Assignment 2 – Jenkins
(Creating a DevOps Pipeline, CI/CD tool)

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SNR: PES1UG20CS243

Task-1

Aim: Set up Jenkins using Docker.

Deliverables:

1. Screenshot of the running Docker Container after installing Jenkins

```
********************************************************
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Jenkins initial setup is required. An admin user has been created and a password generated.
Please use the following password to proceed to installation:

76e43139f3ca47229cceb8e0c9a09cbd

This may also be found at: /var/jenkins_home/secrets/initialAdminPassword

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2023-02-16 05:11:05.816+0000 [id=36]    INFO    jenkins.InitReactorRunner$1#onAttained: Completed initialization
2023-02-16 05:11:05.863+0000 [id=23]    INFO    hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
2023-02-16 05:11:06.567+0000 [id=49]    INFO    h.m.DownloadService$Downloadable#load: Obtained the updated data file for huds
on.tasks.Maven.MavenInstaller
2023-02-16 05:11:06.569+0000 [id=49]    INFO    hudson.util.Retrier#start: Performed the action check updates server successfu
lly at the attempt #1
2023-02-16 05:13:36.917+0000 [id=14]    INFO    hudson.PluginManager#install: Starting installation of a batch of 20 plugins p
lus their dependencies
2023-02-16 05:13:36.925+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of ionicons-ap
i for plugin cloudbees-folder
2023-02-16 05:13:36.926+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of instance-id
entity for plugin ionicons-api
2023-02-16 05:13:36.926+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of bouncycastl
e-api for plugin instance-identity
2023-02-16 05:13:36.927+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of javax-mail-
api for plugin bouncycastle-api
2023-02-16 05:13:36.927+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of javax-activ
ation-api for plugin javax-mail-api
2023-02-16 05:13:36.930+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of sshd for pl
ugin antisamy-markup-formatter
2023-02-16 05:13:36.930+0000 [id=83]    INFO    h.model.UpdateCenter$DownloadJob#run: Starting the installation of javax-activ
ation-api on behalf of admin
2023-02-16 05:13:36.931+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of mina-sshd-a
pi-core for plugin sshd
2023-02-16 05:13:36.932+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of mina-sshd-a
pi-common for plugin mina-sshd-api-core
2023-02-16 05:13:36.934+0000 [id=14]    INFO    hudson.model.UpdateSite$Plugin#deploy: Adding dependent install of token-macro
 for plugin build-timeout
2023-02-16 05:13:36.934+0000 [id=83]    INFO    h.m.UpdateCenter$UpdateCenterConfiguration#download: Downloading javax-activat
```

Task-2

Aim: Set up a job in Jenkins to connect to your repository and build C++ hello.cpp.

Deliverables:

1. Picture showing the console output after the build is successful

✅ **Console Output**

es

le Output

v as plain text

ild Information

build '#1'

ld Data

uild

```
Started by user admin
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/PES1UG20CS243-1
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git
 > git init /var/jenkins_home/workspace/PES1UG20CS243-1 # timeout=10
Fetching upstream changes from https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git
 > git --version # timeout=10
 > git --version # 'git version 2.30.2'
 > git fetch --tags --force --progress -- https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git config remote.origin.url https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git # timeout=10
 > git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
Seen branch in repository origin/main
Seen 1 remote branch
 > git show-ref --tags -d # timeout=10
Checking out Revision cb75f7c5e81129383416686428b59ea055f8c8a8 (origin/main)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f cb75f7c5e81129383416686428b59ea055f8c8a8 # timeout=10
Commit message: "Update hello.cpp"
First time build. Skipping changelog.
[PES1UG20CS243-1] $ /bin/sh -xe /tmp/jenkins6174754373797605687.sh
+ make -C main
make: Entering directory '/var/jenkins_home/workspace/PES1UG20CS243-1/main'
g++ hello.cpp -o hello_exec
make: Leaving directory '/var/jenkins_home/workspace/PES1UG20CS243-1/main'
Finished: SUCCESS
```

2. Picture showing the Stable state of the task in Build History of Jenkins

Build History of Jenkins

S	Build	Time Since ↑	Status	
✅	PES1UG20CS243-1 #2	2 min 35 sec	stable	⌨
✅	PES1UG20CS243-1 #1	11 min	stable	⌨

Icon: S M L   Icon legend 🔊 Atom feed for all 🔊 Atom feed for failures 🔊 Atom feed for just latest builds

Task-3

Aim: Set up a second job that automatically runs after the project builds. This is different from the other job because this will not have a git repository - it doesn't even build

anything.

Just a note: In a real-life scenario you wouldn't run a program through a build job just like this because I/O is not possible via this console. There are other tools people use at this step like SeleniumHQ, SonarQube, or a Deployment. The point of this is to show downstream/upstream job relationships.

Deliverables

1. Console output of second job

Dashboard > PES1UG20CS243-2 > #1

🗐 Status	
</> Changes	
▣ Console Output	
🗋 View as plain text	
🗹 Edit Build Information	
🗑 Delete build '#1'	

✅ **Console Output**

```
Started by upstream project "PES1UG20CS243-1" build number 3
originally caused by:
 Started by user admin
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/PES1UG20CS243-2
[PES1UG20CS243-2] $ /bin/sh -xe /tmp/jenkins15479731737365178519.sh
+ /var/jenkins_home/workspace/PES1UG20CS243-1/main/hello_exec
Hello, World
Hello, Jenkins
I have successfully built and run
Hi my name is Mahika, SRN:PES1UG20CS243Finished: SUCCESS
```

2. Status page of first job

Dashboard > PES1UG20CS243-1 > #3

🗐 Status	
</> Changes	
▣ Console Output	
🗹 Edit Build Information	
🗑 Delete build '#3'	
🔶 Git Build Data	
← Previous Build	

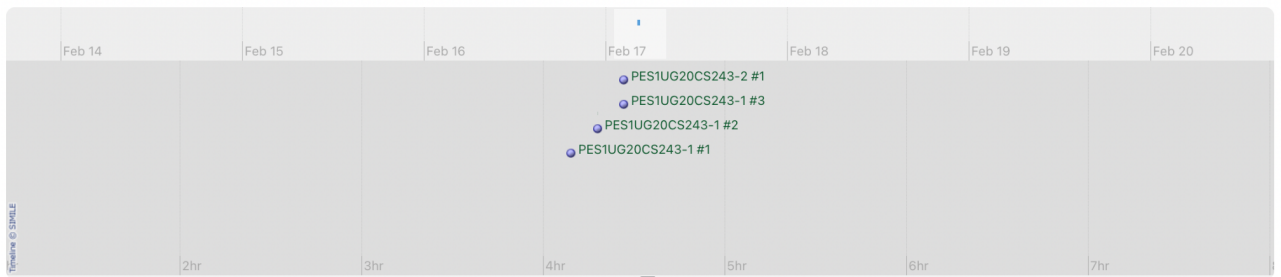✅ **Build #3 (17 Feb 2023, 04:26:46)**

</> No changes.

🕑 Started by user admin

🔶 git **Revision**: cb75f7c5e81129383416686428b59ea055f8c8a8
Repository: https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git

- origin/main

3. Build History of Jenkins

Build History of Jenkins

S	Build		Time Since ↑	Status	
✓	PES1UG20CS243-2	#1	5 min 20 sec	stable	▸_
✓	PES1UG20CS243-1	#3	5 min 27 sec	stable	▸_
✓	PES1UG20CS243-1	#2	13 min	stable	▸_
✓	PES1UG20CS243-1	#1	22 min	stable	▸_

Icon: S   M   L   Icon legend   🔊 Atom feed for all   🔊 Atom feed for failures   🔊 Atom feed for just latest builds

4. Jenkins Dashboard

Task-4

Aim: Add a webhook trigger to your repository in order to automate builds in Jenkins

In the previous tasks, we were polling changes from the repository at an interval of every 5 mins. It is an expensive approach. There is, however, a better approach. By adding a Webhook trigger to your repository and connecting it to your Jenkins server, the instant you commit a change to your repository, your job is automatically executed.
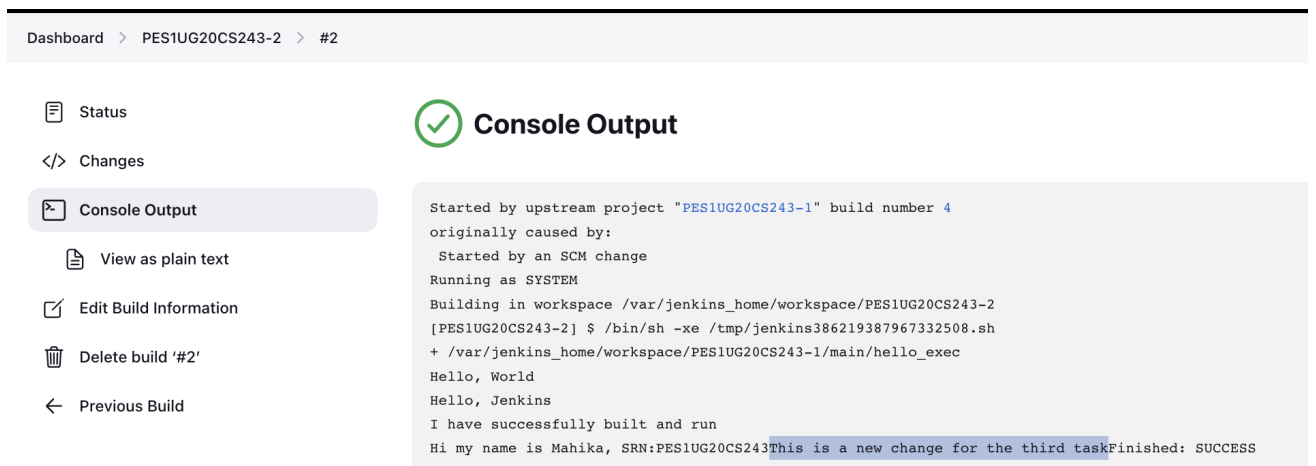
Webhooks allow external services to be notified when certain events happen. When those events happen, a POST request is sent to the designated URL.

Deliverables:

1. Webhook added to your GitHub repository
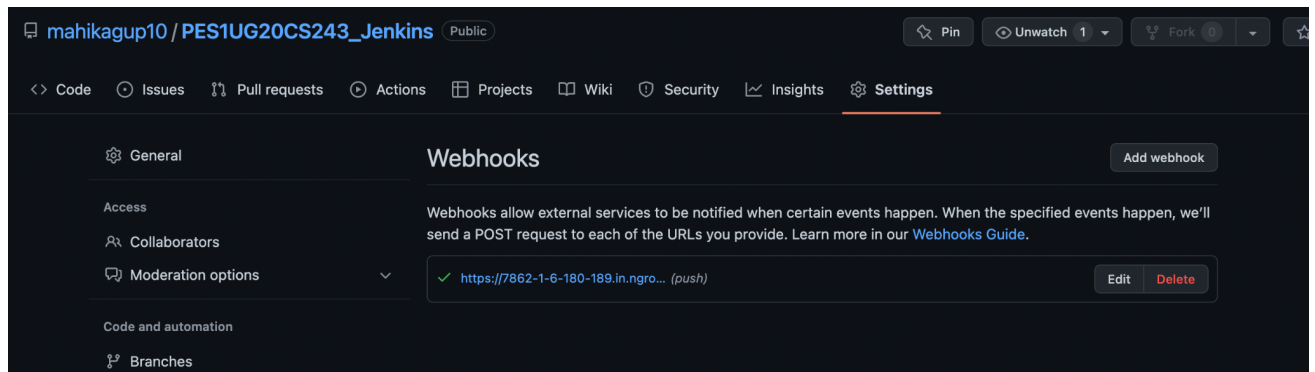
2. Console Output of second job displaying the change made in hello.cpp file.

Task-5

Aim: To create a basic Jenkins pipeline.

Deliverables:

1. Code/script written to create basic pipeline using GitHub repository

mahikagup10 Update Jenkinsfile

👥 **1 contributor**

23 lines (22 sloc)   490 Bytes

```
1    pipeline {
2        agent any
3        stages {
4            stage('Build') {
5                steps {
6                sh "make -C main"
7                    echo 'Build stage completed'
8                }
9            }
10           stage('Test') {
11               steps {
12                   sh "/var/jenkins_home/workspace/pes1ug20cs243-pipeline/main/hello_exec"
13                   echo 'Testing stage completed'
14               }
15           }
16       }
17       post {
18               failure {
19                   echo 'Pipeline Failed'
20               }
21           }
22   }
23
```

2. Output of working created pipeline, the screenshot should include
   - Stage view / Execution status of pipeline with all stages succeeded
   - Verify Declarative: Post Actions stage succeed for handling failures.

Status

Changes

Build Now

Configure

Delete Pipeline

Full Stage View

Rename

Pipeline Syntax

Build History   trend ⌄

🔍 Filter builds...   /

⊗ #4   18 Feb 2023, 17:09
⊗ #3   18 Feb 2023, 17:07
⊗ #2   18 Feb 2023, 17:06
⊘ #1   18 Feb 2023, 17:03

📶 Atom feed for all   📶 Atom feed for failures

Pipeline PES1UG20CS243

Stage View

	Declarative: Checkout SCM	Build	Test	Declarative: Post Actions
Average stage times:	16s	328ms	337ms	37ms
#4 Feb 18 22:39 — 2 commits	16s	319ms	**338ms** failed	33ms
#3 Feb 18 22:37 — No Changes				
#2 Feb 18 22:36 — No Changes	16s	337ms	**337ms** failed	41ms

Permalinks

- Last build (#4), 11 min ago
- Last stable build (#1), 16 min ago
- Last successful build (#1), 16 min ago
- Last failed build (#4), 11 min ago
- Last unsuccessful build (#4), 11 min ago
- Last completed build (#4), 11 min ago

3. Console Output of the Pipeline

Status

</> Changes

▣ Console Output

📄 View as plain text

☑ Edit Build Information

🗑 Delete build '#1'

🔄 Restart from Stage

↪ Replay

▤ Pipeline Steps

📁 Workspaces

→ Next Build

✓ Console Output

```
Started by user admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/PES1UG20CS243
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Status

</> Changes

▣ Console Output

📄 View as plain text

☑ Edit Build Information

🗑 Delete build '#4'

🔶 Git Build Data

🔄 Restart from Stage

↪ Replay

▤ Pipeline Steps

📁 Workspaces

← Previous Build

⊗ Console Output

```
Started by user admin
Lightweight checkout support not available, falling back to full checkout.
Checking out git https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git into
/var/jenkins_home/workspace/PES1UG20CS243@script/f55c72d87436eb4d921329b4a59cd205b436e31209cbfb30edf23c33007b019c to read Jenkinsfile
The recommended git tool is: NONE
No credentials specified
 > git rev-parse --resolve-git-dir /var/jenkins_home/workspace/PES1UG20CS243@script/f55c72d87436eb4d921329b4a59cd205b436e31209cbfb30edf23c33007b019c/.git # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git # timeout=10
Fetching upstream changes from https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git
 > git --version # timeout=10
 > git --version # 'git version 2.30.2'
 > git fetch --tags --force --progress -- https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git +refs/heads/*:refs/remotes/origin/* # timeout=10
Seen branch in repository origin/main
Seen 1 remote branch
 > git show-ref --tags -d # timeout=10
Checking out Revision 5437813ba352d8fdf250e534911722d791b77f4b (origin/main)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f 5437813ba352d8fdf250e534911722d791b77f4b # timeout=10
Commit message: "Update hello.cpp"
 > git rev-list --no-walk 4ffc50794e0dddf4903e8d059a196c13bc367202 # timeout=10
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/PES1UG20CS243
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
The recommended git tool is: NONE
No credentials specified
 > git rev-parse --resolve-git-dir /var/jenkins_home/workspace/PES1UG20CS243/.git # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git # timeout=10
Fetching upstream changes from https://github.com/mahikagup10/PES1UG20CS243_Jenkins.git
 > git --version # timeout=10
```

4. Link to the created GitHub repository

https://github.com/mahikagup10/PES1UG20CS243_Jenkins