

# Cloud Computing Assignment 2

## Details :

- SRN : PES2UG20CS237
- Name : P K Navin Shrinivas
- Section : D

## Task 1 : Using docker to setup Jenkins locally

- Create the following file in the directory :  
Dockerfile :

```
FROM jenkins/jenkins:lts
USER root
RUN apt-get update && apt-get install -y make && apt-get install -y
g++
USER jenkins
```

- Let's build the image :

```
sudo docker build . -t localjenkins:PES2UG20CS237
```

- Run the above image exposing port 8080 to 8080 and port 50000 to 50000 and in interactive mode :

```
sudo docker run -p 8080:8080 -p 50000:50000 -it
localjenkins:PES2UG20CS237 #1.png
```

- Note the password, open put localhost:8080 and make sure to install the github plugin when setting up.

```
1 2
tmux                                0_PES2UG20CS237_P K Navin Shrinivas_A2 - UE20CS35X-Assignments...
2023-02-13 15:46:58.205+0000 [id=44] INFO jenkins.InitReactorRunner$1#onAttained: Augmented all extensions [0/24]
2023-02-13 15:46:58.403+0000 [id=40] INFO jenkins.InitReactorRunner$1#onAttained: System config loaded
2023-02-13 15:46:58.403+0000 [id=30] INFO jenkins.InitReactorRunner$1#onAttained: System config adapted
2023-02-13 15:46:58.404+0000 [id=47] INFO jenkins.InitReactorRunner$1#onAttained: Loaded all jobs
2023-02-13 15:46:58.406+0000 [id=47] INFO jenkins.InitReactorRunner$1#onAttained: Configuration for all jobs updated
2023-02-13 15:46:58.423+0000 [id=66] INFO hudson.util.Retrier#start: Attempt #1 to do the action check updates server
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.codehaus.groovy.vmplugin.v7.Java7$1 (file:/var/jenkins_home/war/WEB-INF/lib/groovy-all-2.4.21.jar) to constructor java.lang.invoke.MethodHandles$Lookup(java.lang.Class,int)
WARNING: Please consider reporting this to the maintainers of org.codehaus.groovy.vmplugin.v7.Java7$1
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
2023-02-13 15:46:58.740+0000 [id=35] INFO jenkins.install.SetupWizard#init:

*****
*****
*****

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

0f4c2f724b614d23a1de3ec6b8aa46c5

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

*****
*****
*****

2023-02-13 15:47:14.041+0000 [id=51] INFO jenkins.InitReactorRunner$1#onAttained: Completed initialization
2023-02-13 15:47:14.056+0000 [id=24] INFO hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running
2023-02-13 15:47:15.261+0000 [id=66] INFO h.m.DownloadService$Downloadable#load: Obtained the updated data file for hudson.tasks.Maven.MavenInstaller
2023-02-13 15:47:15.261+0000 [id=66] INFO hudson.util.Retrier#start: Performed the action check updates server successfully at the attempt #1

[0] 0:zsh- a:[tmux] "zsh" 21:17 13-Feb-23
```

## Task 2 : Setup a jenkins job and connect it to a github repo for auto build.

- Create a new repo and add the following files :  
hello.cpp :

```
//File: hello.cpp
#include <iostream>
using namespace std;
__asm__(".symver realpath,realpath@GLIBC_2.2.5");
// Above line is important as ldd and g++ disagree over glibc
version
int main(void) {
    cout << "Hello, World\n";
    cout << "Hello, Jenkins\n";
    cout << "I have successfully built and run\n";
    return 0;
}
```

Makefile :


```
hello_exec: hello.cpp
    g++ hello.cpp -o hello_exec
```

- Push the repo to github
- Now open up the jenkins dashboard and create a New Item named **SRN-1** in freestyle mode.
- Add the following :
  - Github link
  - select **Git** as **SCM** and enter repo link, go to advanced and add a new brach **\*/main**
  - Build trigger is **Poll SCM** and the schedule **H/5 \* \* \* \***
  - Add build step of **Execute Shell** and the command being :

```
rm -r hello_exec
make
```

- Save and trigger a new build.
- 2.png and 3.png are ss of success build list and console output.

Project PES2UG20CS237-1

 Add description

[Disable Project](#)

#### Permalinks

- [Last build \(#1\), 14 sec ago](#)
- [Last stable build \(#1\), 14 sec ago](#)
- [Last successful build \(#1\), 14 sec ago](#)
- [Last completed build \(#1\), 14 sec ago](#)

Dashboard > PES2UG20CS237-1 > #1

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build '#1'

Git Build Data

Console Output

```

Started by user admin
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/PES2UG20CS237-1
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins
> git init /var/jenkins_home/workspace/PES2UG20CS237-1 # timeout=10
Fetching upstream changes from https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins
> git --version # timeout=10
> git --version # 'git version 2.30.2'
> git fetch --tags --force --progress -- https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins +refs/heads/*:refs/remotes/origin/* # timeout=10
> git config remote.origin.url https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins # 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 927830f8fa147f810905da10bf1700197f907b99 (origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f 927830f8fa147f810905da10bf1700197f907b99 # timeout=10
Commit message: "Junk, I hate create a new repo just for one lab."
First time build. Skipping changelog.
[PES2UG20CS237-1] $ /bin/sh -xe /tmp/jenkins621017223180473350.sh
+ make
make: 'hello_exec' is up to date.
Finished: SUCCESS

```

## Task 3 : Adding post build triggers

- Create a second New Item in free style and only add a build step in Execute shell with the following command :

```

/var/jenkins_home/workspace/<the
name of your first project>/hello_exec

```

- Save and go to the first Item and do the following :
  - Go to the bottom and add a **Post build Action**, Select **build other projects** and enter name of second job.
  - Save this new config and trigger a new build.
- Screenshots :
  - Console output of second job 4.png

Dashboard > PES2UG20CS237-2 > #5

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build '#5'

Previous Build

Console Output

```

Started by upstream project "PES2UG20CS237-1" build number 6
originally caused by:
  Started by user admin
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/PES2UG20CS237-2
[PES2UG20CS237-2] $ /bin/sh -xe /tmp/jenkins15790580949707050570.sh
+ cd /var/jenkins_home/workspace/PES2UG20CS237-1/
+ chmod +x hello_exec
+ ./hello_exec
Hello, World
Hello, Jenkins
I have successfully built and run
Finished: SUCCESS

```

- status page of first 5.png

## Project PES2UG20CS237-1

Add description

Disable Project

### Downstream Projects

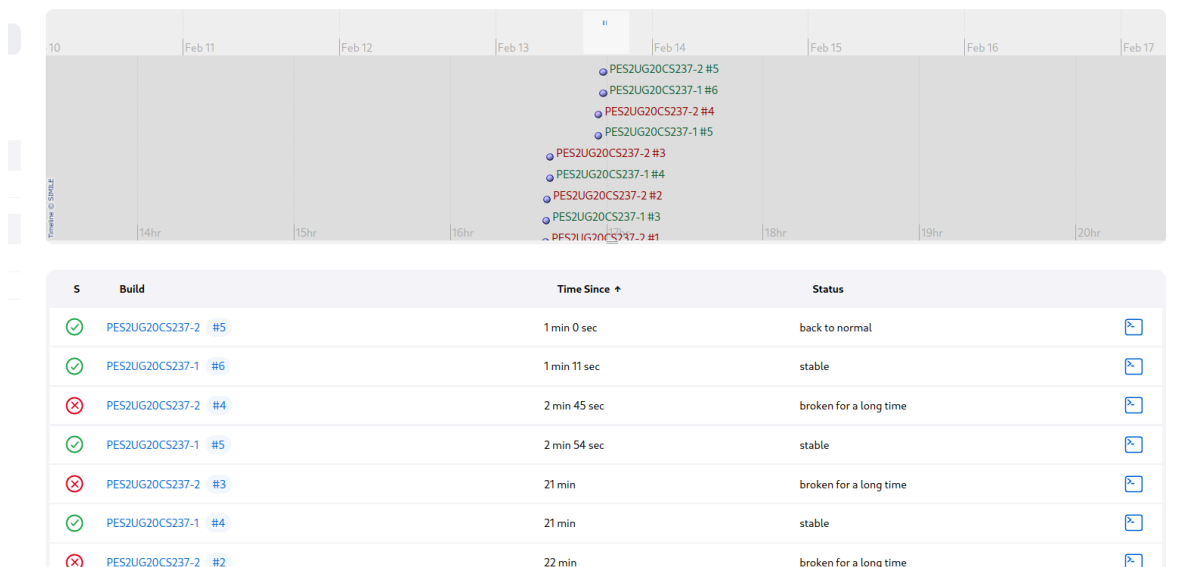
PES2UG20CS237-2

### Permalinks

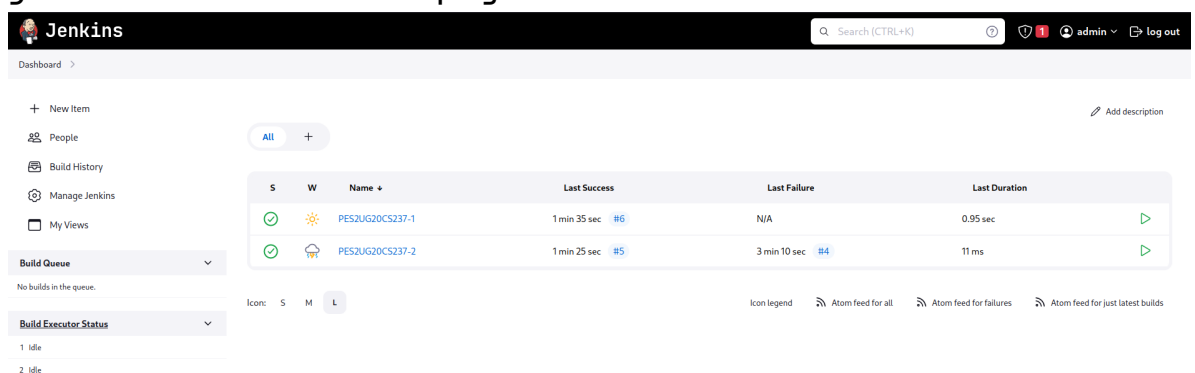
- Last build (#6), 59 sec ago
- Last stable build (#6), 59 sec ago
- Last successful build (#6), 59 sec ago
- Last completed build (#6), 59 sec ago

## • build history of jenkins 6.png

### Build History of Jenkins



## • jenkins dashboard 7.png

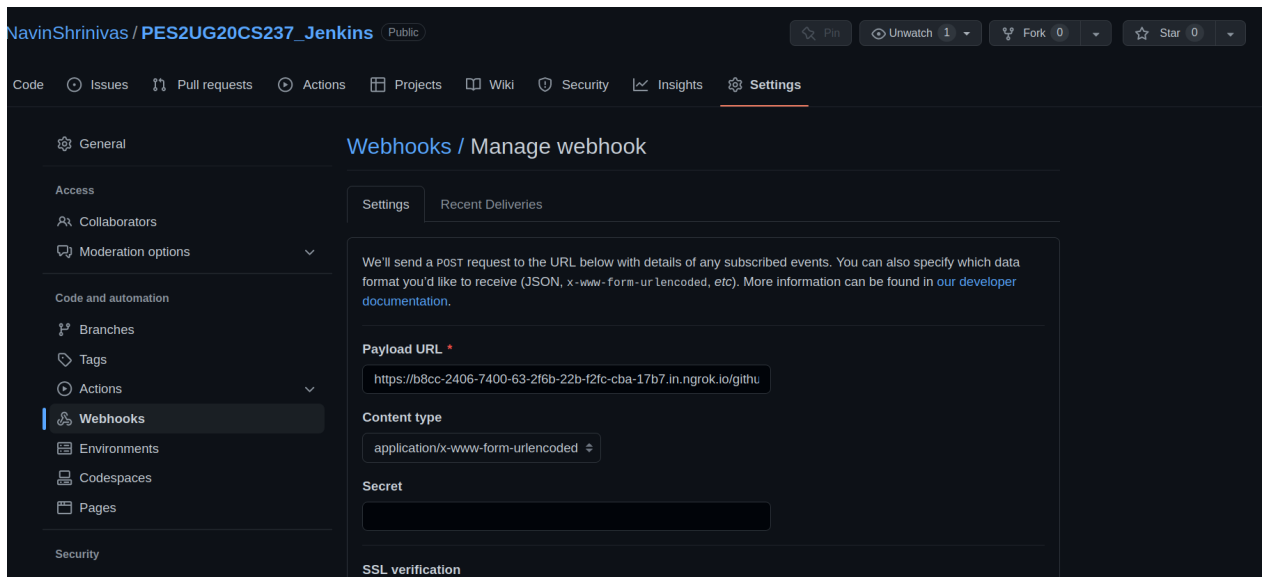


## Task 4 : Adding webhook trigger in github

- Install ngrok
- Expose port 8080 :

ngrok http 8080

- Note the exposing url. This the link to be added in webhook on github. append the needed parts to the webhook such as : `github-webhook`
- Go to setting of the first item and enable `Github hook trigger`
- Now do any change to the repo and a git push should trigger a build automatically!
- Screenshots for this task :



## Task 5 : Creating a jenkins pipeline

- Create a new Item and select pipeline, select the following :
  - github link

- github webhook trigger
- Pipeline from SCM and the usual stuff (remember \*/main)
- The following are the screenshots :
  - SS of script 10.png

```

Jenkinsfile  x |
pipeline {
  agent any
  stages {
    stage('cloning') {
      steps {
        git branch : "main",
        url : "https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins"
      }
    }
    stage("build"){
      steps{
        sh 'rm -r hello_exec'
        sh 'make'
      }
    }
    stage("test"){
      steps{
        sh './hello_exec'
      }
    }
  }
  post{
    failure{
      echo "Pipeline failed"
    }
  }
}

```

- SS of the pipeline steps 11.png

Step	Arguments	Status
Start of Pipeline - (5.3 sec in block)		✓
node - (4.3 sec in block)		✓
node block - (4.1 sec in block)		✓
stage - (1.8 sec in block)	Declarative: Checkout SCM	✓
stage block (Declarative: Checkout SCM) - (1.7 sec in block)		✓
checkout - (1.6 sec in self)		✓
withEnv - (2.1 sec in block)	GIT_BRANCH, GIT_COMMIT, GIT_URL	✓
withEnv block - (2.1 sec in block)		✓
stage - (0.93 sec in block)	cloning	✓
stage block (cloning) - (0.87 sec in block)		✓
git - (0.78 sec in self)		✓
stage - (0.68 sec in block)	build	✓
stage block (build) - (0.63 sec in block)		✓
sh - (0.3 sec in self)	rm -r hello_exec	✓
sh - (0.27 sec in self)	make	✓
stage - (0.36 sec in block)	test	✓
stage block (test) - (0.33 sec in block)		✓
sh - (0.28 sec in self)	./hello_exec	✓

- SS of pipline console output 12.png

```

[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (cloning)
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/jenkins_home/workspace/PES2UG20CS237/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins # timeout=10
Fetching upstream changes from https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins
> git --version # timeout=10
> git --version # 'git version 2.30.2'
> git fetch --tags --force --progress -- https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision 94ffd252132e96b9c2d900237088ed97f06a64e6 (refs/remotes/origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f 94ffd252132e96b9c2d900237088ed97f06a64e6 # timeout=10
> git branch -a -v --no-abbrev # timeout=10
> git checkout -b main 94ffd252132e96b9c2d900237088ed97f06a64e6 # timeout=10
Commit message: "jenkinsfileg"
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (build)
[Pipeline] sh
+ rm -r hello_exec
[Pipeline] sh
+ make
g++ hello.cpp -o hello_exec
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (test)
[Pipeline] sh
+ ./hello_exec
Hello, World
Hello, Jenkins
I have successfully built and run
This is a new version, where builds are being triggered using webhooktesting webhook push
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

- Link to the repo :  
["https://github.com/NavinShrinivas/PES2UG20CS237\\_Jenkins"](https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins)
- Creating an intentional mistake in the pipeline :
  - mistake in script 13.png



```

Jenkinsfile x |
17 pipeline {
16     agent any
15     stages {
14         stage('cloning') {
13             steps {
12                 git branch : "main",
11                 url : "https://github.com/NavinShrinivas/PES2UG20CS237_Jenkins
10             }
9         }
8         stage("build"){
7             steps{
6                 sh 'rm -r hello_exec'
5                 sh 'make'
4             }
3         }
2         stage("test"){
1             steps{
0                 sh './hello'
1             }
2         }
3     }
4     post{
5         failure{
6             echo "Pipline failed"
7         }
8     }
9 }

```

- Failed pipeline stage 14.png

```

Commit message: "mistake"
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (build)
[Pipeline] sh
+ rm -r hello_exec
[Pipeline] sh
+ make
+ make
g++ hello.cpp -o hello_exec
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (test)
[Pipeline] sh (hide)
+ ./hello
/var/jenkins_home/workspace/PES2UG20CS237/tmp/durable-9f99e3c1/script.sh: 1: ./hello: not found
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Declarative: Post Actions)
[Pipeline] echo
Pipline failed
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
ERROR: script returned exit code 127
Finished: FAILURE

```

