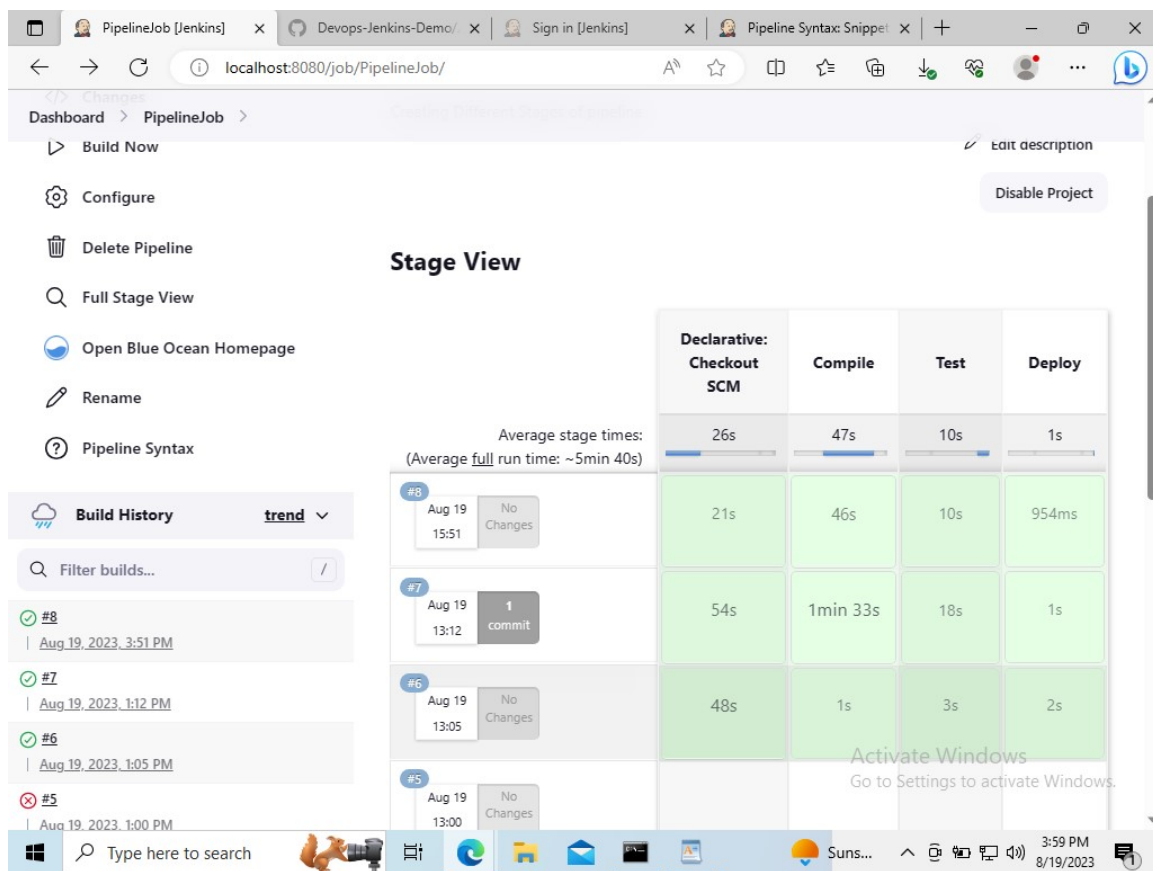


# Jenkins – 201

## Case Study – Continuous Integration

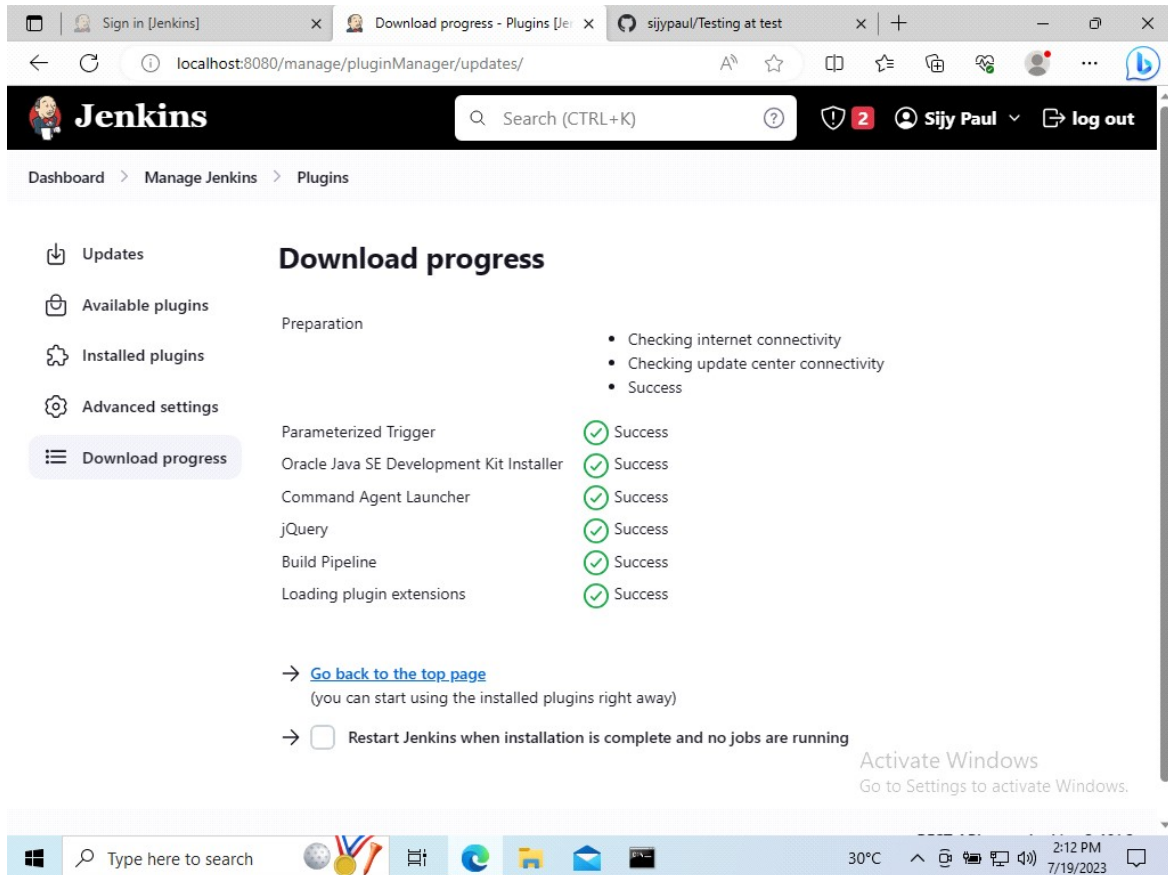
### Goal

Create a build pipeline job



## Details

- Install build pipeline plugin



The screenshot shows the Jenkins 'Download progress' page. The browser address bar indicates the URL is localhost:8080/manage/pluginManager/updates/. The Jenkins header shows the user 'Sijy Paul' is logged in. The left sidebar contains links for Updates, Available plugins, Installed plugins, Advanced settings, and Download progress (which is selected). The main content area is titled 'Download progress' and shows a list of plugins being installed with their status: Parameterized Trigger, Oracle Java SE Development Kit Installer, Command Agent Launcher, jQuery, Build Pipeline, and Loading plugin extensions, all marked as 'Success'. Below the list, there is a link to 'Go back to the top page' and a checkbox to 'Restart Jenkins when installation is complete and no jobs are running'. An 'Activate Windows' watermark is visible in the bottom right corner.

Dashboard > Manage Jenkins > Plugins

Updates  
Available plugins  
Installed plugins  
Advanced settings  
Download progress

### Download progress

Preparation

- Checking internet connectivity
- Checking update center connectivity
- Success

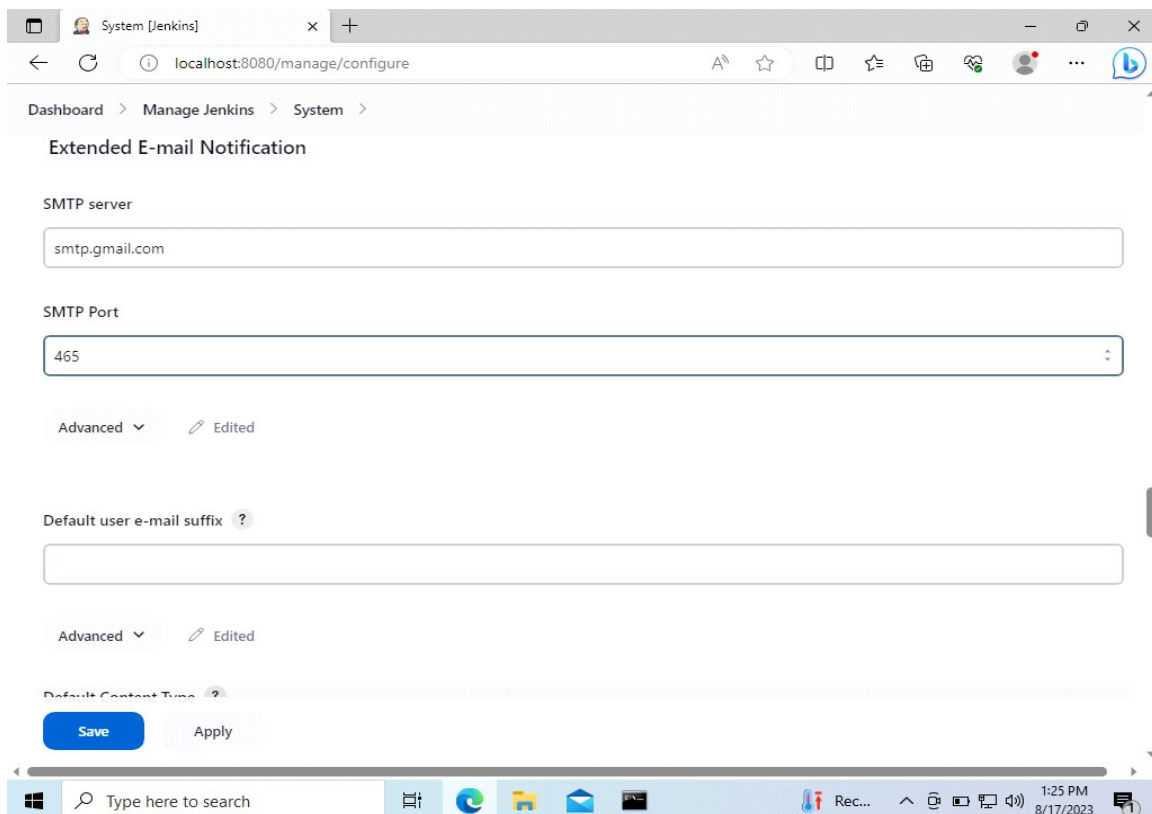
Parameterized Trigger ✓ Success  
Oracle Java SE Development Kit Installer ✓ Success  
Command Agent Launcher ✓ Success  
jQuery ✓ Success  
Build Pipeline ✓ Success  
Loading plugin extensions ✓ Success

→ [Go back to the top page](#)  
(you can start using the installed plugins right away)

→ ☐ Restart Jenkins when installation is complete and no jobs are running

Activate Windows  
Go to Settings to activate Windows.

- Configure email with Jenkins



The screenshot shows the Jenkins 'Extended E-mail Notification' configuration page. The browser address bar indicates the URL is localhost:8080/manage/configure. The left sidebar shows the navigation path: Dashboard > Manage Jenkins > System > Extended E-mail Notification. The main content area has a title 'Extended E-mail Notification' and a sub-header 'SMTP server'. Below this, there is a text input field for the SMTP server (smtp.gmail.com) and a dropdown menu for the SMTP Port (465). There are also buttons for 'Advanced' and 'Edited'. Below the SMTP settings, there is a section for 'Default user e-mail suffix' with a text input field and buttons for 'Advanced' and 'Edited'. At the bottom, there is a section for 'Default Content Type' with a text input field and buttons for 'Save' and 'Apply'.

Dashboard > Manage Jenkins > System > Extended E-mail Notification

### Extended E-mail Notification

SMTP server

smtp.gmail.com

SMTP Port

465

Advanced Edited

Default user e-mail suffix ?

Advanced Edited

Default Content Type ?

Save Apply

System [Jenkins]

localhost:8080/manage/configure

Dashboard > Manage Jenkins > System >

Default Subject ?

Status=\$PROJECT\_NAME - Build # \$BUILD\_NUMBER - \$BUILD\_STATUS!

Maximum Attachment Size ?

-1

Default Content ?

Hi,

Please find the job details below:

\$PROJECT\_NAME - Build # \$BUILD\_NUMBER - \$BUILD\_STATUS:

Check console output at \$BUILD\_URL to view the results.

Thanks,

Devops Team

Note: Please do not reply to this mail

Default Pre-send Script ?

Save

Apply

System [Jenkins]

localhost:8080/manage/configure

Dashboard > Manage Jenkins > System >

Add "Precedence: bulk" Email Header ?

Default Recipients ?

sijypaul.devops@gmail.com

Reply To List ?

Emergency reroute ?

Allowed Domains ?

Excluded Recipients ?

Default Subject ?

Save

Apply

- Create a slave and call it QA environment

The screenshot shows the Jenkins 'Nodes' page. The left sidebar contains links for 'Clouds', 'Node Monitoring', 'Build Queue', and 'Build Executor Status'. The main area displays a table of nodes:

S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Res
	Built-In Node	Windows 10 (amd64)	In sync	14.87 GB	1.43 GB	14.87 GB	
	QA Environment	Windows 10 (amd64)	4.7 sec ahead	N/A	N/A	N/A	
	Data obtained	2 min 22 sec	2 min 22 sec	1 min 58 sec	1 min 58 sec	1 min 58 sec	2 min

Below the table, the 'QA Environment' node is expanded, showing its status as 'Idle'.

The screenshot shows the Jenkins 'Agent QA Environment' page. The left sidebar contains links for 'Status', 'Delete Agent', 'Configure', 'Build History', 'Load Statistics', 'Script Console', 'Log', 'System Information', 'Disconnect', and 'Open Blue Ocean'. The main area displays the following information:

- Agent QA Environment** (Mark this node temporarily offline)
- Jenkins Slave
- Agent is connected.
- Labels**: Jenkins, Slave
- Projects tied to QA Environment**: None



```
Recycle Bin

Command Prompt - java -jar agent.jar -jnlpUrl http://localhost:8080/computer/QA%20Environment/jenkins-agent.jnlp -secret 642589303c07ee2aa6745...

INFO: Using Remoting version: 3107.v665000b 51092
Aug 18, 2023 1:44:54 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\Users\vboxuser\Desktop\QA_Slave\remoting as a remoting work directory
Aug 18, 2023 1:44:56 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Locating server among [http://localhost:8080/]
Aug 18, 2023 1:44:57 PM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Aug 18, 2023 1:44:57 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Agent discovery successful
Agent address: localhost
Agent port: 50203
Identity: 0e:78:3a:c4:cf:26:25:ef:bc:3c:95:47:2e:4d:eb:5a
Aug 18, 2023 1:44:57 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Handshaking
Aug 18, 2023 1:44:57 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connecting to localhost:50203
Aug 18, 2023 1:44:57 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Trying protocol: JNLP4-connect
Aug 18, 2023 1:44:58 PM org.jenkinsci.remoting.protocol.impl.BIONetworkLayer$Reader run
INFO: Waiting for ProtocolStack to start.
Aug 18, 2023 1:45:00 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Remote identity confirmed: 0e:78:3a:c4:cf:26:25:ef:bc:3c:95:47:2e:4d:eb:5a
Aug 18, 2023 1:45:01 PM hudson.remoting.jnlp.Main$CuiListener status
QA-INFO: Connected
```

- Create a pipeline job and trigger it when developer commits the code in GIT

Sign in [Jenkins] x BuildPipelineTest [Jenkins] x sijypaul/Testing at test x +

localhost:8080/view/BuildPipelineTest/

Dashboard > BuildPipelineTest > Build Pipeline

building pipeline job

Trigger a Pipeline Pipeline History Configure Add Step Delete Manage

Run History Configure Add Step Delete Manage

Pipeline #4

#4 Hello Print

Jul 19, 2023 2:18:10 PM

10 sec

sijy

console re-run

Pipeline #3

#3 Hello Print

Jul 19, 2023 2:17:42 PM

26 sec

sijy

console re-run

Pipeline #2

#2 Hello Print

Jul 18, 2023 3:26:04 PM

18 sec

sijy

console re-run

Activate Windows Go to Settings to activate Windows.

- Build the code using Maven/Ant and send the notification to developer in case of build fail

The image shows two screenshots of the Jenkins web interface. The top screenshot displays the main build page for 'Build #16 (Aug 18, 2023, 12:05:09 PM)'. The build status is 'Failed', indicated by a red 'X' icon. The console output is visible, showing the execution of 'mvn clean package' which failed with the error: 'mvn' is not recognized as an internal or external command, operable program or batch file. The bottom screenshot shows the 'Console Output' tab for the same build, providing a detailed view of the terminal logs. The logs show the user running 'java -version' (successful) and 'echo "Hello World!'" (successful), but then attempting to run 'echo' as a command, which fails with the same error: 'echo' is not recognized as an internal or external command, operable program or batch file. The build step 'Execute Windows batch command' is marked as failure, and an email notification is sent to 'sijypaul.devops@gmail.com'. The Jenkins version is 2.401.3.

**Jenkins Build #16 (Aug 18, 2023, 12:05:09 PM)**

Keep this build forever

Started 3 min 24 sec ago  
Took 1 min 52 sec  
[Add description](#)

**Changes**  
No changes.

**Started by user** [Sijy Paul](#)

**Revision:** 30ca4e79fea4ac4cebc3b1cd4a82173b5f161b33  
**Repository:** <https://github.com/sijypaul/Maven-Projects.git>  
• refs/remotes/origin/main

**Module Builds**

Module	Status	Duration
HelloWorld	Success	33 sec

**Console Output**

```
C:\Users\vboxuser\Downloads\Maven-Projects-main\Maven-Projects-main\HelloWorld>mvn clean package
'mvn' is not recognized as an internal or external command,
operable program or batch file.

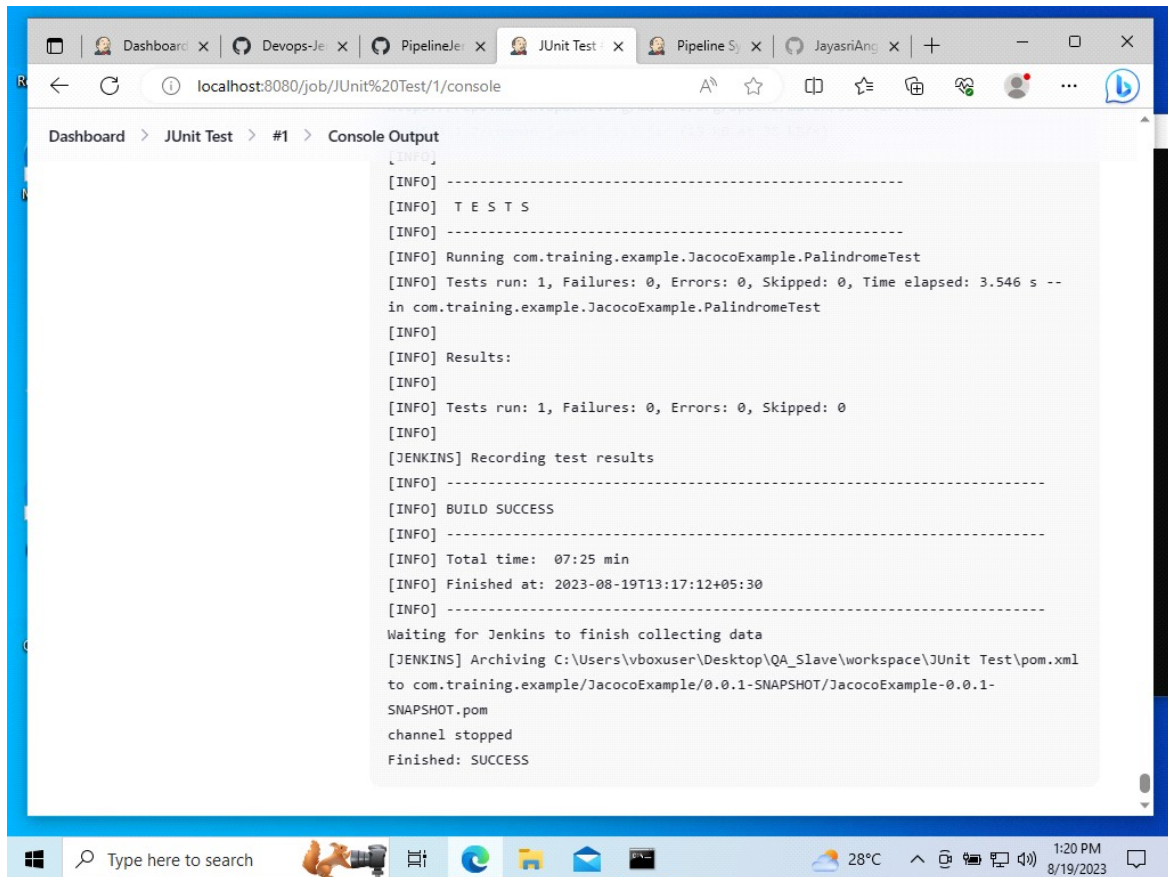
C:\Users\vboxuser\Downloads\Maven-Projects-main\Maven-Projects-main\HelloWorld>java -version
java version "11.0.19" 2023-04-18 LTS
Java(TM) SE Runtime Environment 18.9 (build 11.0.19+9-LTS-224)
Java HotSpot(TM) 64-Bit Server VM 18.9 (build 11.0.19+9-LTS-224, mixed mode)

C:\Users\vboxuser\Downloads\Maven-Projects-main\Maven-Projects-main\HelloWorld>echo "Hello World!!"
'echo' is not recognized as an internal or external command,
operable program or batch file.

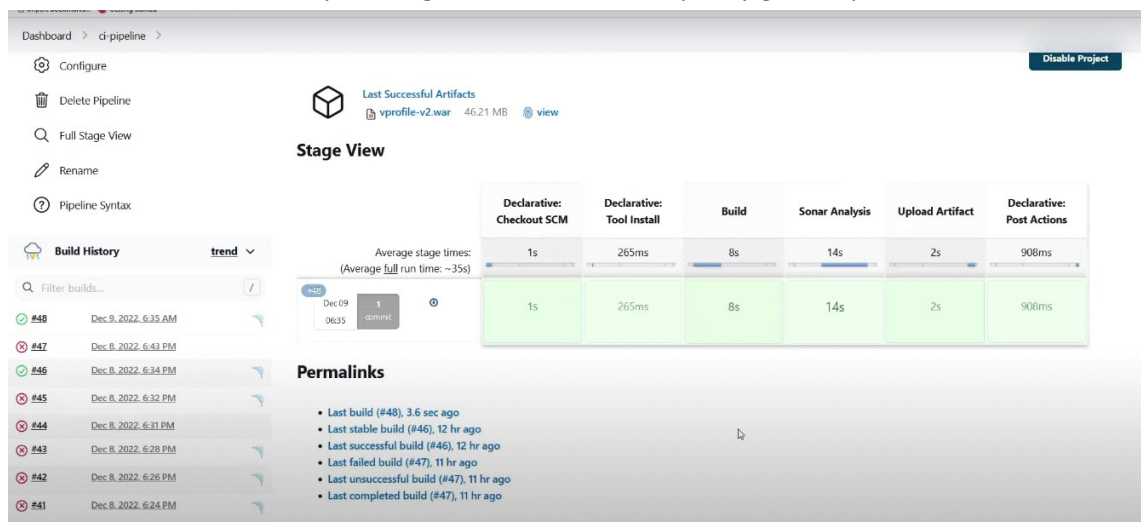
C:\Users\vboxuser\Downloads\Maven-Projects-main\Maven-Projects-main\HelloWorld>exit
9009
Build step 'Execute Windows batch command' marked build as failure
Sending e-mails to: sijypaul.devops@gmail.com
Finished: FAILURE
```

REST API Jenkins 2.401.3

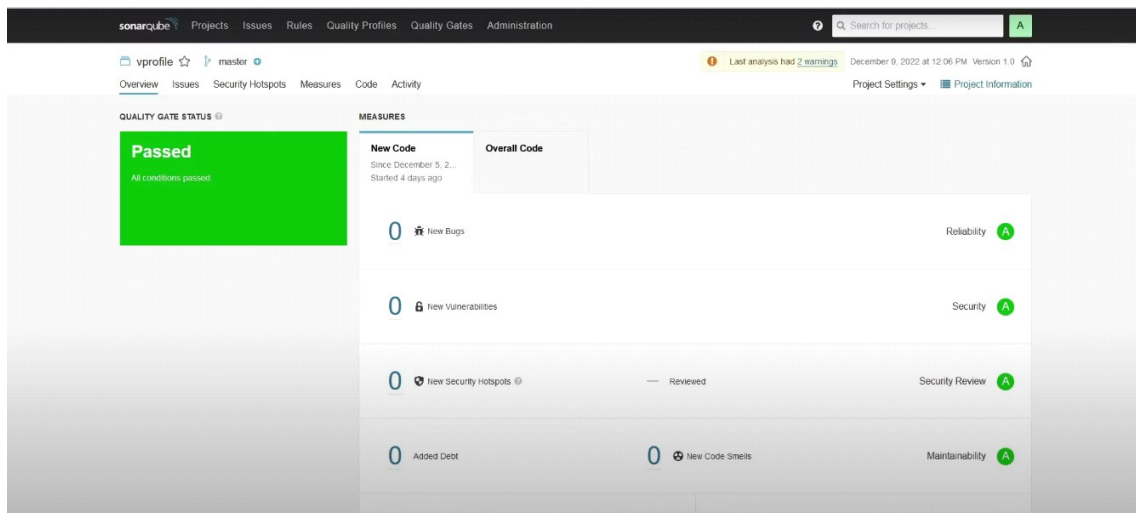
- Unit test the code using Junit



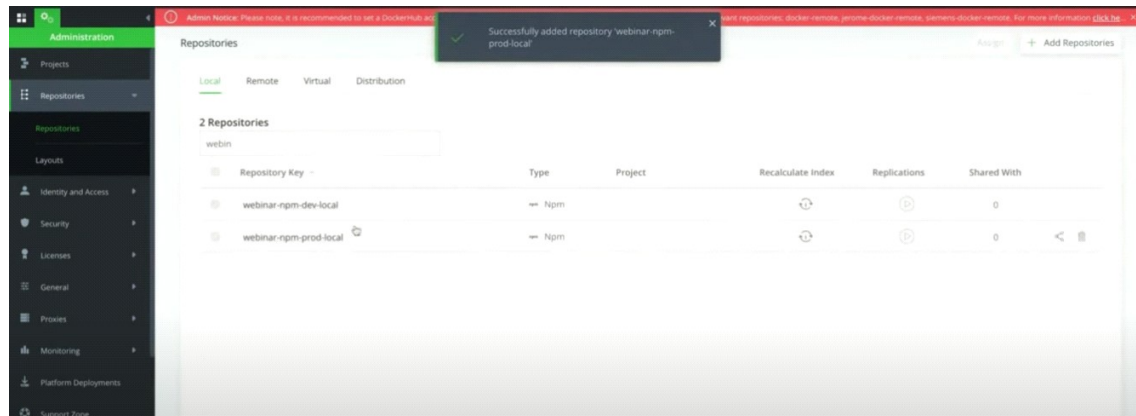
- Do static code analysis using SonarQube, create quality gate to pass to next environment



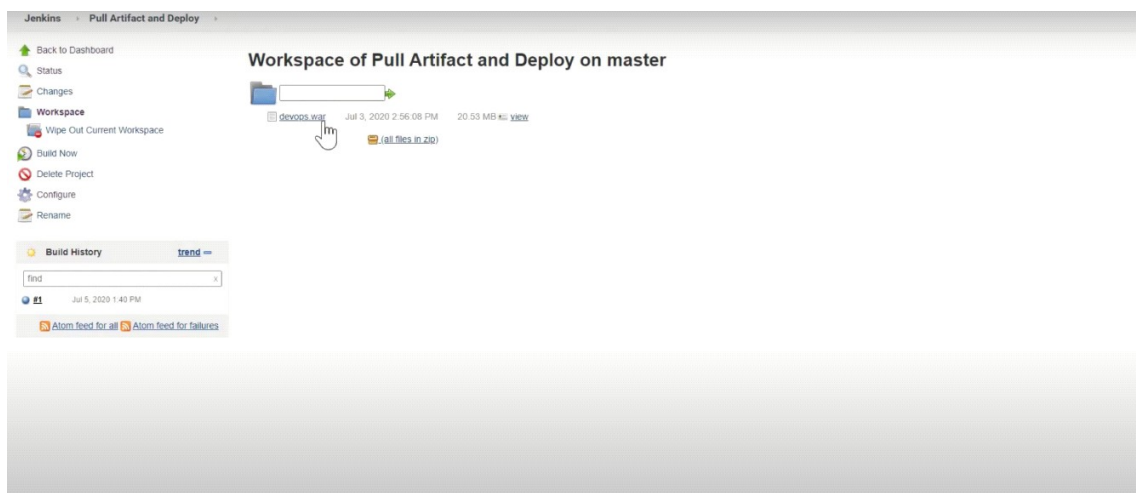




- Create the package and store in Artifactory/Nexus



- Create another job to deploy the code from Artifactory/Nexus to slave QA and host it





- View the status both upstream and downstream job in the dashboard of Jenkins

The screenshot shows the Jenkins 'Project Tests' dashboard. The left sidebar contains navigation links: Status, Changes, Workspace, Build with Parameters, Configure, Delete Project, Rebuild Last, Favorite, Open Blue Ocean Homepage, and Rename. The main content area is titled 'Project Tests' and includes sections for 'Upstream Projects' (with a 'Build' button) and 'Downstream Projects' (with a 'Deploy' button). A 'Permalinks' section lists build information for build #5. The bottom of the dashboard shows a 'Build History' section with a 'trend' dropdown.

- Fail the build and check if email is triggered

The screenshot shows the Jenkins build history page for a job named 'JUnit Job Test'. A modal window titled 'Page Logs (Declarative: Post Actions)' is open, displaying the email configuration for the pipeline. Below the modal, the build history table is visible, showing the status of various builds. The table includes columns for 'Checkout SCM', 'Build', 'compile', 'run', and 'Post Actions'. The 'compile' and 'run' columns show 'failed' status for several builds.

Build	Checkout SCM	Build	compile	run	Post Actions
#5	2min 15s	24s	24s failed	2s failed	14s
#4	2min 22s	20s	19s failed	333ms failed	
#3	8s	10s	24s failed	1s failed	
#2	9s	8s	2s failed	573ms failed	

Fail the quality gate and check if packaging is failed.

The screenshot shows the Jenkins web interface for a pipeline named 'jenkinsfile-git-and-maven'. The left sidebar contains navigation links: Back to Dashboard, Status, Changes, Build now (highlighted), Build scheduled, Configure, Full Stage View, SonarQube, and Pipeline Syntax. The main area displays the 'Stage View' for a build triggered by a commit on April 18, 2018, at 00:51. A table shows the average stage times and the current build's duration for each stage. The 'Quality Gate Status Check' stage is highlighted in red, indicating a failure. Below the table, the 'SonarQube Quality Gate' section shows the project 'my-app' with a status of 'OK'.

**Pipeline jenkinsfile-git-and-maven**

[Recent Changes](#)

**Stage View**

SCM Checkout	Compile-Package	SonarQube Analysis	Quality Gate Status Check
1s	6s	14s	144ms
1s	6s	14s	144ms (passed for this build) <b>failed</b>

**SonarQube Quality Gate**

my-app **OK**