

PROJECT-1

Building a CI/CD Pipeline for a Retail Company

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Task 1: Clone the project from the GitHub link shared in resources to your local machine. Build the code using Maven commands.

Approach i have followed:

- As a given project is based on java I have used maven as a build tool to build the code.

Maven and java are installed already in the master machine. I have run the maven Compile, test, and package tasks successfully in the local environment and produced the results for each and also executed the maven clean install command to build the code.

Before this I have downloaded the sample Java code from the LMS into my own local environment and used git bash to upload to the below newly created public github repository and also I have uploaded all the code that I have developed to do this project in this repository and all the important files are kept within the directory

Github repository:

https://github.com/srinivas30240/Final_Edureka_project.git

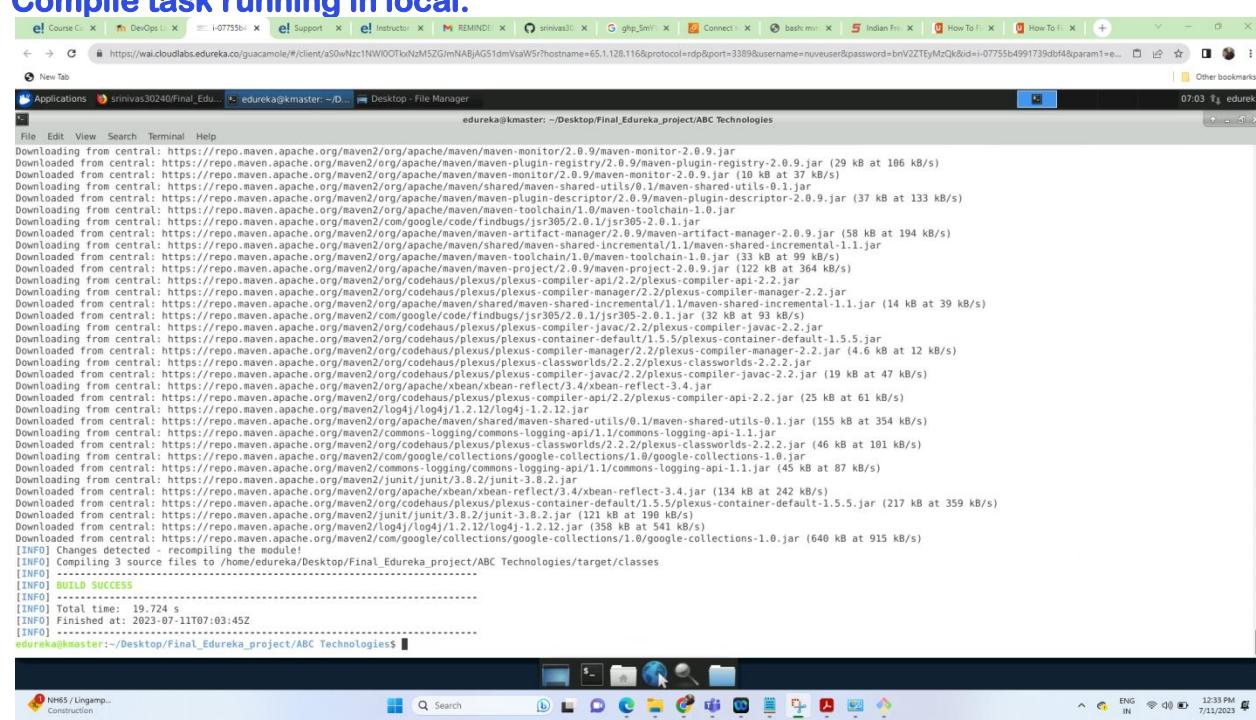
- And executed the below tasks of maven in edureka local environment.

1. [/opt/maven/bin/mvn compile](#)
2. [/opt/maven/bin/mvn test](#)
3. [/opt/maven/bin/mvn package](#)
4. [/opt/maven/bin/mvn clean install](#)

- /opt/maven/bin/mvn - Is the path of the maven executable.

- 1) /opt/maven/bin/mvn compile: Compiles source code of the project
- 2) /opt/maven/bin/mvn test: Runs tests for the project.
- 3) /opt/maven/bin/mvn package: Creates WAR file for the project to convert it into a Distributable format.
- 4) /opt/maven/bin/mvn clean install: Using the clean command, which will delete all? Previously compiled Java .class files and resources (like .properties) in the project.
Build will
Start from a clean slate.
- Install will then compile, test & package my Java project and even install/copy my built .war file into my local Maven repository.
- Below are the snapshots of results that I did in the edureka provided Lab terminal.

Compile task running in local:



```
edureka@kmaster:~/Desktop/Final_Edu...$ mvn clean install
[INFO] Scanning for projects...
[INFO]
[INFO] --- Apache Maven Clean Plugin 3.0.0: clean (default-clean) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Default Surefire Plugin 3.0.0: verify (default-verify) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Compiler Plugin 3.8.1: compile (default-compile) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Resources Plugin 3.2.0: process-resources (default-process-resources) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Plugins Cache Plugin 1.0: cache (default-cache) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven War Plugin 3.2.0: war (default-war) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Assembly Plugin 3.2.0: assembly (default-assembly) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Dependency Plugin 3.1.2: dependency (default-dependency) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Site Plugin 3.6.3: site (default-site) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Help Plugin 3.2.0: help (default-help) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Failsafe Plugin 2.22.2: failsafe (default-failsafe) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Checkstyle Plugin 8.1.1: checkstyle (default-checkstyle) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Findbugs Plugin 3.0.5: findbugs (default-findbugs) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Javadoc Plugin 3.2.0: javadoc (default-javadoc) @ Final_Edu ---
[INFO] [INFO] --- Apache Maven Compiler Plugin 3.8.1: compile (default-compile) @ ABC Technologies ---
[INFO] [INFO] [INFO] [INFO] Changes detected - recompiling the module!
[INFO] [INFO] Compiling 3 source files to /home/edureka/Desktop/Final_Edu_project/ABC Technologies/target/classes
[INFO] [INFO] BUILD SUCCESS
[INFO] [INFO] -----
[INFO] Total time: 19.724 s
[INFO] Finished at: 2023-07-11T07:03:45Z
[INFO] [INFO] -----
```

Test task running in local:

```
el Course C | DevOps L | I-0775bl | el Support | el Instructor | REMIND! | shinivas30 | ghp_SmV | Connect | bash min | Indian Fri | How To F | How To F | el@edureka: ~/Desktop/Final_Edureka_project/ABC Technologies$ 
[New Tab] https://wai.cloudlabs.edureka.co/guacamole/#/client/a50eNzc1NW0OFlk0NzMSZGlmNABjAG51dmVsW5r?hostname=65.1.128.116&protocol=rdp&port=3389&username=nuveuser&password=bnV2ZTExMzQk&id=07755b4991739dbf48&param1=e.. Other bookmarks 07:05 edureka
File Edit View Search Terminal Help
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies
[...]
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/shared/maven-reporting-api/2.12.4/surefire-booter-2.12.4.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/shared/maven-reporting-api/2.12.4/surefire-common-2.12.4.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/shared/maven-common-artifact-filters/1.3/maven-common-artifact-filters-1.3.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-common-lang3/3.1/commons-lang3-3.1.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-common-lang3/3.1/commons-lang3-3.1.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-common-lang3/3.1/commons-lang3-3.1.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-common-lang3/3.1/commons-lang3-3.1.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/reporting/maven-reporting-api/2.0.9/maven-reporting-api-2.0.9.jar (35 kB at 434 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/reporting/maven-reporting-api/2.0.9/maven-reporting-api-2.0.9.jar (31 kB at 183 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/reporting/maven-reporting-api/2.0.9/maven-reporting-api-2.0.9.jar (10 kB at 45 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugin-tools/maven-toolchain/2.0.9/maven-toolchain-2.0.9.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-booter/2.12.4/surefire-booter-2.12.4.jar (118 kB at 417 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugin-tools/maven-plugin-annotations/3.1/maven-plugin-annotations-3.1.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugin-tools/maven-toolchain/2.0.9/maven-toolchain-2.0.9.jar (38 kB at 123 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugin-tools/maven-plugin-annotations/3.1/maven-plugin-annotations-3.1.jar (14 kB at 41 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-common/2.12.4/surefire-common-2.12.4.jar (22 kB at 657 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-junit4/2.12.4/surefire-junit4-2.12.4.jar (263 kB at 644 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/commons/commons-lang3/3.1/commons-lang3-3.1.jar (31 kB at 782 kB/s)
[INFO] Surefire report directory: /home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/surefire-reports
[INFO] Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/reporting/maven-reporting-api/2.0.9/maven-reporting-api-2.0.9.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-junit4/2.12.4/surefire-junit4-2.12.4.jar (2.4 kB at 75 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-providers/2.12.4/surefire-providers-2.12.4.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-providers/2.12.4/surefire-providers-2.12.4.pom (2.3 kB at 63 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-junit4/2.12.4/surefire-junit4-2.12.4.jar (37 kB at 1.6 MB/s)
[...]
T E S T S
-----
Running com.abc.DataAccessObject.ProductingTest
Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.135 sec
Results :
Tests run: 4, Failures: 0, Errors: 0, Skipped: 0
[INFO] -----
[INFO] -----
[INFO] Total time: 7.206 s
[INFO] Finished at: 2023-07-11T07:05:07Z
[INFO] -----
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies$ 
```

Package task running in local:

```
el Course C | DevOps L | I-0775bl | el Support | el Instructor | REMIND! | shinivas30 | ghp_SmV | Connect | bash min | Indian Fri | How To F | How To F | el@edureka: ~/Desktop/Final_Edureka_project/ABC Technologies/target
[New Tab] https://wai.cloudlabs.edureka.co/guacamole/#/client/a50eNzc1NW0OFlk0NzMSZGlmNABjAG51dmVsW5r?hostname=65.1.128.116&protocol=rdp&port=3389&username=nuveuser&password=bnV2ZTExMzQk&id=07755b4991739dbf48&param1=e.. Other bookmarks 07:05 edureka
File Edit View Search Terminal Help
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies/target
[...]
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-mapping/3.0.0/maven-mapping-3.0.0.jar (11 kB at 20 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-mapping/3.0.0/maven-mapping-3.0.0.jar (11 kB at 20 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/codhaus/plexus/plexus-utils/3.1.0/plexus-utils-3.1.0.jar (262 kB at 430 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/commons/commons-compress/1.16.1/commons-compress-1.16.1.jar (566 kB at 905 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/com/thoughtworks/xstream/xstream/1.4.10/xstream-1.4.10.jar (590 kB at 923 kB/s)
[INFO] Packaging webapp
[INFO] Assembling webapp [ABCtechnologies] in [/home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/ABCTechnologies-1.0]
[INFO] Processing war project
[INFO] Copying webapp resources [/home/edureka/Desktop/Final_Edureka_project/ABC Technologies/src/main/webapp]
[INFO] Webapp assembled in [231 ms]
[INFO] Building war: [/home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/ABCTechnologies-1.0.war]
[INFO] ...
[INFO] --- jacoco-maven-plugin:0.8.6:report (jacoco-site) @ ABCTechnologies ---
[INFO] Loading execution data file /home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] ...
[INFO] BUILD SUCCESS
[INFO] ...
[INFO] Total time: 9.788 s
[INFO] Finished at: 2023-07-11T07:06:09Z
[INFO] -----
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies$ ls -ltr
total 7016
-rw-r--r-- 1 edureka edureka 794 Aug 31 2022 pom.xml.bak
-rw-r--r-- 1 edureka edureka 2083 Sep 6 2022 pom.xml
-rw-r--r-- 1 edureka edureka 4083 Sep 6 2022 README.md
drwxrwxr-x 4 edureka edureka 4096 Jul 11 01:51 src
drwxr-xr-x 11 edureka edureka 4096 Jul 11 07:06 target
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies$ cd target/
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies/target$ ls -l
total 7016
drwxr--r-- 4 edureka edureka 4096 Jul 11 07:06 ABCTechnologies-1.0
-rw-r--r-- 1 edureka edureka 7132820 Jul 11 07:06 ABCTechnologies-1.0.war
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:03 classes
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:03 generated-sources
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:05 generated-test-sources
-rw-r--r-- 1 edureka edureka 8576 Jul 11 07:06 jacoco.exec
drwxr--r-- 2 edureka edureka 4096 Jul 11 07:06 maven-archiver
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:03 maven-status
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:06 sites
drwxr--r-- 2 edureka edureka 4096 Jul 11 07:06 surefire-reports
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:05 test-classes
drwxr--r-- 3 edureka edureka 4096 Jul 11 07:05 test-classes
edureka@kmaster: ~/Desktop/Final_Edureka_project/ABC Technologies/target$ 
```

Clean \$ install task running in local:

```

[INFO] Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.202 sec
Results :

Tests run: 4, Failures: 0, Errors: 0, Skipped: 0

[INFO]
[INFO] --- maven-war-plugin:3.2.2:war (default-war) @ ABCTechnologies ---
[INFO] Packaging webapp
[INFO] Assembling webapp [ABCTechnologies] in [/home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/ABCtechnologies-1.0]
[INFO] Processing war project
[INFO] Copying webapp resources [/home/edureka/Desktop/Final_Edureka_project/ABC Technologies/src/main/webapp]
[INFO] Webapp assembled in [153 ms]
[INFO] Building war: [/home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/ABCtechnologies-1.0.war]
[INFO]
[INFO] --- jacoco-maven-plugin:0.8.6:report (jacoco-site) @ ABCTechnologies ---
[INFO] Loading execution data file /home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO]
[INFO] --- maven-install-plugin:2.4:install (default-install) @ ABCTechnologies ---
Download from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0.5/plexus-utils-3.0.5.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0.5/plexus-utils-3.0.5.pom (2.5 kB at 55 kB/s)
Download from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus/3.1/plexus-3.1.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus/3.1/plexus-3.1.pom (19 kB at 54 kB/s)
Download from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-digest/1.0/plexus-digest-1.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-digest/1.0/plexus-digest-1.0.pom (1.1 kB at 35 kB/s)
Download from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-components/1.1.7/plexus-components-1.1.7.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-components/1.1.7/plexus-components-1.1.7.pom (5.0 kB at 355 kB/s)
Download from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-container-default/1.0-alpha-8/plexus-container-default-1.0-alpha-8.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-container-default/1.0-alpha-8/plexus-container-default-1.0-alpha-8.pom (7.3 kB at 173 kB/s)
Download from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-digest/1.0/plexus-digest-1.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-digest/1.0/plexus-digest-1.0.jar (12 kB at 129 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.0.5/plexus-utils-3.0.5.jar (238 kB at 1.4 MB/s)
[INFO] Installing /home/edureka/Desktop/Final_Edureka_project/ABC Technologies/target/ABCtechnologies-1.0.war to /home/edureka/.m2/repository/com/abc/ABCTechnologies/1.0/ABCtechnologies-1.0.pom
[INFO] Installing /home/edureka/Desktop/Final_Edureka_project/ABC Technologies/pom.xml to /home/edureka/.m2/repository/com/abc/ABCTechnologies/1.0/ABCtechnologies-1.0.pom
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 8.497 s
[INFO] Finished at: 2023-07-11T07:27:58Z
[INFO] ------------------------------------------------------------------------
edureka@kmaster:~/Desktop/Final_Edureka_project/ABC Technologies$ 

```

History and target folder after the maven tasks completed:

```

104 ls
105 cd ABC\ Technologies/
106 ls
107 git init
108 git status
109 git add .
110 git status
111 git commit -m "added file"
112 git status
113 git add *
114 git status
115 git add .classpath
116 git status
117 git add .project
118 git add .settings/
119 git status
120 git add -m "added .file"
121 git commit -m "added .file"
122 git status
123 git push https://github.com/srinivas30240/Final_Edureka_project.git
124 git push --set-upstream https://github.com/srinivas30240/Final_Edureka_project.git master
125 ls
126 mvn compile
127 mvn test
128 mvn package
129 ls -ltr
130 cd target/
131 ls
132 history
edureka@kmaster:~/Desktop/Final_Edureka_project/ABC Technologies/target$ ls -l
total 7916
drwxr-xr-x  4 edureka edureka 4096 Jul 11 07:06 ABCTechnologies-1.0
-rw-r--r--  1 edureka edureka 7132820 Jul 11 07:06 ABCTechnologies-1.0.war
drwxr-xr-x  3 edureka edureka 4096 Jul 11 07:03 classes
drwxr-xr-x  3 edureka edureka 4096 Jul 11 07:03 generated-sources
drwxr-xr-x  3 edureka edureka 4096 Jul 11 07:03 generated-test-sources
-rw-r--r--  1 edureka edureka 8576 Jul 11 07:03 jacoco.exec
drwxr-xr-x  2 edureka edureka 4096 Jul 11 07:06 maven-archiver
drwxr-xr-x  3 edureka edureka 4096 Jul 11 07:03 maven-status
drwxr-xr-x  3 edureka edureka 4096 Jul 11 07:06 site
drwxr-xr-x  2 edureka edureka 4096 Jul 11 07:05 surefire-reports
drwxr-xr-x  3 edureka edureka 4096 Jul 11 07:05 test-classes
edureka@kmaster:~/Desktop/Final_Edureka_project/ABC Technologies/target$ 

```

Task 2: Set up the Git repository and push the source code. Then, log in to Jenkins.

2. Create a build pipeline containing a job for each

- One for compiling source code
- Second for testing source code
- Third for packing the code

2. Execute the CI/CD pipeline to execute the jobs created in step 1

3. Set up a master-slave node to distribute the tasks in the pipeline

Approach i have followed:

- Jenkins has been installed in master server already so i have created the 3 jobs for Compile, test, package in Jenkins and created pipeline with these 3 jobs and set up the agent

Machine(slave machine) and shared the load to agent as well.

- As a given project is based on java i have used maven to build the code and Jenkins is a Build automation server that helps to automate these things so i have set up the java, maven paths of master in global tool configuration in Jenkins and set up the Jenkins goals and left git

Path as default.

- Tools location:

[`/opt/maven`](#)

[`/usr/lib/jvm/java-8-oracle`](#)

- Goals:

[`Compile`](#)

[`Test`](#)

[`Package`](#)

Please find the screenshots of the above task-2:

Jenkins

Welcome to Jenkins!

This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.

Start building your software project

New Item

People

Build History

Manage Jenkins

My Views

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

Create a job

Set up a distributed build

Set up an agent

Configure a cloud

Learn more about distributed builds

Global tool configuration:

The following installed plugins are deprecated:

Popper.js 2 API Plugin
JavaScript GUI Libs: ACE Editor bundle plugin

In general, this means that these plugins are either obsolete, no longer being developed, or may no longer work. See the linked web pages for further information about the cause for the deprecation, and suggestions on how to proceed.

Dependency errors:

SSH server [3.270.vb_a_e71e64c287]:
Plugin is missing: mina-sshd-api-core (2.9.20.va_0e1f42659a_a)

New version of Jenkins (2.401.2) is available for download (changelog)

Building on the built-in node can be a security issue. You should set up distributed builds. See the documentation.

Go to plugin manager

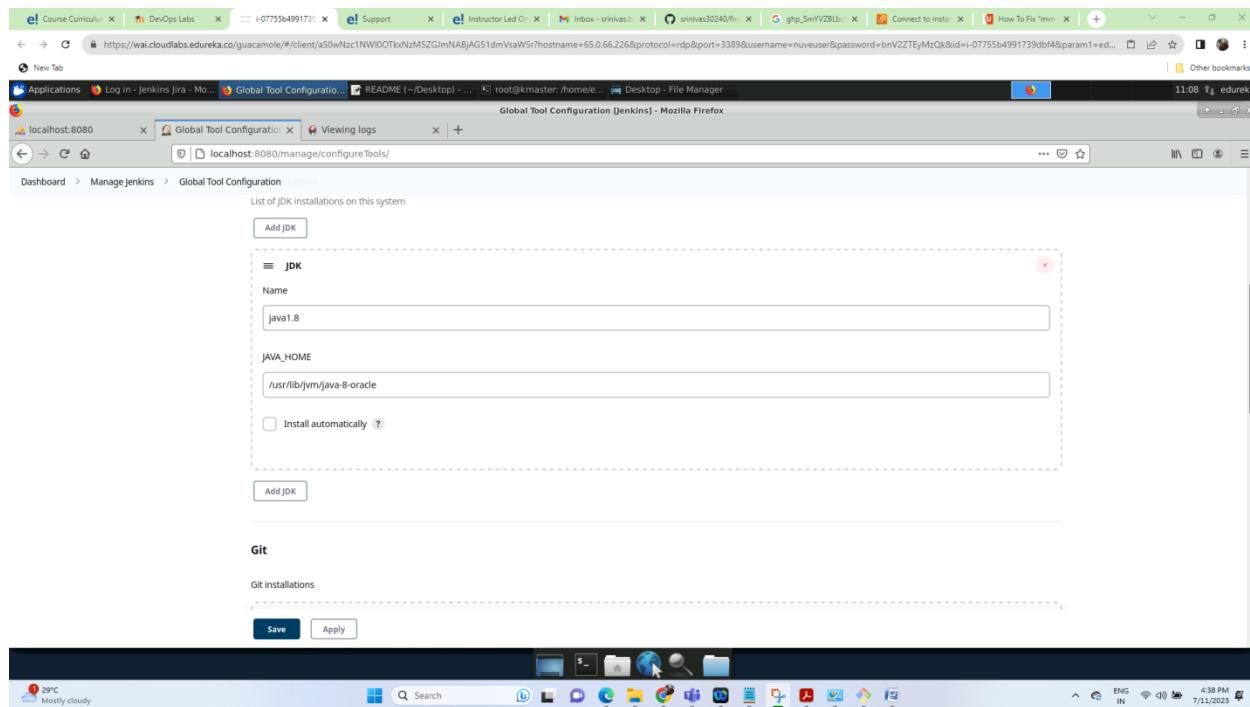
Configure which of these warnings are shown

Warnings have been published for the following currently installed components:

Jenkins 2.361.1 core and libraries:
Multiple security vulnerabilities in Jenkins 2.393 and earlier, LTS 2.375.3 and earlier
CSRF bypass vulnerability

Email Extension Plugin 2.92

Tool location configuration for java:



The screenshot shows the Jenkins Global Tool Configuration page for Java. It displays a single entry for 'java1.8' with the path '/usr/lib/jvm/java-8-oracle'. There is an 'Install automatically' checkbox which is unchecked. Below this section, there is a 'Git' configuration section.

JDK

- Name: java1.8
- JAVA_HOME: /usr/lib/jvm/java-8-oracle
- Install automatically

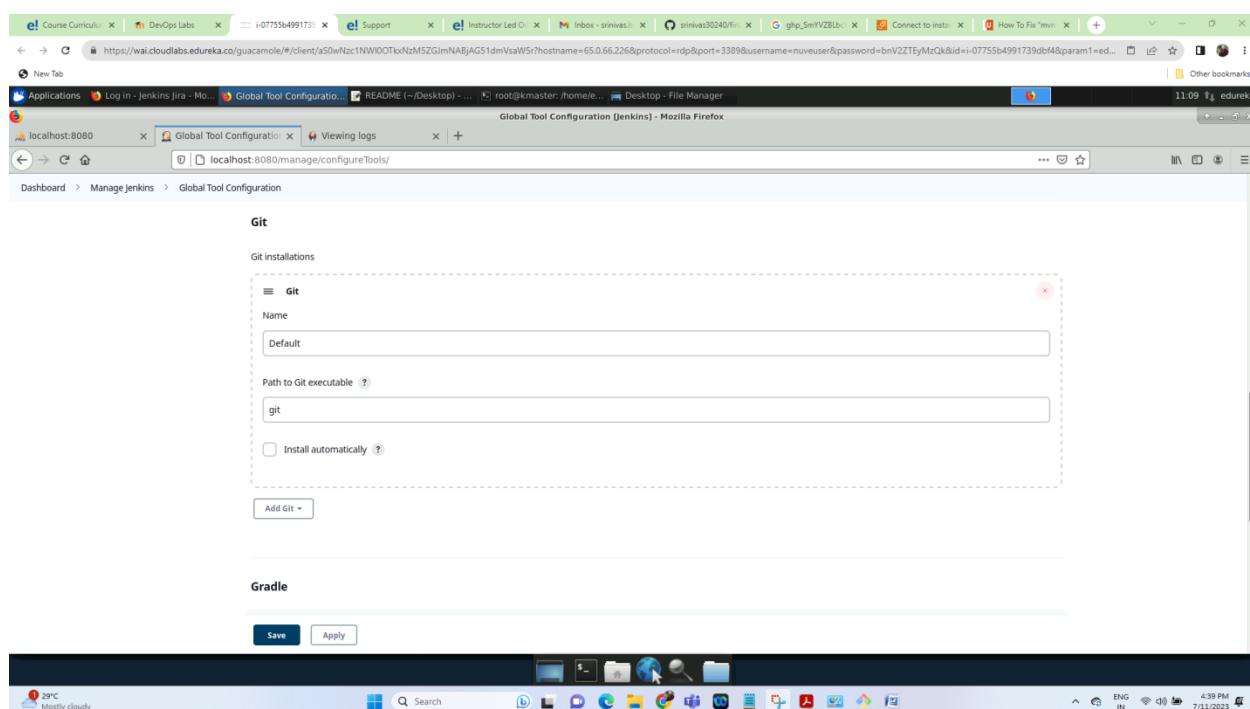
Git

Git installations

Save **Apply**

System tray icons: 29°C, Mostly cloudy, ENG IN, 4:38 PM, 7/11/2023

Tool location configuration for git as default:



The screenshot shows the Jenkins Global Tool Configuration page for Git. It displays a single entry for 'Default' with the path 'git'. There is an 'Install automatically' checkbox which is unchecked. Below this section, there is a 'Gradle' configuration section.

Git

Git installations

- Name: Default
- Path to Git executable: git
- Install automatically

Gradle

Save **Apply**

System tray icons: 29°C, Mostly cloudy, ENG IN, 4:39 PM, 7/11/2023

Tool configuration for maven:

The screenshot shows the Jenkins Global Tool Configuration interface for Maven. The main title is "Maven". Under "Maven installations", there is a single entry named "maven3.6.3". The configuration fields include "Name" (maven3.6.3), "MAVEN_HOME" (/opt/maven), and an unchecked checkbox for "Install automatically". At the bottom are "Save" and "Apply" buttons.

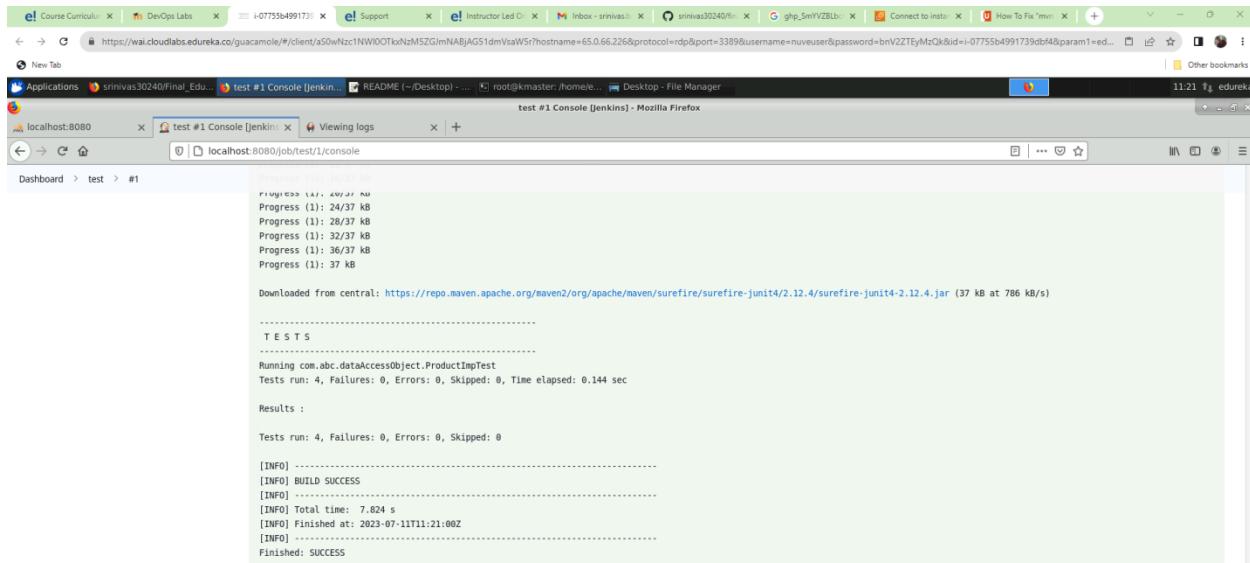
Compile job result in Jenkins:

The screenshot shows the Jenkins job console output for a Maven build. The log output is as follows:

```
Progress (1): 589/640 kB
Progress (1): 594/640 kB
Progress (1): 598/640 kB
Progress (1): 602/640 kB
Progress (1): 606/640 kB
Progress (1): 610/640 kB
Progress (1): 614/640 kB
Progress (1): 618/640 kB
Progress (1): 622/640 kB
Progress (1): 626/640 kB
Progress (1): 630/640 kB
Progress (1): 634/640 kB
Progress (1): 639/640 kB
Progress (1): 640 kB

Downloaded from central: https://repo.maven.apache.org/maven2/com/google/collections/google-collections/1.0/google-collections-1.0.jar (640 kB at 630 kB/s)
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 3 source files to /var/lib/jenkins/workspace/compile/target/classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 24.673 s
[INFO] Finished at: 2023-07-11T11:14:51Z
[INFO] -----
Finished: SUCCESS
```

Test job results in Jenkins:



The screenshot shows a Mozilla Firefox window with multiple tabs open. The active tab displays the Jenkins console output for a test job. The output shows the download of a Maven Surefire JUnit jar file from central, followed by the execution of a com.abc.DataAccessObject.ProductImplTest class. The results indicate 4 tests run, 0 failures, 0 errors, and 0 skipped. The build concludes with a BUILD SUCCESS message.

```
Progress (1): 24/37 kB
Progress (1): 28/37 kB
Progress (1): 32/37 kB
Progress (1): 36/37 kB
Progress (1): 37 kB

downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/surefire/surefire-junit4/2.12.4/surefire-junit4-2.12.4.jar (37 kB at 786 kB/s)

T E S T S
-----
Running com.abc.DataAccessObject.ProductImplTest
Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.144 sec

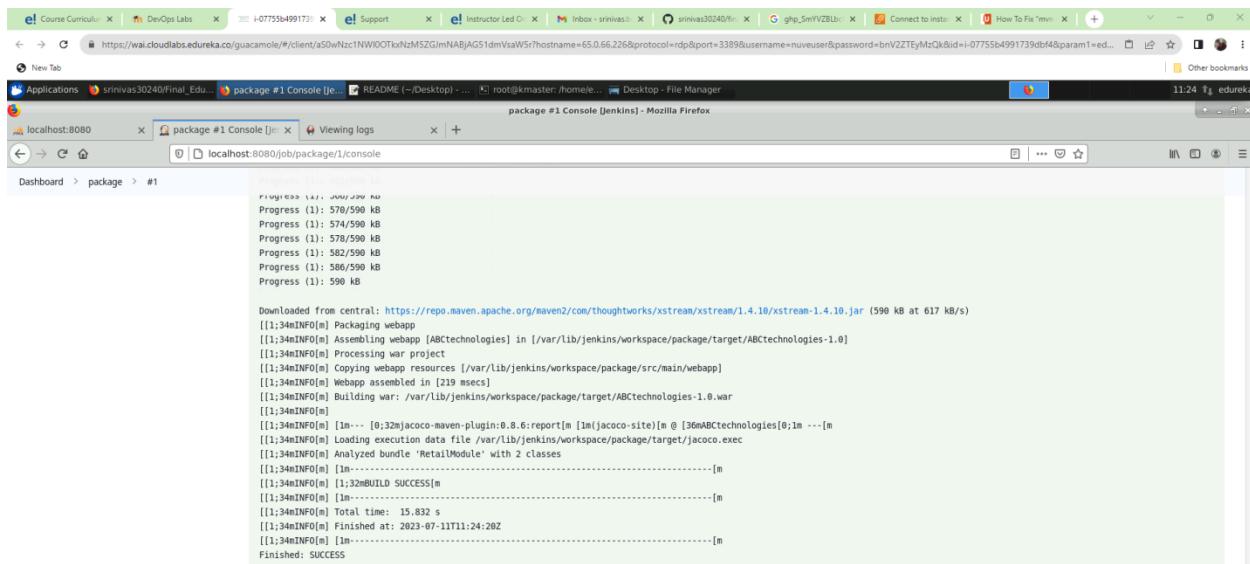
Results :

Tests run: 4, Failures: 0, Errors: 0, Skipped: 0

[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 7.824 s
[INFO] Finished at: 2023-07-11T11:21:00Z
[INFO] -----
Finished: SUCCESS
```



Test result for packaging:



The screenshot shows a Mozilla Firefox window displaying the Jenkins console output for a package job. The output details the download of a Thoughtworks XStream jar file from central, followed by the assembly of a webapp project named ABCtechnologies. The log shows the copying of resources, war assembly, and finally the building of the war file. The total execution time was 15.832 seconds, and the build concluded with a BUILD SUCCESS message.

```
Progress (1): 200/200 kB
Progress (1): 570/500 kB
Progress (1): 574/500 kB
Progress (1): 578/500 kB
Progress (1): 582/500 kB
Progress (1): 586/500 kB
Progress (1): 590 kB

Downloaded from central: https://repo.maven.apache.org/maven2/com/thoughtworks/xstream/xstream/1.4.10/xstream-1.4.10.jar (590 kB at 617 kB/s)
[1;34mINFO[0m] Packaging webapp
[1;34mINFO[0m] Assembling webapp [ABCtechnologies] in [/var/lib/jenkins/workspace/package/target/ABCtechnologies-1.0]
[1;34mINFO[0m] Processing war project
[1;34mINFO[0m] Copying webapp resources [/var/lib/jenkins/workspace/package/src/main/webapp]
[1;34mINFO[0m] Webapp assembled in [219 msec]
[1;34mINFO[0m] Building war: [/var/lib/jenkins/workspace/package/target/ABCtechnologies-1.0.war
[1;34mINFO[0m]
[1;34mINFO[0m] [1m--> [0;32m]jacoco-maven-plugin:0.8.6:report[m [1m(jacoco-site)[m @ [36mABCtechnologies[0;1m -->[m
[1;34mINFO[0m] Loading execution data file [/var/lib/jenkins/workspace/package/target/jacoco.exec
[1;34mINFO[0m] Analyzed bundle 'RetailModule' with 2 classes
[1;34mINFO[0m] [1m-----[m
[1;34mINFO[0m] [1;32mBUILD SUCCESS[m
[1;34mINFO[0m] [1m-----[m
[1;34mINFO[0m] Total time: 15.832 s
[1;34mINFO[0m] Finished at: 2023-07-11T11:24:20Z
[1;34mINFO[0m] [1m-----[m
Finished: SUCCESS
```



Upstream and Downstream Project:

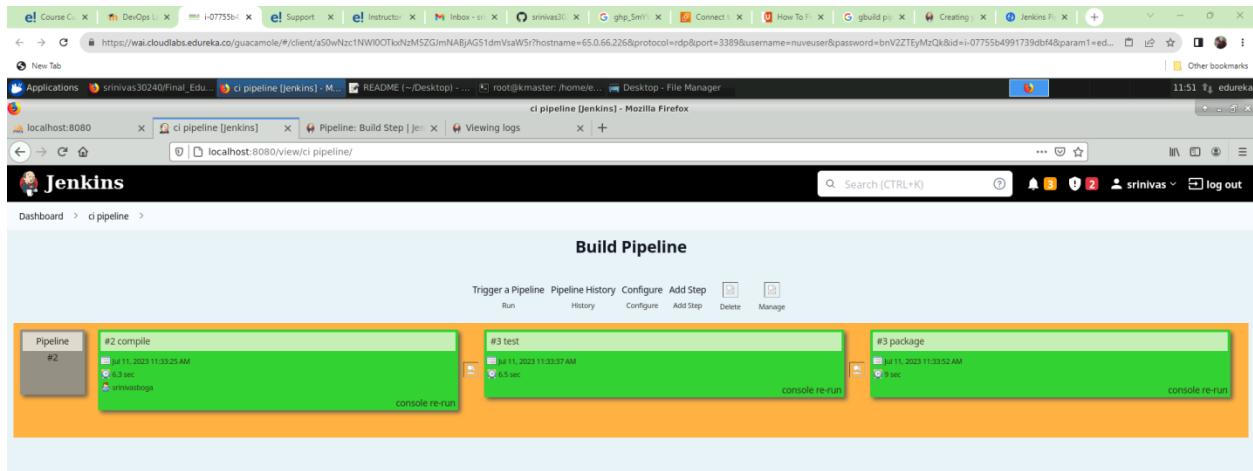
The screenshot shows a Firefox browser window with multiple tabs open. The main content area displays the Jenkins 'Project test' page for a job named 'test'. The page includes sections for 'Upstream Projects' (with a 'compile' step) and 'Downstream Projects' (with a 'package' step). A 'Permalinks' section lists recent builds (#3, #2, #1) with their respective dates. On the left, a sidebar provides navigation links like 'Status', 'Changes', 'Workspace', 'Build Now', 'Configure', 'Delete Project', and 'Rename'. At the bottom, there are 'Atom feed' links for all and failures. The browser's address bar shows the URL: <https://wai.cloudlabs.edureka.co/guacamole/#/client/aSDvNzct1NW10OfkxNzMSZGImNABjAG51dmVsaW5r?hostname=65.66.226&protocol=rdp&port=3389&username=nuveuser&password=bnV2ZTEyMzQ&id=i-07755b4991739dbf4¶m1=ed...>. The status bar at the bottom indicates it's running on a Windows desktop.

Target folder in Jenkins:

The screenshot shows a Firefox browser window displaying the Jenkins 'Workspace of package on Built-In Node : target [Jenkins]' page. It shows the directory structure of the workspace, including subfolders like 'ABCTechnologies-1.0', 'classes/com/abc', 'generated-sources/annotations', 'generated-test-sources/test-annotations', 'maven-archiver', 'maven-status/maven-compiler-plugin', 'site/jacoco', 'surefire-reports', 'test-classes/com/abc/dataAccessObject', 'ABCTechnologies-1.0.war', and 'jacoco.exec'. Below the tree view, specific file details are listed: 'ABCTechnologies-1.0.war' (6.80 MB, modified Jul 11, 2023, 11:34:01 AM) and 'jacoco.exec' (12.56 KB, modified Jul 11, 2023, 11:34:00 AM). The browser's address bar shows the URL: <https://wai.cloudlabs.edureka.co/guacamole/#/client/aSDvNzct1NW10OfkxNzMSZGImNABjAG51dmVsaW5r?hostname=65.66.226&protocol=rdp&port=3389&username=nuveuser&password=bnV2ZTEyMzQ&id=i-07755b4991739dbf4¶m1=ed...>. The status bar at the bottom indicates it's running on a Windows desktop.

Step 2: Execute the CI/CD pipeline to execute the jobs created in step 1

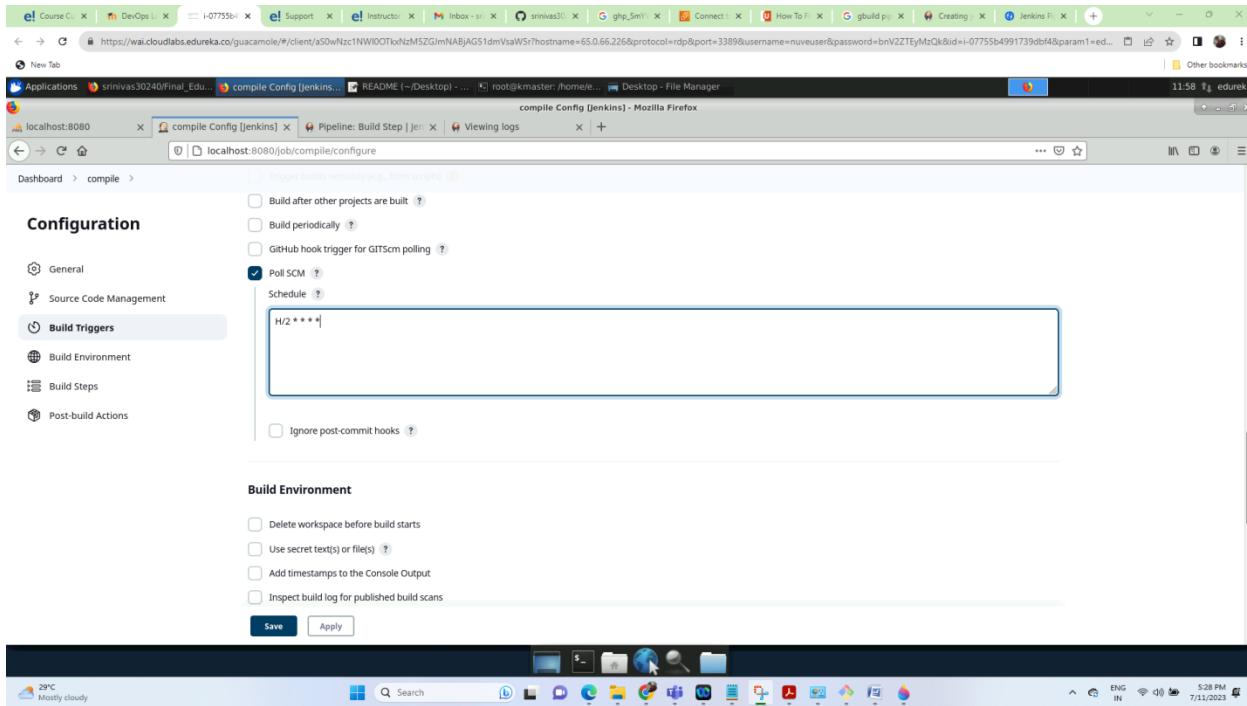
CI_PIPELINE:



And I have configured the git polling as a cron job for a compile job that triggers for every 2 minutes for github code so that if whatever change happens then it will trigger and perform the given task.

https://github.com/srinivas30240/Final_Eduureka_project.git

Poll SCM settings using cronjob in compile job:



Git polling Log that it has triggered automatically after i modified the Readme file:

Step 3: Set up a master-slave node to distribute the tasks in the pipeline

The agent configurations:

- I have created a user Jenkins on second Linux machine so that i can run the Jenkins jobs in slave machine as well.

- When i try to configure the agent i was getting compatibility issue while running the agent

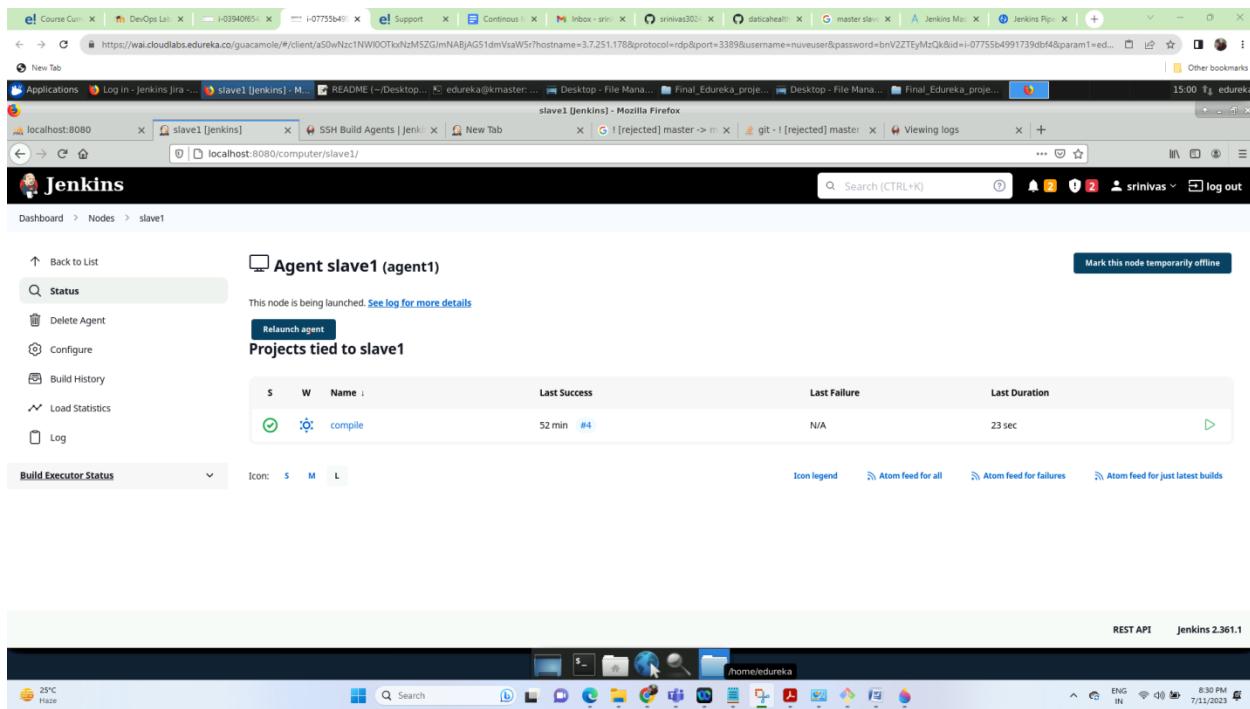
Command in agent server(slave server) and got to know that this is due to java 8

Compatibility issue beginning with Jenkins 2.357 and Jenkins 2.361.1, running the controller On Java 11 and agents on Java 8 will result in the following error:

I installed java 11 and

In cmd: [update-alternatives --config java](#)

Agent connected validation in Jenkins:



Compile job run on slave:

The screenshot shows the Jenkins interface with the 'Console Output' tab selected for job #10. The log output is as follows:

```

Started by user srinivas
Running as SYSTEM
Building remotely on slave1 in workspace /opt/jenkin/workspace/compile
The recommended git tool is: NONE
No recommended git tool specified
> git rev-parse --resolve-git-dir /opt/jenkin/workspace/compile/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/srinivas30240/Final_Eduureka_project.git # timeout=10
Fetching upstream changes from https://github.com/srinivas30240/Final_Eduureka_project.git
> git --version # timeout=10
> git --version # git version 2.17.1'
> git fetch -tags -progress -- https://github.com/srinivas30240/Final_Eduureka_project.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision 0cd1212342cbfc907512ddcdf3cacf7425fe8a04 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f 0cd1212342cbfc907512ddcdf3cacf7425fe8a04 # timeout=10
Commit message: "added war"
> git rev-list --no-walk 0cd1212342cbfc907512ddcdf3cacf7425fe8a04 # timeout=10
[compile] $ /usr/share/maven/bin/mvn compile
[1]:34mINFO[m] Scanning for projects...
[1]:34mINFO[m] [m-----< [0]:36mcom.abc:ABCtechnologies[0];1m ----->[m
[1]:34mINFO[m] [1mBuilding RetailModule 1.0[m
[1]:34mINFO[m] [1m----->[m

```

Package job run on slave1:

The screenshot shows the Jenkins configuration page for the 'package Config' job. The 'General' section is selected. The 'Label Expression' field contains 'slave1'. The 'Save' and 'Apply' buttons are visible at the bottom.

Configuration

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

Plain text Preview

Discard old builds

GitHub project

This project is parameterized

Throttle builds

Execute concurrent builds if necessary

Restrict where this project can be run

Label Expression

slave1

Label slave1 matches 1 node. Permissions or other restrictions provided by plugins may further reduce that list.

Advanced...

Save Apply

Job executing:

Project package

Back to Dashboard

Status

Changes

Workspace

Build Now

Configure

Delete Project

Rename

Build History

trend

Filter builds...

#7 Jul 12, 2023, 10:14 AM

#6 Jul 11, 2023, 3:09 PM

#5 Jul 11, 2023, 2:08 PM

#4 Jul 11, 2023, 12:02 PM

Permalinks

- Last build (#6), 19 hr ago
- Last stable build (#6), 19 hr ago
- Last successful build (#6), 19 hr ago
- Last completed build (#6), 19 hr ago

Add description

Disable Project

log out

Console Output

Back to Project

Status

Changes

Console Output

View plain text

Edit Build Information

Delete build #7

Git Build Data

Previous Build

```
Started by user srinivas
Running as SYSTEM
Building remotely on slave1 in workspace /opt/jenkin/workspace/package
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
  Cloning repository https://github.com/srinivas30240/Final_Eduureka_project.git
    > git init /opt/jenkin/workspace/package # timeout=10
    Fetching upstream changes from https://github.com/srinivas30240/final_edureka_project.git
      > git --version # timeout=10
      > git --version # 'git' version 2.17.1'
      > git fetch --tags --progress .. https://github.com/srinivas30240/Final_Eduureka_project.git +refs/heads/*:refs/remotes/origin/* # timeout=10
      > git config remote.origin.url https://github.com/srinivas30240/Final_Eduureka_project.git # timeout=10
      > git config remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
      Avoid second fetch
      > git rev-parse refs/remotes/origin/master^{commit} # timeout=10
      Checking out Revision 0cd1212342cbfc907512ddcdf3cacf7425fe8a04 (refs/remotes/origin/master)
        > git config core.sparsecheckout # timeout=10
        > git checkout -f 0cd1212342cbfc907512ddcdf3cacf7425fe8a04 # timeout=10
      Commit message: "added war"
        > git rev-list --no-walk 0cd1212342cbfc907512ddcdf3cacf7425fe8a04 # timeout=10
      [package] $ /usr/share/maven/bin/mvn package
      [[1;34mINFO[m] Scanning for projects...
      [[1;34mINFO[m]
```

Task 3: Write a Docket file. Create an Image and container on the Docker host. Integrate docker host with Jenkins. Create CI/CD job on Jenkins to build and deploy on a container.

1. Enhance the package job created in step 1 of task 2 to create a docker image.
 2. In the Docker image, add code to move the war file to the Tomcat server and build
- The image

Below are the screenshots of the above 2 steps of task-3:

1. I have started Tomcat server by using commands:

A screenshot of a Linux terminal window titled 'root@kmaster:/opt/tomcat/bin'. The terminal shows the following command sequence:

```
bin$ ./startup.sh
edureka@kmaster:/bin$ ./startup.sh: No such file or directory
edureka@kmaster:/bin$ pwd
/bin
edureka@kmaster:/bin$ cd ..
edureka@kmaster:/ls
bin boot dev etc home initrd.img initrd.img.old lib lib64 lost+found media mnt opt proc root run sbin snap srv sys usr var vmlinuz vmlinuz.old
ST54 cni contained eclipse maven nagios_4.4.5 nagios-plugins-2.2.1 prometheus-2.27 puppetlabs tomcat
edureka@kmaster:/opt$ cd tomcat/
edureka@kmaster:/opt/tomcat$ ls
BUILDING.txt CONTRIBUTING.md LICENSE NOTICE README.md RELEASE-NOTES RUNNING.txt bin conf lib logs temp webapps work
edureka@kmaster:/opt/tomcat$ cd /bin/
edureka@kmaster:/bin$ pwd
/bin
edureka@kmaster:/bin$ cd ..
edureka@kmaster:/cd /opt/tomcat/
edureka@kmaster:/opt/tomcat$ pwd
/opt/tomcat
edureka@kmaster:/opt/tomcat$ ls
BUILDING.txt CONTRIBUTING.md LICENSE NOTICE README.md RELEASE-NOTES RUNNING.txt bin conf lib logs temp webapps work
edureka@kmaster:/opt/tomcat$ cd bin
bash: cd bin: Permission denied
edureka@kmaster:/opt/tomcat$ sudo us
sudo: us: command not found
edureka@kmaster:/opt/tomcat$ sudo su
root@kmaster:/opt/tomcat# /bin/sh
root@kmaster:/opt/tomcat/bin# ls
bootstrap.jar catalina.sh commons-daemon-native.tar.gz configtest.sh digest.sh setclasspath.bat shutdown.sh tomcat-juli.jar tool-wrapper.sh
catalina-tasks.xml ciphers.bat commons-daemon.jar daemon.sh makebase.bat setclasspath.sh startup.bat tomcat-native.tar.gz version.bat
catalina.bat catalina.sh configtest.bat digest.bat makebase.sh shutdown.bat startup.sh tool-wrapper.bat version.sh
root@kmaster:/opt/tomcat/bin# ./startup.sh
Using CATALINA_BASE: /opt/tomcat
Using CATALINA_HOME: /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME: /usr/lib/jvm/java-8-oracle/jre
Using CLASSPATH: /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
root@kmaster:/opt/tomcat/bin#
```

Issue: I am unable to log in tomcat sever; After running the job I got an issue and was not able to get into the tomcat so i have configured the tomcat conf/tomcat-users.xml file with the below addition to the end like I have created a user as a tomcat and password as a admin for the role of manager-gui and manager_script and later it allowed me to deployed to the tomcat successfully.

Solution:

conf/tomcat-users.xml

```
<role rolename="manager-gui"/>

<role rolename="manager-script"/>
```

<user username="tomcat" password="admin" roles="manager-gui,manager-script"/>

The screenshot shows a Firefox browser window with multiple tabs open. The active tab is 'localhost:8090/manager/html'. The page title is 'Tomcat Web Application Manager'. The main content area displays a table of applications:

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	<button>Start</button> <button>Stop</button> <button>Reload</button> <button>Undeploy</button> <button>Expire sessions with idle ≥ 30 minutes</button>
/docs	None specified	Tomcat Documentation	true	0	<button>Start</button> <button>Stop</button> <button>Reload</button> <button>Undeploy</button> <button>Expire sessions with idle ≥ 30 minutes</button>
/examples	None specified	Servlet and JSP Examples	true	0	<button>Start</button> <button>Stop</button> <button>Reload</button> <button>Undeploy</button> <button>Expire sessions with idle ≥ 30 minutes</button>
/host-manager	None specified	Tomcat Host Manager Application	true	0	<button>Start</button> <button>Stop</button> <button>Reload</button> <button>Undeploy</button> <button>Expire sessions with idle ≥ 30 minutes</button>
/manager	None specified	Tomcat Manager Application	true	1	<button>Start</button> <button>Stop</button> <button>Reload</button> <button>Undeploy</button> <button>Expire sessions with idle ≥ 30 minutes</button>

Git repo setting on Jenkins UI:

The screenshot shows a Firefox browser window with multiple tabs open. The active tab is 'localhost:8080/job/Package_docker_v1/configure'. The page title is 'Configuration' under 'Source Code Management'. The 'Git' option is selected. The 'Repositories' section contains a single repository entry:

- Repository URL: `https://github.com/srinivas30240/Final_Eduureka_project.git`
- Credentials: A dropdown menu showing '- none -'.

At the bottom of the form are 'Save' and 'Apply' buttons.

Choosing ‘Invoke top-level Maven targets’ option to add maven goal setting:

The screenshot shows the Jenkins configuration page for the 'Package_docker_v1' job. In the 'Build Steps' section, there is a step titled 'Invoke top-level Maven targets'. Under 'Goals', the value 'package' is specified. Other sections like General, Source Code Management, Build Triggers, Build Environment, and Post-build Actions are also visible.

The screenshot shows the Jenkins console output for the 'Package_docker_v1 #1' build. The output shows the Maven build process, including copying webapp resources, assembling a war file, and running unit tests. The results indicate 4 tests run, 0 failures, 0 errors, and 0 skipped.

```
Tests run: 4, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.265 sec
```

```
Results :
```

```
Tests run: 4, Failures: 0, Errors: 0, Skipped: 0
```

```
[{1}:34mINFO|m] [{1}:34mINFO|m] [m... [0;32mmaven-war-plugin:3.2.2:war|m [m(default-war)[m @ [36mABC Technologies|0;1m ...|m
```

```
[{1}:34mINFO|m] Packaging webapp
```

```
[{1}:34mINFO|m] Assembling webapp [ABC Technologies] in [/var/lib/jenkins/workspace/Package_docker_v1/target/ABC Technologies-1.0]
```

```
[{1}:34mINFO|m] Processing war project
```

```
[{1}:34mINFO|m] Copying webapp resources [/var/lib/jenkins/workspace/Package_docker_v1/src/main/webapp]
```

```
[{1}:34mINFO|m] Webapp assembled in [1033 msec]
```

```
[{1}:34mINFO|m] Building war: [/var/lib/jenkins/workspace/Package_docker_v1/target/ABC Technologies-1.0.war
```

```
[{1}:34mINFO|m] [{1}:32m]jacoco-maven-plugin:0.8.6:report[m [m(jacoco-site)[m @ [36mABC Technologies|0;1m ...|m
```

```
[{1}:34mINFO|m] Loading execution data file [/var/lib/jenkins/workspace/Package_docker_v1/target/jacoco.exec
```

```
[{1}:34mINFO|m] Analyzed bundle 'RetailModule' with 2 classes
```

```
[{1}:34mINFO|m] [m.....|m
```

```
[{1}:34mINFO|m] [1;32mBUILD SUCCESS|m
```

```
[{1}:34mINFO|m] [m.....|m
```

```
[{1}:34mINFO|m] Total time: 22.033 s
```

```
[{1}:34mINFO|m] Finished at: 2023-07-14T11:16:00Z
```

```
[{1}:34mINFO|m] [m.....|m
```

```
Finished: SUCCESS
```

The screenshot shows the Jenkins console output for the 'Package_docker_v1 #1' build, focusing on the final line which shows the path to the generated war file: '/var/lib/jenkins/workspace/package/ABC Technologies/target'.

Go to console.. Scroll to bottom, you will see the path of the war file:

/var/lib/jenkins/workspace/package/ABC Technologies/target

```

root@kmaster:/opt/tomcat/bin# cd -
root@kmaster:# systemctl start docker
root@kmaster:# docker -version
Docker version 19.03.6, build 369ce74a3c
root@kmaster:# cd /var/lib/jenkins/workspace/
root@kmaster:/var/lib/jenkins/workspace# ls
'ABC Technologies' README.md pom.xml pom.xml.bak src target
root@kmaster:/var/lib/jenkins/workspace# cd package/
root@kmaster:/var/lib/jenkins/workspace/package# ls
'ABC Technologies' README.md pom.xml pom.xml.bak src target
root@kmaster:/var/lib/jenkins/workspace/package/ABC Technologies# ls
README.md pom.xml pom.xml.bak src target
root@kmaster:/var/lib/jenkins/workspace/package/ABC Technologies# cd target/
root@kmaster:/var/lib/jenkins/workspace/package/ABC Technologies/target# ls
ABCtechnologies-1.0 ABCtechnologies-1.0.war classes jacoco.exec maven-archiver maven-status site surefire-reports test-classes
root@kmaster:/var/lib/jenkins/workspace/package/ABC Technologies/target#

```

Create second job with name as ContinousDeployment on tomcat on my machine:

The screenshot shows the Jenkins configuration interface for a new job named "ContinousDeployment". The "Configure" screen is displayed, showing the following settings:

- Source Code Management:** Git
 - Repository URL:** https://github.com/srinivas30240/Final_Eduureka_project.git
 - Credentials:** None
 - Branches to build:**
 - Branch Specifier (blank for 'any'):** */master
- Build Triggers:** None
- Build Steps:** None
- Post-build Actions:** None

At the bottom of the configuration screen, there are "Save" and "Apply" buttons.

The screenshot shows the Jenkins job configuration page for a job named 'deploy'. The 'Configuration' section is open, specifically the 'Post-build Actions' section. A 'Deploy war/ear to a container' step is selected. In the 'Containers' section, a 'Tomcat 9.x Remote' instance is configured with the following details:

- Credentials:** admin***** (tomcat)
- Tomcat URL:** http://3.108.56.21:8080/

At the bottom of the configuration panel, there are 'Save' and 'Apply' buttons.

Excute the job on Jenkins on we can access from
<http://3.108.56.21:8080/ABCtechnologies-1.0/>

The screenshot shows the Tomcat Web Application Manager interface. The 'Applications' section displays the following list of deployed web applications:

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes
/ABCTechnologies-1.0	None specified	Archetype Created Web Application	true	0	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes
/abctechnologies-1.0	None specified	Archetype Created Web Application	true	0	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle > 30 minutes

The 'Deploy' section at the bottom allows for deploying a WAR file from a local directory:

Context Path:
 Version (for parallel deployment):
 XML Configuration file path:
 WAR or Directory path: [Browse]

Docker and Jenkins Integration:

Package_docker_V1_job settings:

systemctl start Jenkins

systemctl start docker

Create a job with name as ContinuousIntegration

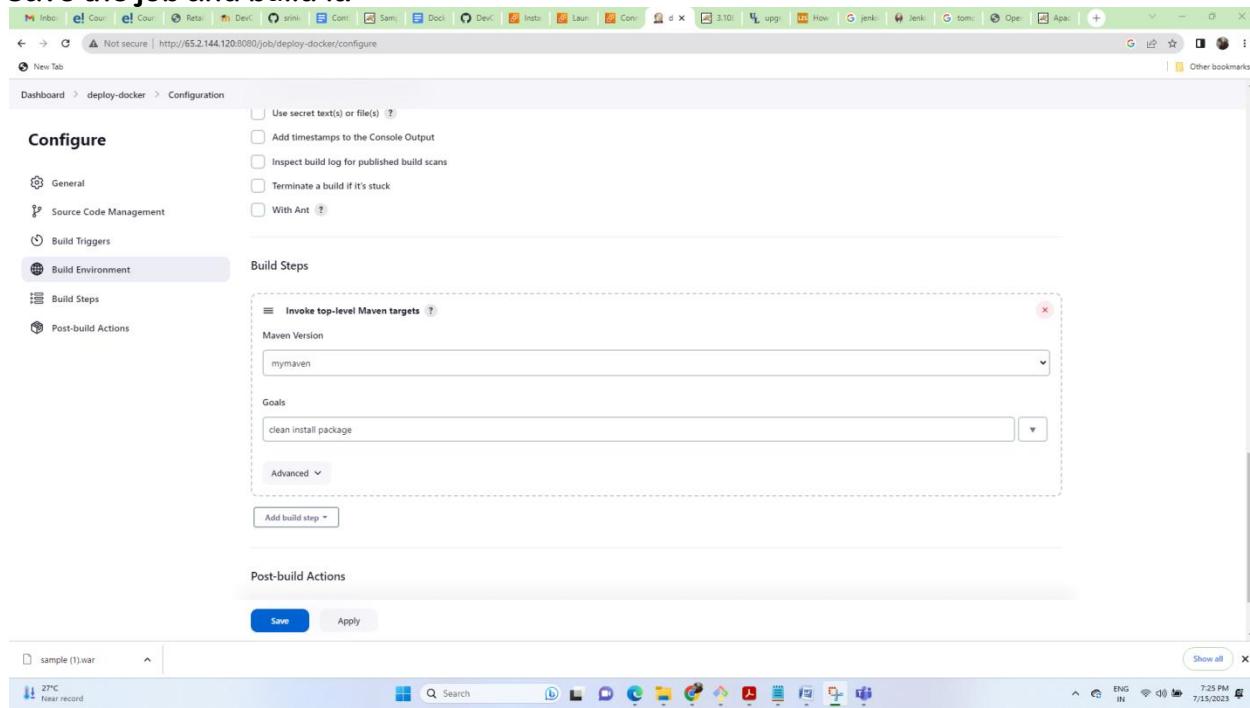
Add the repo in SCM as https://github.com/srinivas30240/Final_EduReka_project.git

Add the build steps as maven targets

Select maven version as maven3.6.3

Select the goal as clean install package

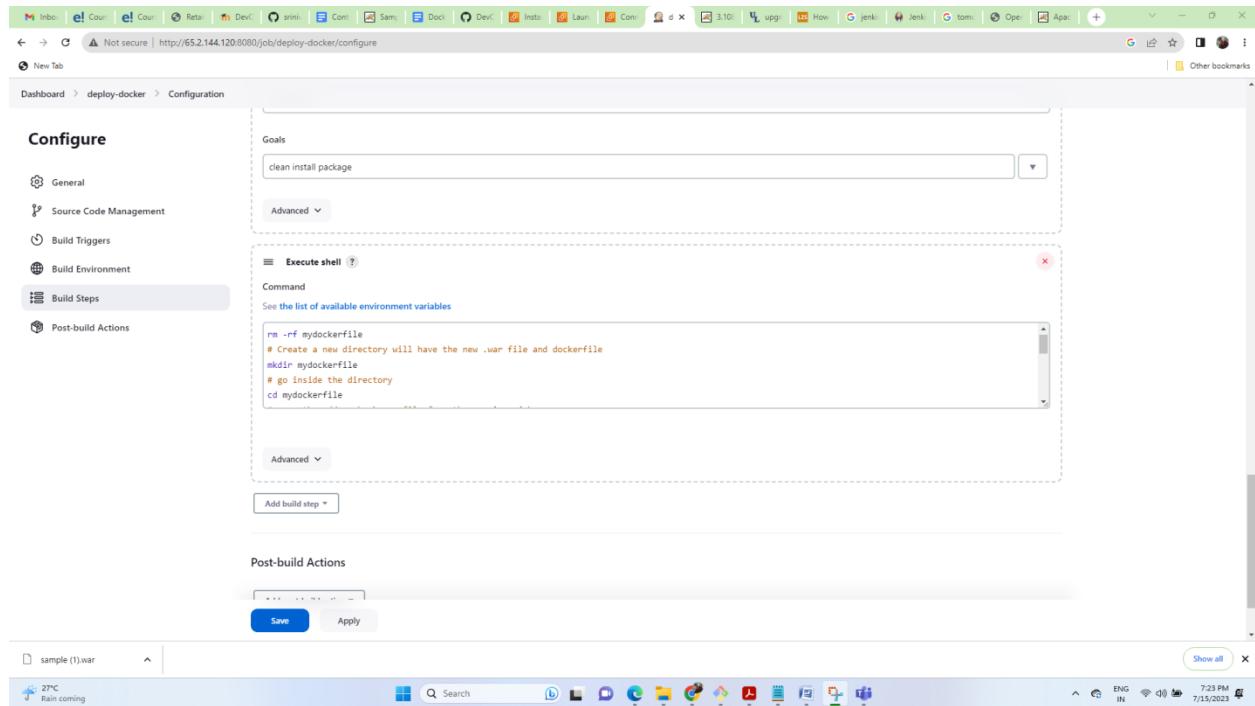
Save the job and build it.



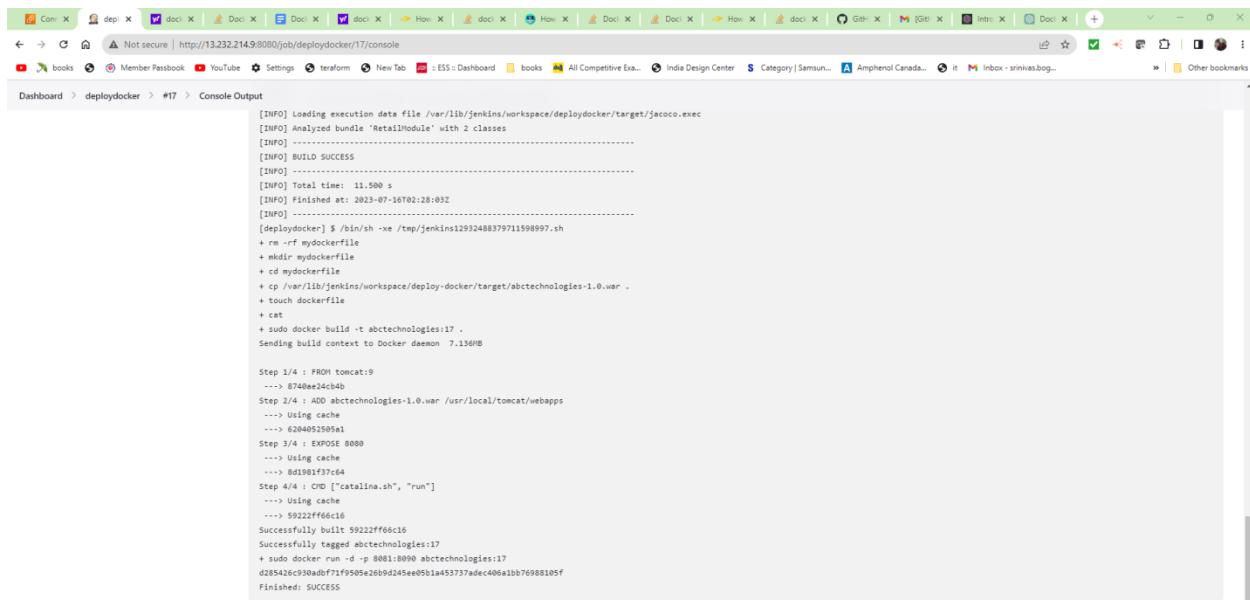
```
rm -rf mydockerfile
# Create a new directory will have the new .war file and dockerfile
mkdir mydockerfile
# go inside the directory
cd mydockerfile
# copy the addressbook.war file from the previous job
cp /var/lib/jenkins/workspace/deploy-docker/target/abctechnologies-1.0.war .
# create a dockerfile
touch dockerfile
cat <<EOT>> dockerfile
FROM tomcat:9
ADD abctechnologies-1.0.war /usr/local/tomcat/webapps
EXPOSE 8080
CMD ["catalina.sh", "run"]
```

EOT

sudo docker build -t abctechnologies-1.0:\$BUILD_NUMBER .
sudo docker run -d -P abctechnologies-1.0:\$BUILD_NUMBER

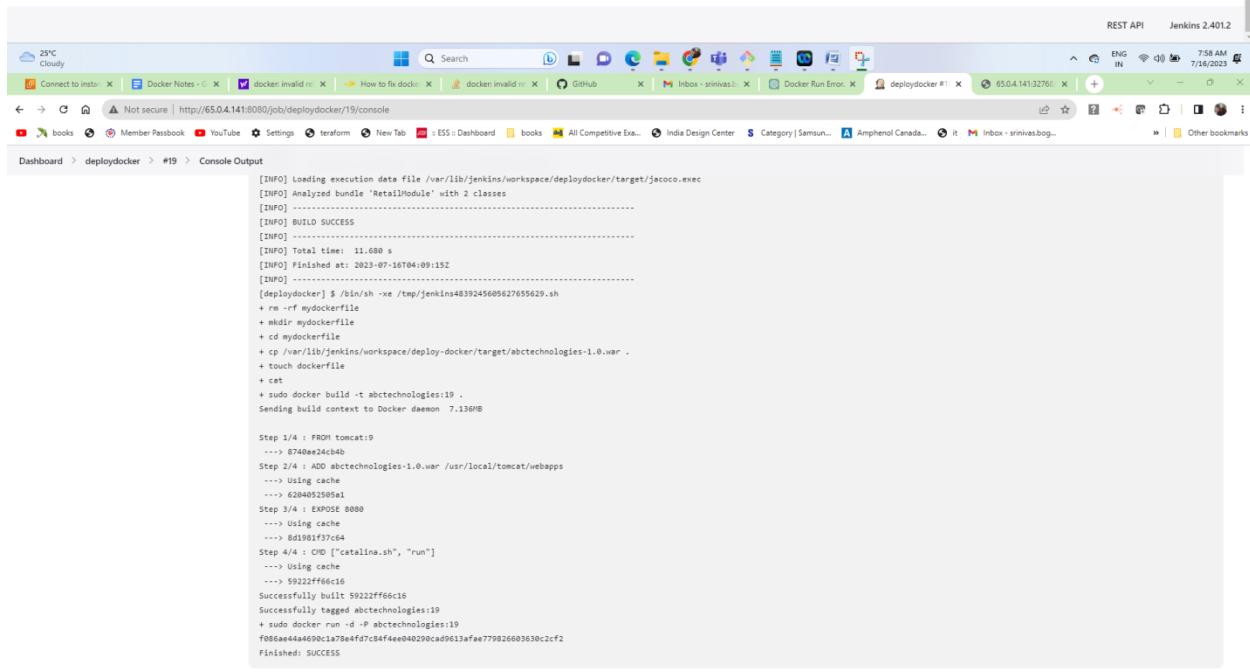


After execute:



```
[INFO] Loading execution data file /var/lib/jenkins/workspace/deploydocker/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 11.500 s
[INFO] Finished at: 2023-07-16T02:28:03Z
[INFO] -----
[deploydocker] $ /bin/sh -xe /tmp/jenkins1293248837971598997.sh
+ rm -rf mydockerfile
+ mkdir mydockerfile
+ cd mydockerfile
+ cp /var/lib/jenkins/workspace/deploy-docker/target/abctechnologies-1.0.war .
+ touch dockerfile
+ cat
+ sudo docker build -t abctechnologies:17 .
Sending build context to Docker daemon 7.136B

Step 1/4 : FROM tomcat:9
--> 8740ee24c4d0
Step 2/4 : ADD abctechnologies-1.0.war /usr/local/tomcat/webapps
--> Using cache
--> 6204052905a1
Step 3/4 : EXPOSE 8080
--> Using cache
--> 8d1001f37c64
Step 4/4 : CMD ["catalina.sh", "run"]
--> Using cache
--> 59222ff66c16
Successfully built 59222ff66c16
Successfully tagged abctechnologies:17
+ sudo docker run -d -p 8080:8090 abctechnologies:17
d285426c930adb71f9505e26b9d245ee05b1a453737ade406a1bb76988105f
Finished: SUCCESS
```



```
[INFO] Loading execution data file /var/lib/jenkins/workspace/deploydocker/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 11.680 s
[INFO] Finished at: 2023-07-16T04:09:15Z
[INFO] -----
[deploydocker] $ /bin/sh -xe /tmp/jenkins4839245605627655629.sh
+ rm -rf mydockerfile
+ mkdir mydockerfile
+ cd mydockerfile
+ cp /var/lib/jenkins/workspace/deploy-docker/target/abctechnologies-1.0.war .
+ touch dockerfile
+ cat
+ sudo docker build -t abctechnologies:19 .
Sending build context to Docker daemon 7.136B

Step 1/4 : FROM tomcat:9
--> 8740ee24c4d0
Step 2/4 : ADD abctechnologies-1.0.war /usr/local/tomcat/webapps
--> Using cache
--> 6204052905a1
Step 3/4 : EXPOSE 8080
--> Using cache
--> 8d1001f37c64
Step 4/4 : CMD ["catalina.sh", "run"]
--> Using cache
--> 59222ff66c16
Successfully built 59222ff66c16
Successfully tagged abctechnologies:19
+ sudo docker run -d -P abctechnologies:19
708aae44a4690c1a78a4fd7c84f4ee040290cad9613afae779826603630c2cf2
Finished: SUCCESS
```



```
26°C Cloudy REST API Jenkins 2.40.12
Not secure | http://65.0.4.141:8080/job/deploydocker/19/console
books Member Passbook YouTube Settings New Tab ESS Dashboard books All Competitive Exam India Design Center Category Samsung Amphenol Canada it Inbox - srinivas.bog... Other bookmarks
Dashboard > deploydocker > #19 > Console Output
[INFO] Loading execution data file /var/lib/jenkins/workspace/deploydocker/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 11.680 s
[INFO] Finished at: 2023-07-16T04:09:15Z
[INFO] -----
[INFO] -----
```

From CMD:

Docker image and container validation in browser

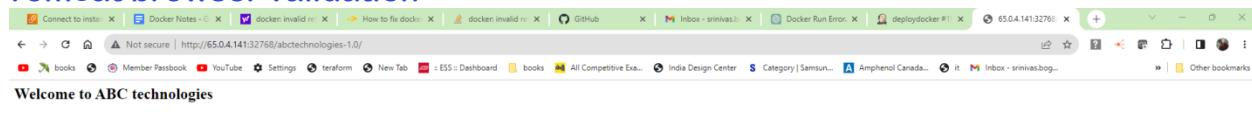
The terminal window shows the following commands and output:

```
[root@ip-172-31-39-189 ec2-user]# systemctl start jenkins
[root@ip-172-31-39-189 ec2-user]# docker images
REPOSITORY          TAG      IMAGE ID      CREATED        SIZE
abctechnologies    10      59222ff66c16  2 hours ago   484MB
abctechnologies    11      59222ff66c16  2 hours ago   484MB
abctechnologies    12      59222ff66c16  2 hours ago   484MB
abctechnologies    13      59222ff66c16  2 hours ago   484MB
abctechnologies    14      59222ff66c16  2 hours ago   484MB
abctechnologies    15      59222ff66c16  2 hours ago   484MB
abctechnologies    16      59222ff66c16  2 hours ago   484MB
abctechnologies    17      59222ff66c16  2 hours ago   484MB
abctechnologies    19      59222ff66c16  2 hours ago   484MB
abctechnologies    8       59222ff66c16  2 hours ago   484MB
abctechnologies    9       59222ff66c16  2 hours ago   484MB
abctechnologies-1.0 7       4e9bcf189193  2 hours ago   484MB
abctechnologies-1.0 5       cb6b79a23c0d  3 hours ago   484MB
tomcat             9       8740ae24cb4b  5 days ago    476MB
[root@ip-172-31-39-189 ec2-user]# docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS
f086ae44a469        abctechnologies:19 "catalina.sh run"   32 seconds ago   Up 30 s
econds 0.0.0.0:32768->8080/tcp, :::32768->8080/tcp
[root@ip-172-31-39-189 ec2-user]# ^C
[root@ip-172-31-39-189 ec2-user]# |
```

Below the terminal, a Jenkins pipeline script is shown:

```
Go to --> build steps --> select execute shell --> add this script
rm -rf mydockerfile
# Create a new directory will have the new .war file and dockerfile
mkdir mydockerfile
# go inside the directory
cd mydockerfile
# copy the addressbook.war file from the previous job
cp /var/lib/jenkins/workspace/package-docker-v2/target/abctechnologies-1.0.war ..
```

Tomcat browser validation



Push image to docker hub:

The screenshot shows a browser window with multiple tabs open. The active tab is a Docker Hub repository page for the user 'sri33' named 'edureka'. The page includes fields for adding a short description, pushing Docker commands, and viewing the repository. It lists one tag ('abctechnologies1-pro...') and provides options for automated builds and upgrading.

Task 4: Integrate the Docker host with Ansible. Write an Ansible playbook to create an image and create a continuer. Integrate Ansible with Jenkins. Deploy Ansible-playbook.

CI/CD job to build code on ansible and deploy it on docker container.

1. Deploy Artifacts on Kubernetes
2. Write pod, service, and deployment manifest file
3. Integrate Kubernetes with Ansible
4. Ansible playbook to create deployment and service

I used my own laptop and installed ansible and Jenkins and docker on ubuntu image.

The screenshot shows a terminal window with several commands run:

- `docker COMMAND --help` for Docker help, listing commands like stats, stop, tag, top, unpause, update, version, and wait.
- `docker --version` output: Docker version 20.10.24, build 297e128
- `ansible --version` output: ansible [core 2.14.6]
 - config file = /etc/ansible/ansible.cfg
 - configured module search path = ['/home/ubuntu/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
 - ansible python module location = /usr/lib/python3/dist-packages/ansible
 - ansible collection location = /home/ubuntu/.ansible/collections:/usr/share/ansible/collections
 - executable location = /usr/bin/ansible
 - python version = 3.10.6 (main, Mar 10 2023, 10:55:28) [GCC 11.3.0] (/usr/bin/python3)
 - jinja version = 3.0.3
 - libyaml = True
- `jenkins --versions` output: Exception in thread "main" java.lang.IllegalArgumentException: Unrecognized option: --versions
- `java -version` output: java version "1.8.0_312" (build 1.8.0_312-b07-75-0819)

The github repo with Inventory file, code file and playbooks:

https://github.com/srinivas30240/Final_Edureka_project.git

Step 2:

On the ACM install Jenkins

Once Jenkins setup is complete

Install Ansible plug-in on Jenkins,

Also configure Ansible tool under global tool configuration

Name: myansible

The path of ansible : /usr/bin

Dashboard > Manage Jenkins > Tools

Install from Apache

- Version: 3.9.3
- Add Installer

Ansible installations

Add Ansible

An ansible

- Name: myansible
- Path to ansible executables directory: /usr/bin/
- Install automatically

Add Ansible

Save **Apply**

Next PIPELINE : we used already buileded war file from git repo and wrote the pipeline script

Dashboard > ansiblepipeline > Configuration

Configure

Pipeline

Definition

Script

```

1 - pipeline {
2   agent any
3   stages {
4     stage('clone repository') {
5       steps {
6         git 'https://github.com/srinivas30240/Final_Eduureka_project.git'
7       }
8     }
9     stage('execute pipeline'){
10    steps{
11      ansiblePlaybook credentialId: 'ansible', disableHostKeyChecking: true, installation: 'myansible', inventory: 'dev.inv', playbook: 'playbookdockerr.yml'
12    }
13  }
14 }
15 }
16 }
17 }

```

Use Groovy Sandbox

Pipeline Syntax

Save **Apply**

REST API Jenkins 2.401.2

callo.ppk

24°C Cloudy

ENG US 8:06 PM 7/21/2023

Next executed script from ACM to host from play book.yml

https://github.com/srinivas30240/Final_Edureka_project.git

play book and docker file is available in git repository

The screenshot shows the GitHub repository page for 'srinivas30240/Final_Edureka_project'. The repository has 1 branch (master) and 0 tags. The README.md file contains the text 'abctechnologies code'. The repository has 0 stars, 0 forks, and 1 watching. The repository URL is https://github.com/srinivas30240/Final_Edureka_project.

The screenshot shows the Jenkins pipeline 'ansiblepipeline' dashboard. The pipeline status is 'Status'. The stage view shows the execution time for each stage: clone repository (671ms), execute pipeline (8s), and other stages (645ms, 8s, 772ms, 594ms, 605ms). One stage failed (8s). The build history shows 13 builds, with the last few failing. Build details include commit information and timestamps (e.g., Jul 21, 2023, 2:29 PM).

Cloning repo on host :

```
[Pipeline] { (clone repository)
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/ansiblepipeline/.git # timeout=10
> git config remote.origin.url https://github.com/srinivas30240/Final_Eduureka_project.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
> git fetch --tags --force --progress -- https://github.com/srinivas30240/Final_Eduureka_project.git +refs/heads/*:refs/remotes/origin/* # timeout=10
Checking out Revision b12f02aefc1b47549343a2958e1c347db6ec5ef0 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f b12f02aefc1b47549343a2958e1c347db6ec5ef0 # timeout=10
> git branch -a -v --no-abrev # timeout=10
> git branch -D master # timeout=10
> git checkout -b master b12f02aefc1b47549343a2958e1c347db6ec5ef0 # timeout=10
Commit message: "Update and rename ockerfile to dockerfile"
> git rev-list --no-walk abba146232fbdaa91d3a398f3e2ca2e70fc688 # timeout=10
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (execute pipeline)
[Pipeline] ansibleplaybook
[ansiblepipeline] $ sshpass ***** /usr/bin/ansible-playbook playbookdockerr.yml -i dev.inv -u ec2-user -k

PLAY [webservers] *****
TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.31.15.39 is using the discovered Python
Interpreter at /usr/bin/python, but future installation of another Python
Interpreter could change this. See https://docs.ansible.com/ansible/2.9/reference\_appendices/interpreter\_discovery.html for more information.
ok: [172.31.15.39]

TASK [Install tomcat] *****

```

Installing tomcat, git, docker on host

```
interpreter could change this. See https://docs.ansible.com/ansible/2.9/reference\_appendices/interpreter\_discovery.html for more information.
ok: [172.31.15.39]

TASK [Install tomcat] *****
ok: [172.31.15.39]

TASK [start tomcat] *****
ok: [172.31.15.39]

TASK [Install docker] *****
ok: [172.31.15.39]

TASK [start docker] *****
ok: [172.31.15.39]

TASK [Install git] *****
ok: [172.31.15.39]

TASK [clone a repo] *****
changed: [172.31.15.39]

TASK [Build docker file] *****
changed: [172.31.15.39]

TASK [create container] *****
changed: [172.31.15.39]

PLAY RECAP *****
172.31.15.39 : ok=9    changed=3    unreachable=0   failed=0    skipped=0    rescued=0    ignored=0

[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

Docker container validation

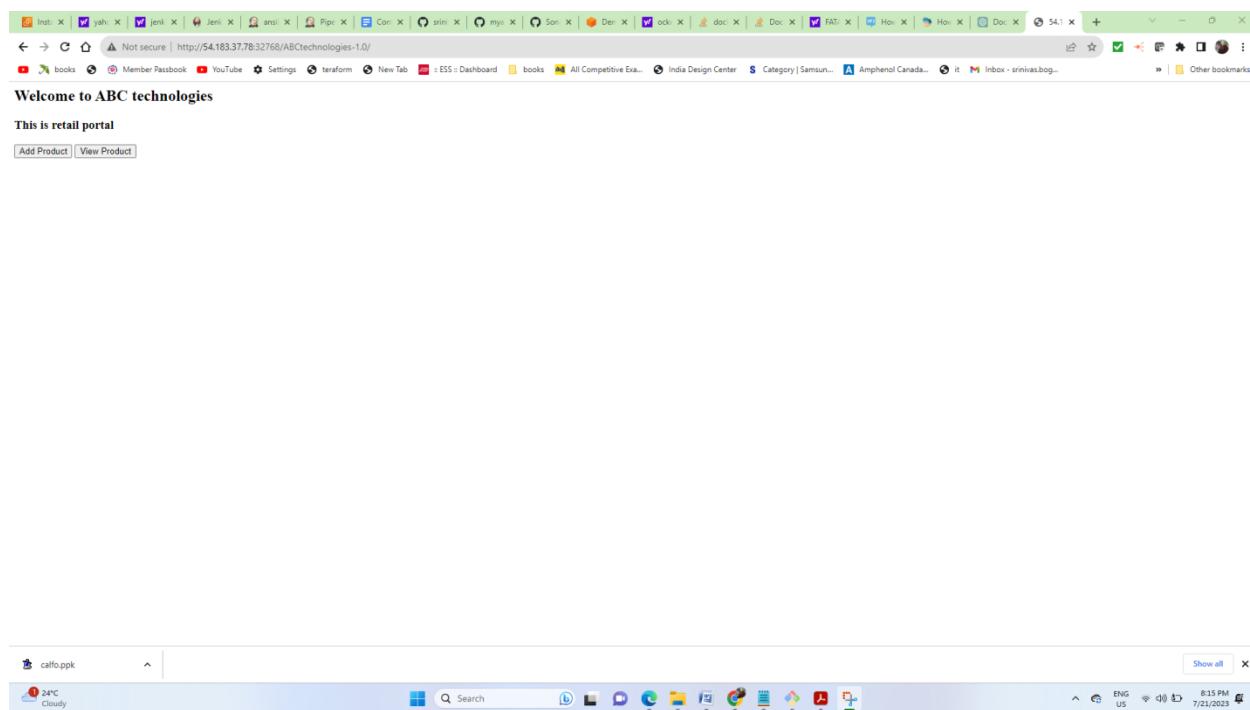
```
[root@host target]# docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
myadd/ansible2 0c8ded833a77 13 minutes ago 484MB
tomcat 9 8740ae24cb4b 10 days ago 476MB
[root@host target]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS
24d8af8a3f9 myadd/ansible2 "catalina.sh run" 13 minutes ago Up 13 minutes
es 24d8af8a3f9 myadd/ansible2 "catalina.sh run" 13 minutes ago Up 13 minutes 0.0.0.0:32768->8080/tcp, :::32768->8080/tcp sad_albattani
[root@host target]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS
s 24d8af8a3f9 myadd/ansible2 "catalina.sh run" 13 minutes ago Up 13 minutes 0.0.0.0:32768->8080/tcp, :::32768->8080/tcp sad_albattani
[root@host target]#
```

Welcome to ABC technologies
This is retail portal

File Edit View Insert Tools Options Help

24°C Cloudy 8:15 PM 7/21/2023 ENG US

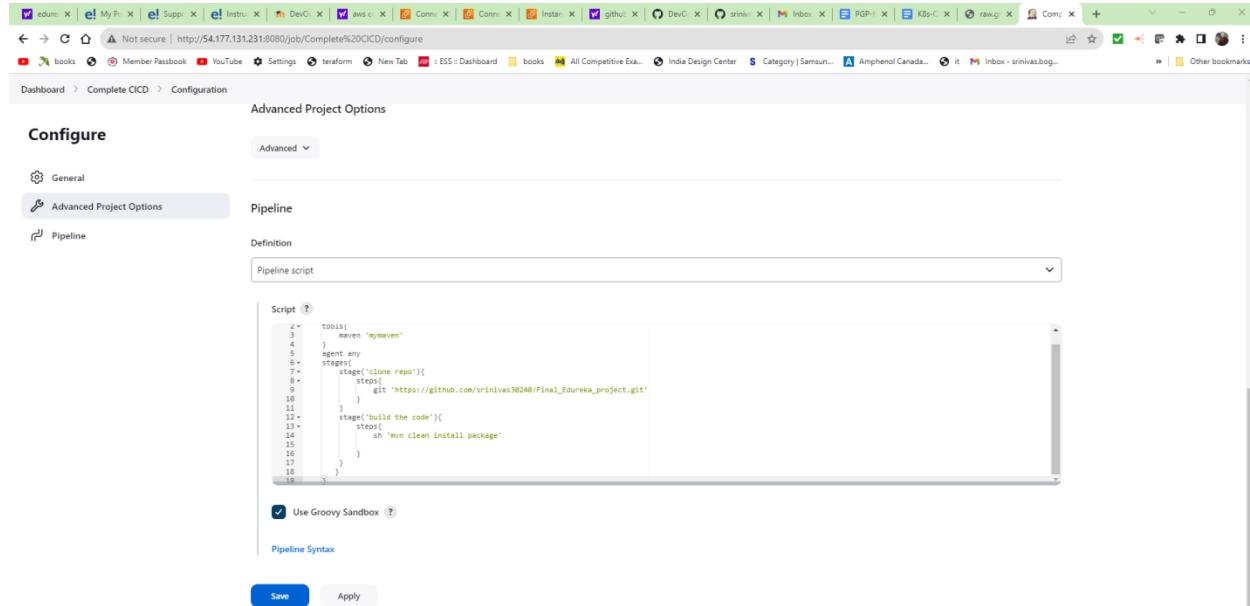
Docker container validation in browser



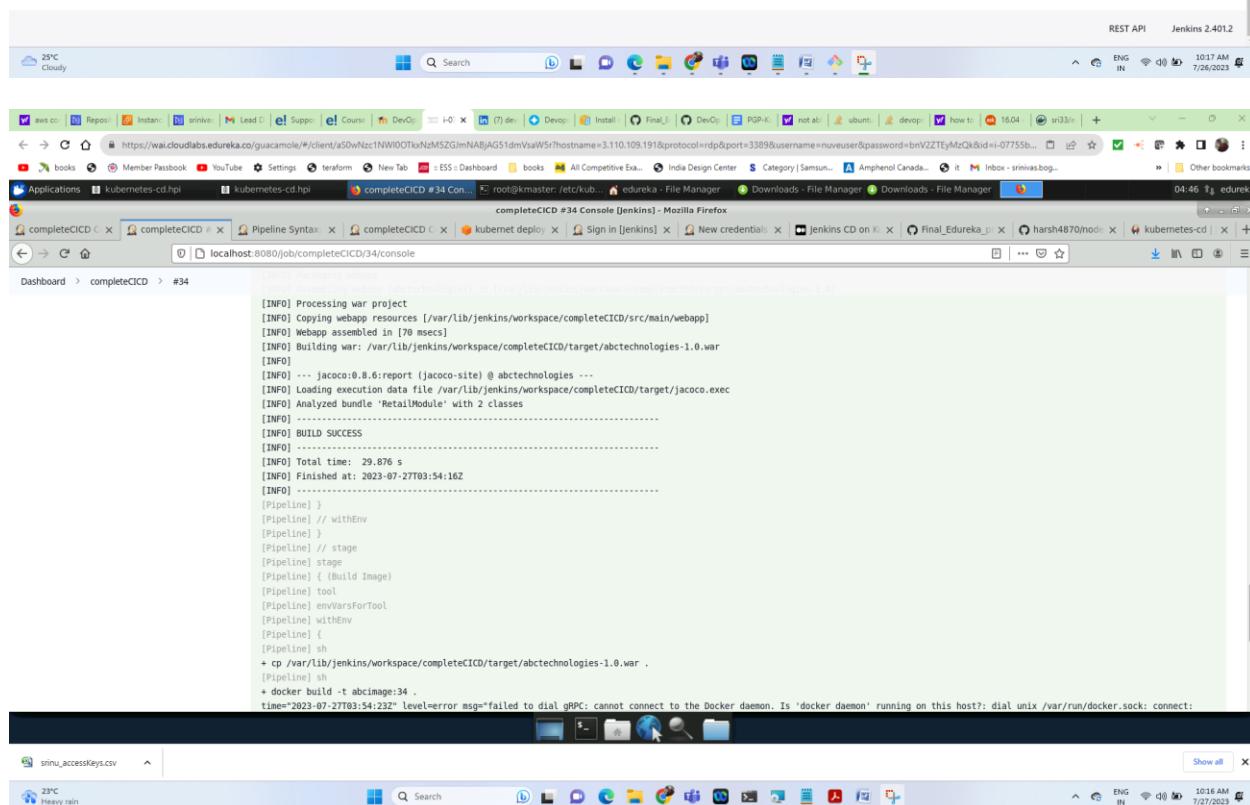
I am integrating kubernets in Jenkins and using EDUREKA LAB

HERE I am done whole CI & CD process by using pipeline script

First step: I added Git repo and packaged war file



```
#!/usr/bin/groovy
node {
    tools {
        maven 'my.maven'
    }
    agent any
    stages {
        stage('clone repo') {
            steps {
                git 'https://github.com/srinivas30240/Final_Edureka_project.git'
            }
        }
        stage('build the code') {
            steps {
                sh 'mvn clean install package'
            }
        }
    }
}
```



```
[INFO] Processing war project
[INFO] Copying webapp resources [/var/lib/jenkins/workspace/completeCICD/src/main/webapp]
[INFO] Webapp assembled in [70 ms]
[INFO] Building war: [/var/lib/jenkins/workspace/completeCICD/target/abctechnologies-1.0.war
[INFO]
[INFO] --- jacoco:0.8.6:report (@abctechnologies ---
[INFO] Loading execution data file [/var/lib/jenkins/workspace/completeCICD/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 29.876 s
[INFO] Finished at: 2023-07-27T03:54:16Z
[INFO] -----
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Build Image)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] withEnv
[Pipeline]
[Pipeline] sh
+ cp /var/lib/jenkins/workspace/completeCICD/target/abctechnologies-1.0.war .
[Pipeline]
+ docker build -t abcmimage:34 .
time=2023-07-27T03:54:23Z level=error msg="failed to dial gRPC: cannot connect to the Docker daemon. Is 'docker daemon' running on this host? dial unix /var/run/docker.sock: connect: no such file or directory"
```

```

[INFO] Changes detected - recompiling the module! :dependency
[INFO] Compiling 1 source file with javac [debug target 1.8] to target/test-classes
[WARN] bootstrap class path not set in conjunction with -source 8
[INFO]
[INFO] --- surefire:3.1.2:test (default-test) @ abctechnologies ---
[INFO] Skipping execution of surefire because it has already been run for this configuration
[INFO]
[INFO] --- war:3.2.2:war (default-war) @ abctechnologies ---
[INFO] Packaging webapp
[INFO] Assembling webapp [abctechnologies] in [/var/lib/jenkins/workspace/Complete CICD/target/abctechnologies-1.0]
[INFO] Processing war project
[INFO] Copying webapp resources [/var/lib/jenkins/workspace/Complete CICD/src/main/webapp]
[INFO] Webapp assembled in [100 msec]
[INFO] Building war: /var/lib/jenkins/workspace/Complete CICD/target/abctechnologies-1.0.war
[INFO]
[INFO] --- jacoco:0.8.6:report (jacoco-site) @ abctechnologies ---
[INFO] Loading execution data file /var/lib/jenkins/workspace/Complete CICD/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] ...
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 18.784 s
[INFO] Finished at: 2023-07-26T04:46:01Z
[INFO] -----
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // stage
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```



[/var/lib/jenkins/workspace/Complete CICD/target/abctechnologies-1.0.war](http://54.177.131.231:8080/job/Complete%20CICD/1/console)

While doing this task i have encounter some issues as below

```

[INFO] Loading execution data file /var/lib/jenkins/workspace/Complete CICD/target/jacoco.exec
[INFO] Analyzed bundle 'RetailModule' with 2 classes
[INFO] ...
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 12.196 s
[INFO] Finished at: 2023-07-26T04:58:07Z
[INFO] -----
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // stage
[Pipeline] stage
[Pipeline] {
    [Pipeline] {
        [Pipeline] {
            [Pipeline] {
                [Pipeline] {
                    [Pipeline] {
                        [Pipeline] {
                            [Pipeline] {
                                [Pipeline] {
                                    [Pipeline] {
                                        [Pipeline] {
                                            [Pipeline] {
                                                [Pipeline] {
                                                    [Pipeline] {
                                                        [Pipeline] {
                                                            [Pipeline] {
                                                                [Pipeline] {
                                                                    [Pipeline] {
                                                                        [Pipeline] {
                                                                            [Pipeline] {
                                                                                [Pipeline] {
                                                                                    [Pipeline] {
                                                                                        [Pipeline] {
                                                                                            [Pipeline] {
                                                                                                [Pipeline] {
                                                                                                  [Pipeline] {
                                                                                                    [Pipeline] {
                                                                                                      [Pipeline] {
                                                                                                        [Pipeline] {
                                                                                                          [Pipeline] {
                                                                                                            [Pipeline] {
                                                                                                              [Pipeline] {
                                                                                                                [Pipeline] {
                                                                                                                  [Pipeline] {
                                                                                                                [Pipeline] {
                                                                                                                  [Pipeline] {
                                                                                                                [Pipeline] {
                                                                                                                  [Pipeline] {
                                                                                                                [Pipeline] {
................................................................

```

Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Post "http://54.177.131.231:8080/_/api/docker/build?image=abctechnologies/3344&tag=4&ulimits=null&version=1": dial unix /var/run/docker.sock: connect: permission denied



Issue1:

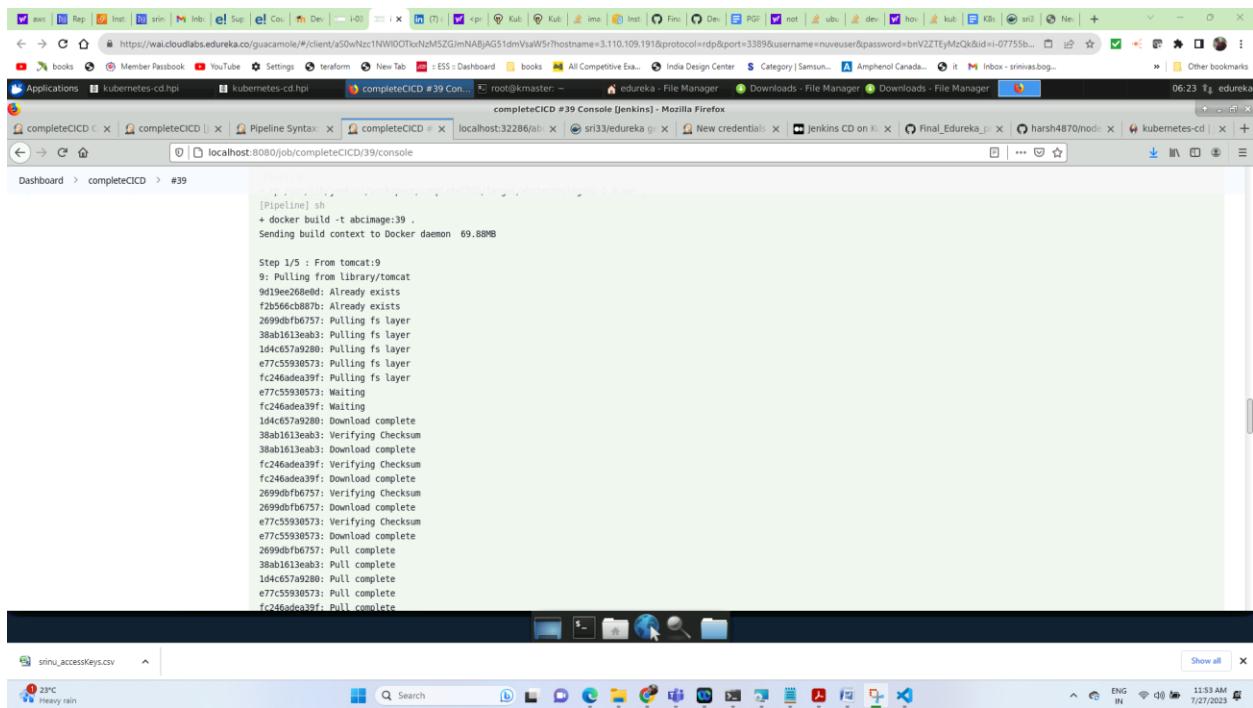
Permission error

Solution:

And add this permission for jenkins user in /etc/sudoers file::: jenkins ALL=(ALL) NOPASSWD: ALL

Change permissions for jenkins to run docker commands::: chmod 777 /var/run/docker.sock

Pushing image to docker Hub:



```
[Pipeline] sh
+ docker build -t abcimage:39 .
 Sending build context to Docker daemon 69.88MB

Step 1/5 : From tomcat:9
9: Pulling from library/tomcat
9d19ee268e0d: Already exists
7f2b566cb870: Already exists
2699dbfb6757: Pulling fs layer
38ab01613ea0b3: Pulling fs layer
1d4c657a972800: Pulling fs layer
e77c55930573: Pulling fs layer
fc246adea39f: Pulling fs layer
e77c55930573: Waiting
fc246adea39f: Waiting
1d4c657a972800: Download complete
38ab01613ea0b3: Verifying Checksum
38ab01613ea0b3: Download complete
fc246adea39f: Verifying Checksum
fc246adea39f: Download complete
2699dbfb6757: Verifying Checksum
2699dbfb6757: Download complete
e77c55930573: Verifying Checksum
e77c55930573: Download complete
2699dbfb6757: Pull complete
38ab01613ea0b3: Pull complete
1d4c657a972800: Pull complete
e77c55930573: Pull complete
fc246adea39f: Pull complete
```

Deploying to kubernetes has been started

```

[DeploymentCondition(lastTransitionTime=2023-07-27T05:55:21Z, lastUpdateTime=2023-07-27T05:55:21Z, message=Deployment does not have minimum availability., reason=MinimumReplicasUnavailable, status=false, type=Available, additionalProperties={}), DeploymentCondition(lastTransitionTime=2023-07-27T06:05:23Z, lastUpdateTime=2023-07-27T06:05:23Z, message=ReplicaSet "abctechnologies-dep-7fbcc64c" has timed out progressing., reason=ProgressDeadlineExceeded, status=false, type=Progressing, additionalProperties={}), observedGeneration=1, readyReplicas=null, unavailableReplicas=2, updatedReplicas=2, additionalProperties={}), additionalProperties={})]
AppliedService: Service(apiVersion=v1, kind=Service, metadata=ObjectMeta(annotations=null, clusterName=null, creationTimestamp=2023-07-27T05:55:21Z, deletionGracePeriodSeconds=null, deletionTimestamp=null, finalizers=[], generateName=null, generation=null, initializers=null, labels=null, name=abc-tech-service, namespace=default, ownerReferences=[]), resourceVersion=158353, selfLink=null, uid=e699e639-1cce-4027-b2f0-e743fb409065, additionalProperties={managedFields=[{manager=http, operation=Update, apiVersion=v1, time=2023-07-27T05:55:21Z, fieldsType=FieldsV1, fieldsV1={f:spec{f:externalTrafficPolicy{}}, f:ports={w:, k:{port:80, protocol:'TCP'}={.}, f:port={}}, f:protocol={}, f:targetPort={}}, f:selector={}, f:sessionAffinity={o, f:type({})}}], spec=ServiceSpec(clusterIP=10.98.13.187, externalIPs=[], externalName=null, externalTrafficPolicy=ClusterTrafficPolicy, ports=[ServicePort(name=null, nodePort=32286, port=80, protocol=TCP, targetPort=IngressPortNumber=8080, kind=NodePort, StrVal=null, additionalProperties={}), additionalProperties={}], publishNotReadyAddresses=null, selector={app=abc-tech-app}, sessionAffinityConfig=null, type=NodePort, additionalProperties={clusterIP=[10.98.13.187], ipFamily=IPv4, ipFamilyPolicy=singleStack, internalTrafficPolicy=ClusterTrafficPolicy}, status=ServiceStatus(loadBalancer=LoadBalancerStatus(ingress=[]), additionalProperties={}), additionalProperties={})})
Finished: Kubernetes deployment
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // stage
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

```

535126407049: Preparing
59c56aeef1b4: Preparing
ed32c247@ab0: Waiting
535126407049: Waiting
59c56aeef1b4: Waiting
ad7bc490b727: Layer already exists
25baea2c091: Layer already exists
3bc0cb20d942: Layer already exists
4b3f0e3a158: Layer already exists
535126407049: Layer already exists
59c56aeef1b4: Layer already exists
ed32c247@ab0: Layer already exists
8416427@elma: Pushed
abcimage2: digest: sha256:3f886c2bfd5df2bc5bad3c3d8077eb760fb1b394c5a7eb63f6648fef8bc8dee size: 1999
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // stage
[Pipeline] stage
[Pipeline] | (Deploy in kube)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] withEnv
[Pipeline] {
[Pipeline] kubernetesDeploy
Starting Kubernetes deployment
Loading configuration: /var/lib/jenkins/workspace/completeCI/completeCI/kubernetes/deployment.yaml
Applied Deployment: Deployment(apiVersion=apps/v1, kind=Deployment, metadata=ObjectMeta(annotations=null, clusterName=null, creationTimestamp=2023-07-27T05:55:21Z, deletionGracePeriodSeconds=null, deletionTimestamp=null, finalizers=[], generateName=null, generation=2, initializers=null, labels=null, name=abctechnologies-dep, namespace=default, ownerReferences=[{name=abctechnologies-dep, type=ReplicaSet}], resourceVersion=158353, selfLink=null, uid=e699e639-1cce-4027-b2f0-e743fb409065, additionalProperties={}), additionalProperties={})
[Pipeline]
[Pipeline] // withEnv
[Pipeline]
[Pipeline] // stage
[Pipeline] | (Deploy in kube)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] withEnv
[Pipeline] {
[Pipeline] kubernetesDeploy
Starting Kubernetes deployment
Loading configuration: /var/lib/jenkins/workspace/completeCI/completeCI/kubernetes/deployment.yaml
Applied Deployment: Deployment(apiVersion=apps/v1, kind=Deployment, metadata=ObjectMeta(annotations=null, clusterName=null, creationTimestamp=2023-07-27T05:55:21Z, deletionGracePeriodSeconds=null, deletionTimestamp=null, finalizers=[], generateName=null, generation=2, initializers=null, labels=null, name=abctechnologies-dep, namespace=default, ownerReferences=[{name=abctechnologies-dep, type=ReplicaSet}], resourceVersion=158353, selfLink=null, uid=e699e639-1cce-4027-b2f0-e743fb409065, additionalProperties={}), additionalProperties={})

```

Dockerhub image in dockehub

Description
This repository does not have a description.

Last pushed: 13 minutes ago

Tags
This repository contains 5 tag(s).

Tag	OS	Type	Pulled	Pushed
abcimage2		Image	--	14 minutes ago
abcimage1		Image	--	an hour ago
abctech		Image	--	16 hours ago
project		Image	11 days ago	11 days ago
abctechnologies1-pro...		Image	11 days ago	11 days ago

To push a new tag to this repository, docker push sri33/edureka:tagname

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How likely are you to recommend Docker Hub to another developer?
Not at all likely 0 1 2 3 4 5 6 7 8 9 10 Extremely likely

powered by InMoment

Validating kubernetes validation resources (deployment, pods, service)

```

root@kmaster:~# kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
abctechnologies-dep-5d5f968f6c-4922n   1/1    Running   0          84s
abctechnologies-dep-5d5f968f6c-6tm7n   1/1    Running   0          84s
root@kmaster:~# kubectl get all
NAME           READY   STATUS    RESTARTS   AGE
pod/abctechnologies-dep-5d5f968f6c-4922n   1/1    Running   0          119s
pod/abctechnologies-dep-5d5f968f6c-6tm7n   1/1    Running   0          119s
NAME            TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)        AGE
service/abc-tech-service   NodePort    10.98.13.187    <none>           80:32286/TCP   19m
service/kubernetes       ClusterIP   10.96.0.1        <none>           443/TCP       16d
NAME           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/abctechnologies-dep   2/2     2           2           19m
NAME           DESIRED   CURRENT   READY   AGE
replicaset.apps/abctechnologies-dep-5d5f968f6c   2         2         2         119s
replicaset.apps/abctechnologies-dep-d7fbcc64c   0         0         0         19m
root@kmaster:~# kubectl describe serviceabc-tech-service
error: the server doesn't have a resource type "serviceabc-tech-service"
root@kmaster:~# kubectl describe service abc-tech-service
Name:          abc-tech-service
Namespace:     default
Labels:        <none>
Annotations:  <none>
Selector:     app=abc-tech-app
Type:          NodePort
IP Family Policy:  IPv4
IP Families:  IPv4
IP:           10.98.13.187
Ports:
  Port:        <unset>  80/TCP
  TargetPort:  <unset>  32286/TCP
  Endpoints:   192.168.245.84:8080,192.168.245.85:8080
Session Affinity: None
External Traffic Policy: Cluster
Events:        <none>
root@kmaster:~#

```

PIPELINE:

Stage View

Stage	Time	Description
Tool Install	214ms	Average stage time: 214ms (Average full run time: ~1min 10s)
clone repo	1s	
build the code	25s	
Build Image	14s	
Push image to dockerhub	12s	
Deploy in kube	1s	

Build History

Build #	Date	Commit	Duration
#39	Jul 27, 2023, 6:11 AM	1 commit	123ms
#38	Jul 27, 2023, 5:54 AM	No changes	158ms
#37	Jul 27, 2023, 5:46 AM	No changes	117ms
#36	Jul 27, 2023, 5:14 AM	No changes	99ms
#35	Jul 27, 2023, 4:48 AM	No changes	99ms
#34	Jul 27, 2023, 3:53 AM	1 commit	99ms
#33	Jul 26, 2023, 2:44 PM	No changes	904ms

Validating the kubernetes container with service port

Welcome to ABC technologies

This is retail portal

Add Product View Product



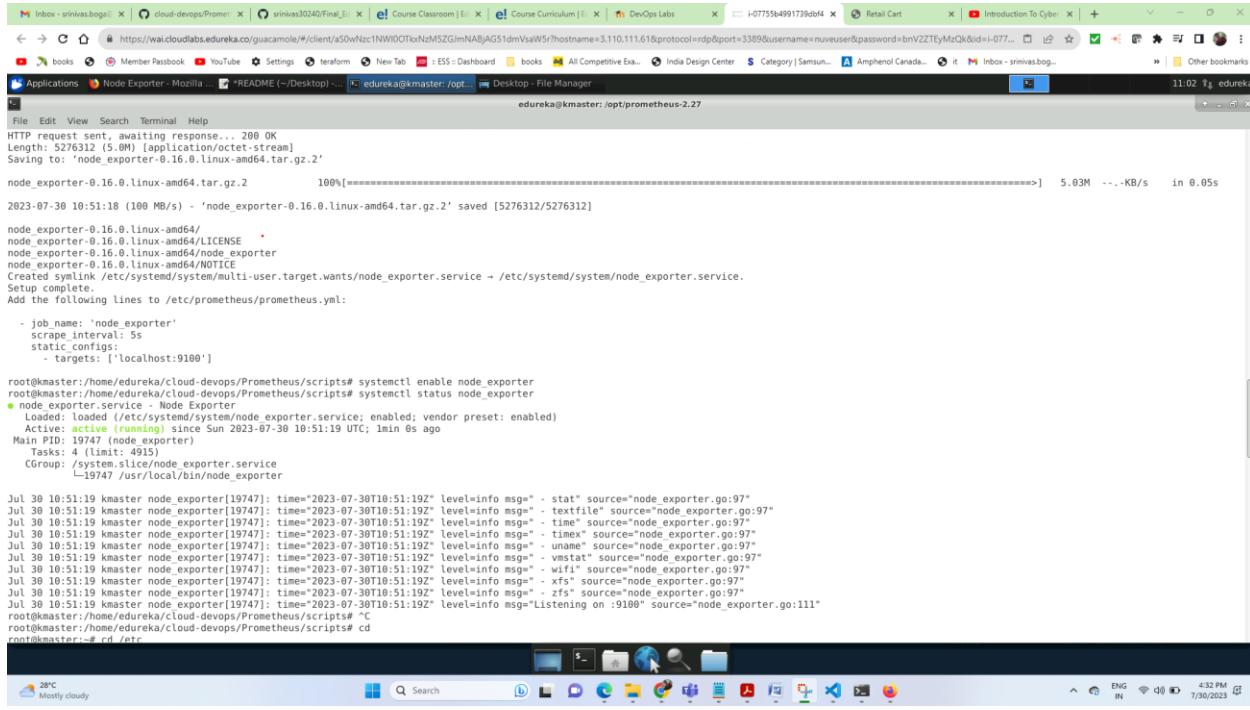
Task 5: Using Prometheus, monitor the resources like CPU utilization: Total Usage, Usage per core, usage breakdown, memory, and network on the instance by providing the endpoints on the local host. Install the node exporter and add the URL to the target in Prometheus. Using this data, log in to Grafana and create a dashboard to show the metrics.

Approach i have followed:

First of all we need to have Prometheus, Grafana but edureka lab already installed these tools. So I had installed the node-exporter in master node to monitor the metrics of a node and added the target url in the prometheus.yml file so that prometheus will start to monitor.

And I have monitored and captured the CPU, memory and network of the target node. And I have created a dashboard by selecting the prometheus app from Grafana and then created a Panel for visualizing the metrics in Grafana.

After installing node exporter I have added the below job in the prometheus.yml file to get the metrics from the target.



```

HTTP request sent, awaiting response... 200 OK
Length: 5276312 (5.0M) [application/octet-stream]
Saving to: 'node_exporter-0.16.0.linux-amd64.tar.gz.2'

node_exporter-0.16.0.linux-amd64.tar.gz.2      100%[=====] 5.03M --.KB/s   in 0.05s

2023-07-30 10:51:18 (100 MB/s) - 'node_exporter-0.16.0.linux-amd64.tar.gz.2' saved [5276312/5276312]

node_exporter-0.16.0.linux-amd64/
node_exporter-0.16.0.linux-amd64/LICENSE *
node_exporter-0.16.0.linux-amd64/node_exporter
node_exporter-0.16.0.linux-amd64/NOTICE
Created symlink /etc/systemd/system/multi-user.target.wants/node_exporter.service → /etc/systemd/system/node_exporter.service.
Setup complete.
Add the following lines to /etc/prometheus/prometheus.yml:

  - job_name: 'node exporter'
    scrape_interval: 5s
    static_configs:
      - targets: ['localhost:9100']

root@kmaster:~/home/edureka/cloud-devops/Prometheus/scripts# systemctl enable node_exporter
root@kmaster:/home/edureka/cloud-devops/Prometheus/scripts# systemctl status node_exporter
● node_exporter.service - Node Exporter
   Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; vendor preset: enabled)
     Active: active (running) since Sun 2023-07-30 10:51:19 UTC; 1min 08s ago
       Main PID: 19747 (node exporter)
          Tasks: 4 (limit: 4915)
         CGroup: /system.slice/node_exporter.service
                 └─19747 /usr/local/bin/node_exporter

Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - stat source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - textfile source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - socket source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - timer source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - uname source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - vmstat source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - wifi source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - xfs source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg=" - fts source=\"node_exporter.go:97\""
Jul 30 10:51:19 kmaster node_exporter[19747]: time="2023-07-30T10:51:19Z" level=info msg="Listening on :9100" source="node_exporter.go:111"
root@kmaster:/home/edureka/cloud-devops/Prometheus/scripts# ``c
root@kmaster:/home/edureka/cloud-devops/Prometheus/scripts# cd
root@kmaster:# cd /etc

```

Added job name and target port to /opt/prometheus-2.27/prometheus.yml

my global config global:

```
scrape_interval: 15s # Set the scrape interval to every 15 seconds. Default is every 1
minute.

evaluation_interval: 15s # Evaluate rules every 15 seconds. The default is every 1
minute.

# scrape_timeout is set to the global default (10s).

# Alertmanager configuration

alerting:

alertmanagers:

- static_configs:

  - targets:

    # - alertmanager:9093

# Load rules once and periodically evaluate them according to the global
'evaluation_interval'.

rule_files:

# - "first_rules.yml"
# - "second_rules.yml"

# A scrape configuration containing exactly one endpoint to scrape:

# Here it's Prometheus itself.

scrape_configs:

# The job name is added as a label `job=<job_name>` to any timeseries scraped from
this config.

- job_name: 'prometheus'

# metrics_path defaults to '/metrics'

# scheme defaults to 'http'.

static_configs:

- targets: ['localhost:9090']
```

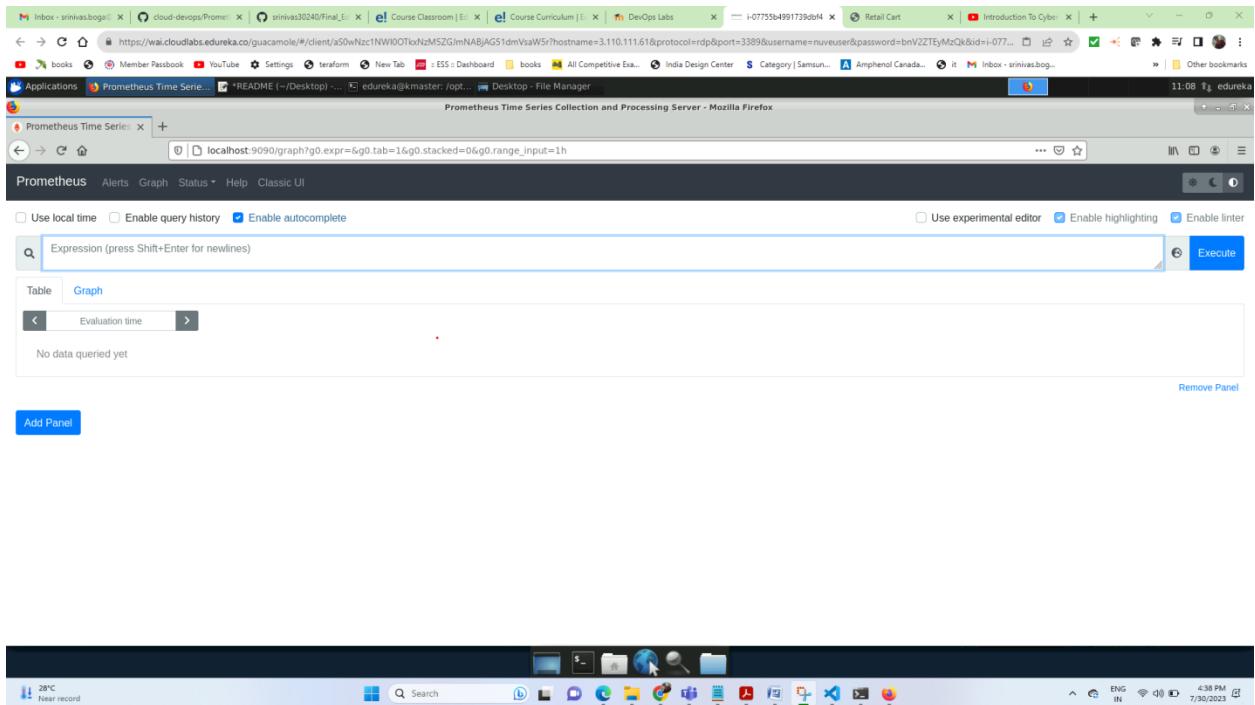
- job_name: 'node_exporter'

scrape_interval: 5s

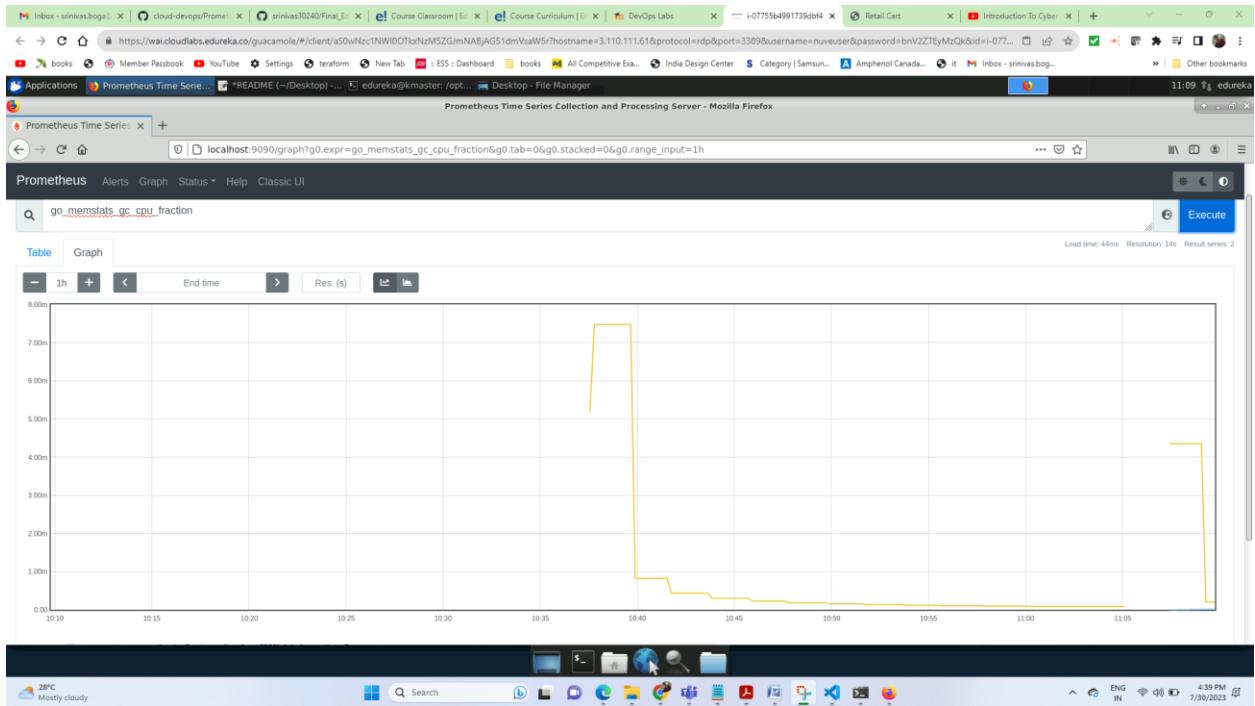
static_configs:

- targets: ['localhost:9100']

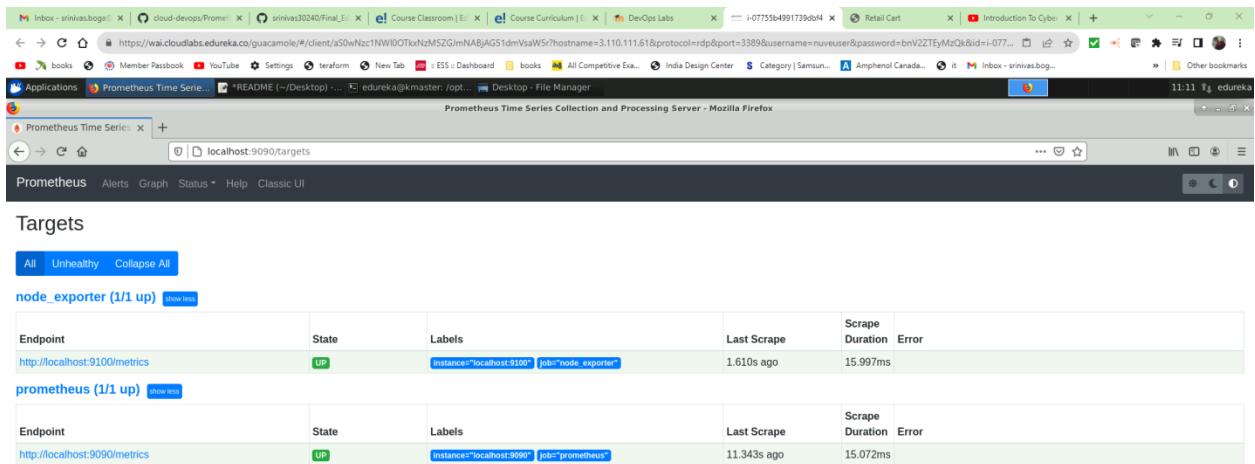
Please find the screenshots: Prometheus self monitoring



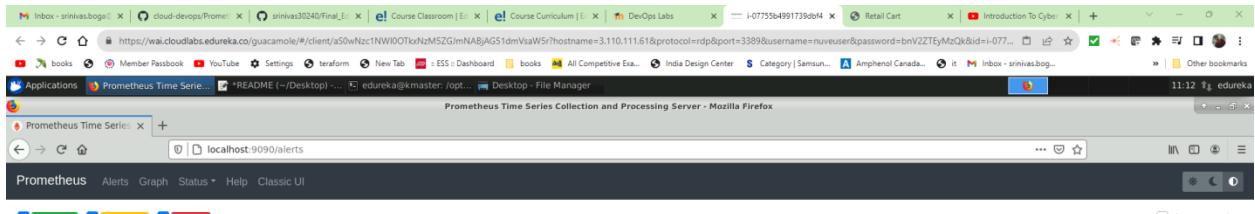
Graph visualization for the metrics in Prometheus:



After adding the node exporter



Alerts tab



Node export metric validation

```
# HELP go_gc_duration_seconds A summary of the GC invocation durations.
# TYPE go_gc_duration_seconds summary
go_gc.duration.seconds.quantile="0.99" 3.6493e-05
go_gc.duration.seconds.quantile="0.25" 5.8176e-05
go_gc.duration.seconds.quantile="0.5" 1.0548e-05
go_gc.duration.seconds.quantile="0.75" 0.000103971
go_gc.duration.seconds.quantile="1" 0.0001971497
go_gc.duration.seconds.sum 0.01476199
go_gc.duration.seconds.count 1
# HELP go_goroutines Number of goroutines that currently exist.
# TYPE go_goroutines gauge
go_goroutines 1
# HELP go_info Information about the Go environment.
# TYPE go_info gauge
go_info.golang_version "1.18.6" 1
# HELP go_memstats_alloc_bytes Number of bytes allocated and still in use.
# TYPE go_memstats_alloc_bytes gauge
go_memstats.alloc.bytes 1.464366e+08
# HELP go_memstats_frees Total number of bytes freed by the allocator.
# TYPE go_memstats_frees total counter
go_memstats.frees.total 1.464366e+08
# HELP go_memstats_heap_bytes Number of bytes used by the profiling bucket hash table.
# TYPE go_memstats_heap_bytes gauge
go_memstats.buck_hash.sys.bytes 1.484376e+06
# HELP go_memstats_gc_sys_bytes Number of bytes used for garbage collection system metadata.
# TYPE go_memstats_gc_sys_bytes total counter
go_memstats.gc.sys.bytes 409594
# HELP go_memstats_gc_cpu_fraction Fraction of this program's available CPU time used by the GC since the program started.
# TYPE go_memstats_gc_cpu_fraction gauge
go_memstats.gc.cpu.fraction 4.177118565394145e-05
# HELP go_memstats_gc_sys_bytes Number of bytes used for garbage collection system metadata.
# TYPE go_memstats_gc_sys_bytes gauge
go_memstats.gc.sys.bytes 409594
# HELP go_memstats_heap_alloc_bytes Number of heap bytes allocated and still in use.
# TYPE go_memstats_heap_alloc_bytes gauge
go_memstats.heap.alloc.bytes 2.340184e+06
# HELP go_memstats_heap_idle_bytes Number of heap bytes waiting to be used.
# TYPE go_memstats_heap_idle_bytes gauge
go_memstats.heap.idle.bytes 2.187264e+06
# HELP go_memstats_heap_inuse_bytes Number of heap bytes that are in use.
# TYPE go_memstats_heap_inuse_bytes gauge
go_memstats.heap.inuse.bytes 3.612672e+06
# HELP go_memstats_heap_objects Number of allocated objects.
# TYPE go_memstats_heap_objects gauge
go_memstats.heap.objects 13666
# HELP go_memstats_heap_released_bytes Number of heap bytes released to OS.
# TYPE go_memstats_heap_released_bytes gauge
go_memstats.heap.released.bytes 0
# HELP go_memstats_heap_total_bytes Number of heap bytes obtained from system.
```

Node cpu usage total utilization

Prometheus Time Series Collection and Processing Server - Mozilla Firefox

localhost:9100/metrics

localhost:9090/graph?g0.expr=node_cpu_seconds_total&g0.tab=1&g0.stacked=0&g0.range_input=1h

		Load time: 25ms Resolution: 14s Result series: 16
node_cpu_seconds_total		<input type="button" value="Execute"/>
Table		Graph
<input type="button" value="Evaluation time"/> <input type="button" value=""/>		
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="idle"}	1942.56	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="iowait"}	59.55	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="irq"}	0	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="nice"}	0.06	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="softirq"}	2.97	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="steal"}	0.01	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="system"}	80.89	
node_cpu_seconds_total{cpu="0", instance="localhost:9100", job="node_exporter", mode="user"}	287.24	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="idle"}	1947.67	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="iowait"}	52.55	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="irq"}	0	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="nice"}	0.04	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="softirq"}	2.9	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="steal"}	0.19	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="system"}	81.41	
node_cpu_seconds_total{cpu="1", instance="localhost:9100", job="node_exporter", mode="user"}	288.41	

Total count of cpu usage in seconds from starting

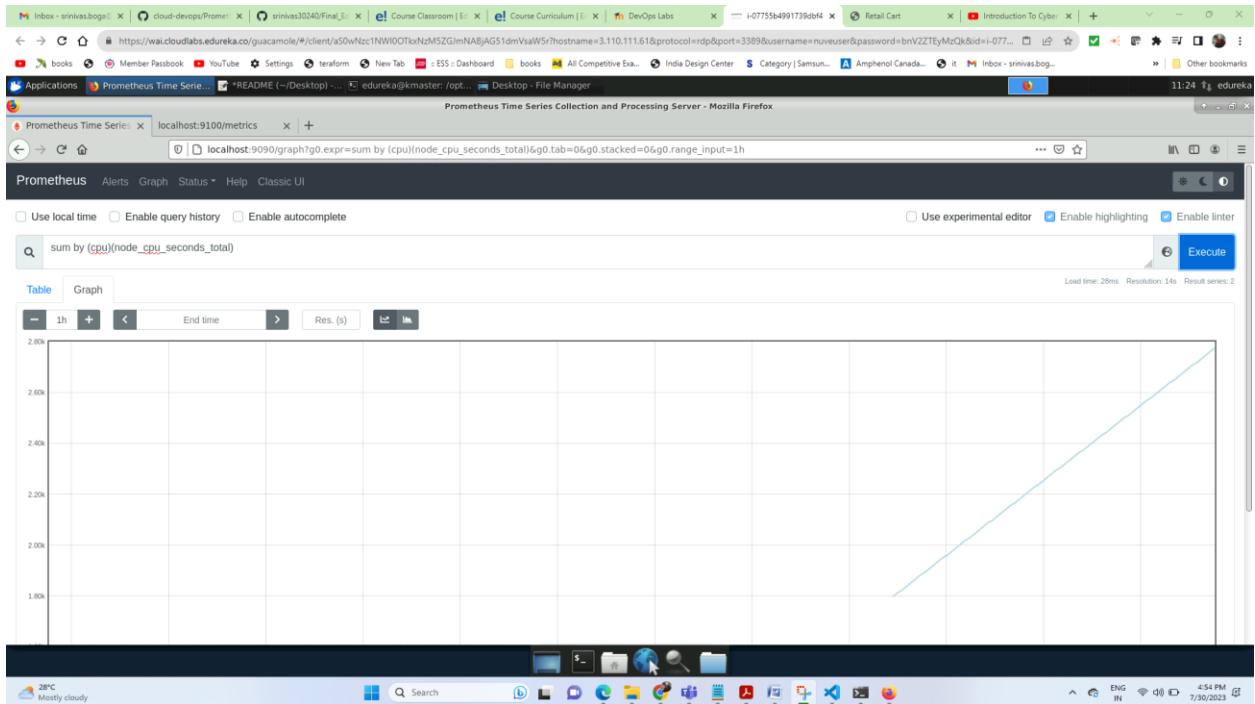
Prometheus Time Series Collection and Processing Server - Mozilla Firefox

localhost:9100/metrics

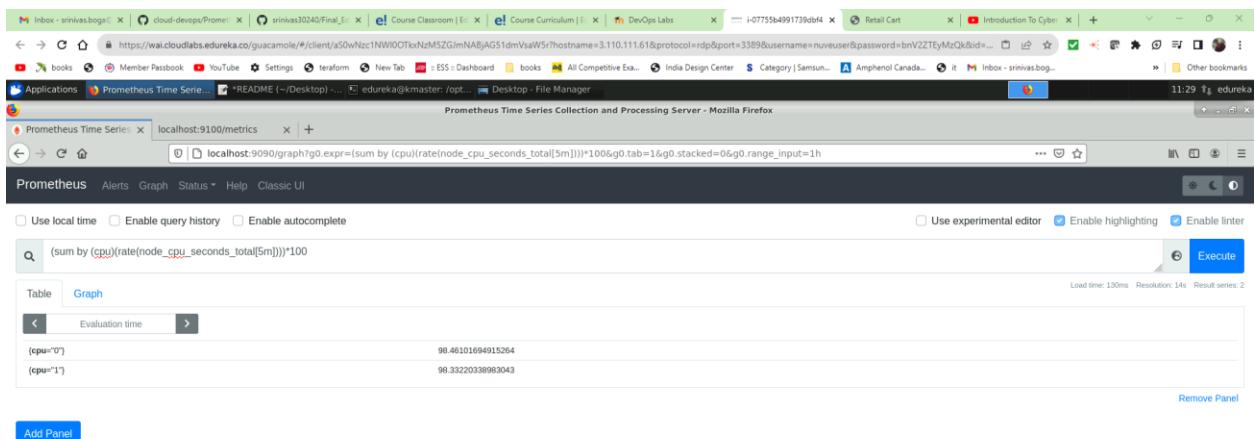
localhost:9090/graph?g0.expr=sum by (cpu)(node_cpu_guest_seconds_total)&g0.tab=1&g0.stacked=0&g0.range_input=1h

		Load time: 22ms Resolution: 14s Result series: 2
sum by (cpu)(node_cpu_guest_seconds_total)		<input type="button" value="Execute"/>
Table		Graph
<input type="button" value="Evaluation time"/> <input type="button" value=""/>		
(cpu="0")	0	
(cpu="1")	0	
<input type="button" value="Add Panel"/>		

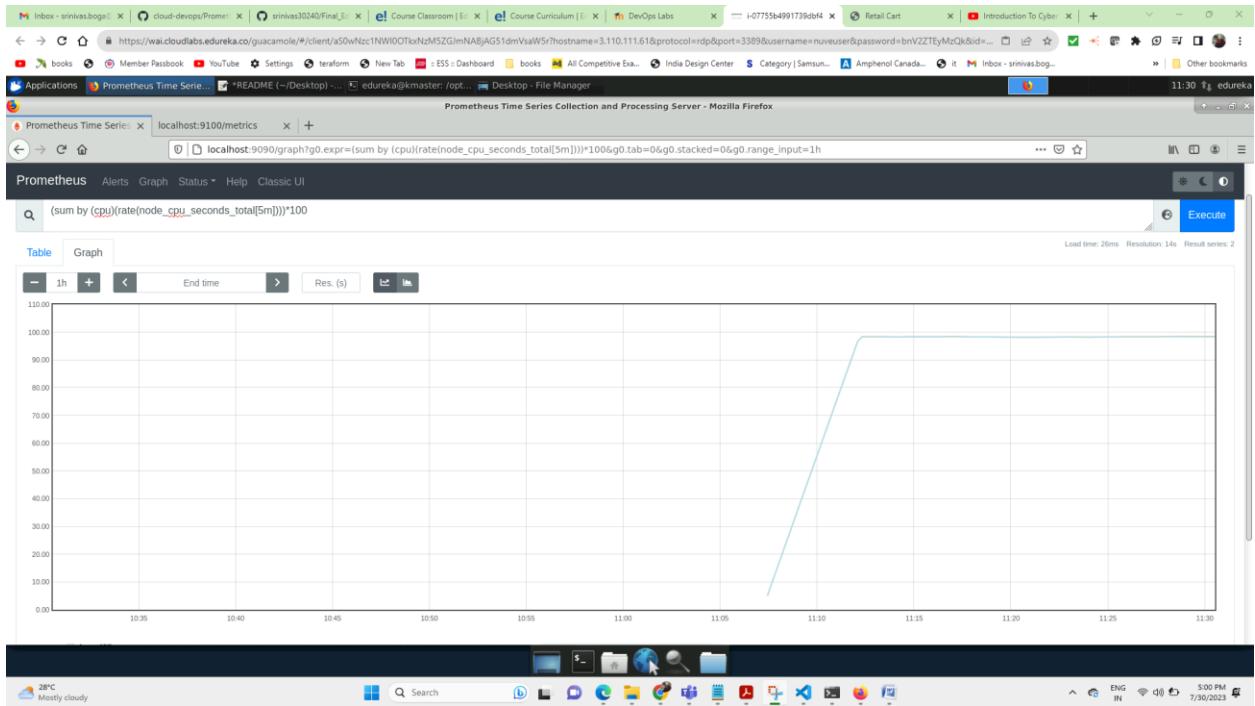
Total count graph



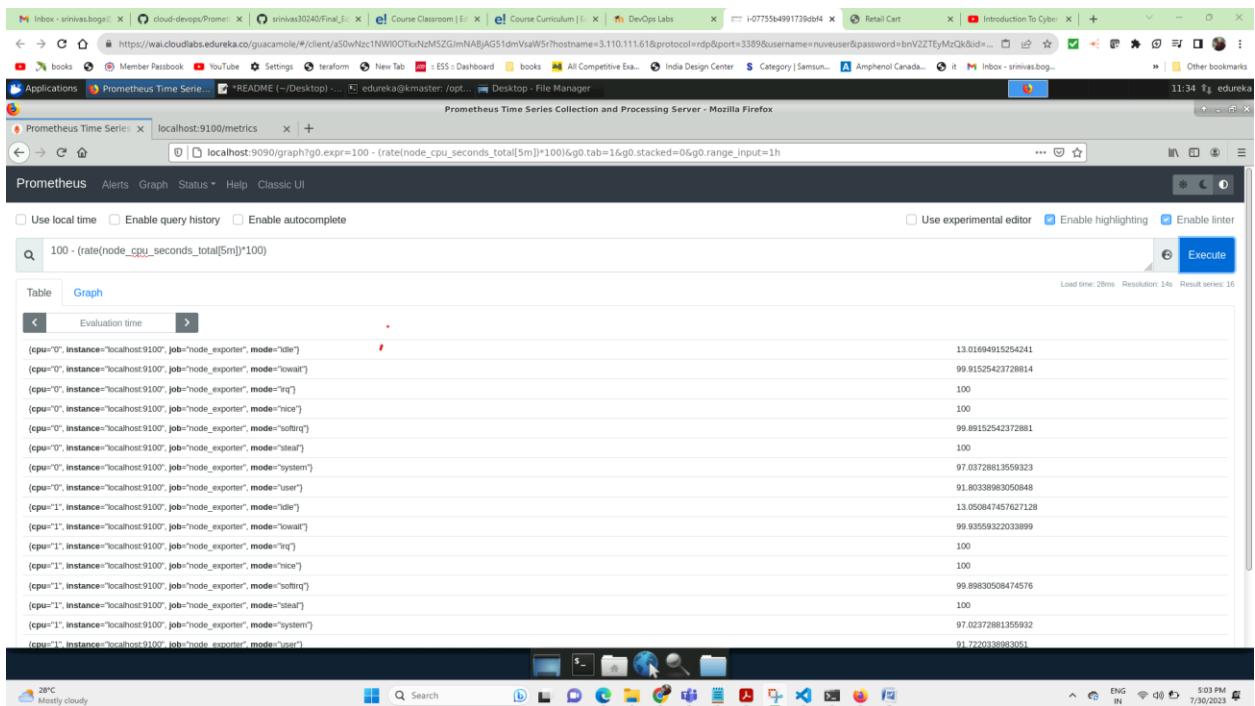
Rate of growth for cpu in last 5 minutes



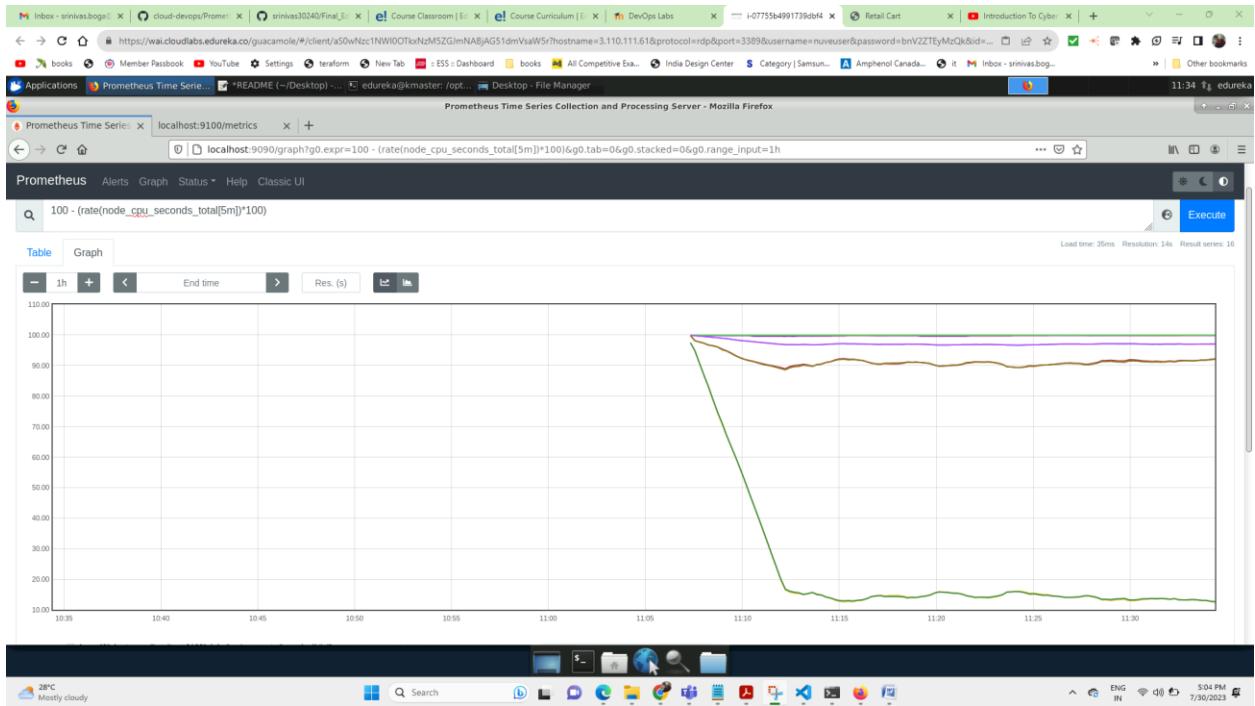
Graph



Cpu utilization:

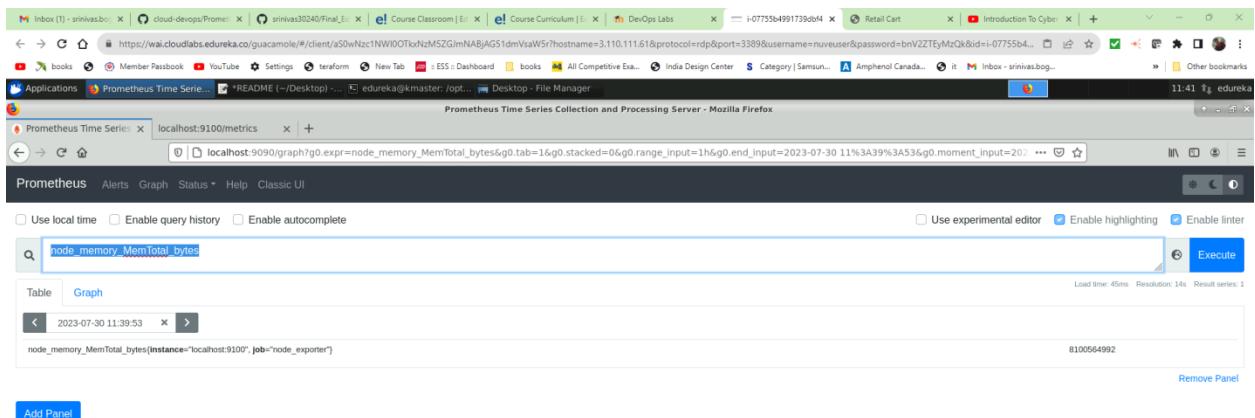


Graph

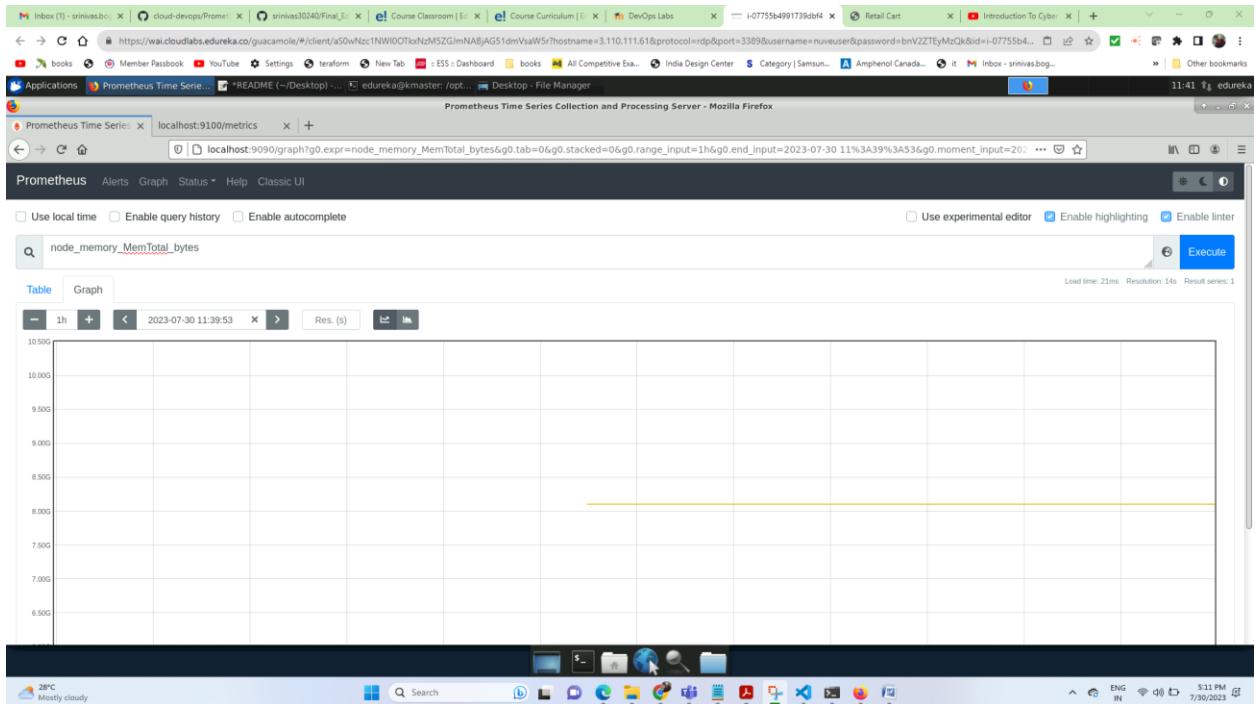


Memory monitoring:

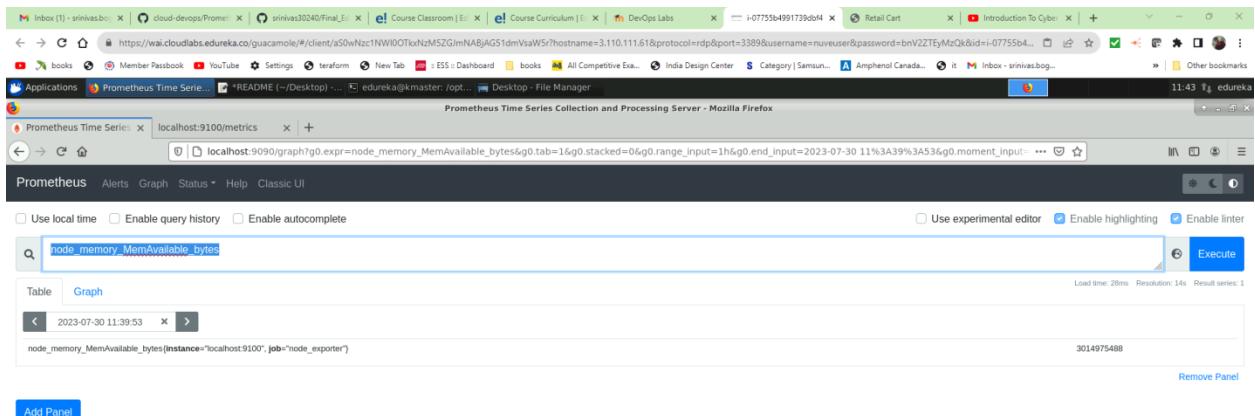
node_memory_MemTotal_bytes:



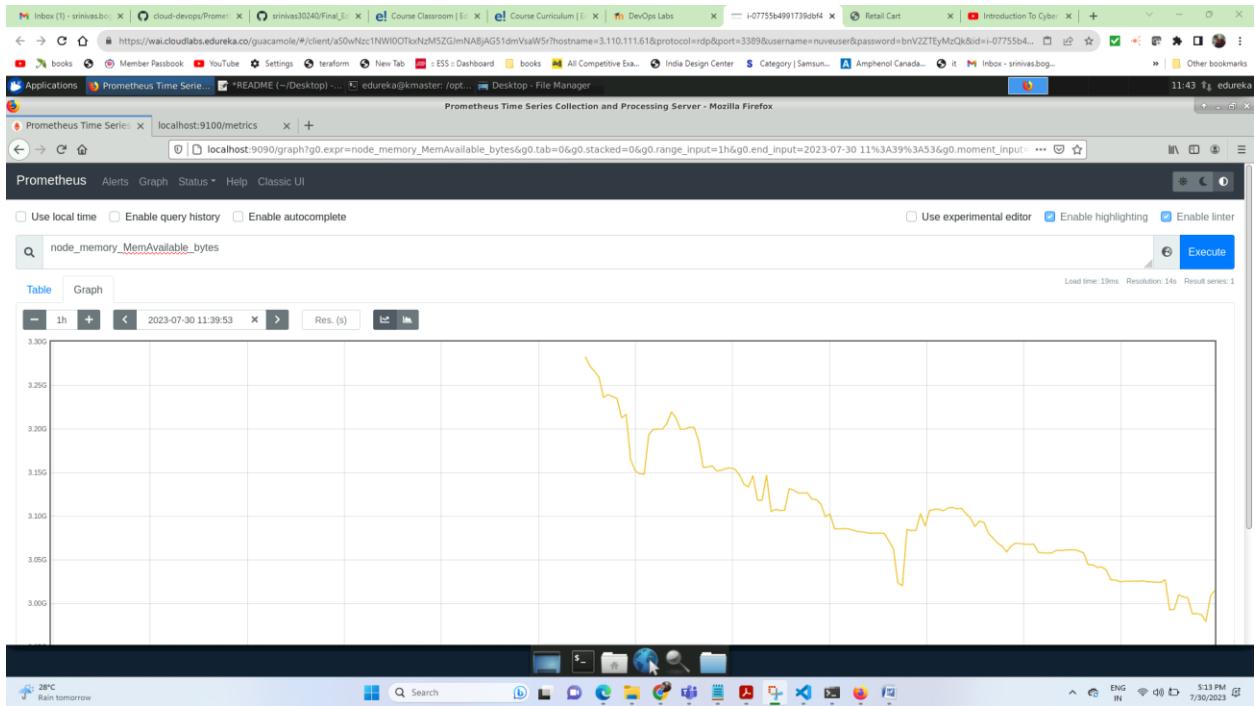
Graph:



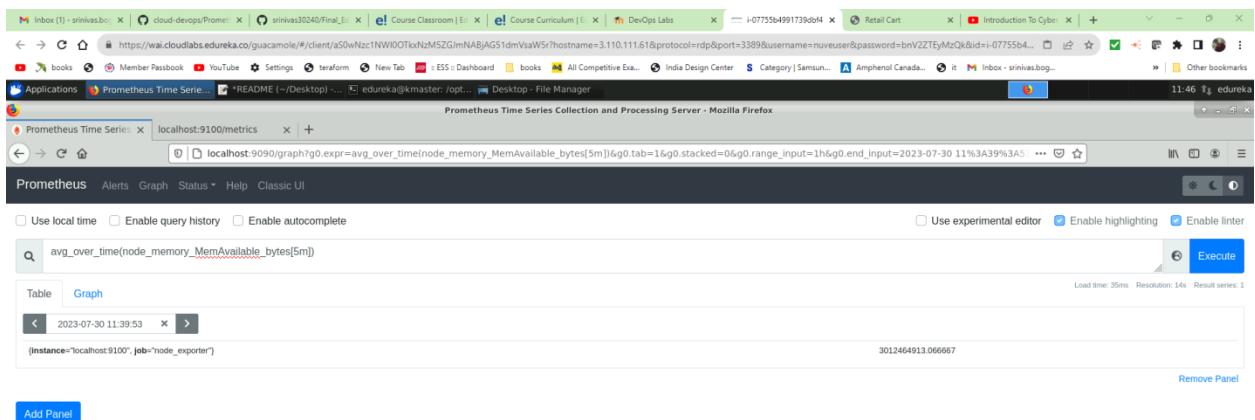
node_memory_MemAvailable_bytes



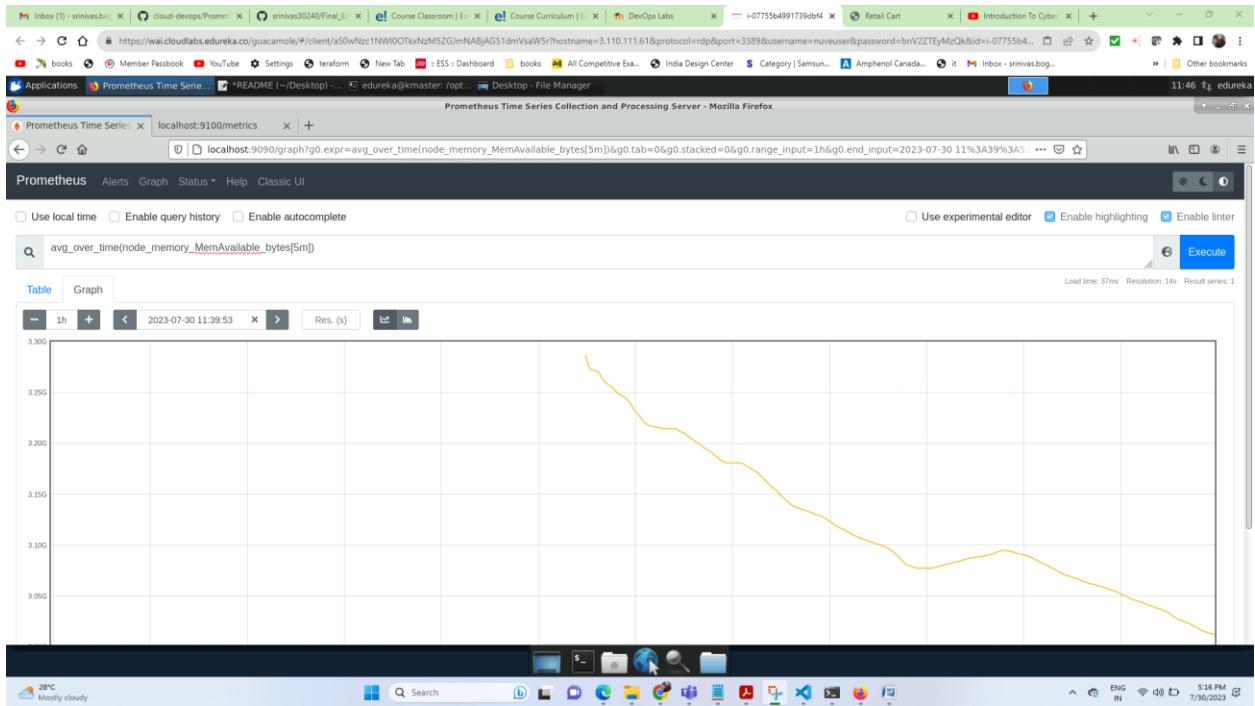
Graph:



Node memory available in MB for last 5min

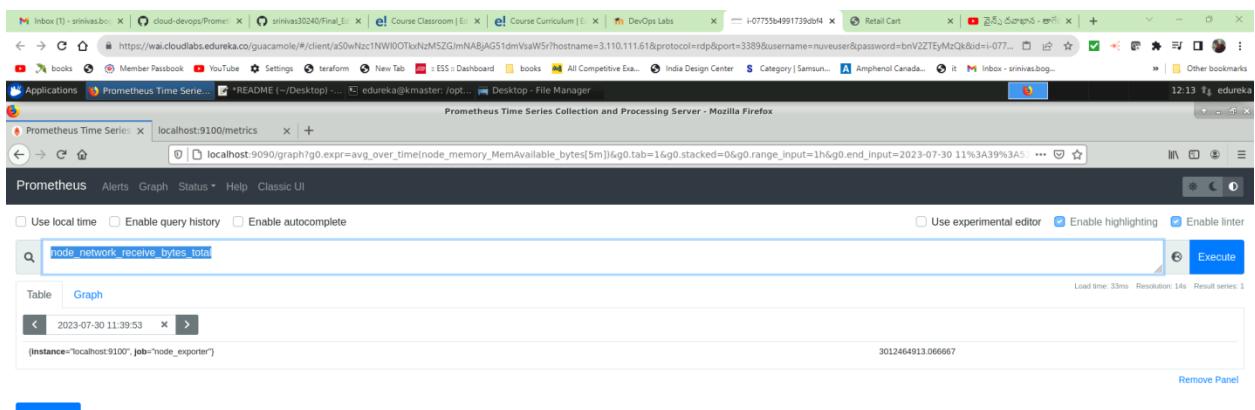


Graph:

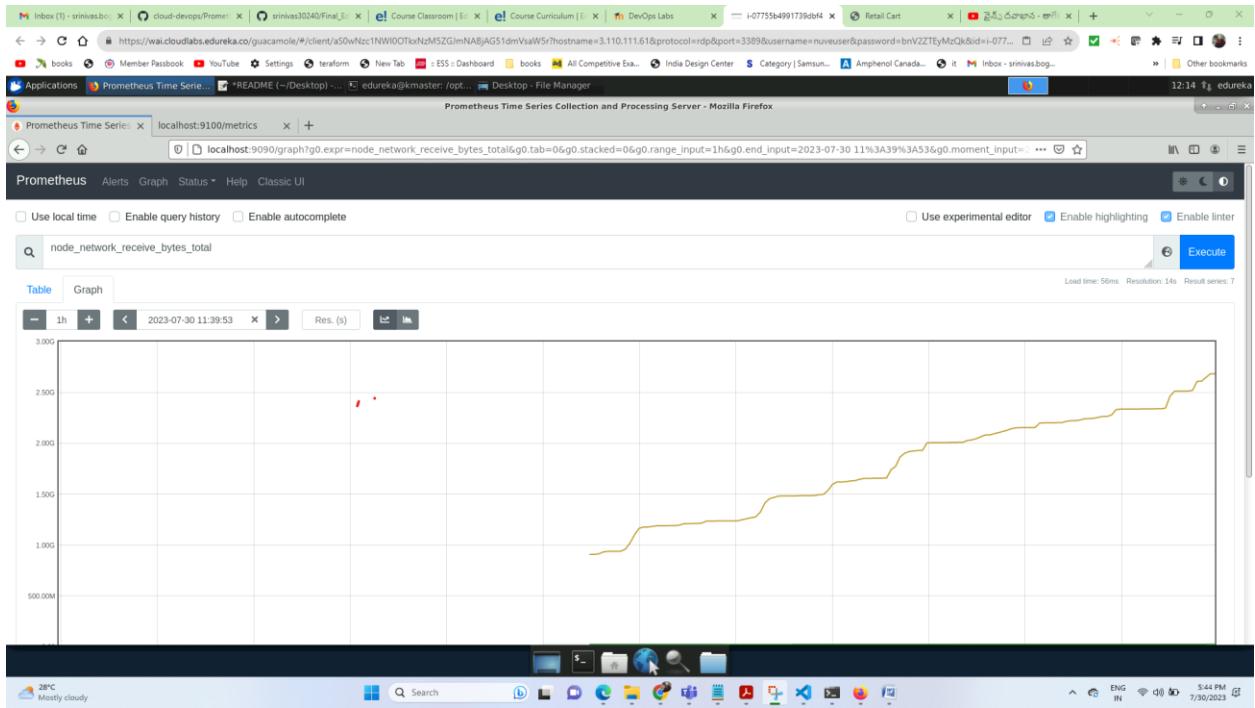


Networking:

`node_network_receive_bytes_total`

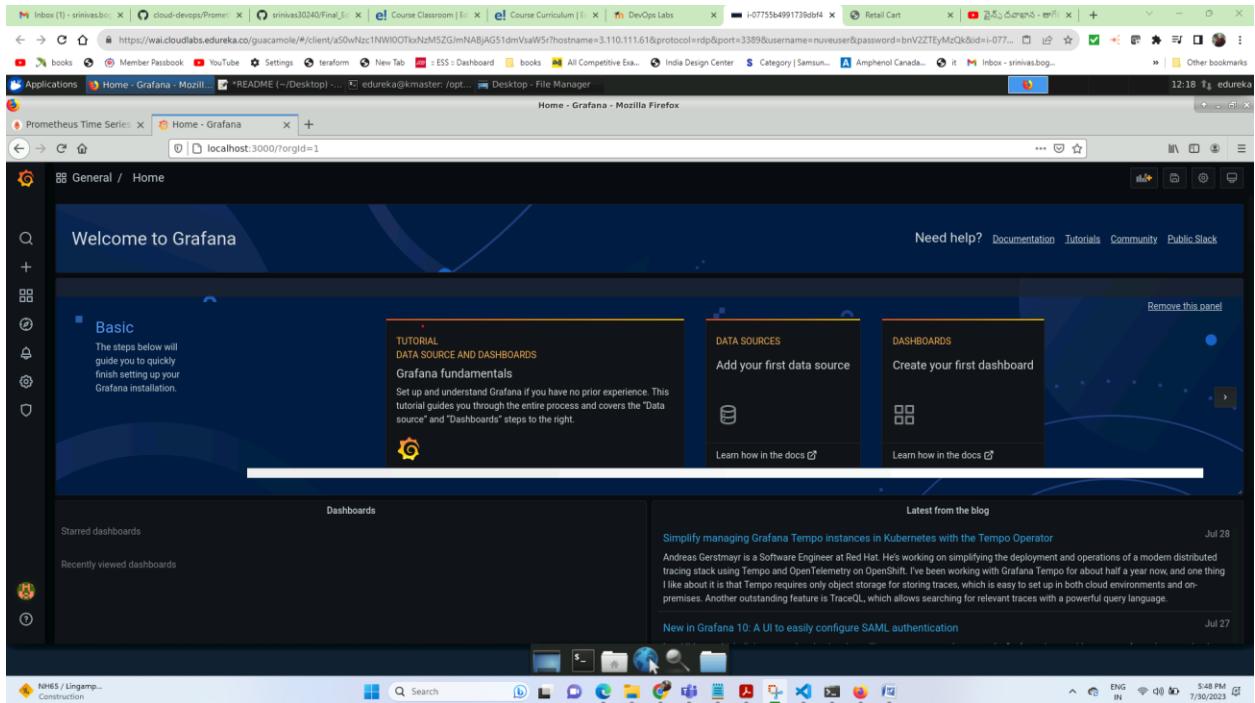


Graph:



Grafana

Grafana home page:



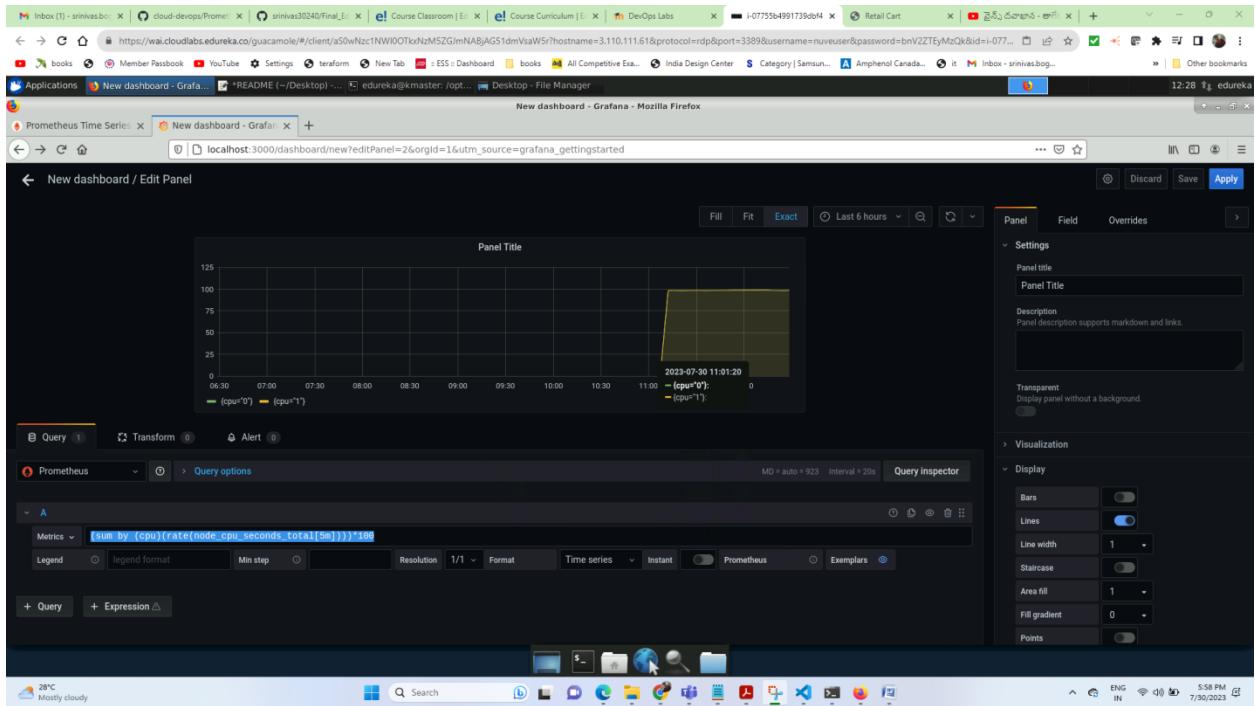
Setting up the prometheus target:

The screenshot shows the 'Data Sources / Prometheus' configuration page. The 'Settings' tab is selected. A message at the top encourages using Grafana Cloud plan for managed sources. The 'Name' field is set to 'Prometheus'. Under the 'HTTP' section, the 'URL' is set to 'http://localhost:9090'. The 'Auth' section includes 'Basic auth' (With Credentials) and 'TLS Client Auth' (With CA Cert). The 'Skip TLS Verify' option is also present. On the right side, there are several icons for managing data sources.

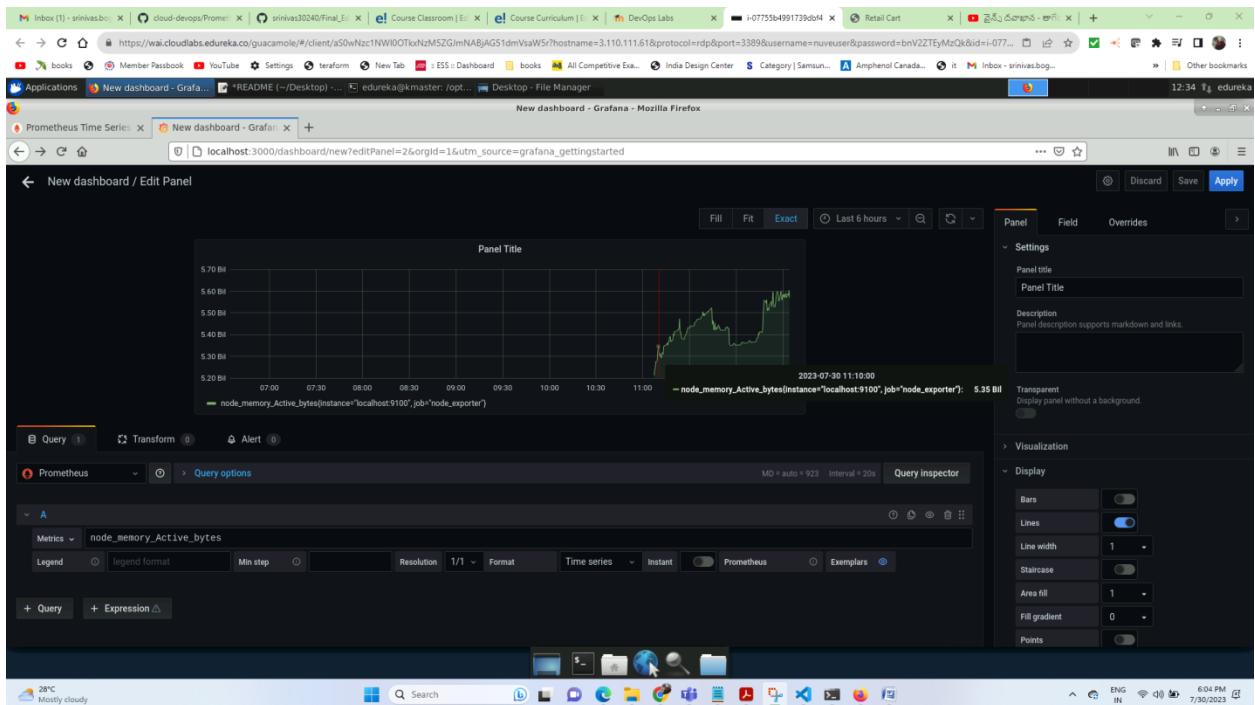
CPU monitoring

The screenshot shows the 'New dashboard - Grafana' creation interface. A single panel titled 'Panel Title' is displayed, showing a line chart of CPU usage over time. The chart has a green area fill representing the total CPU seconds. The legend lists four series: 'node_cpu_seconds_total(cpu=0, instance="localhost:9100", job="node_exporter", mode="idle")', 'node_cpu_seconds_total(cpu=0, instance="localhost:9100", job="node_exporter", mode="idle")', 'node_cpu_seconds_total(cpu=0, instance="localhost:9100", job="node_exporter", mode="idle")', and 'node_cpu_seconds_total(cpu=0, instance="localhost:9100", job="node_exporter", mode="idle")'. The chart shows a sharp increase in CPU usage starting around 11:30. The 'Query' section at the bottom shows the metric 'node_cpu_seconds_total' selected. The 'Inspector' section shows the query 'MD = auto * 892 Interval = 20s'. The right side of the screen displays various visualization and display settings.

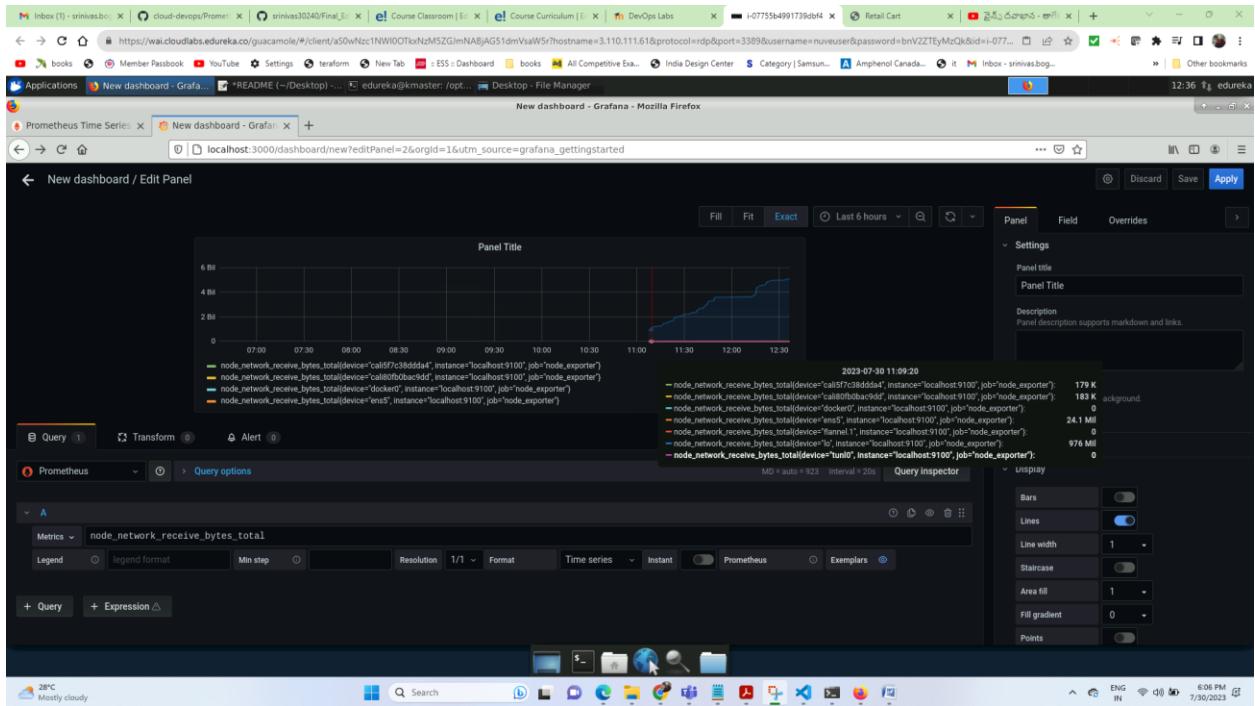
(sum by (cpu)(rate(node_cpu_seconds_total[5m]))) * 100



Memory monitoring



Network:



Thank you

Srinivas boga