TRAINING CONTENT
Continuous Integration
Session-2

YOUR NEXT DESTINATION
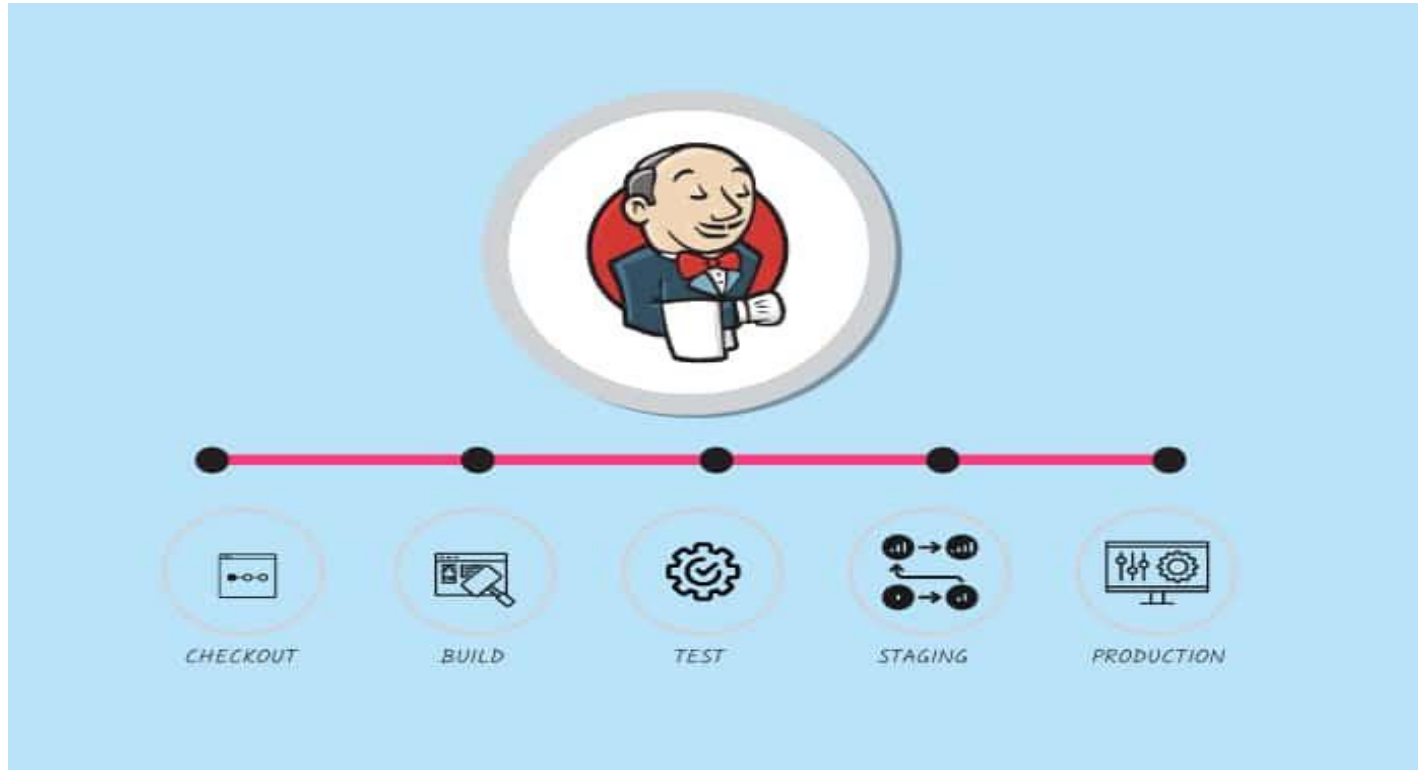OF SOFTWARE OUTSOURCING

Lecture Outline

- ❑ JENKINS
- ❑ Continuous Integration
- ❑ Java installation and configuration
- ❑ Maven Installation
- ❑ Jenkins Installation and Configuration
- ❑ Exploring Jenkins Dashboard
- ❑ Creating Jobs
- ❑ Running the Jobs
- ❑ Setting up the global environments for Jobs
- ❑ Disabling and deleting jobs
- ❑ Understanding Deployment
- ❑ Jenkins Plugins
- ❑ Creating users
- ❑ Node Configuration
- ❑ Assignment

What is Jenkins

Jenkins is an open source automation server. It helps automate the parts of software development related to building, testing, and deploying, facilitating continuous integration and continuous delivery.

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Overview of Jenkins

What is Continuous Integration

Continuous integration (CI) is the practice of automating the integration of code changes from multiple contributors into a single software project. It's a primary DevOps best practice, allowing developers to frequently merge code changes into a central repository where builds and tests then run.

Overview of Continuous Integration
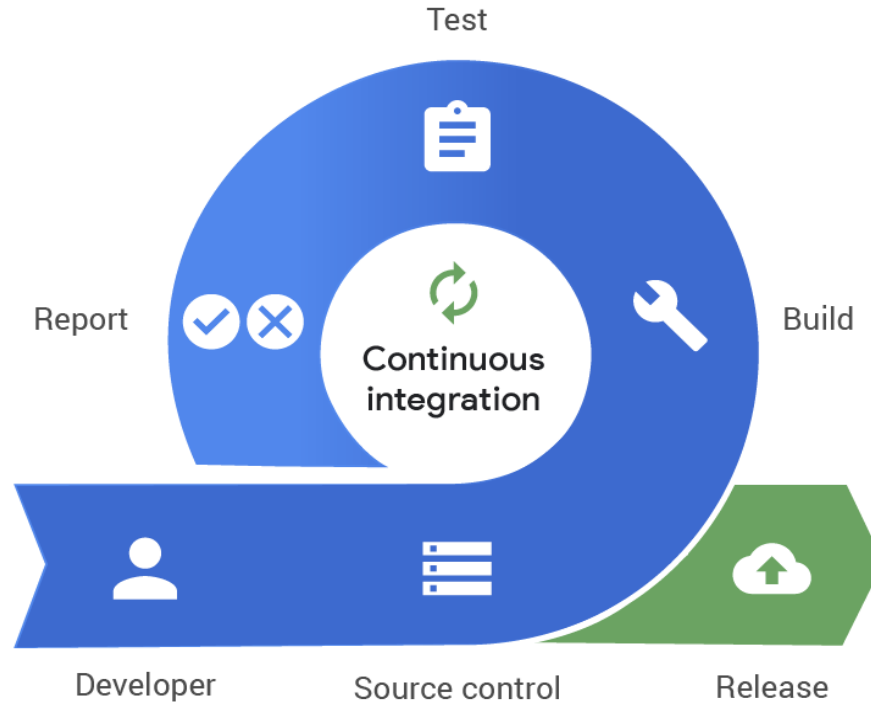
Jenkins Installation and Configuration

Download the Installation Windows MSI installer and follow the steps

Step 1: Setup wizard
On opening the Windows Installer, an Installation Setup Wizard appears, Click Next.

Step 2: Select destination folder
Select the destination folder to store your Jenkins Installation and click Next to continue.

Step 3: Service logon credentials
Specify the domain user name and password, click on Next.

Step 4: Port selection
Specify the port on which Jenkins will be running, click on Next.

Step 5: Select Java home directory
The installation process checks for Java on your machine. If the needed Java version is not installed, you will be prompted to install it. Once your Java home directory has been selected, click on Next.

Step 6: Custom setup
Select other services that need to be installed with Jenkins and click on Next.

Step 7: Install Jenkins
Click on the Install button to start the installation. Once the installation completes, click on Finish.

Java Installation

1. Go to the Manual download page. Download and run the installer.
2. The installation process starts. Click the Install button to accept the license terms and to continue with the installation.

Maven Installation

Step 1. Visit Maven official website, download the Maven zip file, for example : apache-maven-3.6.0-bin.zip.
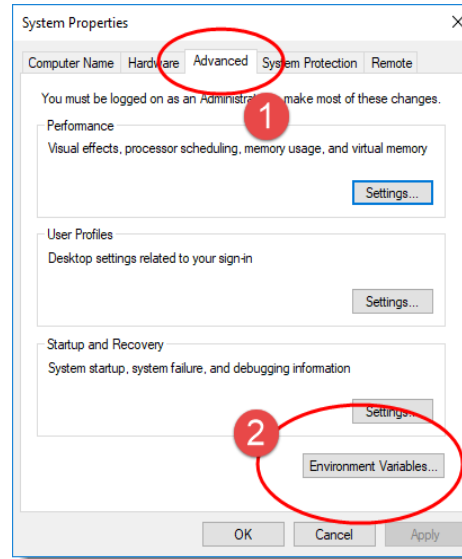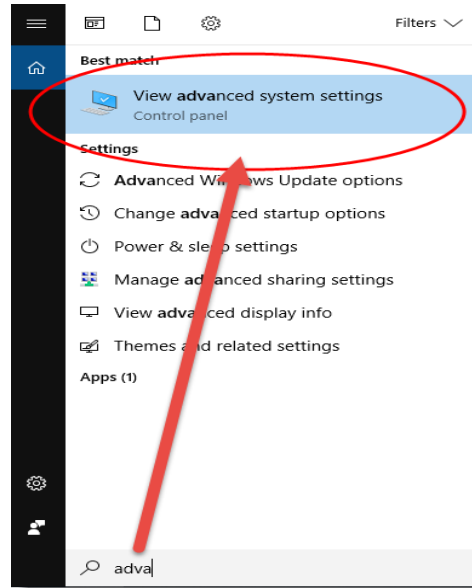

Step 2. Unzip it to a folder. In this article, we are using c:\opt\apache-
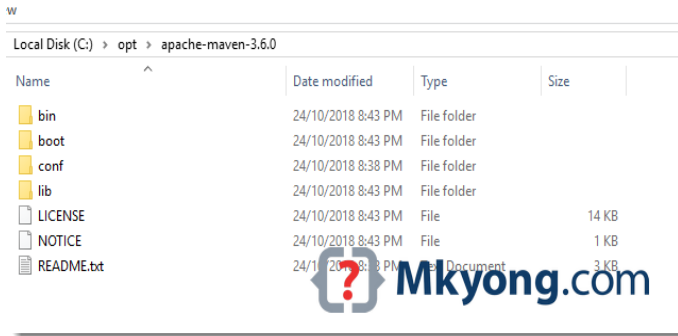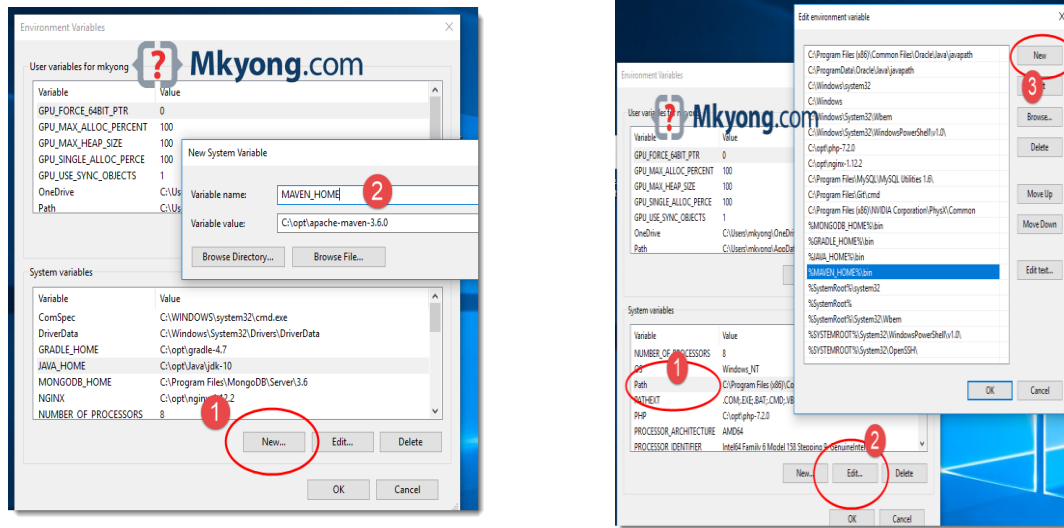
Maven Installation

Step 3. Add a MAVEN_HOME system variables, and point it to the Maven folder.

Step 4. In System Properties dialog, select Advanced tab and clicks on the Environment Variables... button.

Maven Installation

Step 5. In "Environment variables" dialog, System variables, Clicks on the New... button and add a
MAVEN_HOME variable and point it to c:\opt\apache-maven-3.6.0

Step 6. In system variables, find PATH, clicks on the Edit... button. In "Edit environment variable" dialog,
clicks on the New button and add this %MAVEN_HOME%\bin

Maven Installation

Step 6. Done, start a new command prompt, type mvn –

```
C:\Users\mkyong>mvn -version
Apache Maven 3.6.0 (97c98ec64a1fdfee7767ce5ffb20918da4f719f3; 2018-10-25T02:41:47+08:00)
Maven home: C:\opt\apache-maven-3.6.0\bin\..
Java version: 10.0.1, vendor: Oracle Corporation, runtime: C:\opt\Java\jdk-10
```

FAQ 1. 'mvn' is not recognized as an internal or external command?

```
> mvn -version
'mvn' is not recognized as an internal or external command,
operable program or batch file.
```

Answer: Refer to Step 4, make sure the %MAVEN_HOME%\bin is added to the PATH system variable.

FAQ 2. The JAVA_HOME environment variable is not defined

```
co > mvn -version
   The JAVA_HOME environment variable is not defined correctly
   This environment variable is needed to run this program
   NB: JAVA_HOME should point to a JDK not a JRE
```

Answer: Refer to Step 2, make sure JDK is installed and the JAVA_HOME system variable is configured.

Jenkins Installation and Configuration
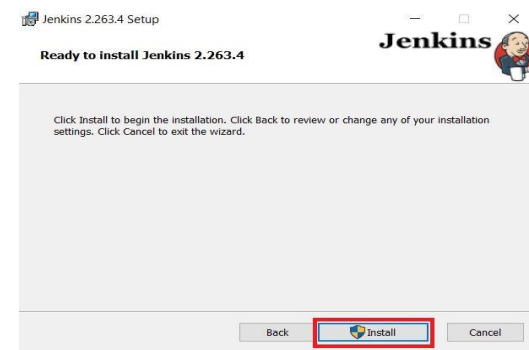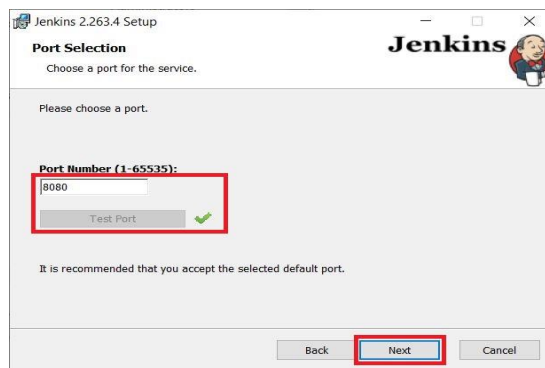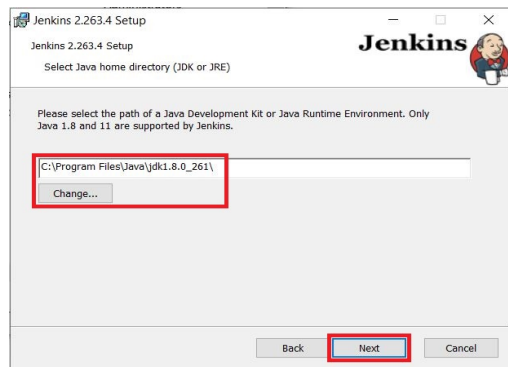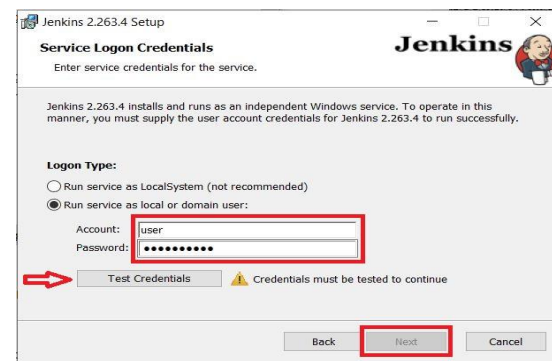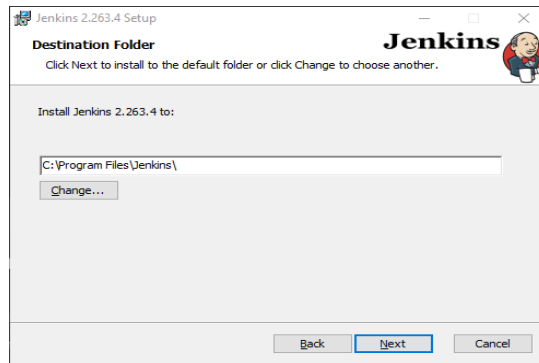
Jenkins Installation and Configuration

Post-installation setup wizard

After downloading, installing and running Jenkins, the post-installation setup wizard begins.

Step 1
Browse to http://localhost:8080 (or whichever port you configured for Jenkins when installing it) and wait until the Unlock Jenkins page appears.

Step 2
The initial Administrator password should be found under the Jenkins installation path. For default installation location to C:\Program Files\Jenkins\secrets.

Step 3
Open the highlighted file and copy the content of the initialAdminPassword file.

Step 4
On the Unlock Jenkins page, paste this password into the Administrator password, click Continue.

Jenkins Installation and Configuration

Jenkins Installation and Configuration
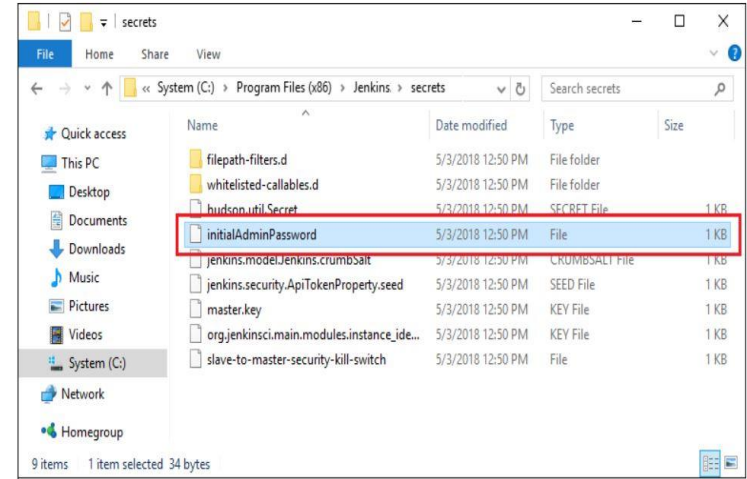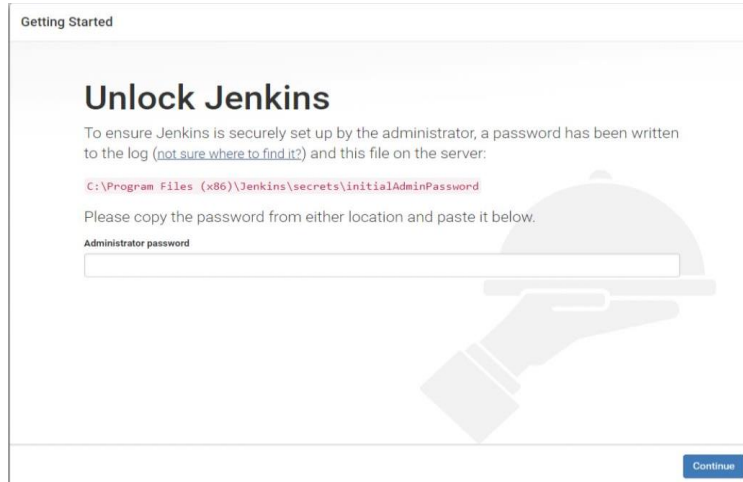
Customizing Jenkins with plugins

After unlocking Jenkins, the Customize Jenkins page appears. Here you can install any number of useful plugins as part of your initial setup.

If you are not sure what plugins you need, choose Install suggested plugins. You can install (or remove) additional Jenkins plugins at a later via the Manage Jenkins > Manage Plugins

Creating the first administrator user

Finally, after customizing Jenkins with plugins, Jenkins asks you to create your first administrator user.
1. When the Create First Admin User page appears, specify the details for your administrator user in the respective fields and click Save and Finish.
2. When the Jenkins is ready page appears, click Start using Jenkins.
3. If required, log in to Jenkins with the credentials of the user you just created and you are ready to start using Jenkins!

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Exploring Jenkins Dashboard

Exploring Jenkins Dashboard

Breadcrumbs: We can traverse pages and and breadcrumb will show the path indices.

Sidebar: It contains most important things which we have in Jenkins

Build Queue and Build Executor : When we will start running job it will show up here. By default it provides two executor, when we will start jobs they will wait in the queue and after finishing the current jobs they will start executing.

All view: In All view section we can see all the jobs which we have in the Jenkins
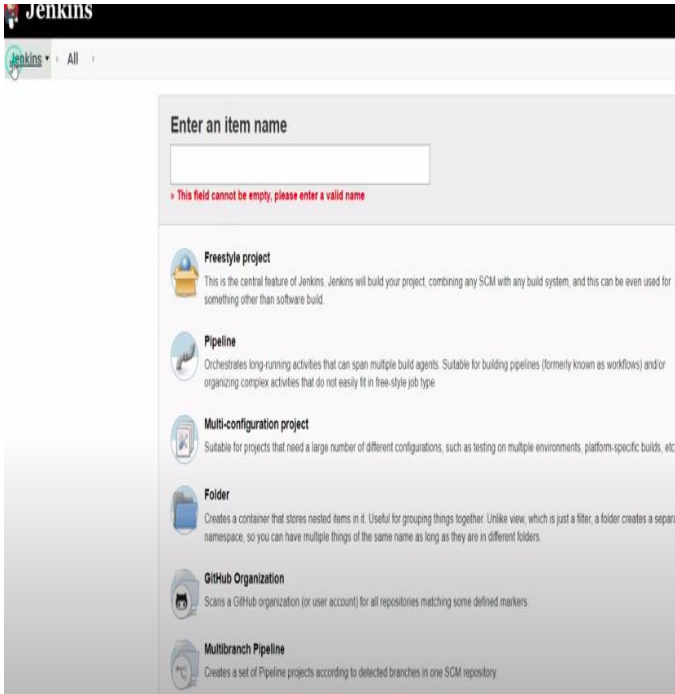
Build Status: Here we can see ball icon and Blue means build is success, Red is failure and Grey means it has not started yet.

New Item: It is used to create a new job

Manage Jenkins: It allows a Jenkins administrator to manage plugins using, users security, nodes, credentials and global tools configurations.

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Exploring Jenkins Dashboard

New Item

Manage Jenkins

Exploring Jenkins Dashboard

Manage Jenkins

Manage Nodes and Cloud: Here Master is
our localhost. We can add slave nodes

Global Tools Configuration: From here we can
configure various tools like JDK, Maven and version
control etc

Manage Jenkins

Configure System: Here we can set Jenkins Location, Global Properties, Environment variables, Shell etc
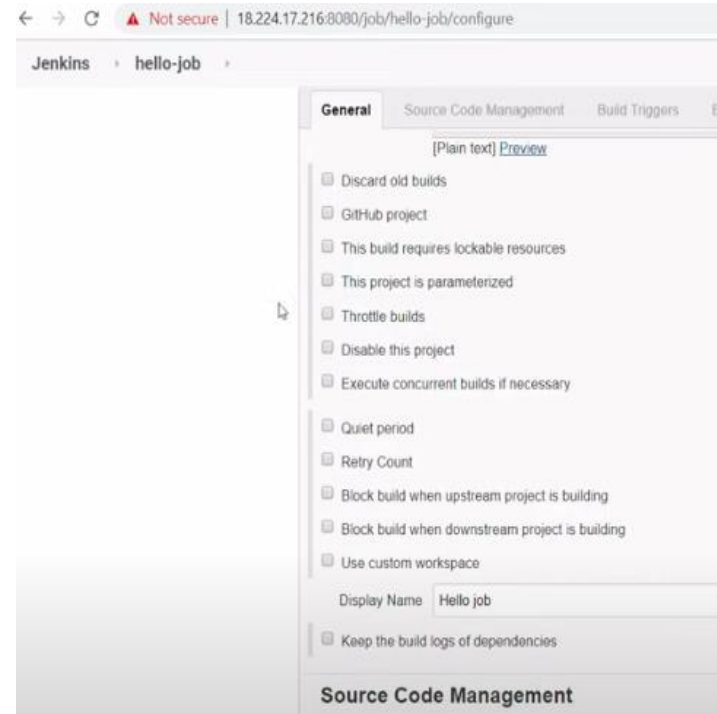
Plugin Management: We can install, remove, update plugin from here

Manage Jenkins

Creating a Job: Click on new item, give a name of the job, select Freestyle project and then click on ok

General: Give a display name or any other section that you want
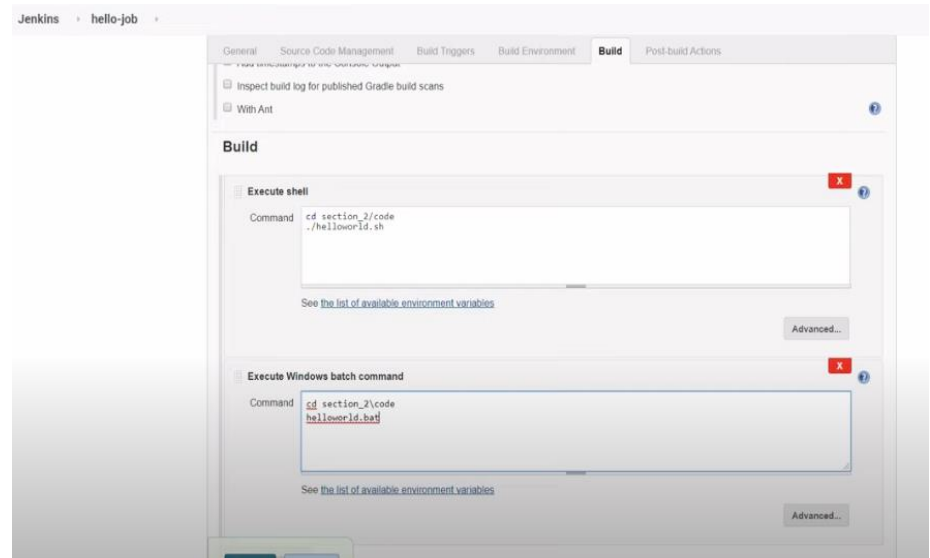
Manage Jenkins

Source Code Management:: Here select Git, give a repository url , branch name and credential if the repository is private. Here for us its a public repository.

Manage Jenkins

Build: Here we can use build option, also we can use other option if needed. Here we are executing shell from inside the project to print Hello world. Click apply and save.
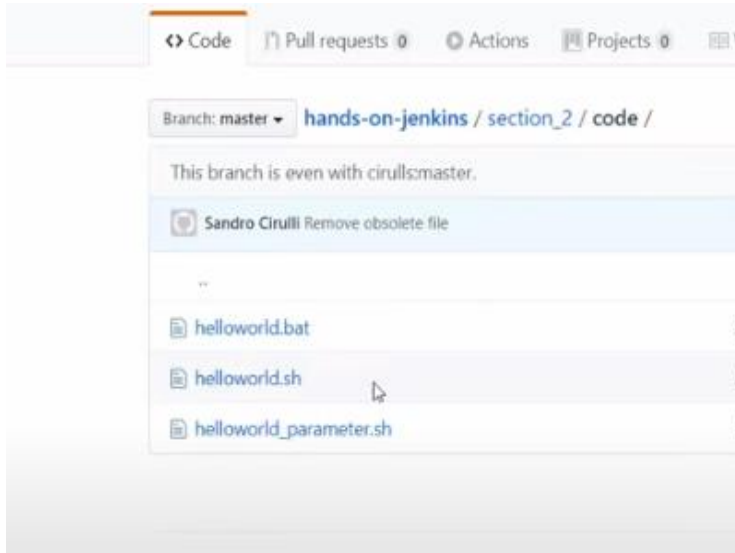
Manage Jenkins

Run a job: Got to the dashboard, we can see the job here Click on it, after that click on build Now..
In build History we can see the executed job, after clicking it we can see the console output.

Manage Jenkins: System Configuration

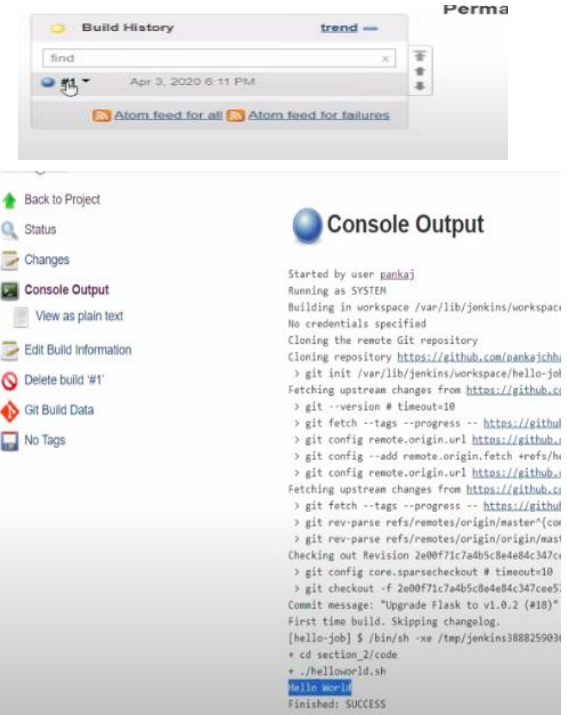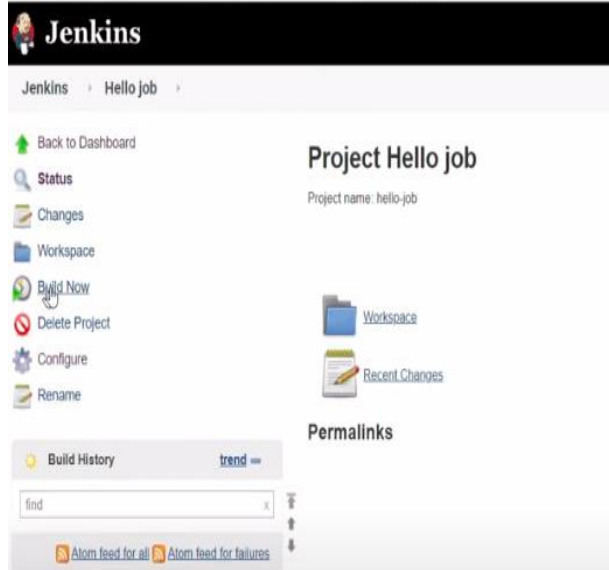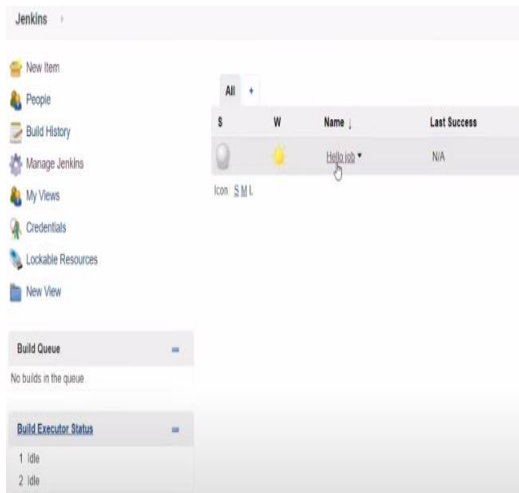Setting up global environments/global properties

Configure System
Configure global settings and paths.

Global properties

☐ Disable deferred wipeout on this node
☑ Environment variables
List of variables

Name
ANT_OPTS

Value
-Dfile.encoding=ISO-8859-1

Name
JAVA_TOOL_OPTIONS

Value
-Dfile.encoding=ISO-8859-1

Name
LANG

Value
en_US.UTF-8

Setting up global Tool Configuration: Use your own home path for JDK, GIT etc

Global Tool Configuration
Configure tools, their locations and automatic installers.

JDK
Name
Java_1.7

JAVA_HOME
/home/bjit/jdk1.7.0_80

☐ Install automatically

Git
Git installations

Git
Name
Default

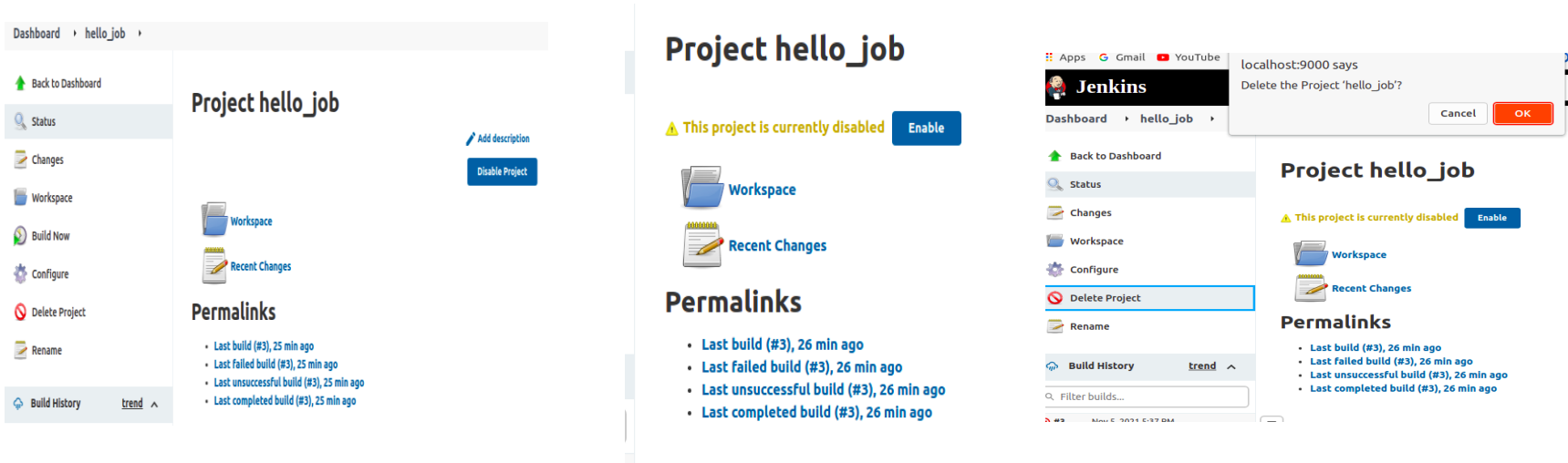**Path to Git executable** ❓
git

☐ Install automatically ❓

Add Git ▾

Disabling and Deleting Job

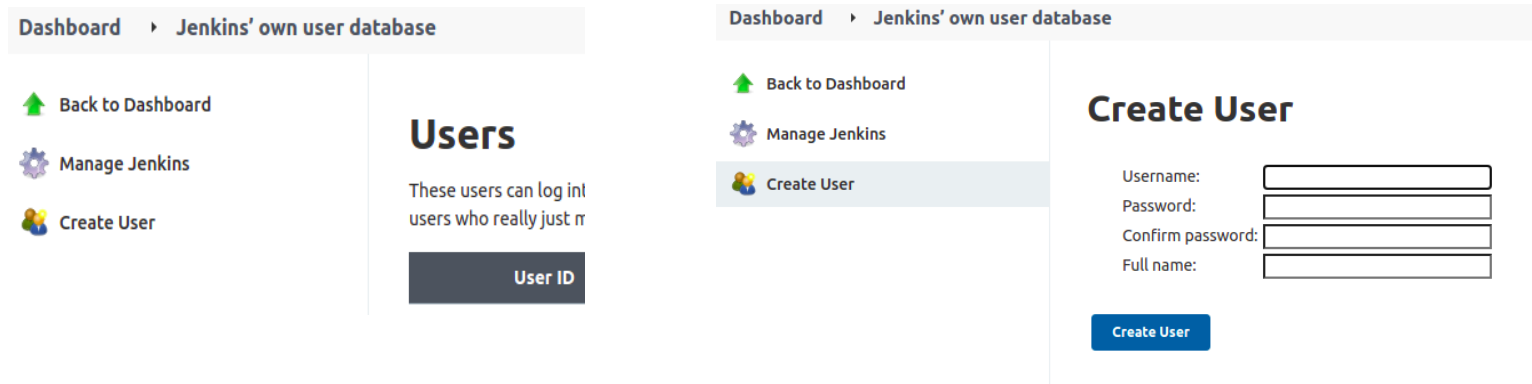To enable , disable and delete a job we need to go to dashboard and then click on a job.

Here we can see the Blue button. By clicking this we can enable and disable a job. Also we can click Delete project from the left menu and then a popup will open, now click ok to delete a job.

Manage Jenkins: Creating a User

From Manage Jenkins in Security section we can find Manage Users

Security

🔒 **Configure Global Security**
Secure Jenkins; define who is allowed to access/use the system.

👥 **Manage Users**
Create/delete/modify users that can log in to this Jenkins

After clicking on Manage Users we can see a dashboard of Users list.
In the left sidebar there is a button 'Create User'.
Click on it and fill-up the form with new user and password

Dashboard ▸ Jenkins' own user database

⬆ Back to Dashboard

⚙ Manage Jenkins

👥 Create User

Users

These users can log in
users who really just m

User ID

Dashboard ▸ Jenkins' own user database

⬆ Back to Dashboard

⚙ Manage Jenkins

👥 Create User

Create User

Username: [   ]
Password: [   ]
Confirm password: [   ]
Full name: [   ]

Create User

Thank You

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