DEVOPS

GIT:-

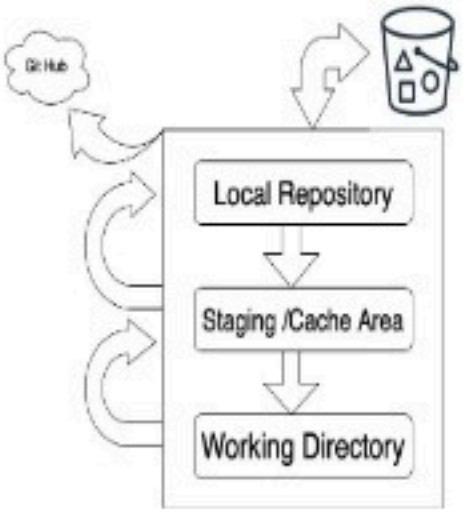
Git is a distributed version-control system for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files. Its goals include speed, data integrity, and support for distributed, non-linear workflows.

Git was created by Linus Torvalds in 2005 for development of the Linux kernel, with other kernel developers contributing to its initial development.Its current maintainer since 2005 is Junio Hamano. As with most other distributed version-control systems, and unlike most client–server systems, every Git directory on every computer is a full-fledged repository with complete history and full version-tracking abilities, independent of network access or a central server.

Install git:-

- You should be running a server with any Ubuntu 16.04 LTS release.
- You will need to log in to SSH via the root user.

First, as always, we should start out by running general OS and package updates. On Ubuntu we'll do this by running:



>> apt-get update

>> apt-get install git-core

>> git --version

Installing GIT - apt-get install git

Telling the GIT to track this folder - git init

Colors – Red color = Files in working directory

Green color = Files in staging / cache Area

Status Check – git status (for checking the tracking of files)

Commit Id's – generally called as SHAW1 number

Git init: -

To track the particular folder and git will only take care about the files but not folders For checking whether it is installed or not check the hidden files

>> ls –a (or) ls –al

>> git config –-global user.name "XXnameXX"

>> git config –-global user.email "XXemail IDXX"

>> git add filename (or) .[for adding complete files]

>> git commit –m "message for that task"

>> git commit –am "message for the task"

>> git log - -oneline

>> git show commitid

>> vi .gitignore

*.html

*.jpg

! filename.html
>> “git add –f filename”
>> “git checkout filename”

Git SERVER:-

Development of the GitHub platform began on October 19, 2007.[55][56][57] The site was launched in April 2008 by Tom Preston-Werner, Chris Wanstrath, P. J. Hyett and Scott Chacon after it had been made available for a few months prior as a beta release.[58]

Projects on GitHub can be accessed and manipulated using the standard Git command-line interface and all of the standard Git commands work with it. GitHub also allows registered and unregistered users to browse public repositories on the site. Multiple desktop clients and Git plugins have also been created by GitHub and other third parties that integrate with the platform.

The site provides social networking-like functions such as feeds, followers, wikis (using wiki software called Gollum) and a social network graph to display how developers work on their versions ("forks") of a repository and what fork (and branch within that fork) is newest.

A user must create an account in order to contribute content to the site, but public repositories can be browsed and downloaded by anyone. With a registered user account, users are able to have discussions, manage repositories, submit contributions to others' repositories, and review changes to code. GitHub began offering unlimited private repositories at no cost in January 2019 (limited to three contributors per project). Previously, only public repositories were free.

Installation :-

>> JAVA 8 version need to be installed
>> Terminal should be updated
>> Should have gitbucket .war should be downloaded
>> IP Address should be Reserved and should fix manually
>> Change to Root user - sudo su –root
>> Install the Vim software – apt-get install vim

>> apt–get install software –properties –common
>> apt-get update
>> apt-get install default-jre
>> apt-get install default-jdk
>> add-apt-repository – rppa:webupdsteam/java
>> apt-get update
>> apt-get install oracle-java8-installer
>> java --version
>> Download Gitbucket.war
>> Go to the path were the gutbucket.war file was situated
>> Java –jar gutbucket.war
>> java –jar gutbucket.war --port =8018
>> apt – get install git

Using local Git bucket :-

>> mkdir myproject – Create a directory
>> cd myproject – navigate to directory
>> git init – initialize the git
>> touch tarun – create a file in myproject
>> git status
>> git add tarun
>> git commit –m 'commit message'
>> git log
>> gibucket – sign In – root/root (username & password)
>> Goto system Adminstration – New user – Create user with credentials – sign out - sign in with newly created user
>> New repository - Create a repository
>> git remote add origin URL
>> git push –u origin master
>> View the file called ".gitbucket" (hidden folder)
>> Give the command "- tree .gitbucket " to view the files in the repository

Git Branches:-

Branching, in version control and software configuration management, is the duplication of an object under version control (such as a source code file or

a directory tree) so that modifications can occur in parallel along multiple branches.

Branches are also known as trees, streams or codelines. The originating branch is sometimes called the parent branch, the upstream branch (or simply upstream, especially if the branches are maintained by different organizations or individuals), or the backing stream. Child branches are branches that have a parent; a branch without a parent is referred to as the trunk or the mainline.

>> git branch

>> git branch newbranchname
>> git checkout branchtochange
>> git merge branchnametomerge
>> git checkout master
>> git branch –D branchname
>> git push origin --delete branchname

Stash Area:-

>> git add .

>> git stash save filename
>> git stash list – To view the stashed files

Play with data in Stash Area

>> Copy + paste = Take a copy from stash area and use it in normally git stash apply stashID
>> Cut + paste = Move a file from stash and use it normally git stash pop stashID
>> Delete = Remove files from stash Area
>> git stash drop stashID

Creating Version tags:-

>> git tag versionnumber = Creating a version tag
>> git tag = Wrapping the files and pushing into version
>> git push –u myproject versionnumber = Pushing into github
>> git tag –d versionnumber = Remove versions locally

>> git push –u myproject --delete versionnumber = Delete the release in the git hub

Email Notification

>> Whatever happens in the github will be notified through email

>> Steps to activate email notification

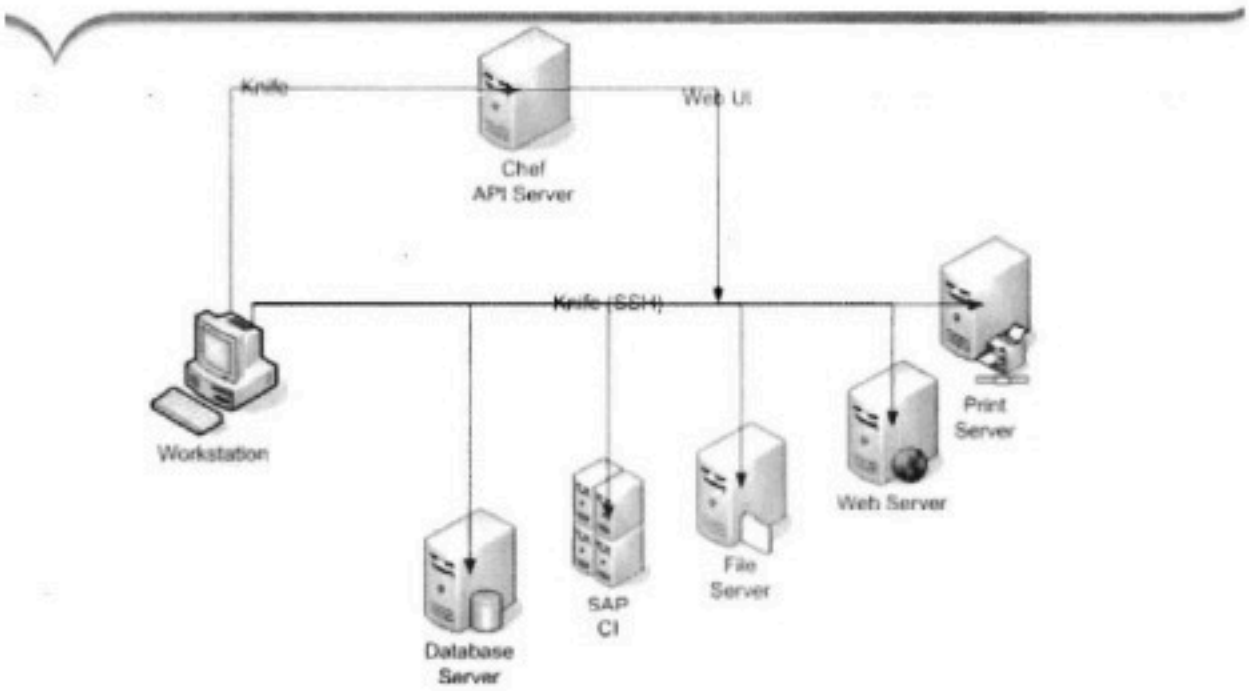
>> Login into Git Hub - myproject – Settings – Notifications – Add - Email Address

Backup and Restore

>> For taking the backup of the files of the git bucket .It is a hidden folder.
>> ls –a (View hidden files)
>> open the .gitbucket fil
>> There we can see the files which were pushed

CHEF:-

Chef Architecture



Chef is a company and the name of a configuration management tool written in Ruby and Erlang. It uses a pure-Ruby, domain-specific language (DSL) for writing system configuration "recipes". Chef is used to streamline the task of configuring and maintaining a company's servers.

The user writes "recipes" that describe how Chef manages server applications and utilities (such as Apache HTTP Server, MySQL, or Hadoop) and how they are to be configured. These recipes (which can be grouped together as a "cookbook" for easier management) describe a series of resources that should be in a particular state: packages that should be installed, services that should be running, or files that should be written. These various resources can be configured to specific versions of software to run and can ensure that software is installed in the correct order based on dependencies.

Chef can run in client/server mode, or in a standalone configuration named "chef-solo". In client/server mode, the Chef client sends various attributes about the node to the Chef server. The server uses Elasticsearch to index these attributes and provides an API for clients to query this information. Chef recipes

can query these attributes and use the resulting data to help configure the node.

Chef-server installation:-

>> hostname -f
>> cd ~
wget https://opscode-omnibus-packages.s3.amazonaws.com/ubuntu/12.04/x86_64/chef-server_11.0.10-1.ubuntu.12.04_amd64.deb
>> sudo dpkg -i chef-server*
>> sudo chef-server-ctl reconfigure
>> https://server_domain_or_IP
>> Default Username: admin
>> Default Password: p@ssw0rd1
>> mkdir -p ~/chef-repo/.chef
>> https://server_domain_or_IP
>> #chef-manage-ctl reconfigure
>> #chef-server-ctl user-create student student student "student@pivotal.com" "redhat" -f student.pem
>> #chef-server-ctl org-create myorg "pivotalsoft" -a student -f myorg-validator.pem
>> #chef-server-ctl restart (for restart)
>> #chef-server-ctl start (for start)
>> #chef-server-ctl stop (for stop)

chef node installation:-

>> updat ip & hostadd
>> #dpkg -i chef-client.....
>> mkdir -p /etc/chef
copy both .pem files
>> cd /etc/chef
>> vi client.rb
log_level :info
log_location STDOUT
chef_server_url 'https://chefserver.pivotal.com/organizations/myorg'

validation_client_name 'myorg-validator'
validation_key '/etc/chef/myorg-validator.pem'
client_key '/etc/chef/student.pem'
trusted_certs_dir '/etc/chef/trusted_certs'

>> knife ssl fetch -s https://chefserver.pivotal.com

>> knife ssl check -s https://chefserver.pivotal.com
>> useradd rishi
>> passwd rishi
>> usermod -aG sudo rishi
>> apt-get install ssh
>> ssh-keygen

Chef workstation installation:-

>> update ip and host address

>> dpkg -i chef-work.....
>> cd /root/chef-repo/.chef
copy both .pem files into .chef folder
>> ls
>> vi knife.rb
log_level :info
log_location STDOUT
node_name 'student'
client_key '/root/chef-repo/.chef/student.pem'
validation_client_name 'myorg-validator'
validation_key '/root/chef-repo/.chef/myorg-validator.pem'
chef_server_url 'https://chefserver.pivotal.com/organizations/myorg
cookbook_path ['/root/chef-repo/cookbooks']
>> knife ssl fetch / knife ssl fetch -s https://chefserver.pivotal.com
>> knife ssl check / knfie ssl check -s https://chefserver.pivotal.com
>> knife bootstrap 192.168.0.221 --ssh-user rishi --sudo --identity-file ~/.ssh/id_rsa --node-name chefnode.pivotal.com
#knife node list

Chef cookbooks:-

Writing cookbooks/recipes

sample cookbooks:-

```
>> chef generate cookbook sample_file
>> vi /chef/cookbook/sample_file/recipes/default.rb
 file "/tmp/test.txt" do
 owner "root"
 group "root"
mode "0644"
content "haiii this is test file"
action :create
end
>> knife cookbook upload sample_file
>> knife node run_list add chefnode.pivotal.com sample_file
>> go to chefnode add type "chef-client"
```

Creates the sysadmin group and users:-

```
users_manage 'sysadmin' do
  group_id 2300
  action [:create]
end
```

Creates the testgroup group, and users

```
users_manage 'testgroup' do
  group_id 3000
  action [:create]
  data_bag 'test_home_dir'
end
```

Creates the nfsgroup group, and users

```
users_manage 'nfsgroup' do
  group_id 4000
  action [:create]
  data_bag 'test_home_dir'
  manage_nfs_home_dirs false
end
```

>> knife cookbook upload users
>> knife node run_list add chefnode.pivotal.com sample_file
>> go to chefnode add type "chef-client"

recipe for apache server:-

>> chef generate cookbook apache

service['apache2'] is defined in the apache2_default_install resource but other resources are currently unable to reference it. To work around this issue, define the following helper in your cookbook:

```
service 'apache2' do
  extend Apache2::Cookbook::Helpers
  service_name lazy { apache_platform_service_name }
  supports restart: true, status: true, reload: true
  action :nothing
end

apache2_install 'default_install'

apache2_module 'headers'
apache2_module 'ssl'

apache2_default_site 'foo' do
  default_site_name 'my_site'
  template_cookbook 'my_cookbook'
  port '443'
  template_source 'my_site.conf.erb'
  action :enable
end
```

>> knife cookbook upload sample_file
>> knife node run_list add chefnode.pivotal.com apache
>> go to chefnode add type "chef-client"

Chef roles:-

>> knife role bulk delete REGE
>> knife role create ROLE_NAME (options)

```
>> knife role create role1
>> knife role edit ROLE_NAME

{
  "name": "role1",
  "default_attributes": {
  },
  "json_class": "Chef::Role",
  "run_list": ["recipe[cookbook_name::recipe_name]",
            "role[role_name]"
  ],
  "description": "",
  "chef_type": "role",
  "override_attributes": {
  }
}
>> knife role show ROLE_NAME
>> knife cookbook upload recipe
>> knife node run_list add chefnode.pivotal.com apache
```

To uninstall:-

```
>> chef-server-ctl uninstall
>> chef-manage-ctl cleanse
>> opscode-analytics-ctl uninstall
>> opscode-reporting-ctl uninstall
>> dpkg -P chefdk
>> rpm -qa *chef*
>> yum remove <package>
>> dpkg --list | grep chef # or dpkg --status chef
>> dpkg -P chef
>> sudo rm -rf /opt/chef
>> sudo rm -rf /etc/chef
```

Maven:-

Maven is a build automation tool used primarily for Java projects. Maven can also be used to build and manage projects written in C#, Ruby, Scala, and other languages. The Maven project is hosted by the Apache Software Foundation, where it was formerly part of the Jakarta Project.
Maven addresses two aspects of building software: how software is built, and its dependencies. Unlike earlier tools like Apache Ant, it uses conventions for the build procedure, and only exceptions need to be written down. An XML file describes the software project being built, its dependencies on other external modules and components, the build order, directories, and required plug-ins. It comes with pre-defined targets for performing certain well-defined tasks such as compilation of code and its packaging. Maven dynamically
downloads Java libraries and Maven plug-ins from one or more repositories such as the Maven 2 Central Repository, and stores them in a local cache. This local cache of downloaded artifacts can also be updated with artifacts created by local projects. Public repositories can also be updated.
Maven is built using a plugin-based architecture that allows it to make use of any application controllable through standard input.

Maven installation:-

```
>> sudo apt-get update -y
>> sudo apt-get upgrade -y
>> add-apt-repository ppa:webupd8team/java
>> apt-get update -y
>> apt-get install oracle-java8-installer
>> java -version
>> wget http://www-eu.apache.org/dist/maven/maven-
3/3.3.9/binaries/apache-maven-3.3.9-bin.tar.gz
>> tar -xvzf apache-maven-3.3.9-bin.tar.gz
>> mv apache-maven-3.3.9 maven
>> nano /etc/profile.d/mavenenv.sh
export M2_HOME=/opt/maven
export PATH=${M2_HOME}/bin:${PATH}
>> chmod +x /etc/profile.d/mavenenv.sh
>> source /etc/profile.d/mavenenv.sh
>> tar -xvf apache-maven -C /opt/
```

>> vi /etc/profile.d/apache-maven.sh
export JAVA_HOME=/usr/lib/jvm/java-8-oracle
export M2_HOME=/opt/apache-maven
export MAVEN_HOME=/opt/apache-maven
export PATH=${M2_HOME}/bin:${PATH} >> apt-get install maven
>> mvn --version >> mvn archetype:generate >> 1352 groupid:pivotal architect:sample Y >> tree sample >> mvn validate
>> mvn compile >> mvn test >> mvn package
>> tree sample
>> root@ubuntu:/home/student# mvn --help
Options:
-am,--also-make If project list is specified, also build projects required by the list
-amd,--also-make-dependents If project list is specified, also build projects that depend on projects on the list
-B,--batch-mode Run in non-interactive (batch) mode
-b,--builder <arg> The id of the build strategy to use.
-C,--strict-checksums Fail the build if checksums don't match
-c,--lax-checksums Warn if checksums don't match
-cpu,--check-plugin-updates Ineffective, only kept for

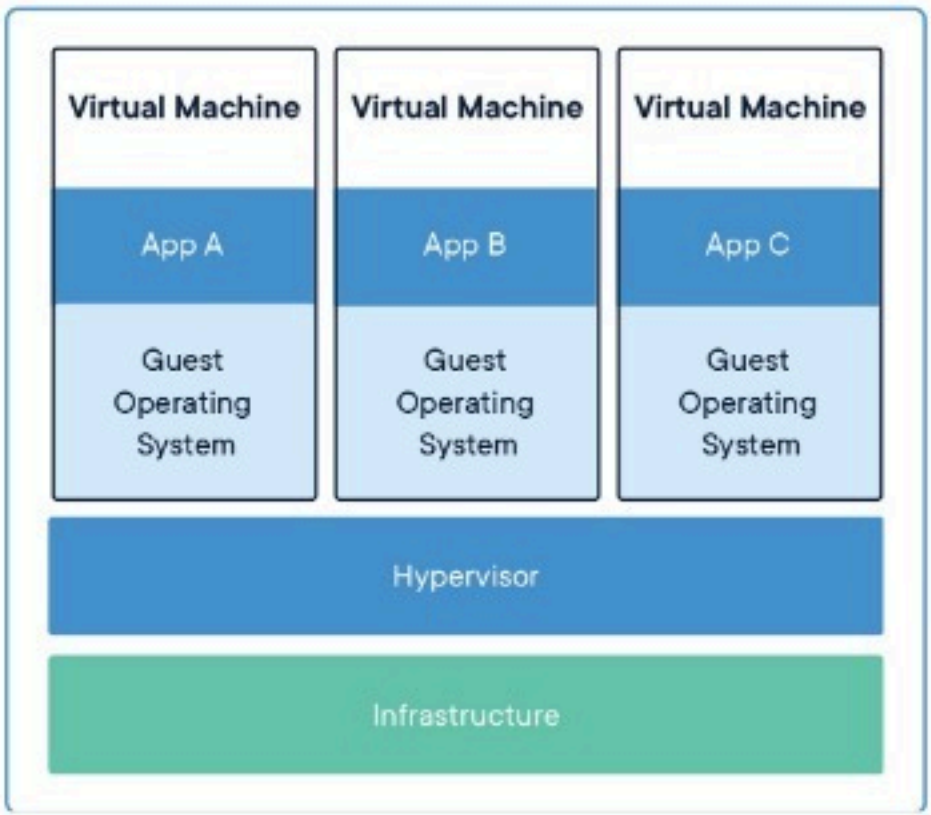
```
                              backward compatibility
-D,--define <arg>                    Define a system property
-e,--errors                          Produce execution error messages
-emp,--encrypt-master-password <arg>  Encrypt master security password
-ep,--encrypt-password <arg>         Encrypt server password
-f,--file <arg>                      Force the use of an alternate POM
                              file (or directory with pom.xml).
-fae,--fail-at-end                   Only fail the build afterwards;
                              allow all non-impacted builds to
                              continue
-ff,--fail-fast                      Stop at first failure in
                              reactorized builds
-fn,--fail-never                     NEVER fail the build, regardless
                              of project result
-gs,--global-settings <arg>          Alternate path for the global
                              settings file
-gt,--global-toolchains <arg>        Alternate path for the global
                              toolchains file
-h,--help                            Display help information
-l,--log-file <arg>                  Log file where all build output
                              will go.
-llr,--legacy-local-repository       Use Maven 2 Legacy Local
                              Repository behaviour, ie no use of
                              _remote.repositories. Can also be
                              activated by using
                              -Dmaven.legacyLocalRepo=true
-N,--non-recursive                   Do not recurse into sub-projects
-npr,--no-plugin-registry            Ineffective, only kept for
                              backward compatibility
-npu,--no-plugin-updates             Ineffective, only kept for
                              backward compatibility
-nsu,--no-snapshot-updates           Suppress SNAPSHOT updates
-o,--offline                         Work offline
-P,--activate-profiles <arg>         Comma-delimited list of profiles
```

```
                          to activate
-pl,--projects <arg>              Comma-delimited list of specified
                          reactor projects to build instead
                          of all projects. A project can be
                          specified by [groupId]:artifactId
                          or by its relative path.
-q,--quiet                    Quiet output - only show errors
-rf,--resume-from  <arg>          Resume reactor from specified
                          project
-s,--settings <arg>               Alternate path for the user
                          settings file
-t,--toolchains <arg>             Alternate path for the user
                          toolchains file
-T,--threads <arg>                Thread count, for instance 2.0C
                          where C is core multiplied
-U,--update-snapshots             Forces a check for missing
                          releases and updated snapshots on
                          remote repositories
-up,--update-plugins              Ineffective, only kept for
                          backward compatibility
-v,--version                  Display version information
-V,--show-version                 Display version information
                          WITHOUT stopping build
-X,--debug                    Produce execution debug output
```

Docker :-

Docker is a tool designed to make it easier to create, deploy, and run applications by using containers. Containers allow a developer to package up an

application with all of the parts it needs, such as libraries and other dependencies, and ship it all out as one package. By doing so, thanks to the container, the developer can rest assured that the application will run on any other Linux machine regardless of any customized settings that machine might have that could differ from the machine used for writing and testing the code.
In a way, Docker is a bit like a virtual machine. But unlike a virtual machine, rather than creating a whole virtual operating system, Docker allows applications to use the same Linux kernel as the system that they're running on and only requires applications be shipped with things not already running on the host computer. This gives a significant performance boost and reduces the size of the application.
And importantly, Docker is open source. This means that anyone can contribute to Docker and extend it to meet their own needs if they need additional features that aren't available out of the box.



>> Install Java on ubuntu Server

>> sudo apt-get update -y

>> sudo apt-get upgrade -y

```
>> add-apt-repository ppa:webupd8team/java
>> apt-get update -y
>> apt-get install oracle-java8-installer
>> java -version
>> sudo apt update
>> sudo apt-key adv --keyserver hkp://ha.pool.skskeyservers.
net:80 --recv-keys
58118E89F3A912897C070ADBF76221572C52609D
>> sudo apt-add-repository "deb
https://apt.dockerproject.org/repo ubuntu-xenial main"
>> sudo apt update
>> sudo apt install docker-engine
>> sudo systemctl start docker
>> docker images
>> docker pull ubuntu
>> root@ubuntu:/home/student# docker --help
Options:
    --config string      Location of client config files (default
                         "/root/.docker")
 -D, --debug             Enable debug mode
    --help               Print usage
 -H, --host list         Daemon socket(s) to connect to
 -l, --log-level string  Set the logging level
                         ("debug"|"info"|"warn"|"error"|"fatal")
                         (default "info")
    --tls                Use TLS; implied by --tlsverify
    --tlscacert string   Trust certs signed only by this CA (default
                         "/root/.docker/ca.pem")
    --tlscert string     Path to TLS certificate file (default
                         "/root/.docker/cert.pem")
    --tlskey string      Path to TLS key file (default
                         "/root/.docker/key.pem")
    --tlsverify          Use TLS and verify the remote
 -v, --version           Print version information and quit
```

Management Commands:
container Manage containers
image Manage images
network Manage networks
node Manage Swarm nodes
plugin Manage plugins
secret Manage Docker secrets
service Manage services
stack Manage Docker stacks
swarm Manage Swarm
system Manage Docker
volume Manage volumes

Commands:

attach Attach local standard input, output, and error streams to a running container
build Build an image from a Dockerfile
commit Create a new image from a container's changes
cp Copy files/folders between a container and the local filesystem
create Create a new container
diff Inspect changes to files or directories on a container's filesystem
events Get real time events from the server
exec Run a command in a running container
export Export a container's filesystem as a tar archive
history Show the history of an image
images List images
import Import the contents from a tarball to create a filesystem image
info Display system-wide information
inspect Return low-level information on Docker objects
kill Kill one or more running containers
load Load an image from a tar archive or STDIN
login Log in to a Docker registry
logout Log out from a Docker registry

logs Fetch the logs of a container
pause Pause all processes within one or more containers
port List port mappings or a specific mapping for the container
ps List containers pull Pull an image or a repository from a registry
push Push an image or a repository to a registry
rename Rename a container restart Restart one or more containers
rm Remove one or more containers
rmi Remove one or more images
run Run a command in a new container
save Save one or more images to a tar archive (streamed to STDOUT by default) search Search the Docker Hub for images
start Start one or more stopped containers
stats Display a live stream of container(s) resource usage statistics
stop Stop one or more running containers
tag Create a tag TARGET_IMAGE that refers to SOURCE_IMAGE
top Display the running processes of a container
unpause Unpause all processes within one or more containers
update Update configuration of one or more containers
version Show the Docker version information
wait Block until one or more containers stop, then print their exit codes

To run Images:-

>> docker images
>> docker run -ti --rm ubuntu /bin/bash\
>> docker ps
>> docker ps –a
>> docker run -ti ubuntu /bin/bash
>> docker ps
>> docker ps –a
>> docker exec -ti <container id> /bin/bash
>> docker run -ti --name “ubuntu18” --hostname ”pivotal”
ubuntu /bin/bash

>> docker start <container id>
>> docker stop <container id>
>> docker rm <container id>
>> docker image rm <image id)

Gitbucket Configuration on Docker:-

Need to maintain gitbucket.war file and Dockerfile in /root Dir.

>> vi Dockerfile

```
From java:latest
MAITAINER student@pivotal.com
LABEL evn=production
ENV apparea /data/app
Run mkdir -p $apparea
ADD ./gitbucket.war $apparea
WORKDIR $apparea
CMD ["java","-jar","gitbucket.war"]
:wq!
```

>> docker build –t pivotal/git . (to build Dockerfile)
>> docker images
>> docker run -d -p 80:8080 pivotal/git (to port forwarding)
>> ifconfig
Open Firefox and give 192.168.0.151:80 to launch gitbucket server

Jenkins Configuration on Docker:-

Need to maintain gitbucket.war file and Dockerfile in /root Dir.

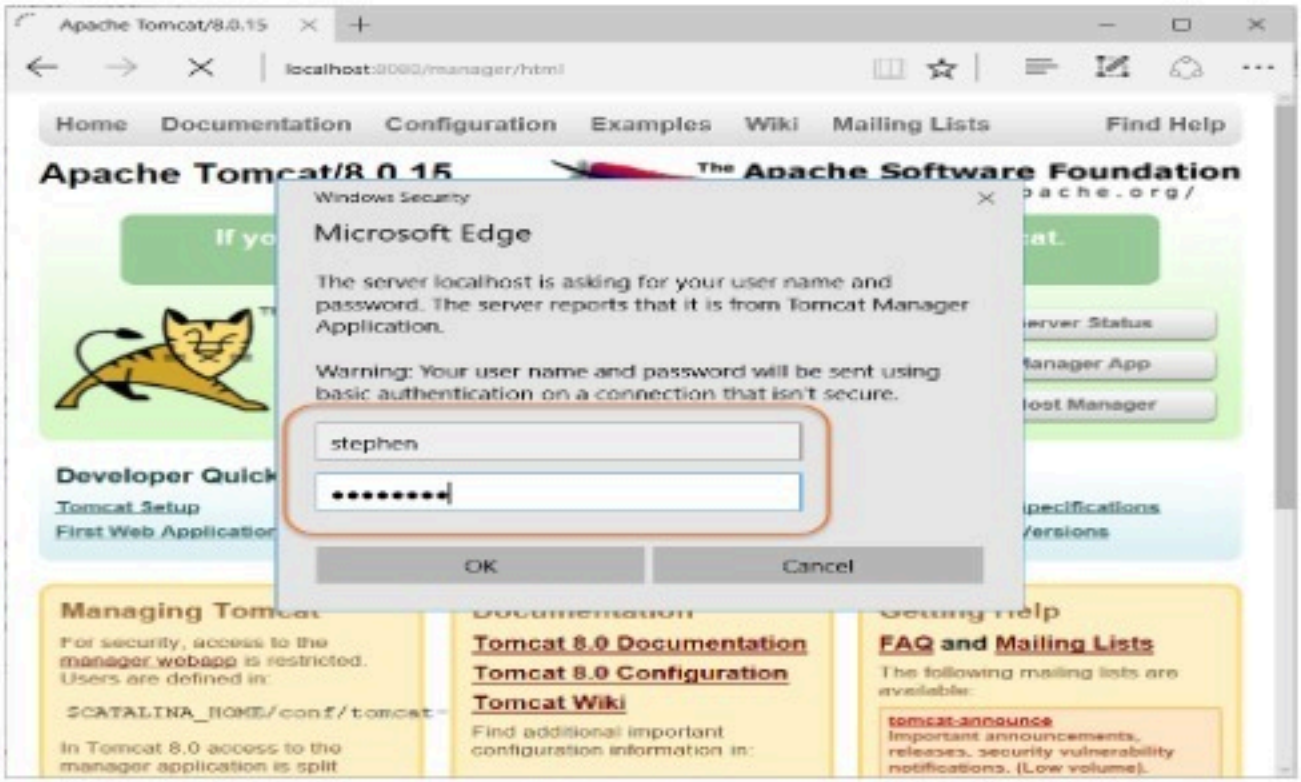
>> vi Dockerfile

```
From java:latest
MAITAINER student@pivotal.com
LABEL evn=production
ENV apparea /data/app
Run mkdir -p $apparea
ADD ./jenkins.war $apparea
```

WORKDIR $apparea
CMD ["java","-jar","jenkins.war"]
:wq!
>> docker build –t pivotal/git . (to build Dockerfile)
>> docker images
>> docker run -d -p 80:8080 pivotal/jenkins (to port forwarding)
>> ifconfig
Open Firefox and give 192.168.0.151:80 to launch gitbucket server

Apache tomcat server:-

Download apache-tomcat app from internet
#tar -xvf apache-tomcat -C /opt/
#cd /opt/apache-tomcat/bin
#./startup.sh
#firefox &
http://192.168.149.159:8080
set user Path----------
#vi /opt/apache-tomcat/conf/tomcat-users.xml
<role rolename="manager-gui"/>
<user username="student" password="redhat" roles="manager-gui"/>
</tomcat-users>
:wq!
http://192.168.149.159:8080



open manager app and deploy .war files
ex: http://192.168.159.149:8080/sampleweb/

Install Apache Tomcat 8:-

>> apt-get update
>> apt-get install default-jdk
>> groupadd tomcat
>> useradd -s /bin/false -g tomcat -d /opt/tomcat tomcat
>> cd /tmp
>> curl -O http://apache.mirrors.ionfish.org/tomcat/tomcat-8/v8.5.5/bin/apache-tomcat-8.5.5.tar.gz
>> mkdir /opt/tomcat
>> tar xzvf apache-tomcat-8*tar.gz -C /opt/tomcat --strip-components=1
>> /opt/tomcat
>> chgrp -R tomcat /opt/tomcat
>> chmod -R g+r conf
>> chmod g+x conf

>> chown -R tomcat webapps/ work/ temp/ logs/
>> update-java-alternatives -l
>> /usr/lib/jvm/java-1.8.0-openjdk-amd64/jre
>> nano /etc/systemd/system/tomcat.service
[Unit]
Description=Apache Tomcat Web Application Container
After=network.target

[Service]

Type=forking

Environment=JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-amd64/jre

Environment=CATALINA_PID=/opt/tomcat/temp/tomcat.pid
Environment=CATALINA_HOME=/opt/tomcat
Environment=CATALINA_BASE=/opt/tomcat
Environment='CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:
+UseParallelGC'
Environment='JAVA_OPTS=-Djava.awt.headless=true
-Djava.security.egd=file:/dev/./urandom'

ExecStart=/opt/tomcat/bin/startup.sh

ExecStop=/opt/tomcat/bin/shutdown.sh

User=tomcat

Group=tomcat
UMask=0007
RestartSec=10
Restart=always

[Install]

WantedBy=multi-user.target

>> systemctl daemon-reload

>> systemctl start tomcat

>> systemctl status tomcat
>> ufw allow 8080
>> http://server_domain_or_IP:8080
>> systemctl enable tomcat
>> nano /opt/tomcat/conf/tomcat-users.xml

```
<tomcat-users . . .>
   <user username="admin" password="password" roles="manager-gui,admin-gui"/>
</tomcat-users>
```

>> nano /opt/tomcat/webapps/manager/META-INF/context.xml
>> nano /opt/tomcat/webapps/host-manager/META-INF/context.xml
>> systemctl restart tomcat
>> http://server_domain_or_IP:8080

http://server_domain_or_IP:8080/manager/html

Tomcat Web Application Manager

Message:	OK

Manager			
List Applications	HTML Manager Help	Manager Help	Server Status

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
/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

Deploy

Deploy directory or WAR file located on server

Context Path (required):
XML Configuration file URL:
WAR or Directory URL:
Deploy

WAR file to deploy

Select WAR file to upload Choose File No file chosen
Deploy

Uploading Gitbucket and Jenkins:-

>> go to Tomcat manager
>> click on deploy option
>> context path /gitbucket
>> war or Directory URL /opt/gitbucket.war
>> deploy
open Gitbucket from Applications

Jenkins :-

>> go to Tomcat manager
>> click on deploy option
>> context path /jenkins
>> war or Directory URL /opt/jenkins.war

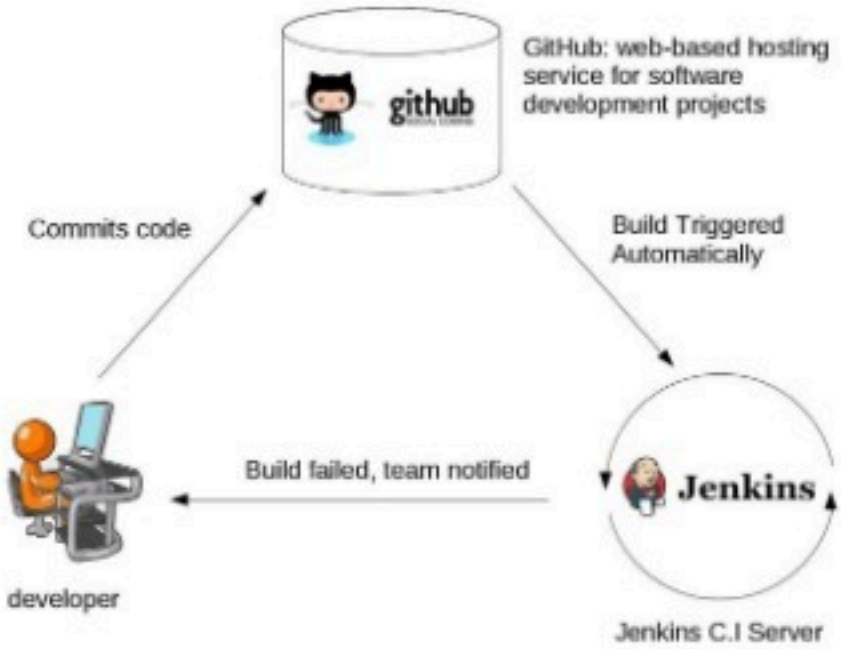
>> deploy
open Gitbucket from Applications

Jenkins:-

Jenkins is a self-contained, open source automation server which can be used to automate all sorts of tasks related to building, testing, and delivering or deploying software.

Jenkins can be installed through native system packages, Docker, or even run standalone by any machine with a Java Runtime Environment (JRE) installed.

In Continuous Integration after a code commit, the software is built and tested immediately. In a large project with many developers, commits are made many times during a day. With each commit code is built and tested. If the test is passed, build is tested for deployment. If deployment is a success, the code is pushed to production. This commit, build, test, and deploy is a continuous process and hence the name continuous integration/deployment.



Jenkins Plugins:-

By default, Jenkins comes with a limited set of features. If you want to integrate your Jenkins installation with version control tools like Git, then you need to

install plugins related to Git. In fact, for integration with tools like Maven you need to install respective plugins in your Jenkins.

Jenkins installation and configuration:-

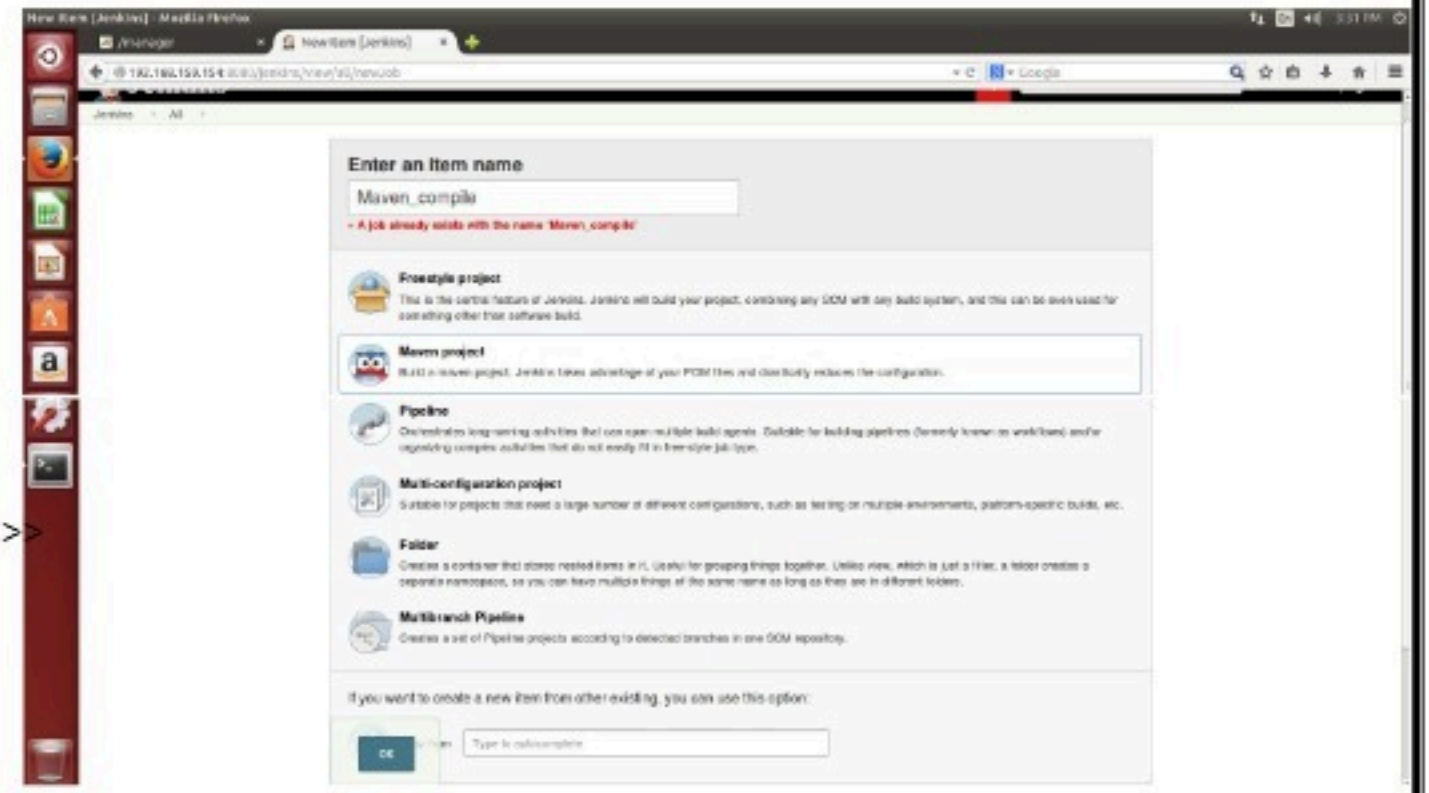
Configure tomcat server and Maven
>> Download Jenkins.war and gitbucket.war files
>> Deploy Jenkins.war and gitbucket.war to Tomcat server
>> Open jekins console and gitbucket console through firefox

Jenkins Plug in management:-

>> Manage Jenkins Manage plugins Available
>> type your required package name
>> install without restart.

Compile Maven code:-

>> Go to Jenkins Dashboard
>> New item item name
>> Select Maven project ok



>>

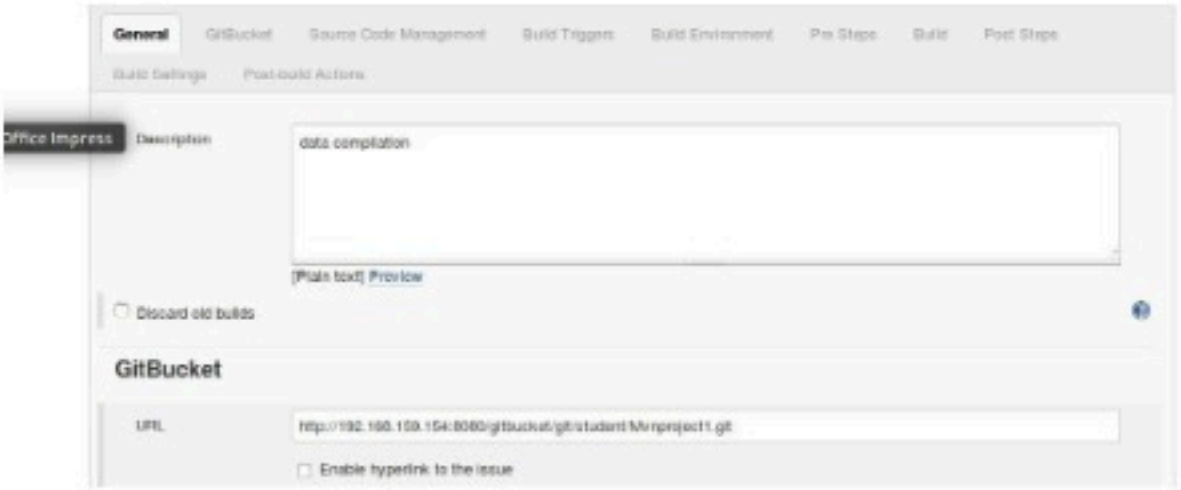
Description GitBucket Url Source code management

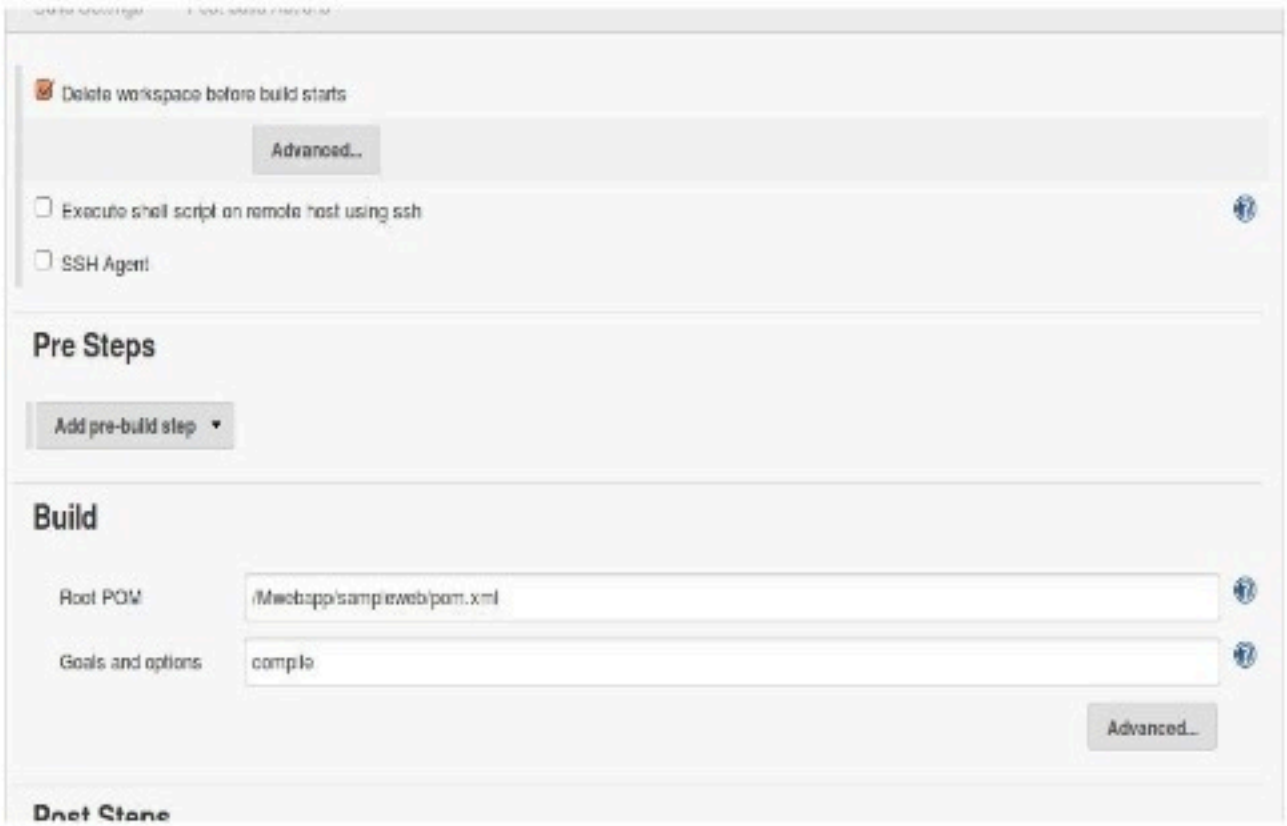
>> Gitbucket url

>> Delete workspace before build starts

>> Build Pom.xml location goal command<compile>

>> save.





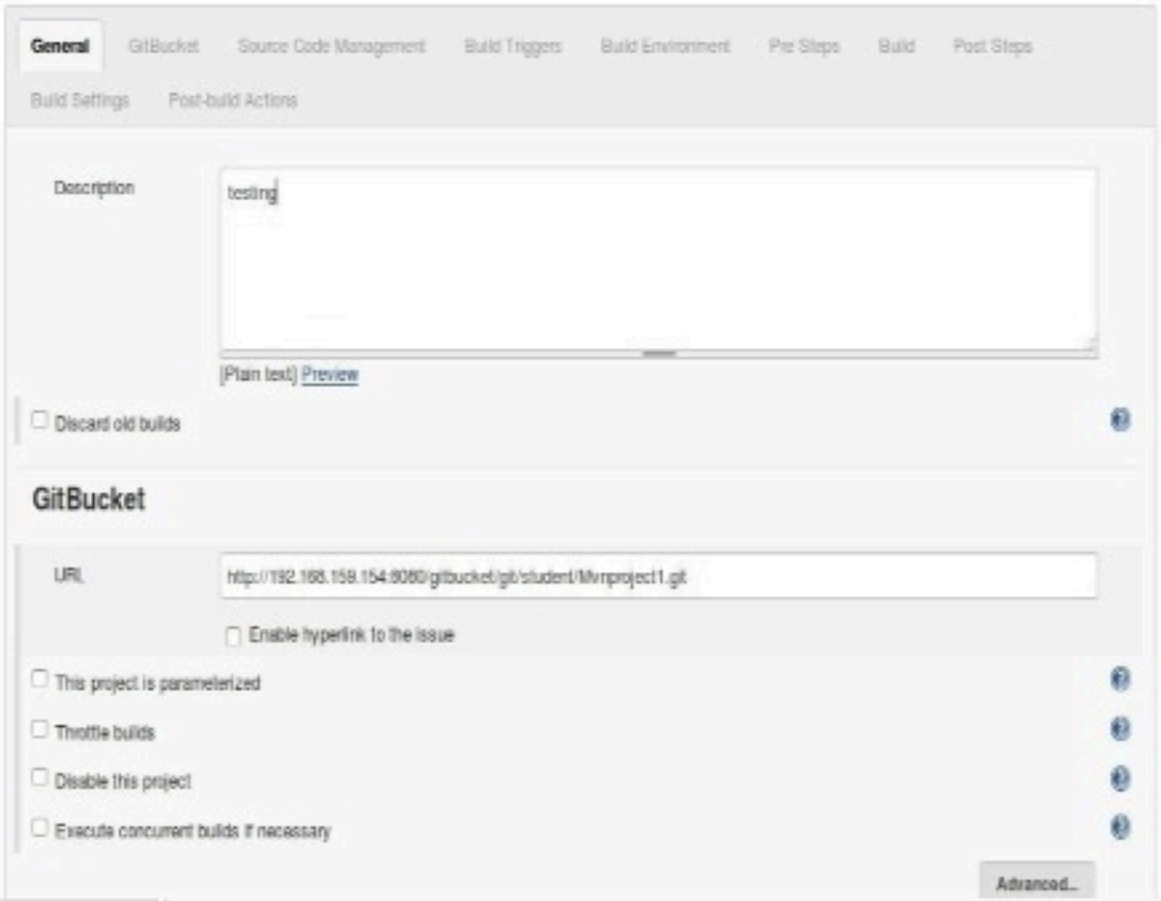
Test Maven code (CB):-

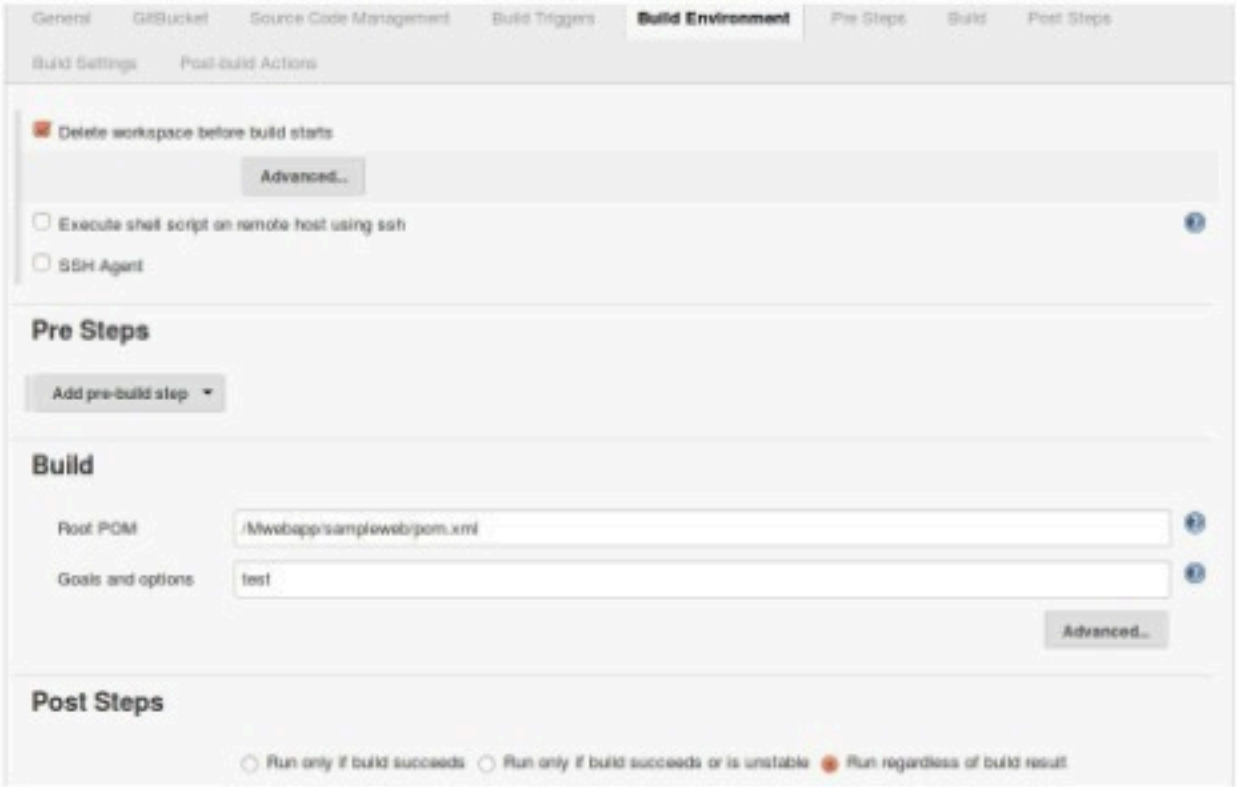
>> Go to Jenkins Dashboard

>> New item

>> item name

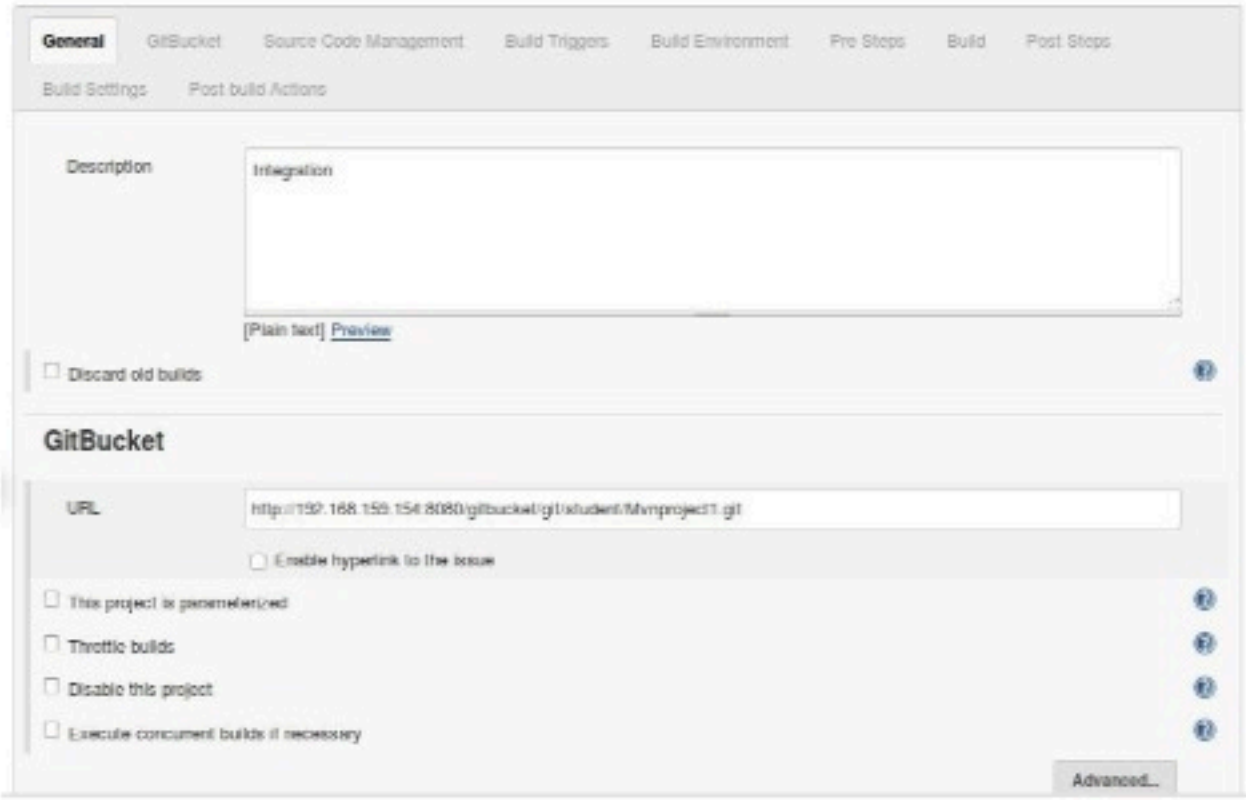
>> Select Maven project >> ok

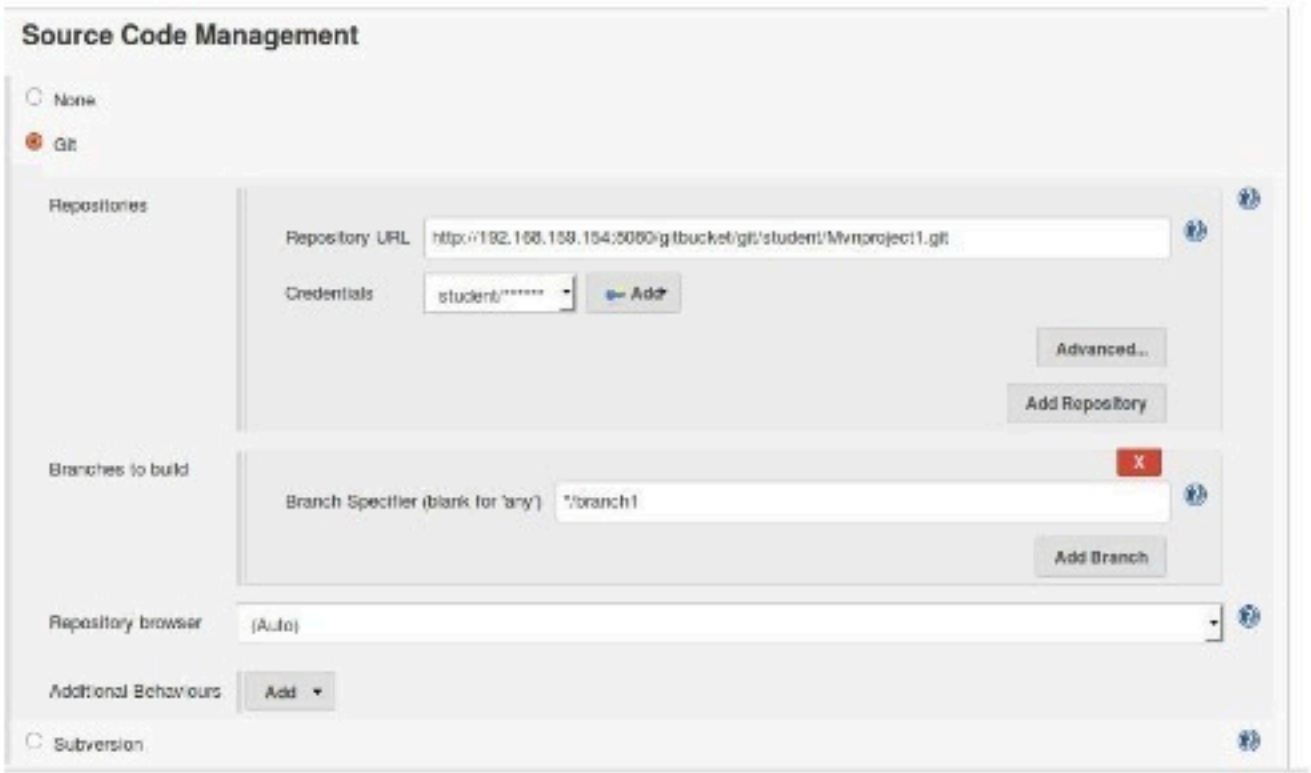




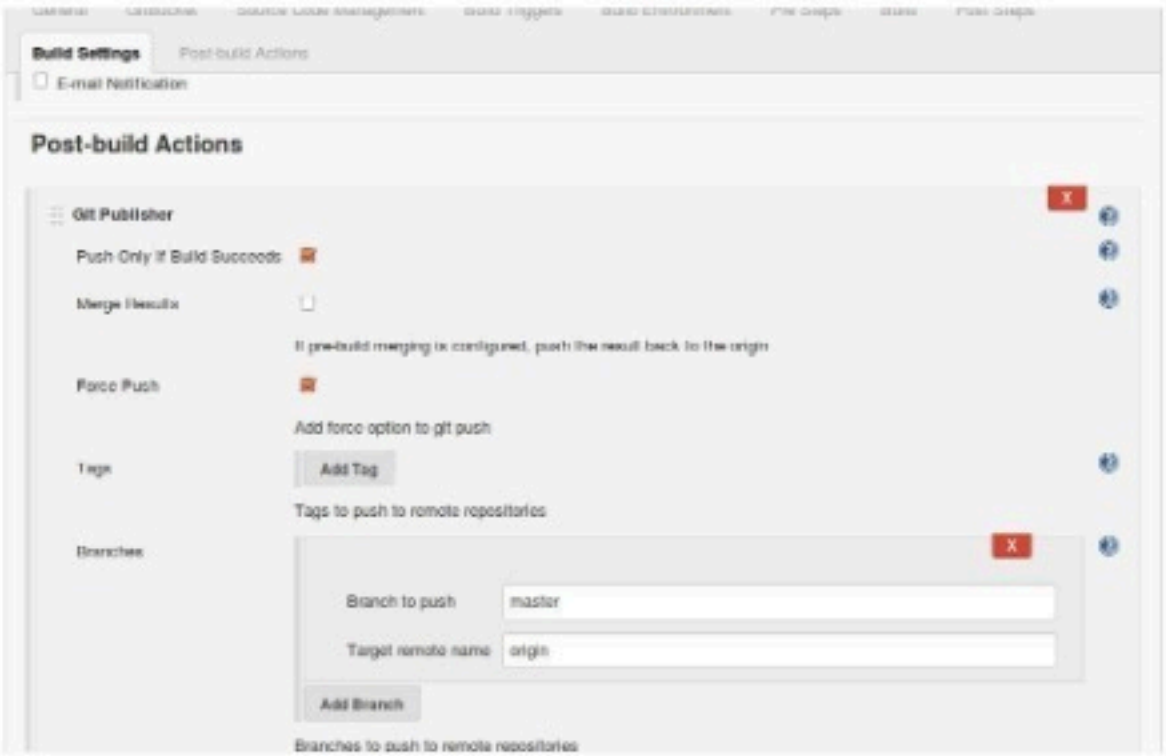
Integrate Maven code in Jenkins:-

>> Go to Jenkins Dashboard
>> New item item name
>> Select Maven project ok
>> Comment
>> git url
>> Build whenever a SNAPSHOT dependency is built
>> Delete workspace before build starts
>> Set root pom path
>> set branches path
>> apply ok
>> click on build icon


General
GitBucket
Source Code Management
Build Triggers
Build Environment
Pre Steps
Build
Post Steps
Build Settings
Post build Actions
Description
Integration
[Plain text] Preview
Discard old builds
GitBucket
URL
Enable hyperlink to the issue
This project is parameterized
Throttle builds
Disable this project
Execute concurrent builds if necessary
Advanced...

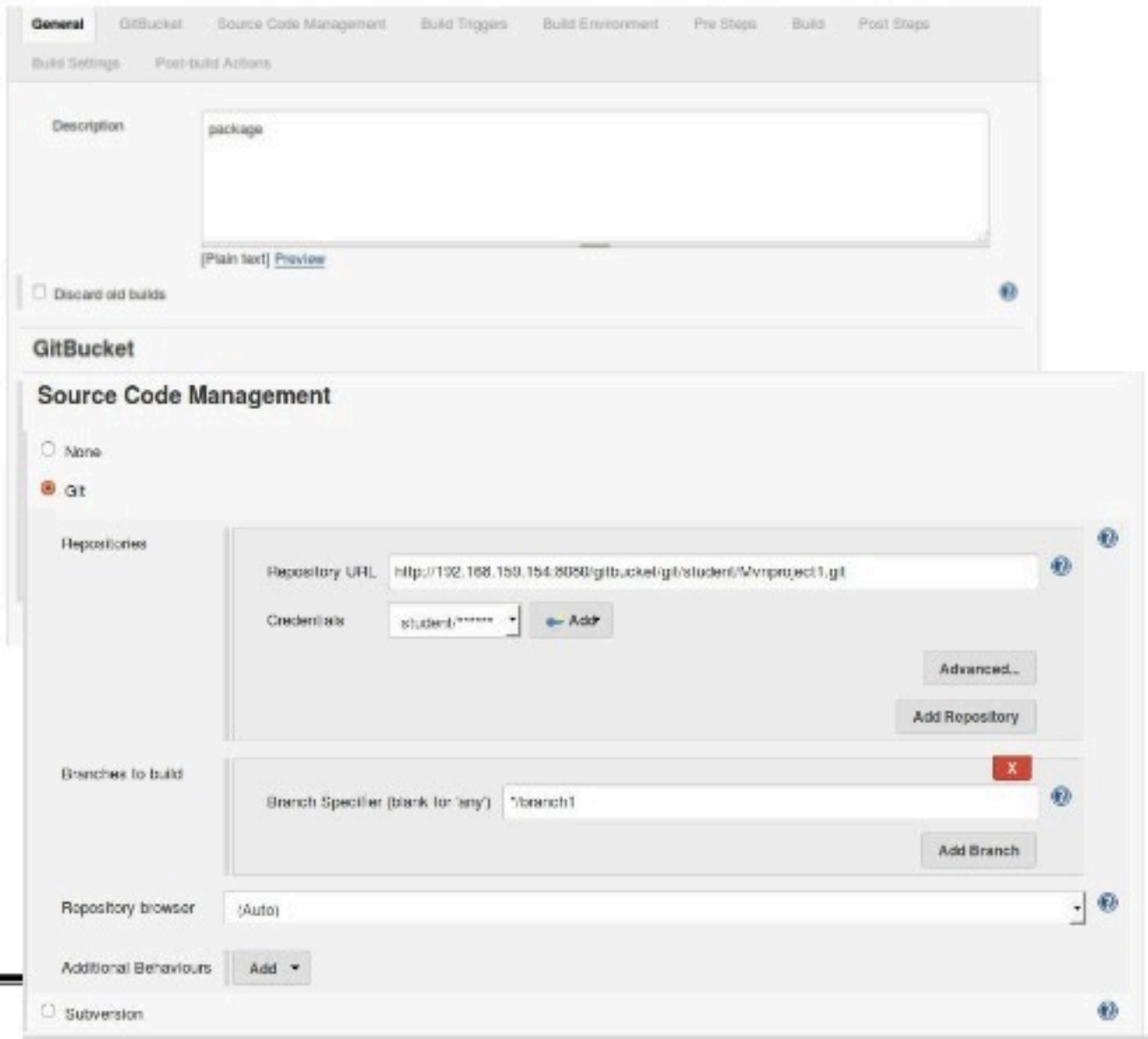

Source Code Management
None
Git
Repositories
Repository URL
http://192.168.159.154:8080/gitbucket/git/student/Mvnproject1.git
Credentials
student/******
Add
Advanced...
Add Repository
Branches to build
Branch Specifier (blank for 'any')
*/branch1
Add Branch
Repository browser
(Auto)
Additional Behaviours
Add
Subversion


Build Settings
Post-build Actions
Add pre-build step
Build
Root POM
/Mavenapp/sample-web/pom.xml
Goals and options
Advanced...
Post Steps
Run only if build succeeds
Run only if build succeeds or is unstable
Run regardless of build result
Add post-build step
Build Settings
E-mail Notification
Post-build Actions


Build Settings
Post-build Actions
E-mail Notification
Post-build Actions
Git Publisher
Push Only If Build Succeeds
Merge Results
Force Push
Add force option to git push
Tags
Add Tag
Tags to push to remote repositories
Branches
Branch to push
master
Target remote name
origin
Add Branch
Branches to push to remote repositories

Package Maven code (CB):-

>> Go to Jenkins Dashboard
>> New item >> item name
>> Select Maven project >> ok
>> Description
>> git url
>> Build whenever a SNAPSHOT dependency is built
>> Delete workspace before build starts
>> Set root pom path
>> Goal package
>> set branches >> path >> apply >> save >> build now.



Automation with Piepline View:-

1st step

>> Go to Maven_compile configuration

>> Build triggers

>> Build after other projects are built

>> Maven_integration

>> Apply >> save.

2nd step

>> Go to Maven_test configuration

>> Build triggers

>> Build after other projects are built

>> Maven_compile

>> Apply >> save.

3rd step

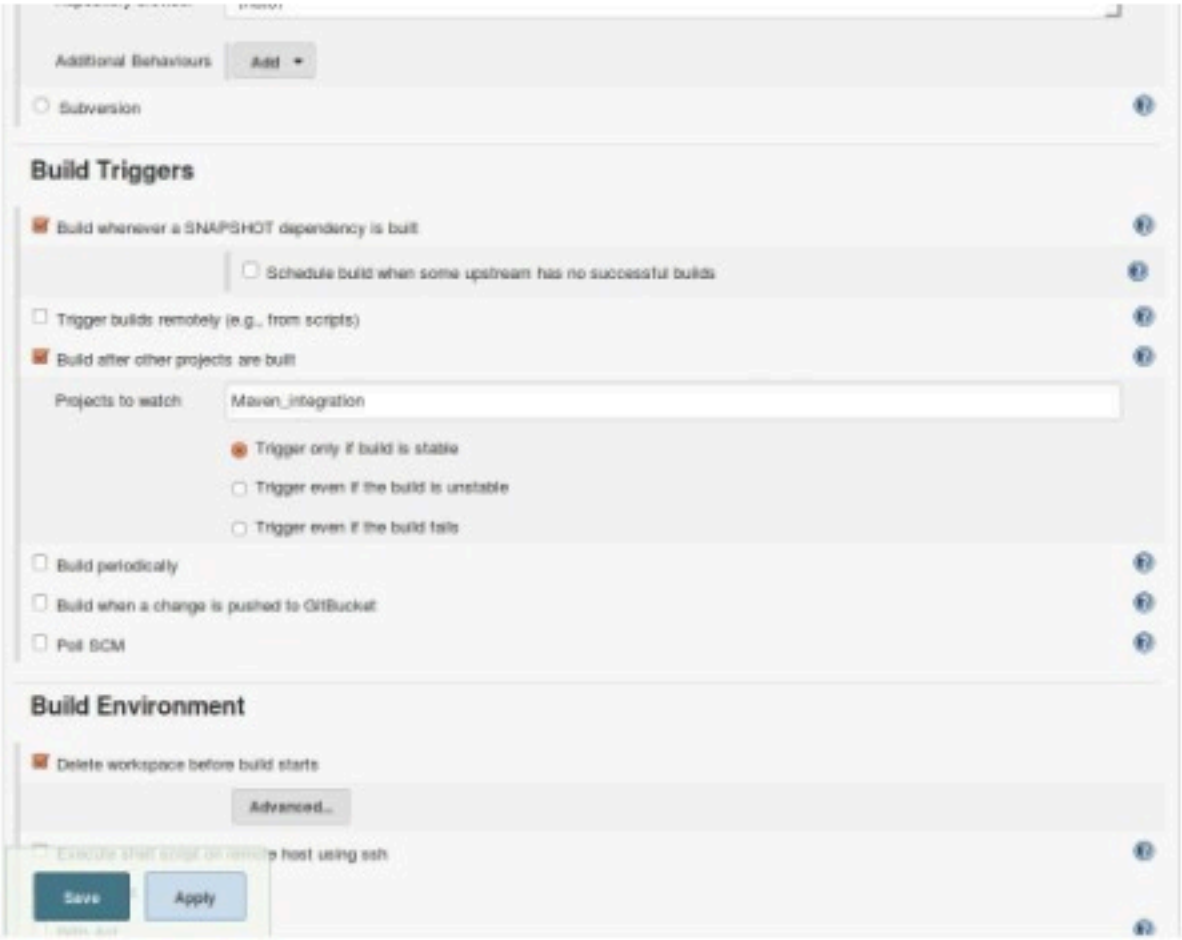
>> Go to Maven_Package configuration

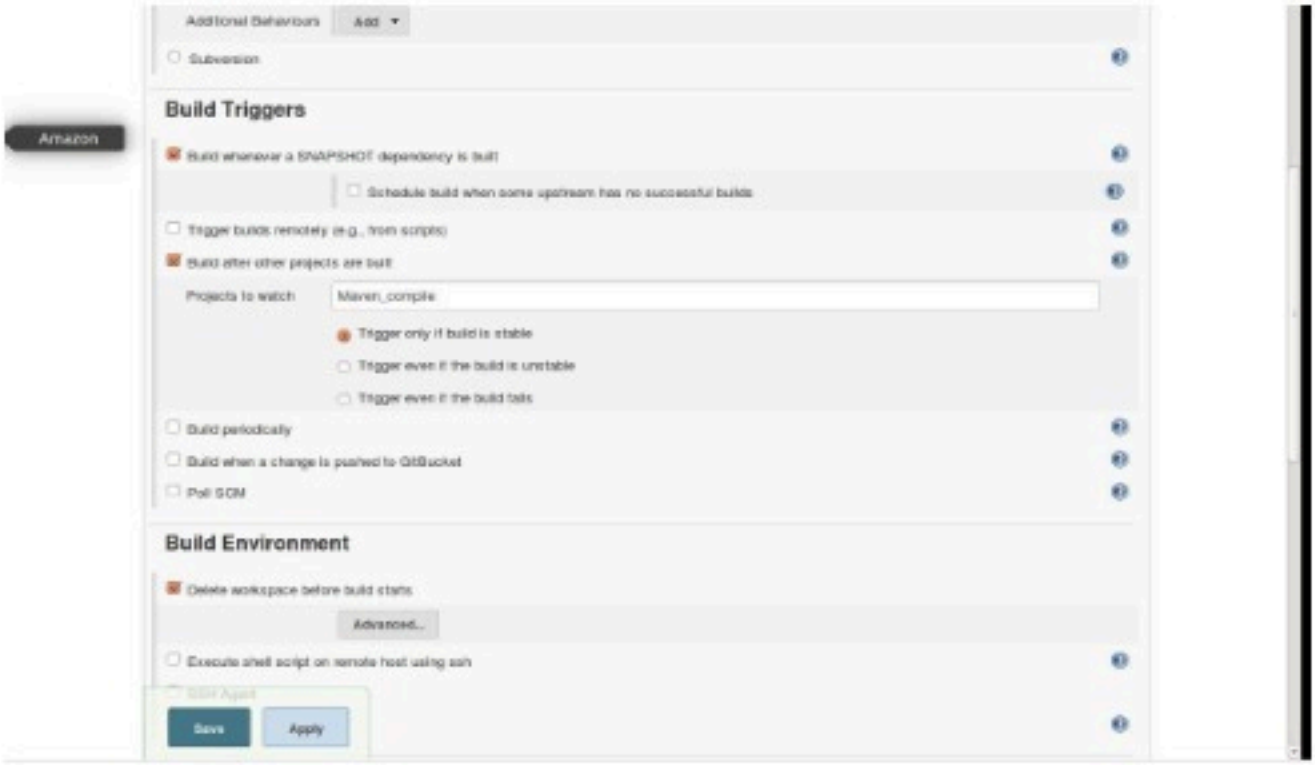
>> Build triggers

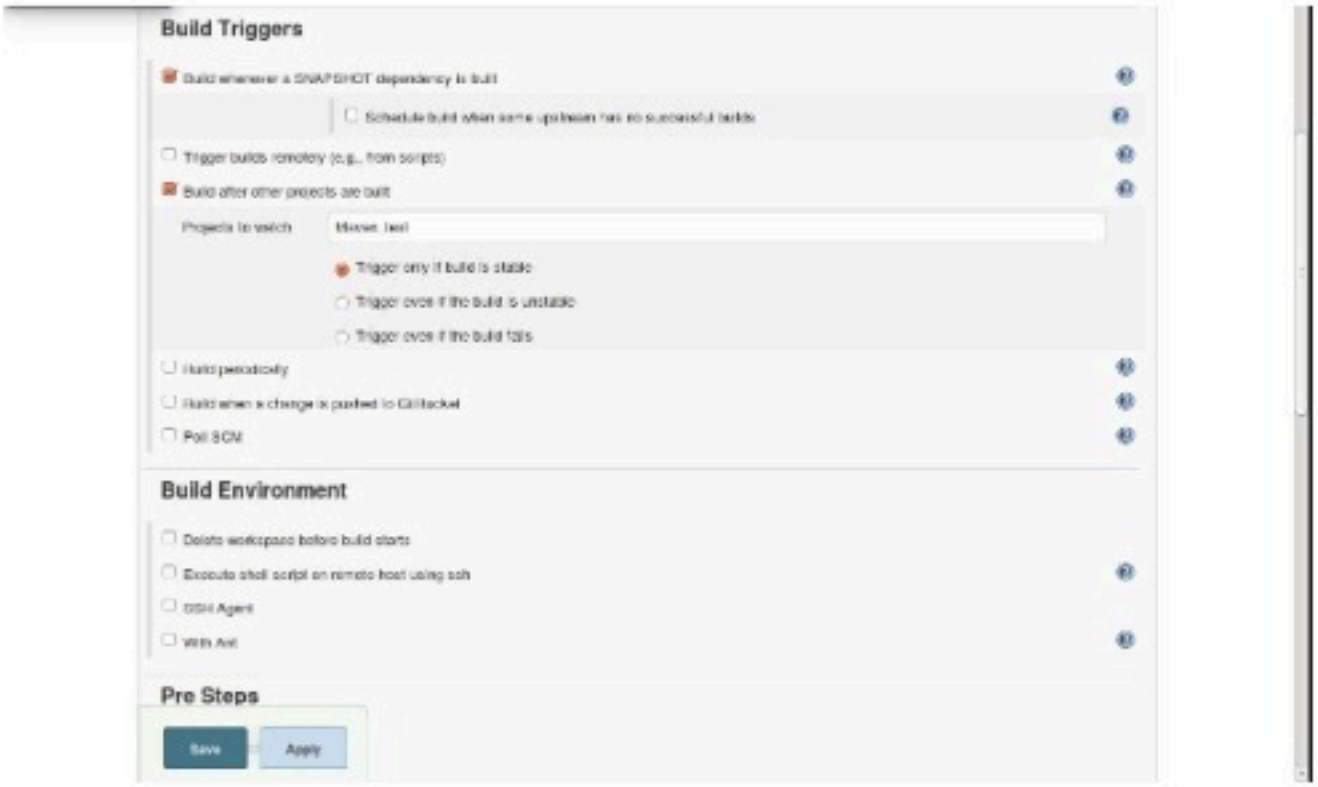
>> Build after other projects are built

>> Maven_test

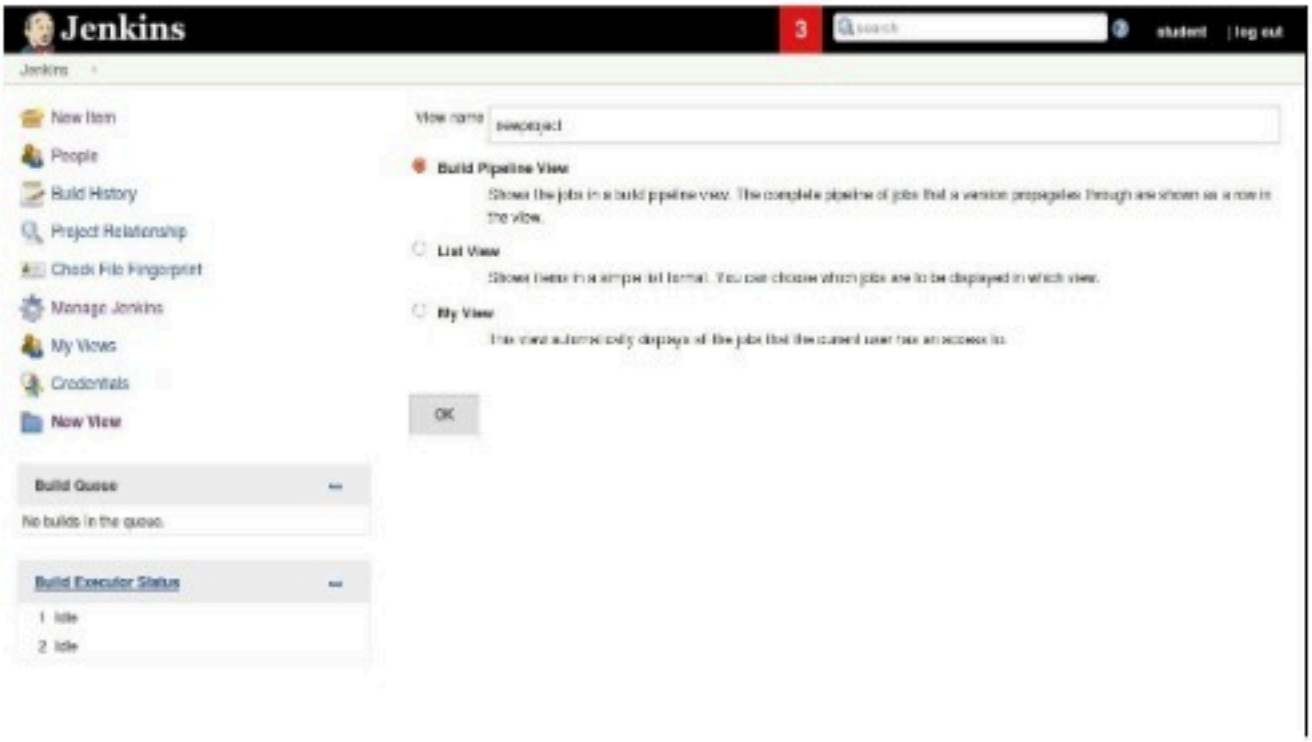
>> Apply >> save

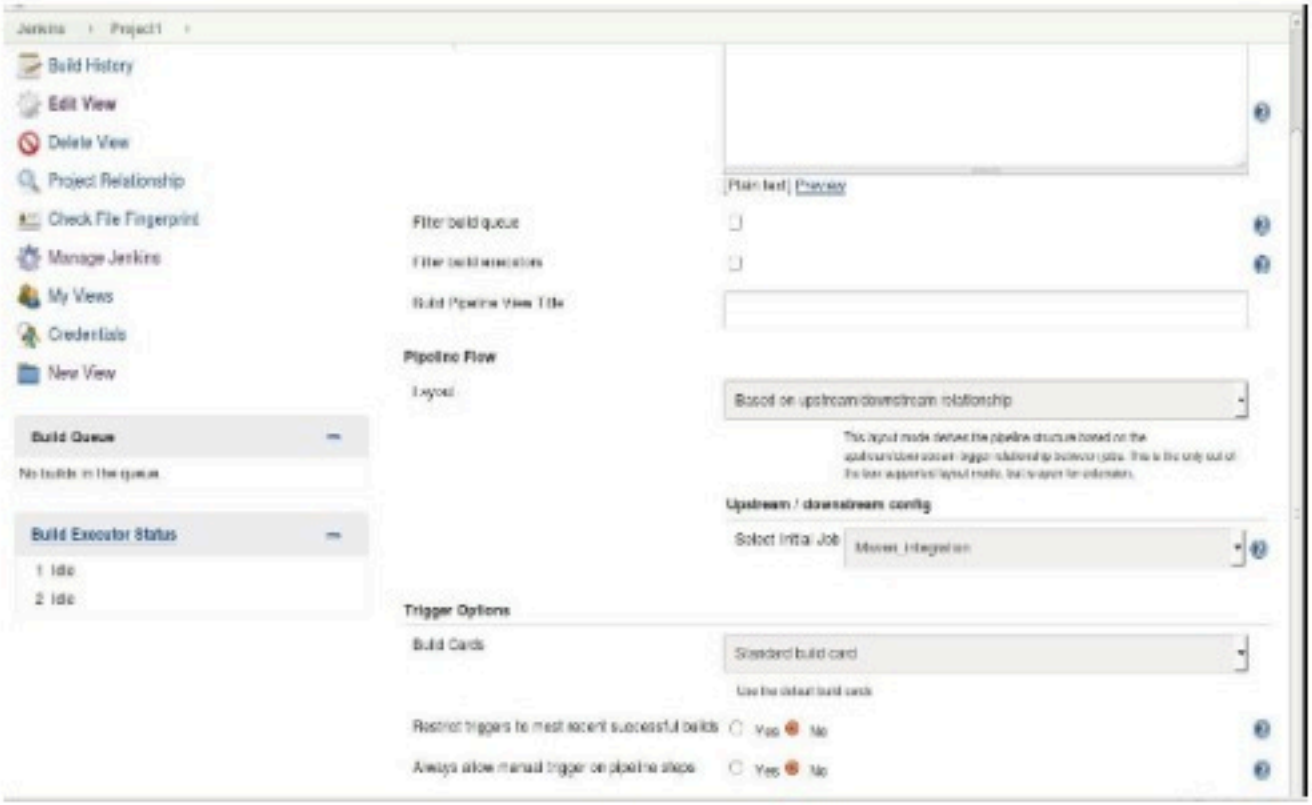

Additional Behaviours
Add
Subversion
Build Triggers
Build whenever a SNAPSHOT dependency is built
Schedule build when some upstream has no successful builds
Trigger builds remotely (e.g., from scripts)
Build after other projects are built
Projects to watch
Maven_integration
Trigger only if build is stable
Trigger even if the build is unstable
Trigger even if the build fails
Build periodically
Build when a change is pushed to GitBucket
Poll SCM
Build Environment
Delete workspace before build starts
Advanced...
Save
Apply

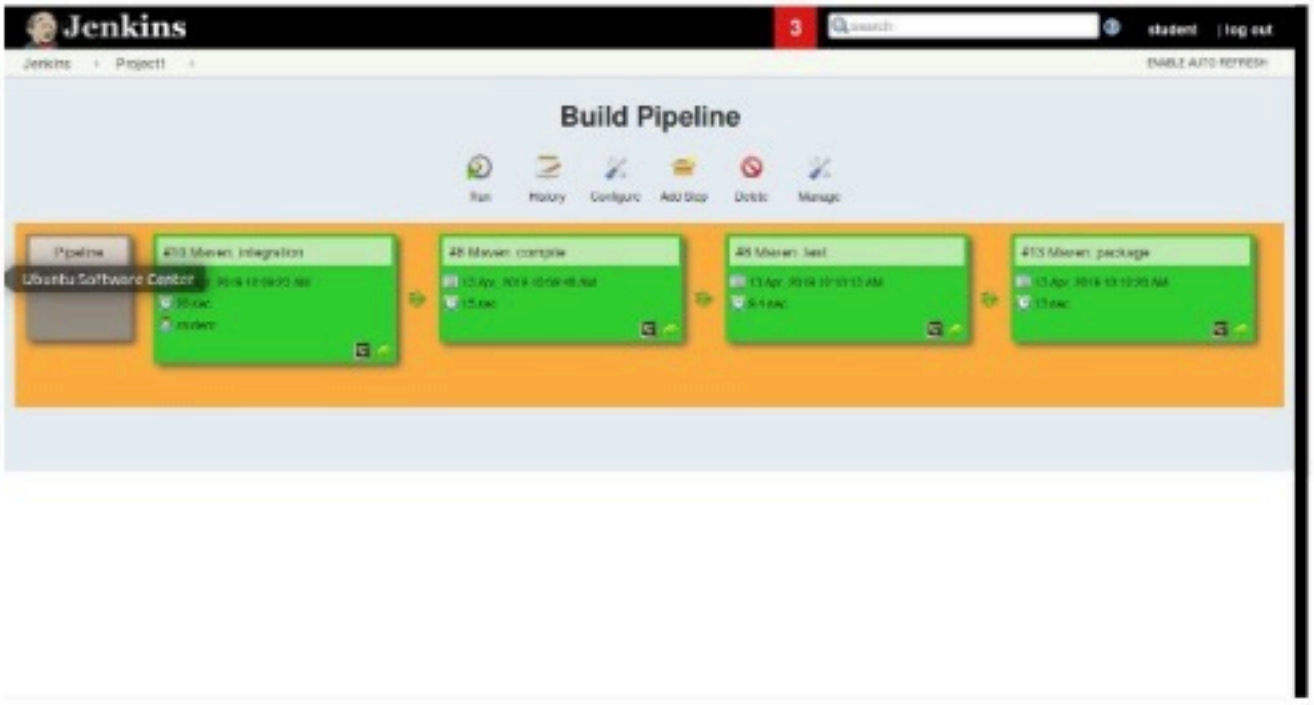

Additional Behaviours
Add
Subversion
Build Triggers
Build whenever a SNAPSHOT dependency is built
Schedule build when some upstream has no successful builds
Trigger builds remotely (e.g., from scripts)
Build after other projects are built
Projects to watch
Maven_compile
Trigger only if build is stable
Trigger even if the build is unstable
Trigger even if the build fails
Build periodically
Build when a change is pushed to GitBucket
Poll SCM
Build Environment
Delete workspace before build starts
Advanced...
Execute shell script on remote host using ssh
Save
Apply


Build Triggers
Build whenever a SNAPSHOT dependency is built
Trigger builds remotely (e.g., from scripts)
Build after other projects are built
Trigger only if build is stable
Trigger over if the build is unstable
Trigger over if the build fails
Build periodically
Poll SCM
Build Environment
Delete workspace before build starts
Execute shell script on remote host using ssh
With Ant
Pre Steps
Save
Apply

Pipeline Installation:- 1st Step >> Manage Jenkins >> Manage plugins >> Available <type build pipeline package name> >> install without restart. 2nd step >> Jenkins Dashboard >> New view >> Name >> build pipeline view >> apply >> save. 3rd Step >> View configure Upstream / downstream config >> Select >> Maven_integration >> Apply >> ok.







Fully Automation in Jenkins:-

1st Step

>> Go to Jenkins user configure

>> Add new Token and copy

>> Apply Save.

2nd step

>> Go to Gitbucket

>> Account Settings

>> Service hooks Add payroll url(Jenkins url)

>> Past the Token >> tick on Push >> save.

3rd step

>> Go to Jenkins

>> Maven_integaration

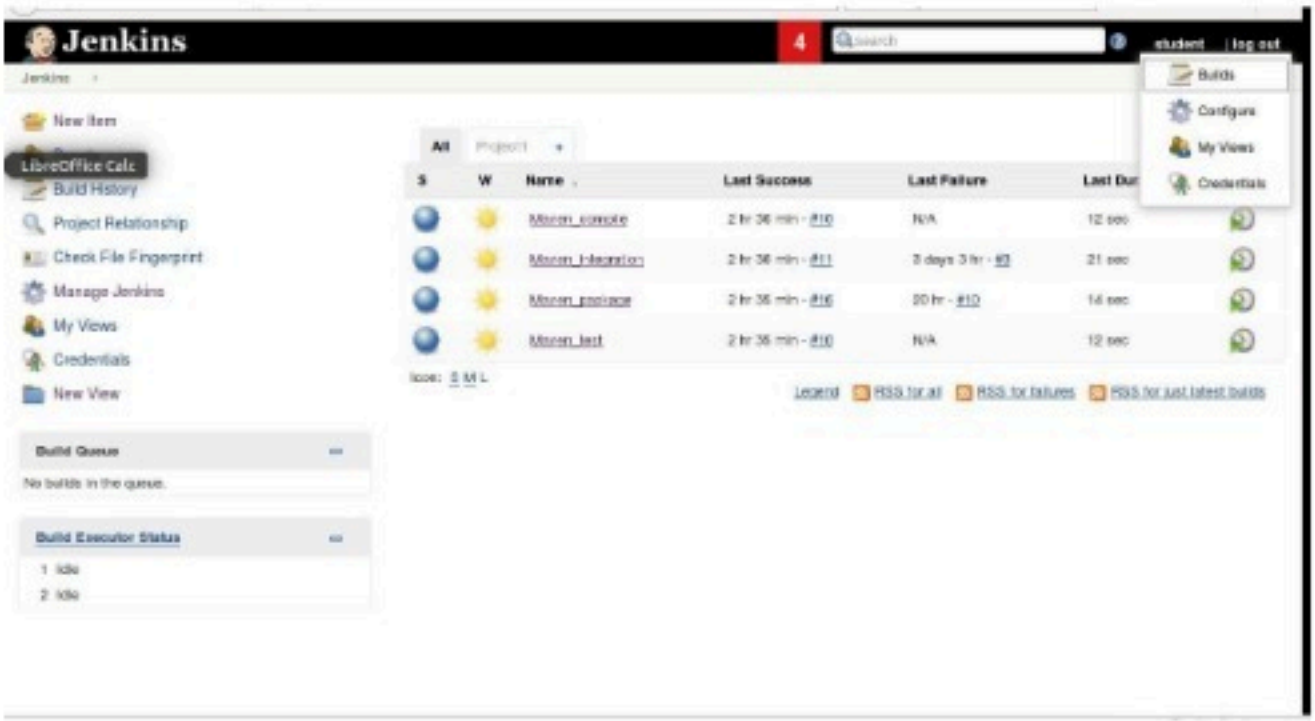
>> Configure

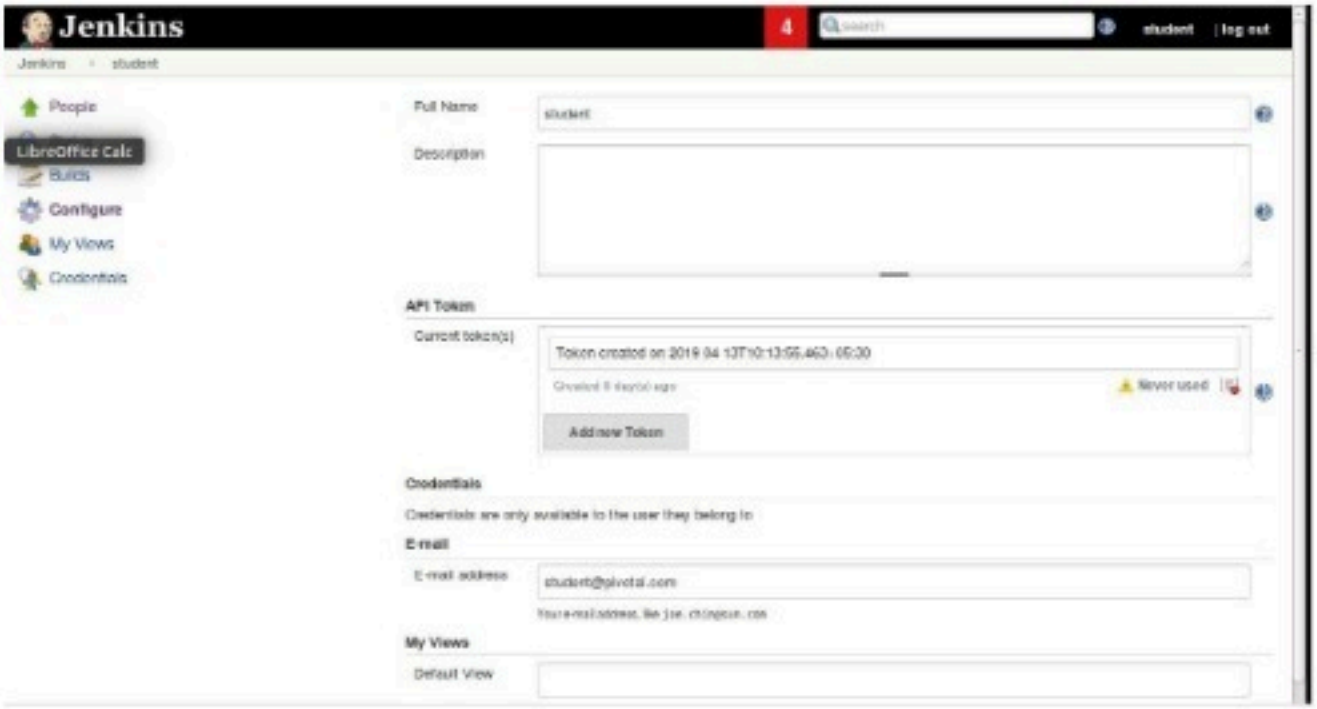
>> Build Triggers

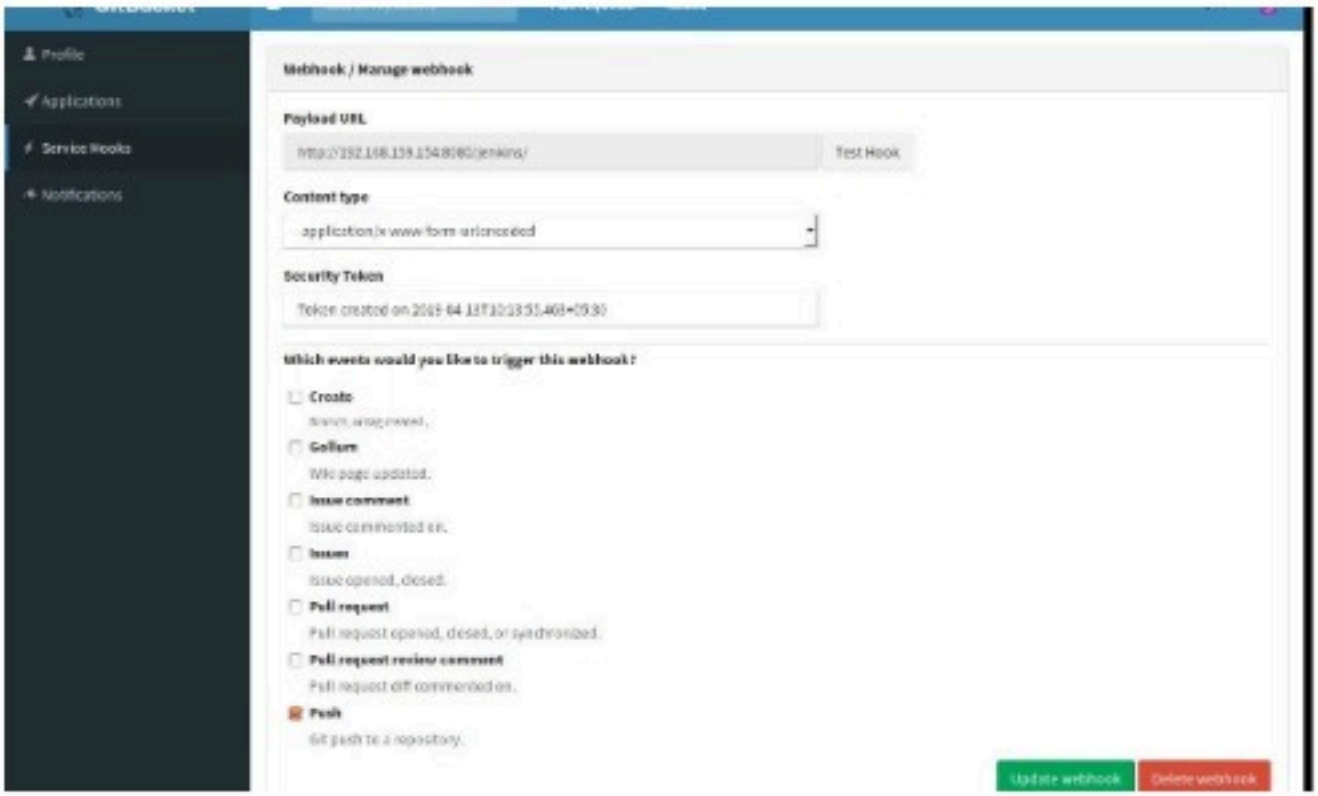
>> Build when a change is pushed to Gitbucket >> apply >> save.

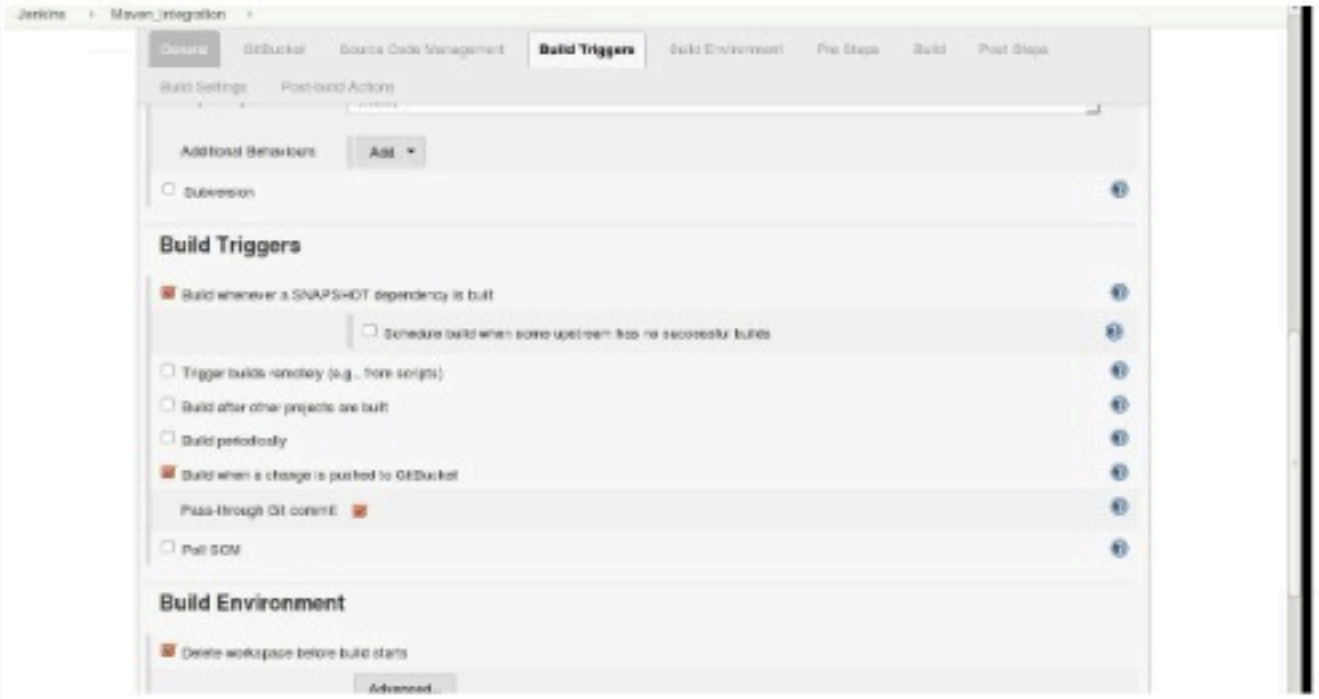
4th step

>> Go to Terminal Push new code to Gitbucket server.





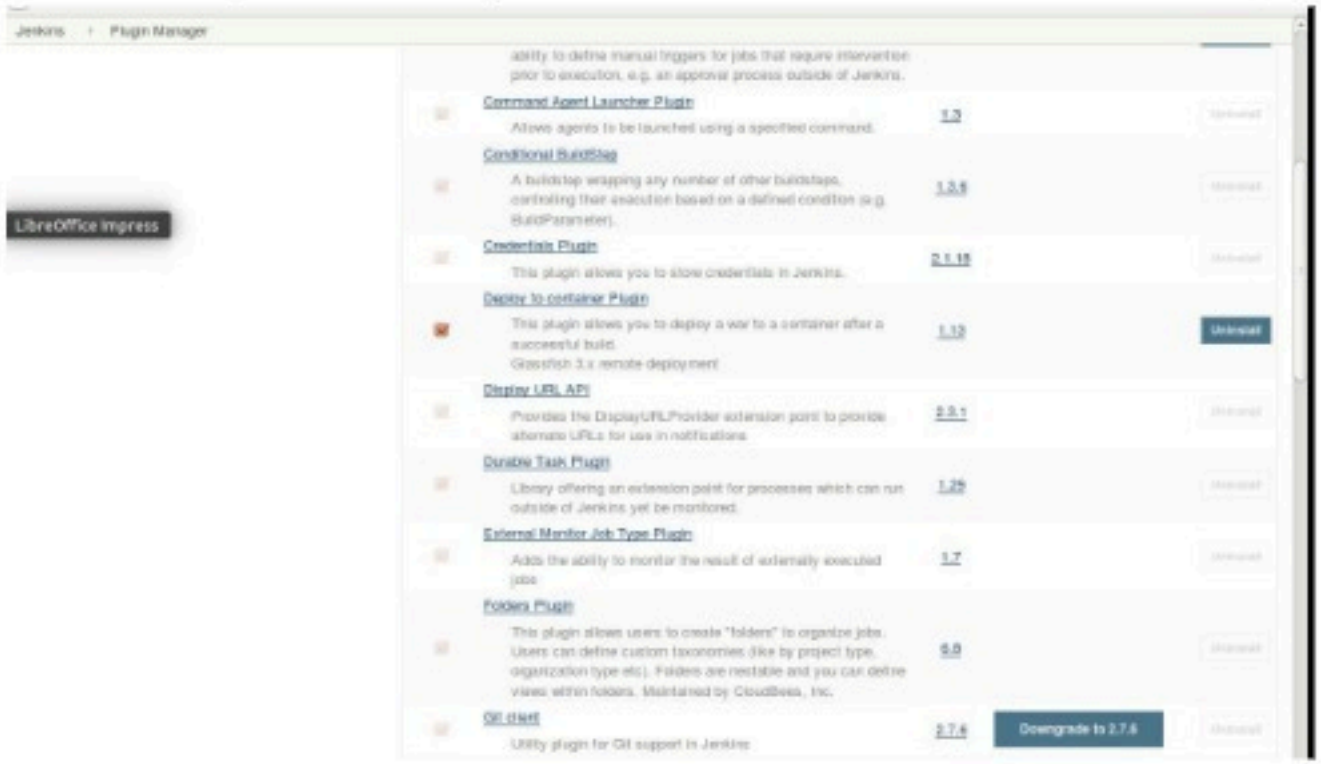




Continues Deploy:-

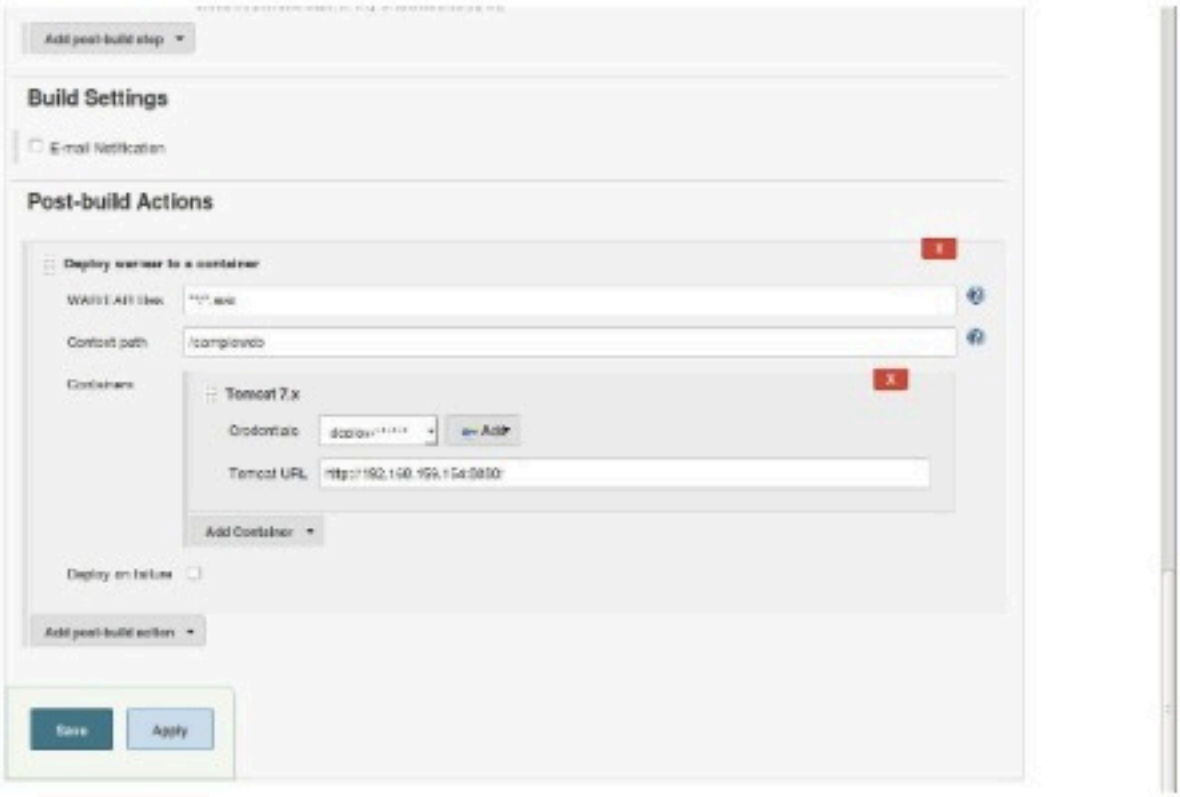
1st step
>> Go to Jenkins Dashboard
>> Manage Jenkins
>> Manage Plugins >> Available >> Deploy to container
>> install without restart >> ok.
2nd step
>> Go to Jenkins Dashboard
>> Maven_Package Configure
>> Post-build Actions
>> Deploy war/ear to container >> war/ear files=**/*.war
>> Context path=/sampleweb >> credentials
>> Tomcat Url Apply Save.
3rd Step
>> Go to Terminal push some new code to Gitbucket than see the changes in firefox.

Jenkins Backup and Restore:-



1st step

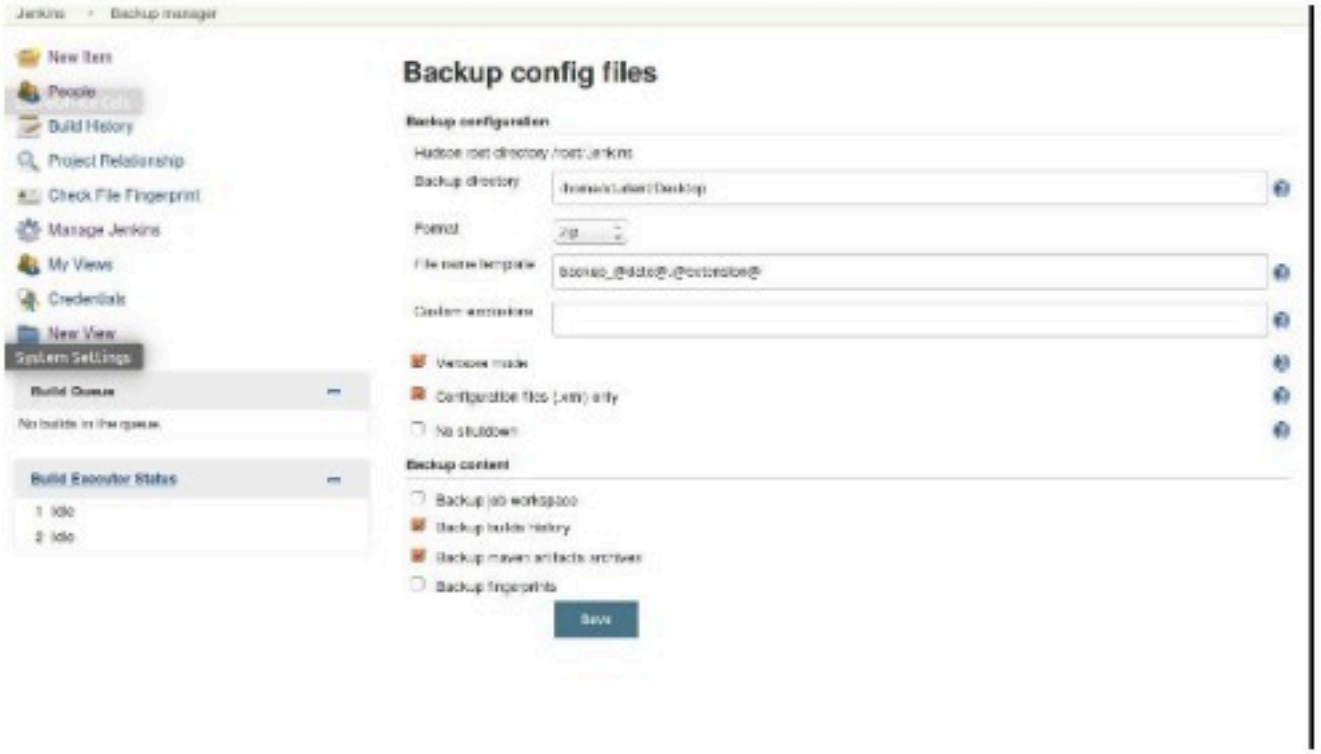
>> Go to Jenkins Dashboard

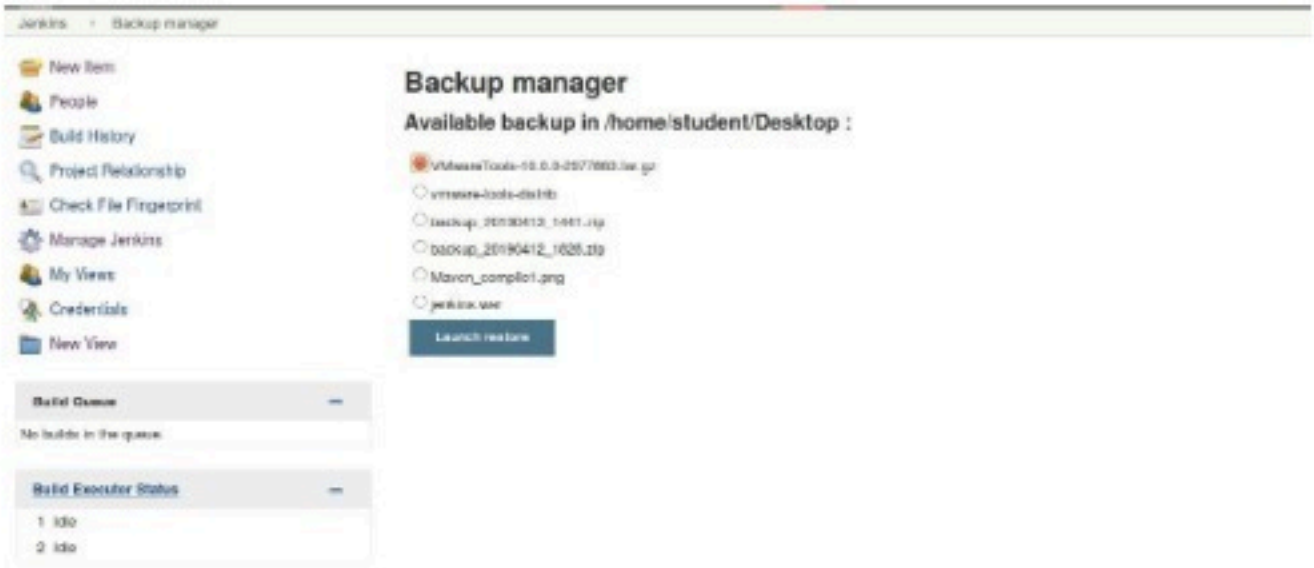


>> Manage Jenkins
>> Manage Plugins >> Available
>> Backup Plugin >> install without restart >> ok.
2nd step >> Go to Jenkins Dashboard
>> Manage Jenkins >> Backup manager
>> Setup >> Backup directory >> Format >> save.
3rd step >> Go to Jenkins Dashboard
>> Manage Jenkins >> Backup manager
>> Backup Hudson configuration >> Ok. 4th step
>> Go to Jenkins Dashboard >> Manage Jenkins
>> Backup manager
>> Restore Hudson configuration >> Launch Restore.

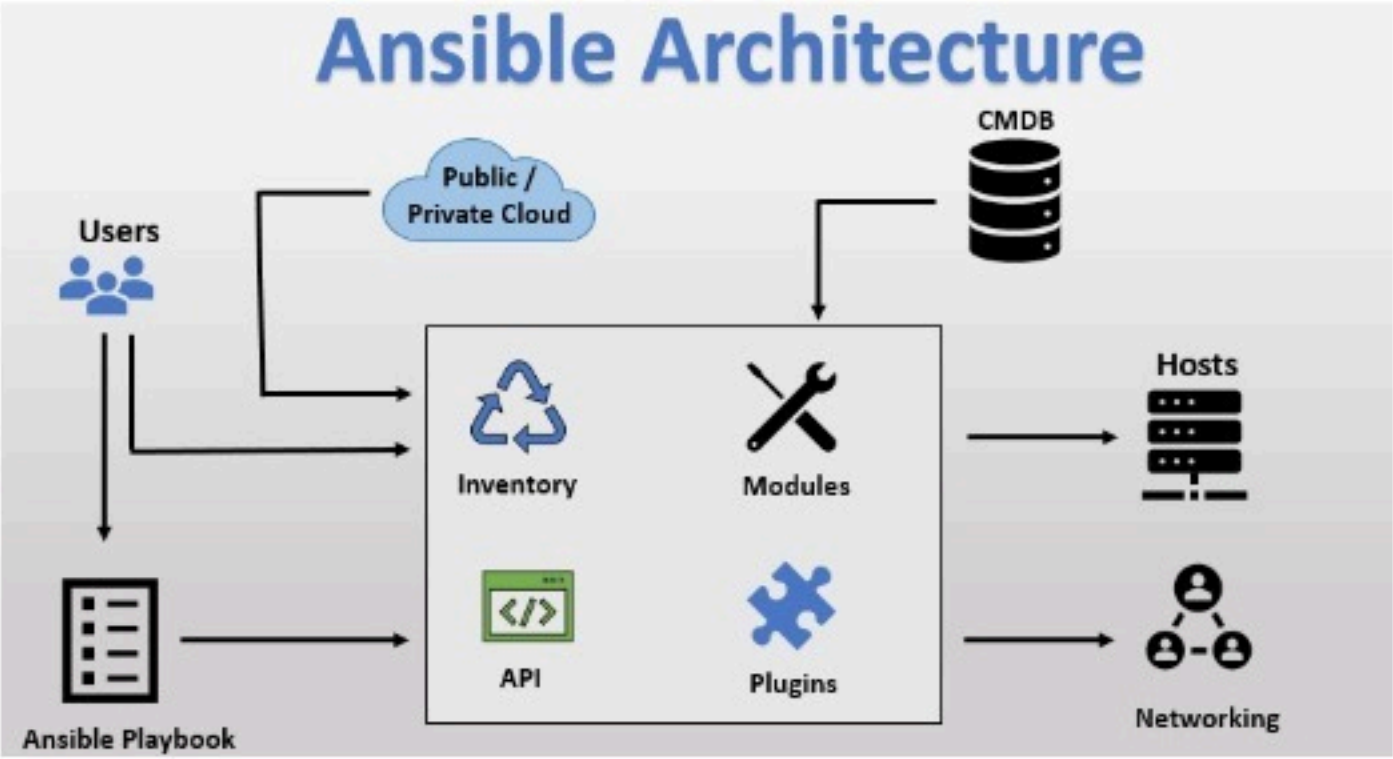
Ansible:-

Ansible is a radically simple IT automation system. It handles configuration





management, application deployment, cloud provisioning, ad-hoc task execution, network automation, and multi-node orchestration. Ansible makes complex changes like zero-downtime rolling updates with load balancers easy.



- Minimal in nature. Management systems should not impose additional dependencies on the environment.[16]
- Consistent. With Ansible one should be able to create consistent environments.
- Secure. Ansible does not deploy agents to nodes. Only OpenSSH and Python are required on the managed nodes.[16][12]
- Highly reliable. When carefully written, an Ansible playbook can be idempotent, to prevent unexpected side-effects on the managed systems. [18] It is entirely possible to have a poorly written playbook that is not idempotent.
- Minimal learning required. Playbooks use an easy and descriptive language based on YAML and Jinja templates.
- Control machines have to be a Linux/Unix host (for example, Red Hat Enterprise Linux, Debian, CentOS, macOS, BSD, Ubuntu[11]), and Python 2.7 or 3.5 is required.[3

Ansible Installation:-

Configure in System 1,System2 and System3 :-

>> set ip address and hostaddress >> install ssh >> install epel-release packages >> install yum packages >> sudo yum localinstall --nogpgcheck https://download1.rpmfusion.org/free/el/rpmfusion-free-release-7.noarch.rpm >> sudo yum localinstall --nogpgcheck https://download1.rpmfusion.org/nonfree/el/rpmfusion-nonfree-release-7.noarch.rpm >> sudo yum localinstall --nogpgcheck http://dl.fedoraproject.org/pub/epel/7/x86_64/Packages/e/epel-release-7-11.noarch.rpm >> sudo yum localinstall --nogpgcheck http://rpms.famillecollet.com/enterprise/remi-release-7.rpm >> sudo rpm --import https://www.elrepo.org/RPM-GPG-KEY-elrepo.org sudo rpm -Uvh http://www.elrepo.org/elrepo-release-7.0- 3.el7.elrepo.noarch.rpm
>> sudo yum localinstall --nogpgcheck
http://repo.webtatic.com/yum/el7/webtatic-release.rpm
>> yum update
>> yum clean all
>> yum install ansible
ssh-key has to setup on both the nodes

Ansible server talks to managed nodes using ssh

Default location of inventory: /etc/ansible/hosts add hosts to /etc/ansible/hosts

and configure password less authentication

Generate ssh keys and setup password less authentication between server and clients

perform jobs either using ansible commnad line or playbooks.

Ansible command line:-

```
>> ansible all -m ping
>> ansible all -a "touch /tmp/hello"
>> ansible webservers -m ping
```

Ansible playbooks:-

playbook for file copying

```
---
- hosts: all
  become_user: root

  tasks:
  - name: Copy file with owner and permissions
    copy:
      src: /root/playfile
      dest: /tmp
      owner: root
      group: root
      mode: '0644'
>> ansible-playbook apache.yml --check
>> ansible-playbook filename
```

Web palybook:-

```
- hosts: all
  become_user: root
  tasks:
```

```
  - name: 1. Install Latest Version of HTTP/Apache
    yum: name=httpd state=present

  - name: 2. start httpd service
    service: name=httpd state=started enabled=yes
  - name: 3. copy the standard index.html file
    copy: src=/tmp/index.html dest=/var/www/html/index.html mode=0664
  - name: 4. Add apache iptable rule
    command: /sbin/iptables -I INPUT 1 -p tcp --dport http -j ACCEPT -m comment
--commnet "Apache on port 80"

  - name: 5. Save iptable rule
    command: iptables-save
>> ansible-playbook apache.yml --check
>> ansible-playbook filename
```

users playbook:-

```
---

- hosts: all
  become_user: root
  tasks:




    # this task creates groups
    - name: add a group
      group:
       name={{ item }}
```

```
    state=present       with_items:
      - demogrp          - demogrp1
                  tags:   add_new_grp
    # this task creates users       -
name: add a user              user:
                  name={{   item   }}
                        state=present
                  password="redhat"
    shell=/bin/bash      with_items:
     - demouser1        - demouser2
                       -    demouser3
   tags: add_new_user
  # this tasks is to delete the users
  - name: delete several users
   user:
    name={{ item }}
    state=absent
   with_items:
    - demouser1
   tags: remove_user
  # this task is to delete the groups
  - name: delete groups
   group:
    name={{ item }}
    state=absent
   with_items:
    - demogrp
    - demogrp1
   tags: remove_group
```

```
>> ansible-playbook apache.yml --check
>> ansible-playbook user.yml --list-tags
>> ansible-playbook user.ymo --tags add_net_user

- name: Patch Windows systems against Meltdown and Spectre
  hosts: "{{ target_hosts | default('all') }}"
  vars:
    reboot_after_update: no
    registry_keys:
      - path: HKLM:\SYSTEM\CurrentControlSet\Control\Session
Manager\Memory Management
        name: FeatureSettingsOverride
        data: 0
        type: dword
      - path: HKLM:\SYSTEM\CurrentControlSet\Control\Session
Manager\Memory Management
        name: FeatureSettingsOverrideMask
        data: 3
        type: dword

      # https://support.microsoft.com/en-us/help/4072699
      - path:
HKLM:\SOFTWARE\Microsoft\Windows\CurrentVersion\QualityCompat
        name: cadca5fe-87d3-4b96-b7fb-a231484277cc
        type: dword
        data: '0x00000000'
  tasks:
    - name: Install security updates
      win_updates:
        category_names:
```

```
    - SecurityUpdates
    notify: reboot windows system

  - name: Enable kernel protections
    win_regedit:
      path: "{{ item.path }}"
      name: "{{ item.name }}"
      data: "{{ item.data }}"
      type: "{{ item.type }}"
    with_items: "{{ registry_keys }}"

handlers:
  - name: reboot windows system
    win_reboot:
      shutdown_timeout: 3600
      reboot_timeout: 3600
    when: reboot_after_update
>> ansible-playbook apache.yml --check
>> ansible-playbook user.yml --list-tags
>> ansible-playbook user.ymo --tags add_net_user
```