

HOW TO BUILD YOCTO USING JENKINS (SHELL SCRIPT):

STAGE1: HOW TO INSTALL JENKINS ON UBUNTU:

. Before installing the Jenkins, we must install the JAVA JDK-11-JRE and JAVA JDK-11-JRE-HEADLESS

- SYNTAX:
- Sudo apt install openjdk-11-jre
- Sudo apt install openjdk-11-jre-headless

After install java check the version: java --version

After installing java: we must install JENKINS

PROCESS: Go to web search Jenkins –click on 1st link --click on downloads—here SELECT **Download Jenkins 2.361.1 LTS for: (ubuntu/Debian)**

Next, we NEED to run the below curl syntax: to install jenkins

- curl -fsSL <https://pkg.jenkins.io/debian-stable/jenkins.io.key> | sudo tee \
- /usr/share/keyrings/jenkins-keyring.asc > /dev/null
- echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
- https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
- /etc/apt/sources.list.d/jenkins.list > /dev/null
- sudo apt-get update
- sudo apt-get install fontconfig openjdk-11-jre
- sudo apt-get install Jenkins
- After installing the JENKINS—check the Jenkins version –using: Jenkins --version

Next: Hit in the web of system ipaddress:8080 to unlock the jenkins

Ex:192.168.210.210:8080

a) . After entering the above ipaddress:8080 the unlock jenkins page will be open (jenkins page if not open here run below syntax;

- Service status Jenkins
- Service stop Jenkins
- Service start Jenkins
- Systemctl enable Jenkins

. Next, we need to unlock the Jenkins using Administrators password

. Administration password has been stored /var/lib/Jenkins/secrets/Initialadminpassword

Ex: 8dc7ce026f744e5da7ee0740338b57c8

. Copy the above initial admin pass and paste into the under-administrator password BOX.

. next click on continue

b). Customize Jenkins:

- . select/click on install suggested plugins
- . here we must wait until installed all plugins
- . after installing the plugins – create admin user
- .to create admin user –click on CONTINUE AS ADMIN—click on start using jenkins –now successfully unlocked the Jenkins and entered Jenkins Dashboard.

STAGE2: BASIC CONFIGURTIONS IN JENKINS:

c) Change Jenkins pass of admin user and add ssh public key:

.Jenkins dashboard – click on manage Jenkins – click on manage users – click on admin user – configure – create new pass under password section ex : Password: kasevaddi

Confirm Password:kasevaddi

. Add SSH Public Keys

SSH Public Keys? (Here paste ssh public key)

. click on APPLY and SAVE.

d) give full permissions to admin user.

1. . dashboard -- click on manage Jenkins -- open Configure Global Security – Authorization – select matrix-based security –click on add user – add admin user – click on grant all permission to admin
2. Configure Global Security-- Host Key Verification Strategy ?

Here select accept first connection

APPLY AND SAVE

e) integrate java, cmake, git:

. dashboard -- manage jenkins -- Global Tool Configuration--

. Under jdk section – click on add jdk

Here UNDER JDK Name section enter: JAVA

UNDER jdk java_home section add : /usr/bin/java (check java home path in shell: **whereis java**

. Under git section click on add git

Here under git name enter GIT

Under Path to Git executable?

Enter git home path (/usr/bin/git)

.TO integrate cmake need to install cmake plugin;

Go to dashboard -- manage jenkins -- manage plugins --click on available and search cmake -- select cmake plugin and click on without restart.

Next: Run below syntax on shell

.sudo apt-get install cmake

.sudo apt-get install g++

Now: go to global tool configuration under cmake section click on add cmake --under cmake name section enter CMAKE

Under Path to cmake?

Enter cmake home path (/usr/bin/cmake)

APPLY AND SAVE

f) system configurations

. dashboard -- Manage Jenkins -- configure system

Home directory?

/var/lib/jenkins. (we can change jenkins home directory)

.# of executors; choose : 2

. Labels; choose: 2

.Quiet period? Mention : 5

. System Admin e-mail address? Configure our email

g) configurations of sending email notifications to recipients

. **dashboard** -- manage jenkins -- configure system-

Extended E-mail Notification;

. SMTP server: smtp.office365.com

. SMTP Port : 587

Click on advance

TO Add email credentials, click on +ADD -- jenkins

Kind: select (username with password)

Scope? : select (global jenkins nodes)

Username? type here: our mail

Password? Type here: our mail password

Click on ADD.

. enable: Use TLS

Advanced Email Properties: ENTER IN BOX: [Dmail.smtp.starttls.enable=true](#)

Default user e-mail suffix? ENTER: @outlook.com

Enable Debug Mode?

Click on default trigger: here choose always

APPLY and SAVE

STAGE3 : CONFIGURATIONS BASED ON THE REQUIREMENTS

h) installed required plugins for yocto build:

. Dashboard --manage Jenkins – manage plugins – click on available

. Here need to install below plugins:

GIT PLUGIN, SCM api plugin, folders plugin,

All changes plugin Version 1.5

Authentication Tokens API Plugin

[Basic Branch Build Strategies Plugin Version 1.3.2](#)

[Bitbucket Branch Source Version 762.v969cfe087fc0](#)

Bitbucket plugin

Bitbucket server integration

Branch api

Cmake plugin

Email extension plugin

Matrix authorization

Matrix plugin

OAUTH Plugin

SSH AGENT PLUGIN

Select the above plugins and click on without restart.

I) configure ssh private key in jenkins:

. **dashboard** -- click on manage jenkins – under security section click open manage credentials – click on jenkins -- click on [Global credentials \(unrestricted\)](#) -- click on +add credentials

. kind: choose: ssh username with private key

Scope? : chose (global jenkins nodes)

USER NAME : SEMABNGLR (THIS IS BITBUCKET USERNAME)

UNDER Private Key

Enable: enter directory

Here click on ADD and paste the ssh private key in box.

Passphrase: enter passphrase

Click on CREATE.

J) how to configure bitbucket app password in jenkins

Before adding app pass in Jenkins we must create one app pass in bitbucket

How to create app pass in bitbucket

. Go to personal settings of bitbucket --- click on app pass – enter Label name (apppassofbitbucket)

. Permissions

Under permissions: enable all permissions and click on create, now copy that app password and store somewhere.

Configure app pass in jenkins:

Dashboard – manage jenkins – manage credentials – click on jenkins – click on [Global credentials \(unrestricted\)](#) -- click on +add credentials

Kind: choose username with password

Scope? : choose: (global, Jenkins, nodes, item)

Username? : semabnglr

Password? : here type app pass which you created in bitbucket.

Click on CREATE.

STAGE 4:

K) HOW TO CREATE PIPELINES/JOB IN JENKINS FOR YOCTO AND CMAKE BUILD:

. on dashboard click on +newitem—enter an item name (yocto) -- select MULTIBRANCH PIPELINE -- Click on OK. (Multibranch pipeline is created)

. Configurations in mutibranch pipeline:

All the pipelines we have created can be seen in the Jenkins dashboard

NAVIGATE INTO THE PIPELINE (OPEN)--Configure

Under branch source section:

A.Git

Project Repository [?](#)

Enter url of repo.git@bitbucket.org:semaconnect/meta-semaconnect-sandbox.git

Credentials [?](#)

Add credentials: sshprivatekeyofdesk

Behaviors

Discover tags

[?](#)

Filter by name (with regular expression)

Regular expression [?](#)

Add regex: `^d{4}\.(0[1-9]|1[012])\.(0[1-9]|12)[0-9]|3[01]_([REL]+)_([S][0-9A-Z.-]+)$`

Property strategy

Select: All branches get the same properties

Build strategies

Tags

[?](#)

Ignore tags newer than [?](#)

Here choose (-1)

Ignore tags older than [?](#)

Choose (-1)

B.Bitbucket

[?](#)

Server [?](#)

Bitbucket cloud (<https://bitbucket.org>)

Credentials [?](#)

Semabnglr/*****apppassword3. (Username of repo=semabnglr), apposword is (which I generated in the repository)

Owner [?](#)

Semaconnect

Repository Name [?](#)

Meta-semaconnect-sandbox

Behaviors [?](#)

Discover tags

[?](#)

Filter by name (with regular expression)

Regular expression [?](#)

Add regex: `^\d{4}\.(0[1-9]|1[012])\.(0[1-9]|1[12][0-9]|3[01])\(_([REL]+)_([S][0-9A-Z.-]+)$`

Property strategy

Select: All branches get the same properties

Build strategies

Tags

[?](#)

Ignore tags newer than [?](#)

Here choose (-1)

Ignore tags older than [?](#)

Choose (-1)

Under build configuration section:

Build Configuration

Mode

Here select: by Jenkins file

Script Path [?](#)

Jenkinsfile (script, which I added in the repo"s)

Under Scan Multibranch Pipeline Triggers

Enable this option: Bitbucket webhook trigger

[?](#)

Trigger on (select at least one)

Enable: All pushes [?](#)

Don't enable: Pull request opened or source branch updated [?](#)

Enable this: Build when a change is pushed to Bitbucket

Override Repository URL or Path

Here mention: [git@bitbucket.org:semaconnect/semaconnect-manifest-sandbox.git](https://bitbucket.org/semaconnect/semaconnect-manifest-sandbox.git)

Enable this : Periodically if not otherwise run [?](#)

Interval [?](#)

Here Choose: one minute

Under apperence section:

Icon [?](#)

Choose: metadata folder icon

Note: don't touch extra configuration

Finally click on APPLAY and click on SAVE

CONFIGURATIONS IN BITBUCKET (REPO)

Personal settings:

Apppassword section:

Apppass3 : UVNf5wEcPwmZSBKnS7TM (I hope you know how to create app pass) in bitbucket server.

Sshkeys section:

Here add public keys of desk or lap

If u have admin permissions go to REPOSITORY SETTINGS;

PIPELINE--->SSHKEYS; HERE ADD SSH PVITEKEY AND PUBKEY Of desk

TO GIVE EXTRA PERMISSIONS TO SSH KEY:

. After generating the ssh key on shell add below permissions to ssh private key

Syntax:

- ssh -T git@bitbucket.org or ssh -T hg@bitbucket.org
- eval 'ssh-agent'
- ssh -add ~/.ssh/id_rsa

NOTE 1 : Yocto build steps must be run manually on our DESK/LAP before entering the Jenkins

NOTE 2 : I added the ssh private key ID in the script, which was created in the Manage Credentials section of Jenkins

Ex : [[credentialsId: '6cc06220-88d0-4b8a-b5ed-547ba10ccda5'.

Similarly you need to add above credential id in script

L) : How to change jenkins home Directory:

.Before changing the jenkins home directory we need to build at least one tag to save into the

/var/lib/jenkins/workspace/

.RUN below syntax to change jenkins home Directory

.sudo -i

.systemctl stop jenkins

.mkdir /mnt/disk1/jenkinshome/jenkins (this is custom path)

. sudo chown jenkins:jenkins /mnt/disk1/jenkinshome/jenkins

. sudo cp -prv /var/lib/jenkins / mnt/disk1/jenkinshome (dont give jenkins folder its enough to upto jenkinshome)

. sudo usermod -d /mnt/disk1/jenkinshome/jenkins / space jenkins

NOW WE NEED TO CHANGE/MODIFIED JENKINS HOME PATH ON BELOW FILES;

. sudo nano /etc/default/jenkins

Here we need to change the parameters as below

A. # jenkins home location

#JENKINS_HOME=/mnt/disk1/jenkinshome2/jenkins (THIS IS CUSTOM PATH)

B. # log location. this may be a syslog facility.priority

JENKINS_LOG=/mnt/log/\$NAME/\$NAME.log

TO SAVE FILE : USE CTRL+X, YES, ENTER

. Sudo nano /usr/share/jenkins/migrate

Here we need to change the parameters as below

NEW_JENKINS_HOME_DEFAULT="/mnt/disk1/jenkinshome2/jenkins" (this is custom path)

NEW_JENKINS_LOG_DEFAULT="/mnt/log/jenkins/jenkins.log"

. sudo nano /lib/systemd/system/jenkins.service

Here we need to change parameters as below to custom path

Directory where Jenkins stores its configuration and workspaces

Environment="JENKINS_HOME=/mnt/disk1/jenkinshome2/jenkins"

Working Directory=/mnt/disk1/jenkinshome2/jenkins

Now we have to start the Jenkins

.systemctl start Jenkins.

If you build yocto using jenkins give the chmod -R 777 permissions to Jenkins home path
(mnt/disk1/jenkinshome/jenkins/workspace/)

NOTE : DONT FORGET THAT ADD SCRIPT IN THE REPO'S

PLEASE LET ME KNOW IF THERE ARE ANY MISTAKES IN THIS DOCUMENT or IF YOU DONT
UNDERSTAND THE ABOVE STEPS

--KASEVADDI

