



**TRG – Enclave (a division of TRG International)**

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# JENKINS INSTALLATION AND CONFIGURATION REFERENCE DOCUMENT



## **TRG – Enclave (a division of TRG International)**

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## 1. Jenkins installation

### 1.1 Environment setting

#### 1.1.1 JDK Installation

For Jenkins environment setting, *openjdk-7-jre* and *openjdk-7-jdk* are suggested.

For Ubuntu 12.04 LTS, you can install *JDK* from Terminal.

1. Open Terminal (Alt + Shift + T)

2. Type command below:

```
sudo apt-get update
```

3. Check if Java environment has been installed or not:

```
java -version
```

4. If Java hasn't been installed on your system, you can use the command below to install *jre-7*:

```
sudo apt-get install openjdk-7-jre
```

5. If you need *jdk-7* for your project, follow the command below:

```
sudo apt-get install openjdk-7-jdk
```

6. To check if *Java environment* :

```
java -version
```

#### 1.1.2 Change default version of Java

Follow the command below to change Java version:

```
sudo update-alternatives --config java
```

Press the number too choose the default version.

#### 1.1.3 Maven Installation

To install Maven from Terminal:

```
sudo apt-get install maven
```

Check if installation is successful or not:

```
mvn --version
```

The Terminal should show you:

```
Apache Maven 3.0.4
```

```
Maven home: /usr/share/maven
```

*Java version: 1.7.0\_80, vendor: Oracle Corporation*

*Java home: /usr/lib/jvm/java-7-oracle/jre*

*Default locale: en\_US, platform encoding: UTF-8*

*OS name: "linux", version: "3.11.0-26-generic", arch: "amd64", family: "unix"*

## **2. Jenkins Installation (Debian-based distributions installation)**

### **2.1.1 Installation**

1. Open Terminal
2. Paste these commands to Terminal:
  - *wget -q -O - https://jenkins-ci.org/debian/jenkins-ci.org.key | sudo apt-key add -*
  - *sudo sh -c 'echo deb http://pkg.jenkins-ci.org/debian binary/ >/etc/apt/sources.list.d/jenkins.list'*
  - *sudo apt-get update*
  - *sudo apt-get install jenkins*
3. Press *Enter*

### **2.1.2 Upgrade**

Once installed like this, you can update to the later version of Jenkins (when it comes out) by running the following commands:

1. Open Terminal
2. Paste these commands to Terminal:
  - sudo apt-get update*
  - sudo apt-get install jenkins*
3. Press *Enter*

### **2.1.3 Remove service**

To remove *Jenkins*, you just need to type below command into *Terminal*:

*sudo apt-get remove jenkins*

### **2.1.4 Configuration**

- By default, Jenkins listen on port 8080.

- If your `/etc/init.d/jenkins` file fails to start jenkins, edit the `/etc/default/jenkins` to replace the line

`HTTP_PORT=8080`

by: `HTTP_PORT=<your port>`

For more further information for configuring Jenkins on Ubuntu, please visit site:

<https://wiki.jenkins-ci.org/display/JENKINS/Installing+Jenkins+on+Ubuntu>

### 2.1.5 Remote service

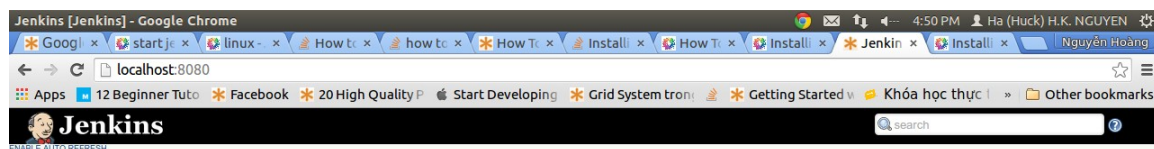
1. To start Jenkins, you can use this command:

`service jenkins start`

or

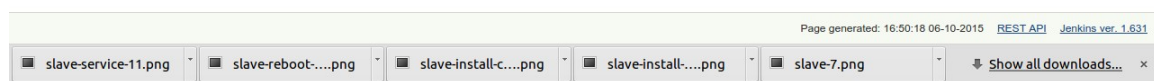
`service jenkins restart`

While processing, the Jenkins page should be like:



**Please wait while Jenkins is getting ready to work.**

Your browser will reload automatically when Jenkins is ready.



2. To stop Jenkins, you can use the command below:

```
root@ED071Huck:/var/lib/jenkins/jobs# service jenkins stop
* Stopping Jenkins Continuous Integration Server jenkins [ OK ]
service jenkins stop
```

3. To start/restart Jenkins, you can use these commands:

```
root@ED071Huck: /var/lib/jenkins/jobs
root@ED071Huck:/var/lib/jenkins/jobs# service jenkins restart
* Restarting Jenkins Continuous Integration Server jenkins [ OK ]
```

*service jenkins start*

or

*service jenkins restart*

4. You can check jenkins service status by using the command below:

*service jenkins status*

```
root@ED071Huck: /var/lib/jenkins/jobs
root@ED071Huck:/var/lib/jenkins/jobs# service jenkins status
Jenkins Continuous Integration Server is running with the pid 11591
```

And it could show you *port id* of Jenkins service.

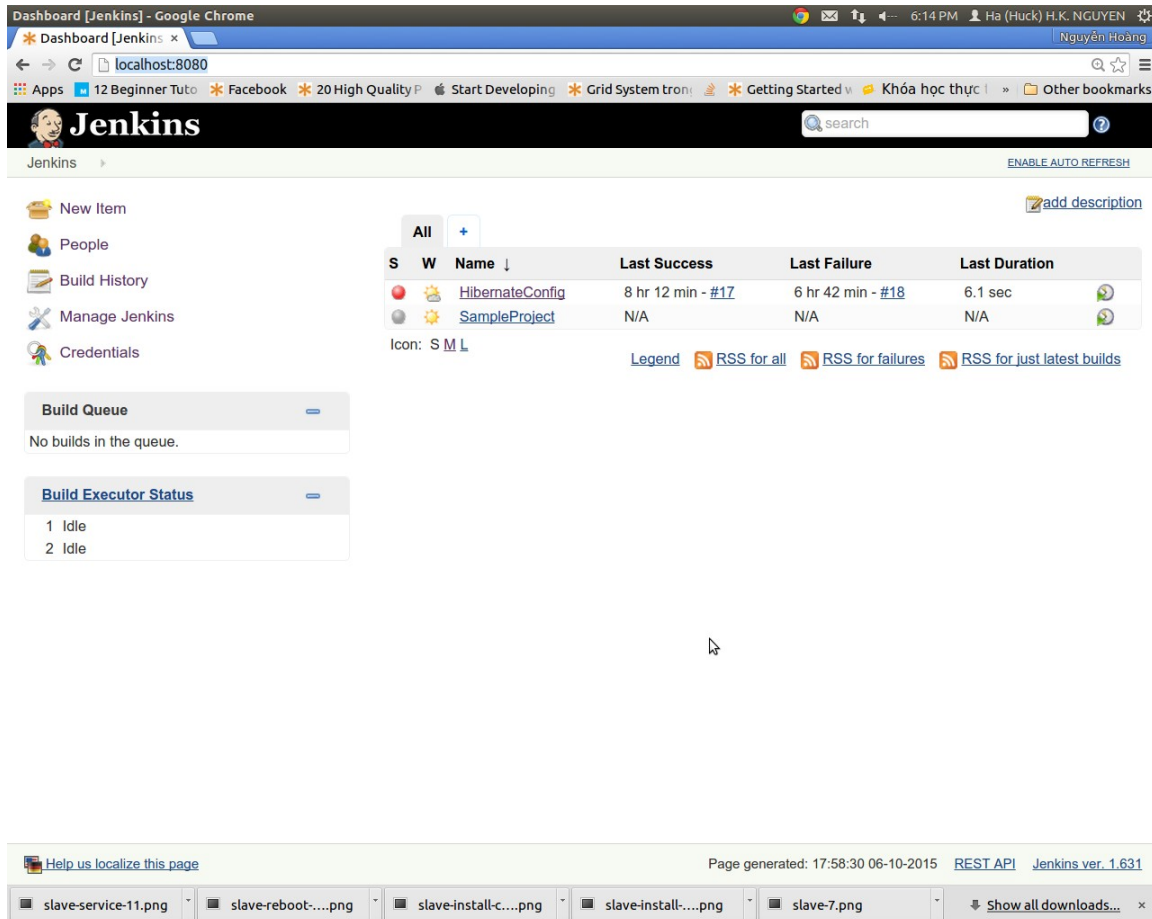
## 3. Jenkins configuration

### 3.1 Overview

After start service, you can access to *jenkins local web-page* by local address:

<http://localhost:8080/>

It should be like the picture below:




S	W	Name	Last Success	Last Failure	Last Duration
●	●	<a href="#">HibernateConfig</a>	8 hr 12 min - #17	6 hr 42 min - #18	6.1 sec
●	●	<a href="#">SampleProject</a>	N/A	N/A	N/A


This page has two main-component:


1. The sidebar on the left





**Jenkins**

 **New Item**

 **People**

 **Build History**

 **Manage Jenkins**

 **Credentials**

**Build Queue**  
No builds in the queue.

**Build Executor Status**  
1 Idle  
2 Idle

This sidebar shows options could be used to configure Jenkins's functionalities. As default, it has 3 part:

- *General Configurations*
- *Build Queue*
- *Build Executor Status*

## **2. The main-content**

[add description](#)

All					
S	W	Name ↓	Last Success	Last Failure	Last Duration
		<a href="#">HibernateConfig</a>	8 hr 44 min - <a href="#">#17</a>	7 hr 14 min - <a href="#">#18</a>	6.1 sec
		<a href="#">SampleProject</a>	N/A	N/A	N/A

Icon: S M L

[Legend](#)
[RSS for all](#)
[RSS for failures](#)
[RSS for just latest builds](#)

The *Main-content* shows the overview about projects using *Jenkins* every first time you visit this site, including Status (*S*), Weather report (*W*: showing aggregated status of recent build), Name, Last Success, Last Failure, Last Duration.

As default, this content is blank.


## 3.2 Jenkins general configuration


Go to *Jenkins – local page*, click on the *Manage Jenkins* on the left sidebar


- New Item
- People
- Build History
- Manage Jenkins
- Credentials


It should change your main-content in the right to the interface of *Manage Jenkins* functionality.


## Manage Jenkins


 It appears that your reverse proxy set up is broken. [More Info](#) [Dismiss](#)


 New version of Jenkins (1.632) is available for [download](#) ([changelog](#)).


 Unsecured Jenkins allows anyone on the network to launch processes on your behalf. Consider at least enabling authentication to discourage misuse. [Setup Security](#) [Dismiss](#)


[Configure System](#)  
Configure global settings and paths.


[Configure Global Security](#)  
Secure Jenkins; define who is allowed to access/use the system.


[Reload Configuration from Disk](#)  
Discard all the loaded data in memory and reload everything from file system. Useful when you modified config files directly on disk.


[Manage Plugins](#)  
Add, remove, disable or enable plugins that can extend the functionality of Jenkins. **(updates available)**


[System Information](#)  
Displays various environmental information to assist trouble-shooting.


[System Log](#)  
System log captures output from `java.util.logging` output related to Jenkins.


[Load Statistics](#)  
Check your resource utilization and see if you need more computers for your builds.


[Jenkins CLI](#)  
Access/manage Jenkins from your shell, or from your script.

[Script Console](#)  
Executes arbitrary script for administration/trouble-shooting/diagnostics.

[Manage Nodes](#)  
Add, remove, control and monitor the various nodes that Jenkins runs jobs on.

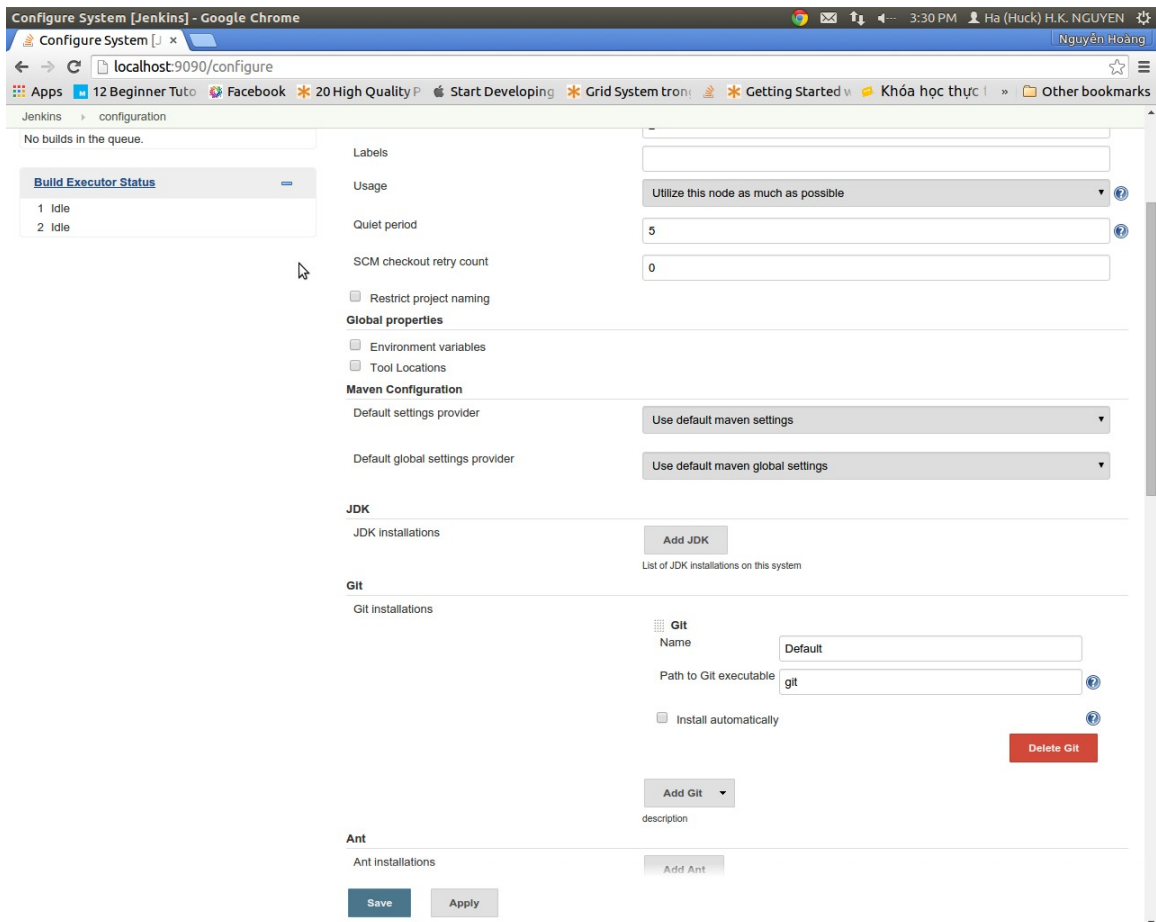
[Manage Credentials](#)  
Create/delete/modify the credentials that can be used by Jenkins and by jobs running in Jenkins to connect to 3rd party services.

[About Jenkins](#)  
See the version and license information.

[Manage Old Data](#)  
Scrub configuration files to remove remnants from old plugins and earlier versions.

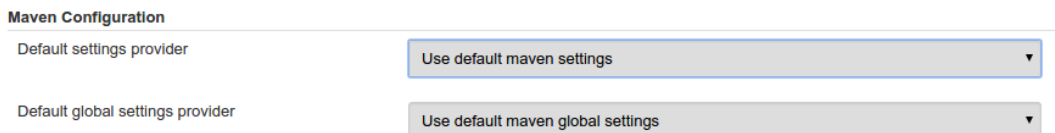
Click *Configure System* to go to Configuration functionalities.

The site will change to show you *system configuration* functionality.



By default, *Jenkins* let you some fill are not blank, but you can customize them as long as you want.

- **Maven configuration:**

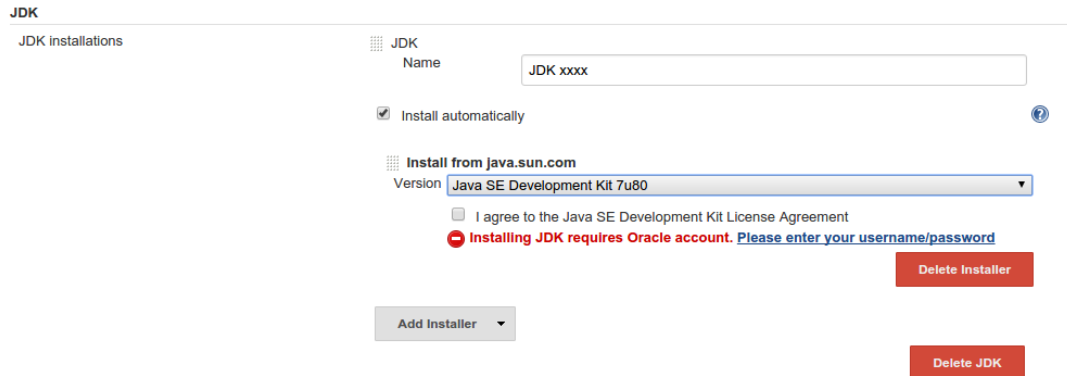


You can define where is *setting.xml* file located, by relative path of every project or relative to system. By default, it's depend on project setting.

- **JDK configuration:**

By default, *Jenkins* uses current Java version.

By clicking on *add JDK*, it should show you the form.



The screenshot shows the 'JDK' section of a configuration tool. It includes a 'JDK Installations' sidebar, a 'JDK Name' field with 'JDK xxxx', an 'Install automatically' checkbox, and a section for installing from 'java.sun.com'. The version is set to 'Java SE Development Kit 7u80'. There is a checkbox for 'I agree to the Java SE Development Kit License Agreement' and a red error message: 'Installing JDK requires Oracle account. Please enter your username/password'. Buttons for 'Delete Installer', 'Add Installer', and 'Delete JDK' are visible.

You can install JDK from your local machine by *Add Installer*, or choose the version of Java from Oracle and install. Which the second option, click on the blue line (*Please enter your username/password*) below the option of version and check I agree to the Java SE Development Kit License Agreement.

## Enter Your Oracle Account

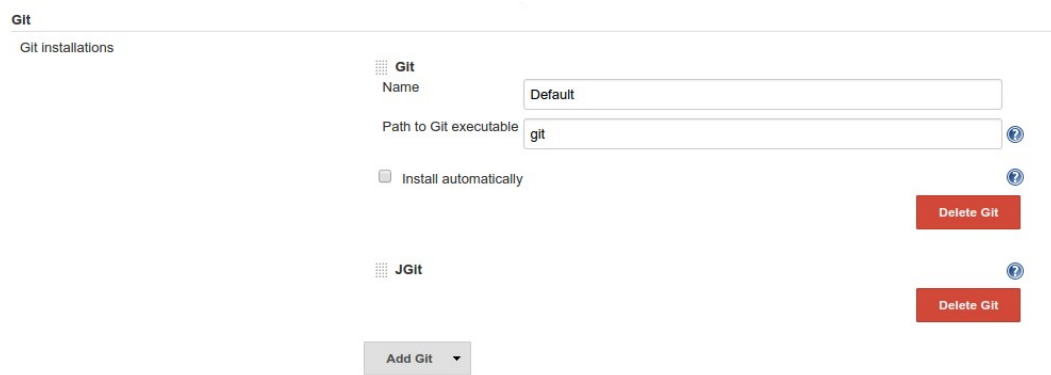
To access older versions of JDK, you need to have [Oracle Account](#).



The screenshot shows a login form with fields for 'Username' and 'Password', and an 'OK' button.

- Git installation (After you installing Git plug-in package)**

Figure where git-executable file is. You can figure it out by completed path or just fill “git” as default.



The screenshot shows the 'Git' section of a configuration tool. It includes a 'Git Installations' sidebar, a 'Git Name' field with 'Default', a 'Path to Git executable' field with 'git', and an 'Install automatically' checkbox. There are buttons for 'Delete Git' and 'Add Git'.

If you have demand to use *JGit*, just click on select tag “Add Git” and choose *Jgit*.

- Jenkins Location Configuration**

To other people can access from another machine, you'd like to deploy it on your host.

**Jenkins Location**

Jenkins URL

System Admin e-mail address

You can use your host by pattern: *http://<your host>:<port>/*

Fill in the *System Admin e-mail address* to figure out the email of project owner.

- **Git - plug-in configuration**

In order to use *Git plug-in* you need to define your account by completing these fields below

**Git plugin**

Global Config user.name Value

Global Config user.email Value

Create new accounts base on author/committer's email ☐

You can add your *Git user name* and *email* stand for your *Git* account

- **Email Notification**

Go to *Email notification*.

**E-mail Notification**

SMTP server

Default user e-mail suffix



Advanced...

☐ Test configuration by sending test e-mail

Define mail server, for specific definition, click on *Advanced* tag.

Click-on *Use SMTP Authentication* to validate your account and password to send mail. (*Account* and *Password* field are below check box).

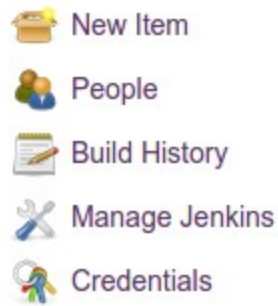
Click-on *Use SSL* to use *SSL* protocol on mail.

Define port of mail server (for example: *Gmail* uses port 465 for *SSL mail-service*).

Checking on *Test configuration by sending test email* to test function.


### 3.3 Plugin management


Go to *Jenkins – local* page, click on the *Manage Jenkins* on the *left sidebar*





Click on *Manage Jenkins* functionality.


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[About Jenkins](#)  
See the version and license information.

[Manage Old Data](#)  
Scrub configuration files to remove remnants from old plugins and earlier versions.

Click on *Manage Plugin* to go to *Plugin - management site*



Filter:

**Updates**
Available
Installed
Advanced

Install	Name ↓	Version	Installed
<input type="checkbox"/>	<a href="#">CVS Plug-in</a> This bundled plugin integrates Jenkins with CVS version control system.	2.12	2.11
<input type="checkbox"/>	<a href="#">Javadoc Plugin</a> This plugin adds Javadoc support to Jenkins.	1.3	1.1
<input type="checkbox"/>	<a href="#">JUnit Plugin</a> Allows JUnit-format test results to be published.	1.9	1.2-beta-4
<input type="checkbox"/>	<a href="#">Matrix Authorization Strategy Plugin</a> Offers matrix-based security authorization strategies (global and per-project).	1.2	1.1
<input type="checkbox"/>	<a href="#">Matrix Project Plugin</a> Multi-configuration (matrix) project type.	1.6	1.4.1
<input type="checkbox"/>	<a href="#">Maven Integration plugin</a> Jenkins plugin for building Maven 2/3 jobs via a special project type.	2.12.1	2.7.1
<input type="checkbox"/>	<a href="#">OWASP Markup Formatter Plugin</a> Uses policy definitions to allow limited HTML markup in user-submitted text.	1.3	1.1
<input type="checkbox"/>	<a href="#">PAM Authentication plugin</a> Adds Unix Pluggable Authentication Module (PAM) support to Jenkins.	1.2	1.1
<input type="checkbox"/>	<a href="#">Script Security Plugin</a> Allows Jenkins administrators to control what in-process scripts can be run by less-privileged users.	1.15	1.13
<input type="checkbox"/>	<a href="#">SSH Slaves plugin</a> This plugin allows you to manage slaves running on *nix machines over SSH.	1.10	1.9
<input type="checkbox"/>	<a href="#">Subversion Plug-in</a> This plugin adds the Subversion support (via SVNKit) to Jenkins.	2.5.3	1.54
<input type="checkbox"/>	<a href="#">Translation Assistance plugin</a> This plugin adds an additional dialog box in every page, which enables people to contribute localizations for the messages they are seeing in the current page.	1.12	1.10
<input type="checkbox"/>	<a href="#">Windows Slaves Plugin</a>	1.1	1.0

Download now and install after restart

Update information obtained: 2 hr 23 min ago

Check now

At the main content, you have the list of *Jenkins Plugin* which you *installed*, *available* on market place, can be *updated*, or something you want to add specifically at *Advanced* tag.

### 3.3.1 Install Git plug-in

Go to *Plugin – management-site* to check if *Git Plug-in* was installed or not.

Go to *Available* tag to find out the plug in

Put name of plug in to *Filter*

Filter:

Updates
**Available**
Installed
Advanced

Install ↓	Name	Version
<input checked="" type="checkbox"/>	<a href="#">Git Parameter Plug-In</a> This plugin allows you to choose between Git tags or sha1 of your SCM repository so Git Plugin installed is required.	0.4.0
<input type="checkbox"/>	<a href="#">/userContent in Git plugin</a> This plugin exposes \$JENKINS_HOME/userContent as Git repository.	1.4
<input type="checkbox"/>	<a href="#">Tracking Git Plugin</a> Lets one project track the Git revisions that are built for another project.	1.0
<input type="checkbox"/>	<a href="#">Team Concert Git Plugin</a> Integrates Jenkins with <a href="#">Rational Team Concert</a> for Jenkins Builds which use Git as source control. This plugin will create traceability links from a Jenkins build to Rational Team Concert <a href="#">Work Items</a> and <a href="#">build</a> results. This plugin adds traceability links from a Jenkins build to an RTC build result. It also publishes links to work items and annotates the change log generated by Jenkins with links to RTC Work Items; It leverages the current RTC features and workflows that users are already familiar with such as, emails, toaster popups, reporting, dashboards, etc.	1.0.10
<input type="checkbox"/>	<a href="#">Alternative build chooser</a> An alternative build chooser plugin for the Jenkins git plugin.	1.1
<input type="checkbox"/>	<a href="#">GIT plugin</a> This plugin allows use of <a href="#">Git</a> as a build SCM. A recent Git runtime is required (1.7.9 minimum, 1.8.x recommended). Plugin is only tested on official <a href="#">git client</a> . Use exotic installations at your own risks.	2.4.0

Install without restart
Download now and install after restart
Update information obtained: 4.7 sec ago
Check now

Checking the plug-in and hitting at “*Install without restart*”.

## Installing Plugins/Upgrades

### Preparation

- Checking internet connectivity
- Checking update center connectivity
- Success

Credentials Plugin	● credentials plugin is already installed. Jenkins needs to be restarted for the update to take effect
SSH Credentials Plugin	● Failure - <a href="#">Details</a>
GIT client plugin	● Success
SCM API Plugin	● Success
Mailer Plugin	● mailer plugin is already installed. Jenkins needs to be restarted for the update to take effect
GIT plugin	● Success
Git Parameter Plug-In	● Success
SSH Credentials Plugin	● Downloaded Successfully. Will be activated during the next boot

Balls show the status processes, the *blue* is success, the *red* one is failure and the *yellow* is waiting for restart service or reboot system. The *gray* one shows that element is in processing.

**Note:** if any failure element, you just need to copy name of that one and find again in list of plug-ins, don't need to install the whole plug-in.

You can check if the plug – in is installed successfully or not by taking a look at *Installed* tag in *list of Plugin*.


<div> <div>Updates</div> <div>Available</div> <div>Installed</div> <div>Advanced</div> </div>					
Enabled	Name ↓	Version	Previously installed version	Pinned	Uninstall
<input checked="" type="checkbox"/>	<a href="#">Ant Plugin</a> This plugin adds <a href="#">Apache Ant</a> support to Jenkins.	<a href="#">1.2</a>			
<input checked="" type="checkbox"/>	<a href="#">Credentials Plugin</a> This plugin allows you to store credentials in Jenkins.	<a href="#">1.23</a>	<a href="#">Downgrade to 1.18</a>	<a href="#">Unpin</a>	
<input checked="" type="checkbox"/>	<a href="#">CVS Plug-in</a> Integrates Jenkins with CVS version control system using a modified version of the Netbeans cvsclient.	<a href="#">2.11</a>			
<input checked="" type="checkbox"/>	<a href="#">External Monitor Job Type Plugin</a> Adds the ability to monitor the result of externally executed jobs.	<a href="#">1.4</a>			
<input checked="" type="checkbox"/>	<a href="#">GIT client plugin</a> Shared library plugin for other Git related Jenkins plugins.	<a href="#">1.19.0</a>			<a href="#">Uninstall</a>
<input checked="" type="checkbox"/>	<a href="#">Git Parameter Plug-In</a> Adds ability to choose from git repository revisions or tags	<a href="#">0.4.0</a>			<a href="#">Uninstall</a>
<input checked="" type="checkbox"/>	<a href="#">GIT plugin</a> This plugin integrates <a href="#">GIT</a> with Jenkins.	<a href="#">2.4.0</a>			<a href="#">Uninstall</a>
<input checked="" type="checkbox"/>	<a href="#">Javadoc Plugin</a> This plugin adds Javadoc support to Jenkins.	<a href="#">1.1</a>			
<input checked="" type="checkbox"/>	<a href="#">JUnit Plugin</a>	<a href="#">1.2-beta-</a>			

To remove plug in, Click on *Uninstall* button and wait for the end of process.

**Note:** To update plug-in, you just need to do the same thing when installing, but with *Updates* tag

## 3.4 Security in Jenkins


Take a look at *Configure Global Security* at *Manage Jenkins functionality*, then, you can see the content is like:



### Configure Global Security

☐ Enable security

Markup Formatter
 

Plain text
 

Treats all input as plain text. HTML unsafe characters like < and & are escaped to their respective character entities.

☐ Prevent Cross Site Request Forgery exploits

☐ Use browser for metadata download

Save

Apply

Checking at *Enable security*:

☒ Enable security

TCP port for JNLP slave agents ☐ Fixed :  ☒ Random ☐ Disable

Disable remember me ☐

Access Control

**Security Realm**

☐ Delegate to servlet container

☒ Jenkins' own user database

☒ Allow users to sign up

☐ LDAP

☐ Unix user/group database

Choose *Jenkins' own user database* (automatically checking at *Allow users to sign up*).

**Authorization**

☐ Anyone can do anything

☐ Legacy mode

☐ Logged-in users can do anything

☐ Matrix-based security

☒ Project-based Matrix Authorization Strategy

User/group	Overall										Credentials						
	Administer	Configure	Update	Center	Read	Run	Scripts	Upload	Plugins	Create	Delete	Manage	Domains	Update	View	Build	Conf
Anonymous	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Checking at *Project-based Matrix Authorization Strategy*, then, enable all permissions for this *Anonymous*. *Save*.

Back to *Manage Jenkins*, you should take a new functionality “*Manage User*”.



### Manage Users

Create/delete/modify users that can log in to this Jenkins

Click on this one to go to *Manage-User functionality*.

## Users

These users can log into Jenkins. This is a sub set of [this list](#), which also contains auto-created users who really just made some commits on some projects and have no direct Jenkins access.

User Id ↓	Name
-----------	------



Click on “Create User” at the left sidebar, it will show you the form to create new user.

## Sign up

Username:	<input type="text" value="master"/>
Password:	<input type="password" value="....."/>
Confirm password:	<input type="password" value="....."/>
Full name:	<input type="text" value="Ha Nguyen"/>
E-mail address:	<input type="text" value="huck@enclave.vn"/>
<input type="button" value="Sign up"/>	

Fill in all fields and click *Sign up*. Back to *Configure Global Security* .

Below the table of user/group, Enter user-name of the account you've just created.

User/group	Overall				
	Administer	Configure	UpdateCenter	ReadRunScripts	UploadPlugins
 admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anonymous	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 master	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

User/group to add:

Provide permissions for that account.

**Note:** In order to start User management, we gave anonymous account all permissions. Remember to remove permissions of anonymous account



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User/group	Overall						Credentials				Slave					
	Administer	Configure	Update	Center	Read	Run	Scripts	Upload	Plugins	Create	Delete	Manage	Domains	Update	View	Build
admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
master	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anonymous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Click *Save*.

**Note:** In case you forget to set permissions for anonymous, go to:

`/var/lib/jenkins/config.xml`

then set:

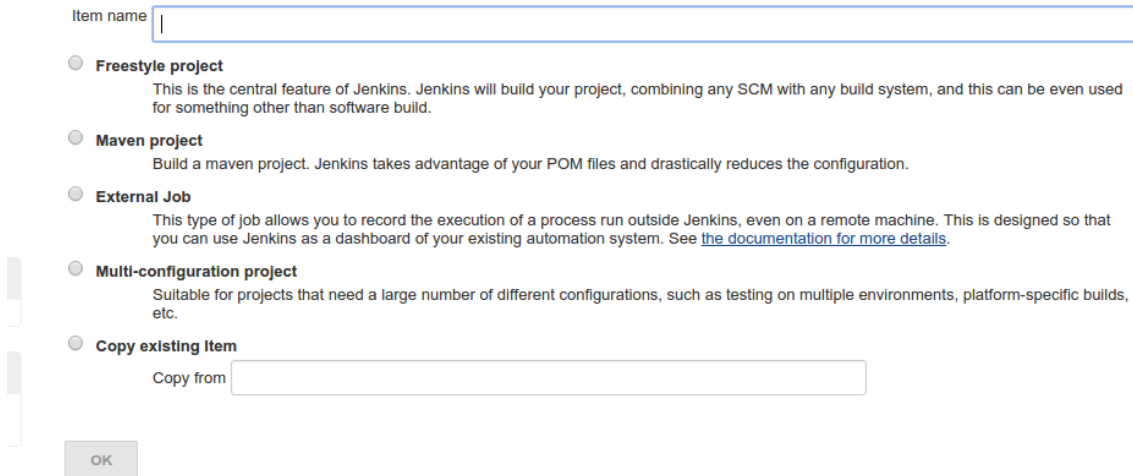
`<useSecurity>true</useSecurity>`

to

`<useSecurity>false</useSecurity>`

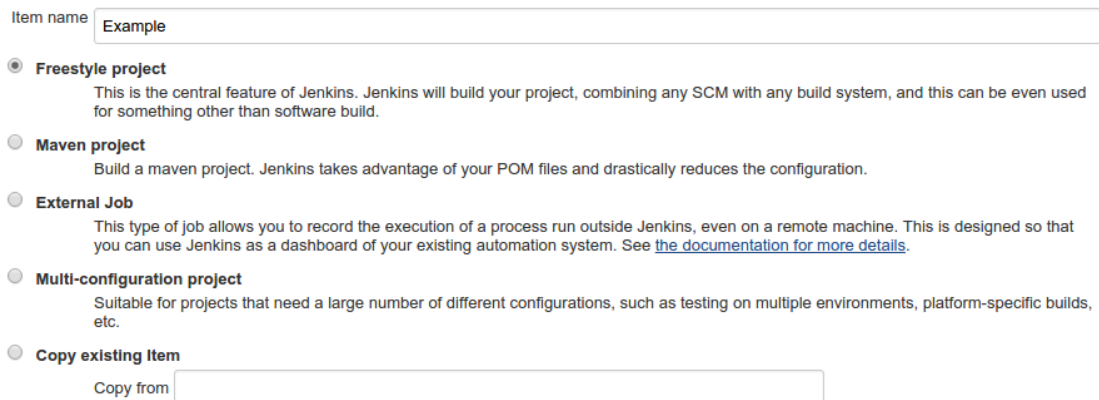
## 3.5 Project management

Click at New Item int left sidebar from *Jenkins' Dashboard* (Homepage).



Fill in the name of project, then, choose one of options below the name field (As default, you have 4 options).

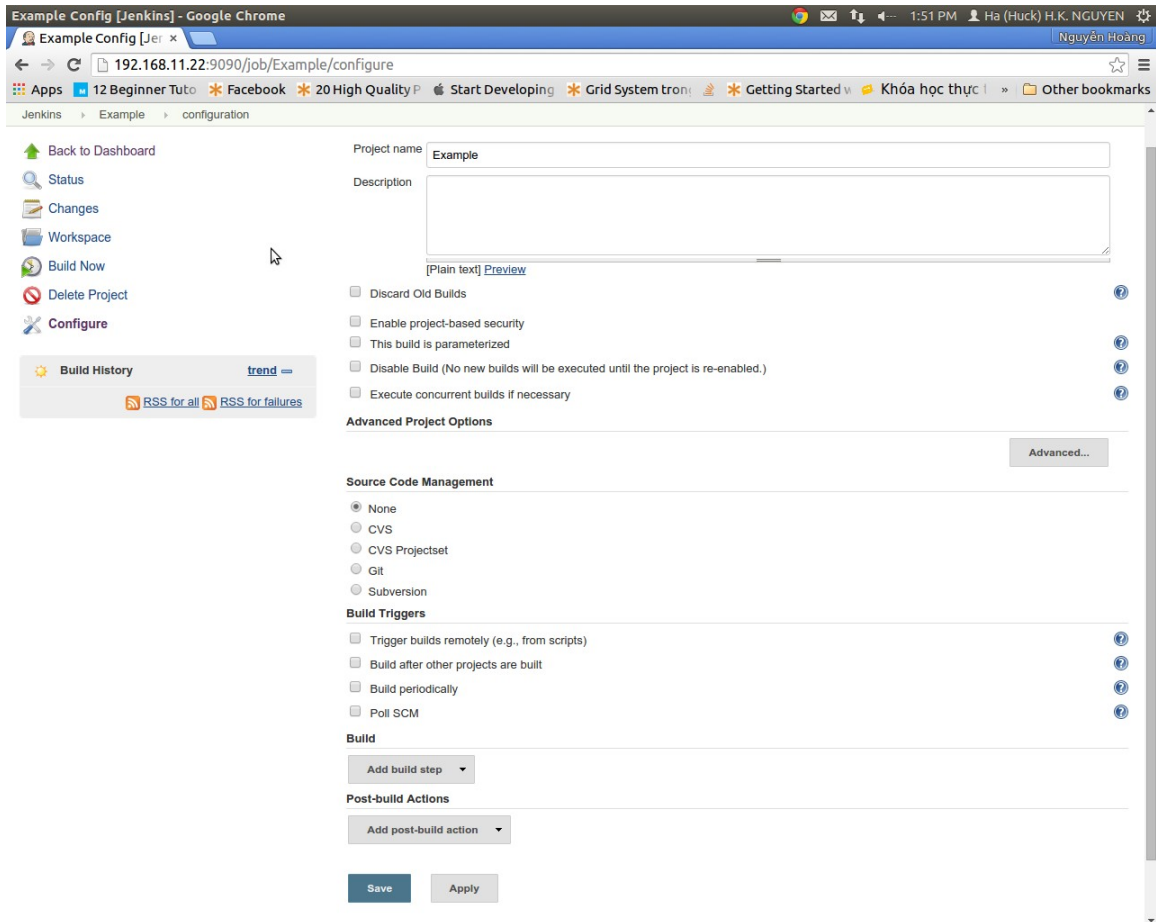
Choose *Freestyle project*



Click *OK*.

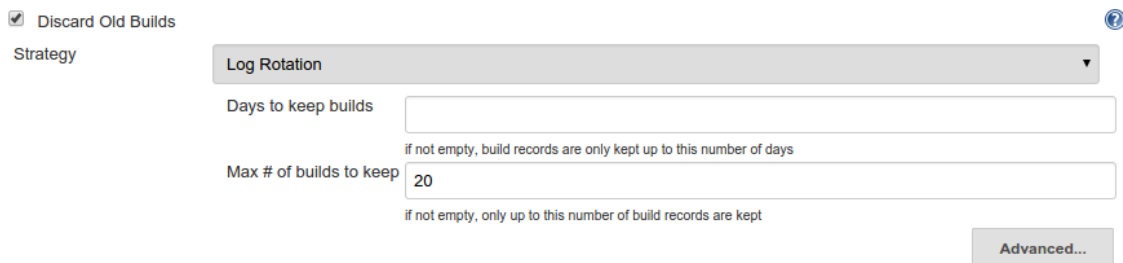


### 3.5.1 Freestyle project



The screenshot shows the Jenkins 'Example Config' page for a Freestyle project. The page is titled 'Example Config [Jenkins] - Google Chrome' and shows the URL '192.168.11.22:9090/job/Example/configure'. The left sidebar contains links to 'Back to Dashboard', 'Status', 'Changes', 'Workspace', 'Build Now', 'Delete Project', and 'Configure'. The main content area includes a 'Project name' field with the value 'Example', a 'Description' text area, and a 'Discard Old Builds' checkbox. Below this are 'Advanced Project Options' and 'Source Code Management' (with 'None' selected). The 'Build Triggers' section has checkboxes for 'Trigger builds remotely (e.g., from scripts)', 'Build after other projects are built', 'Build periodically', and 'Poll SCM'. The 'Build' section has an 'Add build step' button. The 'Post-build Actions' section has an 'Add post-build action' button. At the bottom are 'Save' and 'Apply' buttons.

Check at *Discard Old Builds*, then fill in *Max # of builds to keep* by the max number of build-process you want to keep.



The screenshot shows the 'Discard Old Builds' configuration section in Jenkins. It includes a 'Strategy' dropdown menu set to 'Log Rotation'. Below this is a 'Days to keep builds' text input field. A note states 'if not empty, build records are only kept up to this number of days'. Below that is a 'Max # of builds to keep' text input field with the value '20'. Another note states 'if not empty, only up to this number of build records are kept'. At the bottom right is an 'Advanced...' button.

After adding *Git plug-in* (shown above), you can use git-repository to save your source. Checking at *Git*.





## TRG – Enclave (a division of TRG International)

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### Source Code Management

- ☐ None  
☐ CVS  
☐ CVS Projectset  
☒ Git
- Repositories

Repository URL

Please enter Git repository.

Credentials

- none -

Add

Advanced...

Add Repository

Delete Repository

Branches to build

Branch Specifier (blank for 'any')

Add Branch

Delete Branch

Git executable


jgit

Repository browser

(Auto)

Please fill in *Repository URL* by your Git repository address. If you're familiar with *Jgit*, please choose *jgit* at *Git executable* ( make sure that you did choose *Jgit* at *Jenkins' Configure System*).

Click on *Add* button at *Credentials* field.


**Add Credentials**

Kind

Username with password

Scope

Global (Jenkins, nodes, items, all child items, etc)

Username

Password

Description

Advanced...

Add Cancel

Fill the form with your *Git Username/Password*, click *Add*.

**Note:** you can use *ssh* protocol by changing *Kind*.

Choose your *Credentials* bypass.

☒ Git

Repositories

Repository URL

https://github.com/example12031993/Example.git

Credentials

example12031993/\*\*\*\*\* (For Test)

Add

Advanced...

Add Repository Delete Repository

Branches to build

Branch Specifier (blank for 'any')

\*/master

Add Branch Delete Branch

**Note:** in case you'd have many branches in your *Git*, please specify your need-to-build branch. If you let that field free, *Jenkins* would build whole branches from your *git*.

Check at *Poll SCM* to build by your schedule. You can find out the syntax to define schedule by clicking onto the question mark (?) on the right of the field.

☐ Build periodically
 ☒ Poll SCM

Schedule

**No schedules so will never run**

This field follows the syntax of cron (with minor differences). Specifically, each line consists of 5 fields separated by TAB or whitespace:

MINUTE	HOUR	DOM	MONTH	DOW
MINUTE	Minutes within the hour (0–59)			
HOUR	The hour of the day (0–23)			
DOM	The day of the month (1–31)			
MONTH	The month (1–12)			
DOW	The day of the week (0–7) where 0 and 7 are Sunday.			

To specify multiple values for one field, the following operators are available. In the order of precedence,

- \* specifies all valid values
- M–N specifies a range of values
- M–N/X or \*/X steps by intervals of X through the specified range or whole valid range
- A,B,...,Z enumerates multiple values

To allow periodically scheduled tasks to produce even load on the system, the symbol H (for "hash") should be used wherever possible. For example, using 0 0 \* \* \* for a dozen daily jobs will cause a large spike at midnight. In contrast, using H H \* \* \* would still execute each job once a day, but not all at the same time, better using limited resources.

The H symbol can be used with a range. For example, H H(0–7) \* \* \* means some time between 12:00 AM (midnight) to 7:59 AM. You can also use step intervals with H, with or without ranges.

The H symbol can be thought of as a random value over a range, but it actually is a hash of the job name, not a random function, so that the value remains stable for any given project.

Beware that for the day of month field, short cycles such as \*/3 or H/3 will not work consistently near the end of most months, due to variable month lengths. For example, \*/3 will run on the 1st, 4th, ...31st days of a long month, then again the next day of the next month. Hashes are always chosen in the 1–28 range, so H/3 will produce a gap between runs of between 3 and 6 days at the end of a month. (Longer cycles will also have inconsistent lengths but the effect may be relatively less noticeable.)

Empty lines and lines that start with # will be ignored as comments.

In addition, @yearly, @annually, @monthly, @weekly, @daily, @midnight, and @hourly are supported as convenient aliases. These

Click on *Add Build Step* to define the steps to build.

For Maven project only, choose *Invoke top-level Maven install*, then click on *Advanced* button to show all functions.



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Invoke top-level Maven targets ?

Goals

POM

Properties

JVM Options

Use private Maven repository ☐

Settings file

Global Settings file

Delete

Add build step ▼

You need to define some fields.

- **Goals:** The maven command you need to run when Jenkins build your project.
- **POM:** you can define relative link to POM.xml file in Jenkins project (for example, in my case is:  
*/var/lib/jenkins/jobs/Example/workspace/Jenkins/pom.xml*).

Look at *Post-build Action*, click at *Add post-build action* and choose *Email notification*

Post-build Actions

E-mail Notification ?

Recipients

Whitespace-separated list of recipient addresses. May reference build parameters like \$PARAM. E-mail will be sent when a build fails, becomes unstable or returns to stable.

☒ Send e-mail for every unstable build

☒ Send separate e-mails to individuals who broke the build

Delete

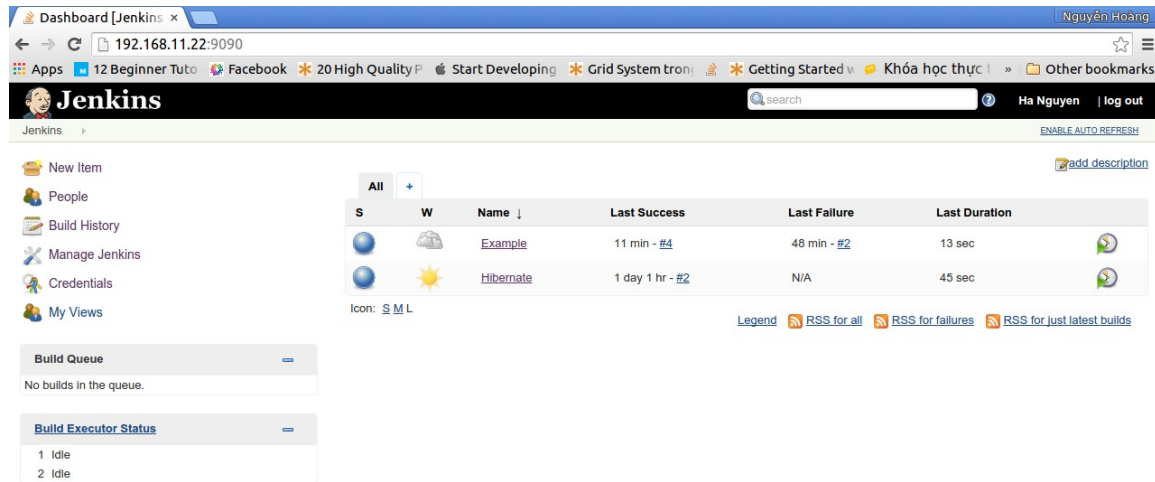
Add post-build action ▼

- Fill in the *Recipients* by the emails of people who you want to send to.
- Check in Send email for every unstable build: to send mail every unstable version of project was build.

- Check in Send separate e-mails to individuals who broke the build: to send email to send mail to the guy who broke the system.

## 3.5.2 Build Project

There are many place to build your project. One of them, click on your own from Project table in Jenkins homepage.



The screenshot shows the Jenkins Dashboard. On the left sidebar, there are links for 'New Item', 'People', 'Build History', 'Manage Jenkins', 'Credentials', and 'My Views'. The main area displays a table of projects. The table has columns for 'S' (Status), 'W' (Workspace), 'Name', 'Last Success', 'Last Failure', and 'Last Duration'. There are two projects listed: 'Example' and 'Hibernate'. Below the table, there are links for 'Icon: S M L' and 'Legend'. On the left, there are sections for 'Build Queue' (No builds in the queue) and 'Build Executor Status' (1 Idle, 2 Idle).

S	W	Name	Last Success	Last Failure	Last Duration
		Example	11 min - #4	48 min - #2	13 sec
		Hibernate	1 day 1 hr - #2	N/A	45 sec

Go to Project page.



The screenshot shows the Jenkins Project Example page. On the left sidebar, there are links for 'Back to Dashboard', 'Status', 'Changes', 'Workspace', 'Build Now', 'Delete Project', 'Configure', and 'Git Polling Log'. The main area displays the 'Project Example' details. There are links for 'Workspace' and 'Recent Changes'. Below, there is a 'Permalinks' section with a list of links for various build states. On the left, there is a 'Build History' section showing a list of builds with their status and timestamps.

**Permalinks**

- Last build (#3), 28 min ago
- Last stable build (#3), 28 min ago
- Last successful build (#3), 28 min ago
- Last failed build (#2), 33 min ago
- Last unsuccessful build (#2), 33 min ago

**Build History**

#	Time	Date
#3	15:17	08-10-2015
#2	15:12	08-10-2015
#1	15:11	08-10-2015

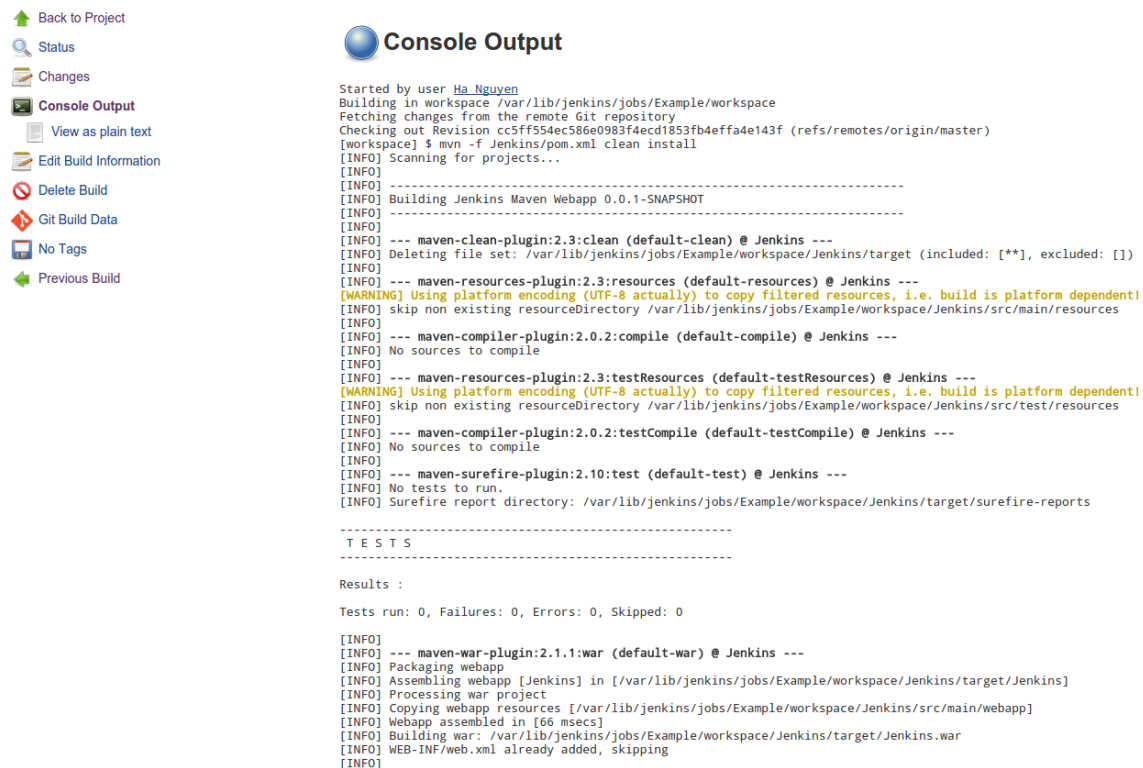
Click on *Build Now*, then look at the Build History on the left sidebar to track process.



The screenshot shows a detailed view of the Jenkins Build History. It displays a list of builds with their status, number, and timestamp. The build #4 is highlighted with a progress bar. Below the list, there are links for 'RSS for all' and 'RSS for failures'.

#	Time	Date
#4	15:49	08-10-2015
#3	15:17	08-10-2015
#2	15:12	08-10-2015
#1	15:11	08-10-2015

You can click at the colorful ball at *Build History* to follow build-processing.



The screenshot shows the Jenkins web interface. On the left sidebar, the 'Console Output' link is highlighted with a blue ball icon. The main area displays the console output for a build. The output starts with 'Started by user Ha\_Nguyen' and shows the build process for 'Jenkins Maven Webapp 0.0.1-SNAPSHOT'. It includes steps for cleaning, resource copying, compilation, and testing. The test results show 'Results : Tests run: 0, Failures: 0, Errors: 0, Skipped: 0'.

```
Started by user Ha_Nguyen
Building in workspace /var/lib/jenkins/jobs/Example/workspace
Fetching changes from the remote Git repository
Checking out Revision ccs5ff554ec586e0983f4ecd1853fb4effa4e143f (refs/remotes/origin/master)
[workspace] $ mvn -f Jenkins/pom.xml clean install
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building Jenkins Maven Webapp 0.0.1-SNAPSHOT
[INFO] -----
[INFO]
[INFO] --- maven-clean-plugin:2.3:clean (default-clean) @ Jenkins ---
[INFO] Deleting file set: /var/lib/jenkins/jobs/Example/workspace/Jenkins/target (included: [**], excluded: [])
[INFO]
[INFO] --- maven-resources-plugin:2.3:resources (default-resources) @ Jenkins ---
[WARNING] Using platform encoding (UTF-8 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory /var/lib/jenkins/jobs/Example/workspace/Jenkins/src/main/resources
[INFO]
[INFO] --- maven-compiler-plugin:2.0.2:compile (default-compile) @ Jenkins ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-resources-plugin:2.3:testResources (default-testResources) @ Jenkins ---
[WARNING] Using platform encoding (UTF-8 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory /var/lib/jenkins/jobs/Example/workspace/Jenkins/src/test/resources
[INFO]
[INFO] --- maven-compiler-plugin:2.0.2:testCompile (default-testCompile) @ Jenkins ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-surefire-plugin:2.10:test (default-test) @ Jenkins ---
[INFO] No tests to run.
[INFO] Surefire report directory: /var/lib/jenkins/jobs/Example/workspace/Jenkins/target/surefire-reports

-----
T E S T S
-----

Results :

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

[INFO]
[INFO] --- maven-war-plugin:2.1.1:war (default-war) @ Jenkins ---
[INFO] Packaging webapp
[INFO] Assembling webapp [Jenkins] in [/var/lib/jenkins/jobs/Example/workspace/Jenkins/target/Jenkins]
[INFO] Processing war project
[INFO] Copying webapp resources [/var/lib/jenkins/jobs/Example/workspace/Jenkins/src/main/webapp]
[INFO] Webapp assembled in [66 msecs]
[INFO] Building war: /var/lib/jenkins/jobs/Example/workspace/Jenkins/target/Jenkins.war
[INFO] WEB-INF/web.xml already added, skipping
[INFO]
```

Click on *Console Output* on the left sidebar to show the console of that build.



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### **4. Summary**