Jenkins From Scratch



By: Eng. Mohamed ElEmam

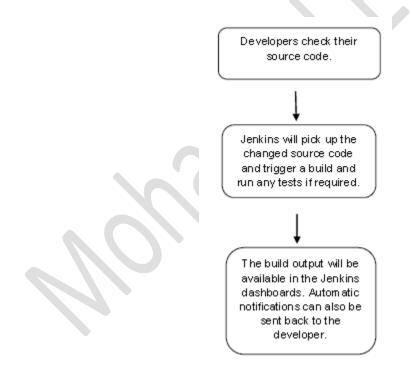
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Jenkins

Jenkins is a powerful application that allows continuous integration and continuous delivery of projects, regardless of the platform you are working on. It is a free source that can handle any kind of build or continuous integration. You can integrate Jenkins with a number of testing and deployment technologies. In this tutorial, we would explain how you can use Jenkins to build and test your software projects continuously.

Why Jenkins?

Jenkins is a software that allows **continuous integration**. Jenkins will be installed on a server where the central build will take place. The following flowchart demonstrates a very simple workflow of how Jenkins works.



Along with Jenkins, sometimes, one might also see the association of **Hudson**. Hudson is a very popular open-source Java-based continuous integration tool developed by Sun Microsystems which was later acquired by Oracle. After the acquisition of Sun by Oracle, a fork was created from the Hudson source code, which brought about the introduction of Jenkins.

What is Continuous Integration?

Continuous Integration is a development practice that requires developers to integrate code into a shared repository at regular intervals. This concept was meant to remove the problem of finding later occurrence of issues in the build lifecycle. Continuous integration requires the developers to have frequent builds. The common practice is that whenever a code commit occurs, a build should be triggered.

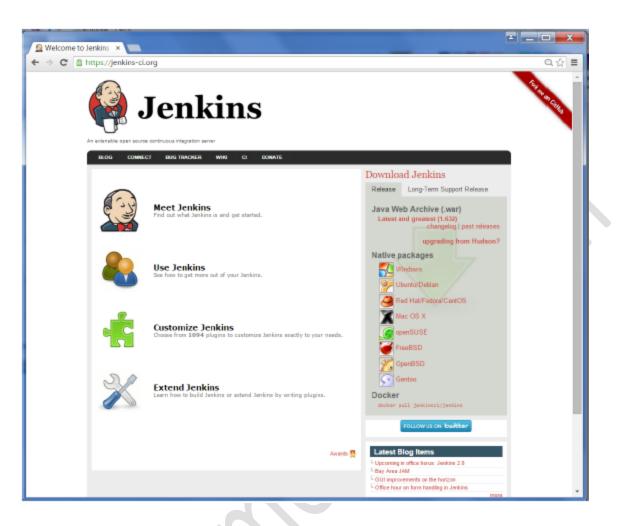
System Requirements

| JDK 1.5 or above |
|--|
| 2 GB RAM (recommended) |
| No minimum requirement. Note that since all builds will be |
| stored on the Jenkins machines, it has to be ensured that |
| sufficient disk space is available for build storage. |
| Jenkins can be installed on Windows, Ubuntu/Debian, Red |
| Hat/Fedora/CentOS, Mac OS X, openSUSE, FReeBSD, |
| OpenBSD, Gentoo or Docker or AWS |
| The WAR file can be run in any container that supports |
| Servlet 2.4/JSP 2.0 or later.(An example is Tomcat 5). |
| |

Jenkins - Installation

Download Jenkins

The official website for Jenkins is <u>Jenkins</u>. If you click the given link, you can get the home page of the Jenkins official website as shown below.



By default, the latest release and the Long-Term support release will be available for download. The past releases are also available for download. Click the Long-Term Support Release tab in the download section.



Click the link "Older but stable version" to download the Jenkins war file.

Starting Jenkins

Open the command prompt. From the command prompt, browse to the directory where the jenkins.war file is present. Run the following command

D:\>Java –jar Jenkins.war

After the command is run, various tasks will run, one of which is the extraction of the war file which is done by an embedded webserver called winstone.

D:\>Java –jar Jenkins.war

Running from: D:\jenkins.war Webroot: \$user.home/ .jenkins Sep 29, 2015 4:10:46 PM winstone.Logger logInternal INFO: Beginning extraction from war file

Once the processing is complete without major errors, the following line will come in the output of the command prompt.

INFO: Jenkins is fully up and running

Accessing Jenkins

Once Jenkins is up and running, one can access Jenkins from the link - http://localhost:8080

This link will bring up the Jenkins dashboard.

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|----------------------------|---|--|---|-----------------------|
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Jenkins – Tomcat Setup

The following prerequisites must be met for Jenkins Tomcat setup.

Step 1: Verifying Java Installation

To verify Java installation, open the console and execute the following java command.

| OS | Task | Command |
|---------|-----------------------|-------------------------------|
| Windows | Open command console | <pre>\>java -version</pre> |
| Linux | Open command terminal | \$java –version |

If Java has been installed properly on your system, then you should get one of the following outputs, depending on the platform you are working on.

| OS | Output |
|---------|--|
| Windows | Java version "1.7.0_60" |
| | Java (TM) SE Run Time Environment (build 1.7.0_60-b19) Java Hotspot (TM) 64-bit Server VM (build 24.60-b09, mixed mode) |
| Linux | java version "1.7.0_25" |
| | Open JDK Runtime Environment (rhel-2.3.10.4.el6_4-x86_64) |
| | Open JDK 64-Bit Server VM (build 23.7-b01, mixed mode) |

We assume the readers of this tutorial have Java 1.7.0_60 installed on their system before proceeding for this tutorial.

In case you do not have Java JDK, you can download it from the link Oracle

Step 2: Verifying Java Installation

Set the JAVA_HOME environment variable to point to the base directory location where Java is installed on your machine. For example,

| OS | Output |
|---------|--|
| Windows | Set Environmental variable JAVA_HOME to C:\ProgramFiles\java\jdk1.7.0_60 |
| Linux | export JAVA_HOME=/usr/local/java-current |

Append the full path of the Java compiler location to the System Path.

| OS | Output |
|---------|--|
| Windows | Append the String; C:\Program Files\Java\jdk1.7.0_60\bin to the end of the system variable PATH. |
| Linux | export PATH=\$PATH:\$JAVA_HOME/bin/ |

Verify the command java-version from command prompt as explained above.

Step 3: Download Tomcat

The official website for tomcat is <u>Tomcat</u>. If you click the given link, you can get the home page of the tomcat official website as shown below.



Browse to the link <u>https://tomcat.apache.org/download-70.cgi</u> to get the download for tomcat.

Go to the 'Binary Distributions' section. Download the 32-bit Windows zip file.

Then unzip the contents of the downloaded zip file.

Step 4: Jenkins and Tomcat Setup

Copy the Jenkis.war file which was downloaded from the previous section and copy it to the webapps folder in the tomcat folder.

Now open the command prompt. From the command prompt, browse to the directory where the tomcat7 folder is location. Browse to the bin directory in this folder and run the start.bat file

E:\Apps\tomcat7\bin>startup.bat

Once the processing is complete without major errors, the following line will come in the output of the command prompt.

INFO: Server startup in 1302 ms

Open the browser and go to the link – **http://localhost:8080/jenkins**. Jenkins will be up and running on tomcat.

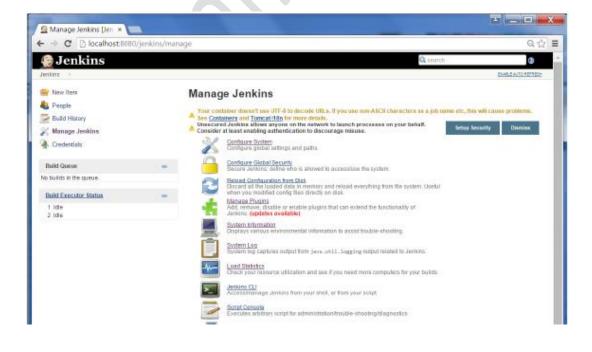
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Jenkins - Git Setup

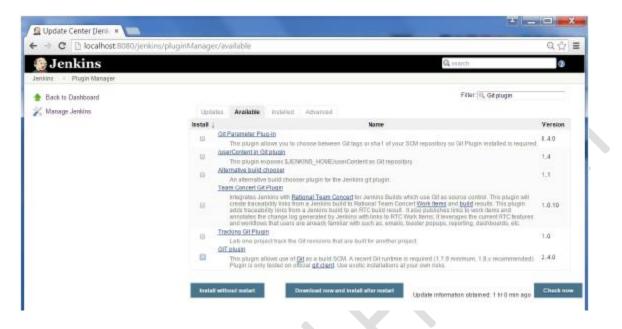
For this exercise, you have to ensure that Internet connectivity is present from the machine on which Jenkins is installed. In your Jenkins Dashboard (Home screen), click the Manage Jenkins option on the left hand side.

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In the next screen, click the 'Manage Plugins' option.



In the next screen, click the Available tab. This tab will give a list of plugins which are available for downloading. In the 'Filter' tab type 'Git plugin'



The list will then be filtered. Check the Git Plugin option and click on the button 'Install without restart'

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| Back to Dashboard | | Filter: 🔍 Git plagin | |
| 🕻 Manage Jenkins | Updat | es Available Installed Advanced | |
| | Install | Name | Version |
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| | | AuserContent in Git plugin This plugin exposes \$JENKINS_HOMEAuserContent as Git repository. | 1.4 |
| | | Alemathie build chooser An alternative build chooser plugin for the Jankins git plugin. Team Concert GR Plugin | 1.1 |
| | 8 | Integrates Jenkins with Batenal Team Corcect for Jenkins Builds which use Git as source centrol. This plugin will create traceability links from a Jenkins build to Rational Team Concert Work Itens and build results. This plugin adds traceability links from a Jenkins build to an RTC build result. Tatagorubishas links the work terms and annotates the charge log generated by Jenkins with links to RTC Work Iterns; It leverages the current IRTC restures and workflows that users are already familiar with such as emails (naster popular, reporting, dashboards, etc. | 1.0.10 |
| | | Tracking Git Plugin Lets one project track the Git revisions that are built for another project. | 1.0 |
| | 8 | GIT plugin This plugin allows use of <u>G8</u> as a build SCM. A recent Git runtime is required (1.7.9 minimum, 1.8.x recommended). Plugin is only instated on official <u>of client</u> : Use exodic installations at your own risks. | 2.4.0 |

The installation will then begin and the screen will be refreshed to show the status of the download.

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Once all installations are complete, restart Jenkins by issue the following command in the browser. **http://localhost:8080/jenkins/restart**

After Jenkins is restarted, Git will be available as an option whilst configuring jobs. To verify, click on New Item in the menu options for Jenkins. Then enter a name for a job, in the following case, the name entered is 'Demo'. Select 'Freestyle project' as the item type. Click the Ok button.

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| Build Queue io builds in the queue. | - | | onfiguration project Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platferm- specific builds, etc. |
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In the next screen, if you browse to the Source code Management section, you will now see 'Git' as an option.

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| Back to Dashboard | Project name Demo | | |
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| | Add post-build action * | | |
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Jenkins – Maven Setup

Step 1: Downloading and Setting Up Maven

The official website for maven is <u>Apache Maven</u>. If you click the given link, you can get the home page of the maven official website as shown below.



While browsing to the site, go to the Files section and download the link to the Binary.zip file.

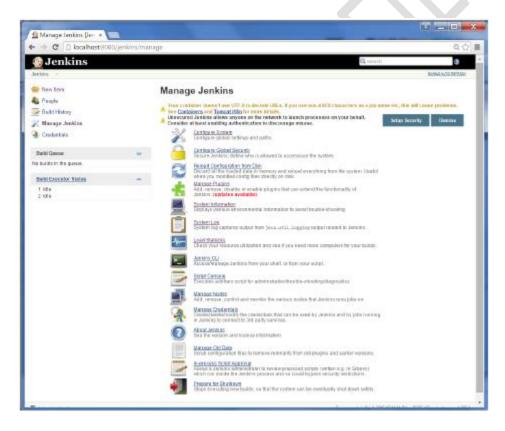
Once the file is downloaded, extract the files to the relevant application folder. For this purpose, the maven files will be placed in E:\Apps\apache-maven-3.3.3.

Step 2: Setting up Jenkins and Maven

In the Jenkins dashboard (Home screen), click Manage Jenkins from the left-hand side menu.

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Then, click on 'Configure System' from the right hand side.



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In the Configure system screen, scroll down till you see the Maven section and then click on the 'Add Maven' button.

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Uncheck the 'Install automatically' option.

Add any name for the setting and the location of the MAVEN_HOME.

----🚊 Configure System [Je × 📃 ← → C □ localhost:8080/jenkins/configure Q☆ ≣ Jenkins i configuration Tookki, CiPregram Files (x89)/Microsoft SDKsType Script/L0, CiProgram Files/Microsoft SOL Server/2017oolsEmin, CiProgram Files/Microsoft/Web Platform Installer/, CiProgram Files/X86/Java3(kt.7.0, 79/bin, %MAVEN_HOBE%bin, Install automatically Add Git • Ant Ant installations Add Ant Mayen Mayen installations Maven Name LOCALMAVEN MAVEN_HOME E:Appsiapache-maven-3.3.3 Install automatically Add Maxen of Mayers instal Maven Project Configuration Global MAVEN_OPTS . Local Maven Repository Default (~/m2/repository) • 🛛 Help make Jankins better by sending anonymous usage statistics and crash reports to the Jankins project 0 Jenkins Location Jankins URL http://ocalhost.8080/jankins/ 0 Please set a valid host name, instead of localhost System Admin e-mail address address not configured yet <nobody@nowhere> 0 SSH Server SSHD Port © Fixed : Random © Disable 0 Git plugin Global Config user name Value R. Global Config user email Value e. Apply

Then, click on the 'Save' button at the end of the screen.

You can now create a job with the 'Maven project' option. In the Jenkins dashboard, click the New Item option.

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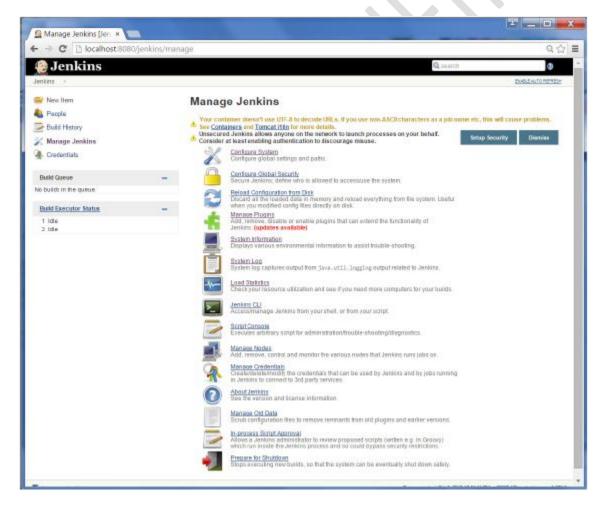
Jenkins - Configuration

You probably would have seen a couple of times in the previous exercises wherein we had to configure options within Jenkins. The following shows the various configuration options in Jenkins.

So one can get the various configuration options for Jenkins by clicking the 'Manage Jenkins' option from the left hand menu side.

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You will then be presented with the following screen –



Click on Configure system. Discussed below are some of the Jenkins configuration settings which can be carried out.

Jenkins Home Directory

Jenkins needs some disk space to perform builds and keep archives. One can check this location from the configuration screen of Jenkins. By default, this is set to ~/.jenkins, and this location will initially be stored within your user profile location. In a proper environment, you need to change this location to an adequate location to store all relevant builds and archives. Once can do this in the following ways

- Set "JENKINS_HOME" environment variable to the new home directory before launching the servlet container.
- Set "JENKINS_HOME" system property to the servlet container.
- **4** Set JNDI environment entry "JENKINS_HOME" to the new directory.

The following example will use the first option of setting the "JENKINS_HOME" environment variable.

First create a new folder E:\Apps\Jenkins. Copy all the contents from the existing ~/.jenkins to this new directory.

Set the JENKINS_HOME environment variable to point to the base directory location where Java is installed on your machine. For example,

| OS | Output |
|---------|---|
| Windows | Set Environmental variable JENKINS_HOME to you're the location you desire. As |
| | an example you can set it to E:\Apps\Jenkins |
| Linux | export JENKINS_HOME =/usr/local/Jenkins or the location you desire. |

In the Jenkins dashboard, click Manage Jenkins from the left hand side menu. Then click on 'Configure System' from the right hand side.

In the Home directory, you will now see the new directory which has been configured.

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| | | | There's no such executable glackes in PATH: C-Windows systems22, C-Windows, C-Windows Systems22, C-Windows, C-Windows Systems20 Windows Power Shelly 1.0 C-Wing optime Pasis/Microsoft SGL Server 1410/073 Similar . C-Wing ram Files | ι, | |

of executors

This refers to the total number of concurrent job executions that can take place on the Jenkins machine. This can be changed based on requirements. Sometimes the recommendation is to keep this number the same as the number of CPU on the machines for better performance.

Environment Variables

This is used to add custom environment variables which will apply to all the jobs. These are key-value pairs and can be accessed and used in Builds wherever required.

Jenkins URL

By default, the Jenkins URL points to localhost. If you have a domain name setup for your machine, set this to the domain name else overwrite localhost with IP of machine. This will help in setting up slaves and while sending out links using the email as you can directly access the Jenkins URL using the environment variable JENKINS_URL which can be accessed as \${JENKINS_URL}.

Email Notification

In the email Notification area, you can configure the SMTP settings for sending out emails. This is required for Jenkins to connect to the SMTP mail server and send out emails to the recipient list.

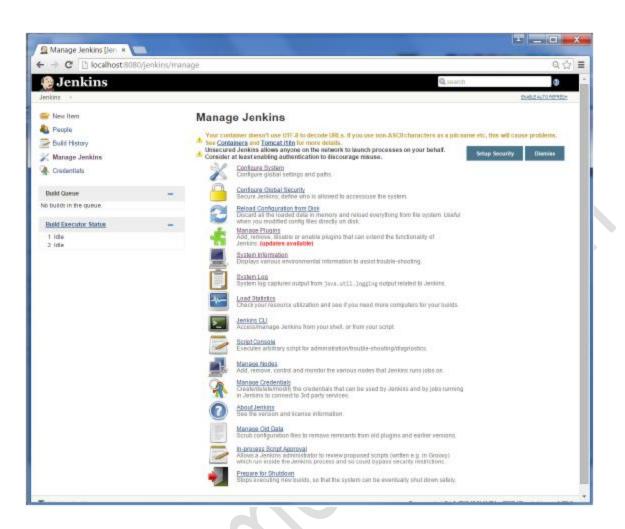
Jenkins - Management

To manage Jenkins, click on the 'Manage Jenkins' option from the left hand menu side.

So one can get the various configuration options for Jenkins by clicking the 'Manage Jenkins' option from the left hand menu side.

| Jenkins | | | | | | | Q hastery | 3 |
|-----------------------------------|---|---------|----|--------|--------------|--------------------|----------------------|-----------------|
| enkins | | | | | | | | DAREA TO REPORT |
| Vew Item | | All | • | | | | | 2ndd (escriptic |
| Build History | | 5 | w | Name : | Last Success | Last Failure | Last Duration | |
| T | | 0 | ٠ | Demo | N/A | N/A | N/A | ٢ |
| 🖌 Manage Jerkins 🏝 Credettials | | kon: 31 | ΠĽ | | | Legend BSS for all | ESS for failures 📑 B | |
| Build Gueue | - | | | | | | | |
| io builds in the queue. | | | | | | | | |
| Build Executor Status | | | | | | | | |
| 1 ldte 2 ldte | | | | | | | | |
| 2 100 | | | | | | | | |

You will then be presented with the following screen -



Some of the management options are as follows -

Configure System

This is where one can manage paths to the various tools to use in builds, such as the JDKs, the versions of Ant and Maven, as well as security options, email servers, and other system-wide configuration details. When plugins are installed. Jenkins will add the required configuration fields dynamically after the plugins are installed.

Reload Configuration from Disk

Jenkins stores all its system and build job configuration details as XML files which is stored in the Jenkins home directory. Here also all of the build history is stored. If you are migrating build jobs from one Jenkins instance to another, or archiving old build jobs, you will need to add or remove the corresponding build job directories to Jenkins's builds directory. You don't need to take Jenkins offline to do this—you can simply use the "Reload Configuration from Disk" option to reload the Jenkins system and build job configurations directly.

Manage Plugin

Here one can install a wide variety of third-party plugins right from different Source code management tools such as Git, Mercurial or ClearCase, to code quality and code coverage metrics reporting. Plugins can be installed, updated and removed through the Manage Plugins screen.

| Jenkins | QL search | | 9 |
|------------------------|---|---------------|------------|
| nkins - Piugin Manager | | | |
| Back to Dashboard | Fitz | ac [0, | |
| Kanage Jenkins | Uplates Available installed Advanced | | |
| | Install Name (| Version | installed |
| | GVS Plug-In This bundled plugin integrates Jankins with CVS version control system | 2.12 | 2.11 |
| | Jourding Plugin This plugin adds Javaddic support to Javidina. | 1.3 | 1.1 |
| | Ani Fluam Alows JUmi-Ibortal test results to be published. | 1,9 | 1.2-beta-4 |
| | Mathy Authorization Strategy Plugin Otens mathy-based security authorization strategies (global and per-project). | 1.2 | 1.1 |
| | Mattix Project Elugin Multi-configuration (matrix) project type | 1.6 | 1.4,1 |
| | Maxim integration plants Jentims plugin for building Maxem 2/0 jobs was a special projective. | 2.12.1 | 2.7.1 |
| | OWASP Markup Formatter Placin Uses poticy definitions to attrivitintified HTML markup in user-autorithad test. | 1.3 | 1.1 |
| | EAM Authentication plugiti Adds Univ Pluggable Authentication Module (PAM) support to Janions. | 1.2 | 1.1 |
| | Sotpt Security Plugin Allows Jenkins administrators to control what in-process scripts can be run by less-privilege | d users. 1.15 | 1.13 |
| | SSH Stores plugh This plugh allows you to manage stores running on Phot machines over SSH. | 1.10 | 1.9 |
| | Sutversion Plug-In This plugin adds the Sutversion support (via SVM60) to Jensina. | 2.5.3 | 3.54 |
| | Transiston Assistance pluoin This plugin adds as additional ifising bas in every page, which enables people is contribute localizations for the massages they are seeing in the current page. | 1.12 | 1.10 |
| | Windows Staves Plagn Alows you to connect to Windows machines and start Gave apents on them. | 1.1 | 1.0 |
| | Deventioned now and install after realiset Update information obtained -1 hr 36 min app Select. All, None This page lists updates to the plugins you currently use. | | |

System Information

This screen displays a list of all the current Java system properties and system environment variables. Here one can check exactly what version of Java Jenkins is running in, what user it is running under, and so forth. The following screenshot shows some of the name-value information available in this section.

| C localhost 808 | Drienkins/systemInfo | 9. |
|--------------------|--|---|
| | oyjerikins/systeminio | 2 |
| Jenkins | | Q, search 👔 |
| ns > | | D08.8.470.484 |
| na y | | |
| New Item | System Properties | i |
| People | | |
| Build History | Name 1 | Value |
| · | awt to olkit | sun awt windows.WToolkit |
| Manage Jenkins | catalina.base | E'Appsitomcaf7 |
| redentials | catalina.home | E'Appsitomcaf7 |
| | catalina.useNaming | bie |
| d Cuana | common Joader | S(catalina.base)/lib.S(catalina.base)/lib.º jar.S(catalina.home)/lib.S(catalina.home)/lib.º jar |
| ld Queue | - file.encoding | Qp1252 |
| ilds in the queue. | file encoding pkg | sunio |
| | file separator | 1 |
| Id Executor Status | java.awl.graphicsenv | sun awt Win32GraphicsEnvironment |
| de | java.awt.printerjob | sun awt.windows.WPrinterJob |
| l de | java.class.path | E:Appsitomcat7/bin/bootstrap.jar.E:\Appsitomcat7/bin/tomcat-juli.jar |
| | java.class.version | 51.0 |
| | java.endorsed.dirs | E:Appsitomcat7iendorsed |
| | java.ext.dirs | C:Program Files (x86)/Java/(dk1.7.0_79)(re/lib/ext;C:Windows/Sun/Java/lib/ext; |
| | java home | C:Program Files (x86)/Java/(dk1.7.0_79)(re |
| | java Jo.tmpdir | E:Appsitomcat7itemp |
| | Java Jibrary, path | C:Ptogram Files (d8/Nava)(el: 7.2, 7%bit) C:Windows/Sun/JavaNin Files J88/Nindows/Sun/JavaNin C:Windows/Sun/JavaNin C:Windows/Sun/JavaNin Files J88/Nindows/Sun/JavaNin C:Windows/Sun/JavaNin Files J88/Nindows/Sun/JavaNin Files J88/Nindows/Sun/JavaNin C:Windows/Sun/JavaNin Files J88/Nindows/Sun/JavaNin Files J88/Nindows/Sun/J |
| | java.naming.factory.initial | org.apache.naming.java.javaURLContexFactory |
| | java.naming.factory.url.pkgs | org apache naming |
| | Java runtime name | Java (TM) SE Runtime Environment |
| | Java.runtime.version | 17.0_79-b15 |
| | java.specification.name | Java Platform API Specification |
| | java specification vendor | Oracle Corporation |
| | java specification version | 17 |
| | java.util.logging.config.file | E:Appsitomcat7iconfilogging.praperties |
| | java util logging manager | org apache juli ClassLoaderLogVlanager |
| | java.vendor | Oracle Corporation |
| | java.vendor.url | http://java.oracie.com/ |
| | java.vendor.url.bug | http://bugreport.sun.com/bugreport/ |
| | java.version | 17.0_79 |

System Log

The System Log screen is a convenient way to view the Jenkins log files in real time. Again, the main use of this screen is for troubleshooting.

Load Statistics

This pages displays graphical data on how busy the Jenkins instance is in terms of the number of concurrent builds and the length of the build queue which gives an idea of how long your builds need to wait before being executed. These statistics can give a good idea of whether extra capacity or extra build nodes is required from an infrastructure perspective.

Script Console

This screen lets you run Groovy scripts on the server. It is useful for advanced troubleshooting since it requires a strong knowledge of the internal Jenkins architecture.

Manage nodes

Jenkins is capable of handling parallel and distributed builds. In this screen, you can configure how many builds you want. Jenkins runs simultaneously, and, if you are using distributed builds, set up build nodes. A build node is another machine that Jenkins can use to execute its builds.

Prepare for Shutdown

If there is a need to shut down Jenkins, or the server Jenkins is running on, it is best not to do so when a build is being executed. To shut down Jenkins cleanly, you can use the Prepare for Shutdown link, which prevents any new builds from being started. Eventually, when all of the current builds have finished, one will be able to shut down Jenkins cleanly.

Jenkins - Setup Build Jobs

For this exercise, we will create a job in Jenkins which picks up a simple HelloWorld application, builds and runs the java program.

Step 1 – Go to the Jenkins dashboard and Click on New Item

| 🙎 Dashboard [Jenkins] × 📃 | | | | |
|--|--------|--|----------|---------------------|
| ← → C Di localhost:8080/je | nkins/ | | | ್ ಭ ≡ |
| 🇐 Jenkins | | | Q search | ٩ |
| Jenkins > | | | | ENABLE AUTO REPRESH |
| 🚔 New Item | | | | add description |
| & People ☞ Build History | | Welcome to Jenkins! | | |
| X Manage Jenkins | | Please create new jobs to get started. | | |
| Credentials | | | | |
| Build Queue | - | | | |
| No builds in the queue. | | | | |
| Build Executor Status | - | | | |
| 1 idle 2 idle | | | | |

Step 2 – In the next screen, enter the Item name, in this case we have named it Helloworld. Choose the 'Freestyle project option'

| · → C 🗋 localhost8080/jenkin | s/view/All/newJob Q | นิ |
|------------------------------|---|------|
| 👩 Jenkins | Q, search | 3 |
| ankins 🔸 Ali 🕞 | | |
| P New Item | Item name Helloworld | |
| People | Freestyle project This is the central feature of Jenkins. Jenkins will build your project, combining any S | av |
| Build History | with any build system, and this can be even used for something other than software b Mayon protect | uild |
| 🐇 Manage Jankins | Build a maven project. Jenkins takes advantage of your POM files and drastically red the conflouration. | uce |
| Credentials | External Job This type of job allows you to record the execution of a process run outside Jenkins, e on a remote machine. This is designed so that you can use Jenkins as a dashboard | wer |
| Build Queue | your existing automation system. See the documentation for more details. Multi-configuration project | |
| io builds in the queue. | Instance configuration projects Statute for projects that need a large number of different configurations, such as test on multiple environments, platform-specific builds, etc. | ing |
| Build Executor Status | - | |
| 1 Idle 2 Idle | ок | |
| 5 TOTO | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Step 3 – The following screen will come up in which you can specify the details of the job.

| > C 🗋 localhost:8080/jenkins/job/ | And a second | | 0.☆ ≣ |
|--------------------------------------|--|--|-------|
| 🔮 Jenkins | | QL sear(3) | 0 |
| Jenkins + Helloworld + configuration | | | |
| Back to Dashboard | Project name | Helloworld | |
| Status | Description | | |
| Changes | | | |
| Workspace | | | |
| Build New | | (Escaped HTML) Preview | |
| O Delete Project | Discard Old GitHub project | | 0 |
| Configure | and the second | parameterized | 0 |
| - | 🗉 Disable Bul | Id (No new builds will be executed unbit the project is re-enabled.) | 0 |
| Build History Irend | | ncurrent builds if recessary | 0 |
| BISS for all D FSB for failures | Advanced Prop | | - I |
| | | Advinced. | |
| | Source Code M | lanagument | - 1 |
| | © CVS | | |
| | O CVS Project O Cit | sut | |
| | Subversion | | |
| | Build Triggers | | |
| | Build after o Build period | ither projects are built ticelly | 0 |
| | Build when | a change is pushed to GIB-lub | |
| | Poll SCM | | 0 |
| | eung Antikanal a | | |

Step 4 – We need to specify the location of files which need to be built. In this example, we will assume that a local git repository(E:\Program) has been setup which contains a 'HelloWorld.java' file. Hence scroll down and click on the Git option and enter the URL of the local git repository.

Note – If you repository if hosted on Github, you can also enter the url of that repository here. In addition to this, you would need to click on the Add button for the credentials to add a user name and password to the github repository so that the code can be picked up from the remote repository.

| | Helloworld/configure | e | | | Q 🕸 | ≡ |
|--|---|---------------------------------|---|-----------------------|-------------|---|
| ankins > Helloworld > configuration | | | | | | - |
| Changes Workspace Build Now Delete Project Configure | Discard Old Builds GliHub project This build is paran Disable Build (Note) | neterized new builds will be | executed until the pro | iject is re-enabled.) | 0 0 0 | l |
| Build History trend = | Execute concurrent Advanced Project Op | | ary | | 0 | |
| 🔀 RSS for all 🔀 RSS for failures | Source Code Manage None CVS CVS Projectset G dt | ment | | Advance | ю | |
| | Repositories | Repository URL | E:/Program | | Ð | |
| | | Credentials | -none - 🔻 | ← Add | 0 | 1 |
| | | | Add Repositor | y Delete Repository | | ł |
| | Branches to build | Branch Specifie | Add Repositor er (blank for 'any') *in | y Delete Repository | 0 | ĺ |

Step 5 – Now go to the Build section and click on Add build step \rightarrow Execute Windows batch command

| ← → C 🗋 localhost 8080/jenkins/jo | b/Helloworld/configure | 2 | | | | Q. 23 | Ξ |
|--------------------------------------|---|--------------------------|---------------------|--------|-------------------|-------|---|
| Jenkins + Helloworld + configuration | | | | | | | |
| | Repositories | Repository URL E:Program | | | 0 | | |
| | | Credentals | - none - | • | hth - | | |
| | | | | | Advanced | • | |
| | | | Add Report | sitory | Delete Repository | | |
| | Branches to build | Branch Specifie | r (blank for "any") | */mast | or | 0 | |
| | | | | | Add Branch | 000 | |
| | | | | | Delete Branch | | |
| | Repository browser | (Auto) | | | | | |
| | | (4010) | | | | | 1 |
| | Additional Behaviours | Add 👻 | | | | | |
| | Subversion | | | | | | |
| | Build Triggers | | | | | - | |
| | Build after other pro Build periodically | ojects are built | | | | 0 | |
| | Build when a change | ge is pushed to Gr | Hub | | | | |
| | Build | | | | | Ð | |
| | Add build step • | 1 | | | | | |
| | Execute Windows ba | ich command | | | | | |
| | Execute shell | in contraine | | | | | |
| | Invoke Ant | | | | | | |
| | Invoke top-level Mave | en targets | | | | | |
| | Set build status to "pe | ending" on GilHub co | trant | | | | |

Step 6 – In the command window, enter the following commands and then click on the Save button.

Javac HelloWorld.java Java HelloWorld

| 😫 Helloworld Config [J: × | e <u>-</u> | | x |
|---------------------------------------|---|----------------|---|
| ← → C 🗋 localhost:8080/jenkins/job/He | lloworld/configure | Q☆ | = |
| Jenkins > Helloworld > configuration | | | |
| | Delete Branch Repository browser (Auto) Additional Behaviours | • ® | |
| | Subversion Build Triggers | | |
| | Build after other projects are built Build periodically Build when a change is pushed to GitHub Poll SCM Build Buil | 9 9 9 | |
| | Execute Windows batch command Command javas HelloWorld.java java HelloWorld | 0 | |
| | See the list of available environment variables Delt Add build step | ste | |
| | Post-build Actions | | |
| | Add post-build action - | | |
| 🝓 Help va Iscolica Uni suco | Page generated: Oct 10, 2015 12-42:11 AM REST AR Janking | t ver. 1.609.3 | * |

Step 7 – Once saved, you can click on the Build Now option to see if you have successfully defined the job.



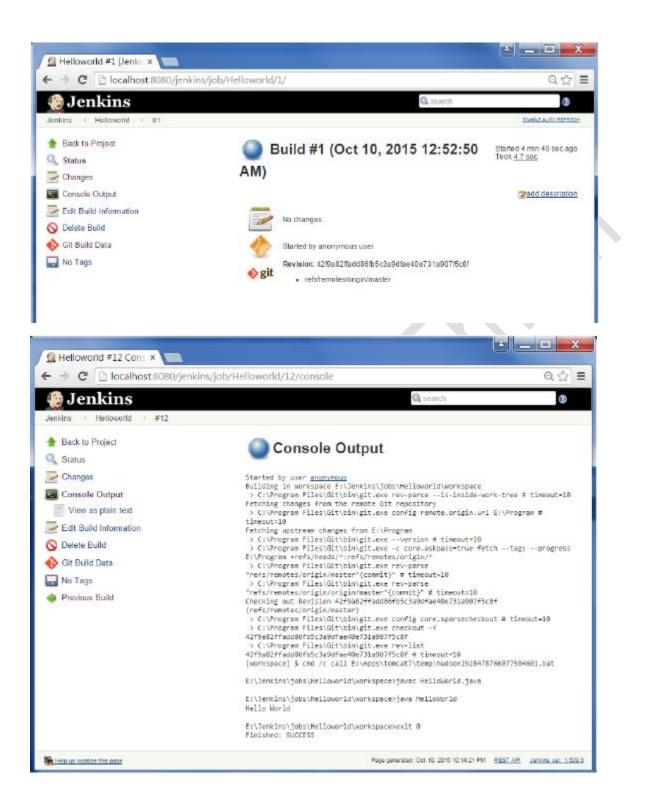
Step 8 – Once the build is scheduled, it will run. The following Build history section shows that a build is in progress.

| Lonling | | | Q search | |
|-------------------------|-----------------|---|--------------|---------------------|
| Jenkins | | | W6 30/81(21) | 0 |
| itins + Helloworld + | | | | ENABLE AUTO REPARCH |
| Back to Dashboard | | Project Helloworld | | |
| Status | | 19 9-92 • CANCEL CONSIGNATION CONTRACTOR - 2011 | | gadd description |
| Changes | | | | Disable Project |
| Workspace | | | | |
| Build New | | Workspace | | |
| Delete Project | | | | |
| Configura | | Recent Changes | | |
| Build History | trend | Permalinks | | |
| #1 Det 10 2015 12:52 AM | | | | |
| RSS for all 🚮 R | SS for failures | | | |

Step 9 – Once the build is completed, a status of the build will show if the build was successful or not. In our case, the following build has been executed successfully. Click on the #1 in the Build history to bring up the details of the build.



Step 10 – Click on the Console Output link to see the details of the build



Apart from the steps shown above there are just so many ways to create a build job, the options available are many, which what makes Jenkins such a fantastic continuous deployment tool.

Jenkins - Unit Testing

Jenkins provides an out of box functionality for Junit, and provides a host of plugins for unit testing for other technologies, an example being MSTest for .Net Unit tests. If you go to the link <u>https://wiki.jenkins-ci.org/display/JENKINS/xUnit+Plugin</u> it will give the list of Unit Testing plugins available.

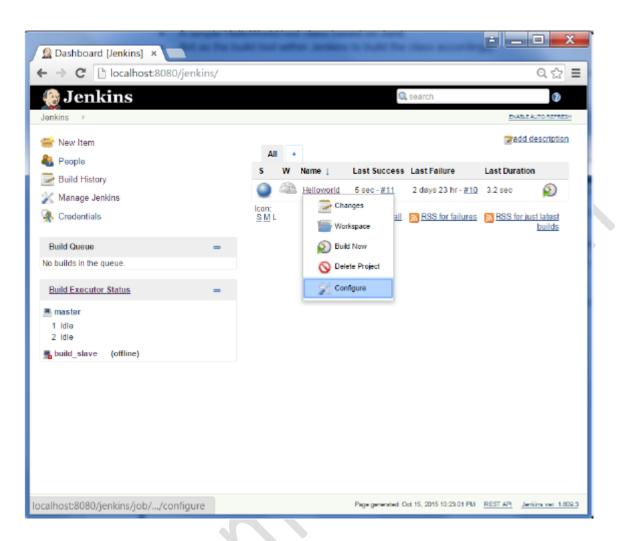
| 🔡 xUı | enkins + Plugins + xUnit | | Browse ▼ Q Search ▲ | | |
|---|--|--|---|--|--|
| r Added by <u>G</u> Jenkins Home | Plugin Informatio | ed by <u>Gregory Boissing</u> t on Oct 08, 2015 (<u>view change</u>) | | | |
| Mailing lists Pl Source code La Bugtracker La Security Re | Plugin ID | xunit | Changes | In Latest Release Since Latest Release | |
| | Latest Release Latest Release Date Required Core Dependencies | 1.98 (archives) Oct 09, 2015 1.580.1 junit (version:1.6) | Source Code Issue Tracking Pull Requests Maintainer(s) | GitHub Open Issues Pull Requests Gregory Boissingt (id: gboissingt) | |
| Events Donation Commercial Support Wiki Site Map | | xunit - installations | Installations | 2014-Oct 11692 2014-Nov 11557 2014-Dec 11631 2015-Jan 12106 2015-Feb 12262 2015-Mar 12891 2015-Apr 12694 2015-Jay 12716 | |
| Vleet Jankins Jae Jankins | | 4000 2000 0 10 11 12 01 02 03 04 05 06 07 08 09 Month | | 2015-Jun 13143 2015-Jul 13470 2015-Aug 13192 2015-Sep 13563 | |
| Extend Jenkins Plugins Servlet Container Notes | This plugin makes it po | ssible to publish the test results of an execution of a t | lesting tool in Jenk | ins. | |

Example of a Junit Test in Jenkins

The following example will consider

- A simple HelloWorldTest class based on Junit.
- Ant as the build tool within Jenkins to build the class accordingly.

Step 1 – Go to the Jenkins dashboard and Click on the existing HelloWorld project and choose the Configure option



Step 2 – Browse to the section to Add a Build step and choose the option to Invoke Ant.

| | nkins/job/Helloworld/configure | Q ☆ 〓 |
|--------------------------------|---|--------|
| nkins 🕨 Helloworld 🕨 configura | tion | Branch |
| | | branch |
| | Repository browser (Auto) | • 📵 |
| | Additional Behaviours Add 👻 | |
| | Subversion | |
| | Build Triggers | |
| | Build after other projects are built | 0 |
| | Build periodically Build when a change is pushed to GitHub | 0 |
| | Poll SCM | 0 |
| | Build | _ |
| | Execute Windows batch command Command java: HelloWorld.java java HelloWorld | • |
| | See the list of available environment variables | Delete |
| | Add build step · | |
| | Execute Windows batch command | |
| | Execute shell | |
| | Invoke Ant | |
| | Invoke top-level Maven targets Set build status to "pending" on GitHub commit | |

Step 3 – Click on the Advanced button.

| enkins + Helloworld + configuration | | |
|-------------------------------------|--|--------------------|
| | Additional Behaviours Add + Subversion Build Triggers | |
| | Build after other projects are built Build periodically Build when a change is pushed to GitHub Poll SCM | 0 0 |
| | Build Execute Windows batch command Command javac Hellokorld, java java Hellokorld | |
| | See the list of available environment variables | <i>d</i> Delete |
| | Invoke Ant Ant Version | |
| | Targets | Advanced |
| | | Delete |
| | Save Apply | |

Step 4 – In the build file section, enter the location of the build.xml file.

| C localhost:8080/jenkins/j | bb/Helloworid/configure | ର ଚ୍ଚ |
|-----------------------------------|--|----------|
| kins + Helloworld + configuration | | |
| | Build Environment | 0 |
| | Create Selenium RC instance Build | |
| | DOBN ² | |
| | Execute Windows batch command | 0 |
| | Command java HelloWorld.java java HelloWorld | |
| | See the list of available environment variables | Delete |
| | Invoke Ant | .0 |
| | Ant Version NewHome | • |
| | Targets | • |
| | Build File E:Java\HelloWorldTest/build.xml | |
| | Properties | × 0 |
| | Java Options | 10 |
| | | Delete |
| | Add build step - | |
| | Post-build Actions | |
| | Publish JUnit test result report Test report XMLs ReportsV*xml Tissue Valuates* certice that use | Ð |

Step 5 – Next click the option to Add post-build option and choose the option of "Publish Junit test result report"

| | s/job/Helloworld/configure | ର୍ 🏠 🔳 |
|------------------------------------|---|--|
| nkins + Helloworld + configuration | | * |
| | Build Environment | |
| | Create Selenium RC instance | 0 |
| | Build | |
| | Execute Windows batch command | 8 |
| | Command javac HelloWorld.java java HelloWorld | |
| | | de la constanción de |
| | See the list of available environment variables | Delete |
| | Publish FindBugs analysis results | |
| | Publish combined analysis results | |
| | Aggregate downstream test results | • |
| | Archive the artifacts | • |
| | Build other projects Fublish JUnit test result report d.xml | |
| | Publish Javadoc | • |
| | Publish Selenium Report | |
| | Record fingerprints of files to track usage | |
| | Git Publisher | Delete |
| | Deploy war/ear to a container | |
| | E-mail Notification | |
| | Set build status on Gillfub commit | |
| | Add post-build action - | |
| | | |

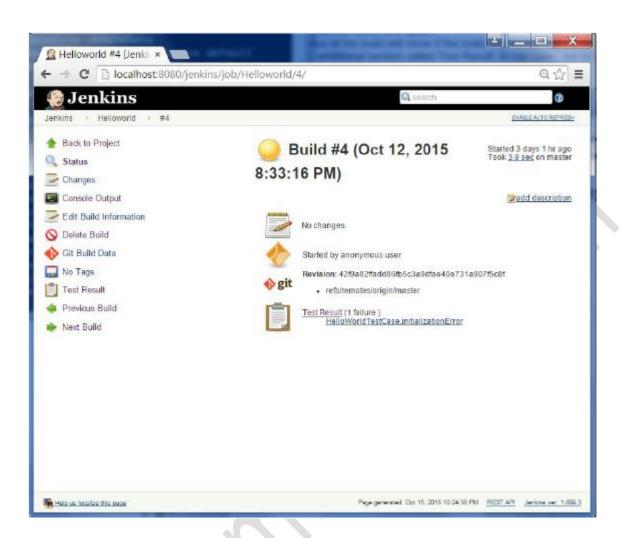
Step 6 – In the Test reports XML's, enter the location as shown below. Ensure that Reports is a folder which is created in the HelloWorld project workspace. The "*.xml" basically tells Jenkins to pick up the result xml files which are produced by the running of the Junit test cases. These xml files which then be converted into reports which can be viewed later.

Once done, click the Save option at the end.

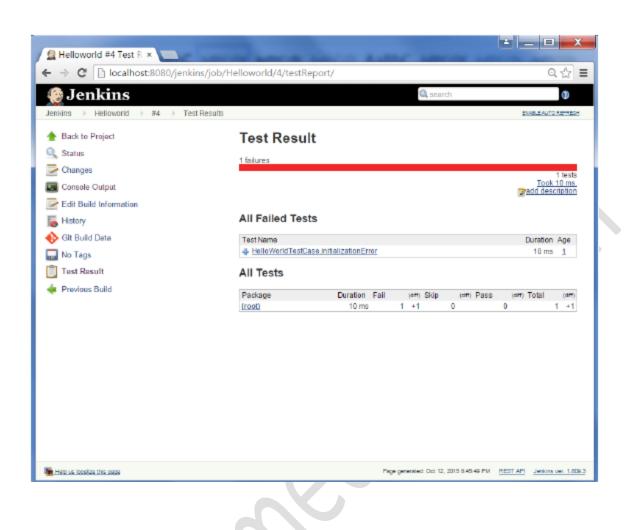
| nkins > Helloworld > configuration | → C localhost:8080/jenkins/j | b/Helloworld/configure | 의 뜻 ≡ |
|--|------------------------------------|--|-------------------------|
| Post-build Actions Publish JUnit test result report Test report XMLs Reports**.xml Floor insurance; carting that specifies the generated row XML report fless Reports are insurance and action as important and the specifies the generated row XML report fless Reports are insurance and action as important and action as important and action for a transmission and action for the float in long standard output/error Retain long standard standard output/error Retain long standard stand | nkins > Helloworld > configuration | Ant Version Targets Build File E:\Java\Hello\WorldTestbuild.xml Properties Java Options | ▼.0 ▼.0 ▼.0 |
| Health report amplification factor 1.0 1% failing tests scores as 99% health. 5% failing tests scores as 95% health Detete | | Publish JUnit test result report Test report XMLs Reports**.xml Elicer instance, sering that specifies the such as impropertizinger/sect-reports*.xm | |
| Add post-build action - | | Retain long standard output/ Health report amplification factor 1.0 1% failing tests scores as 99% he | ealth. 5% failing tests |
| | | Add post-build action - | |

Step 7 – Once saved, you can click on the Build Now option.

Once the build is completed, a status of the build will show if the build was successful or not. In the Build output information, you will now notice an additional section called Test Result. In our case, we entered a negative Test case so that the result would fail just as an example.



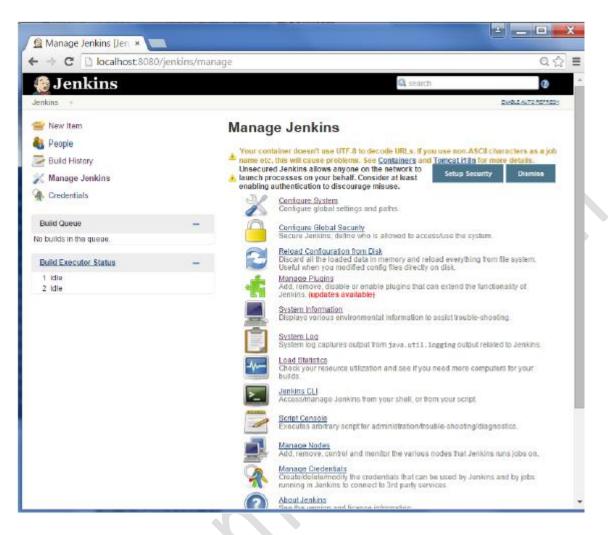
One can go to the Console output to see further information. But what's more interesting is that if you click on Test Result, you will now see a drill down of the Test results.



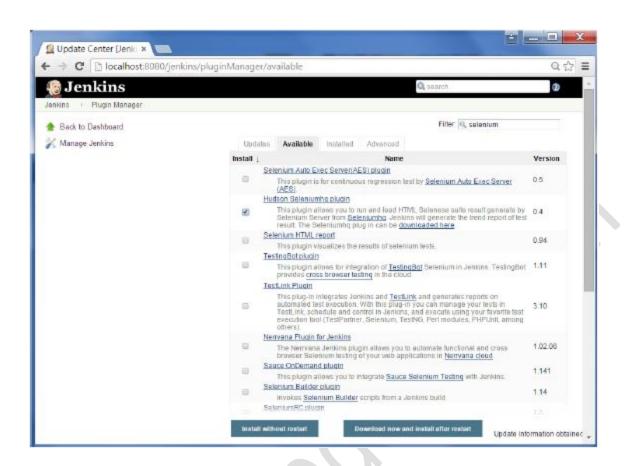
Jenkins - Automated Testing

One of the basic principles of Continuous Integration is that a build should be verifiable. You have to be able to objectively determine whether a particular build is ready to proceed to the next stage of the build process, and the most convenient way to do this is to use automated tests. Without proper automated testing, you find yourself having to retain many build artifacts and test them by hand, which is hardly in the spirit of Continuous Integration. The following example shows how to use Selenium to run automated web tests.

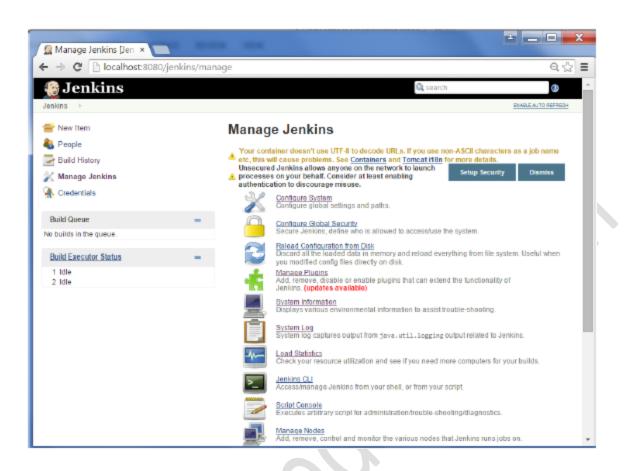
Step 1 – Go to Manage Plugins.



Step 2 – Find the Hudson Selenium Plugin and choose to install. Restart the Jenkins instance.



Step 3 – Go to Configure system.

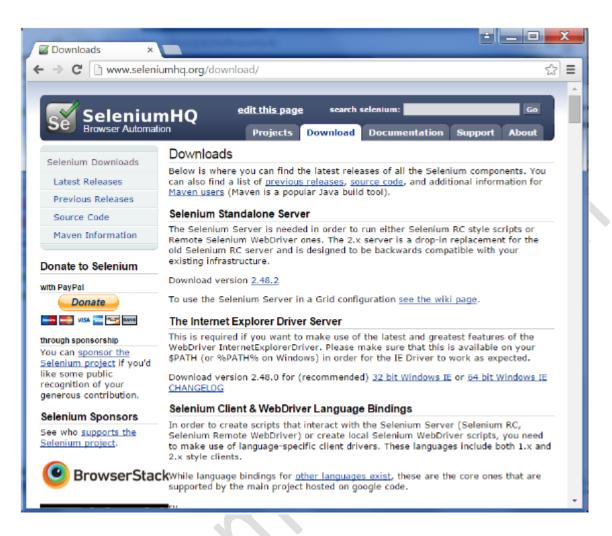


Step 4 – Configure the selenium server jar and click on the Save button.

| → C D localhost:8080/jen/ | cins/configure | | Q 🏠 | = |
|---------------------------|---|--|-----|----|
| kins in configuration | Create tretraccounts take or automotivitititiers and | 1001 | w | - |
| | Default Compression Level Private Key Location | 3 (Recommended) * C/Users/Babul/Usshild_rsa | | |
| | Private Key Password | C. CSETSIBUUT.SSING_S8 | | |
| | Known Hosts Location | C:/Users/Babuli/.ssh/knovn_hosts | | |
| | Authentication | Add | | |
| | Subversion Subversion Workspace Version | 1.4 • | • | |
| | Exclusion revprop name | | 0 | |
| | Validate repository URLs up to the first variable r | 1970.0 | | |
| | Update default Subversion credentials cache aft | | 0 | |
| | Selenium Remote Control | | | |
| | htmlSuite Runner | E:\Apps\selenium-server-standalone-2.48.2 jar | Ø | |
| | Shell | | | |
| | Shell executable | | 10 | |
| | E-mail Notification | | | |
| | SMTP server | | 1 | 10 |
| | Default user e-mail suffix | | | |
| | | - | | |
| | | Advanced | | |
| | Test configuration by sending test e-mail | | | |

Note – The selenium jar file can be downloaded from the location <u>SeleniumHQ</u>

Click on the download for the Selenium standalone server.



Step 5 – Go back to your dashboard and click on the Configure option for the HelloWorld project.

| | nkins/ | | | | | | | 요 문 ☆ Ξ | <u>.</u> |
|-----------------------|--------|------------------|----|----------------|--------------------|-----------------------|-------------------|---------------------|----------|
| Jenkins | | | | | | 🔍 sear | ch | 0 | |
| nkins 🔸 | | | | | | | | DARK AUTO REFRECH | |
| New Item | | All | + | | | | | Redd description | |
| Build History | | 8 | w | Name ↓ | Last Success | Last Failure | Last Duration | | |
| Manage Jenkins | | | | Helloworld | 23 hr - <u>#12</u> | 23 hr - <u>#10</u> | 3.7 sec | | |
| Credentials | | lcon: <u>5</u> ! | ΜL | Changes | Legand 🔝 I | RSS for all 🔝 RSS for | failures 🔉 RSS fo | rjust latest builds | |
| Build Queue | - | | | Duild Now | | | | | |
| builds in the queue. | | | | S Delete Proje | d | | | | |
| Build Executor Status | - | | | 🔀 Contigure | | | | | |
| 1 klie 2 klie | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Step 6 – Click on Add build step and choose the optin of "SeleniumHQ htmlSuite Run"

| Build | Henium RC instance Windows batch command javat HelloWorld.java java HelloWorld | 0 |
|--------------------|---|--------|
| Execute Command | javac HelloWorld,java | 0 |
| Command | javac HelloWorld,java | 0 |
| | java⊂ HelloWorld.java java HelloWorld | |
| | | |
| | tee the list of available environment variables | Delete |
| | nHQ htmlSuite Run | |
| browser | Trefox | 0 |
| startURI | https://www.google.ae | 0 |
| suiteFile | E. Mpps we we ampre. In mi | 0 |
| resultFil | E:Jenkins\jobs\Helloworldworkspace\Reports\Results.html | 0 |
| other | | |
| | | Delete |
| | | |
| Add build | | |
| Post-build Ac | | |
| Add post- | build action · | |
| | | |

Step 7 – Add the necessary details for the selenium test. Here the suiteFile is the TestSuite generated by using the Selenium IDE. Click on Save and execute a build. Now the post build will launch the selenium driver, and execute the html test.

| Helloworld Config [] × | | - <u> </u> |
|--|---|-----------------------------|
| ← → C 🗋 localhost:8080/jenkins/job/Hell | oworld/configure | @☆ ≡ |
| Jenkins > Helloworld > configuration | | - |
| | Repository browser (Auto) | - 10 |
| | Additional Behaviours Add - © Sutiversion Julid Triggers | |
| | Build after other projects are built Build periodically Build when a change is pushed to GitHub Poll SCM | 0 0 0 |
| | tuid Execute Windows batch command Command Java: HelloWorld.java Java HelloWorld Execute Int of available environment variables | 0 |
| | Add build step | Delete |
| | Execute Windows batch command Execute shell Imode Att Imode Att Imode Isp-Isvel Marken targets | |
| | SelaniumHO htmlSale Run Set build status to "pending" on GitHub commit | |
| localhost:8080/jenkins/job/Helloworld/configure# | Page generated Oct 11, 2015 & 17:15 PM | LATI Jenkina ver. 1.628.3 🚽 |

Jenkins - Notification

Jenkins comes with an out of box facility to add an email notification for a build project.

Step 1 – Configuring an SMTP server. Goto Manage Jenkins \rightarrow Configure System. Go to the E-mail notification section and enter the required SMTP server and user email-suffix details.

| | kins/configure | Q. 😭 : |
|-----------------------|--|--------------------------------------|
| nkins E configuration | | |
| | Default Compression Level | 3 (Recommended) |
| | Private Key Location | C:/Users/Babuli/.ssh/id_rsa |
| | Private Key Password | |
| | Known Hosts Location | C/Users/Babull/.ssh/known_hosts |
| | Authentication | Add |
| | Subversion | |
| | Subversion Workspace Version | 1.4 |
| | Exclusion revprop name | |
| | Validate repository URLs up to the first variant | able name |
| | Update default Subversion credentials cach | |
| | Selenium Remote Control | |
| | htmlSuite Runner | E:\Apps\selenium-server-standalone-2 |
| | | selenium-serven jar path |
| | Shell | |
| | Shell executable | |
| | E-mail Notification | |
| | SMTP server | 192.168.0.100 |
| | Default user e-mail suffix | @emirates.com |
| | | Advanced |
| | Test configuration by sending test e-mail | |
| | ,,, | |
| | | |

Step 2 – Configure the recipients in the Jenkins project - When you configure any Jenkins build project, right at the end is the ability to add recipients who would get email notifications for unstable or broken builds. Then click on the Save button.

| → C localhost:8080/jenkins/job/t | telloworld/configure | ୍⇔ ≡ | |
|--|---|-------------------|--|
| enkins → Helloworid > configuration | SeleniumHQ htmlSuite Run browser iexplore startURL https://www.google.ae suiteFile E14pps:Selenium/Sample.html resultFile Result.html other | Device | |
| | Post-build Actions E-mail Notification Recipients St12233@domain.com Whitespace-repended list of recipient addresses. May reference build parameters like prace. E-mail will be service a build for becomes unstande or where is to stable. Send e-mail for every unstable build Send separate e-mails to individuals who broke the build Add post-build action | e a. Deskor | |

Apart from the default, there are also notification plugin's available in the market. An example is the notification plugin from Tikal Knowledge which allows sending Job Status notifications in JSON and XML formats. This plugin enables end-points to be configured as shown below.

| ⇒ C ☐ localhost:8080/jenkins/job/ | Helloworld/configure | | | | | Q. 🏠 | ≡ |
|------------------------------------|---|-----------|--|-----------|---------------|------|---|
| nkins i Helloworld i configuration | | | | | | | - |
| Changes | | | | | | | |
| Workspace | | | | | | | |
| Build Now | | Escaped H | TML) Preview | | | - | |
| Delete Project | Discard Old Builds GifHub project | | | | | | |
| Configure | | | | | | 8 | |
| | Job Notifications Notification Endpoints | | | | | | |
| Build History trend - | Noncentra Endpoints | Delete | | | | | |
| 21 Oct 10, 2015 12:52 AM | | Format | JSON | • | | | |
| RSS for all RSS for failures | | Protocol | HTTP | • | | | |
| | | Event | All Events | | | | |
| | | | Job Mecycle event triggering notification | | | _ | |
| | | URL | http://dx.bmem30/1xe4567h | 0 | | • | |
| | | Timeout | Where to send messages 30000 | | | | |
| | | | Subbu Timeout (in ma) | 0 | | | |
| | | Log | 0 | | | | |
| | | | Number lines of log messages to send. Use -1 for all (use with | caution). | | | |
| | | Add End | lpoint | | | | |
| | This build is parameter | | | | | • | |
| | Disable Build (No net Execute concurrent b | | e executed until the project is re-enabled.) | | | 0 | |
| | Advanced Project Optio | | satry | | | ÷ | |
| | · · · · · · · · · · · · · · · · · · · | | | | Advanced | | |
| | | | | | The Call Call | | |

Here are the details of each option -

- **"Format"** This is the notification payload format which can either be JSON or XML.
- "Protocol" protocol to use for sending notification messages, HTTP, TCP or UDP.
- **"Event"** The job events that trigger notifications: Job Started, Job Completed, Job Finalized or All Events (the default option).
- **"URL"** URL to send notifications to. It takes the form of "<u>http://host</u>" for HTTP protocol, and "host:port" for TCP and UDP protocols.
- **"Timeout"** Timeout in milliseconds for sending notification request, 30 seconds by default.

Jenkins - Reporting

As demonstrated in the earlier section, there are many reporting plugins available with the simplest one being the reports available for jUnit tests.

In the Post-build action for any job, you can define the reports to be created. After the builds are complete, the Test Results option will be available for further drill-down.

| → C lacalhost:8080/jenkins/j | 의 ☆ 🔳 | | |
|------------------------------------|--|--------|-------|
| nkins > Helloworld > configuration | | | |
| | Choose operating system windows | | 0 |
| | Build | | |
| | Execute Windows batch command Command javas Hellolorld.java java Hellolorld | xinhee | |
| | SeleniumHQ html Suite Run browser semione Aggregate devolutionen test results Archive the artifacts Built other projects | tesi | Date: |
| | Publish JUrit test result report Publish Javanico Publish Selenium Report Record Ingerprints of thes to track usage Git Publisher E-mail Notification Set build status on Github corrent | | eeste |
| | Add post-build action - | | |

Jenkins - Code Analysis

Jenkins has a host of Code Analysis plugin. The various plugins can be found at <u>https://wiki.jenkins-ci.org/display/JENKINS/Static+Code+Analysis+Plugins</u>

| -> X 🙆 ht | tps://wiki.jenkins-ci.o | rg/display/JENKINS/Static+Code+Analysis+ | Plug-ins | | ☆ ≡ |
|--|--|--|---|--|-----------|
| shboard Jenkins | Plugins + Static Code | Analysis Plug-ins | | Browse + Q Search | - |
| | Code Analys | is Plug-ins har on Sop 24, 2014 (<u>Visw.change</u>) | i. | 🖉 Edit 🛛 🖶 Add 🔹 | 🕼 Tools 🔹 |
| Jenkins | | | | | |
| Home | Plugin Information | on | | | |
| Mailling lists Source code | Plugin ID | analysis-core | Changes | In Latest Release Since Latest Release | |
| Bughracker Security Advisories Events Donation Commercial Support | Latest Release Latest Release Date Required Core Dependencies | 1.74 (archives) Sep 07, 2015 1.596.1 and (version: 1.1, optional) taken-macre (version: 1.10, optional) maxie-plagin (version: 2.9, optional) matrix-project (version: 1.4) deshboard-view (version: 2.9.4, optional) | Source Code Issue Tracking Pull Requests Maintainer(s) | <u>GilHuti</u> Open Issues PvII:Requests <u>Ulli Hafner</u> (kt. drull) | |
| Wiki Site Map Documents | Usage | analysis-core - installations | Installations | 2014-Oct 26415 2014-Nov 26297 2014-Dec 26166 | |
| Meet Jankins Use Jankins Extend Jankins Plugins Sarvlet Container Notes | | 25000 20000 19000 10000 5000 0 10 11 12 01 02 03 04 05 06 07 08 09 Month | | 2015-Jun 27193 2015-Jun 27193 2015-Fab 27184 2015-Apr 28399 2015-Apr 28399 2015-Apr 28399 2015-Jun 28906 2015-Jul 29519 2015-Apg 29170 2015-Sep 29858 | |

This plugin provides utilities for the static code analysis plugins. Jenkins can parse the results file from various Code Analysis tools such as CheckStyle, FindBugs, PMD etc. For each corresponding code analysis tool, a plugin in Jenkins needs to be installed.

Additionally the add-on plugin <u>Static Analysis Collector</u> is available that combines the individual results of these plugins into a single trend graph and view.

The plugins can provide information such as

- The total number of warnings in a job
- A showing of the new and fixed warnings of a build
- Trend Reports showing the number of warnings per build
- Overview of the found warnings per module, package, category, or type
- Detailed reports of the found warnings optionally filtered by severity (or new and fixed)

Jenkins - Distributed Builds

Sometimes many build machines are required if there are instances wherein there are a larger and heavier projects which get built on a regular basis. And running all of these builds on a central machine may not be the best option. In such a scenario, one can configure other Jenkins machines to be slave machines to take the load off the master Jenkins server.

Sometimes you might also need several different environments to test your builds. In this case using a slave to represent each of your required environments is almost a must.

A slave is a computer that is set up to offload build projects from the master and once setup this distribution of tasks is fairly automatic. The exact delegation behavior depends on the configuration of each project; some projects may choose to "stick" to a particular machine for a build, while others may choose to roam freely between slaves.

Since each slave runs a separate program called a "slave agent" there is no need to install the full Jenkins (package or compiled binaries) on a slave. There are various ways to start slave agents, but in the end the slave agent and Jenkins master needs to establish a bi-directional communication link (for example a TCP/IP socket.) in order to operate.

To set up slaves/nodes in Jenkins follow the steps given below.

Step 1 – Go to the Manage Jenkins section and scroll down to the section of Manage Nodes.

| Jenkins + | | EVALEAUTOREMEEN |
|---------------------------------------|---|--|
| Build Queue No builds in the queue | - | Configure Clobal Security Secure Jenkins; define who is allowed to accessitise the system. |
| Build Executor Status | - | Relead Configuration frem Disk Discard all the loaded data in memory and relead everything them file system. Useful when you modified config files directly on disk. |
| 1 Idle 2 Idle | | Manage Plugins Add, remove, disable or enable plugins that can extend the functionality of Jenkins, (updates available) |
| | | Bystem information Displays various environmental information to assist trouble-shoeting. |
| | | System log captures output from java.util.logging output reisted to Jenkins. |
| | | Check your resource utilization and see If you need more computers for your builds. |
| | | Jenkins CLI Accessemenage Jonkins from your shell, or from your script |
| | | Scilal Console Executes arbitrary script for administration/trouble-shooting/tilagnostics. |
| | | Manage Nodes Add, ramove, control and monitor the various nodes that Jenkins runs jobs on |
| | | Marcana Cradantiate |

Step 2 – Click on New Node

| - → C 🗋 localhost:8080 |)/jenkins/comp | outer/ | | | | | Q 🕁 | = |
|-------------------------|----------------|--------|---------------|--------------------|------------------|-----------------|------------------|-----|
| 🏀 Jenkins | | | | | 🔍 se | arch | 3 | |
| lenkins → nodes → | | | | | | | ENALE AUTO NETTE | 21 |
| 🚖 Back to Dashboard | | 5 | Name (| Architecture | Clock Difference | Free Disk Space | Free Swap Space | Fre |
| 🔀 Manage Jenkins | | | master | Windows 7 (x86) | in sync | 229.89 GB | 12.13 GB | |
| 📕 New Node | | | Data obtained | | 3 min 12 sec | 3 min 12 sec | 3 min 12 sec | |
| 🔀 Configure | | | | | | | Refresh status | |
| Build Queue | - | | | | | | | |
| No builds in the queue. | | | | | | | | |
| Build Executor Status | - | | | | | | | |
| 1 Idle 2 Idle | | | | | | | | |

Step 3 – Give a name for the node, choose the Dumb slave option and click on Ok.

| Q Jenkins × | |
|--|--|
| ← → C 🗋 localhost:8080/jenkins/con | nputer/new Q 😭 🗮 |
| 😥 Jenkins | 🔍 search 🛛 🕐 |
| Jenkins ⊨ nodes ⊨ | |
| ▲ Back to Dashboard ☆ Manage Jenkins ■ New Node ☆ Configure | Node name build_slave Dumb Slave Adds a plain, dumb slave to Jankins. This is called "dumb" because Jankins doesn't provide higher level of integration with these slaves, such as dynamic provisioning. Select this type if no other slave types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc. |
| Build Queue 📼 | OK |
| Build Executor Status = | |

Step 4 – Enter the details of the node slave machine. In the below example, we are considering the slave machine to be a windows machine, hence the option of "Let Jenkins control this Windows slave as a Windows service" was chosen as the launch method. We also need to add the necessary details of the slave node such as the node name and the login credentials for the node machine. Click the Save button. The Labels for which the name is entered as "New_Slave" is what can be used to configure jobs to use this slave machine.

| → C Diocalhost:8080/jenkins/co | omputer/build_slave/co | nfigure | (| à 🗘 |
|--------------------------------|---|--------------------------|---|-----|
| Jenkins | | | Q search | 9 |
| ankins 🕨 nodes 🕨 build_slave | | | | |
| Back to List | Name | build_slave | | 0 |
| 🐛 Status | Description | | | 0 |
| Delete Slave | # of executors | 1 | | 0 |
| Configure | Remote root directory | D: Uankins | | 0 |
| Build History | Labels | New_Slave | | 0 |
| Load Statistics | Usage | Utilize this node as muc | h as possible 🔹 | 0 |
| Log | Launch method | Let Jenkins control this | Windows slave as a Windows service • | 0 |
| Build Executor Status 🚥 | | | This launch method relies on DCOM and is often associated with <u>subte problems</u> . Consider using Launch stave agents using Java Web Start Instaad, which also permits installation as a Windows service but is generally considered more reliable. | |
| | | Administrator user name | admin | 0 |
| | | Password | | |
| | | Host | dibmem30 | 0 |
| | | Run service as | Use Local System User 🔹 | |
| | | | Advanced | |
| | Availability | Keep this slave on-line | as much as possible 🔹 | 0 |
| | Node Properties | | | |
| | Environment varia Tool Locations | bles | | |

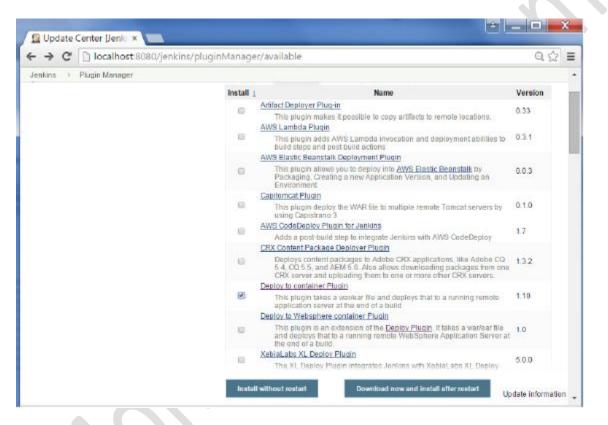
Once the above steps are completed, the new node machine will initially be in an offline state, but will come online if all the settings in the previous screen were entered correctly. One can at any time make the node slave machine as offline if required.

| 🙎 Nodes [Jenkins] 🛛 🗙 | | | | | | | | |
|---|------------------|-------|---------------|--------------------|------------------|-----------------|-----------------|-------------|
| ← → C 🗋 localhost:80 | 80/jenkins/compu | uter/ | | | | | Q | ¶☆ ≡ |
| 👲 Jenkins | | | | | | 🔍 search | | 3 |
| Jenkins → nodes → | | | | | | | EVALUA | UTO REFRECH |
| 🚖 Back to Dashboard | | \$ | Name 1 | Architecture | Clock Difference | Free Disk Space | Free Swap Space | Free Temp S |
| 🎉 Manage Jenkins | | - | build slave | | N/A | NIA | N/A | |
| 🛒 New Node | | | master | Windows 7 (x96) | in sync | 229.89 GB | 12.13 GB | 229.8 |
| 💥 Configure | | | Data obtained | 3 ma | 2 ms | 1 ma | 11 min | |
| Build Queue | - | | | | | | Refresh | status |
| No builds in the queue. | | | | | | | | |
| Build Executor Status | - | | | | | | | |
| I master 1 idie 2 idie ∎ build_slave (offline) | | | | | | | | |

Jenkins - Automated Deployment

There are many plugins available which can be used to transfer the build files after a successful build to the respective application/web server. On example is the "Deploy to container Plugin". To use this follow the steps given below.

Step 1 – Go to Manage Jenkins \rightarrow Manage Plugins. Go to the Available section and find the plugin "Deploy to container Plugin" and install the plugin. Restart the Jenkins server.



This plugin takes a war/ear file and deploys that to a running remote application server at the end of a build.

Tomcat 4.x/5.x/6.x/7.x

JBoss 3.x/4.x

Glassfish 2.x/3.x

Step 2 – Go to your Build project and click the Configure option. Choose the option "Deploy war/ear to a container"

| ← → C 🗋 localhost 8080/jenkins/job/Hel | iowonu/co | nigure | | Q 🟠 | = |
|--|--|---|--|-----|---|
| Jenkins + Helloworld + configuration | | ee the list of available oneitanment y | orizăs Det | eto | |
| | Invoke Ar Ant Version | | | • | |
| | | NewHome | | • | |
| | Targets | | L | × 0 | |
| | Aggregate o Archive the Build other Publish Jun Publish Java Publish Sele | projecta it lest result report | f xml sec serve the selected the service tax XVL second files, such as petitiestreports "well. Based of the fileset is <u>the workscare too</u> in long standard outputierror | 0 | |
| | Git Publishe | r lear to a container |) tests scores as 99% health. 5% failing tests scores as 9 | | |
| | E-mail Note | Contraction of the second s | Des | fic | |
| | Add post-b | Apply | | | |

Step 3 – In the Deploy war/ear to a container section, enter the required details of the server on which the files need to be deployed and click on the Save button. These steps will now ensure that the necessary files get deployed to the necessary container after a successful build.

| > C | 🗅 localhost 8080/jenkins/job/Demo/configu | ire | | 이 않 | = |
|----------|---|---|---------------------------------|------|---|
| enkins - | Demo + configuration | | | | |
| | | ee the list of available environment of | | ekte | |
| | invoke A | | | 0 | |
| | Ant Version | NewHome | | • | |
| | Targets | | | | |
| | | | Advanced. | ** | |
| | WAREAR | tangerapare-1.0.war | | Ð | |
| | Context pat | h spare | | Ð | |
| | Containers | Tomcat 7.x Manager user name | S112233 | | |
| | | | | | |
| | | Torncat URL | http://dxbmern10:8080 | | |
| | | | Delets | | |
| | | Add Container + | | | |
| | | Manager password Terricat URL | http://dxbmern10:8080 Delete | | |

Jenkins - Metrics & Trends

There are various plugins which are available in Jenkins to showcase metrics for builds which are carried out over a period of time. These metrics are useful to understand your builds and how frequently they fail/pass over time. As an example, let's look at the 'Build History Metrics plugin'.

This plugin calculates the following metrics for all of the builds once installed

- Mean Time To Failure (MTTF)
- Mean Time To Recovery (MTTR)
- Standard Deviation of Build Times

Step 1 – Go to the Jenkins dashboard and click on Manage Jenkins

| 📓 Dashboard [Jenkins] × | | | | |
|-------------------------|------------|--|----------|---------------------|
| ← → C 🗋 localhost:808 | 0/jenkins/ | | | ್ ಭ ⊒ |
| Ø Jenkins | | | 🧟 search | ٩ |
| Jenkins > | | | | EVABLE AUTO REPRESE |
| 쯜 New Item | | | | Padd description |
| 🌯 People | | Welcome to Jenkins! | | |
| 🔄 Build History | | | | |
| 💥 Manage Jenkins | | Please create new jobs to get started. | | |
| 强 Credentials | | | | |
| Build Queue | - | | | |
| No builds in the queue. | | | | |
| Build Executor Status | - | | | |
| 1 Idle 2 Idle | | | | |
| 2 1018 | | | | |

Step 2 – Go to the Manage Plugins option.

| ► → C 🗋 localhost.808 | 0/jenkins/ma | age | Q¢ |
|-------------------------|--------------|---|-----------------------------|
| Ø Jenkins | | C search | Ø |
| Jenkins + | | | DWBLEAKTO ASTARON |
| 😑 New Item | | Manage Jenkins | |
| 🍇 People | | . Your container doesn't ase UTF.8 to decode URLs. If you use m | on ASCH characters on a lob |
| Build History | | name etc, this will cause problems. See Containers and Tomcat | titen for more details. |
| 🎉 Manage Jenkins | | Unsecured Jenkins allows anyone on the network to aunch processes on your behalf. Consider at least enabling authentication to discourage misuse. | p Security Dismiss |
| Credentials | | Configure System Configure global settings and paths | |
| Build Queue | - | Configure Global Security | |
| No builds in the queue. | | Secure Jenkins, define who is allowed to access/use to | he cystem. |
| Build Executor Status | - | Reload Configuration from Disk Discard all the loaded data in memory and reload eve Useful when you modified config files directly on disk. | rything from file system. |
| 1 idie 2 idie | | Manade Plugins Add, remove, disable of enable plugins that can exten Jenkins, (updates available) | |
| | | System Information Displays various environmental information to assist to | ouble-shooting. |
| | | System Log System log captures output Yom java.util.logging | output related to Jenkins. |
| | | Check your resource utilization and see if you need m builds | ore computers for your |
| | | Jenkins CLI Access/manage Jenkins from your shell, or from your | script |
| | | Script Console Executes arbitrary script for administration/trouble-sho | ofingidiagnostics. |
| | | Manage Nodes Add, remove, control and monitor the various nodes th | at Jenkins runs jobs on. |
| | | Manage Credentials Create/delete/modify the credentials that can be used running in Jenkins to connect to 3rd party services | by Jenkins and by jobs |
| | | About Jenkins | |

Step 3 – Go to the Available tab and search for the plugin 'Build History Metrics plugin' and choose to 'install without restart'.

| 😫 Update Center [Jenki × | | | |
|------------------------------------|--------------------------------|---|-----------------------------------|
| ← → C 🗋 localhost:8080/jenkins/plu | uginManager/available | | ९.☆ ≡ |
| 🎡 Jenkins | | 🔍 search | 0 |
| Jenkins 🔸 Plugin Manager | | | |
| 🛧 Back to Dashboard | | Filter | 9, build-history-metrics-plugin |
| 💥 Manage Jenkins | Updates Available | Installed Advanced | |
| | Install 🛓 | Namo | Version |
| | Build History M Provides b | <u>etrics plugin</u> uiid metrics that encompass the history of all the runs | 1.2 |
| | Install without restart | Download now and install after restart | Update information obtained: 2 mi |

Step 4 – The following screen shows up to confirm successful installation of the plugin. Restart the Jenkins instance.

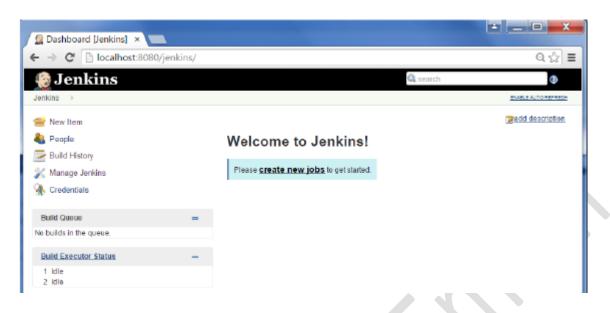
| → C Diocalhost:8080/jenkins/con | iparent pano_parent/co | | | Q☆ |
|---------------------------------|------------------------|---------------------------|---|-----|
| Jenkins | | | Q, search | ٩ |
| nkins > nodes > build_slave | | | | |
| Back to List | Name | build_slave | | 0 |
| Status | Description | | | 0 |
| Delete Slave | # of executors | 1 | | 0 |
| Configure | Remote root directory | D: Uenkins | | ۲ |
| Build History | Labels | New_Slave | | 0 |
| Load Statistics | Usage | Utilize this node as muc | h as possible | • 😣 |
| Log | Launch method | Let Jenkins control this | Windows slave as a Windows service | • 0 |
| Build Executor Status 😐 | | | This launch method relias on DCOM and is often associated with <u>subtle problems</u> . Consider using Launch stave agents using Java Web Start instead which also permits installation as a Windows service is generally considered more reliable. | |
| | | Administrator user name | admin | 0 |
| | | Password | | |
| | | Host | dxbmem30 | 0 |
| | | Run service as | Use Local System User | • |
| | | | Advanced | |
| | Availability | Keep this slave on-line a | as much as possible | • 0 |
| | Node Properties | | | |
| | Environment varia | bles | | |

When you go to your Job page, you will see a table with the calculated metrics. Metric's are shown for the last 7 days, last 30 days and all time.

| | C 🗋 localhost:8080 | /jenkins/job/Hell | oworld/ | Q. 🏠 🗄 | | |
|-------------|-----------------------|-------------------|--|---------------------|-------------|----------------------|
| 🔁 J | enkins | | | | 🔍 search | Ð |
| 00 | Helloworld + | | | | | ENABLE AUTO REFIREDH |
| Back | to Dashboard | | Project Hell | loworld | | |
| Statu | 16 | | rojectnen | oworru | | |
| | | | | | | Padd description |
| Chan | - | | | | | Disable Project |
| Work | space | | | | | |
| Build | Now | | Workspace | | | |
| S Delet | e Project | | -00000000 | | | |
| Confi | aure | | Recent Char | iges | | |
| | 2 | | | | | |
| 🚊 Bui | ld History | trend = | | Last 7 Days | 0 ms |] |
| <u>#12</u> | Oct 24, 2015 3:57 PM | | MTTR | Last 30 Days | 23 hr | |
| <u>≢11</u> | Oct 15, 2015 10:22 PM | | | All Time | 23 hr | |
| ≠1 0 | Oct 12, 2015 10:50 PM | | | Last 7 Days | 0 ms | |
|) <u>#9</u> | Oct 12, 2015 10:48 PM | | MTTE | Last 30 Days | 2 days 4 hr | |
| 2 #8 | Oct 12, 2015 10:40 PM | | | All Time | 2 days 4 hr | |
|) <u>#1</u> | Oct 12, 2015 10:39 PM | | | Last 7 Days | 0 ms | |
| 2 #8 | Oct 12, 2015 10:31 PM | | Standard Deviation | Last 30 Days | 52 sec | |
| #5 | Oct 12, 2015 10:29 PM | | | All Time | 52 sec | |
| 2 # | Oct 12, 2015 8:33 PM | | | | | - |
| | Oct 11, 2015 11:04 PM | | Permalinks | | | |
| i) #3 | Oct 11, 2015 10:51 PM | | Last build (#12). | | - | |
| | Oct 11, 2015 10:48 PM | | Last stable build Last successful t | ouild (#11), 8 days | s 17 hr ago | |
| _ | | | | (#12), 5,5 sec aq | | |

To see overall trends in Jenkins, there are plugins available to gather information from within the builds and Jenkins and display them in a graphical format. One example of such a plugin is the 'Hudson global-build-stats plugin'. So let's go through the steps for this.

Step 1 – Go to the Jenkins dashboard and click on Manage Jenkins





| > C 🗋 localhost 808 | 0/jenkins/ma | nage Q s | 13 |
|-------------------------|--------------|---|----|
| Jenkins | | Q, search 🕖 | |
| lenkins 🕨 | | Diebularto renes | 8 |
| 🔐 New Item | | Manage Jenkins | |
| 👌 People | | | |
| Build History | | Your container doesn't use UTF-8 to decode URLs. If you use non-ASCII characters as a job aname etc, this will cause problems. See <u>Containers</u> and <u>Tomcat H8n</u> for more details. | |
| Manage Jenkins | | Unsecured Jenkins allows anyone on the network to a launch processes on your behalf. Consider at least enabling authentication to discourace misuse. | |
| Credentials | | Configure System Configure global settings and paths | |
| Build Queue | - | Configure Global Security | |
| to builds in the queue. | | Secure Jenkins; define who is allowed to access/use the system. | |
| Build Executor Status | - | 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. | |
| 1 Idie 2 Idie | | 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 shall, 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/modely the credentials that can be used by Jenkins and by jobs running in Jenkins to connect to 3rd party services | |
| | | About Jenkins Saa bina sametrice and licenses information | |

Step 3 – Go to the Available tab and search for the plugin 'Hudson global-build-stats plugin' and choose to 'install without restart'.

| ← → C 🗋 localhost:8080/jer | kins/pluginManager/ | available | | | Q ☆ Ξ |
|----------------------------|---------------------|------------------|--|--|-------------|
| 🧶 Jenkins | | | 🔍 searc | h | 0 |
| Jenkins 🔸 Plugin Manager | | | | | |
| 🛧 Back to Dashboard | | | Fi | iter: 🔍 global-build-stats | |
| 💥 Manage Jenkins | Update | s Available | Installed Advanced | | |
| | Install 🕴 | | Name | | Version |
| | Ŀ | ludson global-bu | ild-stats plugin | | |
| | 8 | build result s | stats plugin will allow to ga atistics. It is a useful tool a trend over time. | ther and display global llowing to display global | 1.3 |
| | | | | | |
| | Install v | thout restart | Download now | and install after restart | Update info |

Step 4 – The following screen shows up to confirm successful installation of the plugin. Restart the Jenkins instance.

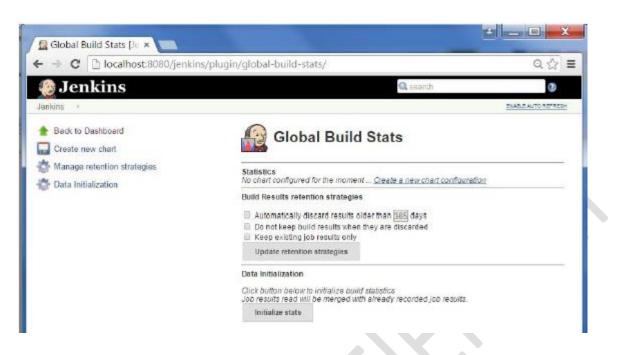


To see the Global statistics, please follow the Step 5 through 8.

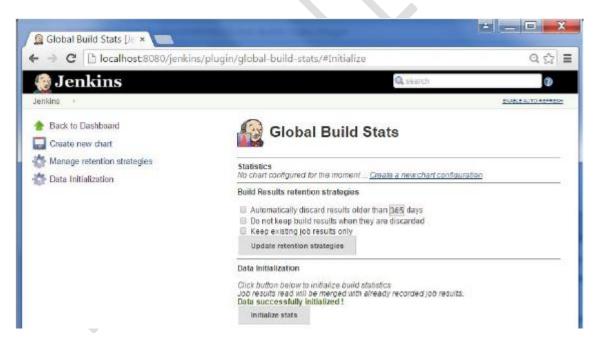
Step 5 – Go to the Jenkins dashboard and click on Manage Jenkins. In the Manage Jenkins screen, scroll down and now you will now see an option called 'Global Build Stats'. Click on this link.



Step 6 – Click on the button 'Initialize stats'. What this does is that it gather's all the existing records for builds which have already been carried out and charts can be created based on these results.



Step 7 – Once the data has been initialized, it's time to create a new chart. Click on the 'Create new chart' link.



Step 8 – A pop-up will come to enter relevant information for the new chart details. Enter the following mandatory information

- Title Any title information, for this example is given as 'Demo'
- 🔸 Chart Width 800
- 4 Chart Height 600
- Chart time scale Daily

4 Chart time length – 30 days

The rest of the information can remain as it is. Once the information is entered, click on Create New chart.

| Global Build Stats [/e × ← → C i localhost:8080/jenkins/plugin/global-build-stats/# Q ☆ = | |
|---|---|
| Search Casearch Casearch | |
| Jenkins > | |
| Back to Dashboard Global Build Stats | • |
| Image retention strategies Statistics Image retention strategies Statistics Image retention strategies No chart configured for the moment <u>Create a new chart configuration</u> | |
| Adding new chart | |
| Chart Width * Height: <u>B00 * B00</u> Chart time length: <u>30</u> days Filters: Job filtering: ® ALL Jobs © Job name regex: Node filtering: ® ALL Jobs © Master only © Node name regex: Launcher filtering: ® ALL Users © System only © Usemame regex: Statuses taken into account: Ø Success Ø Failures Ø Unstables Ø Aborted © Not Build Elements displayed on chart: Ø Build statuses with Y Axis type : Count ▼ Ø Total build time Ø Average build time | |
| Overview Create new chart Cancel | |
| Poge generated. Oct 24, 2016 4.03:17 PM BEST API Junking vor. 1.009.3 | |

You will now see the chart which displays the trends of the builds over time.

| C D localhost 8080/www.in | w/www.gkobility.ukid-stats)* | 요☆ 물 |
|---|--|----------------|
| Jenkins | Q. insert | 0 |
| Jerkina - | | Delinguarday (|
| Brack to Distribution Create new shart | Global Build Stats | |
| 🐉 Menage reteritor strategies 👘 Data Initialization | Bolistics Demo | |
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| | 21 Keep e citang jap eeu lit ann. | |
| | Epidole with the oblight | |
| | Tarla Intradiçulore | |
| | - Check for Haussian and Balance a | 1 |

If you click on any section within the chart, it will give you a drill down of the details of the job and their builds.

| 🔒 Głobal Build Stats Dr. x | | | | | | | |
|---|--|--|-------------------|---------------------------------|------------------------|-------------------------|--|
| | s/plugis/global-build | -stats/buildHistory | ijobFilter=ALLI | ketart=1444507205751@end=144450 | 1005751AssuccessShown= | falsetifallaretShow | n-truellaunstablesShowQ 👷 🚦 |
| Jenkins | | | | | | Q | |
| Janking 1 | | | | | | | PARA A COMPANY |
| Back to Dashiboard | 🕼 Glo | bal Build Se | arch | | | | |
| 👚 Blech to Clabel Dulls Stato | Note the Learcher | ng : @ ALL Jack (0. Jac reg : @ ALL Necks(0. Hering : @ ALL Users Meen Info account : 11 5 | O Byolem only : 0 | | | | |
| | Search results | | | | | | |
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| State and a state of the state | | | | | | Page generative Cut 24. | 2814364096 <u>102749</u> <u>Johnson 14</u> 0 |

Jenkins - Server Maintenance

The following are some of the basic activities you will carry out, some of which are best practices for Jenkins server maintenance

URL Options

The following commands when appended to the Jenkins instance URL will carry out the relevant actions on the Jenkins instance.

http://localhost:8080/jenkins/exit - shutdown jenkins

http://localhost:8080/jenkins/restart - restart jenkins

http://localhost:8080/jenkins/reload - to reload the configuration

Backup Jenkins Home

The Jenkins Home directory is nothing but the location on your drive where Jenkins stores all information for the jobs, builds etc. The location of your home directory can be seen when you click on Manage Jenkins \rightarrow Configure system.

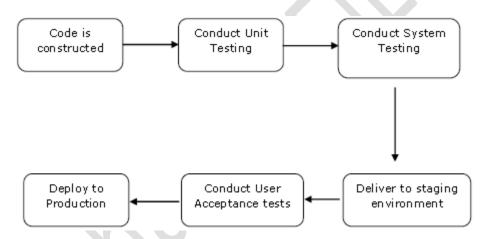
| 🖁 Configure System De 🛪 🔪 | | | | |
|---------------------------|---------------------|--|---|------------------------|
| → C D localhost:8080 |)/jenkins/configure | | | 의 슈 |
| 😥 Jenkins | | | 🔍 searm | 9 |
| enkins i configuration | | | | |
| New Herry | Ho | me directory | E:\Apps\Jenkins | |
| People | | | | Advanced |
| Build History | Syn | nom Merriage | | |
| C Managa Jankiro | | | | |
| Credentials | | | | |
| | # 0 | f executors | [Excaped HTML] Preview | |
| Sull Gueve | - Lai | tee in: | - | |
| builds in the queue. | Utr | age | Utilize this node as much as possible | - 6 |
| Suid Executor Status | - 00 | let period | 5 | |
| 1 101e 2 idie | 50 | M checkout retry count | 0 | |
| | | Restrict project naming bal properties | | |
| | 8 | Environment variables Tool Locations Yen Configuration | | |
| | | rault seltings provider | Use default maven settings | • |
| | De | fauit global settings provider | Use default maven global settings | • |
| | JO | 5 | | |
| | JD | Kinstallations | Auto 2006 | |
| | Git | | | |
| | GR | instalizăons | Nama Default | |
| | | | Path to Off executable git exe C-Windows hystem 24, C-Windows, C-Windows hystem 24, C-Windows, C-Windows hystem 24Windows Por C-Windows Hystem 24Windows Por Cathrogram Patenthy rosoft Stat. Server 16027 Science, Conference | werSheil/v1.01, Tex |
| | | Save Apply | | |

Set up Jenkins on the partition that has the most free disk-space – Since Jenkins would be taking source code for the various jobs defined and doing continuous builds, always ensure that Jenkins is setup on a drive that has enough hard disk space. If you hard disk runs out of space, then all builds on the Jenkins instance will start failing.

Another best practice is to write cron jobs or maintenance tasks that can carry out clean-up operations to avoid the disk where Jenkins is setup from becoming full.

Jenkins - Continuous Deployment

Jenkins provides good support for providing continuous deployment and delivery. If you look at the flow of any software development through deployment, it will be as shown below.



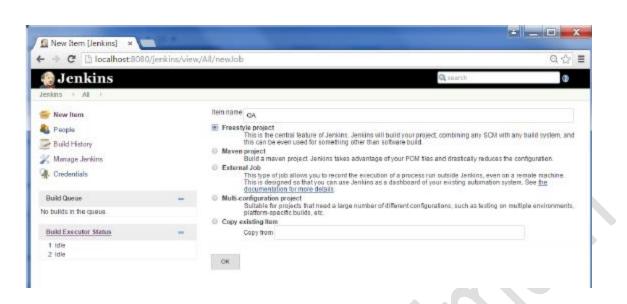
The main part of Continuous deployment is to ensure that the entire process which is shown above is automated. Jenkins achieves all of this via various plugins, one of them being the "Deploy to container Plugin" which was seen in the earlier lessons.

| Jankins • Helloworld • configuration | Invoke Ar Ant Version Tangets Publish Pind Publish com Aggregate a Archive the Build other (Publish Set Record fing Oit Publish Set Record fing | In the test of available deviations and a result of available deviations and a Newthome Bugs analysis results bined analysis results < | _ | 0 | |
|--------------------------------------|---|---|---|---|--|

There are plugins available which can actually give you a graphical representation of the Continuous deployment process. But first lets create another project in Jenkins, so that we can see best how this works.

Let's create a simple project which emulates the QA stage, and does a test of the Helloworld application.

Step 1 – Go to the Jenkins dashboard and click on New Item. Choose a 'Freestyle project' and enter the project name as 'QA'. Click on the Ok button to create the project.



Step 2 – In this example, we are keeping it simple and just using this project to execute a test program for the Helloworld application.

| 🙍 QA Config [Jenkins] 🔺 📃 | NAMES AND ADDRESS ADDR | ÷ _ 0 _ × |
|--|--|---|
| ← → C 🗋 localhost:8080/jenkins/job/QA/co | nfigure | @☆ ≡ |
| | Contraction | • |
| | ld Triggers | |
| | Build after other projects are built Build periodically | 0 |
| | Build when a change is pushed to GitHub | |
| | Poll SCM | 0 |
| | Id Environment | |
| | Create Selenium RC Instance | 0 |
| Bui | ld | |
| | Execute Windows batch command | 0 |
| c | javat HelloWorldTest.java java HelloWorldTest | |
| | Add build step - | Desete |
| | | |
| | t-build Actions | |
| | Add post-build action 🔹 | |
| | Serve Apply | |
| Help valueable this page | Page generated: Oct 24, 20 | H5 S 19:51 PM REST API Jankins var. 1.009.9 |

So our project QA is now setup. You can do a build to see if it builds properly.

| | C 🗋 localhost:8080 |)/jenkins/job/(| QA/ | | | | Q 🏠 🗏 |
|---------|--------------------------|------------------|--------------------|---------------|--------------|----------|--------------------|
| - J | enkins | | | | | 🔍 search | 0 |
| Jenkins | CA + | | | | | | DHBLE AUTO REFAILH |
| 🛧 Back | to Dashboard | | Project QA | | | | |
| 🔍 Statu | 15 | | | | | | |
| Char | | | | | | | Padd description |
| Work | - | | | | | | Disable Project |
| - | | | 1000 | | | | |
| Build | | | Workspace | | | | |
| - | te Project | | | | | | |
| 💥 Conf | igure | | Becent Char | 1095 | | | |
| a Bu | id History | trend - | | Last 7 Days | 2 min 28 sec | | |
| 0 25 | Oct 24, 2015 5:20 PM | | MTTR | Last 30 Days | 2 min 28 sec | | |
| Q E3 | Oct 24, 2015 5:19 PM | | | Al Time | 2 min 28 sec | | |
| 0 12 | Oct 24, 2015 5:18 PM | | | Last 7 Days | 0 ms | | |
| 0 EI | Oct 24, 2015 5:17 PM | | MTTF | Last 30 Dieys | 0 ms | | |
| | 🔊 <u>RSS for all</u> 🔊 E | RSS for failures | | AI Time | 0 ms | | |
| | | | | Last 7 Days | 75 ms | | |
| | | | Standard Deviation | Al Time | 75 ms | | |
| | | | | CM 1000 | 79.005 | 1 | |
| | | | | | | | |

Step 3 – Now go to you Helloworld project and click on the Configure option

| → C ☐ localhost:8080/ji | | | | | | | \$3 |
|--|-----------------------|----------------|---------------|-------------|--|-----------------------------------|-----------|
| Apps For quick access, place your box | okmarks here on the l | ocokmarks bar. | import bookme | arks.new | | ENABLE AUTO REP | |
| New Item People Build History Manage Jenkins Credentials | | All S V | Helloworld | | Last Failure 12 days - <u>#14</u> N/A | Cast Duration 6.6 sec N/A | tion D |
| Build Queue No builds in the queue. | - | S M L | Ø | Build Now E | RSS for failu | res SRS for just latest builds | |
| Build Executor Status | - | | 12 | Configure | | | |

Step 4 – In the project configuration, choose the 'Add post-build action' and choose 'Build other projects'

| 🗧 🔶 C 📋 localhost:8080/jenkins/job/Hell | oworld/configure | | ☆ ≡ |
|---|--|--|-----|
| Apps For quick access, place your bookmarks here on the | bookmarks bar. Import bookmarks now | | |
| Jenkins + Helloworld + configuration | | | - |
| | Aggregate downstream test results Archive the artifacts | targetrestreports' and pased to the workspace not I long standard F | 0 |
| | Build other projects | 1 | 0 |
| | Publish JUnit test result report Publish Javadoc Record fingerprints of files to track usage Git Publisher E-mail Notification | tests scores as 99% failing tests scores as 1 Delete | |
| | Add post-build action * | | |
| | Save Apply | | _ |

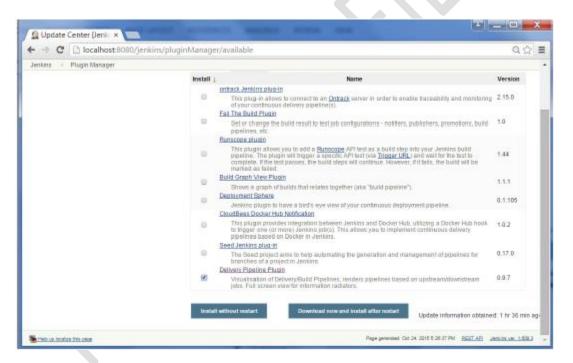
Step 5 – In the 'Project to build' section, enter QA as the project name to build. You can leave the option as default of 'Trigger only if build is stable'. Click on the Save button.

| nkins - Helloworld - configuration | | |
|------------------------------------|--|--------|
| | | |
| | Create Selenium RC Instance | 0 |
| | Build | |
| | Execute Windows batch command | 0 |
| | Command ErN, Jorec Hellokorld-Java Java Hellokorld Dee the build subtle entities unables | Delete |
| | Post-build Actions | |
| | | |
| | Build other projects Projects to build DA | 0 |
| | | |
| | Trigger only if build is stabile Trigger even if the build is unstable Trigger even if the build fails | Delete |
| | Add post-build action + | |

Step 6 – Build the Helloworld project. Now if you see the Console output, you will also see that after the Helloworld project is successfully built, the build of the QA project will also happen.



Step 7 – Let now install the Delivery pipeline plugin. Go to Manage Jenkins \rightarrow Manage Plugin's. In the available tab, search for 'Delivery Pipeline Plugin'. Click On Install without Restart. Once done, restart the Jenkins instance.



Step 8 – To see the Delivery pipeline in action, in the Jenkins Dashboard, click on the + symbol in the Tab next to the 'All' Tab.

| 🚊 Dashboard [Jenkins] 🛛 📃 | | | | | | | | _ 🗆 💻 |
|-------------------------------------|--------|---------|-----|------------|---------------------|---------------------------|-----------------------|------------------|
| + → C 🗋 localhost:8080/jer | ikins/ | | | | | | | Q 🕸 |
| 🎡 Jenkins | | | | | | Q search | h | 0 |
| Jankina + | | | | | | | 1 | NALIAJOAPAD |
| 🚔 New Item | | All | • | | | | | add description |
| Build History | | s | w | Name 1 | Last Success | Last Failure | Last Duration | |
| 🖌 Bulid History X Manage Jankins | | | ab. | Helloworld | 25 min - <u>#14</u> | 1 hr 49 min - <u>#12</u> | 1.4 sec | ø |
| Credentials | | ۲ | æ | <u>QA</u> | 25 min - <u>#5</u> | 28 min - <u>#2</u> | 1.4 sec | ø |
| Build Queue | - | loan: § | ML | | Legend | 🔉 RSS for all 👔 RSS for 1 | ailures 🛛 RSS for jus | it latest builds |
| No builds in the queue. | | | | | | | | |
| Build Executor Status | - | | | | | | | |
| 1 Idle 2 Idla | | | | | | | | |

Step 9 – Enter any name for the View name and choose the option 'Delivery Pipeline View'.

| → C □ localhost 808 | 0/jenkins/new | View | | QÛ |
|---|---------------|---|---|--------------|
| Jenkins | | | QL search | Ø |
| erkins + | | | | |
| Now Item | | View name Delivery Pipeline | | |
| S People | | Build Pipeline View | view. The complete pipeline of jobs that a version propagal | |
| Build History | | shown as a row in the view. | New. The complete piperine or jobs that a version propaga | as mough are |
| K Manage Jenkins | | Delivery Pipeline View Shows one or more delivery pipel | ine instances. | |
| Credentials | | List View Shows items in a simple list formation | f. You can choose which jobs are to be displayed in which v | lev: |
| Build Queue | | OK | | |
| lo builds in the queue. | | | | |
| Build Executor Status | - | | | |
| 1 idle | | | | |

Step 10 – In the next screen, you can leave the default options. One can change the following settings –

- **4** Ensure the option 'Show static analysis results' is checked.
- **4** Ensure the option 'Show total build time' is checked.
- For the Initial job Enter the Helloworld project as the first job which should build.
- Enter any name for the Pipeline
- Click the OK button.

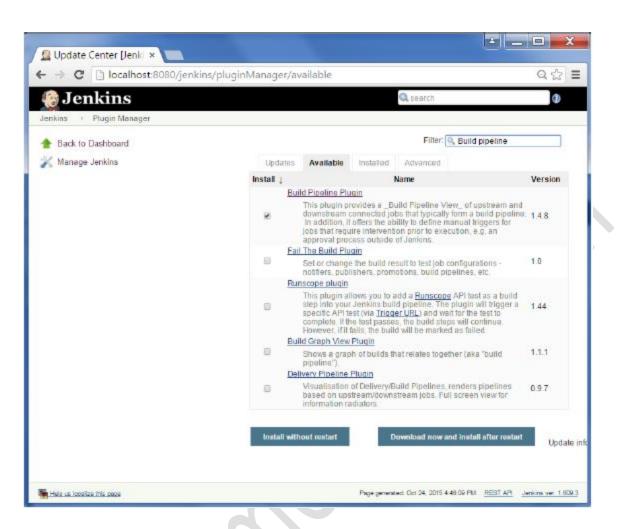
| -> C [] localhost a080/ | Jenkins/view | /Delivery%20Pipeline/configure | | | @.☆ ≡ |
|-------------------------|--------------|---|----------------------|------------|-----------|
| Jenkins | | | | 🔍 search | () |
| ins | | | | | |
| New Item | | Name | Delivery Pipeline | | |
| People | | View settings | | | |
| Build History | | Number of pipeline instances per pipeline | 3 | | • 0 |
| Edit View | | Display aggregated pipeline for each pipeline | 8 | | 0 |
| Delete View | | Number of columns | 1 | | • 0 |
| View Fullscreen | | Sorting | None | | • 0 |
| Manage Jenkins | | Update interval | 2 | | 0 |
| Credentials | | Enable start of new pipeline build | 8 | | 0 |
| Credendard | | Enable manual triggers | 0 | | 0 |
| uld Queue | - | Enable rebuild Show avatars | 8 | | 10 10 |
| uilds in the queue. | | Show commit messages | | | 0 |
| | | Show job description | | | 0 |
| ild Executor Status | - | Shaw jab promotions Shaw junit results | | | 8 |
| lde Ide | | Show static analysis results | 8 | | õ |
| N/O | | Show total build time | 8 | | 0 |
| | | URL for custom CSS file | | | 0 |
| | | URL for custom CSS file (fullscreen) | | | 0 |
| | | Pipelines | | | |
| | | Components | | | Delete |
| | | | Name | Firstjob | 0 |
| | | | Initial Job | Helloworld | • 0 |
| | | | Final Job (optional) |) | • 0 |
| | | | Add | | |
| | | Regular Expression | Add | | |
| | | Regular Expression | Add | | |
| | | OK Annh | | | |

You will now see a great view of the entire delivery pipeline and you will be able to see the status of each project in the entire pipeline.

| | | Delivery%20Pipeline/ | ९ ☆ ≡ |
|---|--|---|-------------------------|
| New Item People Build History Edit View Celorete View Manage Jenkins Credentials Ruid Queue No builds in the queue. Ruid Executor Status I Idia | 🎡 Jenkins | Q, search | 0 |
| Image: Security Status All Delivery Pipeline + Image: Security Status Firstjob Image: Security Status #14 triggered by user anonymous started 29 minutes ago Image: Security Status Total build time: 2 sec Image: Security Status Image: Security Status Image: Status Image: Security Status | Jenkins > Delivery Pipeline > | | ENABLE AUTO REFRESH |
| Build Queue Total build time: 3 sec No builds in the queue. Helloworld Build Executor Status Helloworld 1 Idla QA | Beaple Build History Edit View Delete View View Fullscreen Manage Jenkins | Firstjob #14 triggered by user anonymous started 29 minutes ago Total build time: 2 sec Helloworld QA Helloworld QA | ⊘add description |
| #12 triggered by user anonymous started 2 hours ago Total build time: 1 sec Helloworld QA Helloworld QA | No builds in the queue. Build Executor Status - 1 Idle | Total build time: 3 sec Helloworld Helloworld #12 triggered by user anonymous started 2 hours ago Total build time: 1 sec Helloworld QA | |

Another famous plugin is the **build pipeline plugin**. Let's take a look at this.

Step 1 – Go to Manage Jenkins \rightarrow Manage Plugin's. In the available tab, search for 'Build Pipeline Plugin'. Click On Install without Restart. Once done, restart the Jenkins instance.



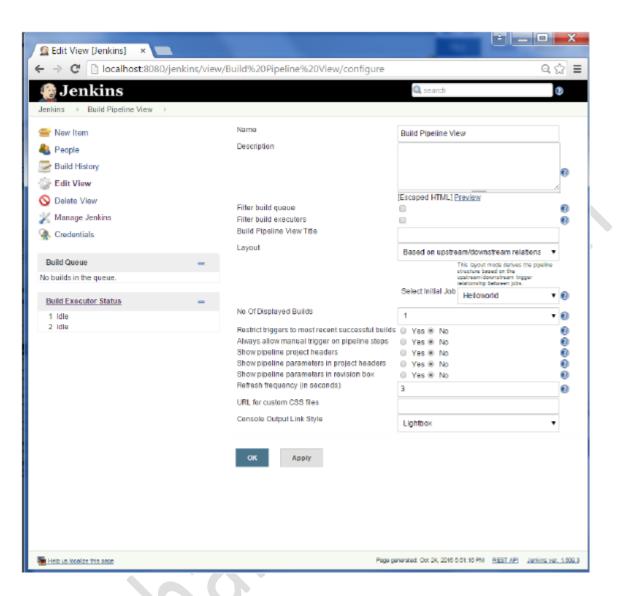
Step 2 – To see the Build pipeline in action, in the Jenkins Dashboard, click on the + symbol in the Tab next to the 'All' Tab.

| enkars - | | | | | | | | KORAL/TEPRES |
|---|---|-----|-----|----------|--------------|----------------|---------------|----------------|
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| | | | | | | | | |

Step 3 – Enter any name for the View name and choose the option 'Build Pipeline View'.

| O C localhost 808 | 0/jenkins/new | Niew | Q ☆ |
|---------------------------------------|---------------|---|-------------------------------|
| 🕘 Jenkins | | 🔍 aearch | 0 |
| enkins) | | | |
| New Item | | View name Build Pipeline View | |
| People | | Build Pipeline View | the stand of the stand of the |
| Build History | | Shows the jobs in a build pipeline view. The complete pipeline of jol propagates through are shown as a row in the view. | os mara version |
| K Manage Jenkins | | Delivery Pipeline View Shows one or more delivery pipeline instances. | |
| Credentials | | List View Shows items in a simple list format. You can choose which jobs are which view. | to be displayed in |
| Build Queue | - | | |
| to builds in the queue. | | OK | |
| Build Executor Status | - | | |
| 1 Idie | | | |

Step 4 – Accept the default settings, just in the Selected Initial job, ensure to enter the name of the Helloworld project. Click on the Ok button.

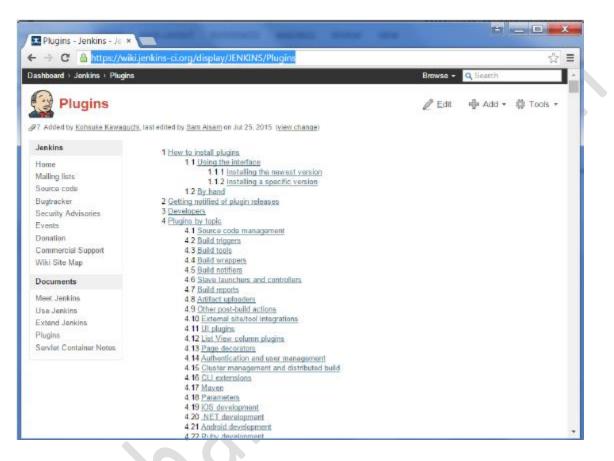


You will now see a great view of the entire delivery pipeline and you will be able to see the status of each project in the entire pipeline.

| Jenkins ans Bald Planine View | | Q imariti | ENBLIGATO REMON |
|----------------------------------|----------------|-----------|-----------------|
| uild Pipeline | | | |
| Poetre #14 | #13 Heltsworth | Pi GA | |
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Jenkins - Managing Plugins

To get the list of all plugins available within Jenkins, one can visit the link – <u>https://wiki.jenkins-ci.org/display/JENKINS/Plugins</u>



We've already seen many instances for installing plugins, let's look at some other maintenance tasks with regards to plugins

Uninstalling Plugins

To uninstall a plugin, Go to Manage Jenkins \rightarrow Manage plugins. Click on the Installed tab. Some of the plugins will have the Uninstall option. You can click these buttons to uninstall the plugins. Ensure to restart your Jenkins instance after the uninstallation.

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| | | dag-m collects the <u>EndBass</u> analysis results of the project (as and visualizes the found veryings) | 4.62 | | | Unimetal + |

Installing another Version of a Plugin

Sometimes it may be required to install an older version of a plugin, in such a case, you can download the plugin from the relevant plugin page on the Jenkins web site. You can then use the **Upload** option to upload the plugin manually.

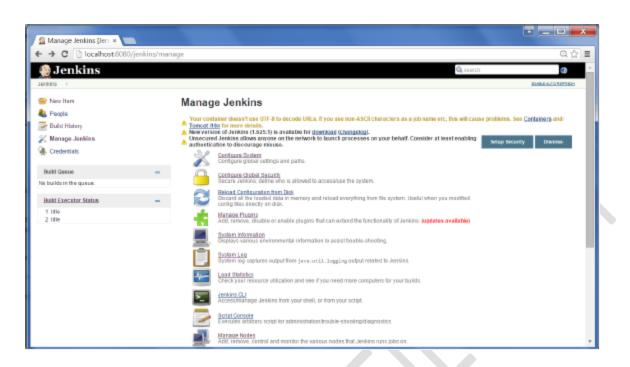
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| | Submit | | |
| | Upload Plugin | | |
| | You can upload a hplifile to install a plugin from outside the central plugin repository. | | |
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| | Submit | | |

Jenkins - Security

In Jenkins you have the ability to setup users and their relevant permissions on the Jenkins instance. By default you will not want everyone to be able to define jobs or other administrative tasks in Jenkins. So Jenkins has the ability to have a security configuration in place.

To configure Security in Jenkins, follow the steps given below.

Step 1 – Click on Manage Jenkins and choose the 'Configure Global Security' option.



Step 2 – Click on Enable Security option. As an example, let's assume that we want Jenkins to maintain it's own database of users, so in the Security Realm, choose the option of 'Jenkins' own user database'.

By default you would want a central administrator to define users in the system, hence ensure the 'Allow users to sign up' option is unselected. You can leave the rest as it is for now and click the Save button.

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Step 3 – You will be prompted to add your first user. As an example, we are setting up an admin users for the system.

| 📓 Sign up [Jenkins] 🛛 🗙 🗖 | |
|--|--|
| ← → C 🗋 localhost:8080/jer | akins/securityRealm/firstUser |
| 🧕 Jenkins | 🔍 search 👔 log in |
| Jenkins > Jenkins' own user database | |
| 摿 Back to Dashboard | Sign up |
| 💥 Manage Jenkins | |
| Note and the User Note and Not | Username: admin Password: Confirm password: |
| | Full name: Administrator E-mail address: al@gmail.com |
| | |

Step 4 – It's now time to setup your users in the system. Now when you go to Manage Jenkins, and scroll down, you will see a 'Manage Users' option. Click this option.

| → C Diocalhost:8080/jenkins/managé | | Q. 22 |
|------------------------------------|---|----------------|
| Jenkins) | and the second design of the second | LEAUTO ASTARON |
| 1 Idle | Add, remove, disable or enable plugins that can extend the functionality of Jenkin available) | s (updates |
| 2 idle | Bystem information Displays various environmental information to assist trouble-shooting | |
| | System Log System log captures output from Sava.util.logging output/related to Jenkins. | |
| | Load Statistics Check your resource utilization and see if you need more computers for your build | ts. |
| | Accessimating Jenkins from your shell, or from your script. | |
| | Strict Consule Executes arbitrary script for administration/trouble-shooting/diagnostics. | |
| | Manage Nodes Add, remove, control and monitor the various nodes that Jankins runs jobs on | |
| | Manage Credentials Create/Jekie/emodity the credentials that can be used by Jenkins and by jobs runn Jenkins to comnect to 3rd party services. | sing in |
| | About Janisms See the version and license information | |
| | Manage Cld Data Scrub configuration ties to remove remnants from old plugins and earlier versions | 4 |
| | Gotal Build State Displays state about daily build results | |
| | Manage Users Create/deletermodity users that can log in to this Jenkins | |
| | Allows a Jankin's administrator to review proposed scripts (written e.g. in Groevy) w mide the Jankin's process and so could bypass security restrictions. | ihich rim |
| | Prepare for Shubbown Stops executing now builds, so that the system can be eventually shut down safely | |

Step 5 – Just like you defined your admin user, start creating other users for the system. As an example, we are just creating another user called 'user'.

| ← → C localhost:8080/jenkins/securityRealm/addUser Q (2) = ✓ Jenkins Jenkins → Jenkins' ewn user database ✓ Back to Dashboard ✓ Manage Jenkins ✓ Create User ✓ Create User ✓ Username: User ✓ Desmodel ✓ Username: User ✓ Desmodel ✓ Sign up ✓ Create User ✓ Sign up ✓ Sign up ✓ Sign up | 🔓 Sign up (Jenkins) 🛛 🗙 🗖 | | | ÷ _ □ _ × |
|--|--------------------------------------|--|--|------------|
| Jenkins Jenkins' ewn user database | ← → C 🗋 localhost:8080/jen | kins/securityRealm/addUser | | Q ☆ ≡ |
| Back to Dashboard Sign up Manage Jenkins Greate User Confirm password: User Full name: User E-mail address: User | 🧕 Jenkins | | 🔍 search | (2) log in |
| Manage Jenkins Manage Jenkins Greate User Password: Confirm password: Full neme: E-mail address: user | Jenkins → Jenkins' own user database | | | |
| | 💥 Manage Jenkins | Usernama: use Password: Confirm password: Full name: use E-mail address: use | H Contraction of the second se | |

Step 6 – Now it's time to setup your authorizations, basically who has access to what. Go to Manage Jenkins \rightarrow Configure Global Security.

Now in the Authorization section, click on 'Matrix based security'

| ⊢ → O D localhe | nt8080/jenkins/configureSecurity/ | | 9.0 |
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| in the second | | | |
| Same Apply | | | |

Step 7 – If you don't see the user in the user group list, enter the user name and add it to the list. Then give the appropriate permissions to the user.

Click on the Save button once you have defined the relevant authorizations.

Your Jenkins security is now setup.

Note – For Windows AD authentication, one has to add the Active Directory plugin to Jenkins.

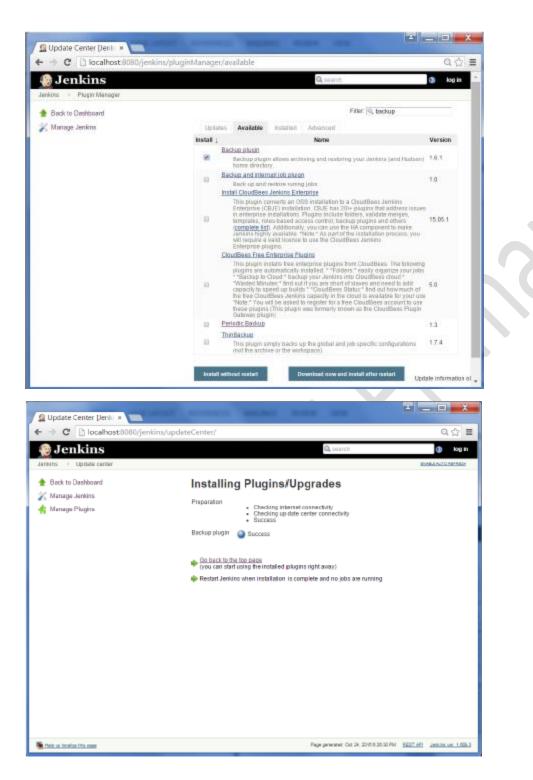
Jenkins - Backup Plugin

Jenkins has a backup plugin which can used to backup critical configuration settings related to Jenkins. Follow the steps given below to have a backup in place.

Step 1 – Click on Manage Jenkins and choose the 'Manage Plugins' option.

| Manage Jenkins (Jen × | - | | | |
|---|----------------|---|--|---|
| ← → C 🗋 localhost808 | 0./jenkins/man | age | | 0.☆ ≡ |
| 🔮 Jenkins | | | 🔍 search | 0 |
| Jenkina -> | | | | ENALE ALTO PREMISE |
| 😑 New Item | | Manage Jeni | kins | |
| & People ≥ Build History ∦ Manage Jenkina & Codertials | | Torncat if lin for more A New version of Jenkis Unsecured Jonkins al authentication to disc | res (1.425-ti) is available for <u>downland (chanaelog)</u> . Howe anyone on the network to lausch precesses on year behalf. Consider at least enabling courage masse. | re. See <u>Containers</u> and Security Doenias |
| Build Queue No builds in the queue. | - | Cantours | Provide Tabulti relative, define without a statewood to accessive the system. | |
| Build Executor Matus | - | Discard all | inflauration train Disk. I the leaded data in memory and reload everything from file system. Useful when you modified s directly en disk. | |
| 1 kdle 2 kdle | | Add, rema | r <u>hades</u> rea, disable or enable plugins that can estand the functionality of Jenkins, tapitates ovafiable) | |
| | | Evstern tel Displays w | BLIDABED orises environmontal infermation to assist troublo-shooting. | |
| | | System Lo System log | 20 g captures output from Sava.ut.S1.logz.Sng output related to Jenkins. | |
| | | Lead State Check you | tation a resource utilization and see if you need more competers for your builds. | |
| | | Jantins Cl Accessive | LL anoge Jestiins from your shell, or fram your script. | |
| | | Script Con | 1991) włatkawy script for administration/bouble-chooling/clagnostics. | |
| | | Mariage Ri Add, fema | Bidex rea, control and monitor the various nodes that Jenaits runs jobs on. | |

Step 2 – In the available tab, search for 'Backup Plugin'. Click On Install without Restart. Once done, restart the Jenkins instance



Step 3 – Now when you go to Manage Jenkins, and scroll down you will see 'Backup Manager' as an option. Click on this option.

| - → C 🗋 localhost:8080/jenkins/manage | | 의 ☆ | = |
|---------------------------------------|----|---|----|
| lenkins > | | ENALE AUTO REFRECH | + |
| | È, | <u>System Log</u> 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. | |
| | 2 | Jenkins CL1 Access/manage Jenkins from your shell, or from your script. | |
| | 2 | <u>Script Console</u> Executes arbitrary script for administration/trouble-shooting/diagnostics. | |
| | ₫. | Manage Nodes Add, remove, control and monitor the various nodes that Jenklins runs jobs on. | į, |
| | R | 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. | I |
| | 0 | About Jenkins See the version and license information. | I |
| | | Manace Old Data Scrub configuration files to remove remnants from oid plugins and earlier versions. | I |
| | | <u>Global Build State</u> Displays stats about daily build results | I |
| | 4 | Manage Users Create/delete/modify users that can log in to this Jenkins | I |
| | 1 | In-process Script Approval Allows a Jenkins administrator to review proposed scripts (written e.g. in Groovy) which run inside the Jenkins process and so could bypass security restrictions. | I |
| | ŋ | <u>Backup manager</u> Backup or Restore Jenkins configuration files | |
| | - | Propare for Shutdown Stops executing new builds, so that the system can be eventually shut down safely. | |

Step 4 – Click on Setup.

| - → C 🗋 localhost:8080 | /jenkins/backup/ | | | ର୍ ଜ |
|--------------------------|----------------------|------------------------------|----------|--------|
| 🍓 Jenkins | | | Q search | () log |
| lenkins 🕐 Backup manager | | | | |
| New Item | | Backup manager | | |
| B People | | Dackup manager | | |
| Build History | 3.0 | - 000 | | |
| 🔀 Manage Jenkins | | Setup | | |
| 🚯 Credentials | | Backup Hudson configuration | | |
| Build Quoue | - 5 | Restore Hudson confiduration | | |
| No builds in the queue. | in the second second | | | |
| Build Executor Status | - | | | |
| 1 kile 2 kile | | | | |

Step 5 – Here, the main field to define is the directory for your backup. Ensure it's on another drive which is different from the drive where your Jenkins instance is setup. Click on the Save button.

| g Jenkins × | | | | ± × |
|--|-------------|--|--|------------|
| ← → C 🗋 localhost:8080/je | enkins/back | kup/backupsettings | | ର୍ഹ ≣ |
| Jenkins Backup manager | | | 🔍 search | (2) log in |
| Sev Item | | Backup Configuratio | config files | |
| Manage Jenkins | | Hudson root director Backup directory Format File name template | y E:Jenkins D:Backup [zp •] backup @date@.@extension@ | |
| Build Queue No builds in the queue. | - | Custom exclusions Verbose mode Configuration file | | 0 |
| Build Executor Status 1 Idle | - | Conliguration me No shutdown Backup content | s (Julii) only | 0 |
| 2 Idle | | Backup job worke Backup builds hit Backup maven at Backup fingerpring | story rifacts archives | |

Step 6 – Click on the 'Backup Hudson configuration' from the Backup manager screen to initiate the backup.

| Jenkins × | | And Address of the owner. | |
|--------------------------|-------|--|-----------|
| ← → C 🗋 localhost 8080 | Q 샵 클 | | |
| Jenkins | | Q search | () log in |
| Jenkins + Backup manager | | | |
| 🔗 New Item | | 👔 Backup manager | |
| A People | | Backup manager | |
| Build History | | 3,0 | |
| 🂥 Manage Jenkins | | Setup | |
| R Credentials | | Rackup Hudson configuration | |
| Build Quoue | - | Restore Hudson configuration | |
| No builds in the queue, | | inerest of the second s | |
| Build Executor Status | - | | |

The next screen will show the status of the backup

| Jenkins Backup manager Penkins Backup manager New Item Jenkins is going to shut down People []NF0] Backup started at []0/24/15 19:19:31] Build History []NF0] Setting hudson in shutdown mode to avoid files corruptions. Build History []NF0] Number of running jobs detected : 0 Manage Jenkins []NF0] rull bes finished. []NF0] Full bes finished. []NF0] rull bes fulles: 011 []]NF0] Saved files : 011 []]NF0] Saved files : 011 []]][]]OFO] Cancel hudson mode []]NF0] Cancel hudson mode | → C localhost:8080/jenk | C localhost:8080/jenkins/backup/backup | | |
|---|---|---|---|-----------|
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| | | | Jenkins is going to shut down | _ |
| | Build History Manage Jenkins | [INFO] Setting hudson [INFO] Waiting all job [INFO] Wumber of rund [INFO] All jobs finish [INFO] Full beckup fil [INFO] Saved files : 0 [INFO] Number of error | <pre>in shutdown mode to avoid files corruptions. is end ing jobs detected : 0 ind. le name : D:\Beckup\beckup_20151024_1919.zip 211 :s : 0</pre> | |

To recover from a backup, go to the Backup Manager screen, click on Restore Hudson configuration.



The list of backup's will be shown, click on the appropriate one to click on Launch Restore to begin the restoration of the backup.

| > C 🗋 localhost:808 | kup/launchrestore Q ☆ | = | |
|--|-----------------------|--|--|
| 🍪 Jenkins | | Septiti () log in | |
| lenitins 🕕 Backup manager | | | |
| New Item People Build History Managa Jenkins Credentials | | Backup manager Available backup in D:\Backup : backup_20151024_1919.zip Lexinch restore | |
| Build Queue | - | | |
| No builds in the queue. | | | |
| Build Executor Status | - | | |
| 1 Idio 2 Idie | | | |

Resources

https://www.jenkins.io/

https://www.jenkins.io/doc/

https://www.jenkins.io/doc/book/system-administration/

https://www.tutorialandexample.com/jenkins-tutorial/