

Module 03 - Using Jenkins

Workshop DevOps

Module Summary

Fingerprints






Remote API

Jenkins Dashboard – Key Concepts

Job/Project : a runnable task (e.g. compiling code, running tests, etc.)






Build : the result of a single execution of a job/project

Build Status : last status of a build

Icon	Status
	In Progress
	Passed
	Unstable
	Failed
	Aborted

Build Trend : weather icon showing the trend of the last builds

View : a way to display jobs in tabbed categories

Icon	Health
	Sunny , more than 80% of Runs passing
	Partially Sunny , 61% to 80% of Runs passing
	Cloudy , 41% to 60% of Runs passing
	Raining , 21% to 40% of Runs passing
	Storm , less than 21% of Runs passing

Jenkins Dashboard

- 1. Dashboard
- 2. Breadcrumbs
- 3. Sidebar
- 4. Build Queue
- 5. Build Executor Status
- 6. "All" view
- 7. Jobs/projects
- 8. Build
- 9. Build status
- 10. Build trend

1

2

3

4

5

6

7

8

9

10

New Item

People

Build History

Project Relationship

Check File Fingerprint

Manage Jenkins

Support

Credentials

My Views

Pooled Virtual Machines

Groups

Roles

Docker Traceability

Build Queue

No builds in the queue.

Build Executor Status

1 part of App

2 part of App

Wasted Minutes

0 ms were wasted because you didn't have enough executors.

6

All

+

S

W

Name ↓

Last Success

Last Failure

Last Duration

9

10

App

Base Image Build

Just another build

With custom build environment

6 mo 15 days - #32

5 mo 13 days - #31

5 mo 13 days - #11

5 mo 13 days - #7

N/A

5 days 1 hr - #32 kohsuke/acmecorp-base

6 mo 21 days - #4

6 mo 21 days - #1

44 sec

23 sec

14 sec

6.7 sec

add description

Legend

RSS for all

RSS for failures

RSS for just latest builds

S	W	Last Success	Last Failure	Last Duration	
		26 min - #1	N/A	8 ms	
Build status (blue)	Trend (weather)	Build 1	No failed builds	Length of a build	Start new build

Job Configuration – Key Concepts

Workspace : a working directory where code, builds, and other temporary files are stored during a build

Build trigger : a criteria or a condition for triggering a build (e.g. time, code change, etc.)

Build step : a task executed during the build process (e.g. shell script)

Post-build step : additional task executed at the end of the build

Artifact : an immutable file generated at the end of the build (jar/zip file)

Job Configuration

1. Job/project configuration page

2. Build History:
2.a Stable build
2.b Failed build

The screenshot shows the Jenkins Job Configuration page for a project named 'Base Image Build'. The page is divided into a left sidebar with navigation links and a main configuration area. A large white bracket labeled '1' spans the top of the configuration area. The sidebar contains links like 'Back to Dashboard', 'Status', 'Changes', 'Workspace', 'Build Now', 'Delete Project', 'Configure', 'GitHub', 'Exports', 'Skip Builds', 'GitHub Hook Log', 'Git Polling Log', 'Move', 'Promote Configuration', 'Groups', and 'Roles'. The 'Build History' section in the sidebar is expanded, showing a list of builds. A large black bracket labeled '2' groups the last three builds. Arrows labeled '2.a' and '2.b' point to the second and third builds respectively. The main configuration area includes fields for 'Project name' (Base Image Build) and 'Description'. Below these are checkboxes for 'Discard Old Builds', 'Show Consolidated Build View', 'Docker Container', and 'Enable Git validated merge support'. A 'GitHub project' field contains the URL 'https://github.com/kohsuke/docker-jenkins-demo-base/'. Further down are 'Advanced Project Options' and 'Source Code Management' (set to Git). At the bottom are 'Save' and 'Apply' buttons.

1

Jenkins > Base Image Build > configuration

Back to Dashboard
Status
Changes
Workspace
Build Now
Delete Project
Configure
GitHub
Exports
Skip Builds
GitHub Hook Log
Git Polling Log
Move
Promote Configuration
Groups
Roles

Build History trend ==

#32 kohsuke/acmecorp-base	Dec 30, 2015 1:12 PM
#31 kohsuke/acmecorp-base	Jul 24, 2015 8:50 PM
#30 kohsuke/acmecorp-base	Jul 16, 2015 7:23 AM

2.a
2.b

2

Project name
Base Image Build

Description

[Escaped HTML] [Preview](#)

☐ Discard Old Builds
☐ Show Consolidated Build View
☐ Docker Container
☐ Enable Git validated merge support

GitHub project
<https://github.com/kohsuke/docker-jenkins-demo-base/>

☐ This build is parameterized
☐ Permission to Copy Artifact
☐ Promote builds when...
☐ Override the default scheduler preference
☐ Disable Build (No new builds will be executed until the project is re-enabled.)
☐ Execute concurrent builds if necessary
☐ Restrict where this project can be run

Advanced Project Options

Advanced...

Source Code Management

☐ None
☒ Git

Save Apply

Manage Jenkins – Key Concepts

Plugin : an extension to Jenkins core functionalities

Node : a machine part of the Jenkins environment and capable of executing a job (master/agent)

Manage Jenkins

1. Manage Jenkins (admin console)

2. Configuration pages:

2.a Configure System
(global configuration)

2.b Configure Global Security

2.c Manage Plugins
(Jenkins update center)

2.d Manage Nodes
(node/slave configuration)

The screenshot shows the Jenkins web interface. At the top, a large bracket labeled '1' spans the width of the page. On the left, a sidebar contains a list of links: New Item, People, Build History, Project Relationship, Check File Fingerprint, Manage Jenkins (highlighted), Support, Credentials, My Views, Pooled Virtual Machines, Groups, Roles, and Docker Traceability. Below this sidebar, there are three sections: 'Build Queue' (empty), 'Build Executor Status' (showing two executors, #64 and #63, both with red progress bars), and 'Wasted Minutes' (0 ms). On the right, the 'Manage Jenkins' section is titled. It contains a list of links, each with an icon: Configure System (wrench), Configure Global Security (lock), Configure Analytics (bar chart), Reload Configuration from Disk (refresh), Manage Plugins (puzzle pieces), System Information (monitor), System Log (notepad), Load Statistics (heartbeat), Jenkins CLI (terminal), Script Console (pencil), Manage Nodes (server rack), and High Availability Status (checkmark). A vertical black box highlights the 'Manage Jenkins' section. To the left of this box, the numbers '2', '2.a', '2.b', '2.c', and '2.d' are placed next to their respective icons. A yellow warning triangle is next to the '2' label. The '2.d' label is also next to the 'Manage Nodes' link.

Jenkins

ENABLE AUTO REFRESH

Manage Jenkins

2. Jenkins (1.609.15.1) is available for [download](#) ([changelog](#)).

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

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

[Configure Analytics](#)
Configure the storage and reporting of Analytics

[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.

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

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

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

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

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

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

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

2.d [High Availability Status](#)
Monitor the status of the Jenkins Enterprise HA cluster

Build Queue

No builds in the queue.

Build Executor Status

Executor	Build	Status
1	part of App	#64
2	part of App	#63

Wasted Minutes

0 ms were wasted because you didn't have enough executors.

Different Types of Jenkins Jobs (1/2)

Freestyle : Freestyle build jobs are general-purpose build jobs, which provides maximum flexibility. It can be used for any type of project.

Pipeline : This project runs the entire software development workflow as code. Instead of creating several jobs for each stage of software development, you can now run the entire workflow as one code.

Multiconfiguration : The multiconfiguration project allows you to run the same build job on different environments. It is used for testing an application in different environments.

Different Types of Jenkins Jobs (2/2)

Folder : This project allows users to create folders to organize and categorize similar jobs in one folder or subfolder.

GitHub Organization : This project scans your entire GitHub organization and creates Pipeline jobs for each repository containing a Jenkinsfile

Multibranch Pipeline : This project type lets you implement different Jenkinsfiles for different branches of the same project.

Fingerprints

Jenkins utilizes fingerprints for tracking a specific instance of a file. **This is critically important when attempting to determine which particular version of a file was used during a build.**

The fingerprint of a file is simply a MD5 checksum that can be used for comparing files.

MD5: d41d8cd98f00b204e9800998ecf8427e

Remote API


Many objects of Jenkins provide the REST remote access API.

<http://localhost:8080/api/>

The simplest way to access Jenkins REST API is to gather the User Token which is available by selecting your User and clicking on Configure.

<http://localhost:8080/user/jenkins/configure>

API Token

User ID	<input type="text" value="jenkins"/>
API Token	<input type="text" value="f1499cc9852c899d327a1f644e61a64d"/> 

Change API Token

Labs

03 - Using Jenkins