Continuous Integration with Jenkins

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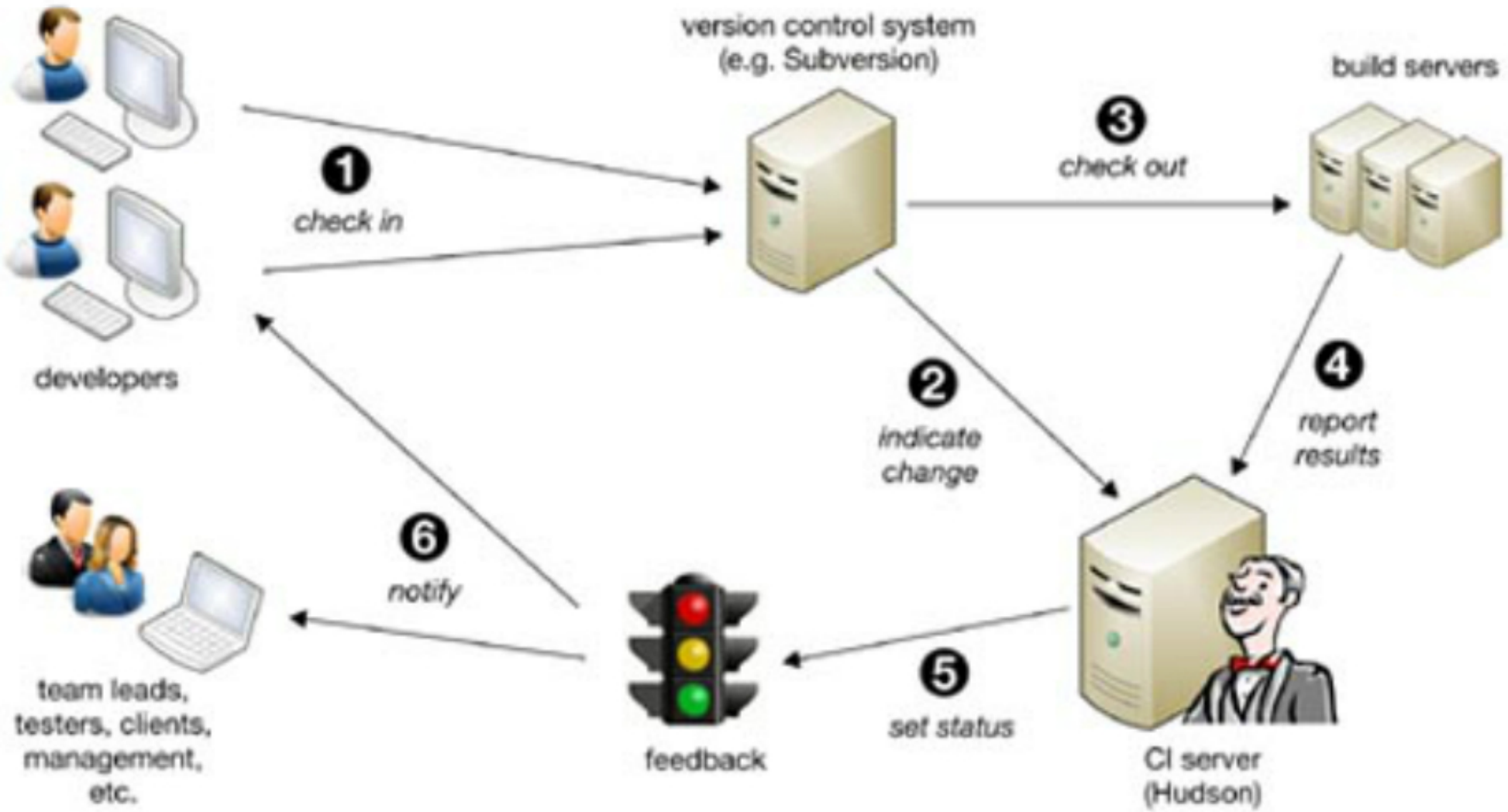
Overview

- Continuous Integration, Explained
- Deployment Pipeline
- CI + Build Script philosophies
- Plugins
- API

What Is Continuous Integration?


version control system
(e.g. Subversion)
build servers
developers
1
check in
3
check out
2
indicate
change
4
report
results
6
notify
5
set status
team leads,
testers, clients,
management,
etc.
feedback
CI server
(Hudson)

Core Concepts

- monitor changes
- build on commit (or push)
- run tests
- release
- publish metrics
- integrate often

TC

ATLASSIAN
BAMBOO

Hudson Or Jenkins?

https://github.com/hudson

github | Search... | Explore | Gist | Blog | Help | jamescarr

hudson (Hudson CI)

ORGANIZATION

URL http://hudson-ci.org
Location Global
Member Since Feb 01, 2011

14 Public Repos
9 Members

Public Repositories (14)

Find a Repository...

All Repositories | Sources | Forks | Mirrors

hudson Java 170 38

Hudson Continuous Integration Platform

Last updated 13 days ago

all commits | commits by owner | 52 week participation

maven-hpi-plugin Java 3 3

Maven Plugin for Hudson

Last updated a month ago

all commits | commits by owner | 52 week participation

Organization Members (9)

8nevil8 (Nikita Levyankov)
25 Public Repositories, 1 followers

antkozak (Anton Kozak)
26 Public Repositories, 2 followers

geoffw (Geoff W)
2 Public Repositories, 0 followers

jdillon (Jason Dillon)
11 Public Repositories, 12 followers

jvanzyl (Jason van Zyl)
18 Public Repositories, 46 followers

mcculls (Stuart McCulloch)
12 Public Repositories, 7 followers

mosabua (Manfred Moser)
30 Public Repositories, 55 followers

tobrien (Tim O'Brien)
27 Public Repositories, 24 followers

b, Inc. [US] https://github.com/jenkinsci

github | Search... | Explore Gist Blog Help | jamescarr | jenkins

jenkinsci (Jenkins)

ORGANIZATION

URL http://jenkins-ci.org/
Location Santa Clara, CA
Member Since Jul 21, 2009

750 Public Repos
368 Members

Public Repositories (750)

Find a Repository...

All Repositories | Sources | Forks | Mirrors

jenkins Java 1,329 497
Forked from kohsuke/hudson
Jenkins Continuous Integration Server
Last updated 11 hours ago
all commits | commits by owner | 52 week participation

unity3d-plugin Java 2 4
Forked from lacostej/jenkins-unity3d-plugin
Jenkins Unity3d plugin
Last updated 8 hours ago

Organization Members (368)

aambrose (Adam Ambrose)
1 Public Repositories, 0 followers

aaronwalker (Aaron Walker)
19 Public Repositories, 9 followers

abayer (Andrew Bayer)
45 Public Repositories, 31 followers

acmarques (Antonio Marques)
16 Public Repositories, 10 followers

adamstrickland (Adam Strickland)
48 Public Repositories, 8 followers

adphillips (Aaron Phillips)
6 Public Repositories, 5 followers

adriancole
0 Public Repositories, 1 followers

agray (Andrew Gray)
2 Public Repositories, 0 followers

Core Features

Easy to Setup

- Runs standalone as a service (both *nix and windows)
- distro packages
- Can be deployed as a war to a web container of your choosing
- Plugins can be installed through UI

Access Control

- Default: Completely Public
- A number of auth schemes exist
  - LDAP
  - Github Users
  - System Accounts
  - Moar!
    - https://wiki.jenkins-ci.org/display/JENKINS/Plugins#Plugins-Authenticationandusermanagement

Build Queue

- Executor lists builds being executed currently
- Max concurrently running jobs is configurable
- When maxed out, new builds sit in build queue

Multiple Nodes

- Jenkins can be configured to
  - Run Standalone
  - Master and slave nodes as part of a cluster

- Master node manages builds and build queue
- Slaves are where jobs execute

Jobs

- Manually Triggered
- Scheduled
- Poll on SCM change
- Triggered upon completion of an "upstream job"

Build History

- The history of each build is captured, tracking all the details
- Graphs test and coverage results over time
- Full build details and logs are available

Before We Move On

Just a little bit of philosophy...

Build Scripts

Can either be...

- HUGE
- small

While CI server can...

- do a lot
- do little but call scripts

Solution?

Find the right trade off that works well for your organization!

My preference:

- Build scripts strictly build
- CI server handles the rest
  - or hooks into other systems that do!

Example Deployment Pipeline

In Java

The Project

- Simple Library JAR
- Uses gradle to build
- Using Git Flow (dev and master branches)
- released to internal Artifactory server

First You Will Need

- Plugins
  - Git
  - Artifactory
  - Gradle
- Add SSH key from jenkins server as deploy key

The Pipeline

For the pipeline we'll have two releases driven by git branches:

- SNAPSHOTs
- RELEASE

SNAPSHOT

- Build on change
- run tests
- report test results
- publish SNAPSHOT release

RELEASE

- Build on change
- run tests
- report test results
- publish RELEASE
- bump version for next SNAPSHOT release

Not Just For Java!

I actually use Jenkins to ...

- publish npm modules
- deploy node.js based web apps
- hot deploy PHP sites (with rollbacks)

Plugins

Jenkins is kind of useless without plugins.

Here are some of my favorites...

Green Balls

The default "Passing" icon is blue while the failing one is red.

I prefer green / red

Artifactory Plugin

Supports publishing various java based builds to artifactory. Including:

- Ant + Ivy
- Maven
- Gradle

SSH / SFTP

SFTP files out to remote servers or execute commands over SSH as a post-build operation

Deployer Plugin

Deploys WARs to remote containers that support open remote deployments

- Tomcat
- JBoss
- Jetty
- Glassfish

Node.js

Execute Node.js code as a build step!

Chuck Norris Plugin

API

Remote Access API

- Just go to http://localhost:8080/api/
- Provides REST API for interacting with Jenkins
  - Great for building custom team radiators!

Jenkins IRC bot

- Allows communication from an IRC channel with the build server
- In addition to kicking off builds, also reports statuses

Tips

- Central CI Servers SUCK in medium to large organizations
  - Consider CI server per team
  - Or per department
- Keep an open mind. Doesn't do what you need?
  - investigate options!

Thank You!

Questions?