



# Continuous Integration\_ (Jenkins/Hudson)

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# ls -al agenda\_

- Continuous Integration
- Jenkins
  - Features
  - Plugins
  - Security
  - Architecture
- Questions?

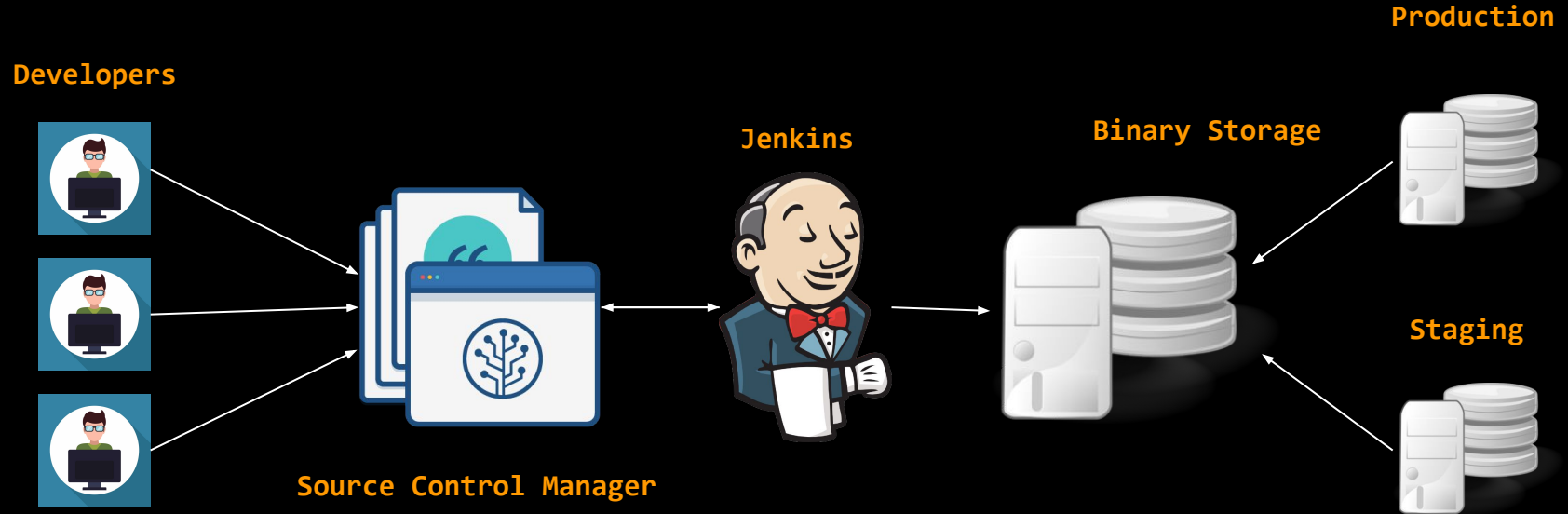


# man continuous\_integration\_

Continuous Integration is a software development practice where members of a team integrate their work frequently, usually each person integrates at least daily - leading to multiple integrations per day. Each integration is verified by an automated build (including test) to detect integration errors as quickly as possible.



# man continuous\_integration\_



# cat benefits.txt\_

happy management 8)

\\_\_\_\_\_ money and time waste lower

\\_\_\_\_\_ fast problem detection while developing

happy engineers \o/

\\_\_\_\_\_ better code quality and development process

\\_\_\_\_\_ test (unit, integration, etc.) and build automation

## man jenkins\_

Jenkins is an open source automation server written in Java. The project was forked from Hudson after a dispute with Oracle.

Jenkins only is “lightweight” but there are plugins available for integrating Jenkins with most version control systems and big databases. Many build tools are supported via their respective plugins. Plugins can also change the way Jenkins looks or add new functionality.



# cat features.txt\_

- Build Triggers
- 
- Pull Repository
- 
- Automatically Build and Test
- 
- Generate Report and Notify
- 
- Deploy





user1

Jenkins

[ENABLE AUTO REFRESH](#)[add description](#)

New Item

People

Build History

Manage Jenkins

Credentials

My Views

**Build Queue**

No builds in the queue.

**Build Executor Status**

| #                                       | Status  |
|---|---|
| <b>master</b>                           |   |
| 1                                       | Idle  |
| 2                                       | Idle  |
| <b>bigger-jenkins</b>                   |   |
| 1                                       | Idle  |
| <b>sfstack-46-231-128-205 (offline)</b> |   |
| <b>sfstack-46-231-128-211</b>           |   |
| 1                                       | Building <a href="#">SoftwareFactory-functional-tests-centos #693</a> |
| <b>sfstack-46-231-128-54 (offline)</b>  |   |

| All |   |  |                                     |                                    |               |
|-----|---|--|-------------------------------------|------------------------------------|---------------|
| S   | W | Name ↓   | Last Success                        | Last Failure                       | Last Duration |
|     |   | <a href="#">config-check</a>                                     | 3 days 22 hr - <a href="#">#60</a>  | 9 days 18 hr - <a href="#">#57</a> | 5.5 sec       |
|     |   | <a href="#">config-update</a>                                    | 3 days 19 hr - <a href="#">#44</a>  | 1 mo 8 days - <a href="#">#19</a>  | 4.3 sec       |
|     |   | <a href="#">periodic-sfstack-unit-tests</a>                      | 4 days 8 hr - <a href="#">#1</a>    | N/A                                | 3 sec         |
|     |   | <a href="#">periodic-SoftwareFactory-functional-tests</a>        | 25 days - <a href="#">#6</a>        | 4 days 9 hr - <a href="#">#7</a>   | 23 min        |
|     |   | <a href="#">periodic-SoftwareFactory-functional-tests-centos</a> | 4 days 9 hr - <a href="#">#12</a>   | 5 days 16 hr - <a href="#">#9</a>  | 20 min        |
|     |   | <a href="#">periodic-SoftwareFactory-publish-sphinx-docs</a>     | 3 days 9 hr - <a href="#">#1</a>    | N/A                                | 20 sec        |
|     |   | <a href="#">periodic-SoftwareFactory-unit-tests</a>              | 4 days 9 hr - <a href="#">#8</a>    | 25 days - <a href="#">#5</a>       | 1 min 44 sec  |
|     |   | <a href="#">sfstack-unit-tests</a>                               | 3 days 18 hr - <a href="#">#28</a>  | 26 days - <a href="#">#18</a>      | 4.1 sec       |
|     |   | <a href="#">SoftwareFactory-functional-tests</a>                 | 10 days - <a href="#">#915</a>      | 10 days - <a href="#">#914</a>     | 38 min        |
|     |   | <a href="#">SoftwareFactory-functional-tests-centos</a>          | 2 days 15 hr - <a href="#">#691</a> | 24 min - <a href="#">#692</a>      | 45 min        |
|     |   | <a href="#">SoftwareFactory-publish-roles</a>                    | 13 days - <a href="#">#39</a>       | 20 days - <a href="#">#27</a>      | 2 min 35 sec  |
|     |   | <a href="#">SoftwareFactory-publish-roles-centos</a>             | 5 days 23 hr - <a href="#">#29</a>  | 1 day 23 hr - <a href="#">#39</a>  | 7 min 7 sec   |
|     |   | <a href="#">SoftwareFactory-unit-tests</a>                       | 16 min - <a href="#">#504</a>       | 5 days 0 hr - <a href="#">#475</a> | 2 min 3 sec   |

Icon: [S](#) [M](#) [L](#)[Legend](#)[RSS for all](#)[RSS for failures](#)[RSS for just latest builds](#)



# cat requirements.txt\_

- Web Server
- 
- Build Tool
- 
- Source Code Management Tool



# ls -al plugins

- Build Triggers
- Source Code Management
- Build Tools
- Build Wrappers
- Build Notifiers
- Build Reports
- Artifacts Uploader
- Authentication and User management
- UI Customization



```
curl -X POST -d build_triggers 10.0.0.1
```

```
<body>
```

Manually -> Button Click

Periodically -> Cronjob

Pipeline -> Build after other jobs are finished

Web Hook -> Pull Request, Diff, ...

Web Hook 2 :) -> IRC, Jabber, ...

```
</body>
```



# git clone Source\_Code\_Management\_

- CVS (built in)
- 
- SVN (built in)
- 
- GIT (installation required)
- 
- ClearCase (installation required)
- 
- Mercurial, PVCS, VSS, etc. (installation required)

Source Code Management

☐ CVS  
☐ CVS Projectset  
☒ Git

Repositories

Repository URL:

Name:

Refspec:

Branches to build

Branch Specifier (blank for default):



# make -j8 tools

- Java (Maven, Gradle, Ant)
- 
- .NET (MSBuild, Powershell, ...)
- 
- Shell Script (Python, Ruby, ...)
- 
- C++ (cmake, etc...)
- 
- Whatever you want?



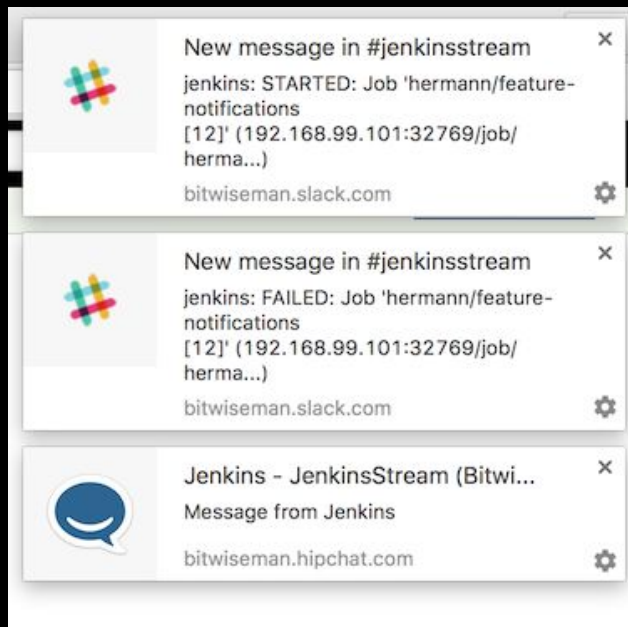
# `docker run -t build_wrapper`

- Virtualization (VMWare, VirtualBox, Docker, etc.)
- 
- Environment Variables
- 
- Other?



# notify build

- E-mail
- 
- Twitter
- 
- Slack
- 
- IRC
- 
- Google Calendar
- 
- A lot of others :)



# doxygen . -o report

- Static Analysis
  - Compiler Warning, Check Style, etc.
- Dynamic Analysis
  - Memory tracking, Benchmarking, etc.
- Test Report and Code Coverage
  - Unit testing, Integration Testing, etc.
- Latest Documentation
  - Doxygen, etc.

## プロジェクト **doxygen01**



[DoxyGen HTML](#)



[ワークスペース](#)



[変更履歴](#)


























```
curl -X POST -d binary artifactory.com
```

- SSH
- FTP
- S3
- Artifactory
- JBOSS
- TOMCAT
- Others



# UI Customization

- Dashboard Customization
- 
- Custom Views
- 
- Mobile Dashboard

|  Build History <a href="#">(trend)</a>        |  Build History <a href="#">(trend)</a>        |
|--|--|
|  #27 <a href="#">Aug 2, 2011 6:20:57 PM</a>   |  #33 <a href="#">Aug 18, 2011 11:16:13 AM</a> |
|  #26 <a href="#">Jul 7, 2011 5:02:16 AM</a>   |  #32 <a href="#">Aug 18, 2011 11:01:14 AM</a> |
|  #25 <a href="#">Jul 3, 2011 10:42:06 PM</a>  |  #31 <a href="#">Aug 18, 2011 10:31:13 AM</a> |
|  #24 <a href="#">Jun 8, 2011 4:16:42 PM</a>   |  #30 <a href="#">Aug 2, 2011 1:46:01 PM</a>   |
|  #23 <a href="#">May 16, 2011 7:11:54 PM</a>  |  #29 <a href="#">Aug 1, 2011 6:16:01 PM</a>   |
|  #22 <a href="#">Mar 5, 2011 12:30:59 AM</a>  |  #28 <a href="#">Aug 1, 2011 2:16:10 PM</a>   |
|  #21 <a href="#">Feb 20, 2011 9:06:45 PM</a>  |  #27 <a href="#">Aug 1, 2011 1:16:01 PM</a>   |
|  #20 <a href="#">Feb 18, 2011 11:09:21 PM</a> |  #26 <a href="#">Aug 1, 2011 12:46:01 PM</a>  |
|  #19 <a href="#">Feb 16, 2011 10:33:38 PM</a> |  #25 <a href="#">Jul 30, 2011 9:46:01 PM</a>  |
|  #18 <a href="#">Feb 14, 2011 12:12:59 AM</a> |  #24 <a href="#">Jul 29, 2011 1:16:02 PM</a>  |
| Without Plugin   | With Green Balls Plugin  |

# Security

- Authentication

- LDAP
- Jenkins
- Delegate to Authentication Server (Kerberos)

- Permissions

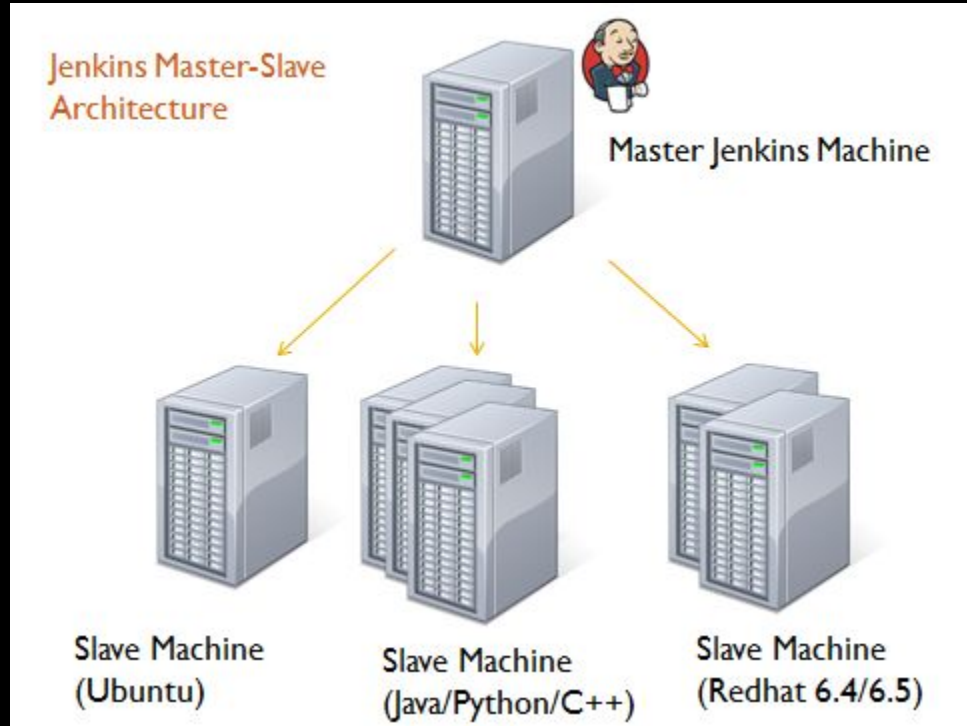
- Open Instance
- All logged in user are admins
- Matrix based permissions
- Project based permissions

# rm -rf bad\_practices\_

- Single Source Repository
- Security (Auth and HTTPS)
- Fail ASAP
- Setup notifications and generate reports
- Integrate with JIRA or other tracking software
- Use slaves in large systems
- Use clean builds
- Avoid starting jobs at same time
- Give meaningful names to jobs
- Backup



# Master Slave Architecture



**Q&A**

Thank you.

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