Jenkins + Gitlab + RabbitMQ + Symfony2 + Phing

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#jenkinsconf

About Me

- Web Developer
- Lead Engineer @ K12 Services Inc
- Total Jenkins Newbie (~6 months)

How I Sold CI to Executives

- We are humans, we make mistakes
- Deploying updates manually takes time and it is error prone
- Tests and code quality assurance is inconsistent without CI
- Automagically test and inspect before every update
- Upfront cost can be significant, especially for a newbie, but pays off in the long run

Why Jenkins?

- Open Source; free as in freedom!
- Battle tested
- Huge community
- Lots of plugins
- In the Ubuntu repository
- Easy to deploy and Update
- Other CI servers are either closed source or too immature

Search

Projects   Issues 5   Merge Requests 4   Help

John Smith commented on commit 90a90a350 at GitLab / gitlabhq   about 3 hours ago.
test comment.

John Smith opened issue #95 at GitLab / gitlab-ci   about 8 hours ago.
oh dear

John Smith commented on issue #95 at GitLab / gitlab-ci   about 8 hours ago.
Hope you re feeling better now

John Smith closed issue #95 at GitLab / gitlab-ci   about 8 hours ago.
oh dear

John Smith commented on commit 96af55bb8 at GitLab / gitlabhq   about 21 hours ago.
What's ActiveRecord? Shouldn't this be ActiveSync?

John Smith closed issue #714 at GitLab / gitlabhq   about 23 hours ago.
test

John Smith commented on commit 7c9330796 at GitLab / gitlabhq   about 23 hours ago.
writing something

John Smith commented on commit 7c9330796 at GitLab / gitlabhq   1 day ago.
xxx

John Smith opened issue #95 at GitLab / gitlab-ci   1 day ago.
oh dear

John Smith commented on issue #95 at GitLab / gitlab-ci   1 day ago.
Test

John Smith closed issue #95 at GitLab / gitlab-ci   1 day ago.
oh dear

Projects 5   Groups 1

Filter by name

GitLab / gitlabhq
Last activity: about 3 hours ago

GitLab / gitlab-ci
Last activity: about 8 hours ago

GitLab / gitlab-recipes
Last activity: 1 day ago

GitLab / gitlab-shell
Last activity: 1 day ago

GitLab / gitlab_git
Last activity: 3 months ago

News Feed

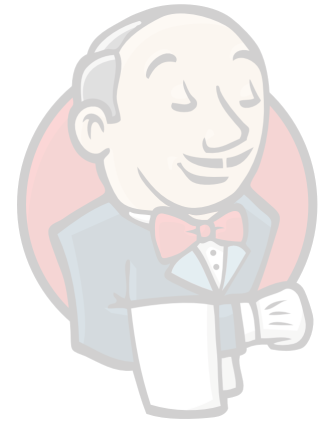Homepage   Blog   @gitlabhq

https://gitlab.com/gitlab-org/gitlab-ce/blob/master/README.md

What Is GITLAB

Open source software to collaborate on code

- Manage Git repositories with fine grained access controls that keep your code secure
- Perform code reviews and enhance collaboration with merge requests
- Each project can also have an issue tracker and a wiki
- Used by more than 100,000 organizations, GitLab is the most popular solution to manage Git repositories on-premises
- Completely free and open source (MIT Expat license)
- Powered by Ruby on Rails

source: https://gitlab.com/gitlab-org/gitlab-ce/blob/master/README.md

Why GitLab?

- Open Source; Free as in freedom!
- Runs on the Linux + Nginx + MySql + Ruby stack
- Easy to deploy and update; Digital Ocean has a push button install
- Predictable release schedule
- Awesome access controls

GITLAB

Why GitLab? Why Not GitHub or BitBucket?

- GitLab could be called a GitHub clone; Fairly intuitive UI and workflow
- We have control of the service; no surprises
- GitHub can get pricey when you have more than a few repositories
- We still use a free BitBucket account for a third tier backups
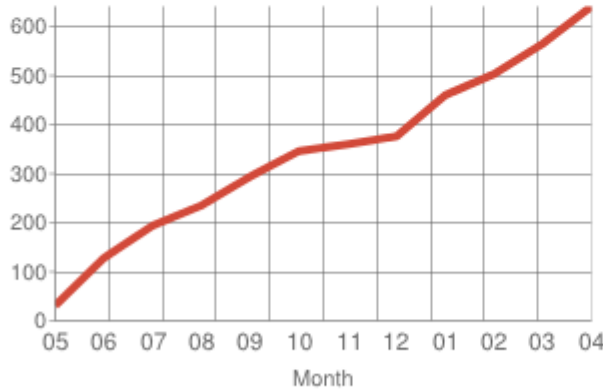- We still use GitHub for Open Source code

https://github.com/K12Labs

Jenkins + GitLab
GitLab Merge Request Builder Plugin

Plugin Information

Plugin ID	gitlab-merge-request-jenkins		Changes	In Latest Release
				Since Latest Release
Latest Release	1.2.1		**Source Code**	GitHub
Latest Release Date	May 26, 2014		**Issue Tracking**	Open Issues
Required Core	1.532		**Maintainer(s)**	Tim Olshansky (id: timols)
Dependencies				

Usage	gitlab-merge-request-jenkins - installations	Installations	2013-May 31

gitlab-merge-request-jenkins - installations

```
600
500
400
300
200
100
  0
   05 06 07 08 09 10 11 12 01 02 03 04
              Month
```

Installations

2013-May 31
2013-Jun 128
2013-Jul 194
2013-Aug 235
2013-Sep 294
2013-Oct 346
2013-Nov 360
2013-Dec 376
2014-Jan 460
2014-Feb 503
2014-Mar 565
2014-Apr 641

A plugin to build merge requests created in Gitlab.

Gitlab Merge Request Builder

Gitlab Host URL

> 🚫 **Gitlab Host Url needs to be set**
>
> The complete URL to the Gitlab server (i.e. http://gitlab)

Jenkins Username

> 🚫 **You must provide a username for the Jenkins user**
>
> Username for jenkins to use on Gitlab

Jenkins API Token

> 🚫 **You must provide an API token for the Jenkins user**
>
> API Token for the Jenkins user

Crontab line

```
* * * * *
```

ERROR

Enable build triggered message ☑

Default success message

```
Build finished.  Tests PASSED.
```

Default unstable message

```
Build finished.  Tests FAILED.
```

Default failure message

```
Build finished.  Tests FAILED.
```

Ignore SSL Certificate Errors ☐

Merge Request #77

Refactor/117_BillbackSummary.php → develop

Download as ▾   **Close**   ✎ **Edit**

0 up   0 down

| Open | Created by 👤 Kevin 16 days ago |

Refactor/117 billback summary.php

Resolved CodeSniffer errors.

Assignee: Brandon Mueller ▾   **Milestone:** Select milestone (none): ▾

You can accept this request automatically.

If you still want to do it manually - **click here** for instructions.
If you want to modify merge commit message - **click here**

Accept Merge Request   ☐ **Remove source-branch**

☰ **Commits (1)**

Browse Code »

16 days ago

💬 **Discussion**   ▦ **Changes**

Jenkins · 16 days ago
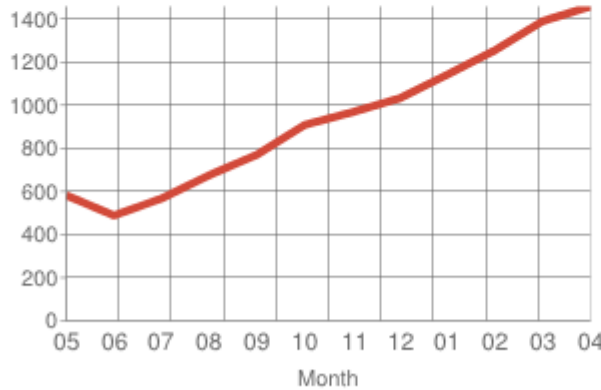
Build triggered.

Jenkins · 16 days ago

Build finished. Tests FAILED. Build results available at: /k12fs2_test/95/

Jenkins + GitLab
GitLab Build Now Plugin

Plugin Information

Plugin ID	gitlab-hook	Changes	In Latest Release Since Latest Release
Latest Release **Latest Release Date** **Required Core** **Dependencies**	1.0.0 Sep 02, 2013 1.432 [ruby-runtime|n/a] (version:0.12) git (version:1.1.26)	**Source Code** **Issue Tracking** **Maintainer(s)**	GitHub Open Issues n/a (id: elvanja)
Usage	gitlab-hook - installations	**Installations**	2013-May 582 2013-Jun 488 2013-Jul 567 2013-Aug 675 2013-Sep 770 2013-Oct 908 2013-Nov 967 2013-Dec 1032 2014-Jan 1142 2014-Feb 1255 2014-Mar 1390 2014-Apr 1458

Enables Gitlab web hooks to be used to trigger SMC polling on Gitlab projects

k12fs2 / app_k12fs2

Search in this project

| Files | Commits | Network | Graphs | Issues 34 | Merge Requests 5 | Wiki | **Settings** |

Web hooks

Web hooks can be used for binding events when something is happening within the project.

- Project
- Members
- Deploy Keys
- **Web Hooks**
- Services

URL

http://example.com/trigger-ci.json

Trigger

☑ **Push events**
This url will be triggered by a push to the repository

☐ **Tag push events**
This url will be triggered when a new tag is pushed to the repository

☐ **Issues events**
This url will be triggered when an issue is created

☐ **Merge Request events**
This url will be triggered when a merge request is created

Add Web Hook

Web hooks (1)

http://s⬛⬛⬛⬛⬛⬛⬛⬛⬛⬛⬛⬛:/gitlab/build_now

Test Hook   Remove

Push Events

Jenkins + GitLab Workflow

- Dev creates a ticket in GitLab
- Dev creates a feature branch following a feature/issue_desc naming schema
  - ex: feature/124_my_awsome_thing
- Dev writes some awesome code, sends a merge request when ready
- Merge Request Builder plugin builds the project when MR is opened and when the MR is updated
- When a MR is accepted, Jenkins triggers a build b/c code was pushed to the develop branch

Jenkins + GitLab Workflow

MR is created or updated

MR is accepted in GitLab

app_test Jenkins Project
(feature branches)

app_dev Jenkins Project
(develop & master branch)
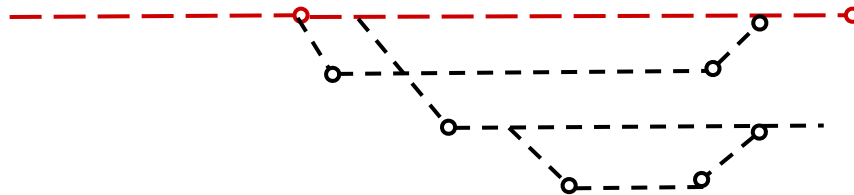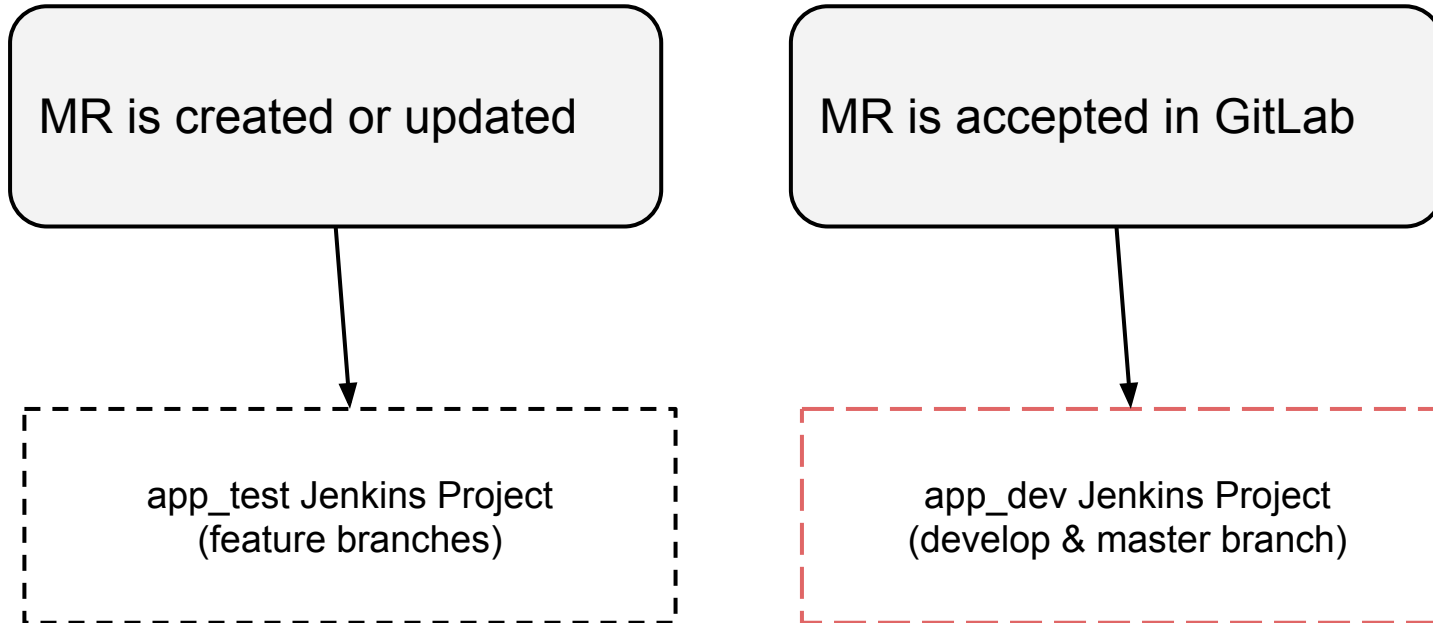
What is Phing?

PHing **I**s **N**ot **G**NU make; it's a PHP project build system or build tool based on Apache Ant. You can do anything with it that you could do with a traditional build system like GNU make, and its use of simple XML build files and extensible PHP "task" classes make it an easy-to-use and highly flexible build framework.

source: phing.info
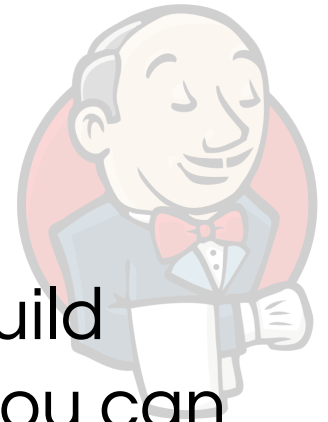
Phing in Dev

- All the things that jenkins does for the build, we can do locally
- No surprises if a build fails (usually)

```
Terminal

$bin/phing -l
Buildfile: /home/brandon/projects/app_k12fs2/build.xml
     [echo] basedir: /home/brandon/projects/app_k12fs2
Default target:
-------------------------------------------------------------------------
 deploy                   Deploys the application

Main targets:
-------------------------------------------------------------------------
 check-yo-self            You better check yo self before you wreck yo self.
 clean                    Cleanup build artifacts
 clean-twigjs             Deletes all compiled twig templates
 deploy                   Deploys the application
 install                  Installs config files, dependencies and assets
 make-build-config-file   Builds a config file build information
 phpcs                    Generate checkstyle.xml using PHP_CodeSniffer
 phpdoc                   Generate API documentation using phpDocumentor
 prepare                  Prepare for build, setting configuration

Subtargets:
-------------------------------------------------------------------------
 clear-cache
 compile-twigjs
 csslint
 install-assetic
 install-bower-dependencies
 install-composer-dependencies
 jshint
 make-config-file
 make-vhost-file
 phpcb
 start-site
 update-hosts-file

$
```

```
Terminal

$sudo bin/phing deploy -Denv vagrant
Buildfile: /home/brandon/projects/app_k12fs2/build.xml
     [echo] basedir: /home/brandon/projects/app_k12fs2

K12FS 2.0 > prepare:

 [property] Loading /home/brandon/projects/app_k12fs2/app/config/dist/global.properties
 [property] Loading /home/brandon/projects/app_k12fs2/app/config/dist/vagrant.properties
     [echo] DATE = Thu, 05 Jun 2014 16:55:58 -0400

K12FS 2.0 > make-vhost-file:

     [echo] Making vhost file for k12fs2.local
     [copy] Copying 1 file to /etc/apache2/sites-available

K12FS 2.0 > start-site:

     [echo] APACHE: enabling site.
     [echo] APACHE: restarting server.

K12FS 2.0 > make-config-file:

     [copy] Copying 1 file to /home/brandon/projects/app_k12fs2/app/config

K12FS 2.0 > deploy:


BUILD FINISHED

Total time: 2.4049 seconds

$
```
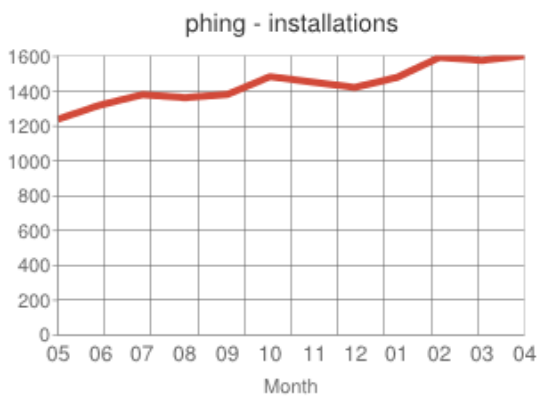
Jenkins + Phing
Phing Plugin
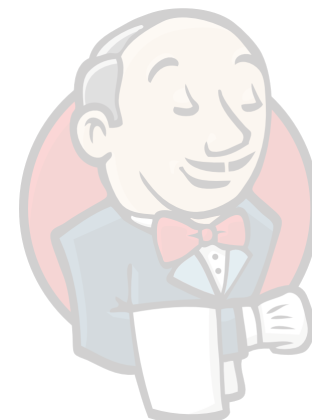
- It works ;)
- Jenkins executes Phing targets as part of the build process

Plugin Information

Plugin ID	phing		**Changes**	In Latest Release
Latest Release	0.13.1		**Sour**	
Latest Release Date	Apr 20, 2013		**Issu**	
Required Core Dependencies	1.480		**Mair**	
Usage			**Insta**	

Build

⊞ **Invoke Phing targets**   ❓

Targets   check-yo-self install   ▼ ❓

Phing Build File _____ ❓

Options   _____
              _____
              _____

Properties   env=dev
              version=${APP_VERSION}
              commit=${GIT_COMMIT}
              build=${BUILD_NUMBER}   ❓

☑ Use ModuleRoot as working directory

                                                    Delete

phing - installations

1600
1400
1200
1000
800
600
400
200
0
   05 06 07 08 09 10 11 12 01 02 03 04
              Month

Jenkins + Phing
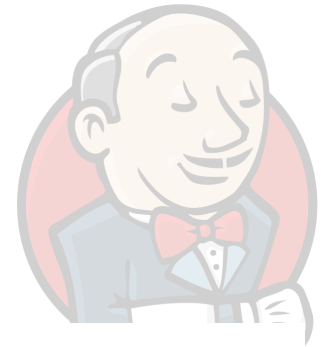
```
Refactor/101 prod usage.js

Fixes issue #101</a>
[EnvInject] - Loading node environment variables.
Building in workspace /var/lib/jenkins/workspace/k12fs2_dev
Fetching changes from the remote Git repository
Fetching upstream changes from
Checking out Revision 3fd7cdcd693ed0fcd136867446b6e5629d5f8ff3 (origin/develop)
[EnvInject] - Executing scripts and injecting environment variables after the SCM step.
looking for '/var/lib/jenkins/workspace/k12fs2_dev/build.xml' ...
use '/var/lib/jenkins/workspace/k12fs2_dev' as a working directory.
[          ] $ phing -buildfile /var/lib/jenkins/workspace/k12fs2_dev/build.xml -Dversion=2.0.2.228 -Denv=dev -
Dbuild=343 -Dcommit=3fd7cdcd693ed0fcd136867446b6e5629d5f8ff3 check-yo-self install -logger
phing.listener.DefaultLogger
Buildfile: /var/lib/jenkins/workspace/k12fs2_dev/build.xml
     [echo] basedir: /var/lib/jenkins/workspace/k12fs2_dev

K12FS 2.0 > clean:
```

Code Quality
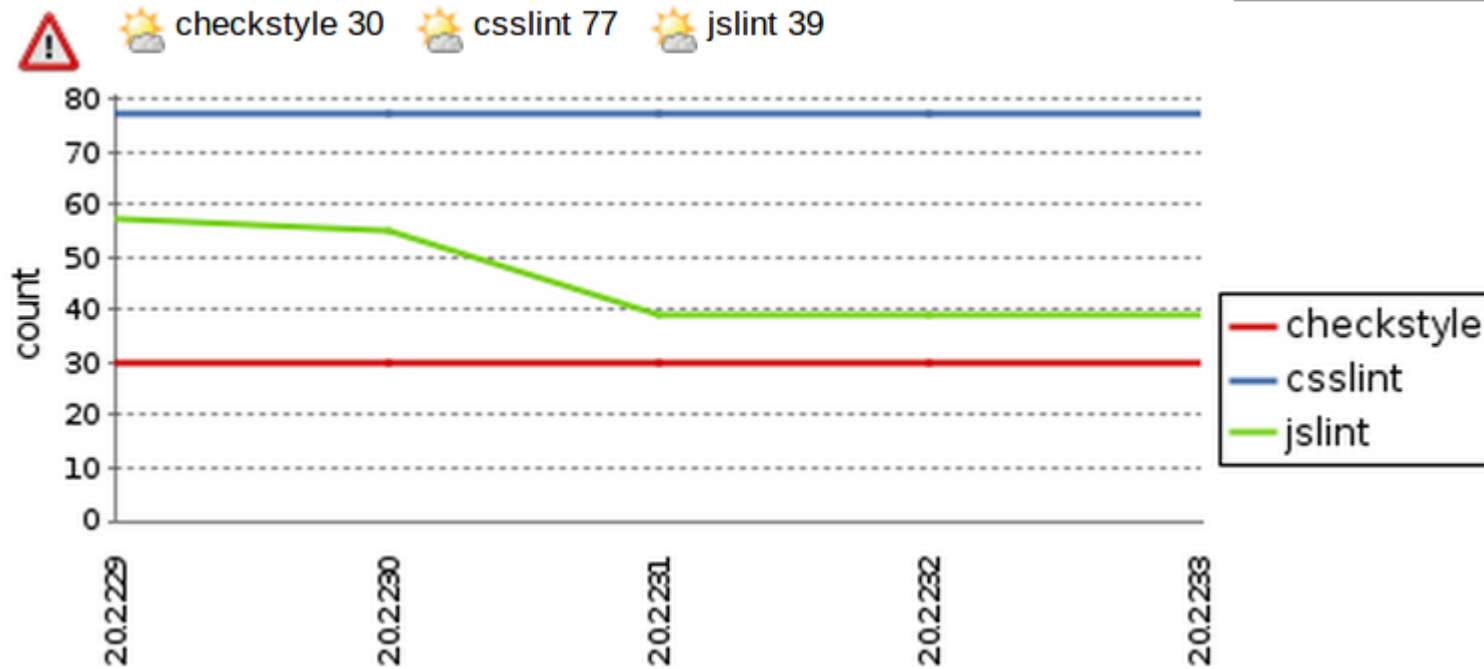
PHP Code Sniffer

- Reports on coding standards (PSR-2)
- Outputs standard checkstyle xml formats (among other formats)

```xml
47  <target name="phpcs"
48          description="Generate checkstyle.xml using PHP_CodeSniffer"
49          depends="prepare">
50    <exec command="phpcs --report=checkstyle
51              --report-file=${basedir}/build/logs/checkstyle-codesniffer.xml
52              --standard=PSR2
53              --extensions=php
54              --report-summary=${basedir}/build/logs/codesniffer-summary.txt
55              --report-full=${basedir}/build/logs/codesniffer-full.txt
56              --report-gitblame=${basedir}/build/logs/codesniffer-gitblame.txt
57              --ignore=*/*.features.*,*/Bundles/*/Resources
58              src"
59          logoutput="true" />
60  </target>
```

CSSlint & JShint

- Same thing, only for CSS and JS

```
61
62    <target name="csslint">
63        <exec command="csslint --format=lint-xml ./web/assets/css/* >> ./build/logs/csslint
64        <exec command="csslint ./web/assets/css/* >> ./build/logs/csslint.txt" logoutput="
65    </target>
66
67    <target name="jshint">
68        <exec command="jshint web/scripts/* --reporter jslint >> ./build/logs/jshint.xml" l
69        <exec command="jshint web/scripts/* >> ./build/logs/jshint.txt" logoutput="true" />
70    </target>
71
```

The Build

- Make env/build specific config files
- Composer
- Bower
- Twig.js
- Assetic
- Symfony Cache

```
$bin/phing install -Denv vagrant
Buildfile: /home/brandon/projects/app_k12fs2/build.xml
     [echo] basedir: /home/brandon/projects/app_k12fs2

K12FS 2.0 > prepare:

 [property] Loading /home/brandon/projects/app_k12fs2/app/config/dist/global.properties
 [property] Loading /home/brandon/projects/app_k12fs2/app/config/dist/vagrant.properties
     [echo] DATE = Thu, 05 Jun 2014 16:53:29 -0400

K12FS 2.0 > make-build-config-file:

     [copy] Copying 1 file to /home/brandon/projects/app_k12fs2/app/config

K12FS 2.0 > make-config-file:

     [copy] Copying 1 file to /home/brandon/projects/app_k12fs2/app/config

K12FS 2.0 > install-composer-dependencies:

     [echo] Running Composer (Dev)

K12FS 2.0 > install-bower-dependencies:

     [echo] Running Bower

K12FS 2.0 > clean-twigjs:

   [delete] Deleting 39 files from /home/brandon/projects/app_k12fs2

K12FS 2.0 > compile-twigjs:

     [echo] Compile twig.js templates

K12FS 2.0 > clear-cache:

     [echo] Clear Cache (Dev)

K12FS 2.0 > install-assetic:

     [echo] Assetic (Dev)

K12FS 2.0 > install:


BUILD FINISHED

Total time: 11.7418 seconds
```

What About Deployment?

- Publish Over SSH Plugin
- Deploy Plugin
- Bash Script

These solutions just get the files to where they need to go - I'm not done after the files are copied!

RabbitMQ
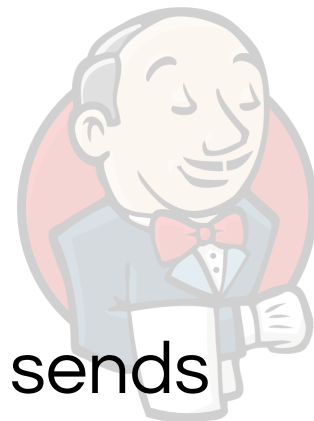
- Post build task triggers a bash script that sends a RabbitMQ message
- Jenkins no longer cares about where the app is being deployed
- Many consumers can receive the message - deploy the app on as many servers as needed

RabbitMQ™
Messaging that just works

Topic Exchange

app_dev.origin_develop

app_dev.origin_master

Develop Branch Queue

Master Branch Fanout Exchange

Feature Branch Branch Queue

Dev App Server

Prod App Server

Prod App Server

Prod App Server

Staging/QA App Server

routing key: ci.project_name.branch_name
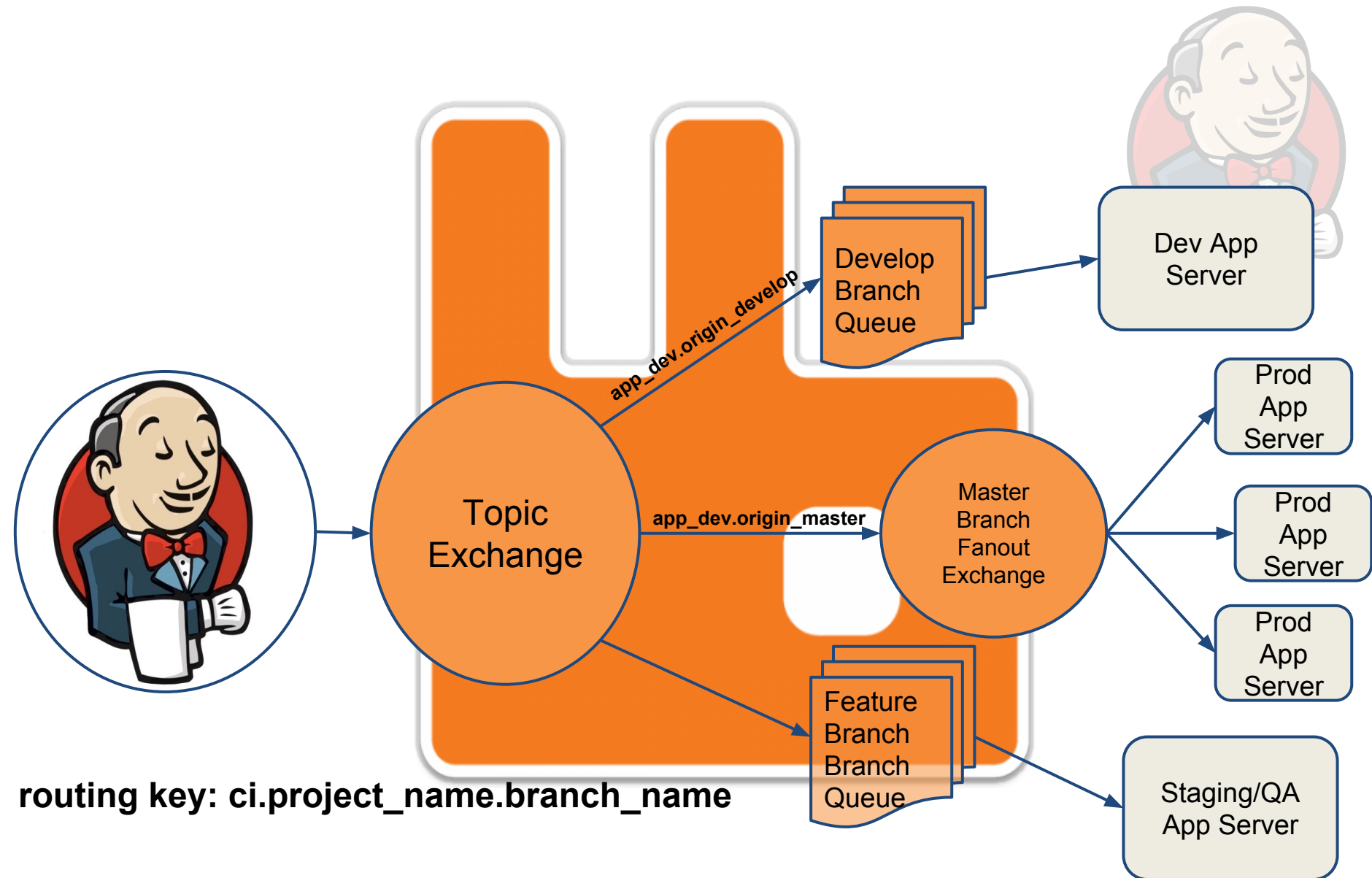
Message Example

Exchange   ci
Routing Key   ci.k12fs2_dev.bug_216_login
Payload

{
status   : "complete",
gitlabMergeRequestId   : "193",
gitlabSourceBranch   : "bug/216_login",
gitlabSourceName   : "k12fs2/app_k12fs2",
gitlabSourceRepository   : "",
gitlabTargetBranch   : "develop",
APP_VERSION   : "2.0.2.233",
BUILD_CAUSE   : "GITLABCAUSE",
BUILD_DISPLAY_NAME   : "#348",
BUILD_ID   : "2014-06-06_14-15-52",
BUILD_NUMBER   : "348",
BUILD_TAG   : "jenkins-k12fs2_dev-348",
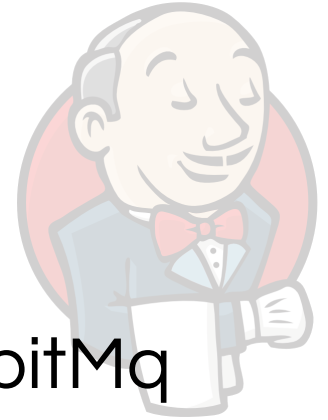BUILD_URL   : "http://example.com/job/k12fs2_dev/348/",
GIT_BRANCH   : "origin/develop",
GIT_COMMIT   : "351790406a56aad54b2afe8fdf6a60b3737441d8",
GIT_PREVIOUS_COMMIT: "351790406a56aad54b2afe8fdf6a60b3737441d8",
GIT_URL   : "http://example.com/",
HUDSON_URL   : "http://example.com/",
JOB_NAME   : "k12fs2_dev",
JOB_URL   : "http://example.com/job/k12fs2_dev/"
}

Symfony2 + RabbitMQ

- High quality bundle called OldSoundRabbitMq Bundle
- Consumer code for deploying the application lives in our Symfony app
- Consumer code drops down to the command line to execute phing targets etc

Configz

```
15  consumers:
16      ci:
17          connection:      default
18          exchange_options: {name: 'ci', type: topic}
19          queue_options:
20              name: 'ci.k12fs2_dev'
21              arguments: {x-dead-letter-exchange: [S, ci.dead_letter]}
22              routing_keys:
23                  - 'ci.k12fs2_dev'
24          callback:        k12.ci_consumer
25          idle_timeout:    60
```
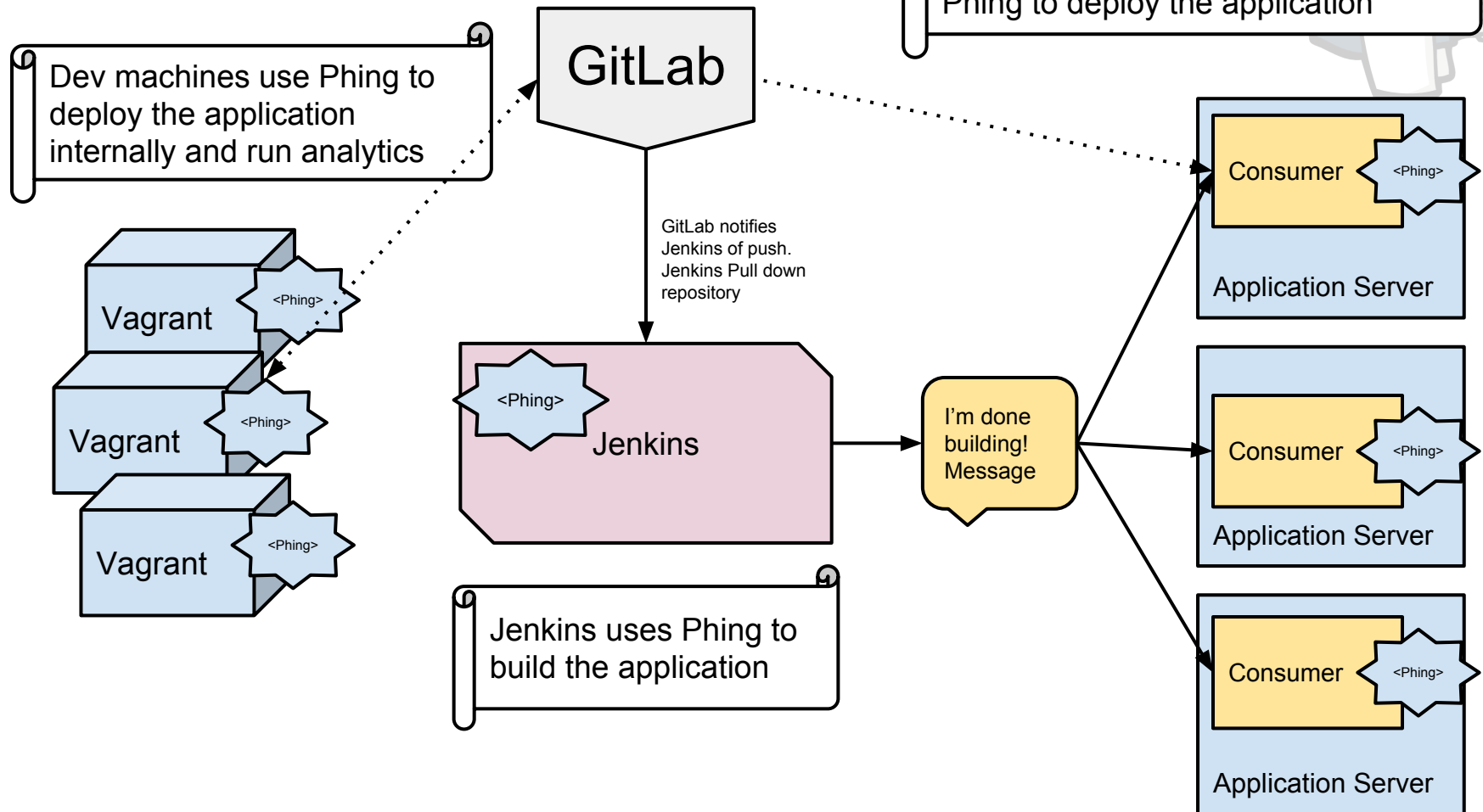
Consumer Codez

```php
33     /**
34      * @param AMQPMessage $msg
35      * @return bool
36      */
37     public function execute(AMQPMessage $msg)
38     {
39         //bug when running as a cron job, need to set the path
40         putenv(getenv('PATH') . ':/usr/local/bin/');
41         $data = json_decode($msg->body, true);
42         $this->getLogger()->debug(sprintf("Consuming CI msg in env %s", $this->env));
43         $checkout = $this->checkout($data["GIT_COMMIT"]);
44         if ($checkout) {
45             $reset = $this->checkout($data['GIT_PREVIOUS_COMMIT']);
46             //reject message
47             return false;
48         }
49         $this->argString = '-Denv ' . $this->env;
50         foreach ($data as $key => $value) {
51             $this->argString .= sprintf(' -D%s %s', escapeshellarg(strtolower($key)), escapeshellarg($value));
52         }
53         $install = $this->install();
54         if ($install) {
55             $this->getLogger()->error("Install returned " . $install);
56             $reset = $this->checkout($data['GIT_PREVIOUS_COMMIT']);
57             if ($reset) {
58                 $reinstall = $this->install();
59             }
60             return false;
61         }
62     }
```

Consumer Codez

```php
33    /**
34     * @param AMQPMessage $msg
35     * @return bool
36     */
37    public function execute(AMQPMessage $msg)
38    {
39        //bug when running as a cron job, need to set the path
40        putenv(getenv('PATH') . ':/usr/local/bin/');
41        $data = json_decode($msg->body, true);
42        $this->getLogger()->debug(sprintf("Consuming CI msg in env %s", $this->env));
43        $checkout = $this->checkout($data["GIT_COMMIT"]);
44        if ($checkout) {
45            $reset = $this->checkout($data['GIT_PREVIOUS_COMMIT']);
46            //reject message
47            return false;
48        }
49        $this->argString = '-Denv ' . $this->env;
50        foreach ($data as $key => $value) {
51            $this->argString .= sprintf(' -D%s %s', escapeshellarg(strtolower($key)), escapeshellarg($value));
52        }
53        $install = $this->install();
54        if ($install) {
55            $this->getLogger()->error("Install returned " . $install);
56            $reset = $this->checkout($data['GIT_PREVIOUS_COMMIT']);
57            if ($reset) {
58                $reinstall = $this->install();
59            }
60            return false;
61        }
62    }
```

Bringing It All Together

GitLab

Application server(s) consume message from Jenkins and use Phing to deploy the application

Dev machines use Phing to deploy the application internally and run analytics

GitLab notifies Jenkins of push. Jenkins Pull down repository

Vagrant

<Phing>

Vagrant

<Phing>

Vagrant

<Phing>

<Phing>

Jenkins

Jenkins uses Phing to build the application

I'm done building! Message

Consumer   <Phing>

Application Server

Consumer   <Phing>

Application Server

Consumer   <Phing>

Application Server

All The Jenkins Things

- Environment Injector Plugin
- Checkstyle Plugin
- Gitlab Hook Plugin
- Gitlab Merge Request Builder Plugin
- Hudson Post Build Task

Things I Feel Are missing

**or I'm too Incompetent to develop myself
or the solution exists and I just don't know about It**

- RabbitMQ Post Build Producer plugin
- Better Notifications from Jenkins to GitLab CE (Coming Soon?!?)
- Artifact publishing inside of Jenkins
- Dynamic build plan for feature branches

All (most of) the things

- https://www.gitlab.com/gitlab-ce/
- http://www.phing.info/
- https://github.com/squizlabs/PHP_CodeSniffer
- https://github.com/CSSLint/csslint
- http://www.jshint.com/
- https://getcomposer.org/
- http://bower.io/
- http://www.rabbitmq.com/
- https://github.com/videlalvaro/rabbitmqbundle

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