High Quality Plugins

Robert Hostlowsky, Christian Langmann
codecentric AG
http://www.codecentric.de

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#jcicph

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Agenda

What is quality, actually?

How can we create high-quality plugins?

I'm Ops. Can I do anything?

A (hundred) definition of Quality

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„Conformance to requirements." (Philip B. Crosby)

„Degree to which a set of inherent characteristics fulfills requirements." (ISO9000)

„Products and services that meet or exceed customers' expectations."(Noriaki Kano)

„Value to some person" (Gerald M. Weinberg)

„A combination of quantitative and qualitative perspectives for which each person has his or her own definition; examples [...]. In technical usage, quality can have two meanings:
a. The characteristics of a product or service that bear on its ability to satisfy stated or implied needs;
b. A product or service free of deficiencies." (American Society for Quality)

Excerpt from http://en.wikiepedia.org/wiki/Quality_(business)

Do testing

… because
as a plugin submitter, you want
happy users

and

you become unhappy from bug
reports from angry testers - ähm
users …

http://makeameme.org/meme/but-happy-cat

What is a Low-Quality-Plugin?

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- Failing: Not doing what was promised ...
- Doing something else (deploy to prod instead of stage), wrong version number
- Worse: breaking other things, crashing whole system
- using a lot of resources: memory, CPU, IO
- or just hanging...
- Creating non-usable UI

Worst case:
Breaking Global Config Page

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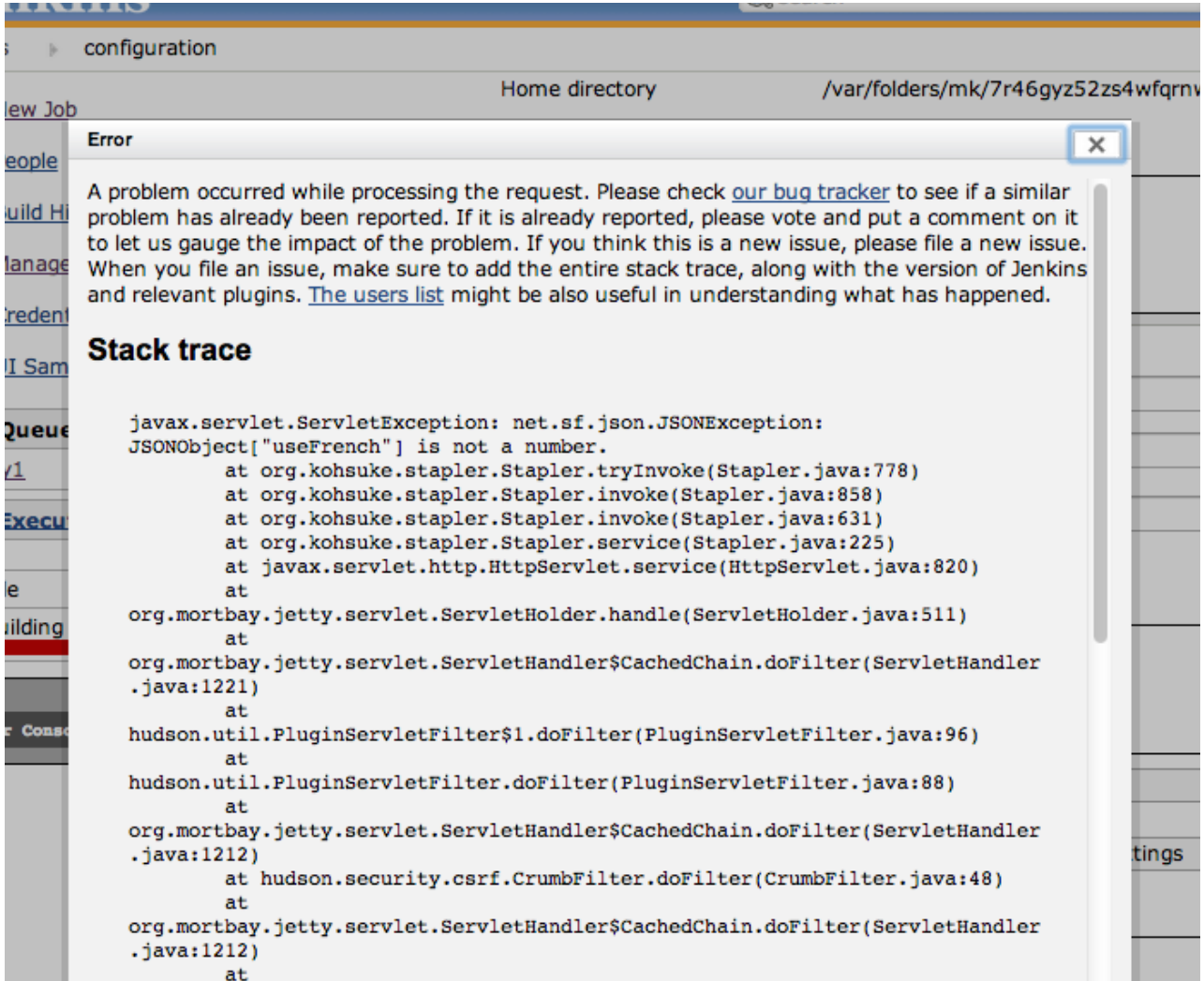

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Avoid “Low-Quality”

- Code defensive, robust.
  - always assume data could be wrong -> check!
- Clean Code Principles
  - SOLID, Test First, Refactoring
- Tools for code analysis
  - Findbugs, PMD, SonarQube
- Assume “hostile” environments
  - handle missing network, timeouts ...

... Software Craftsmanship ...

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Do Automated Testing

Besides Manual testing…

Create automatic test

- **Basic**: Unit testing
- **Advanced**: Acceptance testing

Also do

- **Performance** testing
- Restricted environment: e.g. java -Jmx64m

Simple Plugin Example

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Created with plugin-generator

- one Builder:
- Global config section:

Hello World Builder

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```
public class HelloWorldBuilder extends Builder {
  public boolean perform(AbstractBuild build, Launcher launcher,
                         BuildListener listener) {
    // from -> global configuration of the builder
    if (getDescriptor().getUseFrench())
      listener.getLogger().println("Bonjour, "+name+"!");
    else
      listener.getLogger().println("Hello, "+name+"!");
    return true;
  }
}
```

https://github.com/lowsky/high-quality-plugin/blob/master/src/main/java/org/jenkinsci/plugins/high_quality/HelloWorldBuilder.java

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Unit Testing

```
@Test
public void performPrintsHelloMessageUnitTest() {
        AbstractBuild build = mock(AbstractBuild.class);
        BuildListener listener = mock(BuildListener.class);
        Launcher launcher = mock(Launcher.class);
        ByteArrayOutputStream outStream = new ByteArrayOutputStream(1000);
        PrintStream logger = new PrintStream(outStream);
        when(listener.getLogger()).thenReturn(logger);
        HelloWorldBuilder worldBuilderSpy = spy(worldBuilder);
        doReturn(false).when(worldBuilderSpy).useFrench();
        boolean performed = worldBuilderSpy.perform(build, launcher, listener);
        verify(worldBuilderSpy).printLogMsg(false, logger);
        assertThat("perform shall return true.", performed, is(true));
        assertThat(outStream.toString(), containsString(expectedMsg));
}
```

https://wiki.jenkins-ci.org/display/JENKINS/Unit+Test

Basic Unit Testing - within Jenkins Env

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```
@Rule
 public JenkinsRule jenkinsRule = new JenkinsRule();

@Test
public void performPrintsHelloMessageWithJut() throws Exception {
    FreeStyleProject dummy = jenkinsRule.createFreeStyleProject("dummy");
    dummy.getBuildersList().add(worldBuilder);
    jenkinsRule.buildAndAssertSuccess(dummy);
    Run lastRun = dummy._getRuns().newestValue();
    jenkinsRule.assertLogContains(expectedMsg, lastRun);
}
```

https://wiki.jenkins-ci.org/display/JENKINS/Unit+Test

UI Tests / Web Based Testing

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Built On Columen - plugin without Java Code:

Using built-in HtmlUnit support:

```
htmlPage = jenkins.getWebclient().goto("/view/all");

WebAssert.assertElementPresent(page, "Built On"); //more...
```

Acceptance Driven Testing

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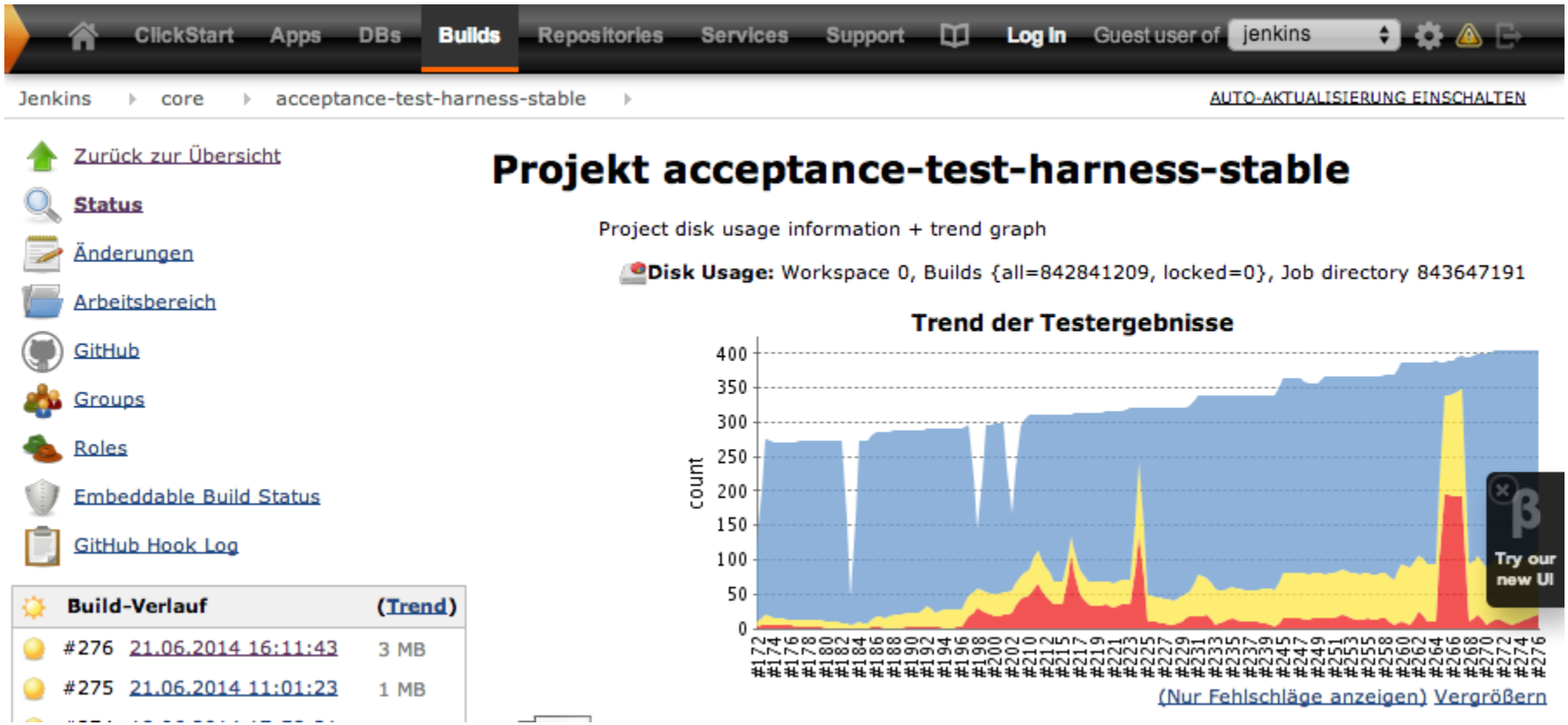
Acceptance Test Harness github.com/jenkinsci/acceptance-test-harness/

Announcement: jenkins-ci.org/content/acceptance-test-project-progress-report



Acceptance Driven Testing

Test Harness:

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Cool Features:

- ATDD testing based on cucumber
- Many re-usable PageObjects/Areas, like
- globalConfiguration, builderSection, jobs,...
- Docker, can be used for test fixtures, git server, ...
- Support for different browsers

Already a huge Test Suite for the LTS release exists!

<< DEMO >>

The DevOps-Story

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Managing my environment...

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Never touch a running environment...

... nice idea ...

leads to an antiquated system:

- „I still have H...n in a version before the fork“
- „New plugins don‘t work in my old environment anymore“
- „I don‘t even know how many Jenkins we have setup with which plugins“

Moving to a controlled environment

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Find out, which Plugins are used

⇒ Click through Jenkins instances

⇒ Analyse config.xml

⇒ Plugin Usage Plugin

MapDB API Plugin	1	Plugin: Operations Center Cloud
Maven Integration plugin	3	Plugin: Dashboard View Plugin: Jenkins Job Configuration History Plugin Plugin: Jenkins promoted builds plugin
Metrics Plugin	2	Plugin: Operations Center Client Plugin Plugin: Support Core Plugin
Monitoring	0	-
Node Iterator API Plugin	2	Plugin: CloudBees VMWare Autoscaling Plugin Plugin: Operations Center Cloud
openid	2	Jenkins Plugin: Operations Center Client Plugin
OpenID4Java API	2	Plugin: openid Plugin: Operations Center OpenID Cluster Session Extension
Operations Center Agent	1	Plugin: Operations Center Client Plugin
Operations Center Client Plugin	2	Jenkins Plugin: Operations Center Cloud

Handle updates carefully

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When updating, check configuration changes

⇒ use JobConfigHistory-Plugin

⇒ verify system and job config

Date ↑	System configuration	Operation
2014-06-24_04-14-29	com.cloudbees.opscenter.client.plugin.OperationsCenterRootAction (system)	Changed
2014-06-24_04-14-28	com.cloudbees.opscenter.client.plugin.OperationsCenterRootAction (system)	Changed
2014-06-24_04-14-27	com.cloudbees.opscenter.client.plugin.OperationsCenterRootAction (system)	Changed
2014-06-24_04-14-26	com.cloudbees.opscenter.client.plugin.OperationsCenterRootAction (system)	Changed
2014-06-24_04-14-25	hudson.tasks.Maven (system)	Changed

Date ↑	Operation	User	Show File	File A	File B
2014-06-24_04-14-25	Changed	anonymous	View as XML (RAW)	○	◉
2014-06-24_04-02-40	Changed	anonymous	View as XML (RAW)	◉	○

Show Diffs

```
1  <?xml version='1.0' encoding='UTF-8'?>
2  <hudson.tasks.Maven_-DescriptorImpl>
3    <installations/>
```

```
1  <?xml version='1.0' encoding='UTF-8'?>
2  <hudson.tasks.Maven_-DescriptorImpl>
3    <installations>
4      <hudson.tasks.Maven_-MavenInstallation>
5        <name>Default</name>
6        <properties>
7          <hudson.tools.InstallSourceProperty>
8            <installers>
9              <hudson.tasks.Maven_-MavenInstaller>
10               <id>3.2.1</id>
```

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Right, yes, ...

... make Backups

Staging of Plugins

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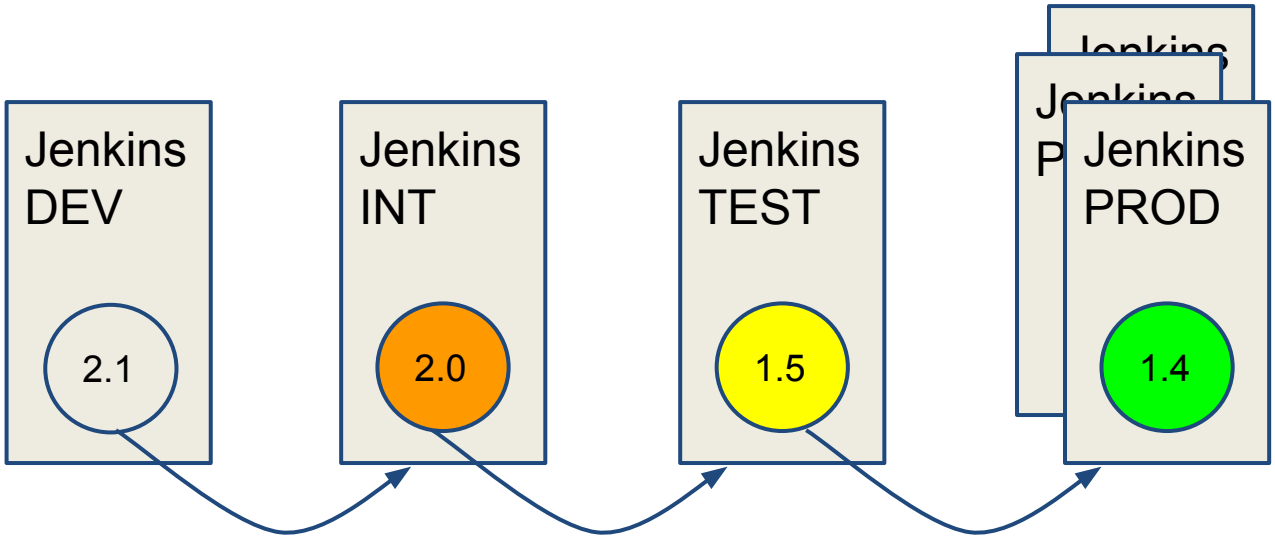

- Plugin-Versions (or Jenkins-Core-Versions) are staged
- Once a quality is reached, a plugin is installed to next stage
- Complexity increases with number of stages and different production setups

Use Custom-Update-Sites

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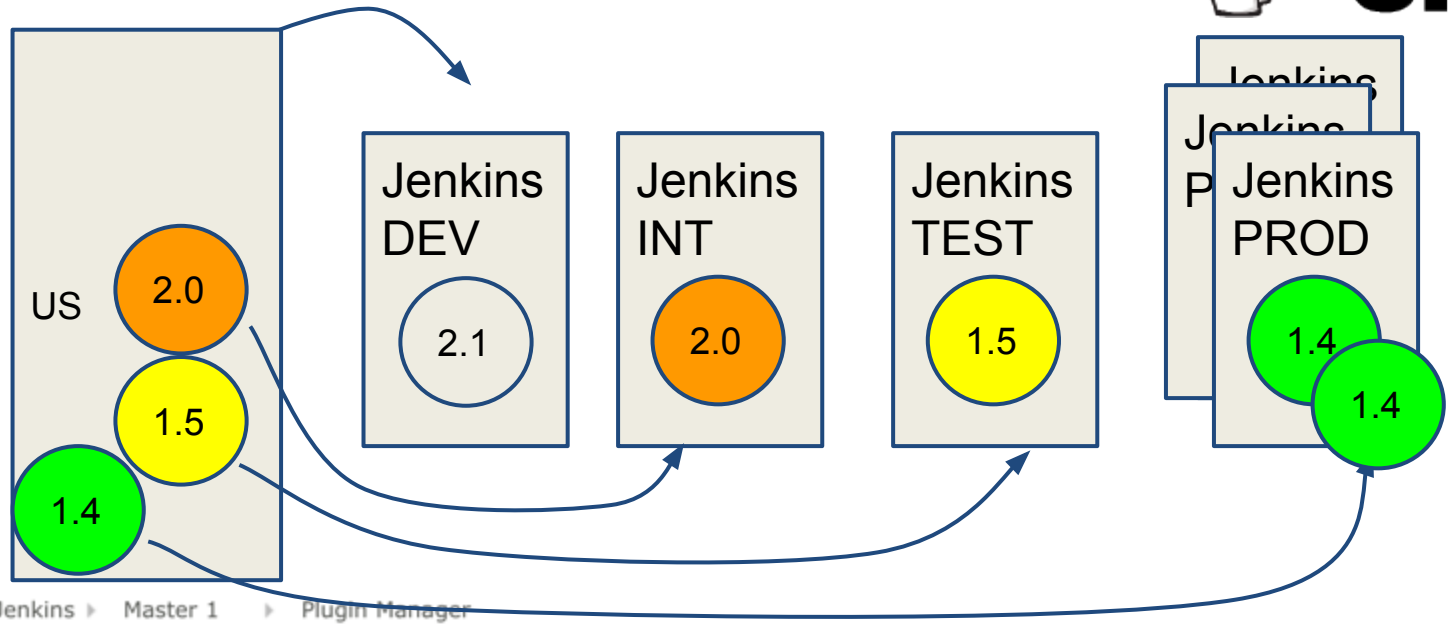

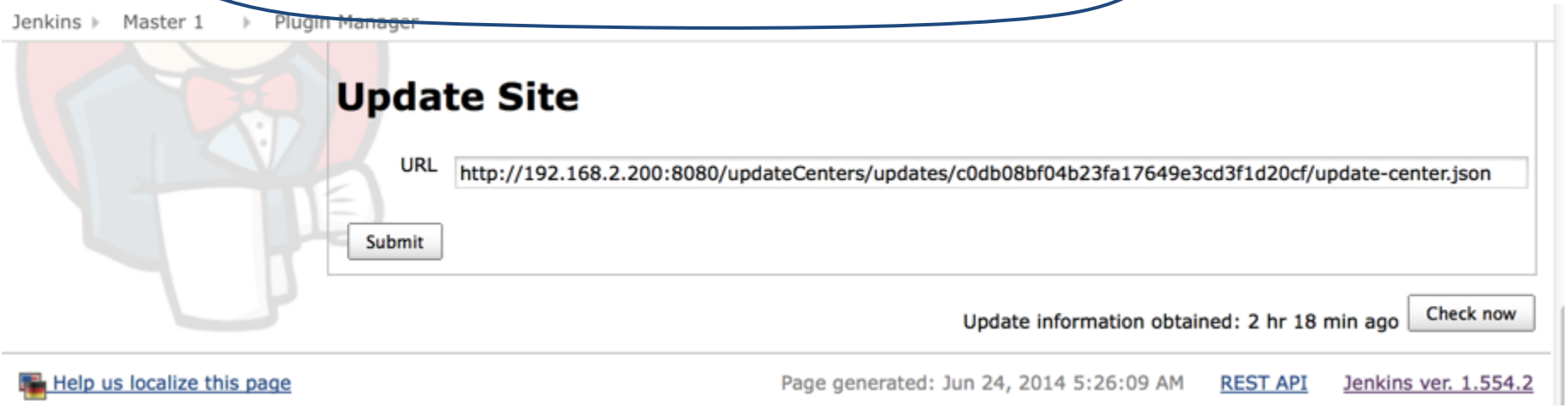

Use Update-Site per environment

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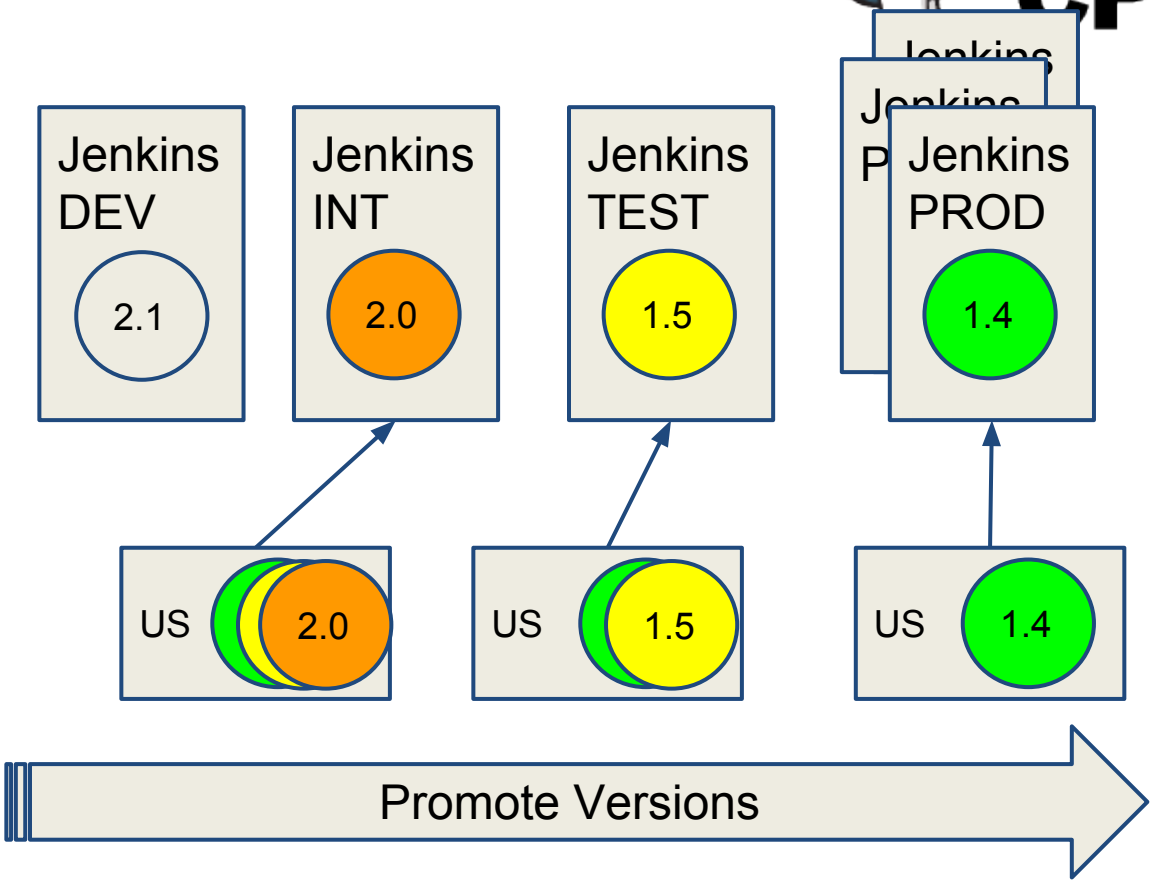

Supporting Plugins

- UpdateSites Manager Plugin
- SimpleUpdateSite Plugin

Using Update Centers

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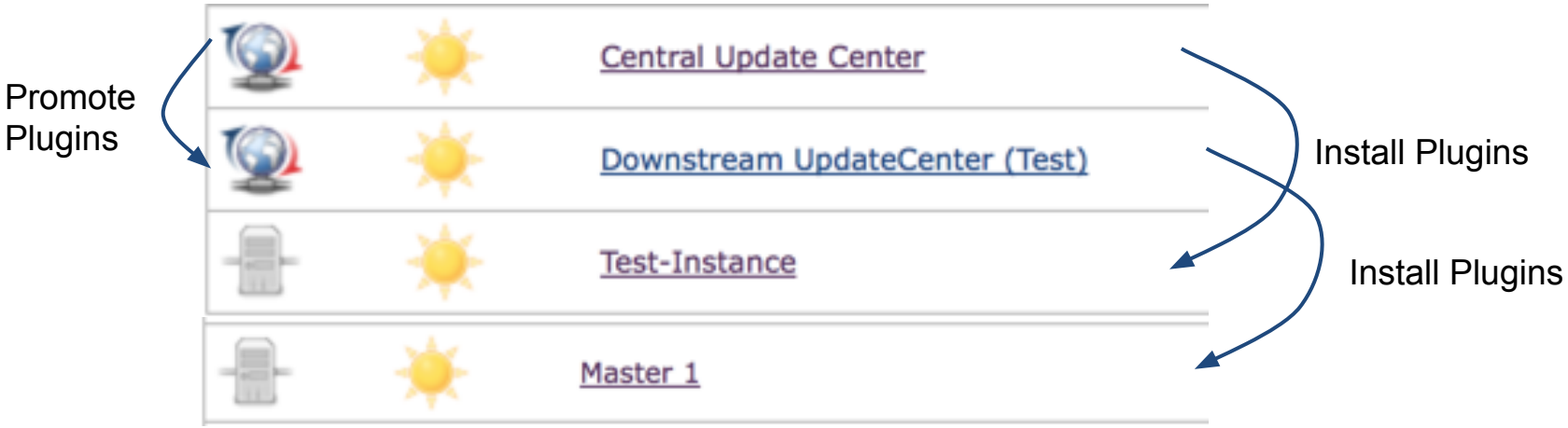

Define Update-Strategy and Quality-Gates (e.g. LTS vs. latest) for each stage

Manage updates centrally

- Jenkins Update Center (CloudBees Enterprise Plugin)
- Jenkins Operations Center (CloudBees)


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