State of Jenkins 2016

Kohsuke Kawaguchi
Creator of Jenkins
CTO, CloudBees, Inc.
Has your company’s use of Jenkins increased over the past year?

- Increased: 89%
- No Change: 11%
- Decreased: 0%
Is Jenkins mission critical?

2013 Survey 83% → 2015 Survey 92%
What types of tasks do you use Jenkins for?

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build</td>
<td>95%</td>
<td>97%</td>
</tr>
<tr>
<td>Test</td>
<td>86%</td>
<td>90%</td>
</tr>
<tr>
<td>Deployment</td>
<td>48%</td>
<td>58%</td>
</tr>
<tr>
<td>Operations</td>
<td>15%</td>
<td>24%</td>
</tr>
</tbody>
</table>
What level of automation have you implemented in Jenkins?

- 59% CI only
- 30% CD with manual deployment
- 11% CD with fully automatic production deployment
Continuous Delivery is here and real
Adoption of Jenkins 2

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Better from the beginning

- 80% of use cases out of the box
- Guide users to best practice
- Start with recommended set of plugins

Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

- Install suggested plugins
  Install plugins the Jenkins community finds most useful.

- Select plugins to install
  Select and install plugins most suitable for your needs.
Guide users to best practice

✓ Git
✓ Folder
✓ Pipeline
✓ Email ext
✓ Build timeout
✓ Credentials
✓ Timestamper
✓ ...

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Pipeline makes Jenkins robust

- Tolerates a restart
- Tolerates plugin updates
- Tolerates loss of master/agent communication
node('java8') {
  // Checkout our source code
  stage('Checkout') {
    checkout scm
  }
  // Build our project
  stage('Build') {
    sh 'mvn clean install'
  }
  // Run our test target
  stage('Test') {
    sh './test.sh'
    // Archive our artifacts
    archiveArtifacts 'target/**/*' .jar'
  }
}
Definition in repository

- Bring transparency to changes
- Capture intent, not just outcome
- Help remove state from Jenkins
#1 Tell Jenkins about your GitHub Org

Jenkins, Inc.
A fictional company to demonstrate Jenkins capabilities
 Everywhere  http://jenkins-ci.org

<table>
<thead>
<tr>
<th>Repositories</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Filters

Find a repository...

**securitay**
Microservice component: securitay
Updated Apr 1, 2016

**borat**
Microservice component: borat
Updated Apr 1, 2016

**meta**
Description and documentation about the demo itself
Updated Mar 3, 2016

**release-engineering**
This is a release engineering territory
node('java8') {
    // Checkout our source code
    stage('Checkout') {
        checkout scm
    }
    // Build our project
    stage('Build') {
        sh 'mvn clean install'
    }
    // Run our test target
    stage('Test') {
        sh './test.sh'
        // Archive our artifacts
        archiveArtifacts 'target/**/*.jar'
    }
}
**#3 Sit & Watch**

**Jenkins, Inc.**

Folder name: Jenkins, Inc.

<table>
<thead>
<tr>
<th>S</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>borat</td>
</tr>
<tr>
<td></td>
<td>release-engineering</td>
</tr>
<tr>
<td></td>
<td>securitay</td>
</tr>
</tbody>
</table>
#3 Sit & Watch

## securitay

<table>
<thead>
<tr>
<th>Branch</th>
<th>Last Success</th>
<th>Last Failure</th>
<th>Last Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>dev</td>
<td>4 mo 21 days - #207</td>
<td>5 mo 19 days - #1</td>
<td>33 sec</td>
</tr>
<tr>
<td>prod</td>
<td>4 mo 21 days - #414</td>
<td>N/A</td>
<td>37 sec</td>
</tr>
<tr>
<td>staging</td>
<td>4 mo 21 days - #208</td>
<td>N/A</td>
<td>48 sec</td>
</tr>
</tbody>
</table>
### Pipeline Visualization

<table>
<thead>
<tr>
<th>Job ID</th>
<th>Date/Time</th>
<th>Build Status</th>
<th>Build Time</th>
<th>Test Status</th>
<th>Test Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>#140</td>
<td>Mar 02 08:51</td>
<td>No Changes</td>
<td>4s</td>
<td>5s</td>
<td>32s</td>
</tr>
<tr>
<td>#139</td>
<td>Mar 02 08:17</td>
<td>No Changes</td>
<td>4s</td>
<td>30s</td>
<td></td>
</tr>
<tr>
<td>#138</td>
<td>Mar 02 00:22</td>
<td>No Changes</td>
<td>4s</td>
<td>30s</td>
<td></td>
</tr>
<tr>
<td>#137</td>
<td>Mar 01 21:42</td>
<td>No Changes</td>
<td>4s</td>
<td>30s</td>
<td></td>
</tr>
</tbody>
</table>

**Average stage times:**
(Average full run time: ~1min 19s)

- **Build docker images:** 4s
- **Unit Test ubuntu-python27:** 31s
- **Unit Test centos6-pyton26:** 12s
- **Unit Test debian-wheezy using python-3.4.3:** 31s
fabric8 = Kubernetes + Jenkins Pipeline

- fabric8 is microservices platform based on Docker, Kubernetes, and Jenkins Pipeline
2016 : One Big Party For Everyone

- Contributors
- Users
- Companies

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© CommitStrip
Contributors from everywhere are here
Google Summer of Code

- 9 detailed project ideas
- 15 mentors, 3 admins
- Dozens of applications
- 5 accepted
One of them is here!

- External workspace manager for Pipeline
  - Student: Alex Somai
  - Mentors: Martin d’Anjou & Oleg Nenashev
Let’s have more local meetups

We help local leaders
  - Swag, speaker referrals, promotion, ...
Jenkins Online Meetup

• On Google Hangout
Number of JAM leaders are here!

- Khai Do & Tim Condit from Seattle
- Casey Vega & Jon Hermansen from Los Angeles
- Tracy Ragan from Albuquerque
- Mor Lajb from Tel Aviv, Israel
- Kenichiro Ohta from Tokyo, Japan
- Susie Hernandez & Hazzim Anaya from Guadalajara, Mexico
- Eddu Melendez & Edson Chavez from Lima, Peru
Project Voltron
New Plugin Site in Jenkins.io

- A project is underway to hopefully replace the current one

<table>
<thead>
<tr>
<th>Plugins by topic</th>
<th>Source code management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jenkins has native support for Subversion and CVS as well as the following plugins:</td>
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</tr>
<tr>
<td>• AnonRepos Plugin — This plugin allows you to use AnonPush as a SCM.</td>
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</tr>
<tr>
<td>• archive-file-as-plugin — ArchiveFiles SCM — This plugin for Jenkins archives archive files and extracts to Jenkins job workspace.</td>
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<tr>
<td>• AWS CodePipeline Plugin — AWS CodePipeline is a continuous delivery service for fast and reliable application updates.</td>
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<tr>
<td>• Bazel Plugin — This plugin integrates Bazel version control system to Jenkins. The plugin requires the Bazel library (bzl) to be installed on the target machine.</td>
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<tr>
<td>• Bitbucket Branch Source Plugin — Multifunctional projects and repositories fetchers from Bitbucket are supported. Please note that this plugin requires a server running Bitbucket 4.0 or later. Slack 3.x and earlier are not supported.</td>
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<tr>
<td>• Bitbucket Plugin — Add Bitbucket support to Jenkins, with Bitbucket</td>
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<td>• BranchSource Plugin — This plugin provides utilities for getting svn info from upstream job to downstream job.</td>
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</tr>
<tr>
<td>• CheckCode Plugin — Integrates Jenkins with CheckCode.</td>
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</tr>
<tr>
<td>• CheckCode UCM Baseline Plugin — Allows using CheckCode UCM baselines as the input of build. When using this SCM, users will be asked at build time to select the baseline on which the job has to work.</td>
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<td>• CheckCode Workspace SCM Plugin — This plugin makes it possible to archive the workspace from builds of one project and reuse them as the SCM source for another project.</td>
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</tr>
<tr>
<td>• DATA Plugin — This plugin integrates DATA to Jenkins.</td>
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</tr>
<tr>
<td>• Concourse Source Code Download for Envelope, PDS, and SPKP Plugin — The Concourse Source Code Download for Envelope, PDS, and SPKP plugin allows Jenkins users to download Envelope, PDS, or SPKP members from the mainframe to the PC.</td>
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<tr>
<td>• Converge Plugin — This plugin integrates Converge with Jenkins.</td>
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</tr>
<tr>
<td>• CVS Plugin — This plugin integrates CVS version control system.</td>
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</tr>
<tr>
<td>• D rape Plugin — This plugin integrates Drape, verison control system to Jenkins. The plugin requires the Drape binary (drape) to be installed on the target machine.</td>
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</tr>
<tr>
<td>• Dimensions Plugin — This plugin integrates the Source Dimensions OAS SCM with Jenkins.</td>
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</tr>
<tr>
<td>• Git Plugin — This plugin allows Git as a build SCM, including repository browsers for several providers. A recent Git runtime is required (0.17.6 minimum, 1.0.1 recommended). Interaction with the Git runtime is performed by the use of the git-credential-plugin, which is only loaded if required. Use extra installations at your own risk.</td>
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<tr>
<td>• GitHub Plugin — This plugin integrates GitHub to your Jenkins.</td>
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<td>• GitHub Branch Source Plugin — Multibranch projects and organization fetchers from GitHub.</td>
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</tr>
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<td>• GitLab Merge Request Builder Plugin — A plugin to build merge requests created in GitLab.</td>
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</tr>
<tr>
<td>• Google Git Notes Publisher Plugin — (source)It provides automated recording of Jenkins build actions to Git Notes (source)</td>
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</tr>
<tr>
<td>• Google Source Plugin — This plugin provides the credential provider to use Google Cloud Platform OAuth Credentials (via the Google Cloud Platform plugin) to access access tokens from <a href="https://cloud.google.com/iam/apis/credentials">https://cloud.google.com/iam/apis/credentials</a>. It supports both kinds of credentials provided by Google Cloud Platform (Google Service Account) and Google Service Account from project keys.</td>
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</tr>
<tr>
<td>• Harvest Plugin — This plugin allows you to use GitHarvest as a SCM.</td>
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</tr>
<tr>
<td>• HP Application Automation Tools — This plug allows Jenkins to trigger HP tests such as: Test setup, Application Lifecycle Management, tests running on Mobile Center, and tests saved on the file system from Unified Functional Testing or LoadRunner emulators.</td>
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<td>• IBM iSeries Connector — IBM iSeries Connector is a plugin which lets you connect your Jenkins to iSeries.</td>
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</tr>
<tr>
<td>• FTTT Build Notifier — A Simple Jenkins Build Status Notifier for FTTT Maker Channel Trigger.</td>
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</tr>
</tbody>
</table>
Demo

New Plugin Site
Security Team

• 1 year of Daniel Beck as security officer!

• Coordinated vulnerability reporting, fixing, & releasing process

• Involves plugin developers and other security organizations
60TB/month of goodness delivered!
Jenkins + Microsoft = Love
We are moving to Azure

- More consistent, uniform infra
- Support the growing needs of the community
- Practice what we preach; kick-ass DevOps for infra
<table>
<thead>
<tr>
<th>Job</th>
<th>Last Success</th>
<th>Last Failure</th>
<th>Last Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>java.net cvs keep-alive</td>
<td>25 minutes (#389)</td>
<td>N/A</td>
<td>1 seconds</td>
</tr>
<tr>
<td>java.net log processor (daily)</td>
<td>8 hours (#4)</td>
<td>N/A</td>
<td>1 minutes</td>
</tr>
<tr>
<td>java.net log processor (weekly)</td>
<td>4 days (#1)</td>
<td>N/A</td>
<td>4 minutes</td>
</tr>
<tr>
<td>java.net mail automation</td>
<td>2 hours (#20)</td>
<td>N/A</td>
<td>0 seconds</td>
</tr>
<tr>
<td>java.net version check</td>
<td>20 minutes (#319)</td>
<td>6 days (#160)</td>
<td>3 seconds</td>
</tr>
<tr>
<td>javadoc</td>
<td>10 hours (#19)</td>
<td>1 days (#18)</td>
<td>11 minutes</td>
</tr>
<tr>
<td>jax-fast</td>
<td>30 minutes (#354)</td>
<td>1 days (#335)</td>
<td>9 minutes</td>
</tr>
<tr>
<td>jax-fast-2.0</td>
<td>1 hours (#134)</td>
<td>36 minutes (#135)</td>
<td>8 minutes</td>
</tr>
<tr>
<td>jaxb-ri</td>
<td>43 minutes (#396)</td>
<td>1 hours (#393)</td>
<td>6 minutes</td>
</tr>
<tr>
<td>msv nightly</td>
<td>19 hours (#9)</td>
<td>N/A</td>
<td>15 minutes</td>
</tr>
<tr>
<td>stapler</td>
<td>7 days (#39)</td>
<td>9 days (#38)</td>
<td>17 seconds</td>
</tr>
</tbody>
</table>
Blue Ocean Project Goals

• Complete rethink of Jenkins UX
• Focused initially on developer UI around pipelines
  – Gradually take over the whole UI over time
• Personalized
  – Is it safe to go home today?
• And just like other projects in Jenkins...
  – Extensible by plugins
  – Design Language to help plugin developers build great UI
Demo

Blue Ocean
## Blue Ocean 1.0 beta

### Jenkins Activity

<table>
<thead>
<tr>
<th>Status</th>
<th>Build</th>
<th>Commit</th>
<th>Branch</th>
<th>Message</th>
<th>Duration</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>✅</td>
<td>11</td>
<td>d495fd8b</td>
<td>feature/editor-plugin</td>
<td>Specific j-s-m...</td>
<td>19 minutes</td>
<td>5 hours ago</td>
</tr>
<tr>
<td>✅</td>
<td>10</td>
<td>L7d28b3</td>
<td>feature/editor-plugin</td>
<td>Squashed co...</td>
<td>25 minutes</td>
<td>6 hours ago</td>
</tr>
<tr>
<td>✅</td>
<td>1</td>
<td>b662c96</td>
<td>task/JENKINS-37685-to...</td>
<td>-</td>
<td>23 minutes</td>
<td>2 days ago</td>
</tr>
<tr>
<td>✅</td>
<td>1</td>
<td>84c7afe</td>
<td>task/JENKINS-37763</td>
<td>-</td>
<td>17 minutes</td>
<td>2 days ago</td>
</tr>
<tr>
<td>✅</td>
<td>2</td>
<td>9f94d6d</td>
<td>task/JENKINS-37323</td>
<td>Using releas...</td>
<td>22 minutes</td>
<td>2 days ago</td>
</tr>
<tr>
<td>✅</td>
<td>1</td>
<td>b7d5c6a</td>
<td>task/JENKINS-37323</td>
<td>-</td>
<td>16 minutes</td>
<td>2 days ago</td>
</tr>
<tr>
<td></td>
<td>302</td>
<td>fdd8744</td>
<td>master</td>
<td>-</td>
<td>21 minutes</td>
<td>2 days ago</td>
</tr>
<tr>
<td></td>
<td>301</td>
<td>fdd8744</td>
<td>master</td>
<td>[maven-role...</td>
<td>18 minutes</td>
<td>2 days ago</td>
</tr>
<tr>
<td>✅</td>
<td>2</td>
<td>5f65550</td>
<td>task/JENKINS-37830</td>
<td>JENKINS-3...</td>
<td>17 minutes</td>
<td>3 days ago</td>
</tr>
<tr>
<td>✅</td>
<td>1</td>
<td>f1b4f83</td>
<td>bug/JENKINS-37425-ru...</td>
<td>-</td>
<td>17 minutes</td>
<td>3 days ago</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>81f3deee</td>
<td>master</td>
<td>[JENKINS-3...</td>
<td>17 minutes</td>
<td>3 days ago</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>bb09e7c</td>
<td>bug/JENKINS-37702-un...</td>
<td>[JENKINS-3...</td>
<td>22 minutes</td>
<td>3 days ago</td>
</tr>
</tbody>
</table>
Next round of efforts focused on ease of use

- Simplified model of pipeline that’s easy to explain & understand
- No more snowflake Jenkinsfile
- Look less like programming, more declarative
- Fails when Jenkins reads it, not when it runs it
- Cater to both point-and-click people & vi/emacs people
Create Pipeline

Start → Build → Browser Tests → Static Analysis → Package → Internet Explorer

Internet Explorer

Run Script

Add step

Run Script

wget -o Results.json https://www.cloudtest.com/CloudBeers/beta-pipeline/ie9.json
./testing/parseResults.sh

Delete stage

Delete step
Jenkinsfile, simplified

```pipeline {
   agent docker:"node_js:0.10"
   stages {
      stage('build') {
         sh './build.sh'
      }
      stage('test') {
         sh './run-test.sh'
      }
   }
}```
Common idioms, simplified

environment {
    SAUCE_USERNAME = 'bootstrap'
    SAUCE_PASSWORD = secret("pJkBwnuae9dKU5tEcCqccfS1QQw7/...")
}

notifications {
    failure {
        mail to: 'jenkins-team-notifications@lists.jenkins.io'
    }
}
Walled garden of idiom
More ease of use

• New documentation site
  – Search
  – Use-case driven examples
• Better error handling & reporting
• Security sandbox improvements
• Language discrepancy
Imagine the world where ...

You install new plugins & modify security setting through pull requests
Meet Jenkins Config as Code

- Plugins, global configuration, views, jobs, agents, credentials configured via $JENKINS_HOME/conf.d/*.conf

- Covers all plugins dynamically without custom code for each

- Machine generated reference manual & syntax checks
Imagine the world where ...

You never have to throw away any build records
Storage Pluggability

• Reduce & eventually eliminate local disk usage

• Benefits
  – Better scalability for larger deployments
  – Better index & data analysis
  – Better fail-over and disaster recovery
  – Faster startup time
Imagine the world where ...

Single Jenkins master handles your global workload
Cloud Native Jenkins

- Single master that spans across multiple JVMs on multiple machines
- 24/7 Availability without down time
- Attractive but big disruptive changes
We are ALL IN! What are you waiting for?

• Jenkins 2
  – Upgrade!

• Blue Ocean
  – Install it and tell us what you think!

• Pipeline
  – Have one job converted during JW!

• More exciting projects coming down the road