Which CI server do you use?

https://snyk.io/blog/jvm-ecosystem-report-2018-tools

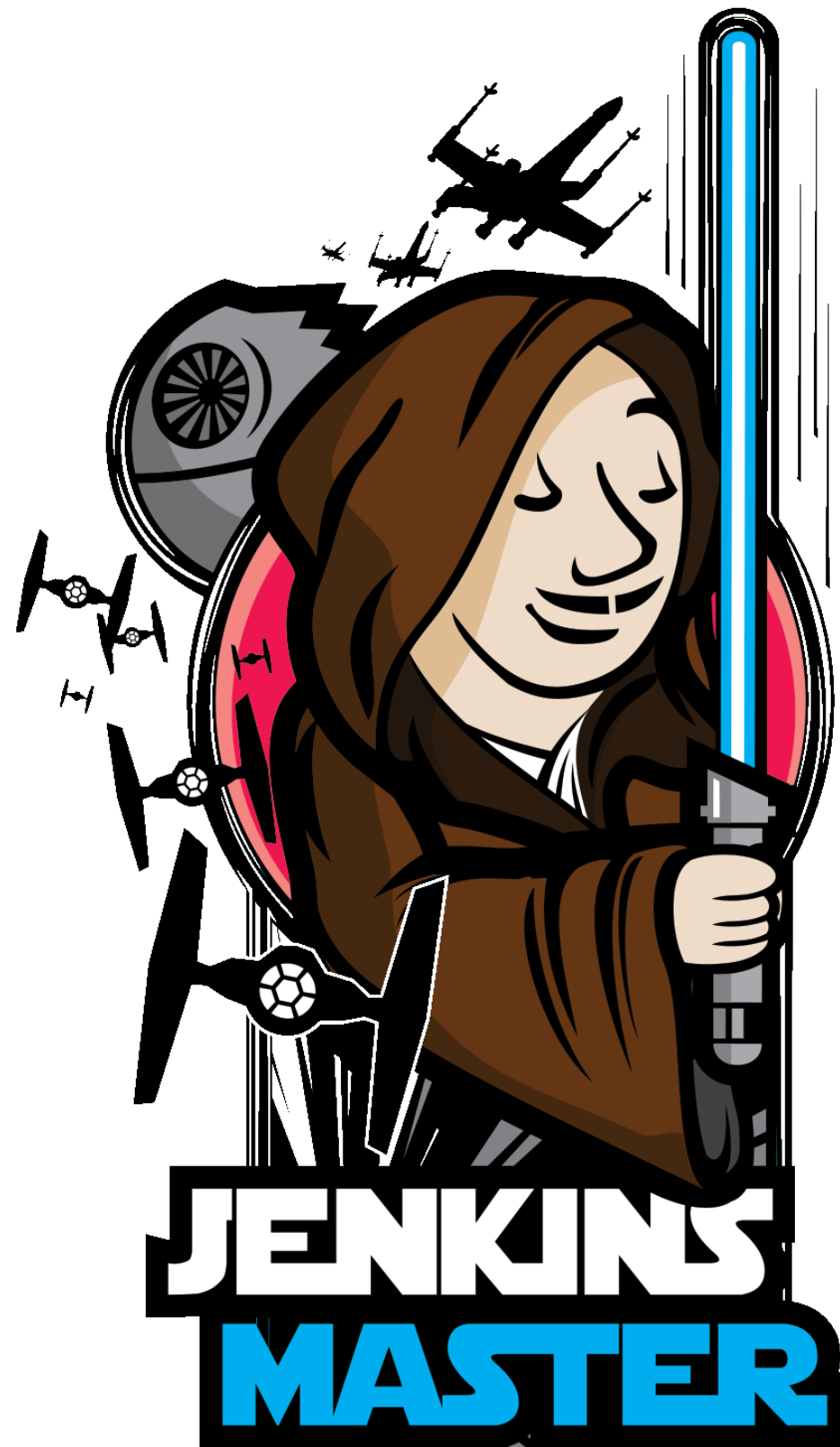https://wiki.jenkins.io/display/JENKINS/Logo

https://medium.com/@ricardoespsanto/jenkins-is-dead-long-live-concourse-ce13f94e4975
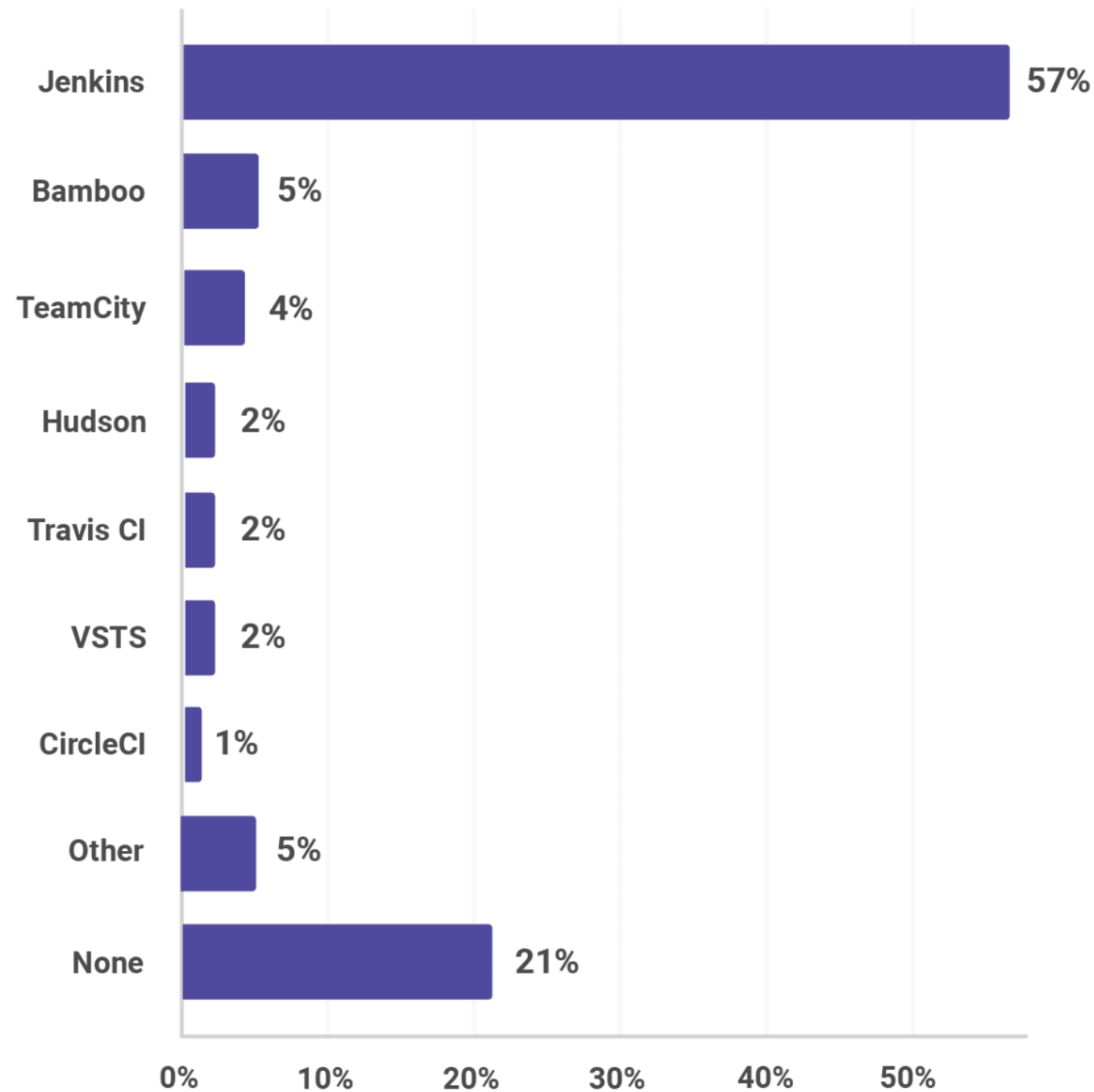
Used with permission from Cloudbees

(1)
Set-up:
Use docker

```
wget -q -O - https://pkg.jenkins.io/debian/jenkins.io.key
| sudo apt-key add -

sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable
binary/ > /etc/apt/sources.list.d/jenkins.list'

sudo apt-get update

sudo apt-get install jenkins
```

```
wget -q                  tps://p          ins.io/debian/jenkins.io.key
| sudo             d -

sudo             'ec        http:/        jenkins.io/debian-stable
binar         /etc/ap        es.        d/jenkins.list'

sudo ap        update

sudo apt-g
```

```
docker run -p 8080:8080 -p 50000:50000 \

 -v $PWD/jenkins:/var/jenkins_home \

 jenkins/jenkins:lts
```

```
docker run -p 8080:8080 -p 50000:50000 \

  -v $PWD/jenkins:/var/jenkins_home \

  jenkins/jenkins:lts


********************************************************

Please use the following password to proceed to installation:

06ac817e24324166880761bae911faf2
```

(2)
Set-up:
Use the `jenkins/jenkins` Docker images

DEPRECATED:

USE:

OFFICIAL REPOSITORY

jenkins ☆

Last pushed: 22 days ago

PUBLIC REPOSITORY

jenkins/jenkins

Last pushed: 17 hours ago

Weekly releases

LTS release

(3)
Set-up:
First time installer & Plugins

Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

`/var/jenkins_home/secrets/initialAdminPassword`

Please copy the password from either location and paste it below.

Administrator password

Continue

Selected (20/

Note that the full list of plugins is not shown here. Additional plugins can be installed in the **Plugin Manager** once the initial setup is complete. See the Wiki for more information.

Organization and Administration (2/3)

☐ **Dashboard View** ↗   16 ◂

Jenkins view that shows various cuts of build information via configured portlets.

☑ **Folders Plugin** ↗

This plugin allows users to create "folders" to organize jobs. Users can define custom taxonomies (like by project type, organization type etc). Folders are nestable and you can define views within folders. Maintained by CloudBees, Inc.

☑ **OWASP Markup Formatter Plugin** ↗   3 ◂

Uses policy definitions to allow limited HTML markup in user-submitted text.

Build Features (4/10)

☐ **build-name-setter** ↗   11 ◂

(4)
Set-up:
Provision your plugins

```
docker exec -it [containerId] /usr/local/bin/install-
plugins.sh [plugins]
```

```
docker exec -it [containerId] /usr/local/bin/install-
plugins.sh [plugins]
```

```
http://[jenkinsurl]/safeRestart
```

```
FROM jenkins/jenkins:lts

COPY plugins.txt

    /usr/share/jenkins/ref/plugins.txt

RUN /usr/local/bin/install-plugins.sh

    < /usr/share/jenkins/ref/plugins.txt
```

(5)
Set-up:
Configure your plugins using Jenkins Configuration as Code

https://jenkins.io/projects/jcasc/

(6)
Set-up:
Don't do work on the Master, use Agents

Jenkins

New Item

People

Build History

Manage Jenkins

My Views

Credentials

Build Queue —

No builds in the queue.

Build Executor Status —

1 Idle

2 Idle

Jenkins

Jenkins ▸

📦 New Item

👥 People

📝 Build History

⚙️ **Manage Jenkins**

👥 My Views

🔑 Credentials

Build Queue ▬

No builds in the queue.

Build Executor Status ▬

1 Idle

2 Idle

Jenkins

Back to Dashboard

Manage Jenkins

New Node

Configure

Build Queue ▬

No builds in the queue.

Build Executor Status ▬

1 Idle

S	Name ↓	Architecture	
	[master](#)	Linux (amd64)	
	Data obtained	**7 min 25 sec**	

Jenkins

⬆ Back to Dashboard

⚙ Manage Jenkins

💻 New Node

⚙ Configure

S	Name ↓	Architecture
💻	master	Linux (amd64)
	Data obtained	7 min 25 sec

Build Queue —

No builds in the queue.

Build Executor Status —

1 Idle

❯

(7)
Set-up:
Provision agents using
Swarm plugin

https://plugins.jenkins.io/swarm

(8)
Set-up:
Automate agent provisioning and make them ephemeral

Which build tool do you use for your main project?

https://snyk.io/blog/jvm-ecosystem-report-2018-tools
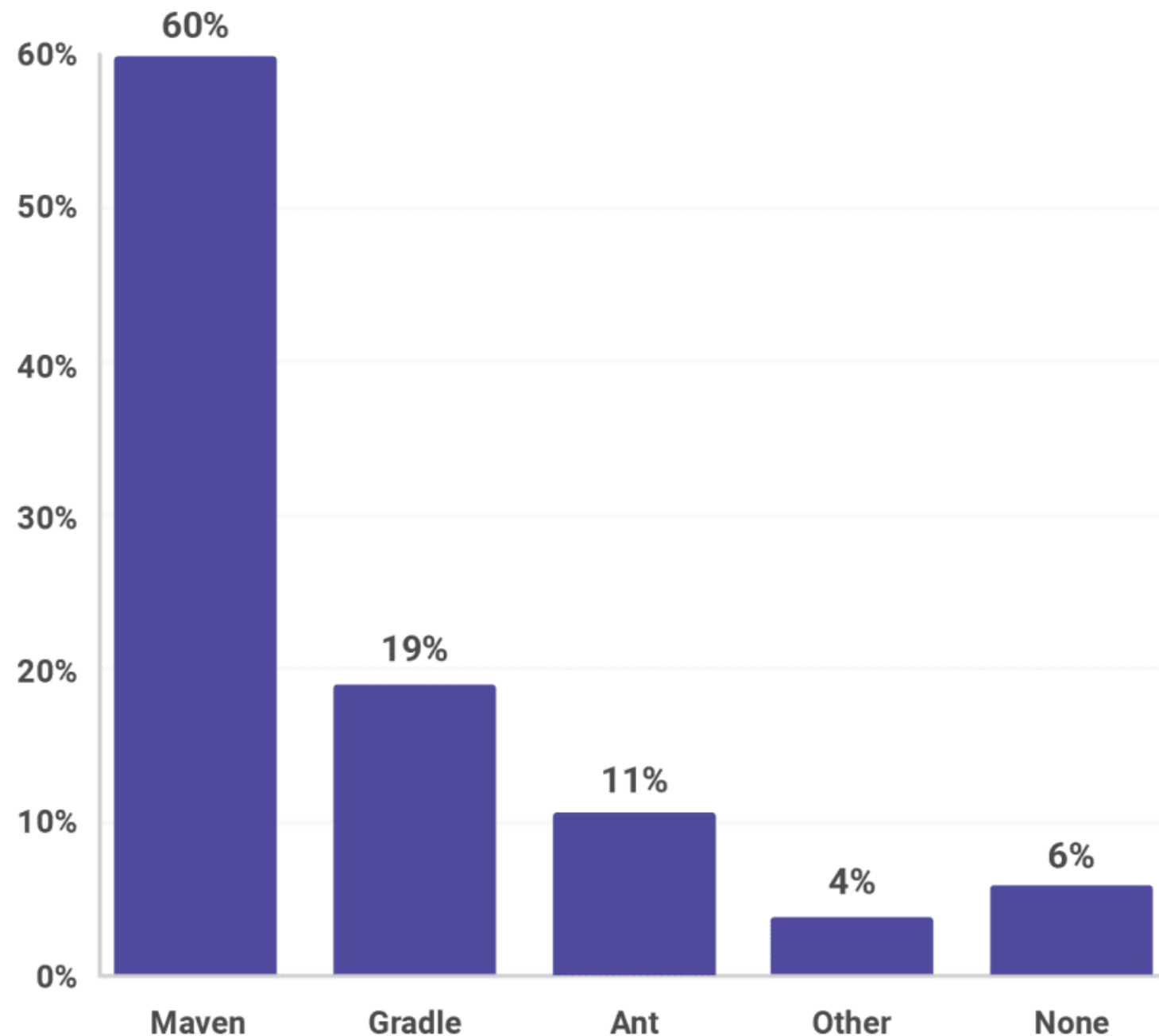
(9)
Jobs:
Don't use Maven job

Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.
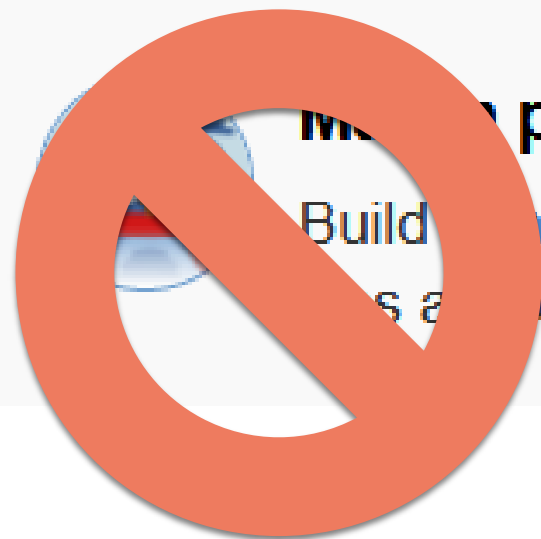
Maven project

Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

M____n project

Build ___ ____aven project. Jenkins takes advantage of your POM ___s a__ ___drastically reduces the configuration.

(10)
Jobs: Pipeline:
Job configuration as code

Pipeline

Orchestrates long-running activities that can span multiple build slaves. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Jenkinsfile

```
pipeline {

    agent any

    stages {

        stage('Hello World') {

            steps {

                sh 'echo Hello world'

            }

        }

    }

}
```
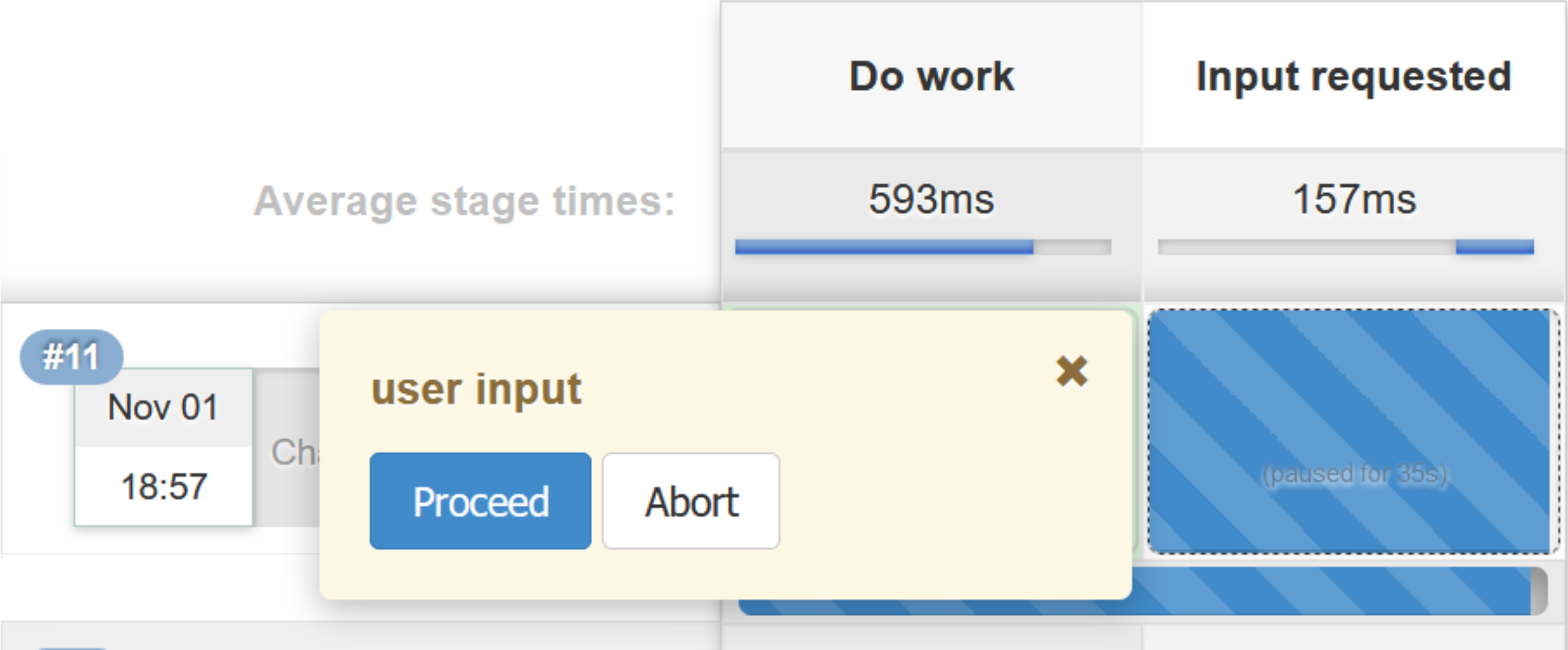
(11)
Jobs: Pipeline:
Stages are groups of steps

```
stages {

        stage('Build') { … }

        stage('Test') { … }

        stage('Deploy') { … }

        stage('E2E') { … }

        stage('Perf test') { … }

        stage('Acc') { … }

        stage('Prod') { … }
}
```

Build	Test	Deploy	E2E	Perf test	Acc	Prod
15s	22s	5s	1min 36s	1min 7s	12s	10s
15s	22s	5s	1min 36s	1min 7s	12s	10s
15s	22s	5s	1min 36s	1min 7s	12s	10s

(12)
Jobs: Pipeline:
Do work on agents...

```
pipeline {

    agent any

    stages {

        stage('Hello World') {

            steps {

                sh 'echo Hello world'

            }

        }

    }

}
```

```
pipeline {

    agent any

    stages {

        stage('Hello World') {

            steps {

                sh 'echo Hello world'

            }

        }

    }

}
```

(13)
Jobs: Pipeline:
Do work on agents...

... unless you're waiting for user input

Stage View

	Do work	Input requested
Average stage times:	593ms	157ms

#11
Nov 01
18:57

Cha

user input ✖

Proceed   Abort

(paused for 35s)

```
pipeline {

    agent none

    stages {

            stage('Do work') {

                    agent any

                    steps { … }

            }

            stage('Input requested') {

                    agent none

                    steps {

                            input message: 'user input'

                    }

            }
```

```
pipeline {
    agent none
    stages {
            stage('Do work') {
                    agent any
                    steps { … }
            }
            stage('Input requested') {
                    agent none
                    steps {
                            input message: 'user input'
                    }
            }
```

```
pipeline {

    agent none

    stages {

            stage('Do work') {

                agent any

                steps { … }

            }

            stage('Input requested') {

                agent none

                steps {

                        input message: 'user input'

                }

            }
```

```
pipeline {

    agent none

    stages {

            stage('Do work') {

                    agent any

                    steps { … }

            }

            stage('Input requested') {

                    agent none

                    steps {

                            input message: 'user input'

                    }

            }
```

(14)
Jobs: Pipeline:
Docker image as agent

```
pipeline {

    agent {

        docker { image 'node:7-alpine' }

    }

    stages {

        stage('Test') {

            steps {

                sh 'node --version'

            }

        }

    }

}
```

(15)
Jobs: Pipeline: Docker image as agent with persistent storage

```
pipeline {

    agent {

        docker {

            image 'maven:3-alpine'

            args '-v $HOME/.m2:/root/.m2'

        }

    }

    stages {

        stage('Build') {

            steps {

                sh 'mvn -B'

}}}}
```

(16)
Jobs: Pipeline:
Stashing files

```
stage('Build') {

        agent any

        steps {

                checkout scm

                sh 'make'

                stash includes: '**/target/*.jar', name: 'app'

        }

}

stage('Test on Linux') {

        agent { label 'linux' }

        steps {

                unstash 'app'

                sh 'make check'

        }

}
```

(17)
Jobs: Pipeline: Locking resources

```
echo 'Starting'

lock('my-resource-name') {

    echo 'I require unique access to the resource'

   // any other build will wait until the one locking

   // the resource leaves this block

}

echo 'Finish'
```

(18)
Jobs: Pipeline:
Parameters are an option

```
pipeline {

    agent any

    parameters {

        string(description: 'foo', name: 'bar')

    }

    environment {

        baz = params.bar

    }
```

(19)
Jobs: Pipeline:
Parallelism

```
parallel 'end-to-end-tests': {

            // E2E


}, 'performance-tests': {

            // Perf tests



}
```

```
parallel 'end-to-end-tests': {
            // E2E
            node('e2e-node'){ … }
}, 'performance-tests': {
            // Perf tests
            node('perf-test-node'){ … }
}
```

```groovy
def splits = splitTests count(2)

def branches = [:]

for (int i = 0; i < splits.size(); i++) {

    def index = i

    branches["split${i}"] = {

            def exclusions = splits.get(index);

            // mvn test excludes exclusions

    }

}

parallel branches
```

```
stash name: 'sources', includes: 'pom.xml,src/'

def splits = splitTests count(2)

def branches = [:]

for (int i = 0; i < splits.size(); i++) {

      def index = i

      branches["split${i}"] = {

              node('remote') {

                      unstash 'sources'

                      def exclusions = splits.get(index);

                      writeFile file: 'exclusions.txt', text: exclusions.join("\n")

                      "${tool 'M3'}/bin/mvn -B -Dmaven.test.failure.ignore test"

                      junit 'target/surefire-reports/*.xml'

}}}
parallel branches
```

(20)
Jobs: Pipeline:
Know the difference between Declarative and Scripted

Declarative

Easy to use

Concise

Validation before running

Visual Editor

Scripted

Bit harder due to more Groovy

Boilerplate

Try-commit-retry-commit-loop

Groovy editor

Declarative

Easy to use

Concise

Validation before running

Visual Editor

-------------------------------- +

Perfect for regular users
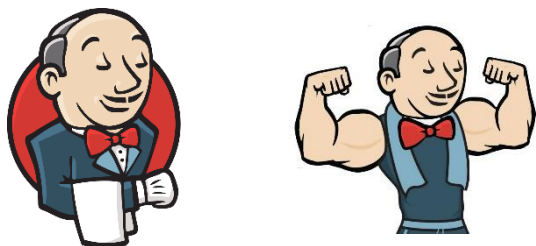
Scripted

Bit harder due to more Groovy

Boilerplate

Try-commit-retry-commit-loop

Groovy editor

-------------------------------- +

More flexiblity for power users
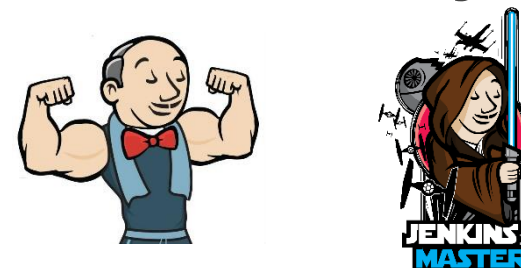
(21)
Jobs: Pipeline:
Keep your Pipelines small

(22)
Jobs: Pipeline:
`@NonCPS`

Continuation-passing style (CPS)

```groovy
@NonCPS

static def prepareDeploymentYaml(text, binding) {

    return new groovy.text.StreamingTemplateEngine()

                    .createTemplate(text)

                    .make(binding)

                    .toString()

}
```

(23)
Jobs: Pipeline:
Aborting Pipelines

Build History

trend —

find   X

⚪ **#2**   Nov 6, 2017 12:05 PM

Aborted by [REDACTED]

Click here to forcibly terminate running steps

Aborted by [REDACTED]

Click here to forcibly terminate running steps

Aborted by [REDACTED]

Click here to forcibly terminate running steps

Aborted by [REDACTED]

Click here to forcibly terminate running steps

Aborted by Joep Weijers

Terminating stage

Click here to forcibly terminate running steps

Click here to forcibly kill entire build

(24)
Jobs: Pipeline:
Blue ocean GUI

Pipelines

New Pipeline

NAME	HEALTH	BRANCHES	PR	
My_other_product		-	-	☆
My_product		-	-	☆

Jenkins

Pipelines   Administration   Logout

My_product ☆ ⚙

Activity   Branches   Pull Requests

▶ Run

STATUS	RUN	COMMIT	MESSAGE	DURATION	COMPLETED
✓	6	–	Started by user admin	1s	a minute ago
✓	5	–	Started by user admin	<1s	3 minutes ago
✗	4	–	Started by user admin	2s	3 minutes ago

Branch: —   ◔ 1s   No changes

Commit: —   🕐 a few seconds ago   Started by user admin

Start   **Build**   Test   Browser test   Deploy   End

Test JS

Test Java

Chrome

Edge

Firefox

Safari
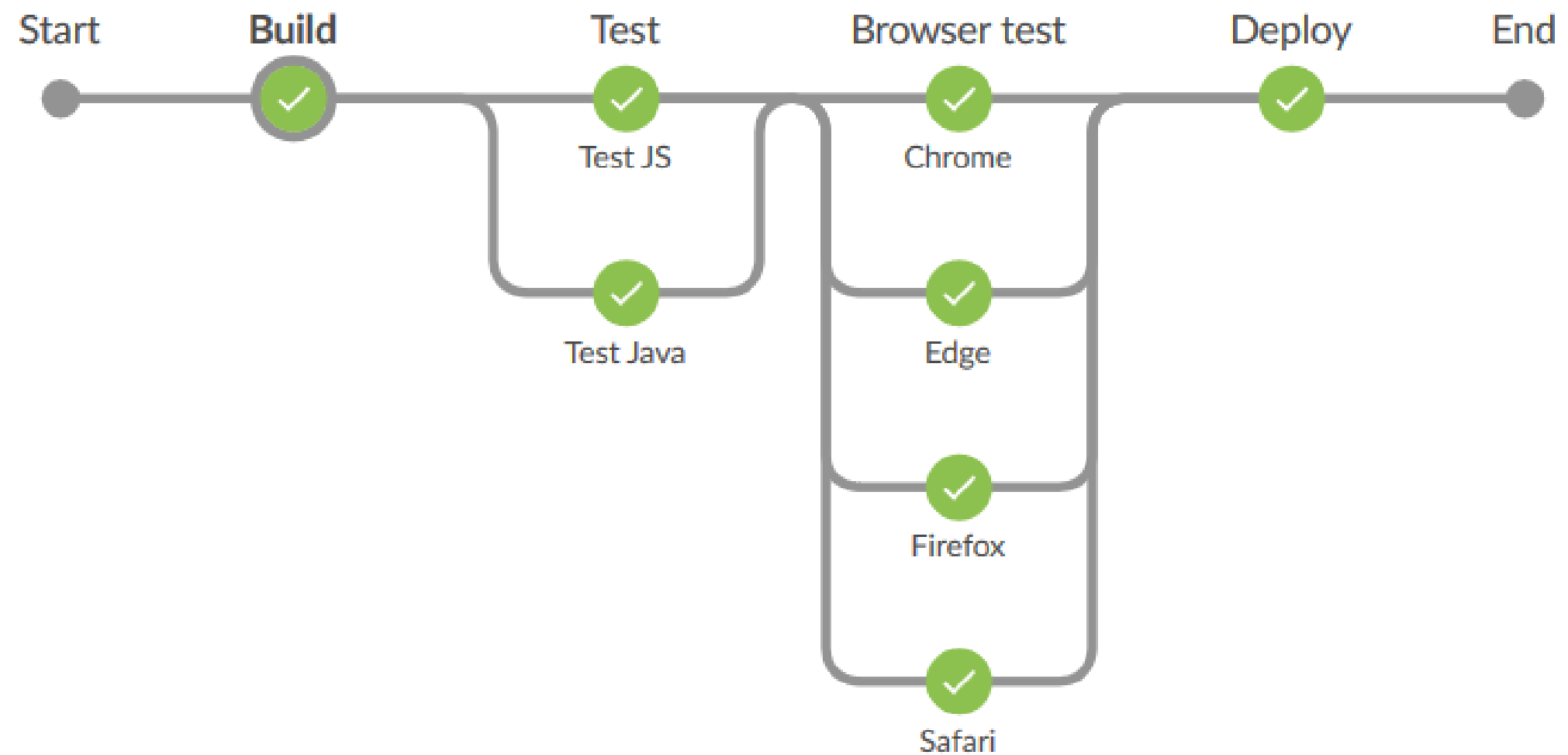
(25)
Jobs: Pipeline:
There is a Pipeline editor
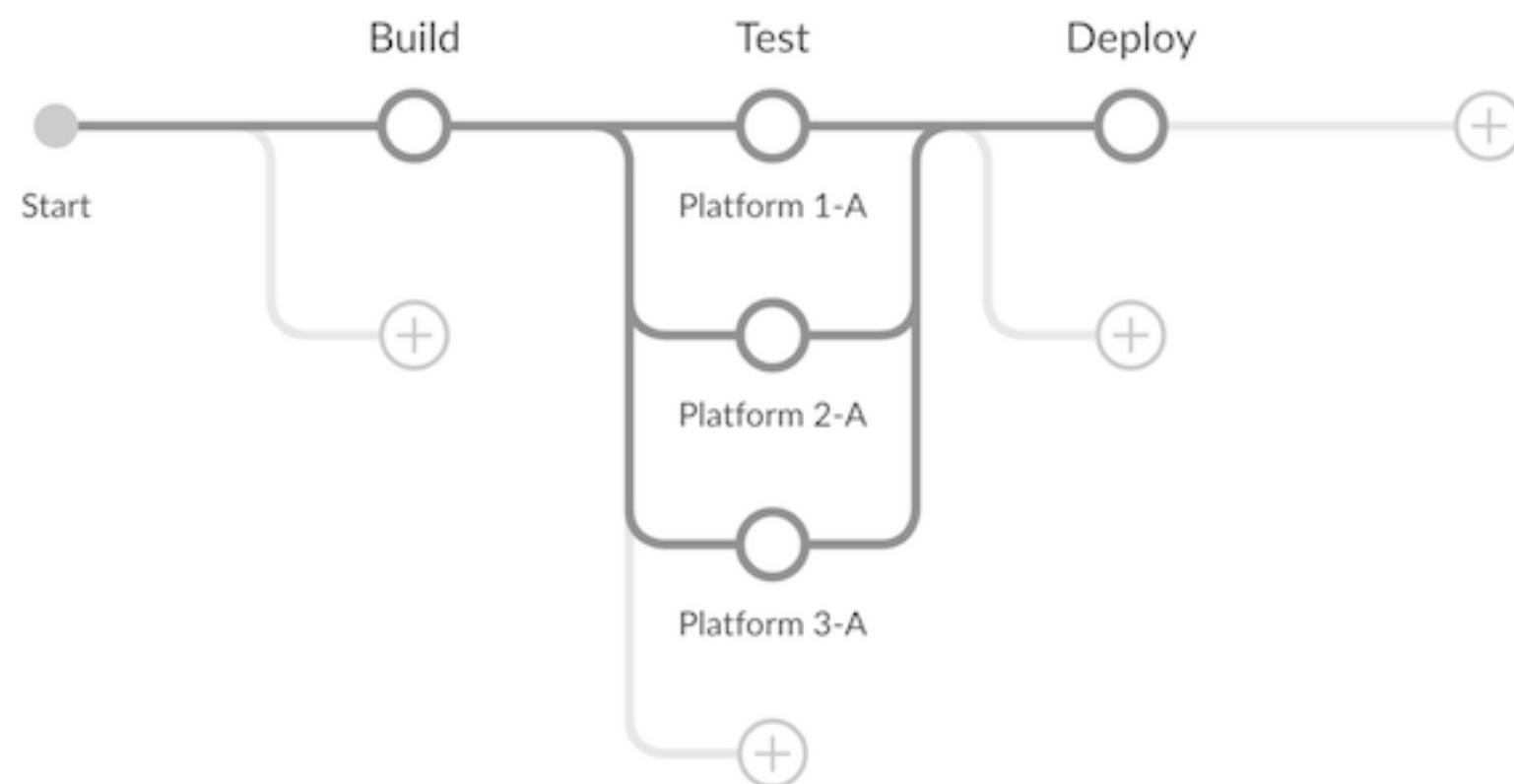
(26)
Jobs: Pipeline:
Use Shared libraries

Don't Repeat Yourself!

(27)
Jobs: Pipeline:
Use files from shared libraries

(28)
Jobs: Pipeline: Developing your shared libraries

Create Rule

When I get email with all of the selected conditions

- [x] From Jenkins
- [ ] Subject contains   A Release job requires your attention
- [ ] Sent to   me only

Do the following

- [ ] Display in the New Item Alert window
- [ ] Play a selected sound: Windows Notify Ema   ▶   ■   Browse...
- [x] Move the item to folder: Deleted Items   Select Folder...

[OK]   [Cancel]   [Advanced Options...]
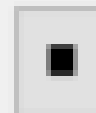
(29)
Views:
Build your own view

Jenkins

New Item

People

Build History

Manage Jenkins

My Views

Credentials

Open Blue Ocean

Build Queue —

Jenkins
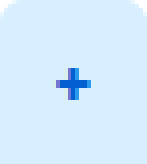
New Item

People

Build History

Build Queue —

No builds in the queue.

All +

S | New View | **Name** ↓

My_othe

My_pro

Project/

Job Filters

Status Filter

All selected jobs

Recurse in subfolders ☐

Jobs

☐ My_other_product

☐ My_product

☐ ProjectA_Authentication_E2E

☐ ProjectA_CI

☐ ProjectA_FeatureX_E2E

☐ ProjectA_NB

☐ ProjectA_Sonar

☐ ProjectB_CD_Pipeline

☑ Use a regular expression to include jobs into the view

Regular expression

ProjectA_.*

Add Job Filter ▼

S	W	Name ↓
🟡	☀️	ProjectA_Authentication_E2E
🔵	☀️	ProjectA_CI
🔵	☀️	ProjectA_FeatureX_E2E
🔵	☀️	ProjectA_NB
🔵	☀️	ProjectA_Sonar

Icon: S M L

(30)
Views:
Less mails, more Build Monitor

View name | My Build Monitor

◉ **Build Monitor View**

Shows a highly visible status of selected jobs. Ideal as an Extreme Feedback Device to be displayed on a screen on your office wall.

My Build Monitor

ProjectA_Authentication_E2E

2 builds have failed

#2   6 minutes ago

ProjectA_CI

#49   a moment ago

ProjectA_FeatureX_E2E

#2   a moment ago

ProjectA_NB

#5   a moment ago

ProjectA_Sonar

#5   a moment ago

ProjectB_CD_Pipeline

#2 [Release]   8m 45s | 0s

Epic Zythos

(31)
There is an API

```
[jenkins url]/api/


[jenkins url]/job/myJob/api/
```

```
[jenkins url]/user/admin/my-
views/view/MyJobs/api/json?tree=jobs[color]
```

```json
{

  "_class" : "com.smartcodeltd.jenkinsci.plugins.buildmonitor.BuildMonitorView",

  "jobs" : [

    {

      "_class" : "hudson.model.FreeStyleProject",

      "color" : "yellow"

    },

    {

      "_class" : "hudson.model.FreeStyleProject",

      "color" : "blue"

    },

    {

      "_class" : "org.jenkinsci.plugins.workflow.job.WorkflowJob",

      "color" : "blue_anime"

    }

  ]

}
```

(32)
Views:
Extreme feedback

Epic Zythos

E2E-aaaa_This_job_fails_every_second_run

Back in the green!

minutes ago   #12

etector

just now :-)

E2E-database-filter

's

17 hours ago   #323 7.03.014

16 hours ago

https://techblog.topdesk.com/

(33)
Build numbers are more than integers

```
http://localhost:8080/job/myJob/4/
```

```
http://localhost:8080/job/myJob/lastBuild/
```

```
http://localhost:8080/job/myJob/lastBuild/

lastBuild

lastStableBuild

lastSuccessfulBuild

lastFailedBuild

lastUnstableBuild

lastUnsuccessfulBuild

lastCompletedBuild
```

(34)
Jenkins X

https://jenkins-x.io/

(35)
Security:
Stay up to date

Jenkins

3 | search

Jenkins ▶

🗃 New Item

👥 People

📝 Build History

⚙ Manage Jenkins

👥 My Views

📁 New View

Build Queue —

No builds in the queue.

Welcome to Jenkins!

Please **create new jobs** to get started.

Jenkins

Jenkins ▶

New Item

People

Build History

Manage Jenkins

My Views

New View

Build Queue   —

No builds in the queue.

3   search

Welcome to Jenkins!

Please **create new jobs** to get started.

New version of Jenkins (2.109) is available for download (changelog).

You have not configured the CSRF issuer. This could be a security issue. For more information, please refer to this page. You can change the current configuration using the Security section CSRF Protection.

This Jenkins instance uses deprecated protocols: JNLP3-connect. It may impact stability of the instance. If newer protocol versions are supported by all system components (agents, CLI and other clients), it is highly recommended to disable the deprecated protocols. See Protocol Configuration.

Manage Jenkins

Build Executor Status

1 Idle

2 Idle

Jenkins

search

admin | log out

New version of Jenkins (2.109) is available for download (changelog).

Manage Jenkins

Build Executor Status

1 Idle

2 Idle

Year-old vuln turns Jenkins servers into Monero mining slaves

The hip world of continuous integration meets the dark world of crypto-jacking

By Richard Chirgwin 20 Feb 2018 at 02:58

8 💬   SHARE ▼

Here's a salutary reminder why it pays to patch promptly: a Jenkins bug patched last year became the vector for a multi-million-dollar cryptocurrency mining hijack.

A campaign security researchers dubbed "JenkinsMiner" exploited CVE-2017-1000353, a deserialisation bug first disclosed with fixes by the Jenkins team in April 2017.

(36)
Security: Warnings: CSRF crumb

You have not configured the CSRF issuer. This could be a security issue. For more information, please refer to this page. You can change the current configuration using the Security section CSRF Protection.

Manage Jenkins

Build Executor Status —

1 Idle

2 Idle

```
curl -u "admin:admin"
'http://localhost:8080/crumbIssuer/api/xml?xpath=concat(/
/crumbRequestField,":",//crumb)'
```

```
curl -u "admin:admin"
'http://localhost:8080/crumbIssuer/api/xml?xpath=concat(/
/crumbRequestField,":",//crumb)'


Jenkins-Crumb:bc22da3c06187f7c042abeb72419d835
```

```
curl -u "admin:admin"
'http://localhost:8080/crumbIssuer/api/xml?xpath=concat(/
/crumbRequestField,":",//crumb)'


Jenkins-Crumb:bc22da3c06187f7c042abeb72419d835


curl -X POST -u "admin:admin" -H "Jenkins-
Crumb:bc22da3c06187f7c042abeb72419d835"
http://localhost:8080/job/someJob/build
```

(37)
Security: Warnings: JNLP

This Jenkins instance uses deprecated protocols: JNLP3-connect. It may impact stability of the instance. If newer protocol versions are supported by all system components (agents, CLI and other clients), it is highly recommended to disable the deprecated protocols. See Protocol Configuration.

Manage Jenkins

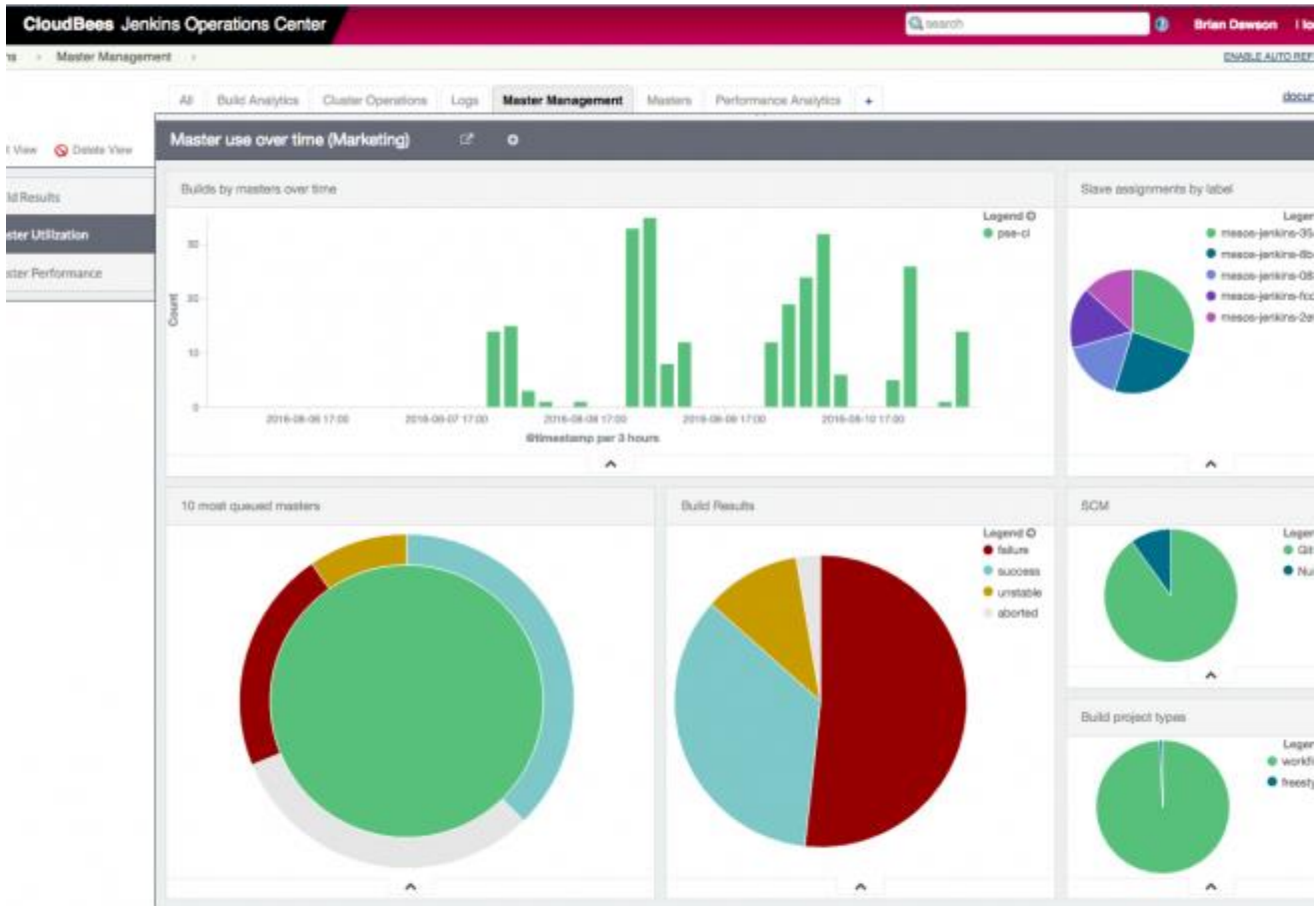**Build Executor Status**   −

1   Idle

2   Idle

(38)
Learn about Cloudbees

(39)
Enterprise Jenkins: Cloudbees

(40)
My favorite plugins

Build Monitor

Job Config History

Job DSL

Throttle Concurrent Builds

Timestamper

Version number plugin & Build-name-setter