DevOps 2TIN

Chapter 5b

CI in jenkins

DE HOGESCHOOL MET HET NETWERK

Elfde-Liniestraat 24, 3500 Hasselt, www.pxl.be

CI in jenkins

Credential manager
jenkinsfile (github)
compiling code
Global tool configuration
unit testing
artifacts
input steps

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Wat is een Pipeline?

Definitie “deployment pipeline”:
(first defined by Jez Humble and David Farley in their book *Continuous Delivery: Reliable Software Releases Through Build, Test, and Deployment Automation*)

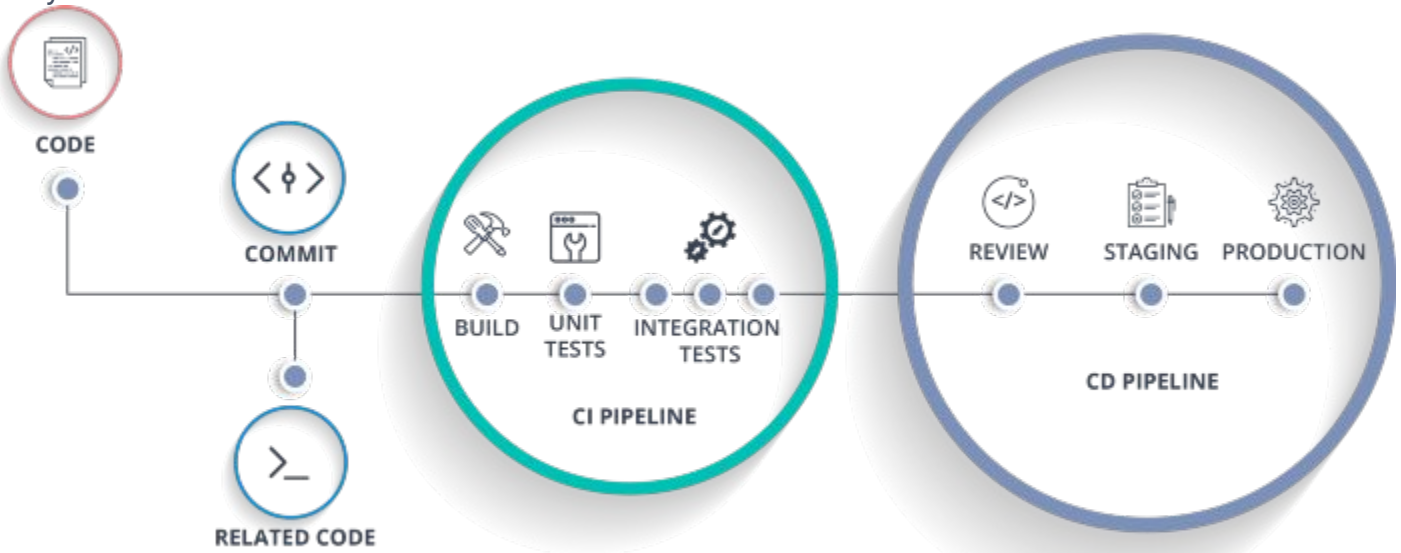
It ensures that all code checked in to version control is automatically built and tested in a production-like environment.

Sleutelwoorden:

- Alle Code
- Versiebeheer
- **Automatisch gebouwd**
- Automatisch getest
- Productie-waardige omgeving

Recap: CI/CD pipeline

A ***continuous delivery (CD) pipeline*** is an automated expression of your process for getting software from version control right through to your users and customers.



Every change to your software (committed in source control) goes through a complex process on its way to being released. This process involves building the software in a reliable and repeatable manner, as well as progressing the built software (called a "build") through multiple stages of testing and deployment.

THE FIRST WAY

CREATE A DELIVERY SYSTEM

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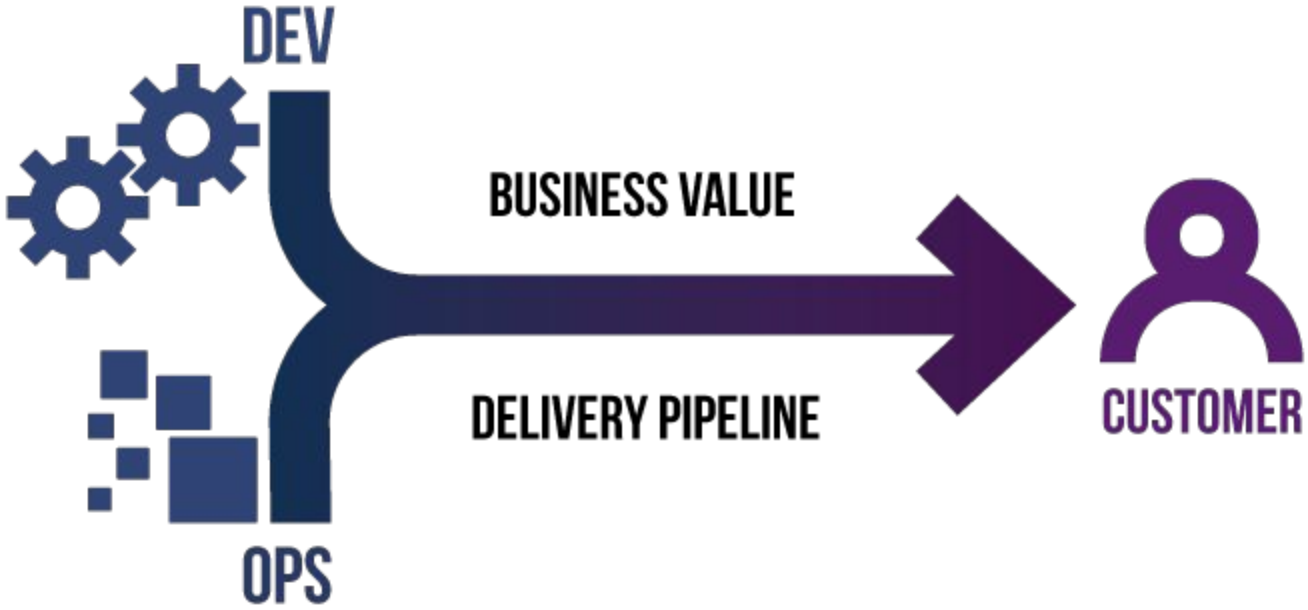
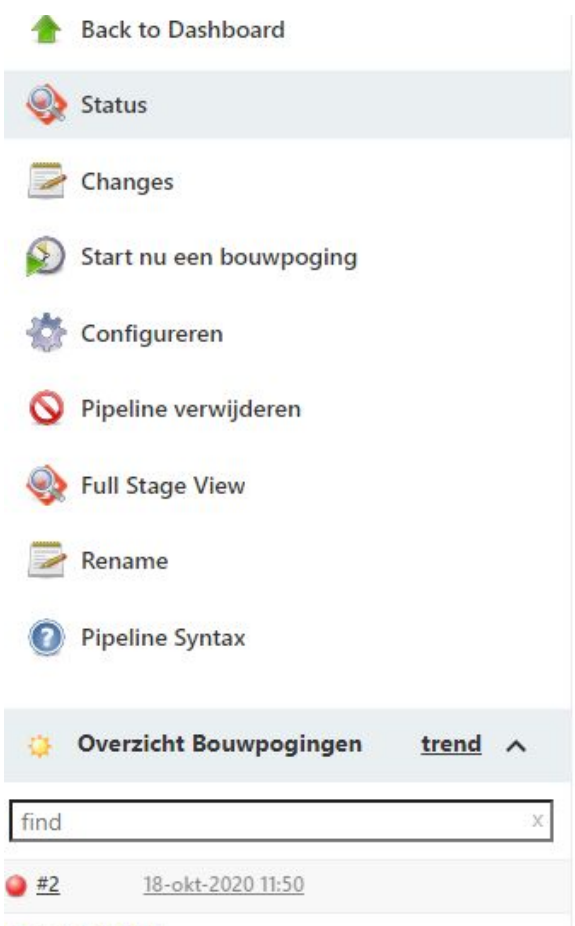
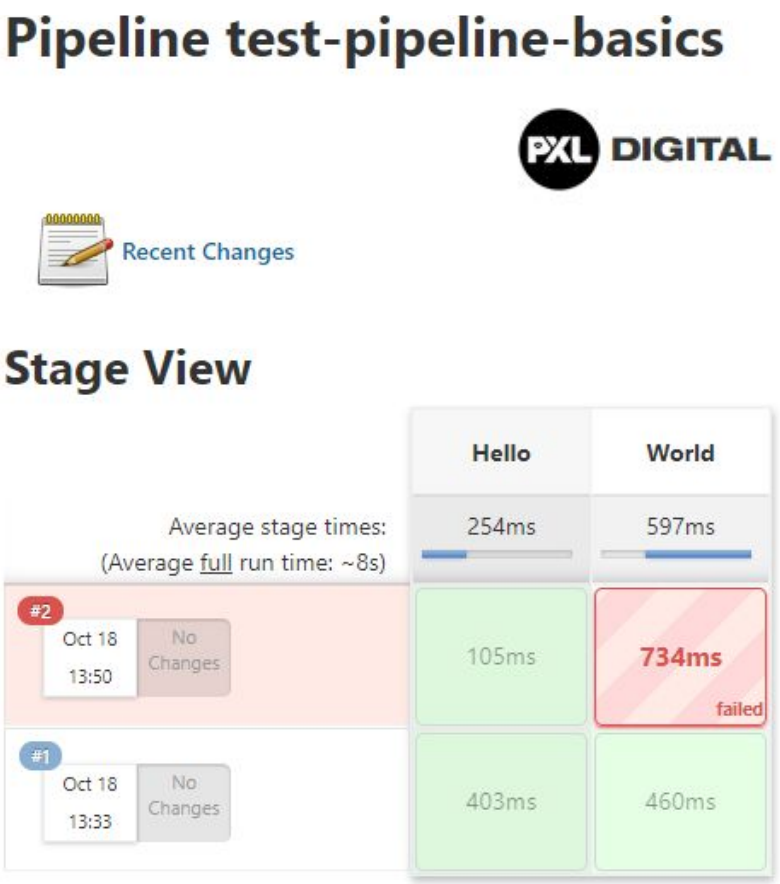


Recap


Back to Dashboard
Status
Changes
Start nu een bouwpoging
Configureren
Pipeline verwijderen
Full Stage View
Rename
Pipeline Syntax
Overzicht Bouwpogingen
trend
find
#2
18-okt-2020 11:50


Pipeline test-pipeline-basics
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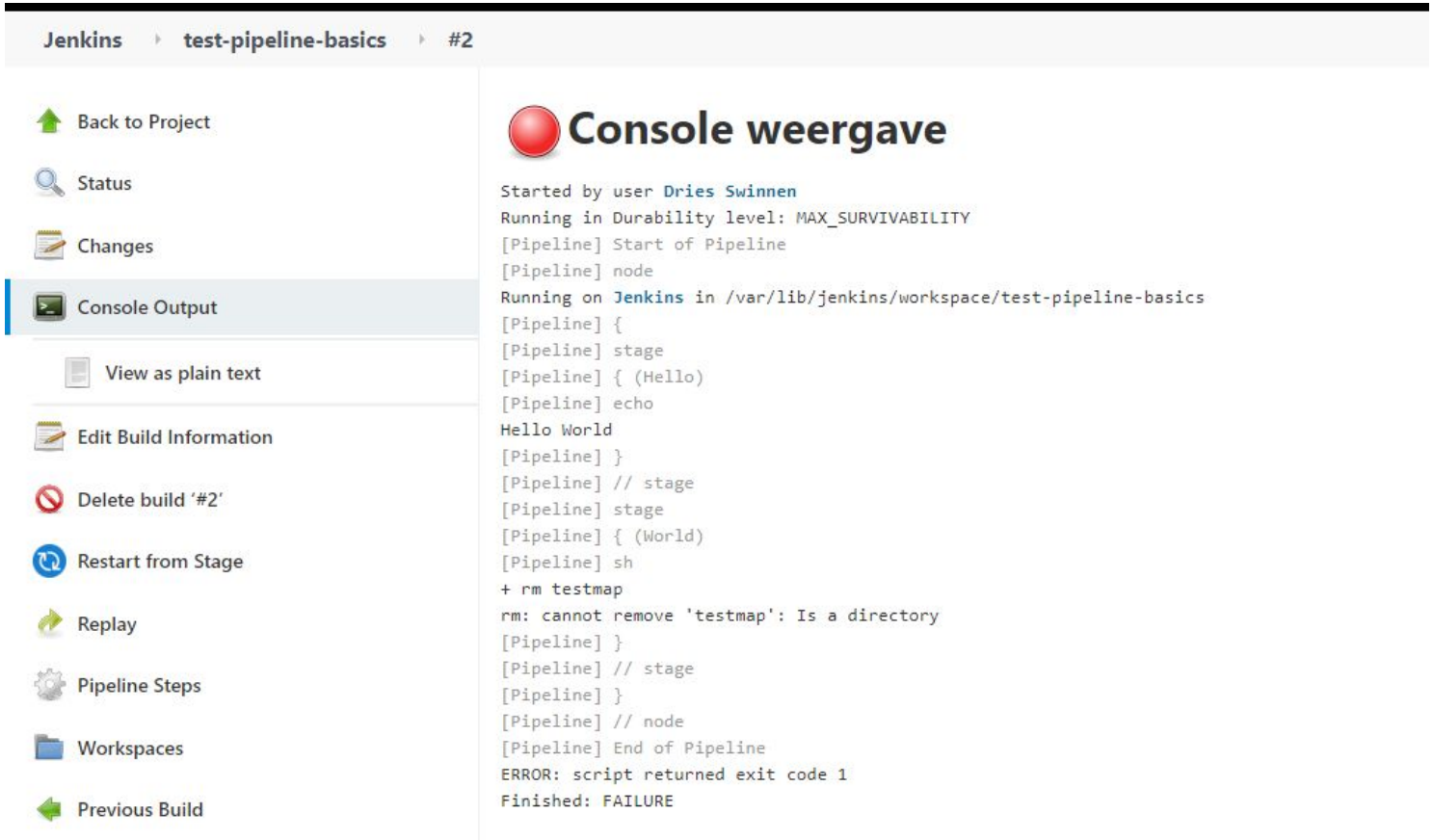
Recent Changes
Stage View
Hello
World
Average stage times:
(Average full run time: ~8s)
254ms
597ms
#2
Oct 18
13:50
No Changes
105ms
734ms
failed
#1
Oct 18
13:33
No Changes
403ms
460ms

Recap


Jenkins
test-pipeline-basics
#2
Back to Project
Status
Changes
Console Output
View as plain text
Edit Build Information
Delete build '#2'
Restart from Stage
Replay
Pipeline Steps
Workspaces
Previous Build
Console weergave
Started by user Dries Swinnen
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/test-pipeline-basics
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (World)
[Pipeline] sh
+ rm testmap
rm: cannot remove 'testmap': Is a directory
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
ERROR: script returned exit code 1
Finished: FAILURE

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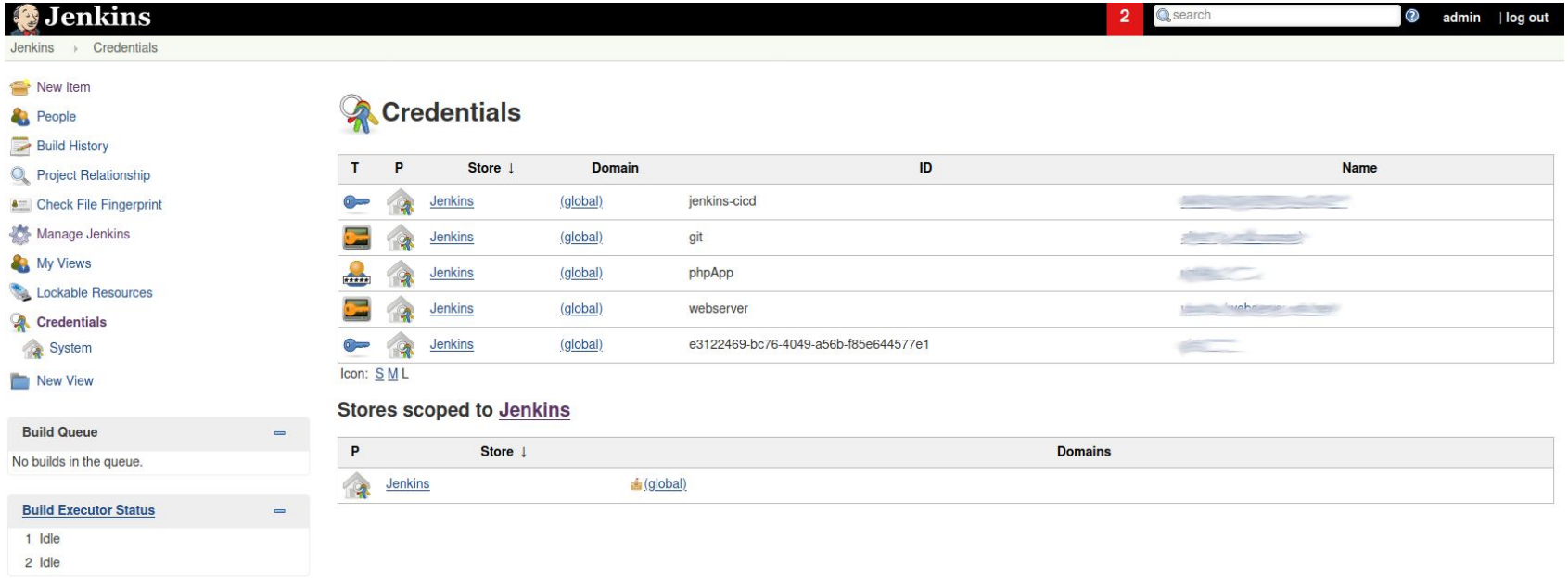
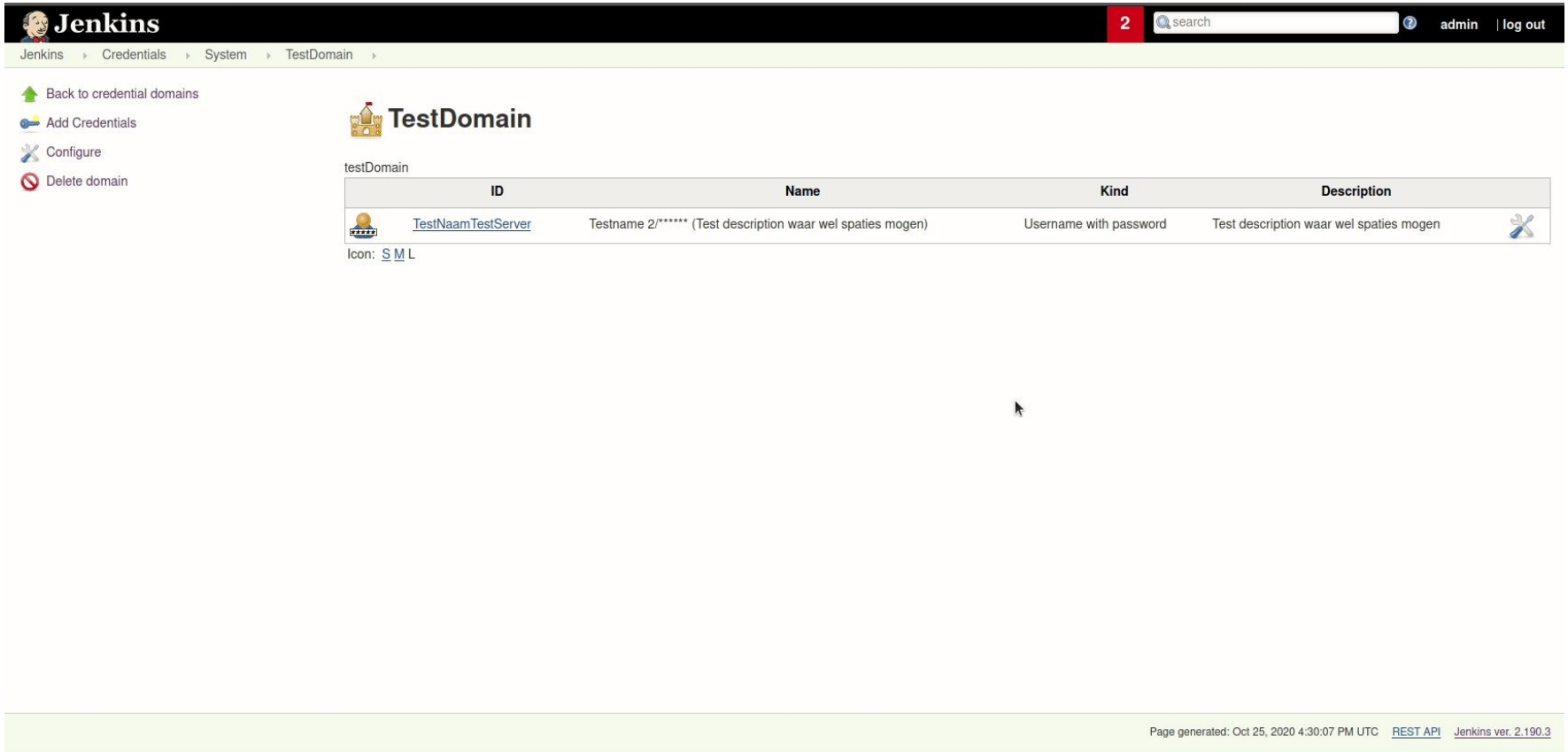
Jenkins - pipeline - credential manager

credentials in een veilige plaats opslaan:



Jenkins - pipeline - credential manager



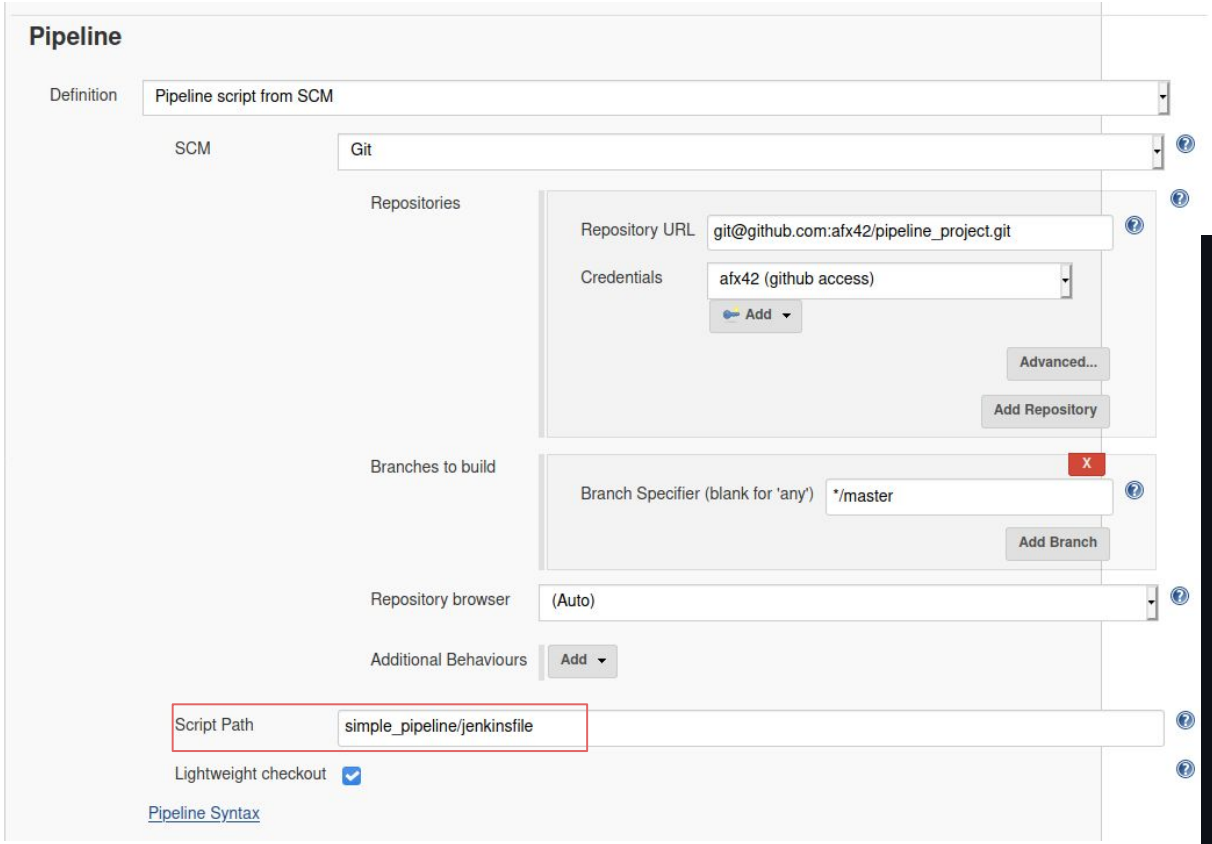
Jenkins - pipeline - credential manager

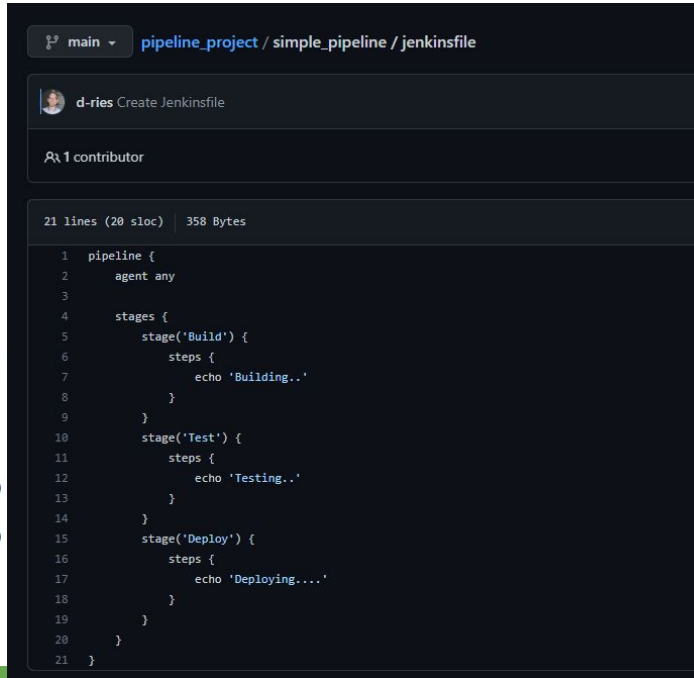
Aanroepen credentials in jenkinsfile:

```
stage('Deploy') {
  // A sleep to make sure we actually get a real difference!
  sleep (30)
sshagent(credentials : ['webserver']) {

    sh "scp -o StrictHostKeyChecking=no CurrentBuild.zip ubuntu@$instanceInfo$remotedir"
    sh "ssh -T -o StrictHostKeyChecking=no ubuntu@$instanceInfo sudo unzip CurrentBuild.zip -d /var/www/html"
      }
```

```
[Pipeline] sshagent
[ssh-agent] Using credentials ubuntu (webserver ssh key)
[ssh-agent] Looking for ssh-agent implementation...
[ssh-agent]   Exec ssh-agent (binary ssh-agent on a remote machine)
$ ssh-agent
SSH_AUTH_SOCK=/tmp/ssh-UAasre7XkOXS/agent.3227
SSH_AGENT_PID=3230
Running ssh-add (command line suppressed)
Identity added: /var/jenkins_home/workspace/DevOps_Calculator@tmp/private_key_8600551491206348113.key (/var/jenkins_home/workspace/DevOps_Calculator@tmp
/private_key_8600551491206348113.key)
[ssh-agent] Started.
[Pipeline] {
[Pipeline] readFile
[Pipeline] echo
172.31.36.68
[Pipeline] sh
+ scp -o StrictHostKeyChecking=no CurrentBuild.zip ubuntu@172.31.36.68:.
Warning: Permanently added '172.31.36.68' (ECDSA) to the list of known hosts.
```

Jenkins - pipeline - jenkinsfile





Jenkins - pipeline - Compiling code

- Java -> Maven

Script

```
1  pipeline {
2      agent any
3      stages {
4          stage('Build') {
5              steps {
6                  git 'https://github.com/jglick/simple-maven-project-with-tests.git'
7
8                  sh "mvn clean package"
9              }
```

Stage Logs (Build)

Git -- https://github.com/jglick/simple-maven-project-with-tests.git (self time 407ms)

Shell Script -- mvn -Dmaven.test.failure.ignore=true clean package (self time 461ms)

```
+ mvn -Dmaven.test.failure.ignore=true clean package
/var/lib/jenkins/workspace/magic-unicorn-bicycle@tmp/durable-c2a01eab/script.sh: 1: mvn: not found
```

Jenkins - pipeline - Compiling code

- Tools die gebruikt worden in de pipeline -> installeren op agents
  - Agent any = Jenkins kiest zelf; huidige jenkins server

```
$ cd /opt
$ wget https://apache.belnet.be/maven/maven-3/3.6.3/binaries/apache-maven-3.6.3-bin.tar.gz
$ sudo tar -xvzf ~/Downloads/apache-maven-3.6.3-bin.tar.gz
$ PATH="...:/opt/apache-maven-3.6.3/bin"
$ mvn --version
```

- Handmatig?

Jenkins - pipeline - Global tool configuration

- Java -> Maven

Pipeline

Definition: Pipeline script

Script:

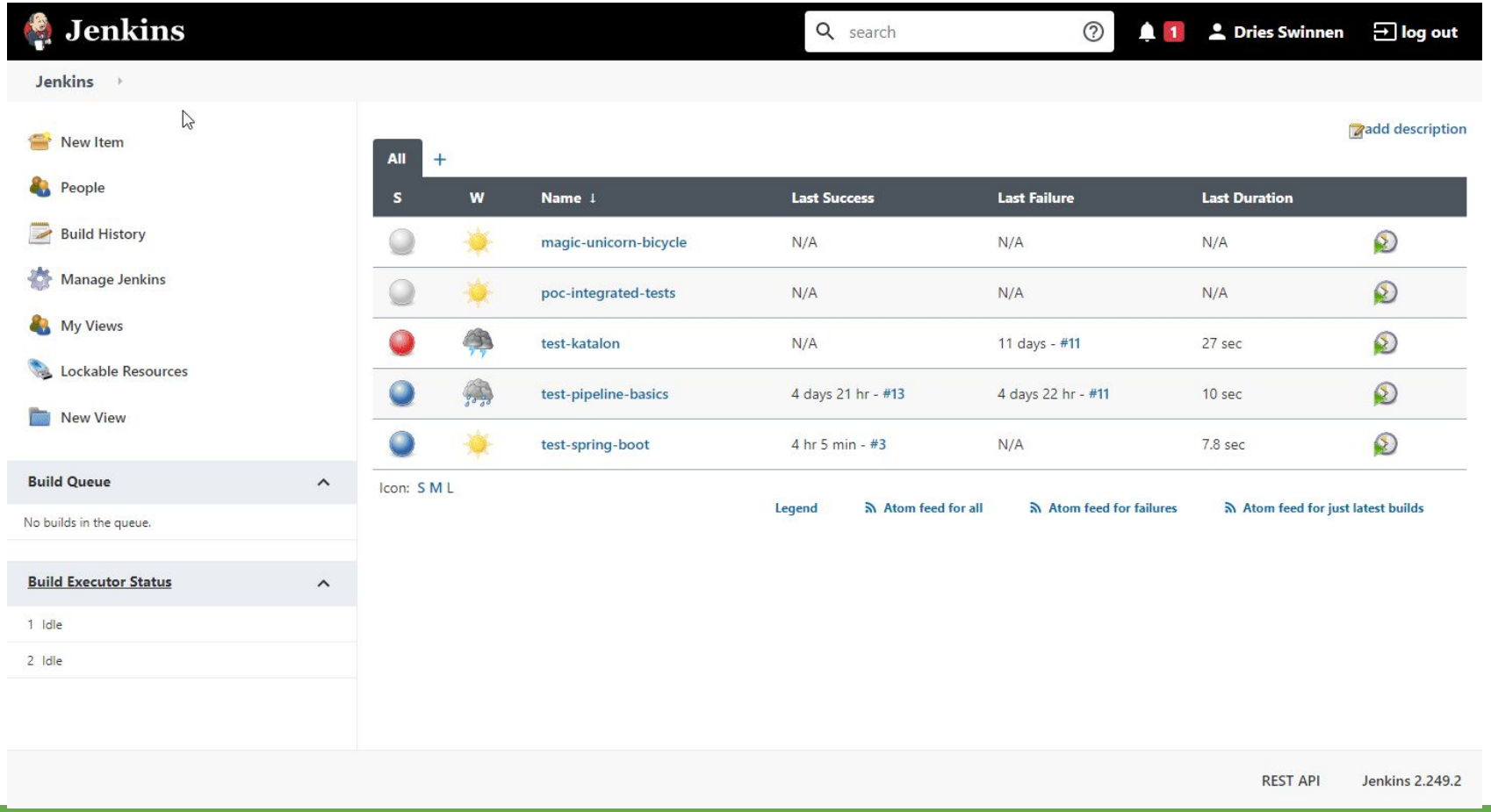
```
pipeline {
    agent any

    tools {
        // Install the Maven version configured as "M3" and add it to the path.
        maven "M3"
    }

    stages {
        stage('Build') {
            steps {
                // Get some code from a GitHub repository
                git 'https://github.com/jglick/simple-maven-project-with-tests.git'

                // Run Maven on a Unix agent.
                sh "mvn -Dmaven.test.failure.ignore=true clean package"
```

GitHub + Maven

Use Groovy Sandbox

Pipeline Syntax

Jenkins - pipeline - Global tool configuration



Jenkins - pipeline - Global tool configuration

- Tools globaal definiëren (maven / Git / JDK / NPM / …)
  - definitie in pipeline => Werkt ook altijd op de agent
- Niet beschikbaar via gobal tool configuration?
  - Plugin?
  - Handmatige installatie op server / agents

Jenkins - pipeline - Compiling code / Installing dependencies

- React(of Angular) / NodeJS/… - NPM

Pipeline

Definition: Pipeline script

Script

```
pipeline {
    agent any

    stages {
        stage('Code pull') {
            steps {
                // Get some code from a GitHub repository
                git branch: 'jenkins2-course',
            url: 'https://github.com/jenkins-docs/simple-node-js-react-npm-app.git'
            }
        }
        stage('build') {
            steps {
            nodejs('npm') {
                echo "Performing npm build..."
                sh 'npm install'
                    }
            }
        }
```

Jenkins - pipeline - Unit testing

- hangt af van testrunner applicatie
  - Java => JUnit
  - NodeJS => Jest
  - Vaak integratie vanuit andere talen naar JUnit

```
stage('unittest'){
    steps {
        sh "mvn test"
    }
}
```

Jenkins - pipeline - Unit testing

```
[Pipeline] sh
+ mvn test
[INFO] Scanning for projects...
[INFO]
[INFO] ----------------< test:simple-maven-project-with-tests >----------------
[INFO] Building simple-maven-project-with-tests 1.0-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ simple-maven-project-with-tests ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /var/lib/jenkins/workspace/magic-unicorn-bicycle/src/main/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ simple-maven-project-with-tests ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ simple-maven-project-with-tests ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /var/lib/jenkins/workspace/magic-unicorn-bicycle/src/test/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ simple-maven-project-with-tests ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-surefire-plugin:2.18.1:test (default-test) @ simple-maven-project-with-tests ---
[INFO] Surefire report directory: /var/lib/jenkins/workspace/magic-unicorn-bicycle/target/surefire-reports

-------------------------------------------------------
 T E S T S
-------------------------------------------------------
Running test.OtherTest
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.012 sec - in test.OtherTest
```

Jenkins - pipeline - Unit testing - Rapporten

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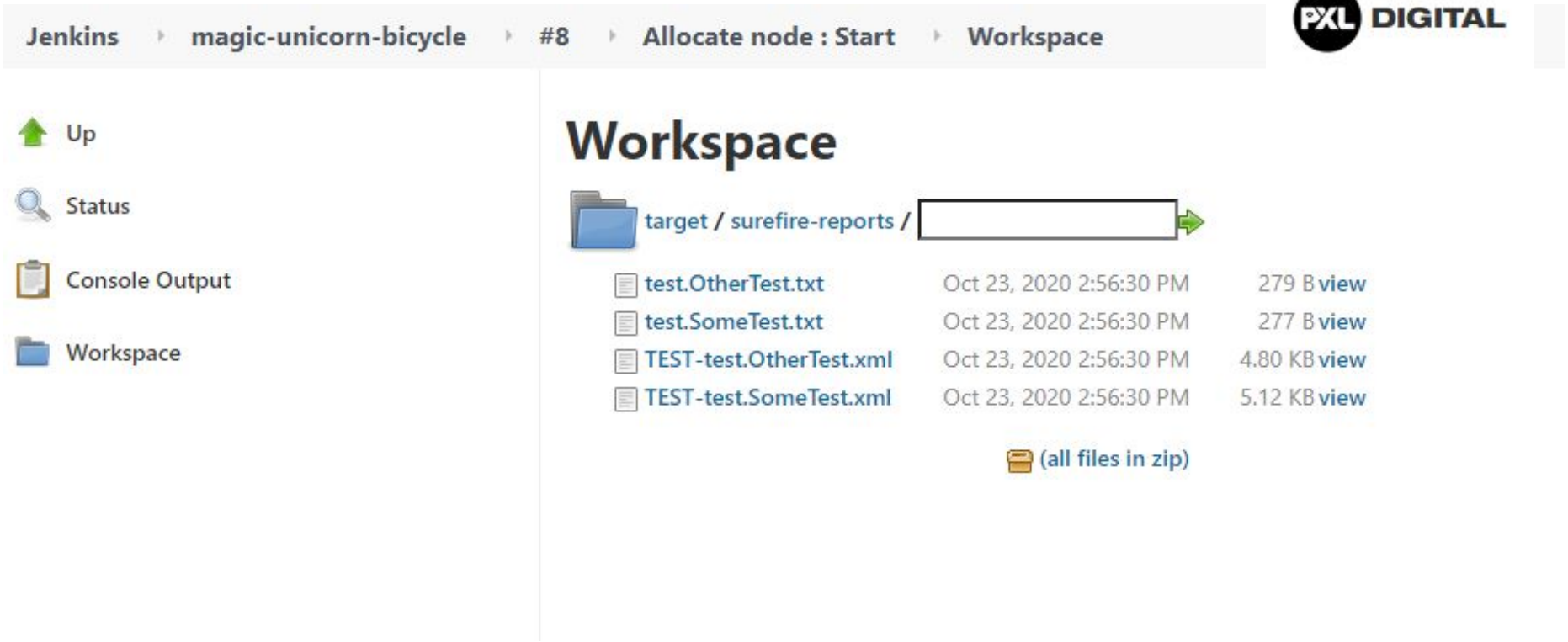

Jenkins - pipeline - Unit testing - Rapporten

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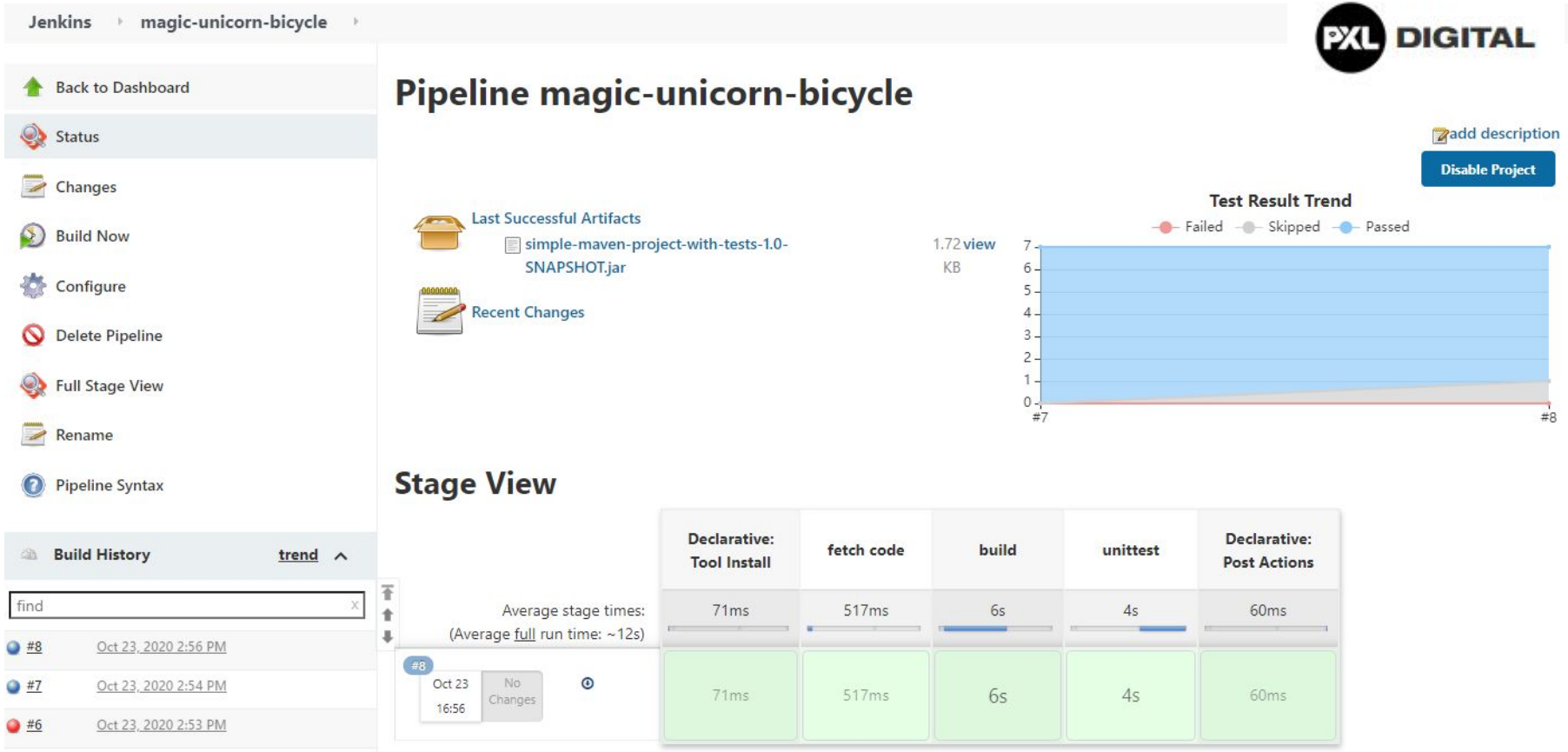
```
stage('unittest'){
    steps {
        sh "mvn test"
        junit '**/target/surefire-reports/TEST-*.xml'
    }
}
```

Jenkins - pipeline - Unit testing - Rapporten



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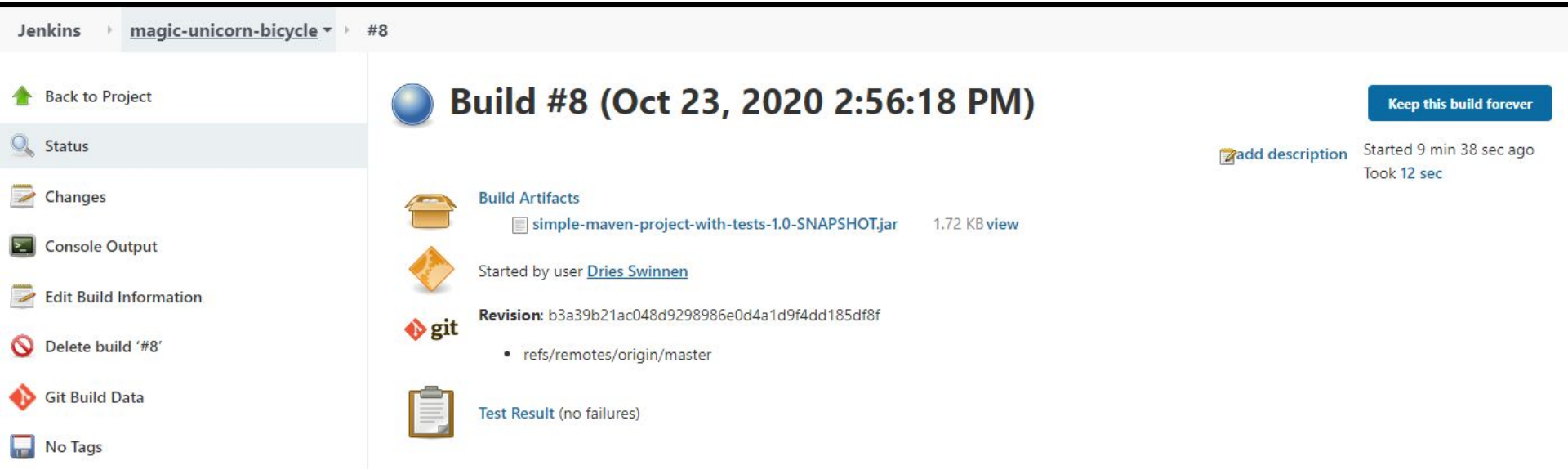

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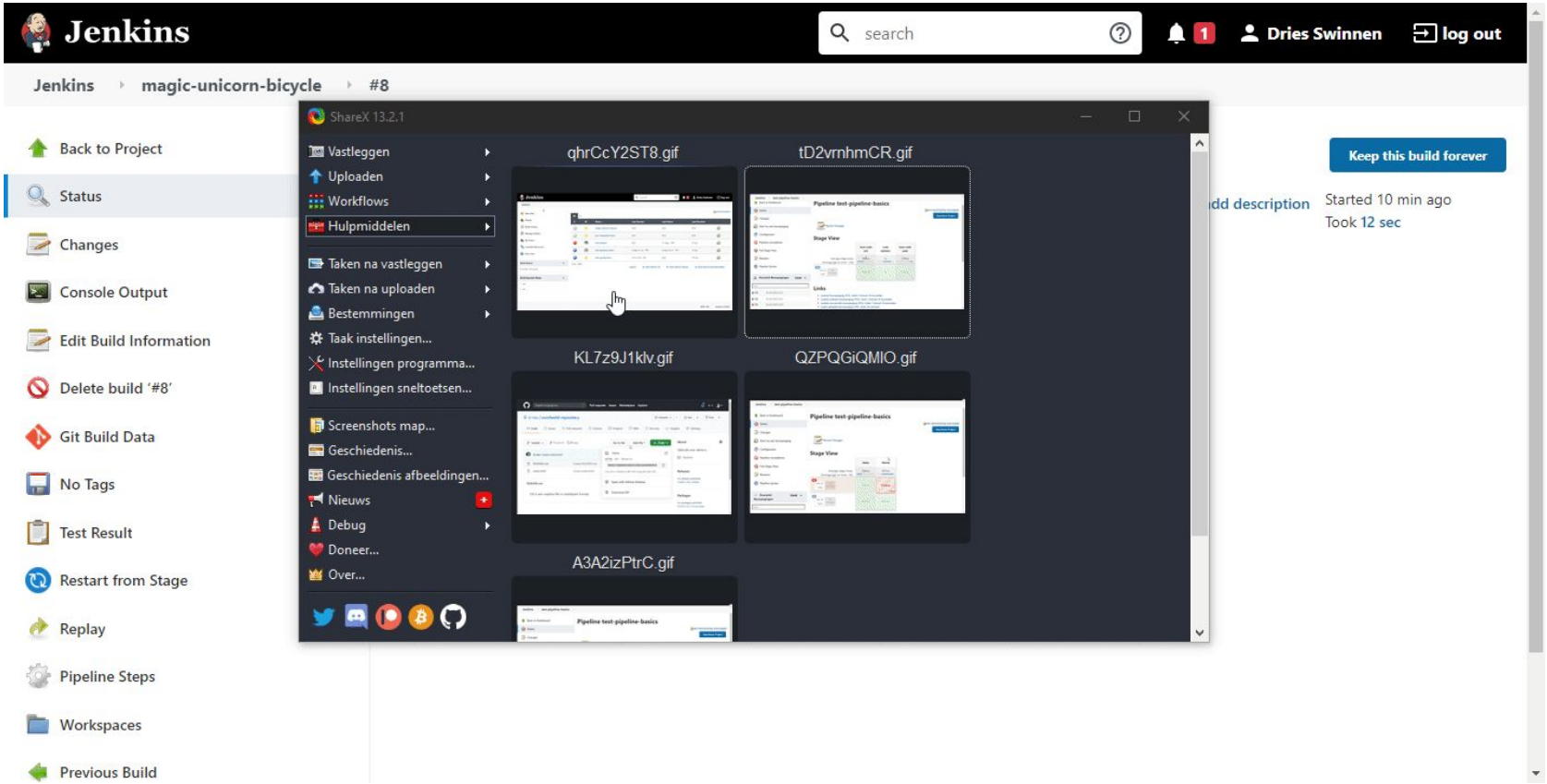
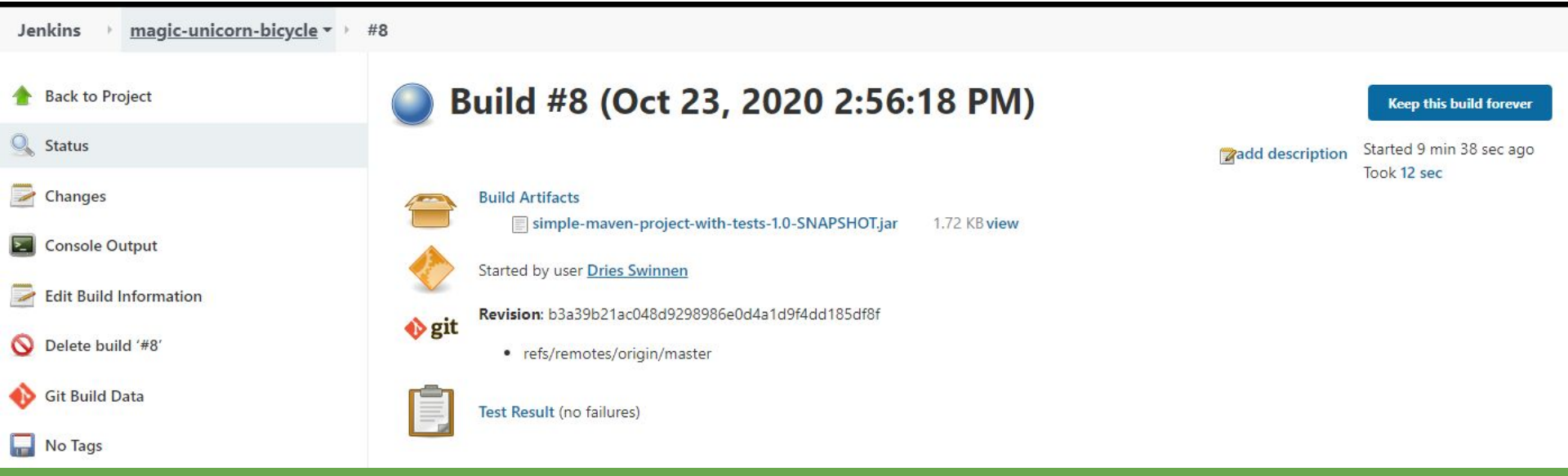


Jenkins - pipeline - Artifacts

In jenkins - java applicatie

```
post {
        success {
            archiveArtifacts 'target/*.jar'
        }
 }
```



Jenkins - pipeline - Artifacts

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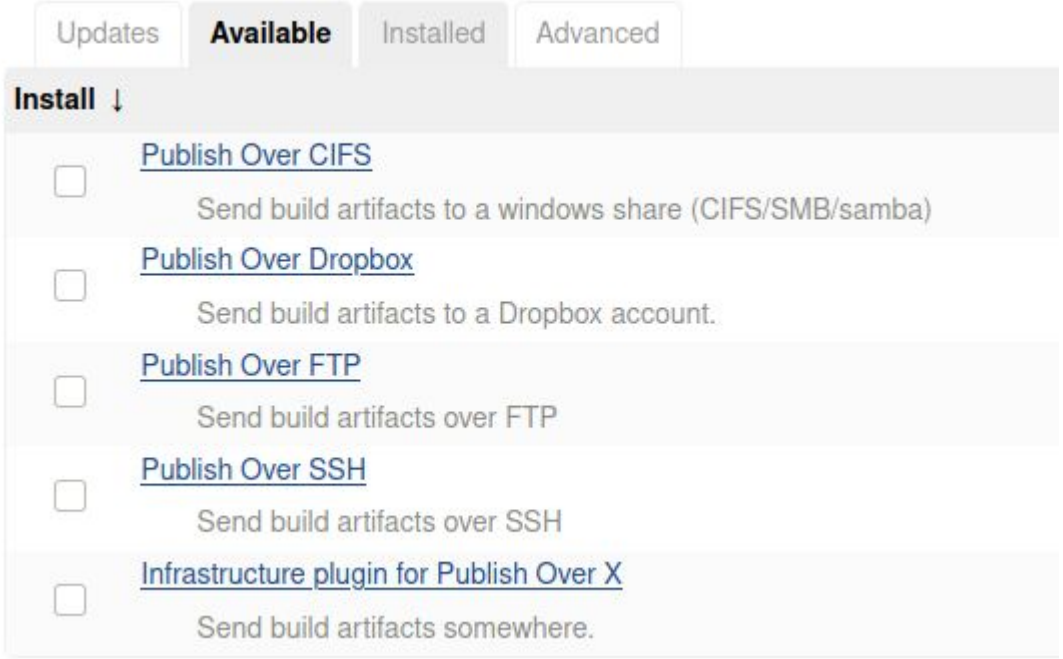
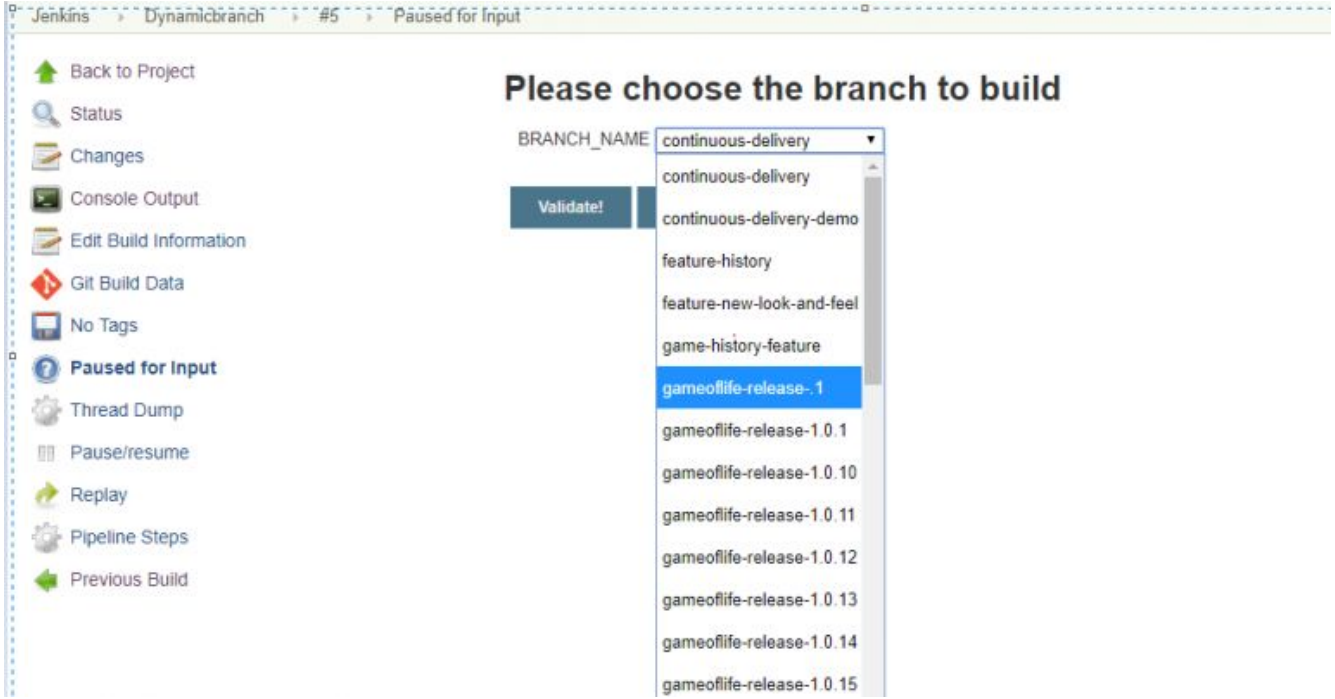
Extern

Via plugins:



Jenkins - pipeline - Input step

Interactieve steps: Vraag welke git branch gebuild moet worden:



https://labs.tadigital.com/index.php/2018/07/18/list-the-git-branches-dynamically-in-jenkins-pipeline-job/

Jenkins - pipeline - Input step

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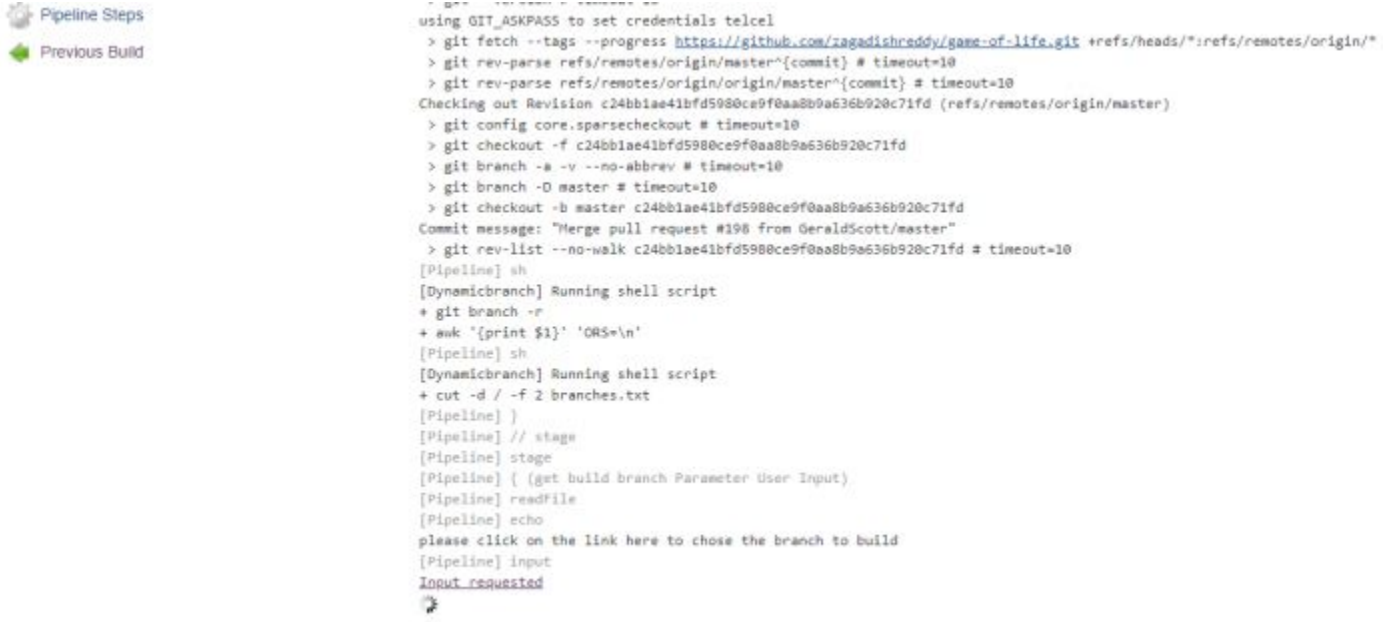

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Recap

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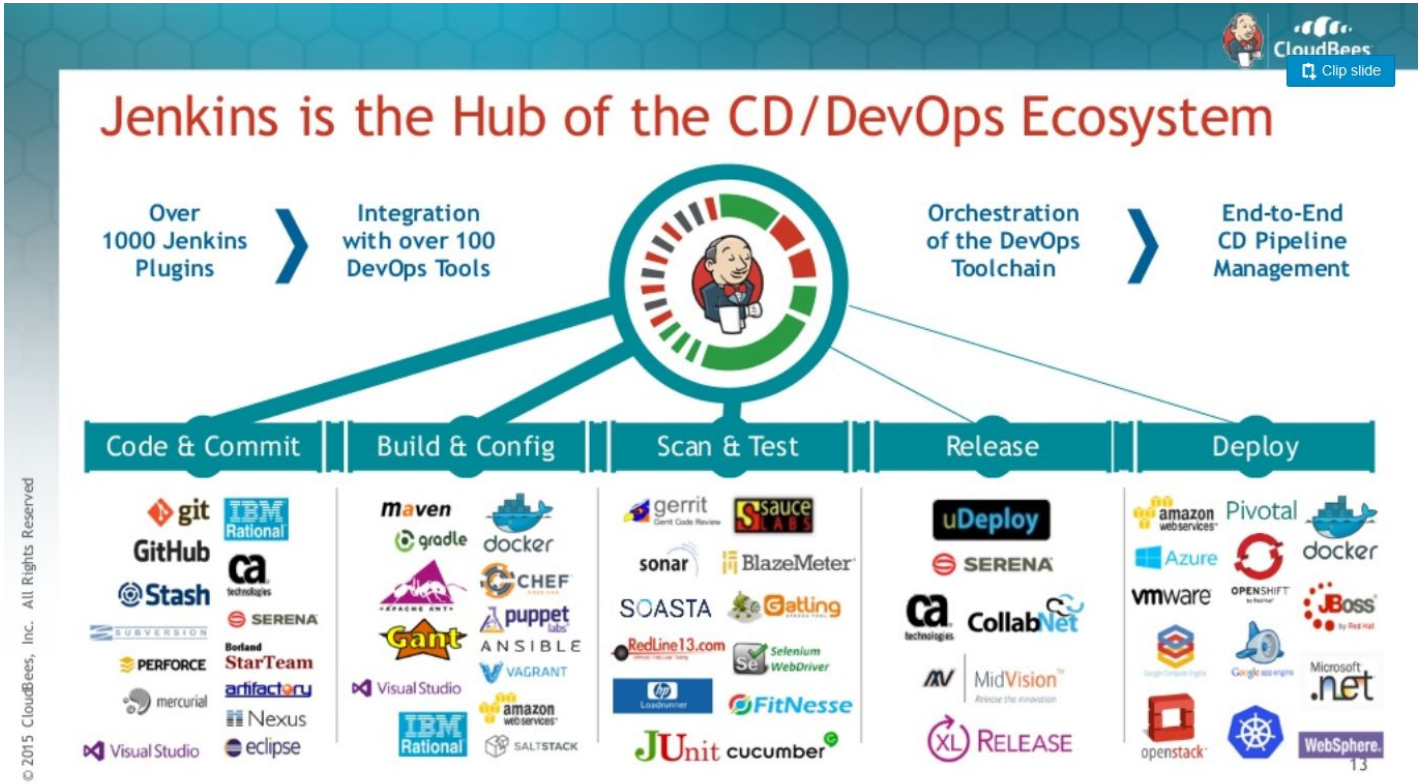

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Assignments

Jenkins - CI

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