

Jenkins

David Hubber

Hologate Gmbh November 17th 2020

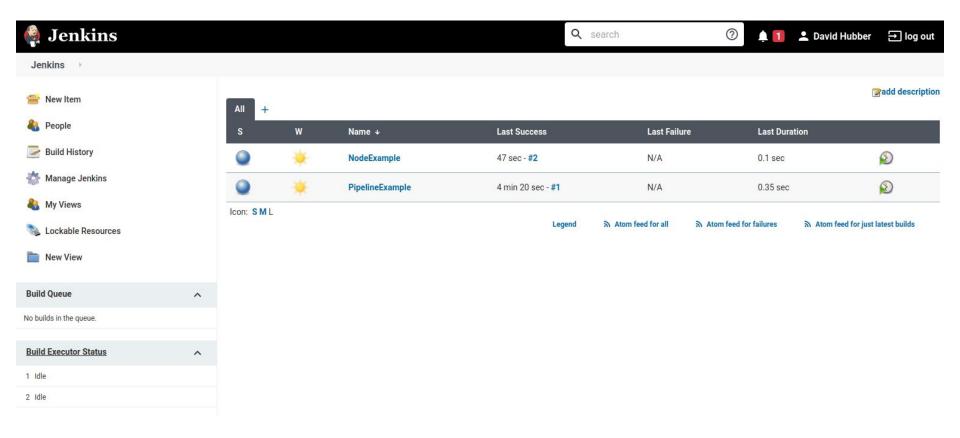
What is Jenkins?

- Jenkins is a Java server programme designed to manage and/or automate any number of tasks such as :
 - Continuous Integration (i.e. regular testing of code)
 - Compiling, building and deploying of code
 - Simply running a script or executable program at a set time every day/week
- For many Linux administrators, it might be able to replace many of the tasks that could be achieved with simple cron files
- Jenkins contains a huge variety of plug-ins that offer support for using Jenkins in combination with local or online services (e.g. Github)

Quick set-up

- Download Jenkins
 - o I'm directly using the java war file, although it can be used in different ways
 - java -jar jenkins.war --httpPort=8080
- Open Jenkins in a browser
 - http://localhost:8080
- Copy the 'secret' administrator password following the prompts
- Install recommended plugins
- Create an admin account
- Update Jenkins and/or plugins
- Create pipeline to run Jenkins

Jenkins GUI



The Jenkins Pipeline

- Pipelines are the most commonly used way of running jobs on Jenkins
- A pipeline is a script that defines the full structure of the job, including each stage, what commands are run, and in what order
 - They also determine what happens depending whether any stage fails with an error
- To create and run a pipeline :
 - Go to the main Jenkins menu (the dashboard)
 - Click on 'New Item'
 - Add a name, select 'Pipeline' from the list of options, and click 'OK'
 - Select all parameters for the pipeline, add in the script code, and click 'Save'
 - Click 'Build Now' in the pipeline menu to run the pipeline

An example pipeline (aka a Jenkinsfile)

- A pipeline contains various keywords defining different sections of the script
 - pipeline
 - entire script body
 - agent
 - external container that runs Jenkins
 - stages
 - contains all defined stages of pipeline
 - stage
 - an individual user-defined stage
 - steps
 - contains individual script code lines

Scheduling

- Jenkins jobs can be easily scheduled for any time in the day, day of the week, or day in the month
- To schedule a pipeline build
 - Click on 'Configure' in the pipeline menu
 - Go to Build Triggers -> Build Periodically
 - Type in a schedule of the form
 - MIN (0 59) HOUR (0 23) DAY (1 31) MONTH (1 12) WEEKDAY (0 7)
 - e.g. To build every day at 8:30am Mon-Fri, 30 08 * * 1-6

Continuous Integration

- One of the most common uses of Jenkins is to create and maintain in-house Continuous Integration systems (e.g. like Travis CI on Github)
- This almost always requires the use of some version control software, such as Git or Subversion
- Such a system typically has the following stages
 - o Build (i.e. compile the code)
 - Unit and integration tests (check for code correctness)
 - o Install (on local machine) or package (i.e. prepare files to download and install elsewhere)

A simple CI example

```
pipeline {
    agent any
    stages {
        stage('Build')
            steps {
            sh '''
                git submodule update --init
                cmake .
                make
                111
        stage('Tests')
            steps {
            sh '''
                git submodule update --init
                cmake .
                make
                ./Tests
                111
```

Processing script results

- In the script, you can define what to do based on the results of the stages in the post section of the script
 - always
 - success
 - failure
 - unstable
 - changed
- You can also email results using the 'mail' command

```
post {
    success {
        echo "Success!"
    }
    failure {
        echo "Fail!"
    }
}
```

What else can Jenkins do? (i.e. stuff I don't know how to do exactly)

- Execute using parameters
- Blue Ocean