How to Dockerize Parallel Execution of Selenium Tests

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Introduction to Presentation

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1. Why?
2. What is Selenium Grid
3. Running Selenium Suite in Parallel
4. What is Docker Selenium
5. Configure Selenium Grid in Docker Containers
6. Creating and maintaining docker-compose file
7. Zalenium
8. Selenoid
9. Q&A

Getting Started with Selenium Grid & Docker

What is Selenium Grid

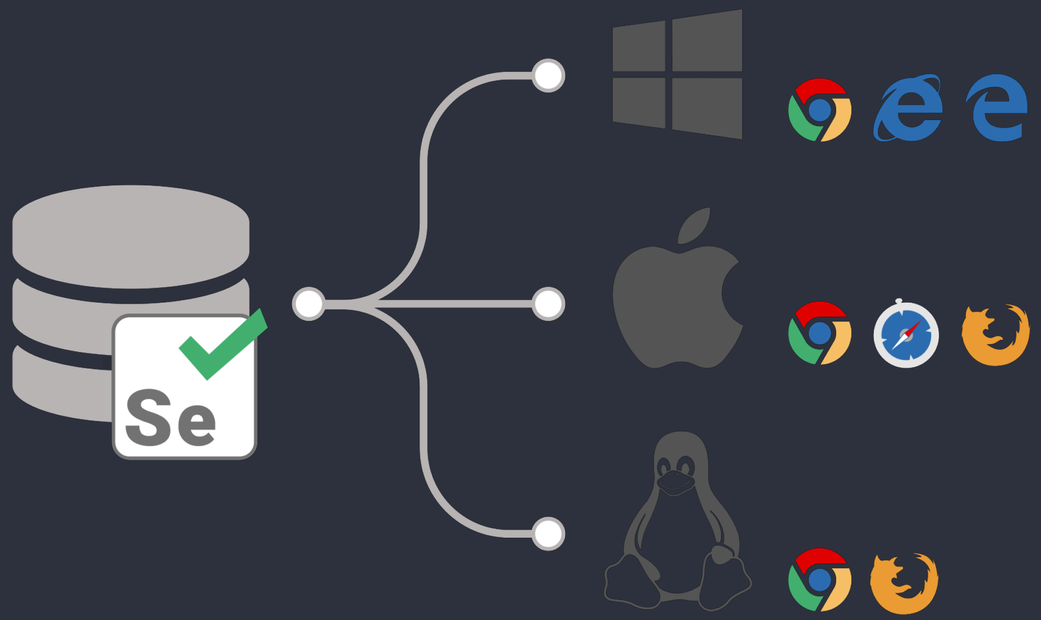


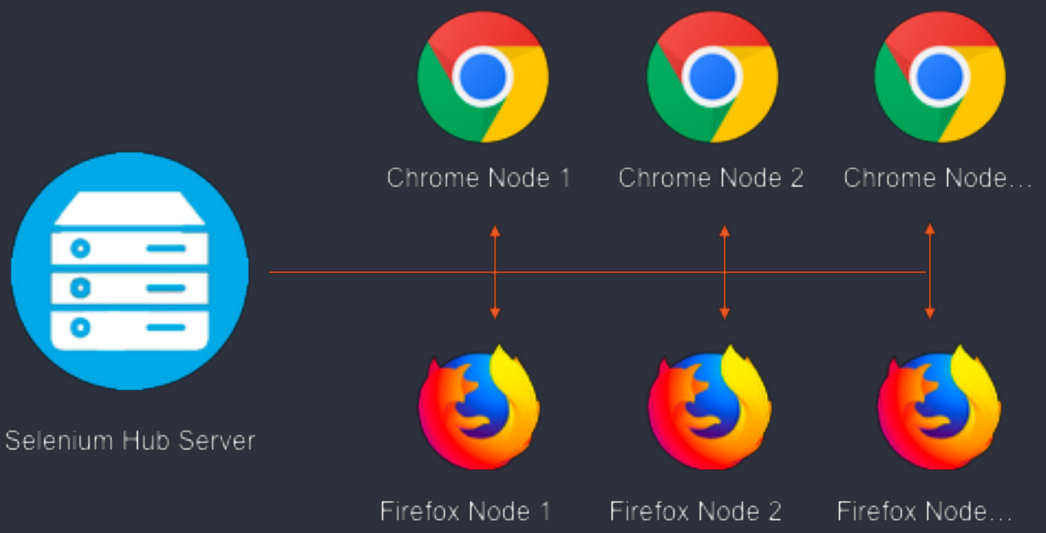
Diagram from https://www.ranorex.com

Selenium Grid

Selenium Grid is a smart proxy server that allows Selenium tests to route commands to remote web browser instances. Its aim is to provide an easy way to run tests in parallel on multiple machines. With Selenium Grid, one server acts as the hub that routes JSON formatted test commands to one or more registered Grid nodes. Tests contact the hub to obtain access to remote browser instances. The hub has a list of registered servers that it provides access to, and allows us to control these instances. Selenium Grid allows us to run tests in parallel on multiple machines, and to manage different browser versions and browser configurations centrally (instead of in each individual test). Selenium Grid isn't a silver bullet. It solves a subset of common delegation and distribution problems, but will for example not manage your infrastructure and might not suit your specific needs.

*SeleniumHQ Documentation

What is Selenium Hub and Nodes



Hub

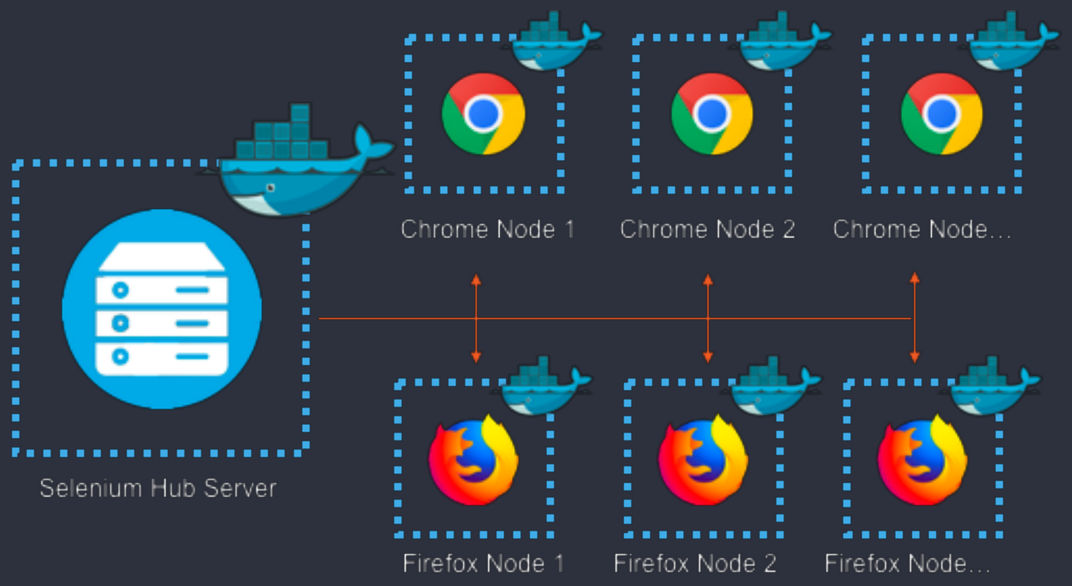
- Intermediary and manager
- Accepts requests to run tests
- Takes instructions from client and executes them remotely on the nodes
- Manages threads

Nodes

- This is where the browsers live
- Registers itself to the hub and communicates its capabilities
- Receives requests from the hub and executes them

*SeleniumHQ Documentation

Docker Selenium Grid



Selenium Grid with Docker

As normal grid with docker we have to install the hub and browser nodes into Docker containers and then start the hub and nodes from the Docker container.

Selenium Images

- Selenium hub image
- Selenium node-firefox image
- Selenium node-chrome image
- Selenium node-firefox-debug image
- Selenium node-chrome-debug image

*SeleniumHQ Documentation

Prepare Sample Tests

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Run tests:

- Open a terminal
- Clone this project

```
~$ git clone https://github.com/sargissargsyan/selenium-parallel-run.git
```

- `cd selenium-parallel-run`
- `mvn clean install -DskipTests`
- `mvn failsafe:integration-test`

Selenium Docker

Setup Selenium Docker locally

Run tests:

- Open a terminal
- Clone this project

```
~$ git clone https://github.com/sargissargsyan/selenium-parallel-run.git
```

- `cd selenium-parallel-run`
- `mvn clean install -DskipTests`
- `mvn failsafe:integration-test -Dselenium.remote=false`

Demo

```
~$ docker -v
```

```
Docker version 18.09.2, build 6247962
```

```
~$ java -version
```

```
java version "1.8.0_191" Java(TM) SE Runtime
Environment (build 1.8.0_191-b12) Java HotSpot(TM)
64-Bit Server VM (build 25.191-b12, mixed mode)
```

```
~$ mvn -v
```

```
Apache Maven 3.6.0
(97c98ec64a1fdfee7767ce5ffb20918da4f719f3;
2018-10-24T22:41:47+04:00)
```

```
~$ docker-compose -v
```

```
docker-compose version 1.23.2, build 1110ad01
```

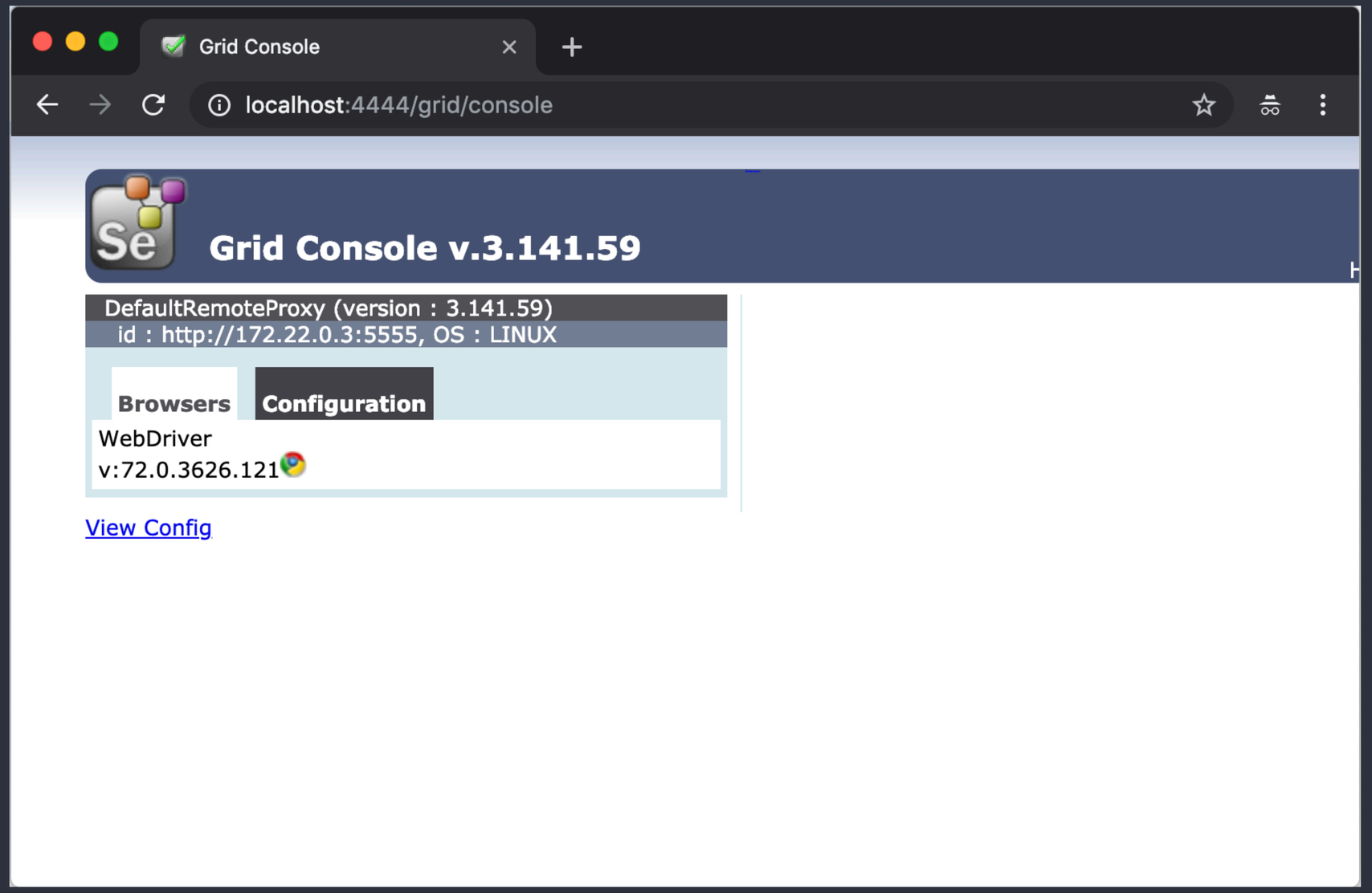
```
~$ docker-machine -v
```

```
docker-machine version 0.16.1, build cce350d7
```

```
~$ docker network create grid
```

```
~$ docker run -d -p 4444:4444 -v /dev/shm:/dev/shm selenium/
standalone-chrome:3.141.59-lithium
```

```
~$ docker run -d --net grid -e HUB_HOST=selenium-hub -v /dev/
shm:/dev/shm selenium/node-chrome:3.141.59-lithium
```


Grid Console
localhost:4444/grid/console
Grid Console v.3.141.59
DefaultRemoteProxy (version : 3.141.59)
id : http://172.22.0.3:5555, OS : LINUX
Browsers
Configuration
WebDriver
v:72.0.3626.121
View Config

Demo

```
~$ docker network rm grid
```

```
~$ docker stop selenium-hub
```

```
~$ docker rm selenium-hub
```

```
~$ docker stop chrome-node
```

```
~$ docker rm chrome-node
```

Selenium Docker up using Docker Compose

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```
~$ cd /selenium-parallel-run
```

```
~$ docker-compose -f docker-compose-selenium-docker.yml up -d
```

```
~$ docker-compose -f docker-compose-selenium-docker down
```

Demo

Zalenium

A flexible and scalable Selenium Grid

How to Build Zealenium?

Zalenium works conceptually in a simple way

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```
~$ docker pull elgalu/selenium
```

```
~$ docker pull dosel/zalenium
```

* Zalenium

How to Build Zealenium?

Zalenium works conceptually in a simple way

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```
~$ docker run --rm -ti --name zalenium -p 4444:4444 \
-v /var/run/docker.sock:/var/run/docker.sock \
-v /tmp/videos:/home/seluser/videos \
–privileged dosel/zalenium start
```

* Zalenium

Demo

Zalenium up using Docker Compose

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```
~$ cd /selenium-parallel-run
```

```
~$ docker-compose -f docker-compose-zalenium.yml up --force-recreate -d
```

```
~$ docker-compose -f docker-compose-zalenium.yml down
```

Demo

Selenoid

Pre steps

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- Create a directory with name selenoid

```
~$ mkdir selenoid
```

- Change directory to selenoid

```
~$ cd selenoid/
```

- Create browsers.config file

```
~$ mkdir config
~$ touch config/browsers.json
```

- Edit browsers.config file

```
~$ nano browsers.config
```

browser.json

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```
{
    "chrome": {
        "default": "72.0",
        "versions": {
            "72.0": {
                "image": "selenoid/vnc:chrome_72.0",
                "port": "4444",
                "path": "/"
            }
        }
    }
}
```

How to Build Selenoid?

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```
~/selenoid$ docker run -d \
--name selenoid \
-p 4444:4444 \
-v /var/run/docker.sock:/var/run/docker.sock \
-v `pwd`/config/:/etc/selenoid/:ro \
aerokube/selenoid:latest-release
```

Demo

How to Build selenoid-ui?

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```
~/$ docker run -d --name selenoid-ui  \
--link selenoid \
-p 8080:8080 \
aerokube/selenoid-ui --selenoid-uri=http://selenoid:4444
```

Demo

How to Build Selenoid with Configuration Manager?

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```
~/$ curl -s https://aerokube.com/cm/bash | bash
```

```
~/$ ./cm selenoid start --vnc
```

```
~/$ ./cm selenoid-ui start
```

```
> ./cm.exe selenoid start --vnc
```

https://github.com/aerokube/cm/releases

Demo

Links

https://github.com/SeleniumHQ/docker-selenium

https://opensource.zalando.com/zalenium/

https://aerokube.com/selenoid/latest/

https://aerokube.com/cm/latest/

Thank You!

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