

Microplugins

***** WITH *****

DOCKER



JULIEN VEY
@julienvey



ERIC BELLEMON
@haklop

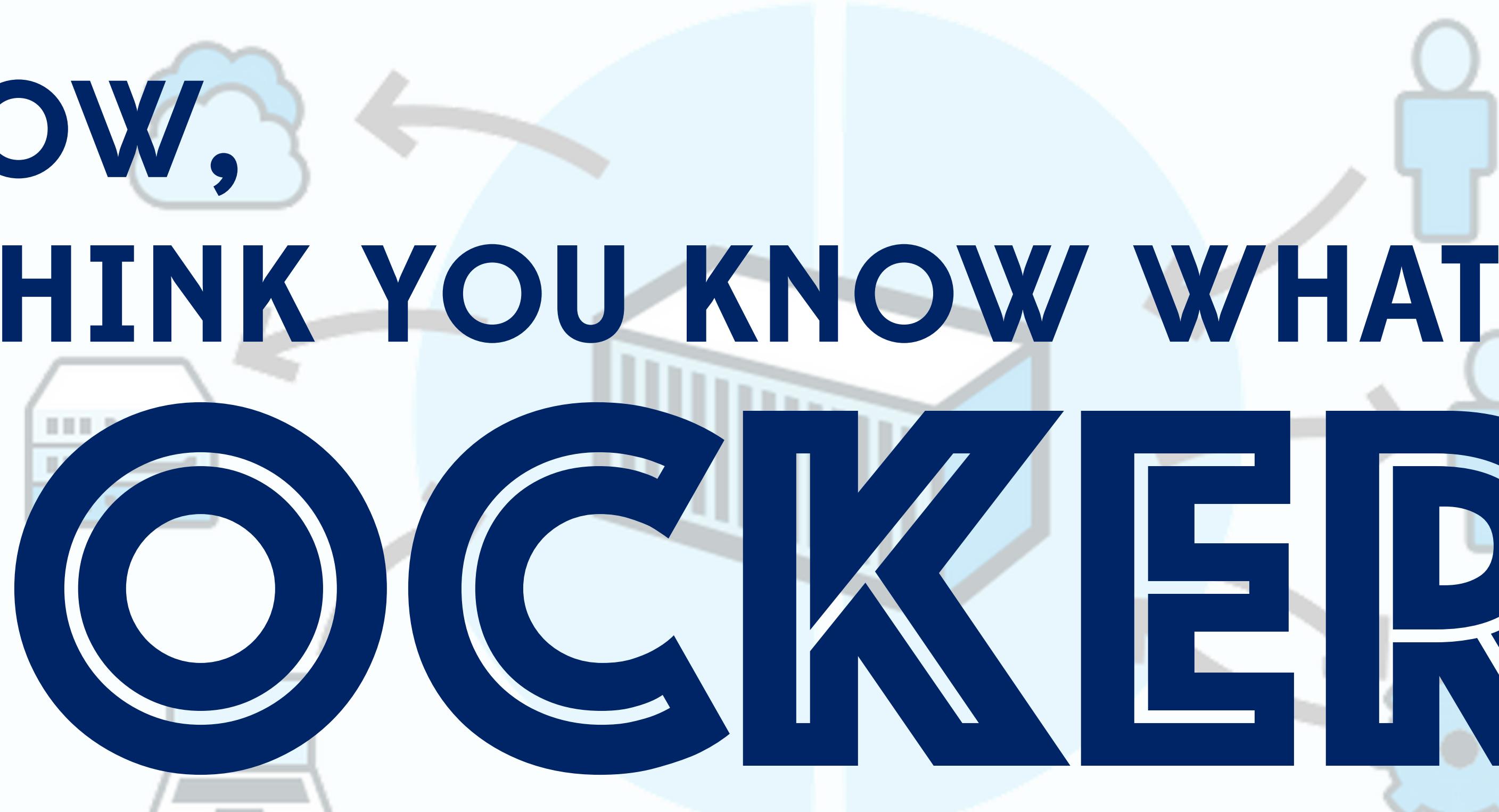
Freelance « DevOps »
at bywan

WHAT ?

What Is Docker?

An open platform for distributed applications

BY NOW,
WE THINK YOU KNOW WHAT IS
DOCKER



Docker Engine

A portable, lightweight application
runtime and packaging tool.

Docker Hub

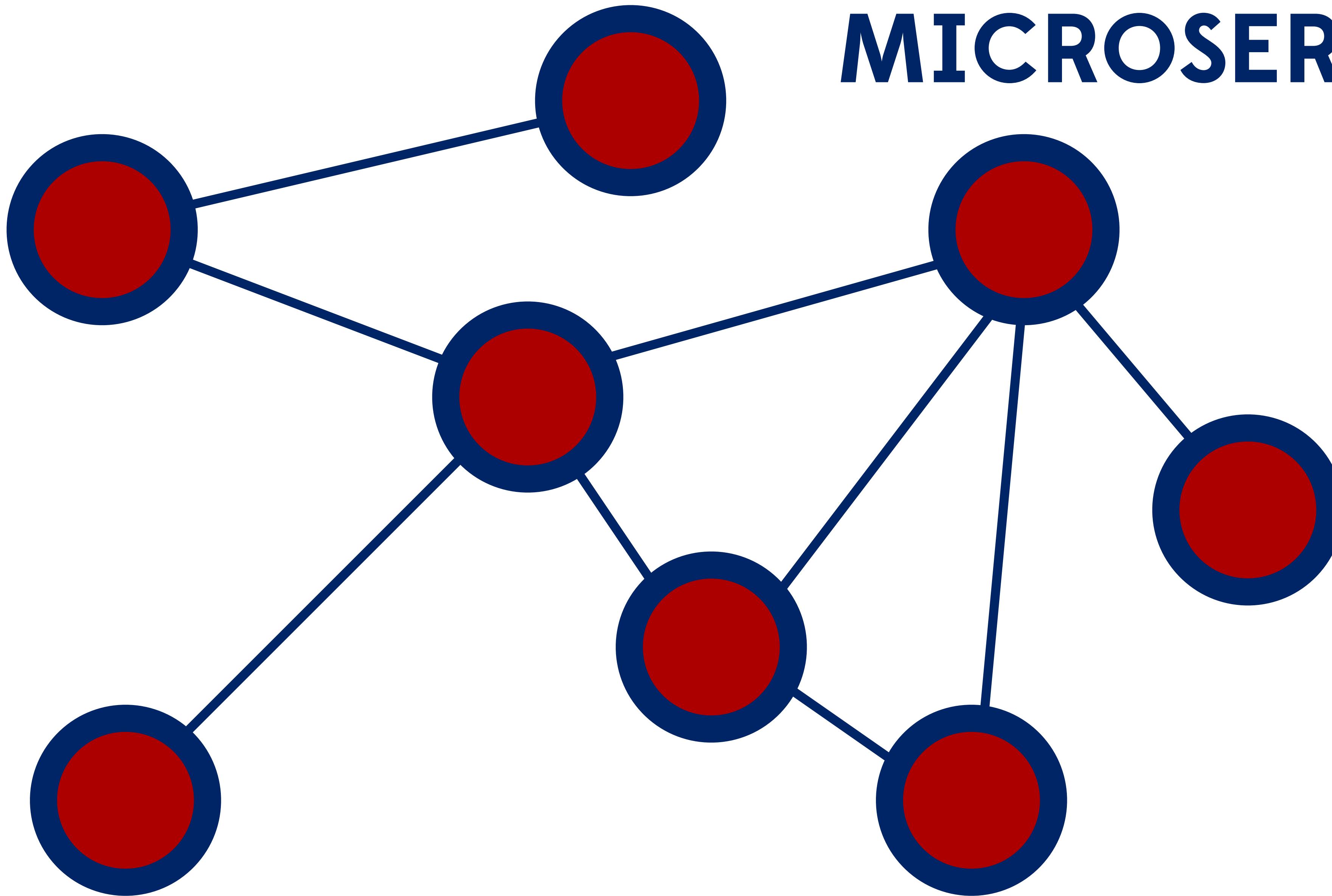
A cloud service for sharing applications
and automating workflows.

HOW ?

DOCKER

Patterns

MICROSERVICES



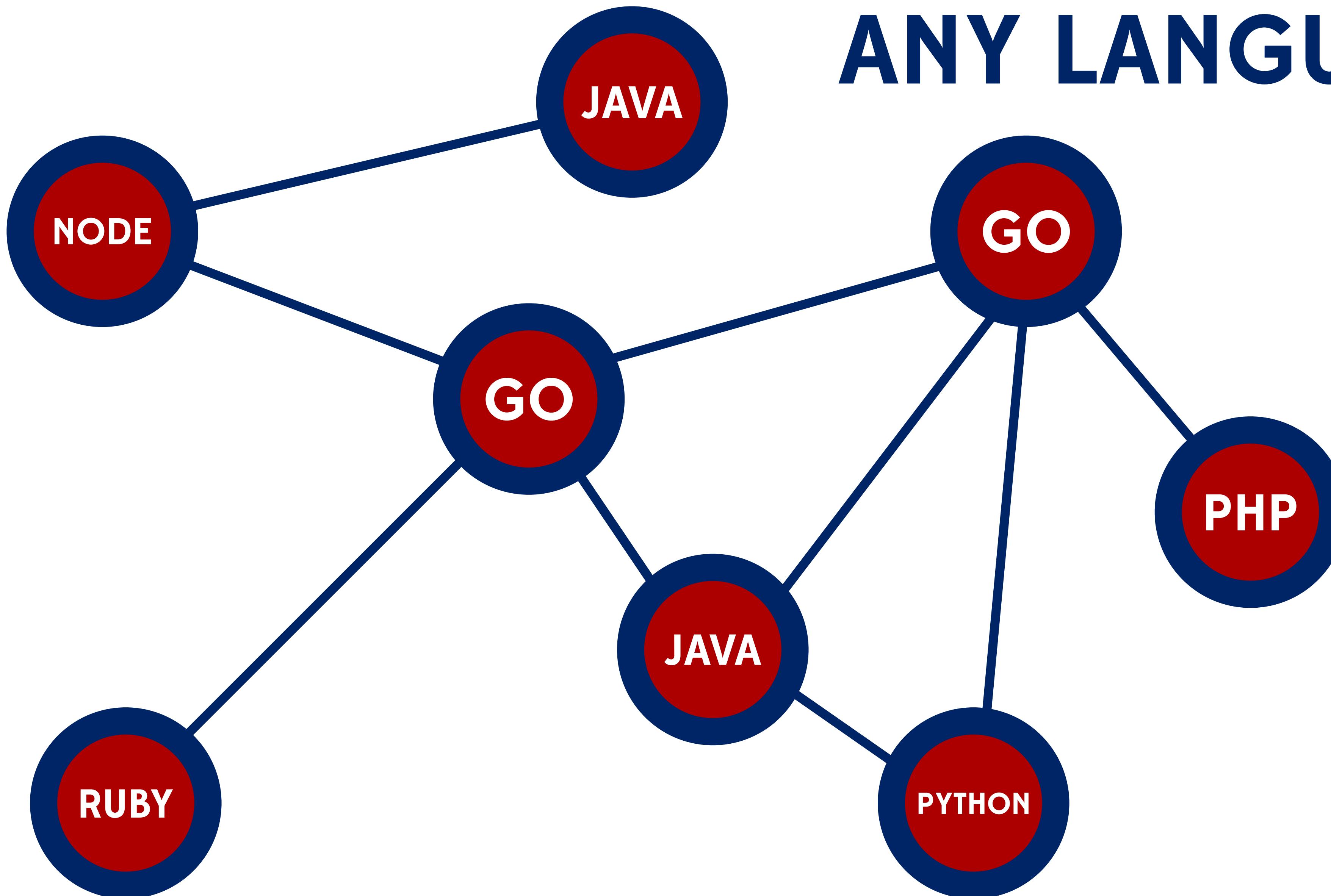
MICROSERVICES



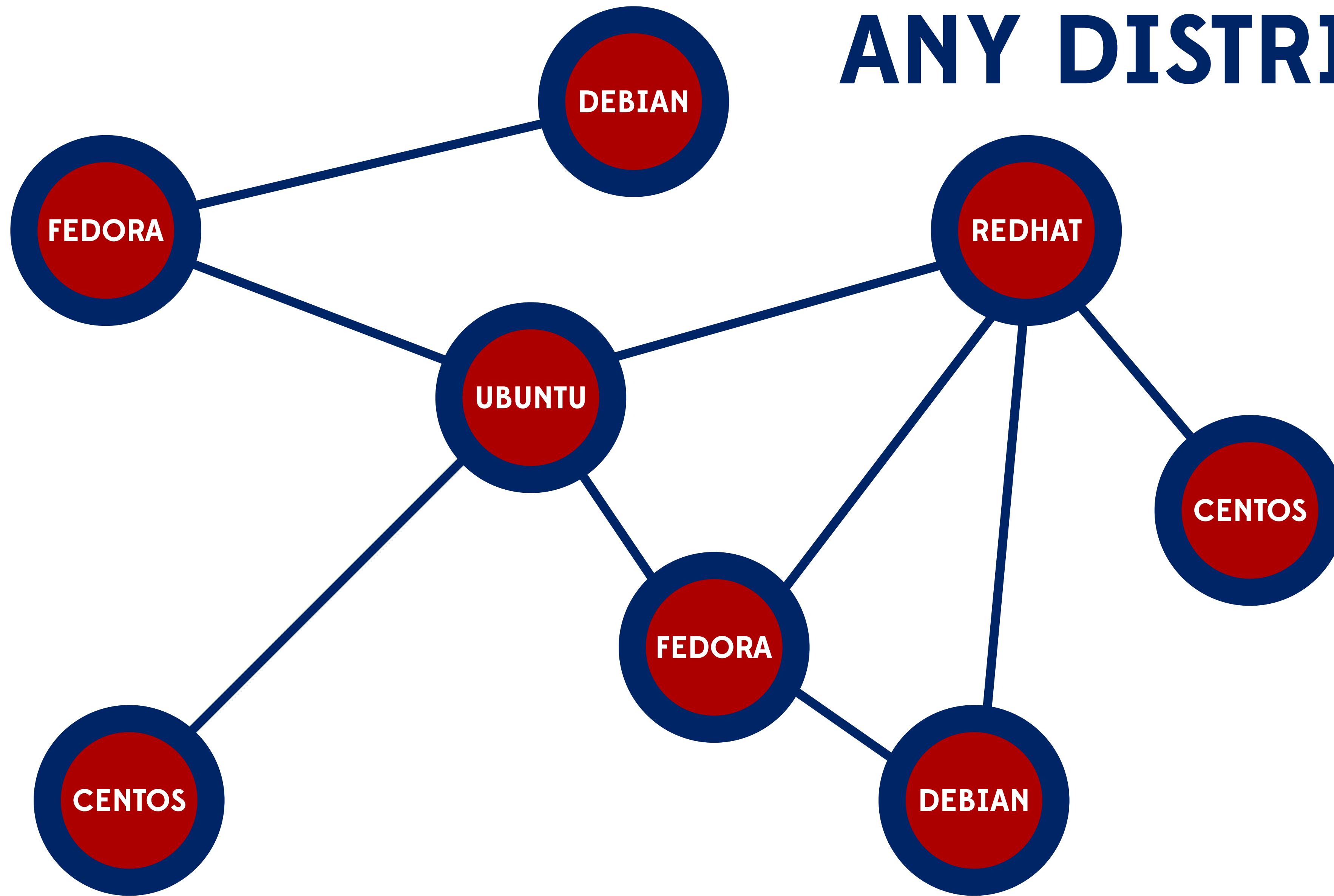
A diagram illustrating a network of microservices. It consists of seven circular nodes, each with a light gray outer ring and a pinkish-orange inner circle. The nodes are interconnected by thin gray lines, forming a complex web of connections. The text 'MICROSERVICES' is positioned at the top right, above the nodes. Below the nodes, the text 'A MICROSERVICE IS USUALLY A PERSISTANT SERVICE YOU CAN ACCESS VIA AN API' is displayed in large, bold, blue and red capital letters.

**A MICROSERVICE IS USUALLY
A PERSISTANT SERVICE
YOU CAN ACCESS VIA AN API**

ANY LANGUAGE



ANY DISTRIBUTION

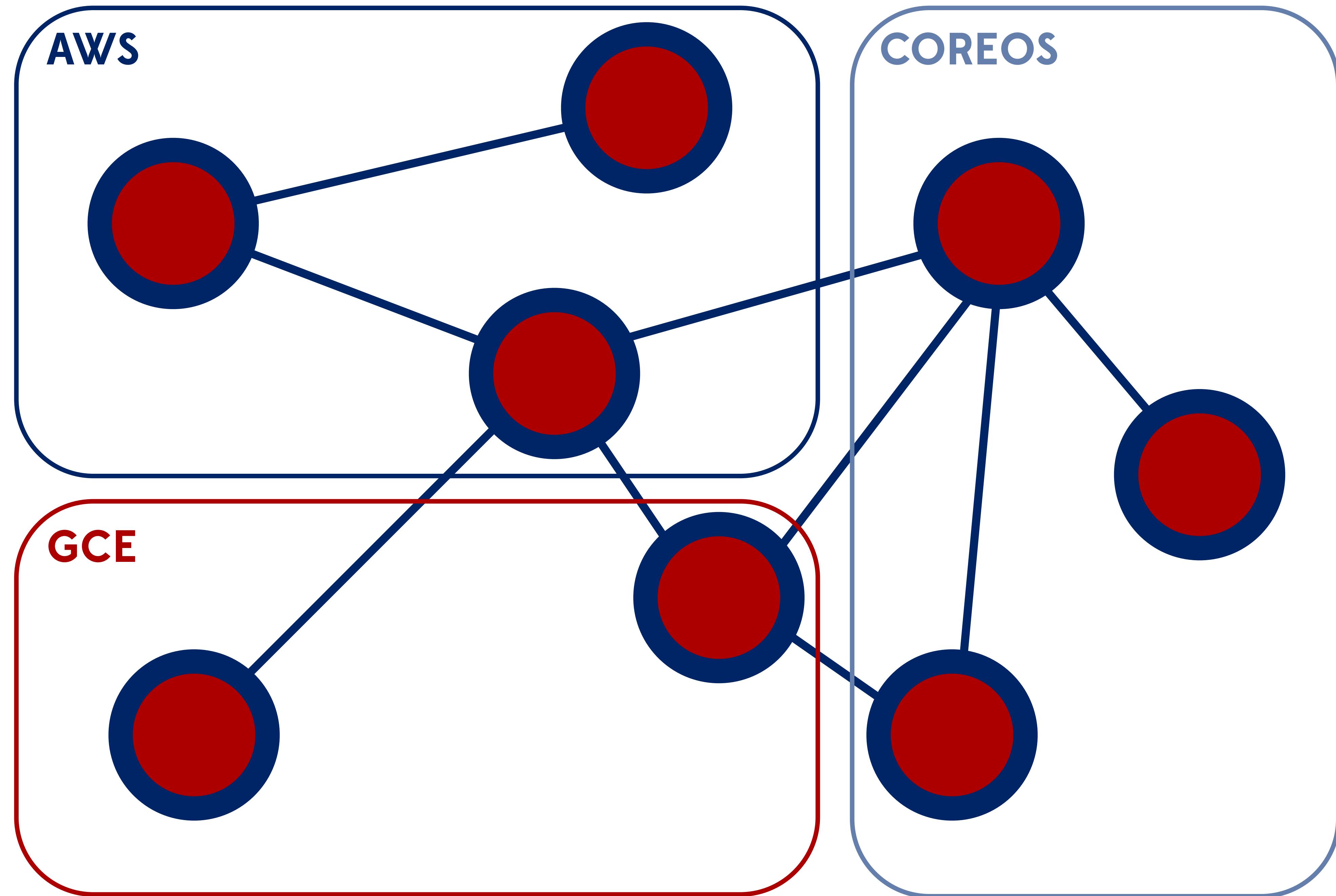


AWS

COREOS

ANY
WHERE

GCE



MICROSERVICES

WHY CONTAINERS AND NOT VMs?

**CONTAINERS
ARE LIGHTWEIGHT
SPAWN FAST
USE LAYERS**

HOW ?

DOCKER

Tips n' Tricks

DOCKER IN DOCKER

A dramatic scene from a movie or video game. In the foreground, six people in business attire stand on a rooftop, looking out over a city that is being destroyed. A massive pile of twisted metal and debris is falling from the sky, crashing into buildings. The city skyline is visible in the background under a bright sky.

THE DOCKER MODEL

DOCKER DAEMON creates an
UNIX SOCKET which exposes the
DOCKER REMOTE API that can be used by the
DOCKER CLI

FIRST APPROACH

DOCKER

IN DOCKER

IN DOCKER

...

```
docker run --privileged -t -i jpetazzo/dind
```

SPECIAL DOCKER IMAGE

```
docker run --privileged -t -i jpetazzo/dind
```

PRIVILEGED MODE

docker run -it ipetazzo/dind



PRIVILEGE

IT RAISES SOME PROBLEMS

INIT SYSTEM

DISK SPACE

CUSTOM IMAGE

SECOND APPROACH

DOCKER

IN DOCKER

IN DOCKER

...



DOCKER HOST

```
docker run  
-v /var/run/docker.sock:/var/run/docker.sock  
[your image]
```

DOCKER SOCKET AS A DOCKER VOLUME

-v /var/run/docker.

docker run

[y/n]

**A DOCKEROCK AS
VOLUME**



**NO PRIVILEGED MODE
ONLY ONE DOCKER DAEMON
(INSTEAD OF ONE PER CONTAINER)**

what about?

**MICRO
PLUGINS**

MICROSERVICE:

**A SMALL SERVICE
RUNNING IN A CONTAINER**

MICROPLUGIN:

A SMALL PLUGIN RUNNING IN A CONTAINER

What is a ?

PLUGIN ARCHITECTURE

A STANDARD INTERFACE

A LOADING MECHANISM

A PACKAGING MECHANISM

A DISTRIBUTION MECHANISM

RUBY EXAMPLE

A PLUGIN ARCHITECTURE

***** WITH *****

VAGRANT

A STANDARD
INTERFACE

RUBY CLASSES

```
require 'vagrant'
```

```
module VagrantPlugins
```

```
  module Openstack
```

```
    class Provider < Vagrant.plugin('2', :provider)
```

A LOADING
MECHANISM

RUBY DYNAMIC LOADING

SOURCES INSTALLED IN VAGRANT BUNDLE DIR

A PACKAGING
MECHANISM

RUBY GEM

PACKAGE CODE AND DOCUMENTATION
DESCRIBE DEPENDENCIES

A DISTRIBUTION MECHANISM

RUBYGEMS.ORG



Search Gems...



GEMS

GUIDES

CONTRIBUTE

JULIENVEY



vagrant-openstack-provider 0.6.1

Enables Vagrant to manage machines in Openstack Cloud.

TOTAL DOWNLOADS

5,907

FOR THIS VERSION

537

Show all versions (16 total) →

REQUIRED RUBY VERSION:

>= 0

LICENSES:

N/A

GEMFILE:

gem 'vagrant-openst



INSTALL:

gem install vagrant



VERSIONS:

- 0.6.1** - January 30, 2015 (62.5 KB)
- 0.6.0** - November 28, 2014 (60.5 KB)
- 0.5.2** - November 6, 2014 (51.5 KB)
- 0.5.1** - November 6, 2014 (51.5 KB)
- 0.5.0** - November 3, 2014 (51.5 KB)

Show all versions (16 total) →

RUNTIME DEPENDENCIES:

- colorize** = 0.7.3
- json** = 1.7.7
- rest-client** ~> 1.6.0
- sshkey** = 1.6.1
- terminal-table** = 1.4.5

DEVELOPMENT DEPENDENCIES:

- fakefs** ~> 0.5.2
- rake** >= 0
- rspec** ~> 3.1.0
- rspec-its** ~> 1.0.1
- webmock** ~> 1.18.0

PROS

***** AND *****

CONS

PROS

PLATFORM INDEPENDANT

**PACKAGING AND DISTRIBUTION
ARE NOT SPECIFIC TO VAGRANT**

CONS

RUBY ONLY

**DEPENDENCY MANAGEMENT
CAN BE HARD**

JAVA EXAMPLE

A PLUGIN ARCHITECTURE

***** WITH *****

JENKINS

A STANDARD
INTERFACE

JAVA INTERFACES & CLASSES

```
package jenkins.plugins.git;

public abstract class AbstractGitSCMSource extends SCMSource {
    protected SCMRevision retrieve(...)
    protected void retrieve(...)
}
```

A LOADING
MECHANISM

JAVA CLASSLOADING

A PACKAGING
MECHANISM

CUSTOM PACKAGING (JPI/HPI)

JPI/HPI = JENKINS/HUDSON PLUG IN

A DISTRIBUTION
MECHANISM

JENKINS HAS ITS OWN
UPDATES.JENKINS-CI.ORG

PROS

***** AND *****

CONS

PROS

PLATFORM INDEPENDANT

COMPILED

CONS

JVM ONLY

SPECIFIC DISTRIBUTION PACKAGING MECHANISM

*Can we do
a Plugin Architecture*

***** WITH *****

DOCKER ?

A PLUGIN ARCHITECTURE

***** WITH *****

DOCKER

A STANDARD INTERFACE

A LOADING MECHANISM

A PACKAGING MECHANISM

A DISTRIBUTION MECHANISM

A STANDARD
INTERFACE

DOCKER VOLUMES

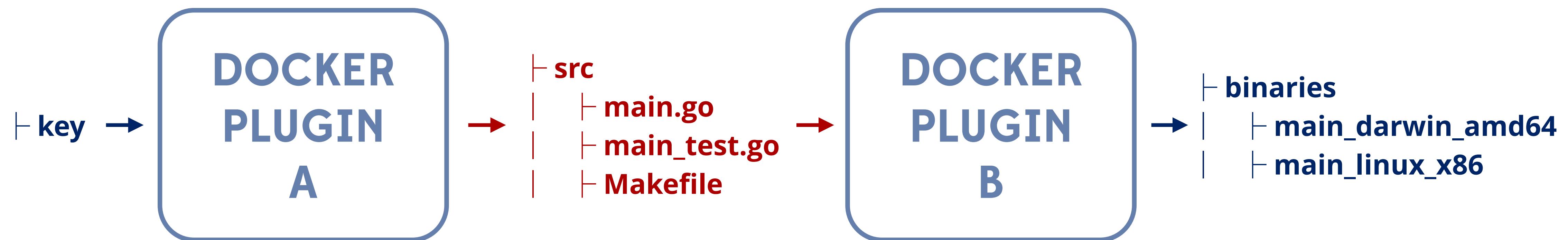
INPUT & OUTPUT



A STANDARD
INTERFACE

DOCKER VOLUMES

INPUT & OUTPUT



A STANDARD
INTERFACE

ENVIRONMENT VARIABLES

INPUT ONLY

```
docker run my_plugin -e URL=github.com -e DEPTH=3
```

A STANDARD
INTERFACE

DOCKER EXIT CODE

OUTPUT ONLY

```
docker run my_image  
echo $?
```

A STANDARD INTERFACE

A LOADING MECHANISM

A PACKAGING MECHANISM

A DISTRIBUTION MECHANISM

A LOADING
MECHANISM

DOCKER RUN

`docker run my_plugin`

A STANDARD INTERFACE

A LOADING MECHANISM

A PACKAGING MECHANISM

A DISTRIBUTION MECHANISM

A PACKAGING
MECHANISM

DOCKER BUILD
DOCKER IMAGES
DOCKERFILES

A STANDARD INTERFACE

A LOADING MECHANISM

A PACKAGING MECHANISM

A DISTRIBUTION MECHANISM

A DISTRIBUTION MECHANISM

DOCKER HUB HUB.DOCKER.COM FOR PUBLIC PLUGINS

Official Repositories



redis



The Official Ubuntu base image



Popular open-source relational database management system



Document-oriented NoSQL database



High performance reverse proxy server



Relational database management system



Node.js is a platform for scalable server-side and networking applications



WORDPRESS

WordPress is a free and open source blogging tool and a content management system



CentOS

Official CentOS base image

Top Contributors



clue

~Aachen, Germany



cpuguy83

Florida



radial

Los Angeles



pinterb

Wisconsin, USA



guilhem

Paris

Popular Repositories



ubuntu

Official Ubuntu base image



1511



library



908



centos

The official build of CentOS.



library



739



nginx

Official build of Nginx.



library

A DISTRIBUTION
MECHANISM

ANY **DOCKER REGISTRY** (OR DOCKER DISTRIBUTION NOW)
FOR PUBLIC AND PRIVATE PLUGINS

CLASSIC PLUGIN ARCHITECTURE

***** VS *****

DOCKER

PROGRAMMING LANGUAGE

CLASSIC

NEED TO LEARN ONLY
ONE LANGUAGE

BUT TIED TO
THIS LANGUAGE

DOCKER

LANGUAGE AGNOSTIC

NATIVE TOOLS

CLASSIC

NEED TO BE WRAPPED

DOCKER

CAN BE NATIVE
LANGUAGE CAN BE
CHOSEN ACCORDINGLY

COMPATIBILITY

CLASSIC

**VERY SPECIALIZED
INTERFACES**

**HARD TO MAINTAIN
RETRO-COMPATIBILITY**

DOCKER

SIMPLE INTERFACES

**BUT ALSO
PERMISSIVE**

SCALING

CLASSIC

JAVA || RUBY || ...
ECOSYSTEM

DOCKER

**DOCKER ECOSYSTEM
CAN BE TRICKY
WITH VOLUMES**

COMPARISON

AN EXAMPLE

***** WITH *****

GIT PLUGIN

THE COMPETITION

RETRIEVE SOURCE CODE

Git URL
Git Branch
SSH Private key



Source Code

The image features a large, bold white "JENKINS" logo on a solid red background. To the right of the logo is a vertical blue bar. Inside this blue bar, there is a snippet of Java code. The code is part of a class named "ChangeSetListTest" and includes methods for testing the "getLinks" and "getLink" methods. The code uses annotations like @Test and @Link, and includes assertions like assertEquals.

JENKINS

JENKINS

~600 LINES OF CODE
TO DO ‘GIT CLONE’

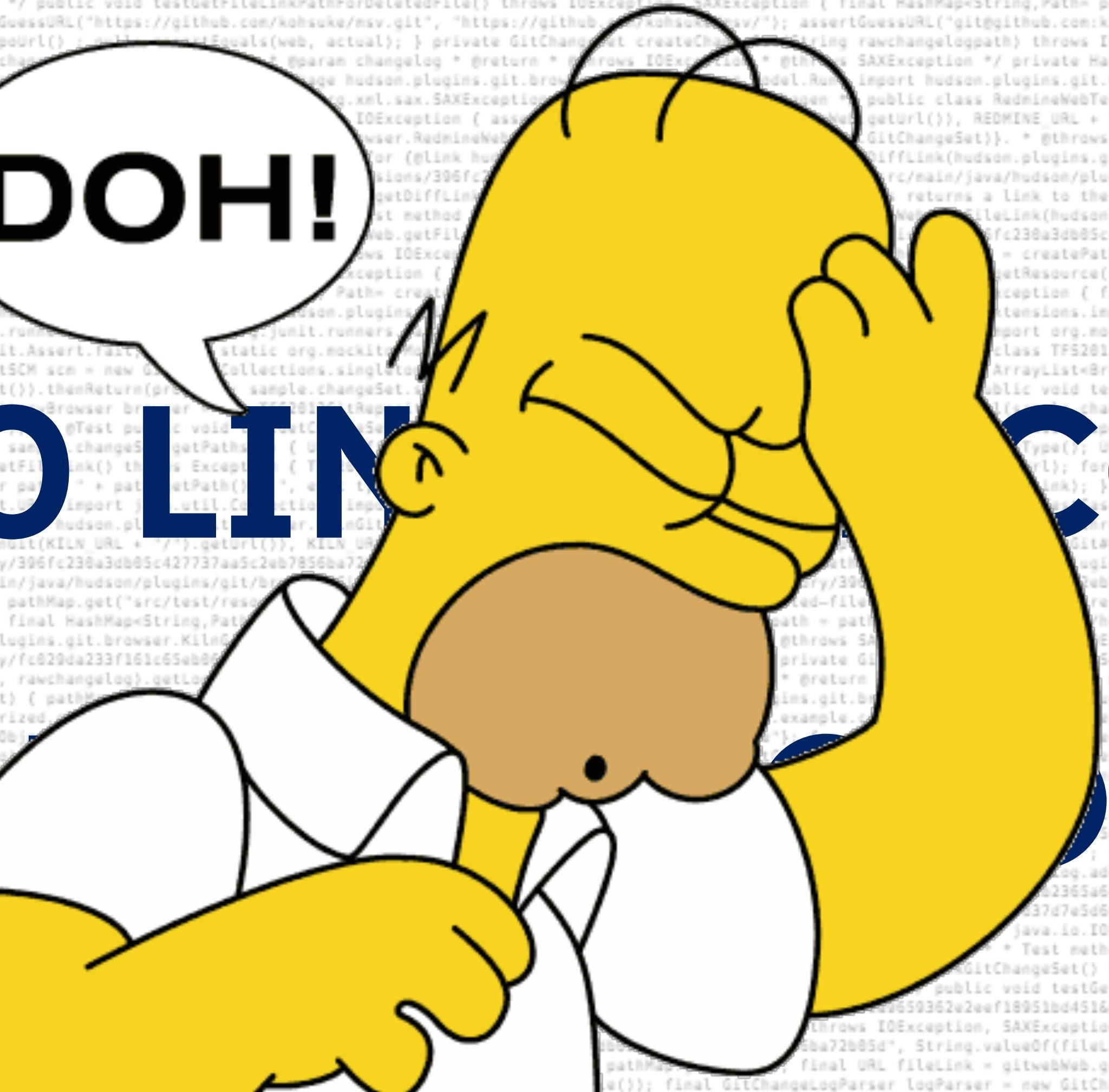
JENKINS

DOH!

~600 LINE'S
TO
CODE

T

N'



DOCKER

└ private-key



\$SCM_URL
\$SCM_BRANCH



**GIT
PLUGIN
CONTAINER**



└ out
 └ main.go
 └ main_test.go
 └ Makefile

DOCKER

```
FROM debian:jessie
```

```
RUN apt-get update \  
 && apt-get install -y git
```

```
ADD run.sh /run.sh
```

```
RUN echo "IdentityFile /private-key" \  
 >> /etc/ssh/ssh_config
```

```
CMD ["/run.sh"]
```

```
#!/bin/bash
```

```
git clone "$SCM_URL" --recursive /out  
cd /out && git checkout "$SCM_BRANCH"
```

Dockerfile

run.sh

**NOW THAT WE HAVE 1 PLUGIN,
HOW CAN WE ORCHESTRATE
MULTIPLE PLUGINS ?**

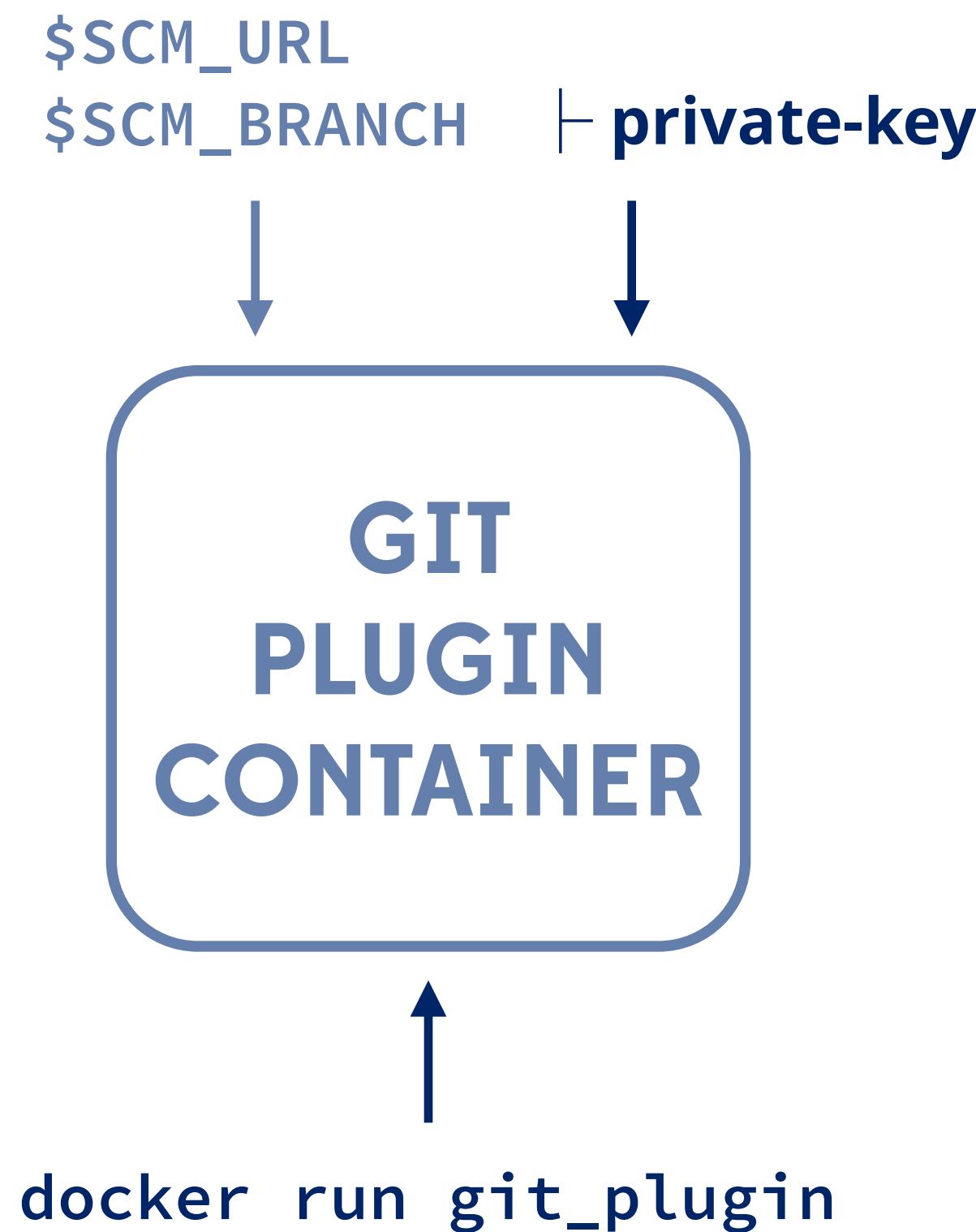
BUILD PIPELINE EXAMPLE

- 1. FETCH SOURCE CODE**
- 2. COMPILE & PACKAGE**
- 3. TEST IT**

BUILD PIPELINE EXAMPLE

ORCHESTRATOR CONTAINER

BUILD PIPELINE EXAMPLE

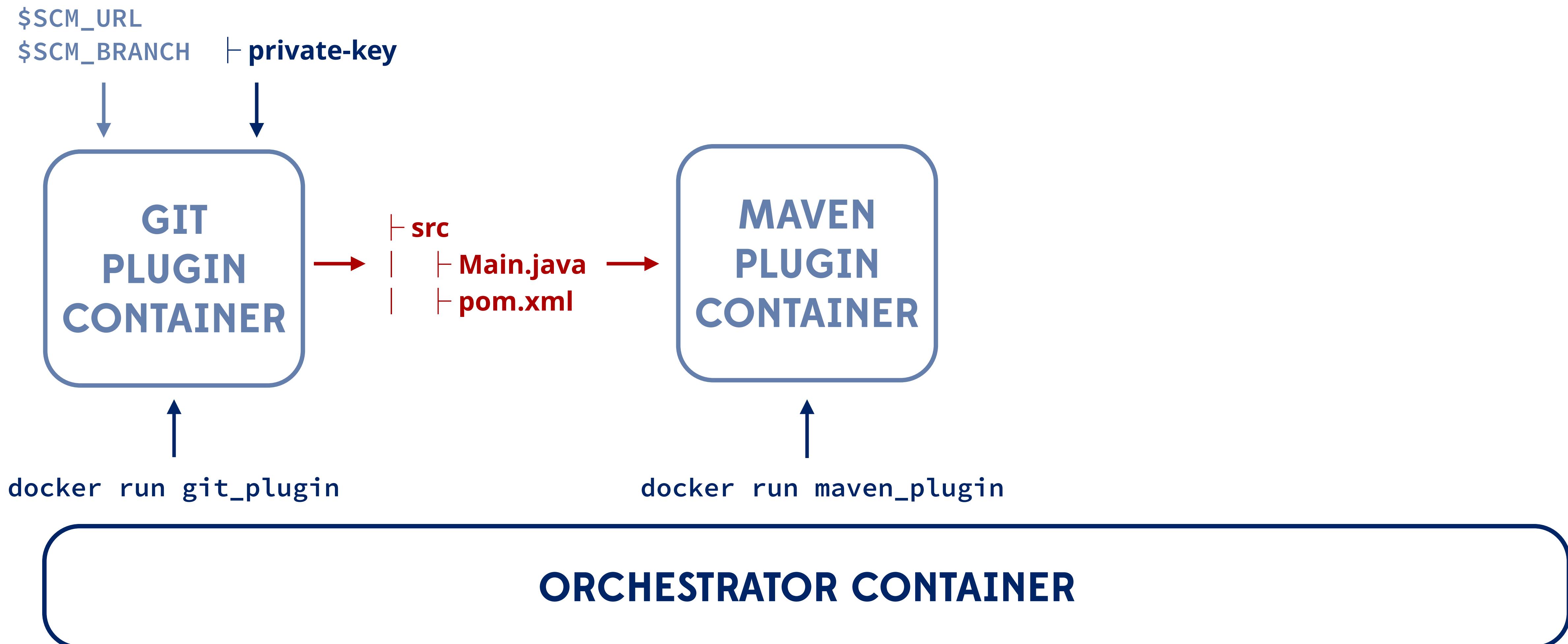


ORCHESTRATOR CONTAINER

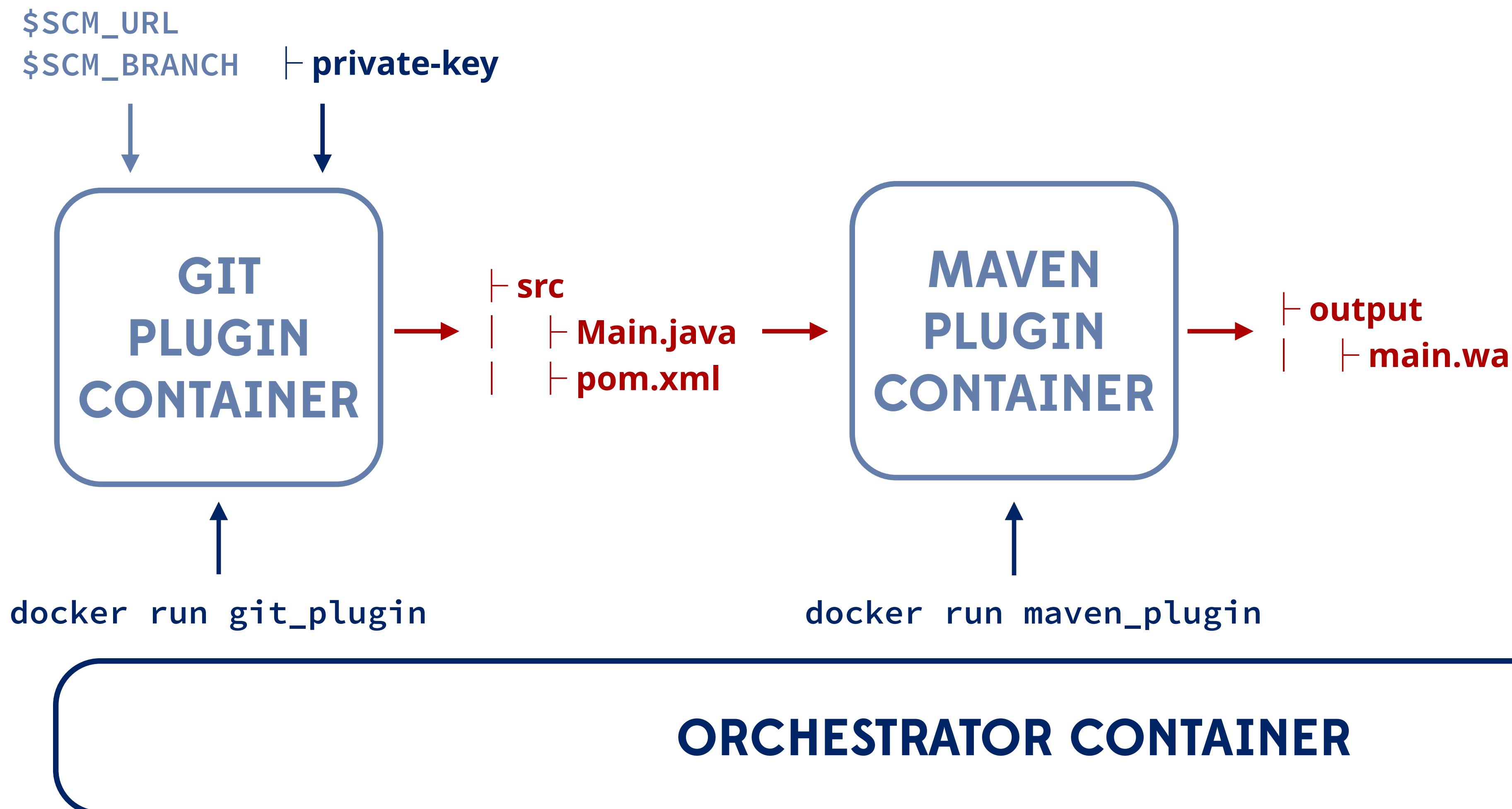
BUILD PIPELINE EXAMPLE



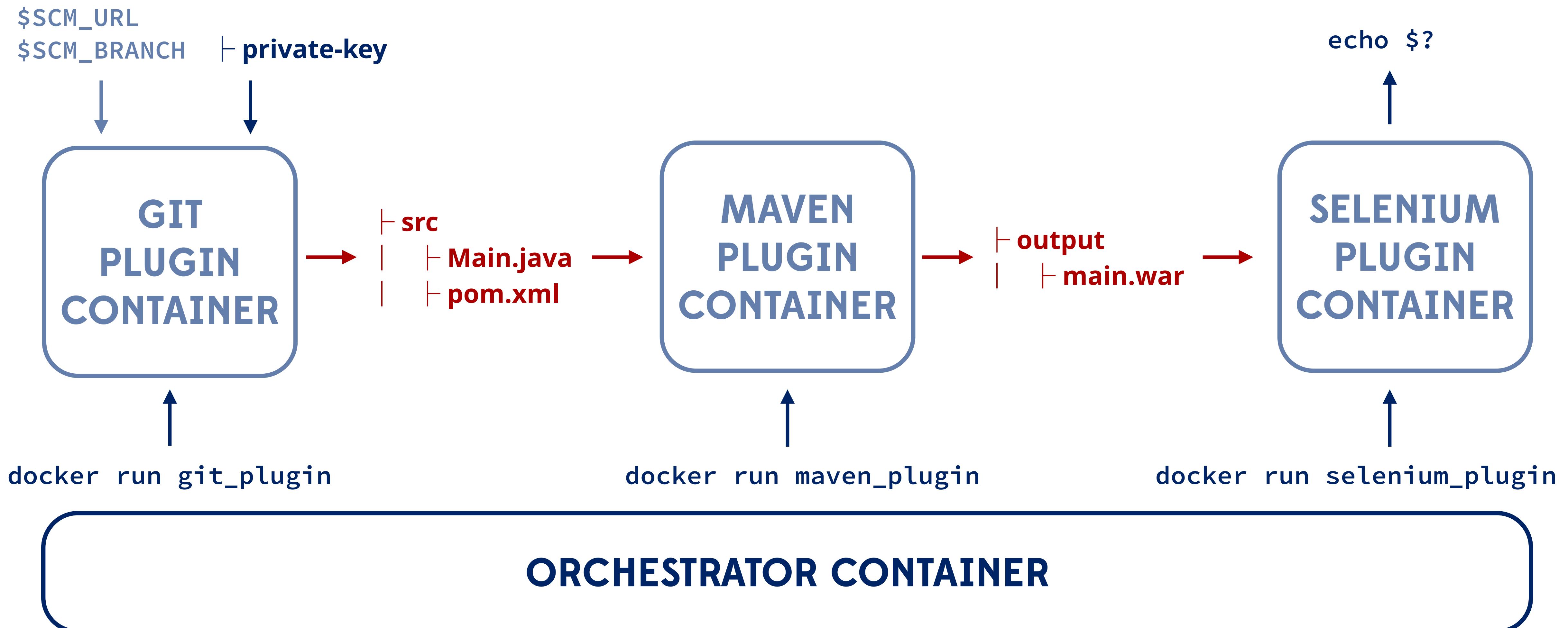
BUILD PIPELINE EXAMPLE



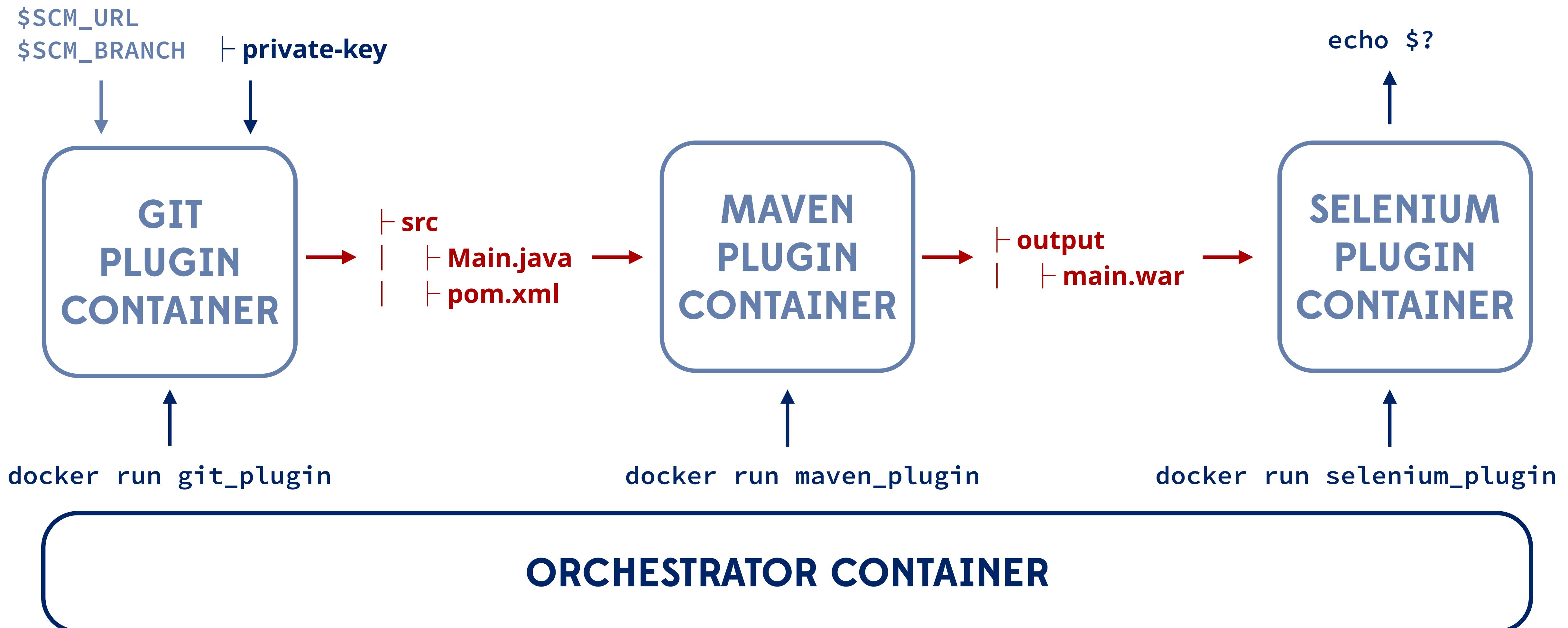
BUILD PIPELINE EXAMPLE



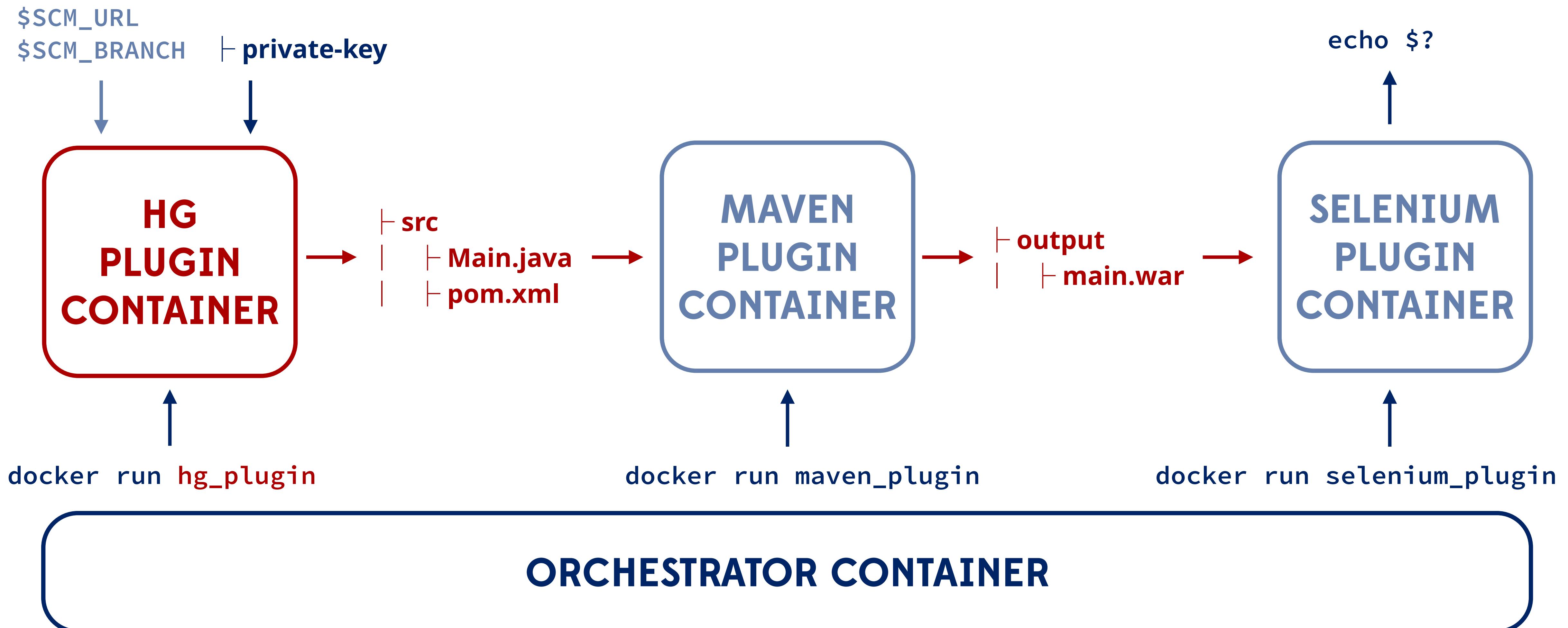
BUILD PIPELINE EXAMPLE



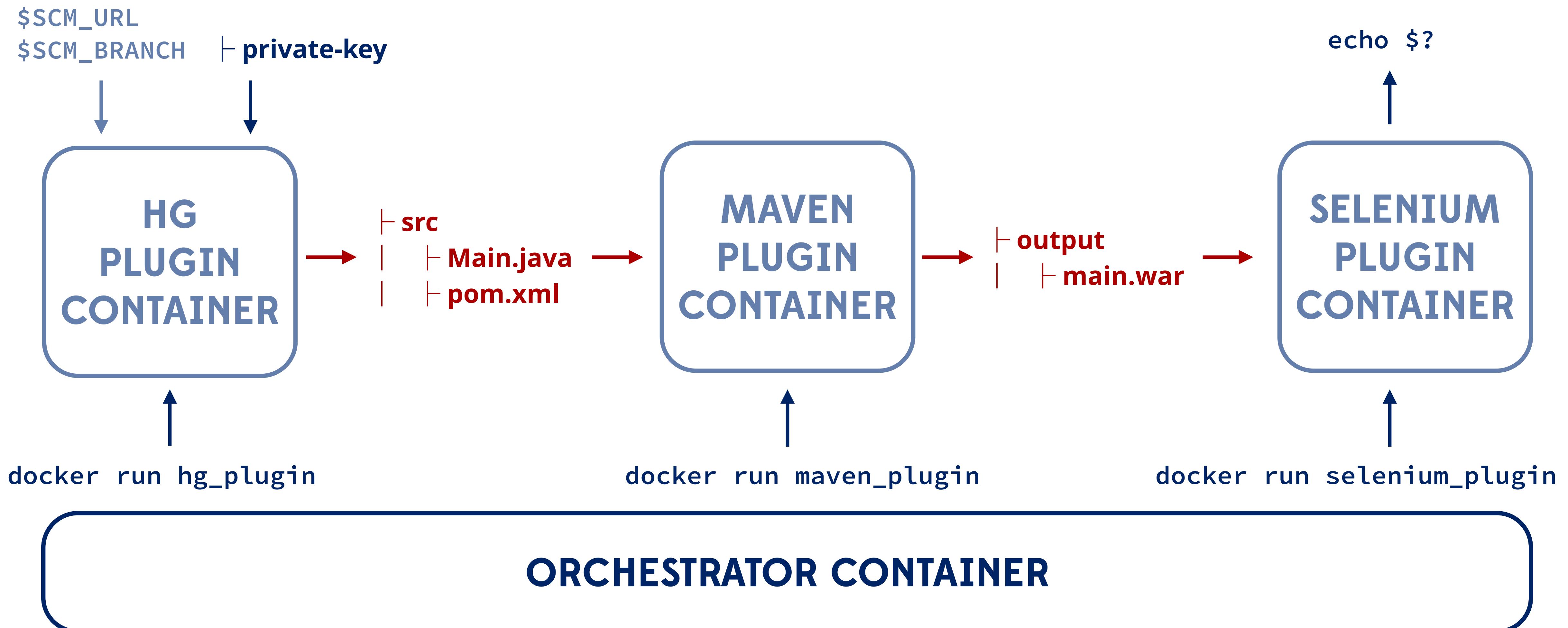
MERCURIAL INSTEAD OF GIT ?



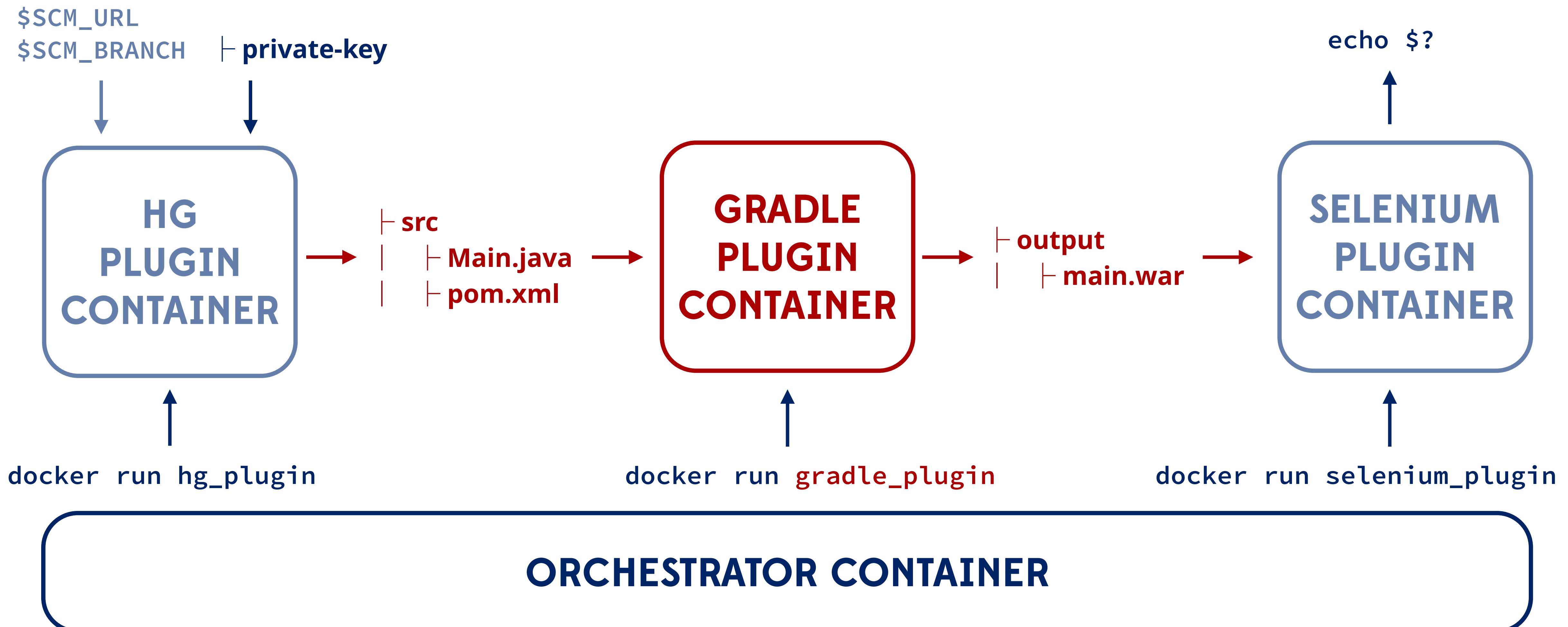
MERCURIAL INSTEAD OF GIT ?



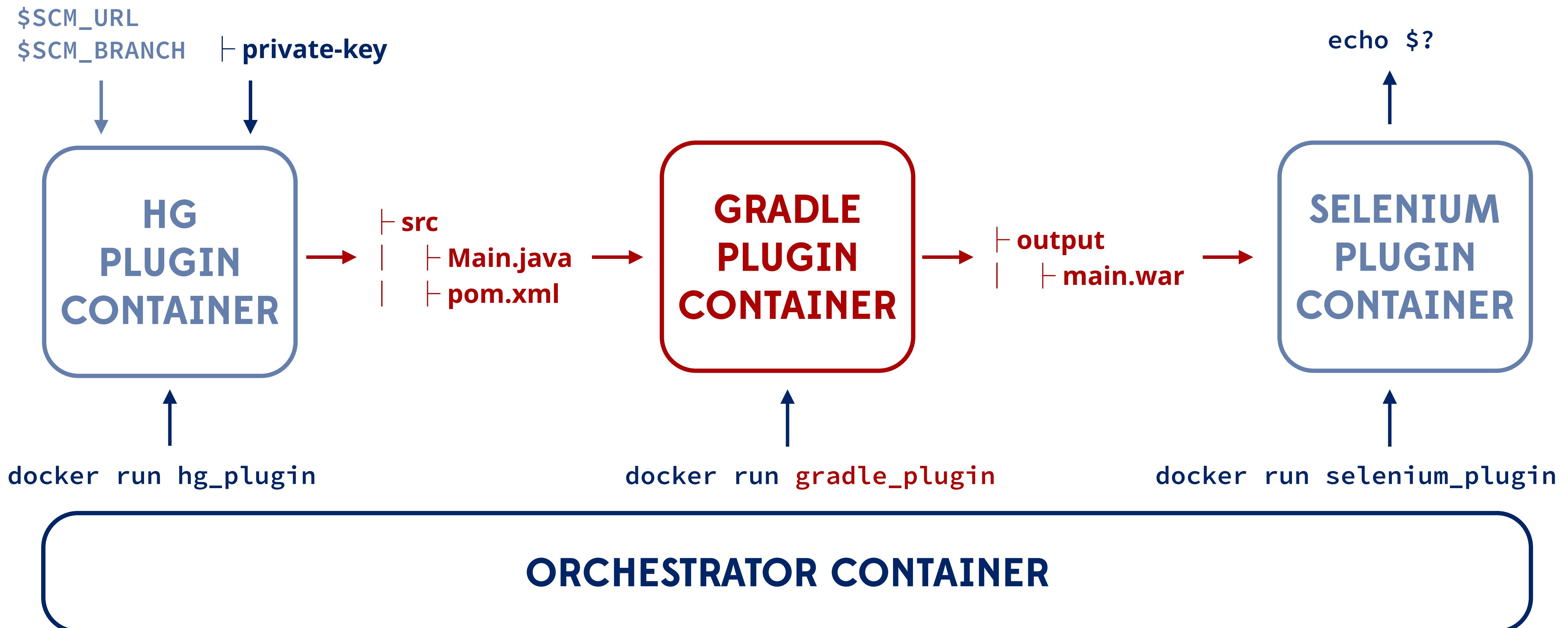
GRADLE INSTEAD OF MAVEN ?



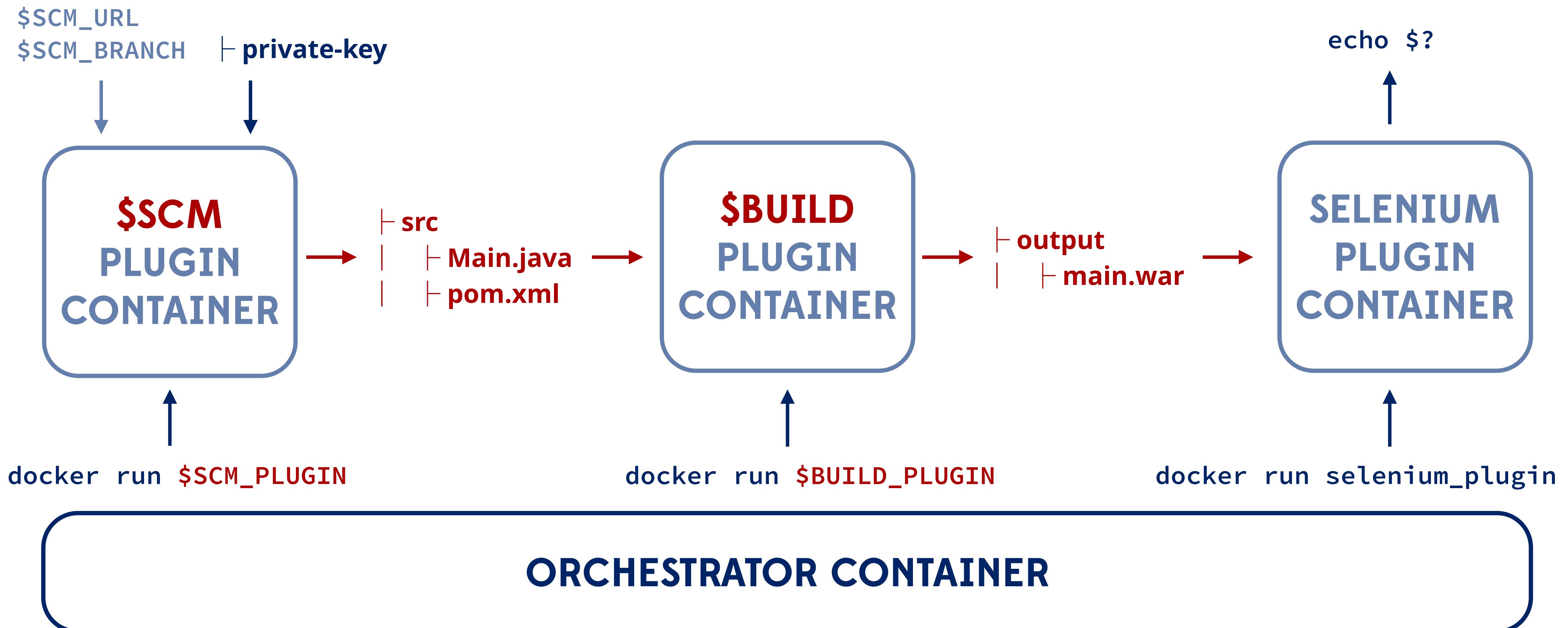
GRADLE INSTEAD OF MAVEN ?



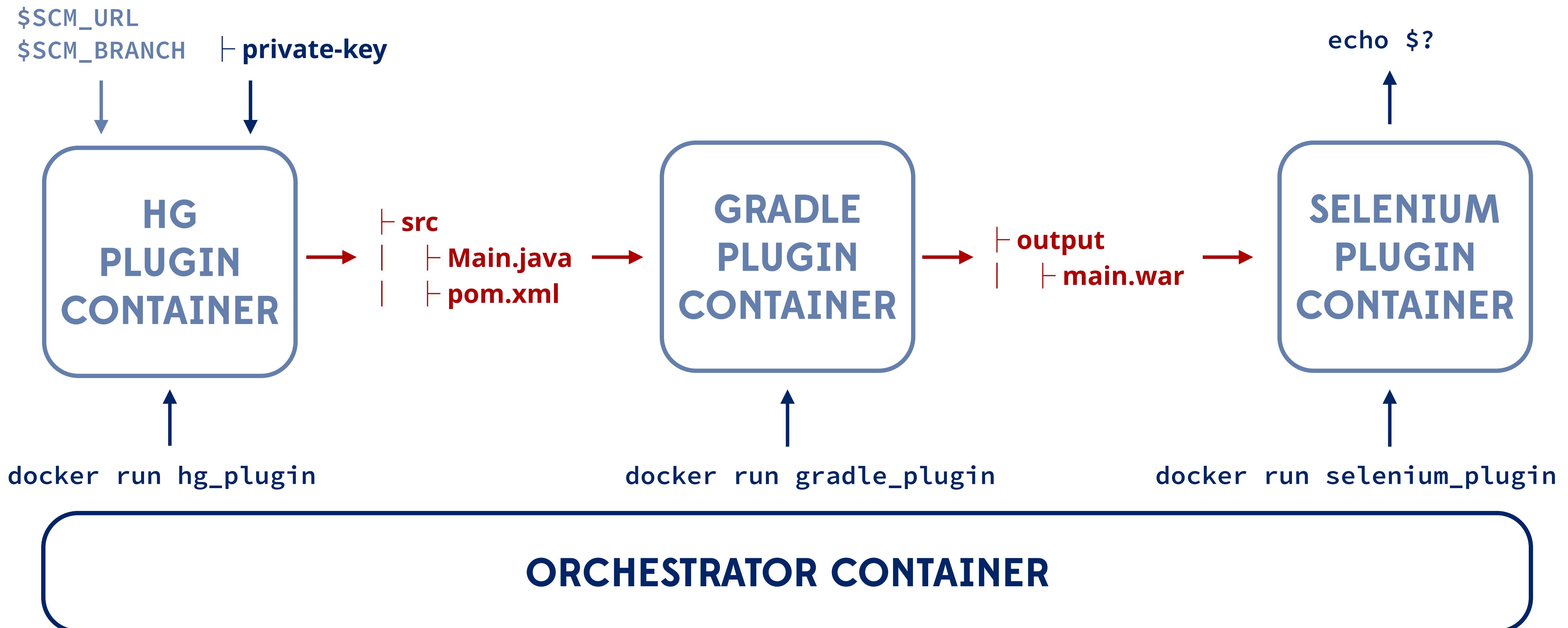
CAN WE MAKE THIS GENERIC ?



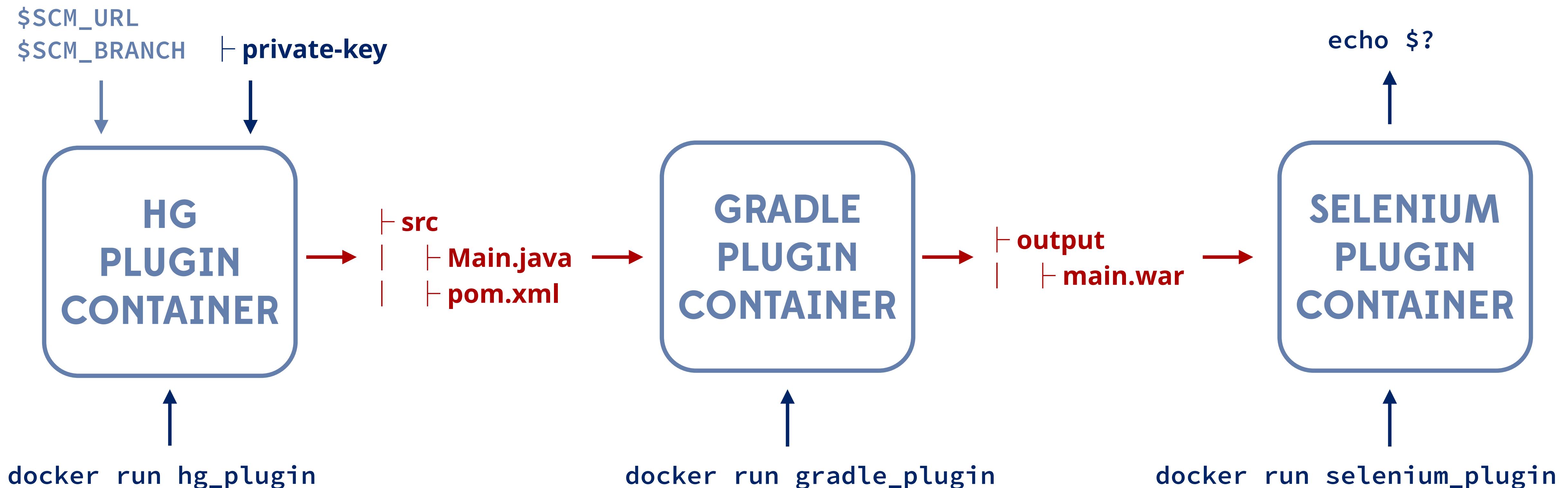
CAN WE MAKE THIS GENERIC ?



ANOTHER BUILD WORKFLOW ?



ANOTHER BUILD WORKFLOW ?



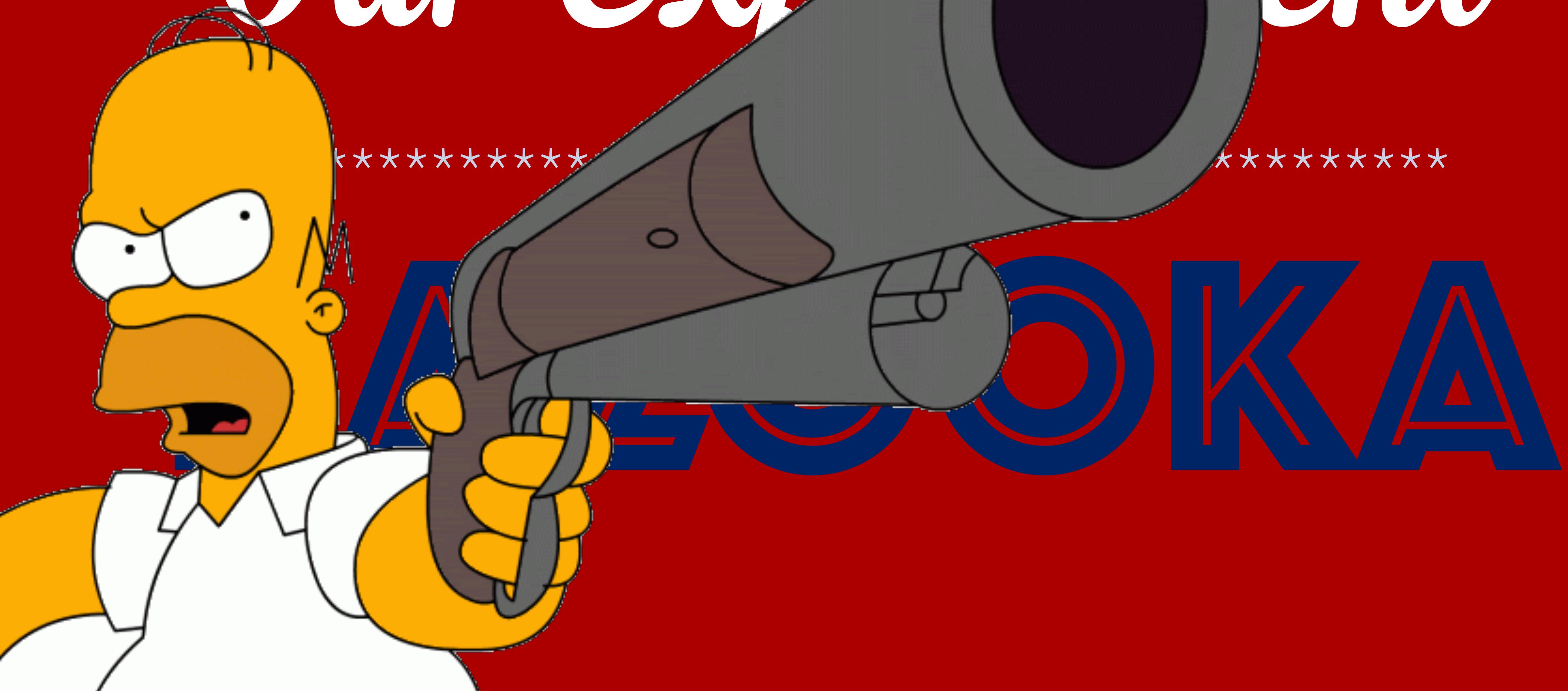
YOUR OWN ORCHESTRATOR CONTAINER

Our Experiment

***** WITH *****

BAZOOKA

Our Experience



Continuous Integration and Continuous Deployment Server <http://bazooka.readthedocs.org> — Edit

359 commits

5 branches

0 releases

3 contributors



branch: master ▾

bazooka / +

Update java.md



jullenvey authored 3 days ago

latest commit e771423623 ↗

cli	Remove redundant type	6 days ago
commons	Fix typos	4 days ago
docs	Update java.md	3 days ago
orchestration	Fix typos	4 days ago
parser	Implement a build artifact archiving mechanism	5 days ago
parserlang	Fix build for classic images	10 days ago
runner	Add runners for golang 1.4.1 and 1.4.2	a month ago
scm	Remove debug mode in git container	10 days ago
scripts	add verbose mode to bash dev-setup	10 days ago
server	Implement a build artifact archiving mechanism	5 days ago
web	Revert "Update build to run on Docker Hub"	a month ago
.bazooka.yml	Change Docker install	6 days ago

Code

Issues 37

Pull requests 2

Wiki

Pulse

Graphs

Settings

HTTPS clone URL

<https://github.com>You can clone with [HTTPS](#), [SSH](#), or [Subversion](#). ⓘ**Clone in Desktop****Download ZIP**

DOCKER MICROPLUGINS

EASY TO SETUP

EXTENSIBLE

PERMISSIVE

EASY TO DISTRIBUTE

LANGUAGE AGNOSTIC

QUESTIONS?

