

Sandbox CI/CD Environments for Everyone

by Leonid Makarov
Chief Architect @ FFW /
Docksal Project Lead

Agenda

- ★ Intro
- ★ Typical development process
- ★ Local environments
- ★ Project automation
- ★ Sandbox CI/CD environments with Docksal
- ★ Bonus: Advanced and cool features



Intro

Hi there!

Intro

- ★ Chief Architect @ FFW US
- ★ DevOps, infrastructure, tooling
- ★ In Drupal since 2006
- ★ In Docksal since 2016



Leonid Makarov

Docksal Team

Maintainers



Leonid Makarov



Oleksii Chekulaiev



Sean Dietrich



David Hernandez

Supporters



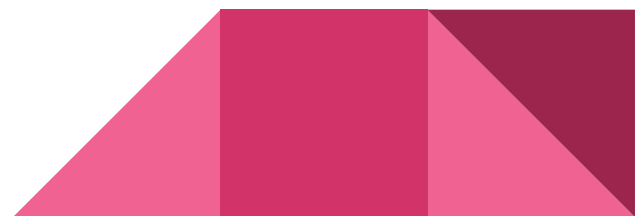
FFW Agency



EPAM Systems




Kanopi Studios



Typical development process

What it should look like

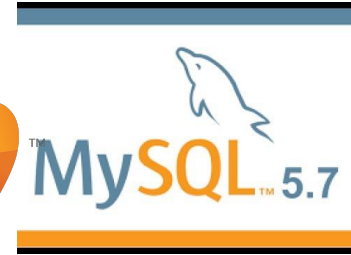
Typical development process

- ★ Local development
 - ★ Feature branch => Pull/merge request
 - ★ Code review
 - ★ CI/CD automation (automated tests & deployments)
 - ★ Hosting: dev, stage, prod
- 

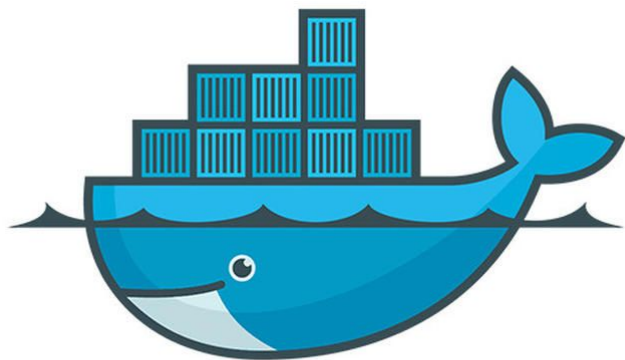
Local environments

Go Docker

“Can not reproduce!”



What to do?



docker




HashiCorp

Vagrant

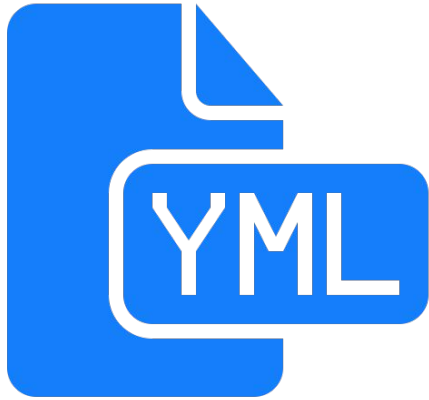


Why Docker

<https://www.slideshare.net/LeonidMakarov2/docksal-better-than-vms>

- ★ Containers are more efficient
 - ★ Immutable images - no fragile provisioning at runtime
 - ★ Work with different project stacks at the same time
 - ★ Containers can be extended in a reproducible way
 - ★ Containers are portable (CI reuse)
- 

Compose + Containers + Conventions = **Docksal**



+



+



docksal.yml is Compose

- ★ **No new YML dialect** you need to learn
- ★ Fully Docker Compose compatible

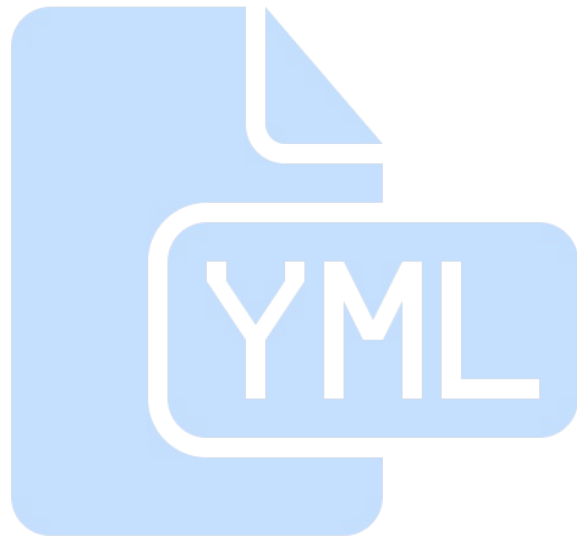
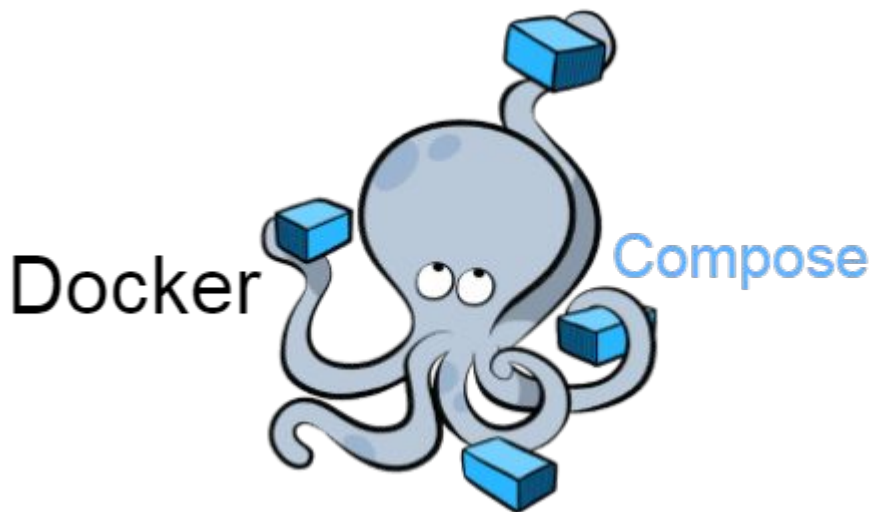


Image library and boilerplates

→ Default stack

- ◆ **CLI** – PHP 5.6, 7.0, 7.1, 7.2
- ◆ **WEB** – Apache 2.2, Apache 2.4
- ◆ **DB** – MySQL 5.5, 5.6, 5.7, 8.0

→ Additional services

- ◆ Solr, Varnish
- ◆ Memcached, Redis, Selenium, MailHog, ...

→ Boilerplate projects for

- | | |
|-----------------------------|-------------|
| ◆ Drupal 8, Drupal 7 | ◆ NodeJS |
| ◆ Wordpress | ◆ Hugo |
| ◆ Magento | ◆ Gatsby JS |
| ◆ Laravel | ◆ Grav CMS |



Change what you like

- ★ Create **custom automation** in BASH, Node or PHP
- ★ Full power and flexibility of **Docker Compose**
- ★ Seamlessly **extend** our stock Docker images at the project level with your **Dockerfile**
- ★ Create and publish addons github.com/docksal/addons



Project automation

Automate routine/complex tasks

Single command

A light gray circular icon containing a white terminal prompt symbol, consisting of a dollar sign followed by an underscore (\$_).

fin init

All-in-one:

- Create containers
- Run project automation: initialize settings, import/update database, compile css, run drush...

Custom commands

Create as many commands as you need

A circular icon with a light gray background and a white border, containing a white terminal prompt symbol consisting of a dollar sign followed by an underscore (\$_).

```
fin db-import && fin db-update
```

```
fin build-theme
```

```
fin behat
```

Sandbox CI/CD environments

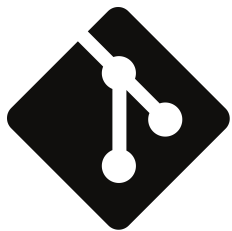
Reuse automation to create sandboxes

What sandboxes are for

- ★ Enhanced code review
- ★ Automated testing
- ★ Manual testing
- ★ Client demos



What you need for sandboxes

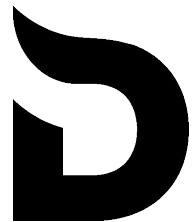


Your project (using Docksal) in a Git repo



Docker based CI solution (e.g. CircleCI)

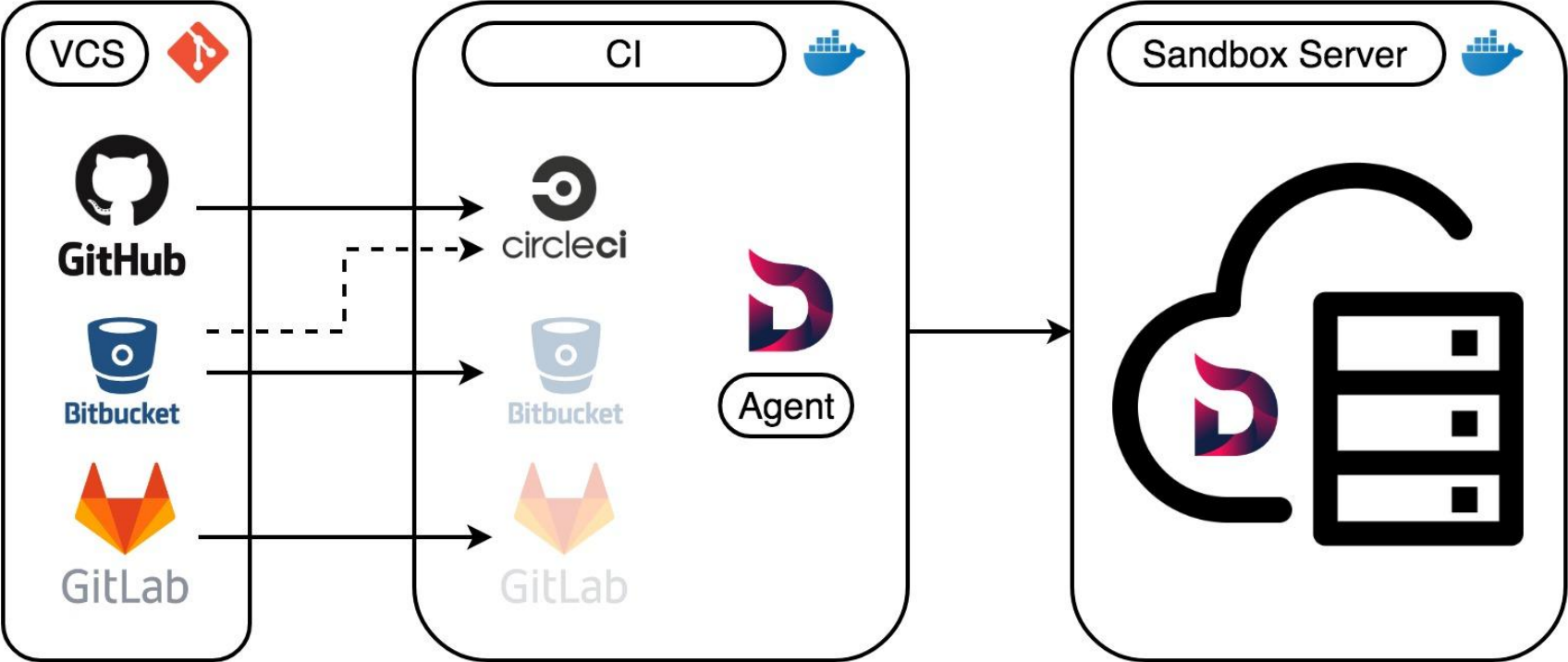
`image:docksal/ci-agent:php`



Sandbox Server



How sandboxes work

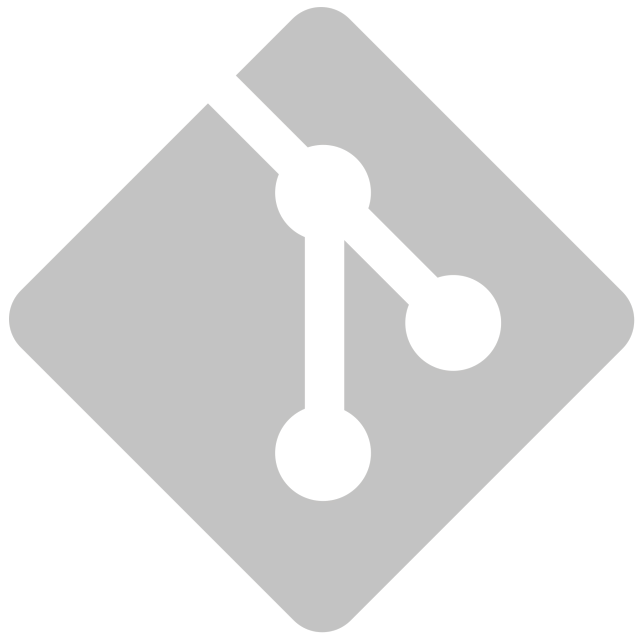


Project and Git repo setup

1. From repo to a fully working site:

\$_

```
git clone <repo-url> .  
fin init
```



2. Repo access: public or using an SSH key pair



Sandbox server setup

<https://github.com/docksal/sandbox-server>

- ★ AWS CloudFormation template

Launch Stack



or `aws cli`

- ★ GCP Deployment Manager template



OPEN IN GOOGLE CLOUD SHELL

and/or `gcloud cli`



Sandbox server setup

← → ↻ 🔒 GitHub, Inc. [US] | <https://github.com/docksal/sandbox-server/tree/develop/aws-cloudformation> ☆

Quick setup (using CloudFormation web UI)

If you have an existing AWS account (with billing and an SSH key pair), just click on the button below!

[Launch Stack](#) ▶

You will be prompted for:

- Instance type
- SSH key name

Once provisioned, the IP address of the server will be printed in the **Outputs** section in CloudFormation.

Sandbox server setup

CloudFormation ▾ Stacks

Create Stack ▾ Actions ▾ Design template ↻ ⚙️

Filter: Active ▾ Showing 1 stack

	Stack Name	Created Time	Status	Description
<input checked="" type="checkbox"/>	docksal-sandbox-server	2018-10-23 14:41:47 UTC-0700	CREATE_COMPLETE	Sandbox server template

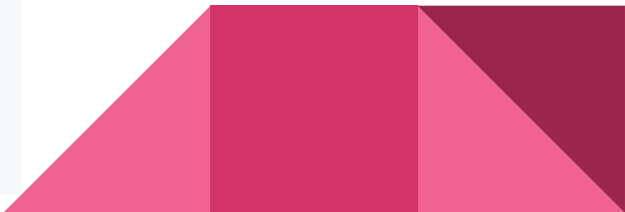
Overview **Outputs** Resources Events Template Parameters Tags Stack Policy Change Sets Rollback Triggers ☰ ☰ ☰

Key	Value	Description	Export Name
InstanceId	i-0d3b22c5a360c2b3a		
InstancePublicIP	18.224.41.78		
InstanceURL	https://18.224.41.78.nip.io		

CircleCI setup: config.yml

```
version: 2

jobs:
  build:
    working_directory: /home/agent/build
    docker:
      - image: docksal/ci-agent:php
    steps:
      - run:
          name: Configure agent environment
          command: echo 'source build-env' >> $BASH_ENV
      - checkout
      - run:
          name: Build sandbox
          command: sandbox-init
```



CircleCI setup: Environment Variables

Environment Variables for docksal/drupal8

Import Variables

Add Variable

Add environment variables to the job. You can add sensitive data (e.g. API keys) here, [rather than placing them in the repository](#).

Name	Value	Remove
DOCKSAL_HOST	xxxxp.io	×
DOCKSAL_HOST_SSH_KEY	xxxxLQ==	×
GITHUB_TOKEN	xxxxd619	×

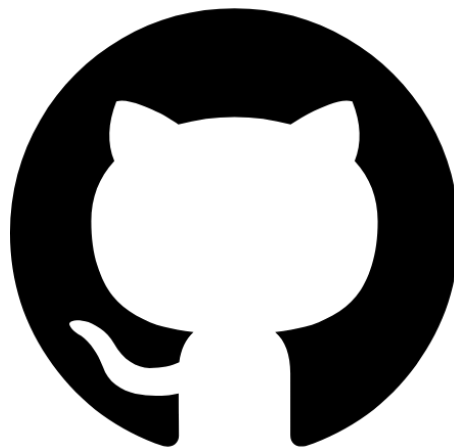


2

Live demo

Do attempt yourself!

Build status notifications



Build status notifications

docksal / drupal8

Unwatch 5

Star 41

Fork 34

Code

Issues 1

Pull requests 1

Projects 0

Wiki

Insights

Settings

Branch: feature/circle...

<https://feature-circleci-drupal8.18.224.41.78.nip.io/>

Commits on Oct 22, 2018

Sandboxing with CircleCI

Imakarov committed on Mar 31 ✓

4285fa6

<>

All checks have passed

4 successful checks

✓  ci/circleci — Your tests passed on CircleCI! [Details](#)

✓  ci/docksal — Sandbox environment build completed [Details](#)

✓  continuous-integration/travis-ci/pr — The Travis ... [Details](#)

✓  continuous-integration/travis-ci/push — The Travi... [Details](#)

Commits on Oct 17, 2018

Merge pull request #30 from doc

shelane committed 6 days ago ✓

7b8a94d

<>

Drupal 8.6.2

shelane committed 6 days ago ✓

122161b


<>

Commits on Sep 20, 2018

Your sandbox, delivered


← → ↻ Not Secure | https://feature-circleci-drupal8.18.224.41.78.nip.io ☆

Log in

 My Drupal 8 Site


Home

Search



Welcome to My Drupal 8 Site

No front page content has been created yet.
Follow the [User Guide](#) to start building your site.





Bonus: Advanced and cool features

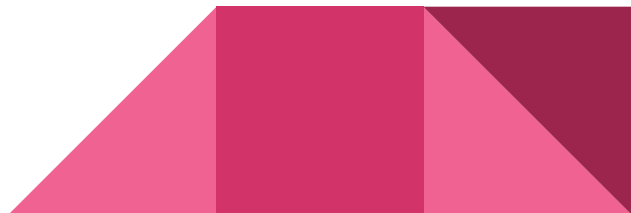
There is more...

Smart resource management


- ★ Automatic hibernation and cleanup of sandboxes
- ★ On-demand waking-up
- ★ Permanent environments (e.g. dev, stage)

Active environments = RAM

Hibernating environments space = Disk



Security

- ★ Custom SSL certificates
 - ★ On-the-fly certificates with LetsEncrypt (coming soon...)
 - ★ Basic HTTP authentication
 - ★ oAuth2 / OIDC authentication (coming soon...)
- 

Visual tools: Web UI (using Portainer)

Stack details 

Stacks > emmis-develop

 Portainer support  admin

[my account](#) [log out](#)

Stack

Information

 This stack was created outside of Portainer. Control over this stack is limited.





















Stack details

emmis-develop

Containers

 Search  Settings

 Start  Stop  Kill  Restart  Pause  Resume  Remove

<input type="checkbox"/> Name	State  Filter 	Quick actions	Stack	Image	IP Address	Published Ports	Ownership
<input type="checkbox"/> emmis-develop_cli_1	healthy	    	emmis-develop	docksal/cli:2.1-php5.6	172.18.0.5	-	 public
<input type="checkbox"/> emmis-develop_web_1	running	    	emmis-develop	docksal/web:2.1-apache2.4	172.18.0.3	-	 public
<input type="checkbox"/> emmis-develop_db_1	running	    	emmis-develop	docksal/db:1.2-mysql-5.6	172.18.0.4	 33246:3306	 public

Items per page 10 

Visual tools: Web IDE (using Cloud9)

The screenshot displays the Cloud9 web IDE interface. The main editor shows a JavaScript file named 'hello.js' with the following code:

```
1 // Load the http module to create an http server.
2 var http = require('http');
3
4 // Configure our HTTP server to respond with Hello World to all requests.
5 var server = http.createServer(function (request, response) {
6   response.writeHead(200, {"Content-Type": "text/plain"});
7   response.end("Hello World\n");
8 });
9
10 // Listen on port 8000, IP defaults to 127.0.0.1
11 server.listen(process.env.PORT,
12               "8000");
13 // Put a friendly message on the terminal
14 console.log("Server running");
```

The terminal window shows the command to install the 'imagemagick' package and its output:

```
javruben@ace:/home/ubuntu/workspace (performance) $ sudo apt-get install imagemagick
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
 libdjvulibre-text libdjvulibre21 libilmbase6 libmagickcore5-extra libnetpbm10
 libopenexr6 libwmf0.2-7 netpbm
Suggested packages:
 imagemagick-doc autotrace cups-bsd lpr lprng enscript ffmpeg gimp gnuplot grads hp2xx
 html2ps libwmf-bin mplayer povray radiance sane-utils transfig ufraw-batch
 libwmf0.2-7-gtk
0 upgraded, 9 newly installed, 0 to remove and 8 not upgraded.
Need to get 2649 kB of archives.
After this operation, 8851 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

The debugger window is open, showing the 'Call Stack' and 'Scope Variables'.

Call Stack:

Function	Script	Ln	Col
anonymous(request, respo...	/hello.js	6	12
EventEmitter.emit(type)	events.js	98	17
parser.onIncoming(req, sh...	http.js	2108	12
parser.onHeadersComple...	http.js	121	23
socket.ondata(d, start, end)	http.js	1966	22
onread(buffer, offset, len...	net.js	527	27

Scope Variables:

Property	Value	Type
request	[Object]	object
response	[Object]	object
this	[Object]	object
_connectionKey	"4:0.0.0:8080"	string
_connections	1	number
_events	[Object]	object
_handle	[TCP]	object
_maxListeners	10	number
_slaves	[Array]	object
_usingSlaves	false	boolean
allowHalfOpen	true	boolean
connections	undefined	undefi...
domain	null	null
httpAllowHalfOpen	false	boolean
timeout	120000	number
Scope		global

The terminal window also shows the command to run the server and the output:

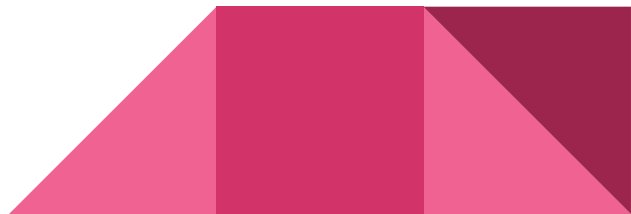
```
bash - javruben-acc x Immediate (Javascr x hello.js - Running
Stop Run Config N Command: hello.js Runner: No... CWD Env...
Your code is running at https://ace-c9-javruben.c9.io.
Important: use process.env.PORT as the port and process.env.IP as the host in your scripts!
debugger listening on port 15454
Server running
```

Full-featured IDE

- Code editing
- Syntax highlighting
- Console
- Debugger

More use cases for sandboxes

- ★ Development environments in the Cloud
- ★ Super enhanced code reviews
- ★ Trainings / Sprints / Contributions
- ★ Simplytest.me on steroids



Live demo

Do attempt yourself!

Q&A

Leonid Makarov
Chief Architect @ FFW
BADCamp 2018

Thank you!

Chat

gitter.im/docksal

Blog

blog.docksal.io

Twitter

[@docksalio](https://twitter.com/docksalio)