



# Continuous Integration for Fun and Profit

Arnold Bechtoldt

Darmstadt, 16.06.2016

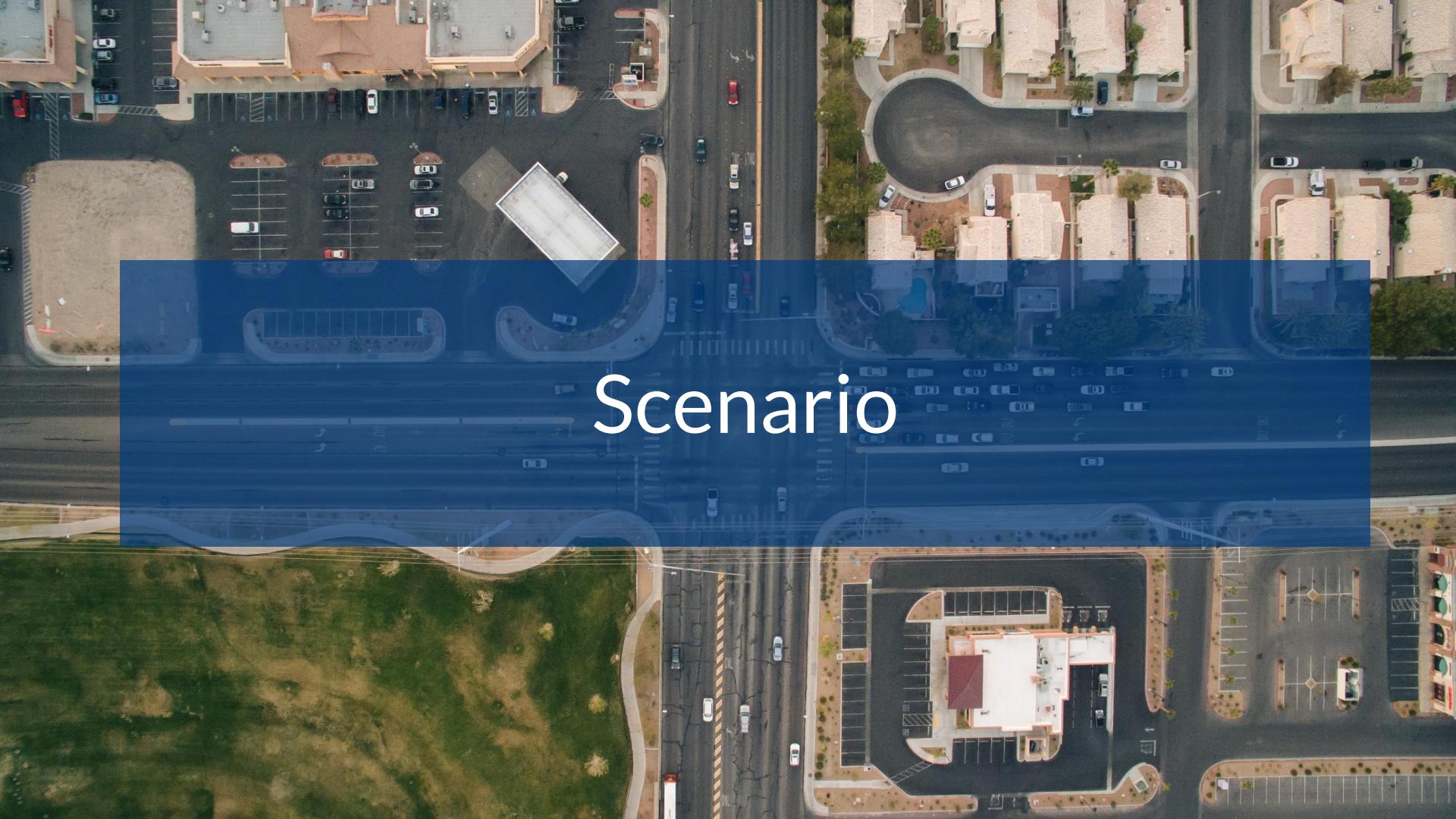


# Arnold Bechtoldt

Systems Engineer / Consultant @ inovex

- › Software-Defined Datacenters
- › Continuous Integration/Delivery
- › DevOps

WE'RE  
HIRING!

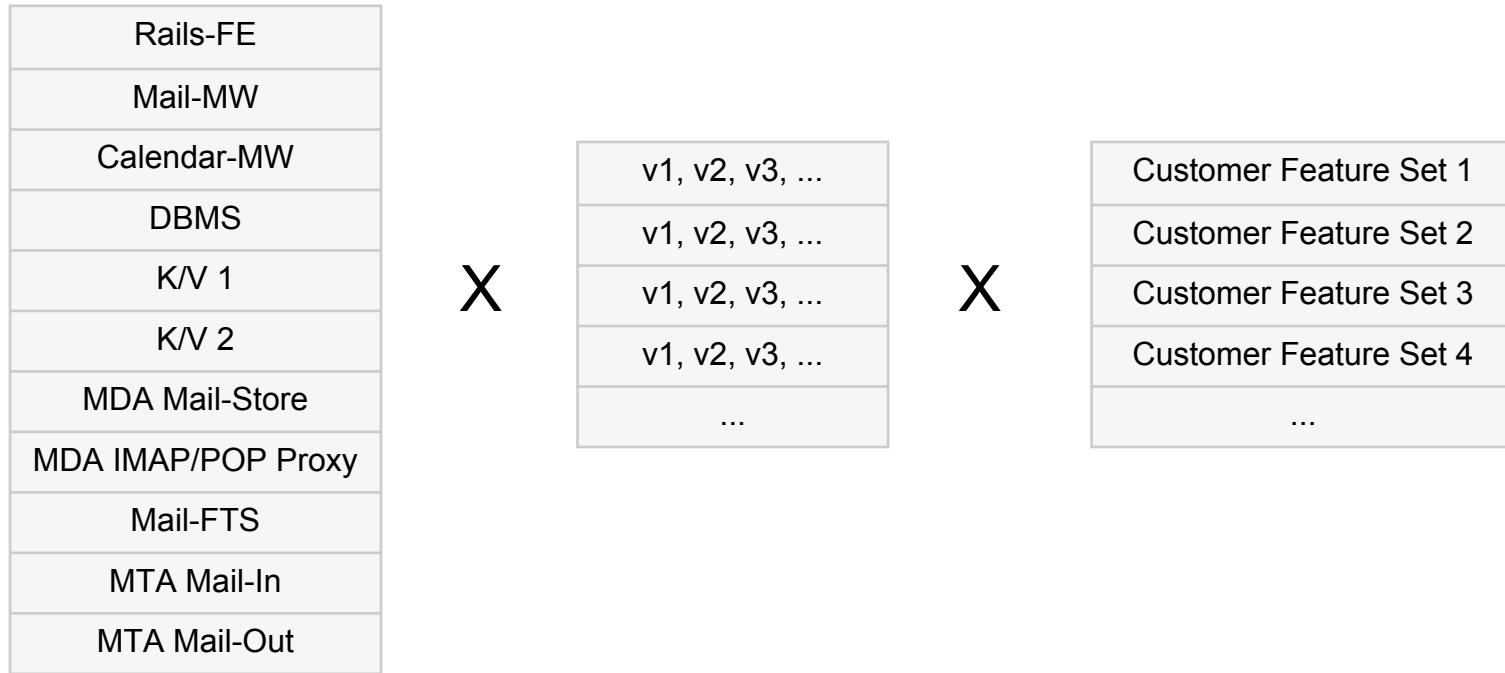
An aerial photograph of a suburban area. On the left, there's a large parking lot with several cars and a building with a brown roof. In the center, a multi-lane road with a median and some trees. To the right, there are several houses with tan roofs arranged in a grid pattern. A blue rectangular overlay covers the middle portion of the image, containing the word "Scenario".

# Scenario

# The Product



# Test Matrix





# Sad Stories from Real World

*We can't run integration tests in parallel.*





*Running all of our tests takes ages.*



*Our integration tests are fragile.*

*Producing a bugfix release is hard work.*





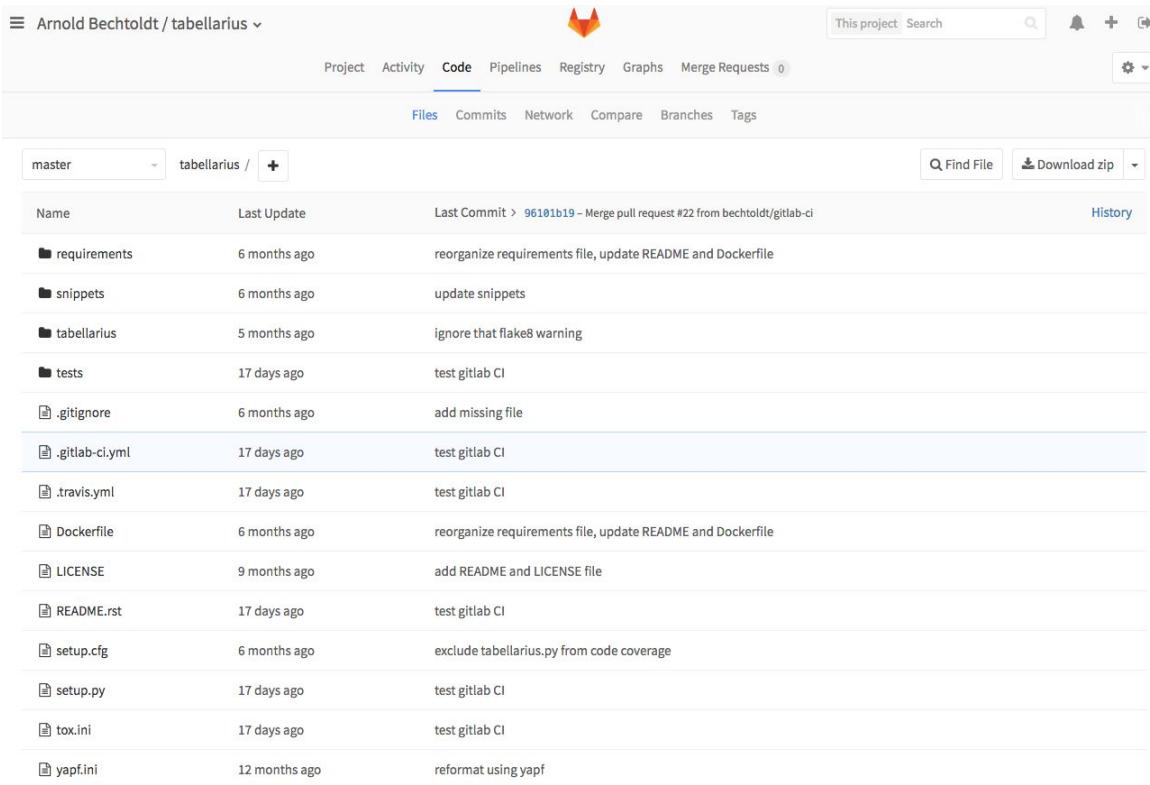
Time For A Plan

# The Plan: Building A Private Travis CI Clone



# Travis CI

# GitLab to the Rescue!



Arnold Bechtoldt / tabellarius

This project Search

Project Activity Code Pipelines Registry Graphs Merge Requests 0

Files Commits Network Compare Branches Tags

master tabellarius / +

Find File Download zip

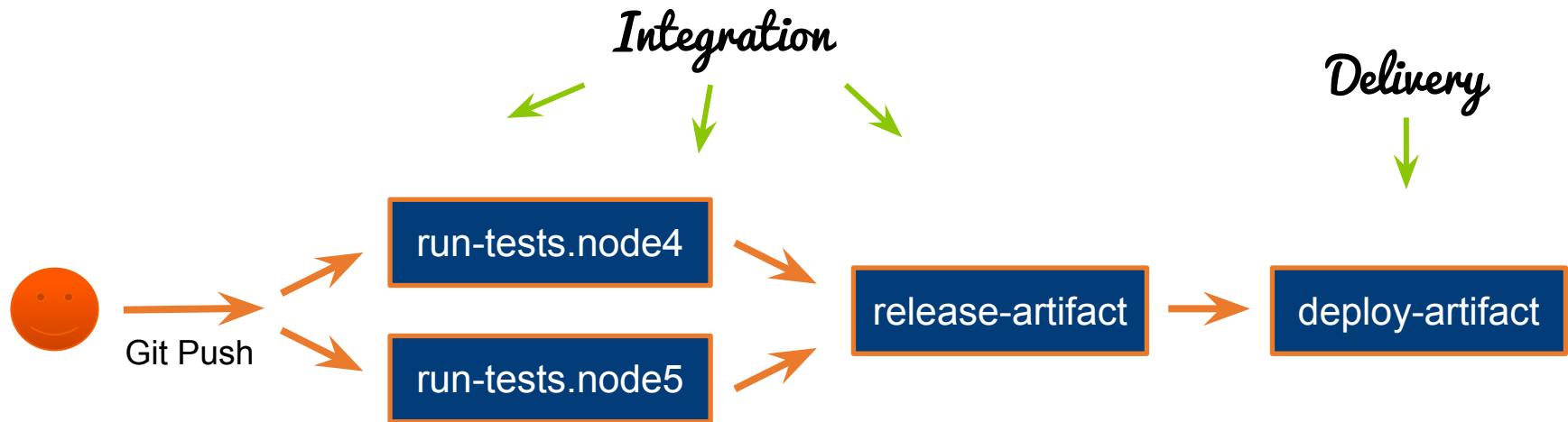
Name	Last Update	Description	History
requirements	6 months ago	reorganize requirements file, update README and Dockerfile	
snippets	6 months ago	update snippets	
tabellarius	5 months ago	ignore that flake8 warning	
tests	17 days ago	test gitlab CI	
.gitignore	6 months ago	add missing file	
.gitlab-ci.yml	17 days ago	test gitlab CI	
.travis.yml	17 days ago	test gitlab CI	
Dockerfile	6 months ago	reorganize requirements file, update README and Dockerfile	
LICENSE	9 months ago	add README and LICENSE file	
README.rst	17 days ago	test gitlab CI	
setup.cfg	6 months ago	exclude tabellarius.py from code coverage	
setup.py	17 days ago	test gitlab CI	
tox.ini	17 days ago	test gitlab CI	
yapf.ini	12 months ago	reformat using yapf	

# Improving the Workflow

1. Git-Pushes go to feature/bugfix branches
2. Every Git-Push triggers a test
3. Tests run in prod-like environments
4. Tests run in isolated/dedicated environments
5. Master branch keeps “stable”
6. Make it easy to improve/add tests



# Pipeline (simplified)



# GitLab CI Config

```
stages:
  - tests
  - release
  - deploy

run-tests.node4:
  stage: tests
  image: node4
  script:
    - npm test

run-tests.node5:
  stage: tests
  image: node5
  script:
    - npm test

release-artifact:
  stage: release
  script:
    - npm release.prod

deploy-artifact:
  stage: deploy
  script:
    - npm deploy.qa
```

# GitLab Code Build Status

test gitlab CI

Request to merge [gitlab-ci](#) into [master](#)

[Check out branch](#) [Download as](#)

CI build running for 87e0861b. [View details](#)

[Merge When Build Succeeds](#)  Remove source branch  Modify commit message

You can also accept this merge request manually using the [command line](#).

Discussion 0 Commits 1 Builds 5 Changes 7

[Cancel running](#)

Status	Build ID	Name	Tags	Duration	Finished at
Tests					
<a href="#">running</a>	#1541647	check-code-style		46 seconds	<a href="#">X</a>
<a href="#">running</a>	#1541646	find-tasks		46 seconds	<a href="#">X</a>
<a href="#">running</a>	#1541648	test-integration:py3.3		43 seconds	<a href="#">X</a>
<a href="#">running</a>	#1541649	test-integration:py3.4		43 seconds	<a href="#">X</a>
<a href="#">running</a>	#1541650	test-integration:py3.5		40 seconds	<a href="#">X</a>

# GitLab CI Pipeline

ID	Commit	Builds	Tests	Deploys	
<a href="#">✓ #3368050</a>	master · 6383560f <span>latest</span> see if a change happens	✓	✓	✓	⌚ 6 minutes 5 seconds 📅 41 minutes ago <a href="#">Download</a>
<a href="#">✓ #3368024</a>	master · ae4fe55f Merge branch 'remote-work-section' into 'master'	✓	✓	✓	⌚ 7 minutes 30 seconds 📅 about an hour ago <a href="#">Download</a>
<a href="#">✓ #3368009</a>	master · d2c75caf use artifacts passings to deploy	✓	✓	✓	⌚ 11 minutes 54 seconds 📅 about an hour ago <a href="#">Download</a>

# GitLab CI Pipeline (2)

Status	Build ID	Commit	Ref	Stage	Name	Duration	Finished at	CI	
<span>✓ passed</span>	#1369	e6502d41	master	release	release	59 seconds	6 days ago	<a href="#">C</a>	
<span>✗ failed</span>	#1361	e6502d41	master	integrationtests	test-integration:store2.2.23	<span>allowed to fail</span>	10 minutes 32 seconds	6 days ago	<a href="#">C</a>
<span>✓ passed</span>	#1360	e6502d41	master	integrationtests	test-integration:store2.2.18		10 minutes 20 seconds	6 days ago	<a href="#">C</a>
<span>✗ failed</span>	#1358	e6502d41	master	unitests	test-unit:store2.2.23	<span>allowed to fail</span>	1 minute 47 seconds	6 days ago	<a href="#">C</a>
<span>✓ passed</span>	#1357	e6502d41	master	unitests	test-unit:store2.2.18		2 minutes 23 seconds	6 days ago	<a href="#">C</a>
<span>✗ failed</span>	#1165	f34f9ecc	migrate_to_gitlabci	integrationtests	test-integration:store2.2.23	<span>allowed to fail</span>	10 minutes 33 seconds	7 days ago	<a href="#">C</a>
<span>✓ passed</span>	#1164	f34f9ecc	migrate_to_gitlabci	integrationtests	test-integration:store2.2.18		9 minutes 15 seconds	7 days ago	<a href="#">C</a>
<span>✓ passed</span>	#1163	f34f9ecc	migrate_to_gitlabci	unitests	test-unit:store2.2.18		2 minutes 3 seconds	7 days ago	<a href="#">C</a>
<span>✗ failed</span>	#1162	f34f9ecc	migrate_to_gitlabci	unitests	test-unit:store2.2.23	<span>allowed to fail</span>	1 minute 55 seconds	7 days ago	<a href="#">C</a>

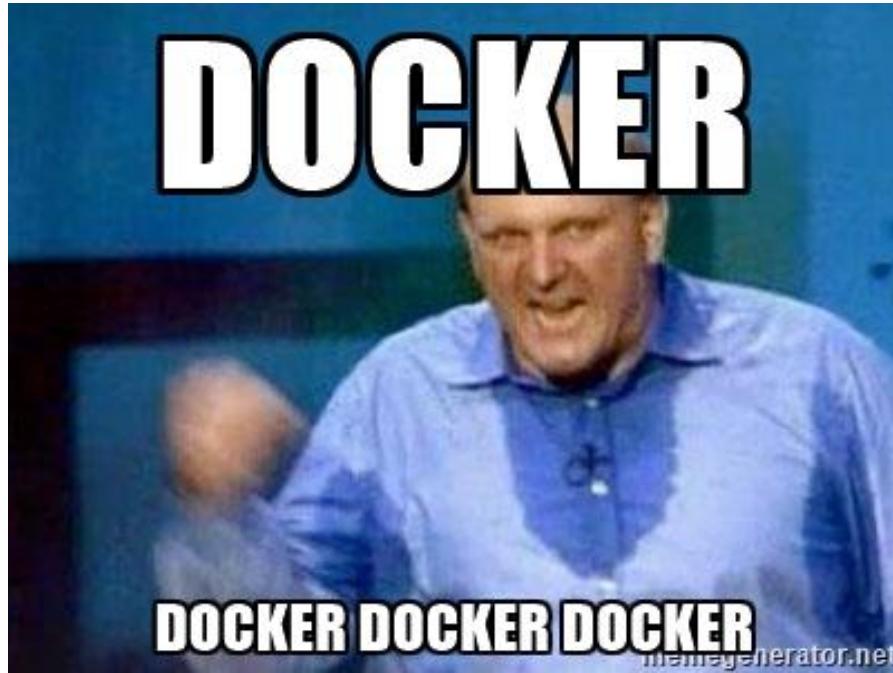
A collage of images depicting various scenes of work and study. One prominent image in the center shows a person's hands writing in a spiral notebook on a desk, with a blue mug and a laptop keyboard visible. Other smaller images show people working at desks, looking at laptops, and holding smartphones. The overall theme is productivity and learning.

# Conclusions

# Conclusions

- › Spawning integration test environments at ludicrous speed
- › Similarity to production leads to faster bugfixing
- › Isolated testing improves test (=product) quality
- › Parallel testing increases work efficiency

A voice in my head..



# Arnold Bechtoldt

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[github.com/bechtoldt](https://github.com/bechtoldt)

inovex.de

[arbe.io](https://arbe.io)

+ArnoldBechtoldtGER

[youtube.com/inovexGmbH](https://youtube.com/inovexGmbH)

# Backup

# GitHub/Travis Code Build Status

add Gitlab ci config, improve tests #22

[Open](#) bechtoldt wants to merge 8 commits into `master` from `gitlab-ci`

Conversation 1 Commits 8 Files changed 7

bechtoldt commented 17 hours ago  
No description provided.

bechtoldt self-assigned this 17 hours ago

bechtoldt added some commits a day ago

- test gitlab CI
- make it export
- add integration for cov test too
- set correct redis port
- reduce flake8 warnings

bechtoldt added some commits 16 hours ago

- trying to modify test order
- fix that damn typo
- reduce pep8 warnings

fix that damn typo  
reduce pep8 warnings

coveralls commented 7 minutes ago  
coverage 100%  
Coverage remained the same at 99.81% when pulling [e33d870](#) on `gitlab-ci` into [8ba7faa](#) on `master`.

Add more commits by pushing to the `gitlab-ci` branch on **bechtoldt/tabellarius**.

Some checks haven't completed yet  
2 pending checks

- continuous-integration/travis-ci/pr — The Travis CI build is in progress
- continuous-integration/travis-ci/push — The Travis CI build is in progress

This branch has no conflicts with the base branch  
Merging can be performed automatically.

Merge pull request You can also open this in GitHub Desktop or view command line instructions.

# Travis CI Pipeline

bechtoldt / tabellarius  build passing

Current	Branches	Build History	Pull Requests
		 <b>gitlab-ci</b> Arnold Bechtoldt	test gitlab CI #267 started 87e8861
		 <b>gitlab-ci</b> Arnold Bechtoldt	reduce pep8 warnings #265 passed ea0c10d
		 <b>gitlab-ci</b> Arnold Bechtoldt	fix that damn typo #263 failed e33d870
		 <b>gitlab-ci</b> Arnold Bechtoldt	trying to modify test order #262 failed 817253c
		 <b>gitlab-ci</b> Arnold Bechtoldt	reduce flake8 warnings #259 failed d5a7896

# Travis CI Pipeline (2)

Current Branches Build History Pull Requests > [Build #267](#)

gitlab-ci test gitlab Ci

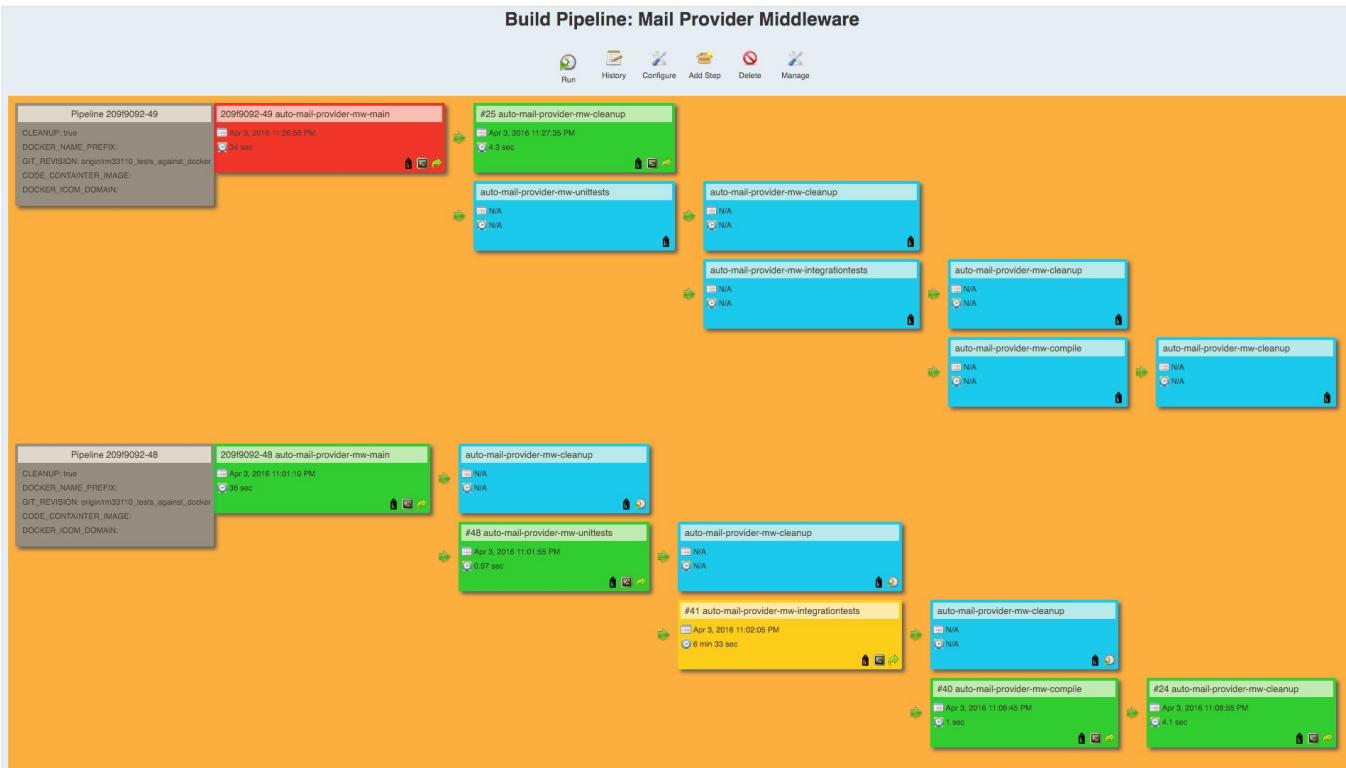
Commit 87e8861  
Compare ea0c10d..87e8861  
Arnold Bechtoldt authored and committed

#267 started  
Elapsed time 52 sec  
Running for 52 sec

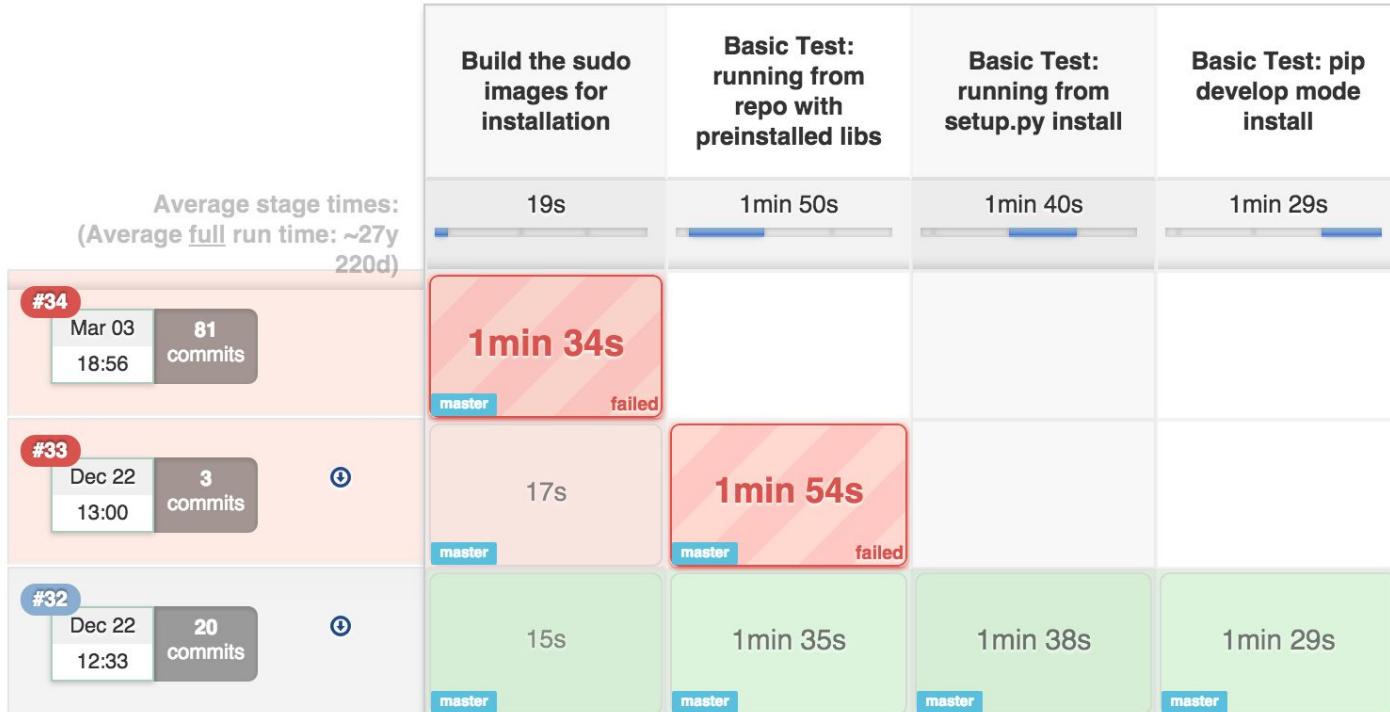
Build Jobs

# 267.1	Python: 3.3	TOX_ENV=app_tests_min START_INTEGRATION_SERVERS=yes	~
# 267.2	Python: 3.4	TOX_ENV=app_tests_min START_INTEGRATION_SERVERS=yes	27 sec
# 267.3	Python: 3.5	TOX_ENV=app_tests_cov_upload START_INTEGRATION_SERVERS=yes	34 sec
# 267.4	Python: 3.5	TOX_ENV=app_flake8	36 sec
# 267.5	Python: 3.5	TOX_ENV=tests_flake8	52 sec

# Jenkins CI Pipeline



# Jenkins CI Pipeline (3)



# Jenkins CI Pipeline (4)

Jenkins / Blue Ocean #423

Branch master  
Commit #601366d  
Changes by Michael Neale, Ben Waldo and Ivan Meredith

3 minutes and 42 seconds  
14 minutes ago

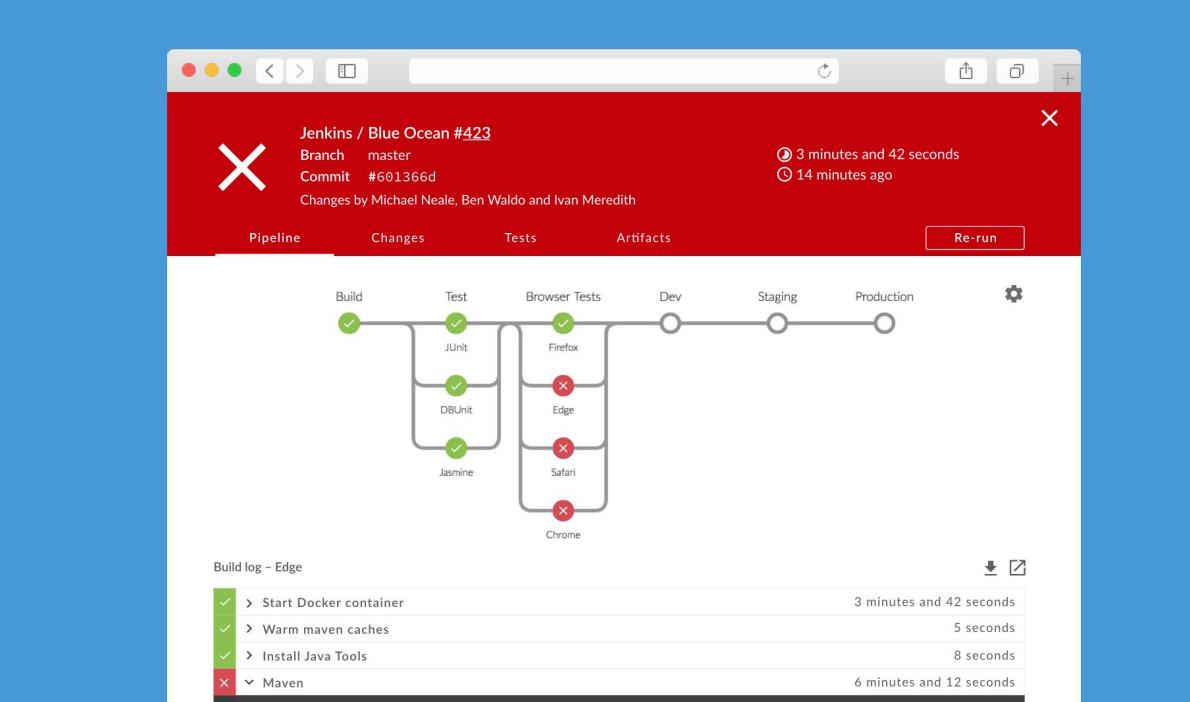
Pipeline Changes Tests Artifacts Re-run

Build Test Browser Tests Dev Staging Production

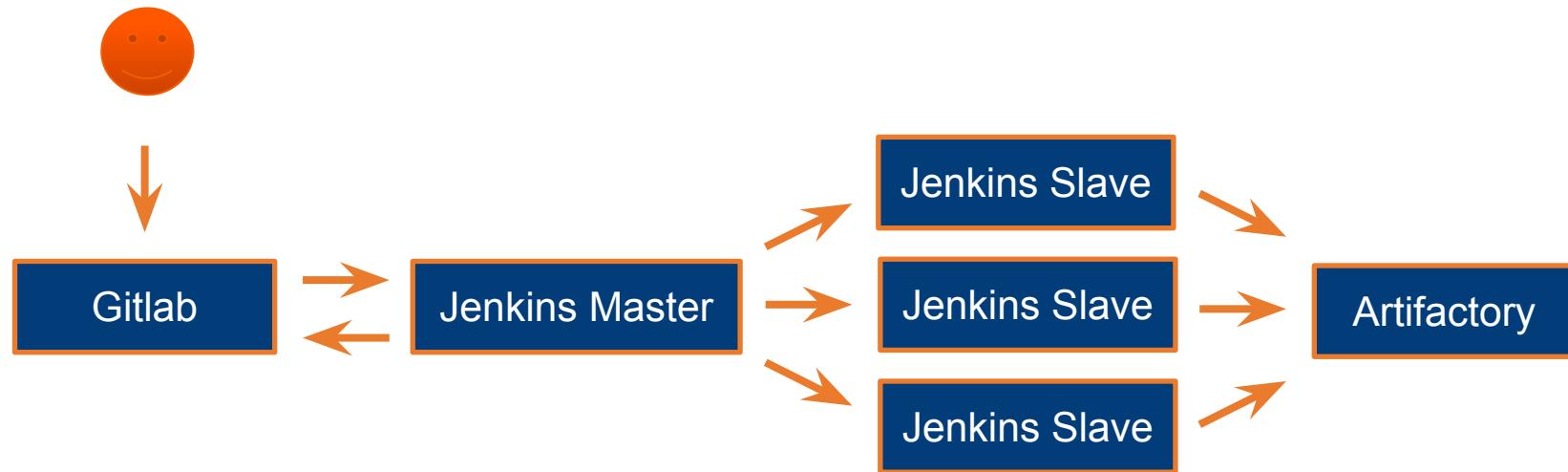
JUnit DBUnit Jasmine Firefox Edge Safari Chrome

Build log - Edge

> Start Docker container	3 minutes and 42 seconds
> Warm maven caches	5 seconds
> Install Java Tools	8 seconds
> Maven	6 minutes and 12 seconds



# Jenkins CI Architecture



# Toolset

Tool	Purpose
GitLab	Git Repository + CI Server
Docker	Container <i>Technology</i>
Docker-Compose	Container/Service Management
Bash + Confd	Image/Container Configuration
Artifactory	Artifact Repository