



Continuous Integration for Fun and Profit

Arnold Bechtoldt

*Now with 42% extra
fancy stuff!*

Assets & Links



github.com/bechtoldt/talks

The background of the slide is a high-angle aerial photograph of a suburban neighborhood. It shows several single-story buildings, including what appears to be a shopping center with a large parking lot containing numerous cars. A road with a median and some trees runs through the center. To the right, there's a residential area with houses and a circular driveway. The overall scene is a typical American suburb.

Scenario: Hosted Groupware

Product: Hosted Groupware

E-Mail

Calendar

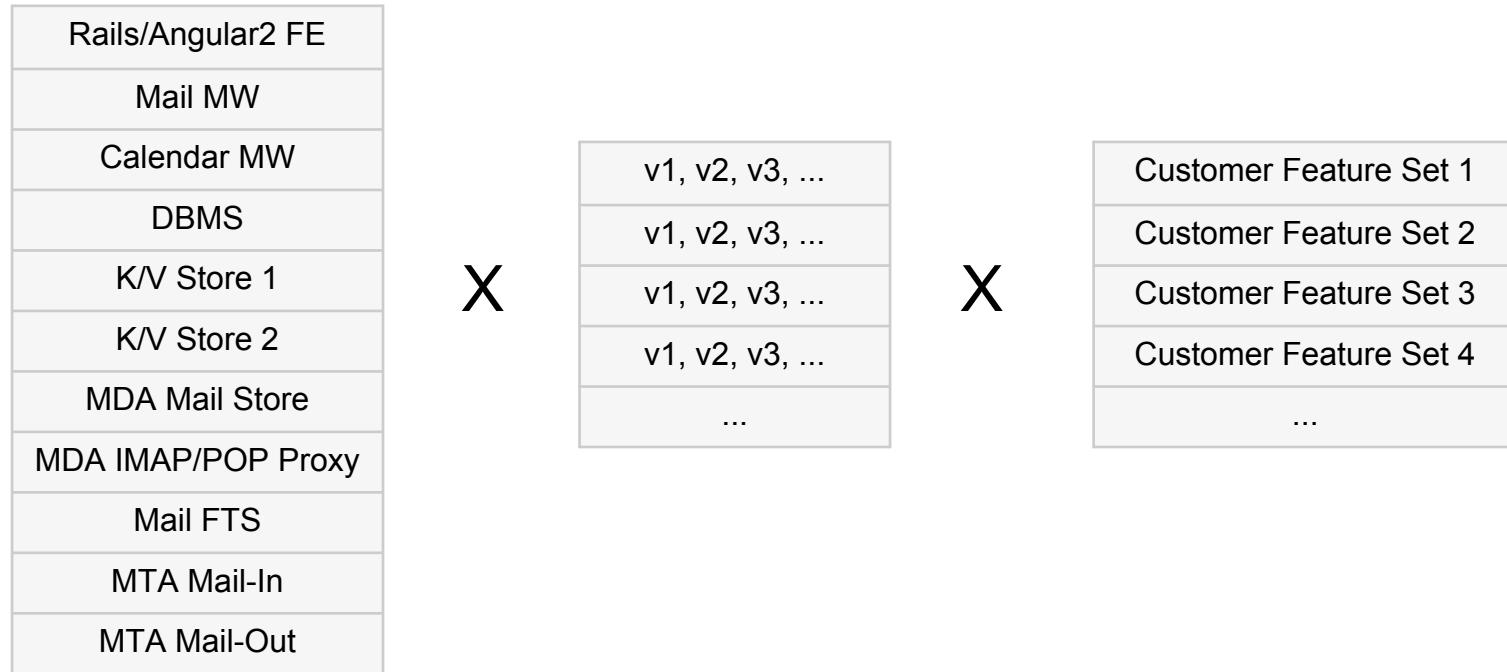
Tasks

Product Architecture



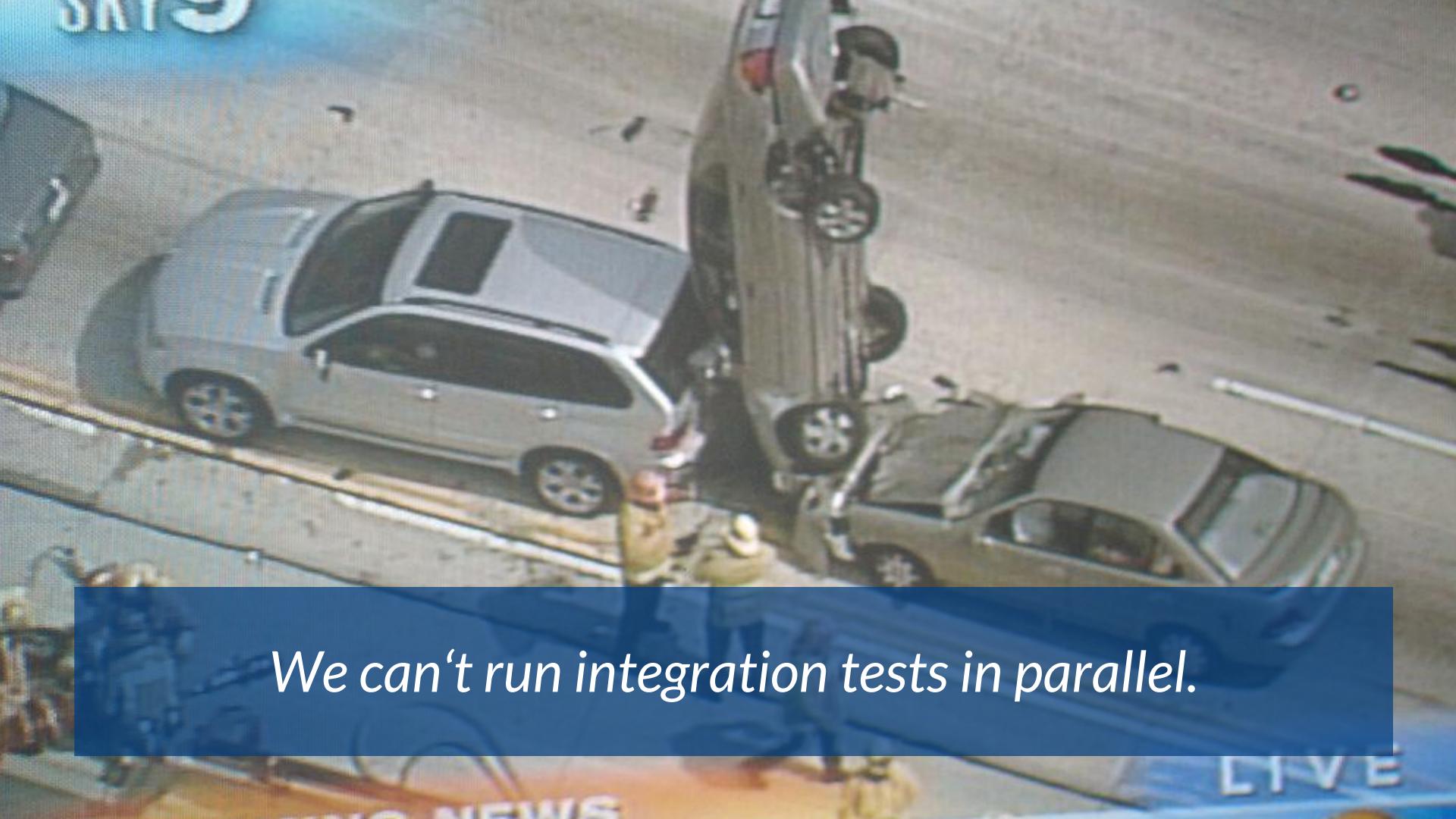
Yepp, that's half of the truth . . .

The Real Madness: Test Matrix



A close-up photograph of a classical statue of a man, showing his head, shoulders, and upper torso. He has a thoughtful expression, with his right hand resting against his chin and his left arm bent across his chest. The statue is made of light-colored stone and is set against a solid blue background. A semi-transparent blue rectangular box covers the middle portion of the image, containing the text.

And now some *Real World Stories* ...

A blurry, high-angle view of a city street. In the center, there's a dark-colored SUV parked on the left side of the road. To its right is a silver sedan. A traffic light pole stands between them. In the background, more cars are visible on the road. The image has a grainy, out-of-focus quality.

We can't run integration tests in parallel.

A photograph of three small, white plastic skeletons arranged in a row. The skeleton on the left has its hands clasped near its chin, appearing to be in deep thought. The middle skeleton has its hands held up to its mouth, with fingers covering it, signifying silence or being quiet. The skeleton on the right has its hands held up to its ears, signifying not wanting to hear something. They are positioned against a dark, slightly blurred background.

Running all of our tests takes ages.



*Integration tests are fragile.
Things just break without a reason.*

A statue of a man in a medieval-style robe, holding a chain, with a blue overlay containing text.

Fixing tests are a pain in the a\$\$.

But There Was Hope...





Time For A Plan

Goals

Make it possible to ...

1. test (almost) everything everywhere at anytime.
2. to have stable main branches.
3. get things done (fast).



Goal: Test Everything Everywhere at Anytime

- ★ Containerize all (integration) services
- ★ Get rid of all external dependencies
- ★ Have everything as code
- ★ Make it easy to use & maintain

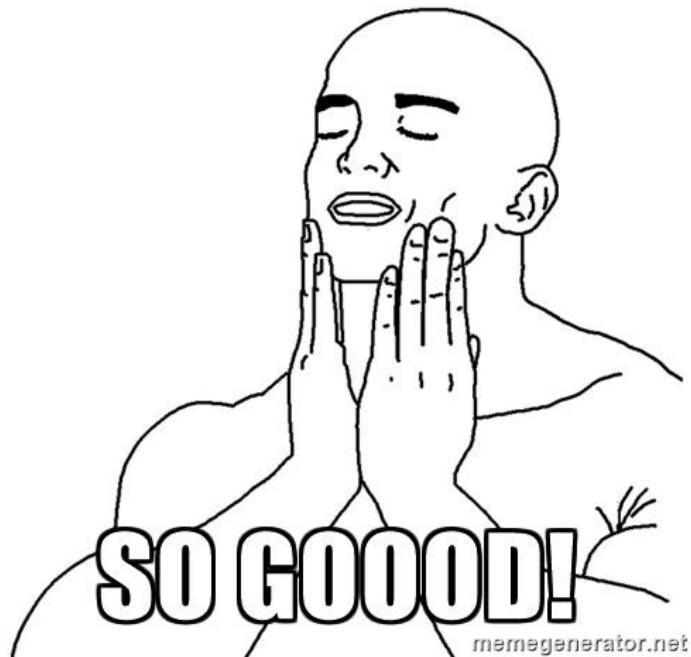
Goal: Stable Main Branches

- ★ Introduce GitLab CI to have full sight on test behaviour
- ★ Parallelize tests
- ★ Forbid Git-Pushes to main branches
- ★ Apply code changes via Pull/Merge Requests only

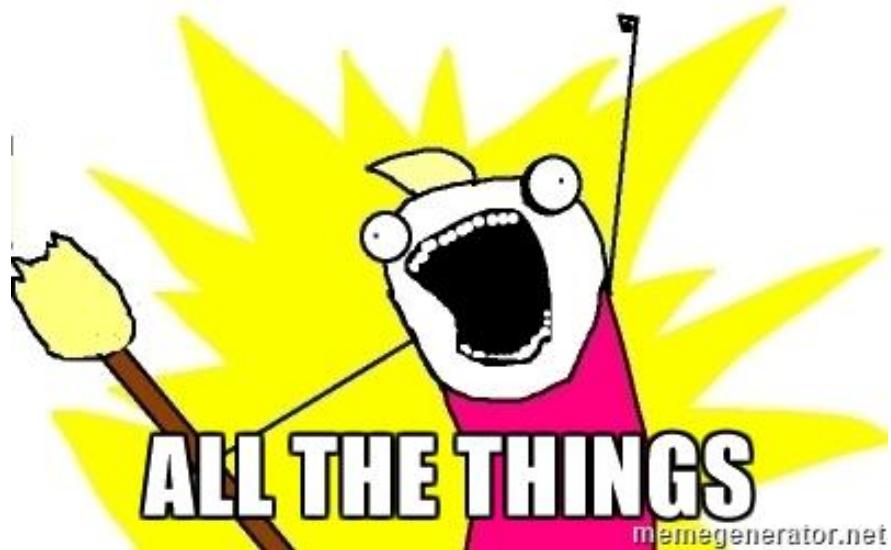
Goal: Get Things Done

- ★ Run tests with prod-like configuration
- ★ Also run integration tests in your local IDE
- ★ Often commit and push your code
- ★ (Use Continuous Delivery for app deployment)

Sounds Great?



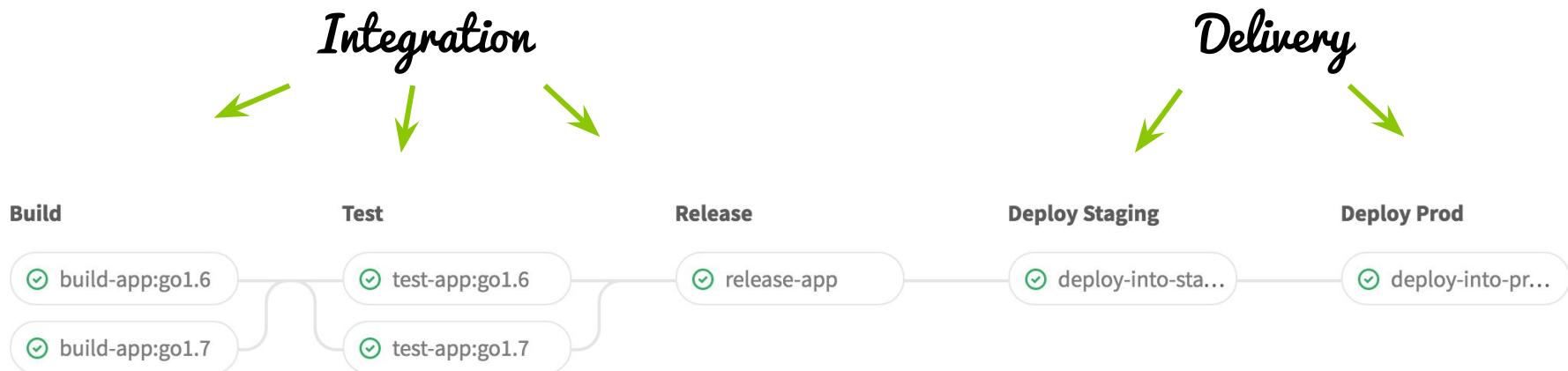
CONT' INTEGRATE



Docker & GitLab to the Rescue!

The screenshot shows a GitLab project page for 'pa-todo-app-web'. At the top, there's a navigation bar with links for Project, Activity, Repository, Pipelines, Graphs, Issues (0), Merge Requests (0), and a settings gear icon. Below the navigation is a large blue circular placeholder with a white letter 'P'. The project name 'pa-todo-app-web' is displayed below it, along with a small circular icon. A description states 'Demo Webapp, a fork of https://github.com/johscheuer/todo-app-web'. Below the description are buttons for Star (0), Fork (2), SSH, and a copy link icon. Further down are links for Files (810 KB), Commits (13), Branch (1), Tag (1), MIT License, CI configuration, Add Changelog, and Add Contribution guide. A green button labeled 'passed' with a checkmark and the commit hash '98730e58' is shown, followed by the text 'add deployments · 13 days ago by Arnold Bechtoldt'. Below this is a 'build SUCCESS' status indicator with a green bar and a pencil icon. The main content area contains sections for 'Example web todo list' (described as a simple web todo list for presentations and demos written in Golang + Javascript) and 'Building the image'. Under 'Compile the code', there's a terminal-like box containing the command '\$ go get -u github.com/johscheuer/todo-app-web'. A green arrow points from the bottom left towards this terminal box.

CI/CD Pipeline



GitLab CI Config

```
stages:
  - build
  - test
  - release
  - deploy-staging
  - deploy-prod

  build-app:go1.6:
    stage: build
    image: golang:1.6
    script:
      - go get
      - go build

  build-app:go1.7:
    stage: build
    image: golang:1.7
    script:
      - go get
      - go build

  test-app:go1.6:
    stage: test
    image: golang:1.6
    script:
      - docker-compose up -d
      - go get
      - go test

  test-app:go1.7:
    stage: test
    image: golang:1.7
    script:
      - docker-compose up -d
      - go get
      - go test

  release:
    stage: release
    image: docker:dind
    only:
      - tags
    script:
      - docker login
      - docker build -t \
        app:${GIT_TAG} .
      - docker push app:${GIT_TAG}
```

GitLab: Code Reviews

Merged Merge Request !6 opened 15 days ago by Arnold Bechtoldt

set artifact version in src code

.. as in <https://github.com/johscheuer/todo-app-web/blob/master/.travis.yml#L27>

```
# HELP todoapp_redis_masters_healthy_total Total count of healthy redis masters
# TYPE todoapp_redis_masters_healthy_total gauge
todoapp_redis_masters_healthy_total{instance="4948ba05f40f",version="v0.1.test7"} 1
# HELP todoapp_redis_masters_total Total count of available redis masters
# TYPE todoapp_redis_masters_total gauge
todoapp_redis_masters_total{instance="4948ba05f40f",version="v0.1.test7"} 1
# HELP todoapp_redis_slaves_healthy_total Total count of healthy redis slaves
# TYPE todoapp_redis_slaves_healthy_total gauge
todoapp_redis_slaves_healthy_total{instance="4948ba05f40f",version="v0.1.test7"} 1
# HELP todoapp_redis_slaves_total Total count of available redis slaves
# TYPE todoapp_redis_slaves_total gauge
todoapp_redis_slaves_total{instance="4948ba05f40f",version="v0.1.test7"} 1
```

Edited 15 days ago

Request to merge bstein:set_articat_version_in_src_code into master

CI build passed for d098ae93. View details

Deployed to production.

Deployed to staging.

Merged by # Benjamin Stein 15 days ago

The changes were merged into **master**. The source branch has been removed.

Discussion 0 Commits 1 Pipelines 1 Builds 4 Changes 1

Showing 1 changed file with 7 additions and 3 deletions

.gitlab-ci.yml

```
... @@ -31,7 +31,9 @@ before_script:
31   31     - mkdir -p $GOPATH $GOBIN
32   32     - go env
33   33     - go get
34 - - CGO_ENABLED=0 GOOS=linux GOARCH=amd64 go build -ldflags "-s -w" -a -installsuffix cgo -o bin/todo-app.go${go_version?}.bin .
34 + + artifact_version=${CI_BUILD_TAG}
```

Hide whitespace changes | Inline | Side-by-side

GitLab: Build Status

Merged by  Benjamin Stein 15 days ago
The changes were merged into `master`. The source branch has been removed.

Discussion 0 Commits 1 Pipelines 1 Builds 4 Changes 1

[Hide pipeline graph ▾](#)

Build **Test**

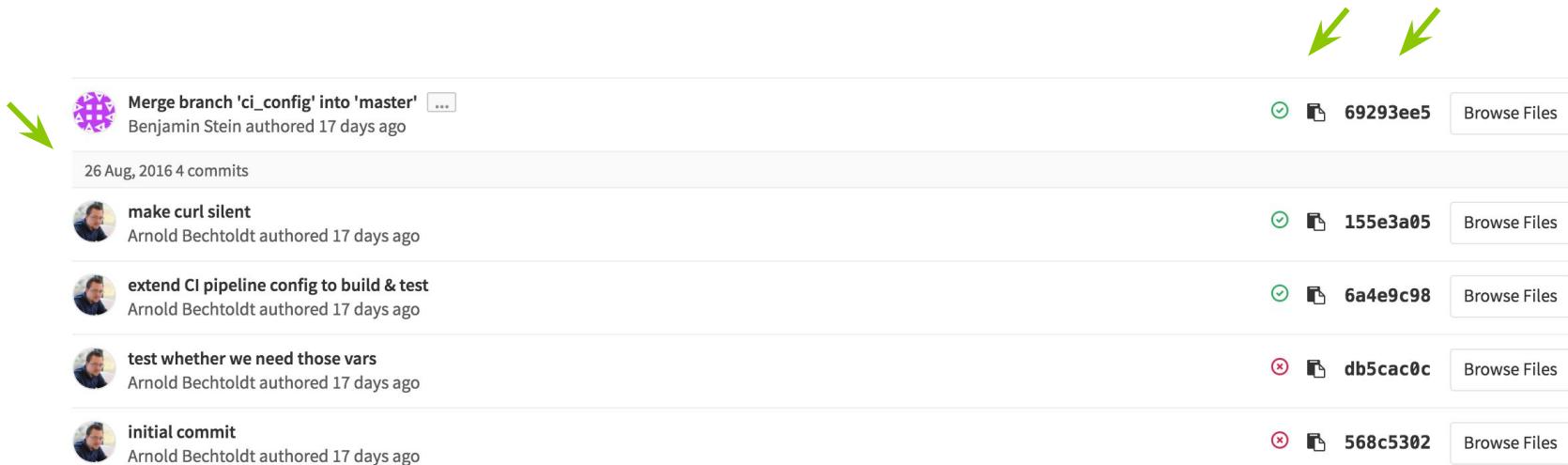
```
graph LR; build1[build-app:go1.7] --- test1[test-app:go1.7]; build2[build-app:go1.6] --- test2[test-app:go1.6]
```

Status Build ID Name

Build

 passed	#3508169 <small>shared</small>	build-app:go1.6	⌚ 01:31 📅 15 days ago	
 passed	#3508170 <small>shared</small>	build-app:go1.7	⌚ 01:29 📅 15 days ago	

GitLab: Code History



 Merge branch 'ci_config' into 'master' ...	✓  69293ee5 Browse Files
Benjamin Stein authored 17 days ago	
26 Aug, 2016 4 commits	
 make curl silent Arnold Bechtoldt authored 17 days ago	✓  155e3a05 Browse Files
 extend CI pipeline config to build & test Arnold Bechtoldt authored 17 days ago	✓  6a4e9c98 Browse Files
 test whether we need those vars Arnold Bechtoldt authored 17 days ago	✖  db5cac0c Browse Files
 initial commit Arnold Bechtoldt authored 17 days ago	✖  568c5302 Browse Files

GitLab: Build History

All 45	Running 0	Branches	Tags						Run pipeline	CI Lint
Status	Commit	Build	Test	Release	Deploy St...	Deploy Pr...				
passed	#4114205 v0.1 ~ 98730e58 [latest] add deployments	✓	✓	✓	✓	✓	20:31:04	10 days ago		
passed	#4100636 P master ~ 98730e58 [latest] add deployments	✓	✓	-	-	-	03:54	15 days ago		
passed	#4071748 P master ~ d098ae93 set artifact version in src code	✓	✓	-	-	-	03:17	16 days ago		
passed	#4064046 P master ~ 593248f1 push image	✓	✓	-	-	-	03:57	16 days ago		
passed	#4063803 P master ~ b33d790d add release job	✓	✓	-	-	-	03:22	16 days ago		
passed	#4063603 P master ~ 85665a40 Merge branch 'update_sources' into 'master'	✓	✓	-	-	-	03:01	17 days ago		
passed	#4062463 P master ~ ced4dd31 Merge branch 'master' into 'master'	✓	✓	-	-	-	03:03	17 days ago		
passed	#4062393 P master ~ 69293ee5 Merge branch 'ci_config' into 'master'	✓	✓	-	-	-	11:07	17 days ago		
passed	#4059555 P ci_config ~ 155e3a05 make curl silent	✓	✓	-	-	-	11:07	17 days ago		

GitLab: Deployment History

Production				Edit	Destroy
ID	Commit	Build			
#3	v0.1 ~ 98730e58 add deployments	deploy-into-production (#3683318)	10 days ago	▶ ▾	Re-deploy
#2	v0.1 ~ 98730e58 add deployments	deploy-into-production (#3646503)	11 days ago	▶ ▾	Rollback

[▶ Deploy-to-staging](#)

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 with laptops, notebooks, and coffee cups.

Conclusions

Conclusions

- ✓ Fast integration tests (ludicrous speed!)
- ✓ Ability to run every test everywhere at anytime
- ✓ More time for important things
- ✓ Less pain, more gain!

DOCKER

DOCKER DOCKER DOCKER

memegenerator.net



Arnold Bechtoldt

Systems Engineer & Consultant @ inovex

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

**WE'RE
HIRING!**
inovex.de/jobs

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github.com/bechtoldt

inovex.de

arbe.io

+ArnoldBechtoldtGER

youtube.com/inovexGmbH

Short Feedback Survey:
sayat.me/arbe

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

  Arnold Bechtoldt	test gitlab CI	-o- #267 started 87e8861
 ✓  Arnold Bechtoldt	reduce pep8 warnings	-o- #265 passed ea0c10d
 ✘  Arnold Bechtoldt	fix that damn typo	-o- #263 failed e33d870
 ✘  Arnold Bechtoldt	trying to modify test order	-o- #262 failed 817253c
 ✘  Arnold Bechtoldt	reduce flake8 warnings	-o- #259 failed d5a7896

Travis CI Pipeline (2)

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

gitlab-ci test gitlab Ci

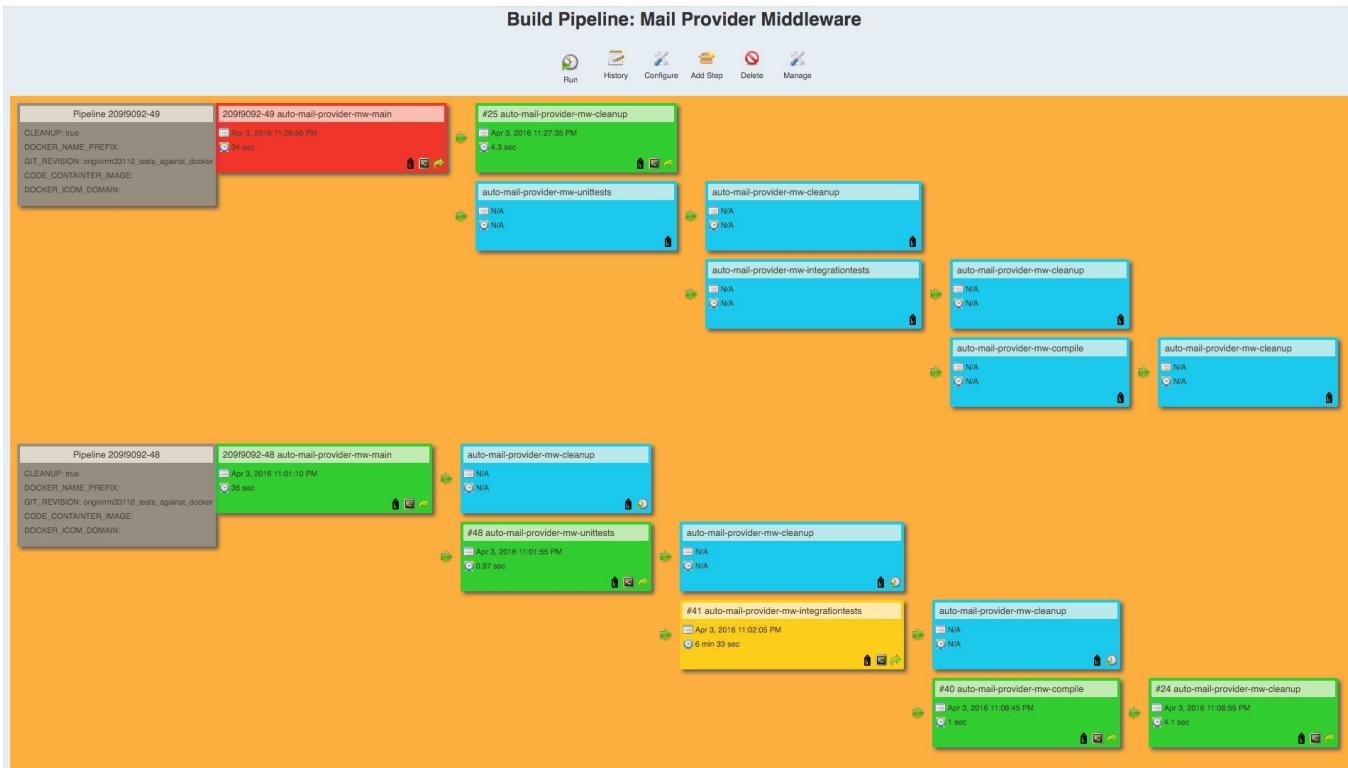
Commit 87e8861
Compare ea0c10d..87e8861
Arnold Bechtoldt authored and committed

#267 started
Elapsed time 52 sec
Running for 52 sec

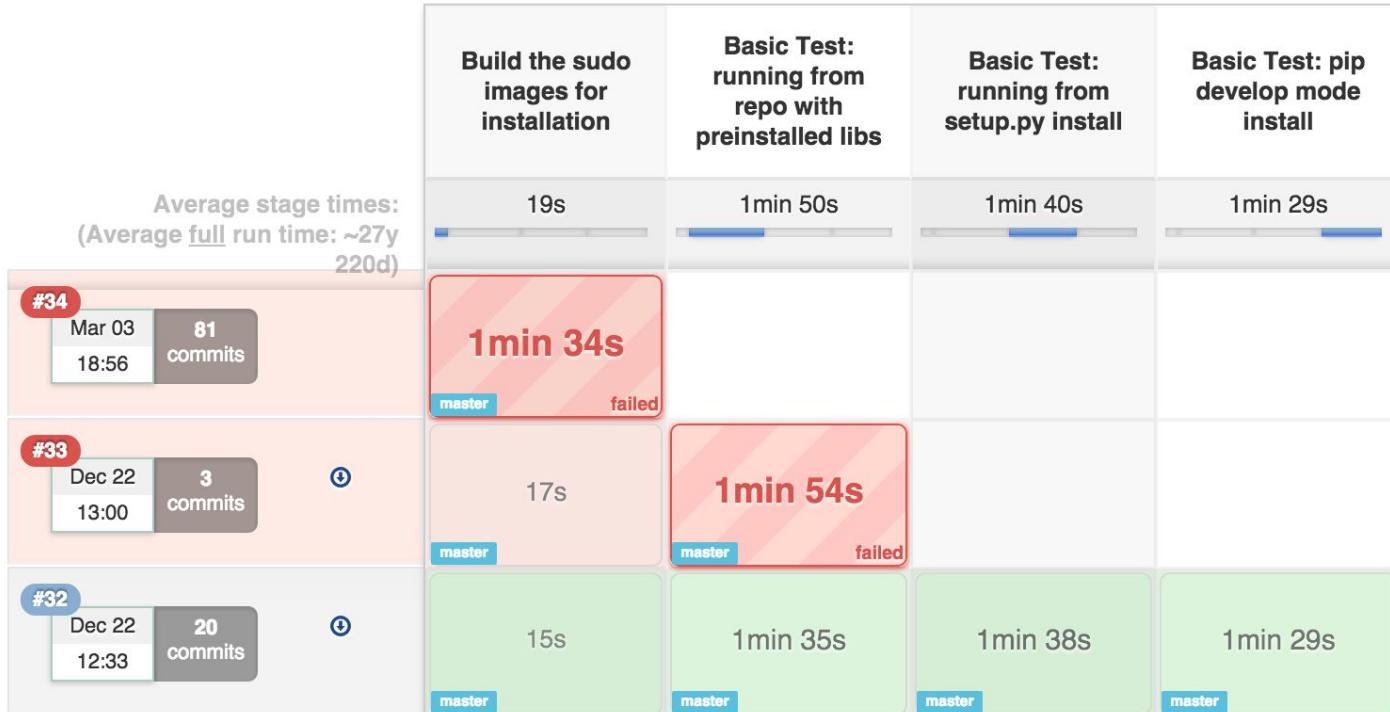
Build Jobs

# 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 (2)



Jenkins CI Pipeline (3)

Jenkins / Blue Ocean #423

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

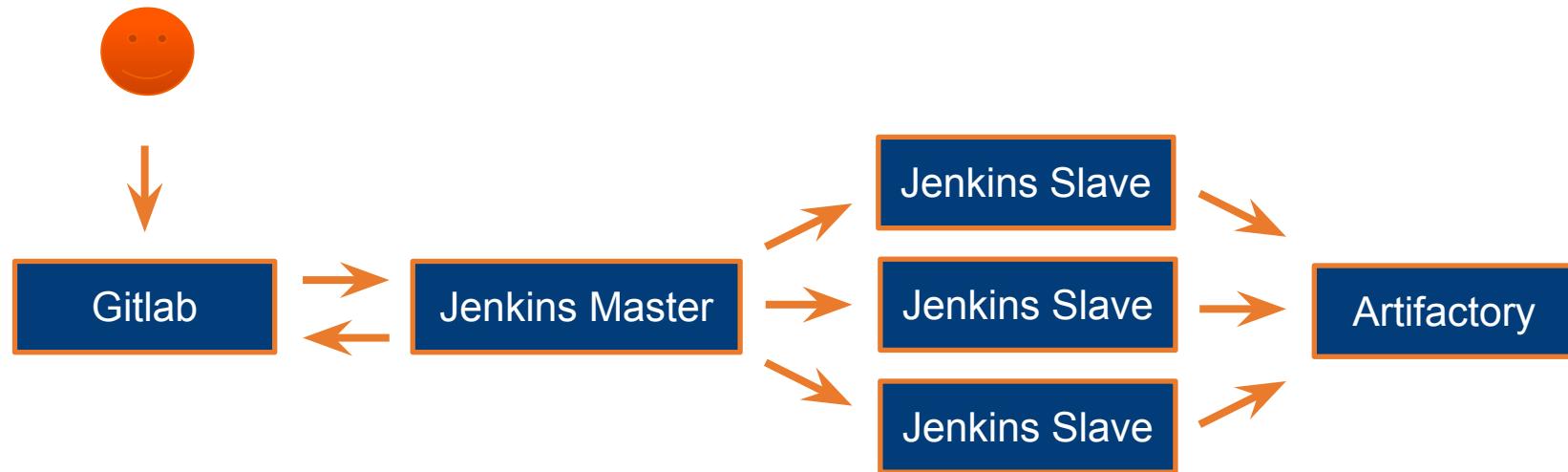
3 minutes and 42 seconds
14 minutes ago

Pipeline Changes Tests Artifacts Re-run

Build 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



CI/CD Pipeline

