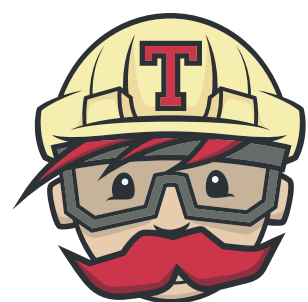
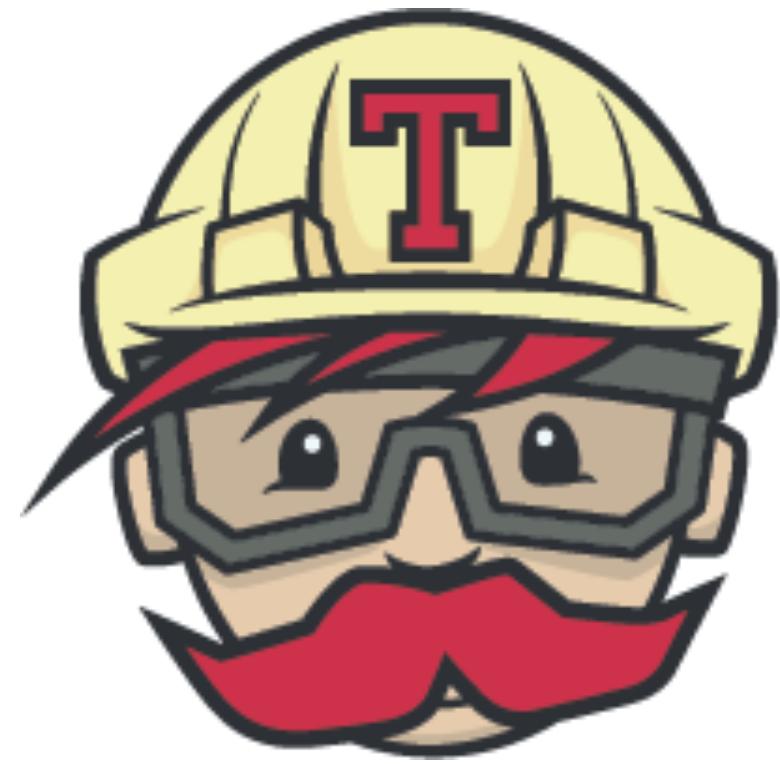


# Continuous Integration & Why You Care



Travis CI  
[travis-ci.com](https://travis-ci.com)

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**Travis CI**



# education.travis-ci.com

GitHub Education Pack → [education.github.com/pack](https://education.github.com/pack)  
clubs/organizations → email: [support@travis-ci.com](mailto:support@travis-ci.com)

background info docs:

[docs.travis-ci.com/user/for-beginners](https://docs.travis-ci.com/user/for-beginners)  
[docs.travis-ci.com/user/getting-started](https://docs.travis-ci.com/user/getting-started)

[railsgirlssummerofcode.org](http://railsgirlssummerofcode.org)

(polyglot summer fellowship for womxn/nb engineers)

[foundation.travis-ci.org](http://foundation.travis-ci.org)

Some stats...

1.3M repos

380M CI jobs



168 years of CI jobs/month

About Cl...

# Story Time!

What happens when you write a big chunk of code, and try to fit it to a codebase all at once?

... you know how this ends.

# Continuous Integration

Integration == adding code to a codebase

# Continuous Integration

Integration == adding code to a codebase

Continuous == Doing that thing over and over - maybe, like, without a break in cadence

# Phrase Overloading

- (1) the engineering process of merging code as it is written
- (2) the automation system that compiles and tests code

Testing in Industry...

# Code is Tested

Write your tests.



# Types of Tests

Automated vs. Manual

Functional vs. Non-Functional Test

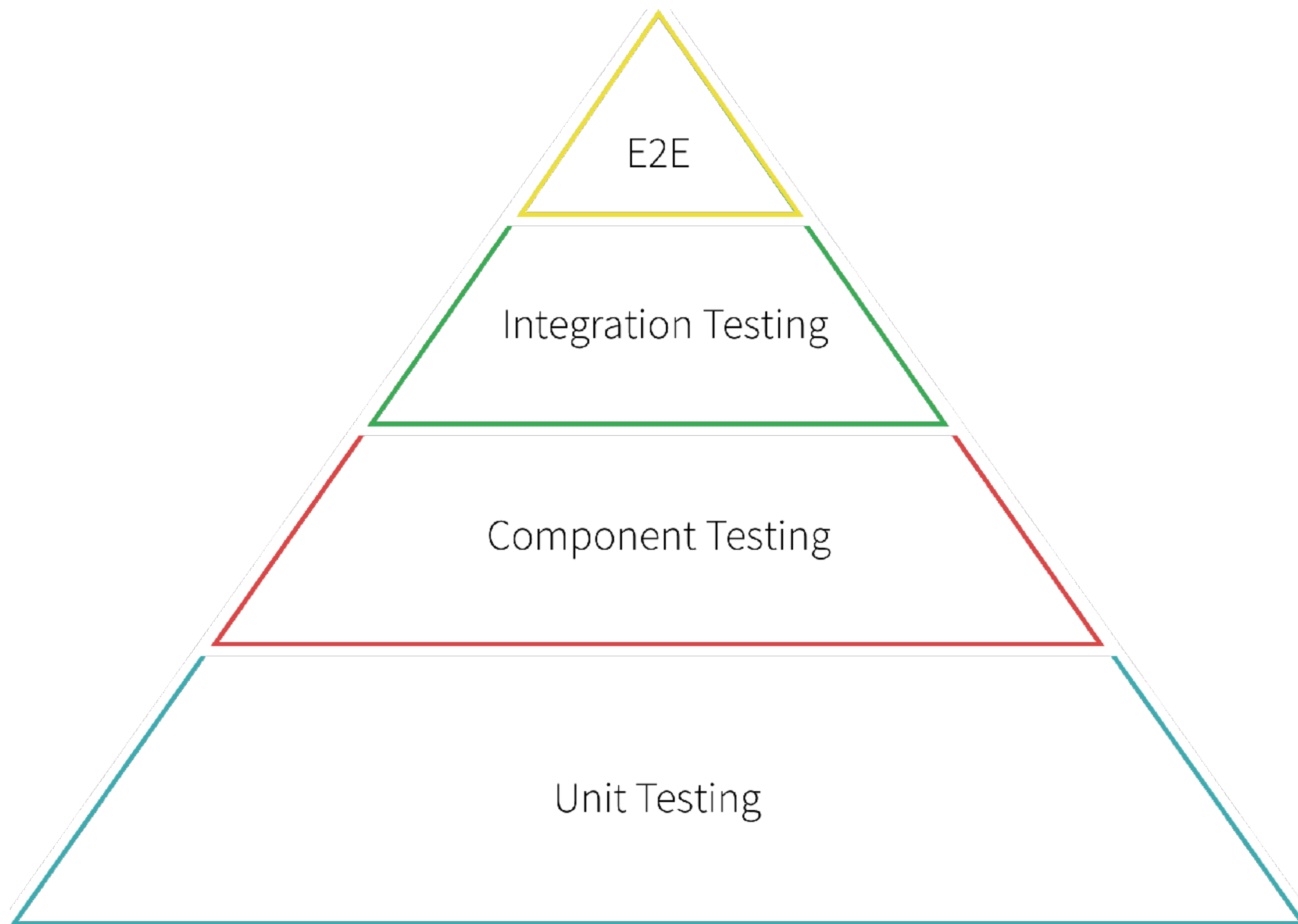
# Automated Tests

A machine follows a script to verify an “assertion”  
These are part of a codebase, and run in CI

# Functional Tests

...tests a specific functionality (or several) of the system  
“does this element meet the requirements that it is supposed to meet?”

Unit tests, integration tests, end-to-end tests



E2E

Integration Testing

Component Testing

Unit Testing

# Unit Test Example

Here's some code:

```
markdownImageString(repo, branch) {  
  const url = this.repositoryUrl(repo);  
  const imageUrl = this.imageUrl(repo, branch);  
  return `[[Build Status]](${imageUrl})(${url})`;  
}
```

Here's a unit test:

```
test('it generates a Markdown image string with a repo and a
branch', function (assert) {
  const service = this.owner.lookup(
    'service:status-images');
  const markdown = service.markdownImageString(
    this.repo, branch);
  assert.equal(markdown,
    `[![Build Status](${root}/travis-ci/travis-
web.svg?branch=primary)](${secureRoot}/
travis-ci/travis-web)`);
});
```

# If this test passes...

we know the method is still doing what it is supposed to be doing!



# What to test for...

Positives - things work as they should be working  
Contrapositives - things fail as they should be failing

Goal: maintain logic + integrity of the application

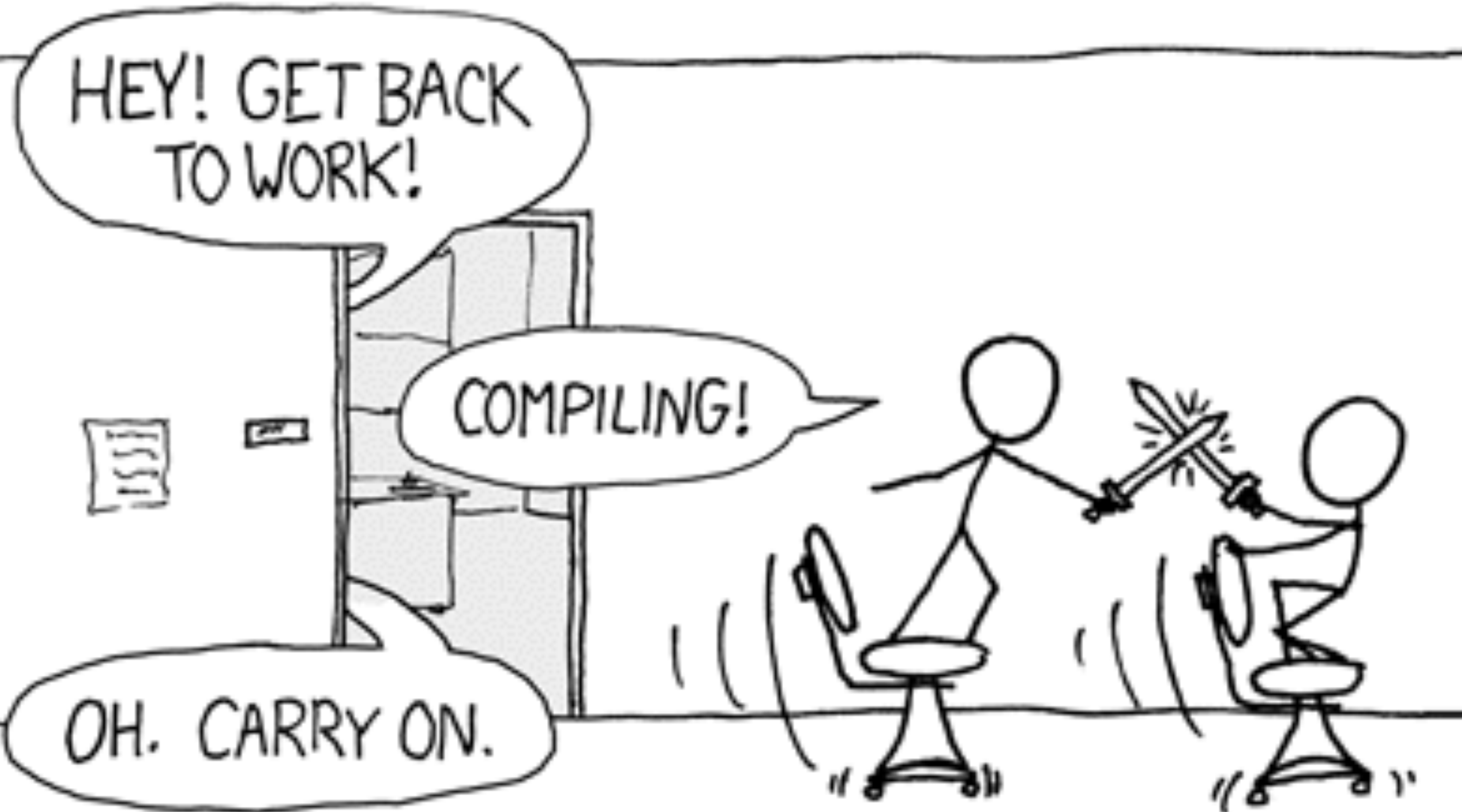
Software Engineering is  
done in teams

Builds & Building...

# Verb

compile/convert this source code into something runnable

THE #1 PROGRAMMER EXCUSE  
FOR LEGITIMATELY SLACKING OFF:  
"MY CODE'S COMPILING."




xkcd, 303 - you've prob seen this one :)

# Noun

the end result of a build process

 edits to custom queues doc ✓ 9989cd1

 the passive voice needed to be fixed on custom queues ✗ ed68c3c



 plaindocs reviewed on Dec 14, 2017 [View changes](#)

user/enterprise/custom-queues.md  Show outdated



 plaindocs approved these changes on Dec 14, 2017 [View changes](#)




plaindocs commented on Dec 14, 2017 Member   

It was thought to look great!

 acnagy added some commits on Dec 14, 2017


 a few last passive voice changes were necessitated ✗ be93a4f



 Merge branch 'master' into an-custom-worker-queues Verified ✗ 85b86a0




acnagy commented on Dec 14, 2017 Owner    

the review was appreciated! a few last corrections to the passive voice usage and the recommended markup edit were just pushed. once tests pass, the pr will be merged.

 Merge branch 'master' into an-custom-worker-queues Verified ✓ c623482


-  edits to custom queues doc ✓ 9989cd1
-  the passive voice needed to be fixed on custom queues ✗ ed68c3c




 **plaindocs** reviewed on Dec 14, 2017

[View changes](#)

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Why CI Systems?

“Works on my machine”

# Reproducibility

Clean environments, everyone has the same environment

# Tidy Deploys

Test in an environment that matches your production environment!

... and does not have all your helper scripts and dependencies

# Faster Development

Improved confidence in code + PRs

Projects with CI release twice as often, PR acceptance is 1.6 hours sooner

[cope.eecs.oregonstate.edu/CISurvey](https://cope.eecs.oregonstate.edu/CISurvey)

# Automate all the things!

Code Coverage, Linting, Language Runtimes  
Dependency Management , Config Management  
Deployment, Container-Building (deployment environments)  
Documentation Generation, Demo Generation

# CICD

CD needs CI - “is this code deployable now?”/“deploy all changes to the code?”

... tests are really important to this

Some Examples



Search all repositories



# cs50 / manual50



build passing

My Repositories +

travis-repos/chirp-org-prod # 92170

Duration: 9 sec

travis-ci/nightwhale # 455

Duration: 28 min 23 sec

Finished: about 4 hours ago

travis-ci/docs-travis-ci-com # 3804

Duration: 4 min 12 sec

Finished: about 6 hours ago

travis-ci/travis-build # 7938

Duration: 7 min 2 sec

Finished: about 7 hours ago

travis-ci/travis-api # 7419

Duration: 10 min 21 sec

Finished: about 16 hours ago

Current Branches Build History Pull Requests

More options



✓ master Merge pull request #33 from cs50/gist

#213 passed

removed gist documentation

Ran for 2 min 42 sec

about 10 hours ago

Commit 14114e1

Compare dc01888..14114e1

Branch master

David J. Malan authored GitHub committed

Job log

View config

Raw log

```
1 Worker information worker_info
6 mode of '/usr/local/clang-5.0.0/bin' changed from 0777 (rwxrwxrwx) to 0775 (rwxrwxr-x)
7 Build system information system_info
404
405 removed '/etc/apt/sources.list.d/basho_riak.list'
406 Network availability confirmed.
407 127.0.0.1 localhost
408 ::1 ip6-localhost ip6-loopback
```

```
language: ruby
rvm: 2.2
cache: bundler
script: bundle exec jekyll build
deploy:
  provider: elasticbeanstalk
  edge:
    source: cs50/dpl
  force_update: true
  access_key_id: "$AWS_ACCESS_KEY_ID"
  secret_access_key: "$AWS_SECRET_ACCESS_KEY"
  region: us-east-1
  app: manual50
  env: manual50
  bucket_name: travis50
on:
  branch: master
slack:
  secure: $long_token
```

Search all repositories



# travis-ci / travis-build



build passing

My Repositories +

travis-repos/chirp-org-prod # 92170

Duration: 1 min 33 sec

travis-ci/nightwhale # 455

Duration: 28 min 23 sec

Finished: about 4 hours ago

travis-ci/docs-travis-ci-com # 3804

Duration: 4 min 12 sec

Finished: about 6 hours ago

travis-ci/travis-build # 7938

Duration: 7 min 2 sec

Finished: about 7 hours ago

travis-ci/travis-api # 7419

Duration: 10 min 21 sec

Finished: about 16 hours ago

Current Branches Build History Pull Requests > Build #7935

More options



✓ master Merge pull request #1346 from travis-ci/ha-pytl

#7935 passed

Restart build

Fail immediately if curl fails to download the Python archive.

Ran for 7 min 46 sec

Total time 10 min 30 sec

Commit e38cb04

Compare 5770777..e38cb04

Branch master

2 days ago



Hiro Asari authored



GitHub committed

Test

2 min 55 sec

✓ # 7935.1



Ruby: 2.3.4

INTEGRATION\_SPECS=0

2 min



✓ # 7935.2



Ruby: 2.3.4

INTEGRATION\_SPECS=1

2 min 3 sec



✓ # 7935.3



Ruby

no environment variables set

2 min 37 sec



it to quay.io

2 min 39 sec

```
before_script:
  - bundle exec rake clean assets:precompile
script:
  - bundle exec rake spec
  - ./script/validate-bash-syntax
after_success: bundle exec codeclimate-test-reporter
before_deploy: ruby script/build_s3_index_html.rb
```



In Review...

# Builds & Testing

Turn this code into something runnable, then run these tests and see what we get  
Historical builds become a kind of semi-living audit-log for tests

Code Quality & Reliability

# CICD in the Wild

Software Engineering teams use CI systems to build and test code as it is changed

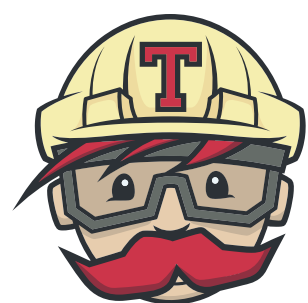
CI also functions as a kind of automation hub - notifications, artifacts uploading, deployment

CD - Continuous Delivery/Deployment:  
“could this be deployed at any step?” vs. “is this deployed at every step?”



Questions?

Thank you!



Travis CI  
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