

# Continuous Integration

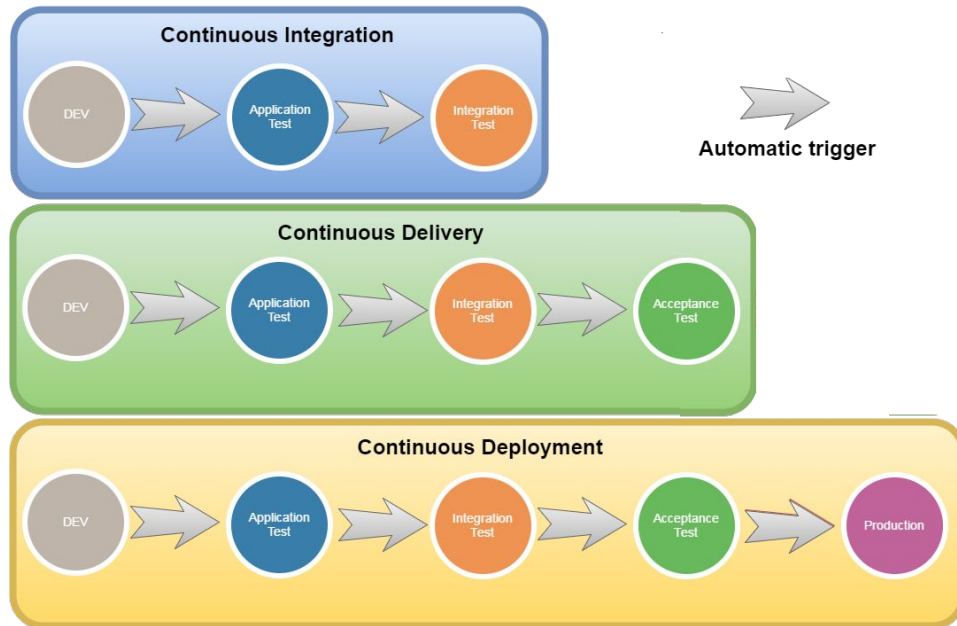
Elena San Miguel Pérez, Anthony Nixon

# Agenda

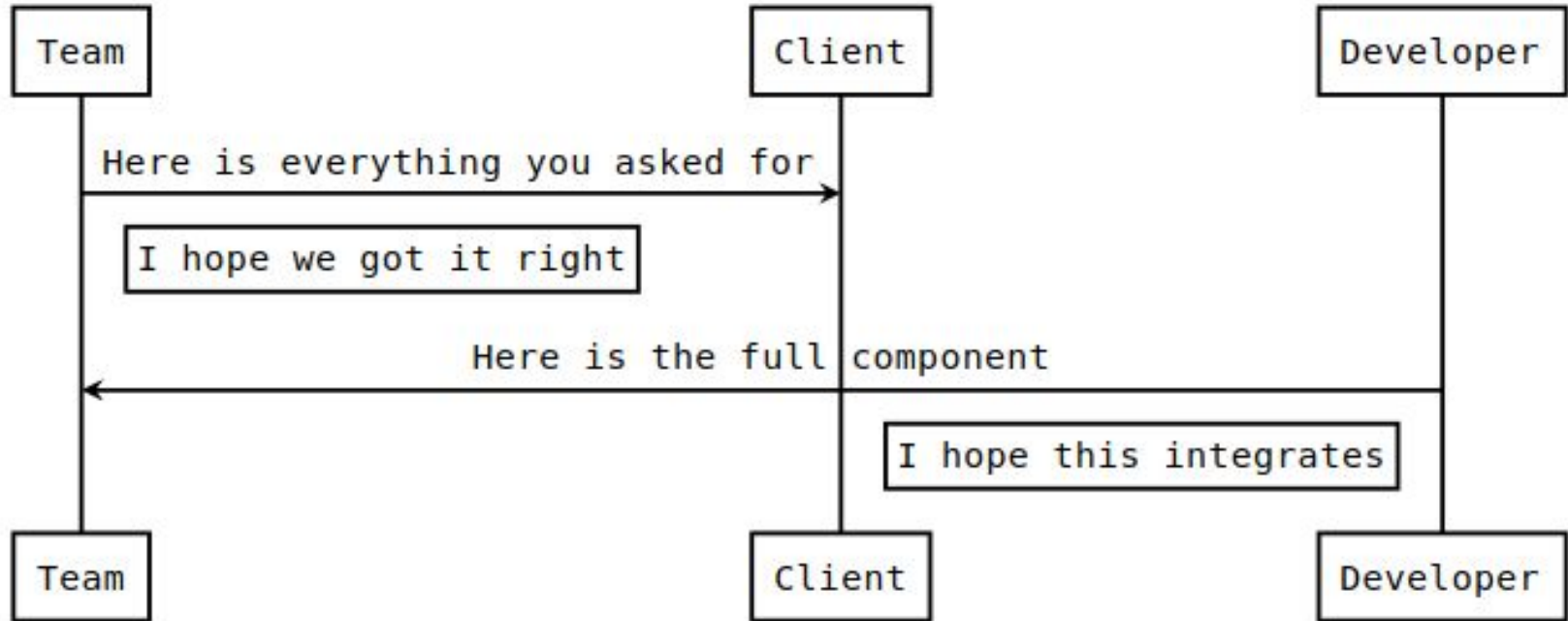
- Introduction
- Motivation and Benefits
- Reviews and Experiences with the CI process
- Basic Process for Implementation
- Common Tools
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# Introduction

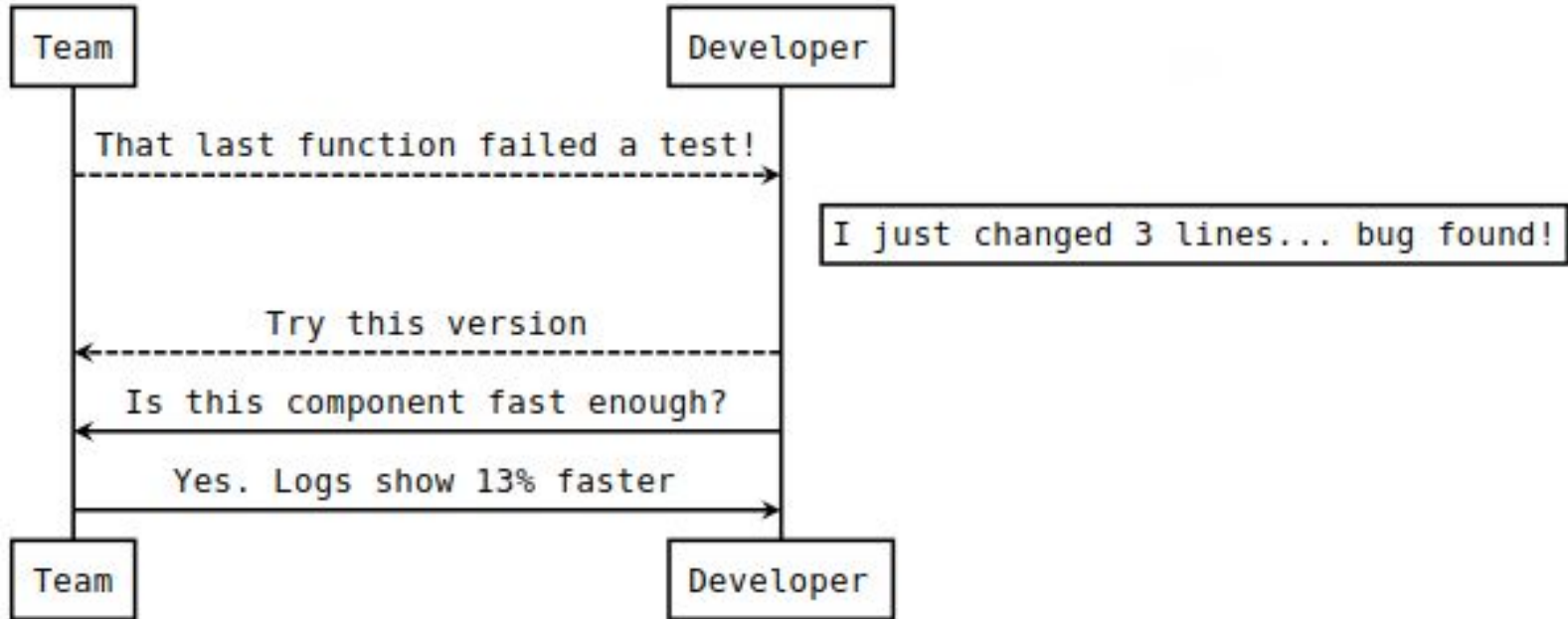
**Continuous Integration requires that developers integrate to a shared repository for an automated build several times a day**



# Traditional Integration (waterfall)



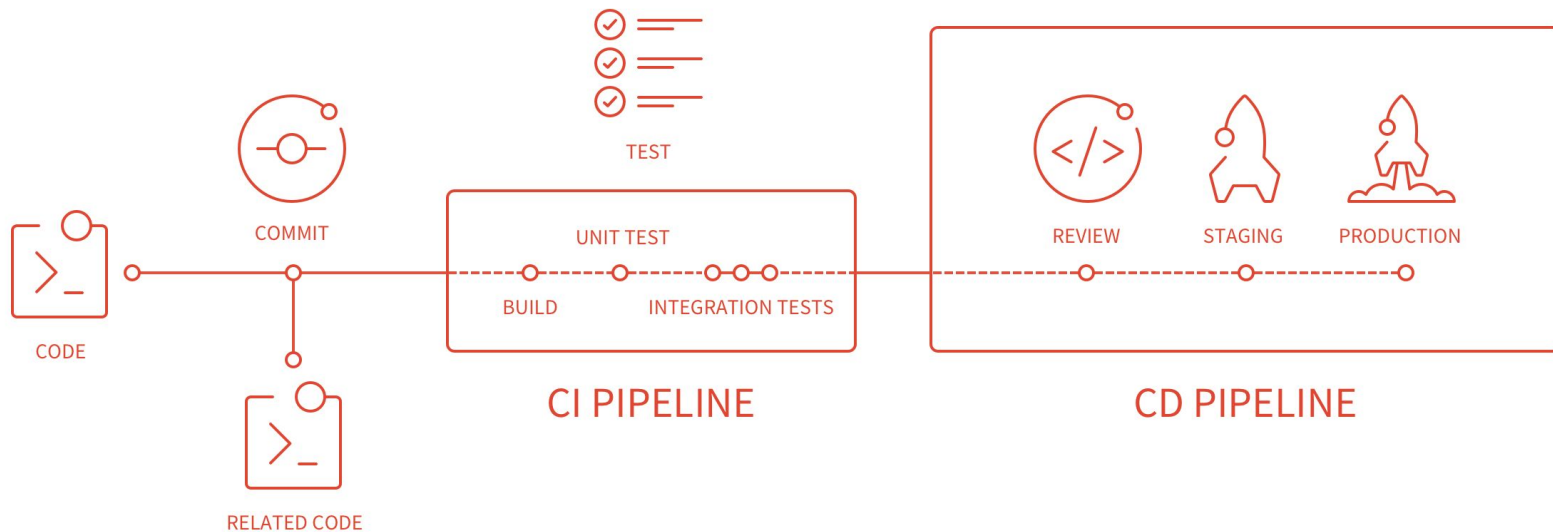
# Continuous Integration (agile)



# Motivation and Benefits

1. Bugs are detected EARLY
2. Removes the stress of upcoming release dates
3. There is a constant availability of a build suitable for testing, demo, and release
4. Ongoing metrics and feedback
5. Improve communication in your team and understanding of the code
6. Scale easily

# Motivation and Benefits



# Reviews and Experiences with the CI Process

- “Let’s please visualize the pipeline by drawing it on a big white board.” They agreed and we had a whole discussion around these pipelines.”
- “Each morning I could see the results of which tests were passed and which were failed and the difference was that I could add the build number while raising the issue, so it got easier for a developer to find the root cause.”
- “Continuous Integration and Deployment is to me the most exciting development of all in recent years.”
- “It really feels like we’re at the point where this kind of automation provides a juicy layer of immediacy, interaction and intelligence that has always been needed in managing these processes, and the result is a huge improvement in reliability and speed and quality”.
- “What’s the urgency of fixing some tests if business value was already delivered?”



# Basic Process for Implementation

1. Maintain a Single Source Repository
2. Automate the Build
3. Make Your Build Self-Testing
4. Everyone Commits to the Mainline Every Day
5. Every Commit Should Build the Mainline on an Integration Machine
6. Keep the Build Fast
7. Test in a Clone of the Production Environment
8. Make it Easy for Anyone to Get the Latest Executable
9. Everyone can see what's happening
10. Automate Deployment

# Common Tools

## *JENKINS*

- OpenSource
- Packages for Unix, Windows, OSX
- Custom plugins
- Large community



# Common Tools

## TRAVIS-CI

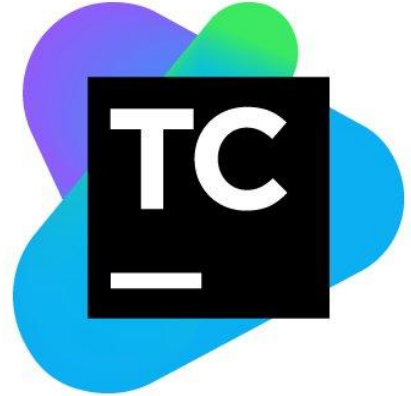
- OpenSource
- Automated pull request verification
- Notifications by Email, Slack, HipChat+
- Extended API



# Common Tools

## *TEAMCITY*

- Excellent Visual Studio Support
  - a. Built-in without need for scripts
- Detailed history reports
- Dynamic scaling of the build agents
  - a. Amazon, Microsoft, VMware stacks



# Travis CI builds and automation

- Cloning GitHub repository into a new virtual environment
- Tasks to build and test your code
- If a task fails, the build is *broken*
- If none of the tasks fail, the build is *passed*
- Travis CI can deploy, setup notifications...

# Travis CI Configuration file

Branch: **travis**  [eb-django-express-signup](#) / [.travis.yml](#)

 [llunaCreixent](#) Update [.travis.yml](#)

[1 contributor](#)

9 lines (8 sloc) | 137 Bytes

```
1 language: python
2 python:
3   - "3.6"
4 # command to install dependencies
5 install:
6   - pip install -r requirements.txt
7 script:
8   - echo "Yay"
```

# GitHub showing Travis CI execution

Add more commits by pushing to the **travis** branch on **llunaCreixent/eb-django-express-signup**.



## Some checks haven't completed yet

[Hide all checks](#)

1 queued and 1 In progress checks



**Travis CI - Pull Request** *Queued — Build Created*

[Details](#)



**Travis CI - Branch** *In progress — Build Started*

[Details](#)



## This branch has no conflicts with the base branch

Merging can be performed automatically.









































Merge pull request



or view [command line instructions](#).

# Travis CI dashboard showing builds

Active repositories [My builds](#)

|   |   |   |  |   |   |
|---|---|---|--|---|---|
|  |  <b>llunaCreixent</b><br>eb-django-express-s | Update .travis.yml<br>master                     |  <b>#12 passed</b><br>a7b52fc  |  23 sec<br> 8 minutes ago           |  |
|  |  <b>llunaCreixent</b><br>eb-django-express-s | Update .travis.yml<br>travis                     |  <b>#11 passed</b><br>f2874a5  |  29 sec<br> 9 minutes ago           |  |
|  |  <b>llunaCreixent</b><br>eb-django-express-s | Update travis config<br>master                   |  <b>#10 failed</b><br>7db5e5b  |  22 sec<br> 14 minutes ago          |  |
|  |  <b>llunaCreixent</b><br>eb-django-express-s | Update travis config<br>travis                   |  <b>#9 failed</b><br>faa7e60   |  33 sec<br> 16 minutes ago          |  |
|  |  <b>llunaCreixent</b><br>eb-django-express-s | Changed python version in .travis.yml<br>travis  |  <b>#7 failed</b><br>edaa77e   |  8 min 51 sec<br> about 2 hours ago |  |



# Travis CI dashboard showing builds

The screenshot displays the Travis CI dashboard interface. At the top, the navigation bar includes the Travis CI logo, a search icon, and links to Dashboard, Changelog, Documentation, and Help. A settings icon is visible in the top right corner.

On the left sidebar, there is a search bar labeled "Search all repositories". Below it, the "My Repositories" section shows a list of repositories. The first repository, "llunaCreixent/eb-django-express # 12", is highlighted with a green bar, indicating a successful build. It shows a duration of 23 seconds and was finished less than a minute ago. Other repositories listed include "llunaCreixent/first-django-app", "llunaCreixent/scrapy-lab", and "llunaCreixent/git-local-reposito".

The main content area displays the build details for "llunaCreixent / eb-django-express-signup". The build status is "unknown". The build history shows "Build #11" as the current build. The build steps include:

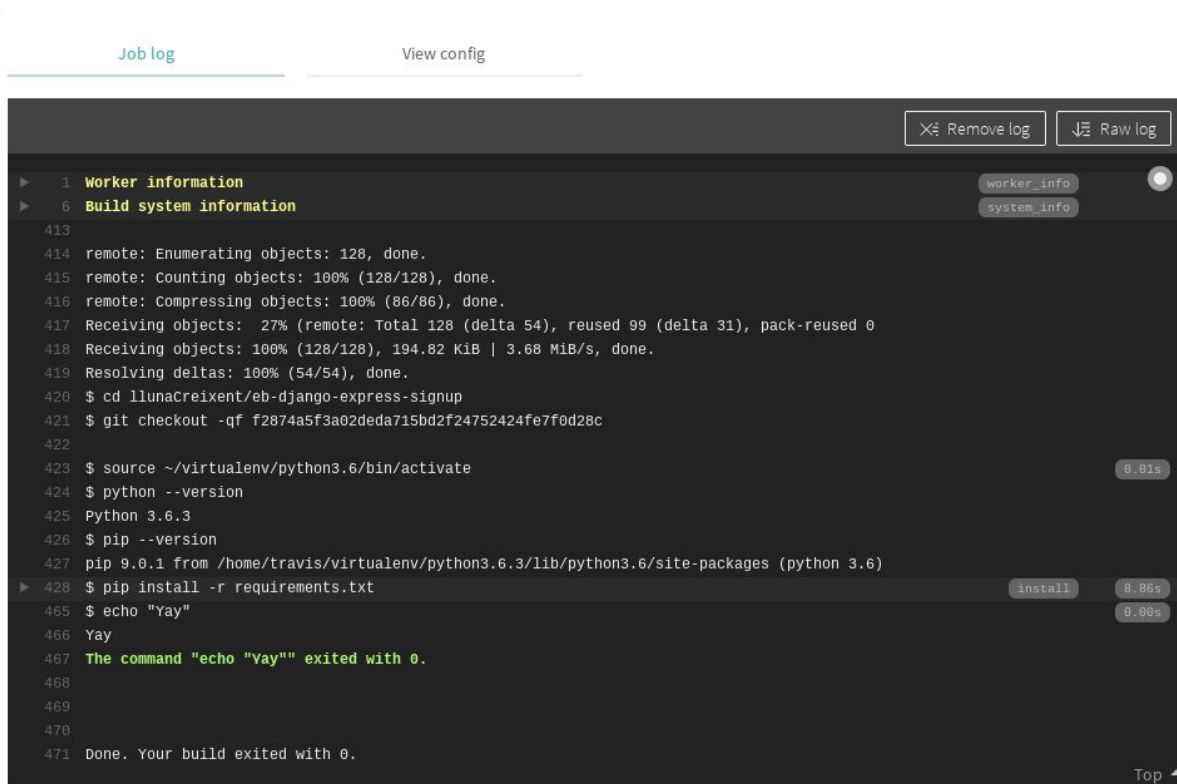
- travis Update .travis.yml**: This step is marked as successful with a green checkmark and a green bar on the left. It shows a commit hash of f2874a5, a comparison of f2874a5 to f2874a5, and the branch "travis". The build was run by "Elena San Miguel".
- Python: 3.6**: The build environment is specified as Python 3.6.

On the right side of the build details, there are buttons for "Restart build" and "Debug build". The build log shows the following steps:

- Commit f2874a5
- Compare f2874a5 to f2874a5
- Branch travis
- Elena San Miguel

At the bottom of the build details, there are links for "Job log" and "View config".

# Travis CI execution in the virtual machine



The screenshot displays the Travis CI job log interface. At the top, there are links for "Job log" and "View config". Below these, there are buttons for "Remove log" and "Raw log". The log content is as follows:

```
1 Worker information
6 Build system information

413
414 remote: Enumerating objects: 128, done.
415 remote: Counting objects: 100% (128/128), done.
416 remote: Compressing objects: 100% (86/86), done.
417 Receiving objects: 27% (remote: Total 128 (delta 54), reused 99 (delta 31), pack-reused 0
418 Receiving objects: 100% (128/128), 194.82 KiB | 3.68 MiB/s, done.
419 Resolving deltas: 100% (54/54), done.
420 $ cd llunaCreixent/eb-django-express-signup
421 $ git checkout -qf f2874a5f3a02deda715bd2f24752424fe7f0d28c
422
423 $ source ~/.virtualenv/python3.6/bin/activate
424 $ python --version
425 Python 3.6.3
426 $ pip --version
427 pip 9.0.1 from /home/travis/virtualenv/python3.6.3/lib/python3.6/site-packages (python 3.6)
428 $ pip install -r requirements.txt
465 $ echo "Yay"
466 Yay
467 The command "echo "Yay"" exited with 0.
468
469
470
471 Done. Your build exited with 0.
```

On the right side of the log, there are buttons for "worker\_info" and "system\_info". At the bottom right, there is a "Top" link with an upward arrow.

# Thoughts and Reflections

- Many errors encountered when starting to use Travis CI
- Then we the benefits
- We would use as a basic tool for team work (like git)
- We will use in the project of CCBDA

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