`Buildbot`: **A continuous integration system**

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Outline

- Testing and Continuous Integration
- Introduction to `Buildbot`
- `BuildMaster`
- `BuildMaster` components
- `BuildSlave`
- Installation and Usage

Testing and continuous integration

Tests:

- the best specification
- safety-net for refactoring
- bug identification

Tests are the most effective if we:

- run them often
- run them on different machines/environments
- can easily see their results

The most straightforward approach would entail:

- logging in to different machines
- fetching the newest source code
- running tests
- analyzing their output

In case we want to test a few environments, repeating the above steps is tedious.

Developers do not focus on the code, instead they run tests.

A continuous integration system performs all of these steps for us, so developers can focus on their code.

Introduction to `Buildbot`: Features

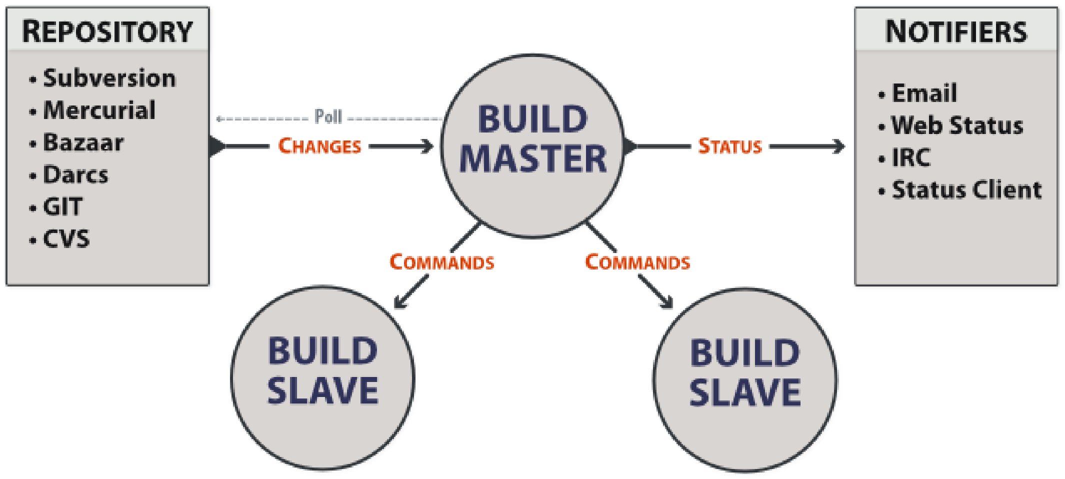
- run builds on a variety of `BuildSlave` platforms
- arbitrary build process: handles projects using C, Python, . . .
- minimal host requirements: python and Twisted
- `BuildSlave` can be behind a firewall if they can still do checkout
- status delivery through web page, email, IRC, other protocols
- track builds in progress, provide estimated completion time
- flexible configuration by subclassing generic build process classes

- debug tools to force a new build, submit fake `Changes`, query `BuildSlave` status

- released under the GPL

source: http://buildbot.net/buildbot/docs/current/manual/introduction.html

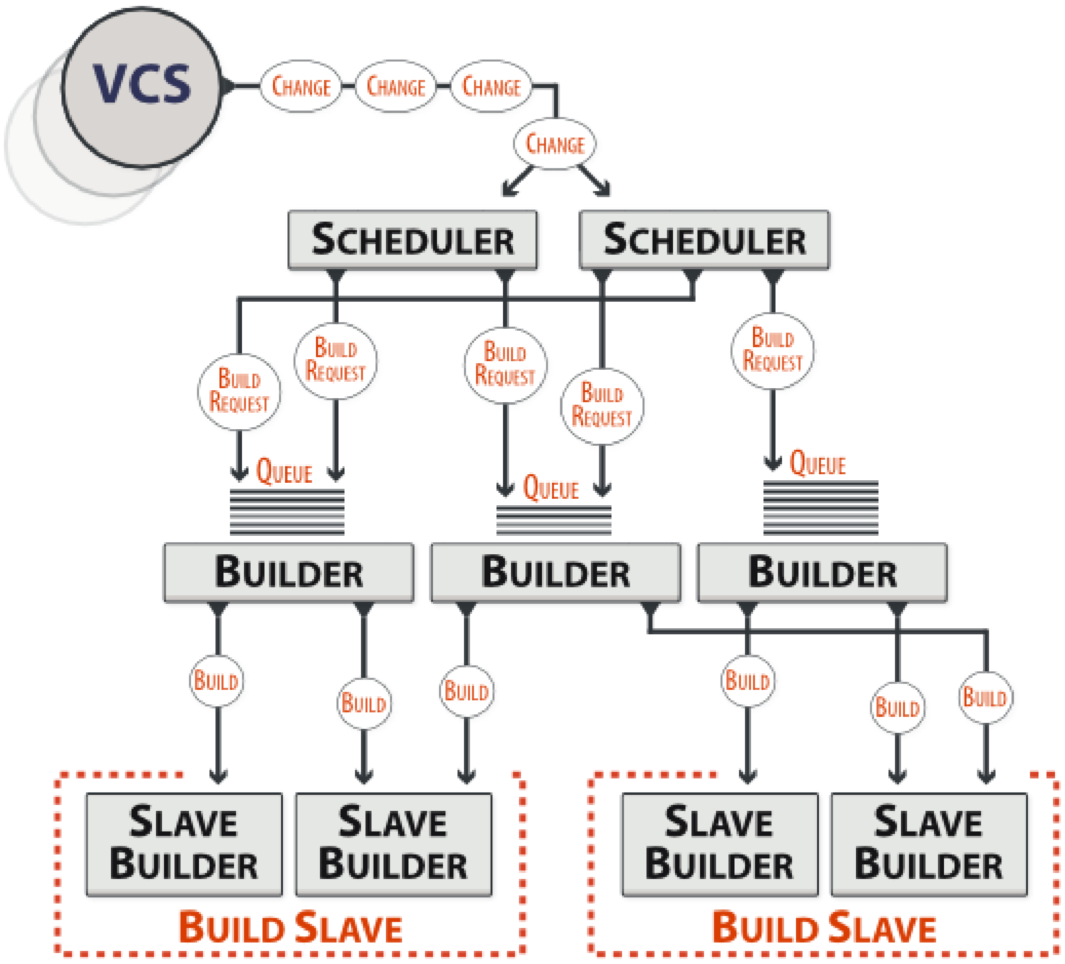
Introduction to `Buildbot`: Overview



system overview

source: http://buildbot.net/buildbot/docs/0.8.1/full.html

BuildMaster



BuildMaster components

source: http://buildbot.net/buildbot/docs/0.8.1/full.html

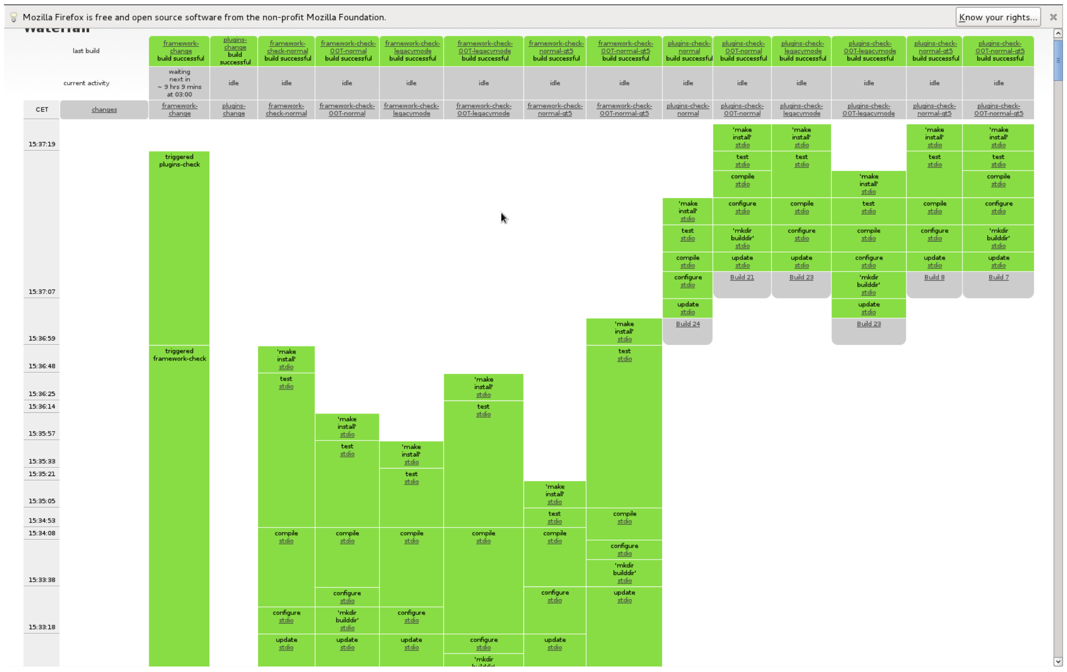
`BuildMaster`

`BuildMaster`:

- holds the configuration of the entire system.
- has information about all `BuildSlaves`.
- periodically checks the version control system to see if any new changes are commited to a repository.
- can watch more than one repository.

Example configuration file

Feedback


Mozilla Firefox is free and open source software from the non-profit Mozilla Foundation.

last build		framework-change build successful	plugins-change build successful	framework-check-normal build successful	framework-check-OOT-normal build successful	framework-check-legacymode build successful	framework-check-OOT-legacymode build successful	framework-check-normal-qt5 build successful	framework-check-OOT-normal-qt5 build successful	plugins-check-normal build successful	plugins-check-OOT-normal build successful	plugins-check-legacymode build successful	plugins-check-OOT-legacymode build successful	plugins-check-normal-qt5 build successful	plugins-check-OOT-normal-qt5 build successful
current activity		waiting next in ~ 9 hrs 9 mins at 03:00	idle	idle	idle	idle	idle	idle	idle	idle	idle	idle	idle	idle	idle
CET	changes	framework-change	plugins-change	framework-check-normal	framework-check-OOT-normal	framework-check-legacymode	framework-check-OOT-legacymode	framework-check-normal-qt5	framework-check-OOT-normal-qt5	plugins-check-normal	plugins-check-OOT-normal	plugins-check-legacymode	plugins-check-OOT-legacymode	plugins-check-normal-qt5	plugins-check-OOT-normal-qt5

tests passed

source: http://www.jonnor.com/2011/12/the-maliit-buildbot/

`BuildMaster` **Components**

Definition. [Scheduler] *A `Scheduler` can be periodic or can be run on events like a commit. There is also a `ForceScheduler`, so we can explicitly run builds.*

After a `Scheduler` adds a `BuildRequest` to a `Builder` queue, `BuildSlaves` are given command to perform their `BuildSteps`.

Definition. [Builder] *A `Builder` is a pair of a list of `BuildSlaves` and a `Factory`.*

Definition. [Factory] *Factory object has a list `BuildSteps` specifying how to perform a build.*

For example:

- *pull changes from a repository*
- *run script to prepare environment variables*

- *run tests in directory A*
- *run tests in directory B*

BuildSlave

BuildSlave knows only about its BuildMaster. It connects to it through TCP. Because it is initiating the connection, it can stay behind a NAT.

It also initiates a connection to a version control repository.

It is a good practice to add a command for starting a BuildSlave to a crontab. That is useful in case your system was subject to an unexpected reboot.

Installation and Usage

```
virtualenv --no-site-packages sandbox
```

```
source sandbox/bin/activate
```

```
easy_install buildbot
```

```
easy_install buildbot-slave
```

To create a `BuildMaster`:

```
buildbot create-master master
```

To run it:

```
buildbot start master
```

To create a `BuildSlave` that connects to a `BuildMaster` running on `localhost:9989`:

```
buildslave create-slave slave localhost:9989
example-slave pass
```

To run a `BuildSlave`:

```
buildslave start slave
```

Resources

- Buildbot website
- Travis website
- Github