

Switching Coq's bug tracker (from Bugzilla to GitHub) and measuring the effect

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The Coq interactive proof assistant

- Software to formally verify *mathematical proofs* and *programs*.
- Created in 1984 by Gérard Huet and Thierry Coquand.
- Developed at Inria ever since.
- ACM Software System Award 2013.

Core development team

Currently 10 people (5 Inria researchers, one postdoc, 2 PhD students, 2 engineers) in:

- Paris area (Paris Diderot Univ., Inria Saclay, Mines ParisTech);
- Sophia-Antipolis (Inria project-team Marelle);
- Nantes (Inria project-team Galinette).

Pull requests

- First to facilitate external contributions.
- Then to improve quality of contributions from core devs.

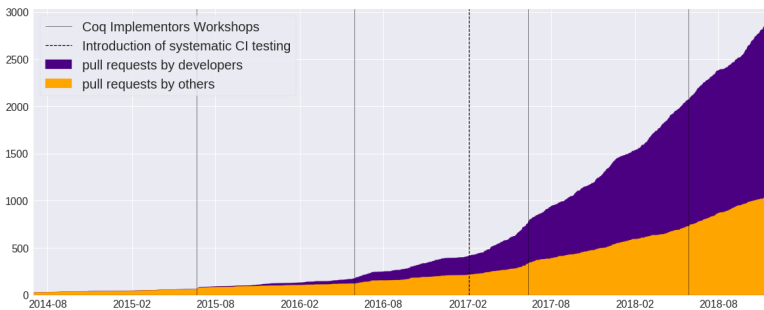


Figure 1: Cumulative number of pull requests on the Coq repository

Bugzilla VS GitHub

Bugzilla:

- used by major open source projects (Mozilla, Linux, Eclipse...)
- advanced info attached to bug reports

GitHub:

- very standard
- formatting, comment editing
- lighter interface
- same place for code, PRs and bugs
- easy to subscribe to activity

Migration tool

<https://github.com/berestovskyy/bugzilla2github/>

- Keeps bug number when possible.
- Adapted to use the issue import API.

Difference between using GitHub's normal REST API and the issue import API

berestovskyy commented on Jun 20 • edited • Owner + 👤 ...

This issue was created automatically with

Bugzilla Bug 1

Date: 2015-03-16 14:49:36 +0100
From: @berestovskyy
To: @berestovskyy
CC: email2@example.org
Last updated: 2015-06-03 08:03:45 +0200

Comment 1

Date: 2015-03-16 14:49:36 +0100
From: @berestovskyy

Just a test

- berestovskyy self-assigned this on Jun 20
- berestovskyy added **enhancement** **invalid** **test** labels on Jun 20
- berestovskyy closed this on Jun 20

coqbot commented on Sep 2, 2007 Member + 👤 ...

Note: the issue was created automatically with bugzilla2github tool

Original bug ID: BZ#1697
From: Yevgeniy Makarov <emakarov@gmail.com>
Reported version: 8.5

coqbot commented on Sep 2, 2007 Member + 👤 ...

Comment author: Yevgeniy Makarov <emakarov@gmail.com>

This is a really weird bug. Consider the following code.

Module Import Test.

Axiom t : True.
Ltac tt := assert (True) by apply t.

End Test.

Goal 0 = 0. tt.

It produces "Anomaly: uncaught exception Not_found". If I remove the module but leave its content, then this error goes away. Another strangeness is that if I keep the module but replace "assert (True) by apply t" with "assert (True); [apply tt]";, the problem also goes away.

coqbot commented on Sep 21, 2007 Member + 👤 ...

Comment author: @herbelin

Fixed in trunk (revision 10131) and branch 8.1 (revision 10135)

[the "assert by" case was bugged in Tacinterp.subst_tactic]

coqbot closed this on Sep 21, 2007

Data extraction for the analysis

All data is extracted from GitHub thanks to its GraphQL API.

```
query issueQuery($owner: String!, $repo: String!,
                 $bodyText: Boolean!, $cursor: String) {
  repository(owner: $owner, name: $repo) {
    issues(first: 100, after: $cursor,
           orderBy:{field: CREATED_AT, direction:ASC}) {
      pageInfo {
        endCursor
        hasNextPage }
      nodes {
        createdAt
        author { login }
        bodyText @include (if: $bodyText)
        number } } } }
```


Bug reports

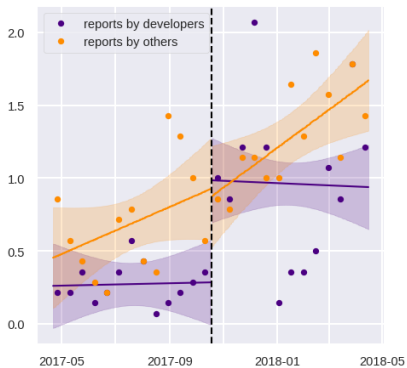


Figure 2: Average number of bug reports per day before and after the switch

Comments

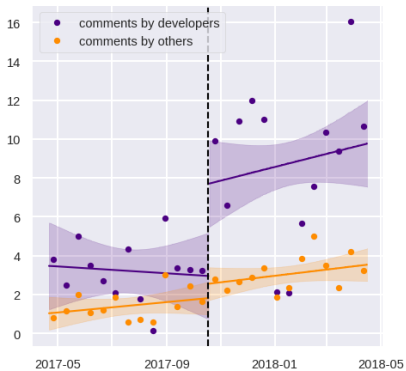


Figure 3: Average number of bug comments per day before and after the switch

Distinct commentators

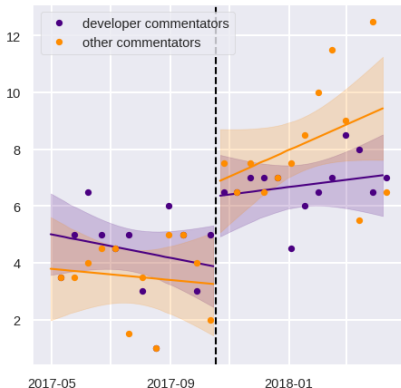


Figure 4: Average number of distinct commentators each week before and after the switch

Conclusion and perspectives

When is it useful for a given project to switch bug trackers?

Some hints:

- Are developers using the bug tracker enough?
- Do you want more discussion happening with non-developers on the bug tracker?

Study more projects (migrating from Bugzilla, JIRA, Trac...):

① 4,270 Open	✓ 66,754 Closed	Visibility ▾	Organization ▾	Sort ▾	
① GNUAspell/aspell	Phonet code bug	sf-bug	sf-l-true-bug	sf-pri-2	🗨 4
#2 opened on Feb 13, 2000 by aspell-helper					
① cyrusimap/cyrus-imapd	seperate out idle imapds from active imapd	P4	SNMP/logging	🔗	🗨 4
enhancement					
#149 opened on Aug 28, 2000 by brong					