Redmine - Defect #5357

Git: SCM revisions ordered by date/time (should be reverse commit order)

2010-04-20 15:53 - Pieter Smith

<table>
<thead>
<tr>
<th>Status:</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority:</td>
<td>Normal</td>
</tr>
<tr>
<td>Assignee:</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>Category:</td>
<td>SCM</td>
</tr>
<tr>
<td>Target version:</td>
<td>Unplanned backlogs</td>
</tr>
<tr>
<td>Resolution:</td>
<td></td>
</tr>
<tr>
<td>Start date:</td>
<td>2010-04-20</td>
</tr>
<tr>
<td>Due date:</td>
<td></td>
</tr>
<tr>
<td>% Done:</td>
<td>0%</td>
</tr>
<tr>
<td>Estimated time:</td>
<td>0.00 hour</td>
</tr>
<tr>
<td>Affected version:</td>
<td>0.9.0</td>
</tr>
</tbody>
</table>

Description
The repository browser displays the commit history sorted by date/time. When developers are working in different time-zones (or have a badly adjusted PC clocks), the commit sequence gets all jumbled up in the repository view.

Reproduction:
1. Commit something to a GIT repo.
2. Set PC clock to <today> - <1 day>.
3. Commit something else.

Related issues:
- Related to Redmine - Defect #7146: Git adapter lost commits before 7 days from... Closed 2010-12-21
- Related to Redmine - Defect #7047: Git adapter very slow when a commit modifi... New 2010-12-04
- Related to Redmine - Defect #7648: Git: Repository Statistics Incorrect New 2011-02-18
- Related to Redmine - Defect #4657: Wrong timestamp for import of entries of t... New 2011-03-10
- Related to Redmine - Defect #8049: Git: fetch_changesets not updating project... Closed 2011-04-02
- Related to Redmine - Feature #2799: Support for Bazaar's shared repositories ... New 2009-02-21
- Related to Redmine - Feature #6566: Convert the git adapter to rugged New 2010-10-04
- Related to Redmine - Feature #5501: Mercurial: Adding visual merge/branch... New 2010-05-11
- Related to Redmine - Defect #11710: Git: Repository view author/date inconsis... Closed 2008-10-29
- Has duplicate Redmine - Defect #13311: In repository view, git commits are or... Closed

Associated revisions
Revision 4986 - 2011-03-02 06:12 - Toshi MARUYAMA
scm: git: add more tests in fetch changesets incremental unit model test (#5357).

Revision 4987 - 2011-03-02 08:10 - Toshi MARUYAMA
scm: subversion: add changesets order test in unit model test (#5357).

Revision 5002 - 2011-03-04 15:03 - Toshi MARUYAMA
scm: mercurial: add changesets order test in unit model test (#5357).

Revision 5052 - 2011-03-08 07:50 - Toshi MARUYAMA
scm: git: add latest changesets test in unit model test (#5357).

Revision 5054 - 2011-03-08 08:06 - Toshi MARUYAMA
scm: git: add latest changesets limit test in unit model test (#5357).

Revision 5055 - 2011-03-08 08:06 - Toshi MARUYAMA
scm: git: add latest changesets tag test in unit model test (#5357).

Revision 5056 - 2011-03-08 08:06 - Toshi MARUYAMA
scm: git: add latest changesets branch test in unit model test (#5357).
Revision 5067 - 2011-03-08 16:05 - Toshi MARUYAMA
scm: git: add reverse log test in unit adapter test (#5357).

Revision 5073 - 2011-03-10 05:30 - Toshi MARUYAMA
scm: git: insert revisions to database with reverse commit order (#7821, #5357).

Revision 5074 - 2011-03-10 05:31 - Toshi MARUYAMA
scm: git: add tests for previous and next versions in unit model test (#7821, #5357).

Revision 5644 - 2011-05-05 01:38 - Toshi MARUYAMA
scm: git: add comments of revision order in fetch_changesets().

Related issues.
#5357, #6013, #7146, #4773, #4547, #1406, #3449, #3567.

Revision 5853 - 2011-05-19 04:16 - Toshi MARUYAMA
scm: git: set revisions ordering inconsistent in existing database (#5357).

Between version 0.9 r2840 (#1406) and version 1.2 r5073 (#7821, #5357),
git revisions are stored as C-B-A-F-E-D in database.

Revision 5854 - 2011-05-19 04:16 - Toshi MARUYAMA
scm: git: add tests for previous and next versions in unit model test (#7821, #5357).

Revision 5855 - 2011-05-19 04:17 - Toshi MARUYAMA
scm: git: add tests for previous and next versions in unit model test (#7821, #5357).

Revision 5899 - 2011-05-25 13:33 - Toshi MARUYAMA
scm: git: add comments of revision order in fetch_changesets().

Revision 8898 - 2012-02-17 15:27 - Toshi MARUYAMA
scm: git: replace "order" at unit model test of fetching from scratch (#5357)
On Rails 3.0.11, this test fails.
Revision order of Git and Mercurial is not date/time order.

Revision 8899 - 2012-02-17 15:28 - Toshi MARUYAMA
scm: git: replace "write_attribute" at unit model test for database order consistency (#5357)
On Rails 3.0.11, "NoMethodError: private method `write_attribute'" error raises.

History
#1 - 2010-04-20 16:40 - Yuya Nishihara
- File sort-changesets-by-id.diff added

Same issue as #3567. 
"order by date/time" is only valid for centralized system like CVS or Subversion.
I have a patch, sort-changesets-by-id.diff, to fix this issue, but which is yet well tested.

#2 - 2010-04-21 10:30 - Pieter Smith
- File sort-changesets-by-id-for-git.diff added

Thanks, but your changeset does appear to solve the problem for a Git repo. It did however provide me with enough info to solve it myself:
sort-changesets-by-id-for-git.diff
It appears that similar changes will have to be applied to ./test/unit/repository_git_test.rb as well, but I am not familiar enough with the unit test infrastructure to make these changes.

#3 - 2010-04-21 10:32 - Pieter Smith
Oops, I made a typo: Your changeset does not appear to solve the problem for a Git repo
Crap.

sort-changes-by-id-for-git.diff doesn't work:

1. With the initial fetch, redmine adds the changesets in reverse commit order.
2. When additional changesets are imported, they are added to the back of the table, also in reverse commit order.
3. Sorting by changesets.id therefore results in a discontinuity

I tried to reverse the order with which changesets are added to the database by using the :reverse option of scm.revisions(), but all the other mechanisms use the changesets.committed_on field to determine if something is new, so new changesets are not imported resulting in changeset fetch deadlocks.

Hi, I read #2108 and feel the issue is much tangled than Mercurial's (#3567).

According to git help log, it sorts changes in chronological order, and Redmine also orders by committed_on. So how do them become different?

BTW, your information about git really helps me. Thanks! :)

Not true. The git log --help does not seem to be accurate (and does not make sense either). Here is a clear example of a log pulled from GIT (git log --date-order and git log produces the same results):

commit 1820eb822442f04f055cce31f030e1813bcb61c8
Author: Pieter Smith <pieter.smith@eu.omron.com>
Date: Tue Apr 20 03:09:01 2010 -0400

Also ignore mongrel rails PID files in ./log

commit 0f42bc80659b08c8f558ee1763c96167872aa1f
Author: Pieter Smith <pieter.smith@eu.omron.com>
Date: Wed Apr 21 18:02:58 2010 -0400

Applied mongrel --prefix use patch:
 * http://www.ruby-forum.com/topic/183811

commit 12fb96220972e99f8748d81eb7082de1697bb12d8
Author: Pieter Smith <pieter.smith@eu.omron.com>
Date: Mon Apr 19 02:46:56 2010 -0400

Added redmine checkout plugin

commit 10406e90f8797dc42999717f1d1260b9762b3c6e
Author: Pieter Smith <pieter.smith@eu.omron.com>
Date: Mon Apr 19 02:37:15 2010 -0400

Ignore files directory entirely:
 * Allow use of symlinks to place attachments elsewhere

commit 29671188126e77452971384715a57e522f84b4b
Author: Pieter Smith <pieter.smith@eu.omron.com>
Date: Mon Apr 19 02:33:57 2010 -0400

Added --proj-id-match and --update-only options to reposman

commit fc6c071e2a593f29fcbbe3d021880b2212b93639
Author: Jean-Philippe Lang <jp_lang@yahoo.fr>
Date: Sun Feb 28 15:12:09 2010 +0000

tagged version 0.9.3

git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/tags/0.9.383515 e93f8b46-1217-0410-a6f0-8f06a7374b81

And the same log in redmine:

Redmine_Repository_View.JPG

- File Redmine_Repository_View.JPG added

And the missing file:
Hmm, I'll see it later how git considers, but `git-changeset-order-workaround.diff` may partially fix the problem. (though I'm not sure.)

It changes the insertion order to be "ORDER BY id" as possible. (so please run clear_changesets to regenerate changesets table, and apply also `sort-changesets-by-id.diff` patch)

Note: Git backend checks the last 7-day logs everytime calling fetch_changesets. Then deletes disappeared changesets from database, and finally inserts missing ones.

---

Further testing is needed, but these two patches (`sort-changesets-by-id.diff` and `git-changeset-order-workaround.diff`) appear to fix the issue. Will this be incorporated in a near-future release, or will I have to patch future versions?

P.S. How should I run clear_changesets? This didn't work:

```
@ruby script/runner "Repository.clear_changesets" -e production
```

I deleted the contents of the changesets table in the MySQL database to test this, but I would prefer not to circumvent the application by messing with the database.

---

I'm not sure but since it requires to refetch all changesets, it might be harder to be merged into Redmine release. Anyway, I need to understand more about Git. (I mostly use Mercurial and its Hg-Git extension.)

P.S. How should I run clear_changesets?

Oops! I completely misread the comment of repository/git.rb saying "The repository can still be fully reloaded by calling #clear_changesets." There seems no way to run it from command-line.

You can regenerate changesets table by: 1. delete repository from settings tab; 2. recreate the same repository, though it's really indirect way. :)

---

FYI: git 1.7 supports "git commit --date DATE".  
http://www.kernel.org/pub/software/scm/git/docs/RelNotes-1.7.0.txt

---

Interesting... The commit date can be overridden. Not quite sure how it could practically help with the display ordering though. :|

---

I think we can create test repository, unit test and functional test.

- source/tags/1.0.0/test/fixtures/repositories/git_repository.tar.gz
- source/tags/1.0.0/test/unit/repository_git_test.rb
- source/tags/1.0.0/test/functional/repositories_git_controller_test.rb

---

If you need any assistance, I'd be glad to help.

---

Yuya is working now. Please see http://www.redmine.org/issues/4455#note-123 and http://www.redmine.org/issues/4455#note-130.
Yuya is working now. Please see http://www.redmine.org/issues/4455#note-123 and http://www.redmine.org/issues/4455#note-130.

Ah, but I've just tried minimizing the impact of #4455 patch, to make a difference only to mercurial backend. :)

As I said before, my workaround patch for git requires database regeneration. I'm not sure how the maintainers and redmine+git users think, though, it sounds awful to me.

There is a patch for time-zone of git adapter at #6346.

No, this is not related. The problem here is that redmine assumes "younger" revisions to be the "newest", which isn't the case with git. The commit date in git is just metadata, it's neither authoritative nor an indication of the ordering of the revisions. The revision order in git is provided only by the linked list nature of revisions, i.e. a revision holds a reference to its parent revision, which in turn holds a reference to its parent, and so on.

This discrepancy between "redmine assumes commit dates in consecutive commits always increases" and "the commit date in git is just metadata" is I think the problem, but that's one that will take more work than "just" fixing the git adapter.

FYI: git 1.7 supports "git commit --date DATE". http://www.kernel.org/pub/software/scm/git/docs/RelNotes-1.7.0.txt

Git has a AuthorDate and CommitDate.

* #2108
  * Pro Git Maintaining a Project

"--date" option changes AuthorDate. AuthorDate and CommitDate can be changed by GIT_AUTHOR_DATE and GIT_COMMITTER_DATE environment variables.

```
$ GIT_AUTHOR_DATE="1990-01-01 00:00:00 +0100" \
  GIT_COMMITTER_DATE="2000-01-01 00:00:00 -0500" \
  git commit -a -m "test."
```

```
$ git log --pretty=fuller -n1 | cat
commit da940a9ed3807b5dd518bd5f6d6b6110e51f67dd2f780a8
Author: Toshi MARUYAMA <XXXXXXXXXXXX>
AuthorDate: Mon Jan 1 00:00:00 1990 +0100
Commit: Toshi MARUYAMA <XXXXXXXXXXXX>
CommitDate: Sat Jan 1 00:00:00 2000 -0500
```

test.

```
$ git log --graph --all --pretty=fuller -n2
  commit 58b4abad53aa5df6d6b6110e51f67dd2f780a8
  | Author: Toshi MARUYAMA <XXXXXXXXX>
  | AuthorDate: Wed Sep 22 21:26:24 2010 +0900
  | Commit: Toshi MARUYAMA <XXXXXXXXX>
  | CommitDate: Wed Sep 22 21:26:24 2010 +0900
  | test01.
```

File git-rebase.png added

git rebase changes CommitDate and keeps AuthorDate.

```
$ git log --graph --all --pretty=fuller -n2
  * commit 58b4abad53aa5df6d6b6110e51f67dd2f780a8
    | Author: Toshi MARUYAMA <XXXXXXXXX>
    | AuthorDate: Wed Sep 22 21:26:24 2010 +0900
    | Commit: Toshi MARUYAMA <XXXXXXXXX>
    | CommitDate: Wed Sep 22 21:26:24 2010 +0900
    | test01.
```
#21 - 2010-09-23 16:57 - Toshi MARUYAMA

- File git-order-new.diff added
- File git-order-before.png added
- File git-order-after.png added

Yuya Nishihara wrote:

Toshi MARUYAMA wrote:

Yuya is working now.
Please see [http://www.redmine.org/issues/4455#note-123](http://www.redmine.org/issues/4455#note-123) and [http://www.redmine.org/issues/4455#note-130](http://www.redmine.org/issues/4455#note-130).

Ah, but I've just tried minimizing the impact of #4455 patch, to make a difference only to mercurial backend. ;)

As I said before, my workaround patch for git requires database regeneration. I'm not sure how the maintainers and redmine+git users think, though, it sounds awful to me.

I referred Yuya's [mercurial implementation](http), then I implement ordering only for git.

I pushed to my github and I attach a new patch.

- [http://github.com/marutosi/redmine/commits/6806ea5af21e75fc1](http://github.com/marutosi/redmine/commits/6806ea5af21e75fc1)

And I post logs and images of following test repository.

- [http://github.com/marutosi/redmine_test_git_repository/commits/marutosi00](http://github.com/marutosi/redmine_test_git_repository/commits/marutosi00)
I hate to quote myself, but:

Felix Schäfer wrote:

The revision order in git is provided only by the linked list nature of revisions, i.e. a revision holds a reference to its parent revision, which in turn holds a reference to its parent, and so on.

So they are ordered by database insertion instead of commit date, still a workaround rather than a solution.

(and don't get me wrong: I appreciate the work you do here, but I think it goes in the wrong direction)

I think better solution for DVCS is creating new tables for DAG.

Please see http://www.redmine.org/issues/4773#note-18.
Rebased multi revisions CommitDate changed same time.
So, ordering with CommitDate is strange.

I pushed these revisions to my github.

- http://github.com/marutosi/redmine_test_git_repository/commits/rebase-test-00
- http://github.com/marutosi/redmine_test_git_repository/commits/57a99e05c3e7bf4d3c87

$ git log --graph --all --pretty=fuller -n 3 | cat
* commit c65291727d4d674f0ea4796a8a666cf6817494dc
  | Author: Toshi MARUYAMA <marutosijp2@foo.bar>
  | AuthorDate: Tue Sep 28 20:32:19 2010 +0900
  | Commit: Toshi MARUYAMA <marutosijp2@foo.bar>
  | CommitDate: Tue Sep 28 20:32:19 2010 +0900
  |    rebase test 10.
  |*
  | * commit de31c2ab3b20188b2b09e168026805688d65ef65
  |   | Author: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | AuthorDate: Tue Sep 28 20:28:42 2010 +0900
  |   | Commit: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | CommitDate: Tue Sep 28 20:28:42 2010 +0900
  |   |    rebase test 01.
  |*
  | * commit 27afe3d47c90d632bd2207fb812c8eb49107923
  |   | Author: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | AuthorDate: Tue Sep 28 20:28:19 2010 +0900
  |   | Commit: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | CommitDate: Tue Sep 28 20:28:19 2010 +0900
  |   |    rebase test 00.

$ git checkout de31c2ab3b20188b2b09e168026805688d65ef65
$ git rebase c65291727d4d674f0ea4796a8a666cf6817494dc

$ git log --graph --all --pretty=fuller -n 3 | cat
* commit 57a99e05c3e7bf4d3c87146f728e51665234a28
  | Author: Toshi MARUYAMA <marutosijp2@foo.bar>
  | AuthorDate: Tue Sep 28 20:28:42 2010 +0900
  | Commit: Toshi MARUYAMA <marutosijp2@foo.bar>
  | CommitDate: Tue Sep 28 20:28:42 2010 +0900
  |    rebase test 01.
  |*
  | * commit dd6129a06b9a38d7d8a80e140cf804d5c76e0e3b
  |   | Author: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | AuthorDate: Tue Sep 28 20:28:19 2010 +0900
  |   | Commit: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | CommitDate: Tue Sep 28 20:28:19 2010 +0900
  |   |    rebase test 00.
  |*
  | * commit c65291727d4d674f0ea4796a8a666cf6817494dc
  |   | Author: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | AuthorDate: Tue Sep 28 20:32:19 2010 +0900
  |   | Commit: Toshi MARUYAMA <marutosijp2@foo.bar>
  |   | CommitDate: Tue Sep 28 20:32:19 2010 +0900
  |   |    rebase test 10.

#25 - 2010-10-01 17:00 - Bernhard Furtmueller

I'm far away being a git expert but I think rebasing on a public "official" repository is evil anyway. Please see git-rebase(1) NOTES and RECOVERING FROM UPSTREAM REBASE. I'm not sure if this could be fixed in redmine with reasonable efforts.

#26 - 2010-10-02 00:40 - Toshi MARUYAMA

Bernhard Furtmueller wrote:

> I'm far away being a git expert but I think rebasing on a public "official" repository is evil anyway.

Yes. In Git and Mercurial, rebasing and history editing on public repository is rare case. But, rebasing and history editing on private repository and pushing these revisions to public repository is popular.
Please see http://www.redmine.org/issues/4455#note-146.

#27 - 2011-02-08 01:59 - Toshi MARUYAMA
- Priority changed from High to Normal

#28 - 2011-02-08 02:01 - Toshi MARUYAMA
- Subject changed from SCM revisions ordered by date/time (should be reverse commit order) to Git: SCM revisions ordered by date/time (should be reverse commit order)

#29 - 2011-02-08 02:14 - Toshi MARUYAMA
- File git-rebase-20110208.png added

These are https://github.com/edavis10/chiliproject/tree/master/core/30-upstream-code-review image and log.

Eric seemed to rebase or cherry-pick. Latest CommitDate changed "Sat Feb 5 21:08:10 2011 -0800".

Latest revisions

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Author</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc016d22</td>
<td>02/06/2011 02:08 pm</td>
<td>Jean-Philippe Lang</td>
<td>Set VERSION to 1.0.5. git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4568 e93f8b46-1217-0410-a6f0-8f06a7374b81</td>
</tr>
<tr>
<td>5659b716</td>
<td>02/06/2011 02:07 pm</td>
<td>Jean-Philippe Lang</td>
<td>Updated INSTALL for 1.0.5 git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4567 e93f8b46-1217-0410-a6f0-8f06a7374b81</td>
</tr>
<tr>
<td>7df152dd5</td>
<td>02/06/2011 02:07 pm</td>
<td>Jean-Philippe Lang</td>
<td>Updated CHANGELOG for 1.0.5 git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4566 e93f8b46-1217-0410-a6f0-8f06a7374b81</td>
</tr>
<tr>
<td>9142d4fc</td>
<td>02/06/2011 02:07 pm</td>
<td>Jean-Philippe Lang</td>
<td>Fixes: Mercurial adapter loses seconds of commit times (#6656), git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4561 e93f8b46-1217-0410-a6f0-8f06a7374b81</td>
</tr>
</tbody>
</table>
| 0f0e743a | 02/06/2011 02:06 pm | Jean-Philippe Lang | Adds themes test for when Redmine is in a sub-uri.

$ git log --graph -b br-chili-eric --pretty=fuller -n3 | cat
* commit dc016d2261adac84a7e9e478434c7064e5d13f1
  | Author: Jean-Philippe Lang
  | AuthorDate: Thu Dec 23 10:04:08 2010 +0000
  | Commit: Eric Davis
  | CommitDate: Sat Feb 5 21:08:10 2011 -0800
  | Set VERSION to 1.0.5.
  | git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4568 e93f8b46-1217-0410-a6f0-8f06a7374b81
* commit 5659b7164c6f15971bf6da5784fa517f5248e8c0
  | Author: Jean-Philippe Lang
  | AuthorDate: Thu Dec 23 10:03:32 2010 +0000
  | Commit: Eric Davis
  | CommitDate: Sat Feb 5 21:08:10 2011 -0800
  | Updated INSTALL for 1.0.5
  | git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4567 e93f8b46-1217-0410-a6f0-8f06a7374b81
* commit 7df152dd5163e2e19edbd0c55b0cb2cad98ad17da
  | Author: Jean-Philippe Lang
  | AuthorDate: Thu Dec 23 10:02:08 2010 +0000
  | Commit: Eric Davis
  | CommitDate: Sat Feb 5 21:07:14 2011 -0800
  | Updated CHANGELOG for 1.0.5
  | git-svn-id: svn+ssh://rubyforge.org/var/svn/redmine/trunk@4566 e93f8b46-1217-0410-a6f0-8f06a7374b81

#30 - 2011-03-02 06:06 - Toshi MARUYAMA
- Assignee set to Toshi MARUYAMA
- Affected version (unused) changed from 0.9.3 to 0.9.0
- Affected version changed from 0.9.3 to 0.9.0

This is a patch for r5074.

https://www.chiliproject.org/projects/chiliproject/repository/show?rev=69bad846048e6b854cda272e2701771f26172234

Files

<table>
<thead>
<tr>
<th>File Name</th>
<th>Size</th>
<th>Date</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>sort-changesets-by-id.diff</td>
<td>2.43 KB</td>
<td>2010-04-20</td>
<td>Yuya Nishihara</td>
</tr>
<tr>
<td>sort-changes-by-id-for-git.diff</td>
<td>836 Bytes</td>
<td>2010-04-21</td>
<td>Pieter Smith</td>
</tr>
<tr>
<td>Redmine_Repository_View.JPG</td>
<td>122 KB</td>
<td>2010-04-21</td>
<td>Pieter Smith</td>
</tr>
<tr>
<td>git-change-set-order-workaround.diff</td>
<td>1.01 KB</td>
<td>2010-04-21</td>
<td>Yuya Nishihara</td>
</tr>
<tr>
<td>git-rebase.png</td>
<td>95.6 KB</td>
<td>2010-09-22</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>git-order-new.diff</td>
<td>1.15 KB</td>
<td>2010-09-23</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>git-order-before.png</td>
<td>97.9 KB</td>
<td>2010-09-23</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>git-order-after.png</td>
<td>94.1 KB</td>
<td>2010-09-23</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>rebase-multi-revs-before.png</td>
<td>48.1 KB</td>
<td>2010-09-28</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>rebase-multi-revs-after.png</td>
<td>33.1 KB</td>
<td>2010-09-28</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>git-rebase-20110208.png</td>
<td>91.6 KB</td>
<td>2011-02-08</td>
<td>Toshi MARUYAMA</td>
</tr>
<tr>
<td>sort-changes-by-id-for-git-r5074.diff</td>
<td>1.01 KB</td>
<td>2011-03-10</td>
<td>Toshi MARUYAMA</td>
</tr>
</tbody>
</table>