Redmine - Defect #23318
#lock_nested_set very slow on mysql with thousands of subtasks
2016-07-13 17:39 - Stephane Evr

Status: Reopened  Start date:  
Priority: Normal  Due date:  
Assignee: Jean-Philippe Lang  % Done: 0%  
Category: Performance  Estimated time: 0.00 hour  
Target version: Candidate for next major release  
Resolution: Fixed  
Affected version:  

Description

I have a complex hierarchy of around 15000 issues in redmine, where an issue of this set could potentially have 3000 subtasks.

When doing CRUD operations on such issue, I notified significant slow downs, caused by the lock_nested_set function.

Here is the profiling for the query actually run in lock_nested_set:

```
SELECT `issues`.'id' FROM `issues` WHERE (root_id IN (SELECT root_id FROM issues WHERE id IN (70395,70389))) ORDER BY `issues`.'id' ASC FOR UPDATE;
```

```
+-------+
|       |
|........|
| 70371 |
| 70373 |
| 70375 |
| 70377 |
| 70379 |
| 70381 |
| 70383 |
| 70385 |
| 70387 |
| 70389 |
| 70391 |
| 70393 |
+-------+
2932 rows in set (2.70 sec)
```

mysql> show profile for QUERY 1;
```
+-------------------------------+-----------+
| Status                        | Duration  |
+-------------------------------+-----------+
| starting                      | 0.00025   |
| Waiting for query cache lock  | 0.00004   |
| checking query cache for query| 0.000081  |
| checking permissions          | 0.00003   |
| checking permissions          | 0.00004   |
| Opening tables                | 0.00038   |
| System lock                   | 0.00017   |
| init                          | 0.00056   |
| optimizing                    | 0.00013   |
| statistics                    | 0.00023   |
```
| preparing | 0.000009 |
| executing | 0.000002 |
| Sorting result | 0.000005 |
| Sending data | 0.000049 |
| optimizing | 0.000015 |
| statistics | 0.000047 |
| preparing | 2.690165 |
| end | 0.000009 |
| query end | 0.000067 |
| closing tables | 0.000010 |
| freeing items | 0.000038 |
| logging slow query | 0.000002 |
| logging slow query | 0.000163 |
| cleaning up | 0.000003 |

24 rows in set (0.00 sec)

It takes around 3 seconds to execute the whole query.

I think the main problem is with the nested SELECT statement. If I execute it separately, then paste its results directly into the main query, the query is much faster:

```
mysql> SELECT root_id FROM issues WHERE id IN (70395, 70389);
+---------+
| root_id |
+---------+
|   45083 |
+---------+
1 row in set (0.00 sec)
```

```
SELECT `issues`.`id` FROM `issues` WHERE (root_id IN (45083))  ORDER BY `issues`.`id` ASC FOR UPDATE;
```

```
+-------+
|       |
|........|
| 70371 |
| 70373 |
| 70375 |
| 70377 |
| 70379 |
| 70381 |
| 70383 |
| 70385 |
| 70387 |
| 70389 |
| 70391 |
| 70393 |
+-------+
2932 rows in set (0.01 sec)
```
I am not an expert in sql queries, and don't want to break anything... Shouldn't we use a JOIN instead?

Environment:
Redmine version                3.3.0.stable
Ruby version                   2.2.2-p95 (2015-04-13) [x86_64-linux]
Rails version                  4.2.6
Environment                    development
Database adapter               Mysql2

Related issues:
- Related to Redmine - Defect # 19344: MySQL 5.6: IssueNestedSetConcurrencyTest...

Associated revisions
Revision 15891 - 2016-10-08 11:15 - Jean-Philippe Lang
#lock_nested_set very slow on mysql with thousands of subtasks (#23318).
Patch by Stephane Evr.

Revision 15892 - 2016-10-09 10:37 - Jean-Philippe Lang
Reverts r15891 (#23318).
Deadlocks with MySQL.

Revision 16053 - 2016-12-10 09:54 - Jean-Philippe Lang
#lock_nested_set very slow on mysql with thousands of subtasks (#23318).
Patch by Stephane Evr.

Revision 16054 - 2016-12-10 10:44 - Jean-Philippe Lang
Reverted r16053 (#23318).
SQL error with PostgreSQL.

History
#1 - 2016-07-13 19:22 - Stephane Evr
FYI, I was able to change the statement used in lock_nested_set
from:

    self.class.reorder(:id).where("root_id IN (SELECT root_id FROM #{self.class.table_name} WHERE id IN (?)", sets_to_lock).lock.ids

to:
self.class.reorder(:id).joins("INNER JOIN #{self.class.table_name} t2 ON #{self.class.table_name}.root_id = t2.root_id").where("t2.id IN (?)", sets_to_lock).distinct.lock.ids

so far the later returns instantly, with the same results as the former. I don’t know though how it affects the locking mechanism.

#2 - 2016-07-14 05:34 - Toshi MARUYAMA  
- Category set to Database

#3 - 2016-07-16 10:10 - Go MAEDA  
- Target version set to Candidate for next major release

Passed all tests.

The following is a diff of changes made by Stephane Evr.

Index: lib/redmine/nested_set/issue_nested_set.rb
===================================================================
--- lib/redmine/nested_set/issue_nested_set.rb (revision 15663)
+++ lib/redmine/nested_set/issue_nested_set.rb (working copy)
@@ -158,7 +158,7 @@
     self.class.reorder(:id).where(:root_id => sets_to_lock).lock(lock).ids
     else
     sets_to_lock = [id, parent_id].compact
-    self.class.reorder(:id).where("root_id IN (SELECT root_id FROM #{self.class.table_name} WHERE id IN (?)")", sets_to_lock).lock.ids
+    self.class.reorder(:id).joins("INNER JOIN #{self.class.table_name} t2 ON #{self.class.table_name}.root_id = t2.root_id").where("t2.id IN (?)", sets_to_lock).distinct.lock.ids
     end
     end

#4 - 2016-07-16 10:18 - Toshi MARUYAMA  
- Target version changed from Candidate for next major release to 3.4.0

#5 - 2016-10-08 11:07 - Jean-Philippe Lang  
- Subject changed from lock_nested_set very slow on mysql to #lock_nested_set very slow on mysql with thousands of subtasks

Go MAEDA wrote:

| Passed all tests.

Did you run the tests with mysql? Because I get an error with Postgresql with the patch applied (FOR UPDATE not allowed with DISTINCT). Tests pass without .distinct

#6 - 2016-10-08 11:10 - Go MAEDA
Jean-Philippe Lang wrote:

Did you run the tests with mysql? Because I get an error with Postgresql with the patch applied (FOR UPDATE not allowed with DISTINCT).
Tests pass without .distinct

Sorry, I run the tests only with sqlite.

#7 - 2016-10-08 11:16 - Jean-Philippe Lang
- Category changed from Database to Performance
- Status changed from New to Closed
- Assignee set to Jean-Philippe Lang
- Resolution set to Fixed

Patch committed without the .distinct call, thanks.

#8 - 2016-10-09 06:48 - Toshi MARUYAMA
- Status changed from Closed to Reopened

MySQL "IssueNestedSetConcurrencyTest#test_concurrency" and "IssueNestedSetConcurrencyTest#test_concurrent_subtasks_creation" fail.
http://www.redmine.org/builds/logs/build_trunk_mysql-ruby-2.3_3063.html

It may be related with #19344.

#9 - 2016-10-09 06:49 - Toshi MARUYAMA
- Related to Defect #19344: MySQL 5.6: IssueNestedSetConcurrencyTest#test_concurrency : always fails added

#10 - 2016-10-09 10:38 - Jean-Philippe Lang
- Assignee deleted (Jean-Philippe Lang)
- Target version deleted (3.4.0)

r15891 reverted.

#11 - 2016-10-12 19:49 - Stephane Evr

I found an alternative solution which passes the tests, although not as fast as with a JOIN. Here, I simply group by issue id in the original subquery:

```
SELECT `issues`.* FROM `issues` WHERE (root_id IN (SELECT root_id from issues WHERE id IN (96457,96455) GROUP BY id))  ORDER BY `issues`.`id` ASC;
```

So the statement would be rewritten as:

```ruby
self.class.reorder(:id).where("root_id IN (SELECT root_id FROM #{self.class.table_name} WHERE id IN (?) GROUP BY id)",
  sets_to_lock).lock.ids
```
#12 - 2016-10-13 06:51 - Toshi MARUYAMA
- Target version set to 3.4.0

#13 - 2016-10-13 12:07 - Stephane Evr
- File issue_nested_set.patch added

I finally found how to refactor the JOIN Statement and keep the initial performance improvements. Please find attached a patch against the master branch. This passed the issue_nested_set_concurrency_test on MySQL.

#14 - 2016-10-13 12:16 - Stephane Evr

I ran the test 10 times and all passed

#15 - 2016-12-10 10:43 - Jean-Philippe Lang
- Target version changed from 3.4.0 to Candidate for next major release

Reverted r16053 because of SQL error with PostgreSQL.

#16 - 2016-12-11 11:18 - Jean-Philippe Lang
- Assignee set to Jean-Philippe Lang

PostgreSQL does not accept the DISTINCT in the subquery:
http://www.redmine.org/builds/logs/build_trunk_postgresql_ruby-2.3_3124.html

One option would be to have a statement specific to MySQL just like we already have one for SQL Server.

#17 - 2016-12-15 10:45 - Stephane Evr

Jean-Philippe Lang wrote:

```markdown
PostgreSQL does not accept the DISTINCT in the subquery:
http://www.redmine.org/builds/logs/build_trunk_postgresql_ruby-2.3_3124.html

One option would be to have a statement specific to MySQL just like we already have one for SQL Server.
```

Perhaps this is the solution. I don't know if PostgreSQL is affected by this problem.

#18 - 2017-03-21 16:35 - Toshi MARUYAMA
- File mysql-deadlock-02.diff added

Based #note-13 patch.
This patch reduces #19344 test failure times on my CentOS7 mariadb-5.5.52-1.el7.x86_64.
(Not always test pass. About 50% time test passes.)
<table>
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<tr>
<th>Files</th>
<th>Size</th>
<th>Date</th>
<th>Author</th>
</tr>
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<tr>
<td>issue_nested_set.patch</td>
<td>834 B</td>
<td>2016-10-13</td>
<td>Stephane Evr</td>
</tr>
<tr>
<td>mysql-deadlock-02.diff</td>
<td>1.31 KB</td>
<td>2017-03-21</td>
<td>Toshi MARUYAMA</td>
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