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Hadoop YARN / YARN-2608

# FairScheduler: Potential deadlocks in loading alloc files and clock access

#### Details

Type: □ Bug Status:

Priority: ♠ Major Resolution:

Affects Version/s: None Fix Version/s:

Component/s: None

Labels: None

## Description

Hadoop Flags:

Two potential deadlocks exist inside the FairScheduler.

Reviewed

1. AllocationFileLoaderService would reload the queue configuration, which calls FairScheduler.AllocationReloadListener.onReload() function. And require FairScheduler's lock;

```
public void onReload(AllocationConfiguration queueInfo) {
    synchronized (FairScheduler.this) {
        ....
    }
}
```

after that, it would require the QueueManager's queues lock.

```
private FSQueue getQueue(String name, boolean create, FSQueueType queueType) {
   name = ensureRootPrefix(name);
   synchronized (queues) {
        ....
   }
}
```

Another thread FairScheduler.assignToQueue may also need to create a new queue when a new job submitted. This thread would hold the **QueueManager's queues lock** firstly, and then would like to hold the **FairScheduler's lock** as it needs to call FairScheduler.getClock() function when creating a new FSLeafQueue. Deadlock may happen here.

2. The AllocationFileLoaderService holds **AllocationFileLoaderService's lock** first, and then waits for **FairScheduler's lock**. Another thread (like AdminService.refreshQueues) may call FairScheduler's reinitialize function, which holds **FairScheduler's lock** first, and then waits for **AllocationFileLoaderService's lock**. Deadlock may happen here.

#### Attachments

YARN-2608-1.patch	2 kB	25/Sep/14 20:45
YARN-2608-2.patch	2 kB	25/Sep/14 21:23
☐ YARN-2608-3.patch	7 kB	25/Sep/14 22:39

# Activity

Wei Yan added a comment - 25/Sep/14 20:59

For the first deadlock, as the clock is only changed by testcases, so we can directly remove the synchronized, and make the clock as volatile. For the second deadlock, we can also remove the synchronized from the reinitialize and initScheduler functions; thus, the reinitialize function would require the \* AllocationFileLoaderService's lock\* first, and then **FairScheduler's lock**.

💌 🔘 Karthik Kambatla (Inactive) added a comment - 25/Sep/14 21:19

Nit: Nothing to do with this patch, can we annotate FS#setClock as VisibleForTesting?

Otherwise, patch looks good to me.

- Sarthik Kambatla (Inactive) added a comment 25/Sep/14 21:40
  - +1, pending Jenkins.
- Hadoop QA added a comment 25/Sep/14 22:02
  - -1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12671305/YARN-2608-1.patch against trunk revision 9f9a222.
  - +1 @author. The patch does not contain any @author tags.
  - -1 tests included. The patch doesn't appear to include any new or modified tests.

Please justify why no new tests are needed for this patch.

Also please list what manual steps were performed to verify this patch.

- +1 javac. The applied patch does not increase the total number of javac compiler warnings.
- +1 javadoc. There were no new javadoc warning messages.
- +1 eclipse:eclipse. The patch built with eclipse:eclipse.
- -1 findbugs. The patch appears to introduce 10 new Findbugs (version 2.0.3) warnings.
- +1 release audit. The applied patch does not increase the total number of release audit warnings.
- +1 core tests. The patch passed unit tests in hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager.
- +1 contrib tests. The patch passed contrib unit tests.

Test results: https://builds.apache.org/job/PreCommit-YARN-Build/5132//testReport/

Findbugs warnings: https://builds.apache.org/job/PreCommit-YARN-Build/5132//artifact/PreCommit-HADOOP-Build-

patchprocess/newPatchFindbugsWarningshadoop-yarn-server-resourcemanager.html Console output: https://builds.apache.org/job/PreCommit-YARN-Build/5132//console

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✓ ○ Wei Yan added a comment - 25/Sep/14 22:39

Update a patch to fix the findbugs.

- ▼ Hadoop QA added a comment 25/Sep/14 22:43
  - -1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12671317/YARN-2608-2.patch against trunk revision 9f9a222.
  - +1 @author. The patch does not contain any @author tags.
  - -1 tests included. The patch doesn't appear to include any new or modified tests.

Please justify why no new tests are needed for this patch.

Also please list what manual steps were performed to verify this patch.

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- +1 contrib tests. The patch passed contrib unit tests.

Test results: https://builds.apache.org/job/PreCommit-YARN-Build/5135//testReport/

Findbugs warnings: https://builds.apache.org/job/PreCommit-YARN-Build/5135//artifact/PreCommit-HADOOP-Build-

patchprocess/newPatchFindbugsWarningshadoop-yarn-server-resourcemanager.html Console output: https://builds.apache.org/job/PreCommit-YARN-Build/5135//console

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- ▼ Hadoop QA added a comment 25/Sep/14 23:42
  - -1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12671328/YARN-2608-3.patch against trunk revision 8269bfa.
  - +1 @author. The patch does not contain any @author tags.
  - -1 tests included. The patch doesn't appear to include any new or modified tests.

Please justify why no new tests are needed for this patch.

Also please list what manual steps were performed to verify this patch.

- +1 javac. The applied patch does not increase the total number of javac compiler warnings.
- +1 javadoc. There were no new javadoc warning messages.
- +1 eclipse:eclipse. The patch built with eclipse:eclipse.
- +1 findbugs. The patch does not introduce any new Findbugs (version 2.0.3) warnings.
- +1 release audit. The applied patch does not increase the total number of release audit warnings.
- +1 core tests. The patch passed unit tests in hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager.
- +1 contrib tests. The patch passed contrib unit tests.

Test results: https://builds.apache.org/job/PreCommit-YARN-Build/5136//testReport/Console output: https://builds.apache.org/job/PreCommit-YARN-Build/5136//console

This message is automatically generated.

- Karthik Kambatla (Inactive) added a comment 26/Sep/14 00:25
  - +1. Committing this.
- Karthik Kambatla (Inactive) added a comment 26/Sep/14 00:47

Thanks for reporting and fixing this, Wei.

Just committed to trunk and branch-2.

✓ O Hudson added a comment - 26/Sep/14 00:51

FAILURE: Integrated in Hadoop-trunk-Commit #6115 (See https://builds.apache.org/job/Hadoop-trunk-Commit/6115/)

YARN 2608. FairScheduler: Potential deadlocks in loading alloc files and clock access. (Wei Yan via kasha) (kasha: rev f4357240a6f81065d91d5f443ed8fc8cd2a14a8f)

- hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/fair/FairScheduler.java
- hadoop-yarn-project/CHANGES.txt
- O Hudson added a comment 26/Sep/14 11:35

FAILURE: Integrated in Hadoop-Yarn-trunk #692 (See https://builds.apache.org/job/Hadoop-Yarn-trunk/692/)

YARN-2608. FairScheduler: Potential deadlocks in loading alloc files and clock access. (Wei Yan via kasha) (kasha: rev f4357240a6f81065d91d5f443ed8fc8cd2a14a8f)

- hadoop-yarn-project/CHANGES.txt
- hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/fair/FairScheduler.java
- ▼ Hudson added a comment 26/Sep/14 14:13

SUCCESS: Integrated in Hadoop-Hdfs-trunk #1883 (See https://builds.apache.org/job/Hadoop-Hdfs-trunk/1883/)

YARN-2608. FairScheduler: Potential deadlocks in loading alloc files and clock access. (Wei Yan via kasha) (kasha: rev

f4357240a6f81065d91d5f443ed8fc8cd2a14a8f)

- hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/fair/FairScheduler.java
- hadoop-yarn-project/CHANGES.txt
- ✓ O Hudson added a comment 26/Sep/14 15:10

FAILURE: Integrated in Hadoop-Mapreduce-trunk #1908 (See https://builds.apache.org/job/Hadoop-Mapreduce-trunk/1908/) YARN-2608. FairScheduler: Potential deadlocks in loading alloc files and clock access. (Wei Yan via kasha) (kasha: rev f4357240a6f81065d91d5f443ed8fc8cd2a14a8f)

- hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/fair/FairScheduler.java
- hadoop-yarn-project/CHANGES.txt

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Assignee:



Reporter:



Votes

O Vote for this issue

Watchers:

6 Start watching this issue

### Dates

Created:

25/Sep/14 20:38

Updated:

01/Dec/14 03:08

Resolved:

26/Sep/14 00:47