Fix Version/s:

3.3.0



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Hadoop HDFS / HDFS-14751

None

# Synchronize on diffs in DirectoryScanner

#### Details

Type: □ Bug Status: RESOLVED

Priority: ♥ Minor Resolution: Fixed

Component/s: None
Labels: None

## Description

Affects Version/s:

```
[ERROR] Tests run: 2, Failures: 0, Errors: 1, Skipped: 0, Time elapsed: 21.693 s <<< FAILURE! - in
org.apache.hadoop.hdfs.server.namenode.TestNameNodeMetadataConsistency
[ERROR] testGenerationStampInFuture(org.apache.hadoop.hdfs.server.namenode.TestNameNodeMetadataConsistency) Time elapsed:
7.572 s <<< ERROR!
java.util.ConcurrentModificationException
                 at java.util.ArrayList$Itr.checkForComodification(ArrayList.java:909)
                 at java.util.ArrayList$Itr.next(ArrayList.java:859)
                 at com.google.common.collect.AbstractMapBasedMultimap$Itr.next(AbstractMapBasedMultimap.java:1153)
                 at java.util.Collections$UnmodifiableCollection$1.next(Collections.java:1044)
                 at org.apache.hadoop.hdfs.server.datanode.DirectoryScanner.reconcile(DirectoryScanner.java:433)
                 at org.apache.hadoop.hdfs.server.datanode.DataNodeTestUtils.runDirectoryScanner(DataNodeTestUtils.java:202)
                 at
\verb|org.apache.hadoop.hdfs.server.namenode.TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataConsistency.testGenerationStampInFuture(TestNameNodeMetadataCon
                 at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
                 at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
                 at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
                 at java.lang.reflect.Method.invoke(Method.java:498)
                 at org.junit.runners.model.FrameworkMethod$1.runReflectiveCall(FrameworkMethod.java:50)
                 at org.junit.internal.runners.model.ReflectiveCallable.run(ReflectiveCallable.java:12)
                 at org.junit.runners.model.FrameworkMethod.invokeExplosively(FrameworkMethod.java:47)
                 at org.junit.internal.runners.statements.InvokeMethod.evaluate(InvokeMethod.java:17)
                 at org.junit.internal.runners.statements.RunBefores.evaluate(RunBefores.java:26)
```

Ref:https://builds.apache.org/job/PreCommit-HDFS-Build/27567/artifact/out/patch-unit-hadoop-hdfs-project\_hadoop-hdfs.txt

## Attachments

	1 kB	21/Aug/19 15:23
	8 kB	22/Nov/19 03:22
	2 kB	22/Nov/19 16:40
E HDFS-14751.004.patch	2 kB	22/Nov/19 16:50

#### Issue Links

# is broken by

↑ HDFS-14476 lock too long when fix inconsistent blocks between disk and in-memory



### relates to

□ HDFS-15048 Fix findbug in DirectoryScanner 

RESOLVED

# Activity

Lisheng Sun added a comment - 20/Aug/19 14:36

This issue is caused by HDFS-14476.

1

I revert HDFS-14476 in my local, TestNameNodeMetadataConsistency#testGenerationStampInFuture succss. I will fix UT.

Lisheng Sun added a comment - 21/Aug/19 15:36 - edited

weichiu seanlook Could you pay attention to this jira?

✓ ○ Wei-Chiu Chuang added a comment - 21/Aug/19 15:56

Thanks for reporting the issue, leosun08.

Honestly, i doubt making the reconcile() a synchronized call is the right solution.

You got CME because of diffs.map is modified. Looking at the code, other threads that modifies diffs.map do not synchronize on the same object.

I would suggest revert HDFS 14476 first, as it doesn't seem like a test problem.

Lisheng Sun added a comment - 21/Aug/19 16:13 - edited

## weichiu

This problem is since that two threads call DirectoryScanner#reconcile. In DirectoryScanner#reconcile#scan diffs.map is modified . So I think to guarantee one thread call

```
for (final Map.Entry<String, ScanInfo> entry : diffs.getEntries()) {
    ....
}
```

no other thread call DirectoryScanner#reconcile#scan.

Hadoop QA added a comment - 21/Aug/19 18:57

```
-1 overall
```

Vote	Subsystem	Runtime	Comment
0	reexec	0m 0s	Docker mode activated.
-1	patch	0m 9s	HDFS-14751 does not apply to trunk. Rebase required? Wrong Branch? See https://wiki.apache.org/hadoop/HowToContribute for help.

Subsystem	Report/Notes
JIRA Issue	HDFS 14751
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12978199/HDFS-14751.001.patch
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/27608/console
Powered by	Apache Yetus 0.8.0 http://yetus.apache.org

This message was automatically generated.

▼ ○ Wei-Chiu Chuang added a comment - 21/Aug/19 20:03

Reverted HDFS-14476 now.

Sean Chow added a comment - 22/Aug/19 05:25 - edited

leosun08 Note that reconcile() will call scan() method that may take hours to finish.

Adding synchronized to reconcile() will make it a long held lock. It could be better that synchronize the codeblock rather than method. Or You just want to make sure there is only one scanning processing?

Sean Chow added a comment - 02/Sep/19 02:37 - edited

Hi leosun08 Shall we just synchronize {{diffs}?

# And in scan():

```
// Hold FSDataset lock to prevent further changes to the block map
synchronized(dataset) {
    synchronized(diffs) {...}
}
```

Lisheng Sun added a comment - 02/Sep/19 15:07

hi seanlook i agree your idea.

we can synchronize diffs, guarantee diffs can't be modified by multiple threads.

■ Wei-Chiu Chuang added a comment - 22/Nov/19 01:20

I would like to push forward HDFS-14476. leosun08 would you like to update the patch here?

▼ ○ Hadoop QA added a comment - 22/Nov/19 06:20

-1 overall

Vote	Subsystem	Runtime	Comment
0	reexec	0m 48s	Docker mode activated.
			Prechecks
+1	@author	0m 0s	The patch does not contain any @author tags.
-1	test4tests	0m 0s	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.
			trunk Compile Tests
+1	mvninstall	20m 41s	trunk passed
+1	compile	1m 8s	trunk passed
+1	checkstyle	0m 47s	trunk passed
+1	mvnsite	1m 14s	trunk passed
+1	shadedclient	15m 5s	branch has no errors when building and testing our client artifacts.
+1	findbugs	2m 17s	trunk passed
+1	javadoc	1m 12s	trunk passed
			Patch Compile Tests
+1	mvninstall	1m 2s	the patch passed
+1	compile	0m 55s	the patch passed
+1	javac	0m 55s	the patch passed
+1	checkstyle	0m 38s	the patch passed
+1	mvnsite	1m 2s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.

+1	obododoliont	14m 20a	notables as arrays when building and testing our client artifacts
+1	shadedclient	14m 28s	patch has no errors when building and testing our client artifacts.
+1	findbugs	2m 36s	the patch passed
+1	javadoc	1m 7s	the patch passed
			Other Tests
-1	unit	104m 36s	hadoop-hdfs in the patch failed.
+1	asflicense	0m 33s	The patch does not generate ASF License warnings.
		169m 44s	

Reason	Tests
Failed junit tests	hadoop.hdfs.server.block management. Test Block Stats MXBean

Subsystem	Report/Notes
Docker	Client=19.03.5 Server=19.03.5 Image:yetus/hadoop:104ccca9169
JIRA Issue	HDFS-14751
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12986484/HDFS-14751.002.patch
Optional Tests	dupname asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux 6078fcedbcda 4.15.0-66-generic #75-Ubuntu SMP Tue Oct 1 05:24:09 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / 9b6906f
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_222
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-HDFS-Build/28373/artifact/out/patch-unit-hadoop-hdfs-project_hadoop-hdfs.txt
Test Results	https://builds.apache.org/job/PreCommit-HDFS-Build/28373/testReport/
Max. process+thread count	2633 (vs. ulimit of 5500)
modules	C: hadoop-hdfs-project/hadoop-hdfs U: hadoop-hdfs-project/hadoop-hdfs
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/28373/console
Powered by	Apache Yetus 0.8.0 http://yetus.apache.org

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▼ ○ Lisheng Sun added a comment - 22/Nov/19 06:37

weichiu

i udpated the patch. Thank you.

➤ ○ Hadoop QA added a comment - 22/Nov/19 16:41

-1 overall

Vote Subsystem Runtime Comment	
--------------------------------	--

0	reexec	0m 0s	Docker mode activated.
-1	patch	0m 8s	HDFS-14751 does not apply to trunk. Rebase required? Wrong Branch? See https://wiki.apache.org/hadoop/HowToContribute for help.

Subsystem	Report/Notes
JIRA Issue	HDFS-14751
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12986538/HDFS-14751.003.patch
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/28377/console
Powered by	Apache Yetus 0.8.0 http://yetus.apache.org

This message was automatically generated.

Lisheng Sun added a comment - 22/Nov/19 16:55

# hi weichiu seanlook

the v004 patch fix this issue. After  $\frac{\text{HDFS-14476}}{\text{HDFS-14476}}$  is merged , TestNameNodeMetadataConsistency#testGenerationStampInFuture is success.

▼ ○ Hadoop QA added a comment - 22/Nov/19 19:52



Vote	Subsystem	Runtime	Comment
0	reexec	0m 47s	Docker mode activated.
			Prechecks
+1	@author	0m 0s	The patch does not contain any @author tags.
-1	test4tests	0m 0s	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.
			trunk Compile Tests
+1	mvninstall	21m 1s	trunk passed
+1	compile	1m 16s	trunk passed
+1	checkstyle	0m 48s	trunk passed
+1	mvnsite	1m 18s	trunk passed
+1	shadedclient	16m 27s	branch has no errors when building and testing our client artifacts.
+1	findbugs	2m 46s	trunk passed
+1	javadoc	1m 29s	trunk passed
			Patch Compile Tests
+1	mvninstall	1m 18s	the patch passed
+1	compile	1m 12s	the patch passed
+1	javac	1m 12s	the patch passed
+1	checkstyle	0m 47s	the patch passed
+1	mvnsite	1m 20s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	15m 19s	patch has no errors when building and testing our client artifacts.
+1	findbugs	2m 42s	the patch passed
+1	javadoc	1m 18s	the patch passed
			Other Tests
-1	unit	111m 4s	hadoop-hdfs in the patch failed.

+1	asflicense	0m 31s	The patch does not generate ASF License warnings.
		181m	
		22s	

Reason	Tests
Failed junit tests	hado op.hdfs. Test DFS In ot if y Event Input Stream Kerberized

Subsystem	Report/Notes
Docker	Client=19.03.5 Server=19.03.5 Image:yetus/hadoop:104ccca9169
JIRA Issue	HDFS 14751
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12986539/HDFS-14751.004.patch
Optional Tests	dupname asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux 6b8a7924a3f5 4.15.0-66-generic #75-Ubuntu SMP Tue Oct 1 05:24:09 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / 4c1a128
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_222
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-HDFS-Build/28378/artifact/out/patch-unit-hadoop-hdfs-project_hadoop-hdfs.txt
Test Results	https://builds.apache.org/job/PreCommit-HDFS-Build/28378/testReport/
Max. process+thread count	2852 (vs. ulimit of 5500)
modules	C: hadoop-hdfs-project/hadoop-hdfs U: hadoop-hdfs-project/hadoop-hdfs
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/28378/console
Powered by	Apache Yetus 0.8.0 http://yetus.apache.org

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➤ ○ Wei-Chiu Chuang added a comment - 06/Dec/19 23:10

+1

I'll add version 03 on top of HDFS 14476.

▼ ○ Wei-Chiu Chuang added a comment - 06/Dec/19 23:11

Thanks leosun08

✓ O Hudson added a comment - 06/Dec/19 23:30

SUCCESS: Integrated in Jenkins build Hadoop-trunk-Commit #17735 (See https://builds.apache.org/job/Hadoop-trunk-Commit/17735/)

HDFS 14751. Synchronize on diffs in DirectoryScanner. Contributed by (weichiu: revectd461f940efcd8c75f4833cf09bc7a52cc0b559)

• (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/datanode/DirectoryScanner.java

### People

Assignee:

Lisheng Sun

Reporter:



Lisheng Sun

Votes:

• Vote for this issue

Watchers:

6 Start watching this issue

# Dates

Created:

20/Aug/19 04:35

Updated:

13/Dec/19 03:56

Resolved:

06/Dec/19 23:11