RESOLVED

Fixed



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Hadoop HDFS / HDFS-13136

# Avoid taking FSN lock while doing group member lookup for FSD permission check

#### Details

Type: Status:

Priority: 

Major Resolution:

Affects Version/s: None Fix Version/s: 3.1.0, 3.2.0, 3.0.3

Component/s: namenode
Labels: None
Hadoop Flags: Reviewed

#### Description

Namenode has FSN lock and FSD lock. Most of the namenode operations need to take FSN lock first and then FSD lock. The permission check is done via FSPermissionChecker at FSD layer assuming FSN lock is taken.

The FSPermissionChecker constructor invokes callerUgi.getGroups() that can take seconds sometimes. There are external cache scheme such SSSD and internal cache scheme for group lookup. However, the delay could still occur during cache refresh, which causes severe FSN lock contentions and unresponsive namenode issues.

Checking the current code, we found that getBlockLocations(..) did it right but some methods such as getFileInfo(..), getContentSummary(..) did it wrong. This ticket is open to ensure the group lookup for permission checker is outside the FSN lock.

#### Attachments

■ HDFS-13136.001.patch	67 kB	13/Feb/18 00:11
■ HDFS-13136.002.patch	69 kB	14/Feb/18 17:25
■ HDFS-13136-branch-3.0.001.patch	72 kB	22/Feb/18 19:29
■ HDFS-13136-branch-3.0.002.patch	73 kB	22/Feb/18 23:36

### Activity

1

➤ ○ Xiaoyu Yao added a comment - 13/Feb/18 00:18

Attach an initial patch to move the getPermissionChecker() out of FSN lock. Thanks for the offline discussion with szetszwo.

This patch also removes the repeated group lookup from recursive calls such as FSDirStatAndListingOp#getContentSummaryInt(), which will help to improve NN performance.

▼ Ogenerica added a comment - 13/Feb/18 03:21



Vote	Subsystem	Runtime	Comment
0	reexec	0m 34s	Docker mode activated.
			Prechecks
+1	@author	0m 0s	The patch does not contain any @author tags.
+1	test4tests	0m 0s	The patch appears to include 1 new or modified test files.
			trunk Compile Tests
+1	mvninstall	20m 56s	trunk passed
+1	compile	1m 2s	trunk passed

		===	William   Page   William   William
+1	checkstyle	0m 45s	trunk passed
+1	mvnsite	1m 2s	trunk passed
+1	shadedclient	11m 51s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 56s	trunk passed
+1	javadoc	0m 55s	trunk passed
			Patch Compile Tests
+1	mvninstall	0m 58s	the patch passed
+1	compile	0m 50s	the patch passed
+1	javac	0m 50s	the patch passed
+1	checkstyle	0m 38s	hadoop-hdfs-project/hadoop-hdfs: The patch generated 0 new + 252 unchanged - 1 fixed = 252 total (was 253)
+1	mvnsite	0m 56s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	10m 59s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 59s	the patch passed
+1	javadoc	0m 52s	the patch passed
			Other Tests
-1	unit	124m 12s	hadoop-hdfs in the patch failed.
+1	asflicense	0m 21s	The patch does not generate ASF License warnings.
		180m 29s	

Reason	Tests
Failed junit tests	hadoop.hdfs.server.namenode. Test Name Node Metadata Consistency
	hadoop.hdfs.server.namenode.TestAuditLogger
	hadoop.hdfs.server.data node. Test Data Node Volume Failure Reporting
	hadoop.hdfs.server.namenode.TestAuditLoggerWithCommands

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:5b98639
JIRA Issue	HDFS-13136
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12910302/HDFS-13136.001.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux df32cca368ce 3.13.0-135-generic #184-Ubuntu SMP Wed Oct 18 11:55:51 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / 5a1db60
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_151
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-HDFS-Build/23039/artifact/out/patch-unit-hadoop-hdfs-project_hadoop-hdfs.txt
Test Results	https://builds.apache.org/job/PreCommit-HDFS-Build/23039/testReport/

Max. process+thread count	3115 (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/23039/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

- Tsz-wo Sze added a comment 14/Feb/18 11:39
  - +1 the 001 patch looks good. Thanks for the fixing all the methods.

The failed tests seem not related. Please take a look.

▼ ○ Xiaoyu Yao added a comment - 14/Feb/18 17:27 - edited

Thanks szetszwo for the review. Update patch v2 that fixed the unit test failures in

 $hadoop.hdfs.server.namenode. Test Audit Logger\ and\ hadoop.hdfs.server.namenode. Test Audit Logger With Commands\ and\ hadoop.hdfs.server.namenode. Test Audit Logger With Logger With Logger With Commands\ and\ hadoop.hdfs.server.namenode. Test Audit Logger With Logg$ 

Now that the getPermissionChecker() is moved out of the FSN lock, the test mocks are updated to reach deeper to get the expected exception and the audit log entry. The delta from v1 to v2 is the two unit test changes above. The other two failures cannot repro.

genericqa added a comment - 14/Feb/18 20:28



Vote	Subsystem	Runtime	Comment
0	reexec	0m 23s	Docker mode activated.
			Prechecks
+1	@author	0m 0s	The patch does not contain any @author tags.
+1	test4tests	0m 0s	The patch appears to include 3 new or modified test files.
			trunk Compile Tests
+1	mvninstall	17m 31s	trunk passed
+1	compile	1m 2s	trunk passed
+1	checkstyle	0m 44s	trunk passed
+1	mvnsite	1m 12s	trunk passed
+1	shadedclient	12m 1s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 58s	trunk passed
+1	javadoc	0m 56s	trunk passed
			Patch Compile Tests
+1	mvninstall	1m 0s	the patch passed
+1	compile	0m 56s	the patch passed
+1	javac	0m 56s	the patch passed
+1	checkstyle	0m 39s	hadoop-hdfs-project/hadoop-hdfs: The patch generated 0 new + 285 unchanged - 1 fixed = 285 total (was 286)
+1	mvnsite	0m 56s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	10m 56s	patch has no errors when building and testing our client artifacts.
+1	findbugs	2m 1s	the patch passed
+1	javadoc	0m 51s	the patch passed
			Other Tests

-1	unit	124m 14s	hadoop-hdfs in the patch failed.
+1	asflicense	0m 24s	The patch does not generate ASF License warnings.
		177m 16s	

Reason	Tests
Failed junit tests	had oop.hdfs.server.name node. Test Name Node Metadata Consistency
	hadoop.hdfs.TestHDFSFileSystemContract
	hadoop.hdfs.server.namenode.ha. Test Retry Cache With HA
	hadoop.hdfs.server.data node. Test Data Node Volume Failure Reporting

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:5b98639
JIRA Issue	HDFS 13136
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12910611/HDFS-13136.002.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux 76750bd05515 3.13.0-135-generic #184-Ubuntu SMP Wed Oct 18 11:55:51 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / f20dc0d
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_151
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-HDFS-Build/23068/artifact/out/patch-unit-hadoop-hdfs-project_hadoop-hdfs.txt
Test Results	https://builds.apache.org/job/PreCommit-HDFS-Build/23068/testReport/
Max. process+thread count	2894 (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/23068/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

▼ ○ Tsz-wo Sze added a comment - 15/Feb/18 07:24

Thanks for the update!

+1 on the 002 patch.

Xiaoyu Yao added a comment - 22/Feb/18 19:32

Thanks szetszwo for the review. I will commit the patch to trunk and branch-3.1 (clean cherry-pick) shortly. There are some conflicts on branch-3.0 which I just submitted a resolved patch for Jenkins check.

➤ ○ Hudson added a comment - 22/Feb/18 21:15

SUCCESS: Integrated in Jenkins build Hadoop-trunk-Commit #13700 (See https://builds.apache.org/job/Hadoop-trunk-Commit/13700/)

HDFS-13136. Avoid taking FSN lock while doing group member lookup for (xyao: rev 84a1321f6aa0af6895564a7c47f8f264656f0294)

- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirConcatOp.java
- (edit) hadoop-hdfs-project/hadoophdfs/src/test/java/org/apache/hadoop/hdfs/server/namenode/TestAuditLoggerWithCommands.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirXAttrOp.java
- (edit) hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirEncryptionZoneOp.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/test/java/org/apache/hadoop/hdfs/server/namenode/NameNodeAdapter.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirDeleteOp.java
- (edit) hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/EncryptionZoneManager.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/test/java/org/apache/hadoop/hdfs/server/namenode/TestAuditLogger.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirAttrOp.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirMkdirOp.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSNamesystem.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirSnapshotOp.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirStatAndListingOp.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirRenameOp.java
- (edit) hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSDirAclOp.java
- ▼ genericqa added a comment 22/Feb/18 21:56



Vote	Subsystem	Runtime	Comment
0	reexec	0m 23s	Docker mode activated.
			Prechecks
+1	@author	0m 0s	The patch does not contain any @author tags.
+1	test4tests	0m 0s	The patch appears to include 3 new or modified test files.
			branch-3.0 Compile Tests
+1	mvninstall	20m 55s	branch-3.0 passed
+1	compile	0m 54s	branch-3.0 passed
+1	checkstyle	0m 45s	branch-3.0 passed
+1	mvnsite	1m 4s	branch-3.0 passed
+1	shadedclient	11m 38s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 54s	branch-3.0 passed
+1	javadoc	0m 56s	branch-3.0 passed
			Patch Compile Tests
+1	mvninstall	0m 58s	the patch passed
+1	compile	0m 50s	the patch passed
+1	javac	0m 50s	the patch passed
+1	checkstyle	0m 39s	hadoop-hdfs-project/hadoop-hdfs: The patch generated 0 new + 306 unchanged - 4 fixed = 306 total (was 310)
+1	mvnsite	0m 55s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	10m 57s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 59s	the patch passed
+1	javadoc	0m 52s	the patch passed
			Other Tests
-1	unit	89m 32s	hadoop-hdfs in the patch failed.
+1	asflicense	0m 24s	The patch does not generate ASF License warnings.

145m	
21s	

Reason	Tests
Failed junit tests	hadoop.hdfs.server.namenode. Test Audit Logger With Commands

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:20ca677
JIRA Issue	HDFS 13136
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12911600/HDFS-13136-branch-3.0.001.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux e19160d6a097 3.13.0-139-generic #188-Ubuntu SMP Tue Jan 9 14:43:09 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	branch-3.0 / c2bbe22
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_151
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-HDFS-Build/23153/artifact/out/patch-unit-hadoop-hdfs-project_hadoop-hdfs.txt
Test Results https://builds.apache.org/job/PreCommit-HDFS-Build/23153/testReport/	
Max. process+thread count	3853 (vs. ulimit of 10000)
modules	C: hadoop-hdfs-project/hadoop-hdfs U: hadoop-hdfs-project/hadoop-hdfs
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/23153/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

genericqa added a comment - 23/Feb/18 02:34



Vote	Subsystem	Runtime	Comment
0	reexec	0m 26s	Docker mode activated.
			Prechecks
+1	@author	0m 0s	The patch does not contain any @author tags.
+1	test4tests	0m 0s	The patch appears to include 3 new or modified test files.
			branch-3.0 Compile Tests
+1	mvninstall	14m 46s	branch-3.0 passed
+1	compile	0m 50s	branch-3.0 passed
+1	checkstyle	0m 41s	branch-3.0 passed
+1	mvnsite	0m 52s	branch-3.0 passed
+1	shadedclient	10m 30s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 47s	branch-3.0 passed

+1	javadoc	0m 52s	branch-3.0 passed
			Patch Compile Tests
+1	mvninstall	0m 53s	the patch passed
+1	compile	0m 47s	the patch passed
+1	javac	0m 47s	the patch passed
+1	checkstyle	0m 36s	hadoop-hdfs-project/hadoop-hdfs: The patch generated 0 new + 306 unchanged - 4 fixed = 306 total (was 310)
+1	mvnsite	0m 50s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	9m 24s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 50s	the patch passed
+1	javadoc	0m 52s	the patch passed
			Other Tests
-1	unit	127m 38s	hadoop-hdfs in the patch failed.
+1	asflicense	0m 21s	The patch does not generate ASF License warnings.
		173m 51s	

Reason	Tests
Failed junit tests	hadoop.hdfs.server.datanode.TestDataNodeVolumeFailure
	hadoop.hdfs.server.namenode.ha.TestRetryCacheWithHA
	hadoop.hdfs.web.TestWebHdfsTimeouts
	hadoop.hdfs.TestDFSStripedOutputStreamWithFailure
	hadoop.hdfs. Test Safe Mode With Striped File With Random ECPolicy

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:20ca677
JIRA Issue	HDFS 13136
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12911632/HDFS-13136-branch-3.0.002.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux b4cb77402914 4.4.0-64-generic #85-Ubuntu SMP Mon Feb 20 11:50:30 UTC 2017 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	branch-3.0 / c2bbe22
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_151
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-HDFS-Build/23159/artifact/out/patch-unit-hadoop-hdfs-project_hadoop-hdfs.txt
Test Results	https://builds.apache.org/job/PreCommit-HDFS-Build/23159/testReport/
Max. process+thread count	4874 (vs. ulimit of 10000)
modules	C: hadoop-hdfs-project/hadoop-hdfs U: hadoop-hdfs-project/hadoop-hdfs
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/23159/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

Erik Krogen added a comment - 07/Mar/18 15:54

Hey xyao, thanks for this work, it looks to be a good improvement. One question - do you know how significant the performance improvement will be if using the background cache refresh feature from HADOOP 13263? It seems to me that with this enabled, the only improvements would be the first time that a user is ever looked up (should be very rare).

Xiaoyu Yao added a comment - 08/Mar/18 23:32

Agree, HADOOP-11238 + HADOOP-13263 definitely will help the group lookup performance issue if configured properly. Together with this fix, even the slow warm-up period (where the cache does not even have an entry for certain user) won't holding FSN lock that could trigger a failover.

Yongjun Zhang added a comment - 09/May/18 18:48 - edited

HI xyao,

Thanks for your work here, could it be Resolved since it's committed?

I saw it's in branch-3.0 which will target for 3.0.3.

Thanks.

Generica added a comment - 09/May/18 19:03

-1 overall

Vote	Subsystem	Runtime	Comment
0	reexec	0m 0s	Docker mode activated.
-1	patch	()m 7s	HDFS-13136 does not apply to branch-3.0. Rebase required? Wrong Branch? See https://wiki.apache.org/hadoop/HowToContribute for help.

Subsystem	Report/Notes
JIRA Issue	HDFS-13136
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12911632/HDFS-13136-branch-3.0.002.patch
Console output	https://builds.apache.org/job/PreCommit-HDFS-Build/24163/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

This message was automatically generated.

Xiaoyu Yao added a comment - 09/May/18 19:25

yzhangal, thanks for the heads up. This has been committed to trunk and branch-3.1.

I saw it's in branch-3.0 which will target for 3.0.3.

Branch-3.0 patch has not been committed yet. I will need to rebase the patch and get a new Jenkins run before commit/resolve it.

Xiaoyu Yao added a comment - 09/May/18 22:46

Sorry, I'm wrong. This is in branch-3.0. I will resolve the ticket. Thanks yzhangal.

People

Assignee:

Xiaoyu Yao

Reporter:



Xiaoyu Yao

Votes:

• Vote for this issue

Watchers:

12 Start watching this issue

## Dates

Created:

12/Feb/18 21:57

Updated:

09/May/18 22:48

Resolved:

09/May/18 22:48