

Public signup for this instance is disabled. Go to our Self serve sign up page to request an account.



Hadoop HDFS / HDFS-7584 Enable Quota Support for Storage Types / HDFS-7811

Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage

Details

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

Description

This is a follow up based on comment from jingzhao on HDFS-7723.

I just noticed that INodeFile#computeQuotaUsage calls getStoragePolicyID to identify the storage policy id of the file. This may not be very efficient (especially when we're computing the quota usage of a directory) because getStoragePolicyID may recursively check the ancestral INode's storage policy. I think here an improvement can be passing the lowest parent directory's storage policy down while traversing the tree.

Attachments

	14 kB	12/Mar/15 16:40
■ HDFS-7811.01.patch	15 kB	30/Mar/15 21:38
■ HDFS-7811.02.patch	18 kB	01/Apr/15 23:42
	18 kB	02/Apr/15 06:22
F HDFS-7811.04.patch	18 kB	02/Apr/15 22:34

Issue Links

is related to

□ HDFS-11254 Standby NameNode may crash during failover if loading edits takes too long



HDFS-8029 NPE during disk usage calculation on snapshot directory, after a sub folder is deleted

RESOLVED

Activity

Xiaoyu Yao added a comment - 12/Mar/15 16:40

Post the patch that avoids recursive getStoragePolicyID call for directory quota usage calculation.

✓ ○ Hadoop QA added a comment - 12/Mar/15 16:51

-1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12704183/HDFS-7811.00.patch against trunk revision ff83ae7.

-1 patch. Trunk compilation may be broken.

Console output: https://builds.apache.org/job/PreCommit-HDFS-Build/9852//console

This message is automatically generated.

Jing Zhao added a comment - 17/Mar/15 21:33

ThankmferworkingovkiliarXigeruliamec,90000011kelgelebtoragePolicyID will not throw UnsupportedOperationException in our current code?

```
try {
   storagePolicyId = getStoragePolicyID();
} catch (UnsupportedOperationException ex) {
   if (LOG.isDebugEnabled()) {
      LOG.debug("BlockStoragePolicy is not supported on " + this.getClass());
   }
}
```

- 2. We now have 4 different versions of computeQuotaUsage to support different parameter combinations. We can remove some of them for simplification. E.g., computeQuotaUsage(BlockStoragePolicySuite, byte, QuotaCounts, boolean) is only called in one place.
- 3. In INodeFile#computeQuotaUsage, we should check if the INodeFile has local storage policy and if so use it to overwrite the given policy.

```
byte storagePolicyId =
   (blockStoragePolicyId != BlockStoragePolicySuite.ID_UNSPECIFIED) ?
   blockStoragePolicyId : getStoragePolicyID();
```

- 4. Similar logic should also be used in INodeDirectory. In general, we should use the current directory's storage policy (if there is one) to overwrite the given policy and pass it down to its children.
- 5. For deleted files/directories in snapshots, we can do the same thing as a normal child file/directory. Thus simply passing the parent directory's storage policy down should be good enough. Handling a referrence INode can be more complicated, but we can do it in a separate jira.

```
- deleted.computeQuotaUsage(bsps, counts, false, Snapshot.CURRENT_STATE_ID);
+ deleted.computeQuotaUsage(bsps, deleted.tryGetBlockStoragePolicyId(),
+ counts, false, Snapshot.CURRENT_STATE_ID);
```

- 6. Minor: there are couple of places where the line length exceeds 80
- Xiaoyu Yao added a comment 17/Mar/15 22:33

Thanks jingzhao for the review.

1. In tryGetBlockStoragePolicyId, looks like getStoragePolicyID will not throw UnsupportedOperationException in our current code?

INodeSymlink#getStoragePolicyID throws UnsupportedOperationException.

2 We now have 4 different versions of computeQuotaUsage to support different parameter combinations. We can remove some of them for simplification. E.g.,computeQuotaUsage(BlockStoragePolicySuite, byte, QuotaCounts, boolean) is only called in one place.

Agree. Will remove that in the next update.

3/4/5 In INodeFile#computeQuotaUsage, we should check if the INodeFile has local storage policy and if so use it to overwrite the given policy.

Agree. Will fix in the next update.

6 Minor: there are couple of places where the line length exceeds 80

Will fix in the next update.

Xiaoyu Yao added a comment - 30/Mar/15 21:38

Patch updated based on feedback.

✓ ○ Hadoop QA added a comment - 31/Mar/15 01:20

-1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12708241/HDFS-7811.01.patch against trunk revision d9ac5ee.

- +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 following test timeouts occurred in hadoop-hdfs-project/hadoop-hdfs:

org. apache. hadoop. hdfs. server. block management. Test Datano de Manager and the server and

Test results: https://builds.apache.org/job/PreCommit-HDFS-Build/10116//testReport/Console output: https://builds.apache.org/job/PreCommit-HDFS-Build/10116//console

This message is automatically generated.

Xiaoyu Yao added a comment - 31/Mar/15 07:09

I can't find an easy way to unit tests the recursive call does not happen without adding test hooks in production code.

Jing Zhao added a comment - 01/Apr/15 23:32

Thanks for updating the patch, Xiaoyu! The patch looks good to me overall. Some comments:

- 1. In tryGetBlockStoragePolicyId(byte), it is still possible that getStoragePolicyID gets called repeatedly when the storage policy id is not specified on any INode in the path.
- 2. In FSImage#updateCountForQuotaRecursively, the following code may keep using the same policy id (which is not ID_UNSPECIFIED) instead of refreshing it based on child INode's local setting.

```
- updateCountForQuotaRecursively(bsps, child.asDirectory(), counts);
+ updateCountForQuotaRecursively(bsps,
+ (blockStoragePolicyId == BlockStoragePolicySuite.ID_UNSPECIFIED) ?
+ child.tryGetBlockStoragePolicyId() : blockStoragePolicyId,
+ child.asDirectory(), counts);
```

- 3. For computeQuotaUsage of a reference INode we can simply use the given storage policy id
- 4. However, for INodeReference#computeContentSummary, we should call getStoragePolicyID
- 5. It looks to me that the parameter blockStoragePolicyId's semantic is not consistent currently. In some cases it is the policy id of the parent, but sometimes it's the policy id of the current INode (e.g.,

 ${\tt DirectoryWithSnapshotFeature\#computeQuotaUsage4CurrentDirectory)}$

Jing Zhao added a comment - 01/Apr/15 23:42

I did some simple cleanup based on the current 01 patch. Please see if it's correct and looks ok to you.

- ✓ Hadoop QA added a comment 02/Apr/15 03:26
 - -1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12708859/HDFS-7811.02.patch against trunk revision 75cb1d4.
 - +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 failed these unit tests in hadoop-hdfs-project/hadoop-hdfs:

org.apache.hadoop.hdfs.server.namenode.snapshot.TestSnapshotDiffReport

org.apache.hadoop.fs.TestSymlinkHdfsDisable

org.apache.hadoop.hdfs.TestDFSInotifyEventInputStream

org.apache.hadoop.security.TestPermissionSymlinks

org.apache.hadoop.hdfs.server.namenode.ha.TestRetryCacheWithHA

org.apache.hadoop.hdfs.server.namenode.TestFileContextAcl

org.apache.hadoop.hdfs.server.namenode.TestNamenodeRetryCache

org. apache. hadoop. fs. Test Symlink Hdfs File System

org.apache.hadoop.fs.TestGlobPaths

org.apache.hadoop.hdfs.server.namenode.TestFileTruncate

org.apache.hadoop.hdfs.server.namenode.TestNameNodeXAttr

org.apache.hadoop.hdfs.TestEncryptionZones

org.apache.hadoop.hdfs.server.namenode.TestFSImage

org.apache.hadoop.hdfs.server.namenode.TestNameNodeAcl

org.apache.hadoop.hdfs.TestEncryptionZonesWithKMS

org.apache.hadoop.fs.TestSymlinkHdfsFileContext

org.apache.hadoop.hdfs.server.namenode.TestFsck

org.apache.hadoop.fs.TestResolveHdfsSymlink

org.apache.hadoop.hdfs.tools.offlineEditsViewer.TestOfflineEditsViewer

org.apache.hadoop.hdfs.TestListFilesInFileContext

org.apache.hadoop.hdfs.server.namenode.TestCheckpoint

org.apache.hadoop.hdfs.server.namenode.TestINodeFile

Test results: https://builds.apache.org/job/PreCommit-HDFS-Build/10155//testReport/Console output: https://builds.apache.org/job/PreCommit-HDFS-Build/10155//console

This message is automatically generated.

Jing Zhao added a comment - 02/Apr/15 06:22

The 02 patch missed the symlink check before calling getStoragePolicyID. Update the patch.

- ▼ Hadoop QA added a comment 02/Apr/15 10:03
 - -1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12708922/HDFS-7811.03.patch against trunk revision 867d5d2.
 - +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 failed these unit tests in hadoop-hdfs-project/hadoop-hdfs:

org. apache. had oop. hdfs. server. namenode. ha. Test DFSZKFail over Controller to the control of the contro

Test results: https://builds.apache.org/job/PreCommit-HDFS-Build/10160//testReport/Console output: https://builds.apache.org/job/PreCommit-HDFS-Build/10160//console

This message is automatically generated.

Xiaoyu Yao added a comment - 02/Apr/15 16:25

Thanks jingzhao for the patch. The v03 looks pretty good to me.

The failed Jenkins test seems unrelated. I tried TestDFSZKFailoverController locally with patch v03 and it did not repro. +1 (non-binding).

- ▼ O Tsz-wo Sze added a comment 02/Apr/15 22:29
 - INode.getStoragePolicyID(byte) does not throw exception for symlinks but INode.getStoragePolicyID() does. How about renaming the new method to getStoragePolicyIDNoException(byte)?
 - The indentation below is off.

```
//INodeReference
- computeQuotaUsage(summary.getBlockStoragePolicySuite(), q, false, lastSnapshotId);
- summary.getCounts().addContent(Content.DISKSPACE, q.getStorageSpace());
- summary.getCounts().addTypeSpaces(q.getTypeSpaces());
+ computeQuotaUsage(summary.getBlockStoragePolicySuite(),
+ getStoragePolicyID(), q, false, lastSnapshotId);
+ summary.getCounts().addContent(Content.DISKSPACE, q.getStorageSpace());
+ summary.getCounts().addTypeSpaces(q.getTypeSpaces());
```

Jing Zhao added a comment - 02/Apr/15 22:34

Thanks for the review, Xiaoyu and Nicholas! Update the patch to address Nicholas's comments.

- ▼ Tsz-wo Sze added a comment 02/Apr/15 23:17
 - +1 the new patch looks good.
- Hadoop QA added a comment 03/Apr/15 02:31
 - -1 overall. Here are the results of testing the latest attachment http://issues.apache.org/jira/secure/attachment/12709097/HDFS-7811.04.patch against trunk revision 16b74f9.
 - +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 failed these unit tests in hadoop-hdfs-project/hadoop-hdfs:

org. a pache. hado op. hdfs. Test Encryption Zones With KMS

Test results: https://builds.apache.org/job/PreCommit-HDFS-Build/10168//testReport/Console output: https://builds.apache.org/job/PreCommit-HDFS-Build/10168//console

This message is automatically generated.

Jing Zhao added a comment - 03/Apr/15 04:28

I've committed this to trunk, branch-2 and branch-2.7.

Hudson added a comment - 03/Apr/15 04:34

FAILURE: Integrated in Hadoop-trunk-Commit #7503 (See https://builds.apache.org/job/Hadoop-trunk-Commit/7503/)

HDFS-7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao. (jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java

- hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeSymlink.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeReference.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt

✓ ○ Hudson added a comment - 03/Apr/15 11:31

FAILURE: Integrated in Hadoop-Yarn-trunk-Java8 #152 (See https://builds.apache.org/job/Hadoop-Yarn-trunk-Java8/152/)
HDFS-7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao. (jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeSymlink.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeReference.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java

➤ O Hudson added a comment - 03/Apr/15 11:47

FAILURE: Integrated in Hadoop-Yarn-trunk #886 (See https://builds.apache.org/job/Hadoop-Yarn-trunk/886/)

HDFS 7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao. (jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

- hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeSymlink.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeReference.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt

▼ ○ Hudson added a comment - 03/Apr/15 14:41

FAILURE: Integrated in Hadoop-Hdfs-trunk-Java8 #143 (See https://builds.apache.org/job/Hadoop-Hdfs-trunk-Java8/143/) HDFS-7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao. (jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeSymlink.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeReference.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java

O Hudson added a comment - 03/Apr/15 14:46

FAILURE: Integrated in Hadoop-Hdfs-trunk #2084 (See https://builds.apache.org/job/Hadoop-Hdfs-trunk/2084/)
HDFS-7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao.

(jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/lNodeReference.java
- hadoop-hdfs-project/hadoop
 - hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeSymlink.java

Hudson added a comment - 03/Apr/15 18:16

FAILURE: Integrated in Hadoop-Mapreduce-trunk-Java8 #153 (See https://builds.apache.org/job/Hadoop-Mapreduce-trunk-Java8/153/)

HDFS-7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao. (jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/lNodeSymlink.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeReference.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java

O Hudson added a comment - 03/Apr/15 18:36

FAILURE: Integrated in Hadoop-Mapreduce-trunk #2102 (See https://builds.apache.org/job/Hadoop-Mapreduce-trunk/2102/) HDFS-7811. Avoid recursive call getStoragePolicyID in INodeFile#computeQuotaUsage. Contributed by Xiaoyu Yao and Jing Zhao. (jing9: rev 72f6bd4893dcf10d6dad24753f9be99505a87a1f)

- hadoop-hdfs-project/hadoophdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/snapshot/DirectoryWithSnapshotFeature.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeMap.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeDirectory.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeReference.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeSymlink.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/FSImage.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INodeFile.java
- hadoop-hdfs-project/hadoop-hdfs/src/main/java/org/apache/hadoop/hdfs/server/namenode/INode.java
- hadoop-hdfs-project/hadoop-hdfs/CHANGES.txt

People

Assignee:



Reporter:



Votes:

Vote for this issue

Watchers:

7 Start watching this issue

Dates

Created:

4/17/23, 5:54 PM

18/Feb/15 23:17

Updated:

16/Dec/16 13:10

Resolved:

03/Apr/15 04:28