

# Upgrading to Lucene 7.1.0

## Initial Changes

The **lucene.version** in **gradle/dependency-versions.properties** was changed:

From:

```
lucene.version = 6.4.1
```

To:

```
lucene.version = 7.1.0
```

## Compilation

With this change, compilation failed with:

```
geode/open/geode-lucene/src/main/java/org/apache/geode/cache/lucene/internal/repository/IndexRepositoryImpl.  
java:125: error: incompatible types: possible lossy conversion from long to int  
    totalHits = docs.totalHits;
```

**org.apache.lucene.search.TopDocs totalHits** changed from int to long.

That required a few changes.

**org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImpl query** was changed:

From:

```
int totalHits = 0;
```

To:

```
long totalHits = 0;
```

**org.apache.geode.cache.lucene.internal.LuceneIndexStats endRepositoryQuery** signature was changed:

From:

```
public void endRepositoryQuery(long start, final int totalHits)
```

To:

```
public void endRepositoryQuery(long start, final long totalHits) {
```

## Unit Test Execution

### Issue

**org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImplJUnitTest queryShouldUpdateStats** failed with:

```

org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImplJUnitTest > queryShouldUpdateStats FAILED
Argument(s) are different! Wanted:
    luceneIndexStats.endRepositoryQuery(
        <any long>,
        (Integer) 2
    );
-> at org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImplJUnitTest.queryShouldUpdateStats
(IndexRepositoryImplJUnitTest.java:163)
Actual invocation has different arguments:
    luceneIndexStats.endRepositoryQuery(
        0L,
        (Long) 2L
    );
-> at org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImpl.query(IndexRepositoryImpl.java:
136)
    at org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImplJUnitTest.queryShouldUpdateStats
(IndexRepositoryImplJUnitTest.java:163)

```

## Resolution

The **org.apache.geode.cache.lucene.internal.repository.IndexRepositoryImplJUnitTest queryShouldUpdateStats** test was changed:

From:

```
verify(stats, times(1)).endRepositoryQuery(anyLong(), eq(2));
```

To:

```
verify(stats, times(1)).endRepositoryQuery(anyLong(), eq(2L));
```

## Issue

Several **org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit** tests failed with the exception below including:

- luceneQueryReturnsCorrectResultsAfterClientAndServersAreRolledOver
- luceneQueryReturnsCorrectResultAfterTwoLocatorsWithTwoServersAreRolled
- luceneQueryReturnsCorrectResultsAfterServersRollOverOnPartitionRegion

```

org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit >
luceneQueryReturnsCorrectResultsAfterClientAndServersAreRolledOver[0] FAILED
    org.apache.geode.test.dunit.RMIException: While invoking org.apache.geode.cache.lucene.
LuceneSearchWithRollingUpgradeDUnit$$Lambda$204/1077331008.run in VM 2 running on Host 192.168.2.6 with 4 VMs
        at org.apache.geode.test.dunit.VM.invoke(VM.java:393)
        at org.apache.geode.test.dunit.VM.invoke(VM.java:363)
        at org.apache.geode.test.dunit.VM.invoke(VM.java:308)
        at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.verifyLuceneQueryResultInEachVM
(LuceneSearchWithRollingUpgradeDUnit.java:553)
        at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.
putSerializableObjectAndVerifyLuceneQueryResult(LuceneSearchWithRollingUpgradeDUnit.java:500)
        at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.
luceneQueryReturnsCorrectResultsAfterClientAndServersAreRolledOver(LuceneSearchWithRollingUpgradeDUnit.java:264)
    Caused by:
        java.lang.reflect.InvocationTargetException
            at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
            at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
            at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
            at java.lang.reflect.Method.invoke(Method.java:497)
            at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.verifyLuceneQueryResults
(LuceneSearchWithRollingUpgradeDUnit.java:536)
            at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.
lambda$verifyLuceneQueryResultInEachVM$b83f705c$2(LuceneSearchWithRollingUpgradeDUnit.java:553)
    Caused by:
        java.lang.IllegalArgumentException: Could not load codec 'Lucene62'. Did you forget to add lucene-
backward-codecs.jar?
    Caused by:
        java.lang.IllegalArgumentException: An SPI class of type org.apache.lucene.codecs.Codec with
name 'Lucene62' does not exist. You need to add the corresponding JAR file supporting this SPI to your
classpath. The current classpath supports the following names: [Lucene70, Asserting, CheapBastard,
FastCompressingStoredFields, FastDecompressionCompressingStoredFields, HighCompressionCompressingStoredFields,
DummyCompressingStoredFields, SimpleText]

```

## Resolution

The following line was added to **geode-lucene/build.gradle**:

```
testRuntime 'org.apache.lucene:lucene-backward-codecs:' + project.'lucene.version'
```

## Issue

**org.apache.geode.cache.lucene.internal.distributed.DistributedScoringJUnitTest uniformDistributionProducesComparableScores** failed with:

```

org.apache.geode.cache.lucene.internal.distributed.DistributedScoringJUnitTest >
uniformDistributionProducesComparableScores FAILED
    org.junit.ComparisonFailure: expected:<key-[6]> but was:<key-[5]>
        at org.junit.Assert.assertEquals(Assert.java:115)
        at org.junit.Assert.assertEquals(Assert.java:144)
        at org.apache.geode.cache.lucene.internal.distributed.DistributedScoringJUnitTest.
uniformDistributionProducesComparableScores(DistributedScoringJUnitTest.java:119)

```

## Analysis

This test compares the scores for query results from one **IndexRepositoryImpl** vs the scores for query results from three **IndexRepositoryImpls**. The test expects the ordering to be the same but its not.

In Lucene 6.4.1, logging shows the scores like:

Single IndexRepositoryImpl Result:

```
singleQueryResult=[key=key-0 score=1.8132632, key=key-3 score=1.2614386, key=key-6 score=1.0530728, key=key-5 score=1.0299048, key=key-7 score=0.63357]
```

Three IndexRepositoryImpl Result:

```
collector1QueryResult=[key=key-0 score=1.8866812]
```

```
collector2QueryResult=[key=key-3 score=1.1131656, key=key-5 score=0.5000039]
```

```
collector3QueryResult=[key=key-6 score=0.59086174, key=key-7 score=0.33355096]
```

```
mergedResult=[key=key-0 score=1.8866812, key=key-3 score=1.1131656, key=key-6 score=0.59086174, key=key-5 score=0.5000039, key=key-7 score=0.33355096]
```

In Lucene 7.1.0, logging shows the scores like:

Single IndexRepositoryImpl Result:

```
singleQueryResult=[key=key-0 score=1.9968563, key=key-3 score=1.2946333, key=key-5 score=1.1341828, key=key-6 score=1.0530728, key=key-7 score=0.73058176]
```

Three IndexRepositoryImpl Result:

```
collector1QueryResult=[key=key-0 score=2.0834162]
```

```
collector2QueryResult=[key=key-3 score=1.13994, key=key-5 score=0.5442147]
```

```
collector3QueryResult=[key=key-6 score=0.59086174, key=key-7 score=0.3901917]
```

```
mergedResult=[key=key-0 score=2.0834162, key=key-3 score=1.13994, key=key-6 score=0.59086174, key=key-5 score=0.5442147, key=key-7 score=0.3901917]
```

The difference is *key-5* and *key-6* are in different orders in the single **IndexRepositoryImpl** query vs the multiple **IndexRepositoryImpl** query.

## Issue

**org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit  
luceneQueryReturnsCorrectResultsAfterServersRollOverOnPartitionRegion** failed with:

```
[info 2017/10/18 16:14:35.167 PDT <RMI TCP Connection(1)-192.168.2.6> tid=0x13] Got result: EXCEPTION_OCCURRED
java.lang.reflect.InvocationTargetException
    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:497)
    at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.verifyLuceneQueryResults
(LuceneSearchWithRollingUpgradeDUnit.java:536)
    at org.apache.geode.cache.lucene.LuceneSearchWithRollingUpgradeDUnit.
lambda$verifyLuceneQueryResultInEachVM$b83f705c$2(LuceneSearchWithRollingUpgradeDUnit.java:553)
Caused by: org.apache.geode.InternalGemFireError: Unable to create index repository
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.lambda$computeRepository$0(AbstractPartitionedRepositoryManager.
java:118)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.lambda$35/248730969.apply(Unknown Source)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.util.concurrent.
ConcurrentHashMap.compute(ConcurrentHashMap.java:1853)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.computeRepository(AbstractPartitionedRepositoryManager.java:108)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.getRepository(AbstractPartitionedRepositoryManager.java:137)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.getRepositories(AbstractPartitionedRepositoryManager.java:91)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.distributed.LuceneQueryFunction.execute(LuceneQueryFunction.java:105)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.internal.cache.
PartitionedRegionDataStore.executeOnDataStore(PartitionedRegionDataStore.java:2911)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.internal.cache.
partitioned.PartitionedRegionFunctionStreamingMessage.operateOnPartitionedRegion
(PartitionedRegionFunctionStreamingMessage.java:98)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.internal.cache.
partitioned.PartitionMessage.process(PartitionMessage.java:332)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionMessage.scheduleAction(DistributionMessage.java:374)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
```

```
internal.DistributionMessage$1.run(DistributionMessage.java:440)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.util.concurrent.
ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1142)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.util.concurrent.
ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:617)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionManager.runUntilShutdown(DistributionManager.java:662)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionManager$9$1.run(DistributionManager.java:1108)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.lang.Thread.run(Thread.
java:745)
    at org.apache.geode.distributed.internal.ReplyException.handleAsUnexpected(ReplyException.java:89)
    at org.apache.geode.internal.cache.execute.FunctionStreamingResultCollector.
waitForCacheOrFunctionException(FunctionStreamingResultCollector.java:465)
    at org.apache.geode.internal.cache.partitioned.PRFunctionStreamingResultCollector.getResult
(PRFunctionStreamingResultCollector.java:91)
    at org.apache.geode.cache.lucene.internal.LuceneQueryImpl.findTopEntries(LuceneQueryImpl.java:121)
    at org.apache.geode.cache.lucene.internal.LuceneQueryImpl.findKeys(LuceneQueryImpl.java:69)
    ... 31 more
Caused by: org.apache.lucene.index.IndexFormatTooNewException: Format version is not supported (resource
BufferedChecksumIndexInput(segments_2)): 7 (needs to be between 4 and 6)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.lucene.codecs.
CodecUtil.checkHeaderNoMagic(CodecUtil.java:216)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.lucene.index.
SegmentInfos.readCommit(SegmentInfos.java:302)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.lucene.index.
SegmentInfos.readCommit(SegmentInfos.java:286)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.lucene.index.
IndexWriter.<init>(IndexWriter.java:938)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.IndexRepositoryFactory.computeIndexRepository(IndexRepositoryFactory.java:84)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.PartitionedRepositoryManager.computeRepository(PartitionedRepositoryManager.java:42)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.lambda$computeRepository$0(AbstractPartitionedRepositoryManager.
java:116)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager$$Lambda$35/248730969.apply(Unknown Source)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.util.concurrent.
ConcurrentHashMap.compute(ConcurrentHashMap.java:1853)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.computeRepository(AbstractPartitionedRepositoryManager.java:108)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.getRepository(AbstractPartitionedRepositoryManager.java:137)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.AbstractPartitionedRepositoryManager.getRepositories(AbstractPartitionedRepositoryManager.java:91)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.cache.lucene.
internal.distributed.LuceneQueryFunction.execute(LuceneQueryFunction.java:105)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.internal.cache.
PartitionedRegionDataStore.executeOnDataStore(PartitionedRegionDataStore.java:2911)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.internal.cache.
partitioned.PartitionedRegionFunctionStreamingMessage.operateOnPartitionedRegion
(PartitionedRegionFunctionStreamingMessage.java:98)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.internal.cache.
partitioned.PartitionMessage.process(PartitionMessage.java:332)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionMessage.scheduleAction(DistributionMessage.java:374)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionMessage$1.run(DistributionMessage.java:440)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.util.concurrent.
ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1142)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.util.concurrent.
ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:617)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionManager.runUntilShutdown(DistributionManager.java:662)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in org.apache.geode.distributed.
internal.DistributionManager$9$1.run(DistributionManager.java:1108)
    at Remote Member '192.168.2.6(57006)<v3>:32773(version:GEODE 1.2.0)' in java.lang.Thread.run(Thread.
java:745)
```

## Analysis

This test does not fail every time.

The test:

- creates a **LuceneIndex** in 3 servers on older version servers
- rolls each server one at a time and:
  - creates the region
  - executes a query
  - verifies the results

The **LuceneQueryImpl.findKeys** method causes **LuceneQueryFunction** to be invoked in an older member. That older member tries to create an **IndexWriter** and fails.

The exception in the older member is:

```
[vm2_v120] [info 2017/10/25 16:33:49.576 PDT <Pooled Waiting Message Processor 7> tid=0x78] Exception thrown
while constructing Lucene Index for bucket:53 for file region:/__PR/_B__index#__aRegion.files_53
[vm2_v120] [warn 2017/10/25 16:33:49.577 PDT <Pooled Waiting Message Processor 7> tid=0x78] Task failed with
exception
[vm2_v120] org.apache.geode.InternalGemFireError: Unable to create index repository
[vm2_v120]     at org.apache.geode.cache.lucene.internal.AbstractPartitionedRepositoryManager.
lambda$computeRepository$0(AbstractPartitionedRepositoryManager.java:118)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.AbstractPartitionedRepositoryManager$$Lambda$35
/1749028657.apply(Unknown Source)
[vm2_v120]     at java.util.concurrent.ConcurrentHashMap.compute(ConcurrentHashMap.java:1853)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.AbstractPartitionedRepositoryManager.
computeRepository(AbstractPartitionedRepositoryManager.java:108)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.LuceneBucketListener.lambda$afterPrimary$0
(LuceneBucketListener.java:40)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.LuceneBucketListener$$Lambda$34/1771106111.run
(Unknown Source)
[vm2_v120]     at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1142)
[vm2_v120]     at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:617)
[vm2_v120]     at org.apache.geode.distributed.internal.DistributionManager.runUntilShutdown
(DistributionManager.java:662)
[vm2_v120]     at org.apache.geode.distributed.internal.DistributionManager$6$1.run(DistributionManager.
java:989)
[vm2_v120]     at java.lang.Thread.run(Thread.java:745)
[vm2_v120] Caused by: org.apache.lucene.index.IndexFormatTooNewException: Format version is not supported
(resource BufferedChecksumIndexInput(segments_2)): 7 (needs to be between 4 and 6)
[vm2_v120]     at org.apache.lucene.codecs.CodecUtil.checkHeaderNoMagic(CodecUtil.java:216)
[vm2_v120]     at org.apache.lucene.index.SegmentInfos.readCommit(SegmentInfos.java:302)
[vm2_v120]     at org.apache.lucene.index.SegmentInfos.readCommit(SegmentInfos.java:286)
[vm2_v120]     at org.apache.lucene.index.IndexWriter.<init>(IndexWriter.java:938)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.IndexRepositoryFactory.computeIndexRepository
(IndexRepositoryFactory.java:84)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.PartitionedRepositoryManager.computeRepository
(PartitionedRepositoryManager.java:42)
[vm2_v120]     at org.apache.geode.cache.lucene.internal.AbstractPartitionedRepositoryManager.
lambda$computeRepository$0(AbstractPartitionedRepositoryManager.java:116)
[vm2_v120]     ... 10 more
```

The **SegmentInfos.readCommit** method is reading an int from a **FileIndexInput** which is gotten from **RegionDirectory.openInput**:

```
public IndexInput openInput(String name, IOContext context) throws IOException {
    ensureOpen();
    final File file = fs.getFile(name);
    return new FileIndexInput(name, file);
}
```

The **FileSystem.getFile** method does a get on the **fileAndChunkRegion**:

```
final File file = (File) fileAndChunkRegion.get(name);
```

I'm not sure which **File** is being requested but all of the activity on that bucket is from current version vm0:

```

[vm0] [warn 2017/10/25 16:33:37.613 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.fdx
[vm0] [warn 2017/10/25 16:33:37.620 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.fdt
[vm0] [warn 2017/10/25 16:33:37.672 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.nvd
[vm0] [warn 2017/10/25 16:33:37.682 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.nvm
[vm0] [warn 2017/10/25 16:33:37.697 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.nvd
[vm0] [warn 2017/10/25 16:33:37.699 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.nvm
[vm0] [warn 2017/10/25 16:33:37.703 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.fdt
[vm0] [warn 2017/10/25 16:33:37.706 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.fdx
[vm0] [warn 2017/10/25 16:33:37.708 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1_Lucene50_0.doc
[vm0] [warn 2017/10/25 16:33:37.711 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1_Lucene50_0.pos
[vm0] [warn 2017/10/25 16:33:37.714 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1_Lucene50_0.tim
[vm0] [warn 2017/10/25 16:33:37.717 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1_Lucene50_0.tip
[vm0] [warn 2017/10/25 16:33:37.721 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1_Lucene50_0.tim
[vm0] [warn 2017/10/25 16:33:37.724 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1_Lucene50_0.tip
[vm0] [warn 2017/10/25 16:33:37.725 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1_Lucene50_0.doc
[vm0] [warn 2017/10/25 16:33:37.729 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1_Lucene50_0.pos
[vm0] [warn 2017/10/25 16:33:37.730 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.fnm
[vm0] [warn 2017/10/25 16:33:37.733 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.fnm
[vm0] [warn 2017/10/25 16:33:37.737 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.cfs
[vm0] [warn 2017/10/25 16:33:37.739 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.cfe
[vm0] [warn 2017/10/25 16:33:37.750 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.cfe
[vm0] [warn 2017/10/25 16:33:37.752 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.cfs
[vm0] [warn 2017/10/25 16:33:37.754 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=_1.si
[vm0] [warn 2017/10/25 16:33:37.758 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=_1.si
[vm0] [warn 2017/10/25 16:33:37.778 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.createFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=pending_segments_2
[vm0] [warn 2017/10/25 16:33:37.788 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=pending_segments_2
[vm0] [warn 2017/10/25 16:33:37.789 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.renameFile fileAndChunkRegion=_B_index#_aRegion.files_53; source=pending_segments_2
[vm0] [warn 2017/10/25 16:33:37.790 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.updateFile fileAndChunkRegion=_B_index#_aRegion.files_53; key=pending_segments_2
[vm0] [warn 2017/10/25 16:33:37.792 PDT <Event Processor for GatewaySender_AsyncEventQueue_index#_aRegion_3>
tid=0x5a] FileSystem.putIfAbsentFile fileAndChunkRegion=_B_index#_aRegion.files_53; name=segments_2

```

So, it looks like a newer version server with Lucene 7 puts a **File** into the **fileAndChunkRegion**, and an older version server with Lucene 6 gets it out and attempts to read it unsuccessfully.

I added the **luceneQueryReturnsCorrectResultsAfterClientAndServersAreRolledOverAllBucketsCreated** test to **LuceneSearchWithRollingUpgrade DUnit** that reproduces this issue every time.

The main sequence in this test that causes the failure is:

1. start two servers with old version using Lucene 6
2. roll one server to new version server using Lucene 7
3. do puts into primary buckets in new server which creates entries in the fileAndChunk region with Lucene 7 format

4. stop the new version server which causes the old version server to become primary for those buckets
5. do a query which causes the IndexFormatTooNewException to be thrown

## Hydra Test Execution

The **lucene.bt** and **backwardCompatibilityLucene.bt** had only 1 hung test which I don't think was related to Lucene 7.x.

lucene/serialParReg.conf	P	00:11:14	closed/pivotalgf-assembly/build
/hydraTest/serialParReg-1023-192645			
lucene/concParReg.conf	P	00:24:33	closed/pivotalgf-assembly/build
/hydraTest/concParReg-1023-193804			
lucene/serialParRegPersist.conf	P	00:15:20	closed/pivotalgf-assembly/build
/hydraTest/serialParRegPersist-1023-200244			
lucene/serialParRegIncremental.conf	P	00:10:49	closed/pivotalgf-assembly/build
/hydraTest/serialParRegIncremental-1023-201809			
lucene/concParRegPersist.conf	P	00:22:47	closed/pivotalgf-assembly/build
/hydraTest/concParRegPersist-1023-202902			
lucene/concParRegIncremental.conf	P	00:12:30	closed/pivotalgf-assembly/build
/hydraTest/concParRegIncremental-1023-205153			
lucene/concParRegBridge.conf	P	00:25:06	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridge-1023-210430			
lucene/concParRegBridge.conf	P	00:25:05	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridge-1023-212942			
lucene/concParRegBridge.conf	P	00:25:46	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridge-1023-215452			
lucene/concParRegBridge.conf	P	00:23:51	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridge-1023-222043			
lucene/concParRegBridgePersist.conf	P	00:24:18	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridgePersist-1023-224441			
lucene/concParRegBridgePersist.conf	P	00:23:09	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridgePersist-1023-230905			
lucene/concParRegBridgePersist.conf	P	00:22:24	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridgePersist-1023-233220			
lucene/concParRegBridgePersist.conf	P	00:22:15	closed/pivotalgf-assembly/build
/hydraTest/concParRegBridgePersist-1023-235449			
lucene/serialParRegHA.conf	P	00:10:56	closed/pivotalgf-assembly/build
/hydraTest/serialParRegHA-1024-001710			
lucene/concParRegHA.conf	P	00:32:02	closed/pivotalgf-assembly/build
/hydraTest/concParRegHA-1024-002811			
lucene/serialParRegHA.conf	P	00:11:25	closed/pivotalgf-assembly/build
/hydraTest/serialParRegHA-1024-010017			
lucene/concParRegHA.conf	P	00:32:37	closed/pivotalgf-assembly/build
/hydraTest/concParRegHA-1024-011147			
lucene/serialParRegHAPersist.conf	P	00:13:38	closed/pivotalgf-assembly/build
/hydraTest/serialParRegHAPersist-1024-014428			
lucene/serialParRegHAPersist.conf	P	00:13:36	closed/pivotalgf-assembly/build
/hydraTest/serialParRegHAPersist-1024-015811			
lucene/concParRegHAPersist.conf	P	00:19:42	closed/pivotalgf-assembly/build
/hydraTest/concParRegHAPersist-1024-021152			
lucene/concParRegHAPersist.conf	P	00:20:06	closed/pivotalgf-assembly/build
/hydraTest/concParRegHAPersist-1024-023138			
lucene/concParRegHABridge.conf	P	00:34:45	closed/pivotalgf-assembly/build
/hydraTest/concParRegHABridge-1024-025150			
lucene/concParRegHABridge.conf	P	00:33:29	closed/pivotalgf-assembly/build
/hydraTest/concParRegHABridge-1024-032640			
lucene/concParRegHABridge.conf	P	00:33:07	closed/pivotalgf-assembly/build
/hydraTest/concParRegHABridge-1024-040015			
lucene/concParRegHABridge.conf	P	00:33:54	closed/pivotalgf-assembly/build
/hydraTest/concParRegHABridge-1024-043328			
lucene/concParRegHABridgePersist.conf	P	00:21:58	closed/pivotalgf-assembly/build
/hydraTest/concParRegHABridgePersist-1024-050729			
lucene/concParRegHABridgePersist.conf	P	00:21:55	closed/pivotalgf-assembly/build
/hydraTest/concParRegHABridgePersist-1024-052931			
lucene/concParRegRecover.conf	P	00:13:42	closed/pivotalgf-assembly/build
/hydraTest/concParRegRecover-1024-055135			
lucene/concParRegRecover.conf	P	00:15:49	closed/pivotalgf-assembly/build
/hydraTest/concParRegRecover-1024-060521			
lucene/concParRegRecover.conf	P	00:14:59	closed/pivotalgf-assembly/build
/hydraTest/concParRegRecover-1024-062115			
lucene/luceneQueriesWithRebalance.conf	P	00:06:02	closed/pivotalgf-assembly/build



/hydraTest/luceneQueriesWithRebalance-1024-063618				
lucene/luceneQueriesWithRebalance.conf	P	00:06:53	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithRebalance-1024-064226				
lucene/luceneQueriesWithRebalancePersist.conf	P	00:11:01	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithRebalancePersist-1024-064923				
lucene/luceneQueriesWithRebalancePersist.conf	P	00:09:16	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithRebalancePersist-1024-070030				
lucene/luceneQueriesWithHA.conf	P	00:12:03	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHA-1024-070951				
lucene/luceneQueriesWithHA.conf	H	00:16:37	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHA-1024-072200				
lucene/luceneQueriesWithHA.conf	P	00:12:38	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHA-1024-073844				
lucene/luceneQueriesWithHA.conf	P	00:12:56	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHA-1024-075128				
lucene/luceneQueriesWithHA.conf	P	00:13:05	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHA-1024-080428				
lucene/luceneQueriesWithHAPersist.conf	P	00:14:38	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHAPersist-1024-081740				
lucene/luceneQueriesWithHAPersist.conf	P	00:15:38	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHAPersist-1024-083223				
lucene/luceneQueriesWithHAPersist.conf	P	00:15:51	closed/pivotalgf-assembly/build	
/hydraTest/luceneQueriesWithHAPersist-1024-084807				
lucene/concDestroyIndex.conf	P	00:12:10	closed/pivotalgf-assembly/build	
/hydraTest/concDestroyIndex-1024-090403				
lucene/backwardCompatibility/concParRegBridge.conf	P	00:25:50	closed/pivotalgf-assembly/build	
/hydraTest/concParRegBridge-1024-091618				
lucene/backwardCompatibility/concParRegBridge.conf	P	00:25:09	closed/pivotalgf-assembly/build	
/hydraTest/concParRegBridge-1024-094213				
lucene/backwardCompatibility/concParRegBridgePersist.conf	P	00:23:35	closed/pivotalgf-assembly/build	
/hydraTest/concParRegBridgePersist-1024-100726				
lucene/backwardCompatibility/concParRegBridgePersist.conf	P	00:24:43	closed/pivotalgf-assembly/build	
/hydraTest/concParRegBridgePersist-1024-103106				
lucene/backwardCompatibility/concParRegHABridge.conf	P	00:33:06	closed/pivotalgf-assembly/build	
/hydraTest/concParRegHABridge-1024-105556				
lucene/backwardCompatibility/concParRegHABridgePersist.conf	P	00:21:18	closed/pivotalgf-assembly/build	
/hydraTest/concParRegHABridgePersist-1024-112907				

The **errors.txt** file contained:

```

THREAD vm_0_thr_7_accessor1_mclaren_11724 Subthread Dynamic Client VM Stopper
HANG Timeout during dynamic action: Failed to stop vm_3 within 300 seconds
hydra.HydraTimeoutException: Failed to stop vm_3 within 300 seconds
    at hydra.ClientMgr.killClientVm(ClientMgr.java:969)
    at hydra.ClientMgr.stopClientVm(ClientMgr.java:819)
    at hydra.ClientMgr._stopClientVm(ClientMgr.java:761)
    at hydra.ClientMgr$2.run(ClientMgr.java:720)
    at java.lang.Thread.run(Thread.java:745)
-----

```

The thread dump contained these two threads that look interesting:

```
"vm_0_thr_7_accessor1_mclaren_11724 Subthread" #7932 daemon prio=5 os_prio=0 tid=0x00007fd5e0003800 nid=0x2c56
in Object.wait() [0x00007fd6f2aeb000]
  java.lang.Thread.State: WAITING (on object monitor)
    at java.lang.Object.wait(Native Method)
    at java.lang.Object.wait(Object.java:502)
    at hydra.DynamicActionUtil.waitForDynamicActionToComplete(DynamicActionUtil.java:79)
    - locked <0x00000000ec1b8740> (a hydra.DynamicActionUtil$PidSignal)
    at hydra.DynamicActionUtil.runActionThread(DynamicActionUtil.java:53)
    at hydra.ClientVmMgr.reserveAndStop(ClientVmMgr.java:567)
    at hydra.ClientVmMgr.stop(ClientVmMgr.java:534)
    at hydra.ClientVmMgr.stop(ClientVmMgr.java:390)
    at util.StopStartVMs.run(StopStartVMs.java:86)
    at java.lang.Thread.run(Thread.java:745)

"vm_0_thr_7_accessor1_mclaren_11724" #7928 daemon prio=5 os_prio=0 tid=0x00007fd6f8006000 nid=0x2c47 in Object.
wait() [0x00007fd74962f000]
  java.lang.Thread.State: WAITING (on object monitor)
    at java.lang.Object.wait(Native Method)
    at java.lang.Thread.join(Thread.java:1245)
    - locked <0x00000000ec1bb1b0> (a hydra.HydraSubthread)
    at java.lang.Thread.join(Thread.java:1319)
    at util.StopStartVMs.joinStopStart(StopStartVMs.java:400)
    at util.StopStartVMs.stopStartVMs(StopStartVMs.java:307)
    at parReg.ParRegTest.cycleVMsNoWait(ParRegTest.java:5029)
    at lucene.LuceneTest.stopStartVMs(LuceneTest.java:641)
    at lucene.LuceneTest.HydraTask_stopStartVMs(LuceneTest.java:637)
    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:497)
    at hydra.MethExecutor.execute(MethExecutor.java:182)
    at hydra.MethExecutor.execute(MethExecutor.java:150)
    at hydra.TestTask.execute(TestTask.java:191)
    at hydra.RemoteTestModule$1.run(RemoteTestModule.java:212)
```