RESOLVED

3.2.0, 3.1.1, 2.10.1

Fixed



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

Status:

Resolution:

Fix Version/s:



Hadoop YARN / YARN-8459

# Improve Capacity Scheduler logs to debug invalid states

#### Details

Priority: 

Major

Affects Version/s: 3.1.0

Component/s: capacity scheduler

Labels: None
Target Version/s: 3.1.1
Hadoop Flags: Reviewed

### Description

Improve logs in CS to better debug invalid states

#### Attachments

	17 kB	26/Jun/18 00:02
	17 kB	27/Jun/18 02:25
YARN-8459.003.patch	3 kB	27/Jun/18 19:47
	11 kB	02/Jul/18 17:46
	12 kB	07/Aug/20 20:42

#### Activity

■ Wangda Tan added a comment - 26/Jun/18 00:04

Attached ver.1 patch to run Jenkins, I felt it might be not straightforward to add tests. We need a lot of mock. I'm thinking to add a chaosmonkey-like UT to just randomly start/stop nodes/apps. We should be able to get some interesting results from that.

Will update ver.2 patch with tests.

cc: sunil.govind@gmail.com, Tao Yang, cheersyang.

genericqa added a comment - 26/Jun/18 02:10



Vote	Subsystem	Runtime	Comment
0	reexec	0m 29s	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	24m 15s	trunk passed
+1	compile	0m 37s	trunk passed
+1	checkstyle	0m 11s	trunk passed
+1	mvnsite	0m 40s	trunk passed
+1	shadedclient	10m 23s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 0s	trunk passed
+1	javadoc	0m 26s	trunk passed
			Potah Compile Toeta

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) I IVI			[171K1V-0437] Improve Capacity Scheduler logs to debug invalid states - 7351 31K7
			Paten Compile Tests
+1	mvninstall	0m 39s	the patch passed
+1	compile	0m 36s	the patch passed
+1	javac	0m 36s	the patch passed
+1	checkstyle	0m 10s	the patch passed
+1	mvnsite	0m 39s	the patch passed
+1	whitespace	0m 1s	The patch has no whitespace issues.
+1	shadedclient	11m 12s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 12s	the patch passed
+1	javadoc	0m 22s	the patch passed
			Other Tests
-1	unit	72m 28s	hadoop-yarn-server-resourcemanager in the patch failed.
+1	asflicense	0m 18s	The patch does not generate ASF License warnings.
		125m 48s	

Reason	Tests
Failed junit tests	hadoop. yarn. server. resource manager. applications manager. Test AMR est artification of the control of the

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:abb62dd
JIRA Issue	<del>YARN 8459</del>
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12929112/YARN-8459.001.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux 02b0c0fa91df 4.4.0-89-generic #112-Ubuntu SMP Mon Jul 31 19:38:41 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / 7a3c6e9
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_171
findbugs	v3.1.0-RC1
unit	https://builds.apache.org/job/PreCommit-YARN-Build/21102/artifact/out/patch-unit-hadoop-yarn-project_hadoop-yarn_hadoop-yarn-server_hadoop-yarn-server-resourcemanager.txt
Test Results	https://builds.apache.org/job/PreCommit-YARN-Build/21102/testReport/
Max. process+thread count	935 (vs. ulimit of 10000)
modules	C: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager U: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager
Console output	https://builds.apache.org/job/PreCommit-YARN-Build/21102/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

### ➤ ○ Weiwei Yang added a comment - 26/Jun/18 06:15

# Hi leftnoteasy

Both CapacityScheduler#removeNode and CapacityScheduler#doneApplicationAttempt remove all reservations of the node/app. Do you mean this issue happens because the allocation thread is reading a stale info of app/node? Instead of adding a stop flag, can we check if node/app is still valid while doing the reserve/allocate?

Sunil G added a comment - 26/Jun/18 17:38

Hi leftnoteasy and cheersyang

This issue happens as doneApplicationAttempt is in CS lock but reserve containers can be done w/o this lock. Its a race condition however we can handle this by this new flag as this flag is used within the context of app/node.

One comment here, could this is Stopping flag be volatile?

Wangda Tan added a comment - 26/Jun/18 17:51

#### cheersyang,

According to our current locking design of CapacityScheduler:

- 1) Add/remove node/app requires CS lock.
- 2) Allocate/release container acquires app/node/queue lock only for better performance.

The simplest solution is to put allocate/release container under CS lock, but it will cause performance regression. Adding a stopping flag to app/node seems like cleanest solution in my mind, please share if you have any better idea.

#### sunilg,

My intention is to put the setStopping under app/node lock instead of using volatile. We don't want a node is allocating container but the other thread is trying to remove the node.

Sunil G added a comment - 26/Jun/18 22:17

Thanks leftnoteasy

This makes sense to me. Some comments

- 1. In FiCaSchedulerApp#accept call if (isStopping) is missing a return statement.
- 2. If node.reserveResource is failing, is it completed needed to call internalUnReserve?
- Wangda Tan added a comment 27/Jun/18 02:26

Thanks sunilg,

 ${\tt Addressed~\#1.~For~\#2, it~is~required~since~we~need~to~revert~changes~in~previous~commonReserve.}$ 

Weiwei Yang added a comment - 27/Jun/18 02:29

Hi leftnoteasy, sunilg

 $\hbox{c. Reserve on node operation finished after app\_1\ removed\ (done Application Attempt)}.$ 

Do we have a check in commit phase to make sure a reservation only can be made for a valid app and on a valid node? Allocate may make invalid proposals as it is not holding the CS lock, but we could reject it in commit phase, can we?

genericqa added a comment - 27/Jun/18 05:08



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 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	24m 3s	trunk passed
+1	compile	0m 40s	trunk passed
+1	checkstyle	0m 14s	trunk passed
+1	mvnsite	0m 43s	trunk passed
+1	shadedclient	10m 57s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 6s	trunk passed

+1	javadoc	0m 26s	trunk passed
			Patch Compile Tests
+1	mvninstall	0m 41s	the patch passed
+1	compile	0m 37s	the patch passed
+1	javac	0m 37s	the patch passed
+1	checkstyle	0m 9s	the patch passed
+1	mvnsite	0m 39s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	11m 6s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 10s	the patch passed
+1	javadoc	0m 25s	the patch passed
			Other Tests
+1	unit	68m 37s	hadoop-yarn-server-resourcemanager in the patch passed.
+1	asflicense	0m 21s	The patch does not generate ASF License warnings.
		122m 28s	

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:abb62dd
JIRA Issue	<del>YARN-8459</del>
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12929311/YARN-8459.002.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux bc6b5718491b 4.4.0-89-generic #112-Ubuntu SMP Mon Jul 31 19:38:41 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / bedc4fe
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_171
findbugs	v3.1.0-RC1
Test Results	https://builds.apache.org/job/PreCommit-YARN-Build/21125/testReport/
Max. process+thread count	950 (vs. ulimit of 10000)
modules	C: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager U: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/resourcemanager
Console output	https://builds.apache.org/job/PreCommit-YARN-Build/21125/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

➤ ○ Wangda Tan added a comment - 27/Jun/18 19:50

### cheersyang,

I come back to check the logic, this should not happen ..

Basically, all tryCommit / doneAppAttempt / removeNode holds CS write lock. I took some time but could not get the root cause. Logs are rolled so I cannot see the initial state as well. I just converted this JIRA to fix logs, and downgrade to critical.

cc: gopalv.

genericqa added a comment - 27/Jun/18 22:20

-1 overall

Vote	Subsystem	Runtime	Comment
0	reexec	0m 21s	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	31m 8s	trunk passed
+1	compile	0m 41s	trunk passed
+1	checkstyle	0m 13s	trunk passed
+1	mvnsite	0m 44s	trunk passed
+1	shadedclient	11m 41s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 12s	trunk passed
+1	javadoc	0m 28s	trunk passed
			Patch Compile Tests
+1	mvninstall	0m 45s	the patch passed
+1	compile	0m 42s	the patch passed
+1	javac	0m 42s	the patch passed
+1	checkstyle	0m 9s	the patch passed
+1	mvnsite	0m 43s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	12m 3s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 21s	the patch passed
+1	javadoc	0m 27s	the patch passed
			Other Tests
+1	unit	68m 42s	hadoop-yarn-server-resourcemanager in the patch passed.
+1	asflicense	0m 26s	The patch does not generate ASF License warnings.
		131m 51s	

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:abb62dd
JIRA Issue	<del>YARN-8459</del>
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12929466/YARN-8459.003.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux 0d747a8d8430 3.13.0-137-generic #186-Ubuntu SMP Mon Dec 4 19:09:19 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / aaf03cc
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_171
findbugs	v3.1.0-RC1
Test Results	https://builds.apache.org/job/PreCommit-YARN-Build/21133/testReport/
Max. process+thread count	940 (vs. ulimit of 10000)
modules	C: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager U: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server-resourcemanager
Console output	https://builds.apache.org/job/PreCommit-YARN-Build/21133/console

Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org	
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- ✓ Weiwei Yang added a comment 28/Jun/18 01:43
  - +1 to v3 patch, that helps to narrow down the issue, thanks leftnoteasy.
- Bibin Chundatt added a comment 28/Jun/18 14:54

leftnoteasy

Can we remove the CapacityScheduler#allocate

```
LOG.info("Allocation for application " + applicationAttemptId + " : " + allocation + " with cluster resource : " + getClusterResource());
```

Observed in one of cluster seems to be flooding the logs .. Since its printed even of allocation is empty.. thoughts?

■ O Wangda Tan added a comment - 30/Jun/18 04:40

Thanks bibinchundatt,

Can we move this to the YARN 8471? There're whole bunch of logs we need to remove when no new allocation/reservation happens.

Tao Yang added a comment - 02/Jul/18 09:55

Hi, leftnoteasy.

Can we improve the skip queue log in ParentQueue#assignContainers? In async-scheduling mode, there are too many such debug logs (thousands every second) and may generate several new log files every minute when there is no pending request on the root queue. I think this log can be printed at periodic intervals.

■ Wangda Tan added a comment - 02/Jul/18 17:48

Attached patch (004) which moved re-reservation to debug log, and addressed comments from bibinchundatt / Tao Yang.

Please review and let me know your thoughts.

genericqa added a comment - 02/Jul/18 19:54

x -1 overall

Vote	Subsystem	Runtime	Comment
0	reexec	0m 25s	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	24m 4s	trunk passed
+1	compile	0m 40s	trunk passed
+1	checkstyle	0m 15s	trunk passed
+1	mvnsite	0m 43s	trunk passed
+1	shadedclient	11m 5s	branch has no errors when building and testing our client artifacts.
+1	findbugs	1m 7s	trunk passed

+1	javadoc	0m 27s	trunk passed
			Patch Compile Tests
+1	mvninstall	0m 41s	the patch passed
+1	compile	0m 37s	the patch passed
+1	javac	0m 37s	the patch passed
+1	checkstyle	0m 10s	the patch passed
+1	mvnsite	0m 40s	the patch passed
+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	shadedclient	11m 18s	patch has no errors when building and testing our client artifacts.
+1	findbugs	1m 15s	the patch passed
+1	javadoc	0m 24s	the patch passed
			Other Tests
+1	unit	69m 55s	hadoop-yarn-server-resourcemanager in the patch passed.
+1	asflicense	0m 18s	The patch does not generate ASF License warnings.
		124m	
		14s	

Subsystem	Report/Notes
Docker	Client=17.05.0-ce Server=17.05.0-ce Image:yetus/hadoop:abb62dd
JIRA Issue	<del>YARN 8459</del>
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/12929980/YARN-8459.004.patch
Optional Tests	asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux ed01fc5eb0c8 4.4.0-64-generic #85-Ubuntu SMP Mon Feb 20 11:50:30 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	/testptch/patchprocess/precommit/personality/provided.sh
git revision	trunk / 1804a31
maven	version: Apache Maven 3.3.9
Default Java	1.8.0_171
findbugs	v3.1.0-RC1
Test Results	https://builds.apache.org/job/PreCommit-YARN-Build/21163/testReport/
Max. process+thread count	920 (vs. ulimit of 10000)
modules	C: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager U: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server-resourcemanager
Console output	https://builds.apache.org/job/PreCommit-YARN-Build/21163/console
Powered by	Apache Yetus 0.8.0-SNAPSHOT http://yetus.apache.org

# ▼ ○ Sunil G added a comment - 02/Jul/18 20:31

Thanks leftnoteasy. Latest change seems fine. It covers the case mentioned by Tao Yang

I will commit this patch by end of day if no other objections.

# Sunil G added a comment - 03/Jul/18 17:02

Thanks leftnoteasy for the patch and reviews from Tao Yang cheersyang bibinchundatt for reviews. I committed this to trunk and branch-3.1. However patch is not getting applied to branch-3.0.

leftnoteasy is this patch targeted for 3.0?

➤ ○ Hudson added a comment - 03/Jul/18 17:23

SUCCESS: Integrated in Jenkins build Hadoop-trunk-Commit #14520 (See https://builds.apache.org/job/Hadoop-trunk-Commit/14520/) YARN 8459. Improve Capacity Scheduler logs to debug invalid states. (sunilg: rev 51654a3962bcd0482c0e1dd32765e9533e3f9158)

- (edit) hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/common/fica/FiCaSchedulerApp.java
- (edit) hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/capacity/CapacityScheduler.java
- (edit) hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/capacity/ParentQueue.java
- (edit) hadoop-yarn-project/hadoop-yarn/hadoop-yarn/server/hadoop-yarn-serverresourcemanager/src/main/java/org/apache/hadoop/yarn/server/resourcemanager/scheduler/capacity/allocator/AbstractContainerAllocator.java
- ✓ O Jim Brennan added a comment 04/Aug/20 20:11

leftnoteasy, I have uploaded a patch for branch-2.10, there were just a few minor changes needed. We have a similar change in our internal branch, but I was hoping we could pull this one back to bring our code closer to community. The improved logging messages would be good to have. Any concerns with pulling this back to branch-2.10?

Jim Brennan added a comment - 06/Aug/20 15:53

epayne any concerns with pulling this back to branch-2.10?

Jim Brennan added a comment - 07/Aug/20 20:42

Reopening so I can run precommit tests on branch-2.10 patch.

Hadoop QA added a comment - 07/Aug/20 22:31

x -1 overall

Vote	Subsystem	Runtime	Comment
0	reexec	12m 32s	Docker mode activated.
			Prechecks
+1	dupname	0m 0s	No case conflicting files found.
+1	@author	0m 0s	The patch does not contain any @author tags.
-1	test4tests	Om Os	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.
			branch-2.10 Compile Tests
+1	mvninstall	10m 17s	branch-2.10 passed
+1	compile	0m 52s	branch-2.10 passed with JDK Oracle Corporation-1.7.0_95-b00
+1	compile	0m 44s	branch-2.10 passed with JDK Private Build-1.8.0_265-8u265-b01-0ubuntu2~16.04-b01
+1	checkstyle	0m 31s	branch-2.10 passed
+1	mvnsite	0m 48s	branch-2.10 passed
+1	javadoc	0m 38s	branch-2.10 passed with JDK Oracle Corporation-1.7.0_95-b00
+1	javadoc	0m 29s	branch-2.10 passed with JDK Private Build-1.8.0_265-8u265-b01-0ubuntu2~16.04-b01
0	spotbugs	1m 35s	Used deprecated FindBugs config; considering switching to SpotBugs.
+1	findbugs	1m 32s	branch-2.10 passed
			Patch Compile Tests
+1	mvninstall	0m 42s	the patch passed
+1	compile	0m 47s	the patch passed with JDK Oracle Corporation-1.7.0_95-b00
+1	javac	0m 47s	the patch passed
+1	compile	0m 38s	the patch passed with JDK Private Build-1.8.0_265-8u265-b01-0ubuntu2~16.04-b01
+1	javac	0m 38s	the patch passed
-0	checkstyle	0m 26s	hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager: The patch generated 1 new + 124 unchanged - 1 fixed = 125 total (was 125)
+1	mvnsite	0m 47s	the patch passed

+1	whitespace	0m 0s	The patch has no whitespace issues.
+1	javadoc	0m 32s	the patch passed with JDK Oracle Corporation-1.7.0_95-b00
+1	javadoc	0m 26s	the patch passed with JDK Private Build-1.8.0_265-8u265-b01-0ubuntu2~16.04-b01
+1	findbugs	1m 36s	the patch passed
			Other Tests
+1	unit	65m 49s	hadoop-yarn-server-resourcemanager in the patch passed.
+1	asflicense	0m 26s	The patch does not generate ASF License warnings.
		102m 33s	

Subsystem	Report/Notes
Docker	ClientAPI=1.40 ServerAPI=1.40 base: https://ci-hadoop.apache.org/job/PreCommit-YARN-Build/61/artifact/out/Dockerfile
JIRA Issue	<del>YARN 8459</del>
JIRA Patch URL	https://issues.apache.org/jira/secure/attachment/13009305/YARN-8459-branch-2.10.001.patch
Optional Tests	dupname asflicense compile javac javadoc mvninstall mvnsite unit shadedclient findbugs checkstyle
uname	Linux 2c8a3510031c 4.15.0-60-generic #67-Ubuntu SMP Thu Aug 22 16:55:30 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux
Build tool	maven
Personality	personality/hadoop.sh
git revision	branch-2.10 / 120cd9e
Default Java	Private Build-1.8.0_265-8u265-b01-0ubuntu2~16.04-b01
Multi-JDK versions	/usr/lib/jvm/java-7-openjdk-amd64:Oracle Corporation-1.7.0_95-b00 /usr/lib/jvm/java-8-openjdk-amd64:Private Build-1.8.0_265-8u265-b01-0ubuntu2~16.04-b01
checkstyle	https://ci-hadoop.apache.org/job/PreCommit-YARN-Build/61/artifact/out/diff-checkstyle-hadoop-yarn-project_hadoop-yarn_hadoop-yarn-server_hadoop-yarn-server-resourcemanager.txt
Test Results	https://ci-hadoop.apache.org/job/PreCommit-YARN-Build/61/testReport/
Max. process+thread count	863 (vs. ulimit of 5500)
modules	C: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager U: hadoop-yarn-project/hadoop-yarn/hadoop-yarn-server/hadoop-yarn-server-resourcemanager
Console output	https://ci-hadoop.apache.org/job/PreCommit-YARN-Build/61/console
versions	git=2.7.4 maven=3.3.9 findbugs=3.0.1
Powered by	Apache Yetus 0.13.0-SNAPSHOT https://yetus.apache.org

➤ ○ Eric Payne added a comment - 10/Aug/20 20:36

Thanks Jim\_Brennan for the updated patch. Yes, I think we should pull this back to 2.10. I will do so this afternoon.

▼ ○ Eric Payne added a comment - 10/Aug/20 21:19

 $Okay, I committed this back into branch-2.10. Thanks \\ leftnote as y and \\ Jim\_Brennan for this helpful debugging work.$ 

✓ ○ Jim Brennan added a comment - 10/Aug/20 21:21

Thanks epayne!

### ▼ People

Assignee:

Wangda Tan

Reporter:

Wangda Tan

Votes:

O Vote for this issue

Watchers:

11 Start watching this issue

### Dates

Created:

25/Jun/18 22:47

Updated:

10/Aug/20 21:21

Resolved:

10/Aug/20 21:19