

art - Bug #21384

Mixing input goes into infinite loop

11/15/2018 04:48 PM - David Brown

Status:	Closed	Start date:	11/15/2018
Priority:	Normal	Due date:	
Assignee:	Kyle Knoepfel	% Done:	100%
Category:	Infrastructure	Estimated time:	0.00 hour
Target version:	2.11.05	Spent time:	4.00 hours
Occurs In:	2.10.04	Experiment:	Mu2e
Scope:	Internal	SSI Package:	art
Description			
<p>When reading a secondary stream input (mixing) with multiple files, the MixHelper can go into an infinite loop if the number of requested events exceeds the number in the current file. MixHelper gives the following message (repeating 'forever'):</p> <pre>%MSG-w MixingInputWrap: MixBackgroundFrames:flashMixerTrkCal@ 15-Nov-2018 16:27:49 CST run: 1002 subRun: 0 event: 4 Wrapping around to initial input file for mixing after 4288 secondary events read.</pre> <p>Note this can occur in any read mode, including 'sequential'. By contrast, if the same set of mixing input files are first concatenated using 'artcat' and then passed to the mixing input as a single file, the mixing job works as expected. Naively I expect the mixing to behave the same regardless of how the inputs are divided into files, preferably for all read modes, but certainly for sequential. Also the fact that the failure manifests as an infinite loop and not an exception tells me this is unexpected behavior (ie a bug).</p> <p>A pair of example jobs which demonstrate the problem can be found in: /mu2e/app/users/brownd/debug/Offline/debug/cnf.mu2e.debug.MDC2018e.001002_00000000.fcl (15 files as mixing input) vs /mu2e/app/users/brownd/debug/Offline/debugcat/cnf.mu2e.debugcat.MDC2018e.001002_00000000.fcl (single file made of same 15 files pre-concatenated by artcat)</p>			
Related issues:			
Related to art - Feature #21412: Enable product-mixing to read from multiple ...		Accepted	11/20/2018

History

#1 - 11/15/2018 06:45 PM - Rob Kutschke

If this turns out to be straightforward to diagnose and fix, I would like to see it in art v2_11_05.

#2 - 11/16/2018 09:49 AM - Kyle Knoepfel

- Category changed from Event Loop to Infrastructure
- Status changed from New to Assigned
- Assignee set to Kyle Knoepfel

I was able to reproduce the error. I am investigating.

#3 - 11/16/2018 01:41 PM - Kyle Knoepfel

- Status changed from Assigned to Feedback

The problem is understood. Due to complications related to ROOT-file management, the current product-mixing system does not support reading secondary events across multiple secondary input files for a given event. When a file is opened, the mixing system checks if the number of secondary events requested exceeds the number of events in a secondary input file. If so, then the system moves to the next secondary input file. If file-wrapping is enabled, then the system will go back to the first secondary input file, and the process repeats *ad infinitum*, as observed.

To support mixing events from multiple secondary input files for a given event requires re-architecting some of the system. There is no fundamental reason why it cannot be done; however, we are unlikely to have a full solution by the time [art2.11.05](#) is desired. At the very least, we have implemented a check to ensure that infinite file-wrapping does not occur. If no file can be found that has the requisite number of events and wrapping has been enabled, then the following exception will be printed to the screen:

...

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Begin processing the 5th record. run: 1002 subRun: 0 event: 5 at 16-Nov-2018 13:34:18 CST
%MSG-w MixingInputWrap: MixBackgroundFrames:flashMixerTrkCal@BeginModule 16-Nov-2018 13:34:42 CST run: 1002
subRun: 0 event: 6
Wrapping around to initial input file for mixing after 7427 secondary events read.
%MSG
...

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%MSG-s ArtException: PostEndJob 16-Nov-2018 13:34:42 CST ModuleEndJob
cet::exception caught in art
---- OtherArt BEGIN
---- EventProcessorFailure BEGIN
EventProcessor: an exception occurred during current event processing
---- ScheduleExecutionFailure BEGIN
Path: ProcessingStopped.
---- UnimplementedFeature BEGIN
An error occurred while preparing product-mixing for the current event.
The number of requested secondaries (3469) exceeds the number of events in any
of the files specified for product mixing. For a read mode of 'SEQUENTIAL',
the framework does not currently allow product-mixing to span multiple secondary
input files for a given event. Please contact artists@fnal.gov for more information.
cet::exception going through module MixBackgroundFrames/flashMixerTrkCal run: 1002 subRun: 0 event: 6
---- UnimplementedFeature END
Exception going through path TriggerPath
---- ScheduleExecutionFailure END
---- EventProcessorFailure END
---- OtherArt END
%MSG
Art has completed and will exit with status 1.

```

We propose that for [art2.11.05](#), the above check/exception be introduced (commit [art:cf001eb](#)), which will avoid the infinite loop. We would then ask that a separate feature request be made that allows a mix operation for an event to span multiple secondary input files. Is that acceptable?

#4 - 11/19/2018 08:36 AM - Kyle Knoepfel

- Status changed from *Feedback* to *Resolved*
- Target version set to *2.11.05*
- % Done changed from *0* to *100*

Per discussion with Rob, [art2.11.05](#) will have the bug fix alluded to above.

#5 - 11/19/2018 03:01 PM - Kyle Knoepfel

- Status changed from *Resolved* to *Closed*

#6 - 11/20/2018 01:38 PM - Kyle Knoepfel

- Related to Feature #21412: *Enable product-mixing to read from multiple secondary input files per primary event added*