

artdaq - Feature #23131

Add reporting of fragment IDs for missing fragments to the FragmentWatcher module

08/15/2019 11:45 AM - Kurt Biery

Status:	Assigned	Start date:	08/15/2019
Priority:	Normal	Due date:	
Assignee:	Kurt Biery	% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:		Co-Assignees:	Eric Flumerfelt
Experiment:	-		
Description			
The FragmentWatcher art module (included in artdaq/ArtModules) already has reporting of the fragment IDs of individual Empty fragments. It would be helpful to also have this level of detail in the tracking of Missing fragments.			
Related issues:			
Related to artdaq - Feature #5958: Add the ability to flag various conditions...		Closed	12/18/2012

History

#1 - 08/15/2019 12:12 PM - Kurt Biery

The candidate code changes are on the feature/23131_FragWatcher_MissingFragDetail branch in the artdaq repo. This branch was created based on the v3_06_00 tag.

In addition to adding detailed tracking and reporting of the fragment IDs for missing fragments, I removed blocks of code in the constructor and destructor that dealt with the metrics_pset. This code must have been a hold-over from whatever source code file(s) that I used as a starting point for the FragmentWatcher, but my current sense is that it was very much out-of-place there. The configuration snippet for the FragmentWatcher will likely never include information about metrics.

I also tried to organize the TRACE messages and explain their intention with comments in the code.

#2 - 08/15/2019 12:27 PM - Kurt Biery

I tested these changes in an artdaq-demo system on sbnd-daq33 with the mediumsysteM_with_routing_master sample configuration.

Here are sample file metrics entries:

```
[biery@sbnd-daq33 eventbuilder]$ pwd
/home/nfs/biery/gpmTest/daqlogs/eventbuilder
[biery@sbnd-daq33 eventbuilder]$ egrep 'EventsWith|EventsProcessed' evb_13508_metrics.log
...
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsProcessed: 80 events.
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsWith50PctMissingFragments: 0 events.
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsWith10PctMissingFragments: 16 events.
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsWithMissingFragments: 16 events.
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsWith10PctEmptyFragments: 76 events.
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsWithEmptyFragments: 76 events.
Thu Aug 15 08:26:33 2019: FileMetric: EventBuilder3_art1.EventsWith50PctEmptyFragments: 76 events.
```

Here are sample logfile messages:

```
[biery@sbnd-daq33 art]$ pwd
/home/nfs/biery/gpmTest/daqlogs/art
[biery@sbnd-daq33 art]$ grep -A 2 -i msg-w art-sbnd-daq33-2019081508254*.log | tail -15
art-sbnd-daq33-20190815082548-13508.log:%MSG-w EventBuilder3_art1_FragmentWatcher: DAQ 15-Aug-2019 08:26:18 C
DT Booted FragmentWatcher_module.cc:216
art-sbnd-daq33-20190815082548-13508.log-Event 224: total_fragments=9, fragmentIDs for empty_fragments: 1, 2, 3
, 4, 5, 6, 8, 9
art-sbnd-daq33-20190815082548-13508.log-%MSG
art-sbnd-daq33-20190815082548-13508.log:%MSG-w EventBuilder3_art1_FragmentWatcher: DAQ 15-Aug-2019 08:26:18 C
DT Booted FragmentWatcher_module.cc:202
art-sbnd-daq33-20190815082548-13508.log-Event 225: total_fragments=9, fragmentIDs for missing_fragments: 7
art-sbnd-daq33-20190815082548-13508.log-%MSG
art-sbnd-daq33-20190815082548-13508.log:%MSG-w EventBuilder3_art1_FragmentWatcher: DAQ 15-Aug-2019 08:26:18 C
DT Booted FragmentWatcher_module.cc:216
art-sbnd-daq33-20190815082548-13508.log-Event 225: total_fragments=9, fragmentIDs for empty_fragments: 1, 2, 3
, 4, 5, 6, 8, 9
art-sbnd-daq33-20190815082548-13508.log-%MSG
```

```

art-sbnd-daq33-20190815082548-13508.log:%MSG-w EventBuilder3_art1_FragmentWatcher: DAQ 15-Aug-2019 08:26:18 C
DT Booted FragmentWatcher_module.cc:202
art-sbnd-daq33-20190815082548-13508.log-Event 226: total_fragments=9, fragmentIDs for missing_fragments: 7
art-sbnd-daq33-20190815082548-13508.log-%MSG
art-sbnd-daq33-20190815082548-13508.log:%MSG-w EventBuilder3_art1_FragmentWatcher: DAQ 15-Aug-2019 08:26:18 C
DT Booted FragmentWatcher_module.cc:216
art-sbnd-daq33-20190815082548-13508.log-Event 226: total_fragments=9, fragmentIDs for empty_fragments: 1, 2, 3
, 4, 5, 6, 8, 9
art-sbnd-daq33-20190815082548-13508.log-%MSG

```

Here are sample TRACE messages:

```

19622 08-15 08:26:16.909988 13507 13507 1 EventBuilder1_art1_FragmentWatcher wrn . Event 211: total_f
ragments=9, fragmentIDs for empty_fragments: 1, 2, 3, 4, 5, 6, 8, 9
19623 08-15 08:26:16.909812 13507 13507 1 EventBuilder1_art1_FragmentWatcher wrn . Event 211: total_f
ragments=9, fragmentIDs for missing_fragments: 7
19624 08-15 08:26:16.909797 13507 13507 1 EventBuilder1_art1_FragmentWatcher d04 . Event 211: this ev
ent: total_fragments=9, missing_fragments=1, empty_fragments=8 (66 events processed)
19724 08-15 08:26:16.795336 13507 13507 1 EventBuilder1_art1_FragmentWatcher d07 . Event 210: events_
with_50pct_missing_fragments=0, events_with_50pct_empty_fragments=65
19725 08-15 08:26:16.795326 13507 13507 1 EventBuilder1_art1_FragmentWatcher d07 . Event 210: events_
with_10pct_missing_fragments=11, events_with_10pct_empty_fragments=65
19726 08-15 08:26:16.795321 13507 13507 1 EventBuilder1_art1_FragmentWatcher d06 . Event 210: events_
with_missing_fragments=11, events_with_empty_fragments=65
19727 08-15 08:26:16.795250 13507 13507 1 EventBuilder1_art1_FragmentWatcher wrn . Event 210: total_f
ragments=9, fragmentIDs for empty_fragments: 1, 2, 3, 4, 5, 6, 8, 9
19728 08-15 08:26:16.795146 13507 13507 1 EventBuilder1_art1_FragmentWatcher wrn . Event 210: total_f
ragments=9, fragmentIDs for missing_fragments: 7
19729 08-15 08:26:16.795136 13507 13507 1 EventBuilder1_art1_FragmentWatcher d04 . Event 210: this ev
ent: total_fragments=9, missing_fragments=1, empty_fragments=8 (65 events processed)
19739 08-15 08:26:16.794524 13507 13507 1 EventBuilder1_art1_FragmentWatcher d07 . Event 209: events_
with_50pct_missing_fragments=0, events_with_50pct_empty_fragments=64

```

The local changes to the EventBuilder configuration files were the following:

```

--- a/simple_test_config/mediumsystem_with_routing_master/EventBuilder1.fcl
+++ b/simple_test_config/mediumsystem_with_routing_master/EventBuilder1.fcl
@@ -27,6 +27,7 @@ daq: {
    send_requests: true
    request_port: 3001
    request_address: "227.128.12.26"
+   multicast_interface_ip: "192.168.230.0"
    expected_art_event_processing_time_us: 2000000

    routing_token_config: {
@@ -46,8 +47,8 @@ daq: {
    evbFile: {
      metricPluginType: "file"
      level: 4
-     fileName: "eventbuilder/evb_%UID%_metrics.log"
-     absolute_file_path: false
+     fileName: "/home/nfs/biery/gpmTest/daqlogs/eventbuilder/evb_%UID%_metrics.log"
+     absolute_file_path: true
      unquify: true
    }
  }
@@ -61,12 +62,16 @@ outputs: {

  physics: {
    analyzers: {
-   }
+   fragmentwatcher: {
+     metrics_reporting_level: 1
+     mode_bitmask: 7
+     module_type: "FragmentWatcher"
+   }
  }

- producers: {
- }
+ producers: { }

+ a1: [ fragmentwatcher ]
  my_output_modules: [ rootNetOutput ]
}

```

```
source: {
```

#3 - 10/14/2019 10:17 AM - Eric Flumerfelt

- *Status changed from New to Assigned*
- *Co-Assignees Eric Flumerfelt added*

Performed code review. I noticed that the fragmentHandles are iterated over twice; it may be more performant to only iterate over them once and do both the missing and empty Fragment checks at that time. Also, it would be nice if the metrics reporting level for at least DETAILED_COUNTS_MODE was different, so that the XML could be sent to a different metric destination.

Code tested and verified.

#4 - 10/14/2019 11:29 AM - Eric Flumerfelt

Thinking more about my comments, I'd almost suggest replacing the mode_bitmask and metrics_reporting_level with "basic_counts_metric_level", "fractional_counts_metric_level", and "detailed_counts_metric_level" and indicate in the documentation that a level of 0 means to disable that reporting, which would be the default for fractional and detailed modes.

#5 - 10/18/2019 02:51 PM - Eric Flumerfelt

- *Related to Feature #5958: Add the ability to flag various conditions in a RawEvent added*

#6 - 01/07/2020 10:12 AM - Eric Flumerfelt

I have made a set of changes on this branch that should avoid a potential logic error when different Fragment IDs are missing in the first few events of a run.

We should also consider a mechanism by which FragmentWatcher can reset its expected Fragment ID list, for when the DAQ changes its expected Fragment IDs.