LArSoft - Support #17715

Large memory usage in SpacePointSolver for MicroBooNE

09/14/2017 04:52 PM - Tingjun Yang

Status:	Assigned	**Start date:**	09/14/2017
Priority:	Normal	**Due date:**	
Assignee:	Christopher Backhouse	**% Done:**	0%
Category:		**Estimated time:**	0.00 hour
Target version:		**Spent time:**	0.00 hour
Experiment:	MicroBooNE	**Co-Assignees:**	

Description

Dear LArSoft experts,

Chris Backhouse's SpacePointSolver has been recently added to larreco. This module produces 3D points using hits as input. However, this module uses large amount of memory for a MicroBooNE job. Here is the command to reproduce the problem:

```
lar -c reco3djob_uboone.fcl /uboone/data/users/vmeddage/test_trajcluster.root --nskip 40 -n 2
```

One needs to use the fcl file from the develop HEAD.
Here are the details from the MemoryTrack db using Marc Paterno's R package 'artsupport':

```
> head(mods,16)
# A tibble: 16 x 9
                Step   Run SubRun Event     Path    ModuleLabel            ModuleType    Vsize
   RSS
               <chr> <int>  <int> <int>    <chr>          <chr>                 <chr>    <dbl>
 <dbl>
 1  PreProcessModule     1     27  1341     reco         reco3d      SpacePointSolver 1687.863  61
7.4679
 2 PostProcessModule     1     27  1341     reco         reco3d      SpacePointSolver 2327.364 125
5.7189
 3  PreProcessModule     1     27  1341     reco TriggerResults TriggerResultInserter 2327.364 125
5.7189
 4 PostProcessModule     1     27  1341     reco TriggerResults TriggerResultInserter 2327.364 125
5.7189
 5  PreProcessModule     1     27  1341 end_path           out1            RootOutput 2327.364 125
5.7189
 6 PostProcessModule     1     27  1341 end_path           out1            RootOutput 2327.364 125
5.7189
 7     PreWriteEvent     1     27  1341 end_path           out1            RootOutput 2327.364 125
7.1279
 8    PostWriteEvent     1     27  1341 end_path           out1            RootOutput 4054.274 297
2.6188
 9  PreProcessModule     1     27  1342     reco         reco3d      SpacePointSolver 4054.274 297
3.4052
10 PostProcessModule     1     27  1342     reco         reco3d      SpacePointSolver 4547.080 346
0.8374
11  PreProcessModule     1     27  1342     reco TriggerResults TriggerResultInserter 4547.080 346
0.8374
12 PostProcessModule     1     27  1342     reco TriggerResults TriggerResultInserter 4547.080 346
0.8374
13  PreProcessModule     1     27  1342 end_path           out1            RootOutput 4547.080 346
0.8374
14 PostProcessModule     1     27  1342 end_path           out1            RootOutput 4547.080 346
0.8374
15     PreWriteEvent     1     27  1342 end_path           out1            RootOutput 4547.080 346
0.8374
16    PostWriteEvent     1     27  1342 end_path           out1            RootOutput 4547.080 346
2.8731
```

We do not see such an increase of memory usage for a similar DUNE job. We were also able to rule out memory leak using the tool massif with help from Gianluca.

We appreciate any help in understanding and solving this issue.

Tingjun

History

#1 - 09/15/2017 09:59 AM - Tingjun Yang

Here is the memory usage for 10 events without writing art output (--no-output):

	Step	Run	SubRun	Event	Path	ModuleLabel	ModuleType	Vsize	RSS
	<chr>	<int>	<int>	<int>	<chr>	<chr>	<chr>	<dbl>	<dbl>
1	PreProcessModule	1	27	1341	reco	reco3d	SpacePointSolver	1685.459	621.7441
2	PostProcessModule	1	27	1341	reco	reco3d	SpacePointSolver	2324.419	1259.0203
3	PreProcessModule	1	27	1341	reco	TriggerResults	TriggerResultInserter	2324.419	1259.0203
4	PostProcessModule	1	27	1341	reco	TriggerResults	TriggerResultInserter	2324.419	1259.0203
5	PreProcessModule	1	27	1342	reco	reco3d	SpacePointSolver	1863.377	799.8628
6	PostProcessModule	1	27	1342	reco	reco3d	SpacePointSolver	2824.487	1756.4959
7	PreProcessModule	1	27	1342	reco	TriggerResults	TriggerResultInserter	2824.487	1756.4959
8	PostProcessModule	1	27	1342	reco	TriggerResults	TriggerResultInserter	2824.487	1756.4959
9	PreProcessModule	1	27	1343	reco	reco3d	SpacePointSolver	2154.320	1090.8099
10	PostProcessModule	1	27	1343	reco	reco3d	SpacePointSolver	2162.250	1097.3594
11	PreProcessModule	1	27	1343	reco	TriggerResults	TriggerResultInserter	2162.250	1097.3594
12	PostProcessModule	1	27	1343	reco	TriggerResults	TriggerResultInserter	2162.250	1097.3594
13	PreProcessModule	1	27	1344	reco	reco3d	SpacePointSolver	2162.250	1097.3594
14	PostProcessModule	1	27	1344	reco	reco3d	SpacePointSolver	2263.466	1198.1169
15	PreProcessModule	1	27	1344	reco	TriggerResults	TriggerResultInserter	2263.466	1198.1169
16	PostProcessModule	1	27	1344	reco	TriggerResults	TriggerResultInserter	2263.466	1198.1169
17	PreProcessModule	1	27	1345	reco	reco3d	SpacePointSolver	2154.320	1090.9409
18	PostProcessModule	1	27	1345	reco	reco3d	SpacePointSolver	2451.575	1387.4422
19	PreProcessModule	1	27	1345	reco	TriggerResults	TriggerResultInserter	2451.575	1387.4422
20	PostProcessModule	1	27	1345	reco	TriggerResults	TriggerResultInserter	2451.575	1387.4422
21	PreProcessModule	1	27	1346	reco	reco3d	SpacePointSolver	2192.134	1128.6241
22	PostProcessModule	1	27	1346	reco	reco3d	SpacePointSolver	3922.612	2856.8945
23	PreProcessModule	1	27	1346	reco	TriggerResults	TriggerResultInserter	3922.612	2856.8945
24	PostProcessModule	1	27	1346	reco	TriggerResults	TriggerResultInserter	3922.612	2856.8945
25	PreProcessModule	1	27	1347	reco	reco3d	SpacePointSolver	2291.192	1227.6818
26	PostProcessModule	1	27	1347	reco	reco3d	SpacePointSolver	2431.361	1366.0365
27	PreProcessModule	1	27	1347	reco	TriggerResults	TriggerResultInserter	2431.361	1366.0365
28	PostProcessModule	1	27	1347	reco	TriggerResults	TriggerResultInserter	2431.361	1366.0365
29	PreProcessModule	1	27	1348	reco	reco3d	SpacePointSolver	2338.619	1275.1094
30	PostProcessModule	1	27	1348	reco	reco3d	SpacePointSolver	2400.309	1333.7887
31	PreProcessModule	1	27	1348	reco	TriggerResults	TriggerResultInserter	2400.309	1333.7887
32	PostProcessModule	1	27	1348	reco	TriggerResults	TriggerResultInserter	2400.309	1333.7887
33	PreProcessModule	1	27	1349	reco	reco3d	SpacePointSolver	2333.266	1269.8870
34	PostProcessModule	1	27	1349	reco	reco3d	SpacePointSolver	2333.807	1270.2966
35	PreProcessModule	1	27	1349	reco	TriggerResults	TriggerResultInserter	2333.807	1270.2966
36	PostProcessModule	1	27	1349	reco	TriggerResults	TriggerResultInserter	2333.807	1270.2966
37	PreProcessModule	1	27	1350	reco	reco3d	SpacePointSolver	2333.807	1270.2966
38	PostProcessModule	1	27	1350	reco	reco3d	SpacePointSolver	2400.985	1335.3124
39	PreProcessModule	1	27	1350	reco	TriggerResults	TriggerResultInserter	2400.985	1335.3124
40	PostProcessModule	1	27	1350	reco	TriggerResults	TriggerResultInserter	2400.985	1335.3124

It seems the memeory increase seen before was associated with RootOutput. Sometimes reco3d does use a lot of memory (e.g. event 1346).

#2 - 09/18/2017 10:27 AM - Lynn Garren

- Status changed from New to Assigned

- Assignee set to Christopher Backhouse

Chris, would you take a look at this? Let us know if you need help.