Subject: How to write Macros with newest trunk code
Posted by Stefan Pflueger on Thu, 14 Sep 2017 16:11:39 GMT

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Hello,

I updated to the newest FairRoot (17.03) and pandaroot code (trunk), and cannot get the lmd macros to work (or also the macros in macro/run). Our lmd macros seem not to be compatible with the current development trunk as the all create double free corruption errors. Is there any macros that should work and have been tested with this development setup? Then I have some guideline on how to steer the whole simulation and reconstruction chain and adapt our macros to the new FairRoot. Thanks in advance

Stefan

Subject: Re: How to write Macros with newest trunk code
Posted by Ralf Kliemt on Fri, 15 Sep 2017 07:23:04 GMT

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Hallo Stefan,

Just to be clear on your setup: Did you install
FairSoft may16p1
FairRoot v-17.03
PandaRoot trunk
ROOT version 6
?

The macros in macro/run are phasing out. Please go on in macro/master for the default configuration.
I know there is a double free message upon quitting root 6, which should not harm the calculations.
Other than that, some error message log would be helpful.

Cheers!
  Ralf

Subject: Re: How to write Macros with newest trunk code
Posted by Stefan Pflueger on Fri, 15 Sep 2017 07:54:21 GMT

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Hi Ralf,

yes exactly that's my configuration. I should add that i used gcc 6.4.0. So everyone gets the double free error messages at the end of the macro runtime? I almost assume so... Because it crashes at the end of the runtime, the macros should still deliver valid output like you said. Strangely most of the output files for the lmd reconstruction chain are empty. I will investigate further today and compare our lmd macros with the master ones. Maybe some change in fairroot etc is not implemented correctly in our lmd macro code up to now.

Nevertheless if everyone using root6 and the trunk code of pandaroot gets these double free issues, its quite embarrassing to me... Because it is a double free at the end of the runtime done by the root "garbage collector", it is also a bit hard to debug that. But I checked some of the code yesterday and there are a lot of delete statements in the code, which could be responsible for this kind of thing. I will post the output later, however I don't think it will be of much help.

Stefan

Subject: Re: How to write Macros with newest trunk code
Posted by Tobias Stockmanns on Fri, 15 Sep 2017 08:11:07 GMT
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Dear Stefan,

the reason for the double free error is well known. It is a problem inside root. We can bypass it but it should be fixed inside root which has not happened up to now.

If this is causing a problem I can fix it in PandaRoot.

Cheers,

Tobias

Subject: Re: How to write Macros with newest trunk code
Posted by Stefan Pflueger on Fri, 15 Sep 2017 08:22:56 GMT
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Hi Ralf,

here is the stacktrace as promised

```
#5  0x00002af63f04f7ec in TObjArray::Delete(char const*) () from
/software/fairsoft/fairsoft_may16p1_root6/lib/root/libCore.so.6.08
#6  0x00002af64405d01e in TGeoManager::~TGeoManager() () from
/software/fairsoft/fairsoft_may16p1_root6/lib/root/libGeom.so.6.08
#7  0x00002af64405d239 in TGeoManager::~TGeoManager() () from
/software/fairsoft/fairsoft_may16p1_root6/lib/root/libGeom.so.6.08
#8  0x00002af63f048445 in TList::Delete(char const*) () from
/software/fairsoft/fairsoft_may16p1_root6/lib/root/libCore.so.6.08
#9  0x00002af63ef497b2 in TROOT::~TROOT() () from
/software/fairsoft/fairsoft_may16p1_root6/lib/root/libCore.so.6.08
#10 0x0000003aeda35b22 in __run_exit_handlers (status=0) at exit.c:78
#11 exit (status=0) at exit.c:100
#12 0x0000003aeda1ed64 in __libc_start_main (main=0x402814 <main>, argc=1,
ubp_av=0x7fffe4463698, init=<value optimized out>, fini=<value optimized out>,
    rtld_fini=<value optimized out>, stack_end=0x7fffe4463688) at libc-start.c:258
#13 0x0000000000402059 in _start ()
```

Subject: Re: How to write Macros with newest trunk code
Posted by Stefan Pflueger on Fri, 15 Sep 2017 08:38:42 GMT
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Hi Tobias,

hmm I'm not sure I understand correctly. So the root6 team knows there is a bug in their code and their working on it? In my opinion our code does a "non root conform" delete in some destructor that causes this problem. I will ignore the double free for now and try to get the lmd macros running again. Thanks for the information.

Stefan

Subject: Re: How to write Macros with newest trunk code
Posted by Florian Uhlig on Fri, 15 Sep 2017 10:59:53 GMT
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Hi Tobias,

I think your statement is not 100% correct. We had a discussion with the ROOT developers since we think that the problem is due to ROOT. Their opinion is that the problem is inside our geometries. Up to now we have not been able to prove that the problem is not our geometry.

To overcome the problem on can do the following steps at the end of the macro

```
gGeoManager->GetListOfVolumes()->Delete();
gGeoManager->GetListOfShapes()->Delete();
delete gGeoManager;
```

Ciao

Florian

Subject: Re: How to write Macros with newest trunk code
Posted by Stefan Pflueger on Fri, 15 Sep 2017 11:09:34 GMT
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Hi Florian,

ok thx for the tip. I saw that reason that the lmd macros did not deliver any results was that the simulation macro did not generate geant hits in the lumi detector geometry. As if the lumi geometry is not seen by it.

Below is the output log of the macro until geant start propagating particles. I stumbled across the line

Error in <TGeoVoxelFinder::SortAll>: Volume lmd_vol_ref_sys: Cannot make slices on any axis

Is that normal? Does anyone know if this is an error that can be ignored?

Quote:
[INFO   ] Media file used: /home/pflueger/pandaroot/geometry/media_pnd.geo
Info in (PndGeoHandling::Instance): Making a new instance using the framework.
- I - PndLmdDetector: fListOfSensitives contains:
 LumActive
Info in <TGeoManager::TGeoManager>: Geometry FAIRGeom, FAIR geometry created

****
    initialisation for run id 1505472465
****
-I- FairRunTimeDB::InitContainer() PndSensorNamePar
[ERROR] init() PndSensorNamePar not initialized
Error in <FairRuntimeDb::initContainers()>: Error occured during initialization
Loading Geant4 libraries (using geant4-config) ...
31
Loading VGM libraries ...
Loading g4root library ...
Loading geant4vmc library ...
Loading mtroot library ...

==
 Geant4 Virtual Monte Carlo
 Version 3.3 (15 January 2016)
 WWW : http://root.cern.ch/drupal/content/geant4-vmc
==

Info in <TGeoManager::SetTopVolume>: Top volume is cave. Master volume is cave
Info in <TGeoNavigator::BuildCache>: --- Maximum geometry depth set to 100
<I> PndPipe - Using geometry /home/pflueger/pandaroot/geometry/beampipe_201309.root
Info in <TGeoManager::CheckGeometry>: Fixing runtime shapes...
Info in <TGeoManager::CheckGeometry>: ...Nothing to fix
Info in <TGeoManager::CloseGeometry>: Counting nodes...
Info in <TGeoManager::Voxelize>: Voxelizing...
Error in <TGeoVoxelFinder::SortAll>: Volume lmd_vol_ref_sys: Cannot make slices on any axis
Info in <TGeoManager::CloseGeometry>: Building cache...
Info in <TGeoManager::CountLevels>: max level = 8, max placements = 36
Info in <TGeoManager::CloseGeometry>: 1347 nodes/ 81 volume UID's in FAIR geometry
Info in <TGeoManager::CloseGeometry>: ---------------modeler ready----------------
Info in <TObject::SetNavigator>: TG4RootNavigator created and registered to
G4TransportationManager
isMaster=1
Running TVirtualMCApplication::ConstructGeometry
****
 Geant4 version Name: geant4-10-02-patch-01   (26-February-2016)
                Copyright : Geant4 Collaboration
               Reference : NIM A 506 (2003), 250-303
                   WWW : http://cern.ch/geant4
****

Info in <TObject::Initialize>: Creating G4 hierarchy ...
Info in <TGeoManager::ConvertReflections>: Converting reflections in: FAIRGeom - FAIR
geometry ...
Info in <TGeoManager::ConvertReflections>: Done
===> GEANT4 materials created and mapped to TGeo ones...
===> GEANT4 physical volumes created and mapped to TGeo hierarchy...
INFO: TG4RootDetectorConstruction::Construct() finished
TG4PostDetConstruction::Initialize
G4 Stat: instantiated 404 logical volumes
                1346 physical volumes
Info in <TObject::ConnectToG4>: ROOT detector construction class connected to
G4RunManager
Adding HadronPhysicsList QGSP_BERT_EMV
G4PhysListFactory::GetReferencePhysList <QGSP_BERT_EMV> EMoption= 1
<<< Geant4 Physics List simulation engine: QGSP_BERT 4.0

<<< Reference Physics List QGSP_BERT_EMV is built

Adding SpecialPhysicsList stepLimiter+specialCuts+
TG4SpecialControlsV2 constructed
Visualization Manager instantiating with verbosity "warnings (3)"...
Geant4 has been created.
 -I g4Config() using g4conf macro: /home/pflueger/pandaroot/gconfig/g4config.in
SetCuts Macro: Setting Processes..
SetCuts Macro: Setting cuts..
TG4RootDetectorConstruction::ConstructSDandField
TG4PostDetConstruction::InitializeSDandField
 -I- Initializing PndSdsDetector()
-W- PndSdsDetector: New branch LMDPoint created!
Global magnetic field created with stepper ClassicalRK4
INFO: TG4RootDetectorConstruction::ConstructSDandField finished
Adding tracking cuts for neutron TimeCut(ns)= 10000 KinEnergyCut(MeV)= 0
Hadron physics constructed.
Processes mapped to VMC controls ok.
Step limiter physics constructed.
Special Cuts constructed.
User particles physics constructed.
Processes mapped to VMC codes ok.
TGEmModelPhysics::ConstructProcess
No EM models are defined.
Available UI session types: [GAG, tcsh, csh]
Converting VMC cuts in regions
Number of added regions: 9

****
   GEANT4 Geometry statistics:
        404 logical volumes
       1346 physical volumes
         15 materials
         14 user limits
         81 sensitive detectors
****

Stefan

Subject: Re: How to write Macros with newest trunk code
Posted by Stefan Pflueger on Fri, 15 Sep 2017 13:37:04 GMT

Hi Florian,

your code snippet indeed fixes the double free crash at the end of the macro. However the lmd uses a special backtracking task, more precisely FairGeane & FairGeaneApplication. I still get the same double free crash report in the geant3 initialization phase (see log below). It crashes in the Geant3 vmc InitMC() function. From the stack trace it looks like that the problem is the same as before, something inside the TGeoManager getting deleted again that was deleted before.

Quote:
*** glibc detected *** /software/fairsoft/fairsoft_may16p1_root6/bin/root.exe: double free or corruption (!prev): 0x00000000096bb140 ***
======= Backtrace: =========
/lib64/libc.so.6(+0x75f4e)[0x2b0192deff4e]
/lib64/libc.so.6(+0x78cf0)[0x2b0192df2cf0]
  /software/fairsoft/fairsoft_may16p1_root6/lib/root/libCore.so.6.08(_ZN9T
ObjArray6DeleteEPKc+0x10c)[0x2b0191f5c7ec]
  /software/fairsoft/fairsoft_may16p1_root6/lib/root/libGeom.so.6.08(_ZN11
TGeoManagerD1Ev+0x29e)[0x2b019fc6501e]
  /software/fairsoft/fairsoft_may16p1_root6/lib/root/libGeom.so.6.08(_ZN11
TGeoManagerD0Ev+0x9)[0x2b019fc65239]
  /software/fairsoft/fairsoft_may16p1_root6/lib/root/libCore.so.6.08(_ZN5T
List6DeleteEPKc+0x205)[0x2b0191f55445]
  /software/fairsoft/fairsoft_may16p1_root6/lib/root/libCore.so.6.08(_ZN5T
ROOT20EndOfProcessCleanupsEv+0x4c)[0x2b0191e57c8c]
/lib64/libc.so.6(exit+0xe2)[0x2b0192dafb22]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(+0x2719de)[0x2b01b43639de]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(zabend_+0x3 f)[0x2b01b42eecaf]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(zfatal_+0x7 92)[0x2b01b42f3b42]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(mztabc_+0x2 1a)[0x2b01b42e4b7a]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(mztabr_+0x1 55)[0x2b01b42e1645]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(mzgar1_+0x2 10)[0x2b01b42f2480]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(mzlift_+0x3 df)[0x2b01b42f459f]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(mzbook_+0xf b)[0x2b01b42f07db]
  /software/fairsoft/fairsoft_may16p1_root6/lib/libgeant321.so(g3physi_+0x 1f7d)[0x2b01b42058dd]
  /home/pflueger/FairRoot_install/lib/libBase.so.17.03.00(_ZN20FairGeaneAp
plication6InitMCEPKcS1_+0x26)[0x2b019e9feff6]

/home/pflueger/FairRoot_install/lib/libGeane.so.17.03.00(_ZN9FairGeane4I
nitEv+0x502)[0x2b01a52e0d12]
  /home/pflueger/FairRoot_install/lib/libBase.so.17.03.00(_ZN8FairTask8Ini
tTaskEv+0x55)[0x2b019e9f66a5]
  /home/pflueger/FairRoot_install/lib/libBase.so.17.03.00(_ZN8FairTask9Ini
tTasksEv+0x5b)[0x2b019e9f660b]
  /home/pflueger/FairRoot_install/lib/libBase.so.17.03.00(_ZN10FairRunAna4
InitEv+0x3be)[0x2b019e9ea77e]
[0x2b01a98bd5f5]
[0x2b01a98ba0b2]
  /software/fairsoft/fairsoft_may16p1_root6/lib/root/libCling.so(_ZN5cling
11Interpreter11RunFunctionEPKN5clang12FunctionDeclEPNS_5ValueE+0x24a)[0x
2b01940cd3ea]

I managed to overcome this problem, by adding the first two lines of your code snipped in the
FairGeaneApplication. However I need to verify that the physics results are meaningful once i
have the simulation macro running...

void FairGeaneApplication::ConstructGeometry()
{
  TVirtualMC::GetMC()->SetRootGeometry(); // notify VMC about Root geometry
  gGeoManager->GetListOfVolumes()->Delete();
  gGeoManager->GetListOfShapes()->Delete();
}

Thx for the help.

Stefan