package G4Svc

- Components:
  - G4Svc
    - triggers G4SvcRunManager initialization, event processing loop and termination
  - BesHepMCInterface
    - Inherits from G4HepMCInterface
    - Interface to EvtDataSvc for retrieving HepMC events
    - Convert HepMC event to G4Event
    - Replace AthenaHepMCInterface , HepMCEventConverter in package G4SimAlg(unused now)

package G4Svc

- Components:
  - G4SvcRunManager
    - inherits from G4RunManager
    - extends functionality
      - GenerateEvent from HepMCInterface or userPrimaryGeneratorAction
      - Replace BeamOn(nEvent) with SimulateEvent(anEvent)
      - other G4RunManager methods unchanged !
  - G4SvcVisManager
    - Register graphics system (DAWN, OPENGL)

New Package BOOST

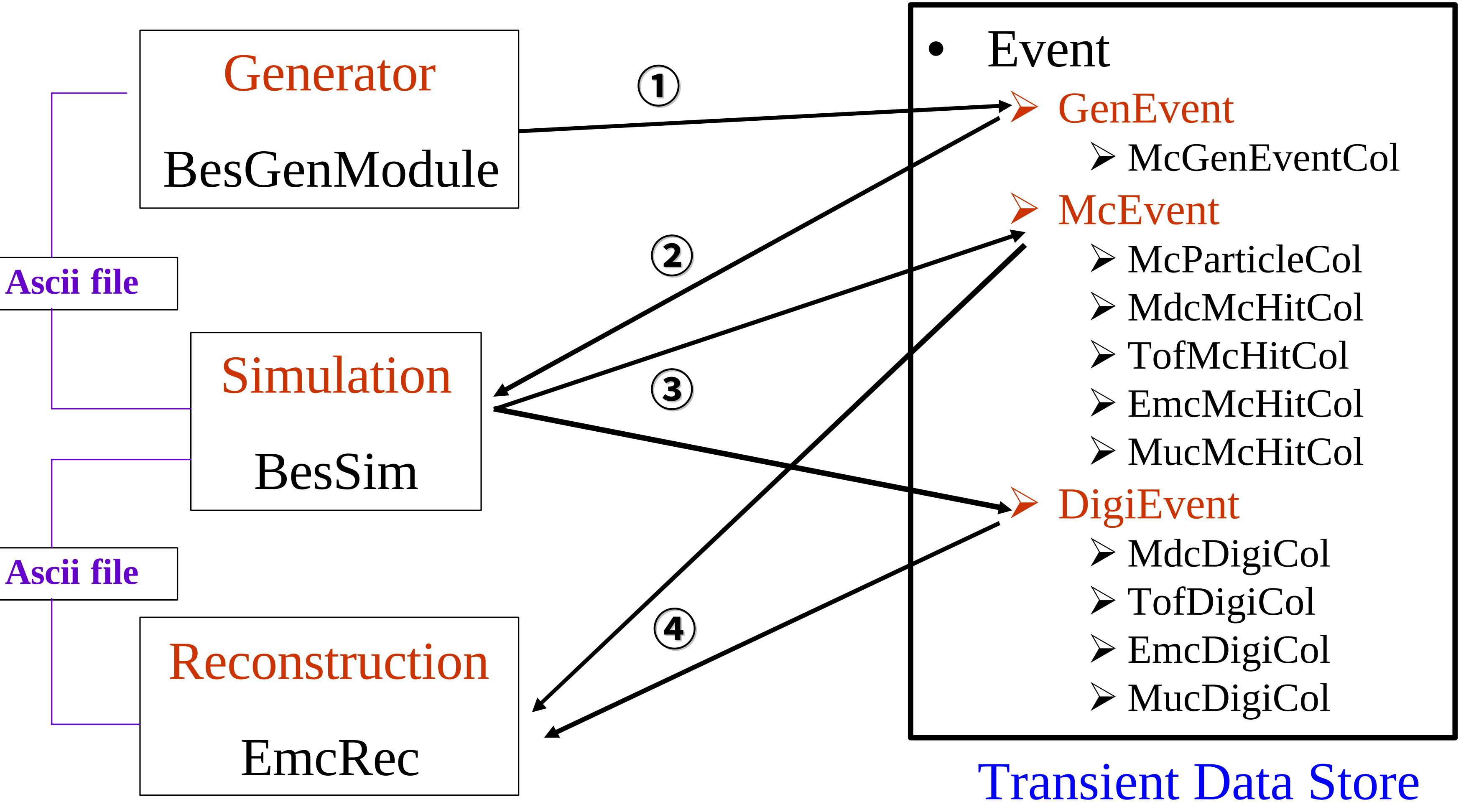
- Old package: BOOSTAlg
  - All in one package
  - inefficient in development and maintenance
  - Algorithm name: BOOSTAlg

- New package: BOOST
  - As a container package
  - Can checkout and compile one contained package
  - Algorithm name: BesSim

- BOOST
  - BesSim: use all the others
  - MdcSim
  - TofSim
  - EmcSim
  - MucSim
  - TruSim
  - SimUtil
  - GenSim
  - PhySim
    - PhySim
    - cmt
    - src

MdcSim, TofSim, EmcSim, MucSim: Use package TruSim and SimUtil

Register and retrieve TDS



Generator

BesGenModule

Ascii file

Simulation

BesSim

Ascii file

Reconstruction

EmcRec

- Event
  - GenEvent
    - McGenEventCol
  - McEvent
    - McParticleCol
    - MdcMcHitCol
    - TofMcHitCol
    - EmcMcHitCol
    - MucMcHitCol
  - DigiEvent
    - MdcDigiCol
    - TofDigiCol
    - EmcDigiCol
    - MucDigiCol

Transient Data Store

BesGenModule

- First we divide the main program of Fortran Generator into three parts (mainini, mainexe, mainfin) to generate events by job options
- Then we select a generator (eg. tester or howl) to generate MC events
- When generating MC events, we put them into HepEVT common block
- After generating events, we make an access to MC events from HepEVT common block
- Finally we convert MC events to HepMC Format and put them in TDS
- MC events also stored in a HepEVT format file (evt.dat).

--------by Yu guowei

Generator Interface

- Create one interface for each generator
  - if a user want to use a generator, replace the DLL with the generator's name in jobOptions.
  - For example: ApplicationMgr.DLLs += { "Tester" , "BesSim" };
- Generator interfaces' directory structure
  - Generator/BesGenInterface/Bhagen

```
                        /Ddgen
                        /…
```

--------by Ma qiumei

How to Run

- Edit TestRelease requirements
  - #========= for Generator =============
  - use PartPropSvc PartPropSvc-* Generator
  - use Tester Tester-* Generator/BesGenInterface
  - use Howl Howl-* Generator/BesGenInterface
  - use Radee Radee-* Generator/BesGenInterface
  - ………………………………………………………………………..
  - #========== for Simulation ===============
  - use BesSim BesSim-* Simulation/BOOST

- cmt broadcast gmake
- cd ../run

How to Run

- Edit job option jobOptions_sim.txt
  - ApplicationMgr.DLLs += { "Tester" , "BesSim" };
  - ApplicationMgr.TopAlg += { "BesGenModule" , "BesSim"};
  - #include "Bes_Gen.txt"
  - #include "PartPropSvc.txt"
  - #include "jobOptions.G4Svc.txt“
  - BesSim.Mdc = 1;   (0, 1, 2)
  - BesSim.Tof =   1;   (0, 1, 2)
  - BesSim.Emc = 1;   (0, 1, 2)
  - BesSim.Muc = 1;   (0, 1)
  - BesSim.Field = true;
  - BesSim.TDSFlag = true;
  - BesSim.PhysicsList = 1;   (1:BesPhysicsList, 2:LHEP_GN ….)
  -
- Edit Genbes card: run.cards
  - Open tester generator: matching with DLL name Tester
- boss.exe jobOptions_sim.txt

G4Svc Job Options

- G4Svc.Visualize
  - turn on/off visualization
- G4Svc.InteractiveG4
  - Turn on/off interactive mode
- G4Svc.RunVerbosity, EventVerbosity, TrackingVerbosity
  - G4 information output level
- G4Svc.FADSmacro
  - Macro file to execute (run.mac)
- G4Svc.BesGenAction
  - Using generator supplied by BOOST itself, don’t need BesGenModule algorithm
  - If false, use BesGenModule, retrieve HepMC events from EvtDataSvc

run.mac

- If G4Svc.BesGenAction = true
    - /generator/name tester
    - /generator/tester 1 e- -0.8 0.8 0. 360. 1. 0
    - #/generator/name genbes
    - #/generator/genbes /d9/liuhm/test/genbes/tester.evt

- Ascii I/O control
    - /runAction/ascii 0 1 0 0 0 1 0 0 tof.dat

- Don’t use /run/beamOn, use ApplicationMgr.EvtMax = 1

vis.mac

- Used in Interactive mode
  - Idle> /control/execute vis.mac

- /vis/open DAWNFILE
  - view with DAWN
  - ps file can be generated

- /vis/open OGLIX
  - view with OpenGL
  - On koala and lxplus, OpenGL extension is needed with your Exceed or XManager