# FCC SW - fast/full simulation

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A quick look at current LHC simulation SW

- Geant4 is THE full simulation engine used by all LHC experiments

  - geometry input is differently handled though
    (xml, GeoModel via DB)

  - Geant4 does provide an event processing backbone
    (event handling, particle stack, …)

- ATLAS/CMS (at least) have created fast simulations based on the reconstruction geometry

  - Tracking not based on Geant4

  - Geometry model not based on Geant4

Sketch of our current work plan : fast simulation (1st step)

InputFile

Gaudi

DD4HepDetDescrSvc::initialize()

LCDD::getInstance()

DD4Hep

ApplicationMgr

IEventSelector

IncidentSvc   BeginRun

DD4HepDetDescrSvc::buildDetector()   LCDD::loadGeometry(xmlPath)

Reconstruction Geometry   build as Extension from DD4HepGeometry

FastTrackingKernel::execute

Algorithm2::execute   EVENT LOOP

OutputFile
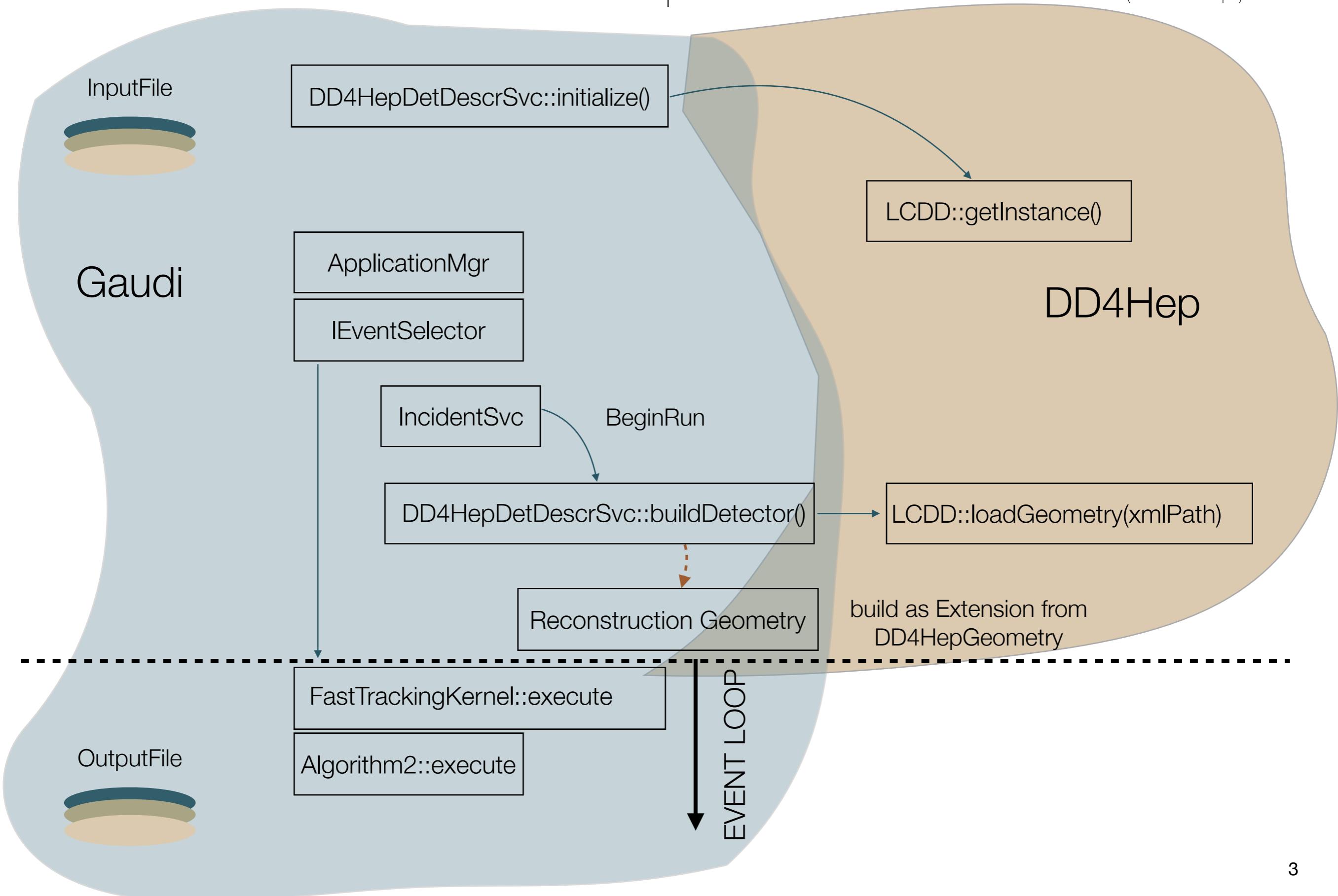
Does this work for Geant4 as well ?

A common solution

InputFile

DD4Hep

Gaudi

DD4HepDetDescrSvc::initialize()

LCDD::getInstance()

DD4HepDetDescrSvc::buildDetector()

LCDD::loadGeometry(xmlPath)

TrackingGeometry

DD4Hep::Simulation::Geant4Kernel

StoreGateSvc::record()

Geant4 Geometry

Geant4Kernel::initialize()

Geant4::init()

FastSim**Tool**::initialize()

EVENT LOOP

Geant4Kernel::execute()
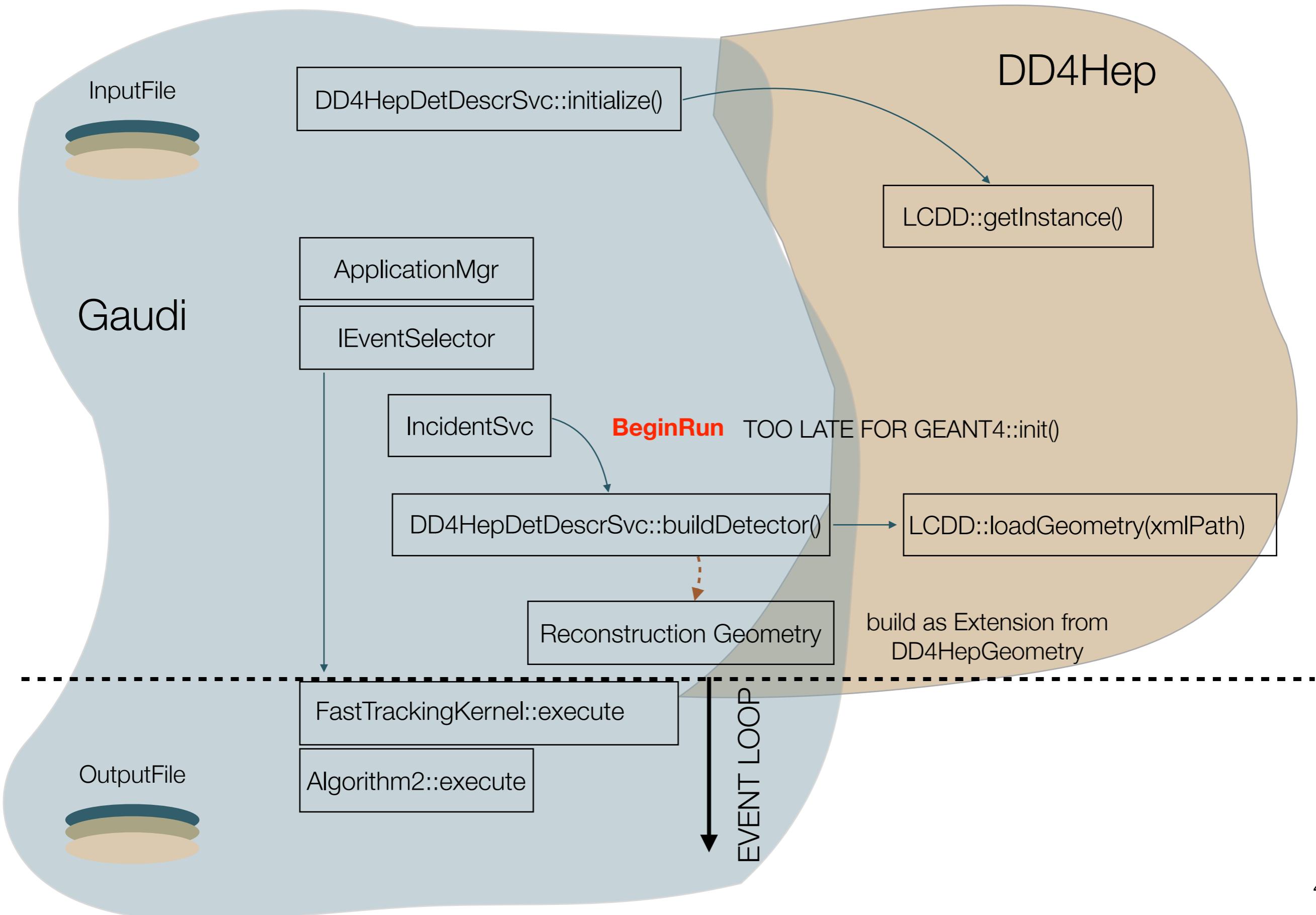
G4RunManager
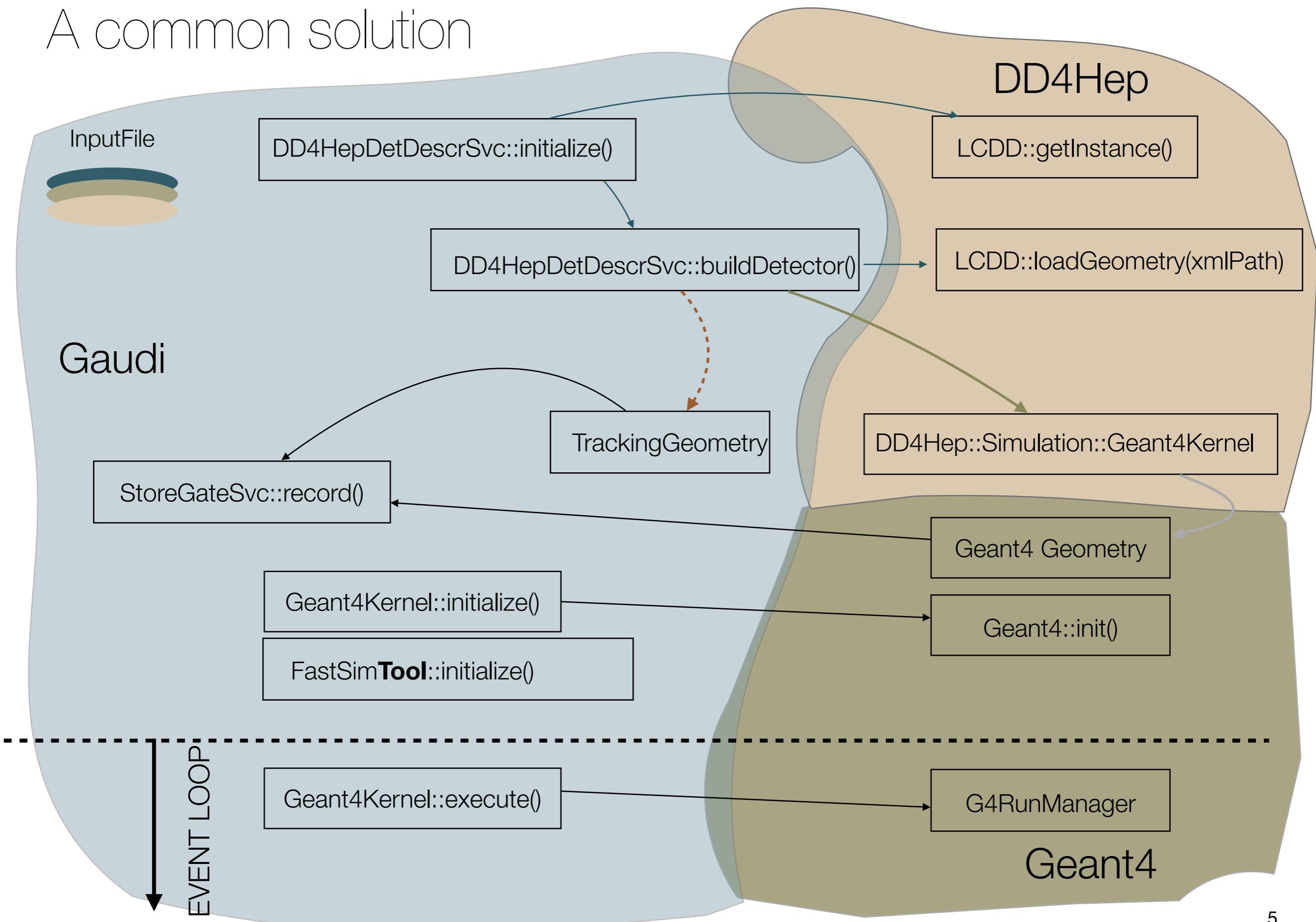
Geant4

ISF2Geant4

Geant4

EVENT LOOP

Geant4Kernel::execute()

G4RunManager

Geant4

G4FastSimulationManager 1

G4FastSimulationManager 2

G4::simulatie()

FastSim**Tool**::simulate()

ParametricSim**Tool**::simulate()