Delphes Infrastructure update

FCC Software Meeting 24.07.2020
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```
int main() {
 confReader = new ExRootConfReader;
 confReader->ReadFile("cards/delphes_card_CMS.tcl");

 modularDelphes = new Delphes("Delphes");
 modularDelphes->SetConfReader(confReader);

 allParticleinputArray = modularDelphes->ExportArray("allParticles"); ...

 modularDelphes->InitTask();

 while(true) { // Event loop
    modularDelphes->Clear();
    ConvertInput(modularDelphes->GetFactory(), allParticleInputArray, … )
    modularDelphes->ProcessTask();
    ConvertOutput(modularDelphes);
 }
 // Finalization
 modularDelphes->FinishTask();
}
```

From Delphes wiki

```
int main() {

    confReader = new ExRootConfReader;
    confReader->ReadFile("cards/delphes_card_CMS.tcl");

    modularDelphes = new Delphes("Delphes");              Initialize
    modularDelphes->SetConfReader(confReader);

    allParticleinputArray = modularDelphes->ExportArray("allParticles"); ...

    modularDelphes->InitTask();


    while(true) { // Event loop
        modularDelphes->Clear();                          Execute
        ConvertInput(modularDelphes->GetFactory(), allParticleInputArray, … )
        modularDelphes->ProcessTask();
        ConvertOutput(modularDelphes);
    }
    // Finalization
    modularDelphes->FinishTask();                         Finalize
}
```

Issues with current DelphesInterface

- DelphesInterface forces the user to manually set output branches
  - Makes joboptions incompatible with other delphes cards
  - In principle, all the information is included in the delphes cards
- HepMC AND GenParticleCollection as input
  - HepMC only required for weight
- Numerous FIXME's, commented out codelines
- ExRootAnalyses RootFile still being carried around
- Not really used as a framework component

```cpp
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  confReader = new ExRootConfReader;
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  while(true) { // Event loop
      modularDelphes->Clear();
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  }
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  modularDelphes->FinishTask();
}
```

Configurable Property

Input

Output

Things to Consider For: Input

- EDM4hep MCParticles should be the standard interface
- .. but the FCCSW Generation components use HepMC2 + Converter
- .. And Gaussino uses HepMC3

Things to Consider for: Output

- Delphes uses classes defined in DelphesClasses.h
  - Largely
- References are implemented via pointers to MCParticles
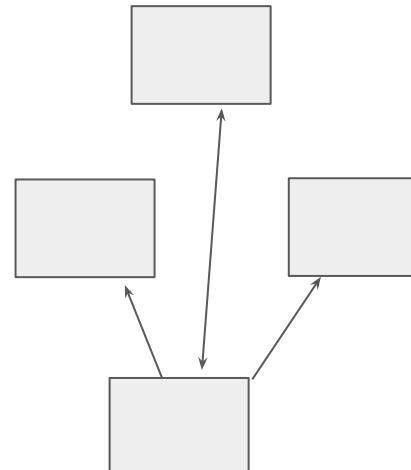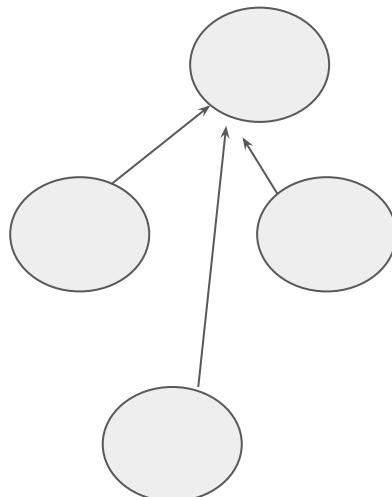
Things to Consider for: Output

- Different DelphesCards produce different Output
- User configuration of output branches cumbersome
- … but no good way to dynamically add DataHandles to GaudiAlgorithms.
- DelphesEDM4hepConverter

Running from Central Installation

```
source
/cvmfs/sw.hsf.org/key4hep/views/edm4hep-delphes-0.1/edm4hep-
delphes.sh


DelphesPythia8_EDM4HEP
~/delphes/cards/delphes_card_IDEA.tcl
~/delphes/examples/Pythia8/configNoLHE.cmnd
output_test.root
```
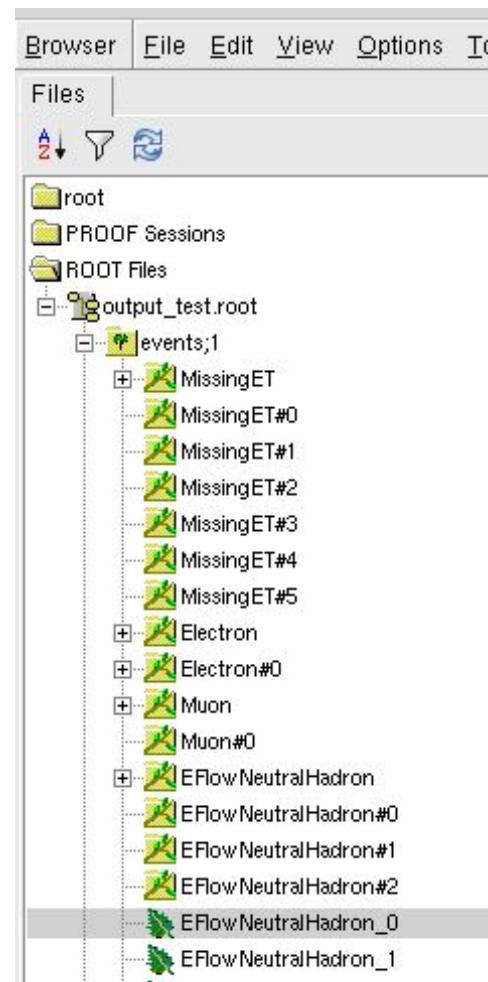
- Bug reports to Converter (and EDM4hep content) welcome