

DarkLight customConfig

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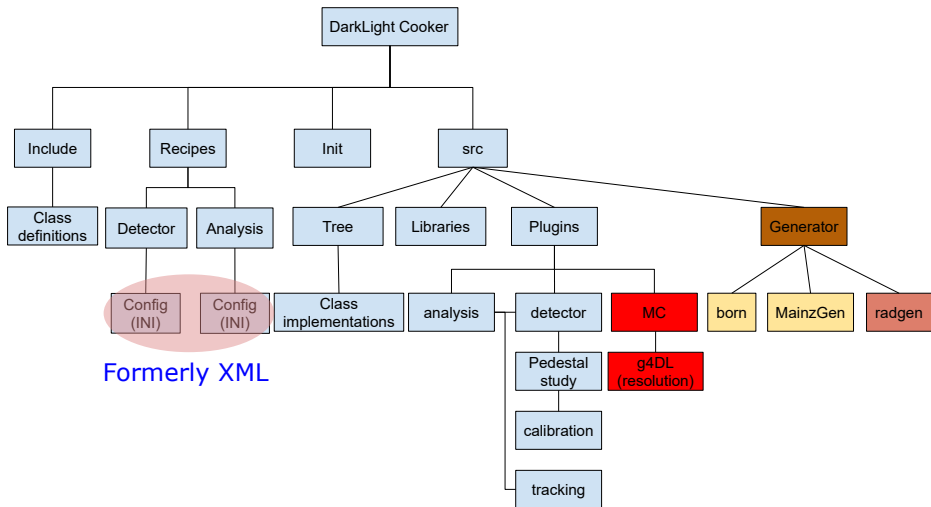
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- Modified g4DL G4UIMessenger methods: update GEM readout board geometry

customConfig Recipe

- Xqilla is deprecated/discontinued since 2018 and removed from package managers (self-build)
- Need new hierarchical configuration architecture
- Structurally Cooker remains the same
- Human-friendly data serialization
- Get rid of XML parsers
- customConfig: handle loading of plugins and configuration files (init files)
- plugin(s) are keyed by name
- TOML: ✗
- YAML: ✗

GEMini.ini Example

```
[darklight]
  init=$HOME/.darklight/shared/init/GEMini.ini
  source=T
  destination=DLMT
[plugins]
  GEMini=libGEMini
  DARKLIGHTteleTracker=libDARKLIGHTteleTracker
[defineHistograms]
[startup]
  GEMini=startup_digi
  DARKLIGHTteleTracker=startup_digi
[execute]
  GEMini=process_digi
[finalize]
  GEMini=findPedestals
```

Key Points of New Config

- Branch of new config: default is to use INI
- Default parsing is with XML
- `cmake ../ -DUSE_XML=OFF` to turn off XML parsing and enable `customConfig` parsing
- **Not tested if XML parsing if fully working. Cedar keeps hanging**
- Use `std::map` as look-up table
- key: `runnumber`, `id` (channel no.), `detector element`
- Not all detector elements and/or channels are changed for all run numbers
- Changed elements get overwritten
- `eetsumMorConfig` creates a map of `runnumber` and sequence of config items
- Might be buggy, and some functionality still to be added

Keeping Things the same

GEMini functions

```
Long_t GEMini::setAPV(int id,int off,int ch,int ch_off,const char *name){ ... }  
Long_t GEMini::setPedestals(int id, char *param){ .... }  
Long_t GEMini::setAxis(int id, int apvid1,int offset1, int apvid2,int  
offset2,const char* name){ ... }
```

XML <run nr="10137">

```
<apv id="0">0,128,0,"APV0"</apv>  
<apvped id="0">"229.61 852.181 872.292 855.482 872.207 848.577..."  
<axis id="0">0,0,7,128,"x"</axis>
```

INI: [run:10137]

```
apv:0=0,128,0,"APV0"  
apvped:0="229.61 852.181 872.292 855.482 872.207 848.577..."  
axis:0=0,0,7,128,"x"
```

Keeping Things the same

Example with multiple runs in the config file

INI: [run:10137]

apv:0=0,128,0,"APV0"

apvpd:0="229.61 852.181 872.292 855.482 872.207 848.577..."

axis:0=0,0,7,128,"x"

INI: [run:10157]

apv:0=0,128,0,"APV0"

apvpd:0="229.61 352.181 872.92 855.482 872.2 848.577..."

axis:0=0,0,7,128,"x"

Resultant config file

INI: [run:10157]

apv:0=0,128,0,"APV0"

~~apvpd:0="229.61 852.181 872.292 855.482 872.207 848.577..."~~

apvpd:0="229.61 352.181 872.92 855.482 872.2 848.577..."

axis:0=0,0,7,128,"x"

Keeping Things the same

RecipeReader: XML

```
AutoDelete<XQQuery> qinit(xqilla.parse(X("data(/darklight/init)")));  
AutoDelete<DynamicContext> context (qinit->createDynamicContext());  
Result rinit=qinit->execute(context);  
InitXML=UTF8(rinit->next(context)->asString(context));
```

RecipeReader: CustomConfig

```
topnodename=input.topNode();  
initfile=nodemap[topnodename]["init"];  
// Use install dir from $HOME  
const fs::path initfileloc((initfile).c_str());  
InitName=initfileloc;
```

G4UIMessenger: UI GEM Boards

Changes in the g4PSIGEM.cc

- Change in the constructor
`g4PSIGEM(G4String, G4LogicalVolume* mv, G4Transform3D trans, G4double, G4double);`
`g4PSIGEM(G4String, G4LogicalVolume* mv, G4Transform3D trans, G4double, G4double, G4String);` ✓
- Last G4String takes input from UI Messenger: select gem readout boards

UI Messenger input

- `/det/gemreadout gemviz` ⇒ for visualization
- `/det/gemreadout gembatch` ⇒ for batch mode
- `/det/update` Update the geometry and needs to be run before:
`/run/initialize`

Eet-Sum-Mor Init File

```
[ config ]
apvped=setPedestals
apvgain=setGains
apv=setAPV
axis=setAxis
format=setDataFormat

[ run:10137 ]
apv:13=0,128,0,"APV0"
apv:14=128,128,0,"APV1"
apv:15=256,128,0,"APV2"
apv:16=384,128,0,"APV3"

axis:0=0,0,7,128,"x"
axis:1=8,0,12,128,"y"
```