Online Histogramming in athenaHLT

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Background

- When running offline, histograms are simply written to files

Gaudi's implementation writes histograms to files
Publishing Online

- When running online, histograms have to be published to IS

This interface was in tdaq in the past and is now in tdaq-common. It is implemented in tdaq.
Old Implementation

- In Run 1, publishing was implemented by histmon, on the TDAQ side

```
hlinterface:: ITHistRegister
+registerTObject(name, hist)
+getPublicationMutex()
...
```

Histmon threads used the OHRootProvider to publish histograms to IS

```
histmon:: THistRegister
+registerTObject(name, hist)
+getPublicationMutex()
...
```

```
histmon:: OHTThread
+config
+connect
+prepare
...
```

```
OHRootProvider publishes to IS
```

"
New Implementation

- New scheme relies on monsvc and has an additional step
athenaHLT... (1)

- ... initializes IPC in its own process – IPCCore::init
- ... uses custom ipc_init.ref by default (but supports a user ipc_init.ref)

- ... launches necessary external processes and waits for their output:
  - Initial IPC server
  - IPC server for custom partition
  - IS Histogramming server
  - OH Display if desired
- ... reuses processes if there are any in the same IPC domain
- ... cleans up processes and ipc_init.ref in the end and...
  - ... in case of abnormal situations (exceptions, signals)
athenaHLT... (2)

- ... chooses TrigMonTHistSvc instead of ThistSvc
  - This is actually the default in the HLT – athenaHLT adds the precommand include("TrigServices/OfflineTHistSvc.py") to the configuration ptree when offline monitoring is desired

- ... loads the MonSvcInfoService lib
  - This is configurable at the moment – option can be removed in the future when all of this settles

- ... implements python bindings for the InfoService type

- ... configures and steers the InfoService – some new options:
  - --histogram-exclude
  - --histogram-include
  - --histogram-publishing-interval

- ... saves IS contents at the end of a run

- ... has high coverage of all of this in automatic tests