Running the tracking only HLT tests

There is a suite of qmtests available at Hlt/Moore/tests/qmtest/moore/physics/tracking

To run them standalone go to Hlt/Moore/tests/options and do:

```python
gaudirun.py Moore_Hlt1And2.py Input_Default.py Moore_Hlt1Only.py hlt1_trackingonly-threshold.py --option=
```

you can check if the TrackReports RawBank has been created by running

```python
gaudirun.py --option="from Gaudi.Configuration import *; from Configurables import RawEventDump;
```

more details you can get by actually running a decoder and dumping the tracks:

```python
gaudirun.py --option="from Gaudi.Configuration import *; from Configurables import RawEventDump,
```

HLT2 is run like this:

```python
gaudirun.py Moore_Hlt1And2.py Input_Default.py Moore_Hlt2Only.py hlt2_trackingonly-threshold.py --option=
```

You can switch between decoding the Hlt1 tracks in HLT2 or redoing the tracking from scratch with these options:

```python
from Configurables import Hlt2Conf; Hlt2Conf().Hlt1TrackOption = 'Decode'
```

```python
from Configurables import Hlt2Conf; Hlt2Conf().Hlt1TrackOption = 'Rerun'
```

2015 Tracking Sequence

Discussion: HLT Tracking beyond LS1

Here is a collection of ideas for possible improvements/changes to the tracking after LS1. Developments have to further he goals of bringing online and offline reco closer together to reduce systematic biases, as well as improving the selectivity of the trigger. Ideas are fairly unstructured at the moment and there clearly are overlaps. Feel free to add (but not remove!) stuff.

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Running the tracking only HLT tests
Review tracking sequence
Upgrade all tracks? If not, can the full Kalman be run on upgraded tracks? Can we run the same Kalman in Hlt1 and Hlt2? See also this TASK Savannah Task

Partial IP cut
Can we live without IP cuts for very high PT tracks?

Add FixMomentum Kalman filter right after FastVelo in HLT1
Test if this makes it feasible to use IPCHI2 in HLT1 already

VeloTT momentum estimate
Backporting developments from UT studies to TT. Adapt forward pattern reco to asymmetric momentum estimate from TT.

D candidates for Alignment
The alignment team needs D candidates for alignment

Use HLT1 tracks for RICH mirror alignment
can we use a special HLT1 track selection for the RICH alignment. Put this into the calibration stream.

Downstream tracking hit flagging
Hits are lost to ghost tracks due to tagging as "used". Cut on quality of long tracks before tagging?

Ghosts in HLT1
Can we cut on ghost probability in HLT1? See TASK

How can we reuse tracks fitted in HLT1 in HLT2?
How much information can be stored (and resurrected) between Hlt1 and Hlt2? Can Hlt2 profit from better seeds? Savannah Task

Propagating info from HLT1 to HLT2
Which constraints to the amount of information is set by online data rates? What is the coding/decoding overhead?

Scenarios

Given: FullVelo; reuse tracks in HLT2;

We do upgrade all tracks above pt=0.5...0.8 GeV

We want lifetime unbiased --> Golden exclusive Modes in HLT1 (mass cuts, lifetime cut)

Rest of the rate with single track with IPCHI2 cut

Possibility: For lower pt cut a displaced vertex trigger would be awesome (Inclusive D* in HLT1??)

PV after Forward

FullVelo + ForwardUpgrade + PV on long tracks (no Kalman fit)

is compatible with full forward pattern recognition --> seeding HLT2 with HLT1

Discussion: HLT Tracking beyond LS1
Seeding

FullVelo + FixMomentum + PV on VeloTracks + SimpleSeeding (IT, OT separately without shared regions) + Matching (no Kalman fit)

seeding HLT2 with HLT1

PV with Improved VeloTracks

FullVelo + FixMomentum + PV on velo tracks + ForwardUpgrade + Kalman fit

makes only sense if you use the improved PV to reduce the number of tracks that are forwarded --> only partial seeding of HLT2

Budget

What is CPU / Disk budget?

2.0±0.2 x current CPU / 8PB ????

Differences Online / Offline Tracking -- Status

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<th>Online Tracking</th>
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<td>HLT1 Velo tracking</td>
<td>Full Velo</td>
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<tr>
<td>HLT2 Velo tracking</td>
<td></td>
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<tr>
<td>Track quality cuts: TrackLength...</td>
<td></td>
</tr>
<tr>
<td>PV from Velo tracks</td>
<td>PV from long tracks (clone killed)</td>
</tr>
<tr>
<td>VeloTT optional / confirmation mode</td>
<td>VeloTT included</td>
</tr>
<tr>
<td>Forward thresholds: ...</td>
<td>Forward thresholds: ...</td>
</tr>
<tr>
<td>Second forward loop optional</td>
<td>Second forward loop always</td>
</tr>
<tr>
<td>Kalman iterations:</td>
<td>Kalman iterations:</td>
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HLT Tracking Benchmark

The following quantities are used to benchmark the HLT tracking (Brainstorming)

Please add your suggestions to the table below:

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<td>IP resolution</td>
<td>IPchi2</td>
<td>??</td>
<td>Good for overall performance measure</td>
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This topic: LHCb > HltTracking
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