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Trigger information in DPD

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- Proposal for Performance DPDs
- What are the needs of physics/performance groups
- Preliminary list of trigger objects in DPDs
- Feedback needed to finalize Performance DPDs

Performance DPD Proposal

	Trigger Stream	Event Selection	Heavy Content	Usage
#1	EGamma	high p_T e/γ OR pre-scale	ROI ESD	e/γ reco+ID, τ fake
#2	Muon	high p_T μ OR pre-scale	ESD of μ+τ	μ reco+ID, τ fake
#3	Jet	high p_T jet OR pre-scale	full ESD	clustering, jets, MET, lepton fakes, b-tag
#4	EGamma	Z/W/JPsi → e medium	full ESD	e/τ signal, MET
#5	Muon	Z/W/JPsi → μ medium	full ESD	μ/τ signal, MET
#6	Jet	Z→τ med OR W→MET	ROI ESD	τ signal
#7	EGamma	γ tight OR Z→ee	full ESD	jet calibration (γ/Z+jet)
#8	Min Bias	pre-scale	full ESD	jet calibration, MET, LArg

➡ Should DPD #3 be split in two (tracking-oriented & calo-oriented) ?

All AOD's are also available from all trigger streams.

David Côté - Physics Coordination - 20 August 2008 6/10

See PhysicsAnalysis/PrimaryDPDMaker/python/PrimaryDPD_OutputDefinitions.py for list of objects

Requests to phys/perf groups

- Definition of the trigger content in the DPDs is becoming an important issue ahead of first data taking
- At the end of July we sent an e-mail to all conveners and trigger contact persons in order to request feedback on what are the needs in physics and performance groups
  - Which L2/EF objects ?
  - Do you need the navigation ?
  - Do you need to know about pre-scale/pass-through ?
  - Do you only need to know which trigger passed ?
  - Do you want to use trigger information to do tag-and-probe ?
  - Is there any other use case ?

Initial response from WGs

- Input from slices and physics groups collected: reported in the July 23rd Menus meeting
  - Which triggers passed/failed, prescale, passthrough
  - Enough info to allow tag-and-probe (match trigger and offline objects)
    - Benchmark for minimal trigger info being requested!
- Trigger navigation:
  - For 2008 run: store as is, no thinning
  - For 2009 run:
    - Thin down to contain only requested chains
    - Tomasz and Harvard group interested
    - Not clear how to deal with trigger features attached to deleted chains
    - Configuration information to remain un-slimmed
- Matching between offline and online objects
  - Existed in EventViewTrigger
  - Carsten Hensel working on this

Current Trigger content in DPD

Configuration and steering:
TrigDec::TrigDecision#TrigDecision
HLT::HLTResult#HLTResult_EF
HLT::HLTResult#HLTResult_L2
TrigRoiDescriptorCollection#HLT
TrigRoiDescriptorCollection#HLT_T2TauFinal
TrigRoiDescriptorCollection#HLT_TrigT2CaloEgamma
TrigRoiDescriptorCollection#HLT_TrigT2CaloJet
TrigRoiDescriptorCollection#HLT_TrigT2CaloTau
TrigRoiDescriptorCollection#HLT_forMS

Level 1:
LVL1_ROI#LVL1_ROI
LVL1::JEMRoI#JEMRoIs
LVL1::TriggerTower#TriggerTowers
LVL1::JEMEtSums#JEMEtSums

L2 muons:
CombinedMuonFeature#HLT_egamma
CombinedMuonFeature#HLT
MuonFeatureContainer#HLT
TrigMuonEFContainer#HLT_MuonEF

L2 Jets:
TrigT2JetContainer#HLT_TrigT2CaloJet

L2 Missing ET:
TrigMissingETContainer#HLT_T2MissingET

L2 egamma:
TrigEMClusterContainer#HLT
TrigEMClusterContainer#HLT_TrigT2CaloEgamma
TrigElectronContainer#HLT_L2IDCaloFex
TrigPhotonContainer#HLT_L2PhotonFex

L2 taus:
Trigtauclustercontainer#HLT_TrigT2CaloTau
TrigTauContainer#HLT
TrigTauTracksInfoCollection#HLT

L2 tracks:
TrigInDetTrackCollection#HLT
TrigInDetTrackCollection#HLT_TRTSegmentFinder
TrigInDetTrackCollection#HLT_TRTxK
TrigInDetTrackCollection#HLT_TrigIDSCAN_eGamma
TrigInDetTrackCollection#HLT_TrigSiTrack_eGamma
TrigInDetTrackCollection#HLT_TrigIDSCAN_Tau
TrigInDetTrackCollection#HLT_TrigSiTrack_Tau
TrigInDetTrackCollection#HLT_TrigIDSCAN_Muon
TrigInDetTrackCollection#HLT_TrigIDSCAN_Jet
TrigInDetTrackCollection#HLT_TrigIDSCAN_eGamma

EF taus:
Analysis::TauJetContainer#HLT_TrigTauRecMerged
Analysis::TauJetContainer#HLT_TrigTauRecCalo
Analysis::TauDetailsContainer#HLT_TrigTauDetailsCalo
Analysis::TauDetailsContainer#HLT_TrigTauDetailsMerged
Analysis::TauJetContainer#HLT_TrigTauRecMerged
Analysis::TauJetContainer#HLT_TrigTauRecCalo
TrigTauTracksInfoCollection#HLT

EF Missing ET:
TrigMissingETContainer#HLT_TrigEFMissingET

EF Jets:
JetCollection#HLT
JetCollection#HLT_TrigJetRec

EF Muons:
TrigMuonEFContainer#HLT_MuonEF

EF egamma:
egammaContainer#HLT_egamma

EF tracks:
VxContainer#HLT_PrimVx
Rec::TrackParticleContainer#HLT_InDetTrigParticleCreation_Tau_EFID

Feedback needed to finalize DPD content

- Feedback is needed from all trigger experts to finalize the trigger contents in the DPDs before start of data taking
- Twiki page available where all info are collected:

  https://twiki.cern.ch/twiki/bin/view/Atlas/TrigInfoInPrimaryDPD
- Some input have already been received (many thanks!)

Muon Slice:
IsoMuonfeatureContainer#HLT
TileMuFeatureContainer#HLT
TileTrackMuFeatureContainer#HLT
TrigMuonEFInfoContainer#HLT_MuonEF

MissingET Slice:
EnergySum_ROI#HLT
RecEnergyRoI#HLT

- Please have a look at what is missing from your slice and let us know what needs to be added to the DPDs
- Some test DPDs with trigger info available at:

  https://twiki.cern.ch/twiki/bin/view/Atlas/TauDPDSamples

Backup Slides

Performance DPDs

- Strategies:
  - "RoI DPD" – keep heavy objects only from regions of interest
    - E.g. calorimeter cells in a cone around an electron
    - Typical "efficiency" wrt full ESD found to be ~20%
  - Skim events to keep signal enriched sample (W/Z signal/standard candles, high-p_T, tight PID)
  - Prescale: keep only a fraction of events in some DPDs
- Heavy and Light performance DPDs
  - Heavy:
    - ESD->DPD at Tier0
    - ESD-level information for detailed performance studies
    - 8 heavy DPDs ≅ 80% AOD volume
  - Light:
    - AOD->DPD at Tier1
    - AOD-level information for quick exploration
    - 8 light DPDs ≅ 10% AOD volume
    - DPD Light intended as basis for Physics DPD
- See Ric's talk at Trigger Menu meeting