

DS Application Design: Status Summary

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(and others interested but who were unable to join the
discussion last week)

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Status Summary

- Two meetings held last week:
 - Friday's recording and slides: <https://indico.fnal.gov/event/44986/>
- Goal:
 - Layout of DS modules within DAQ application framework, so implementation can begin.
- Expect continued development/refinement in the near future, with testing.
- Anticipate close collaboration with app framework experts.

Take Away's from Discussion

Agreement on:

- The design must accommodate **“plug and play”** of different algorithms tested so far, including TP, TC, and TD generation, and conventional as well as ML algorithms
- We should move toward the direction of deconstructing TP>TC>TD generation into steps which fit within **“unit cell”** applications
 - “unit cell” corresponds to a **well-defined, physical, active detector volume** (e.g. wire (1D), wireplane (1D), PDS sensor aggregate (2D), full TPC FD, full TPC+PDS FD, all 4 TPC+PDS FDs...)
 - Whatever the algorithm may be (TP hit finding, CNN classification, etc, would be called by a “unit cell” module depending on which level of information it is acting on
- Need a **new schema** which encompasses data definitions more inclusively

Take Away's from Discussion

- We should **classify triggers according to activity**, not physics, e.g.
 - EXT trigger, including beam, elec_CALIB, n_CALIB, pd_CALIB
 - TPC trigger, including LE_local, HE_local, LE_extended
 - PDS trigger, including LE_local, HE_local, LE_extended

 - Above types, and combinations, can be used to map into physics event types...

Take Away's from Discussion

- Physics vs. trigger source **matrix**:

	Beam nu	Atm nu	Cosmic	pdk, nnbar	SNB nus	Solar nus	SN nus
beam	Yes	Not	Not	Not		Not	Not
elec_CALIB							
n_CALIB							
pd_CALIB							
TPC_LE_local						Yes	Yes
TPC_HE_local		Yes	Yes	Yes			
TPC_LE_extended					Yes		
PDS_LE_local						Yes	Yes
PDS_HE_local		Yes	Yes	Yes			
PDS_LE_extended					Yes		

*PDS and TPC could be .OR.'d or .AND.'d

Take Away's from Discussion

- Physics vs. trigger source **matrix:**

Will be the focus of first code implementation

	Beam nu	Atm nu	Cosmic	pdk, nnbar	SNB nus	Solar nus	SN nus
beam	Yes	Not	Not	Not		Not	Not
elec_CALIB							
n_CALIB							
pd_CALIB							
TPC_LE_local						Yes	Yes
TPC_HE_local		Yes	Yes	Yes			
TPC_LE_extended					Yes		
PDS_LE_local						Yes	Yes
PDS_HE_local		Yes	Yes	Yes			
PDS_LE_extended					Yes		

*PDS and TPC could be .OR.'d or .AND.'d

SNB: careful consideration
Solar/SN nu: lower priority

Today's Discussion Focus: Implementation

- Friday: Reviewed ptmp as a starting point for implementation
- Today: DS in AppFwk (Pierre L.)
- Discussion:
 - New implementation (being worked on by Brett) allows for broader schema (TP, TC, and TD...)
 - We should avoid type proliferation, and decide on a few types and clear definitions
 - We need to decide on what schema types to codify