



Data Quality Monitoring - Level 2 Trigger

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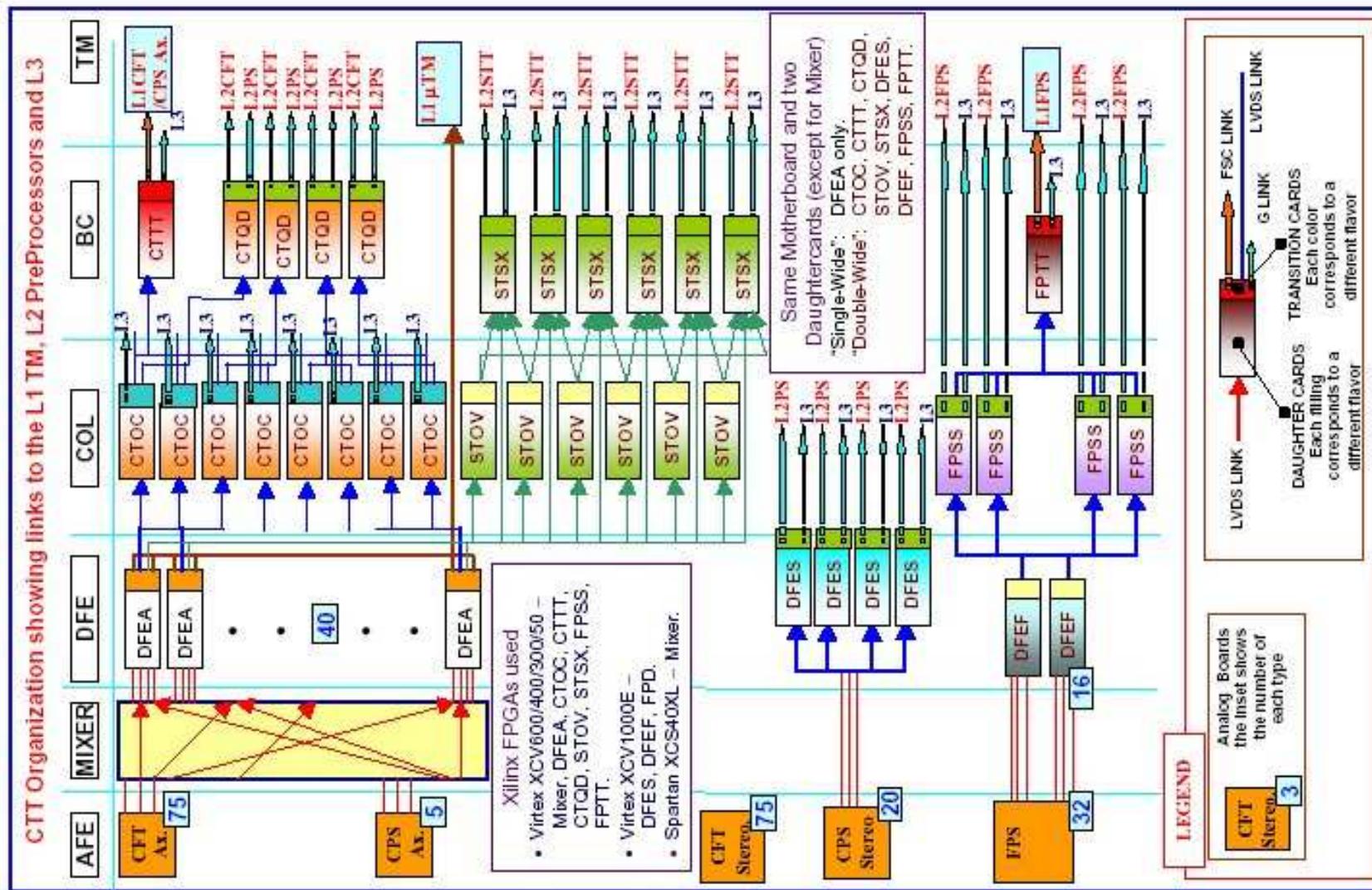
The University of Oklahoma
on behalf of the L1/L2 trigger group

- L2 (L1) PS and CTT status - summary
- Data quality monitoring - “bit-by-bit” comparison
- L1/L2 simulation status
- Conclusions & plans ...



L1/L2 trigger PS/CTT status

L2 Data Quality





⇒ **L1** trigger is getting closer and closer to the point
when actual data will be flowing to **L2**

- L1 CPS axial:

- CPS axial personality firmware recently downloaded to the AFE boards
- trigger information should be ready to go through the trigger chain
- ...but... inputs to L2 PS are stucked somewhere at CTOC & CTQD

- L1 CPS stereo:

- big progress on the firmware for the DFES boards
- thanks to that, currently, testing of DFES outputs

- as soon as everything's ready ⇒ data will flow to L2PS

- L1 FPS chain:

- working on firmware for DFEE, FPSS and FPTT boards
- also working on the trigger simulation



- L2 CPS pre-processor:

- L2 trigger is ready - waiting only for the L1 CPS problems to be solved

- L2 FPS pre-processor:

- building the L2 FPS package, working on the algorithm in progress
- output from L2 FPS is expected to be ready for L2 global in Fall 2003

L1 and L2 CTT status

- L1 CTT chain is being tested (AFE → Mixer → DFEA → CTOC → CTQD)
- L2 CTT pre-processor is ready and will be tested online when we make sure that the L1 data quality is good



The purpose is to monitor behavior of the L2 trigger comparing processed inputs (by L2) with the L2 trigger simulation: ideally \longrightarrow will be identical.

How is it all done?

- detector's FE boards \rightarrow L1 trigger \rightarrow L2 trigger ... RawDataChunk (RDC)
- run the L2 trigger simulation on the data file using `tsim_1112`
- create a new RDC and extract L2 objects (L2MUF, L2MUC, L2CAL, etc. ...)
- compare the object in the original RDC with the new one
- write differences into a file/on the screen (for the time being)

What's the reason for all this exercise?

- found differences - within the tolerance
- this would point into potential problems with (in either online or offline):
 - * in the L2 trigger configuration
 - * in L2 pre-processor algorithms



Example #1:

there was found differences for CAL. Investigation by experts revealed a bug in the swapping code of `tsim_l1cal` - and fixed.

Example #2:

when trying to set a tolerance for variables coming from muon triggers, a bug in `l2iogen` was found - and fixed.

Things recently done: (as of Friday, June 13)

- conversion/migration from `tsim_l112` to `d0trigsim` successful (p13,p14 → p15)
- first results on p15 data available for: **L2CAL, L2CALJET, L2MUC, L2MUF** (on ~ 100 events sample)

	# of identical objects	# of dif. in objects	# of events with dif. # of objects
L2CAL	70	70	0
L2CALJET	157	0	0
L2MUC	113	14	1
L2MUF	70	4	0



- p15 is the current release
- p15.01 is running online in L2 will switch to p15.03 when new trigger list runs
- runs fine on MC inputs
- on DATA - some parts don't run (eg. L2 global). Was being investigated by J. Kowalkowski as a potential framework problem; no recent progress reports.
- l2io currently puts generated code into the source area of release. This breaks offsite users and must be changed - interface change coming.



Bit-by-bit comparison:

- EXPERTS - look at the first results
- currently it's run offline (collect data, run simulation, compare)
- it's planned to run it online (like an EXAMINE - number of differences)
- L2CTT bit-by-bit is almost ready

Other things to be done:

- continue to work on L1/L2 PS
- continue to test quality of L1 CTT inputs to L2 CTT (data already flowing!)
 - ⇒ L2 CTT part of L2 global



... and L1/L2 simulation in future:

- most development work has centered on tracking (L2STT); the rest of p15 has been very quiet
- James, Reinhard and Volker are working to improve L2CAL algorithms; probably means that change to CAL object format is coming
- developers can still use `tsim_l112` but are encouraged to switch to `d0trigsim` as it is better supported

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