WBS 3.2 – Data Acquisition

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Breakout Session Agenda

- **Introduction - V. O'Dell**
- **Data To Surface – K. Sumorok**
- **Builder Unit/Filter Farm – J. Branson**
- **Conclusions and Wrapup – V. O'Dell**

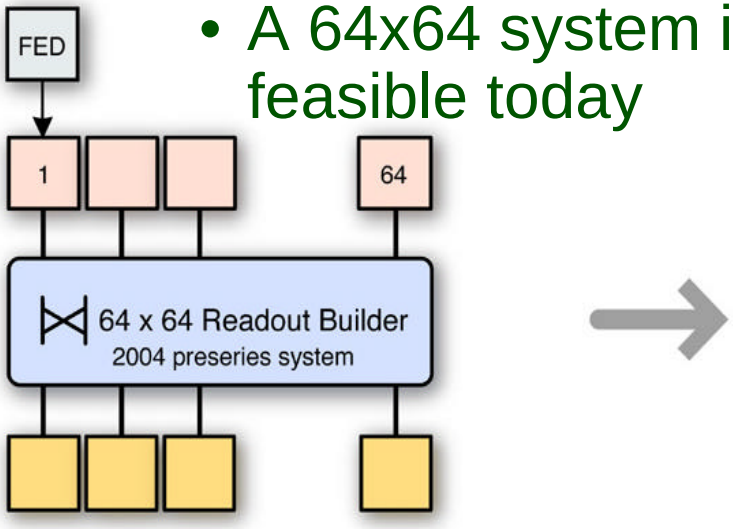
Introduction

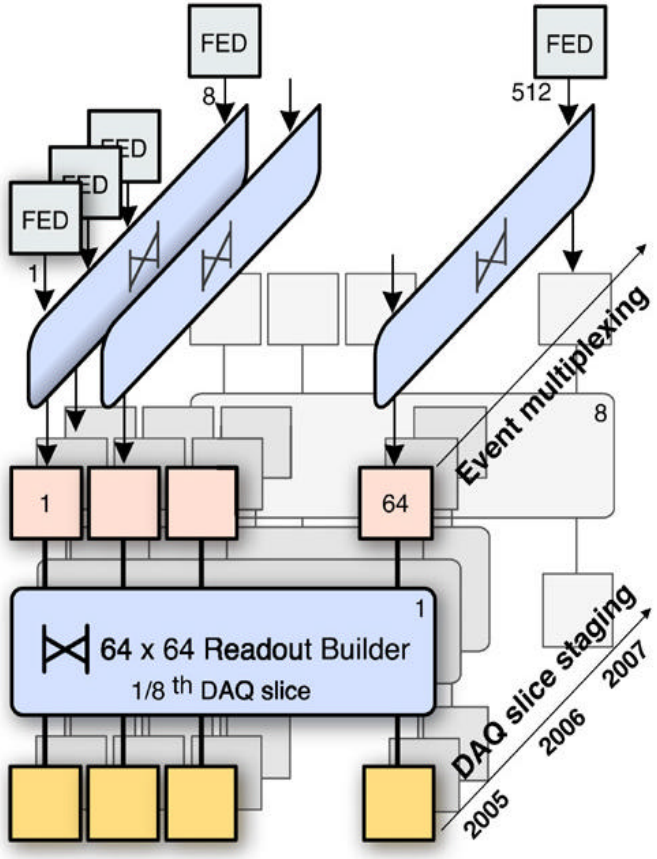
- **Brief Overview of (new) CMS DAQ**
  - **(Brief) System Overview**
  - **Institutional Responsibilities**

The new design: principle

Basic principle:

- **Break DAQ into a number of functionally identical, parallel, smaller DAQ systems**
  - A 64x64 system is feasible today





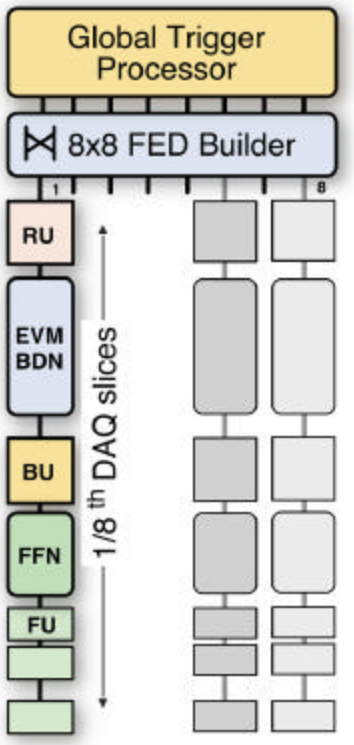
CMS DAQ: Overview

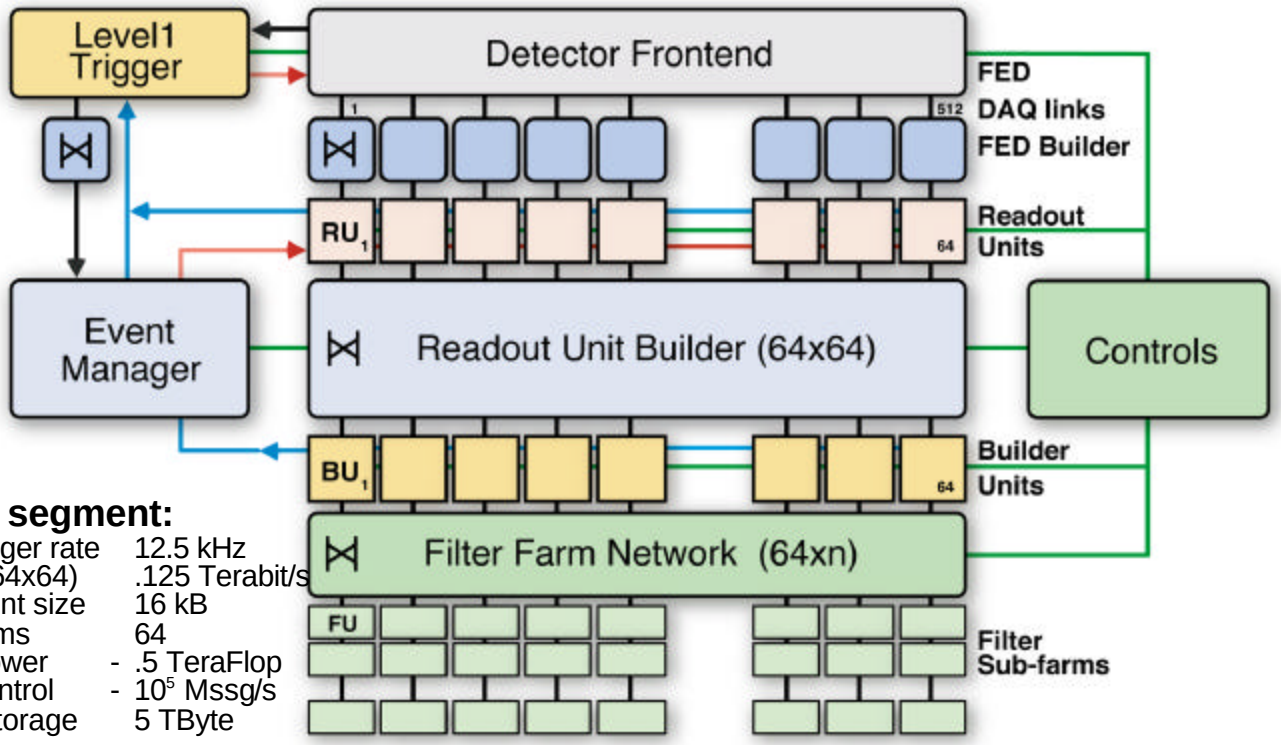
Data to surface:

Average event size	1 Mbyte
No. FED s-link64 ports	> 512
DAQ links (2.5 Gb/s)	512+512
Event fragment size	2 kB
FED builders (8x8)	- 64+64

The DAQ system consists of two parts:

- **The front end electronics readout and the data link to surface**
- **The DAQ core implemented as 8 DAQ segments each processing a fraction of the trigger rate**





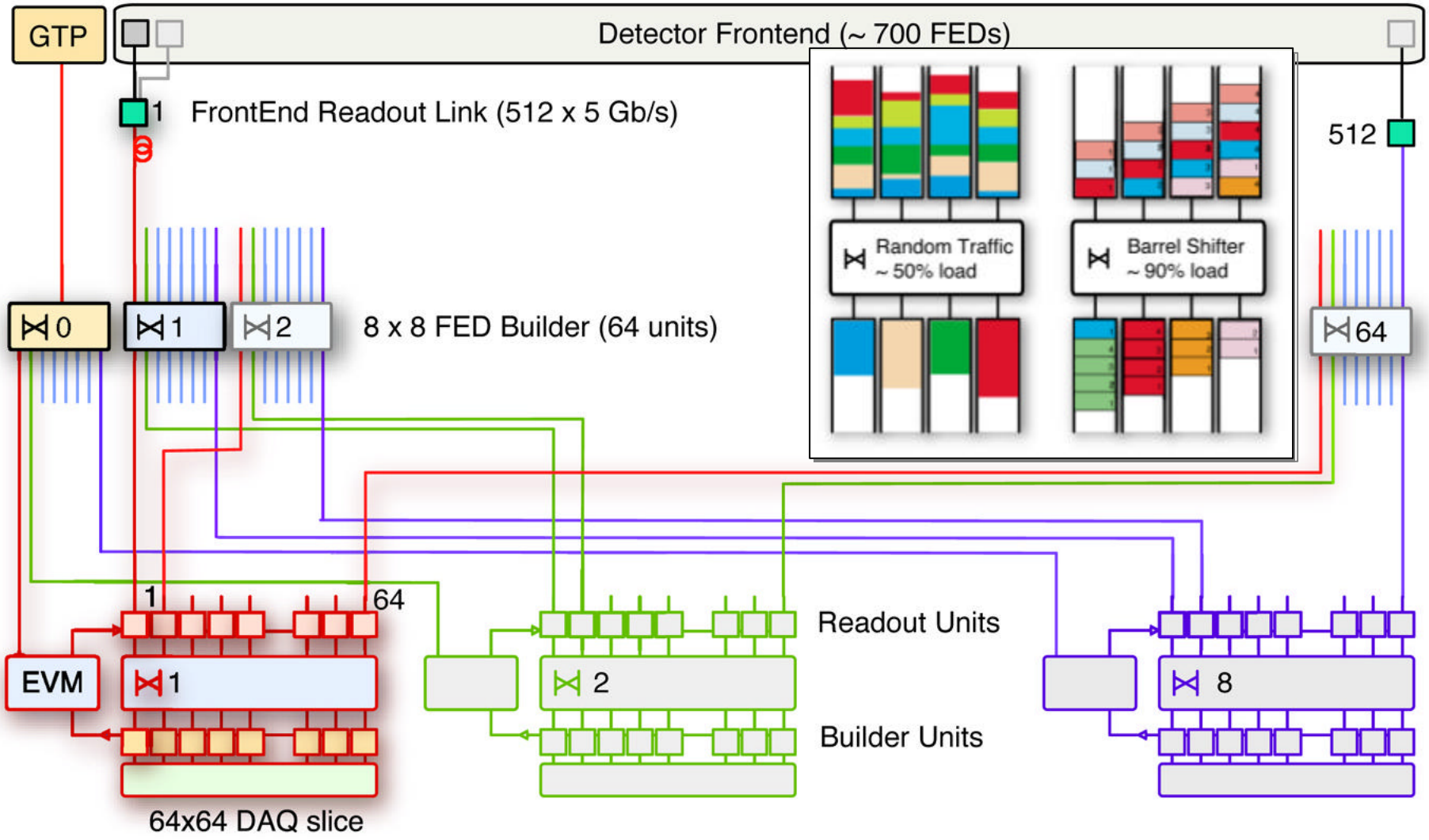
1/8th DAQ segment:

Lv-1 max. trigger rate	12.5 kHz
RU Builder (64x64)	.125 Terabit/s
Event fragment size	16 kB
RU/BU systems	64
Event filter power	- .5 TeraFlop
Event flow control	- 10^5 Mssg/s
Local mass storage	5 TByte

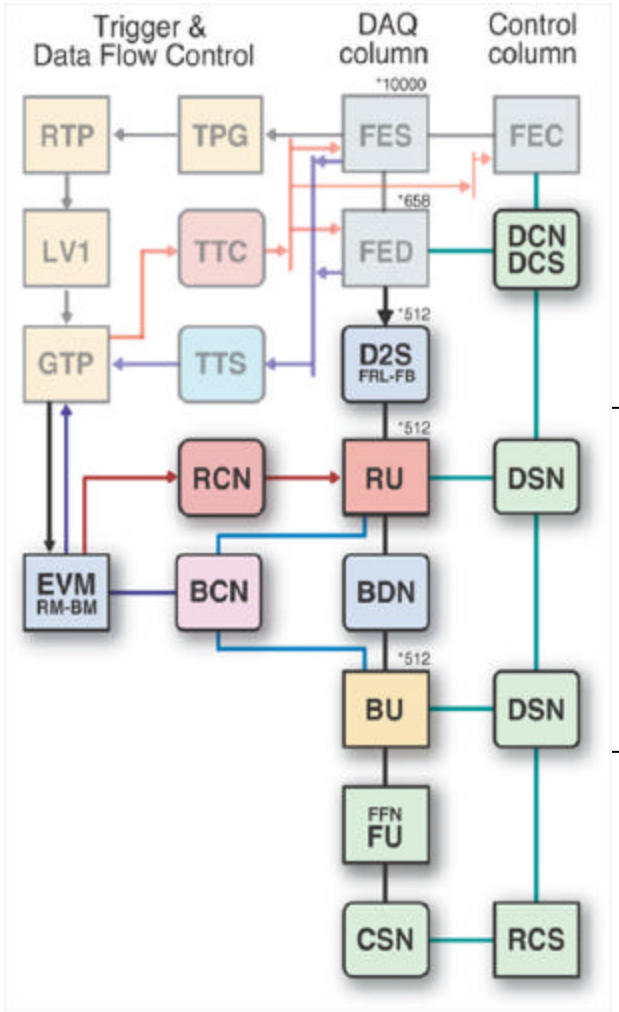
Side view

Front view

Detector readout to surface



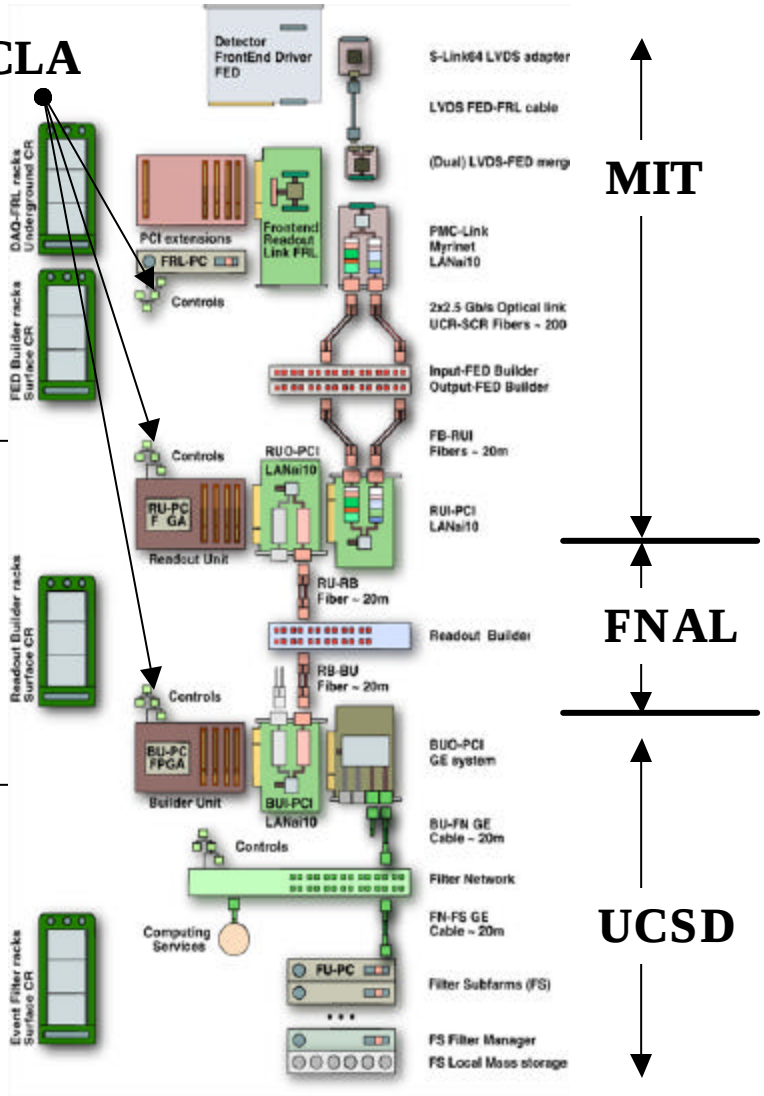
Institutional Responsibility



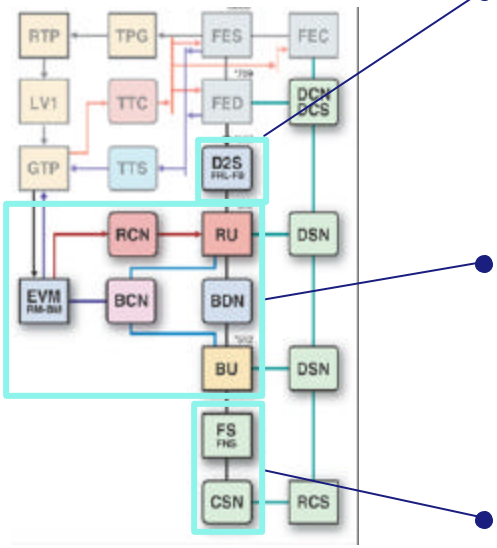
Data to Surface

Readout Builder

Event Filter



Institutional Responsibilites



MIT (Data To Surface) — **P. Sphicas**

- S-Llink64 to FRL Merger
- FED Data channels
- FED Builder
- RUI interface
- Readout Unit (RUI, RUO, RUM)

Fermilab (Readout Builder) — **V. O'Dell**

- Readout Builder
- Event Manager and control networks

UC San Diego (Event Filter) — **J. Branson**

- Builder Unit (BUI,BUO, BUM)
- Filter Farm Networks
- Farm Manager
- Filter Unit
- Local Mass storage

UC Los Angeles(Error Handling) — **S. Erhan**

- Error Analyses
- Hardware Supervisors
- Error Manager

Preseries

- D2S, RB and EF (same institutional boundaries)