FTK integration at Lab - CERN4

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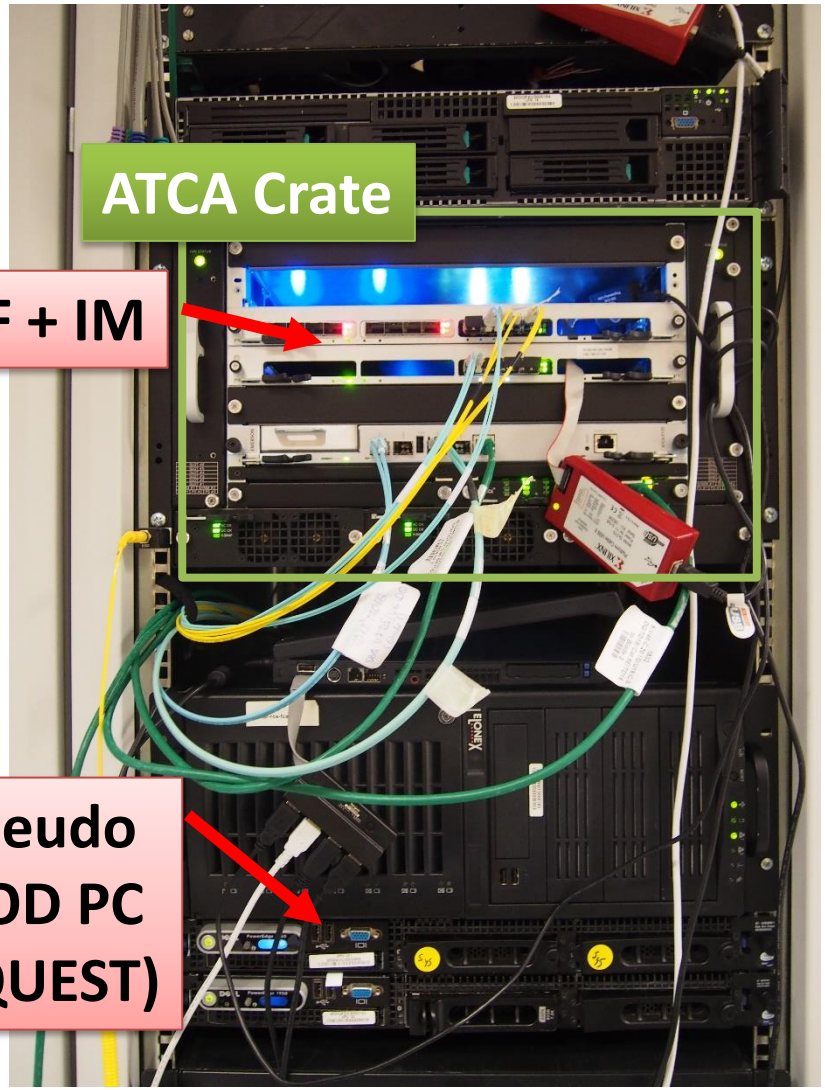
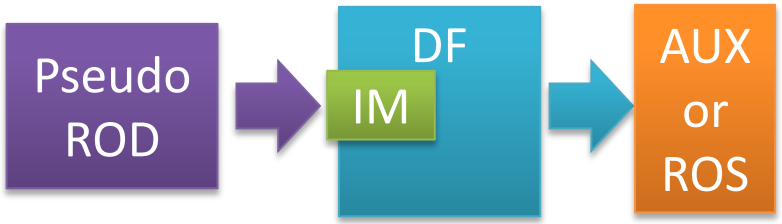
FTK Test Stand @ Lab4



CERN Lab 4 setup

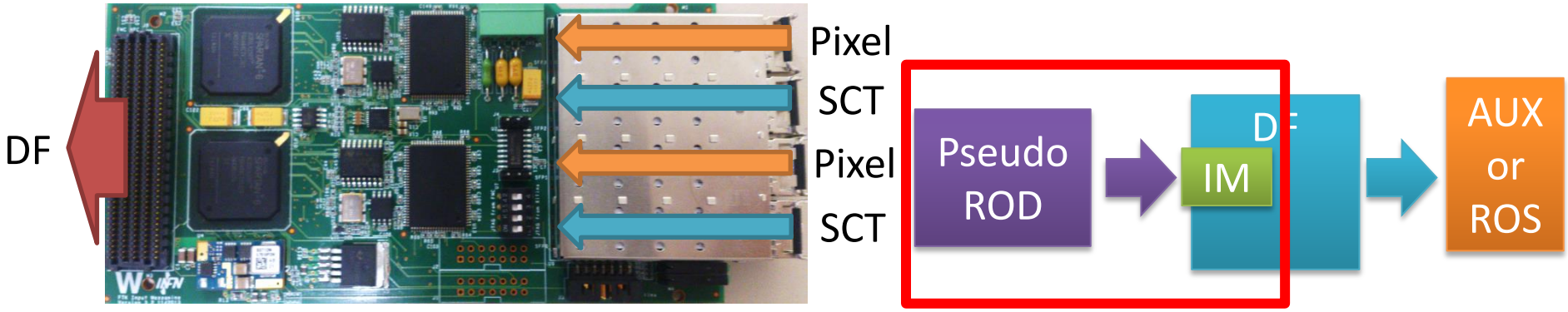
- 2 QUEST [4x2 SLINK]
- 4 IM [4x4 SLINK](ver 3.2)
- 1 DF+RTM [4 IM](pulsar IIb)
- 2 ROS [3x2 SLINK] (robin)
- AUX, AM, SSB, FLIC etc.



We are configuring“proto-FTK” setup at Lab4.

Test Status : Input Mezzanine (IM)

IM receives hit information from IBL, Pixel, and SCT Read-Out Drivers, performs hit clustering to reduce data size, and send the data to Data Formatter.



- Core functionality is being implemented and tested.
- Several monitoring registers are defined and in use, and will be added.
- Tolerance to the input rate is being tested.
  - -- Stable dataflow with ~20kHz input rate is established.
  - -- Single pieces of FW running at 100kHz in simulation.
  - -- Now increasing input rate up to 100kHz.

Basic functionality and connection with DF is established,
We are developing IM to be more tolerate to high input rate.

Example of IM Monitoring

Event information:

	Run#	L1ID	#words	word	time(CLK,40MHz)	#LostWords
Current event (on going)	195847	19847221	316	0x1D1E1D1E	1251	0
Previous event (done)	195847	19847220	315	0xE0F00000	3009	0

Flow of word state:

	1st	2nd	3rd	4th	5th	6th	7th	8th
Current event (on going)	HEADER	DATA	TRAILER	---	---	---	---	---
Previous event (done)	HEADER	DATA	TRAILER	IDLE	---	---	---	---

Previous event variables:

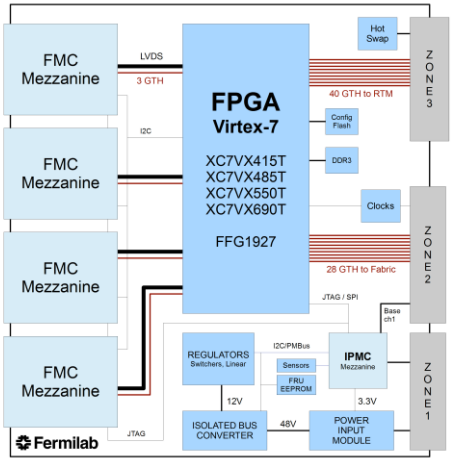
	#words	ClusterSize	time(bof-bof)	time(bof-eof)	latency
Previous	315	0	3009	715	0xDEADBEEF
Previous2	315	0	2243	339	0xDEADBEEF
Previous3	315	0	2234	374	0xDEADBEEF

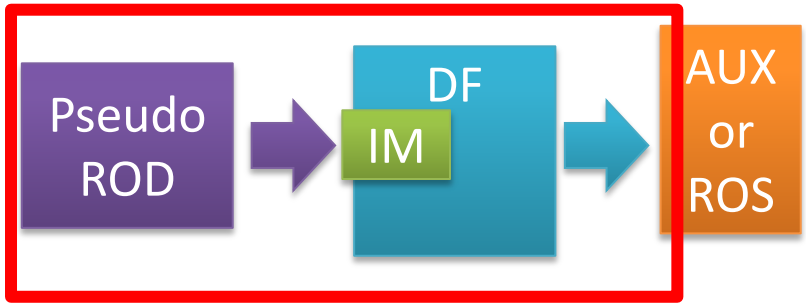
FIFO status:

	was full	is full	was almost full	is almost full	is empty	#was almost full
INFIFO	OFF	OFF	OFF	OFF	ON	0
SYSFIFO	OFF	OFF	ON	OFF	N/A	255
RODFIFO	OFF	OFF	OFF	OFF	OFF	0
DATAFIFO	OFF	OFF	OFF	OFF	ON	0
OUTFIFO	OFF	OFF	OFF	OFF	ON	0

Test Status : Data Formatter (DF)

The ATCA-based Data Formatter system will organize the trigger tower data, sharing data among boards over a full-mesh backplane.





- One of prototype board has been tested in ATCA shelf in TDAQ lab4.
- User Interface of IPbus is being demonstrated for DF board operation in CERN GPN.
- Initial switching FW is ready for testing and being tested with QUEST - IM - DF chain.
- Interface for IM and AUX is being tested.

IM – DF

Dataflow and I2C interface for monitoring configuration are being demonstrated.

DF – AUX

6.4 Gb/s SLINK is being tested (with required speed).

Several more complicated tests are ongoing.