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EIGER – Updates and Outlook

Stefan Brandstetter

HDRMX, March 15th 2017

DECTRIS Ltd.
5405 Baden-Dättwil
Switzerland
www.dectris.com

Last HDRMX Meeting – Sept 2016

*Dectris indicated that they are **seriously investigating** the possibility of having an option of **40 Gigabit DCU** support, but are not ready to commit yet on a specific schedule.*

⇒ ***Now we know the schedule***

⇒ ***40 Gbit cards were successfully tested***

⇒ ***Available from May 2017***

⇒ ***Interface***

Update

- *Improving EIGER*
- *EIGER Processing Unit*
- *Faster processing with XDS*
- *Outlook & Summary*

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Pushing the EIGER

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Switzerland
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15-Mar-17

Performance of the EIGER family SRI 2015

	max. frame rate [Hz]	# of images at max. frame rate	min. continuous frame rate [Hz]
EIGER X 1M	3000	> 90’000	1500
EIGER X 4M	750	> 22’000	375
EIGER X 9M	238	> 7’100	119
EIGER X 16M	133	> 4’000	66

Performance of the EIGER family

	max. frame rate [Hz]	# of images at max. frame rate	min. continuous frame rate [Hz]
EIGER X 1M	3000	> 90’000	1500
EIGER X 4M	750	> 22’000	375 **(500)**
EIGER X 9M	238	> 7’100	119 **(200)**
EIGER X 16M	133	> 4’000	66 **(100)**

Since FW 1.6.0
Autumn 2016

Performance of the EIGER family

	max. frame rate [Hz]	# of images at max. frame rate	min. continuous frame rate [Hz]
EIGER X 1M	3000	> 90’000	1500
EIGER X 4M	750	**> 22’000** **>50’000 (4M ROI at 9M)**	375 (500)
EIGER X 9M	238	**> 7’100** **>15’000**	119 (200)
EIGER X 16M	133	> 4’000	66 (100)

Since FW 1.6.4
January 2017

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EPU – EIGER Processing Unit

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Switzerland
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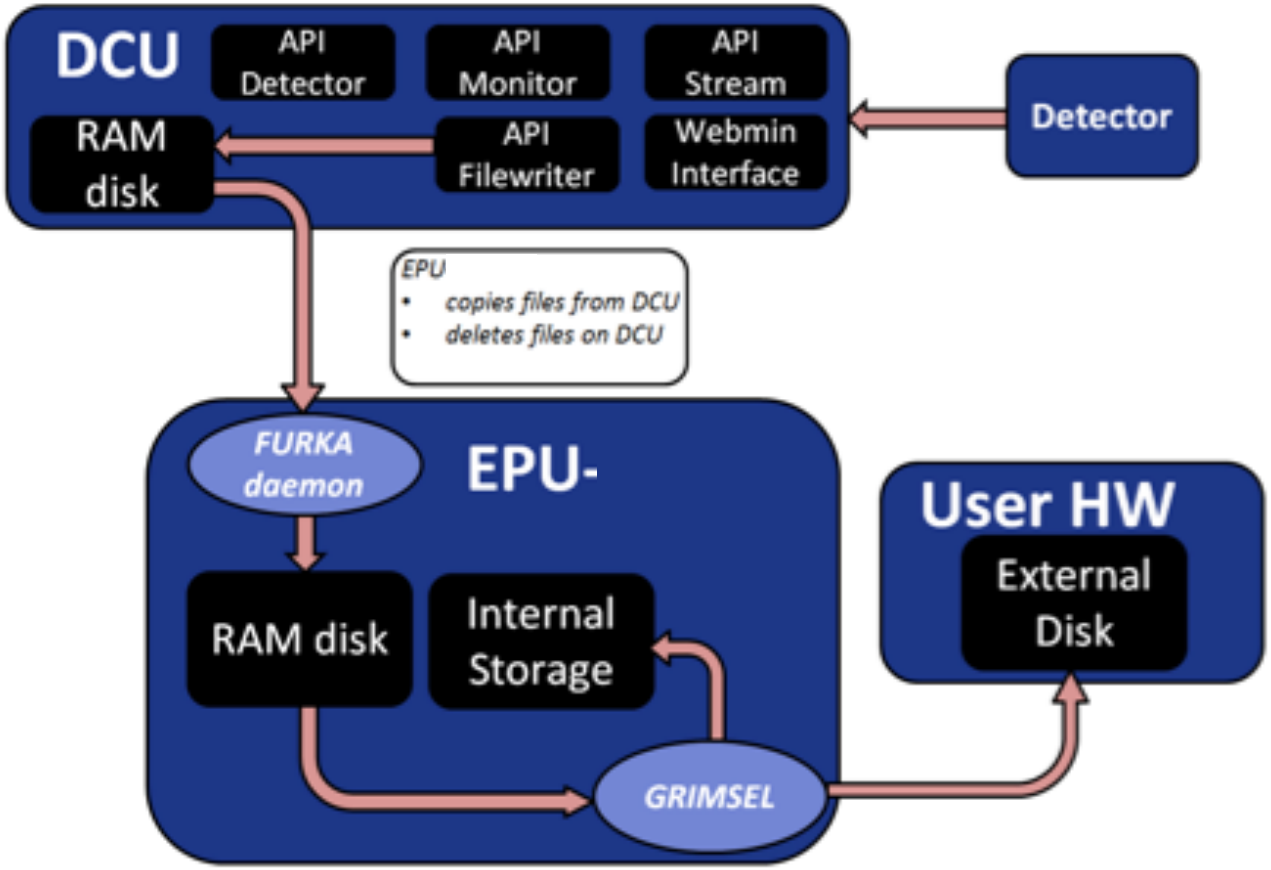
EPU XL & mini

- Continuous rate - 750 MB/s
- Peak rate - 1000 MB/s (for one data set)
- Version XL: Processing a **9000 image** data set (EIGER X 16M) in short time



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Specs

- *EPU XL*
- **DELL Power Edge – R930**
- **160 Threads (4 Sockets)**
- **12 TB Storage (RAID 50), 768 GB RAM for Processing**
- **Full automated data transfer**

- *EPU mini (only to move data)*
- **DELL Power Edge - R430**
- **no storage, only RAM (384 GB)**
- **Full automated data transfer**

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Faster processing with XDS

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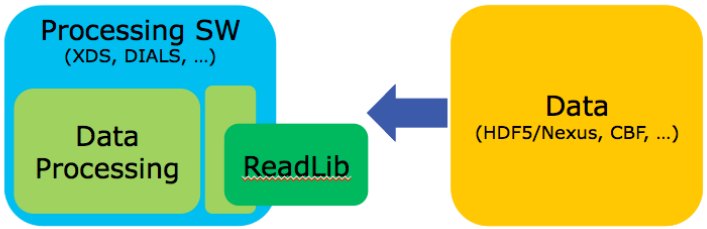
XDS Plugin

As presented at BNL

Another approach

- *A separation between code for reading data and processing data would make everyone's job easier.*
- *The code for reading data can be physically separated from the code processing data by a plugin mechanism.*
- *This allows every user to feed the processing software with his data in an optimal way.*
- *Ideally the community agree on a common set of plugins to ensure reliable usage.*



As implemented in XDS

New keyword:

LIB= /path/to/library

As implemented by DECTRIS

dectris-neggia.so

- reads HDF5 in parallel
- written for FW 1.6.4
- might work with earlier data

Spotfinding with XDS

Hardware

Dell PowerEdge 930
- 4x 20 cores (HT)
- 768 GB RAM

Data

Lysozyme
- EIGER X 16M
- 9,000 images
- FW 1.5.2

50 frames per second

LIB= ../dectris-neggia.so
DATA_RANGE= 1 9000
BACKGROUND_RANGE= 1 9000
SPOT_RANGE= **1 9000**
JOB= **INIT COLSPOT IDXREF**
MAX_NUM_PROCS= 75

total elapsed wall-clock time = 175.9 s

Processing with XDS

Hardware

Dell PowerEdge 930

- 4x 20 cores (HT)
- 768 GB RAM

Data

Lysozyme

- EIGER X 16M
- 9,000 images
- FW 1.5.2

2.3x collection time

LIB= ../dectris-neggia.so

DATA_RANGE= 1 9000

SPOT_RANGE= **2x 10°**

1. JOB= **XYCORR INIT**
   JOBS/PROCS= 1/50
2. JOB= **COLSPOT IDXREF DEFPIX INTEGRATE CORRECT**
   JOBS/PROCS= 15/10

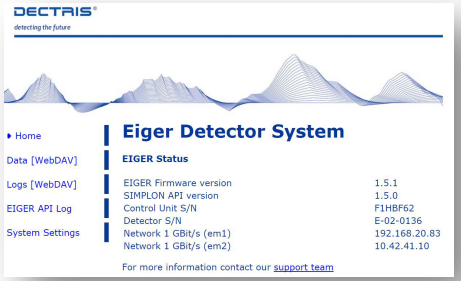
total elapsed wall-clock time = 154 s

collect 9000 images at 133 Hz = 68 s

Outlook

- *providing data*
- **Stream - usage should increase (we want feedback)**
- **HDF5/NeXus – the standards are there to be followed**

- *configuring the DCU – expected in Summer/Autumn 2017*
- **New basis for the configuration interface – network and ntp configuration (functionality also via SIMPLON API).**
- **Log files – more structure and time stamps**



Summary

- *40 Gbit will allow optimal integration to your infrastructure*
- **May 2017**
- *EIGER Processing Unit is available*
- **XL EPU processes and moves your data**
- *Thanks to XDS: processing is improved via neggia*
- **Plugin mechanism allows to use the power of HDF5**
- *Continuous quest to keep HDF5/NeXus standards*
- **Data archiving and automated processing**

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Thank you for your attention!

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