JLAB CLAS12 SRO

Sergey Boyarinov, Ben Raydo

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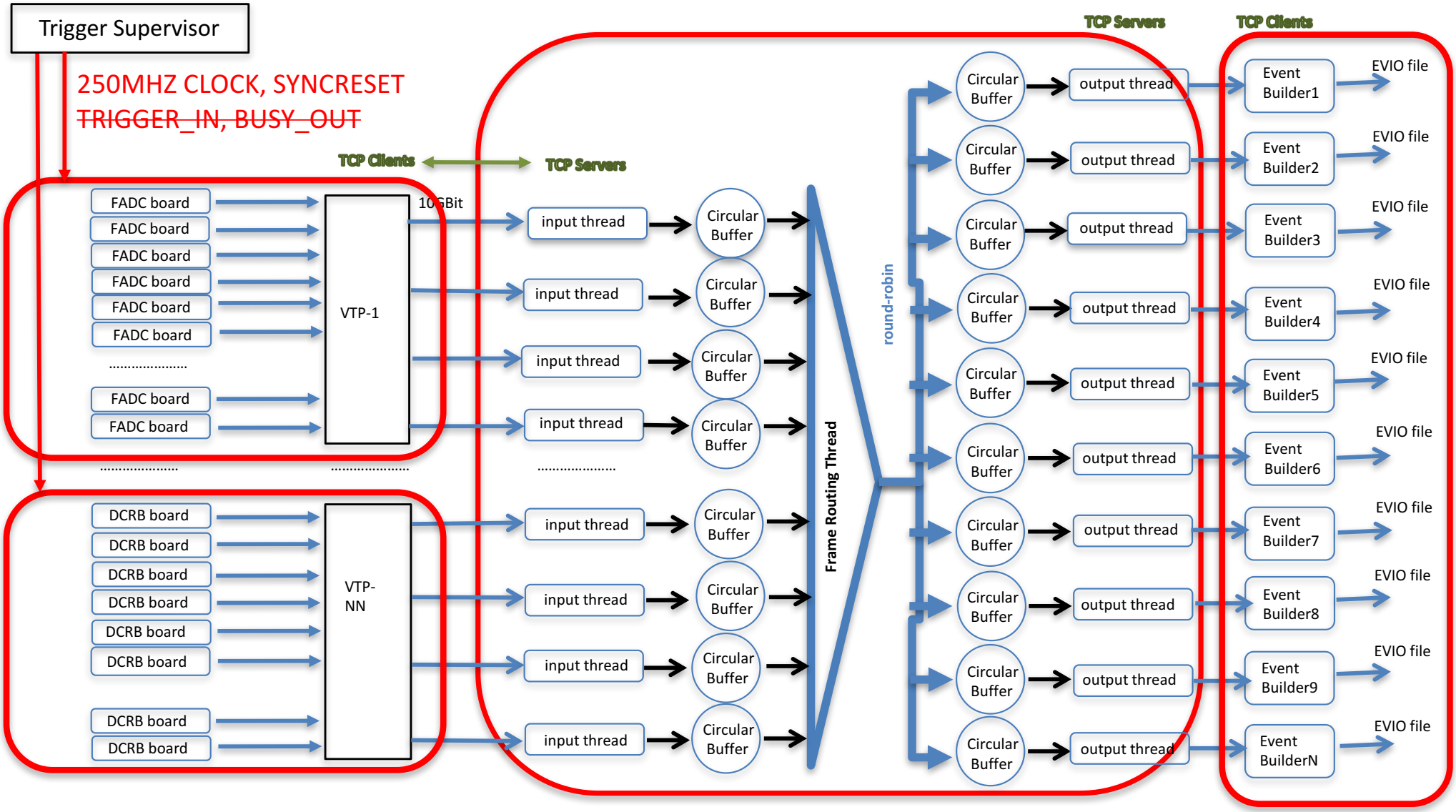
Hall B Streaming DAQ Diagram

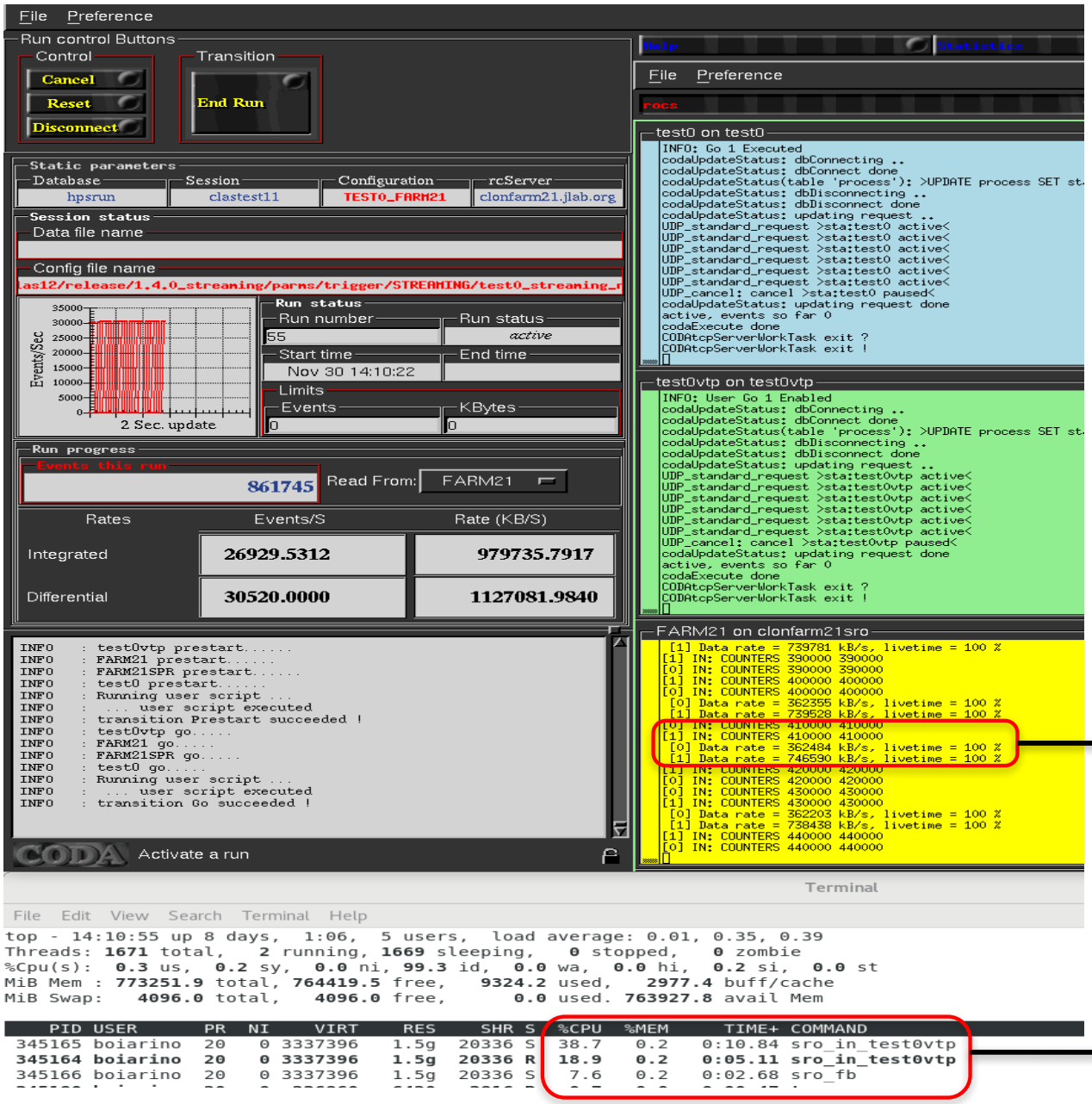


VXS CRATES

FRAME ROUTERS (shown one, can be as many as needed, all running using the same scheduler)

DATA PROCESSORS/ EVENT BUILDERS

CPU usage on clonfarm21: FADC noise test, 2 streams

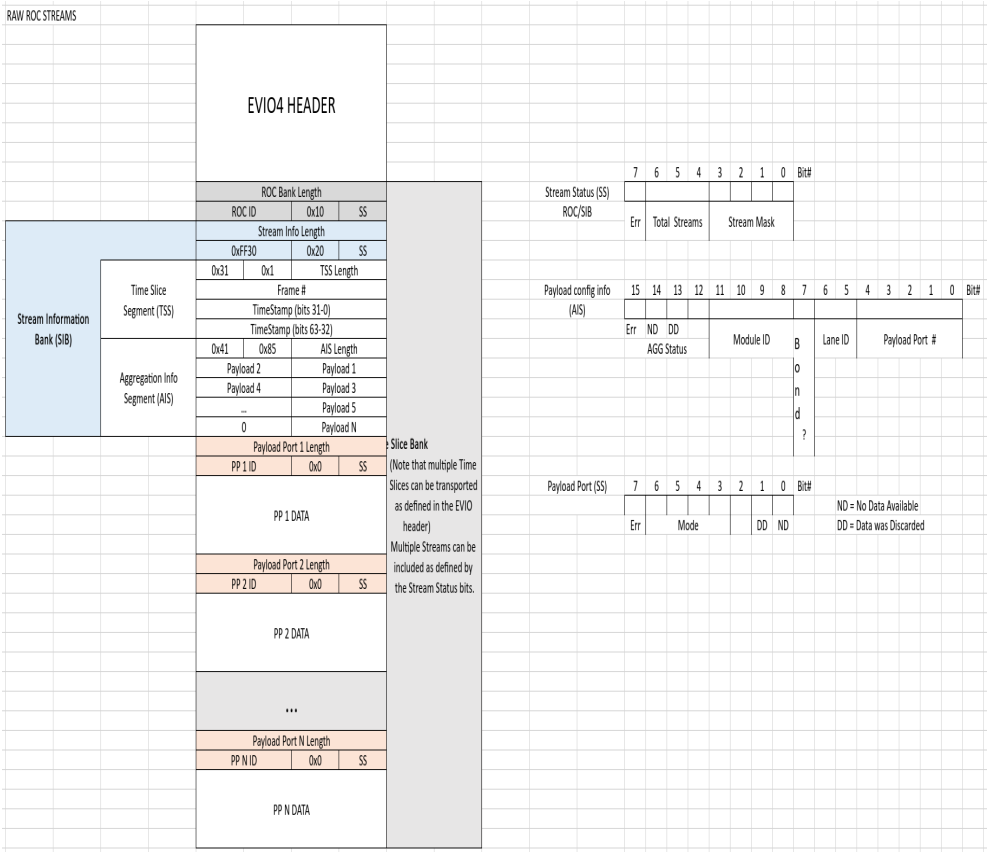


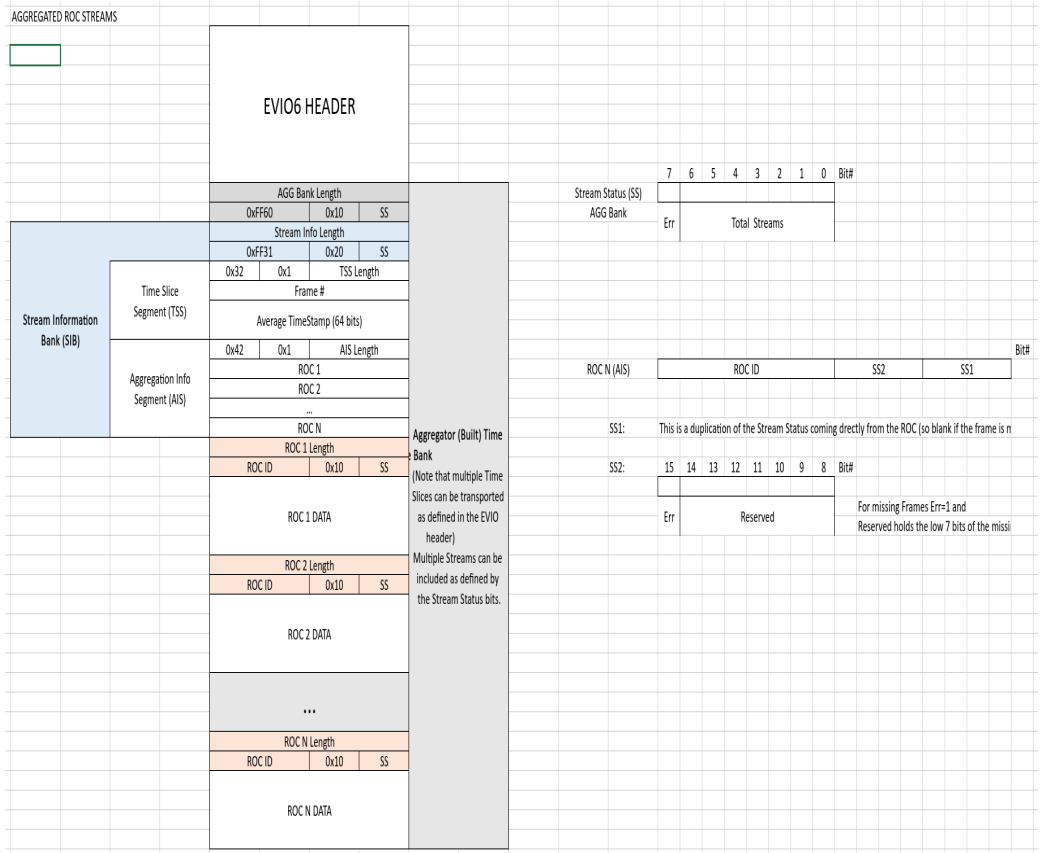
Performance tests are using front-end noise, since it can deliver much higher data rate then real data. On that particular machine, all threads are adequate to stream data without any frame losses

Component	Data Rate (Mbyte/s)	CPU usage (per core)
InputThread	360	19%
InputThread	740	38%
FrameRouter	1100	8%

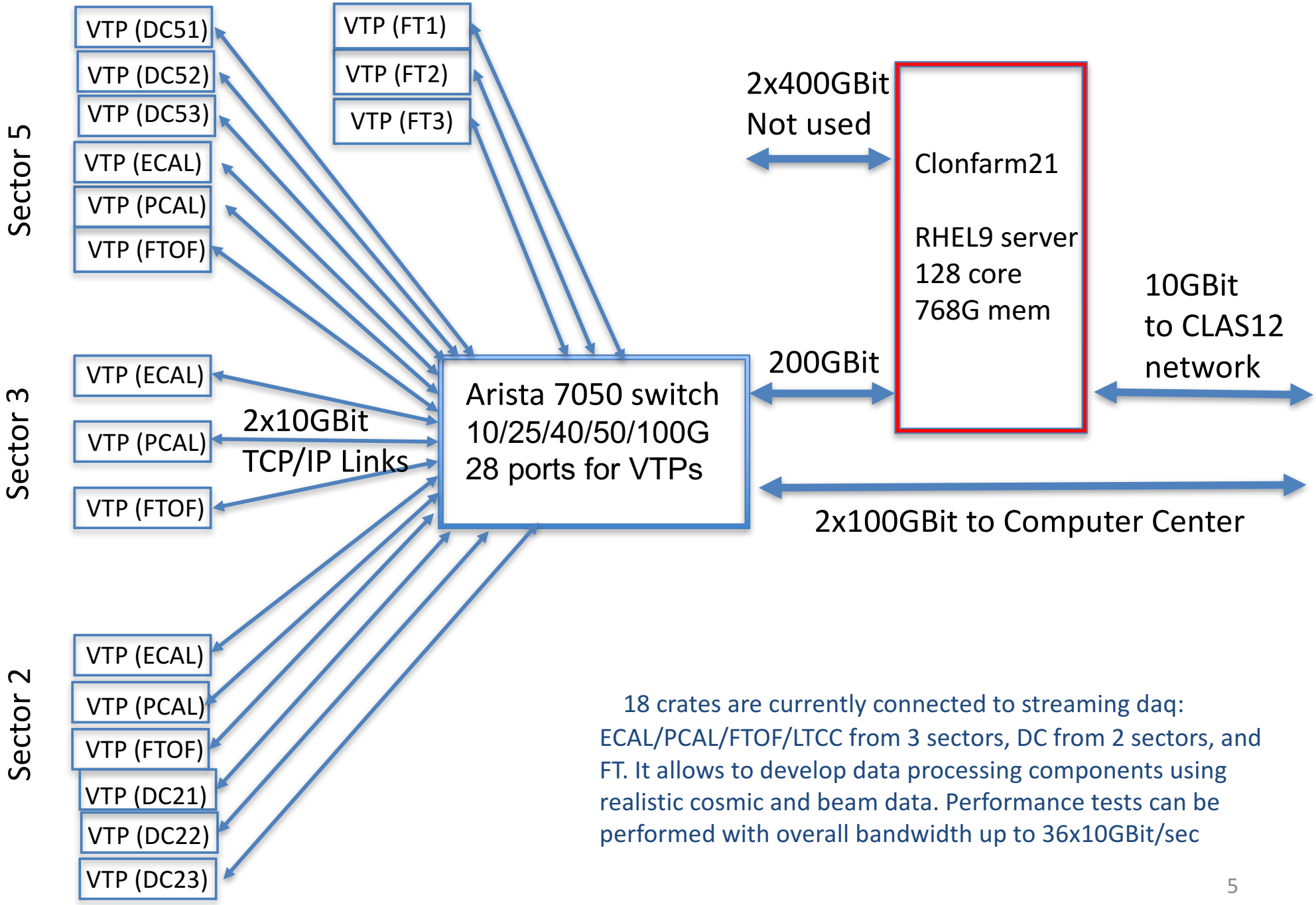
Streaming Data Format

Following is the streaming data format recommended by JLAB DAQ Group (David Abbott / Carl Timmer). Hall B adopted that format for current development. Shown data structure is suitable for raw streaming data only. In case of online data processing, we will try to stick with existing data banks used in triggered daq operation.



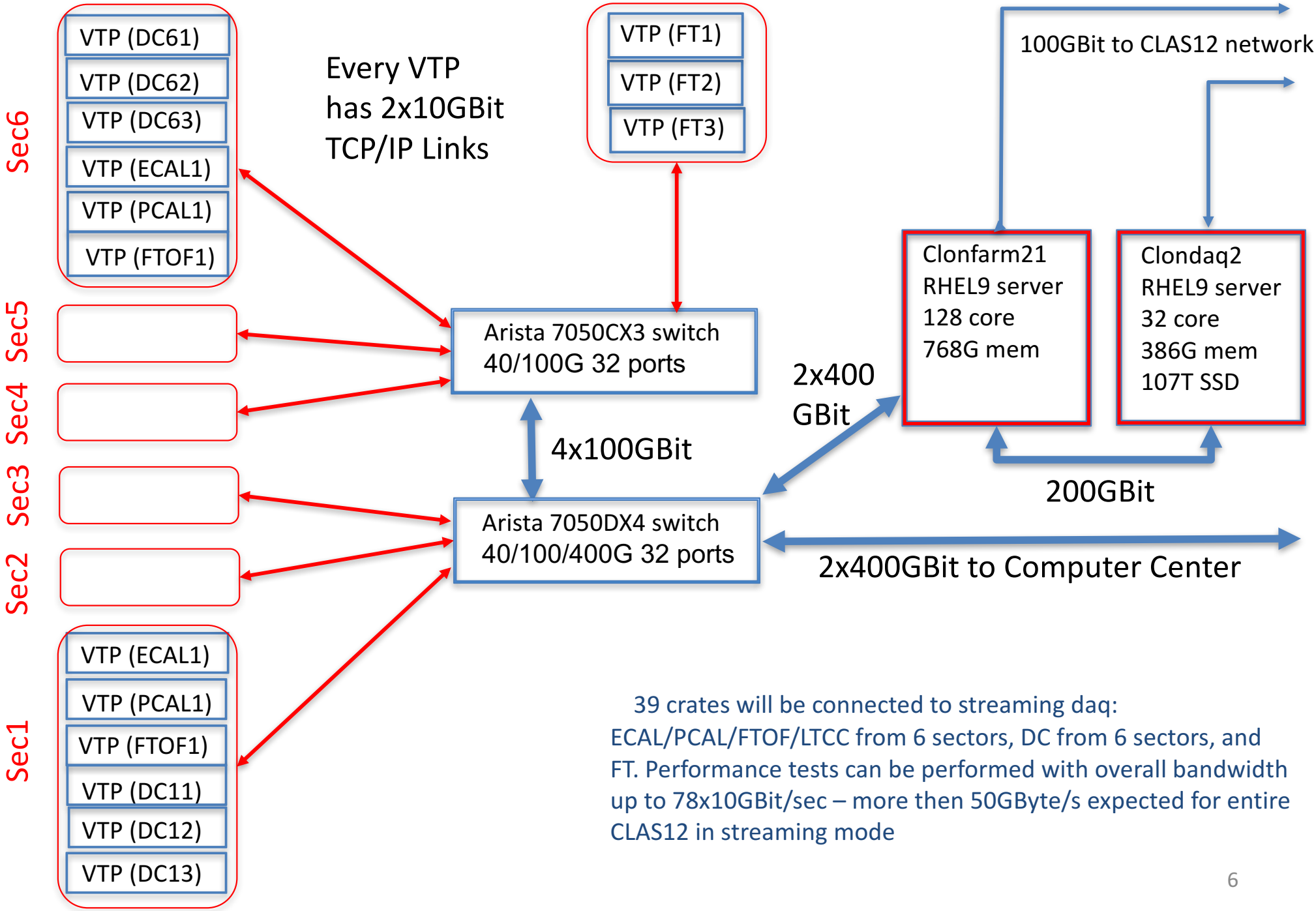


CLAS12 streaming network/computing- current status



18 crates are currently connected to streaming daq: ECAL/PCAL/FTOF/LTCC from 3 sectors, DC from 2 sectors, and FT. It allows to develop data processing components using realistic cosmic and beam data. Performance tests can be performed with overall bandwidth up to 36x10GBit/sec

CLAS12 streaming network/computing- plan for 2025



39 crates will be connected to streaming daq: ECAL/PCAL/FTOF/LTCC from 6 sectors, DC from 6 sectors, and FT. Performance tests can be performed with overall bandwidth up to 78x10GBit/sec – more then 50GByte/s expected for entire CLAS12 in streaming mode

Conclusion

- CLAS12 operates using triggered DAQ with typical event rate up to 30kHz, and will continue to operate same way through high luminosity upgrade, reaching event rate up to 100kHz
- In the same time, CLAS12 readout system being upgraded and eventually will become fully compatible with streaming DAQ mode
- Data processing solutions for the future streaming operation being developed and tested as part of current operation