

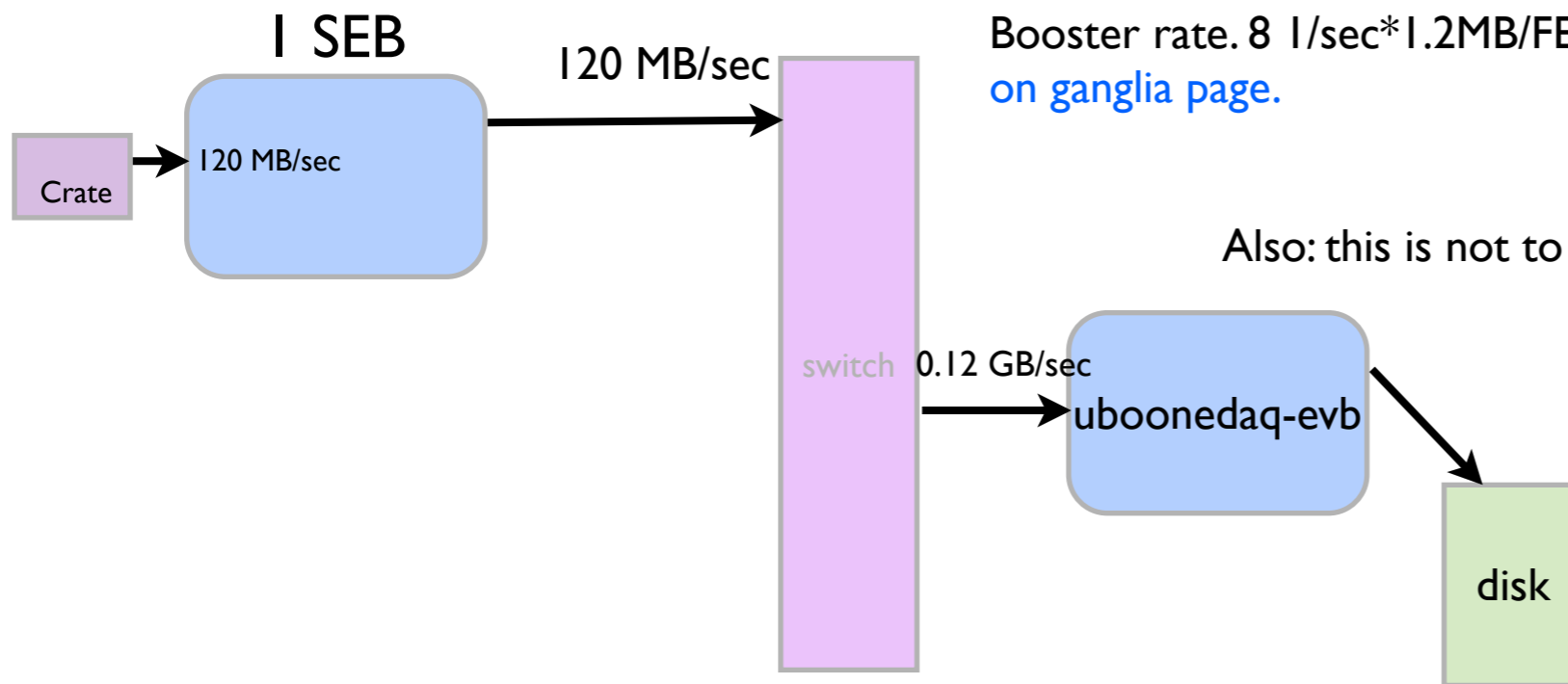
**DAB Readout status,
SN mode
considerations, coming
PO's**

Eric Church, Yale 19-Dec-2012

DAQ traffic so far:

trigger stream only

We can run 1 almost full crate at 8 Hz with external trigger. That's basically the Booster rate. $8 \text{ 1/sec} * 1.2 \text{ MB/FEM} * 12 \text{ cards/crate} = 120 \text{ MB/sec}$. [We see this rate on ganglia page.](#)



Also: this is not to say we have all glitches worked out. We don't.

So, with current evb NIC and current switch we can not do this for 10 crates. With new NIC and switch we can. On the other hand, this is not a reasonable, sustainable mode. We will want it to be pre-scaled. Also, no PMT info is used yet (*0.03) nor compression (0.1).

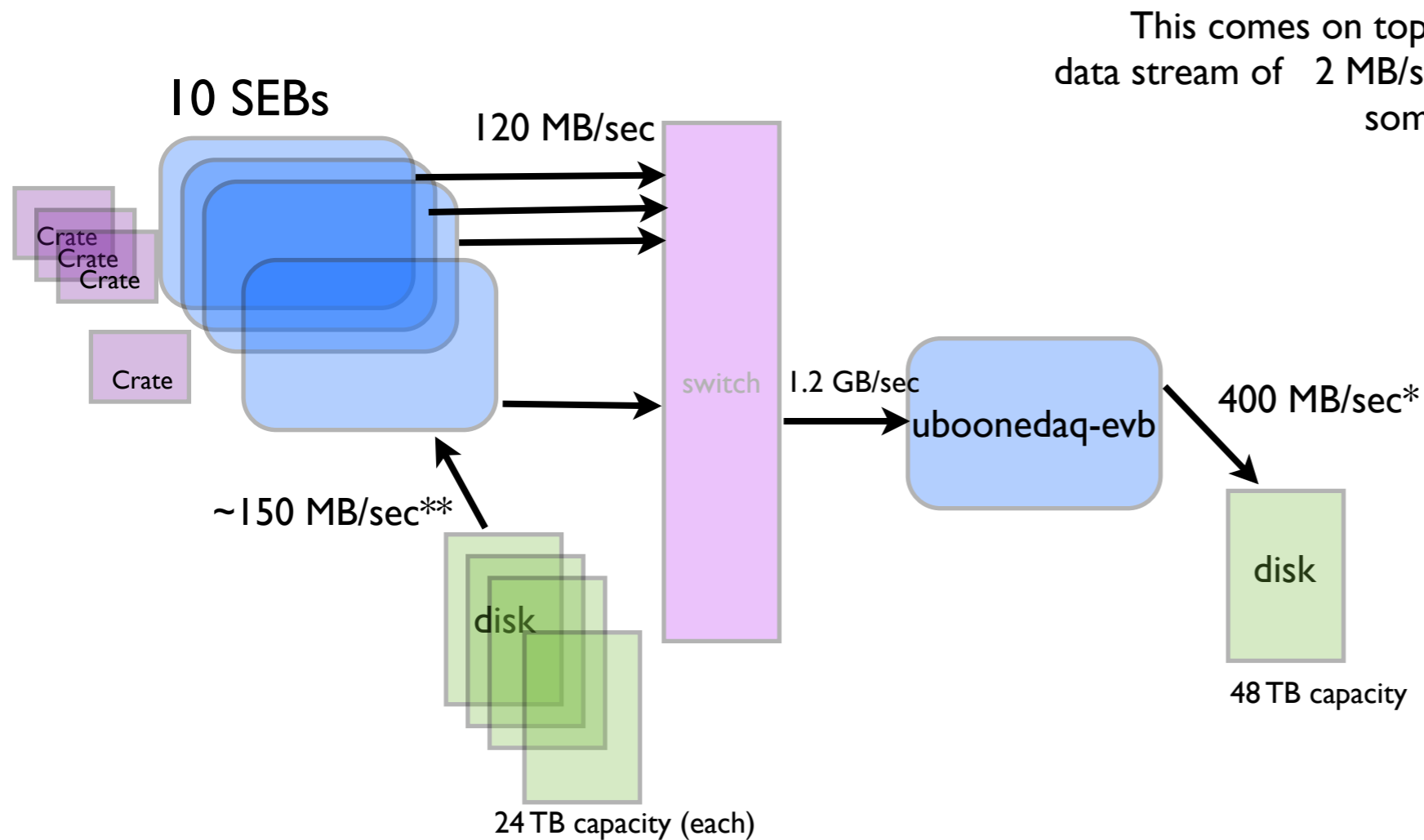
$$1.2 \text{ MB/FEM} = 64 * 2 * 3600 * 3$$

Nearterm Readout work at DAB

- (1) write recipes to allow SN set-up and running. And subsequent to that try running in simultaneous SN+Trig mode.
- (2) Running fake data patterns at either ADC or FEM stage and then testing compression mode readout, since fake data allows for understanding datasize and thus not timing out ungracefully or wrapping across evt boundary,
- (3) adopting Georgia's end-of-event boundary crossing strategy, and
- (4) trying to intersperse FEM/Trigger/XMIT Status Reads during actual running!

- (5) fhicl parametrization, ASIC/Pulser config into state machine
- (6) ROOT analysis code to read up the data
- (7) LArSoft code to swizzle binary data

SN event building traffic



This comes on top of a presumed “normal,” Triggered data stream of 2 MB/sec coming through the same switch and some of the same disks.

Must pull 10x3hrs of SN data from disk, and build the evts and write it out to disk on assembler. That is $10 \times 100 \text{ [MB/s]} \times 3600 \times 3 \text{ [sec]} = 10\text{TB}$. 10 TB at 1.2 GB/sec is 3 hrs just to get it all into assembler on evb. **6 hrs** (concurrent) to write it onto 5 RAIDed 2TB disks on the evb machine. x20 Compressed.

* it's true. demonstration: `dd if=/dev/zero of=/tmp/file.tmp bs=16MB`
** conservative guess

Could one do better?

- Don't grab 3 hrs history. Grab only, say, 20 min. *Seems better to have a more conservative chunk of time.*
- Buy 10 GbE NICs on all 10 SEBs and an (even) nicer switch. *This will only buy a factor of 2 throughput, since evb side of switch is limited to 20 GbE into it. We also would give up a PCIe slot in each SEB for the upgraded NIC, which we can not afford to lose. That means 3U chasses and more expensive motherboard s everywhere instead of our current 2U SEB design. seb-10, which is already stuffed with PCIe cards will have to become Intel, instead of AMD to get the onboard 10GbE and save a slot. (ugly mixing of architectures.)*
- More evb machines to write more files in parallel, more switches. *This begins to get complicated and very expensive – a total software re-design.*
- I think the current design can deal with our once/wk (at most!) SN exercise.

Equipment needs/ procurement

- This has led me to start a list (which should be formalized) of what we should procure for computers/switches/cable/connectors ... by end of February.
- We have current equipment needs too
- Will have still more needs for “Rolling DAQ.” That stuff must be ready by end-of-March.

KOI quote (Supermicro distributor) for LArTF

Item Number	Qty	Description	Unit Cost	Total Amount
<p>KOI COMPUTERS Solutions Today with Tomorrow's Technology!</p> <p>SBA 8(a) SDB/WBE Company, in business since 1995! ● ISO9001:2008 (WITH DESIGN) Certified 200 West North Avenue, Lombard, IL 60148, Tel. No. (630) 627-8114, Fax No. (630) 627-8377 www.koicomputer.com</p> <p>FORM LETTER ATTN: Eric D. Church [echurch@fnal.gov] Quotation No. 20121213-01 Koi 2U/4U AMD Opteron 6212/6272 Storage Servers</p>				
9		Koi 2U Dual AMD Opteron 6212 2.6GHz Eight-Core Storage Server	\$2,350.00	\$21,150.00
Breakdown per item:				
1		2U Black Rack Chassis, 560W High-efficiency 80Plus Gold Level Power Supply. 8 x 3.5" Hot-swap SAS/SATA Drive Bays. With Universal I/O (UIO) Card for Expansion slots. 26.5" to 36.4" slide rail set, quick/quick.		
1		AMD SR5670+SP5100 Chipset, dual AMD Opteron 6100 Series processors (G34) Sixteen/Twelve/Eight-Core ready; HT3.0 Link support. 16 DIMM sockets support up to 256GB DDR3 1600/1333/1066MHz quad channel memory bus. Onboard Intel 82576 Dual-Port Gigabit Ethernet, 6 x SATA 3.0Gbps Ports, integrated Matrox G200 Graphics, IPMI 2.0 with virtual media over LAN and KVM over LAN support.		
2		AMD Opteron 6212 2.6GHz 8-Core G34 Processor (Upgrade to Opteron 6272 - 2.1GHz 16-Core Processors - add \$600.00)		
2		2U Heat Sink		
8		4GB DDR3-1600 ECC Registered DIMM		
1		RSC-R2UU-A4E8+ 4 PCI-E x8 2U Riser Card		
2		WD2003FYYS 2TB RE4 64MB SATA2/300 7200RPM HDD		
1		Server Labor/ 3 Year Parts Repair/Replacement with Labor On-Site Warranty		
2		4U Dual AMD Opteron 6272 16-Core 2.1GHz Storage Server	\$14,600.00	\$29,200.00
Breakdown per 4U Server:				
1		Supermicro 4U Black Rack-mount Storage Chassis, 1800W High-efficiency 80Plus Gold Certified Redundant Power Supplies. 24 x 3.5" Hot-swap SAS/SATA Drive Bays. 4U/26.5" to 36.4" Rail set included.		
1		AMD SR5690/SP5100 Chipsets, Quad 1944-pin Socket G34 supports up to 16MB Sixteen/Twelve/Eight-Core ready AMD Opteron 6000 Series processors, HT3.0 Link support. 16 DIMM sockets support up to 512GB DDR3 Reg. ECC 1866/1600/1333/1066MHz or 128GB of DDR3 Unb.ECC/non-ECC memory, Quad channel memory bus. Onboard 6 x SATA2 3.0Gbps Ports via AMD SP5100 controller, RAID 0, 1, 10; Dual-port Gigabit LAN Controller, 4 x USB 2.0 ports, 1 x dedicated LAN for system management (IPMI 2.0), Matrox G200 Graphics. Expansion Slot: 3/2/1PCI-E Gen 2.0 x16/x8 (in x16)/x4(in x16) slots.		
4		AMD Opteron 6272 Sixteen-Core 2.1GHz 115W G34 Processor		
4		2U Passive Heat Sink		

plus a \$4.5k 3U box (uboone-10)
 a simple \$0.8k 1U IPMI server
 a \$900 10GbE NIC
 a \$7k 10GbE switch
 more disk,
 plus 2-3 more 2U boxes for
 slowmoncon \$2.5k each.

Up to \$75k, so far.

One is evb, one is uboone-offline.

More stuff for LArTF

(The idea is to leave current DAB test-stand largely intact when we move to LArTF.)

- Obviously power supplies and Nevis/BNL stuff.
- Lots of duplex fibers
- wireless routers for computer room and platform?
- sliding rack-mount kvm's
- Another pulser?
- Back-up GPS card?

For “Rolling DAQ”

- One uboonedaq-seb-01-like server
- more webcams! (one is on its way!)
- Ranger (USB fanout for ASICs config)

Please weigh in

- Slowmoncon people, particularly, please survey and relay to me/Bruce your equipment needs.
- The time is very near that we need to put out POs
- What hardware is being ignored/forgotten?