

# Ideas for an LBNE's Request for Fermilab's Computing Resources FY14 (FY15)

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LBNE Software and Computing Meeting  
December 20, 2013

Last Year's Request  
Last Year's Usage  
Goals to meet  
What we know of what we'll need

Practice talk is Expected to be January 9, 2014

# Last Year's Computing Request for Fermilab Resources

On January 12, 2013, we asked for:

30 TB of data space in /lbne/data in BlueArc  
(double from the 15 TB we had)

2 TB of app space in /lbne/app in BlueArc  
(double from the 1 TB we had)

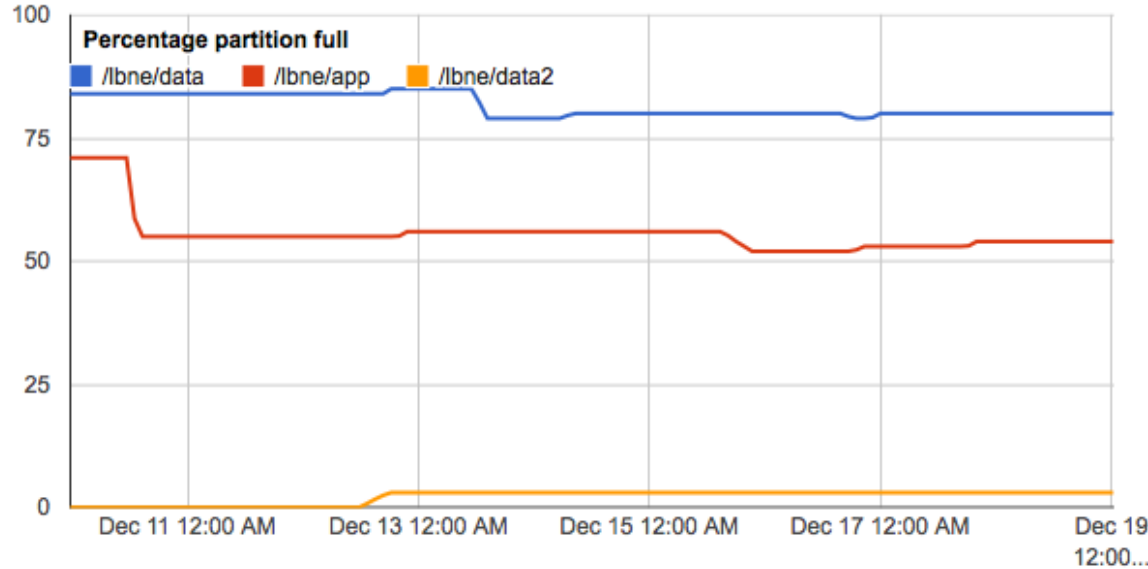
100 TB of tapes in Enstore

Average expected batch slot usage: 50 slots

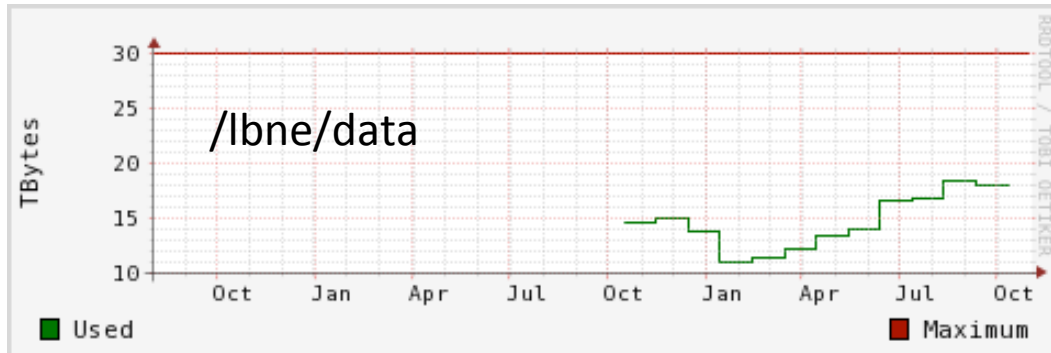
Peak expected batch slot usage: 5000 slots

# BlueArc for lbne

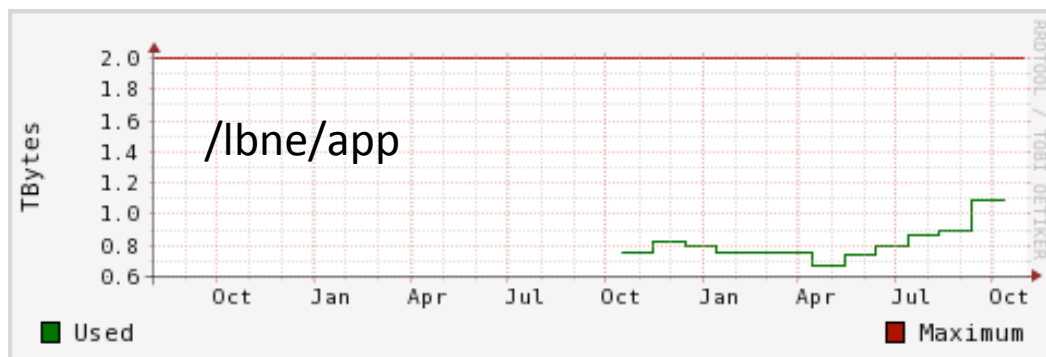
<http://fifemon.fnal.gov/lbne>



December usage:  
Since we got /lbne/data2  
(earlier history does not  
make it into the plot)



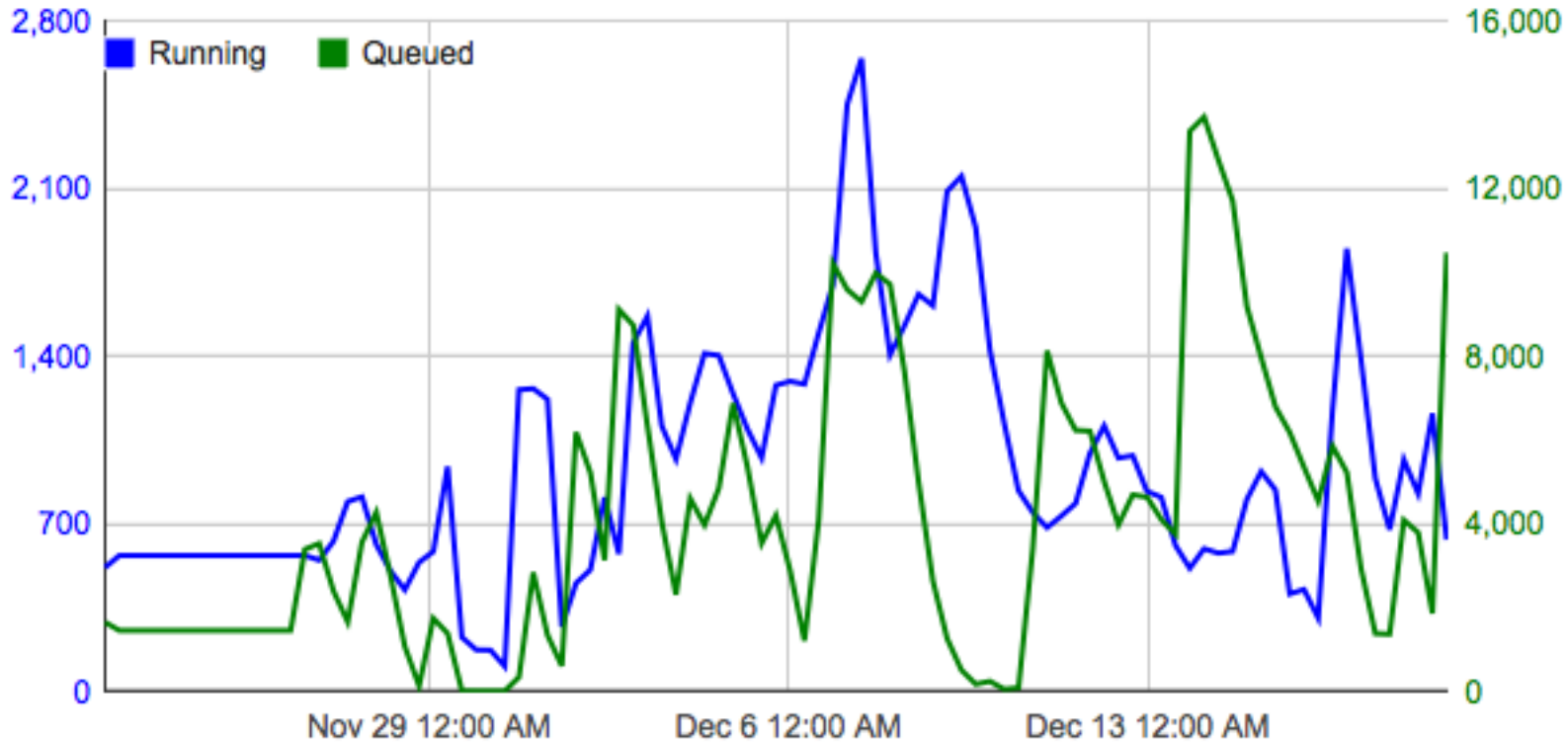
Our usage on  
/lbne/data from  
Oct 2012 – Oct 2013



Our usage on  
/lbne/app from  
Oct 2012 – Oct 2013

quest

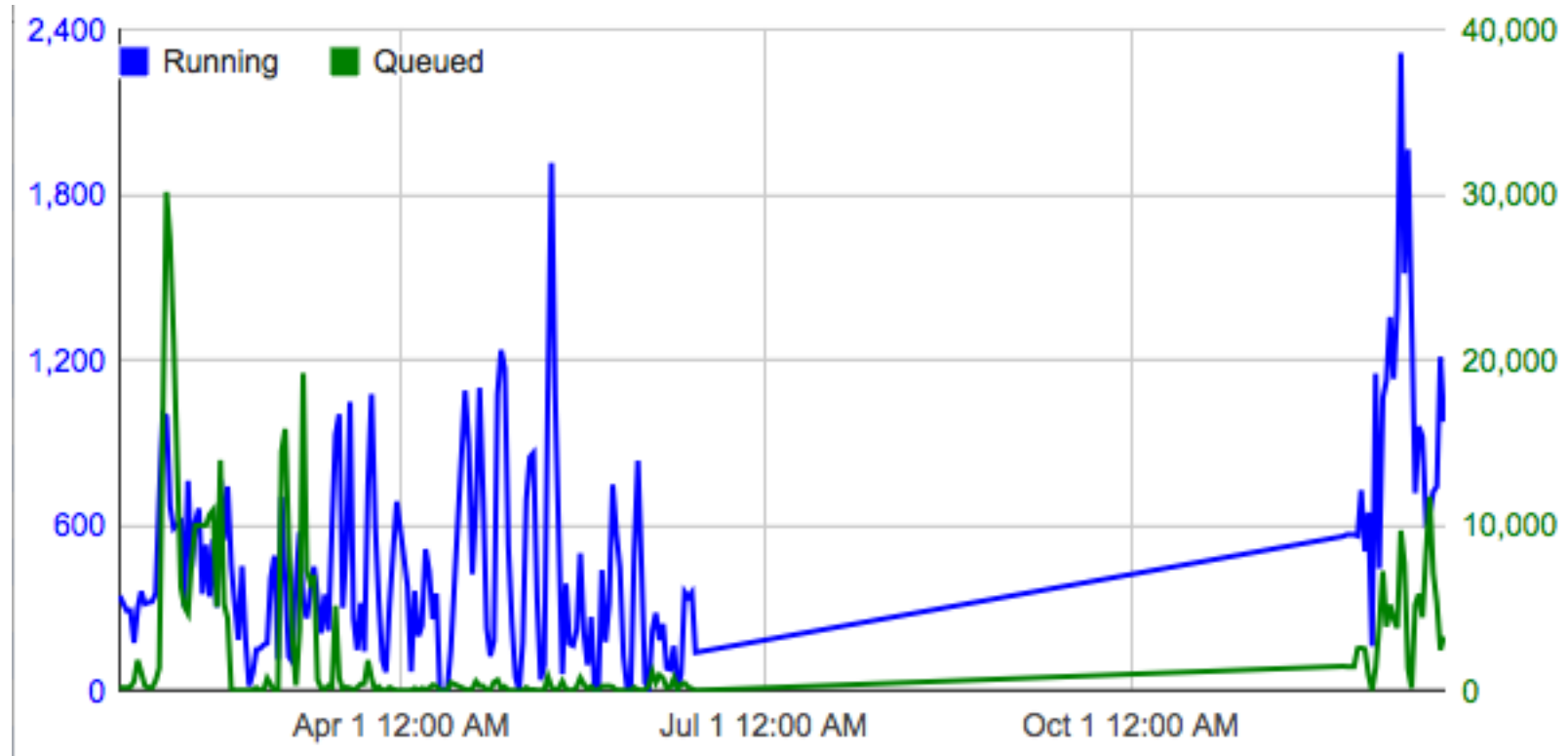
# LBNE Batch Slot usage since November 2013



<http://fifemon.fnal.gov/lbne>

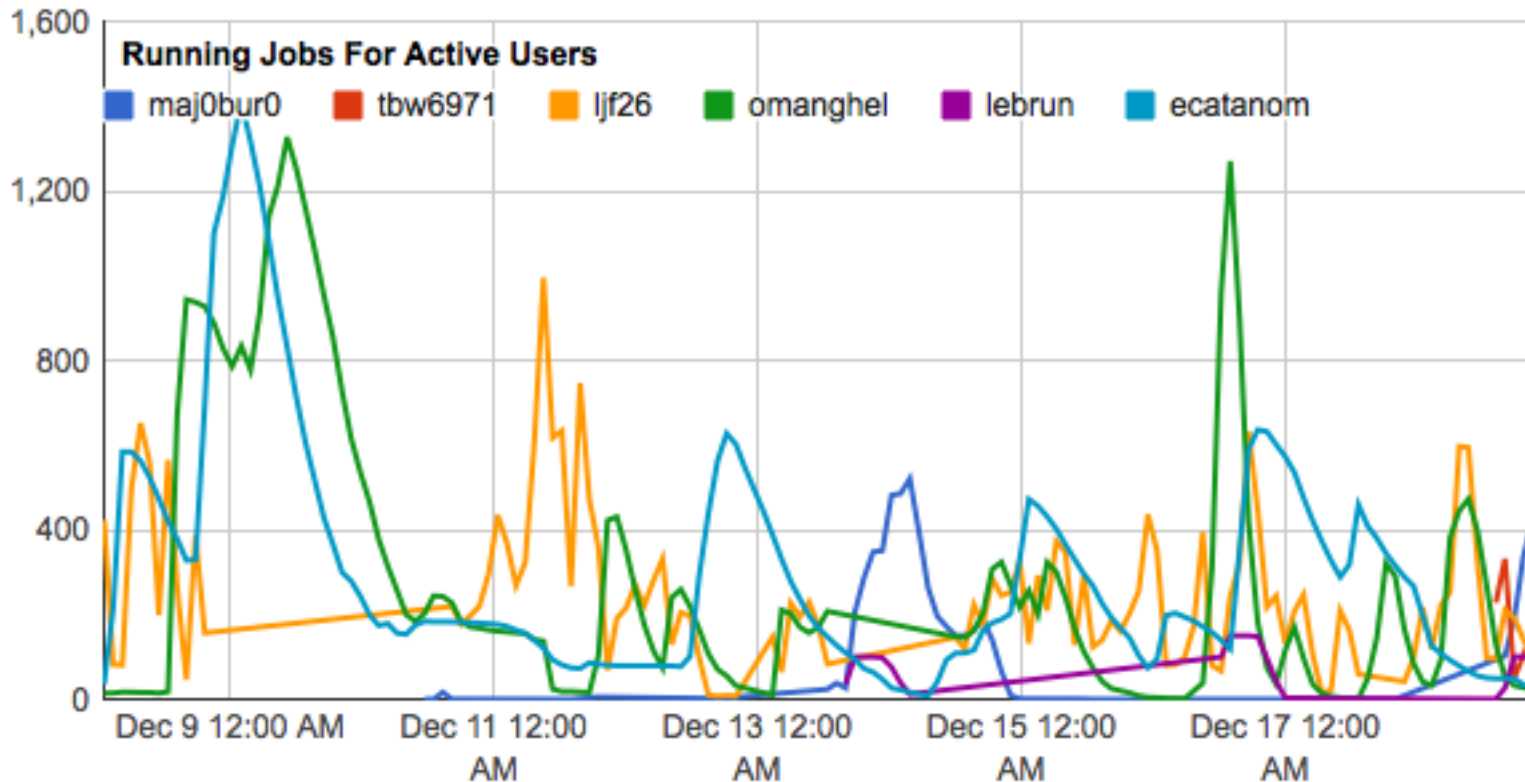
Need better axis numbering  
in FifeMon

# A longer View of LBNE's batch usage – from Jan 19, 2013 to Dec 19, 2013



Fifemon's data are not complete.

# Who's using the batch resources?



For December. ljf26=Laura Fields, beam simulations.  
lebrun=Paul Lebrun, beam simulations

maj0bur0=Maria Rosell  
-- FastMC  
omanghel=Ionana Anghel  
(WC. Continue through mid-2014)  
ecatanom=Erika Mur  
(WC)

# Key Dates in 2014

Jan 20: LArSoft switchover

Jan 31 – Feb 1: Far Detector hackathon

Feb. 2-4: Collaboration meeting

March 20 – 22: ANL R&D pre-review

May 12-16: DOE Review

Early 2015: 35T Phase II begins taking data. 2 Months of data taking (?)

# Physics Tools Deliverables for DOE Review, May 2014

Would like preliminary estimates of FD hit-finding efficiency, tracking efficiency, energy resolution,  $dE/dx$ ,  $e/\gamma$  separation, photon detector performance.

Beam systematics – maturing! These look good.

See DocDB 8180

What about ND? This is a weak spot for us.

Cosmogenics – this is either small or gigantic. Vitaly's group simulates trillions of cosmic rays to estimate tiny backgrounds. We have been asked to justify backgrounds to nucleon decay and supernova neutrinos underground. Rather difficult to do with full simulation.

Software and computing – should have in place people, and tools for an effective development environment at Fermilab and the institutions.



# FD Event Sizes

35T cosmic-ray events: 320 kB/Event (Babu's sample of 1000 from Dec. 18)  
Zero suppression on, no noise.

35T uncompressed raw data: 13 MB/event (scaled with channel count, assuming same readout window as the FD).

10 kt surface cosmic-ray event (~200 particles) 300 MB/event  
Zero suppression on, no noise.

Uncompressed raw data from the 10 kt FD: 2 GB/event for one drift time  
(no pre-spill or post-spill readout)

Other groups' needs to be polled. ND, Cosmo, FastMC, beam sims

# LBNE Request for FY2014 -- Storage

From Mark Convery: 36 TB of raw data (after filter) for 35T operations.

These data will come in FY15.

But we will need MC to back this up – naively assume a similar amount of space: call it 50 TB for 35T support in FY14. This can be in Enstore/dCache, but some of it will need to be on BlueArc for staging and interactive use.

Beam simulations: Just asked Laura – waiting to hear back

ND: Just asked Christopher, Sanjib, Bipul – waiting to hear back

Cosmogenics: ?? (currently done with offsite resources) Just asked Vitaly this morning. Cosmogenics people want to start working on 35T and FD.

FastMC: Prefers BlueArc for storage (does not use art). Using 1 TB in /lbne/data as of 19 Nov.

FD: 50 TB of tape/dCache usage – this is a guess. Could be more

# LBNE Request for FY2014 – Batch Slots

Already we are **averaging** ~1000 slots! Lots of usage by beam simulations people, fast MC, nuclear modeling

FD/35t sim/reco should pick up in usage.

Need to track down the WC people and see what they're doing. Is it for LBNE? Two WC users – e-mailed on Dec. 19 to ask about their intentions. Ioana Anghel says she will run WC jobs through mid-2014.

Dan Cherdack expects FastMC usage to be spiky. Would like spikes of ~500 slots for two-week periods.

Average of 2000 slots can be used in FY14 (!). 1000 slots is a minimum. Peak of whatever can be supplied (we can use 5000 if it can be delivered).

Would like GPU-enabled nodes. Already have two – hpcgpu1.fnal.gov, hpcgpu2.fnal.gov we are not using. Let's use them! (What if we like them?)

Can always use more! But we can be smart.

# Other Resource Needs

- Databases
- Hardware for taking data from 35t and networking to it
- Control-Room Logbook
- Issue-Tracking service (JIRA?)
- Collaboration Tools
  - DocDB, Primavera, SharePoint, TeamCenter, Redmine
- **Need support for LArSoft, ART, build tools, UPS/UPD, CVMFS**
- Code repository support
- Batch system support
  - submission
  - monitoring
  - VO managemnet
- Data handling support – Enstore and dCache
- Licenses for external products (Oracle, totalview, others?)
- Documentation – Wikis and LBNE-specific documentation
- Physics support – GEANT4 and GENIE physics parameterizations

# FY15

Haven't yet given enough thought this far. 35T Phase II operations occur this year.