Title of the talk

Your name
Fermilab
October 1, 2011

U.S. DEPARTMENT OF ENERGY

Fermilab

Intensity Frontier Software Architecture

Administrator

End User

Developer/ Debugger

Framework		"ART","GAUDI","LOON"
Job Submission		"jobsub"
Analysis Tools		ROOT
Application Wrapping & Staging		ups/upd
Monitoring and Reporting	**Applications**	CAFMon, ganglia, other
Workload Management		CONDOR, *Glidein-WMS*
Workflow Management		*DAGMAN*
Storage Management		*SRM*
Data Management – Event and Conditions/Calibrations	**Middleware**	*SAM, NuConDB, DBI, others*
Compute	*GPCF, FermiGrid (includes CMS, Run II resources)*	Linux, VMWare,XEN
Disk Caches		BlueArc, dCache,
Tape Storage	*Local Univ. Clusters*	(investigating Hadoop, LUSTRE)
Persistent VMs	*Remote Resources via OSG*	
	Physical Infrastructure	Enstore/STK

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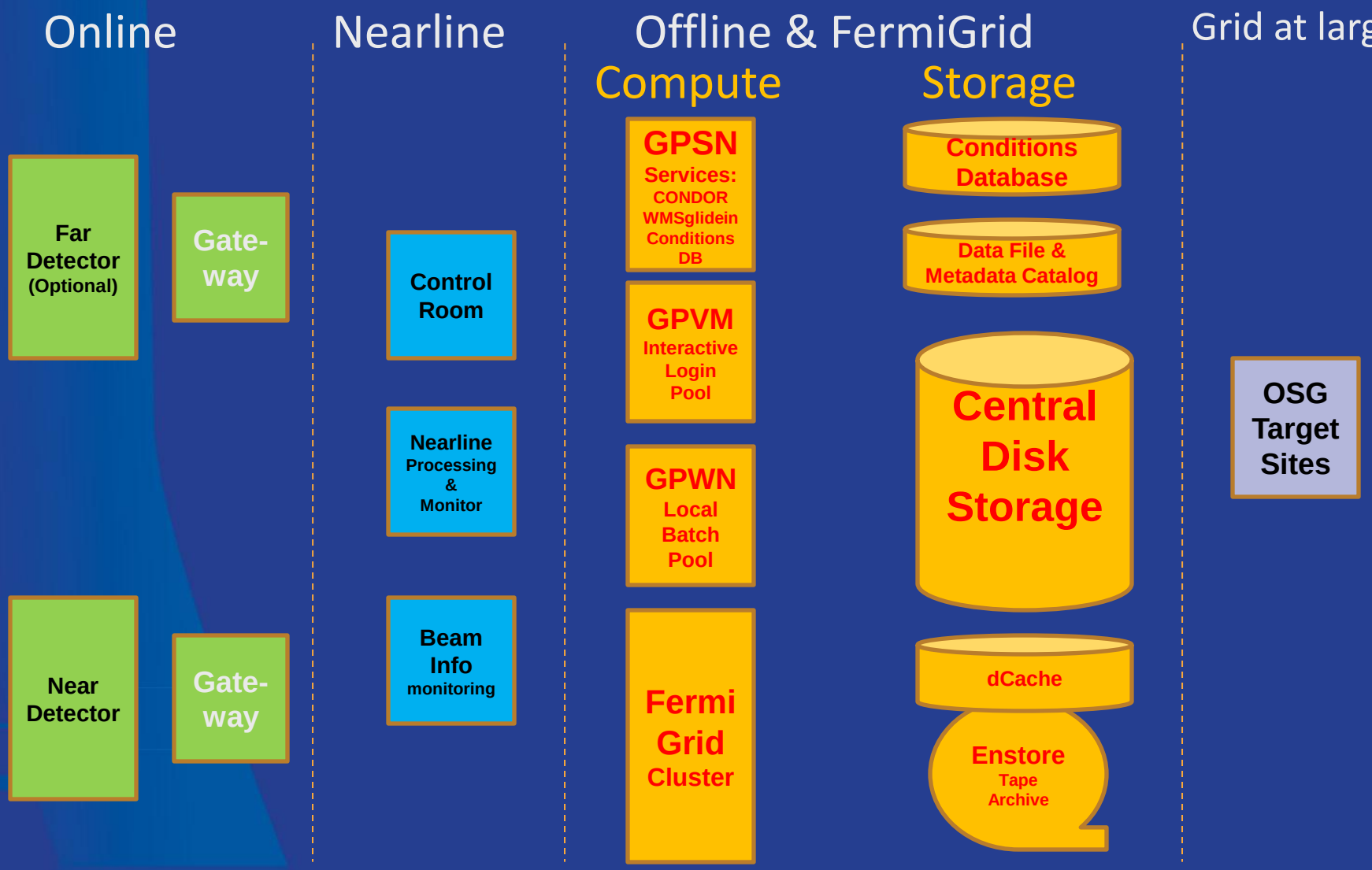
Intensity Frontier Hardware Architecture



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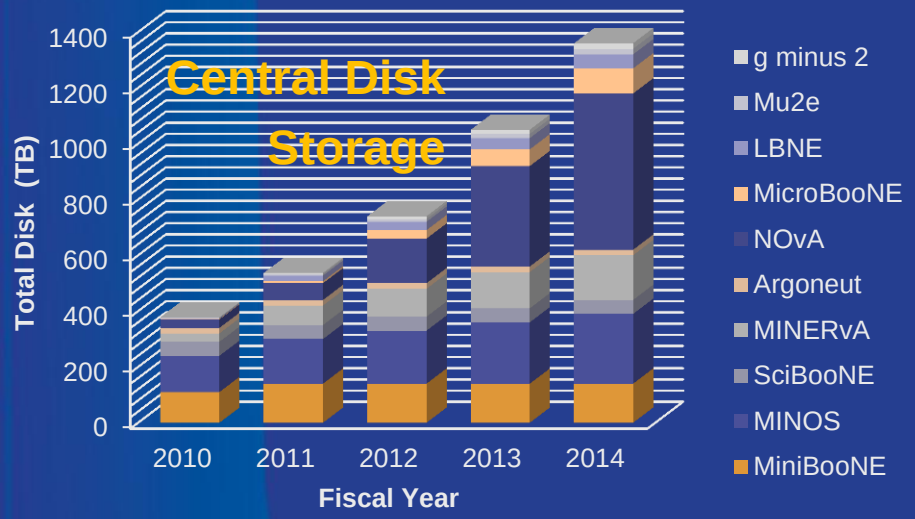
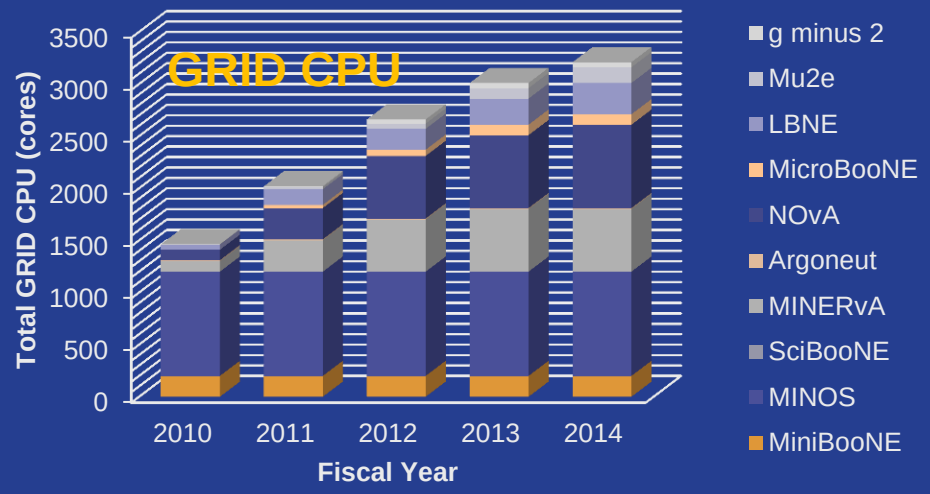
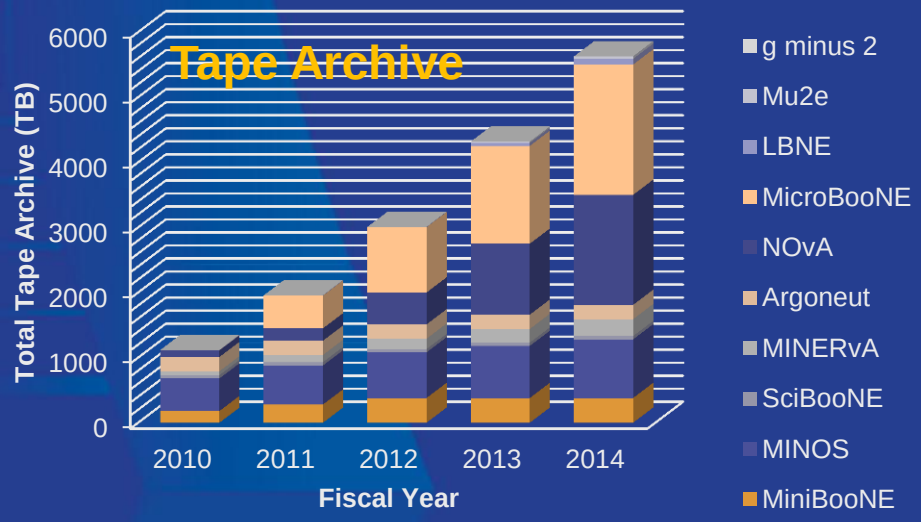
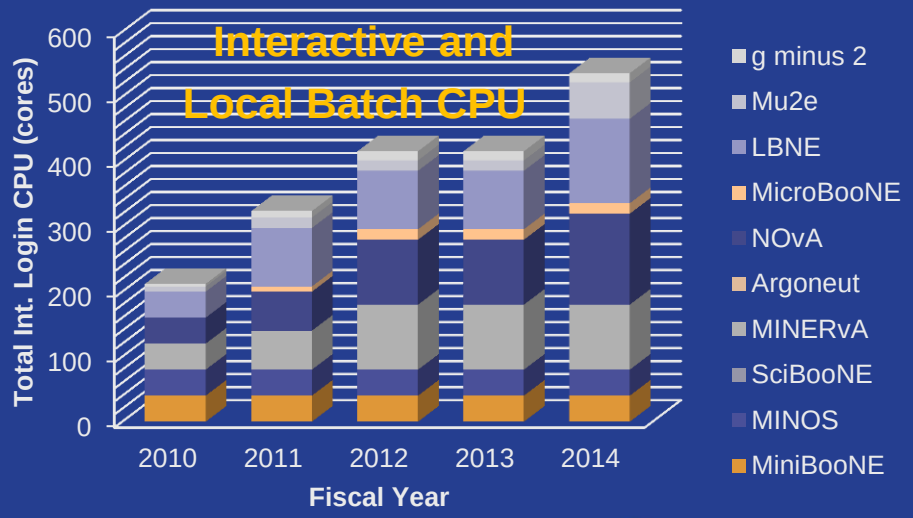
Intensity Frontier Computing Resources







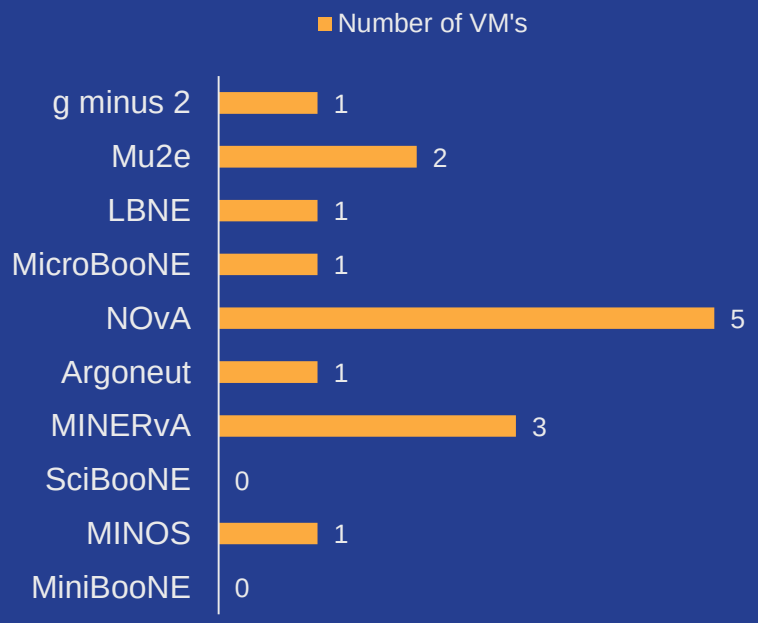


GPCF: General Physics Computing Facility

What is GPCF?

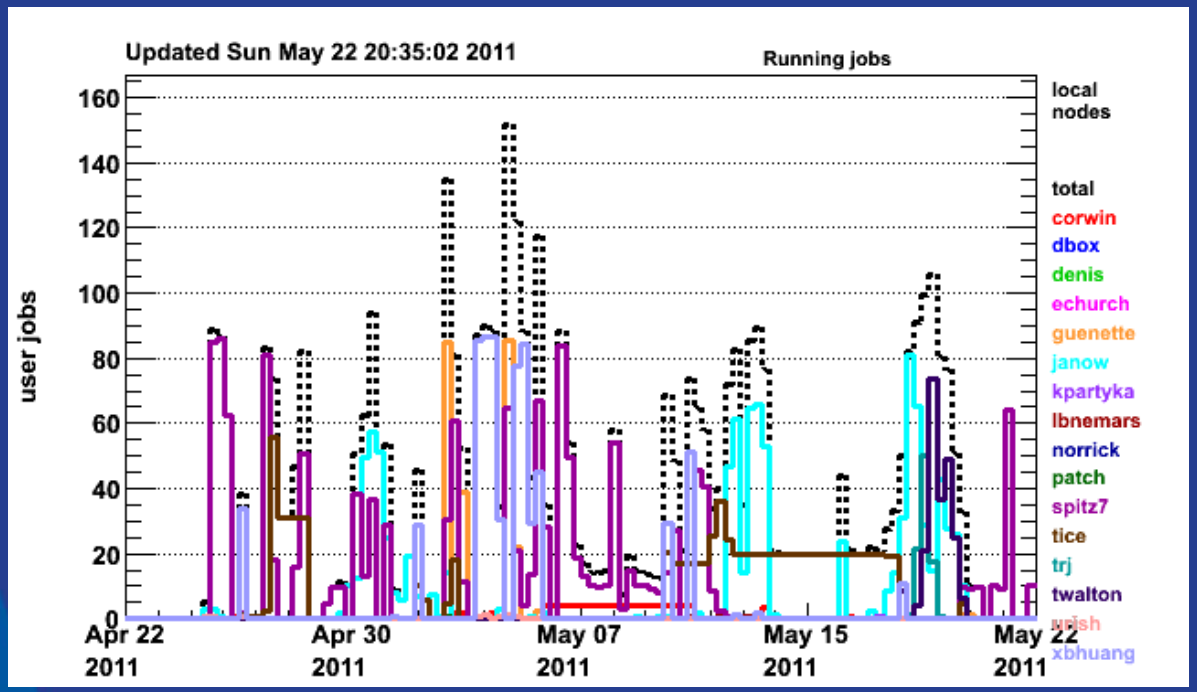
- Interactive login VM's (Virtual Machines) and "Local" Condor Batch slots.
- Each VM comprises 4 computing cores and 4GB memory.
- Central Disk Storage mounted as appropriate for each experiment.
- MINOS and MINERvA have their own dedicated clusters.

GPCF Virtual Machine Assignment



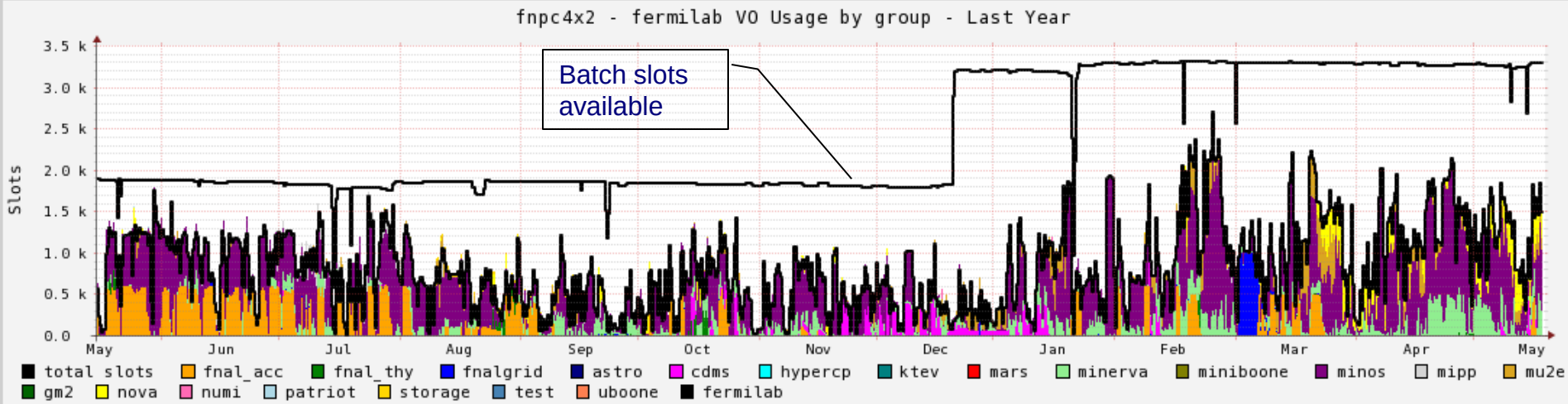
GPCF Local Batch

- GPCF Local Batch is for running small jobs and preparing jobs for the GRID.
- GPCF provides 88 batch slots. MINERvA and MINOS have their own local batch systems with 30 & 32 slots respectively.
- Chart shows the number of GPCF jobs, per user, for the last month.



GP GRID usage (last 12 m)

GP GRID=Fermilab General Purpose Grid Cluster



	Maximum	Average	Minimum	LastVal
total slots	3299	2401.55	572	3291
fermilab	2691	815.89	0	1492
fnal_acc	615	119.64	0	0
fnal_thy	399	5.90	0	0
fnalgrid	1000	14.99	0	0
astro	0	0.00	0	0
cdms	511	24.08	0	8
hypercp	0	0.00	0	0
ktev	0	0.00	0	0
mars	0	0.00	0	0
minerva	551	94.69	0	294
miniboone	418	0.50	0	0
minos	1960	473.01	0	740
mipp	298	10.28	0	0
mu2e	649	56.64	0	139
gm2	0	0.00	0	0
nova	550	44.74	0	310
numi	120	0.45	0	0
patriot	100	0.26	0	0
storage	108	4.49	0	0
test	0	0.00	0	0
uboone	0	0.00	0	0

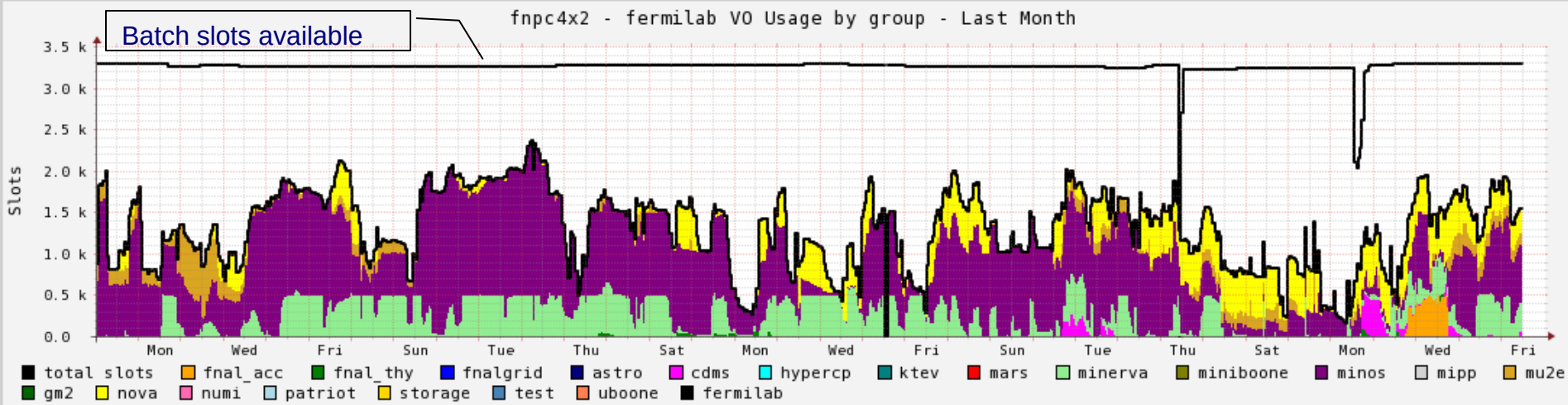
Data for fnpc4x2 between 15-May-2010 and 20-May-2011
Plot generated on 20-May-2011 10:27:37

MINERvA
MiniBooNE
MINOS
MIPP
Mu2e
Gm2
NOvA

Use of this resource by D0, CDF, and OSG are not shown.

GP GRID usage (last month)

GP GRID=Fermilab General Purpose Grid Cluster



	Maximum	Average	Minimum	LastVal
total slots	3291	3252.10	2	3291
fermilab	2358	1303.56	0	1547
fnal_acc	498	12.10	0	0
fnal_thy	96	2.43	0	0
fnalgrid	1	0.00	0	0
astro	0	0.00	0	0
cdms	442	12.69	0	58
hypercp	0	0.00	0	0
ktev	0	0.00	0	0
mars	0	0.00	0	0
minerva	628	250.24	0	341
miniboone	1	0.01	0	0
minos	1850	754.18	0	714
mipp	0	0.00	0	0
mu2e	626	72.47	0	138
gm2	0	0.00	0	0
nova	622	199.43	0	296
numi	0	0.00	0	0
patriot	0	0.00	0	0
storage	0	0.00	0	0
test	0	0.00	0	0
uboone	0	0.00	0	0

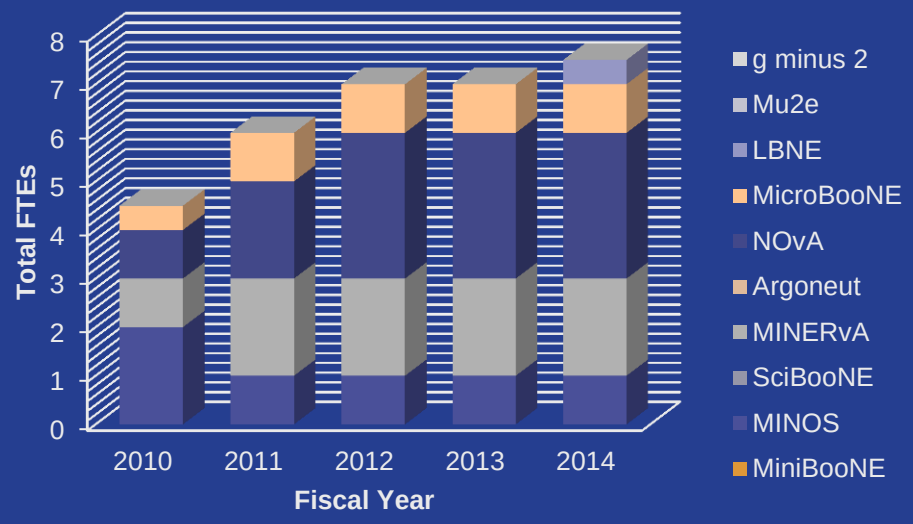
Data for fnpc4x2 between 17-Apr-2011 and 20-May-2011
Plot generated on 20-May-2011 10:27:29

MINERvA
MiniBooNE
MINOS
MIPP
Mu2e
Gm2
NOvA

Use of this resource by D0, CDF, and OSG are not shown.

Intensity Frontier Computing Manpower

CD Manpower

- Software development, maintenance and support.
- Support for experiment computing setup and data operations.
- Infrastructure procurement, commissioning and operations (not included in Exp. Manpower requests).

Experiment Requests for SW & Data Operations Support