



# What's new in FIFE



**FIFE WORKSHOP**  
**JUNE 16, 2014**  
**MICHAEL KIRBY**

# Outline

2

- Changes to FIFE support
- Updates to documentation
- Cloud utilization
- Changes to FermiGrid
  - Improvements to job workflows and resource utilization
- New services

# FIFE Support Group

3

- new group has been formed within service now
- can be used as for SNOW tickets where uncertain which service
- triage the issues and direct them to appropriate experts
- Act as Open Science Grid stakeholder for FIFE experiments
  - Interface with OSG team
  - Gather requirements and submit request to GOC
  - Track those request and deploy new services/features

# FIFE Support Group

4

Kirby's ELog   Personal   News   Sports   Physics   FNAL Computing   FIFE   MicroBooNE

## ermilab

Mi Powered by ServiceNow (Dublin)

ext   A   A   ↺   ▢   ▾

ce   ⤴

page  
service  
e Catalog  
Computing Services  
ific Computing Service  
edge

urrent Requested Items  
atched Requested Item  
st Requested Items  
urrent Incidents  
atched Incidents  
st Incidents

atched Enhancements  
atched Defects

### ← Catalog Item - I'm having a problem with Scientific Computing

#### Create a Scientific Computing Incident

Please describe the nature of your problem in the fields below. Your incident will be routed to the appro

**Open on behalf of this user**  
▶ [More information](#)  
Michael Kirby   🔍   📁

**Select the Experiment**  
E-974 (MicroBooNE)   ⬆

**Select the Appropriate C**  
Offsite Batch Submission

**Support Group**  
FIFE Support   📁

**Short Description**  
▶ [More information](#)

# FIFE Documentation

5

- Katherine Lato written extensive FIFE intro/docs
- <https://cdcv.sfnal.gov/redmine/projects/fife/wiki>
- Covers introduction as well as detailed links to services and projects within FIFE
- Also transitioning away from IFRONT page
  - Please let us know if you have old links to IFRONT so we can help you update those links
- UPS Documentation has been updated
  - <http://www.sfnal.gov/docs/products/ups/ReferenceManual/html/upsv4toc.html>
  - <https://cdcv.sfnal.gov/redmine/projects/ups/wiki/Documentation>
  - [https://cdcv.sfnal.gov/redmine/projects/ups/wiki/Getting\\_Started\\_Using\\_UPS](https://cdcv.sfnal.gov/redmine/projects/ups/wiki/Getting_Started_Using_UPS)
- More projects on the way (SAM, jobsub, etc)
- Better documentation for integrating services into experiment operations

# FermiCloud On-Demand Services

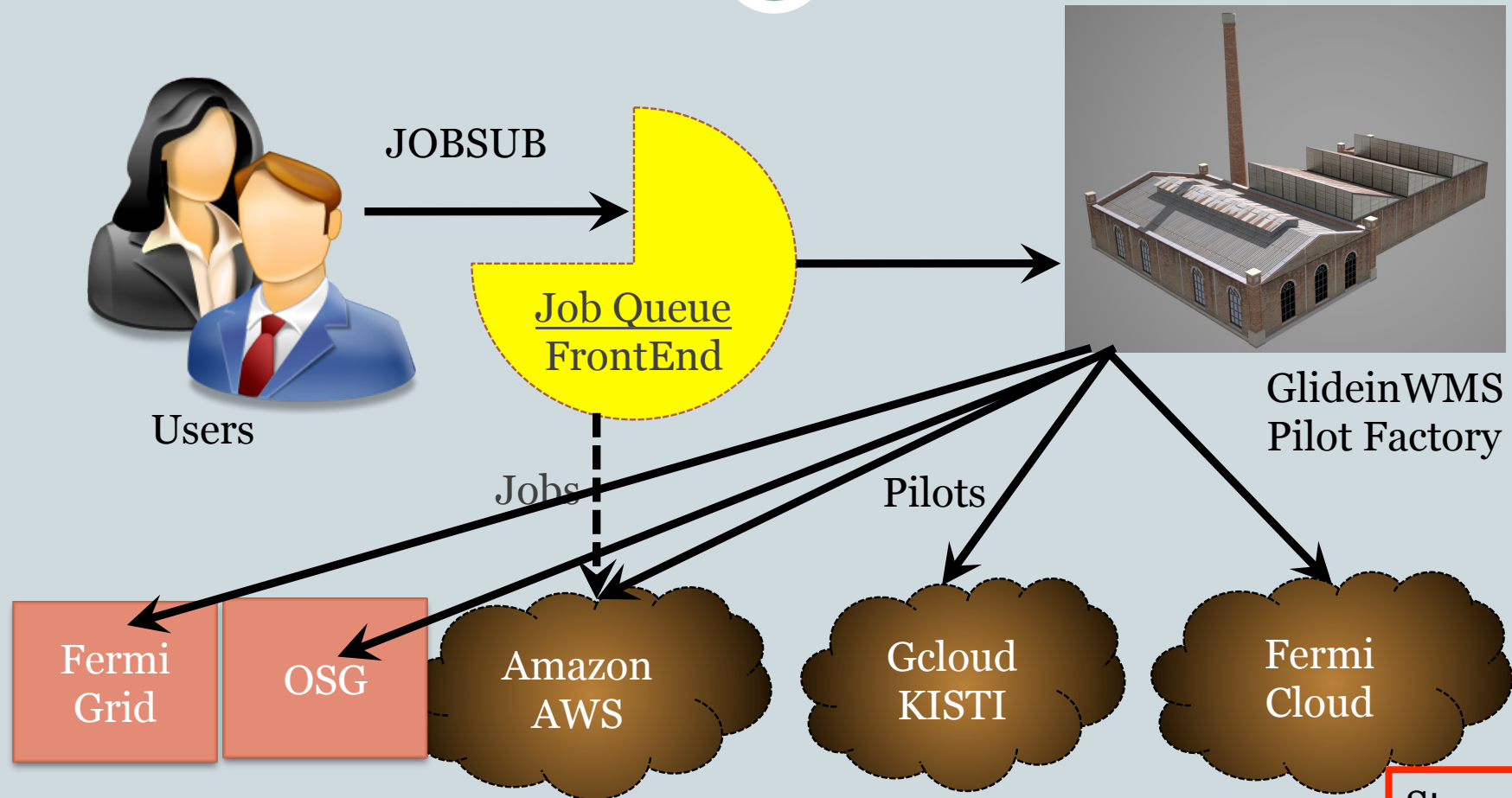
6

- **Our Goals:**
  - Enabling users to access cloud resources both on- and off-site
  - Dealing with unusual/temporary resource needs not usually my by normal grid computing
  - Providing burst computing capacity
  - Providing capacity to make data movement, compute, and web caching services scalable on demand

Steve  
Timm

# GlideinWMS – Grid and Cloud Bursting

7



Steve  
Timm

# On-demand Grid-bursting – NOvA MC on AWS

8

Number of jobs 1088:

- Successes 1047
  - Relies on extensions to GlideinWMS
- Failures 41
  - File upload (ifdh) 1
  - File download (SAM) 1
  - nova executable 33
  - Art non-0 exit code 1
  - Geant4 failure 4
  - Hang job (100% cpu): killed

Total hours: 1135 (56 min/job)

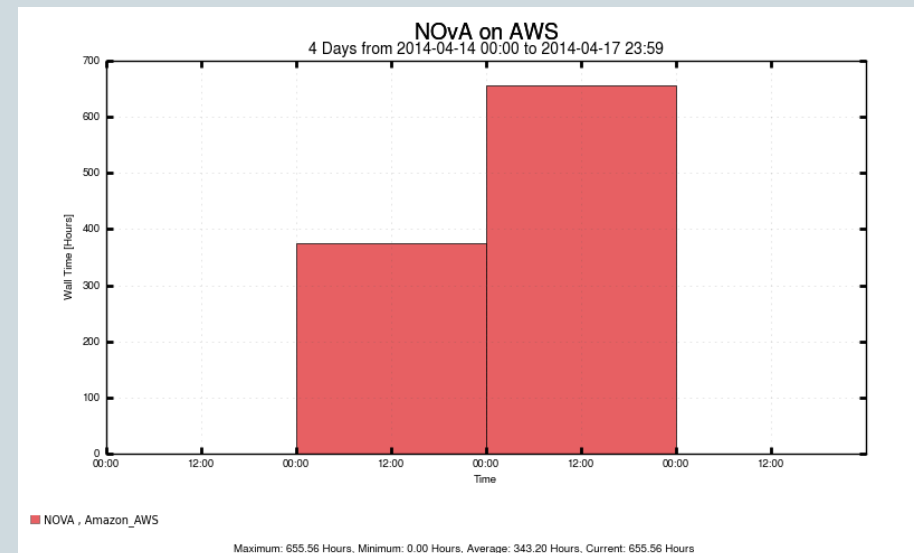
- overhead: 6 min/job

Output data: 326 (incl. 4GB tests)

- data: 152GB (BA via BeStMan)
- log files: 170 GB (on fifebatch1)

Input data: 72 GB (free)

## Cosmics Background in the Near Detector



m1.medium spotpricing bid \$0.07 →  
got “blended” price \$0.066 , instead: need to  
investigate

Total cost: \$125

Data transfer: \$39

CPU: \$86

Steve  
Timm



# Jobsub High Availability

9

- What is it? Suite of tools to manage batch/grid submission
  - Fault Tolerant: Minimal dependency between components
  - Scalable: High Availability (HA)
- Advantages?
  - Define common interfaces for experiments
  - Simplify the job submission process by:
    - ✦ Integrating complex grid tools in a sensible manner (credential management)
    - ✦ Automates mundane tasks interfacing with storage
      - Start SAM project
      - Facilitates data movement using ifdh to protect shared resources from overload
      - Stop SAM project
  - Jobsub along with GlideinWMS shields the user from complexity of running complex workflows on Grids & Clouds

Gerard  
Bernabeu

# Partitionable Slots

10

- What is it?
  - One 'partitionable' slot per WorkerNode (server)
  - From which 'dynamic' slots are made
  - When dynamic slot exit, merged back into 'partitionable'
  - Split happens at claim time (JDL/classadd)
- What does it buy us?
  - Partitionable slots split on CPU, Disk, Memory. You need all to get a matching slot => will have to monitor all resources
  - When you're out of one you're out of slots

8 Gb Partitionable slot

1Gb

1Gb

1Gb

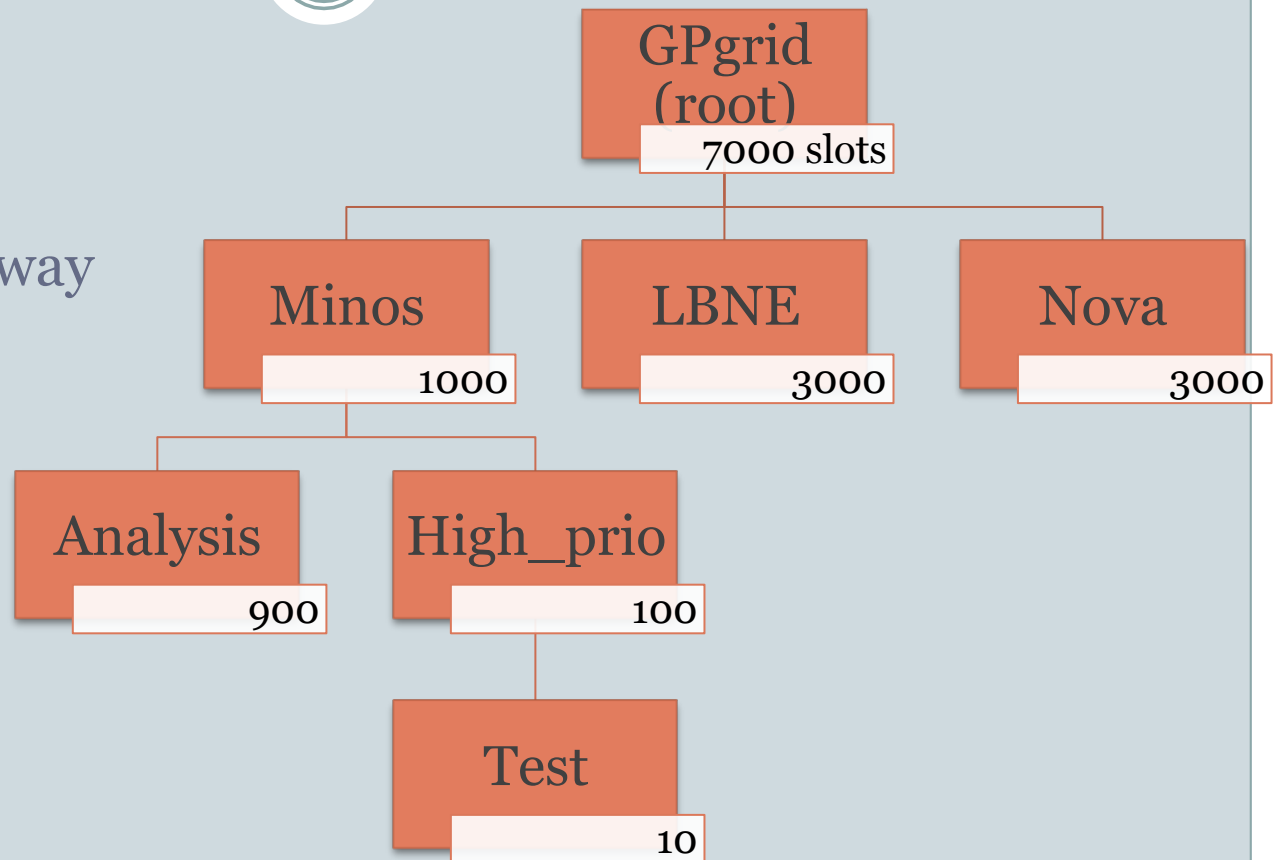
5Gb

Gerard  
Bernabeu

# Hierarchical quotas

11

- What is it?
  - Hard quotas
  - in a hierarchical way



- Advantages?
  - Different 'queues' within the experiment

Gerard  
Bernabeu

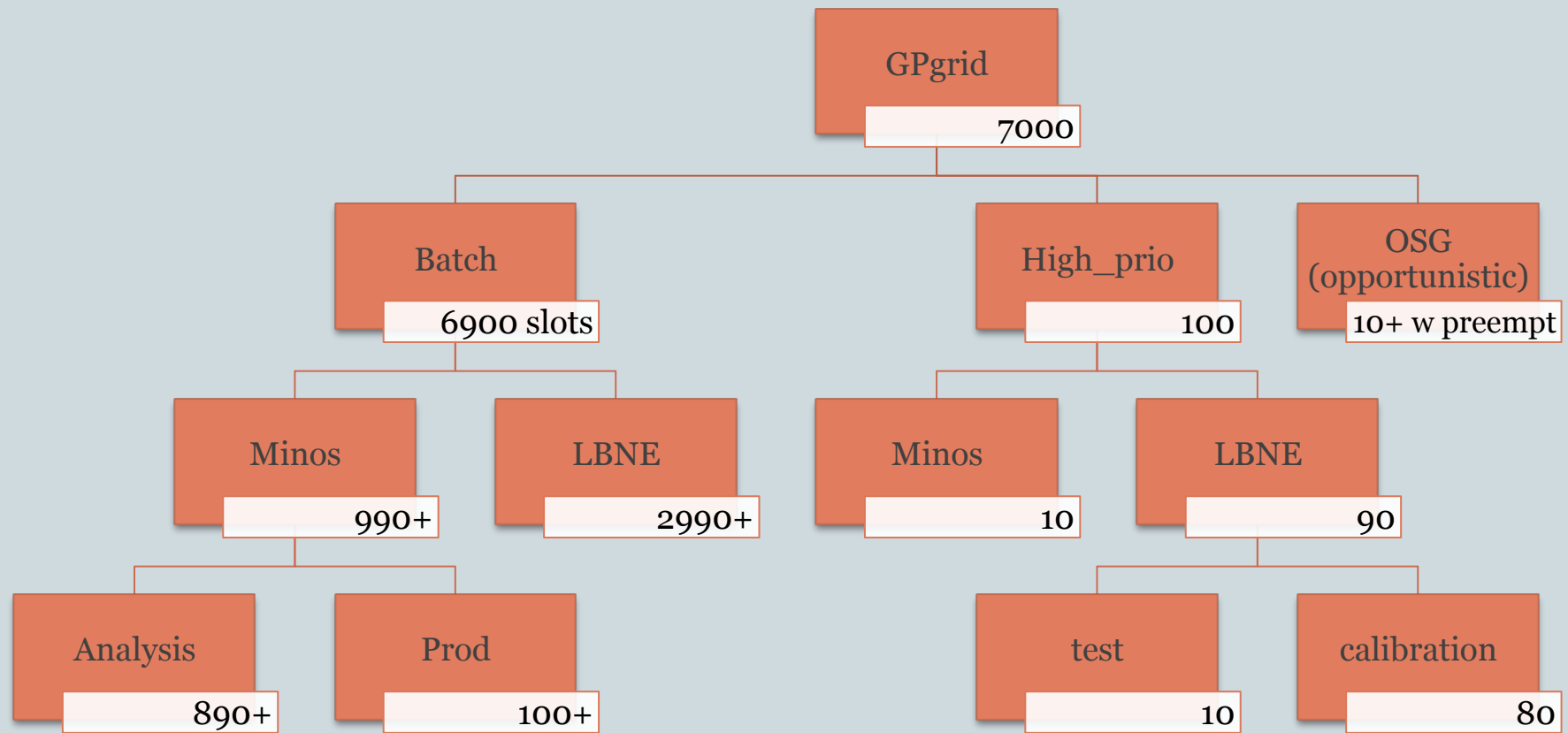
# Hierarchical quotas with surplus

12

- What is it?
  - Soft quotas (can go over if available resources)
  - Surplus follows the hierarchy (can be limited by a higher tier)
  - We need to agree on a maximum running time (in real hours, not cpu time) Eg: jobs must be shorter than 48h
    - ✦ Can have special 'queues' (AccountingGroups) with larger max time, but no surplus enabled for those
    - ✦ Time length is an open questions for experiments
- Advantages?
  - Allows Fermilab-based jobs to more easily grow to take up the whole GP Grid cluster if there is the demand.
    - ✦ Simplifies current jobsub structure; users will no longer have to pick opportunistic or non-opportunistic
    - ✦ Removes preemption for local resources (Gpgrid)
  - Tends to ensure desired quotas (if the farm is full, after the max running time)
  - Allows implementation of high priority accounting groups (ie queues)

# Hierarchical quotas with surplus

13



Gerard  
Bernabeu

# GPgrid upgrade to SL6

14

- GPgrid WorkerNodes are being reinstalled in a phased way.
- Process will be completed by Fall 2014, meaning that there will be no more SL5 slots available in GPgrid.
- In order to obtain a reduced amount of SL5 WorkerNode slots jobs can be directed to FermiCloud SL5 on-demand WorkerNode (without NFS mount points?).

End of month	SL5 slots	SL6 slots
July'14	3232	4456
September'14	0	7688

Gerard  
Bernabeu


# Other new services

15

- Continuous Integration
- Updates to CVMFS
- Potential larger memory allocation on OSG
- Data Handling
- Jobsub client
- Many new projects to help you get your science done

# Hopefully not this kind of computing...

16



[White Papers](#)[Webcasts](#)[Research Centers ▼](#)[IT Jobs](#)[CIO Executive Council](#)

[NEWS](#)[ANALYSIS](#)[BLOGS](#)[SLIDESHOWS](#)[VIDEOS](#)

[DRILLDOWNS](#)[Applications](#)[Big Data](#)[BYOD](#)[Careers](#)[Cloud](#)[Consumer Tech](#)[Mobile](#)[Operating System](#)

## US Researcher Banned for Mining Bitcoin Using University Supercomputers

Caught using supercomputers, the researcher gets a government-wide ban

By Tim Hornyak  
Thu, June 05, 2014

 1 Comment

 Share  2









 Like  221





IDG News Service (Tokyo Bureau) — The U.S. National Science Foundation (NSF) has banned a researcher for using supercomputer resources to generate bitcoin



# Thanks to everyone for their contributions and participating in the workshop!

17



Thanks Katherine for the image!

