

---

**HEPiX Fall 2011 Vancouver BC  
SLAC Site Report  
October 25, 2011  
Neal V. Adams**

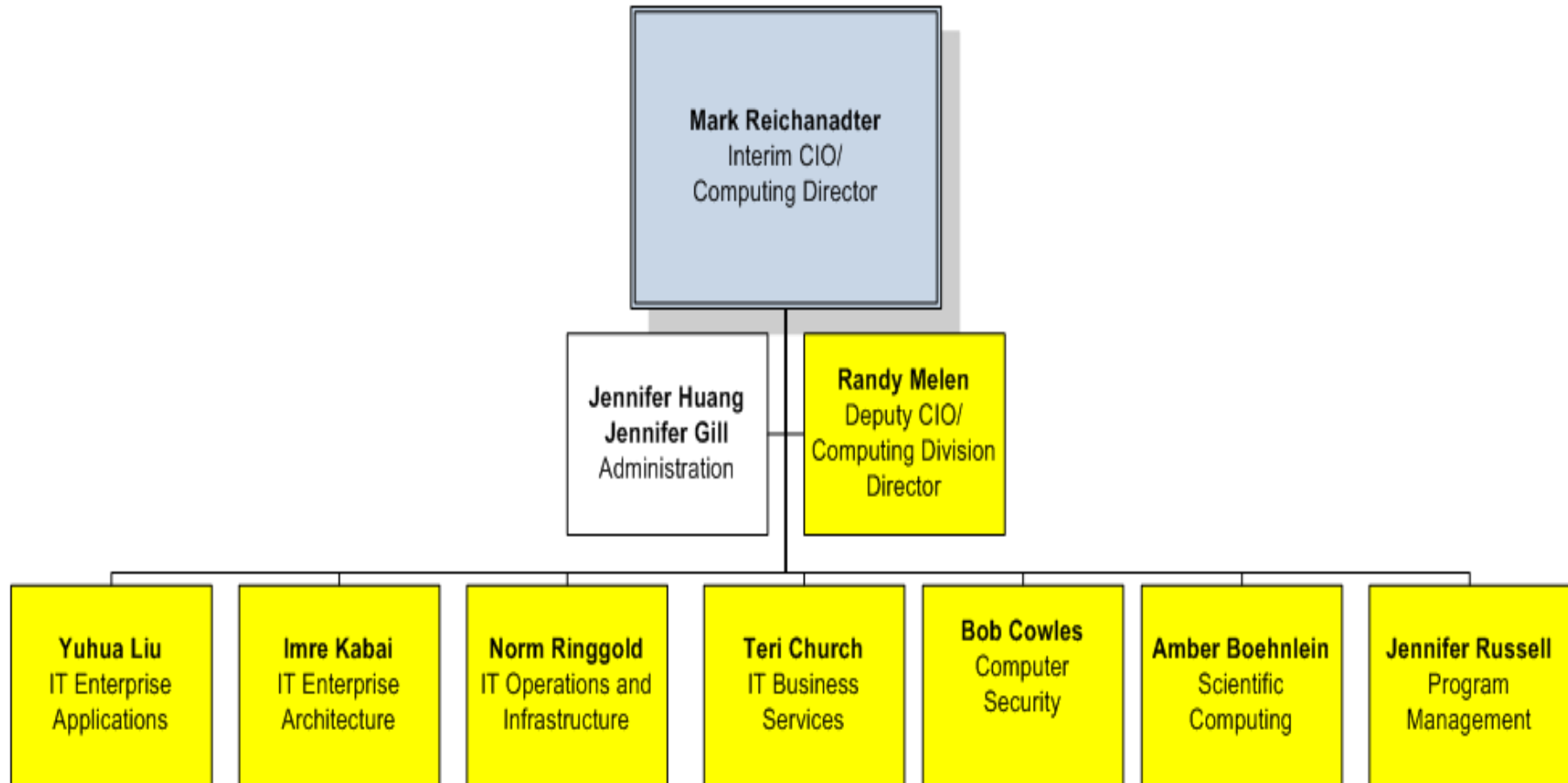
# Computing Division Organization Changes

---

- Deputy COO appointed as interim CIO
- Search committee established for hiring of new CIO.
- Organizational “flattening” to “increase bandwidth” to COO.
- Position open on Scientific Computing UNIX team.

# Computing Division and Office of the Chief Information Officer

---



# Scientific Computing Towards a Strategic 5 Year Plan

---

- Key areas of focus
  - Data Management
  - Simulation
  - Hardware Facilities
- Additional areas
  - Algorithms/Visualization
  - DAQ/Controls
  - Unified Shared Disk Storage
  - Replacement of EOL equipment

# Scientific Computing Steering Committee (SCSC)

---

- CD Scientific Computing Unix and Storage teams submitted a list of proposed projects (~40) to the SCSC.
- SCSC ranked projects and selected the Top 10.
- Two projects are in the pipeline:
  - Globus Online
  - NFSv4 for Kerberos authentication

# Scientific Computing Steering Committee (SCSC)

- CD Scientific Computing project list (top ranked by SCSC)

|                |                                |               |     |  |   | Sheets       | Charts                  |
|----------------|--------------------------------|---------------|-----|--|---|--------------|-------------------------|
| A              | B                              | C             | D   | E                                      | F   | G            | H                       |
| Category       | Subcategory                    | Direction     | ID# | Project Name                           | Project Description   | Dependencies | Stakeholders            |
| Infrastructure | System administration          | Forward going | 19  | upgrade Unix system management at SLAC | investigate the integration, installation, configuration, and management of unix systems, including monitoring; evaluate alternatives |              | CD                      |
| Basic Services | Account management             | Forward going | 1A  | Identity Lifecycle Management (ILM)    | move to modern, vendor-supported Identity Lifecycle Management system   |              | CD, customers           |
| Basic Services | System administration/security | Forward going | 14  | Cross Realm Authentication             | allow use of Unix password to authenticate to Windows and vice-versa  |              | CD, Security, customers |
| New Service    | Software management            | Forward going | 34  | git.slac.stanford.edu                  | provide central git server for SLAC   |              | CD, customers           |
| Basic Services | Accounting                     | Forward going | 5   | batch system accounting                | determine package for resource tracking, e.g., Platform Analytics   |              | CD, customers           |
| New Service    | Storage/security               | Forward going | 35A | NFSv4 evaluation                       | investigate use of NFSv4 for authenticated file access  |              | CD, customers           |
| Basic Services | Printing                       | Forward going | 10  | standardize central printer support    | modernize, standardize and integrate printer support for Unix & Windows at SLAC (Includes CUPS investigation)                         |              | customers               |
| Basic Services | Monitoring                     | Forward going | 7   | Groundwork monitoring                  | migration of Nagios into Groundwork framework; integrate Ganglia, network, PDUs; consistent access to monitoring tools                |              | CD, customers           |
| Basic Services | Storage                        | Routine       | 11  | Lustre 2.x                             | evaluate next generation Lustre for lab HPC use   |              | CD, customers           |
| Basic Services | System administration          | Routine       | 12  | LSF 8.1 Upgrade                        | deploy Platform LSF 8.1; evaluate new features  |              | CD, customers           |

# Globus Online

---

- Examining Globus Online as an easy-to-use tool to manage large volume data transfers in and out of SLAC.
- Working with the SLAC user community to define usage prototypes.
- Prototypes setup with GridFTP, MyProxy/Simple CA and Globus Online endpoints.
- User authentication against SLAC/SSRL unix account, or external Virtual Organizations.
- X509 certificate usage is hidden from users.
- Organizing tests with Harvard Medical School/SBGrid, Caltech and UCSD.

# LCLS Photon Control Data Systems

---

- SC CD Unix/Storage teams taking expanded role in support of offline computing environment and data storage.
- PCDS have 4x 1PB Lustre file systems
  - Three are deployed. (4th early next year)
  - ~10TB per day during experiment run.
  - Two copies saved to HPSS, one to Lustre.
  - No current plans to buy PB 5-6 yet.
  - Retention policy not yet established



# BaBar Long Term Data Access

---

- BaBar Long Term Data Access is in progress!
- Provide and maintain the capability to perform BaBar data analyses to at least the end of 2018.
- LTDA = A “simple” Virtual Data Center
- The LTDA system is designed to do “one thing” well and with acceptable risk: BaBar analysis in a limited and controlled environment
- Implementation
  - Well advanced
  - But still “exploring as we go” in some areas
    - Will have some fun with the full system 😊

# BaBar Long Term Data Access

---

- Hardware
  - 50 Intel Dual-Hex-Core, 3GHz, 48GB RAM, 24TB disk; Cisco 6506-720 switch (Gbit E); NFS server; a few dedicated infrastructure and login servers.
  - 1<sup>st</sup> stage delivered, 2<sup>nd</sup> stage in progress
- Storage requirements
  - NFS
    - Home dirs; group space; builds; CVS repo; VM image repo
  - Xrootd
    - ~1.4 PB usable; HPSS backend
  - MySQL
    - Dedicated server(s) backed up.

# Cyber Security Notes

---

- One of many goals: Make user access and account provisioning easier!
- BlueCoat WebFilter testing.
  - Protect SLAC's computer network
  - Meet Federal and DOE guidelines regarding computer security
  - Provide transparent protection from potentially malicious code
  - Prohibit access to inappropriate content on the SLAC network

# IT Desktop Support

---

- Windows 7 rollout continues
  - Migrated 682 to W7 since 1/11; 1654 XP to go.
  - All new desktops and rebuilds will be W7.
- Macintosh Support
  - Many Macs on site. By default we support them.
  - Support model TBD.
- “Centrally managed; field deployed” model embraced by management.

# Data Center Expansion

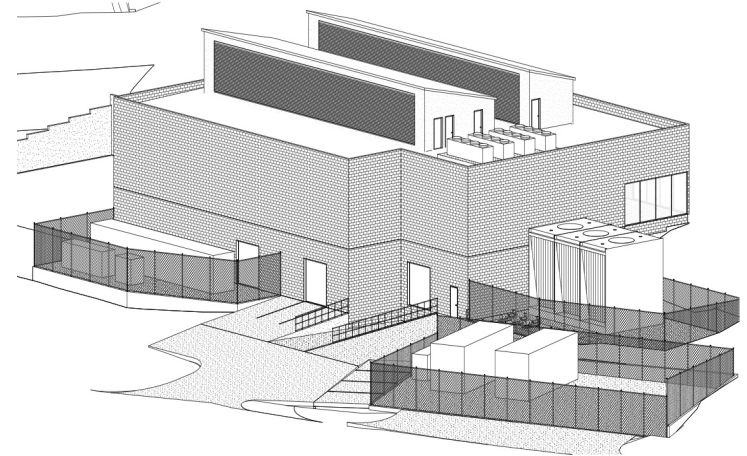
---



# Data Center Expansion

- **Stanford Research Computing Facility (SRCF)**

- Stanford's Board of Trustees approved design on Oct 10<sup>th</sup>.
  - Project phase review for approval expected in December.
  - Construction phase review in February 2012.
  - Hope for final approval late 2011 with occupancy in 2014
- Interviews for SRCF Computing Director underway.
  - We will explore other opportunities and partnerships with Stanford, where there would be likely cost savings or operational efficiencies or enhancements.



# Other Computing Developments

---

- HR/Financial computing rollout successfully completed.
- SLAC Strategic Site plan (new buildings) will provide new “opportunities” for IT.
- IT involved in site physical security system infrastructure planning.
- Partnering with Stanford University for monthly HPC discussions.
- SLAC will participate in SC11.

# Other Computing Developments

---

- Phasing out RHEL 4 (hopefully by our winter break) EOL 2/29/2012.
- RHEL6.1 deployed for user testing (builds, batch) as well as desktops.
- Purchasing from other hardware vendors such as Super Micro, as we move away from Oracle HW.



# Storage

---

- HPSS: Plan to upgrade tape drives from 1TB drives to 5TB T10KC drives.
- HPSS: Currently store 6.5 PB on 5768 tapes.
- With Lustre in wider and higher profile use (PCDS, KIPAC) a Lustre test system is in the works.
- Investigating the use of shared HPC storage
  - High throughput, IOPS, reliability, availability, scalability
  - Robust file system
  - Single namespace, mount point
  - Ease of management
  - Low cost

# XLDB

---

- XLDB 5 conference recently held (October 18-19)
- 293 attendees; quite a few turned away!
- Two new communities engaged; health care and genomics
- Important groundwork in getting database and statistics communities together.
- Increasing demand to expand conference program (i.e. tutorials, demos, reference cases, large-scale benchmarks, specialized workshops...)
- Attendees requested that SLAC continue to lead the effort.
- New initiative under consideration. TBA.

# Recent Power/Cooling Outages

---

- 9/20 - Power Glitch Master Substation.
  - Short duration, lost ~60 servers in LCLS NEH, ~120 SciComp servers in B050 affected.
- 9/29 - Cooling Tower 101 pumps failed due to non-redundant faulty sensor
  - OPS alerted, pumps were restarted in time before significant heat problems (~20 minutes).
- 10/1 - Lab wide power dropped to two phases.
  - Some systems stayed up. Some crippled or went down.
- 10/14 - Master substation problem took out some substations
  - CGB Sub 8 effected but failover to Sub 7 failed due to blown fuse.
  - UPS and generator kept some essential services up. SciComp services not so fortunate.
- 10/20 - Lost power to SLAC Campus area CT101 pumps stopped.
  - CD powered off 1<sup>st</sup> floor SciComp cluster servers (~820 servers).
  - Left down for planned (over-heating) transformer replacement outage on 10/21 – 10/24

# Future Challenges

---

- Disaster Recovery business continuity plan.
  - Identify critical services.
- Mobile computing plan and strategy.
- Identity and Privilege management.
- Enterprise Resource Provisioning (ERP)
  - HR and Finance systems
  - Determine who's going to do it and funding.
  - At SLAC or ???

# Nostalgia

---

Original SLAC Data Center torn down to begin construction of new Research Science Building.



# Thanks HEPiX!

---

## Happy 20<sup>th</sup> Anniversary!

