

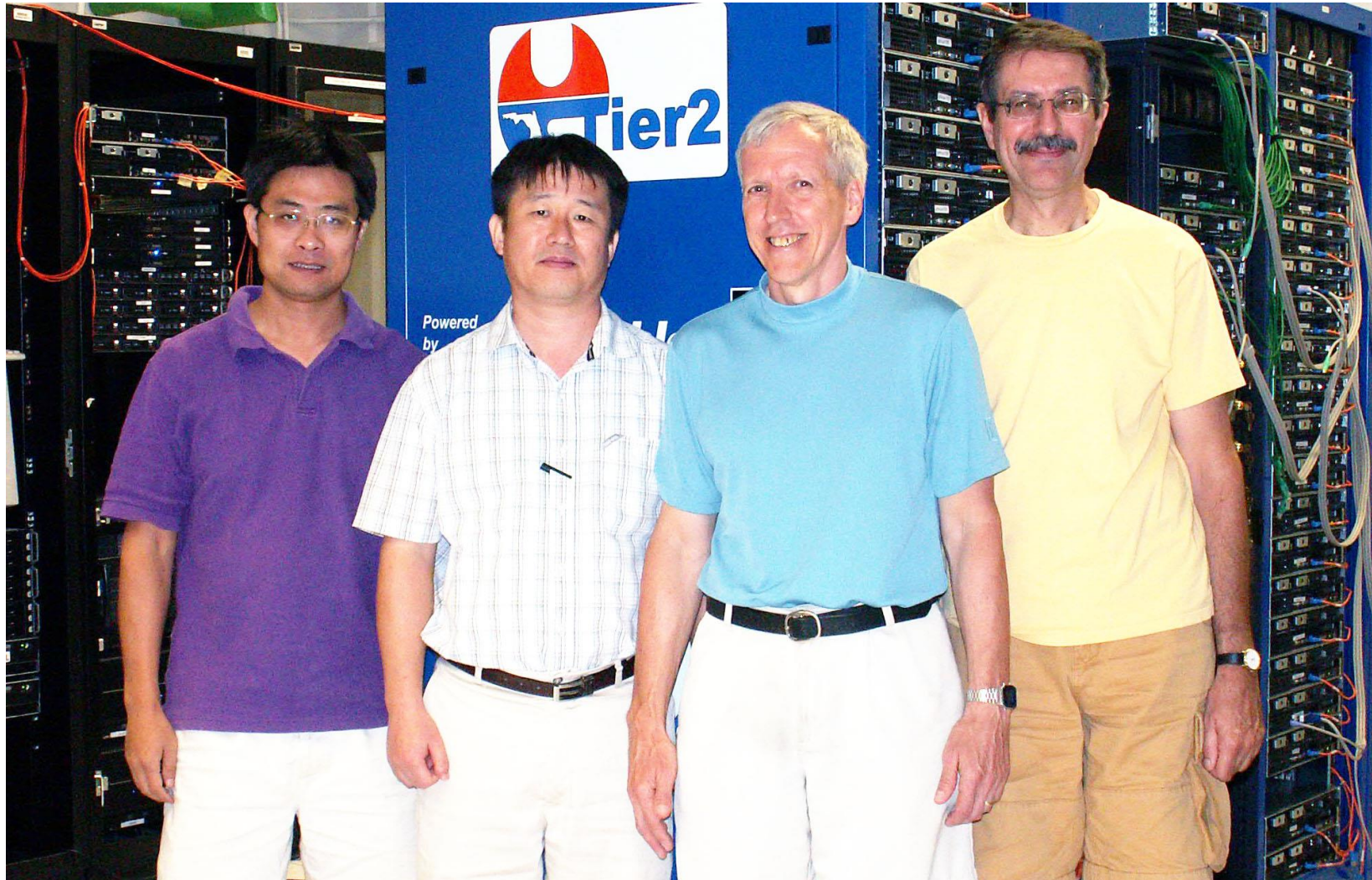


# Florida Tier2 Site Report

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# The Team



# The Computer Room

- 25,000 square-foot Data Center opened in 2013.
- Home for UF IT and UF Research Computing who hosts and manages Florida CMS Tier2 hardware.
- Battery-backed central UPS for critical services.
- Stationed 3000 kW diesel generator provides >72 hours of emergency power at full load.
- Mobile diesel generator available as a backup.
- 600 kW PDUs and corresponding cooling capacity for UF Research Computing as of now, 800 kW is being added now.



# Plenty of Room for Growth







# The HiPerGator



# The HiPerGator Supercomputer

- 21,000 processor cores.
- 4 GB RAM per core.
- 1440-spindle Lustre parallel filesystem for high-speed job scratch I/O.
- Torque/Moab batch system, most likely will be replaced by SLURM later this year.
- Florida CMS Tier2 owns 4126 dedicated cores on the HiPerGator.
- Florida CMS Tier2's dedicated HS06: 36,647.
- A lot of opportunistic slots.


# New HiPerGator2 Project

- 30,000 new core, 50,000 total core when completed.
- Scheduled to open: fall 2015.
- Florida CMS Tier2 will focus FY15's purchase on dedicated core share of this cluster.
- Expected Florida CMS Tier2 HS06 by end of FY2015: >50,000.

# Florida CMS Tier2 Storage

- 2.3 PB net usable space on a dedicated Lustre parallel filesystem consisting of 19 OSSes and 135 hardware-RAID-based OSTs with FDR IB.
- High performance.
- Outstanding reliability.
- Excellent scalability.
- 44 TB hardware-RAID-based NFS server for \$DATA etc.
- Bestman SE with 10x 10Gbps gridftp servers.



A photograph of a server room with multiple rows of server racks. The racks are dark-colored with glass doors, and some have APC logos. Blue lights are visible on the racks, and the room is dimly lit with blue ambient lighting. The floor is light-colored and reflective. The racks are arranged in a long aisle, and the perspective is from the end of the aisle looking down it.

**CMS Tier2 Storage**

# Florida CMS Tier2 Network

- 55 Gps FDR Infiniband interconnection between local nodes.
- 200 Gbps campus network.
- 100 Gbps WAN.
- 40 Gbps IB-IP bridges.
- 40 Gbps high-performance hardware NAT to provide WAN access to worker nodes on private networks.



# Readiness

- 100G WAN: yes
- Multicore capability: yes
- IPv6: in progress

# Automation and Modernization

- System provisioning (imaging) system handles most installs and post-install configs.
- Ganglia and Nagios monitor system.
- 10G perfSONAR for network monitor.
- OSSEC for security scanning and logging.
- Customized monitor and automation systems:
  - Home-made/customized tools to monitor CE, SE etc.
  - PhEDEx transfer monitoring/approval/deletion automated/cronized.



# Site Status

- 500 ~ 5000 pilot jobs at a single time
- WLCG CPU contribution increasing
- SAM : good
- HC: better than 90%
- PhEDEx:
  - Hosts more than 2500 datasets.
  - Supports 4 PAG/PDG groups.
  - Achieved >30 Gbps transfer rate in the 20G tests.

# Site Evolvment

- Cluster upgrade: HiPerGator -> HiPerGator2.
- Will likely migrate from Torque/Moab to SLURM.
- Migrating from three distributed locations to a centralized single location: the University's Data Center. Will finish soon.
- Upgrade of power and cooling is ongoing in the Data Center, scheduled to finish in June.
- Plenty of floor space and power/cooling capacity for any Florida CMS Tier2 growth in foreseeable future.
- Ready for startup of CMS Run II.



# Challenges

## Integration with UFIT/RC:

- Advantage:
  - Advanced infrastructure and resources.
  - Experienced operation team.
  - Professional expertise.
  - Low price of large purchase.
- Downside:
  - Many projects, priority issues.
  - Interference with and by other projects/groups.

Communication and coordination are essential.

# Questions?