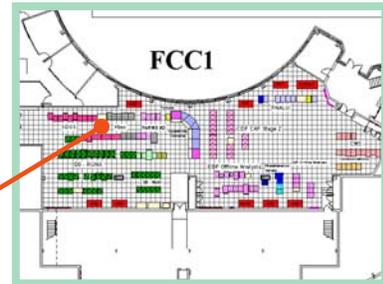


# Fermilab

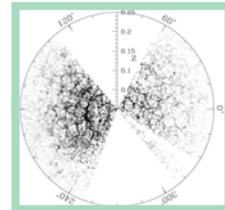
Computing Division

## Sloan Digital Sky Survey (SDSS)

- Map one-quarter of entire sky.
- Determine position, absolute brightness of >100 M celestial objects
- Measure distances to >1 M galaxies and quasars.



- At Apache Peak, NM observatory on a clear moonless night, acquire ~250 Gb of image data and send to Fermilab.
- At Fermilab, process via 16 Linux PCs and 20 Tb disk; add to celestial archive for study by >130 SDSS collaborators world wide.

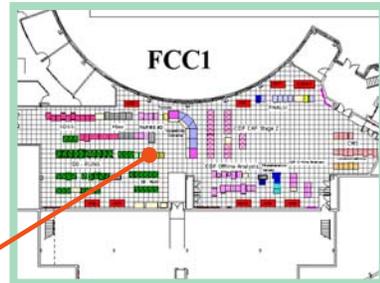


# Fermilab

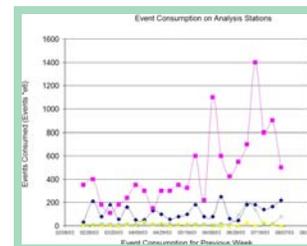
Computing Division

## DZero Central Analysis Backend Facility (CAB)

- Analyze track reconstructed data.
- Determine properties of force that binds quarks into protons—QCD.
- Search for evidence of new particles, such as the Higgs, believed to cause mass.



- Via Linux PC cluster, submit analysis jobs to CAB's 160 dual 2.0 GHz AMD Linux PCs.
- Via Fermilab created SAM s/w, jobs get input data from Fermilab robotic storage.

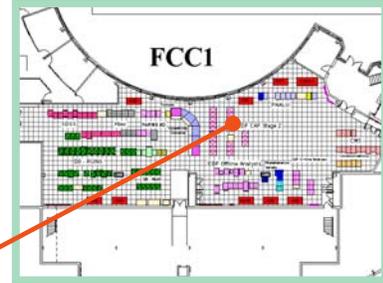


# Fermilab

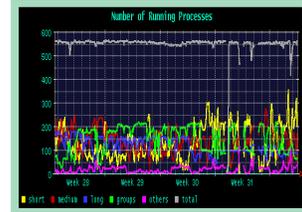
Computing Division

## CDF Central Analysis Facility (CAF)

- Analyze track reconstructed data.
- Look for new mixings of quarks.
- Make more precise measurements of the Fermilab-discovered Top quark.
- Search for the Higgs and supersymmetry particles.



- Via Linux PCs, prepare jobs, submit to 311 dual CPU worker nodes (Athlon 1.6 GHz with 2 Gb of RAM and 80 Gb of disk).
- Via SAM, dcache s/w & 92 file servers each with 2 Tb disk, obtain input data from robotic storage.

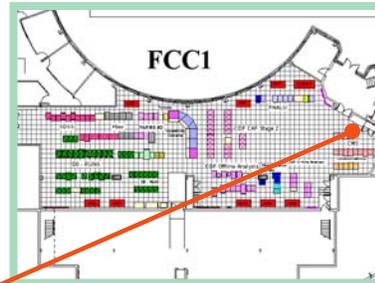


# Fermilab

Computing Division

## US CMS Tier-1 Computing Facility

- Help design the Compact Muon Solenoid experiment for the Large Hadron Collider, CERN in Geneva, Switzerland.
- Create simulated data and test design with the data and improve design.



- Via 121 Linux 1.9 GHz PCs, simulate particle collisions and detection by the CMS experiment.
- Store results on 10 Tb disks of file servers.
- Save to robotic tape storage.
- Prove out CERN-FNAL network for later data-taking.

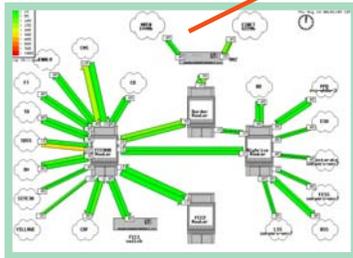


# Fermilab

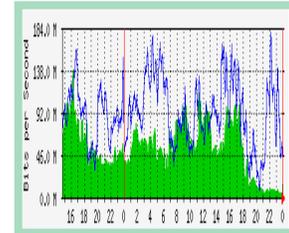
Computing Division

## The Network

- Provide world-wide scientific collaborations with the means to communicate, analyze data, and publish results.
- Provide the laboratory with the tools to operate at a management, administrative, and technical level.



- Via >7000 computers, >150 bridges, switches, and routers, >120 wireless access points, and >250 miles of optical fiber, transmit 60 Gb per hour.
- Connect via Starlight facility to CERN in Geneva.



# Fermilab

Computing Division

## Robotic Storage

- Provide quick, efficient, and cost-effective world-wide access to data.
- Make over 1.5 Pb of information, including not only data but simulation results, backups of software, etc., available for access within a few minutes at any hour, day or night.



- Via robots STK, ADIC robots, transfer ~10 Tb/day from 17,000 tapes via network to/from dcache disks for access by analysis jobs using STK9940B, IBM LTO-2, at 200 Gb/tape, 30 Mb/sec rate.

