



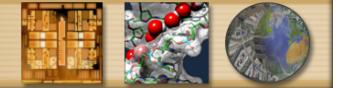
Application of ND CRC to be a member of the OSG Council

Jarek Nabrzyski
CRC Director
naber@nd.edu



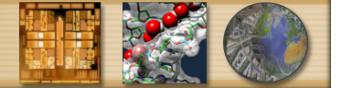
About me

- 1995-2008 – Poznan Supercomputing and Networking Center, Poland
 - Co-founder of eGrid (European Grid Forum)
 - Co-founder of GGF
- 2008-2009 – CCT@LSU – Executive Director
- 2009-today – CRC@ND
 - First incoming director of the CRC
 - Faculty in the CSE department
- Research – Resource management, workflow scheduling, cloud computing
- Teaching – Cloud Computing



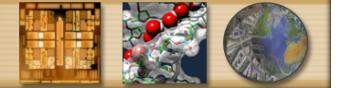
Why I am here?

- Notre Dame is becoming more and more involved in national and international large-scale scientific collaboration
 - CMS
 - Data preservation
 - Malaria, and other infectious diseases
 - Adaptation to climate change, and more...
- Need for national collaborations from apps to infrastructure layers
- OSG's has always been perceived by the CRC as one of the most important national production DCEs



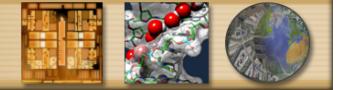
Why am I here (2)

- Strong belief that together we can do much more
- High value of OSG's goals
- Be a good citizen
 - Contribute spare resources to a national production infrastructure
 - Contribute to the national cyberinfrastructure vision
- This is a long term commitment!



CRC Mission

The University of Notre Dame's Center for Research Computing (CRC) engages in computational science, fosters multidisciplinary research and provides advanced computational tools and services. The CRC works to facilitate discoveries across science, engineering, arts, humanities, social sciences, business and other disciplines.



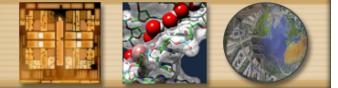
CRC Vision

To become an internationally recognized multidisciplinary research computing center based upon our reputation for facilitating and accelerating discovery through effective and novel applications of cyberinfrastructure.

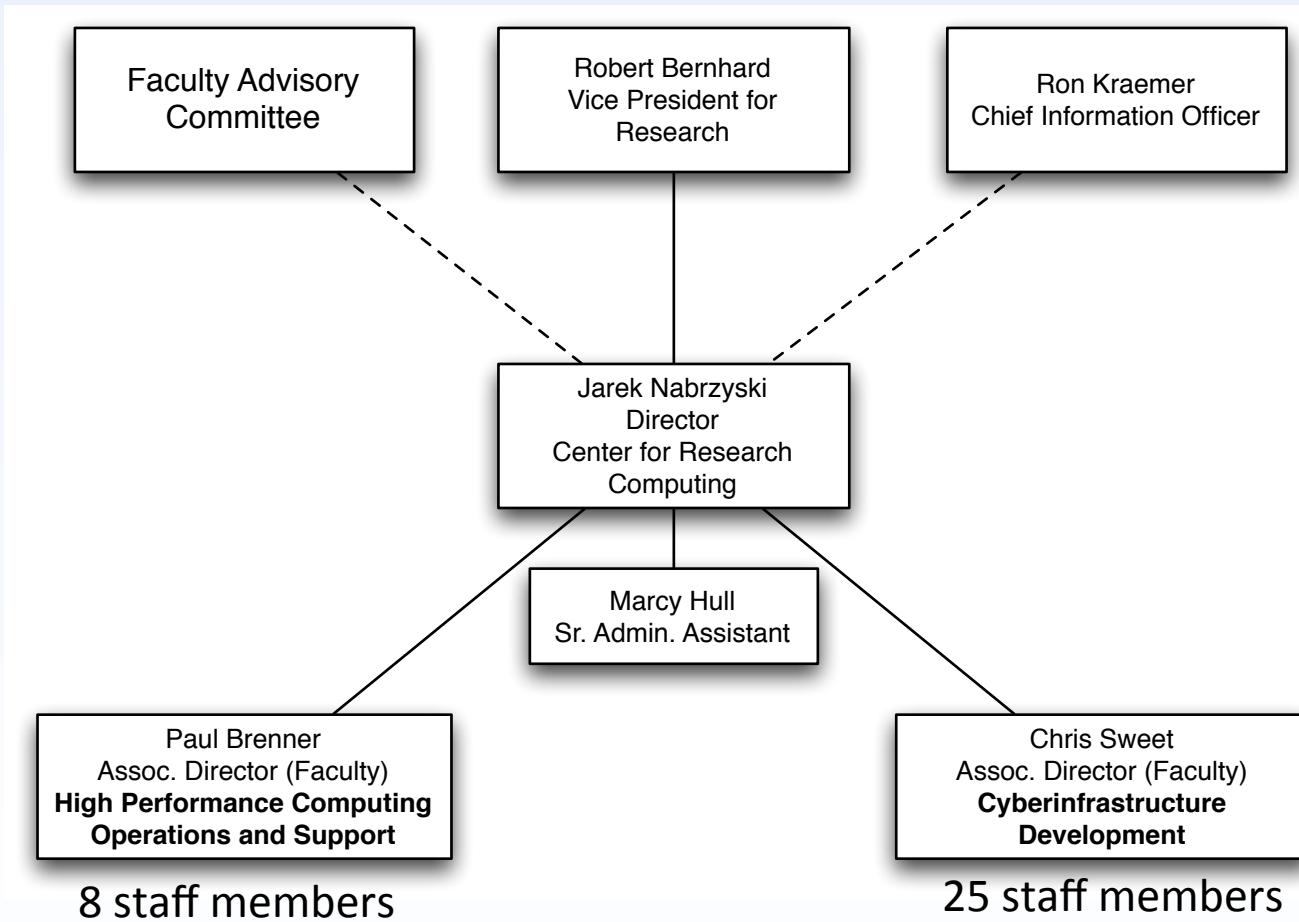


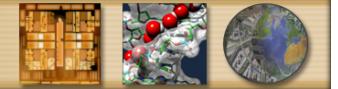
CRC Goals

- **Research:** To help Notre Dame be among the world's leaders in conducting multidisciplinary research through the application of cyberinfrastructure.
- **Infrastructure:** To provide reliable advanced computational architectures, software solutions and multidisciplinary collaborative lab spaces.
- **Service and Education:** To develop a customer service strategy, improving support for current CRC customers while attracting new customers.
- **Economic Development:** To facilitate technology transfer and accelerate innovation.



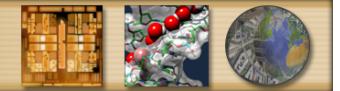
Organization Chart





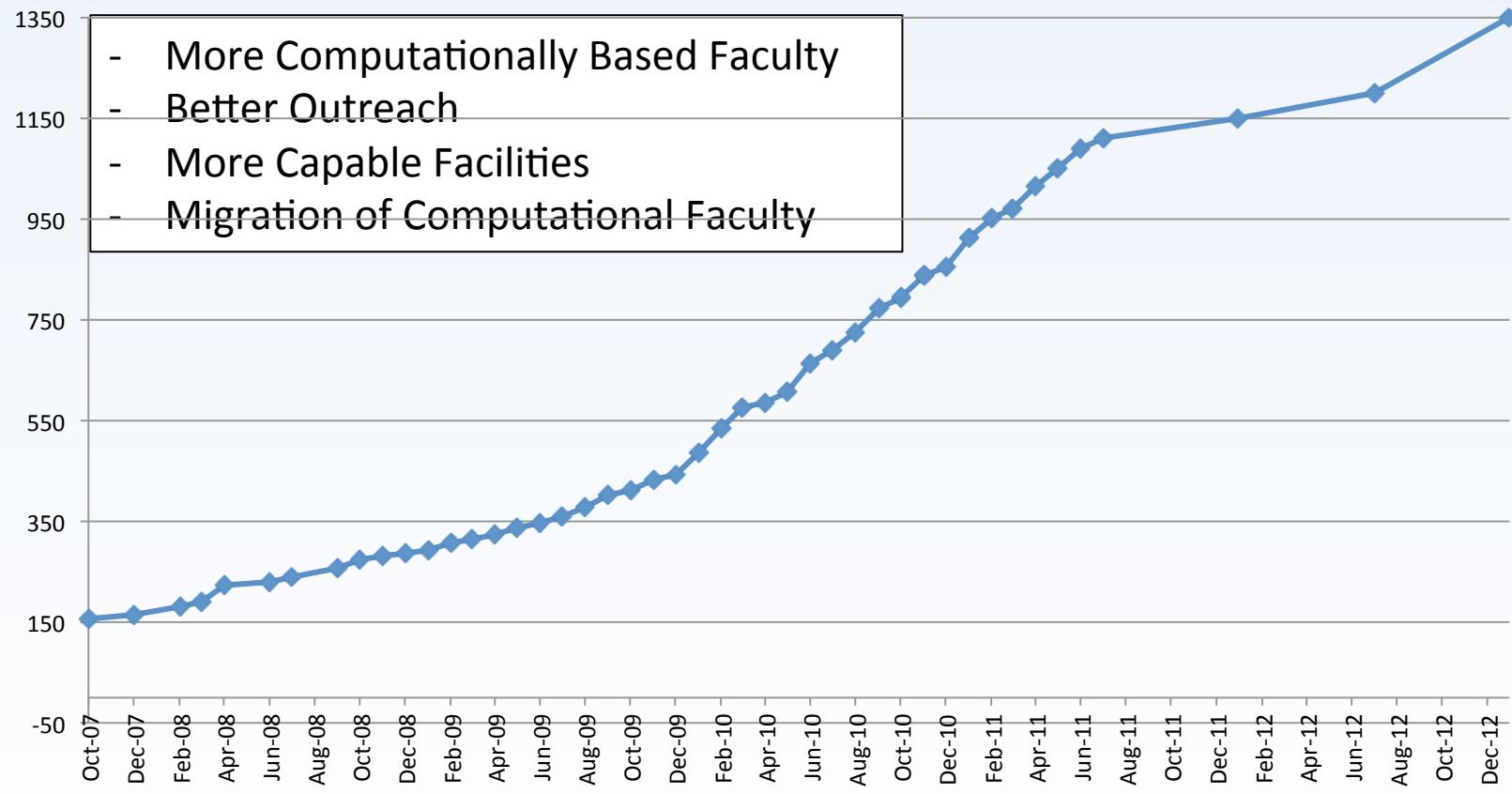
CRC in Numbers

- ~\$1.5M in re-charge projects per year
- PI/co-PIs on grants
 - \$50M total value
 - \$12.9M annual research expenditures
- 65 publications co-authored by CRC computational scientists over last three years
- 1350+ users (350 faculty, 700 grad students)
- 100+ CI projects of various size supported over last two years
- 20,000 computing cores managed by the CRC
- 4x more computational resources (since I joined ND)
- 5x more users (since I joined ND)



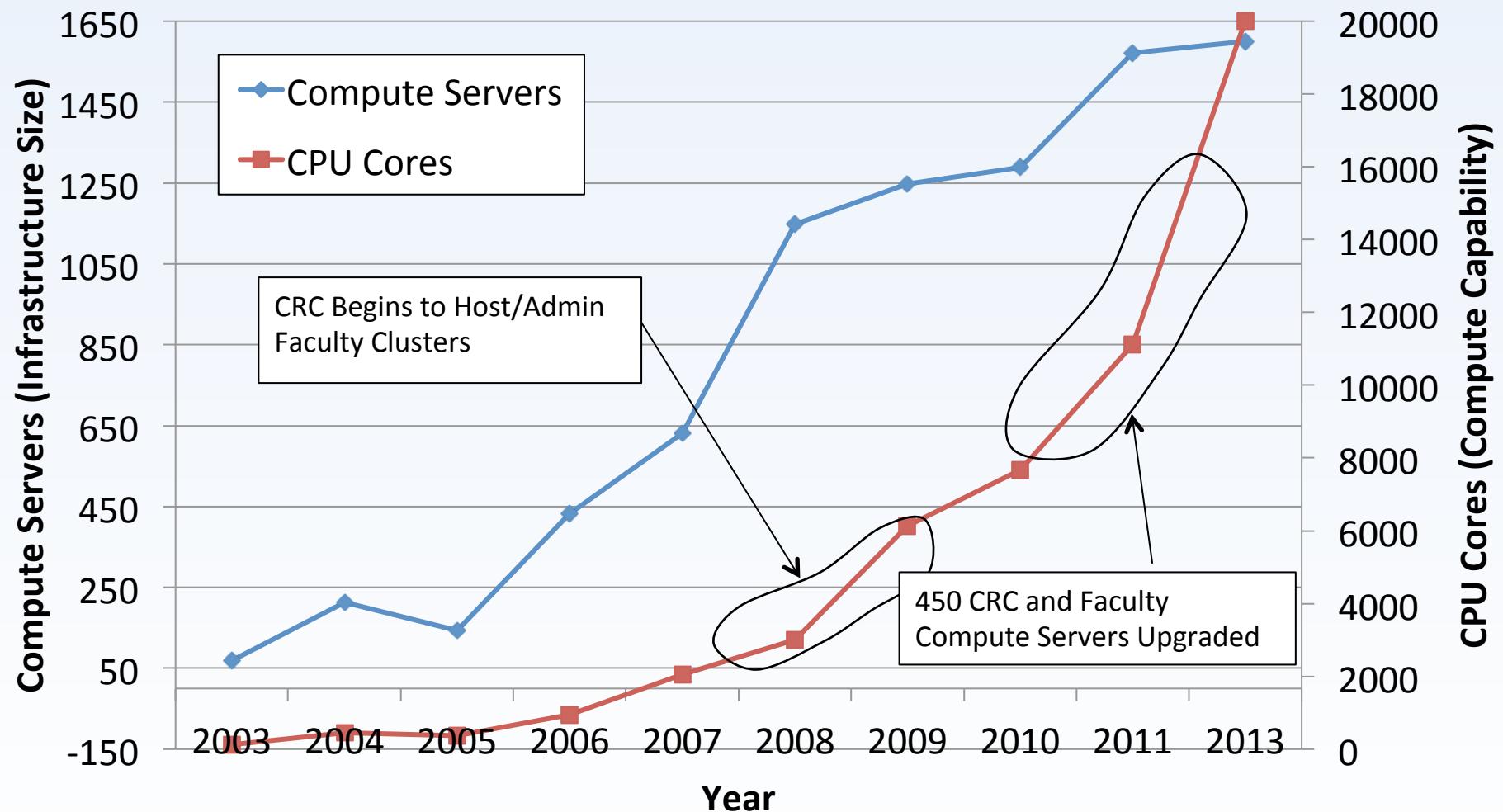
User Growth

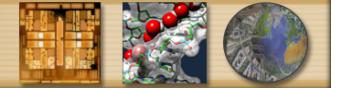
Number of Active Accounts By Request





Research Computing Growth – ND CRC





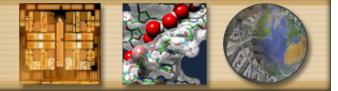
Equipment Facilities



ND CRC Data Center

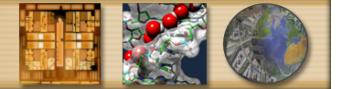
- Located at Union Station
- 1700 sqft machine room
- 650 sqft office
 - 4 offices
 - 1 hotel station
- > 1,600 servers
- 20,000 Cores





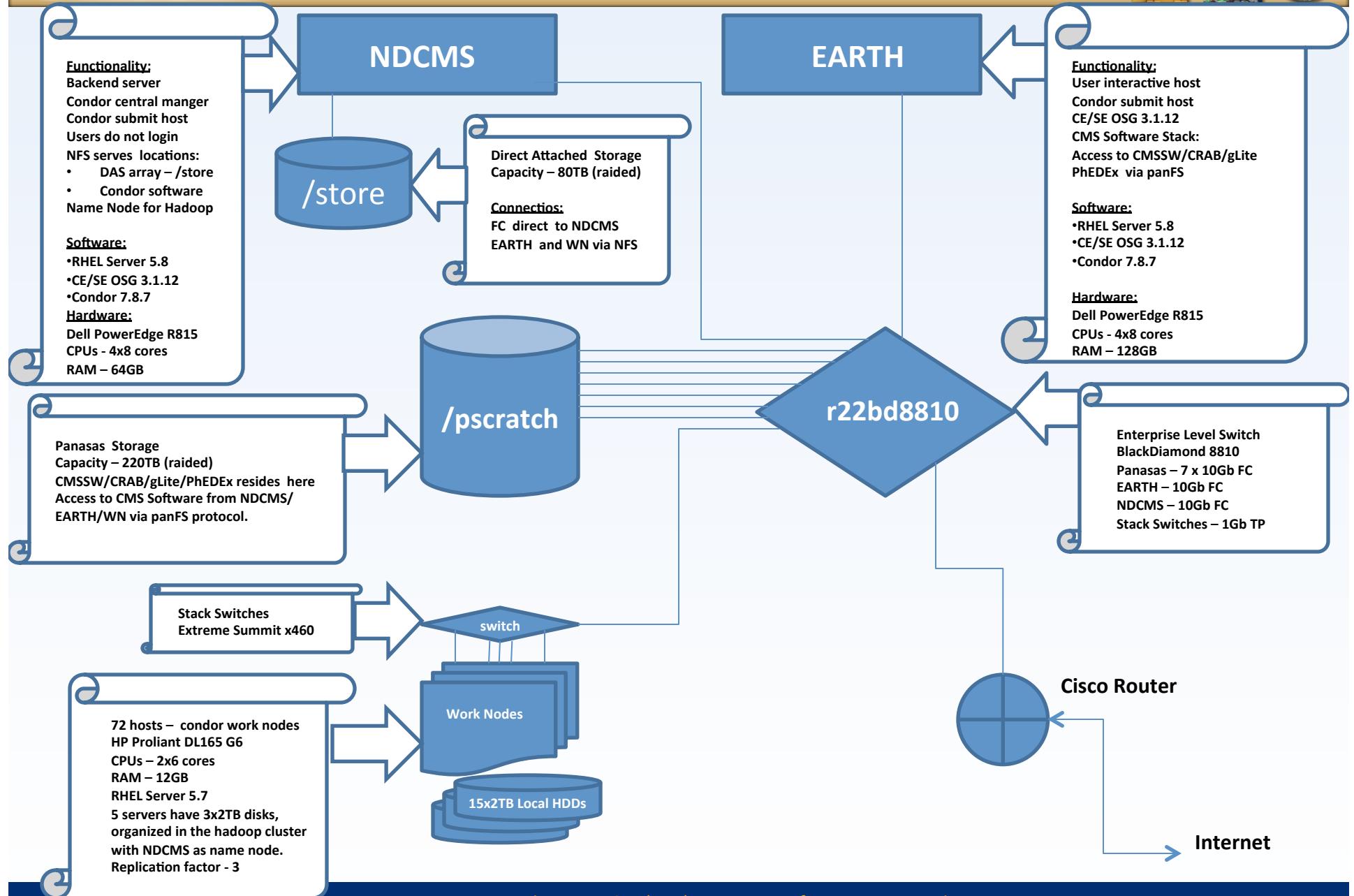
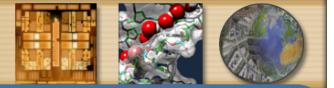
ND CRC application groups

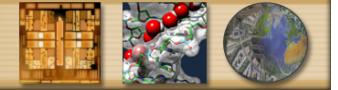
- Molecular dynamics groups, Folding@home
- Chemical engineering and chemistry
- Civil engineering (storm surge, winds and high buildings, hurricane center)
- AME (flow problems, gas turbines)
- Biology (genomics, infectious diseases, ecology, climate change)
- Social sciences
- Biology and social sciences are growing fast!



ND Collaboration examples

- VecNet and MTC projects
 - Gates Foundation malaria projects
 - Malaria transmission and intervention: data, models and simulations
 - International collaboration involving UK, Greece, Australia, Mexico, Switzerland
- CyberEye – hurricane preparedness center
- ND CMS and physics groups
 - Support the CMS infrastructure
 - Data preservation for HEP (DASPOS - NSF Grant)
 - QuarkNet (NSF) program
- Folding@Home - research and infrastructure with Stanford
 - 200,000 computers around the world





Summary

- CRC is at the forefront of Notre Dame's expanding research efforts
- Growing demand for CRC infrastructure and services, both CI and HPC
- Great opportunities still out there!
 - Reach out to remaining ND departments
 - National Cyberinfrastructure, capitalize on existing collaborations and build new
 - International collaboration



Questions?

I welcome your questions and engagement to help you decide on my application