

# Internet 2 Panel: “Now You’ve Built It; Will They Come”

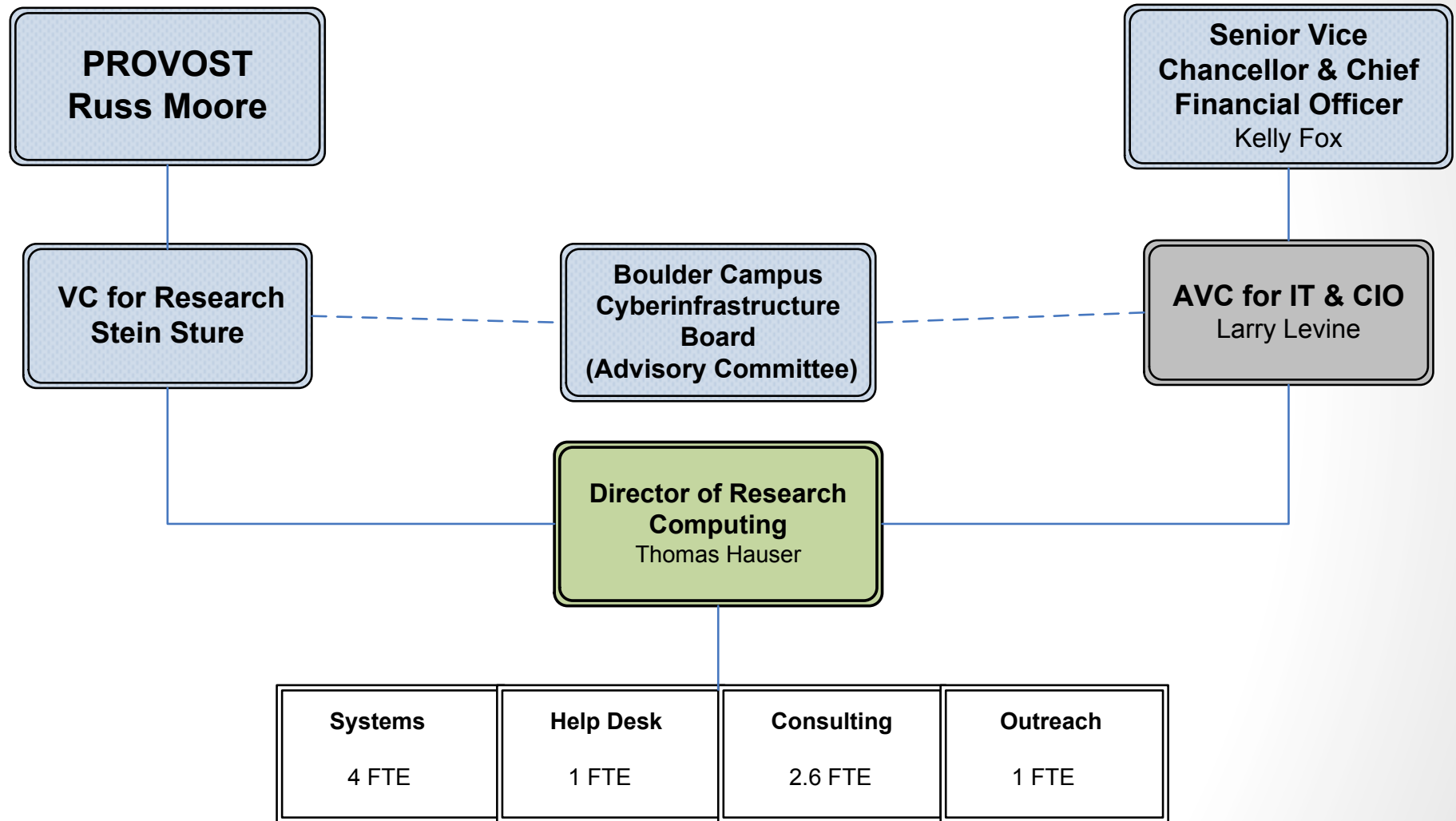
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# CU Boulder Research Computing



# CU-Boulder's CI Plan

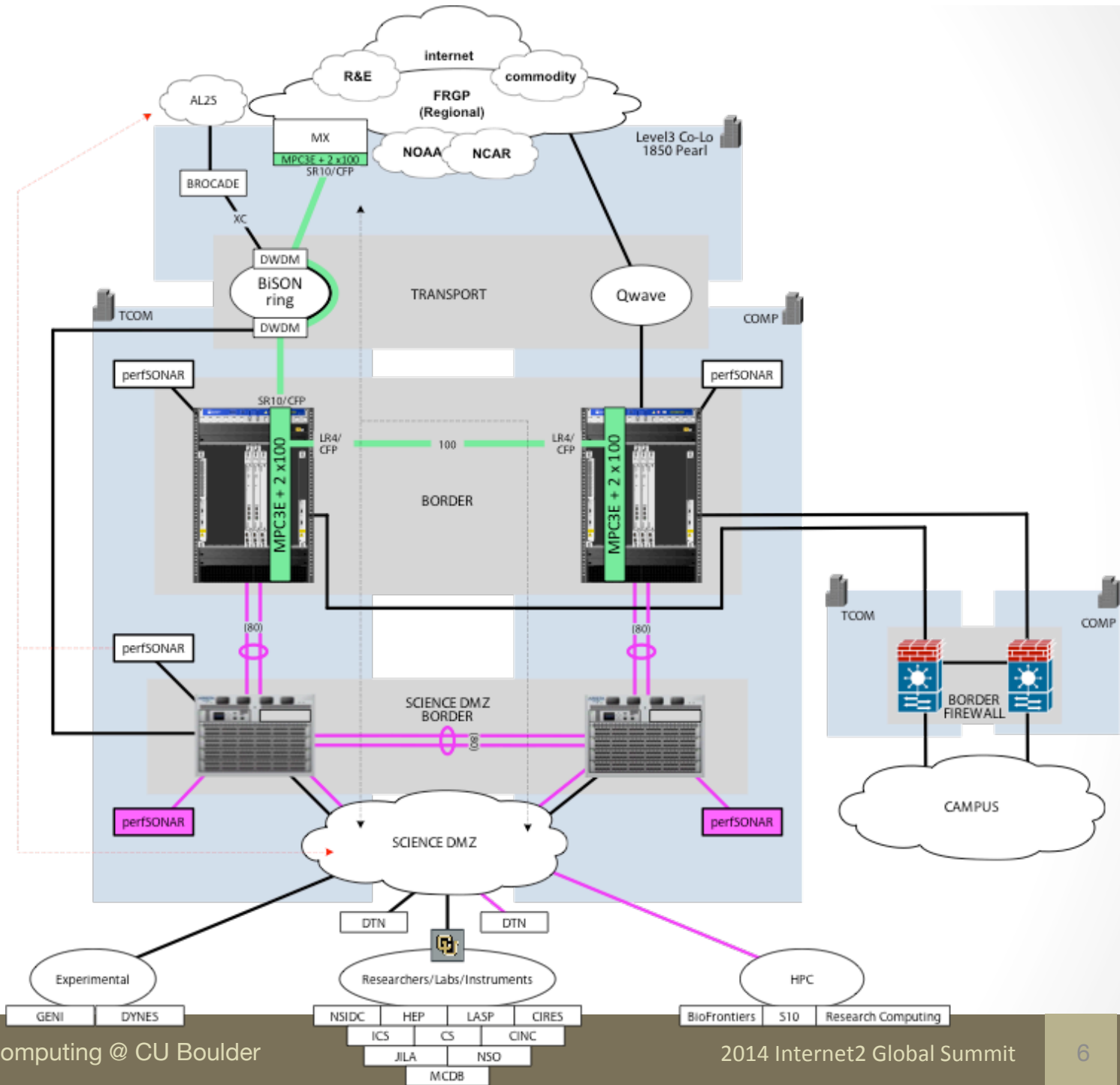
- Created in 2010
- Components
  1. **Colocation** → new data center will be ready this summer
  2. **Compute**
    - Janus supercomputer in operation July 2011
    - Condo cluster → coming this summer
  3. **RC network**
    - Connect instruments, servers to Janus
    - Layer 2 network
    - CC-NIE award in 2012
    - Proposal to upgrade external connectivity to 100 Gbps
  4. **Digital data services**
    - PetaLibrary storage award in 2011
    - Research data management task force
    - Research data services in collaboration with the CU Boulder Libraries
    - Data Governance Committee since fall 2012
- CC-NIE proposal created opportunity to update the plan, i.e IPV6

# Requirements Gathering

- RC's mission is to support research
  - Constant dialogue
  - Trying to find new ways to engage researchers
- PetaLibrary storage service MRI award in 2011
  - Big data requirements
  - Storage requirements are fairly similar to networking requirements
- RC network
  - Layer 2 network since 2010
  - DYNES proposal in collaboration with Physics in fall 2010
  - Performance debugging
    - Physics experienced performance issues
  - CC-NIE award in 2012

# Major Research Activities

- National Snow and Ice Data Center
  - Sharing of cryospheric and other data
  - 183 TB and 23 million files
- Institute of Cognitive Science
  - MIND Research Network collaboration
- BioFrontiers Institute
  - Data transfers to the Anschutz Medical Center in Denver
  - Shipping of disk drives
- Computer Science
  - Social networking data
- High Energy Physics
  - Open Science Grid site used by CMS
  - **Biggest Science DMZ user**
  - **100's of TB in 2013**



# GridFTP and Globus

- GridFTP cluster
  - 4 endpoints
    - Public: colorado#gridftp
    - Transfer of data between departments and RC
      - National Snow and Ice Data Center: colorado#nsidc
      - JILA: colorado#jila
      - Institute for Behavioral Genetics: colorado#ibg
  - External transfers since Nov 2013
    - 1.4 Gbps to NCAR
    - 1.3 Gbps to Stampede
    - 37.8 TB (6.5 TB to Kraken, 3.3 TB to Blacklight)
- PetaLibrary storage + Science DMZ + Globus sharing
  - Killer application for networking
  - Transparent to the users (Museum, Libraries)
  - fMRI data sharing with external collaborators – Neuroscience

# Next Steps

- 100 Gbps
- Advanced Layer 2 Service
- SDN
- Outreach to other institutions in collaboration with
  - FRGP
  - Rocky Mountain Advanced Computing Consortium
- Main challenges
  - Sustainability
  - Keeping up with the research demands
  - End to end performance, e.g. Anschutz