Building the Digital University

Rick Wagner
HPC Systems Manager

IDI: Building the Digital University

Rick Wagner   **Frank K. Wuerthwein**   **Rob Knight**

"…integrates compute & storage resources at SDSC with instruments and labs across campus…"

2 Focuses

- Integrative Omics
- Seamless Data & Computing

3 Components

- Core and embedded IT staff in a tiered model
- High-performance, scalable, central storage
- Campus backbone and the Prism network as a Science DMZ

SDSC SAN DIEGO SUPERCOMPUTER CENTER

UNIVERSITY OF CALIFORNIA

On Campus $c = \infty$

Data & Compute Needs

ScienceDMZ

Knight Lab

Physical Sciences

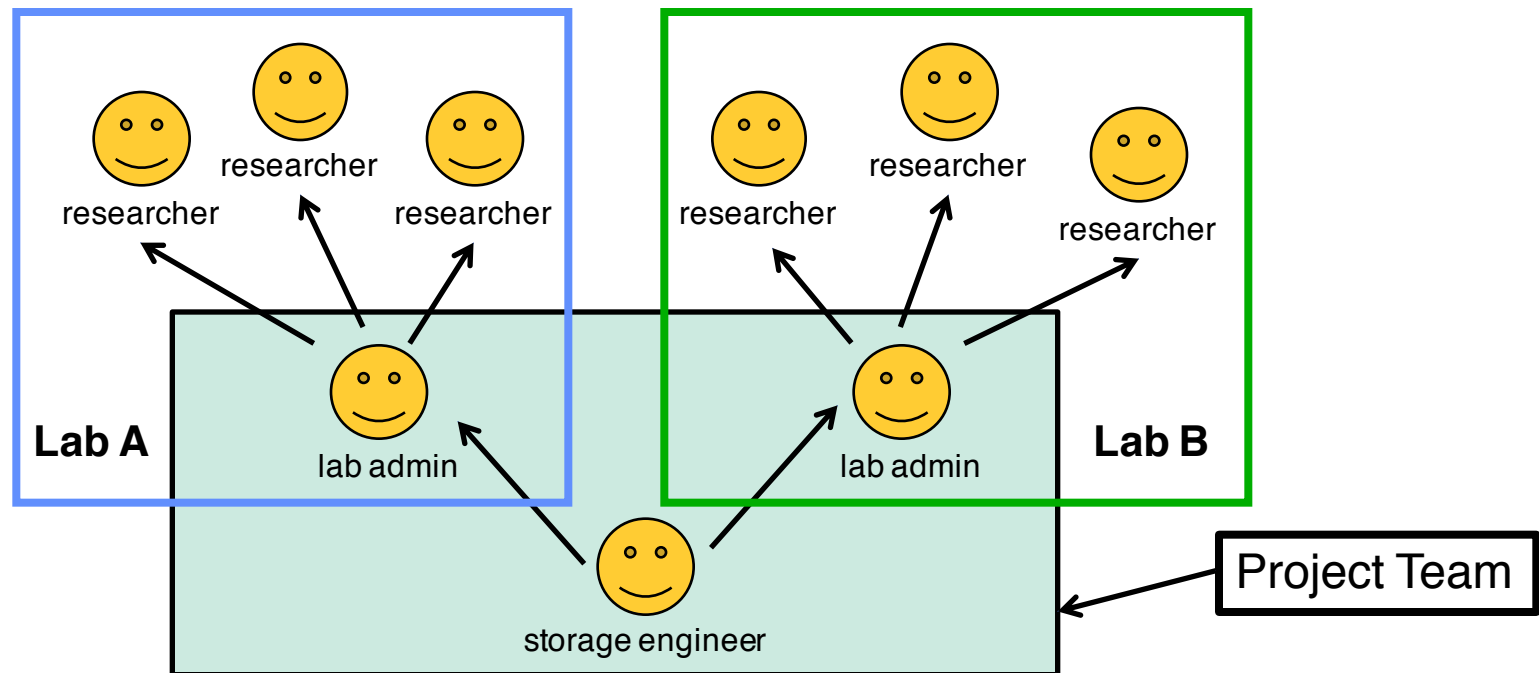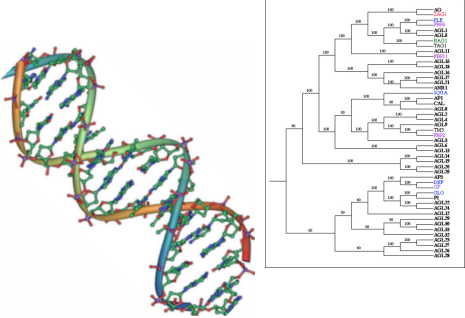**Comet**

Data Oasis

Parallel File Systems

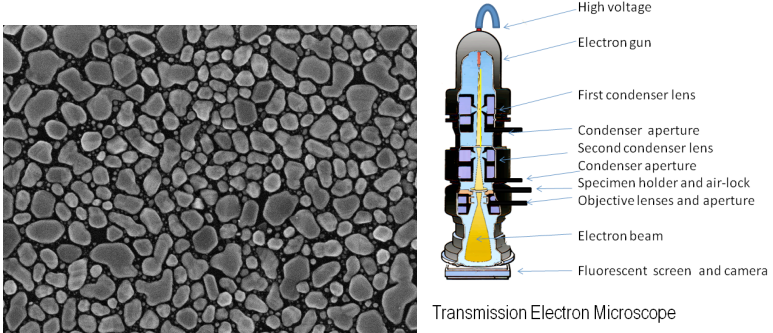# People First, Technology Second

Tiered Staffing Model

Project funds central storage engineers and lab admins
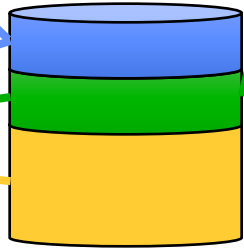

Labs are not customers, they're part of the team!
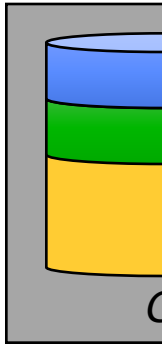
Lab A

Lab B

High voltage

Electron gun

First condenser lens

Condenser aperture
Second condenser lens
Condenser aperture
Specimen holder and air-lock
Objective lenses and aperture

Electron beam

Fluorescent screen and camera

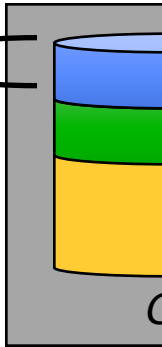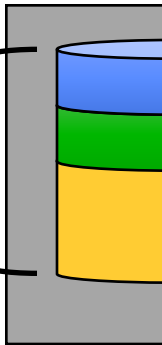Transmission Electron Microscope

HPC

**Lustre+ZFS
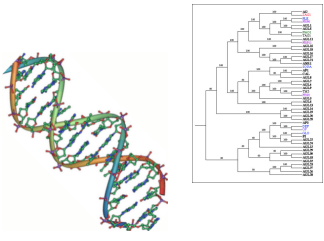Scalable Storage**
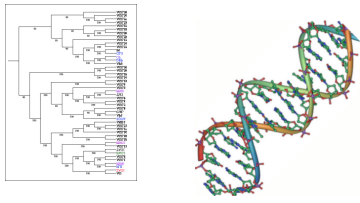
zpool

dataset

/oasis/projects/labA

/oasis/projects/labB

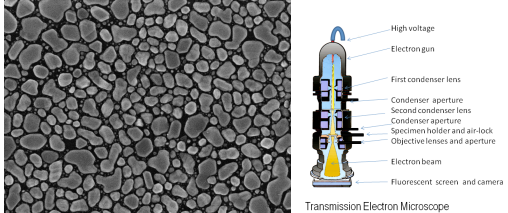/oasis/comet/scratch
/oasis/projects/labA
/oasis/projects/labB

magical!

Lab A

Lab C

Lab C

Transmission Electron Microscope
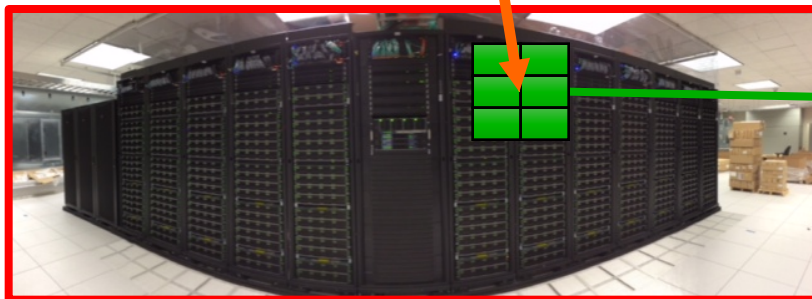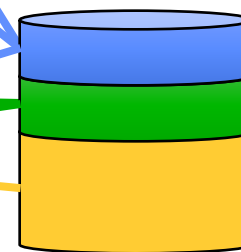
High voltage
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First condenser lens
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Specimen holder and air-lock
Objective lenses and aperture
Electron beam
Fluorescent screen and camera

virtual cluster

HPC

Lustre+ZFS
Scalable Storage

Where We Went & Will Go

Done

- Built & strengthened relationships between staff in distinct areas
  - SDSC, Physical Sciences, Knight Lab, Campus Networking, PRP
- Shared knowledge exchange around technologies
  - Lustre, networking, high-throughput computing, QIMME, Qiita
- Built a 500TB Lustre+ZFS testbed
- Delivered 10Gbps networking to Knight Lab
- Mounted Lustre on high-throughput computing endpoint in Physics

Doing & Will Do

- Configuring multi-lab Lustre environment (pushing boundaries)
- Evaluating recharge+condo business model
- Computing on the data!