Biomedical Research Computing Facility (BRCF)

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**Provide a standard
hardware, software and _storage_ architecture,
suitable for _local_ research computing,
that can be efficiently managed**
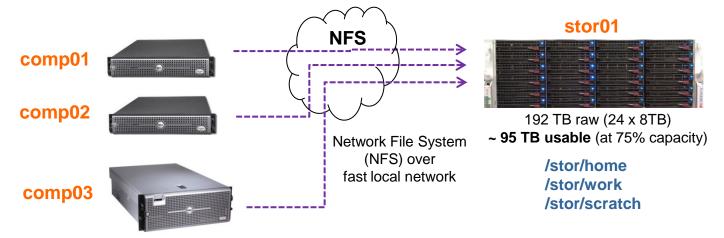
https://wikis.utexas.edu/display/RCTFusers

BRCF "POD" Compute/Storage model

Compute Server(s)

command line access via **ssh**
(no batch system)
web-based R Studio, Jupyterhub servers

Storage Server (shared)

Mac/Windows desktop file access via **Samba**
direct file transfer via **scp**, **rsync**

comp01

comp02

comp03

NFS

Network File System
(NFS) over
fast local network

stor01

192 TB raw (24 x 8TB)
~ 95 TB usable (at 75% capacity)

/stor/home
/stor/work
/stor/scratch

- Large set of Bioinformatics software available on all compute nodes
- Storage managed by high-performance, high-integrity **ZFS** file system
- Automated weekly backups (to spinning disk at the UT Data Center)
- Archiving of backup data every 4-6 months (to TACC's **Ranch** tape system)
- Common file system structures aid data organization, collaboration & automation
- Centralized deployment, monitoring & administration
- Supported jointly by biological sciences and IT services staff

POD Customers

- Currently have 9 PODs implemented
  - customers in Molecular Biosciences, Integrative Biology, Chemical Engineering, core facilities
  - 22 compute servers, 9 storage servers, 4 backup servers
    - ~800 TB available POD storage; ~350 TB of backup; ~750 TB tape storage to date

- Some examples
  - Edward Marcotte lab (proteomics; mass spec data)
  - Waggoner Center for Alcohol & Addiction Research (WCAAR), Vishwanath Iyer and Jonghwan Kim labs (functional genomics; NGS data)
  - Hans Hofmann lab (behavioral genetics; NGS & image processing)
  - George Georgiou lab (antibody repertoires; NGS data)
  - Howard Ochman lab (microbiome research; NGS data)
  - GSAF core offers customers no-cost 2 TB allocation on their POD
  - Educational POD dedicated to instructional support coming soon

Cost Model

- Each POD is owned by one or more PIs or organizations

- Customers purchase initial POD equipment
  - ~ $10,500 for storage server, ~95 TB usable
  - One or more compute server(s), e.g.:
    - Dell R430 w/96 GB RAM; 16 cores/32 threads – $4,500
    - Dell R430 w/256 GB RAM; 32 cores/64 threads – $ 8,500
    - these are examples – watch for sales!

- BRCF charges a per-POD maintenance fee
  - $450/month per POD = $5,400/year
    - $225/mo for ½ POD; $150/mo for 1/3 POD
  - Covers ~1 admin staff, backup equipment, spare parts, overhead