Research Cyberinfrastructure at UCSD

David Minor

January, 2012
A brief history ...

- 2008: Campus-wide needs assessment

- April, 2009: *Blueprint for the Digital University* issued

- April, 2010: *Cyberinfrastructure Planning and Operations Committee Report* issued
  - report accepted, business plan created

- January, 2011: RCI Oversight Committee formed
  - business plan accepted, oversight committee charged
RCI elements

• High-Performance Computing
• Data Center Colocation
• Storage
• Networking and other services
• Data curation
High-performance computing

• Triton Resource: a cost–effective and accessible high-performance computing system primarily for UC San Diego and UC researchers

• Triton Affiliates and Partners Program (TAPP): high performance cluster computing time at a reasonable cost.

• New developments include “condo” computing

http://www.sdsc.edu/us/tapp
Data center colocation

- Standard rack provided with ISO-Base seismic protection, aisle containment, and 2x30A power distribution

- 10+ Gb networking fabric connectivity both throughout SDSC aggregation fabric and into CENIC

- 24/7 operations staff providing facility oversight and emergency "remote hands" hardware assistance

http://rci.ucsd.edu/services/colocation.html
## Storage

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Cost per Terabyte-Year</th>
<th>Availability</th>
<th>Application Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel File System</td>
<td>• Designed for HPC users</td>
<td>99.5%</td>
<td>Up to 100 GB/s</td>
</tr>
</tbody>
</table>
| Project Storage      | • Standard Availability, Single-Site Durability  
                      • High Availability, Multiple-Site Durability | • 99.5% 
                        • 99.95% | • Up to 1 GB/s  
                        • Up to 1 GB/s |
| Cloud Storage        | • Single-Site Durability  
                      • Triple Copy | • 99.5% 
                        • 99.5% | • Up to 100 MB/s  
                        • Up to 100 MB/s |
Networking and other services

• Web Hosting

• Database Hosting

• 10GigE research network throughout campus

http://rci.ucsd.edu/services/other-services.html
Data curation

• Starting with a two year pilot phase

• Using existing tools whenever possible
  – Storage at SDSC
  – Digital Asset Management System at UCSD Libraries
  – Campus high-speed networking
  – Chronopolis digital preservation network

http://rci.ucsd.edu/services/data-curation.html

http://rci.ucsd.edu/pilots
Preserve and curate the digital version of the brain of patient HM, the most studied neuropsychological patient in modern medicine.
NSF OpenTopography Facility

Provide fully curated, DOI-referenced, long-term hosting for the OpenTopography data archive
Levantine Archaeology Laboratory

Develop the infrastructure needed to curate cultural heritage data that is spurred by new visualization and analysis tools.
Scripps Institution of Oceanography
Geological Collections

Assist with the creation of a standards-based access, discovery and preservation system for one of the largest collections of marine geology samples in the United States.
The Laboratory for Computational Astrophysics

Provide data management and curation to improve collaborations with other UCSD researchers, and to support publishing simulations of astrophysical phenomenon in cosmology, star formation and turbulence.
Data management plans

- Resources and contacts available to UCSD researchers
- Examples from submitted proposals
- Guidance, tips and recommendations for DMP preparation
- UCSD-centered version of DMP Tool

http://rci.ucsd.edu/dmp/index.html
http://rci.ucsd.edu

David Minor
Curation and Preservation Manager
San Diego Supercomputer Center
UC San Diego Libraries
minor@sdsc.edu