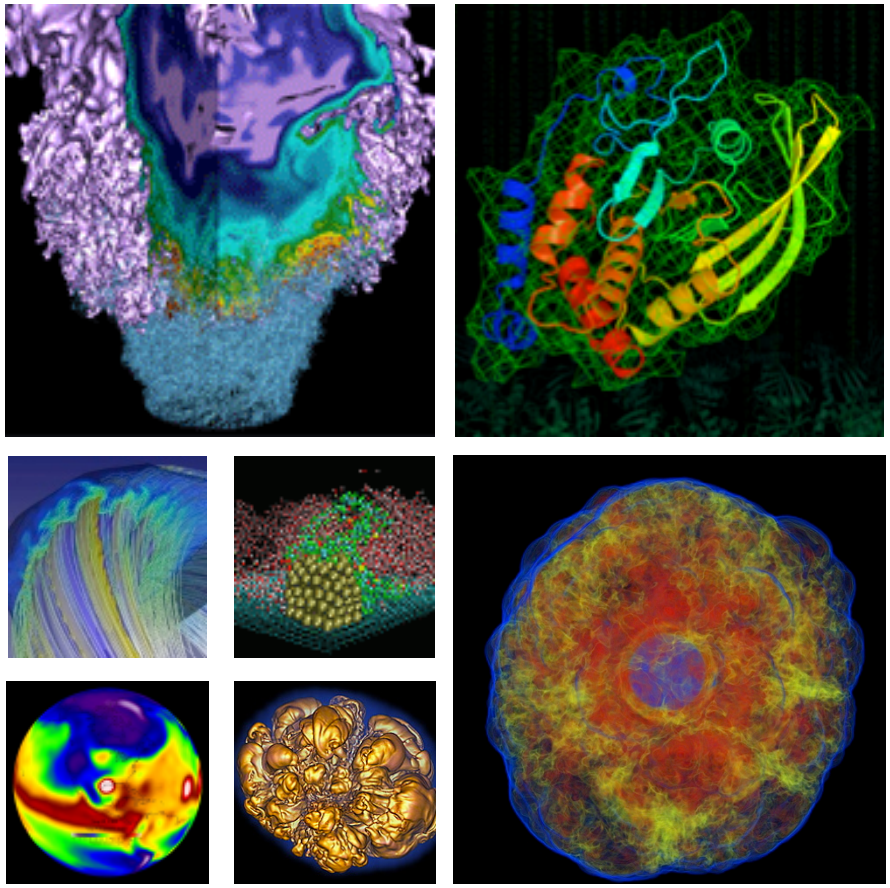
Web Portal Opportunities @ NERSC



NERSC 40 YEARS at the FOREFRONT 1974-2014

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Data and Analytics Services

NUG 2014

2014-02-03

U.S. DEPARTMENT OF ENERGY | Office of Science

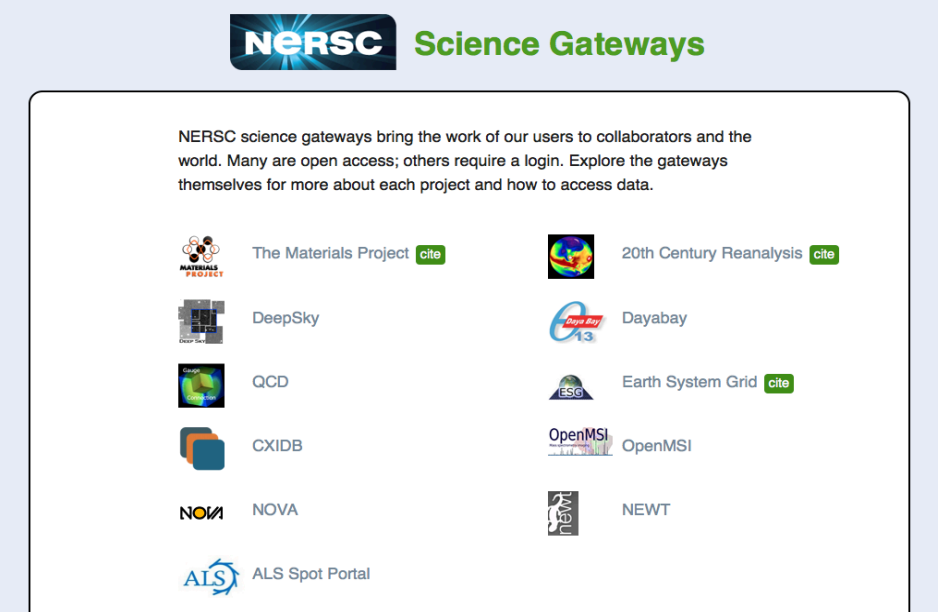
BERKELEY LAB
Lawrence Berkeley National Laboratory

Science On The Web

- **Increasing demand for access to NERSC via the web**
- **People expect web interfaces and applications for usability**
  - ✗ don't want to deal with SSH/UNIX/batch queue
  - ✔ want to interact directly with scientific tools
- **Web interfaces enable new ways modes of science in a data driven world**

NERSC Science Gateways

- **Web portals that allow you to interface with your data and computation at NERSC**
- **Interfaces built around your science**
- **Science-As-A-Service**



Services

- Simple data publishing capabilities
- Rich web interfaces and complex portals
- Backend databases and message queues
- NEWT API to access NERSC resources
- Virtual machines and “designer” URLs

Publish Data On the Web

- **Every repo now has a project directory**
- **Trivial to wire up your project directory to make it accessible over the web**
- **Create a file in your www directory**
  - mkdir /global/project/projectdir/<yourproj>/www
  - cd /global/project/projectdir/<yourproj>/www
  - vi index.html

  <html>Hello World</html>
- **Make sure all the above files and directories are world readable**
  - chmod 775 /global/project/projectdir/<yourproj>/ etc.
- **Voila:**
  - http://portal.nersc.gov/project/<yourproj>/

Simple Example

- Create a www directory in /project/projectdirs/m670 (replace with your own repo)
- Copy data
- View online
- http://portal.nersc.gov/project/m670

Build Full Stack Web Applications

- **Build full stack web applications for your science at NERSC**
  - **Python/Django, PHP**, Ruby on Rails, Java Backends
  - JavaScript + AJAX Frontends
- **Databases**
  - MongoDB, MySQL, PostGreSQL, SciDB
  - http://tinyurl.com/nerscdbs
- **Public or Authenticated Gateways**
  - http://portal.nersc.gov OR https://portal-auth.nersc.gov
- **OpenDAP and MQ services**

Some Examples

- http://materialsproject.org
- https://spot.nersc.gov
- https://openmsi.nersc.gov
- https://portal-auth.nersc.gov/atc

Use NEWT API to access NERSC

- **NEWT – the NERSC REST API**
- **Use the NEWT HTTP API to access NERSC HPC resources directly from your web apps.**

Basic NEWT Example

- **HTTP verb + URL returns structured JSON data**

eg.

GET https://newt.nersc.gov/newt/status/

```
[{"status": "up", "system": "hopper" },
 {"status": "up", "system": "carver" },
 { "status": "up", "system": "edison" },
 { "status": "up", "system": "pdsf" },
 { "status": "up", "system": "genepool" },
 { "status": "up", "system": "archive"}]
```

NEWT Features

- **Run Commands on any system**
- **Transfer files**
- **Authentication**
- **Submit/Query Jobs directly through NEWT**
- **Persistent Store**
  - Store JSON objects in the NEWT storage
- **Access to NIM info**
  - Information about Users, Repos etc.
- **System Status**

NEWT demos

- See https://newt.nersc.gov/ for documentation and live demos

Virtual Machines and Custom URLs

- **We typically build portals on shared hosts:**
  - portal.nersc.gov and portal-auth.nersc.gov
- **We can add designer URLs that point specifically gateway eg.**
  - http://cxidb.org/
  - http://deepskyproject.org/
  - https://openmsi.nersc.gov/
- **If you need dedicated resources for your project we can also allocate Virtual Machines to host your gateways**

Engagement

- **There are various levels of engagement and collaboration**
  - NERSC provides building blocks and backend infrastructure, science groups build their own gateways.
  - Immersive development - science groups work in collaboration with NERSC engineers to build gateways. (But requires more resources from both sides).
- **If you are interested in building a portal please come and talk to us. We can help customize our offerings to meet user needs.**

Thanks!

Questions? Comments?

Contact Us:

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