Web Portal Opportunities @ NERSC

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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/nerscdbc

• Public or Authenticated Gateways

• OpenDAP and MQ services
Some Examples

- [http://materialsproject.org](http://materialsproject.org)
- [https://spot.nersc.gov](https://spot.nersc.gov)
- [https://openmsi.nersc.gov](https://openmsi.nersc.gov)
- [https://portal-auth.nersc.gov/atc](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"}]

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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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