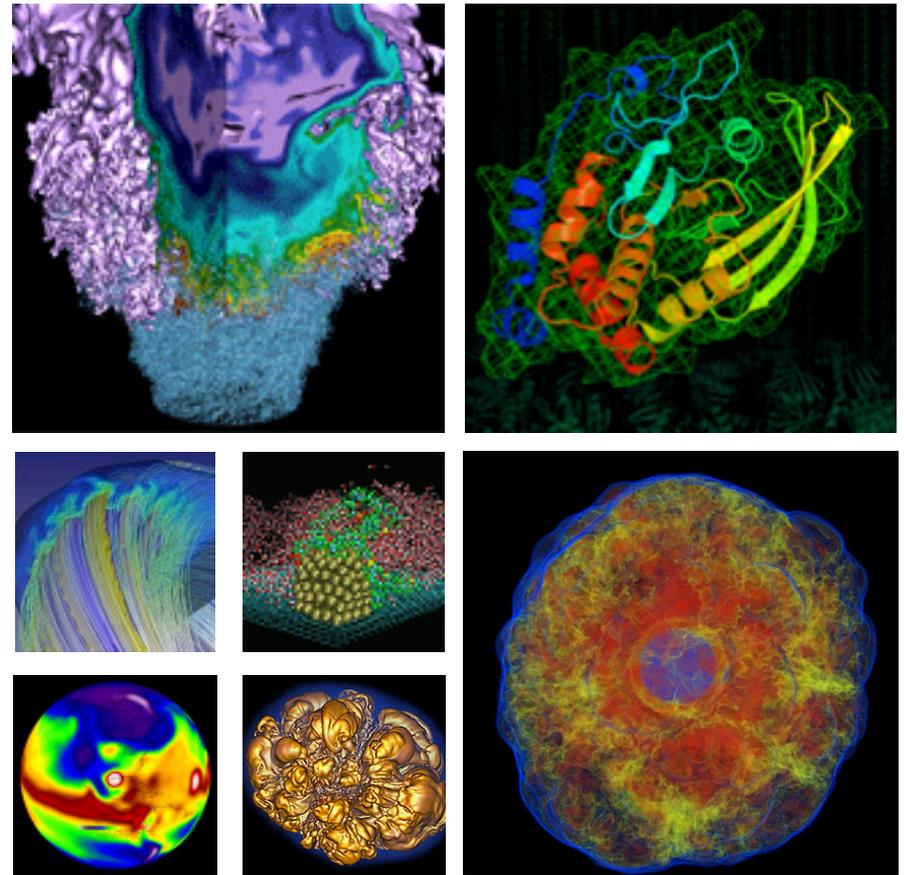


Connecting to NERSC



Rebecca Hartman-Baker
NERSC User Engagement Group

Outline: Connecting to NERSC



- **ssh – the Secure Shell**
 - The *lingua franca* of contacting NERSC
- ***NX - Accelerated X*** (also uses ssh)
 - Persistent sessions, Accelerated Graphics, KDE Desktop

- All of the computational systems at NERSC are accessible via ssh
- Each system has a set of load-balanced login nodes which offer ssh service
- Use your **NIM** username & password
- Addresses for NERSC systems:

Large-scale Systems

- edison.nersc.gov
- cori.nersc.gov

Mid-range Systems

- genepool.nersc.gov
- pdsf.nersc.gov

Data Transfer Nodes

- dtn[1-4].nersc.gov

<http://www.nersc.gov/users/network-connections/connecting-to-nersc/>

Basic SSH use from Mac/Linux/cygwin



- **If you have a UNIX-like computer, you can directly contact NERSC with your built-in ssh client**
 1. Open a new terminal
 2. Enter: `ssh -l <NIM username> edison.nersc.gov`
- **Depending on your preferences you might want additional ssh flags:**
 - `ssh -Y` *performs robust X-forwarding over ssh*
 - `ssh -A` *forwards ssh-agent information (if you use ssh-keys)*
- **Advanced Topic: ssh keys**
 - If you choose to setup an ssh key to access NERSC systems, please use a passphrase on the key (*no unencrypted ssh keys!*)

SSH from a Windows System



- **Many ssh clients exist for Windows**
 - A very popular one is **putty**
 - <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>
 - Advanced users might prefer to use ssh directly within **mintty** (from cygwin distribution)
- **Both of these options support all ssh features (that I've ever tried to use)**
 - For X-forwarding to work, you'll need to find X-server software
 - Cygwin/X
 - Exceed
 - Consider using NX instead of X-forwarding

Example Session



```
doe6933093:~ dmj$ ssh -l <NIM username> edison.nersc.gov
```

← Prompt on local system

```
*****
*
*          NOTICE TO USERS
*          -----
*
* Lawrence Berkeley National Laboratory operates this
* computer system under contract to the U.S. Department of
* Energy. This computer system is the property of the United
* States Government and is for authorized use only. *Users
* (authorized or unauthorized) have no explicit or implicit
* expectation of privacy.*
*
* Any or all uses of this system and all files on this system
* may be intercepted, monitored, recorded, copied, audited,
* inspected, and disclosed to site, Department of Energy, and
* law enforcement personnel, as well as authorized officials
* of other agencies, both domestic and foreign. *By using
* this system, the user consents to such interception,
* monitoring, recording, copying, auditing, inspection, and
* disclosure at the discretion of authorized site or
* Department of Energy personnel.*
*
* *Unauthorized or improper use of this system may result in
* administrative disciplinary action and civil and criminal
* penalties. _By continuing to use this system you indicate
* your awareness of and consent to these terms and conditions
* of use. LOG OFF IMMEDIATELY if you do not agree to the
* conditions stated in this warning._*
*
*****
```

← Notification of acceptable use.

```
Password: <enter your NIM password here>
```

← Password prompt

Password: <enter your NIM password here>
Last login: Fri Feb 26 07:09:53 2016 from 128.3.135.9

Password prompt



----- Contact Information -----

NERSC Contacts <http://www.nersc.gov/about/contact-us/>
NERSC Status <http://www.nersc.gov/users/live-status/>
NERSC: 800-66-NERSC (USA) 510-486-8600 (outside continental USA)

----- Current Status as of 2016-03-11 10:39 PST -----

Compute Resources:

Cori: Available.
Edison: Available.
Genepool: Available.
PDSF: Available.

Global Filesystems:

DNA: Available.
Global Common: Available.
Global Homes: Available.
Project: Available.
ProjectA: Available.
ProjectB: Available.

Mass Storage Systems:

HPSS Backup: Available.
HPSS User: Available.

----- Service Status as of 2016-03-11 10:39 PST -----

All services are available.

----- Planned Outages -----

NIM: 03/15/16 9:00-9:30 PDT, Scheduled maintenance.
 Users may experience brief disruption at this time.

Edison: 03/16/16 8:00-21:00 PDT, Scheduled maintenance.

Oracle Databases: 03/17/16 7:00-21:00 PDT, scheduled maintenance.
 Oracle Databases will not be accessible while they are being
 relocated from OSF to CRT. The systems affected are:
 gpodb07.nersc.gov, gpodb08.nersc.gov, gpodb11.nersc.gov,
 gpodb13.nersc.gov. Production Informatics and IMG will also be
 impacted.

Science Gateways Services: 03/24/16 8:00-17:00 PDT, Scheduled maintenance.
 Science Gateways will not be accessible while they are being
 relocated from OSF to CRT.

----- Past Outages -----

No Outages in Last 24 Hours

For past outages, see: <http://my.nersc.gov/outage1og-cs.php>

MOTD: Message of the Day

NERSC will post

- system-status messages
- Upcoming maintenance
- Past outages

Make sure to look at the MOTD to see if something is going on or will happen which may affect your plans

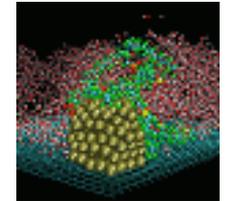
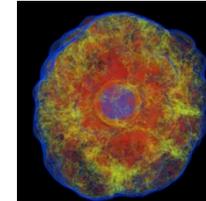
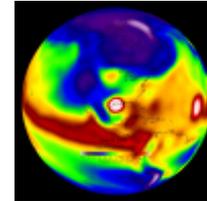
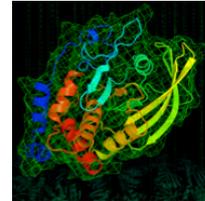
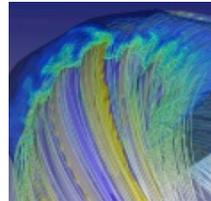
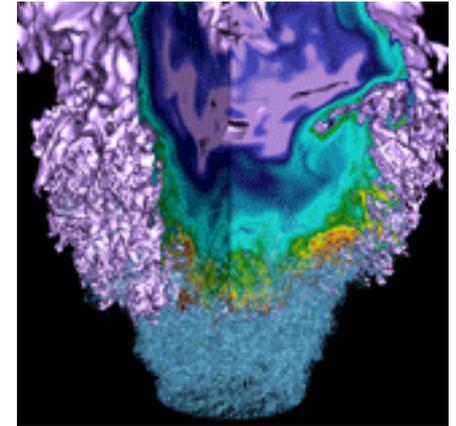
<NIM Username>@edison06:~>

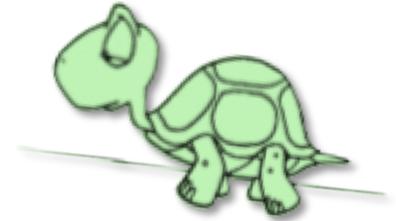
Prompt at NERSC



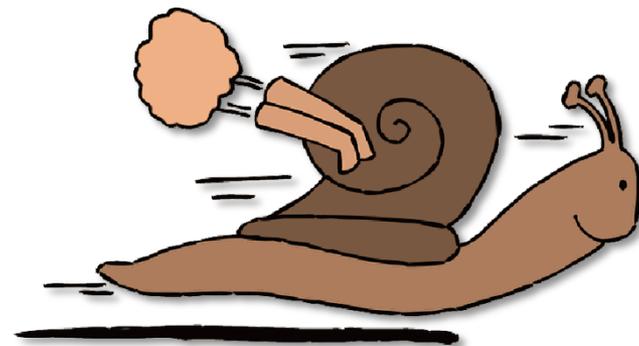
- **Some NERSC systems won't give you unlimited time on the login nodes**
 - After 48 hours idle, Edison & Cori login nodes will terminate your session
 - PDSF and Genepool session are unlimited

NX@NERSC – Accelerated X





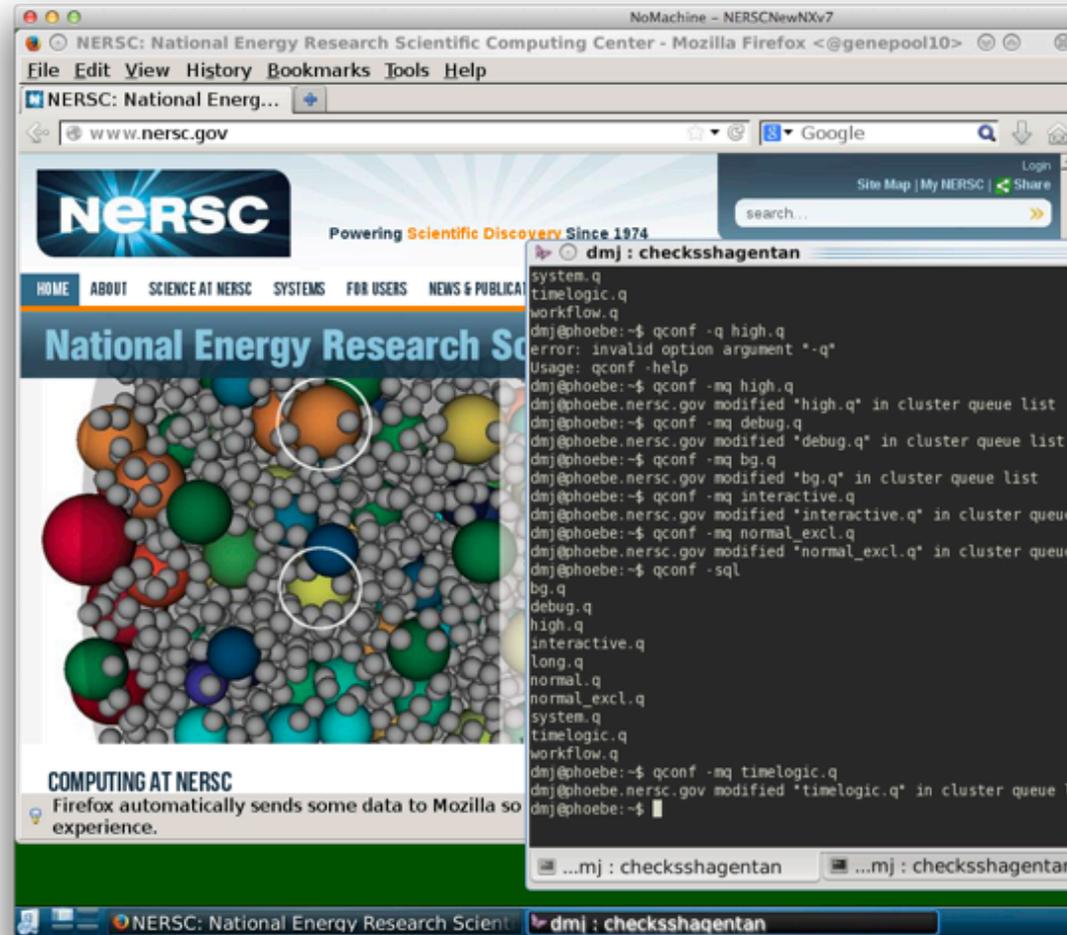
- **Slow Speeds:** X-Windows is slow over network. Remote windows from emacs can take minutes to open
- **Solution:** NX Buffers/Compresses X messages, giving much better X experience



Reasons for NX



- **Long Lasting Desktop:** NX gives you a desktop, so you can connect to NERSC resources (such as edison) and start your GUI applications.





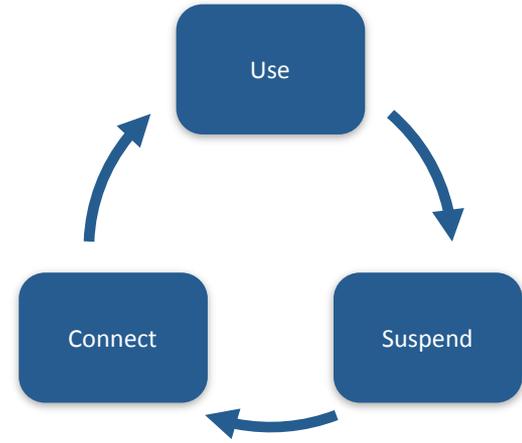
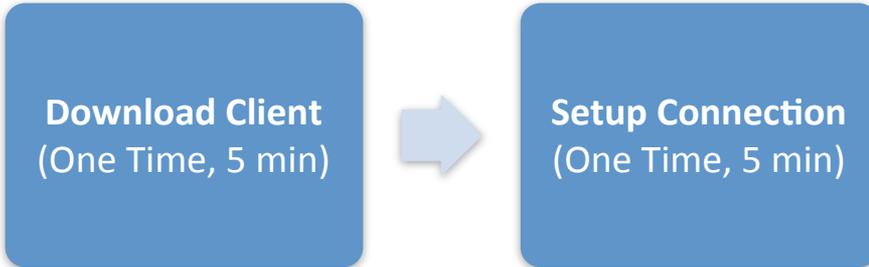
- **Lost Connections:** If I lose internet connection, I might lose all running processes.
- **Solution:** NX provides sessions. You can suspend the session without terminating the running processes.
 - And get back to the same point when reconnected, *even from a different location or computer.*

What you need for NX



- **Any Desktop/Laptop**
 - Windows/Linux/Mac
- **NX Client Software (Free)**

- **10 Minute Start-up Guide**



Documentation:

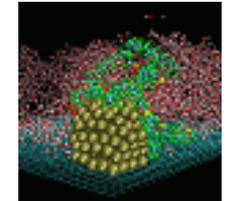
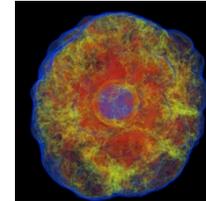
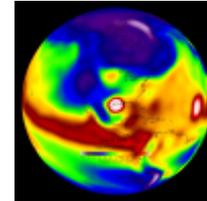
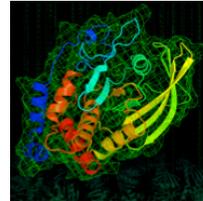
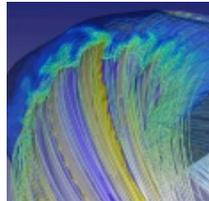
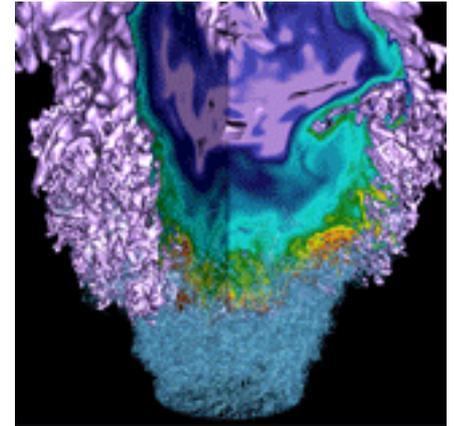
Go to www.nersc.gov, search for “NX”





National Energy Research Scientific Computing Center

X-forwarding through SSH



X-forwarding



- Allows you to access Visualization programs remotely at NERSC

Example:

```
localhost% ssh -l elvis -Y hopper.nersc.gov
```

```
...  
e/elvis> module load vmd  
e/elvis> vmd  
<vmd starts up>
```

NERSC Recommends using NX
instead of X-forwarding.

Next section!

