Connecting to NERSC

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Outline: Connecting to NERSC

- **ssh – the Secure Shell**
  - The *lingua franca* of contacting NERSC

- **ssh with X-forwarding (Graphical User Interface)**

- **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:
  – edison.nersc.gov
  – hopper.nersc.gov
  – carver.nersc.gov
  – genepool.nersc.gov
  – pdsf.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](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> hopper.nersc.gov

*******************************************************************************
*                                                                             *
*                                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._*                                        *
*******************************************************************************

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

Last login: Mon Aug 5 10:56:43 2013 from 128.55.19.61

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 2013-09-09 14:35 PDT

Compute Resources:
Carver: Available.
Dirac: Available.
Edison: Available.
   Notes: (09/09/13 14:35 PDT) - Edison is reserved for dedicated science runs on 9/12 Thursday 18:00 PDT - 9/13 Friday 6:00 PDT.
GenePool: Available.
Hopper: Available.
   Notes: (09/09/13 8:51 PDT) - /scratch access issues are affecting some batch jobs. Engineers are investigating.
PDSF: Available.

Global Filesystems:
Global Homes: Available.
Global Scratch: Available.
Project: Available.
ProjectB: Available.

Mass Storage Systems:
HPSS Backup: Available.
HPSS User: Available.

Service Status as of 2013-09-09 14:35 PDT

All services are available.

Planned Outages

HPSS User: 09/11/13 9:00-13:00 PDT, Scheduled maintenance.
Data Transfer Nodes: 09/18/13 8:00-16:00 PDT, Scheduled maintenance.
   Maintenance on DTN01 thru DTN04.
Service: 09/22/13 22:00-09/23/13 2:00 PDT, Scheduled maintenance.
   The NERSC production instance of Service Now (Ticket System) will be down for an upgrade.

Past Outages

Carver/Dirac: 09/09/13 13:00-13:11 PDT, System in degraded mode.
   Restarted Moab.

For past outages, see: https://www.nersc.gov/users/live-status/outage-log/

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R@hopper12:~>
Login Node Auto-Logout

• Some NERSC Systems won’t give you unlimited time on the login nodes
  – After 8 hours idle, hopper login nodes will terminate your session
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!
NX@NERSC – Accelerated X
Reasons for NX

Desktop:

• **The Pain:** I’m used to starting my workflow on my windows machine and let it run for a week, where is my desktop now?

• **Solution:** NX gives you a desktop, so you can connect to NERSC resources (such as hopper or carver) and start your GUI applications.
Reasons for NX

Sessions:

• **The Pain:** 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.*
Reasons for NX

Speed:

- **The Pain:** X-Windows is slow over network. Tried starting emacs with a slow network connection? It might take minutes to get the window open.

- **Solution:** NX Buffers/Compresses X messages, giving much better X experience
What you need for NX

• Any Desktop/Laptop
  – Windows/Linux/Mac

• NX Client Software (Free)
NERSC NX Service

• 10 Minute Start-up Guide

Documentation:
Go to www.nersc.gov, search for “NX”
Hands On Time

- Go to www.nersc.gov, search for “NX”
- Click on “Startup Tutorial”
- Follow the tutorial to connect via NX

- I’m available to answer questions via chat and in person

- Next talk at 11:30am Pacific Time