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](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

******************************************************************************
*                                                                *
*                      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: Fri Feb 26 07:09:53 2016 from 128.3.135.9

-------------------------------- 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/outagelog-cs.php

<<NIM Username>@edison06:-->

Password prompt

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

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
Reasons for NX

• **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.
Reasons for NX

- **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)
NERSC NX Service

• 10 Minute Start-up Guide

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

Map of Current Users
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!