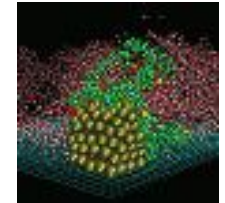
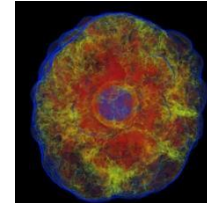
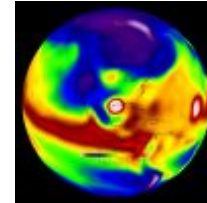
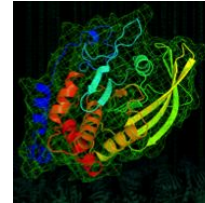
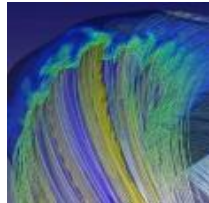
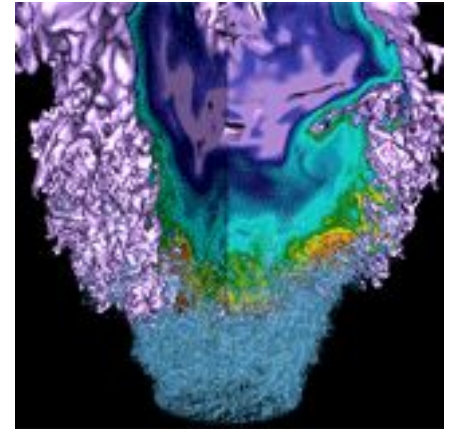


Connecting to NERSC

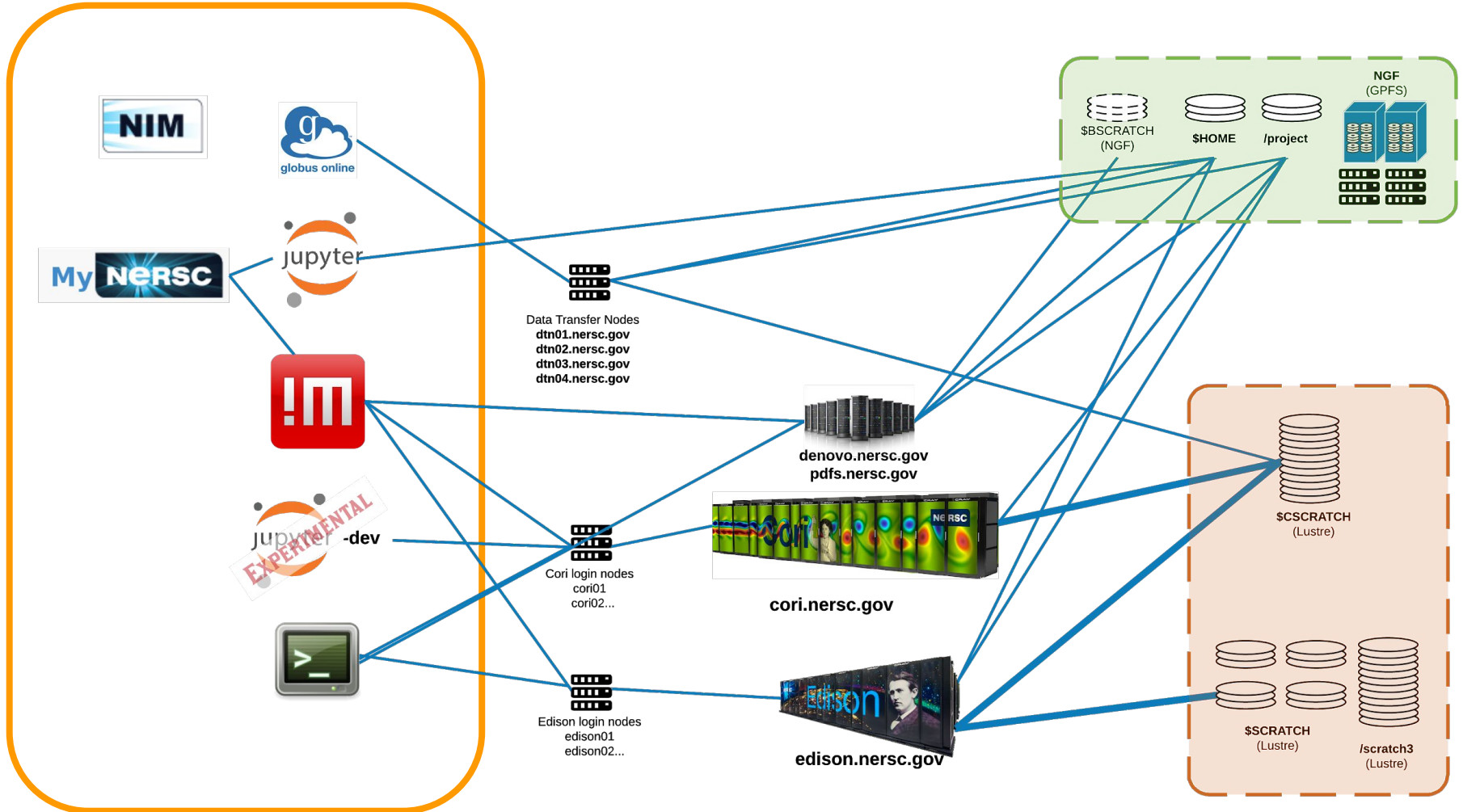


Agenda



1. Options for connecting
2. MFA (Multi-Factor Authentication)
3. Password resets and login failures (NIM)
4. NX
5. SSH

Connecting to NERSC



Agenda



1. Options for connecting
2. **MFA (Multi-Factor Authentication)**
3. Password resets and login failures (NIM)
4. NX
5. SSH

- **Multi-Factor Authentication**

- NIM password + OTP ("One-Time Password")
- OTP obtained via Google Authenticator on your smartphone

<https://play.google.com/store/apps/details?id=com.google.android.apps.authenticator2&hl=en>
<https://itunes.apple.com/us/app/google-authenticator/id388497605?mt=8>

- Alternative/backup option: Authy on desktop

<https://authy.com/>

- Much harder for someone to hack your account

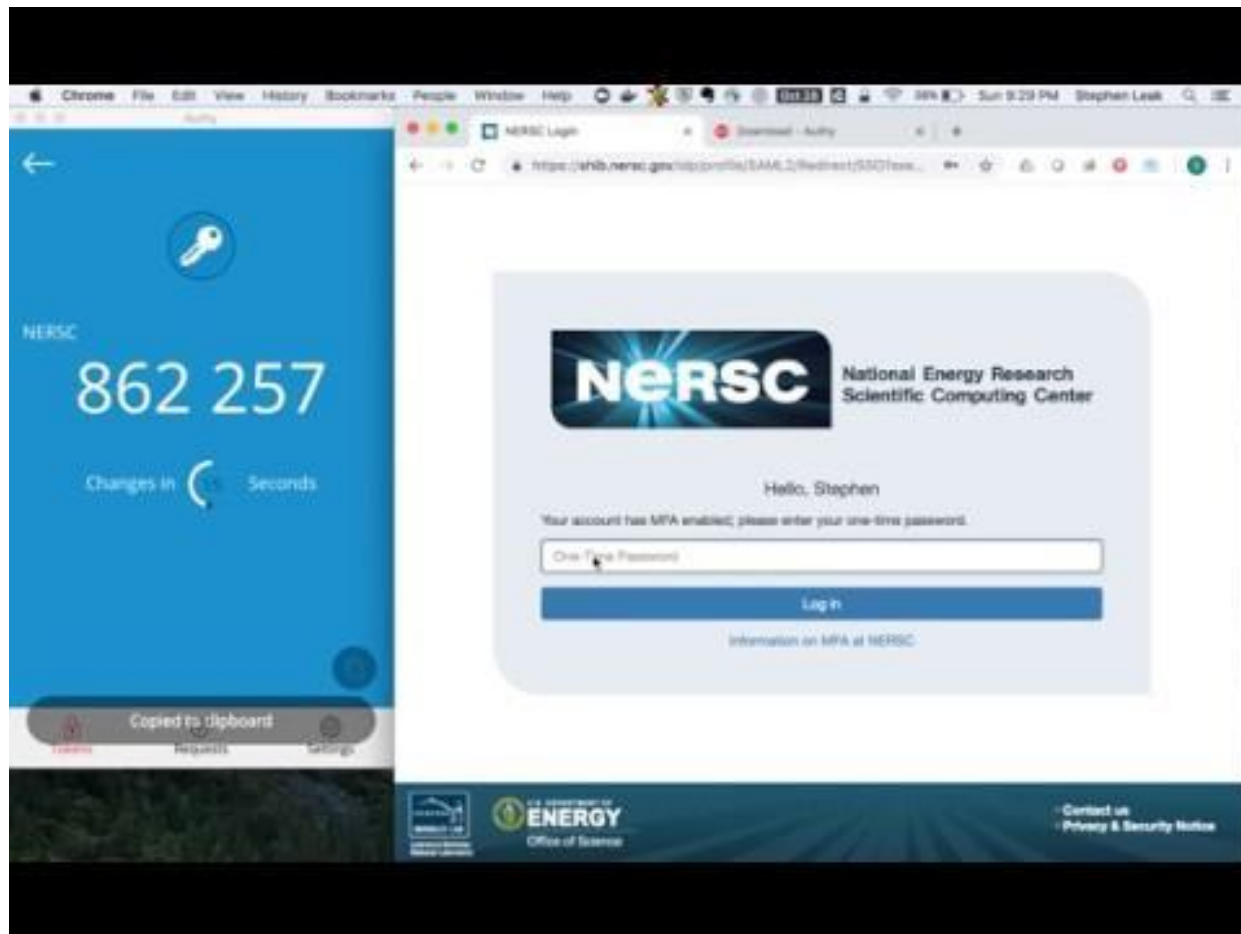
- **Mandatory in 2019**

- except in special circumstances

MFA on NERSC services



Shibboleth (help.nersc.gov, some science gateways)



MFA on NERSC services



Jupyter-dev, RStudio

A screenshot of a web browser showing the JupyterHub login page. The address bar displays "https://jupyter-dev.nersc.gov/hub/login". The page has a "jupyter" header. The main content area features a "Sign in" form with an orange header bar. The form includes fields for "Username:", "Password:", and "MFA [if Enabled]:", each with a corresponding input box. An orange "Sign In" button is located at the bottom of the form.

JupyterHub

https://jupyter-dev.nersc.gov/hub/login

jupyter

Sign in

Username:

Password:

MFA [if Enabled]:

Sign In

A screenshot of a web browser showing the RStudio Sign In page. The address bar displays "https://rstudio.nersc.gov/auth-sign-in". The page has an "RStudio" header. The main content area features a "Sign in to RStudio" form. The form includes fields for "Username:", "Password:", and "MFA Token (testing):", each with a corresponding input box. Below these fields is a notice: "Notice: NERSC will enable MFA on RStudio in the near future." and a checkbox labeled "Stay signed in". A blue "Sign In" button is located at the bottom of the form.

RStudio Sign In

https://rstudio.nersc.gov/auth-sign-in

RStudio

Sign in to RStudio

Username:

Password:

MFA Token (testing):

Notice: NERSC will enable MFA on RStudio in the near future.

☐ Stay signed in

Sign In

Agenda

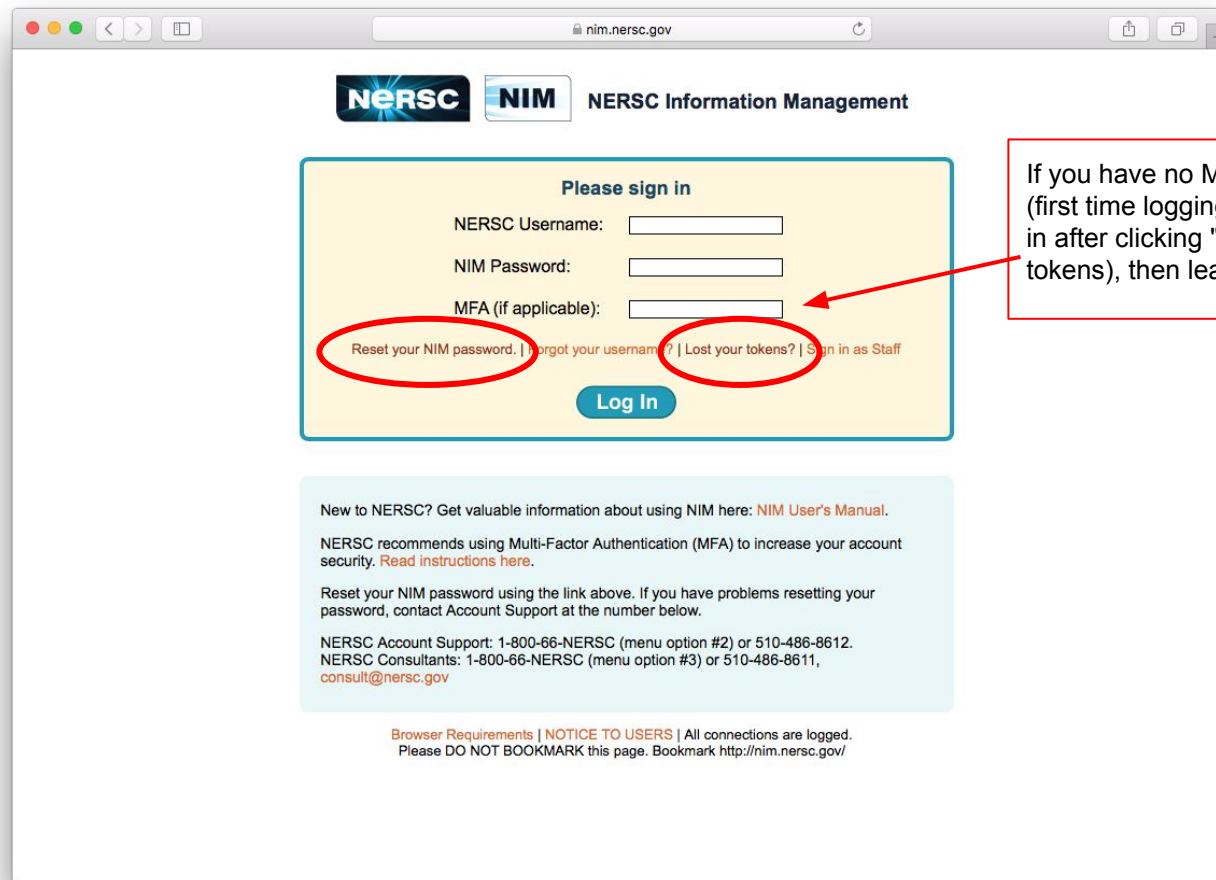


1. Options for connecting
2. MFA (Multi-Factor Authentication)
3. **Password resets and login failures (NIM)**
4. NX
5. SSH

First exercise: NIM



<https://nim.nersc.gov>



The screenshot shows the NIM login page in a web browser. The page has a header with the NERSC and NIM logos and the text "NERSC Information Management". Below the header is a yellow box titled "Please sign in" containing three input fields: "NERSC Username:", "NIM Password:", and "MFA (if applicable):". Below these fields are four links: "Reset your NIM password.", "Forgot your username?", "Lost your tokens?", and "Sign in as Staff". A red circle highlights the "Reset your NIM password." link, and another red circle highlights the "Lost your tokens?" link. A red arrow points from a text box on the right to the "Lost your tokens?" link. Below the yellow box is a blue "Log In" button. Below the "Log In" button is a light blue box containing text about NERSC's security recommendations and contact information. At the bottom of the page, there is a footer with links to "Browser Requirements", "NOTICE TO USERS", and a disclaimer about connections being logged.

NERSC NIM NERSC Information Management

Please sign in

NERSC Username:

NIM Password:

MFA (if applicable):

[Reset your NIM password.](#) | [Forgot your username?](#) | [Lost your tokens?](#) | [Sign in as Staff](#)

[Log In](#)

New to NERSC? Get valuable information about using NIM here: [NIM User's Manual](#).

NERSC recommends using Multi-Factor Authentication (MFA) to increase your account security. [Read instructions here.](#)

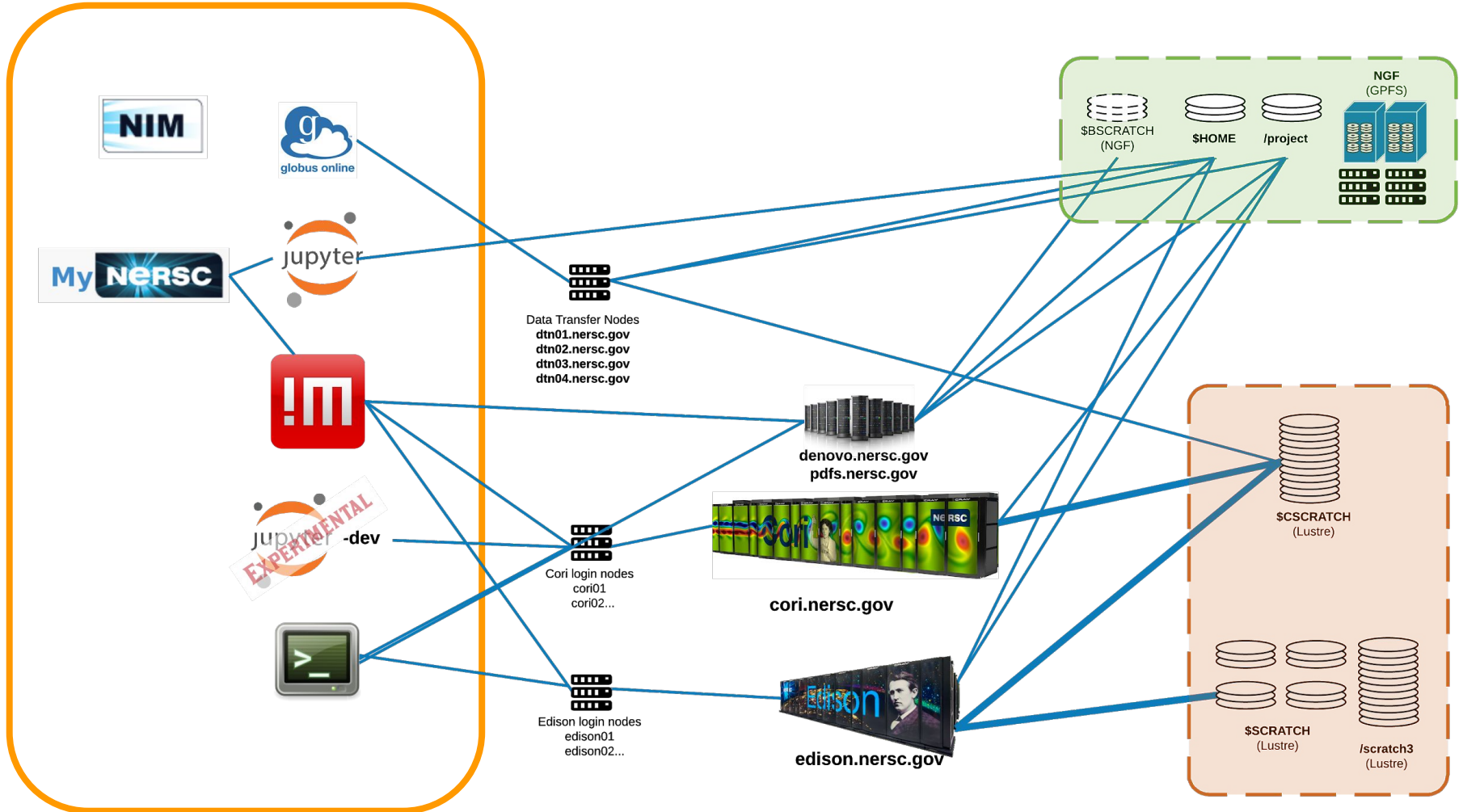
Reset your NIM password using the link above. If you have problems resetting your password, contact Account Support at the number below.

NERSC Account Support: 1-800-66-NERSC (menu option #2) or 510-486-8612.
NERSC Consultants: 1-800-66-NERSC (menu option #3) or 510-486-8611, consult@nersc.gov

[Browser Requirements](#) | [NOTICE TO USERS](#) | All connections are logged.
Please DO NOT BOOKMARK this page. Bookmark <http://nim.nersc.gov/>

If you have no MFA tokens (first time logging in, or logging in after clicking "Lost your tokens"), then leave this empty

Connecting to NERSC



Next exercise: MyNERSC



<https://my.nersc.gov>

MyNERSC

Secure | <https://my.nersc.gov/index.php>

Admin NESAP Monitoring User Docs SCC Interesting NERSC sites Git resources Markup resources Saved State troubleshooting

My NERSC

Sign In

Dashboard

Jobs

Center Status

File Browser

My Tickets

Data Dashboard

NX Desktop

Jupyter Hub

Changelog

NERSC Homepage

Dashboard

My Repo Usage

Please Login

My Personal Disk Usage

Please Login

My Project Disk Usage

Please Login

My Active Jobs

Please Login

System Status

Compute Systems:

Cori Up

Edison Up

Genepool Up

PDSF Up

Global Filesystems:

DNA Up

Global Common Up

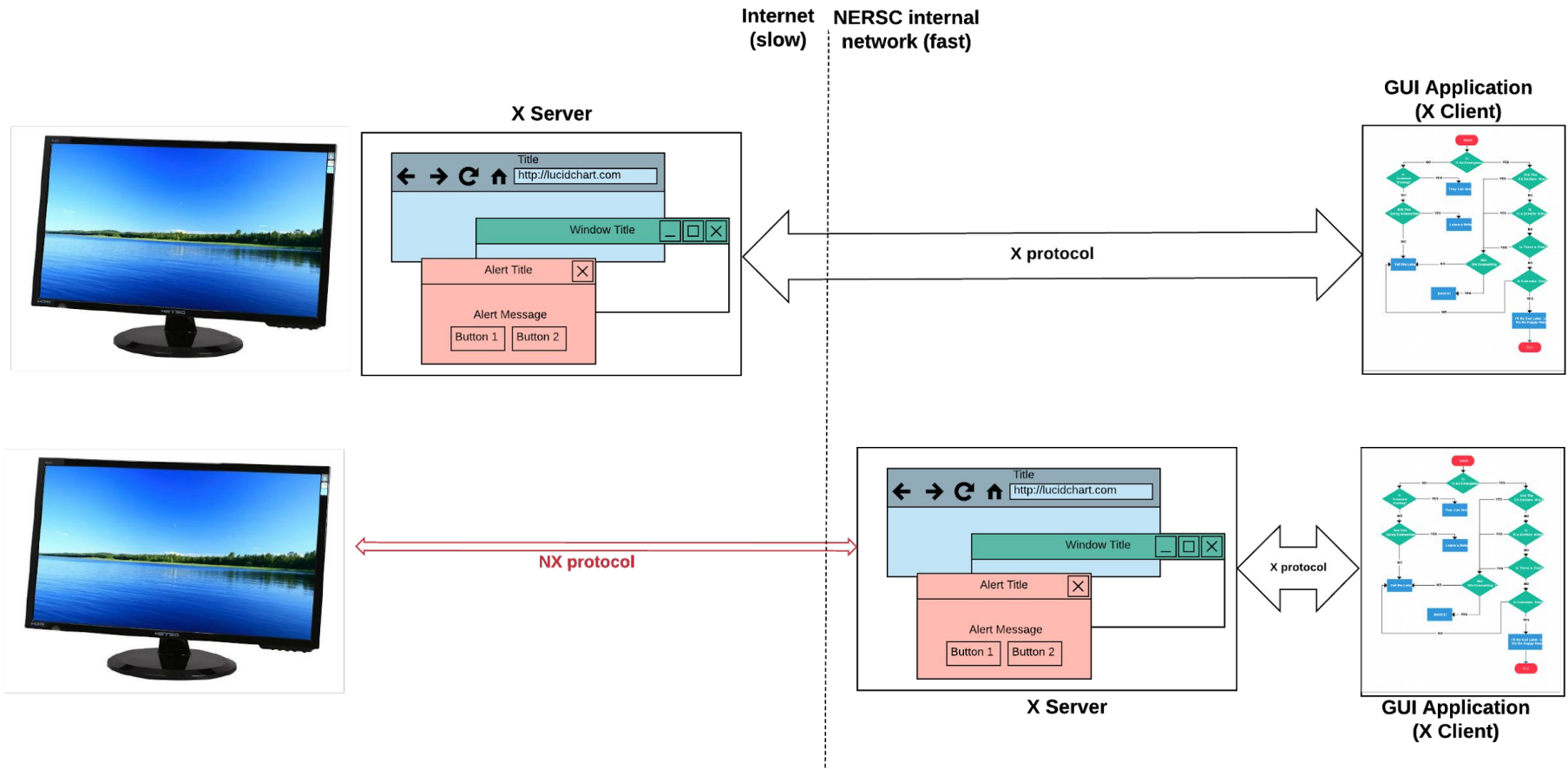
Global Homes Up

Agenda



1. Options for connecting
2. MFA (Multi-Factor Authentication)
3. Password resets and login failures (NIM)
4. **NX**
5. SSH

NX@NERSC - Accelerated X



Reasons for NX (aka NoMachine)



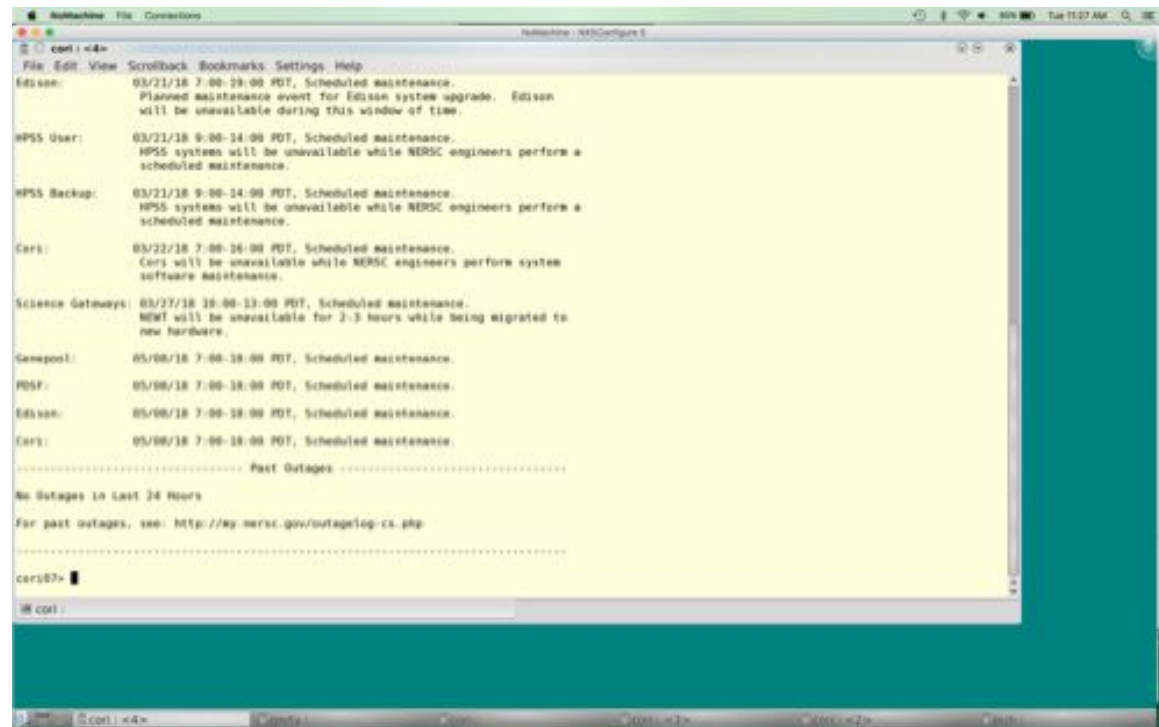
- **Slow Speeds:** X-Windows is slow over network. Remote windows from emacs can take minutes to open
- **Solution:** NX Buffers/Compresses X messages, giving much better X experience

Reasons for NX

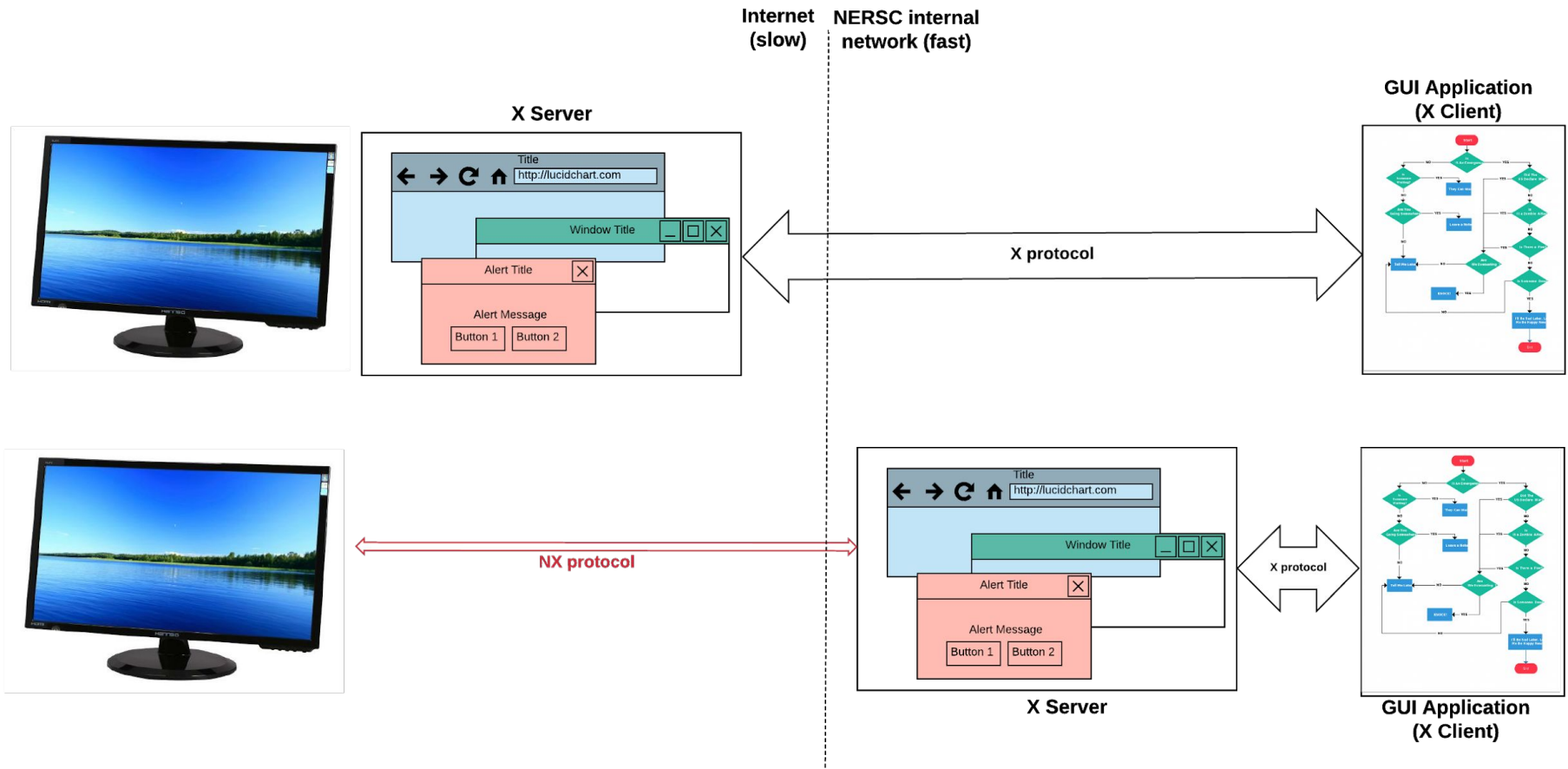


- **Long Lasting Desktop:**

NX gives you a desktop, so you can connect to NERSC resources (such as Edison) and start your GUI applications.



NX@NERSC - Accelerated X



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)**

<http://www.nersc.gov/users/connecting-to-nersc/using-nx/download-tested-nx-player/>

<http://www.nersc.gov/users/connecting-to-nersc/using-nx/nxconfig-2/>

- Search for "NX" on www.nersc.gov or docs.nersc.gov

The screenshot shows the NERSC website with the search bar highlighted by a red circle and a red arrow pointing to it. The search results for "NX" are displayed, showing the "NX / NoMachine" page. The page content includes a description of the NX Client software and a "Table of contents" section with links to "Benefits", "Speed", "Session", "Desktop", "Installing", and "Download latest NX Client". The "Download latest NX Client" link is also highlighted by a red circle and a red arrow. The page footer includes the U.S. Department of Energy logo and the Office of Science logo.

NERSC Documentation (beta)

Search

GitLab/NERSC/docs

NERSC Documentation (beta)

NX / NoMachine

Site Map | My NERSC | Login | Share

NX

program that handles remote X Window System connections
additional X forwarding.

Table of contents

- Benefits
- Speed
- Session
- Desktop
- Installing
- Download latest NX Client
- Windows XP/Windows 7/Windows 8 (Download)

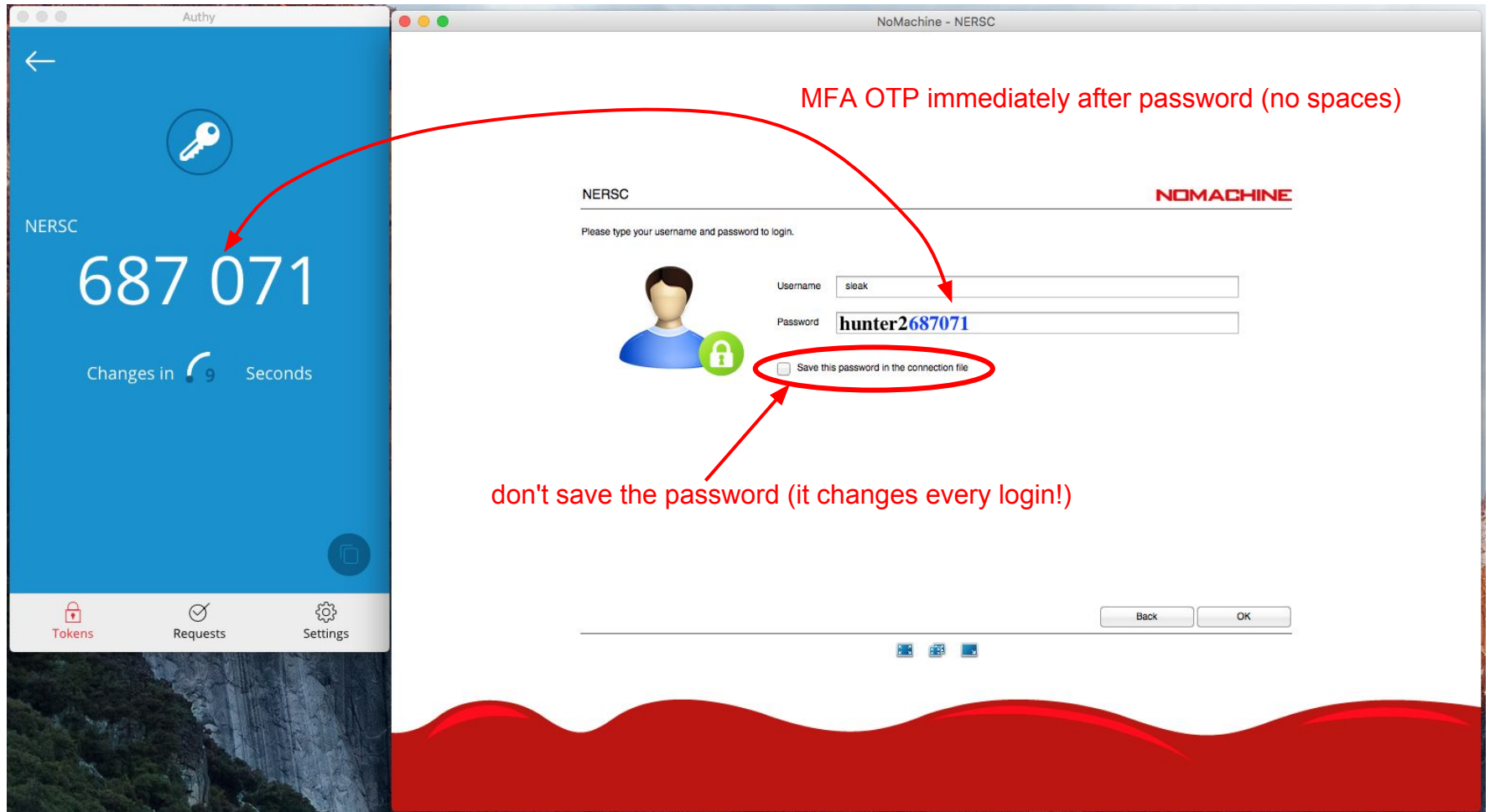
HOME ABOUT SCIENCE AT NERSC SYSTEMS FOR USERS NEWS & PUBLICATIONS R & D EVENTS LIVE STATUS TIMELINE

National Energy Research Scientific Computing Center

U.S. DEPARTMENT OF ENERGY Office of Science



Login to NX



Agenda



1. Options for connecting
2. MFA (Multi-Factor Authentication)
3. Password resets and login failures (NIM)
4. NX
5. **SSH**

- All NERSC computational systems are accessible via `ssh`
- **First:** you need a terminal program on your desktop/laptop
 - Mac: "terminal" (built-in) or "iTerm2"
(<https://www.iterm2.com/>)
 - Windows: PuTTY (or XWin32 or Git BASH)
(<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>)
 - Linux: Your own favorite :)
- If you will use X-forwarding (coming up) (**Note:** NX is better!) then you also need an X server
 - Mac: XQuartz (<https://www.xquartz.org/>)
 - Windows: Cygwin/X (<http://x.cygwin.com/>)
 - Linux: built in

Example Session (terminal only)



```
4. ssh
22:13 sleak@macbook:~ $ ssh -l sleak cori.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 + OTP: █
```

Prompt on local system

Notification of acceptable use.

Password prompt
Type password
then OTP (nothing
between) then hit
enter

NERSC Message of the Day



- After you type the password and logged in to a system, you will see NERSC MOTD before your session prompt appears

Last login: Wed Feb 22 16:07:29 2017 from 198.128.212.1

----- 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 2017-02-22 14:35 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 2017-02-22 14:35 PST -----

All services are available.

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

Cori: 02/28/17 6:00-03/01/17 6:00 PST, Scheduled maintenance.
Cori will be degraded due to cabinet additions. Datawarp nodes
will be reduced during this time.

Cori: 03/01/17 6:00-03/03/17 17:00 PST, Scheduled maintenance.
Cori will be down for adding cabinets and HSN (high-speed
network) maintenance. Logins will not be available.

Data Transfer Nodes: 03/01/17 9:00-12:00 PST, Scheduled maintenance.

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

Cori: 02/21/17 8:00-21:15 PST, Scheduled maintenance.
Cori will be unavailable while updates are applied. Logins will
be available, however no jobs will run.

Cori: 02/21/17 21:15-22:15 PST, System in degraded mode.
The majority of the system's compute nodes are currently
unavailable. Engineers are investigating the issue

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

Example with X-forwarding



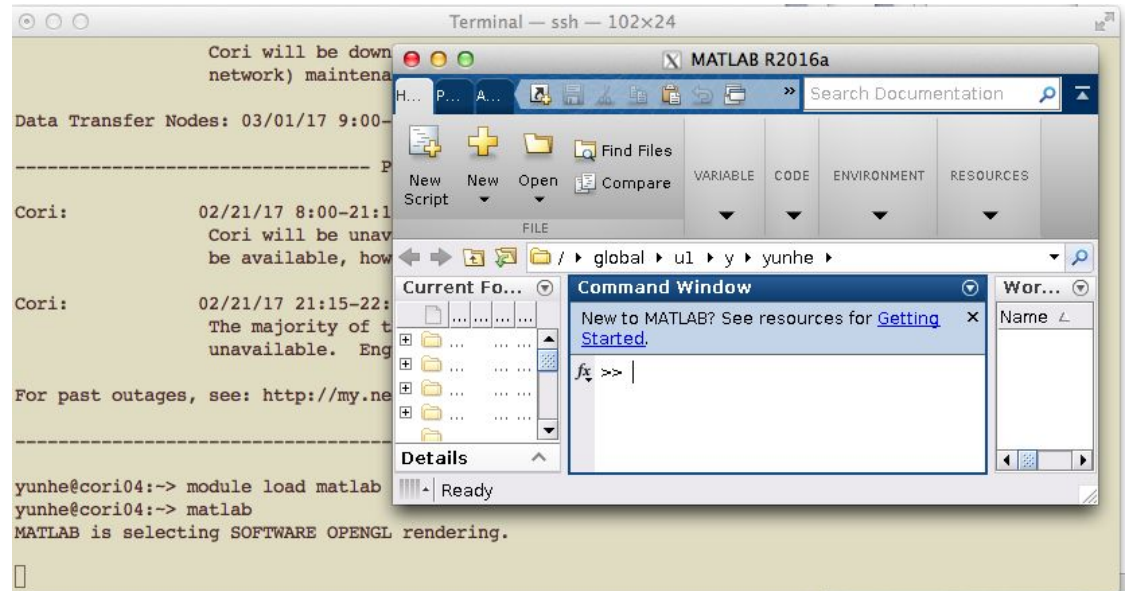
- Allows you to access Visualization programs remotely at NERSC

Example:

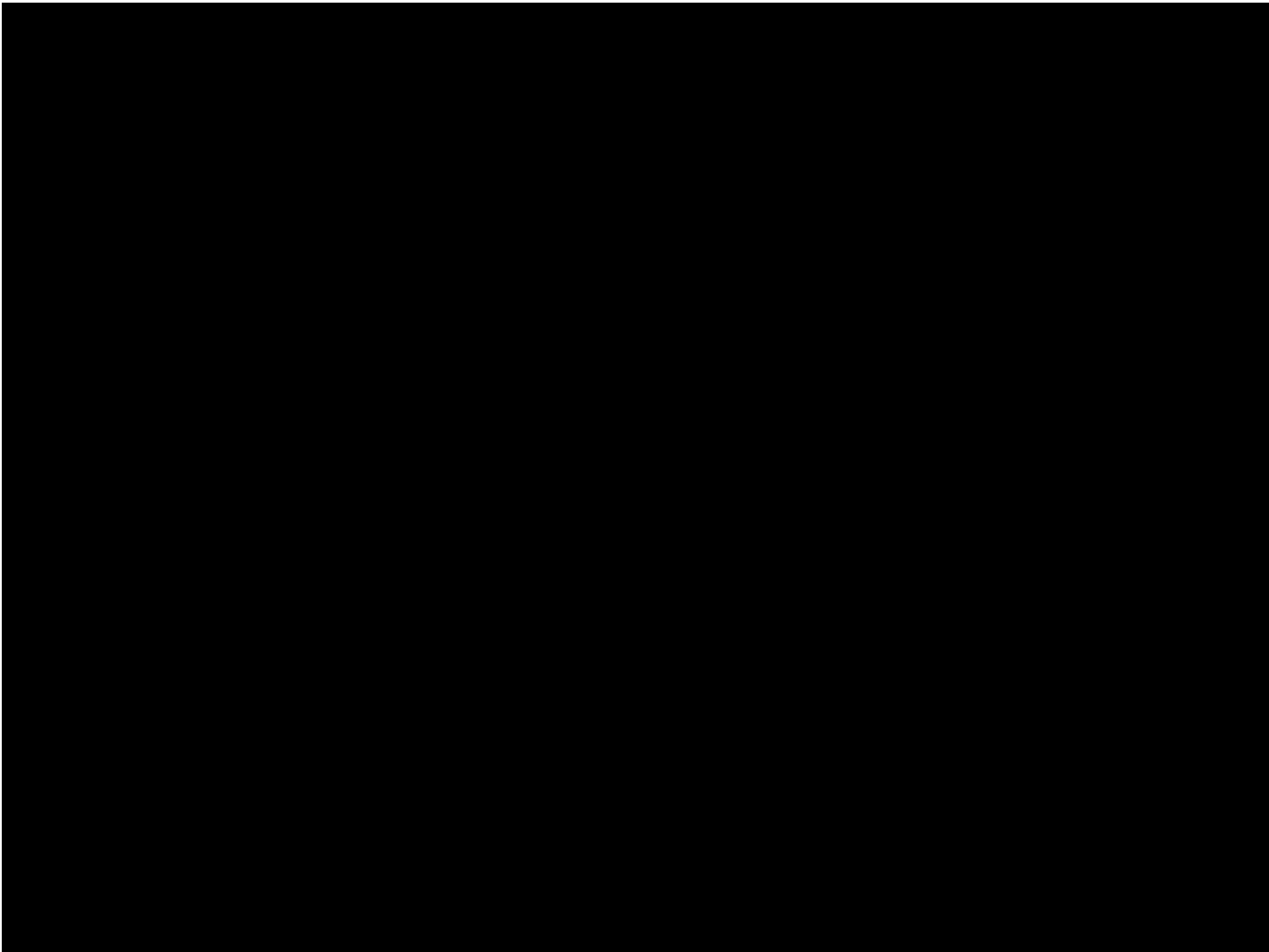
```
localhost% ssh -l elvis -Y cori.nersc.gov
```

```
...  
e/elvis> module load matlab  
e/elvis> matlab  
<MATLAB starts up>
```

**NERSC Recommends using NX
instead of X-forwarding (faster,
more reliable)**



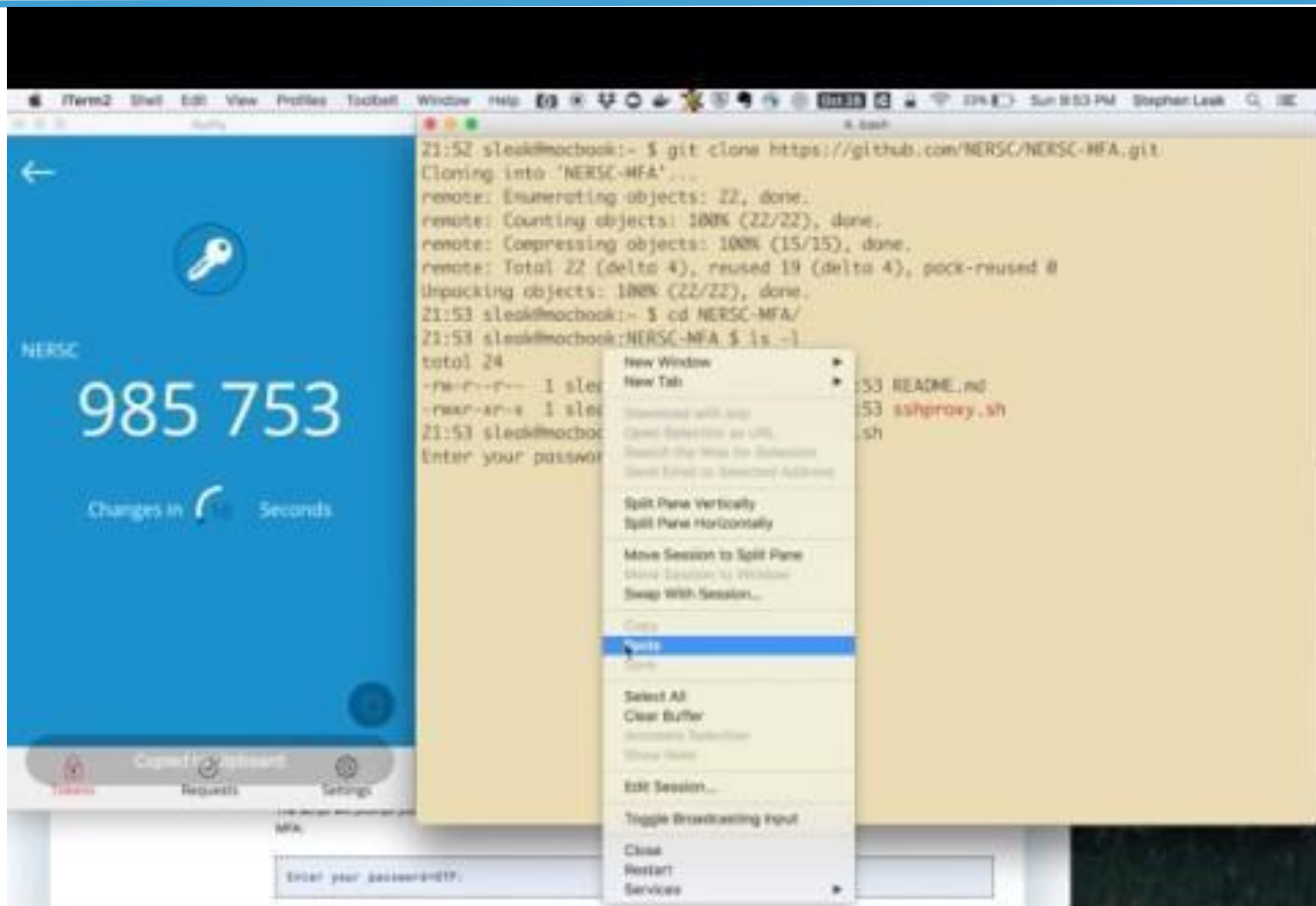
Logging in with MFA



- Tired of repeatedly typing password + OTP?
- sshproxy creates a short-term (24 hours) certificate
- Run sshproxy.sh once, then you can ssh to NERSC systems for the next 24 hours before being asked for password+OTP again

sshproxy.sh

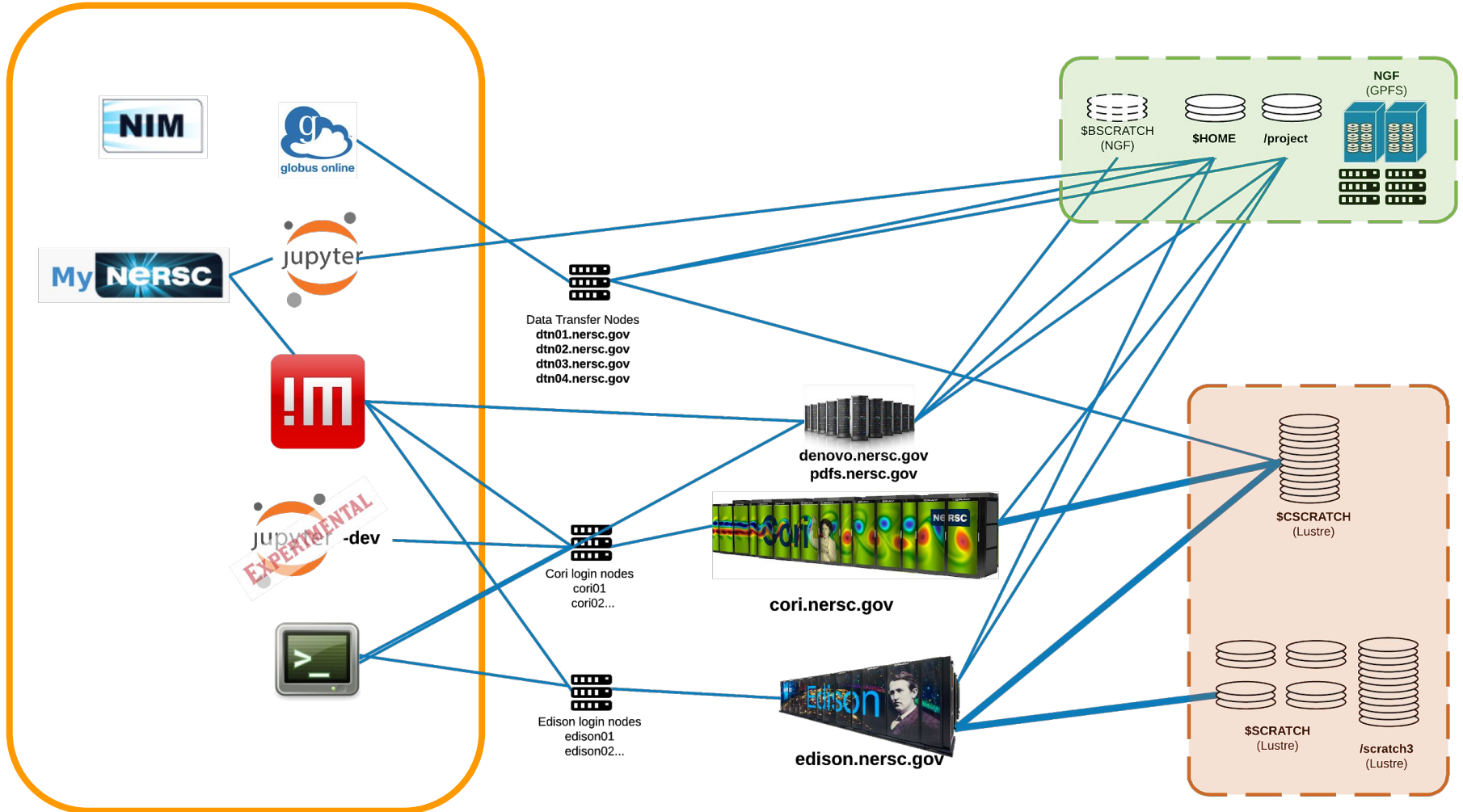
NERSC



```
21:52 sleeklaptopbook:~ $ git clone https://github.com/NERSC/NERSC-MFA.git
Cloning into 'NERSC-MFA'...
remote: Enumerating objects: 22, done.
remote: Counting objects: 100% (22/22), done.
remote: Compressing objects: 100% (15/15), done.
remote: Total 22 (delta 4), reused 19 (delta 4), pack-reused 0
Unpacking objects: 100% (22/22), done.
21:53 sleeklaptopbook:~ $ cd NERSC-MFA/
21:53 sleeklaptopbook:NERSC-MFA $ ls -l
total 24
-rw-r--r--  1 sleeklaptopbook  12K  21:52 README.md
-rw-r--r--  1 sleeklaptopbook  12K  21:52 sshproxy.sh
21:53 sleeklaptopbook:NERSC-MFA $
```

The screenshot shows an iTerm2 terminal window with a menu open over the output. The menu options include: New Window, New Tab, Download with curl, Open Session as URL, Search the Web for Selection, Save Email to Selected Address, Split Pane Vertically, Split Pane Horizontally, Move Session to Split Pane, Move Session to Window, Swap With Session..., Copy, Paste, Select All, Clear Buffer, Increase Font Size, Show Menu, Edit Session..., Toggle Broadcasting Input, Close, Restart, and Services.

Connecting to NERSC



NeRSC

Thank you.

Example with MFA



- Detailed help:

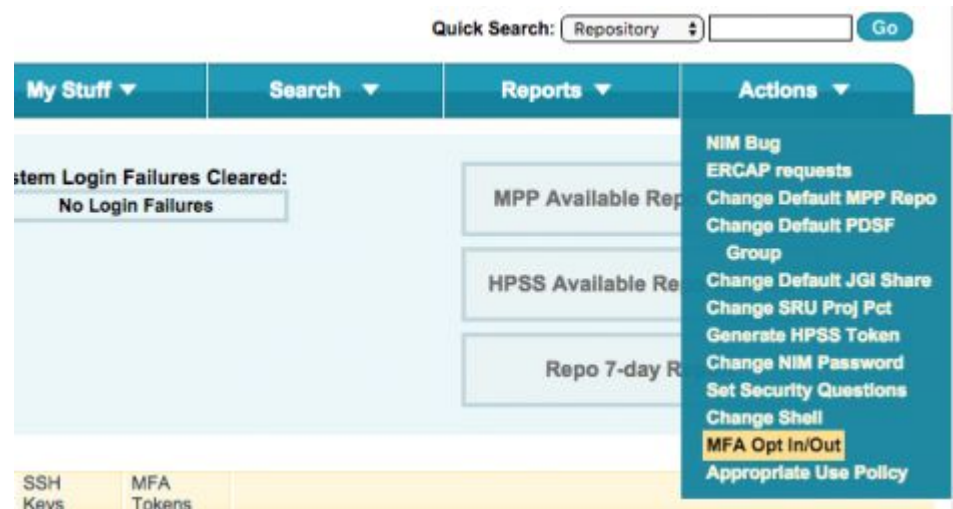
- <http://www.nersc.gov/users/connecting-to-nersc/mfa/>

1. Install Google Authenticator (on phone)

<https://play.google.com/store/apps/details?id=com.google.android.apps.authenticator2&hl=en>

<https://itunes.apple.com/us/app/google-authenticator/id388497605?mt=8>

2. Enable in NIM



- | User | Serial Id | Token Description | Fail |
|-------------------------|-----------|-------------------|------|
| Add Token | | Delete All | |
| Select User | wyang | | |
| Enter Token Description | my phone | | |
| Submit | | | |

User	Serial Id	Token Description	Fail
wyng	TOTP22856A68	my phone	0

OATH Soft Token

OTP seed

QR-Code for installing the OATH compatible Soft Tokens (FreeOTP, Google Authenticator and other apps using the 'otpauth://' syntax).

This will be the only time you will be able to scan this code into your Google Authenticator (or similar app), or use the URL string below.

For other apps that require manual configuration, choose the "OTP seed" tab above.



otp://NERSC-wywang-TOTP22856A68?
WS3MEWJGV14YL3NMZ6TL6HULS42L
TOTP22856A68



U.S. DEPARTMENT OF
ENERGY

Office of
Science

MFA Advanced setup



- You can set "ControlMaster" in your `.ssh/config` file to multiplex SSH connections, saving you from re-typing your password+OTP
 - See <http://www.nersc.gov/users/connecting-to-nersc/mfa/#toc-anchor-5>

SSH Keys



- If you are not using MFA, you can reduce the number of times you type a password by creating an SSH key pair, and saving the public key in NIM
 - Note: please always set a passphrase on your SSH key!
(No unencrypted keys)

Logout | Change My Password

Quick Search: Repository Go

NERSC NIM NIM Home My Stuff Search Reports Actions

Welcome to the NERSC Information Management (NIM) system. Use this interface to find information about NERSC users and repositories. Authorized managers can also modify information and create or review allocation requests. Staff-only options are in **gold**.

Last NIM login on 03/06/2018 13:57:07
Your password will expire on 07/01/2018

NERSC System Status: **MOTD**

System Login Failures Cleared:
No Login Failures

MPP Available Repo Balance

HPSS Available Repo Balance

Repo 7-day Report

Account Usage Logins by Host Unix Groups Roles Contact Info Grid Certificates **SSH Keys** MFA Tokens

SSH Public Keys

Username	SSH Public Key	Enabled
☐ sleek	ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCAm4ts31RK0xg7s3K+ng9XOaxperpHCluo1xax3GCJp/67/4aWw 6yC-CF-F... bXg Ccf /1hK RV2... Q/63oW5oZGmMin6KQrM990/jyU9jyw+Q8bChXE47mSvin/KI68gSNs5Q8PD1xKrioG94AbxMBLvcMzH0I	☒ Update Key

- **Instructions for SSH-agent and SSH keys:**

<http://www.nersc.gov/users/connecting-to-nersc/connecting-with-ssh/>

(Note that most of this happens on your workstation!)