# Connecting to NERSC

# Agenda

1. **Options for connecting**

2. **MFA (Multi-Factor Authentication)**

3. **Password resets and login failures (NIM)**

4. **NX**

5. **SSH**

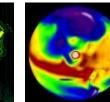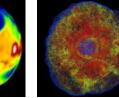# Connecting to NERSC

# Agenda
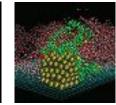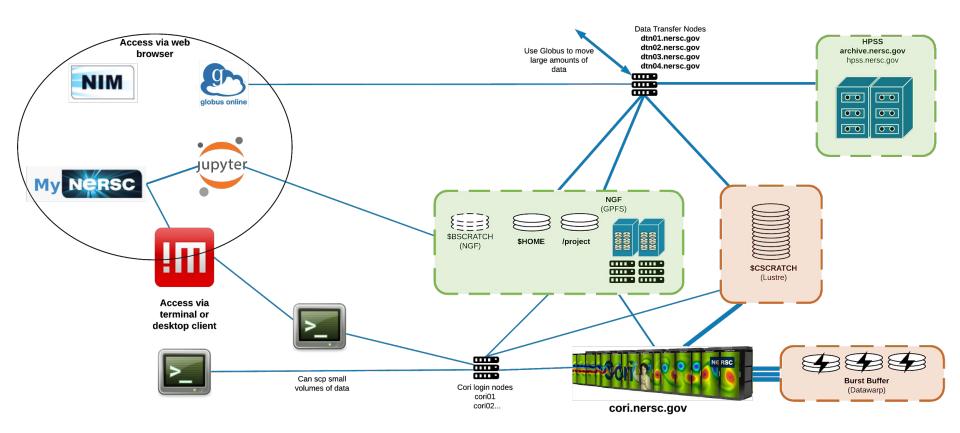
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# MFA

- **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/

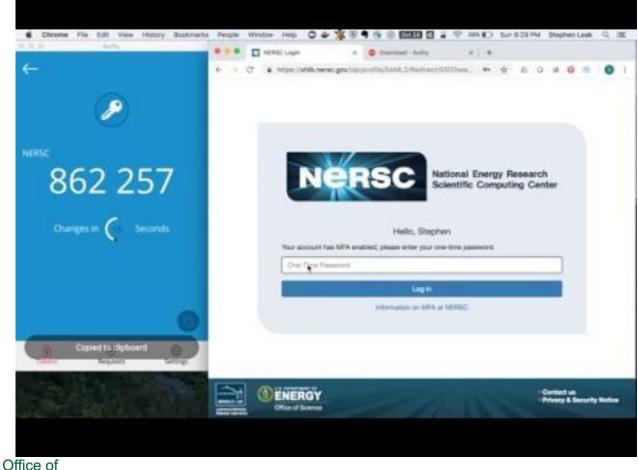  - Much harder for someone to hack your account

- **Mandatory**
  - except in special circumstances

# MFA on NERSC services

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

# MFA on NERSC services

## Jupyter-dev, RStudio

# MFA on NERSC services

- **MyNERSC**
  - similar to Jupyter, Rstudio


- **SSH, NX, etc:**
  - details below …

# 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

# Connecting to NERSC

# Next exercise: MyNERSC

## https://my.nersc.gov

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1. **Options for connecting**

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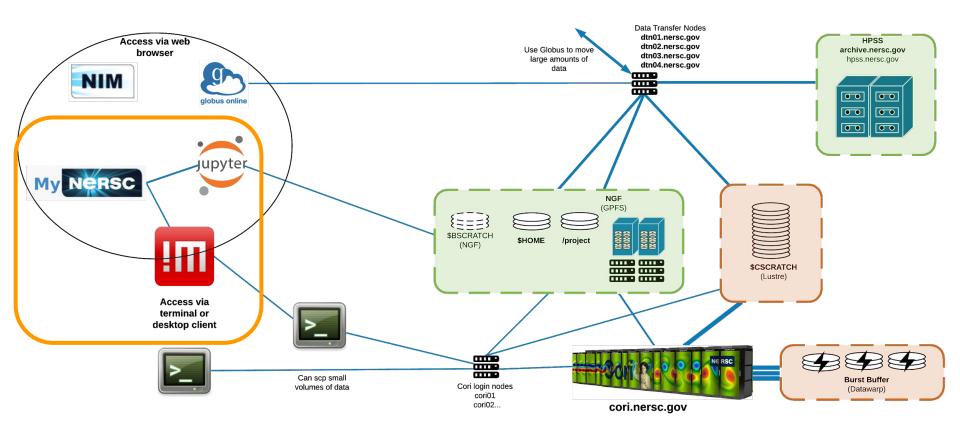3. **Password resets and login failures (NIM)**

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5. **SSH**

# NX@NERSC - Accelerated X

# Reasons for NX (aka NoMachine)
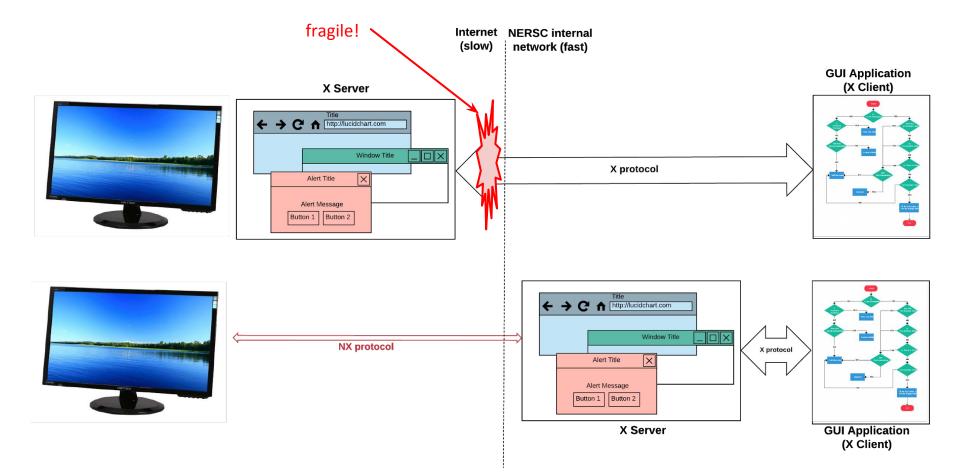
- **Slow Speeds:** X-Windows is slow over network. Remote windows from emacs can take minutes to open

- **Solution:** NX Buffers/Compresses X messages, giving much better X experience

# NX@NERSC - Accelerated X

# Reasons for NX

- **Long Lasting Desktop:**
  NX gives you a
  desktop, so you
  can connect to
  NERSC resources
  (eg, cori)
  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
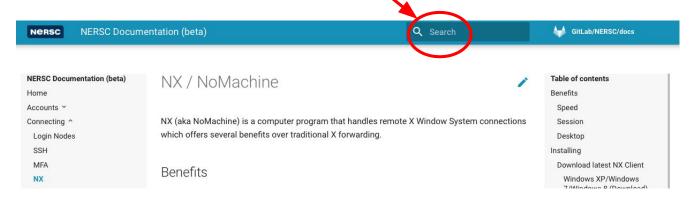
- **Any desktop/laptop**
  - Windows/Linux/Mac
- **NX Client software (free)**

  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/
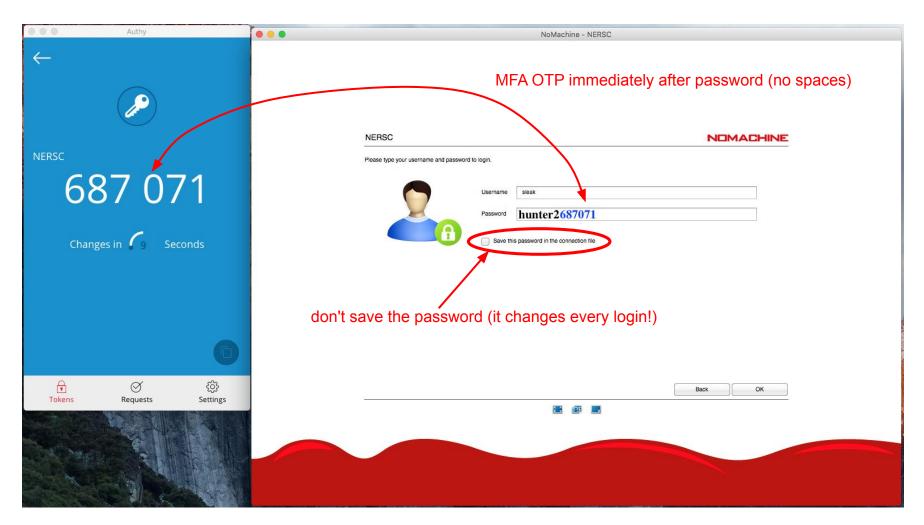
- **Search for "NX" on docs.nersc.gov**

# Login to NX



MFA OTP immediately after password (no spaces)

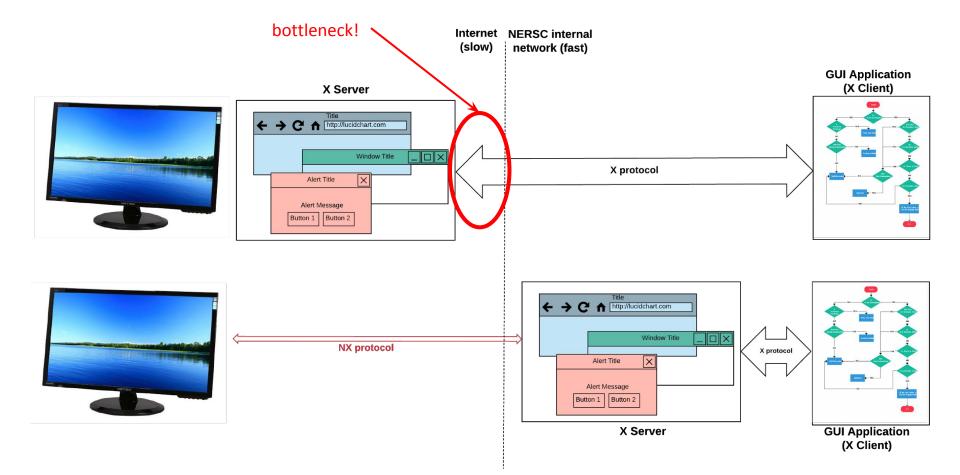don't save the password (it changes every login!)

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# 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)



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
---------------------------------------------------------------------------
```
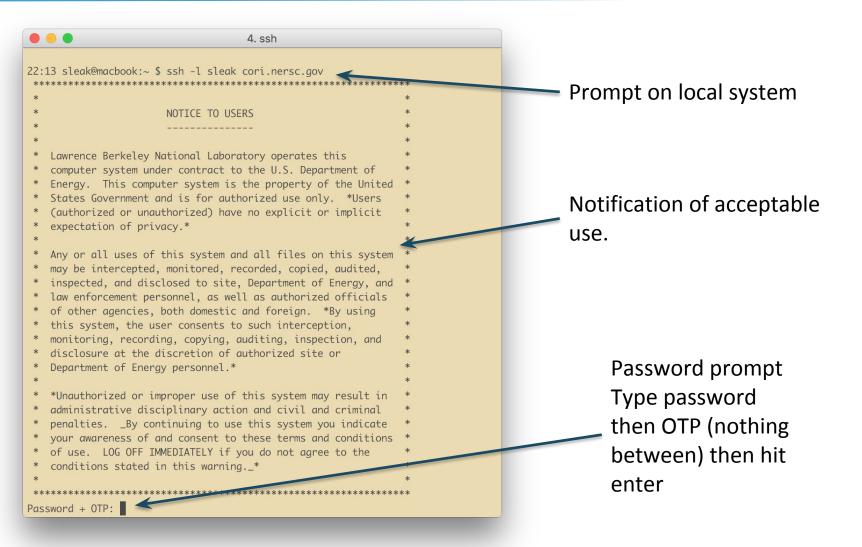
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# Example with X-forwarding

- **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)**
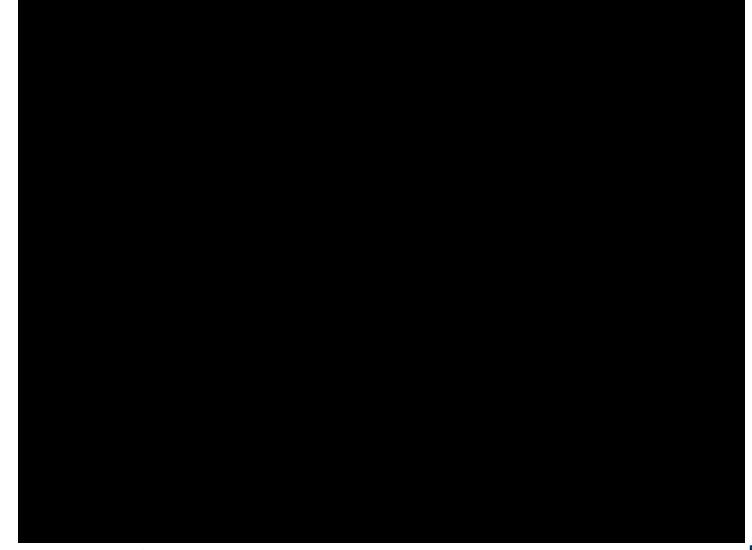
# Logging in with MFA

# sshproxy.sh

- **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**
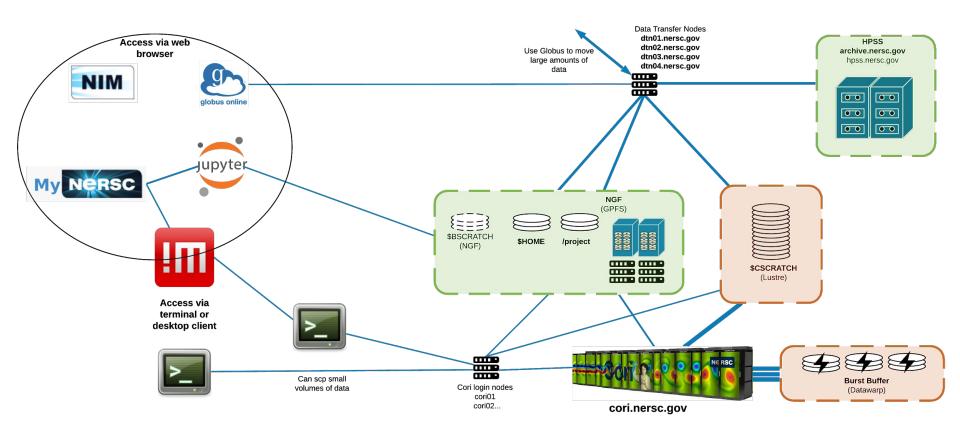
# sshproxy.sh

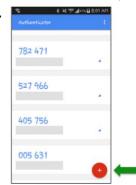# Connecting to NERSC

**Thank you.**

# Setting up MFA

1. **Install Google Authenticator (on phone)**
2. **Enrol OTP Token**
   - from "MFA Tokens" tab in NIM, hit "Add Token"
   - Give it a name, hit "Submit" then scan the QR code with Google Authenticator

3. **Login**
   - Use your NIM password followed by the numbers provided by Google Authenticator

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

In the above example ("my phone"), the user is trying to generate a token that will be used with the Google Authenticator on a phone. If you have more than one token from different devices, you can add a proper description for each token for your reference.

Click the '**Submit**' button. Then, the webpage will display a token and a QR code that is to be scanned into your device. Note the token ID (TOTP22856A68 in the following example).

| User | Serial Id | Token Description | Fails |
|------|-----------|-------------------|-------|
| wyang | TOTP22856A68 | my phone | 0 |
| | Add Token | Delete All | |

**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.

otpauth://totp/NERSC-wyang-TOTP22856A68?
secret=KCTIWS3MEWJGVI4YL3NMZ6TL6HULS42L
TOTP22856A68

Authenticator

782 471

527 966

405 756

005 631

```
$ ssh cori.nersc.gov
*****************************************************************
*                                                              *
*                    NOTICE TO USERS                           *
*                    ---------------                           *
...
Password + OTP:
```