

Running Applications on the Hoffman2 Cluster: An Introduction

Doing research on the Hoffman2 cluster

Raffaella D'Auria, PhD

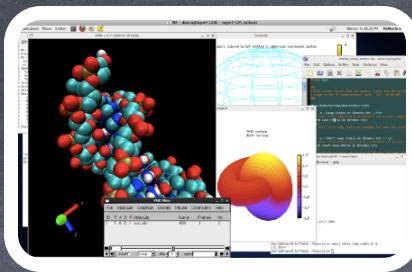
Learning outcomes:

- ▷ what is the Hoffman2 cluster
- ▷ getting an account on Hoffman2
- ▷ connecting to the Hoffman2 cluster w/ X11-forwarding enabled (from different OSs)
- ▷ copying your data to and from Hoffman2
- ▷ unix command line survival quick & dirty guide
- ▷ getting an interactive session
- ▷ how to find out what applications are on Hoffman2?
- ▷ loading/unloading applications in your environment
- ▷ install/compile your application
- ▷ run a batch job

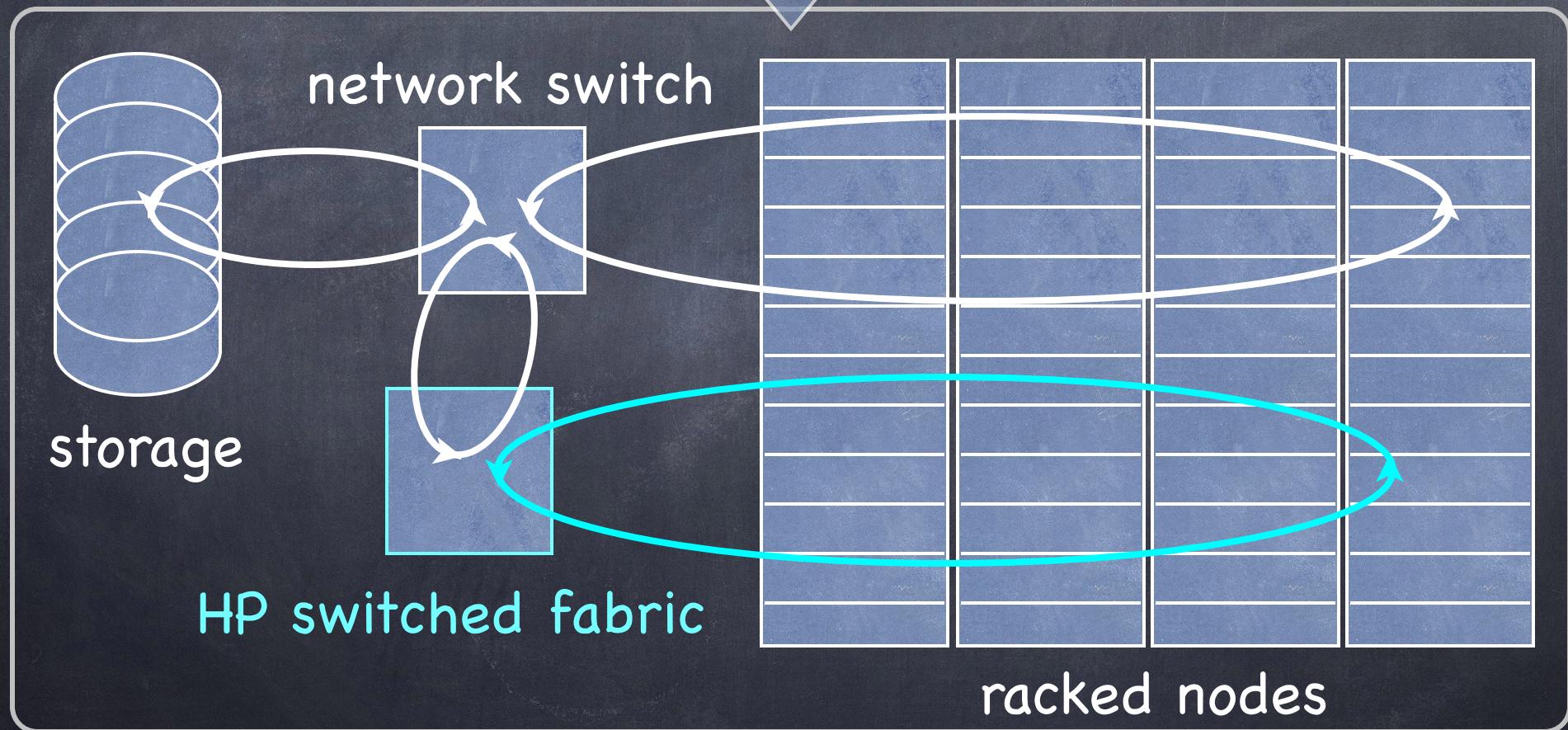


The Hoffman2 cluster

User running
applications



Hoffman2 cluster



https://www.hoffman2.idre.ucla.edu

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UCLA
Hoffman2 Cluster User Guide

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You are here: Home

Home

Welcome to the Hoffman2 Cluster User Guide. To look up usage information, click on one of the navigation tabs above or the sidebar items on the left.

Recent Announcements

Free Classes IDRE Research Technology Group is pleased to present Fall Quarter classes. There is no charge or fee to attend these classes. See [IDRE Fall 2017 HPC Classes](#)

Stata 15 A new version of Stata has been installed. See [Stata 15 available](#) for further information.

About

User Support

FAQ

Getting started

News

Security policy

Status

How to acknowledge the Hoffman2 cluster program

How to use this site

The screenshot shows a web browser window displaying the "Getting Started" page of the UCLA Hoffman2 Cluster User Guide. The URL in the address bar is <https://www.hoffman2.idre.ucla.edu/getting-started/>. A green oval highlights the URL bar. The page features the IDRE logo and the UCLA logo. A search bar at the top right contains the placeholder text "Search this website". Below the header, there is a navigation menu with tabs: ACCESS, COMPUTING, DATA STORAGE, FILE TRANSFER, and SOFTWARE. The COMPUTING tab is currently selected. On the left side, there is a sidebar with links: About, User Support, FAQ, Getting started (which is highlighted with a green oval), News, Security policy, Status, How to acknowledge the Hoffman2 cluster program, and How to use this site. The main content area displays the "Getting Started" section, which includes a "Contents [hide]" link and four links: New User Registration, Your account on a cluster hosted by IDRE, Your Grid account, and Faculty Sponsor information. Below this, a paragraph explains account eligibility and links to the Security Policy page. At the bottom of the page, there is another link to New User Registration.

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https://www.hoffman2.idre.ucla.edu/getting-started/

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Hoffman2 Cluster User Guide

Search this website

ACCESS COMPUTING DATA STORAGE FILE TRANSFER SOFTWARE

About

User Support

FAQ

Getting started

News

Security policy

Status

How to acknowledge the Hoffman2 cluster program

How to use this site

You are here: Home / Getting Started

Getting Started

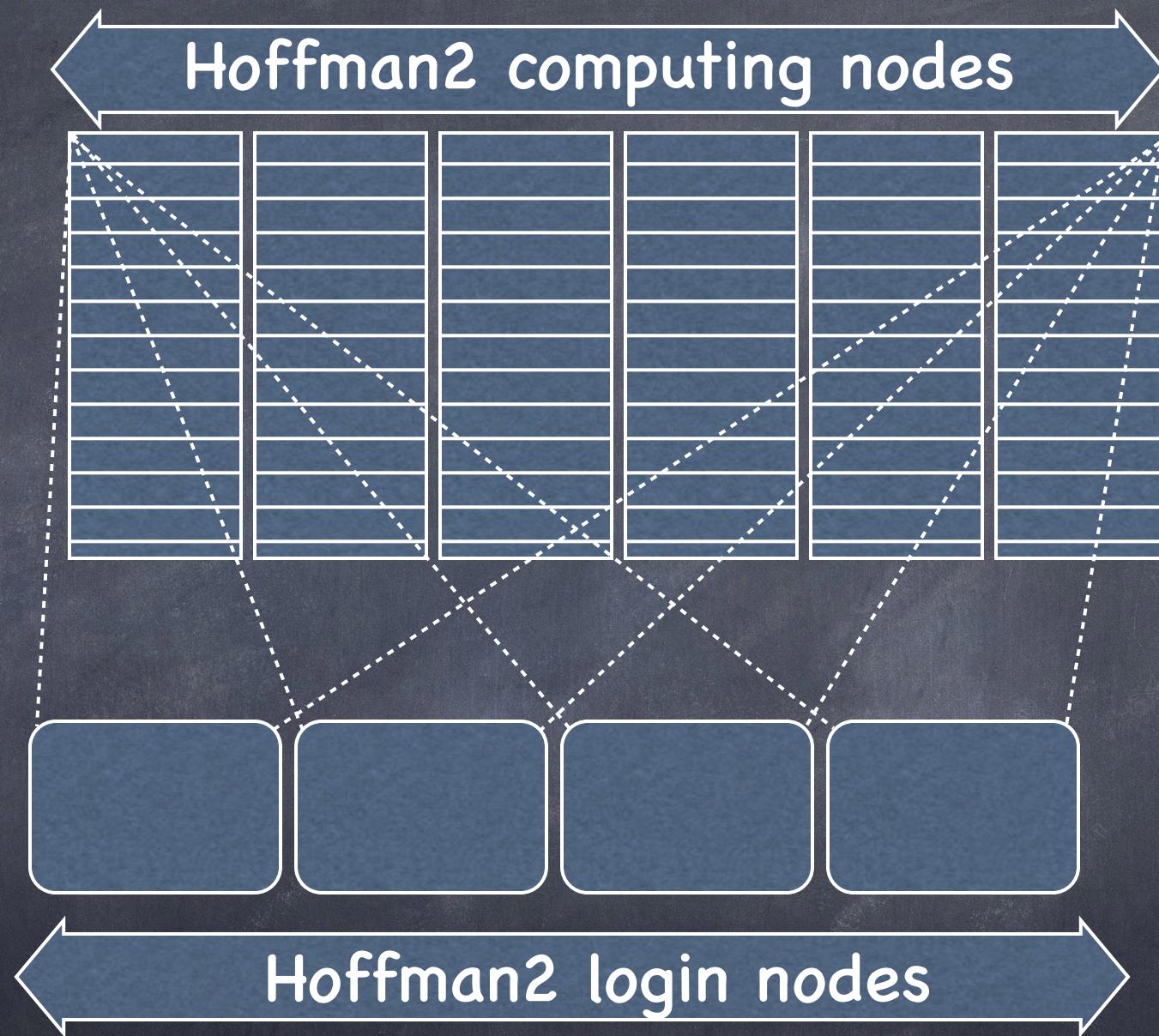
Contents [hide]

New User Registration <- Click here to apply for an account on a cluster hosted by IDRE.
Your account on a cluster hosted by IDRE
Your Grid account
Faculty Sponsor information

Who is eligible for an account on a cluster hosted by IDRE? Find out on the [Security Policy](#) page. All accounts on any cluster hosted by IDRE are governed by the Security Policy. Read it.

- [New User Registration](#)
- [Your account on a cluster hosted by IDRE](#)
- [Your Grid account](#)
- [Faculty Sponsor information](#)

[New User Registration](#) <- Click here to apply for an account on a cluster hosted by IDRE.



https://www.hoffman2.idre.ucla.edu/access/

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UCLA Hoffman2 Cluster User Guide

Search this website ...

ACCESS COMPUTING DATA STORAGE FILE TRANSFER SOFTWARE

About ↗
User Support
FAQ
Getting started
News
Security policy
Status
How to acknowledge the Hoffman2 cluster program
How to use this site

You are here: Home / Accessing the Hoffman2 Cluster

Accessing the Hoffman2 Cluster

Contents [hide]

Using SSH
[Linux and Mac](#) (circled)
Windows
Opening GUI Applications
Connecting via the NX protocol
NoMachine client
X2Go client
Connecting via a Jupyter notebook
Additional Topics

https://www.hoffman2.idre.ucla.edu/access/

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UCLA Hoffman2 Cluster User Guide

Search this website ...

ACCESS COMPUTING DATA STORAGE FILE TRANSFER SOFTWARE

About ↗
User Support
FAQ
Getting started
News
Security policy
Status
How to acknowledge the Hoffman2 cluster program
How to use this site

You are here: Home / Accessing the Hoffman2 Cluster

Accessing the Hoffman2 Cluster

Contents [hide]

- Using SSH
 - Linux and Mac
 - Windows
- Opening GUI Applications
- Connecting via the NX protocol
 - NoMachine client
 - X2Go client
- Connecting via a Jupyter notebook
- Additional Topics

https://www.hoffman2.idre.ucla.edu/access/

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UCLA
Hoffman2 Cluster User Guide

Search this website ...

ACCESS COMPUTING DATA STORAGE FILE TRANSFER SOFTWARE

About ↗
User Support
FAQ
Getting started
News
Security policy
Status
How to acknowledge the Hoffman2 cluster program
How to use this site

You are here: Home / Accessing the Hoffman2 Cluster

Accessing the Hoffman2 Cluster

Contents [hide]

- Using SSH
 - Linux and Mac
 - Windows
- Opening GUI Applications
- Connecting via the NX protocol
 - NoMachine client
 - X2Go client
- Connecting via a Jupyter notebook
- Additional Topics



Search this website ...

Report
Typos
and
Errors

ACCESS

COMPUTING

DATA STORAGE

FILE TRANSFER

SOFTWARE

[About](#)

[User Support](#)

[FAQ](#)

[Getting started](#)

[News](#)

[Security policy](#)

[Status](#)

[How to acknowledge the Hoffman2 cluster program](#)

[How to use this site](#)

You are here: [Home](#) / [Accessing the Hoffman2 Cluster](#) / Setting X11 Forwarding for GUI Applications

Setting X11 Forwarding for GUI Applications

Contents [\[hide\]](#)

[Linux](#)

[Notes for X Window System users](#)

[Mac OS X](#)

[Notes for XQuartz users](#)

[Windows](#)

[Notes for MobaXterm users](#)

[Notes for Xming users](#)

[Notes for Cygwin users](#)

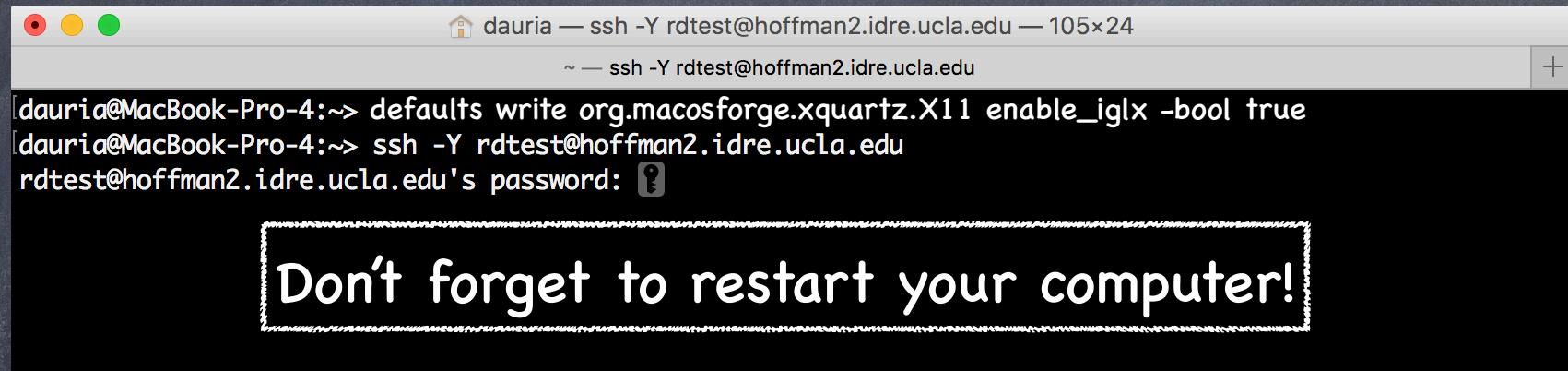
[Connecting via the NX protocol](#)

[NoMachine client](#)

[X2Go client](#)

You can run interactive applications that have Graphical User interfaces (GUI) by connecting to the cluster login node using ssh with X11 Forwarding enabled. Your local machine must be running an X server and enable X11 forwarding in order to display graphical output.

Connecting to the Hoffman2 Cluster from a Unix-like environment (Linux, OSX, MacOS, etc.)



```
dauria — ssh -Y rdtest@hoffman2.idre.ucla.edu — 105x24
~ — ssh -Y rdtest@hoffman2.idre.ucla.edu
[dauria@MacBook-Pro-4:~] defaults write org.macosforge.xquartz.X11 enable_iglx -bool true
[dauria@MacBook-Pro-4:~] ssh -Y rdtest@hoffman2.idre.ucla.edu
rdtest@hoffman2.idre.ucla.edu's password: [REDACTED]

Don't forget to restart your computer!
```

Notes for XQuartz users

Indirect GLX was disabled by default in Xorg 1.17, starting from XQuartz version 2.7.9, to enable indirect GLX and to allow remote visualization on the cluster you will have to issue at the terminal command prompt of your mac:

defaults write org.macosforge.xquartz.X11 enable_iglx -bool true

See [About X11 and OS X Mountain Lion](#) from <http://support.apple.com/kb/HT5293>. For Mac OS X 10.4 (Tiger): X11 should be installed from the OS media and manually started.



Search this website ...

Report
Typos
and
Errors

ACCESS

COMPUTING

DATA STORAGE

FILE TRANSFER

SOFTWARE

About 

User Support

FAQ

Getting started

News

Security policy

Status

How to acknowledge the
Hoffman2 cluster program

How to use this site

You are here: [Home](#) / [Accessing the Hoffman2 Cluster](#) / [Setting X11 Forwarding for GUI Applications](#)

Setting X11 Forwarding for GUI Applications

[Contents](#) [hide]

Linux

[Notes for X Window System users](#)

Mac OS X

[Notes for XQuartz users](#)

Windows

[Notes for MobaXterm users](#)

[Notes for XMing users](#)

[Notes for Cygwin users](#)

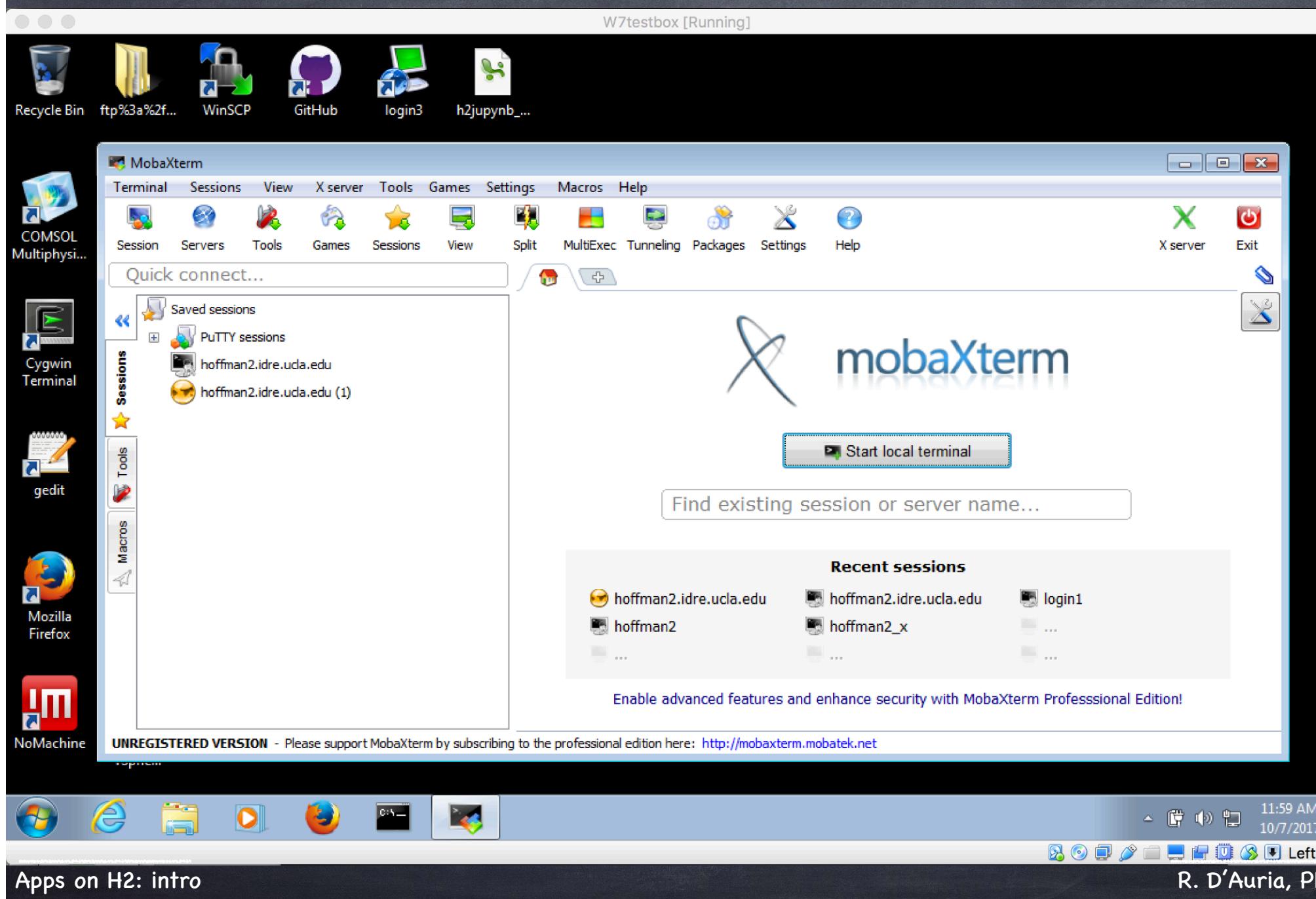
[Connecting via the NX protocol](#)

[NoMachine client](#)

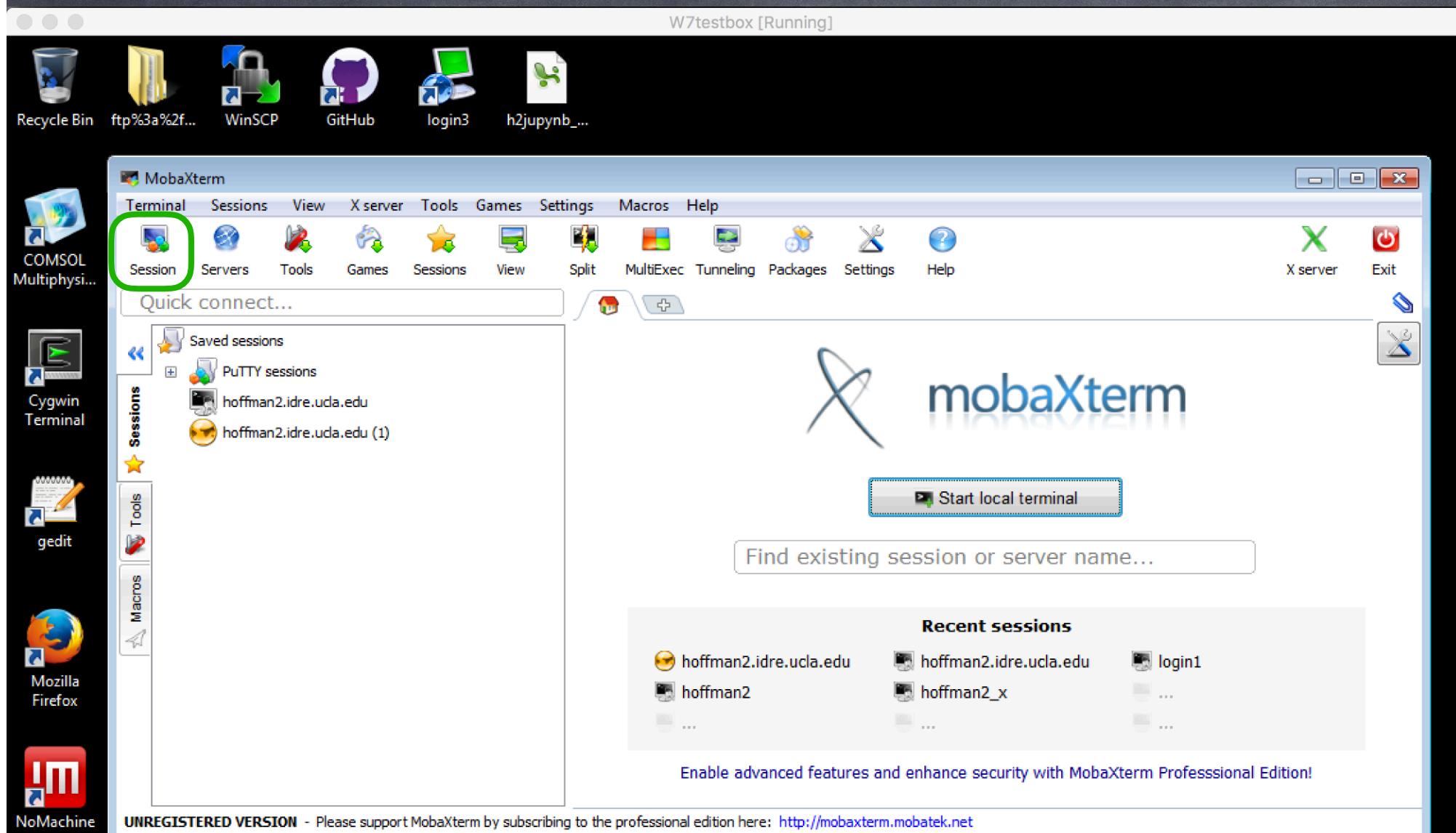
[X2Go client](#)

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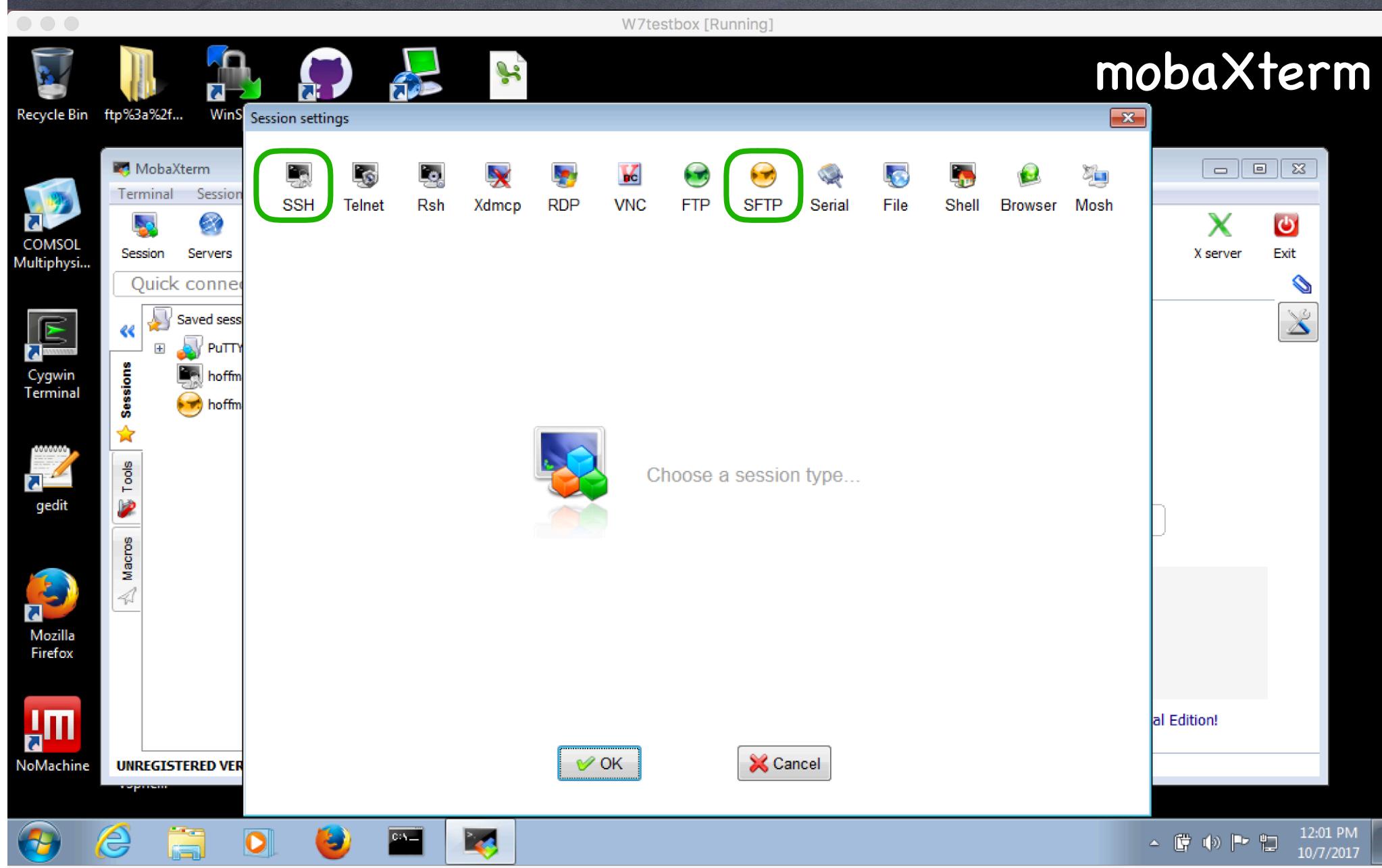
Connecting to the Hoffman2 Cluster from Windows box



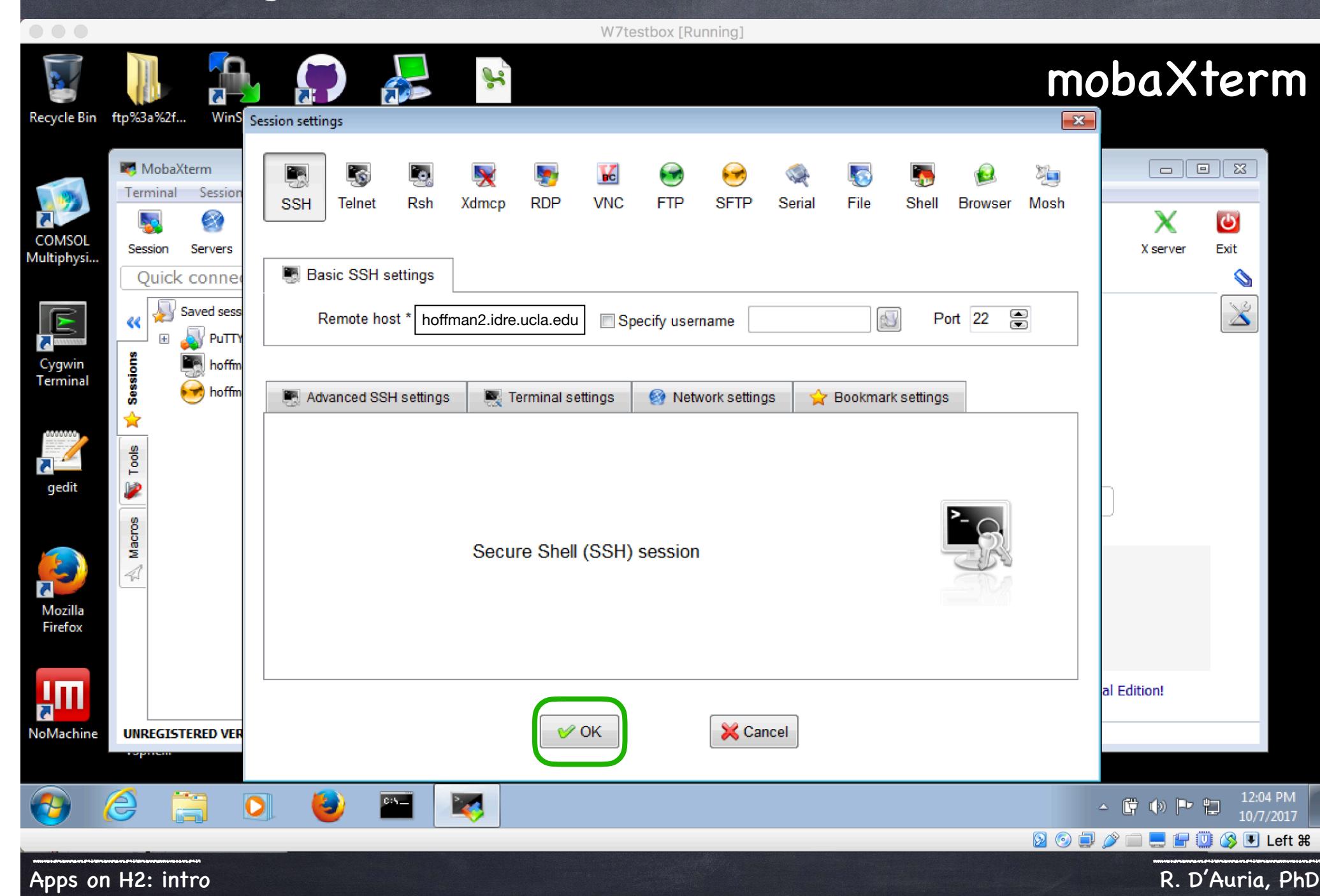
Connecting to the Hoffman2 Cluster from Windows box



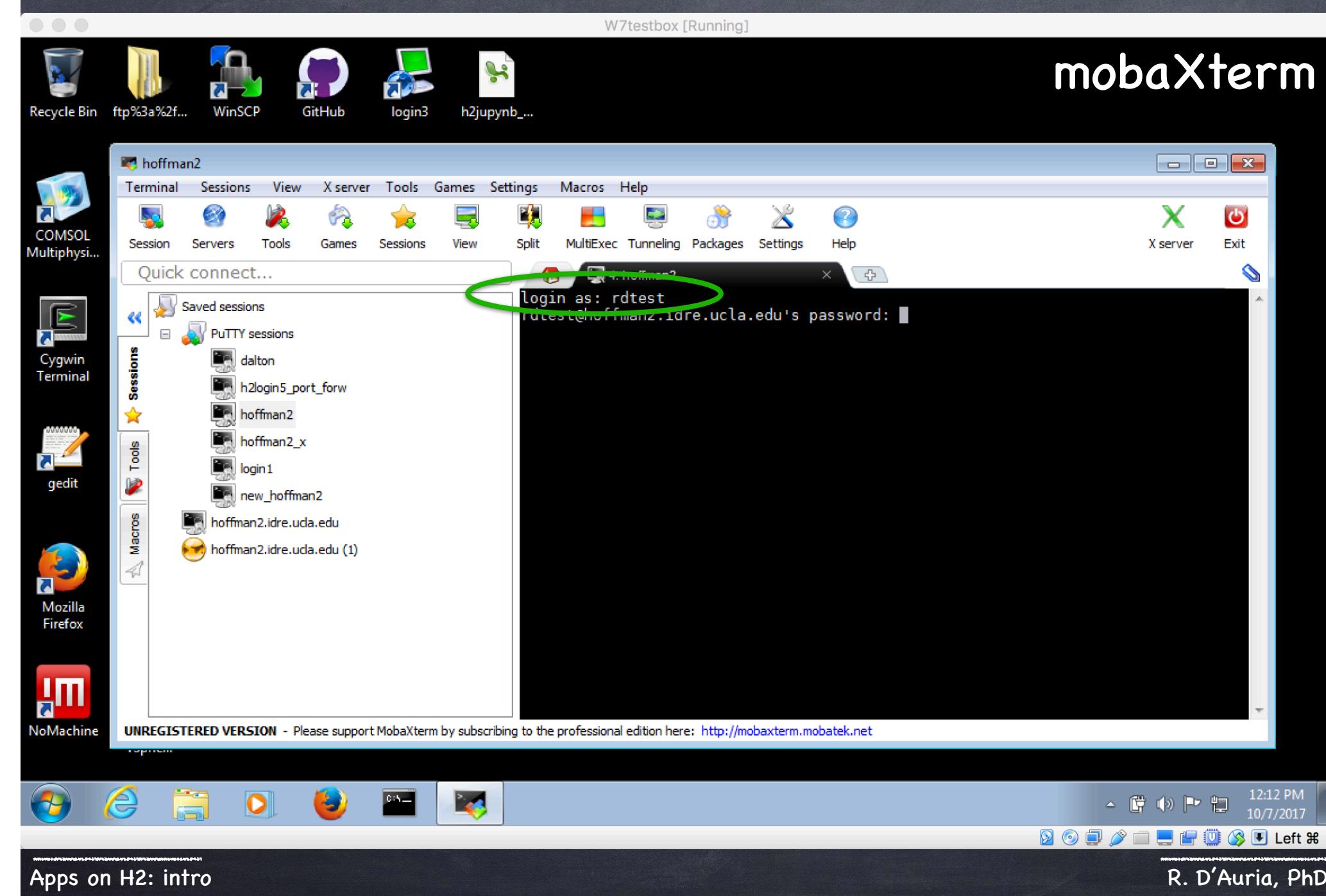
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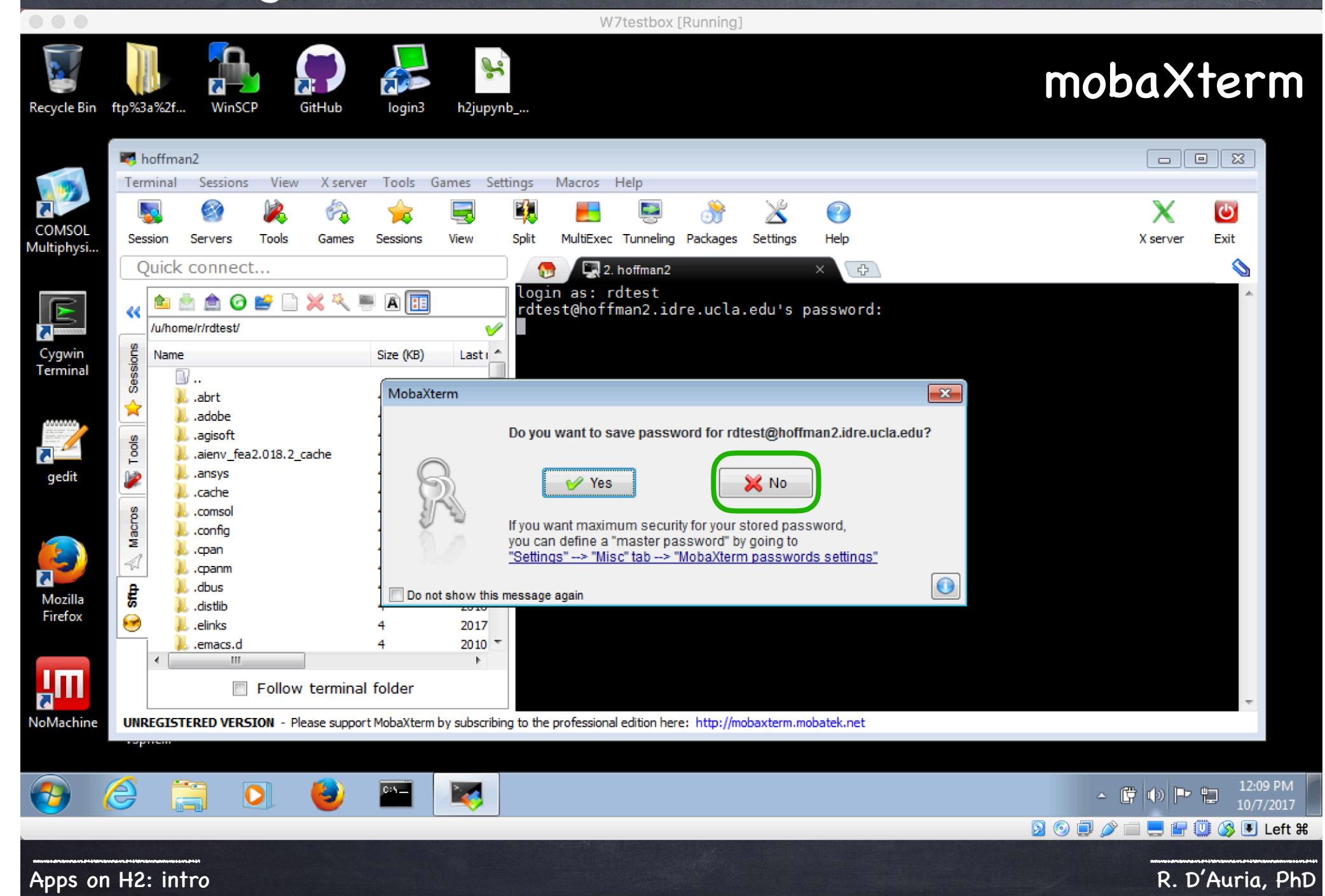


Connecting to the Hoffman2 Cluster from Windows box

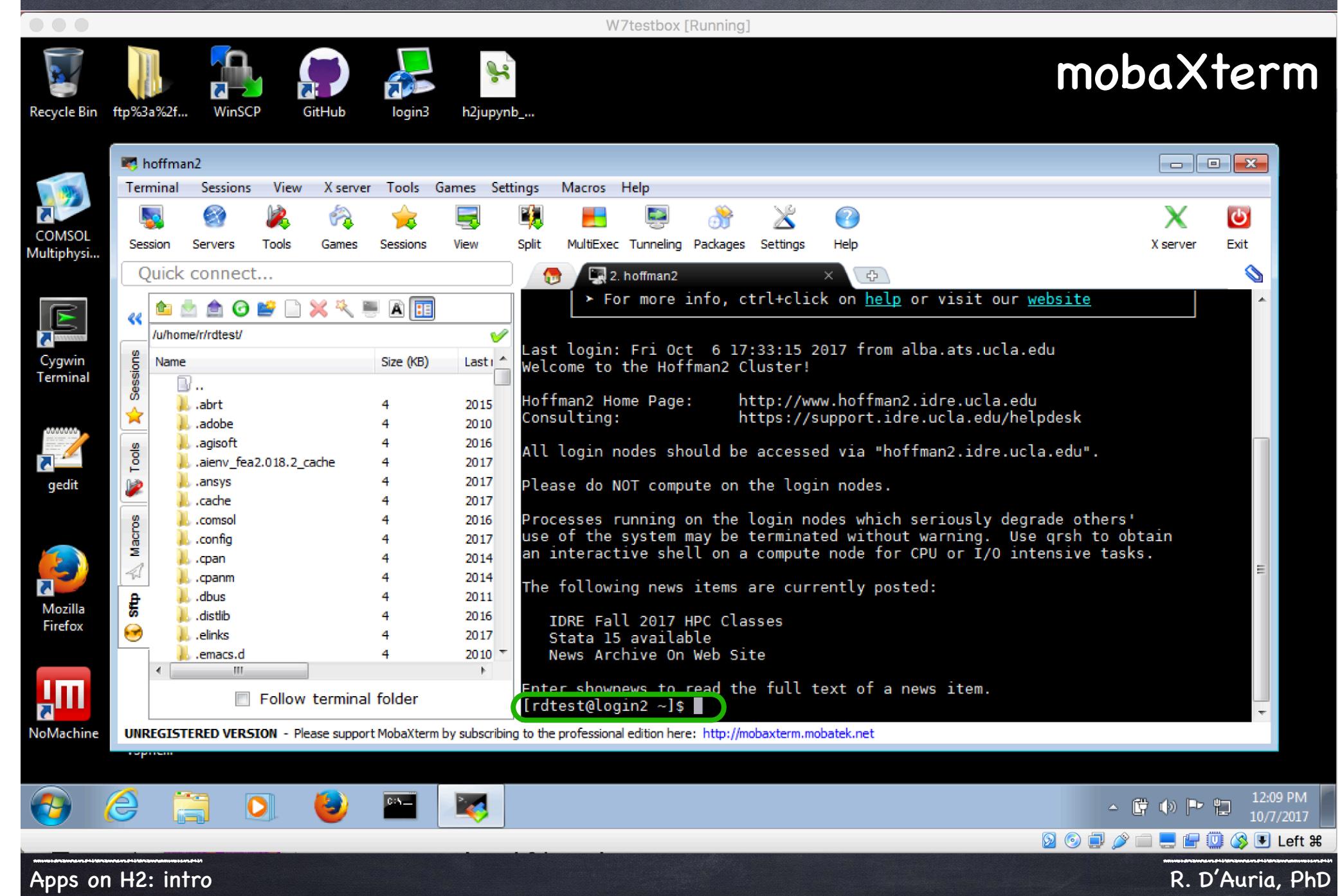


Connecting to the Hoffman2 Cluster from Windows box

mobaXterm



Connecting to the Hoffman2 Cluster from Windows box





Search this website ...

ACCESS

COMPUTING

DATA STORAGE

FILE TRANSFER

SOFTWARE

[About](#)[User Support](#)[FAQ](#)[Getting started](#)[News](#)[Security policy](#)[Status](#)[How to acknowledge the Hoffman2 cluster program](#)[How to use this site](#)You are here: [Home](#) / [Accessing the Hoffman2 Cluster](#) / Setting X11 Forwarding for GUI Applications

Setting X11 Forwarding for GUI Applications

Contents [hide]

Linux

[Notes for X Window System users](#)

Mac OS X

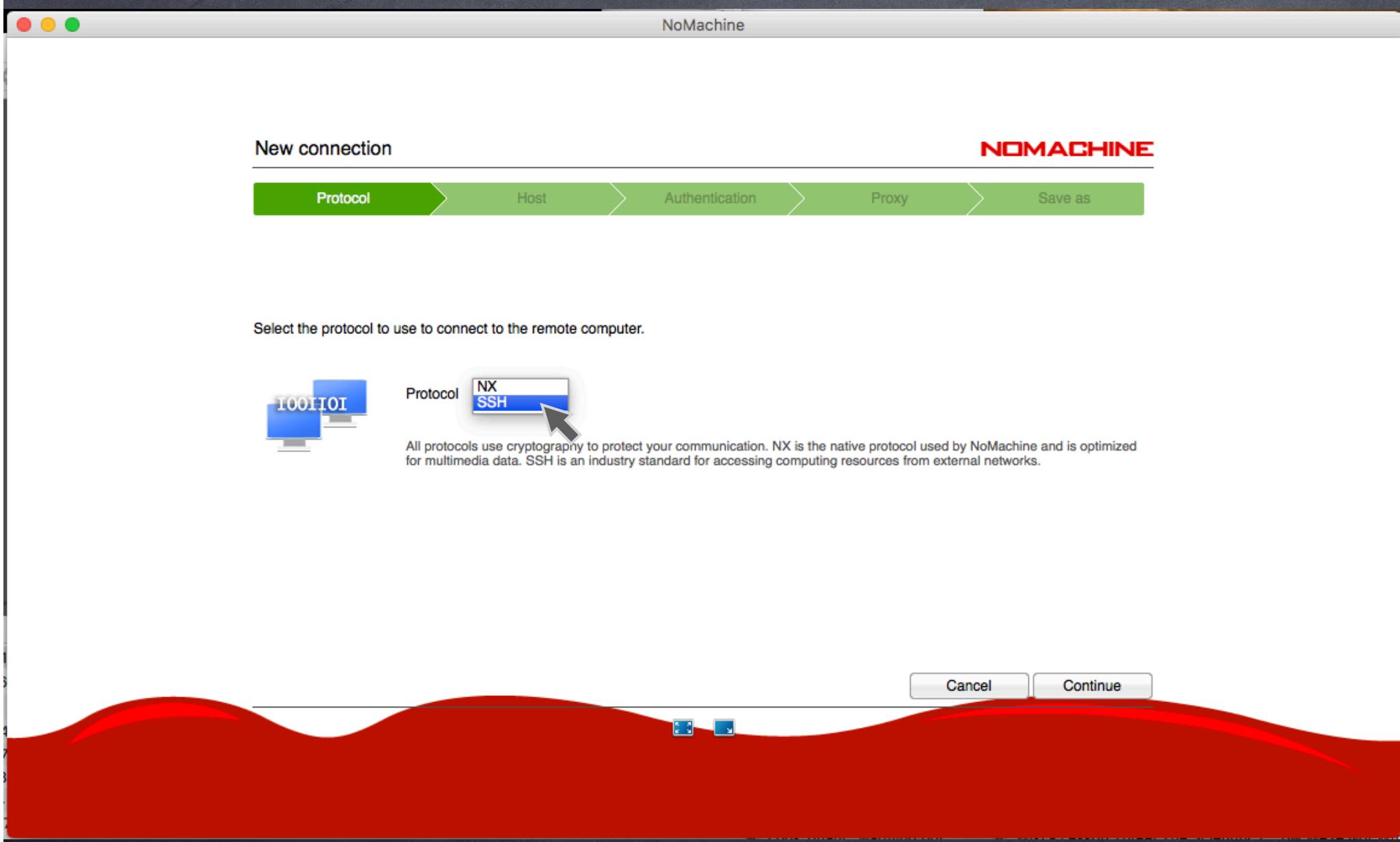
[Notes for XQuartz users](#)

Windows

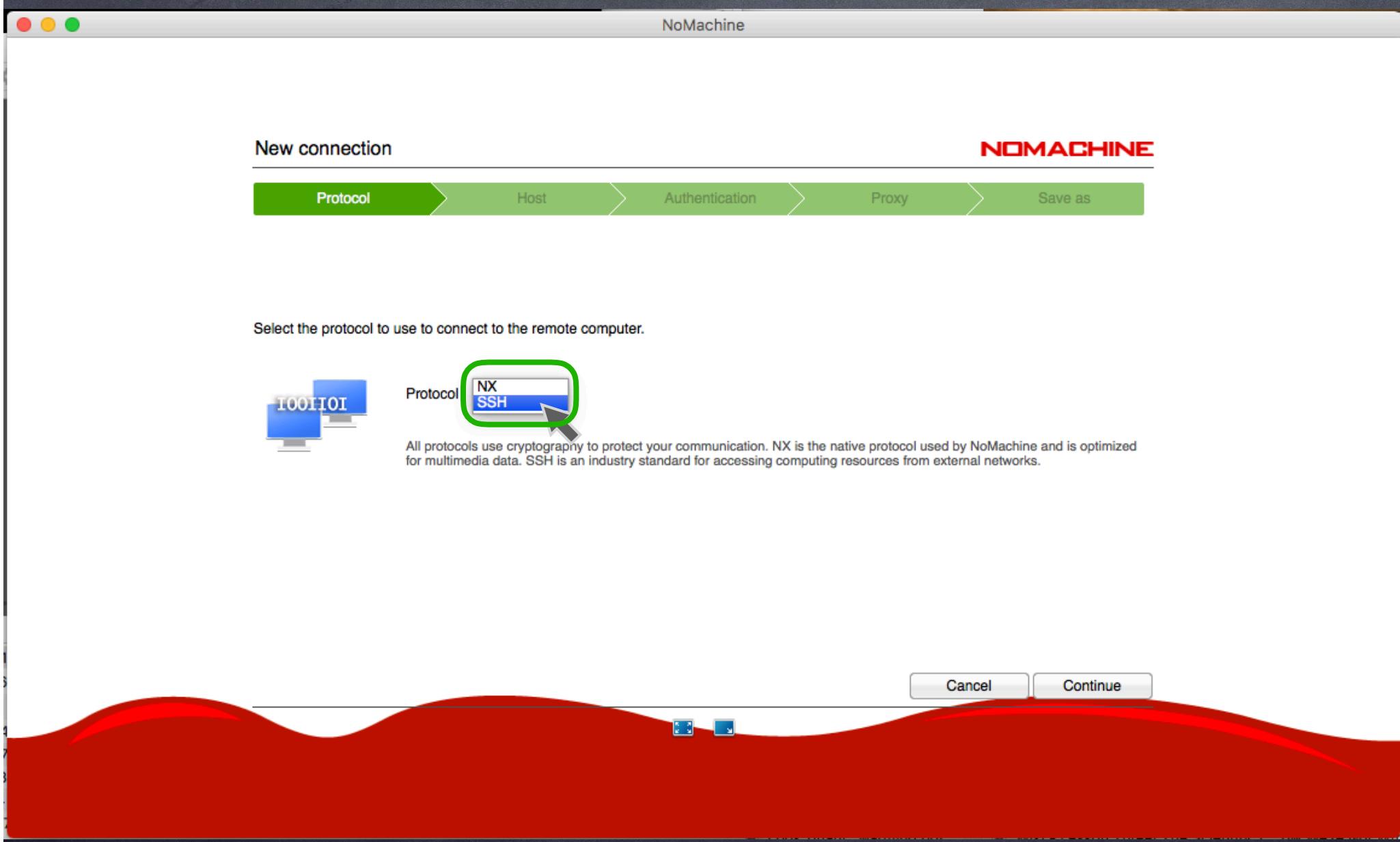
[Notes for MobaXterm users](#)[Notes for Xming users](#)[Notes for Cygwin users](#)[Connecting via the NX protocol](#)[NoMachine client](#)[X2Go client](#)

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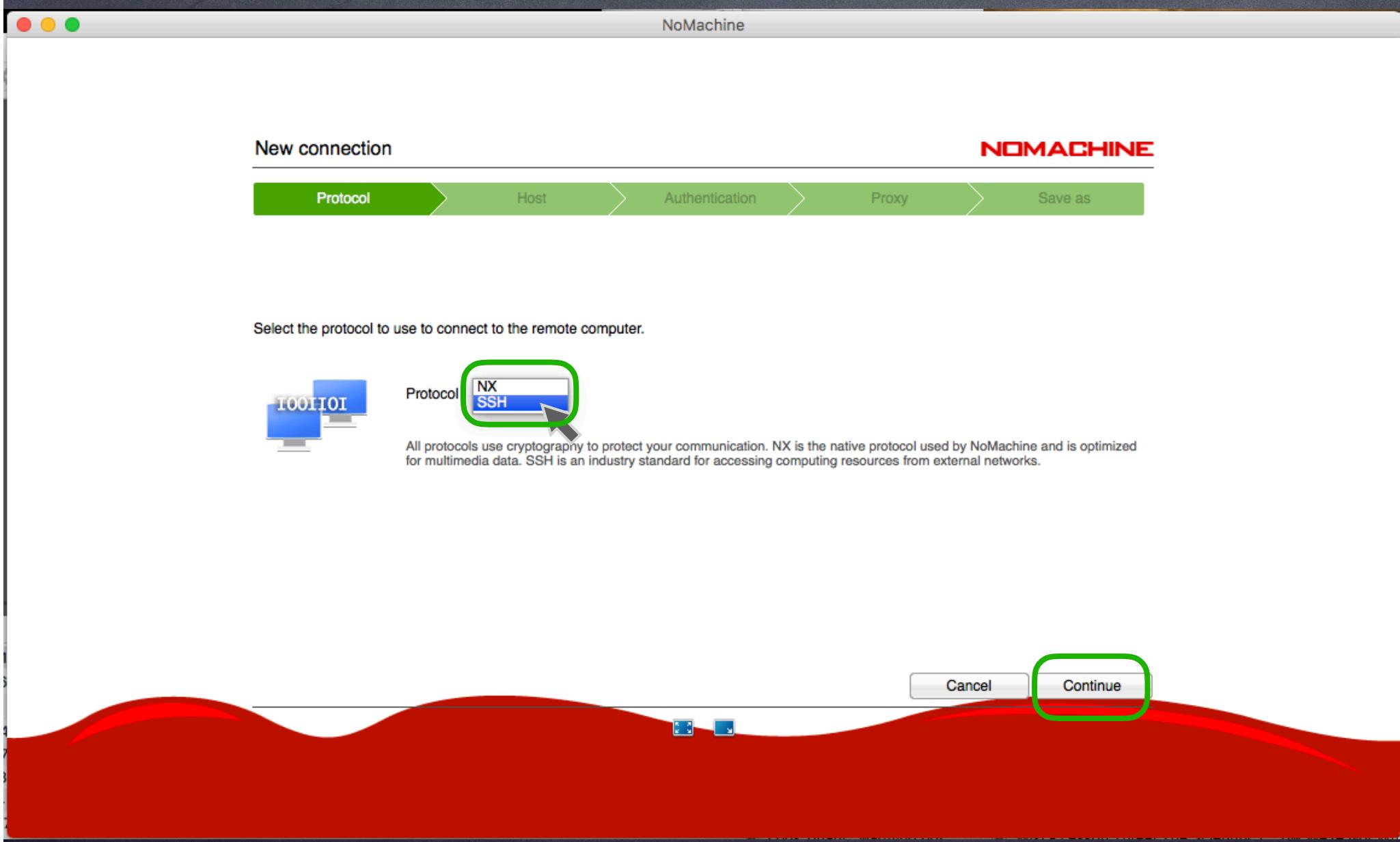
Connecting to the Hoffman2 Cluster via NX client



Connecting to the Hoffman2 Cluster via NX client



Connecting to the Hoffman2 Cluster via NX client



Connecting to the Hoffman2 Cluster via NX

NoMachine

New connection **NOMACHINE**

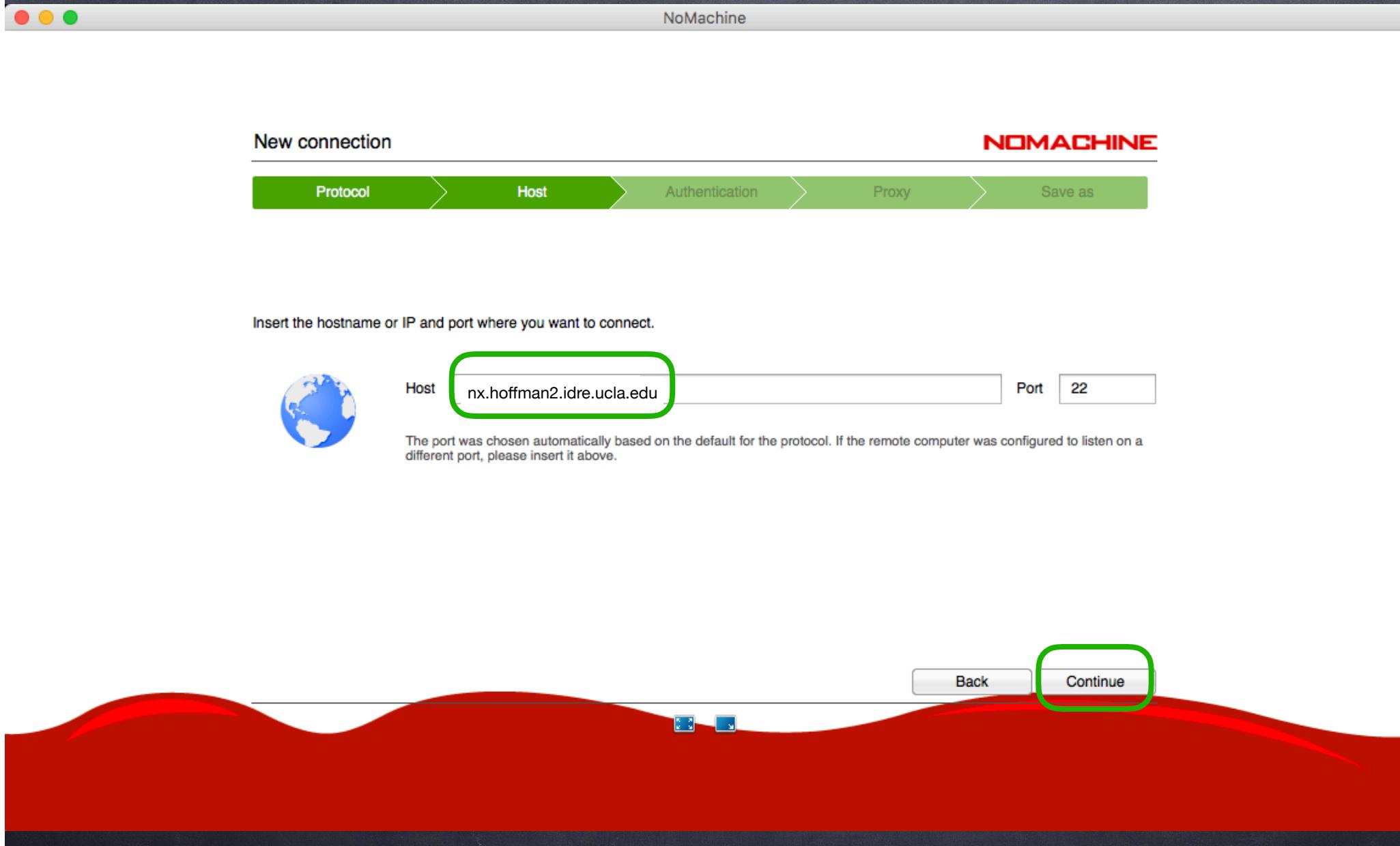
Protocol > Host > Authentication > Proxy > Save as

Insert the hostname or IP and port where you want to connect.

Host: nx.hoffman2.idre.ucla.edu Port: 22

The port was chosen automatically based on the default for the protocol. If the remote computer was configured to listen on a different port, please insert it above.

Back Continue



Connecting to the Hoffman2 Cluster via NX

NoMachine

New connection **NOMACHINE**

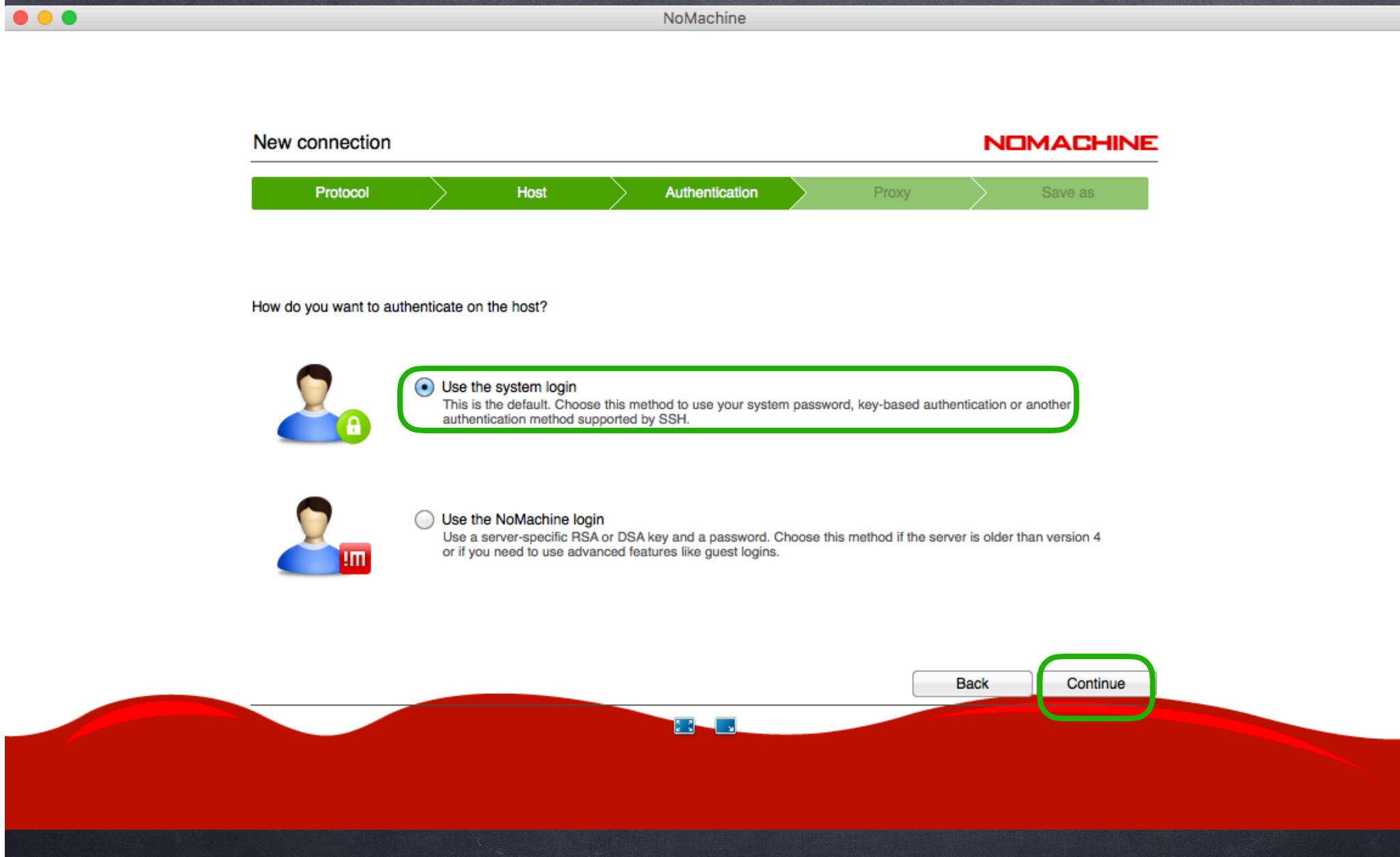
Protocol > Host > **Authentication** > Proxy > Save as

How do you want to authenticate on the host?

Use the system login
This is the default. Choose this method to use your system password, key-based authentication or another authentication method supported by SSH.

Use the NoMachine login
Use a server-specific RSA or DSA key and a password. Choose this method if the server is older than version 4 or if you need to use advanced features like guest logins.

Back **Continue**



Connecting to the Hoffman2 Cluster via NX

NoMachine

New connection **NOMACHINE**

Protocol > Host > Authentication > Proxy > Save as

Choose which authentication method you want to use.

- Password**
Use password authentication.
- Private key**
Use key-based authentication with a key you provide.
- Smart card**
Use key-based authentication with a key stored on a PKCS11 smart card.
- Kerberos**
Use Kerberos ticket-based authentication.

Back **Continue**

Connecting to the Hoffman2 Cluster via NX

NoMachine

New connection **NOMACHINE**

Protocol > Host > Authentication > Proxy > Save as

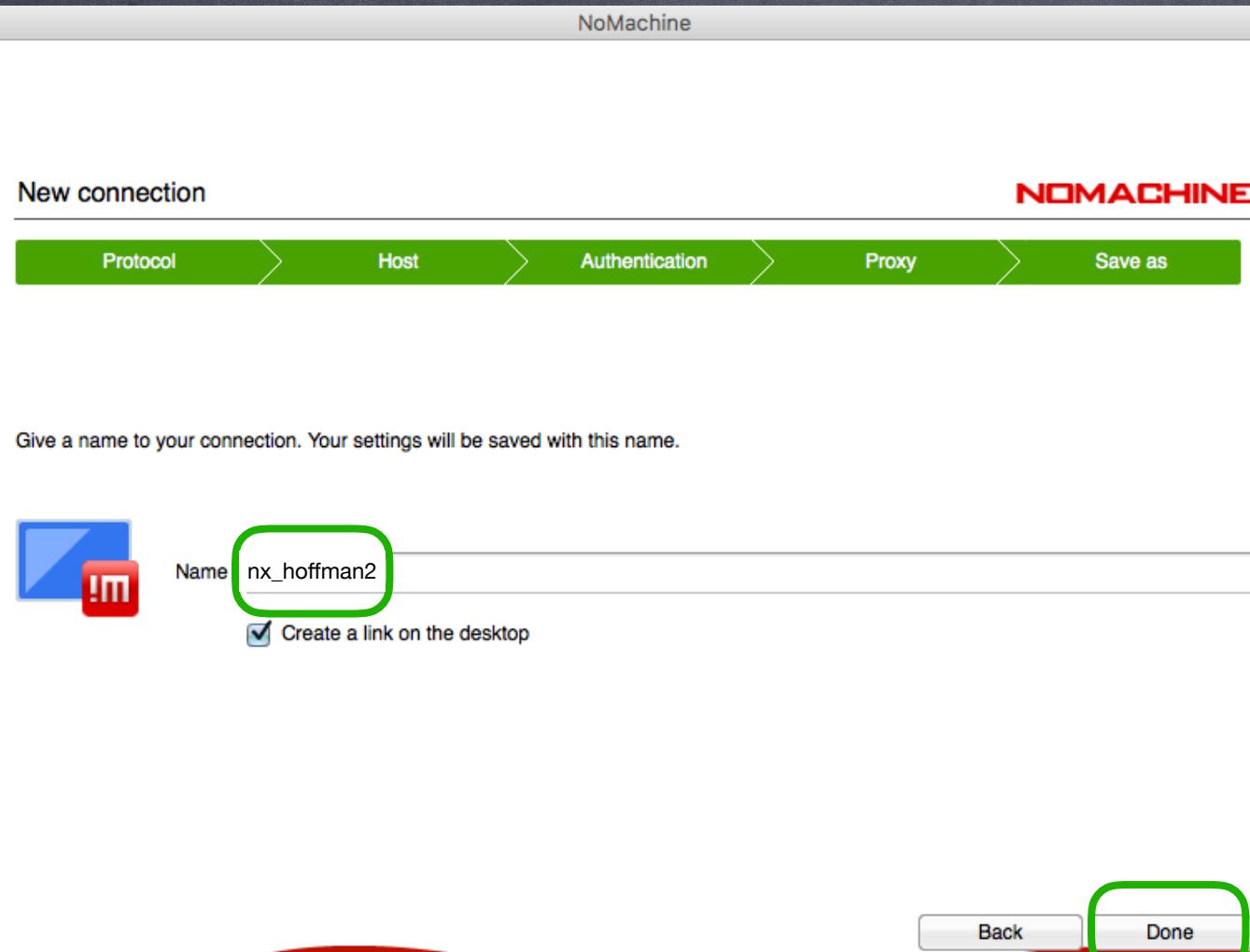
Use a HTTP proxy for the network connection.

Don't use a proxy
Choose this if you are connecting to a computer on your same LAN or if you are on a residential broadband connection.

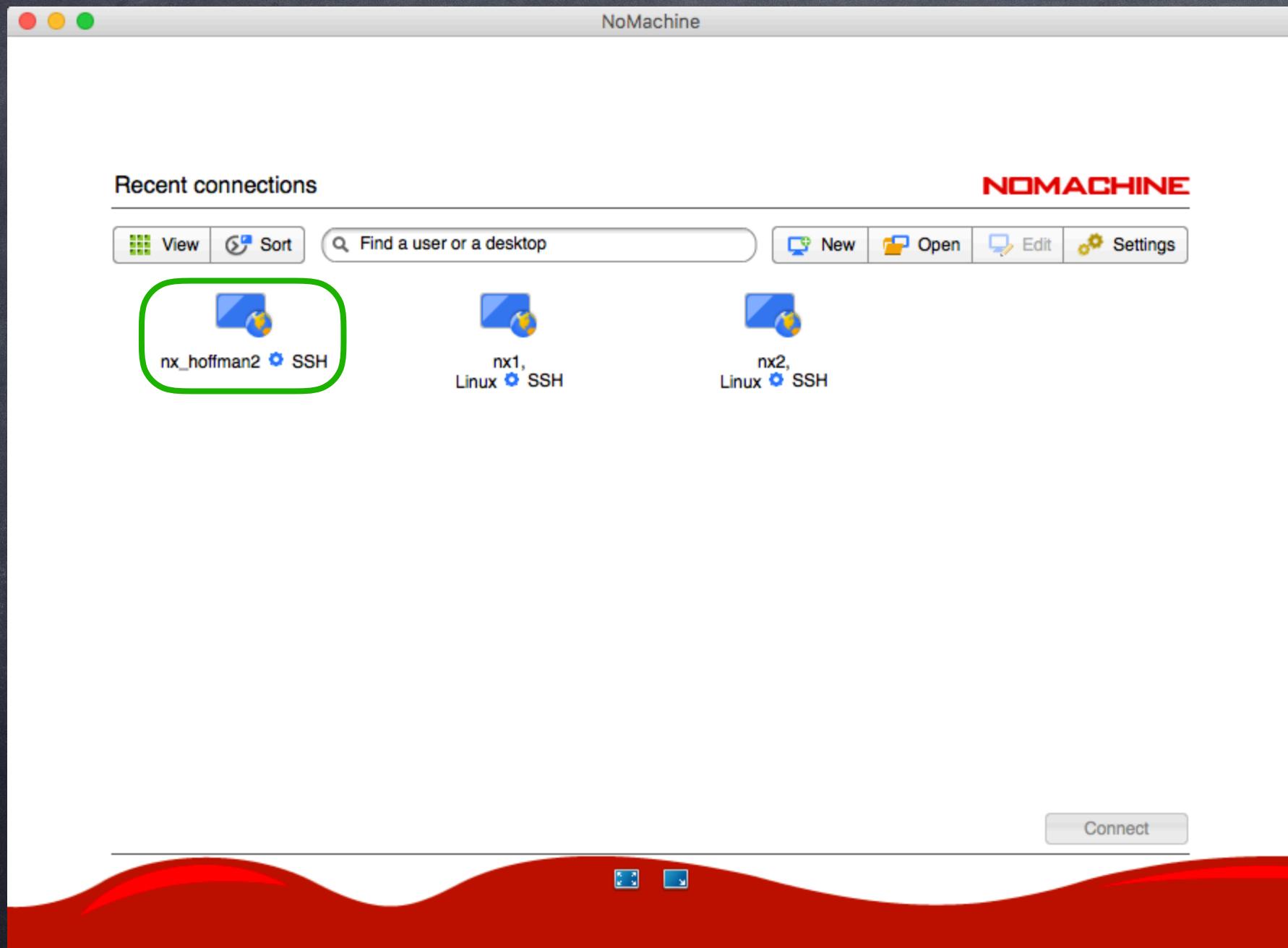
Connect using a HTTP proxy
Use a proxy if you are connecting to a computer outside your LAN from a corporate network where external access is protected by a firewall.

Back Continue

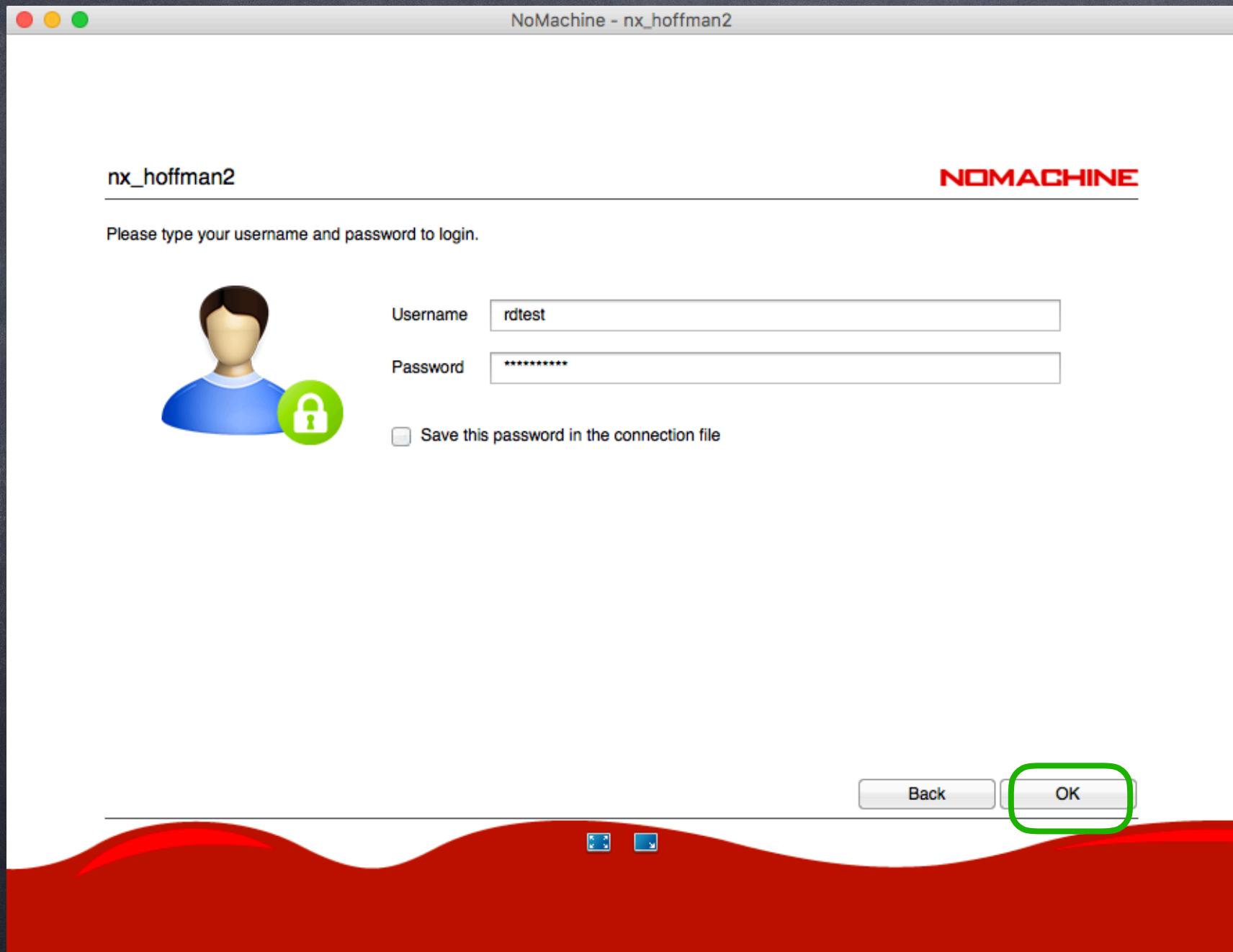
Connecting to the Hoffman2 Cluster via NX



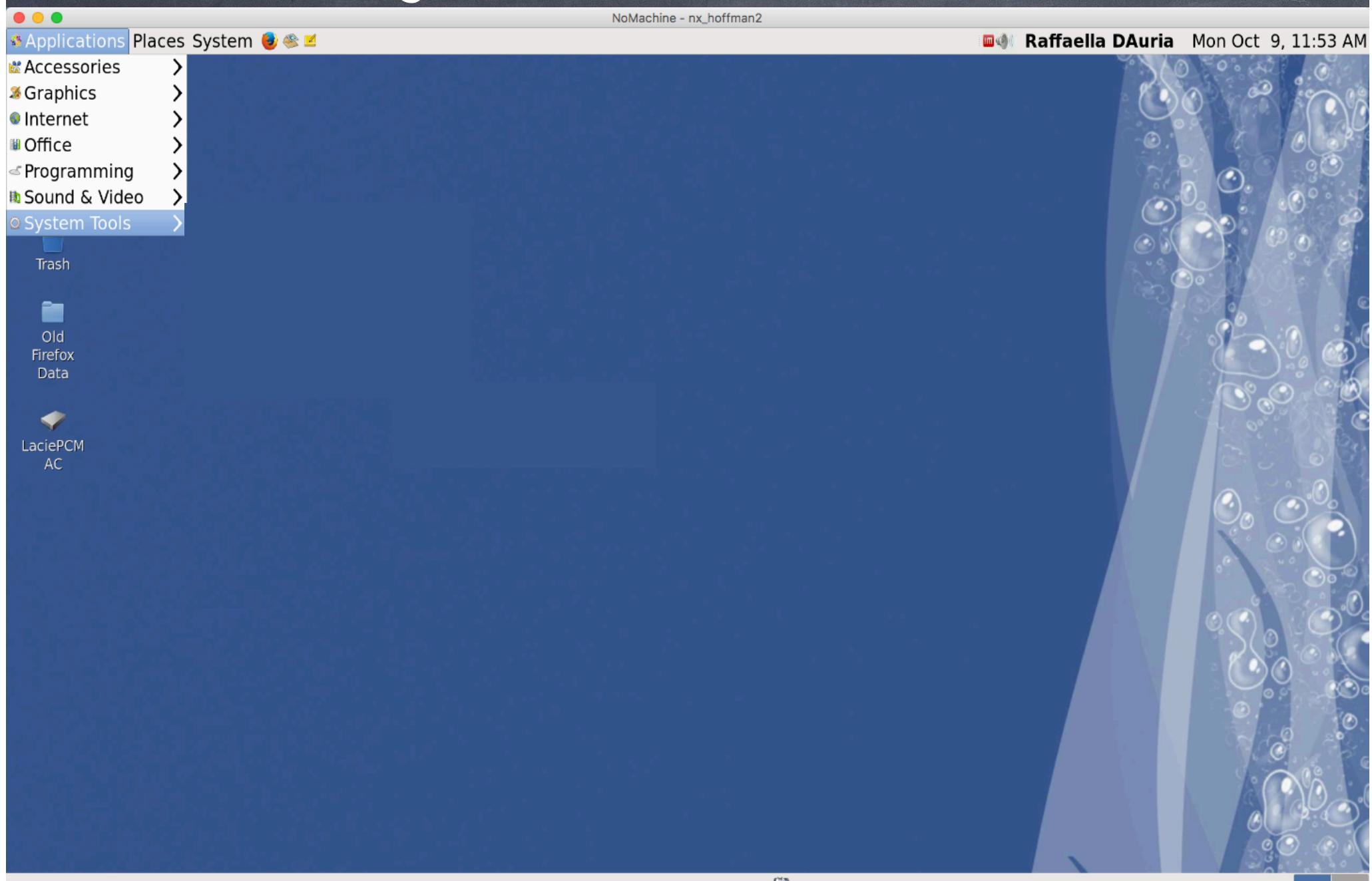
Connecting to the Hoffman2 Cluster via NX



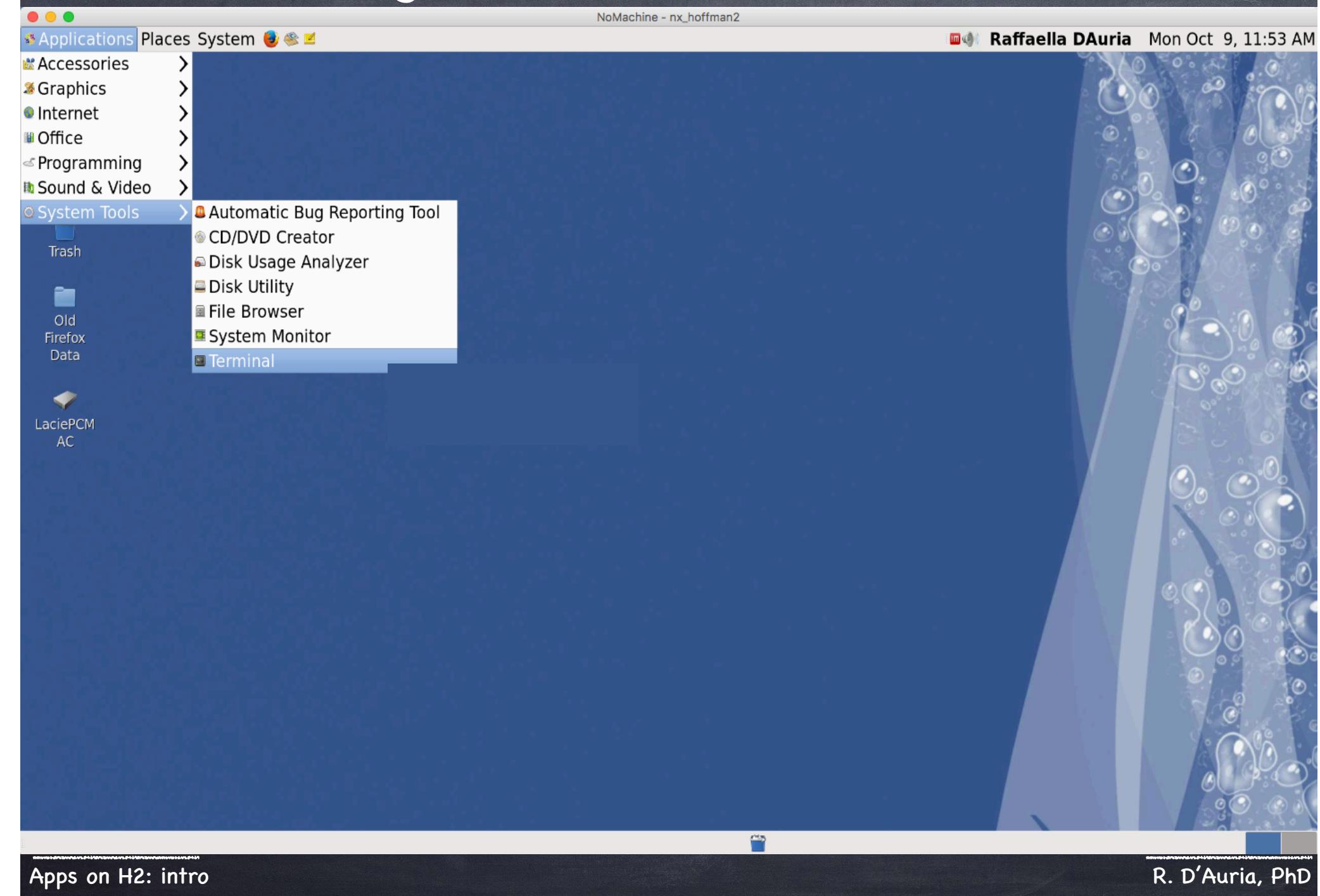
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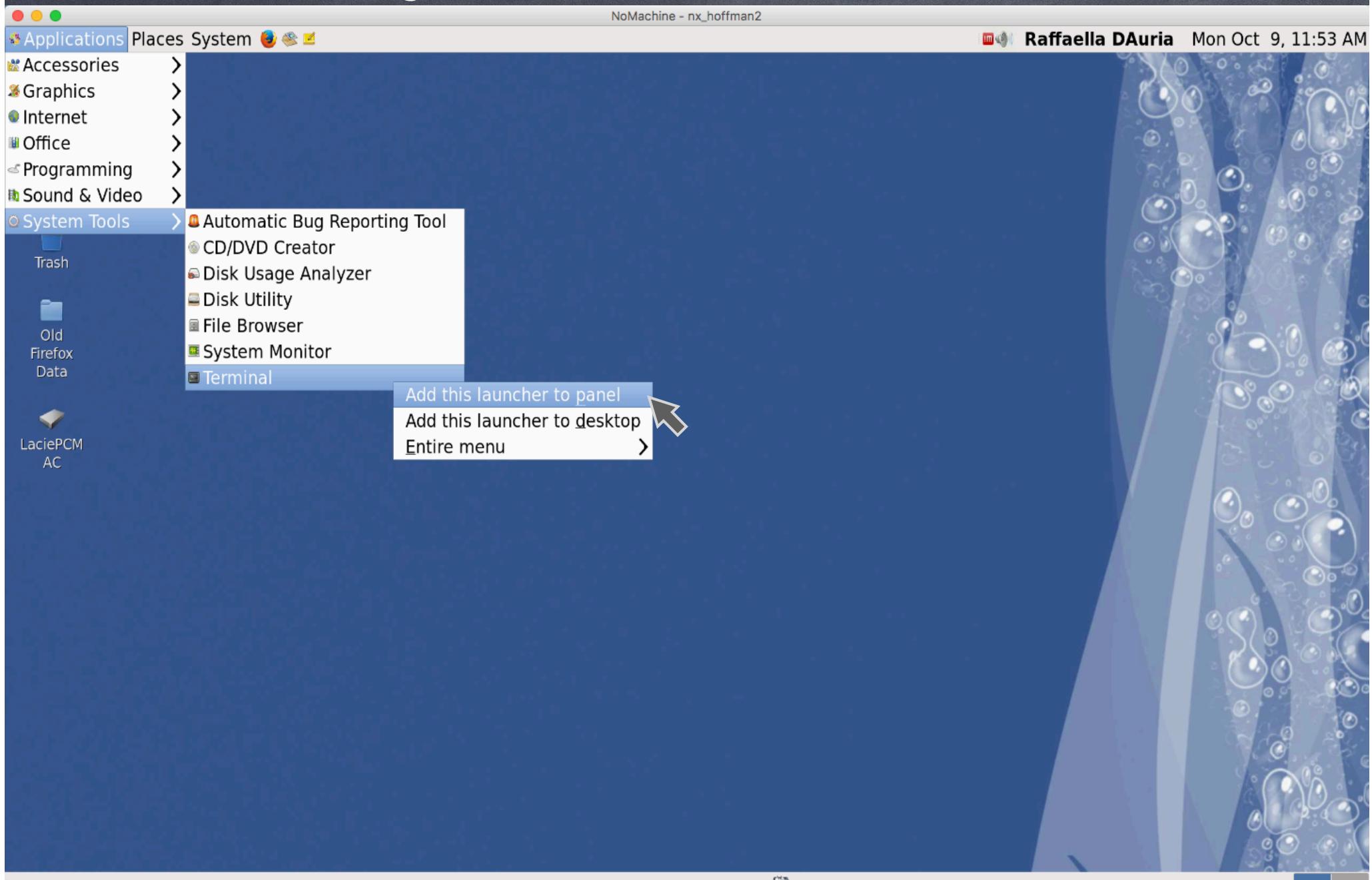
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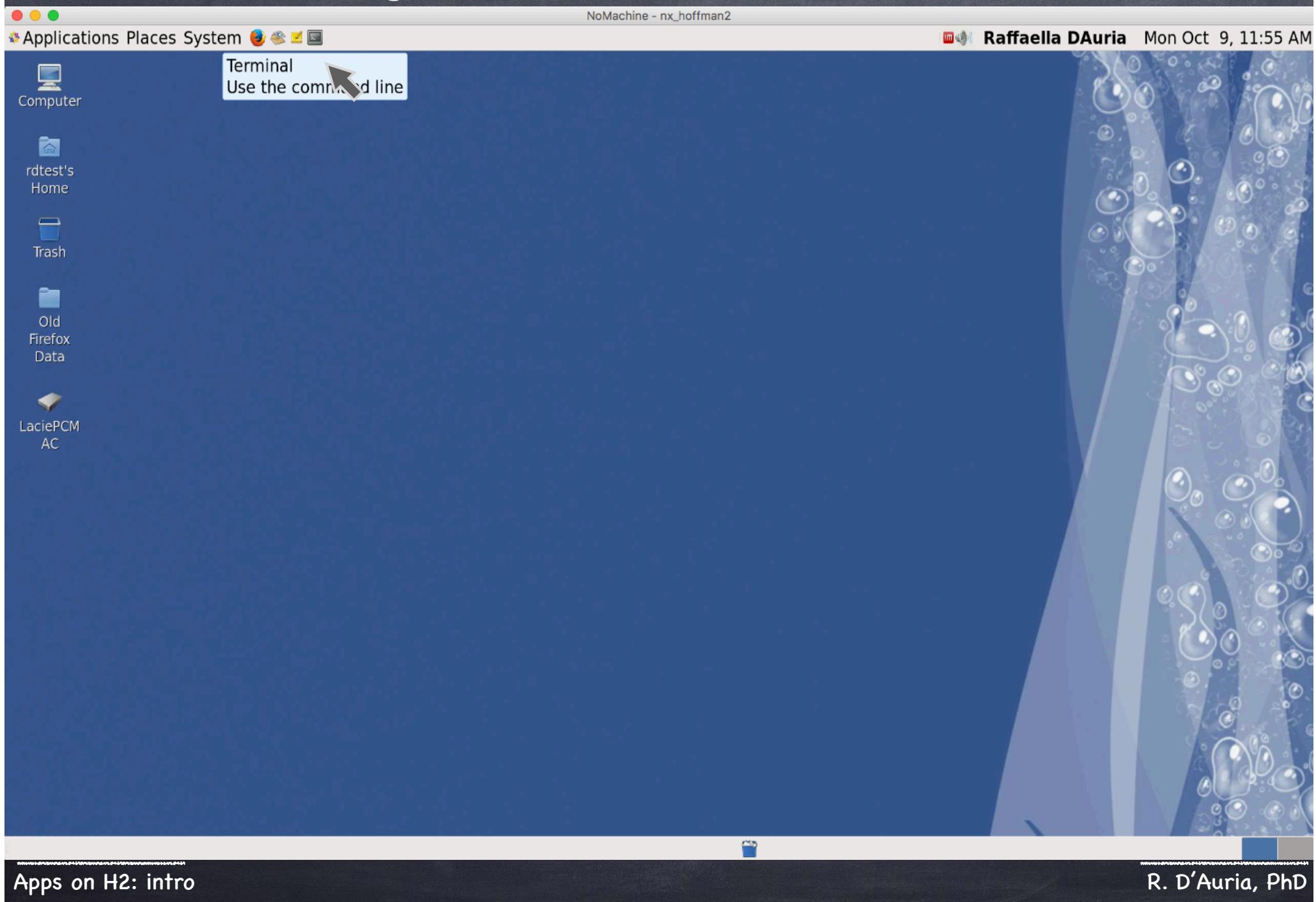
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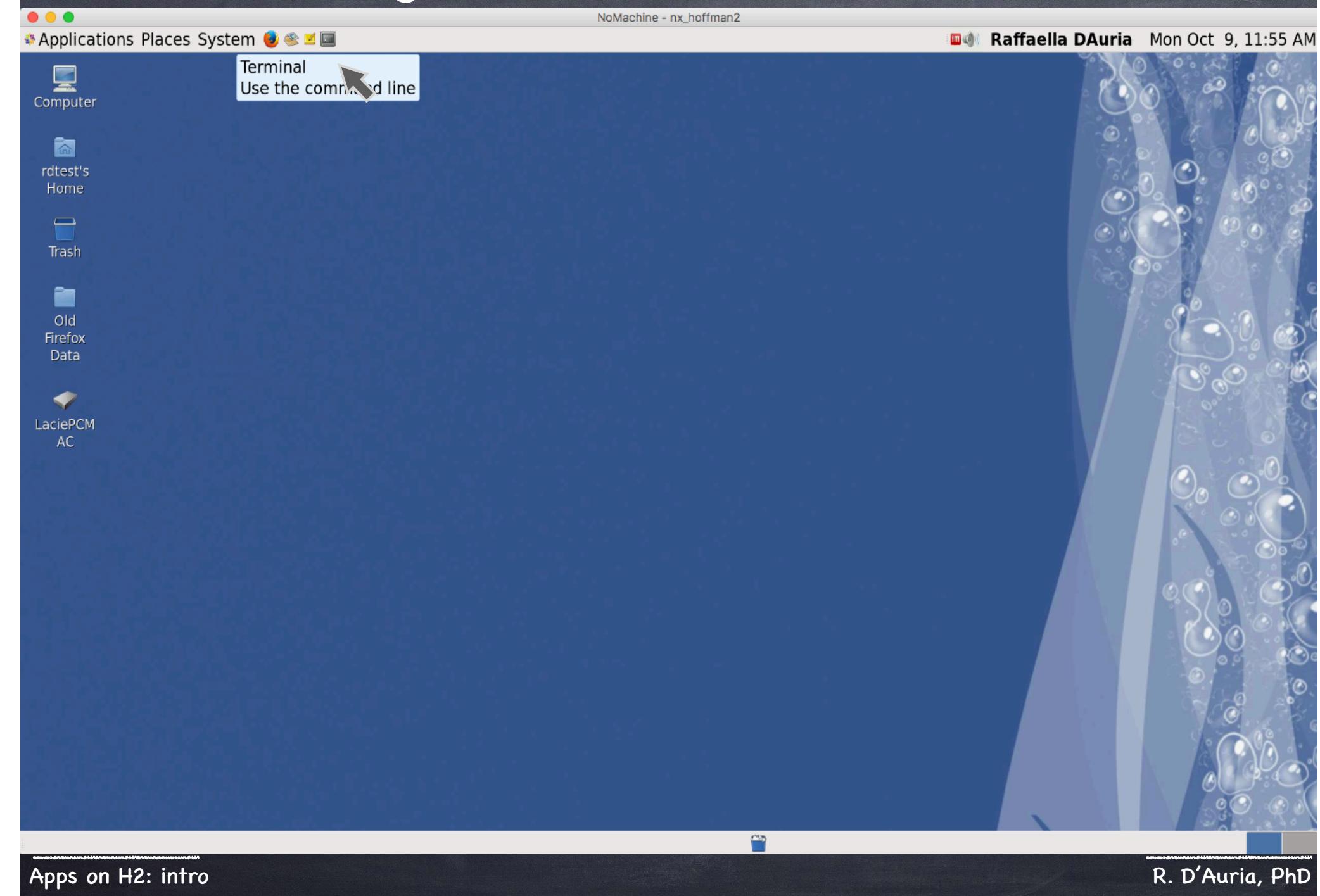
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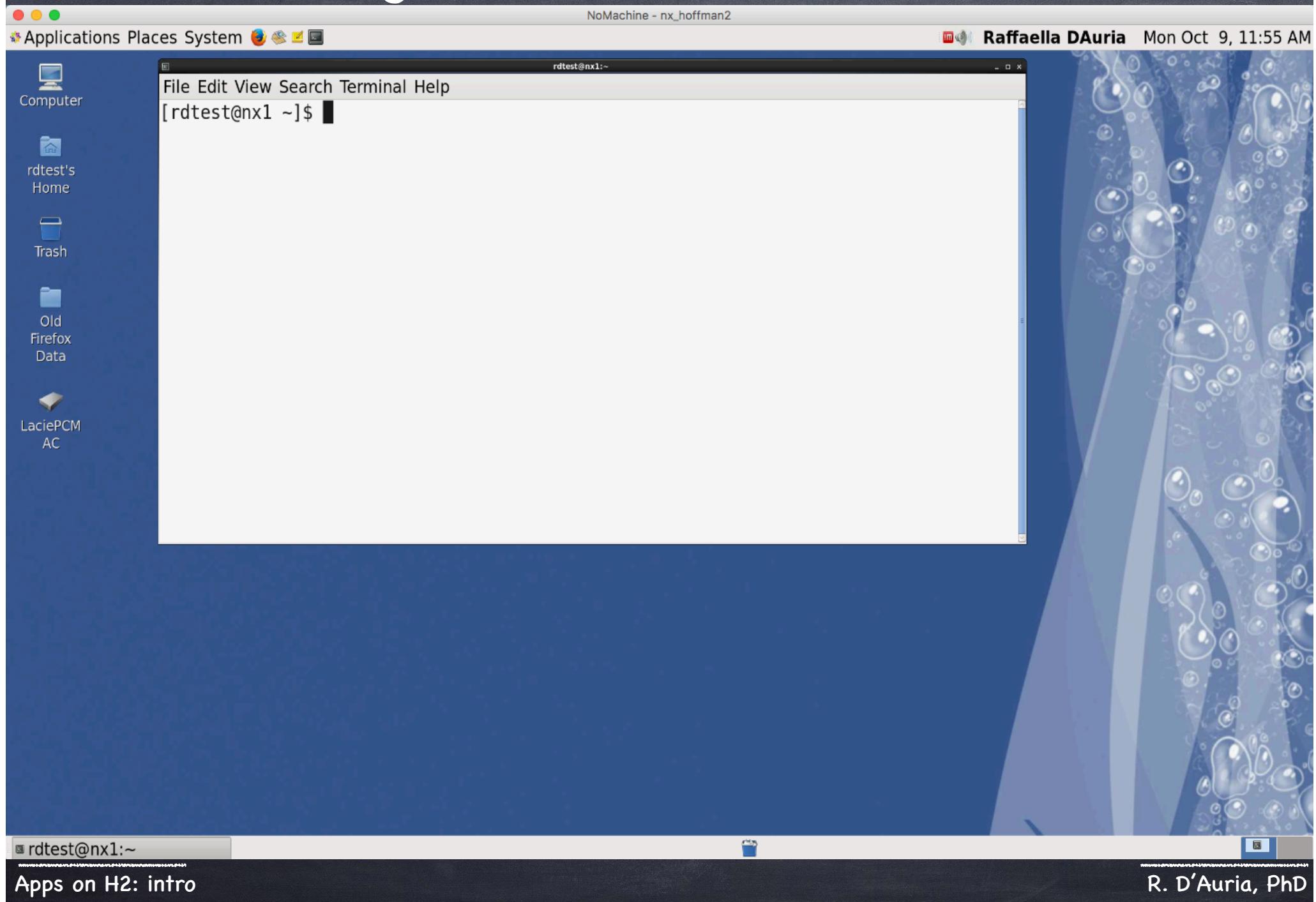
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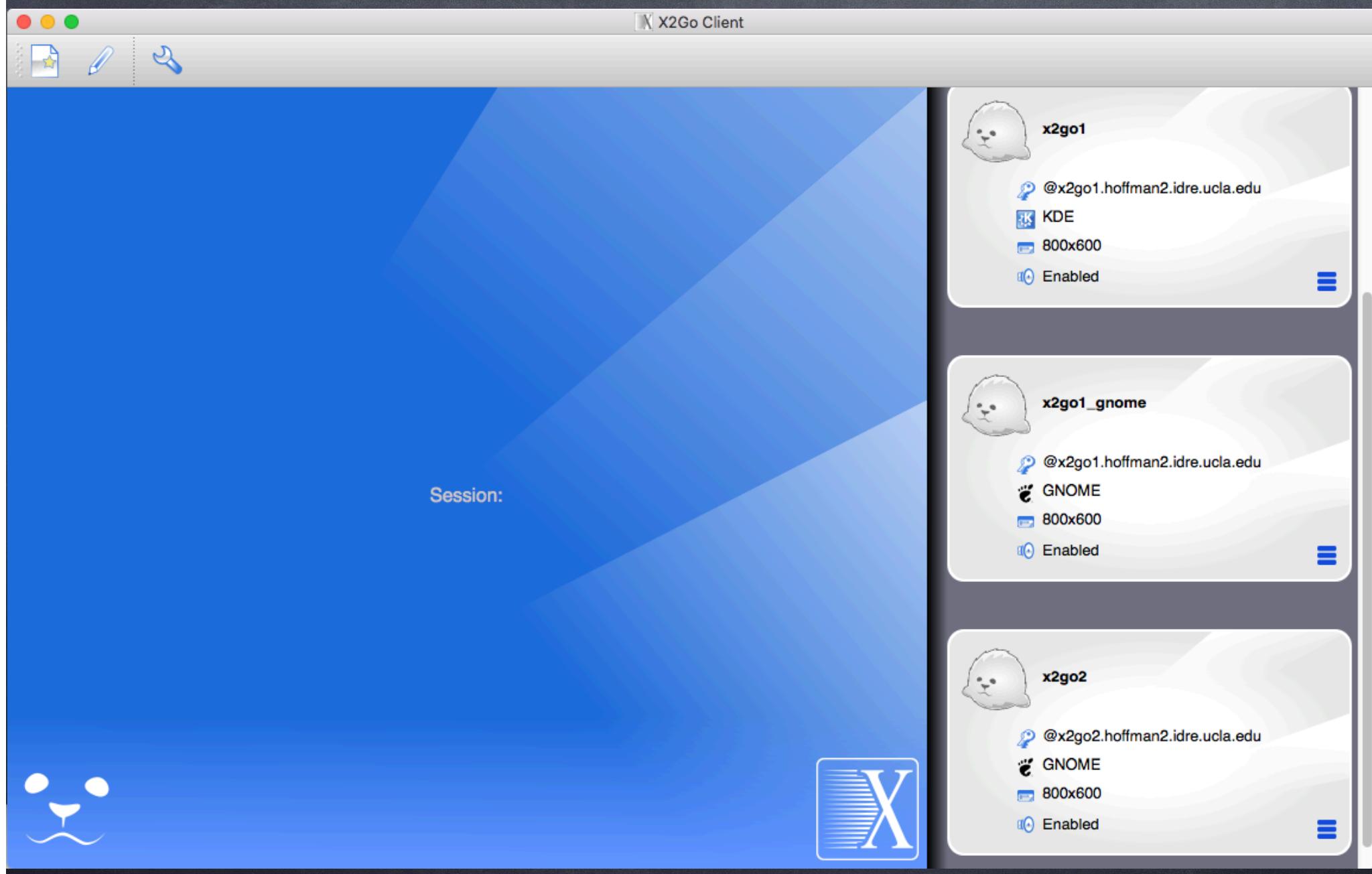
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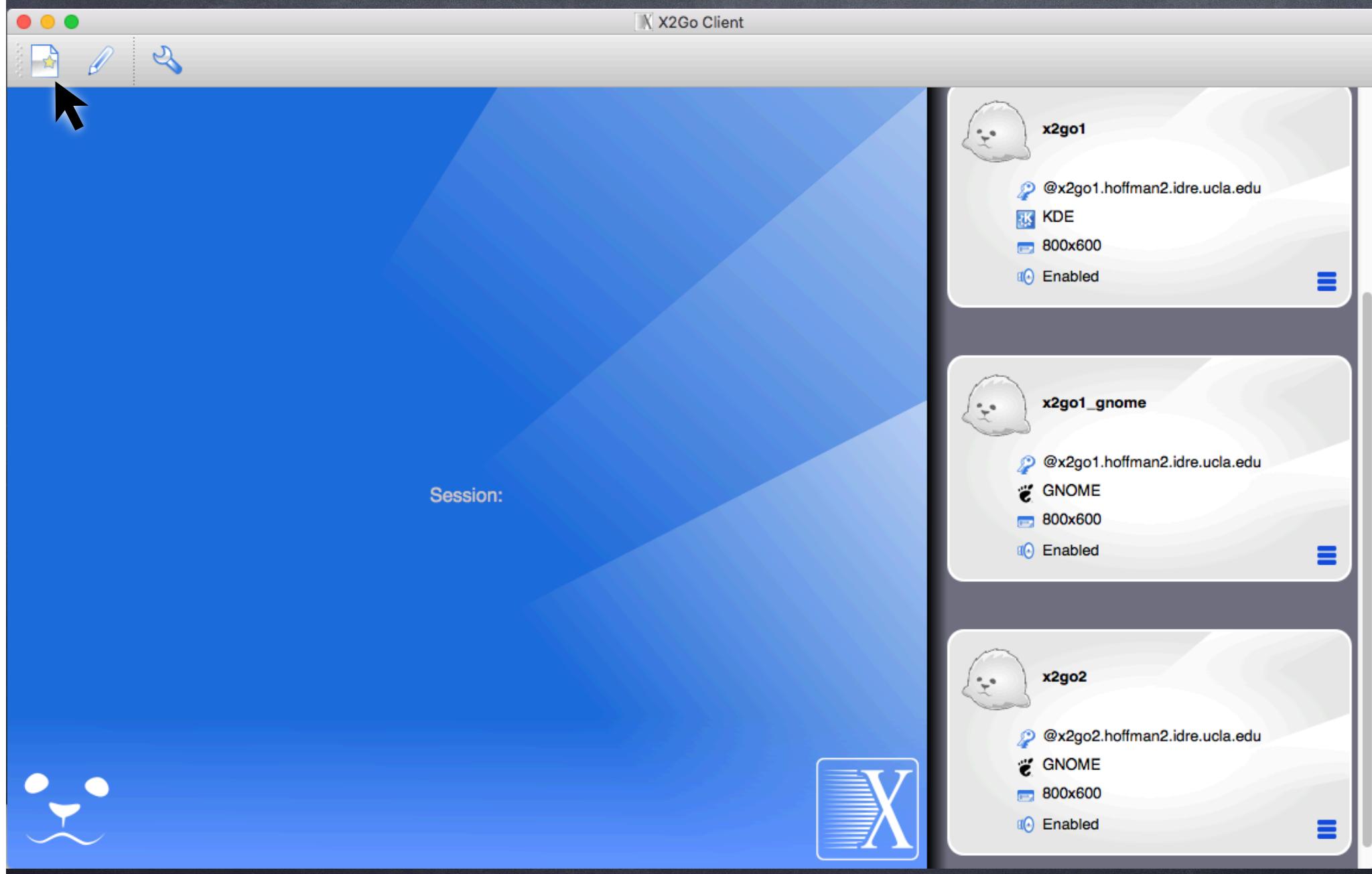
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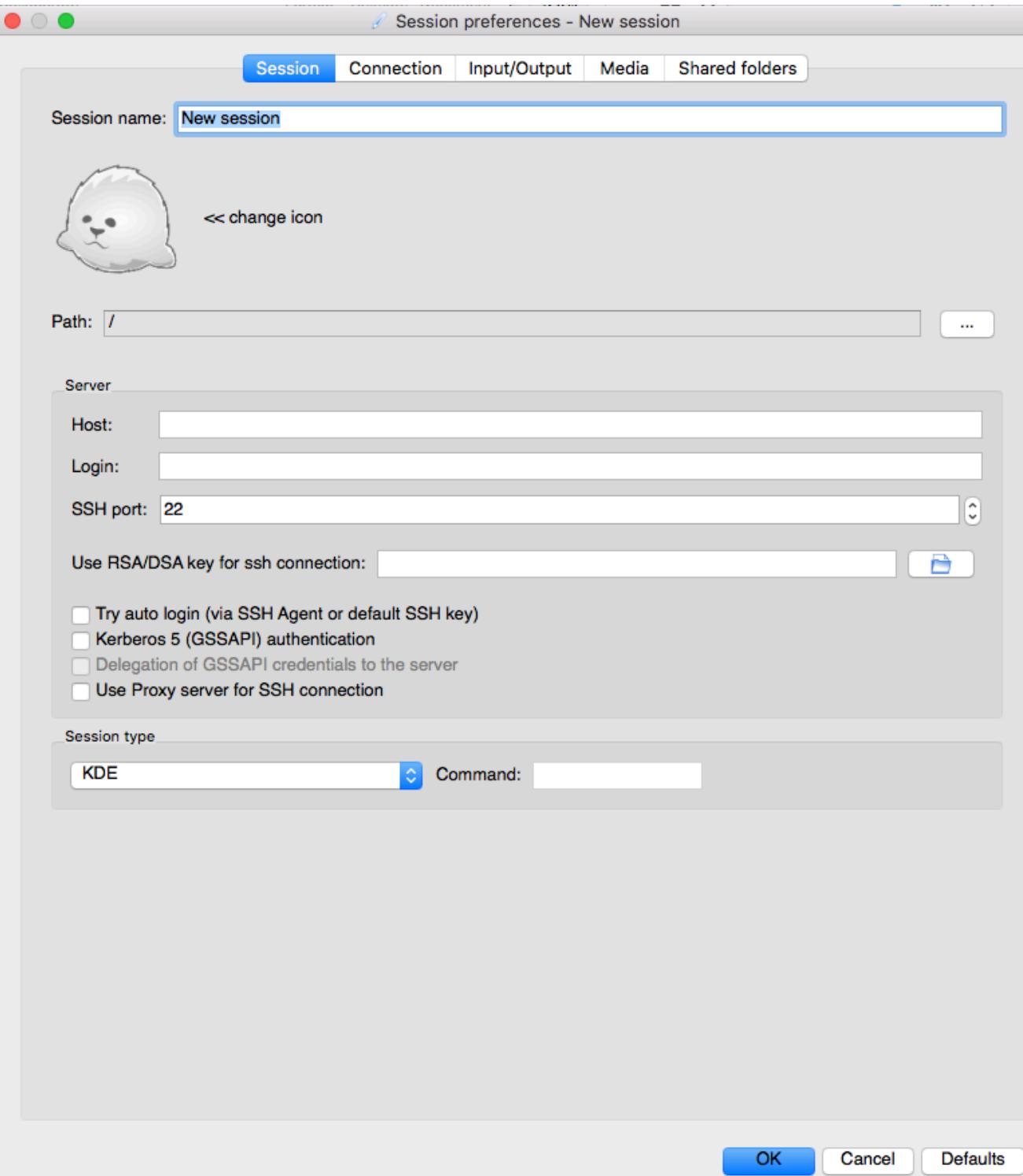


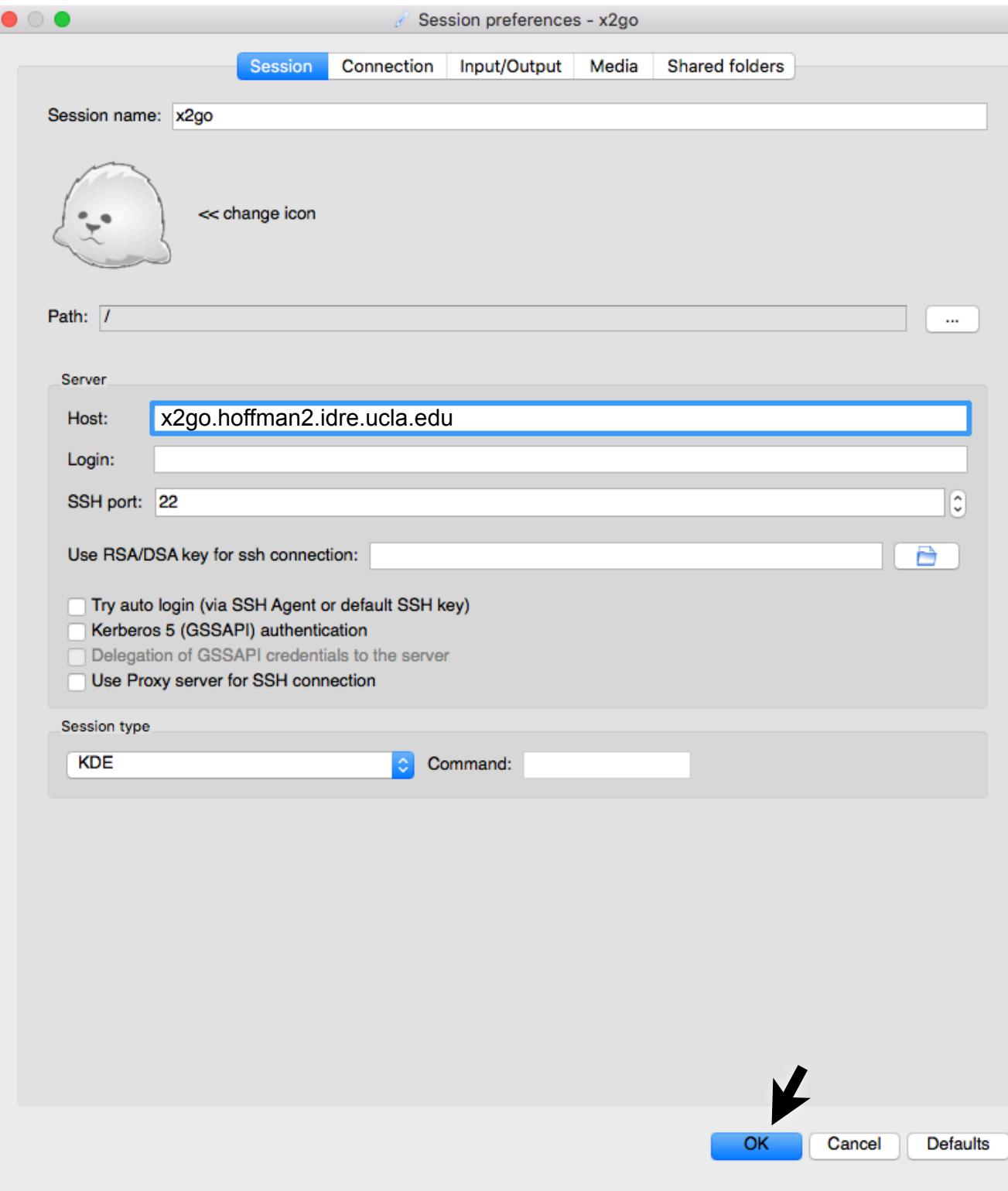
Connecting to the Hoffman2 Cluster via X2go client

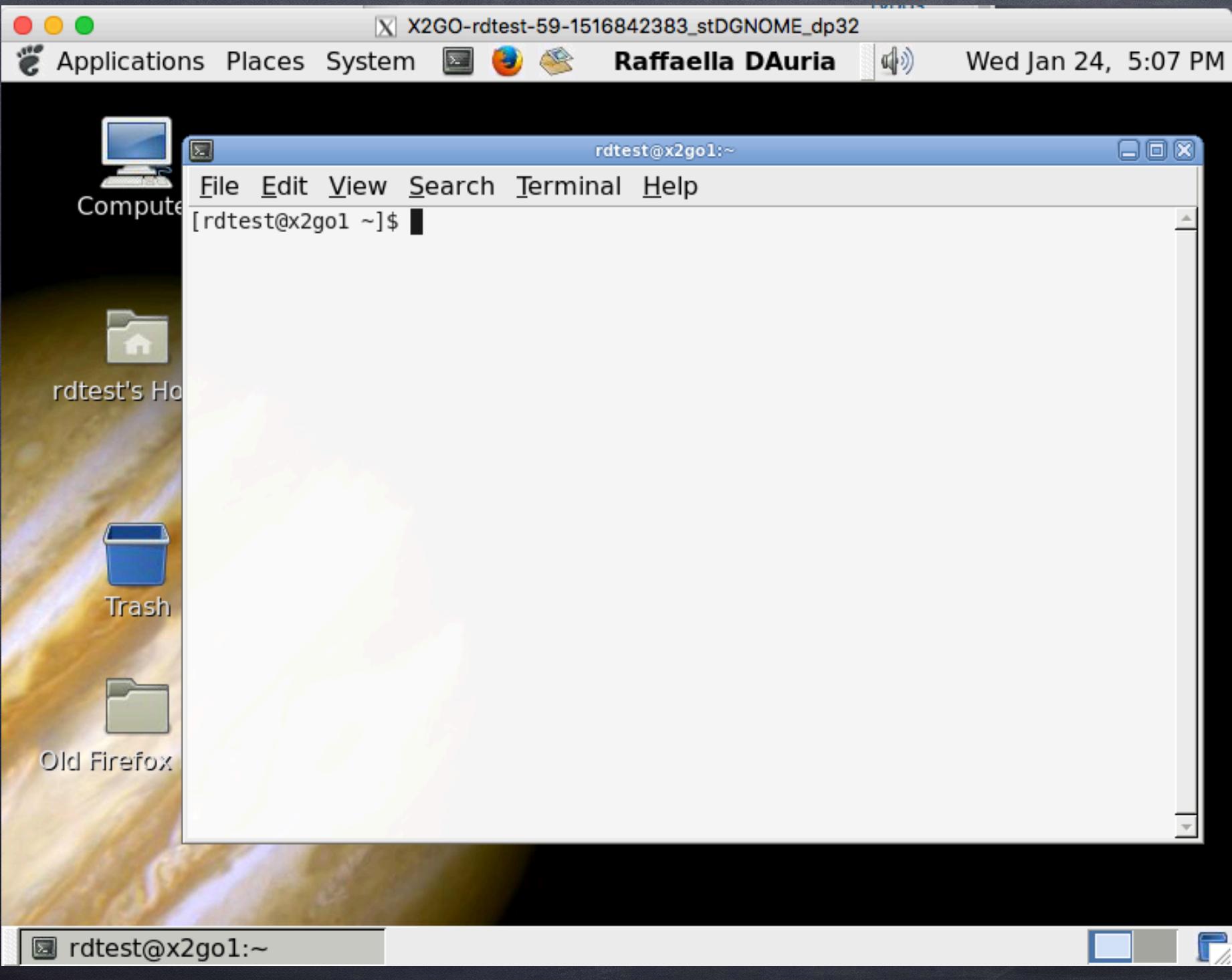


Connecting to the Hoffman2 Cluster via X2go client









Transferring your data/code on Hoffman2

The screenshot shows a web browser displaying the [File Transfer](https://www.hoffman2.idre.ucla.edu/file-transfer/) page of the Hoffman2 Cluster User Guide. The URL in the address bar is highlighted with a green oval. The page has a blue header navigation bar with links for ACCESS, COMPUTING, DATA STORAGE, FILE TRANSFER (which is active), and SOFTWARE. A sidebar on the left contains links for About, User Support, FAQ, Getting started, News, Security policy, Status, How to acknowledge the Hoffman2 cluster program, and How to use this site. The main content area shows the breadcrumb trail "You are here: Home / File Transfer" and the title "File Transfer". Below the title is a "Contents [hide]" section with links for Globus, scp and sftp (which is also highlighted with a green oval), rsync, and UCLA/UC Grid Portals (will retire soon). The "Globus" section describes it as a software tool for reliable, high-performance, and secure file transfer across the web. The "scp and sftp" section states that file transfer is allowed only through these protocols for security reasons.

https://www.hoffman2.idre.ucla.edu/file-transfer/

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Search this website

Report Typos and Errors

ACCESS COMPUTING DATA STORAGE FILE TRANSFER SOFTWARE

About User Support FAQ Getting started News Security policy Status How to acknowledge the Hoffman2 cluster program How to use this site

You are here: Home / File Transfer

File Transfer

Contents [hide]

Globus
scp and sftp
rsync
UCLA/UC Grid Portals (will retire soon)

Globus

Globus is a software tool to transfer files across the web in a reliable, high-performance and secure way. It provides fault-tolerant, fire-and-forget data transfer using simple web or command line interfaces. It is appropriate for transferring very large files either between your desktop machine and a remote machine like the Hoffman2 Cluster, or between two remote machines on which you have accounts; both remote machines need to be part of the Globus project. All XSEDE resources are configured as Globus endpoints.

See [High-speed file transfer with Globus](#) for information on using Globus.

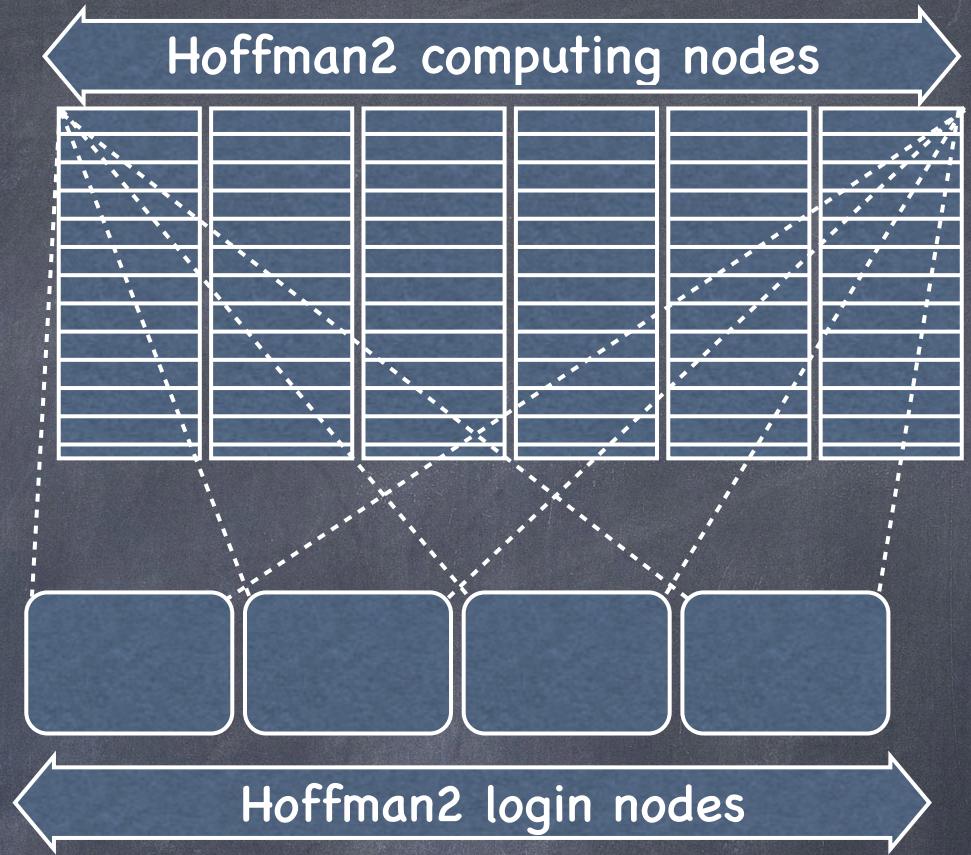
scp and sftp

For security reasons, Hoffman2 Cluster allows file transfer only with **scp** or **sftp** or **grid-ftp**. For the same reason, you should use an scp or sftp client on your local machine. You should not use the scp command on the cluster.

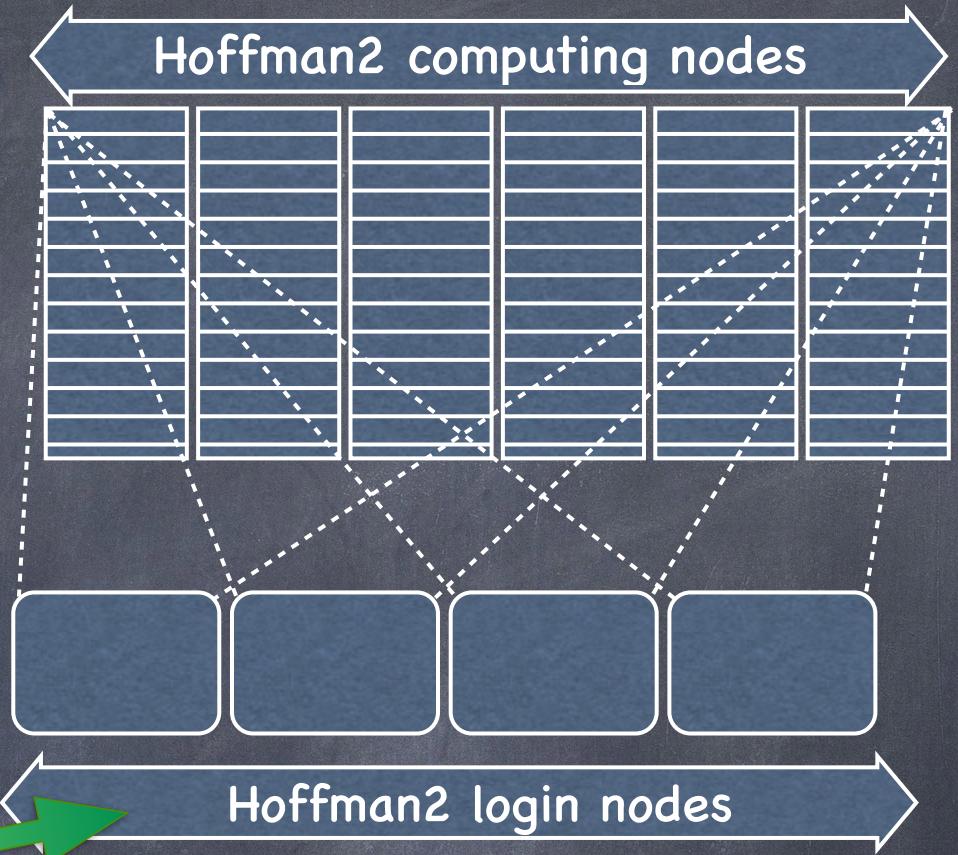
Using the Hoffman2 cluster: How?



Hoffman2 user



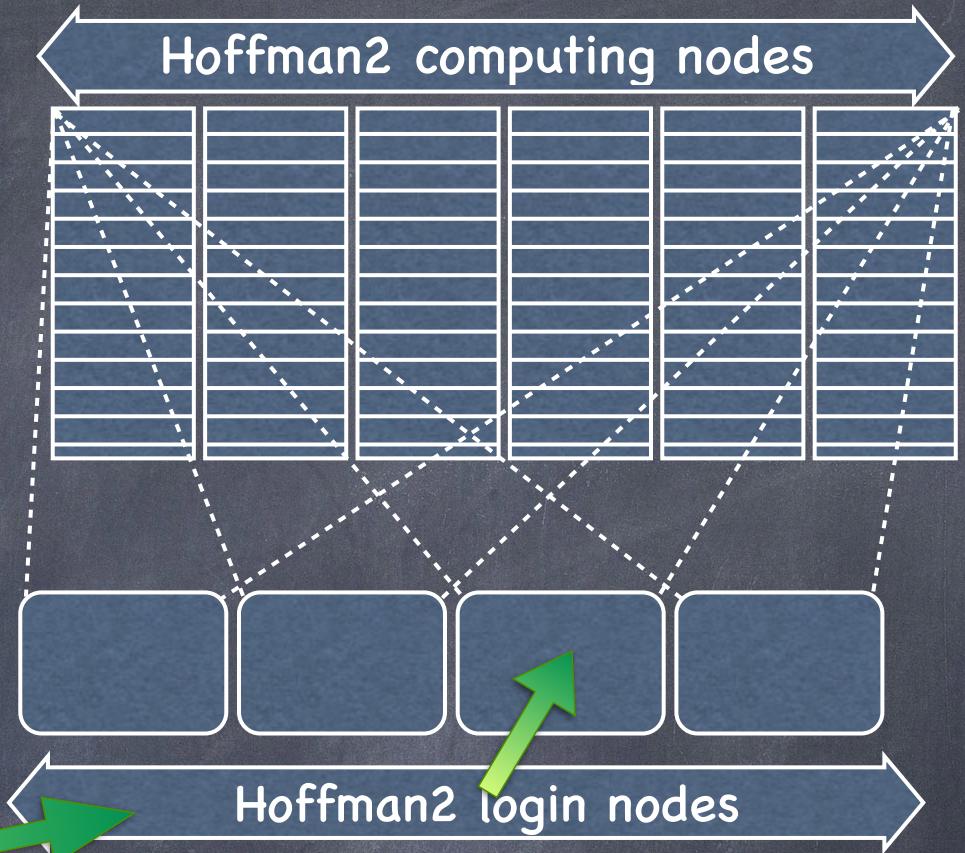
Using the Hoffman2 cluster: How?



Using the Hoffman2 cluster: How?



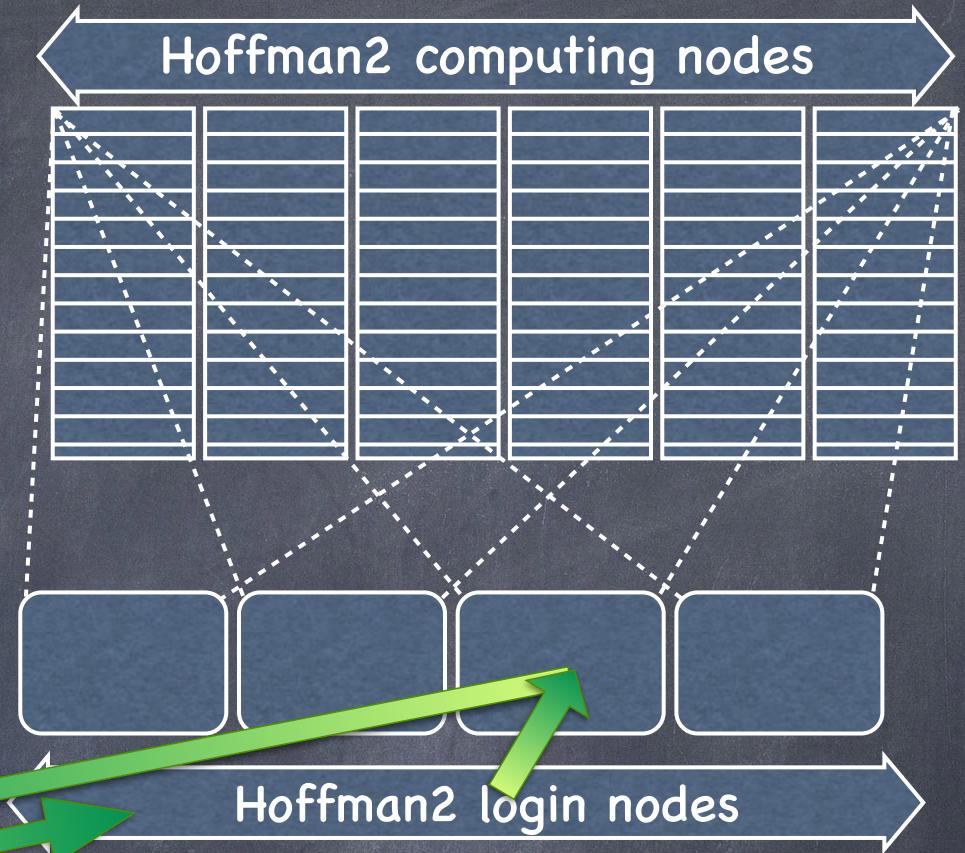
Hoffman2 user



Using the Hoffman2 cluster: How?



Hoffman2 user



Using the Hoffman2 cluster: How?

Unix command line

```
~ — rdtest@login1:~ — ssh -Y rdtest@hoffman2.idre.ucla.edu
Last login: Mon Oct  9 11:33:46 on ttys004
[dauria@alba:~> rdtest
[rdtest@hoffman2.idre.ucla.edu's password:
Warning: No xauth data; using fake authentication data for X11 forwarding.
Last login: Mon Oct  9 12:31:27 2017 from alba.ats.ucla.edu
Welcome to the Hoffman2 Cluster!

Hoffman2 Home Page:      http://www.hoffman2.idre.ucla.edu
Consulting:                https://support.idre.ucla.edu/helpdesk

All login nodes should be accessed via "hoffman2.idre.ucla.edu".

Please do NOT compute on the login nodes.

Processes running on the login nodes which seriously degrade others'
use of the system may be terminated without warning. Use qrsh to obtain
an interactive shell on a compute node for CPU or I/O intensive tasks.

The following news items are currently posted:

IDRE Fall 2017 HPC Classes
Stata 15 available
News Archive On Web Site

Enter shownews to read the full text of a news item.
[rdtest@login1 ~]$ Now what?
```

Using the Hoffman2 cluster: How?

Unix command line, a couple of handy commands

- navigation:

- ♦ ls

- ♦ ls -a

- ♦ ls -l

- ♦ ls -lat

- ♦ ls -latr

- ♦ cd \$SCRATCH

- ♦ pwd

- ♦ mkdir \$HOME/test; cd \$HOME/test

- ♦ pwd

Using the Hoffman2 cluster: How?

Unix command line, a few handy concepts

- environmental variables:
 - ♦ \$PATH
 - ♦ \$LD_LIBRARY_PATH
 - ♦ \$HOME
 - ♦ \$SCRATCH
- How to check the contents of an env var:
 - ♦ echo \$HOME

Using the Hoffman2 cluster: How?

Unix command line, a few handy commands:

- just look at a file (no editing):
 - ◆ `less $HOME/.bashrc`
 - ◆ `cat $HOME/.bashrc`
- look to the first few lines of a file:
 - ◆ `head $HOME/.bashrc`
 - ◆ `head -n 5 $HOME/.bashrc`
- look to the last few lines of a file:
 - ◆ `tail $HOME/.bashrc`
 - ◆ `tail -n 5 $HOME/.bashrc`
- look to the last few lines of a file on the fly:
 - ◆ `tail -f /u/local/licenses/LOGS/logit.matlab`
 - ◆ Control-C (to exit)

Using the Hoffman2 cluster: How?

Unix command line, a couple of handy commands

- editing w/out X11-forwarding enabled:
 - ◆ nano
 - ◆ emacs
 - ◆ vi
- editing w/ X11-forwarding enabled:
 - ◆ (nano)
 - ◆ gedit &
 - ◆ emacs &
 - ◆ gvim &