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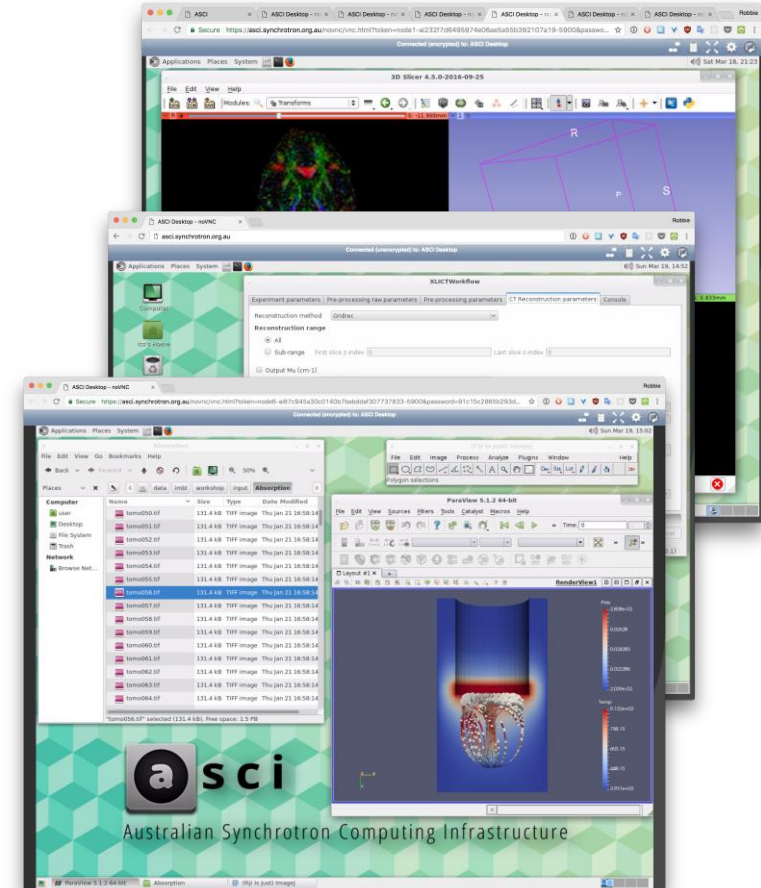
# ASCI: Australian Synchrotron Compute Infrastructure

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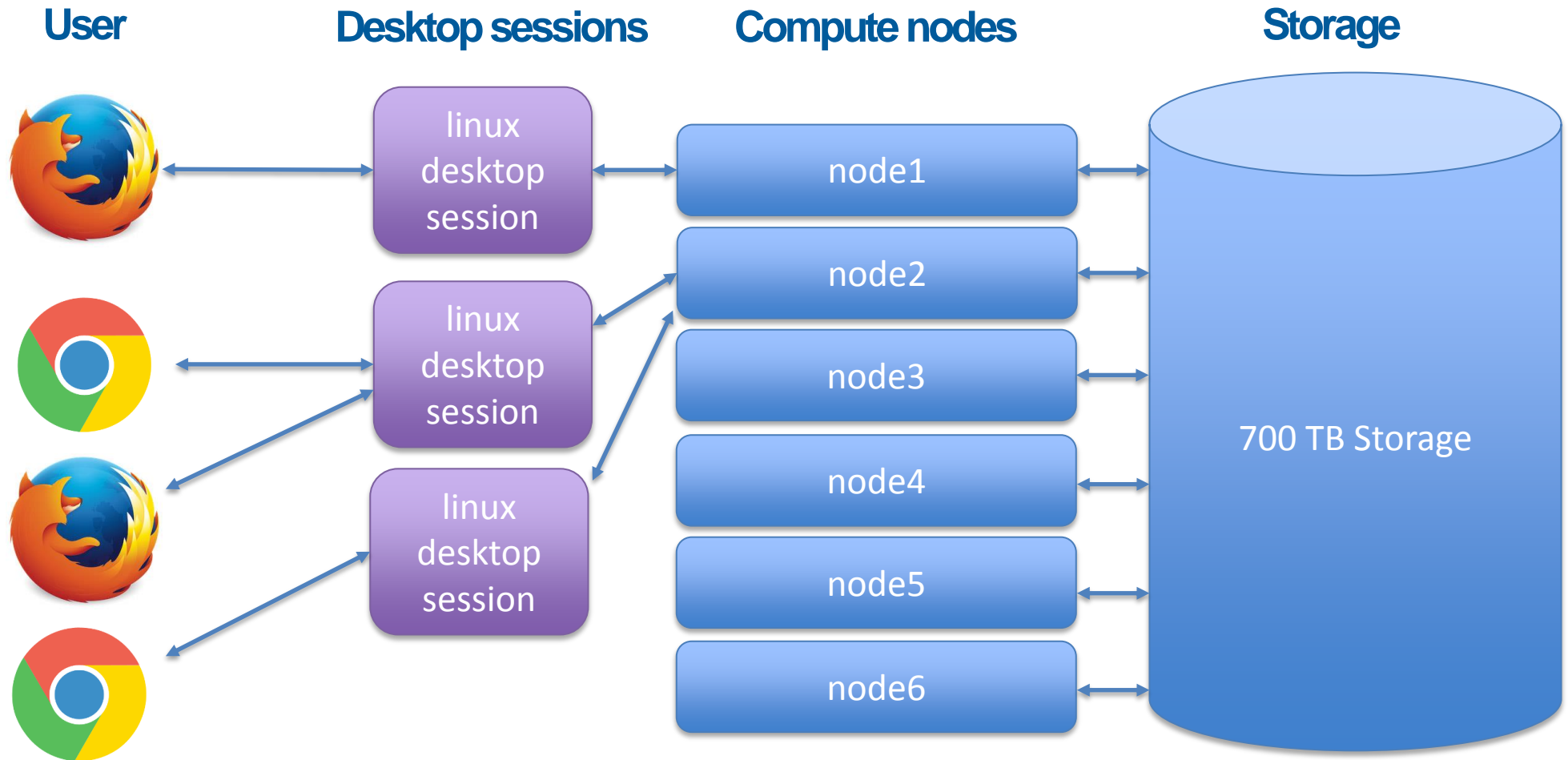
Robbie Clarken

# ASCI

- High performance computing platform
- Intuitive desktop interface
- Preconfigured processing environments
- Data instantly available
- No client-side configuration
- Accessible anywhere in the world



# System



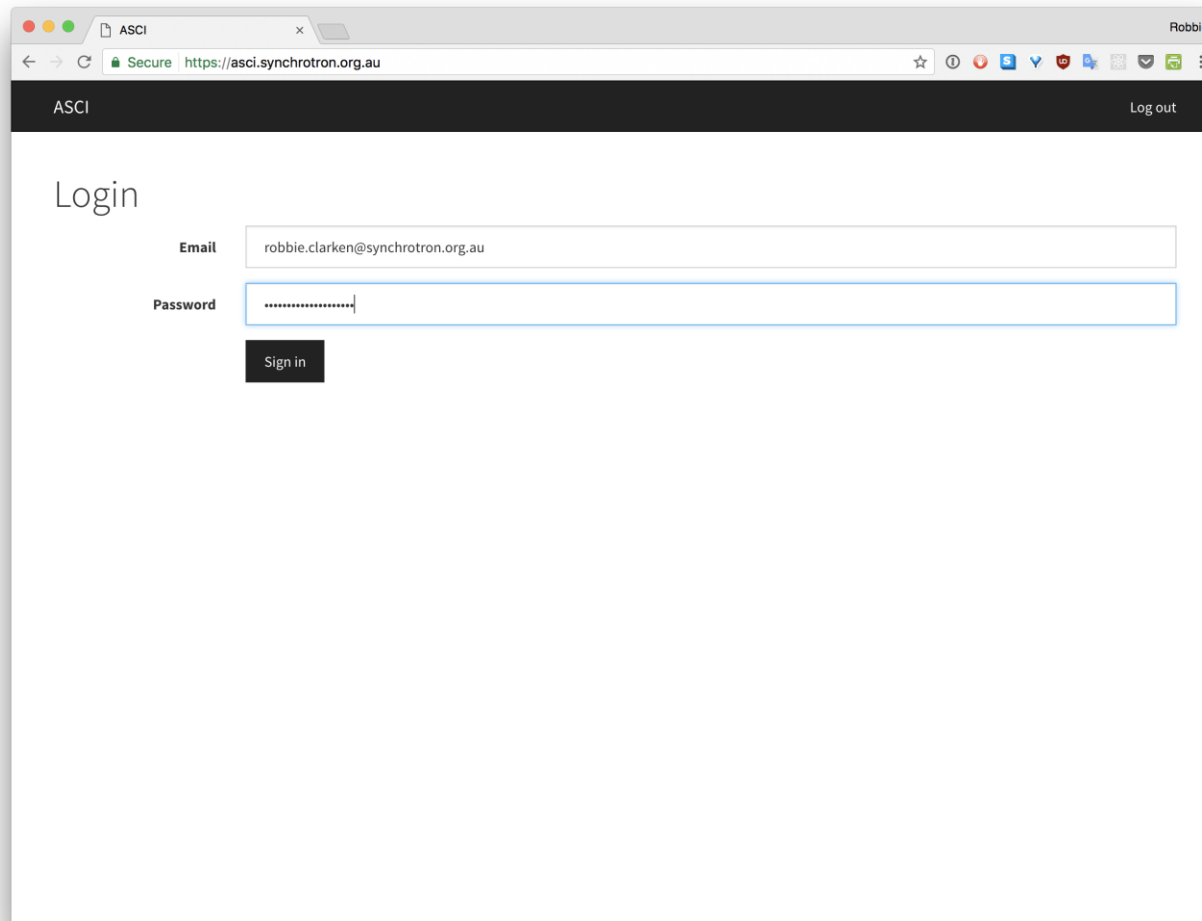
# Node Hardware

## Each node has:

- 2 x Intel Xeon E5-2650 v4
  - ❑ 12 cores / 2.2 GHz
  - ❑ With hyper-threading: 48 cores per node
- 2 x NVIDIA GeForce GTX 1080, 8GB
  - ❑ 5120 cuda cores per node
- 512 GB RAM
- 480 GB SSD per node
- 2-5 times faster than MASSIVE M1



# User Perspective



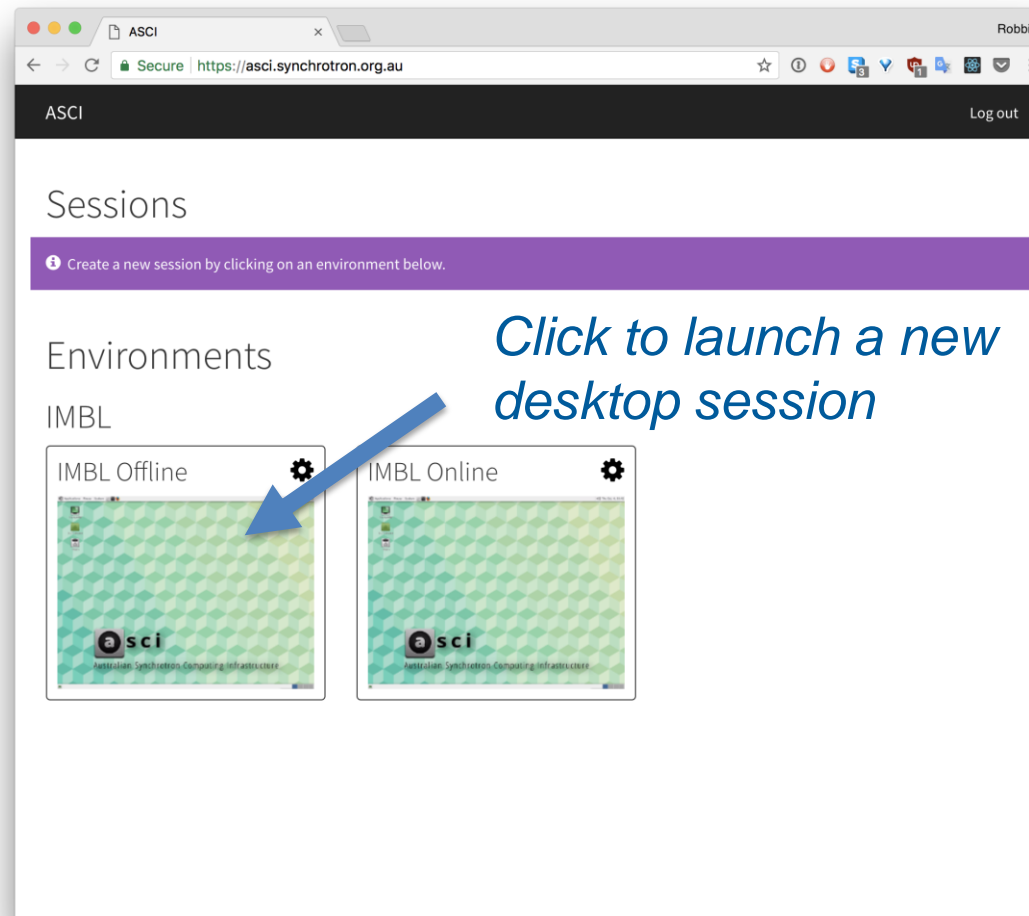
ASCI Log out

## Login

**Email**

**Password**

# User Perspective



ASCI Log out


## Sessions

Create a new session by clicking on an environment below.


### Environments

IMBL

#### IMBL Offline

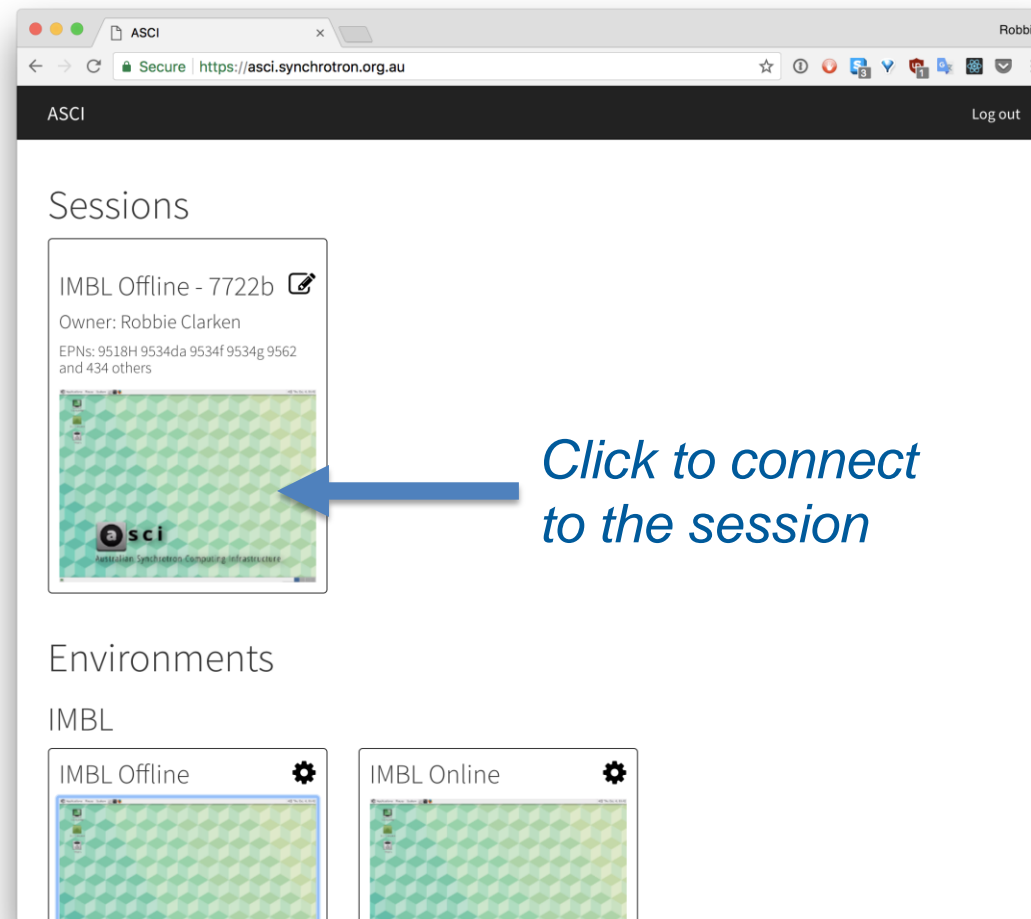


#### IMBL Online

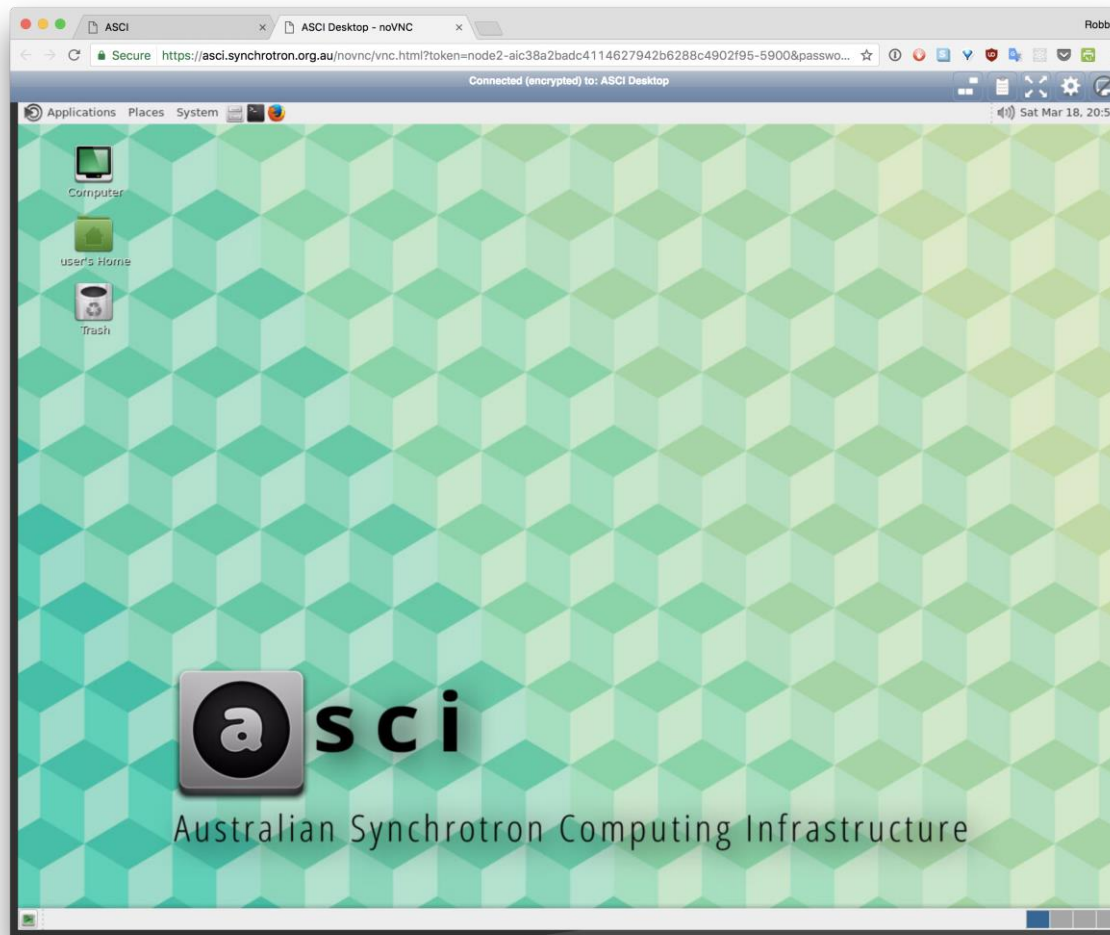


*Click to launch a new desktop session*

# User Perspective

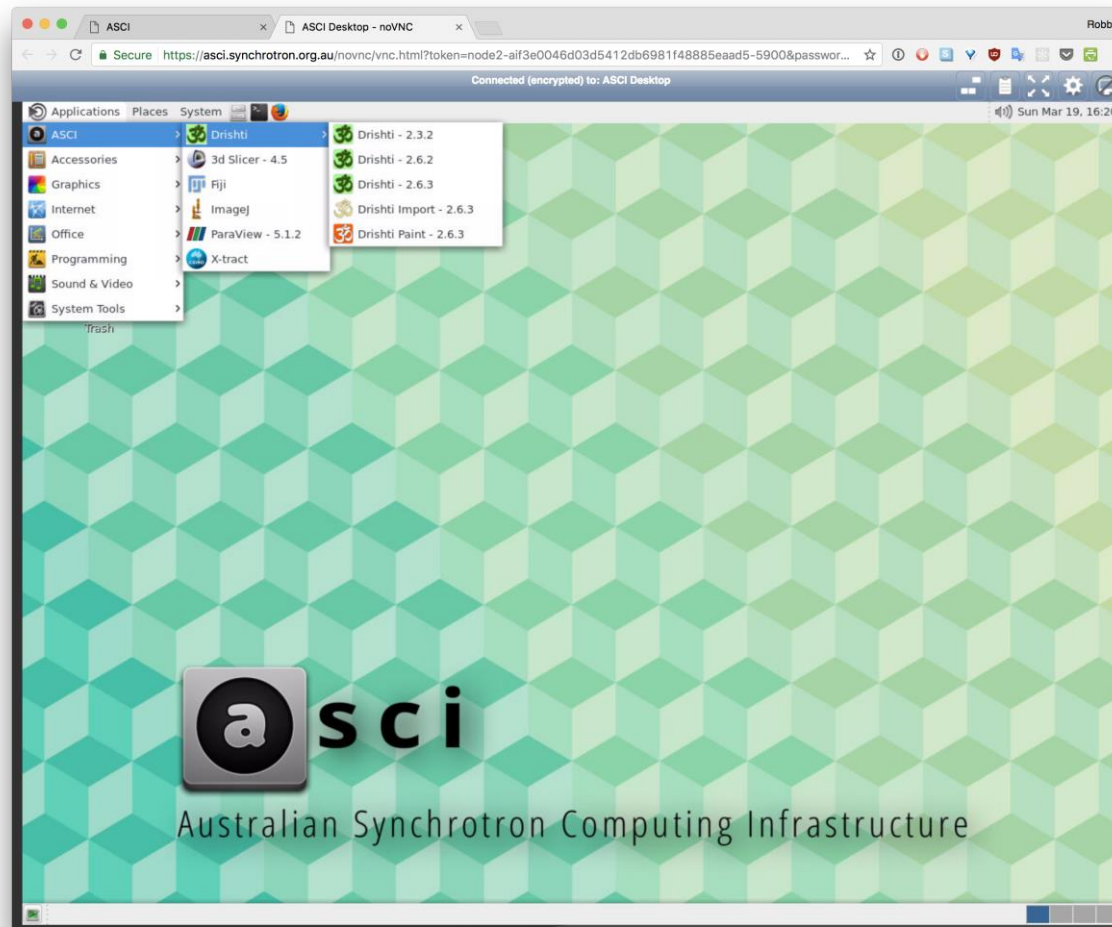


# User Perspective





# User Perspective



# Switching to full screen

1. Open a terminal
2. Enter the following command:

`asci-resolution WIDTH HEIGHT`

3. Hit Enter
4. Expand left menu
5. Click full screen button



# Where to find your data

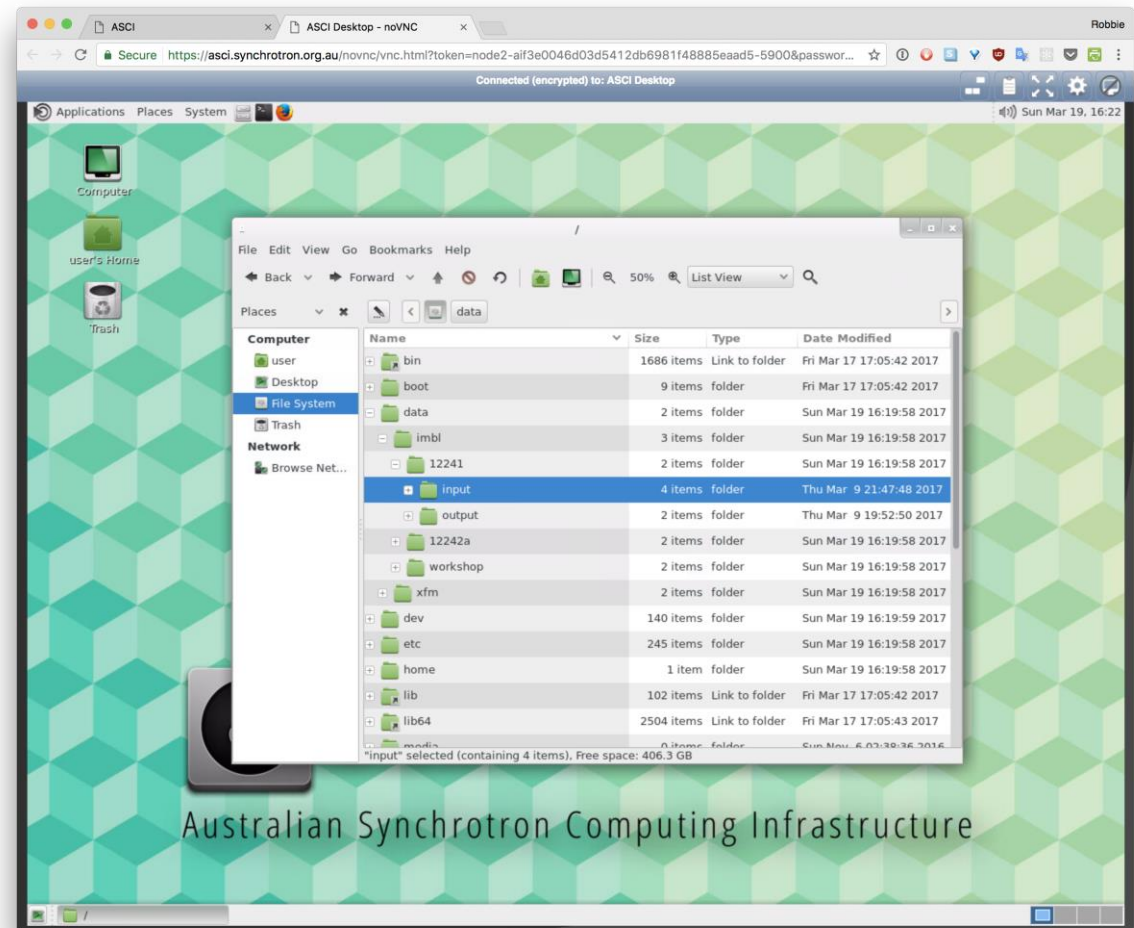
Data is found in

**`/data/<beamline>/<epn>`**

Eg:

**`/data/imbl/12241`**

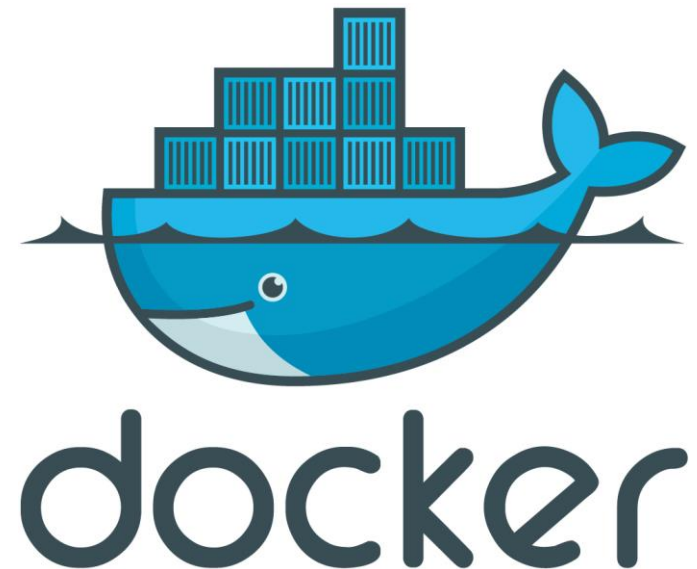
- **input** folder is readonly
- **output** folder is writable (applications should be set to write processed data here)



Australian Synchrotron Computing Infrastructure

# What is a “Session”

- Linux container running directly on the node
- Isolated process environment
- Processes have direct access to system resources (unlike VMs where there is an emulation layer)
- Low overhead → can run many sessions on the same node
- Sandboxed: users cannot read or write to files they haven't been given access to



# How long will a session last

- Up to a week: initially we plan to schedule maintenance on ASCI for every week
- As the system matures we will revisit this

## ***Note:***

- Changes made inside a container are not saved
- Only data stored inside the experiment folder will be persisted between sessions
- Save all scripts inside the experiment folder

## Session resources

- Nodes are allocated per beamline
- Ensure “online” experiment processing have sufficient resources
- All post-experiment IMBL processing will be allocated to a single node
- Sessions on this node will have full access to all RAM, CPU, GPU resources
- If resources become constrained we can add more nodes

node1: IMBL Online

node2: IMBL Offline

node3: XFM Online

node4: XFM Offline

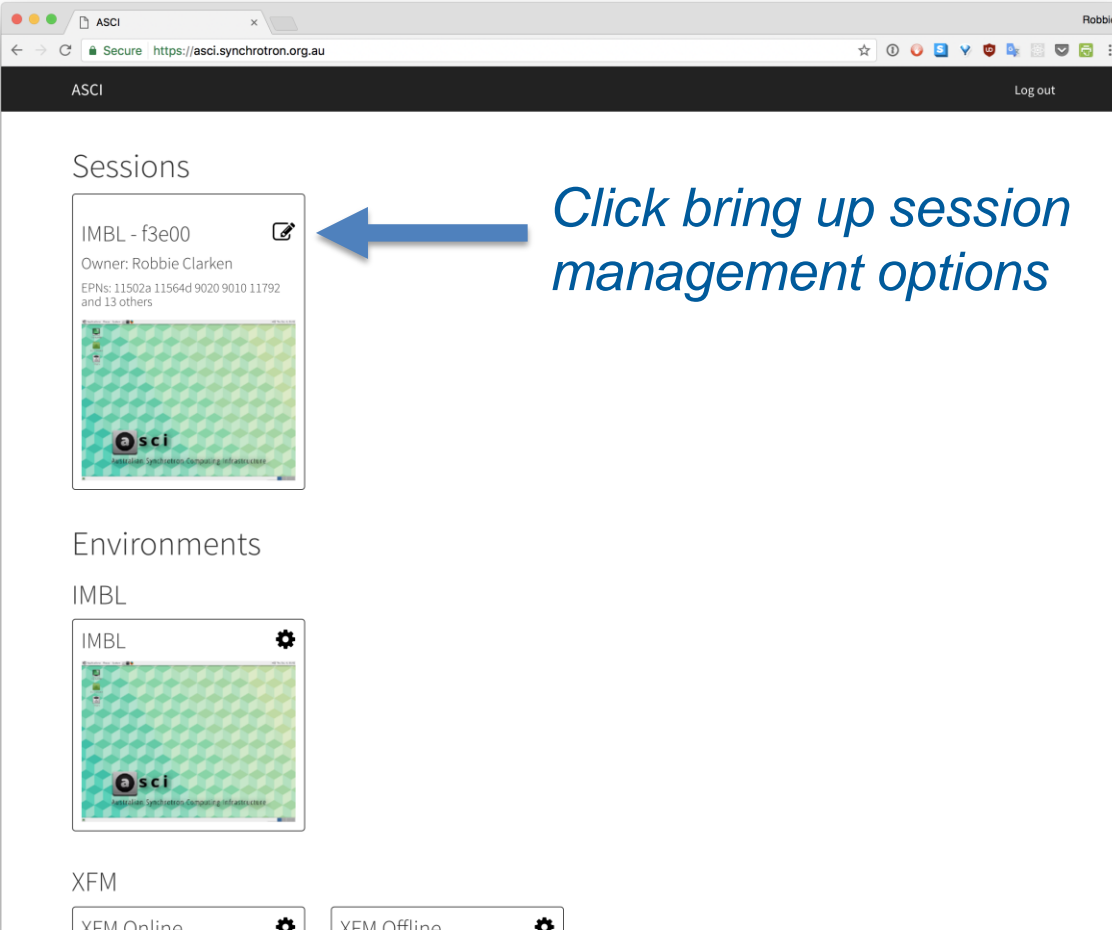
node5: MX2

node6: MX2

# Session management

- The user who creates the session is the “owner”
- Initially only the owner can connect to the session
- Owner can share the session with any other ASCL user
- When multiple users connect, they each see the same desktop
- Both users can control the mouse cursor and enter keyboard input

# Sharing a session



The screenshot shows a web browser window with the URL <https://asci.synchrotron.org.au>. The page title is "ASCI" and the user is logged in as "Robbie". The main content area is titled "Sessions" and lists a session named "IMBL - f3e00". The session details include the owner "Robbie Clarken" and EPNs "11502a 11564d 9020 9010 11792 and 13 others". A thumbnail image of the session is shown below the details. A blue arrow points to the session card with the text "Click bring up session management options". Below the "Sessions" section is the "Environments" section, which lists "IMBL" with a thumbnail image. At the bottom is the "XFM" section, which has two buttons: "XFM Online" and "XFM Offline", each with a gear icon.

Sessions

IMBL - f3e00

Owner: Robbie Clarken

EPNs: 11502a 11564d 9020 9010 11792 and 13 others

Environments

IMBL

XFM

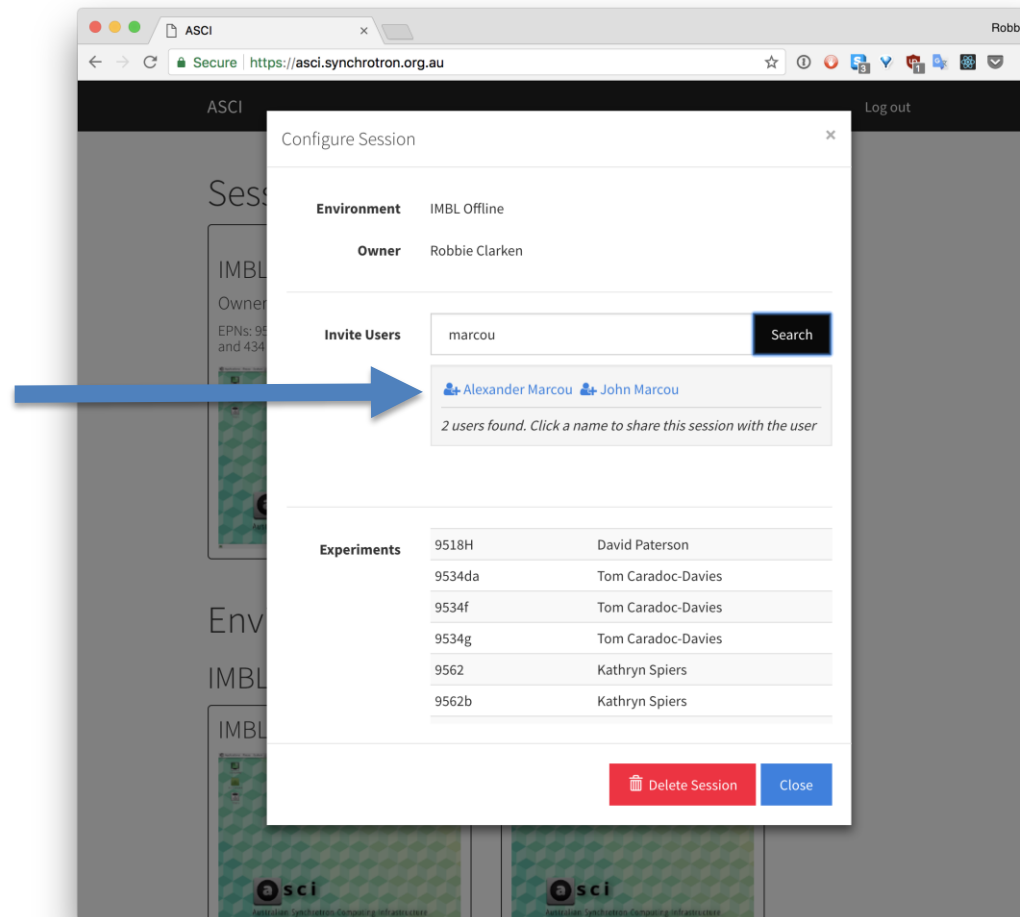
XFM Online XFM Offline

*Click bring up session management options*



# Sharing a session

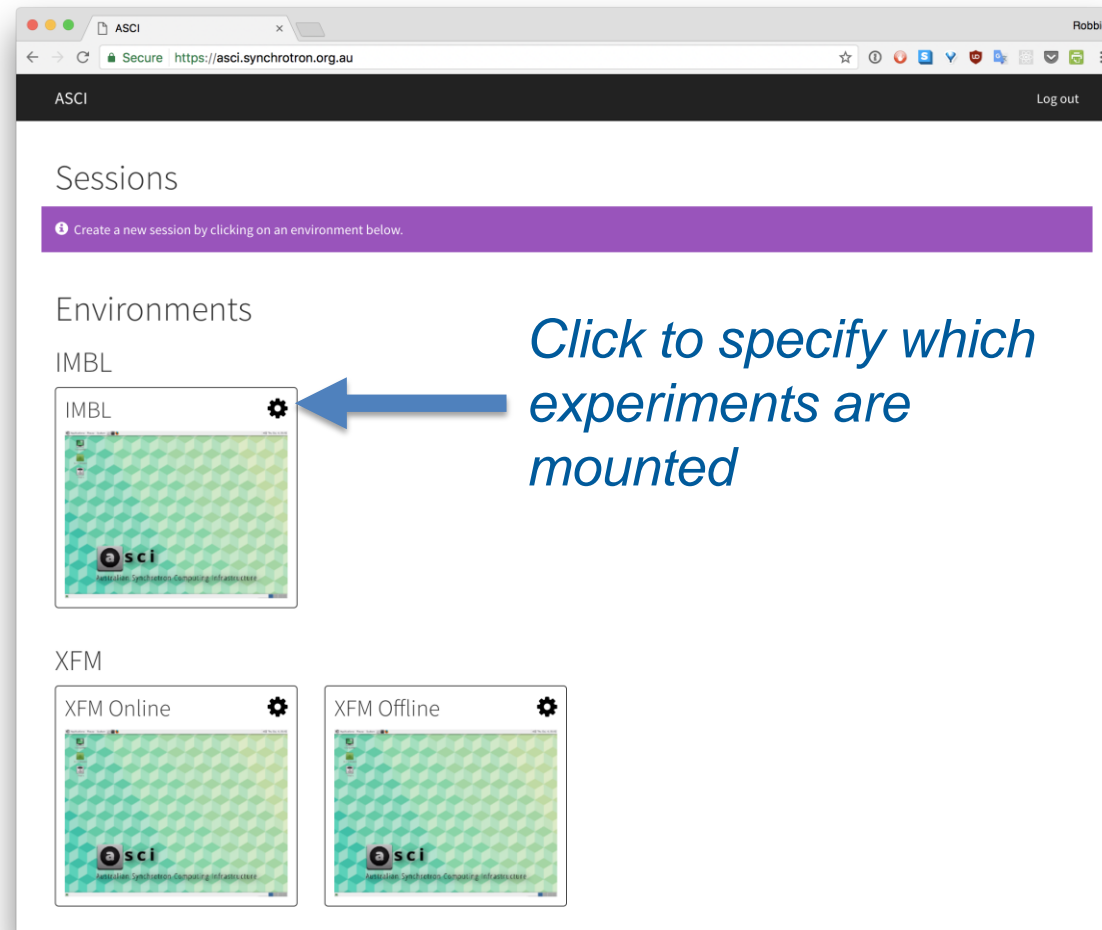
*Search for users  
and click their  
name to share*



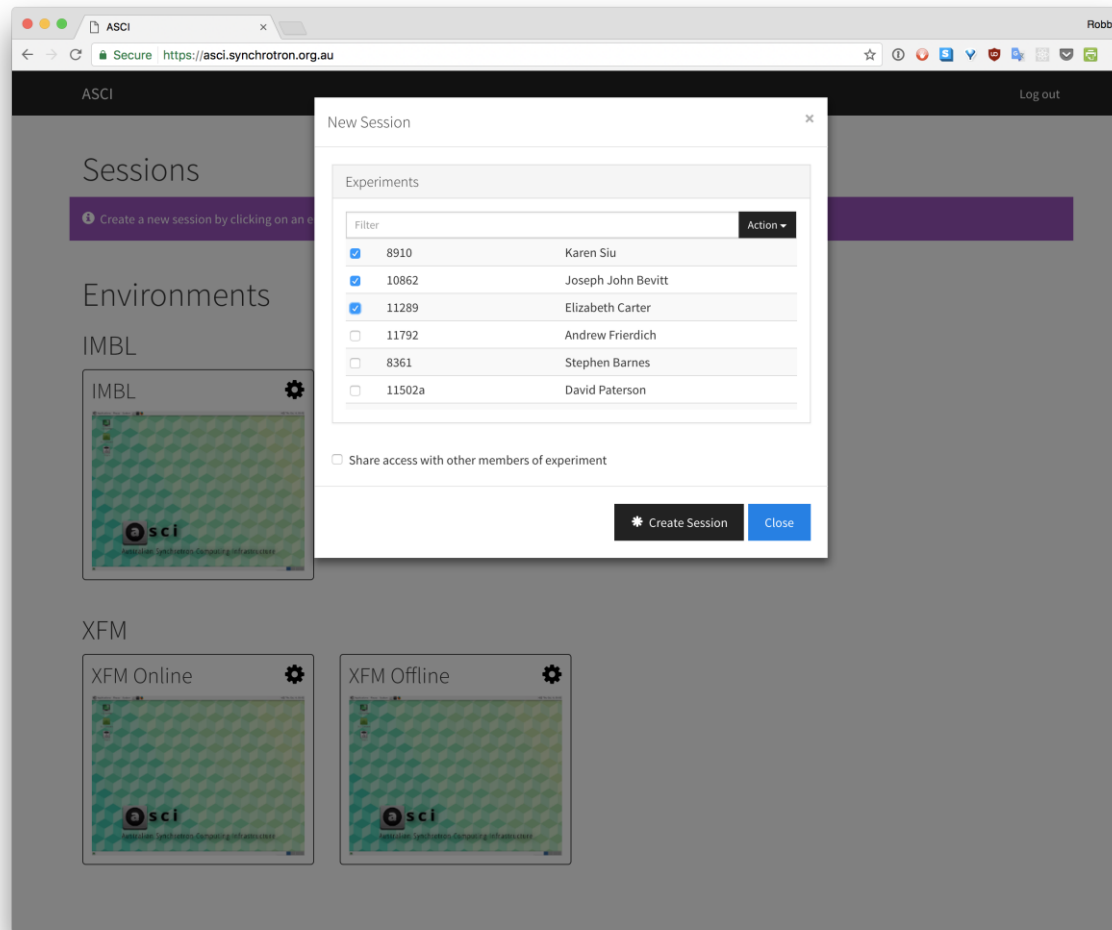
# Experiment data

- By default, every experiment you are a member of is mounted
- When you share a session you are granting the other user access to every experiment you have mounted
- If you want to restrict which experiments are mounted you must do it before creating the session

# Controlling which experiments are mounted



# Controlling which experiments are mounted



# What is an “Environment”

- Defines the software available inside the session
- Supports versioning to facilitate reproducing analysis
- IMBL environment has:
  - ☐ X-TRACT
  - ☐ Drishti
  - ☐ ctas
  - ☐ Fiji
  - ☐ Python
  - ☐ ITK
  - ☐ ParaView
  - ☐ 3D Slicer
  - ☐ VolView
  - ☐ Meshlab
- Additional software can be added upon request
- Software needs to run on Linux or under Wine

# Conclusion

## Future of ASCI

- Batch job submission
- Alternative interfaces such as Jupyter Notebooks
- Windows desktops

## We need your feedback

- When filling out user survey
- [ascidev@synchrotron.org.au](mailto:ascidev@synchrotron.org.au)

Slides at: <https://goo.gl/GgXZ6E>