



Australian Government



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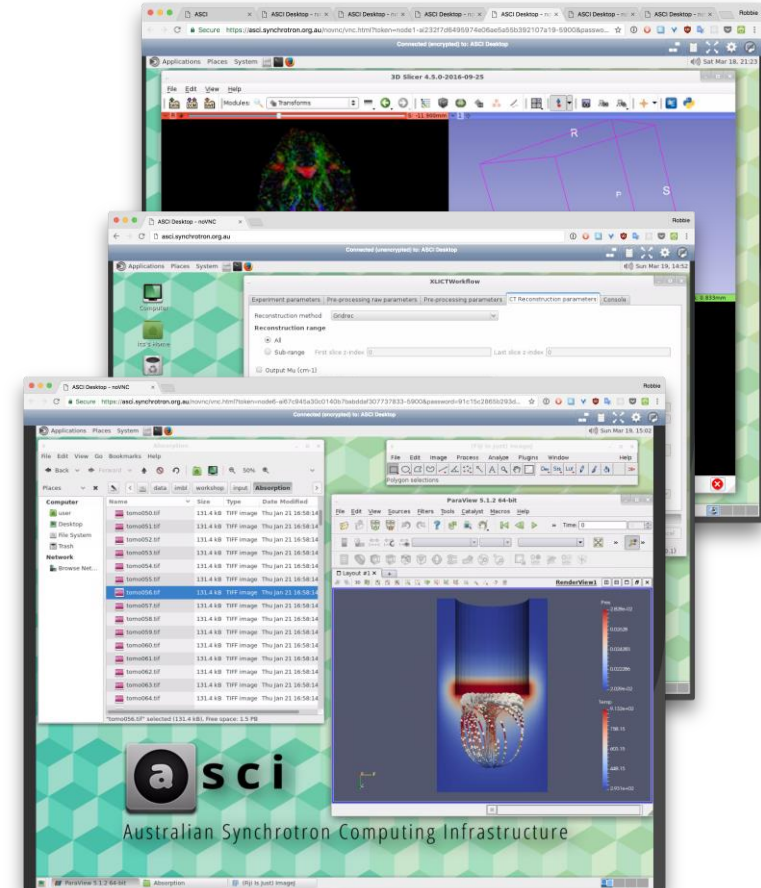
# ASCI: Australian Synchrotron Compute Infrastructure

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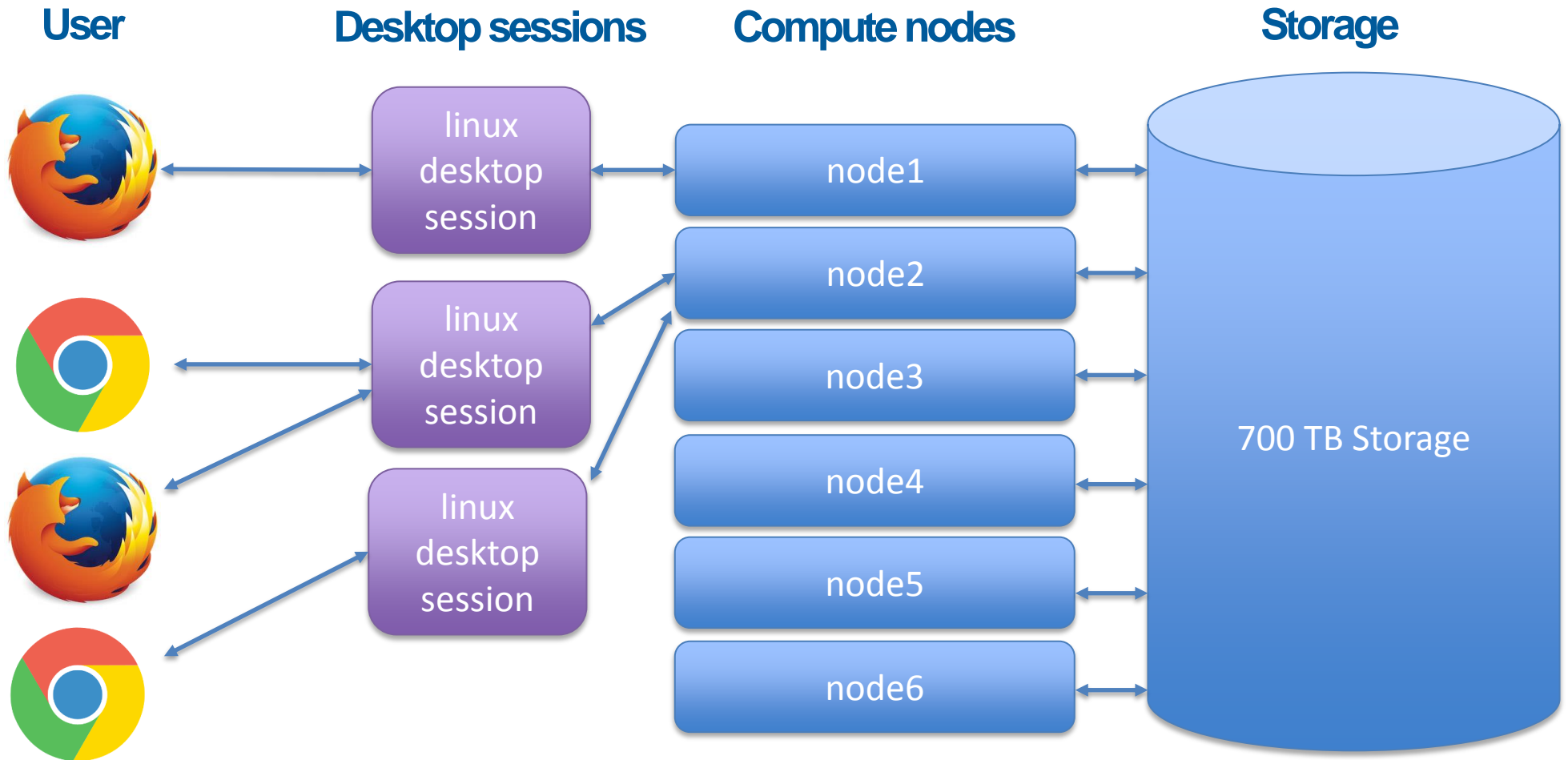
John Marcou

# ASCI

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



# System



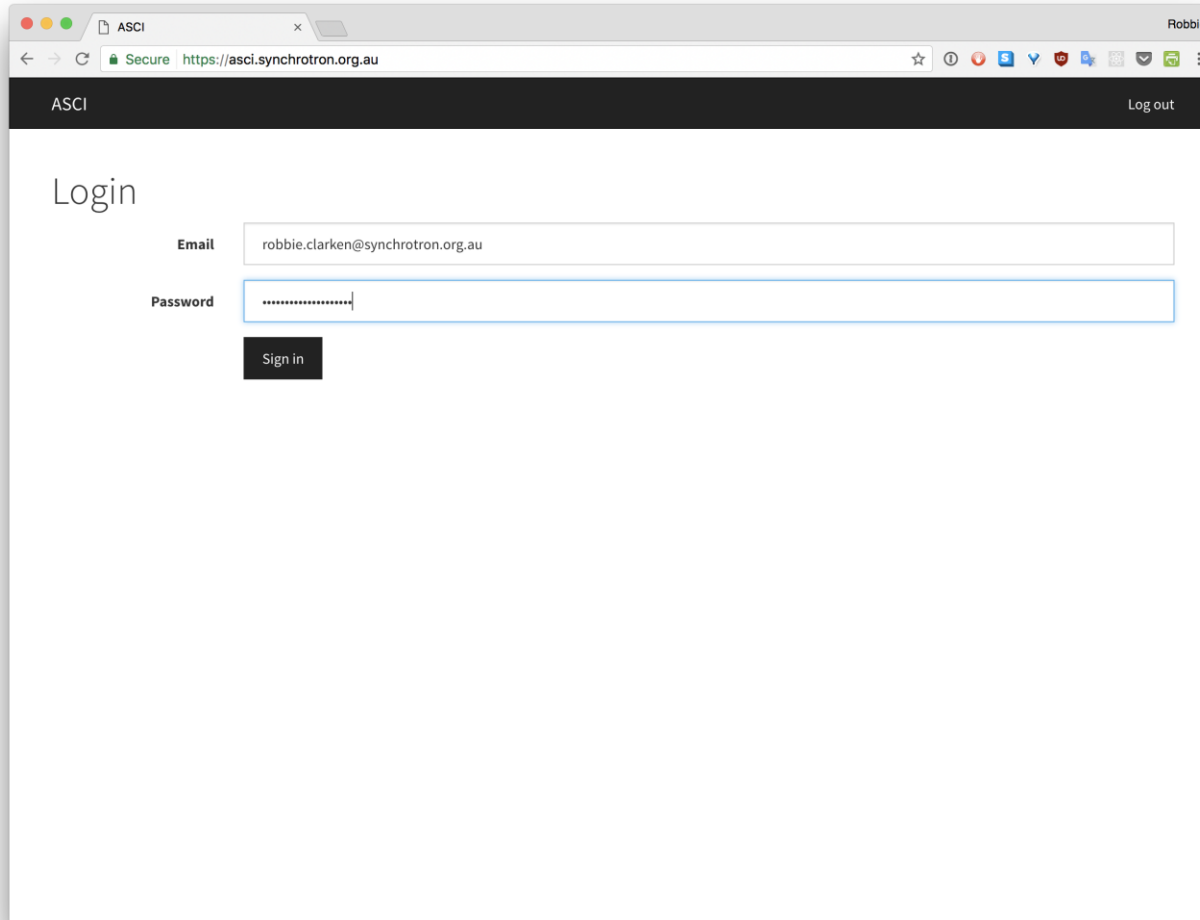
# Node Hardware

## 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

Robbie

Secure <https://asci.synchrotron.org.au>

ASCI [Log out](#)

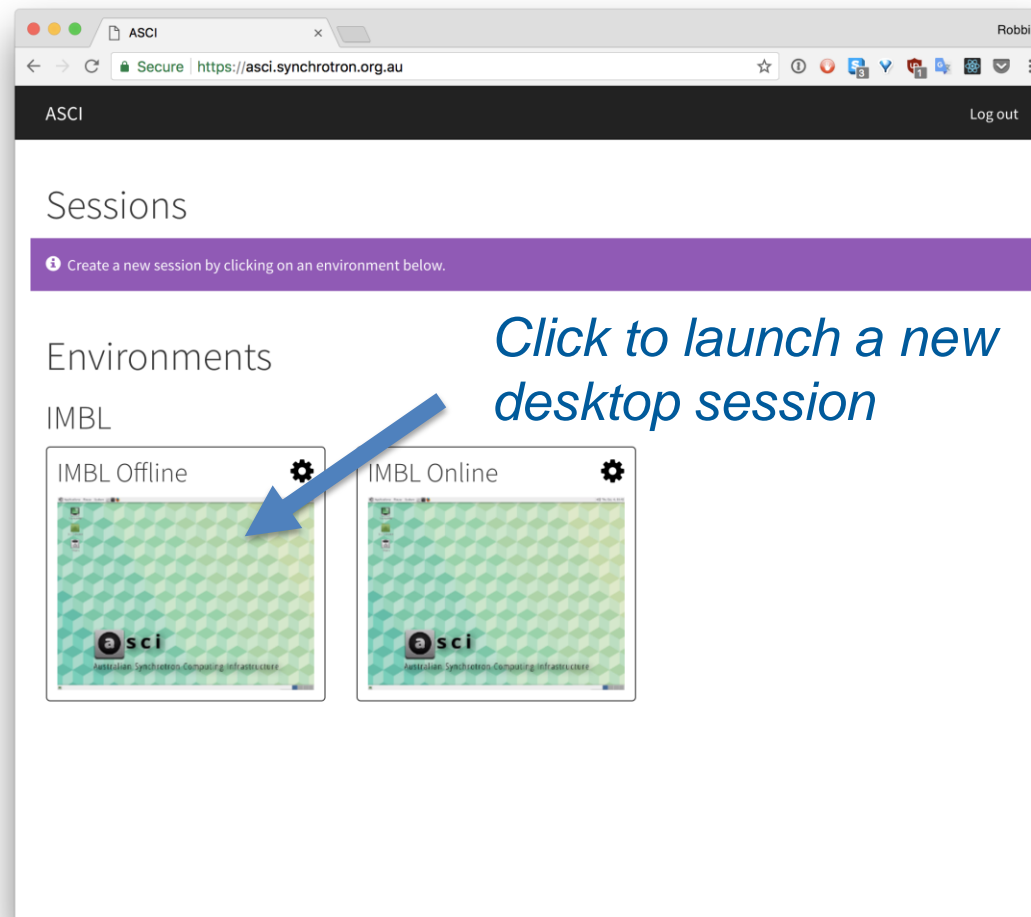
## Login

**Email**

**Password**

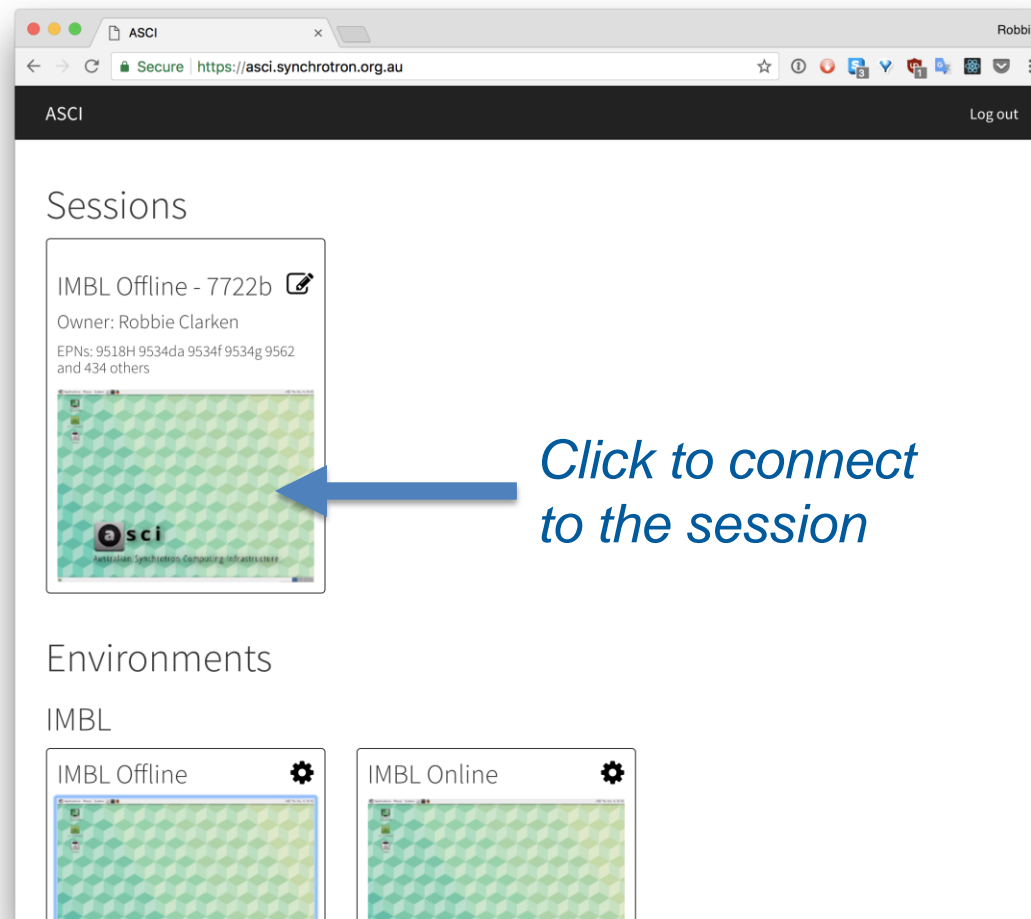
[Sign in](#)

# User Perspective

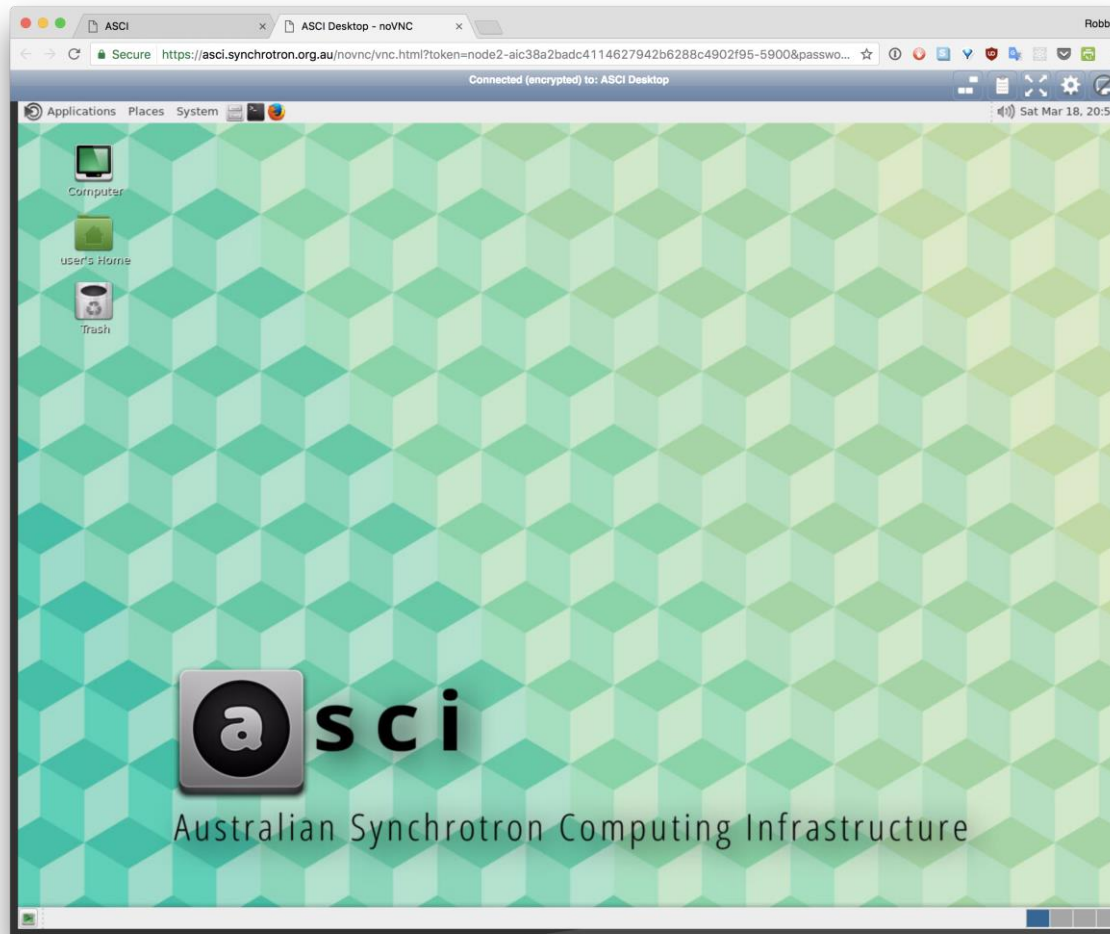


*Click to launch a new desktop session*

# User Perspective

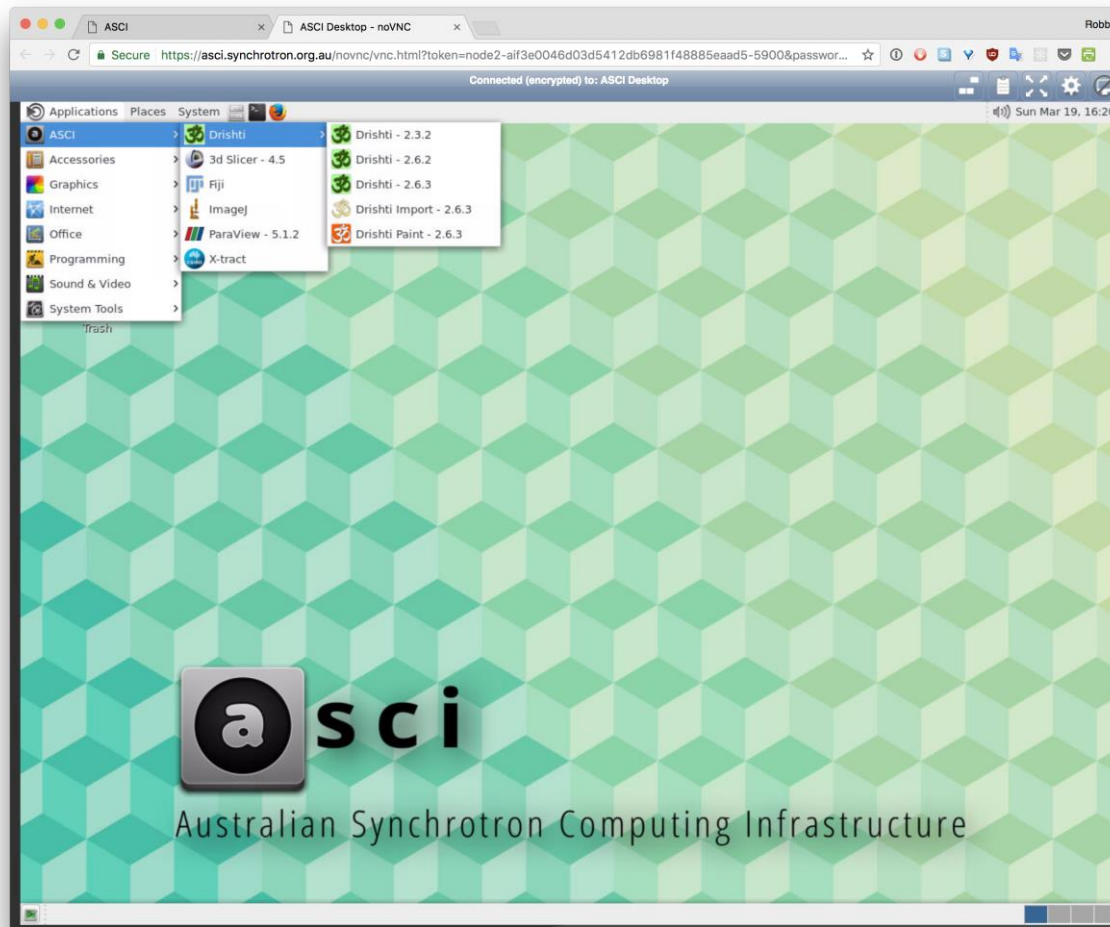


# User Perspective





# 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

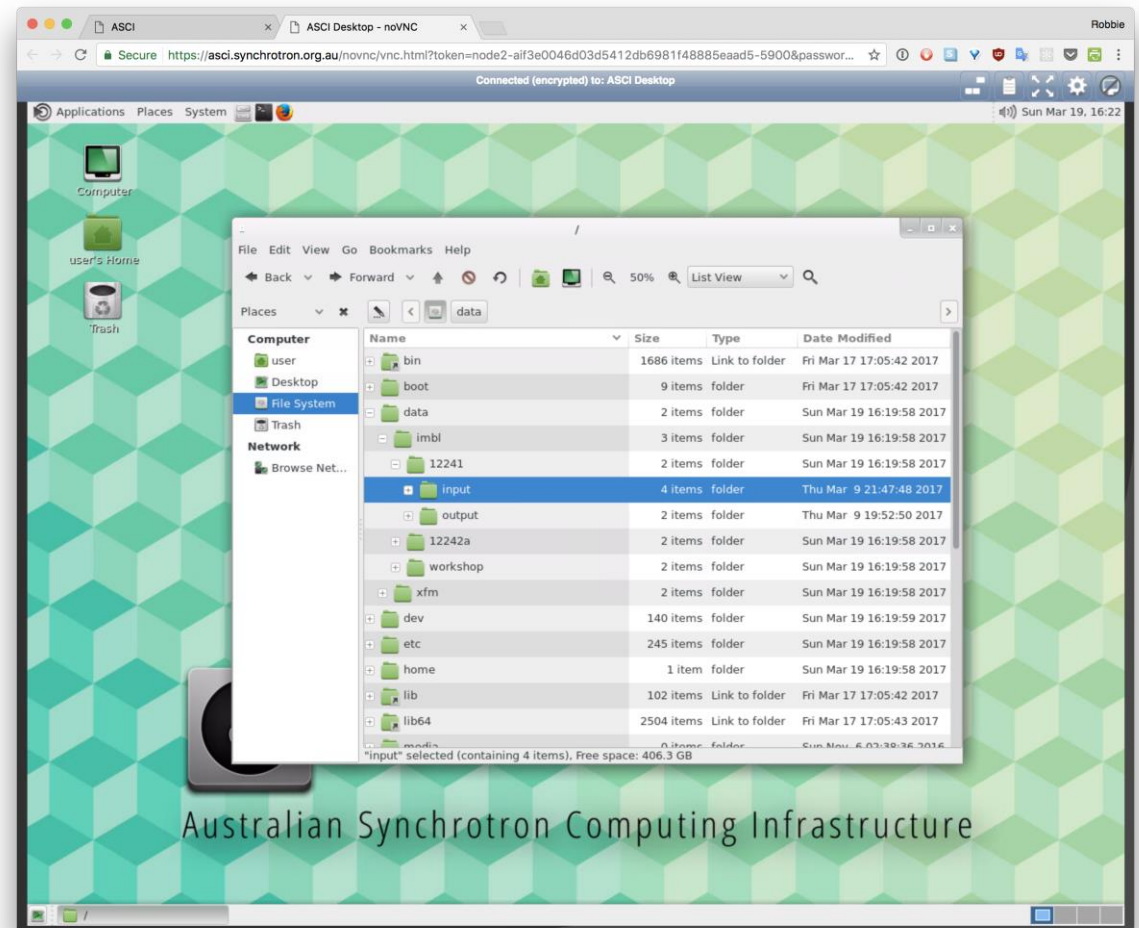
Data is found in

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

Eg:

`/data/imbl/12241`

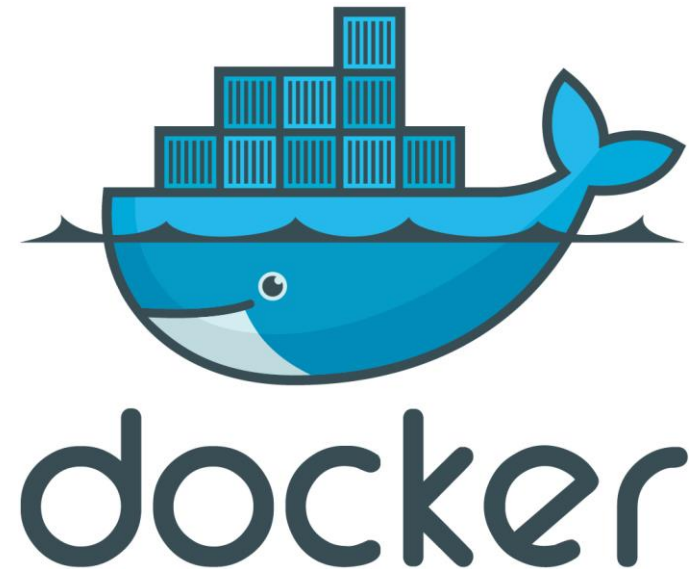
- **input** folder is readonly
- **output** folder is writable (applications should be set to write processed data here)



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

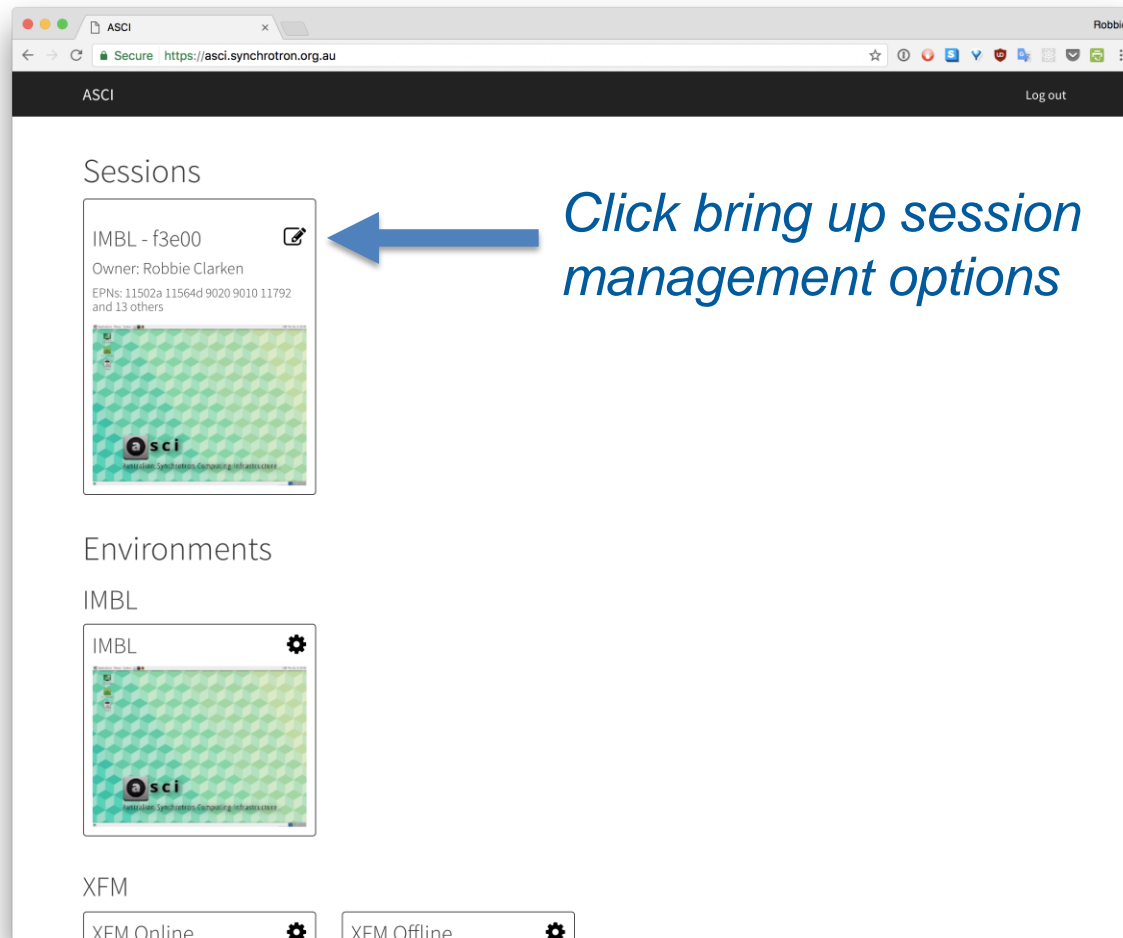
node5: MX2

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 ASCI 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

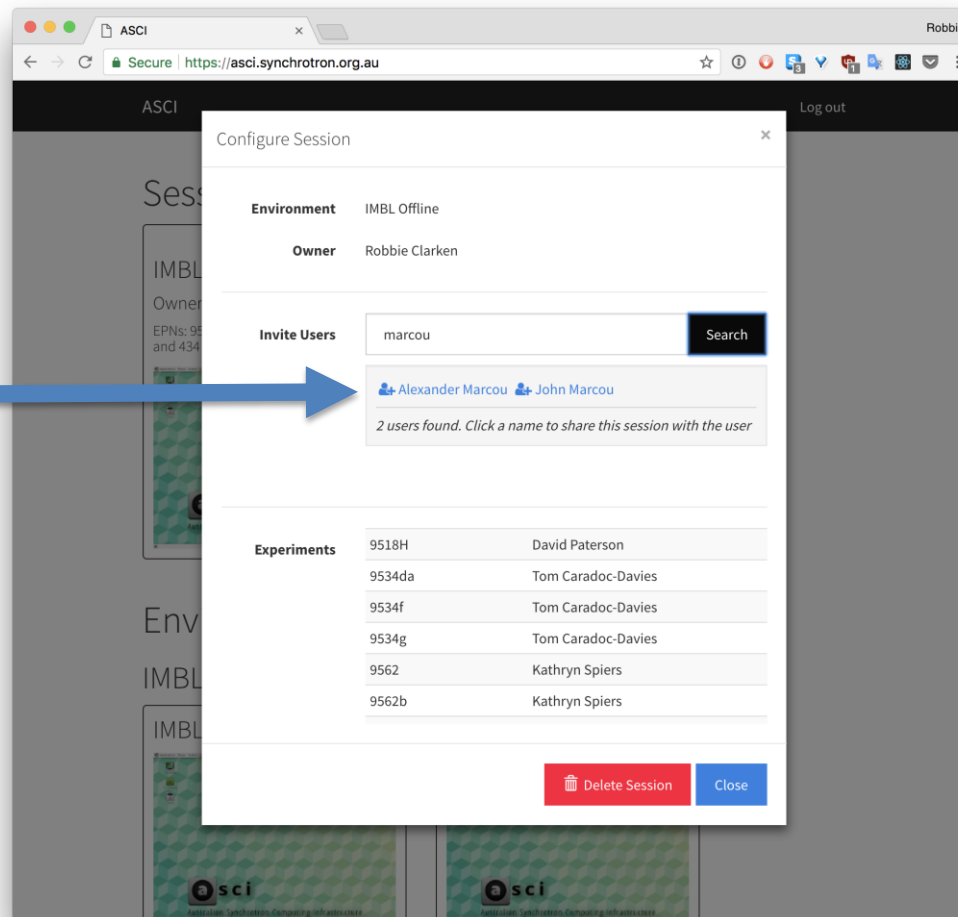


The screenshot shows a web browser window with the URL <https://asci.synchrotron.org.au>. The page title is "ASCI" and the user is logged in as "Robbie". The main content area is titled "Sessions" and lists a session named "IMBL - f3e00". The session details include the owner "Robbie Clarken" and EPNs: "11502a 11564d 9020 9010 11792 and 13 others". A blue arrow points to a small icon in the top right corner of the session card, which is labeled with the text "Click bring up session management options". Below the "Sessions" section, there are sections for "Environments" (IMBL) and "XFM" (XFM Online and XFM Offline), each with a gear icon for settings.



# Sharing a session

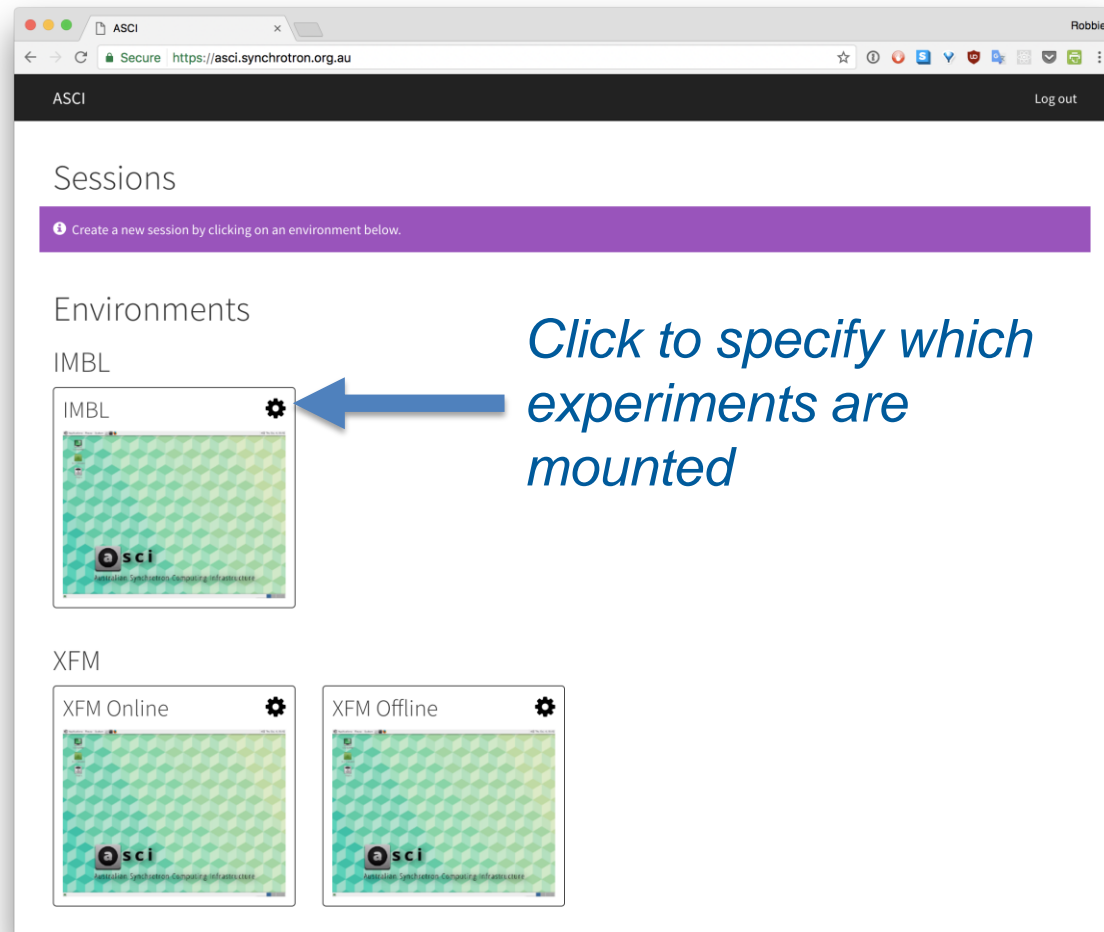
*Search for users  
and click their  
name to share*



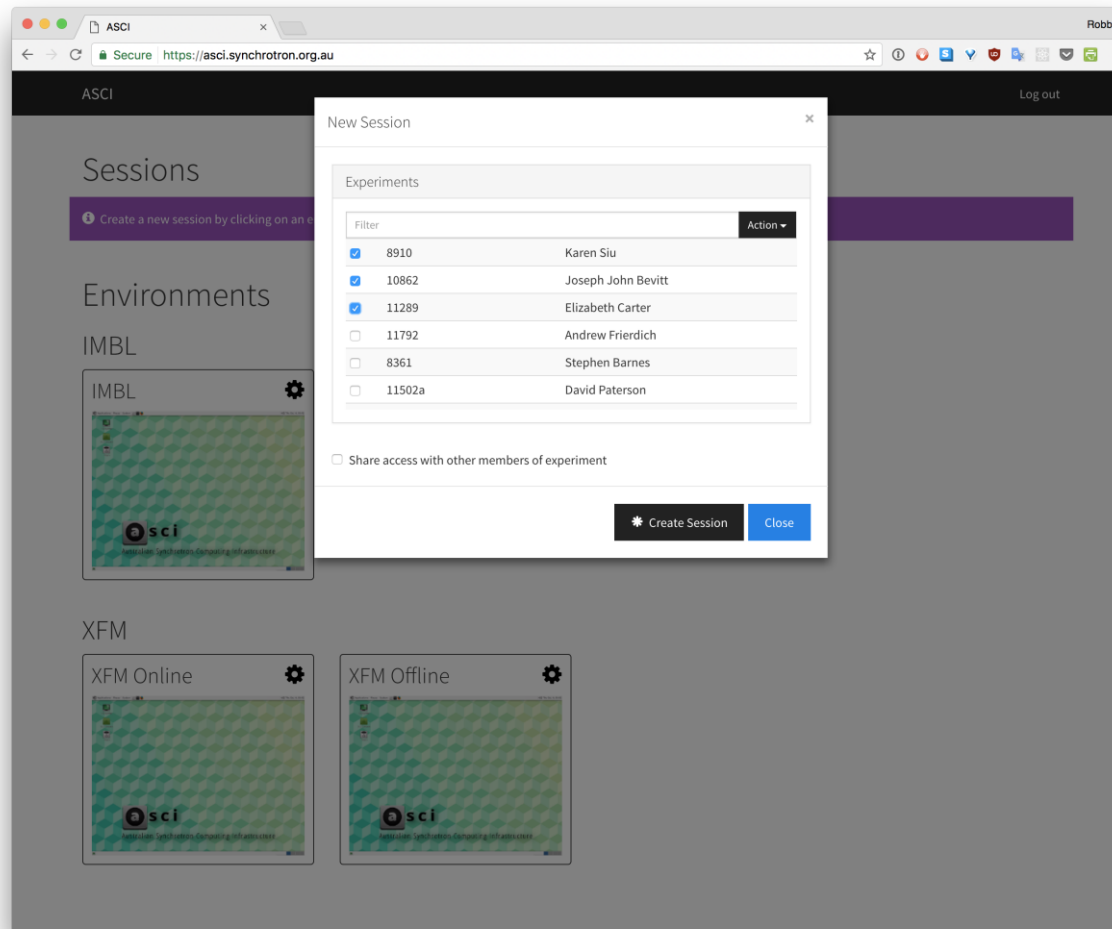
# Experiment data

- 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>