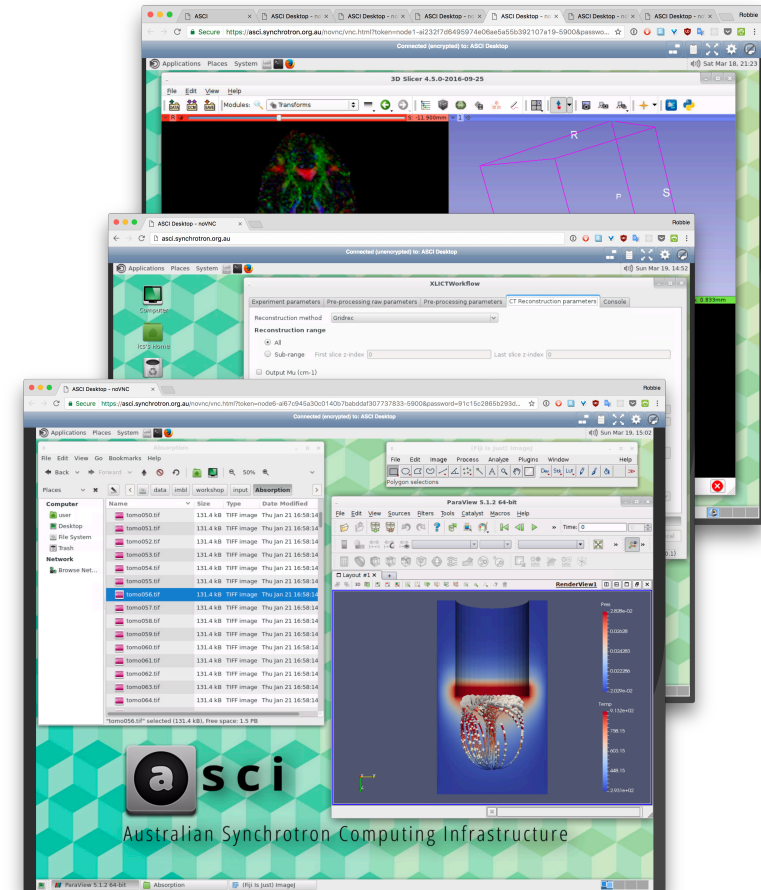




ASCI: Australian Synchrotron Compute Infrastructure

ASCI

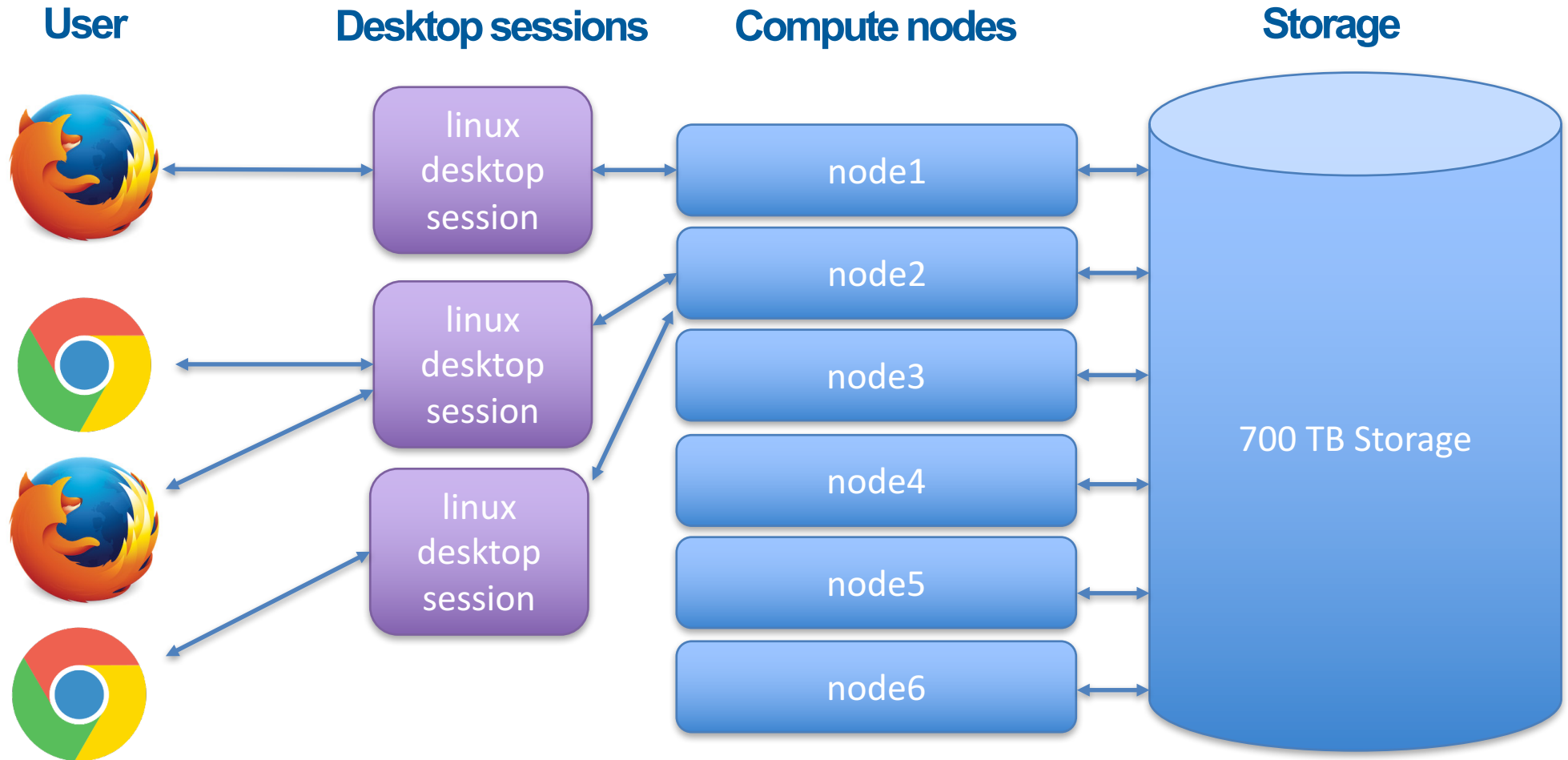
- New high performance compute infrastructure
- Will support:
 - Data processing during experiment
 - Post-experiment processing
- Familiar desktop environment for processing and visualisation backed by powerful compute hardware



Motivation

- MASSIVE M1 cluster hardware is reaching end of life
- Increase flexibility:
 - develop new processing workflows
 - support new applications
- Provide the same processing environment during experiment as post-experiment
- Avoid issues with user authentication and permissions
- Integrating the storage with the compute hardware will increase performance

System



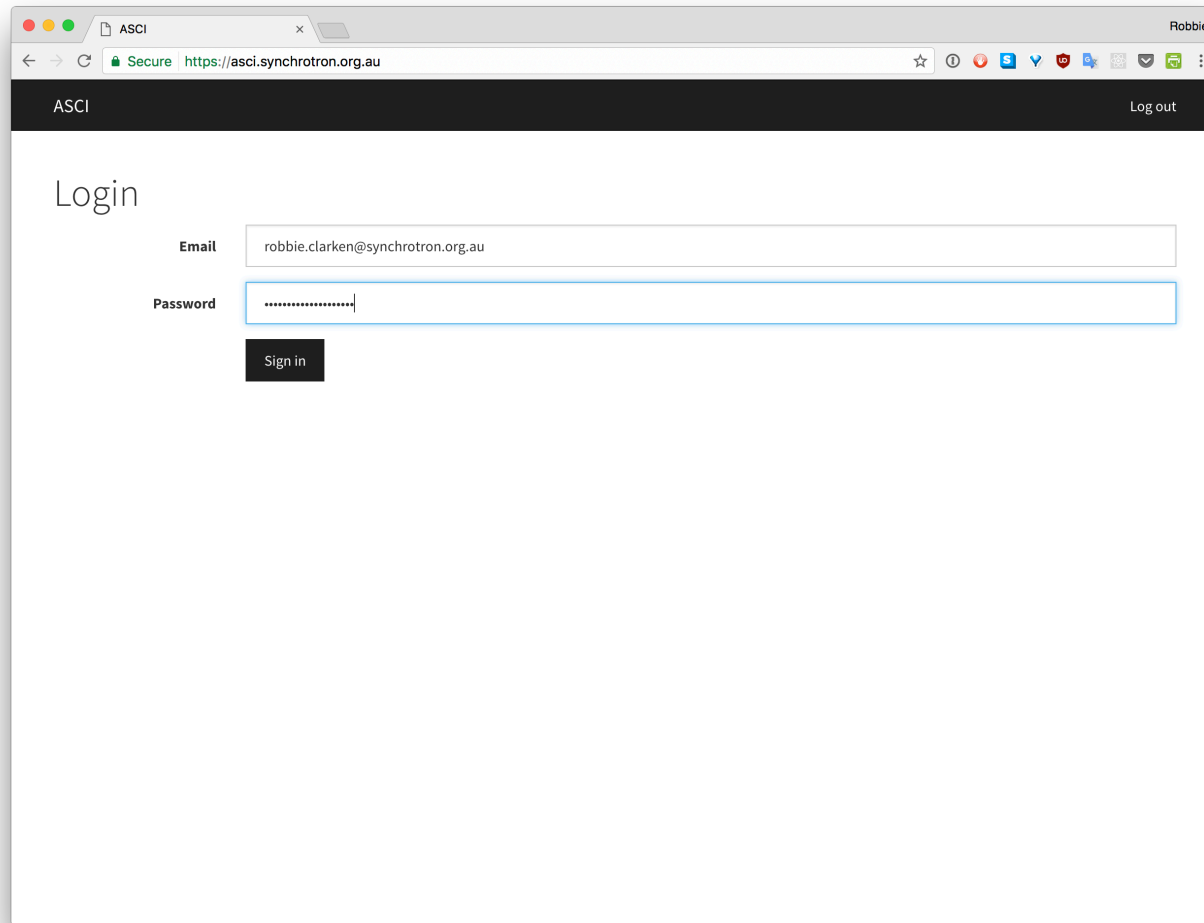
Node Hardware

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



User Perspective



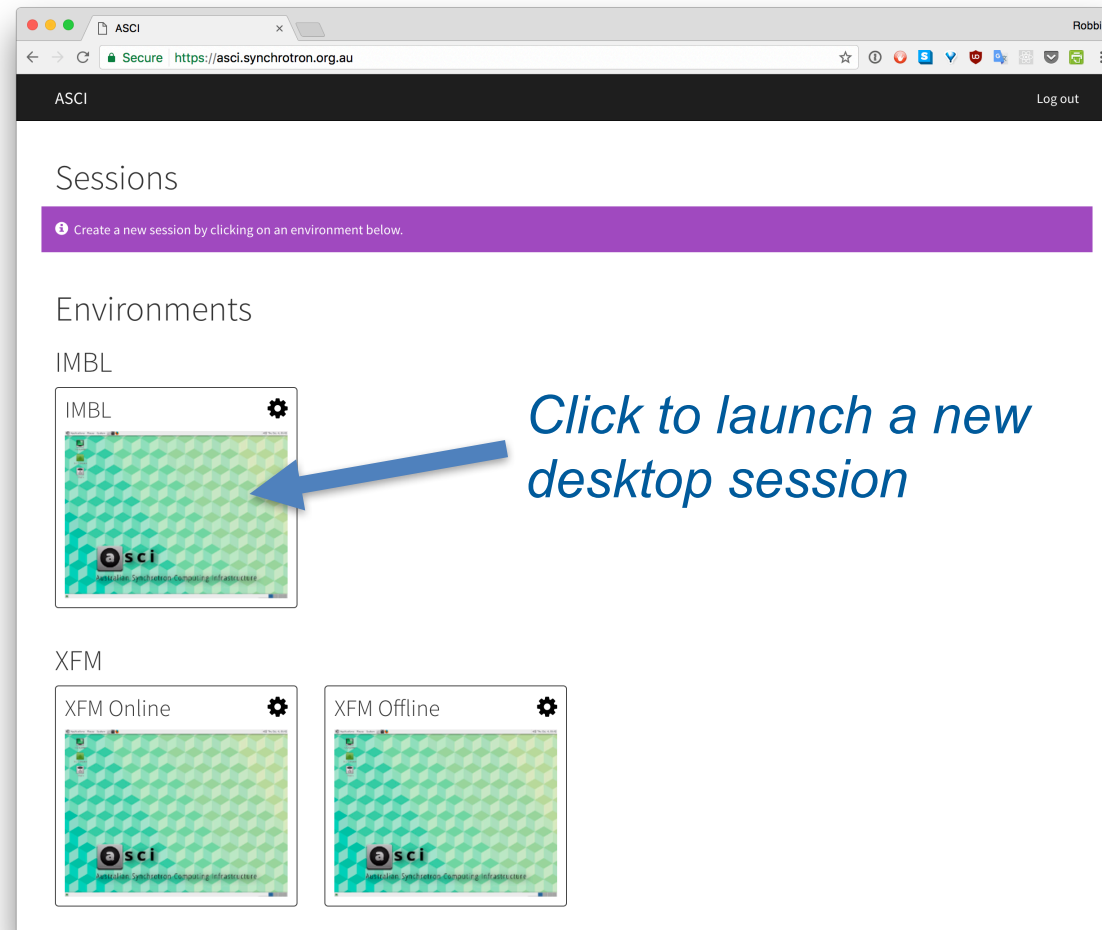
ASCI Log out

Login

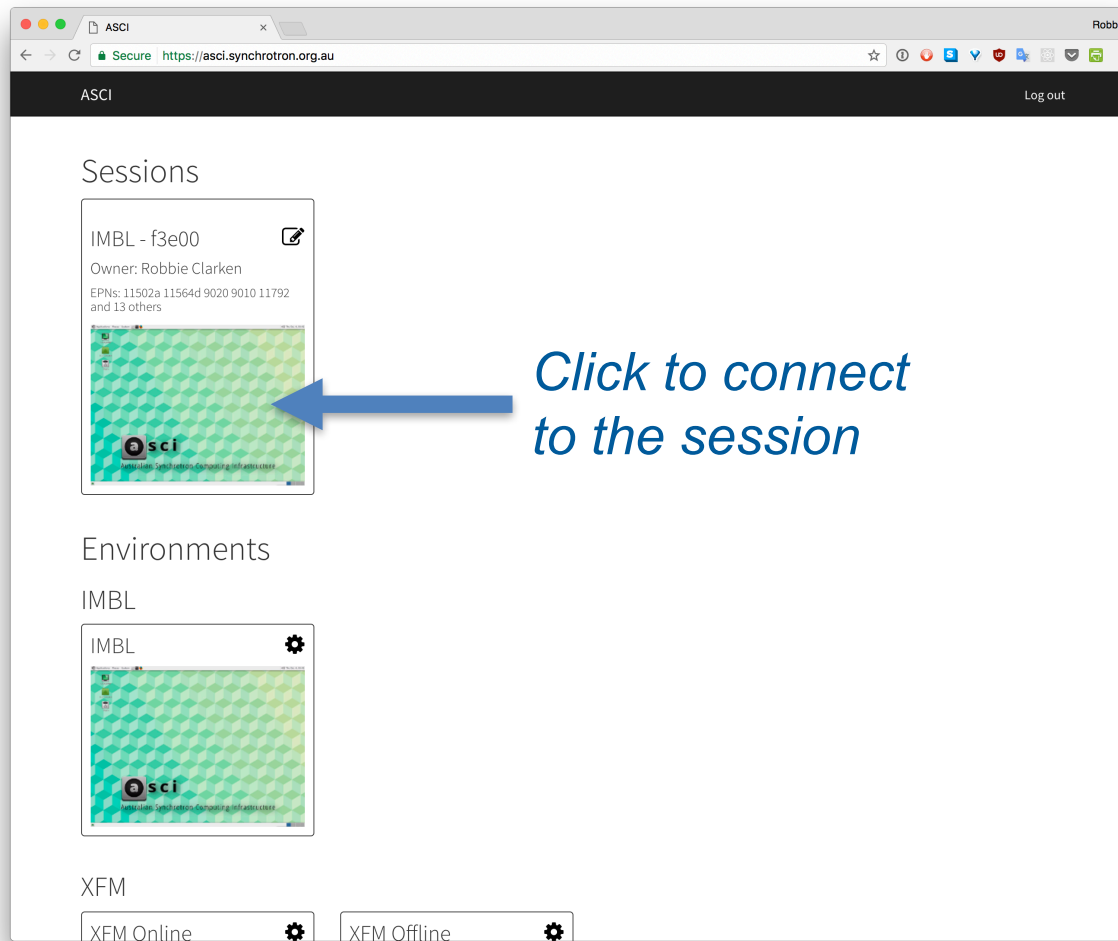
Email

Password

User Perspective



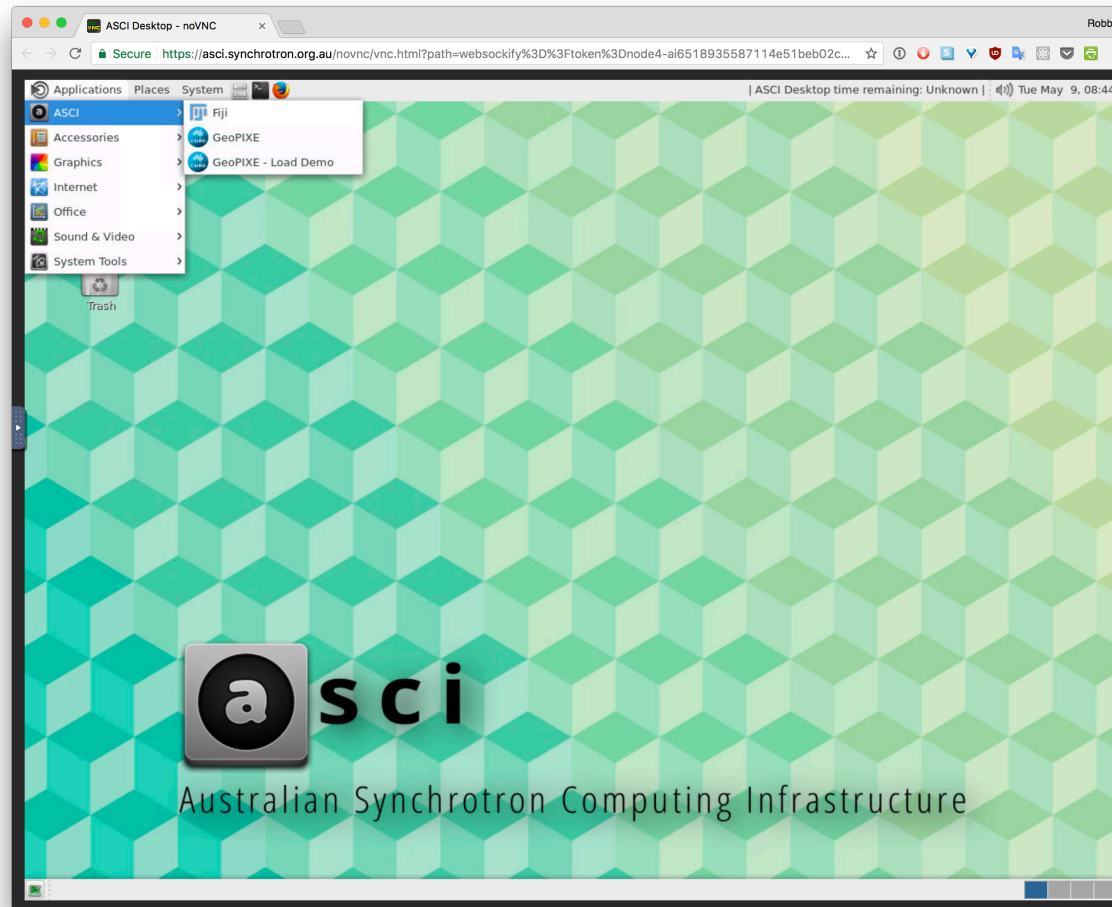
User Perspective



User Perspective



User Perspective



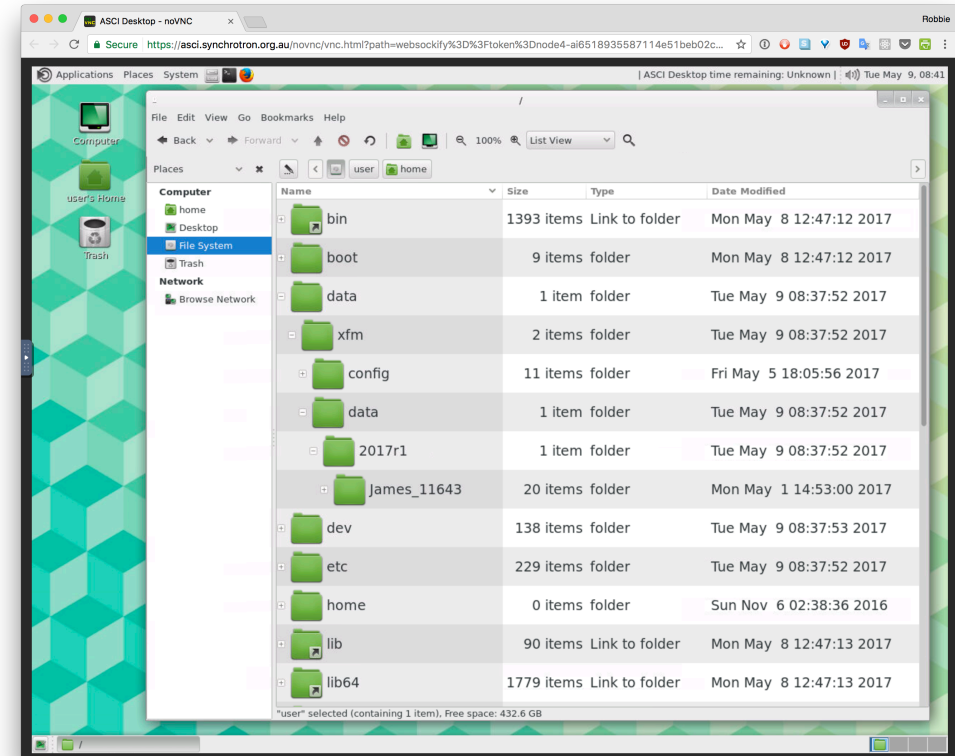
User Perspective

Data is found in

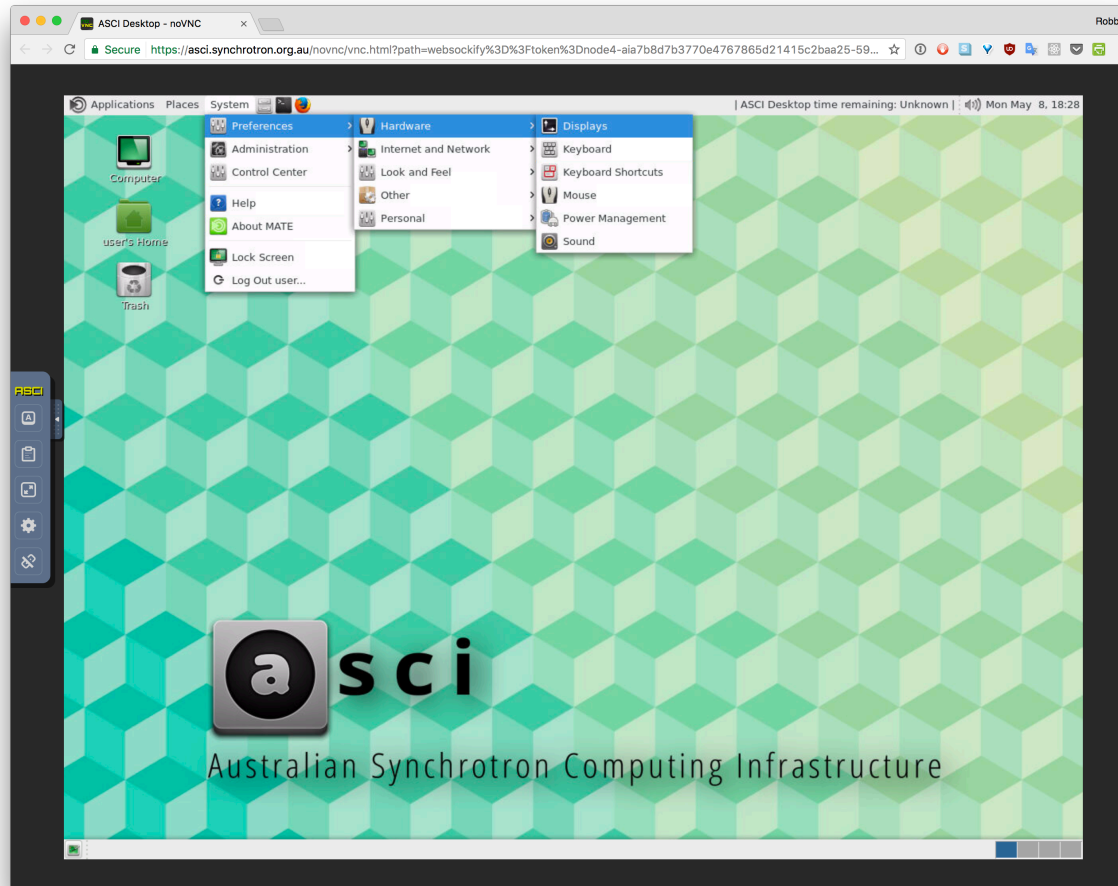
`/data/xfm/data/<round>/<experiment>`

Eg:

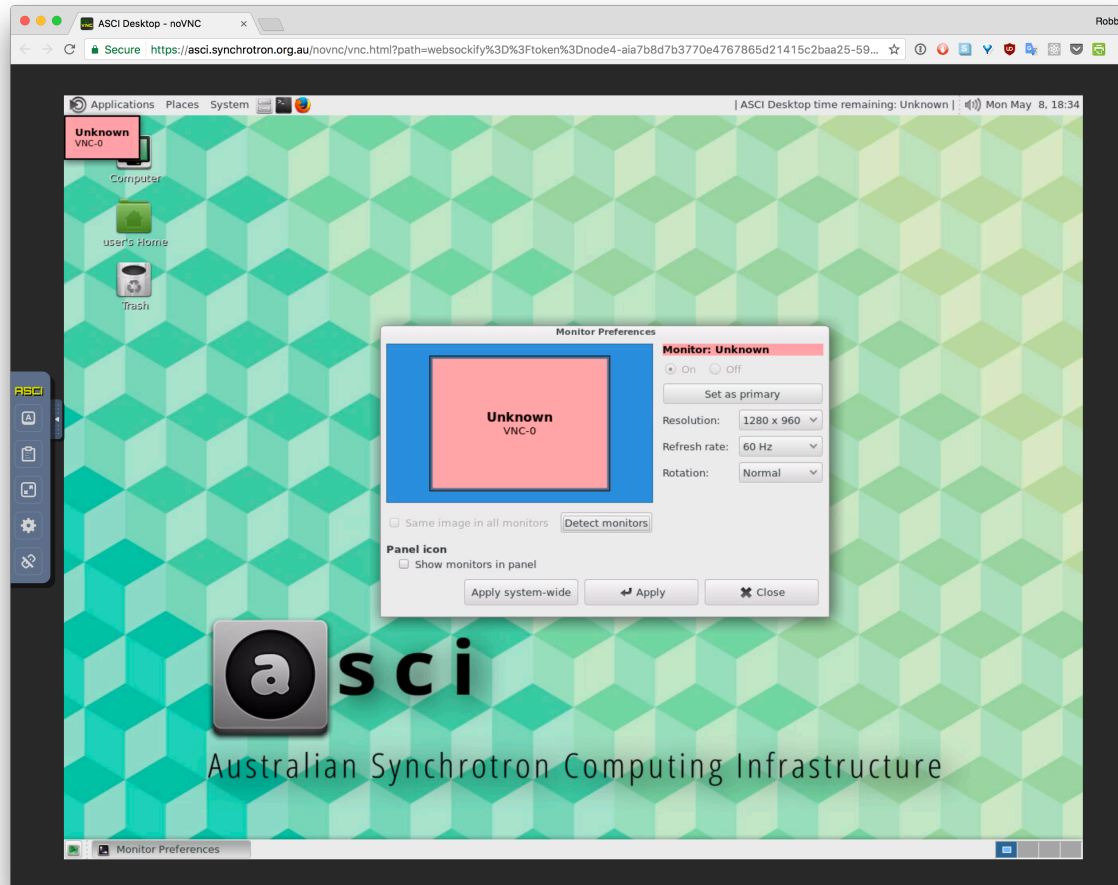
`/data/xfm/2017r1/James_11643`



Changing the screen resolution



Changing the screen resolution



Changing the screen resolution

- Run the following command to set the resolution:

```
asci-resolution 1320 1200
```

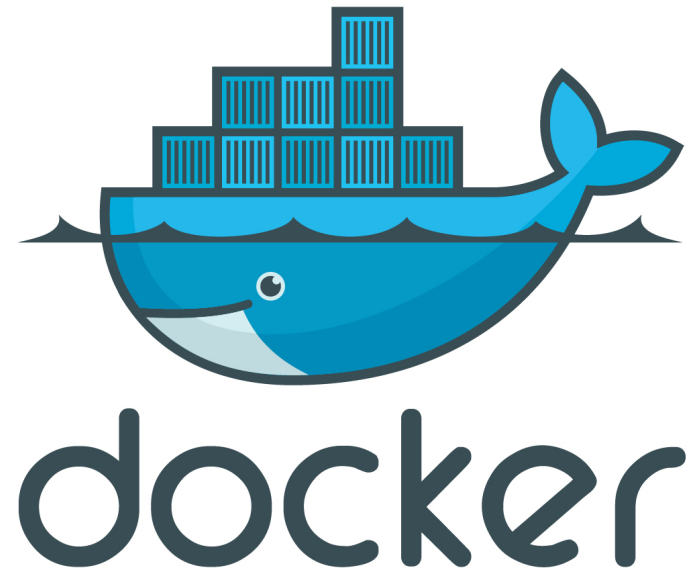
- (May need to run twice to get rid of scrollbars)

Known Issues

- Only works on up to date version of **Chrome** or **Firefox**
- On Mac, hitting Cmd+key will result in *key* being repeated
 - Solution: Hit any key to break it out of the loop
- Occasionally the “key released” signal doesn’t go through and it will make the keyboard unresponsive
 - Solution: Hit Ctrl and Alt keys

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

- Initially nodes will be allocated per beamline
- Ensure “online” experiment processing have sufficient resources
- All post-experiment XFM 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: XFM Online

node2: XFM Offline

node3: IMBL Online

node4: IMBL Offline

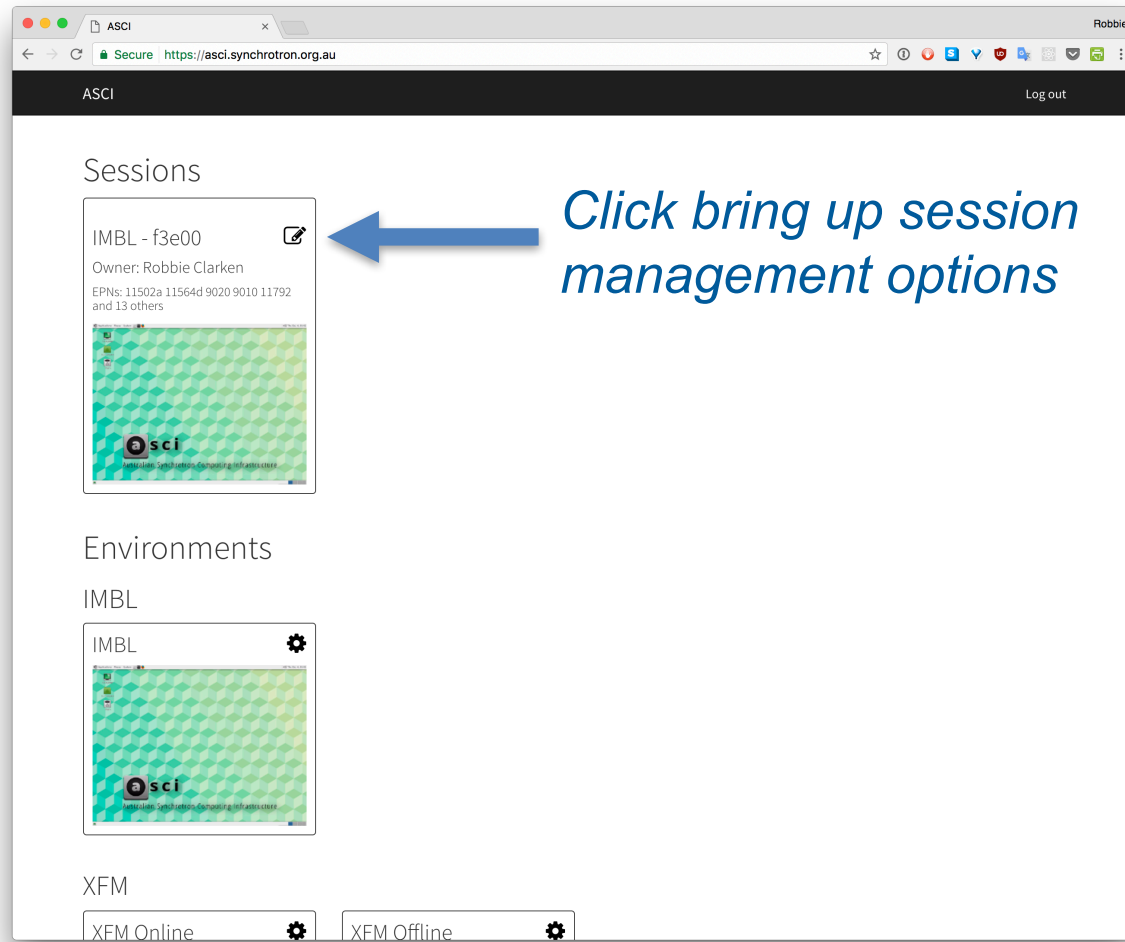
node5: MX2 Online

node6: Development

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:
 - All collaborators of mounted experiments can then connect to the desktop
- 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 has a dark header with "ASCI" on the left and "Log out" on the right. 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". Below the text is a thumbnail image of a session interface. A blue arrow points from the text "Click bring up session management options" to the session card. Below the "Sessions" section is the "Environments" section, which lists "IMBL" with a thumbnail and a gear icon. 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

Click bring up session management options

Environments

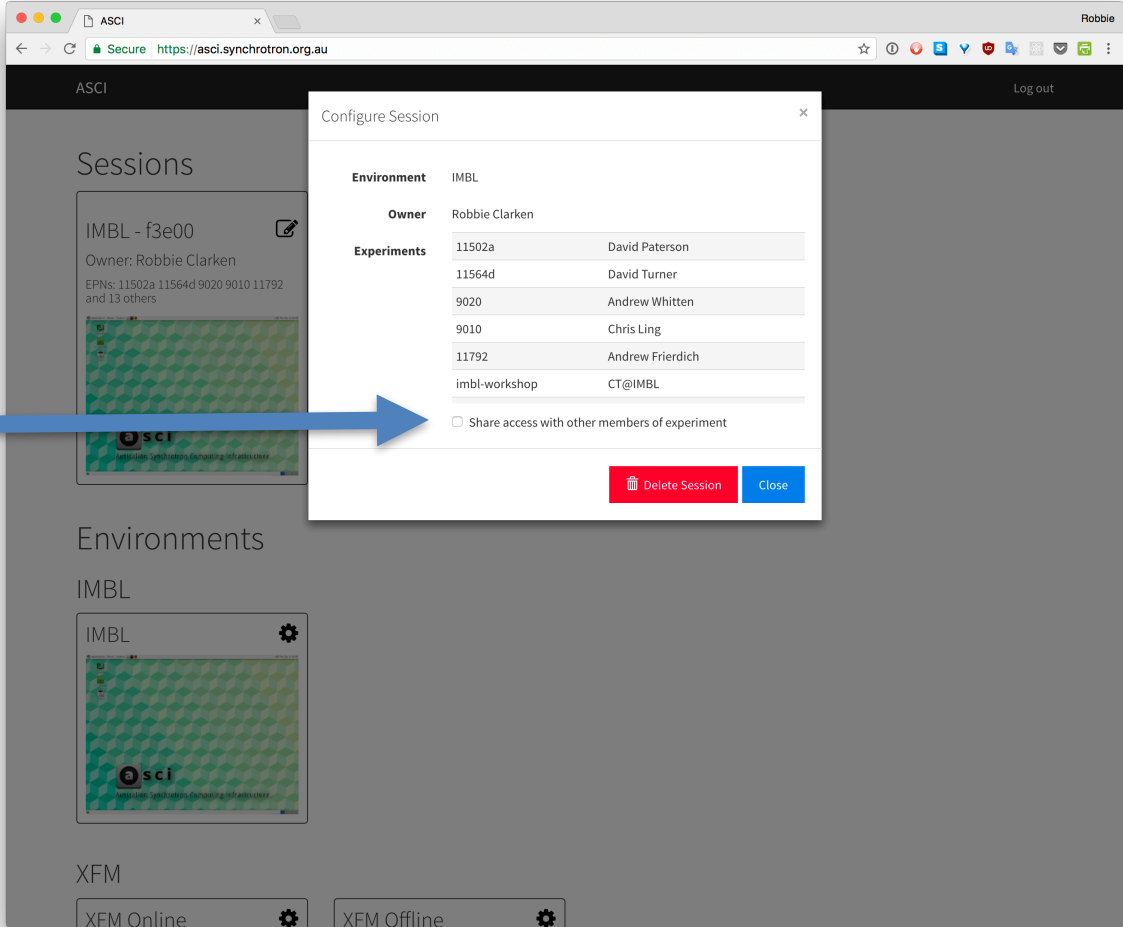
IMBL

XFM

XFM Online XFM Offline

Sharing a session

*Click to share
the session*



The screenshot shows the ASCI web interface with a 'Configure Session' modal open. A blue arrow points from the text 'Click to share the session' to the share icon on the 'IMBL - f3e00' session card.

Configure Session

Environment IMBL

Owner Robbie Clarken

Experiments

11502a	David Paterson
11564d	David Turner
9020	Andrew Whitten
9010	Chris Ling
11792	Andrew Friedrich
imbl-workshop	CT@IMBL

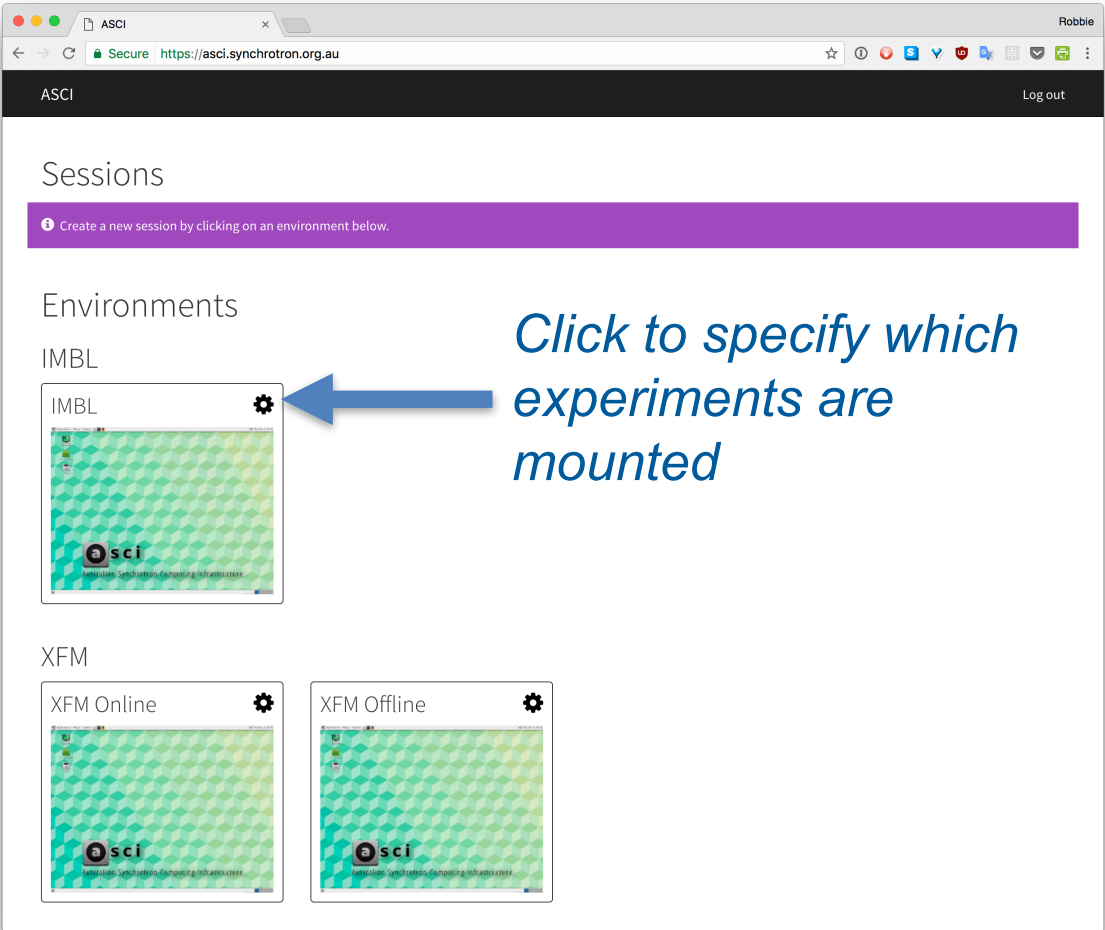
☐ Share access with other members of experiment

[Delete Session](#) [Close](#)

Experiment data

- By default, every experiment you are a member of is mounted
- When you share a session you are granting your collaborators 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



The screenshot shows a web browser window with the URL <https://asci.synchrotron.org.au>. The page has a black header with "ASCI" on the left and "Log out" on the right. Below the header, the "Sessions" section contains a purple bar with the text "Create a new session by clicking on an environment below." The "Environments" section lists three options: "IMBL", "XFM Online", and "XFM Offline". Each option has a thumbnail image and a gear icon in the top right corner. A blue arrow points from the text "Click to specify which experiments are mounted" to the gear icon of the "IMBL" environment.

ASCI

Log out

Sessions

Create a new session by clicking on an environment below.

Environments

IMBL

IMBL

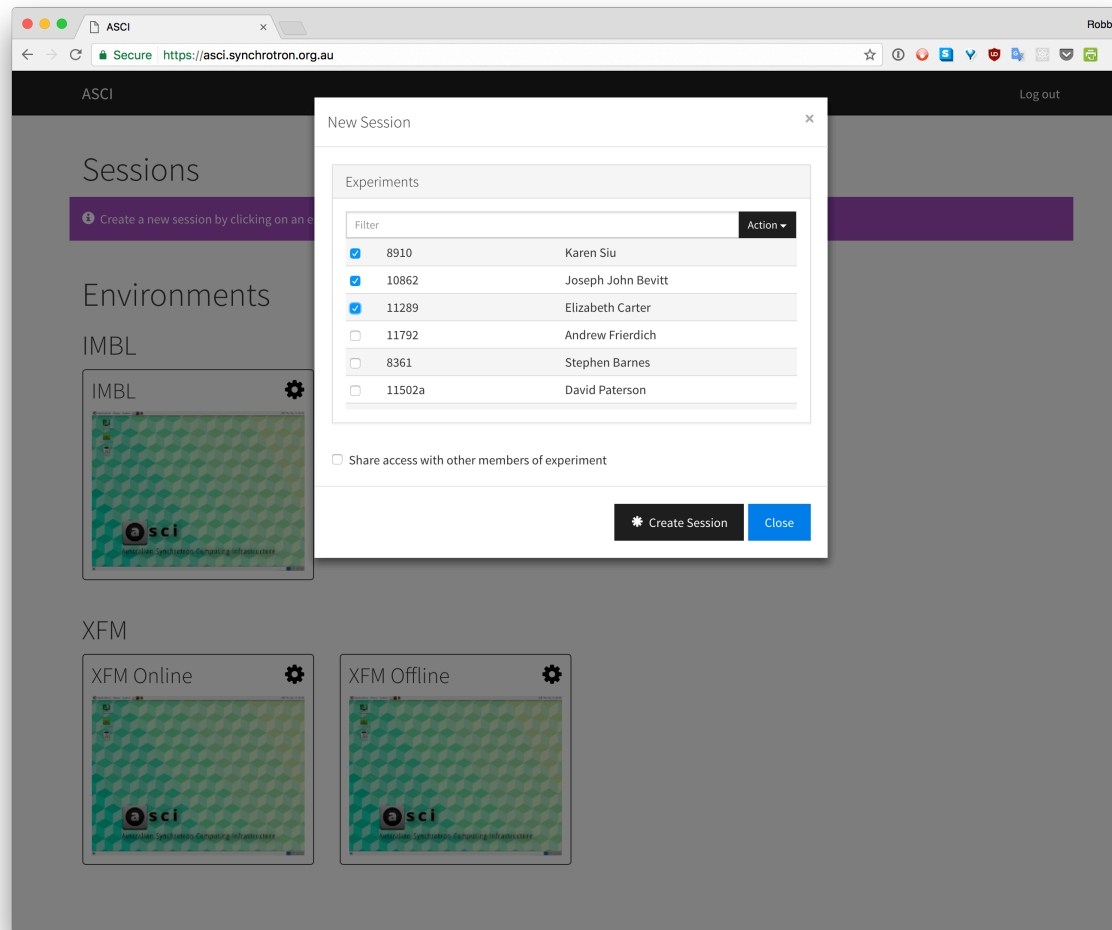
XFM

XFM Online

XFM Offline

Click to specify 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
- XFM environment has:
 - ImageJ
 - GeoPIXE
- Additional software can be added upon request
- Software needs to run on Linux or under Wine

When will ASCI be available?

- XFM experiments will be switched over this month
- Remote access to ASCI will follow shortly
- MASSIVE M1 will continue to be supported for the near term
- Please give us feedback so we can design the system to meet your needs