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ASCI: Australian Synchrotron Compute Infrastructure

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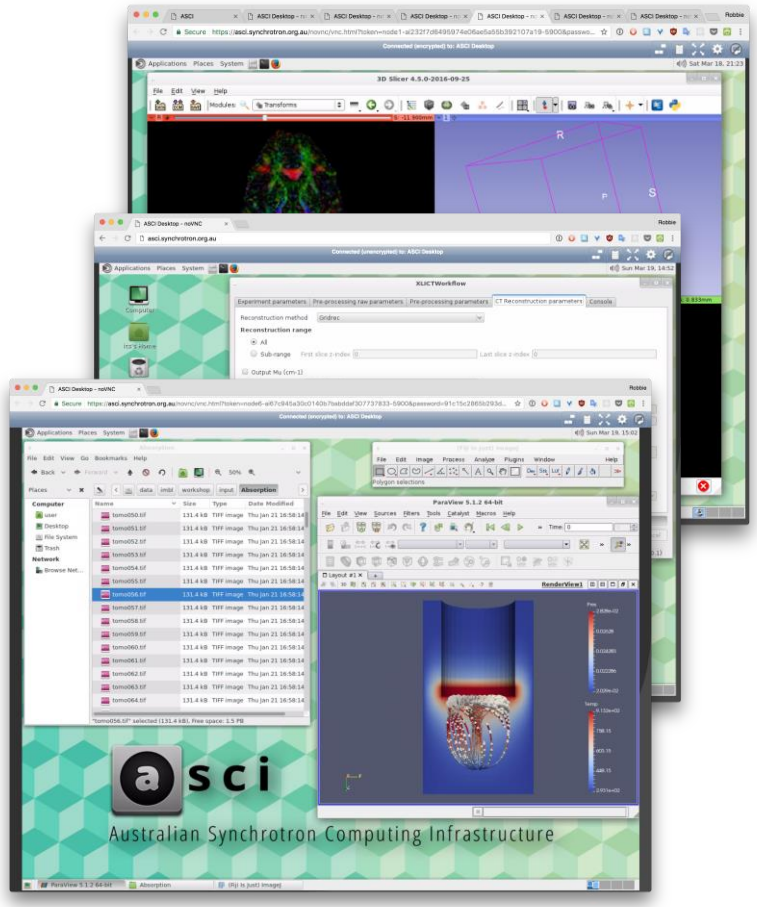
ASCI

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



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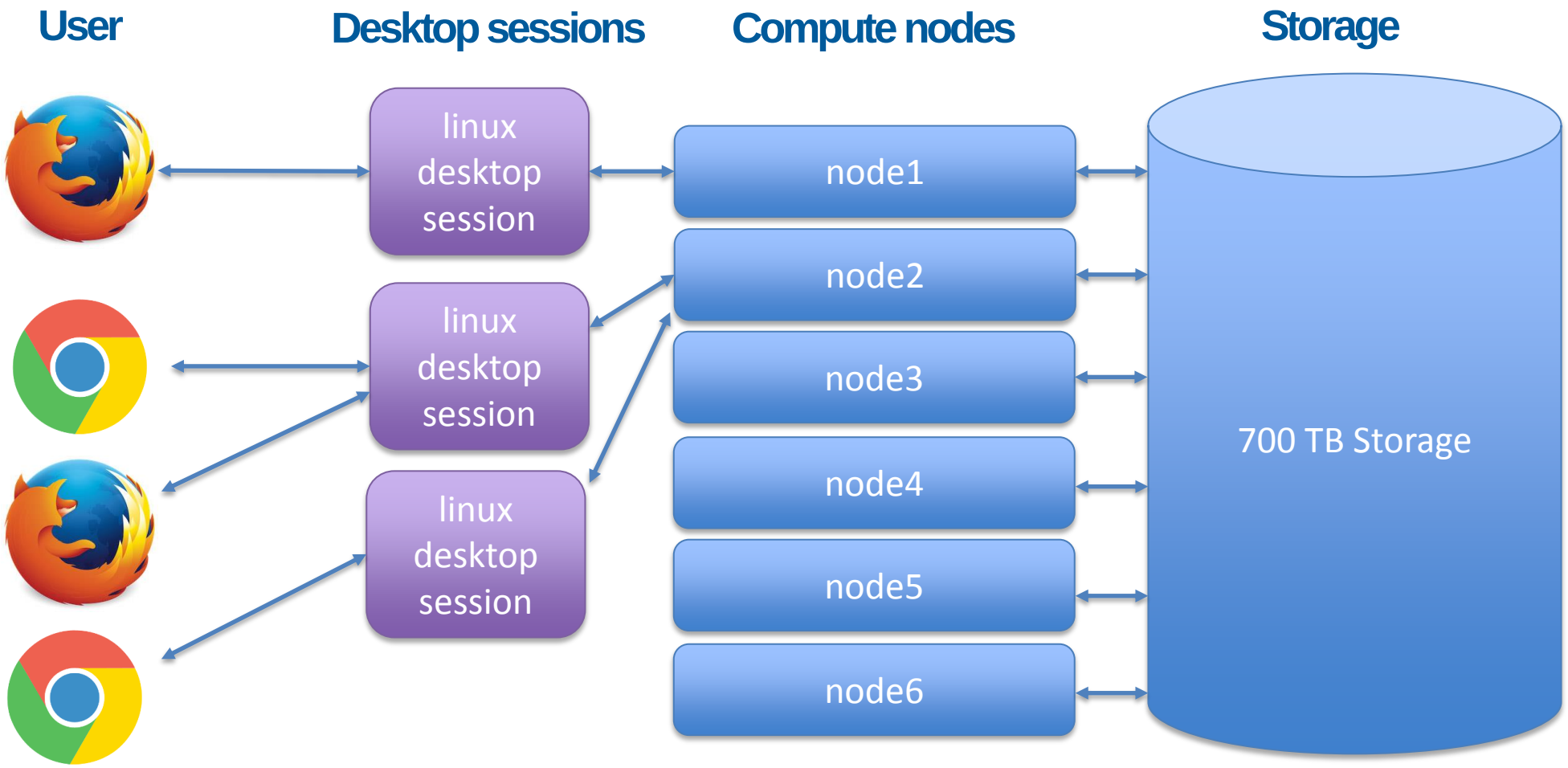
System



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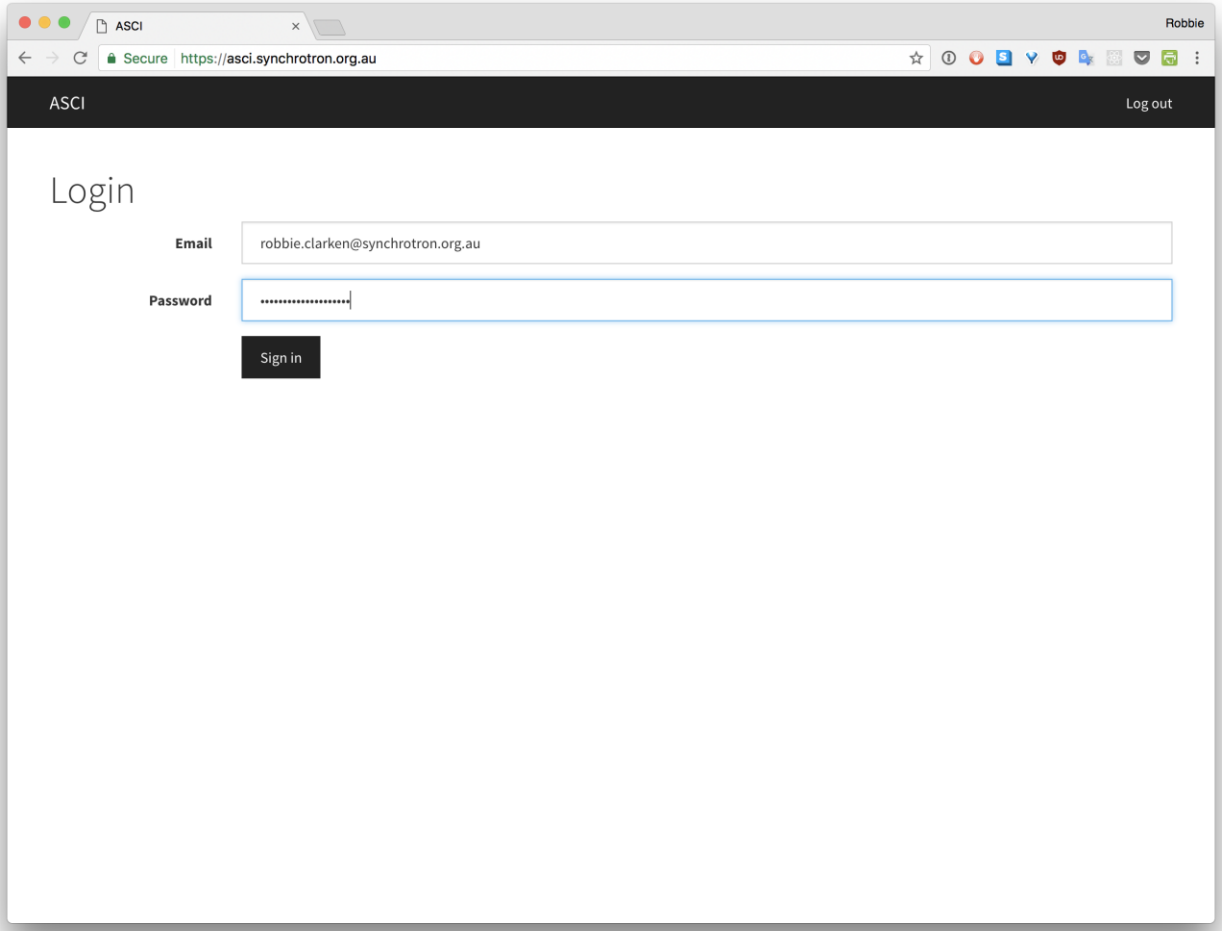
Node Hardware

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



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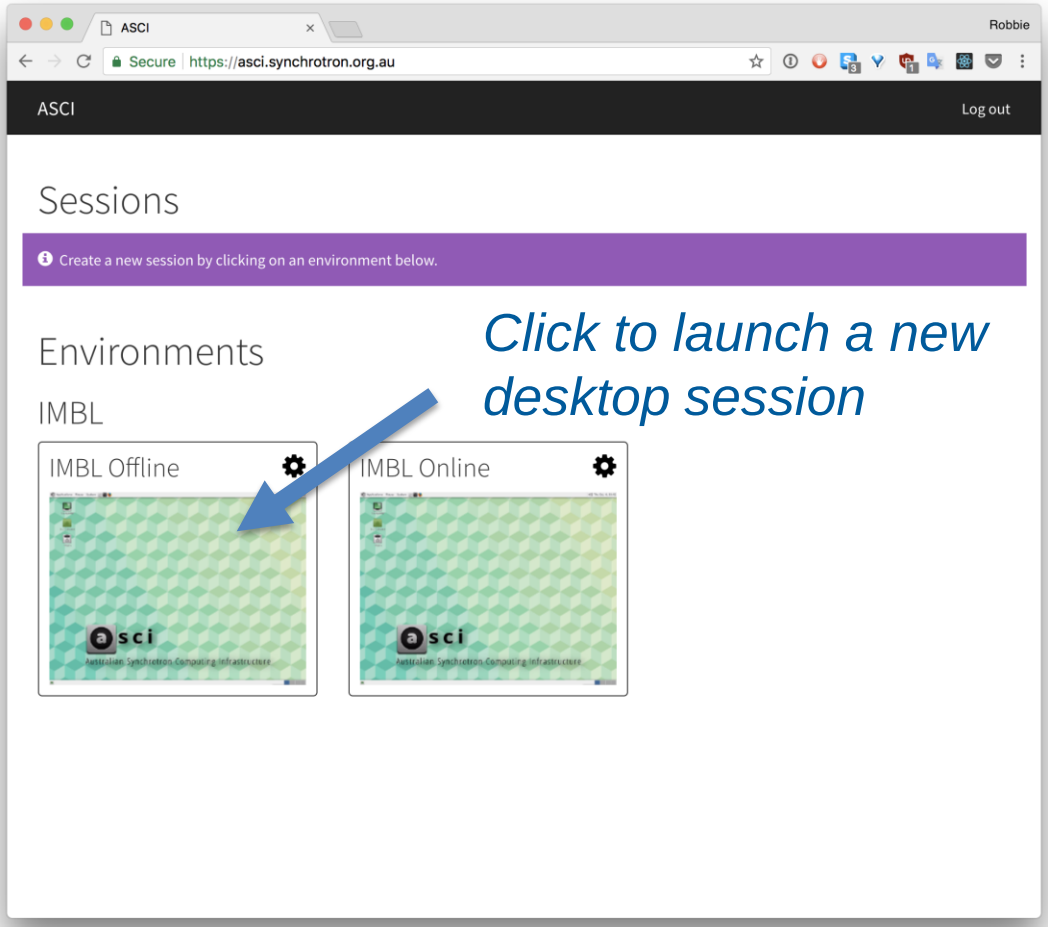

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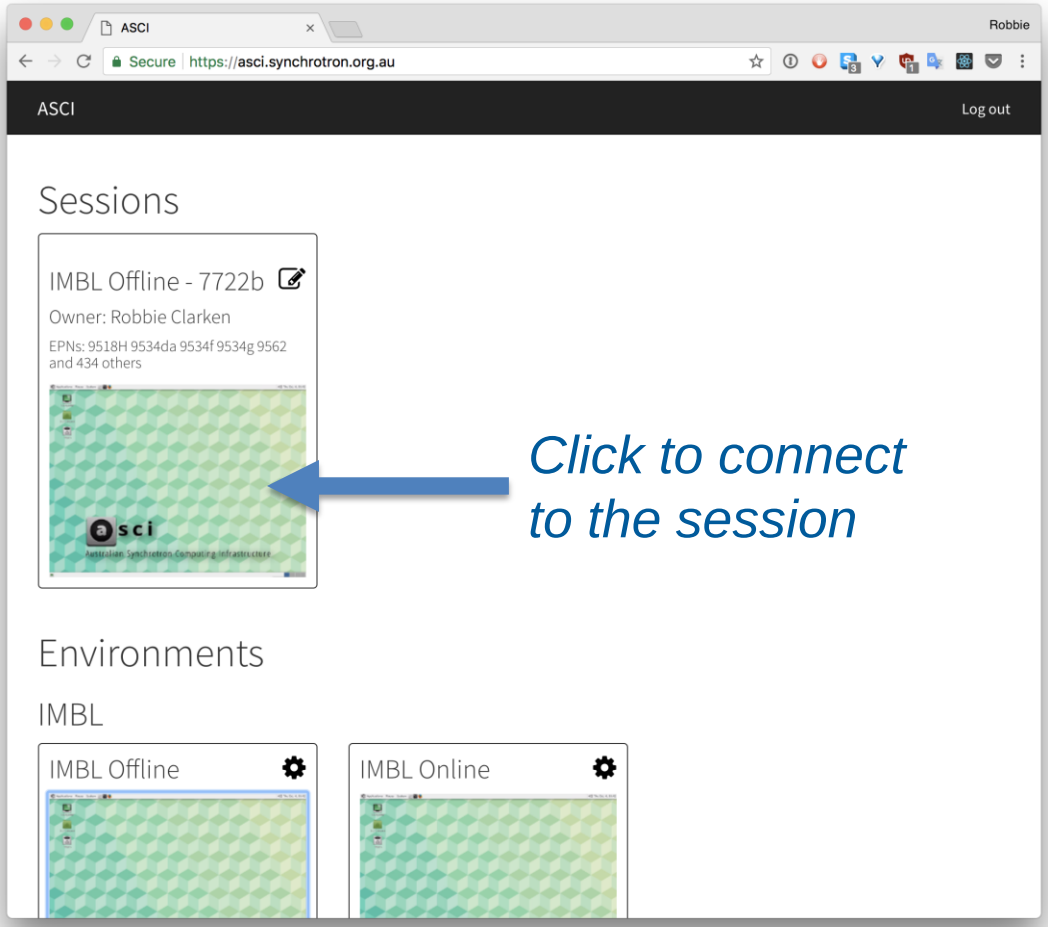

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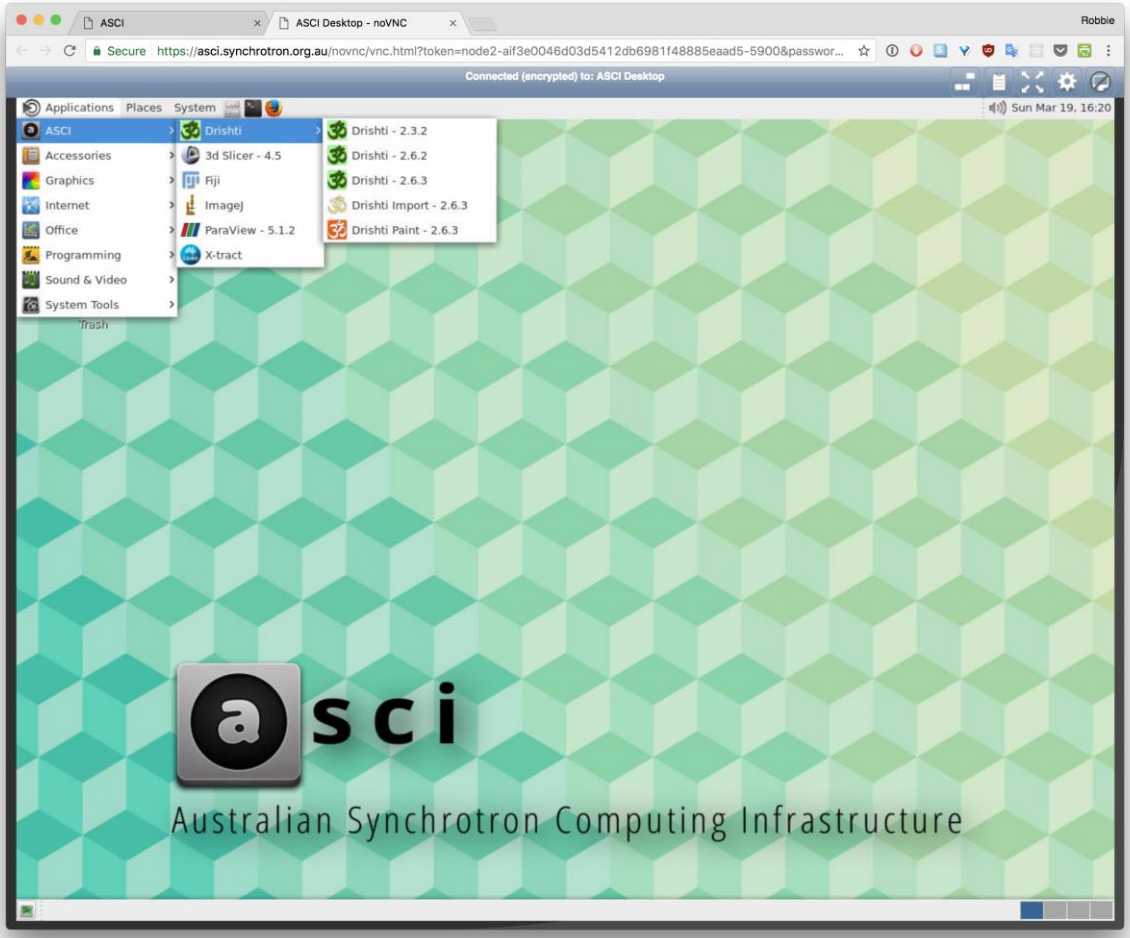

Switching to full screen

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

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Where to find your data

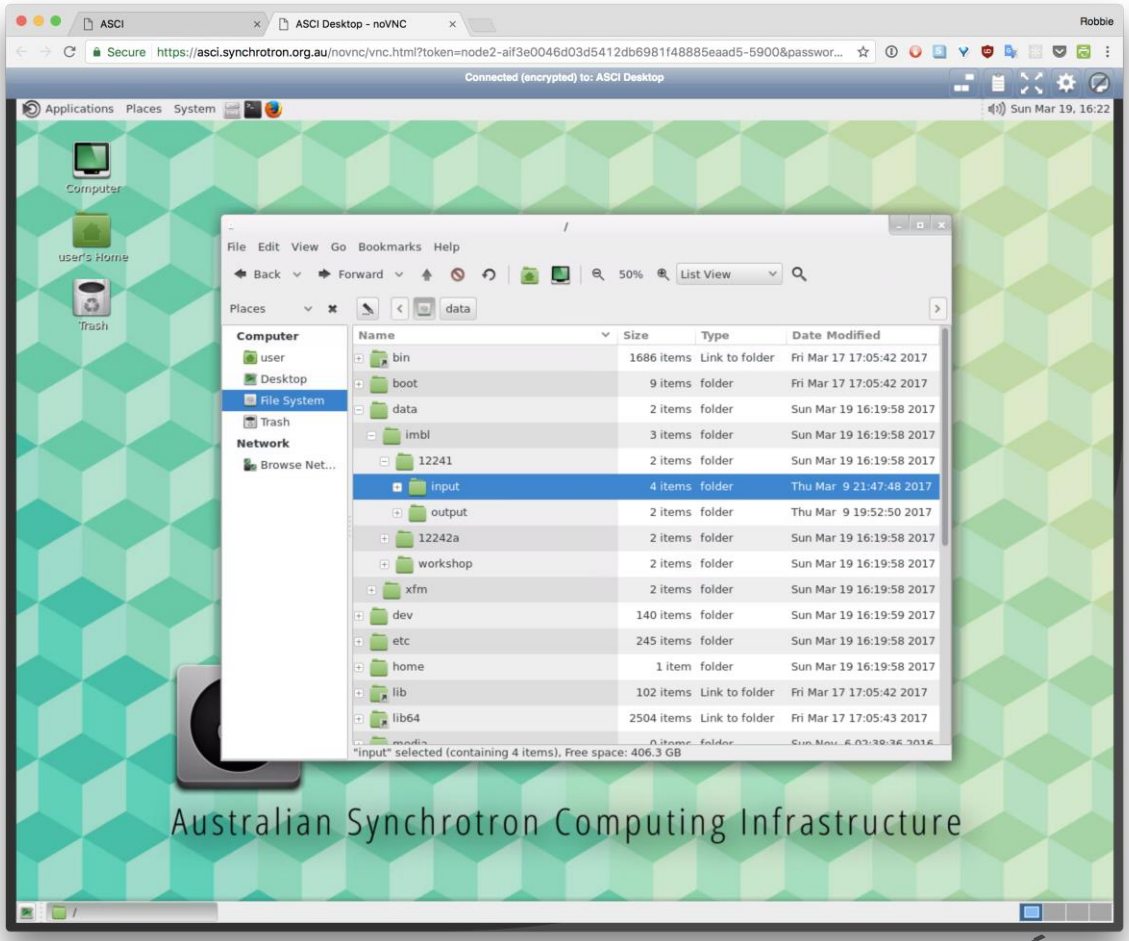
Data is found in

/data/<beamline>/<epn>

Eg:

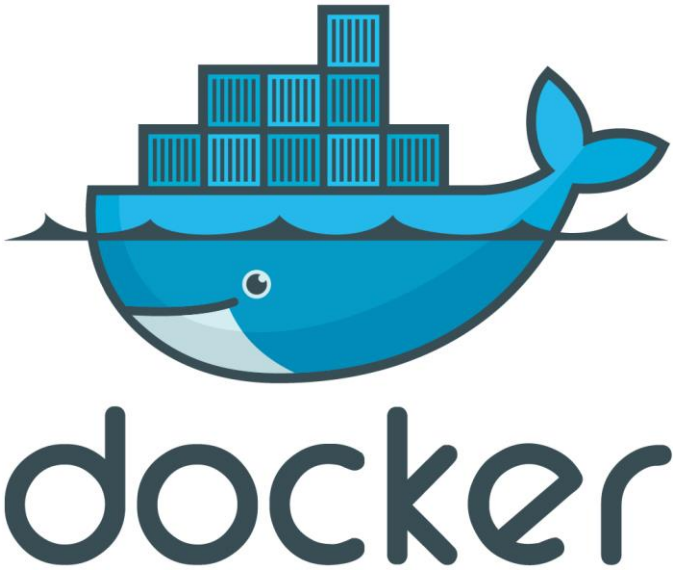
/data/imbl/12241

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



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

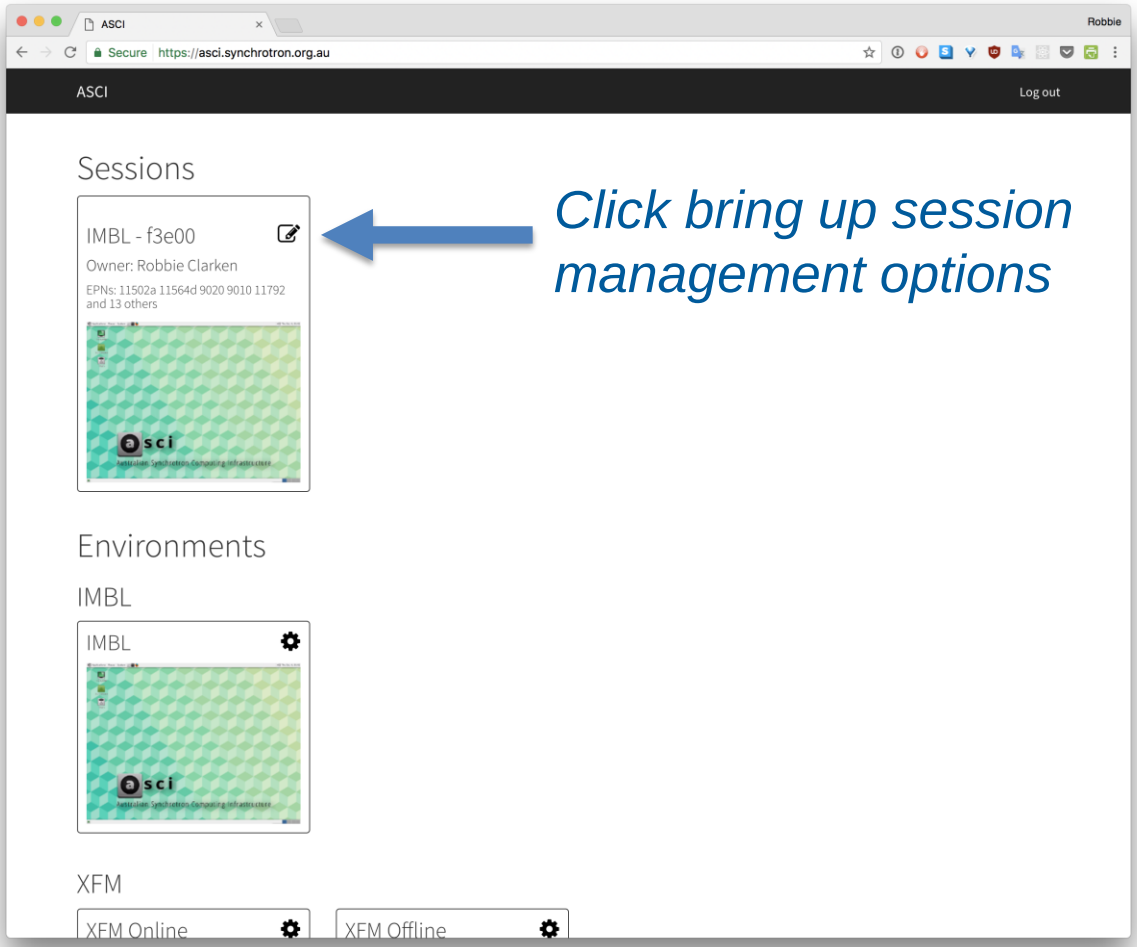
Session resources

- 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

Session management

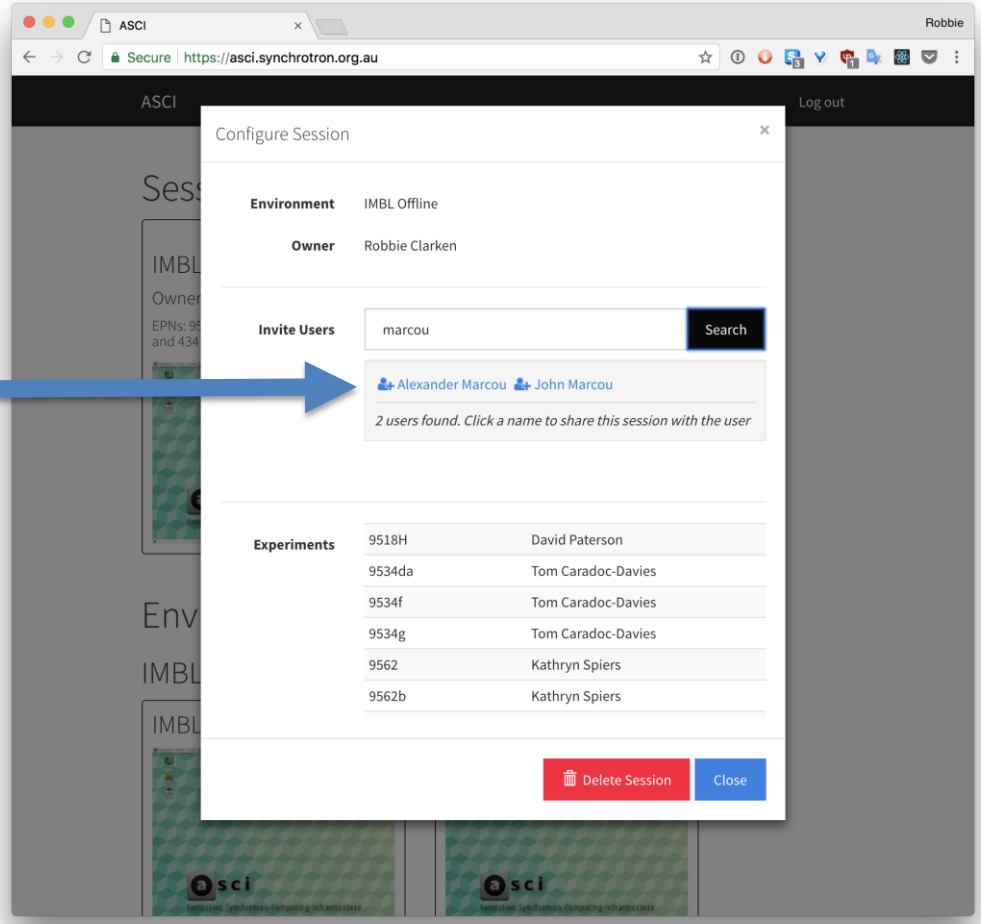
- The user who creates the session is the “owner”
- Initially only the owner can connect to the session
- Owner can share the session with any other ASCI user
- When multiple users connect, they each see the same desktop
- Both users can control the mouse cursor and enter keyboard input

Sharing a session



Sharing a session

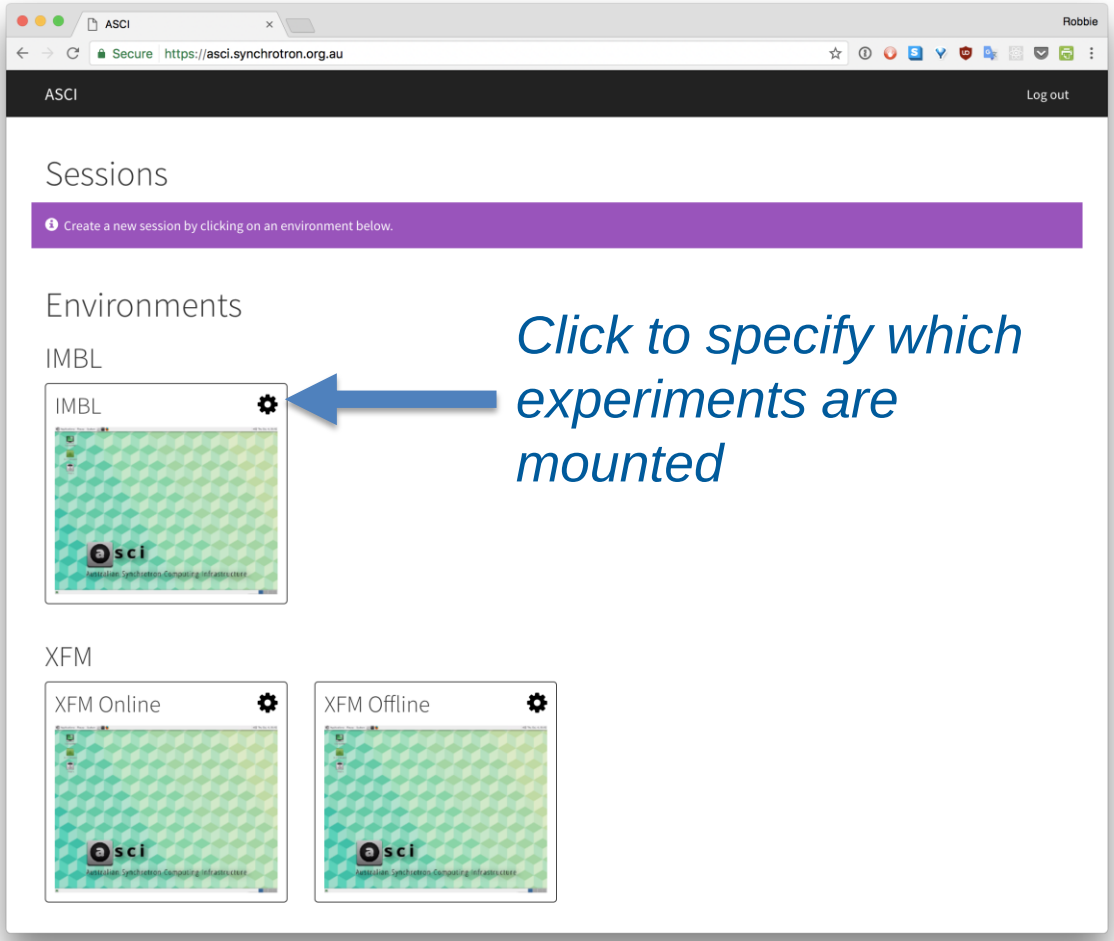
Search for users and click their name to share



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



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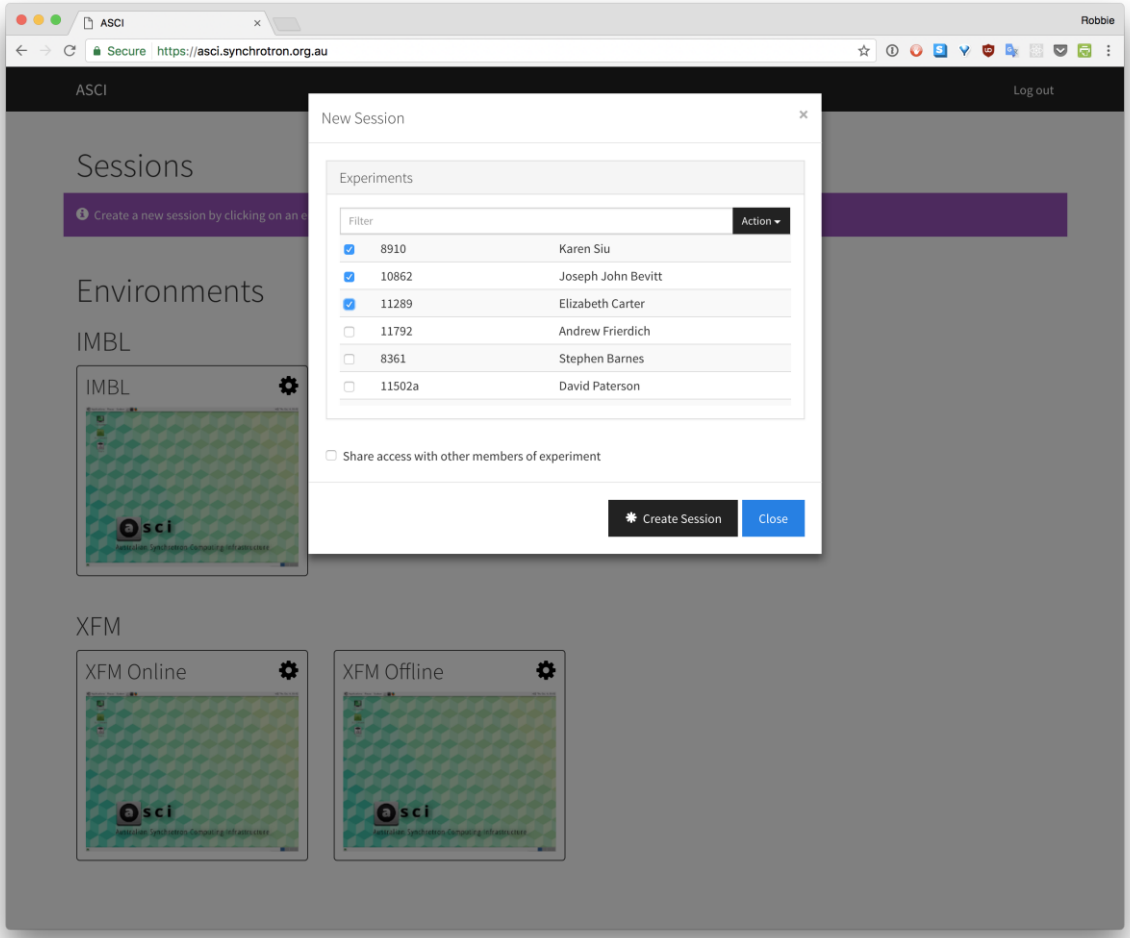

What is an “Environment”

- 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

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