VBL e-Research Environment @ The Australian Synchrotron

THE UNIVERSITY OF MELBOURNE

Victoria
The Place To Be

LA TROBE UNIVERSITY

MONASH University

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Chris Myers, RI Team Lead
Open Presentation
Version 3.4

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Team

- Virtual Beamline (VBL)
  - Australian Synchrotron
- Remote Instrumentation (RI)
  - La Trobe
- VBL Theatrette
  - La Trobe

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VBL Introduction

Why we need a VBL

- Science particularly that based on large instruments increasingly involves distributed, global collaborations enabled by the internet and using very large scale data collections, high performance computing resources, tele-science (remote access and control of instrumentation) and collaborative visualisation. For the Australian Synchrotron the Virtual Beam Line will be a model for this sort of distributed access.

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Goals

- User Friendly
- Safe
- Reliable
- Fast
- Modular design

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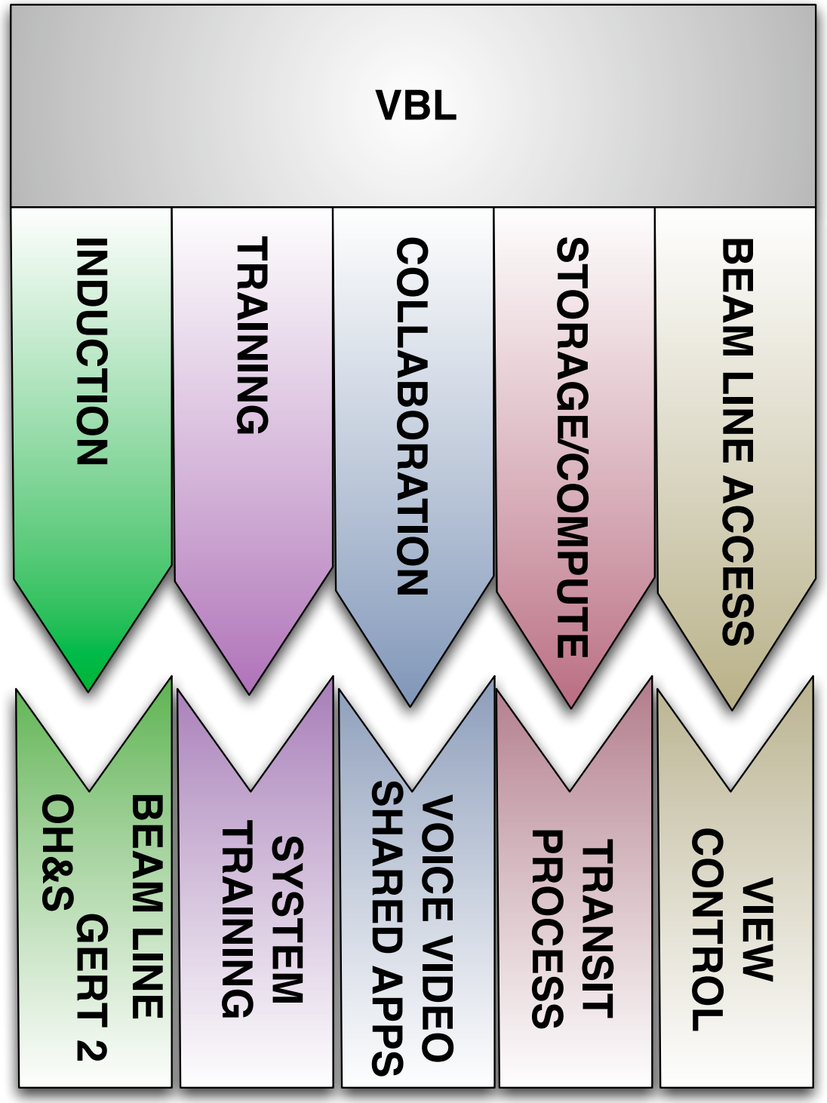

VBL Overview

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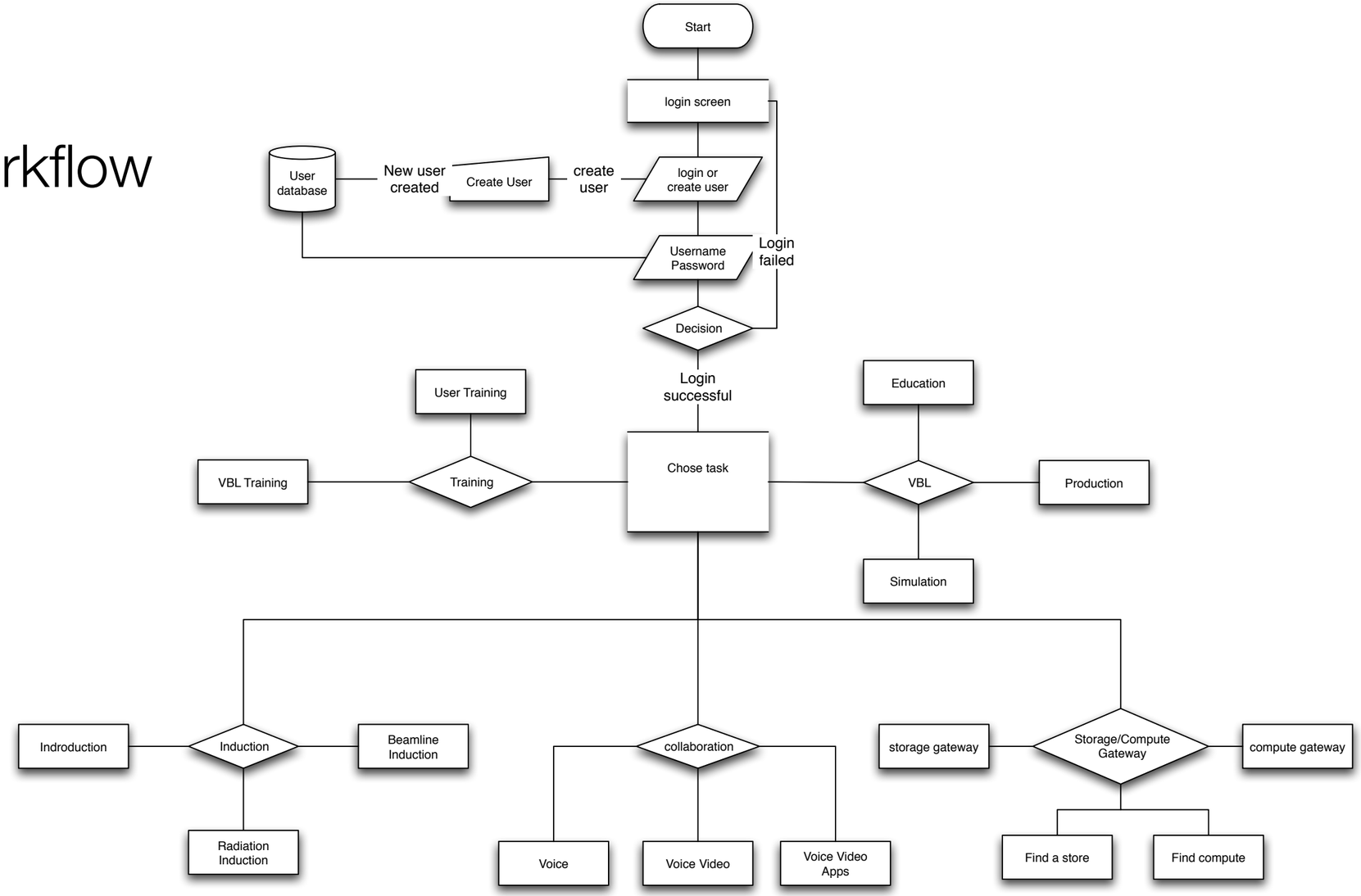
VBL Workflow



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Facility Status Monitor

- The Facility Status Monitor (FSM) was developed by the Control Systems team to provide a snapshot overview of the synchrotron status. VeRSI worked with the controls team to produce a web interface to the status monitor, the WEB-FSM, and a mobile phone interface, the mini-FSM.

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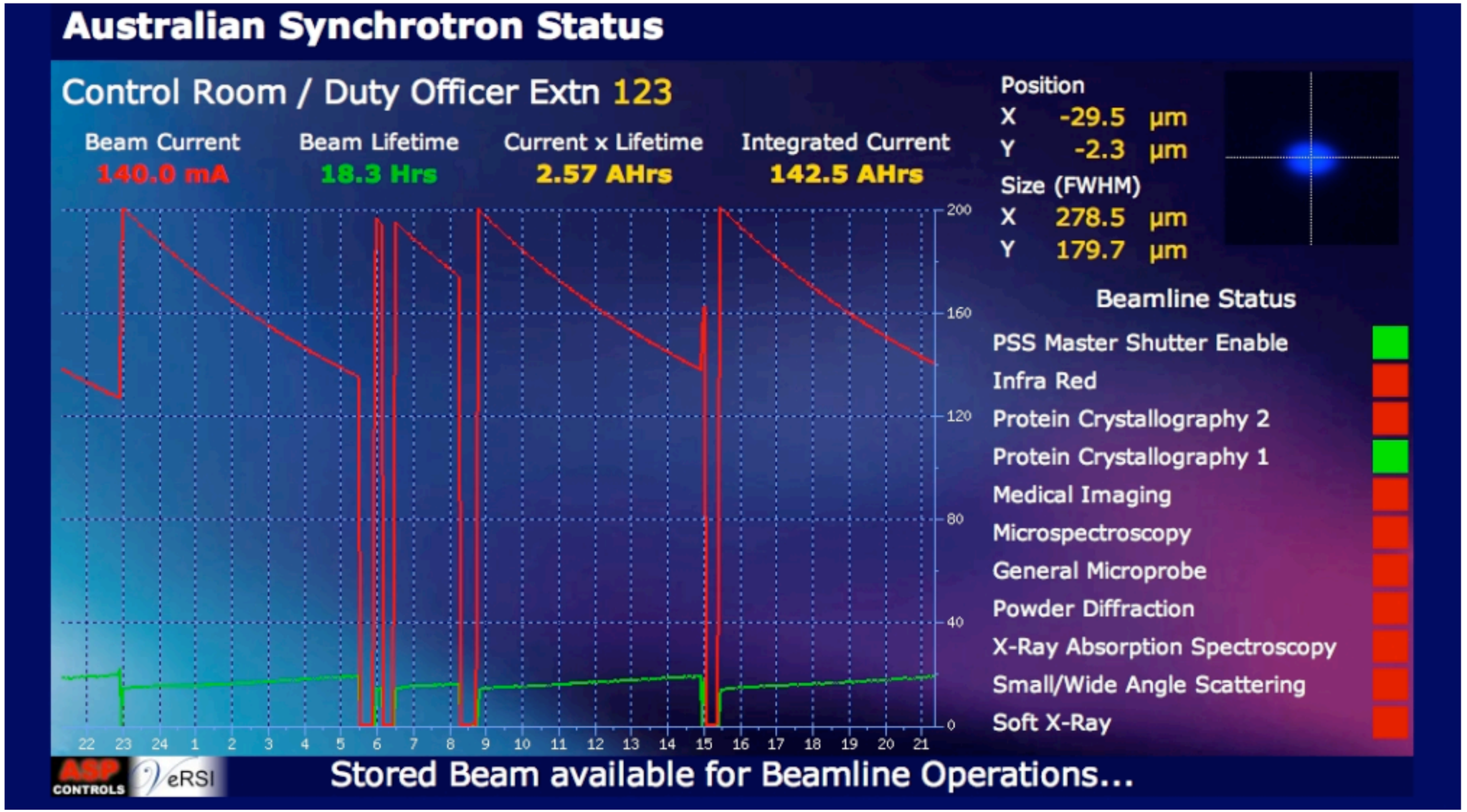

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WEB-FSM

http://vbl.synchrotron.vic.gov.au/fsm/

MINI-FSM

- -- Mini FSM --
- Beam Current: 162.8 mA
- Beam Lifetime: 162.8 mA
- Current x Lifetime: 162.8 mA
- Integrated Current: 162.8 mA
- PSS Master Shutter Enable: Open
- Infra Red: Open
- Protein Crystallography 2: Shut
- Protein Crystallography 1: Open
- Medical Imaging: Shut
- Microspectroscopy: Shut
- General Microprobe: Shut
- Powder Diffraction: Shut
- X-Ray Absorption Spectroscopy: Shut
- Small/Wide Angle Scattering: Shut
- Soft X-Ray: Shut
- Position
- X: -111.6 um
- Y: +3.4 um
- Size (FWHM)
- X: 278.5 um
- Y: 197.7 um

Note: must be a mobile phone with internet access that supports WML

http://vbl.synchrotron.vic.gov.au/fsm/index.wml

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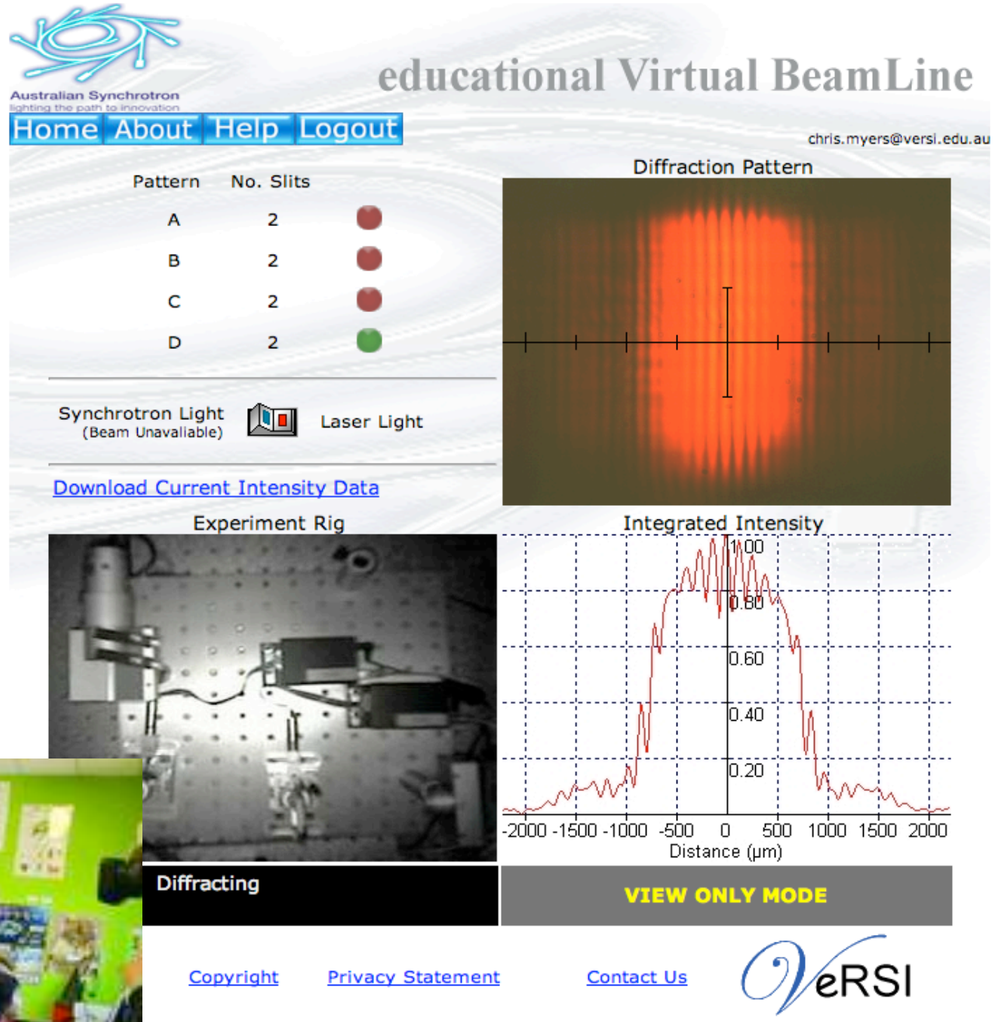
eVBL

- The Educational Virtual BeamLine (eVBL) demonstrates, in real-time, Thomas Young's classic Double-Slit diffraction experiment. The experiment has been designed as a demonstration to be used in the Victorian VCE Physics Unit 4, Study Area 2: Interaction of Light and Matter. It also provides a link to the optional Detailed Study 3.1: Synchrotron and its applications, with the primary source for diffraction the optical light produced by the Australian Synchrotron.



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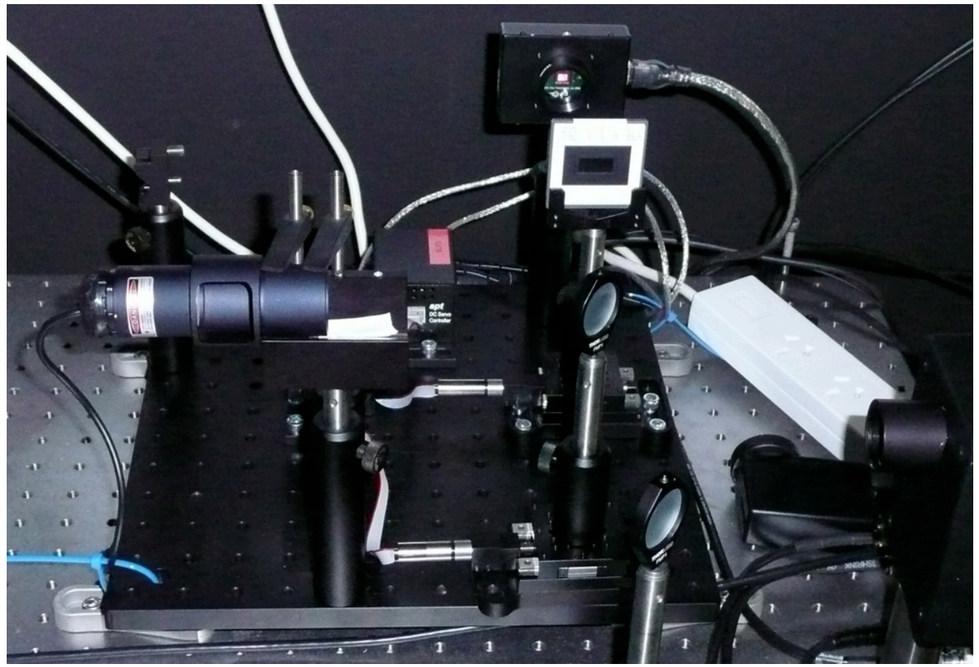

The eVBL is located in the ODB Hutch at the Australian Synchrotron
Professional optical equipment has been used.
This uses Live Beam - not simulated.

- This space has been provided by Mark Boland. (Big Thank-you)

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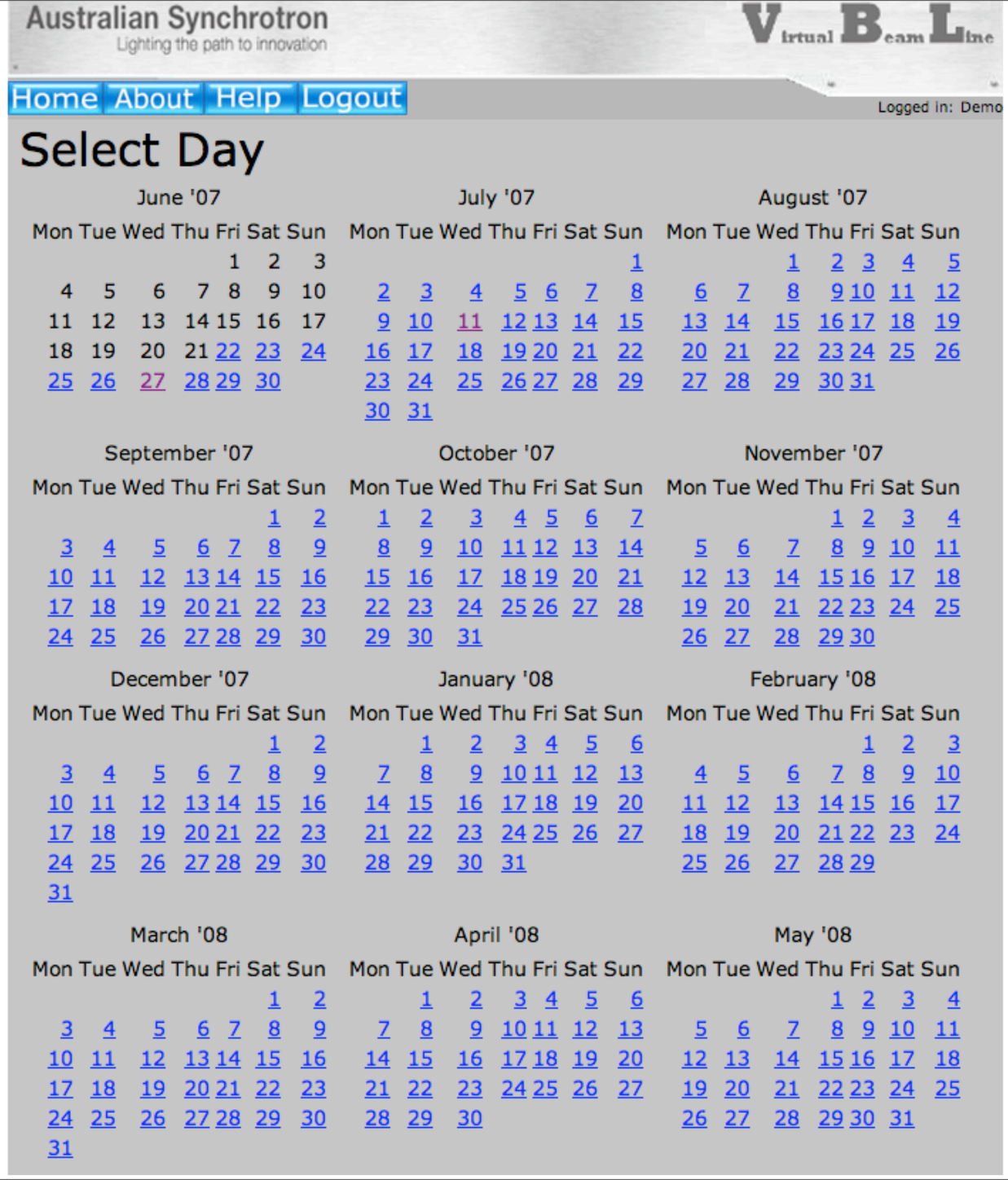
eVBL - Booking

- The eVBL has its own login system.
- The eVBL also has a stand-alone booking system - 30 minute sections.
- A teacher control window.
- And a student/public view-only window



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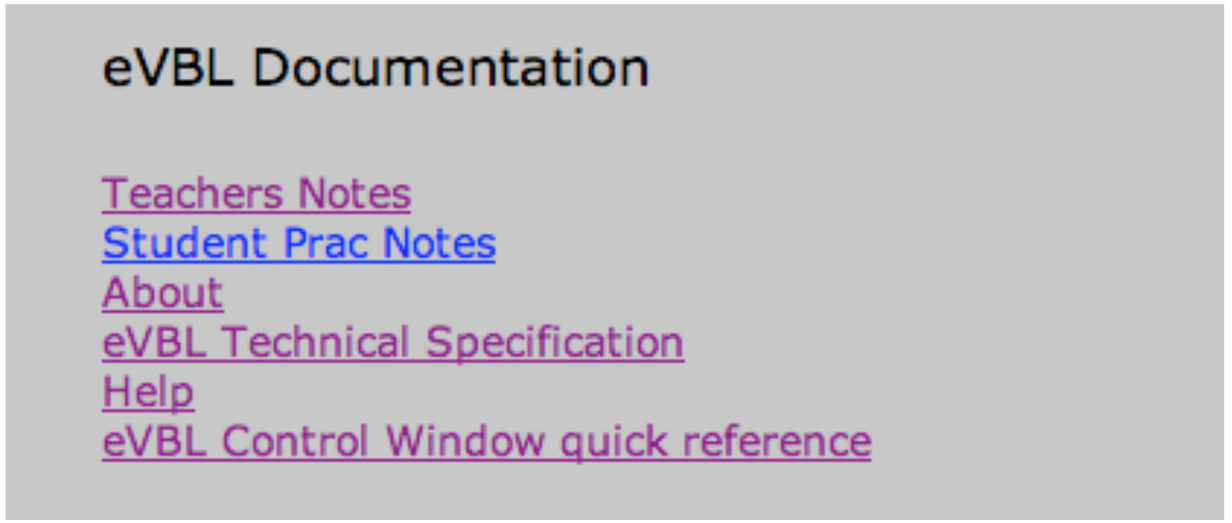
eVBL - Documentation

- Construction, overview and tech documentation is available.

- All teaching notes and prac information is available for download.



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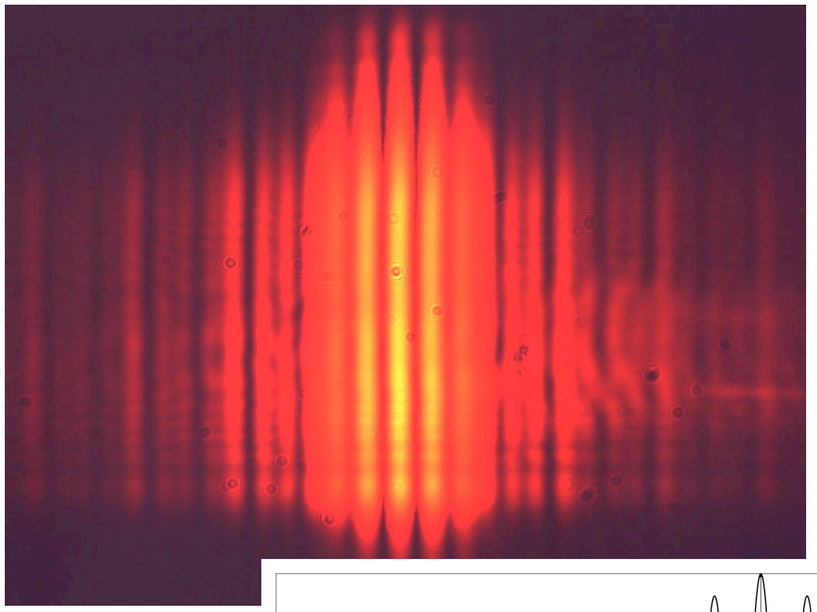
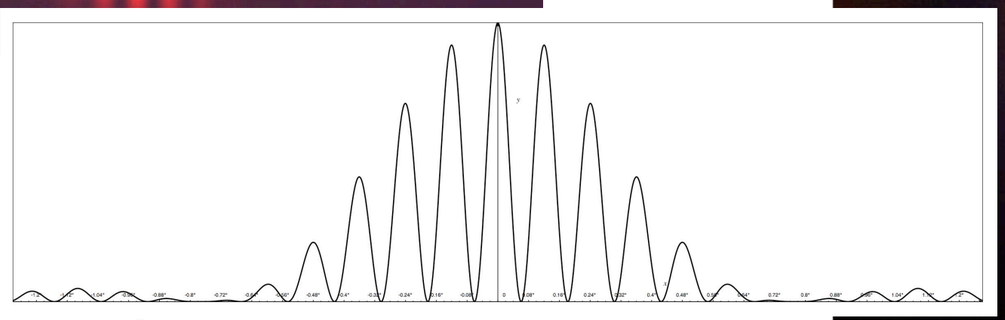
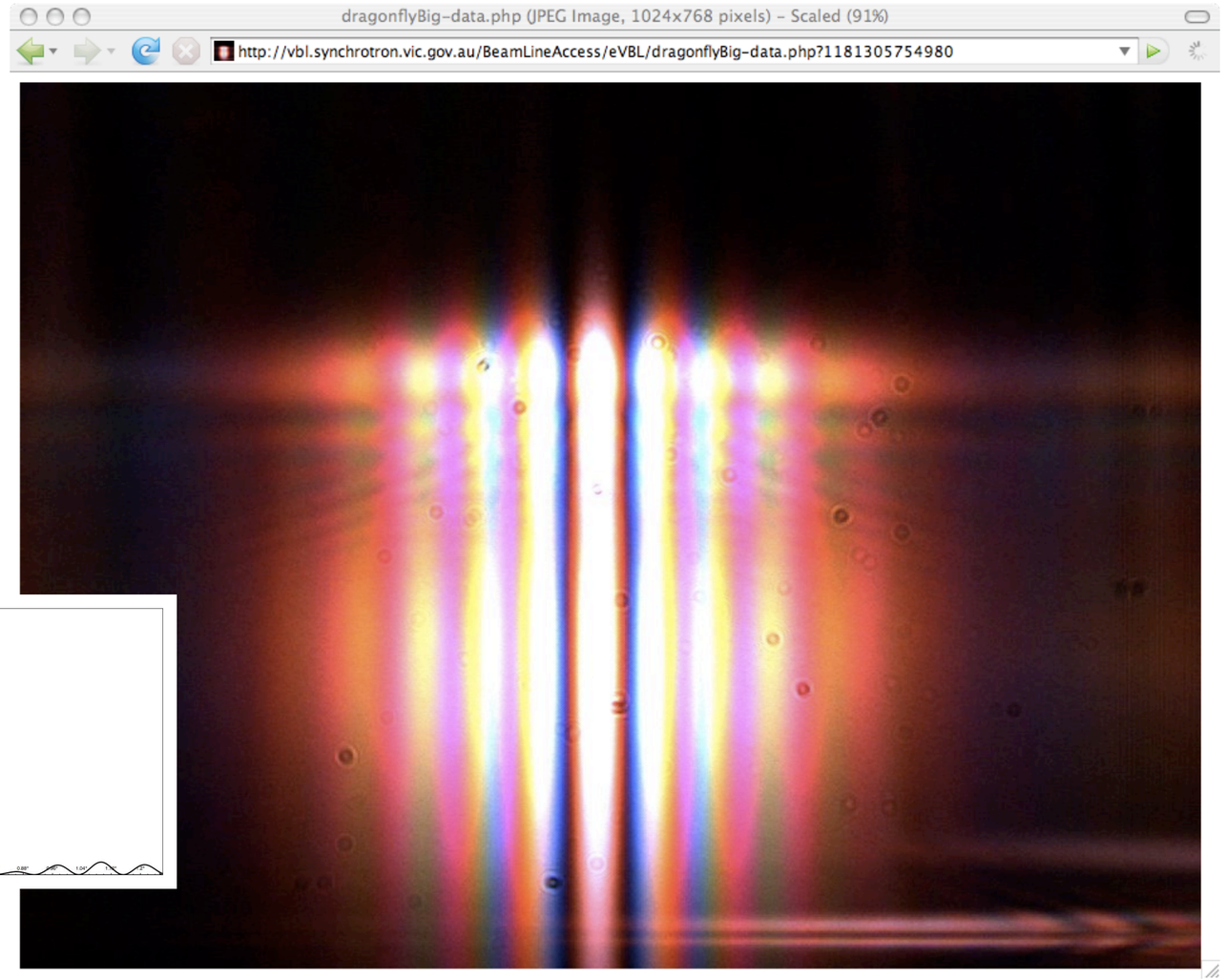
eVBL - Images







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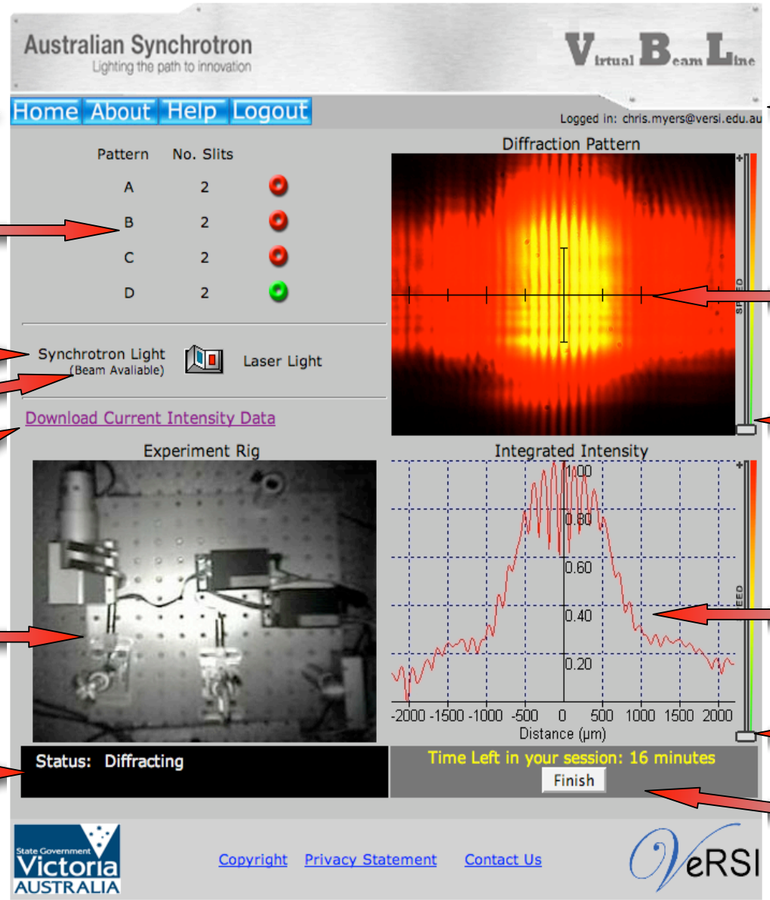
eVBL - Control Window

eVBL control window quick reference.



main navigation buttons.

Slit pattern selector area.
The green button indicates the currently selected Slit.
Click on a red button of an alternative slit to move that slit into the beam.
Buttons will be yellow whenmotors are in movement.

Light source selector.
This toggle switches between Synchrotron light and laser light.

The status of the synchrotron Light will be indicated here:

This link will take you to a separate page with the current data used to produce the intensity graph, at right.

Experiment Rig
This is a still image of the birds eye view of the experiment rig
Move your mouse over the different items will provide information on the rig's elements.

This status monitor will show the current activity of the eVBL.
e.g. the motors moving a different slit into place.

The logged in user will appear here.

Diffraction Image
This is the current diffraction image produced by the CCD camera.
This image is automatically refreshed.
If you click on the image a high resolution image will appear in a separate window.

This slider will increase the refresh rate of the image.
Internet speeds above 2 Mbps are required for higher refresh rates.

Integrated Intensity Graph
This is the current intensity graph, with data for the graph from the diffraction image above.
This image will automatically refresh.
If you click on the graph a larger graph will appear in a new window.

This slider will increase the refresh rate of the image.
Internet speeds above 2 Mbps are required for higher refresh rates.

This area will indicate if you are in view only mode, rather than control mode.
In control mode it will show the time remaining in the current session.
The finish button will take you back to the home page

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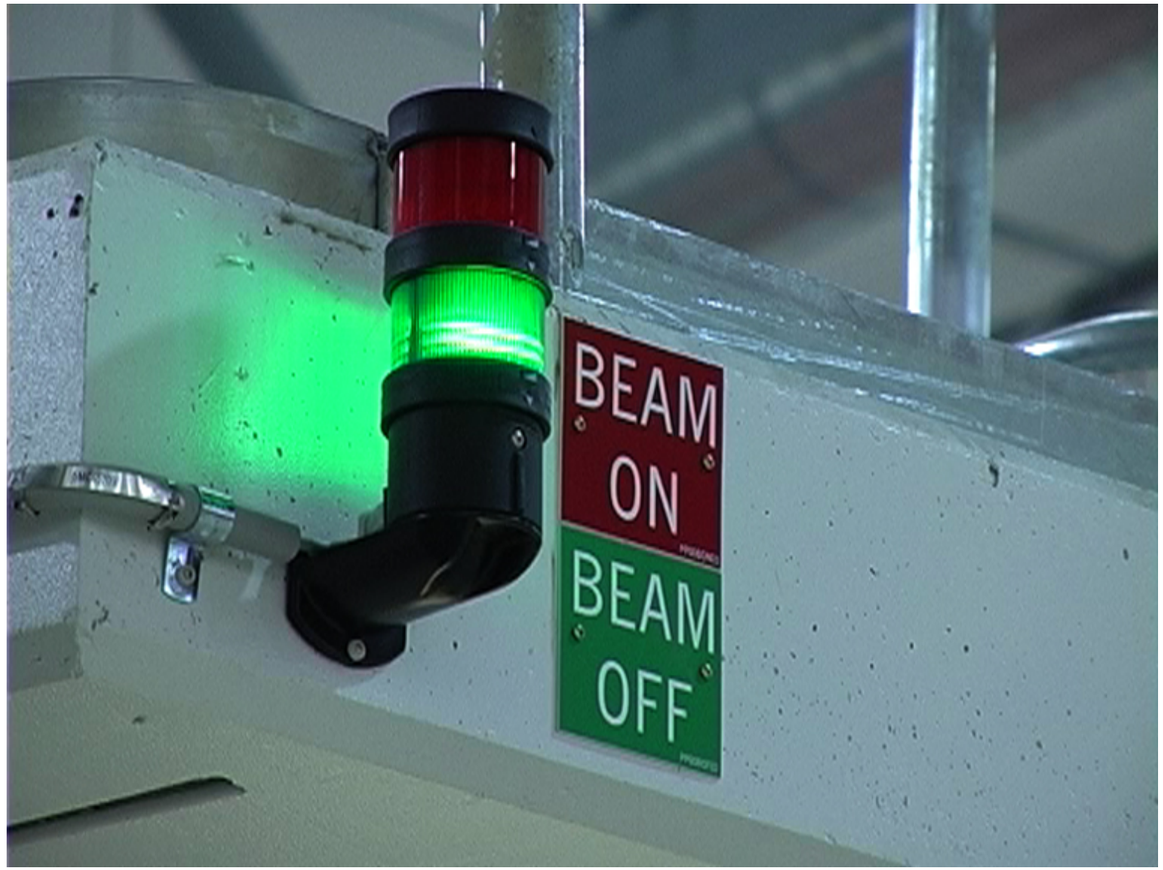
Online Induction System

- The online induction system allows remote users to undertake an exam via the internet.
- The features of this system include multiple choice questions, multiple answer multiple choice, automatic marking, picture and/or text questions and answers, exam timer and users and examiners are emailed the result of the exam.
- Automatic update of LDAP directory



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Online Induction System

- Slide image presentations.
- Video presentations.
- All slide and video presentations are timed to prevent users from skipping sections.
- Overlays or hyperlinks are available to add extra information for slides only.

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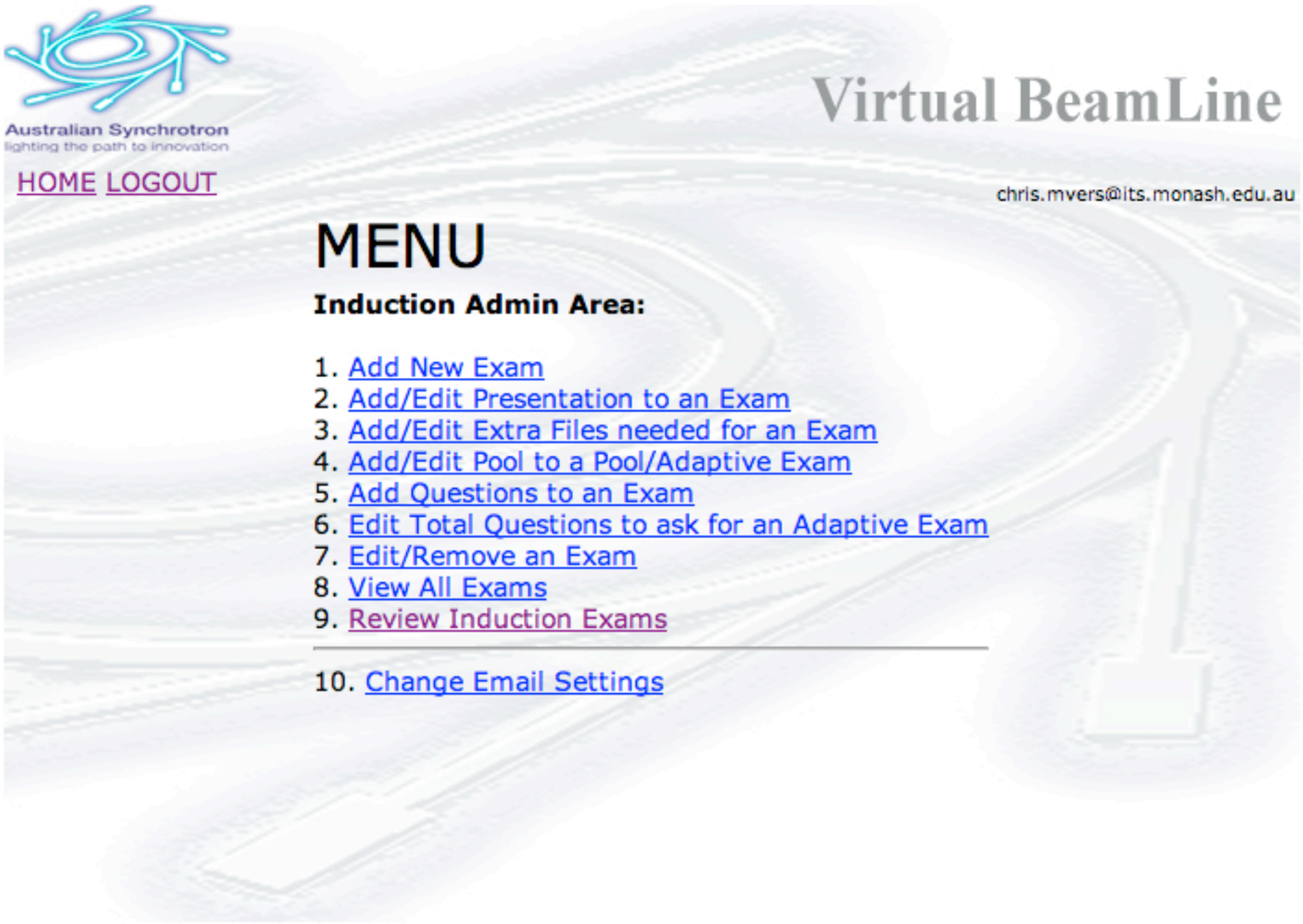
Online Induction System

- Full admin back end.
- Modify, add, remove exams.
- Modify, add, remove questions.
- Add, remove Slides.
- Add extra material for download.



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State Government Victoria AUSTRALIA

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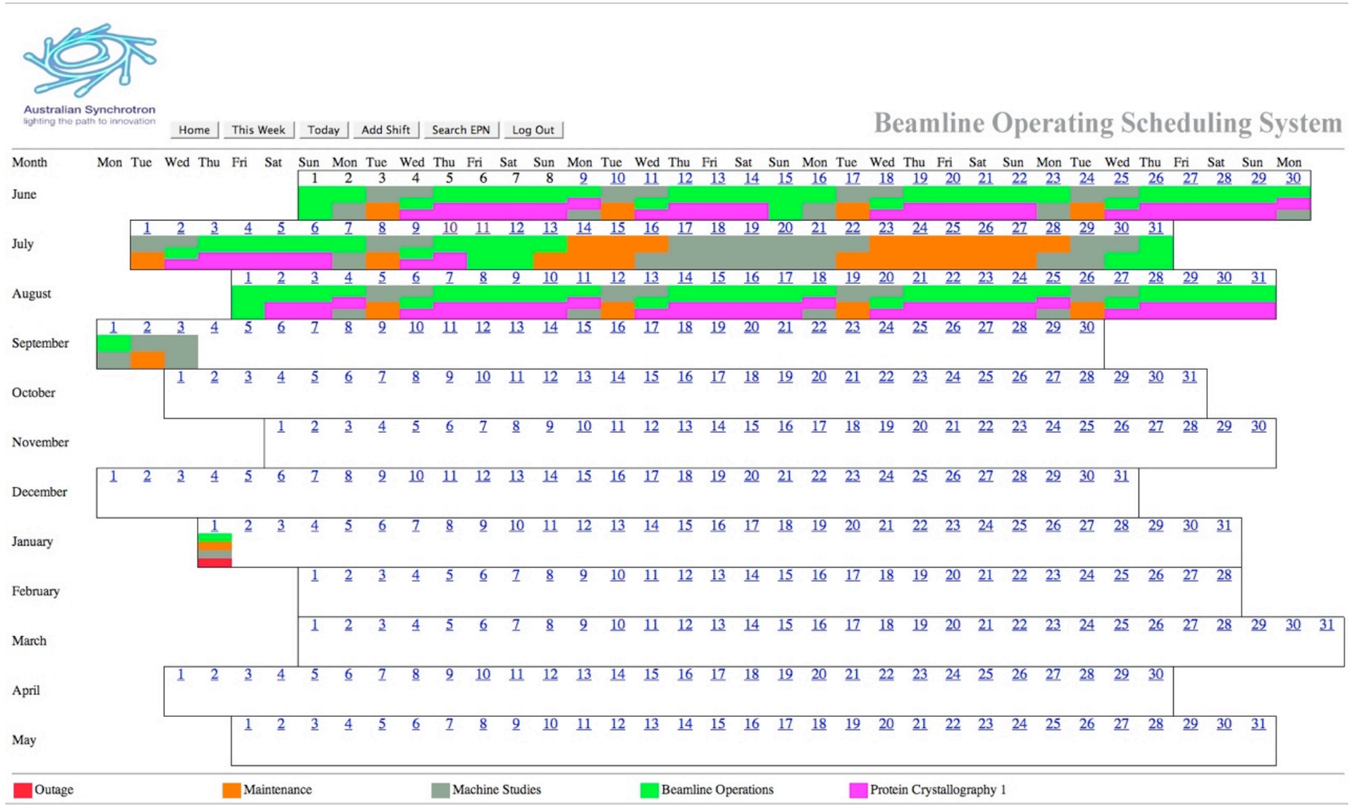
BOSS

- The Beamline Operating Scheduling System (BOSS) is a tool for booking in user beamline activities, sharing that data with your team and with the accelerator OPS group, user office and safety officers.



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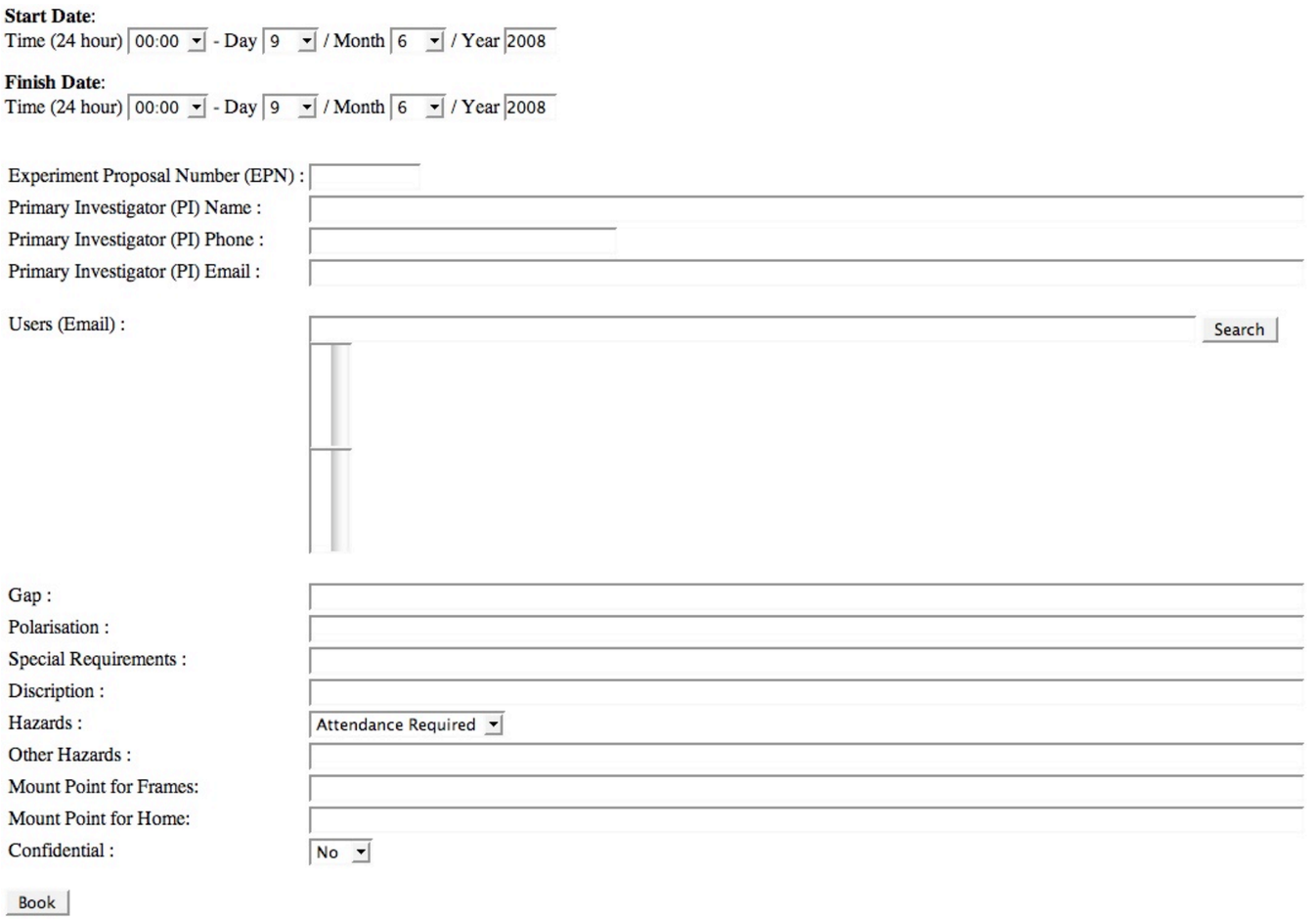
BOSS

- Each Beamline has it own view with the accelerator OPS group having an overview.
- Booking are made by the Beamline Scientist.



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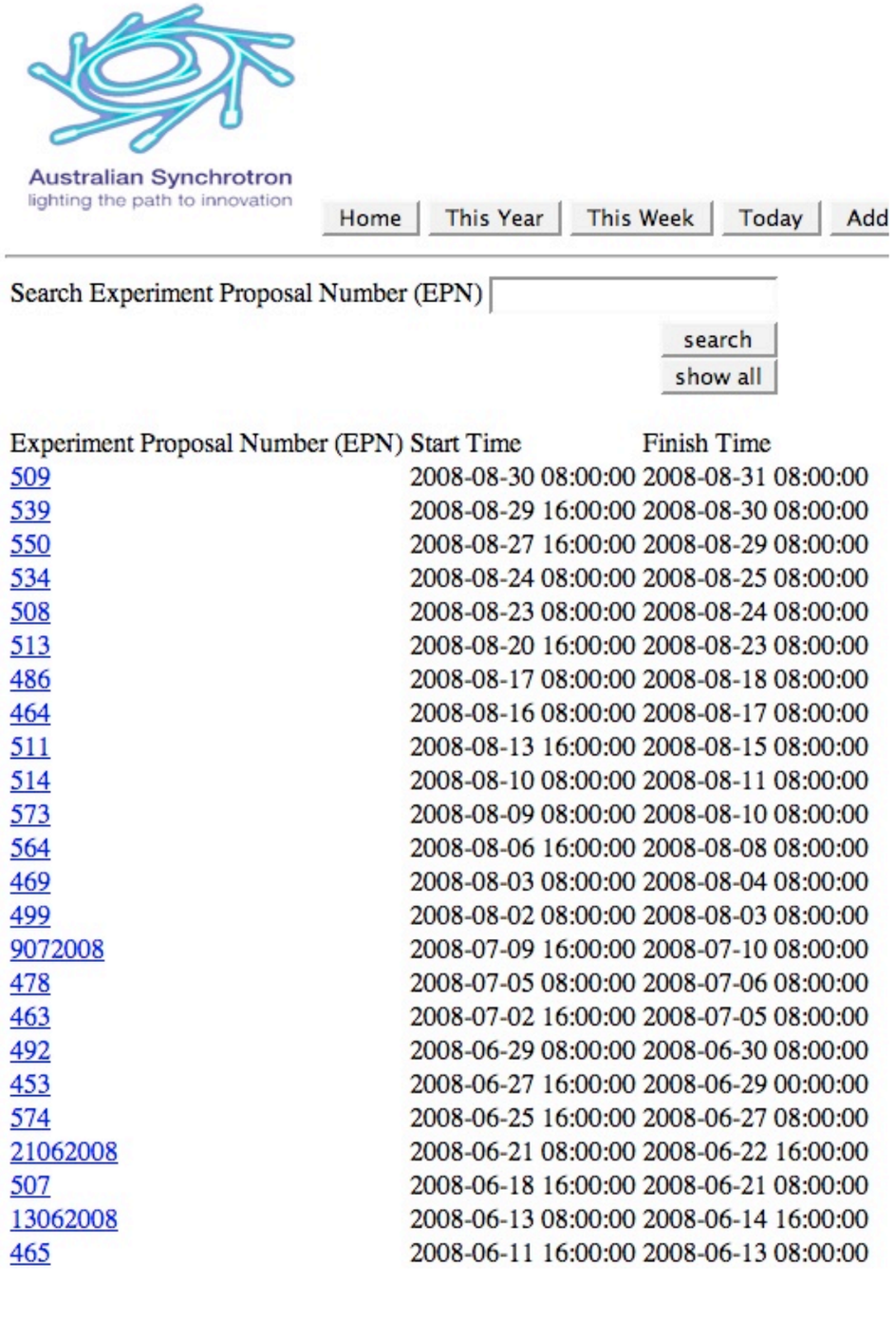
BOSS

- Features
  - man power shift scheduling.
  - Experiment search.
  - Data Access Control.
  - Setup information.



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User Pref.

- Features
  - Update their own personal details.
  - Upload proxy's for data transfer.
  - Check current access rights and role.

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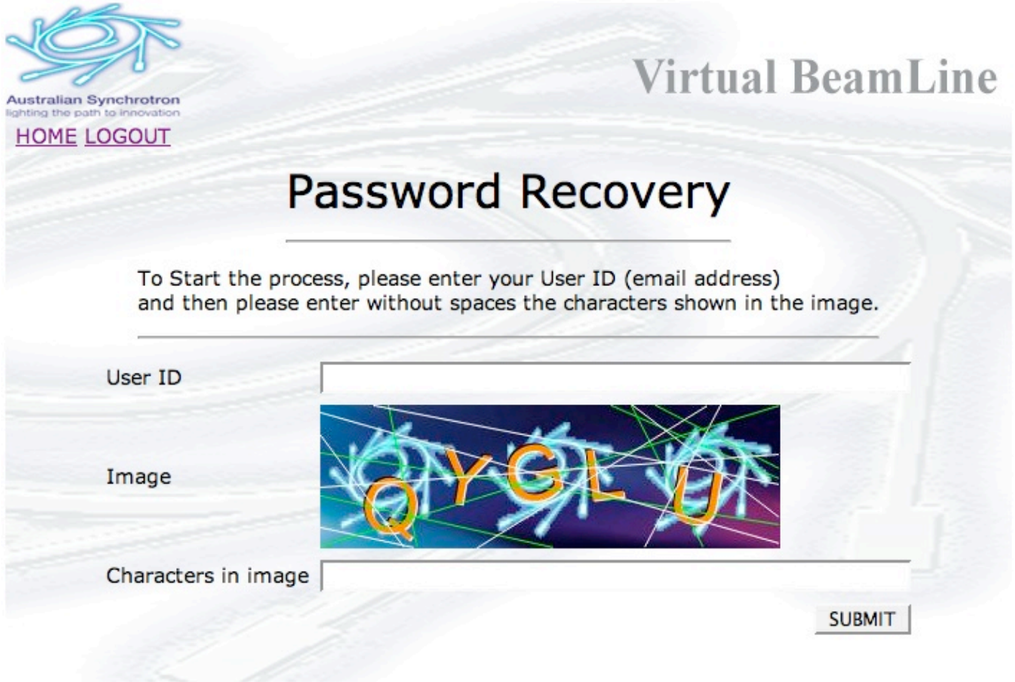
User Pref.

- Features
  - Users can also change their passwords.
  - And perform self server password recovery.



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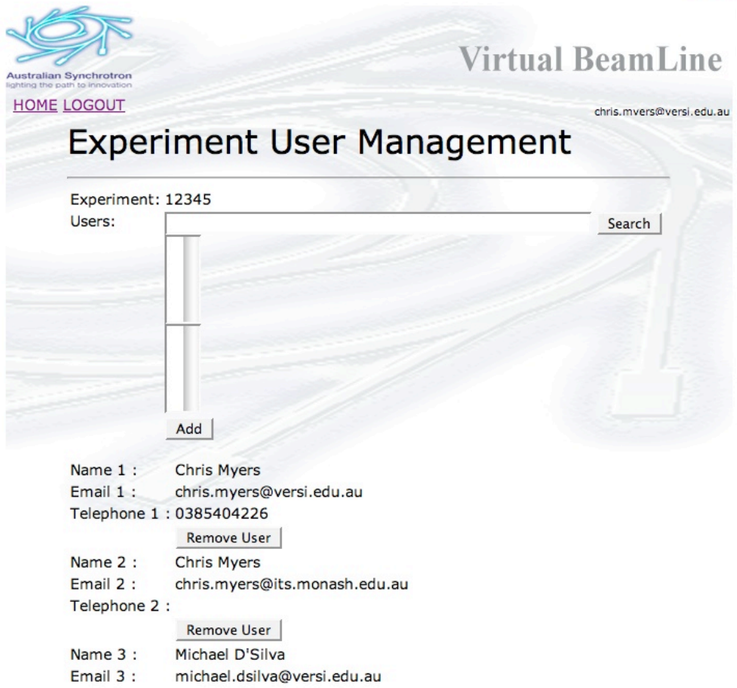
User Pref.

- Features
  - Users can create their own account to be authorised by the user office.
  - PI's of experiments can also add authorised users to the experiment or to access the data sets.



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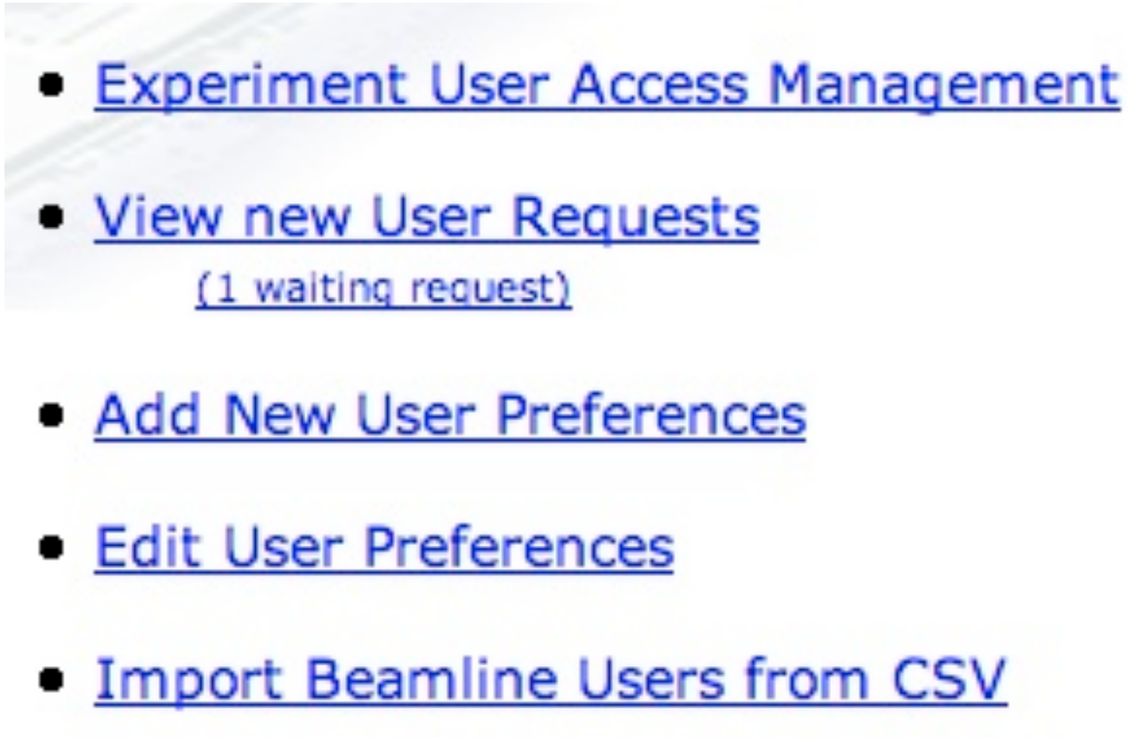
User Pref.

- Back end tools are available for authorised personal to:
  - approve new users.
  - add or edit users details.
  - and import users via a CVS formated file.



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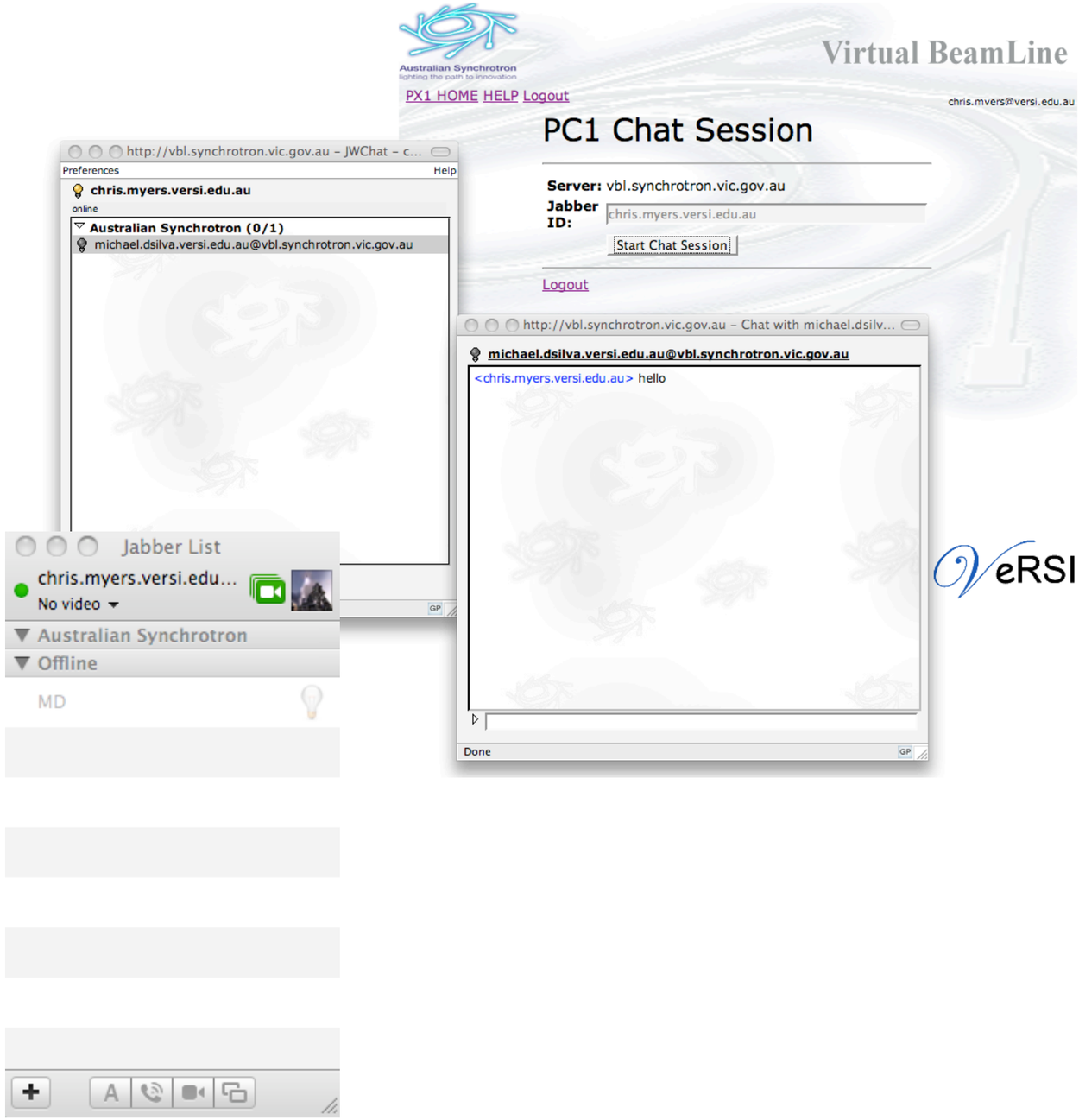
IM Solution

- Openfire jabber server.
- integrated into local LDAP server.
- jwchat client installed into web portal.
- Can integrate with existing clients like ichat.
- Allows group/conference chat with password protection.
- connections can be encrypted.



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Data Transfer

- This VBL service will ultimately enable transport of data sets to all national and international Grid enabled storage systems from the Australian Synchrotron.

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Data Transfer

- Comprising a GSI enabled Globus GridFTP service to transport data between the sites; for authorisation and authentication we use IGTF compliant X509 certificates issued by the APAC Grid Authority under ARCS.

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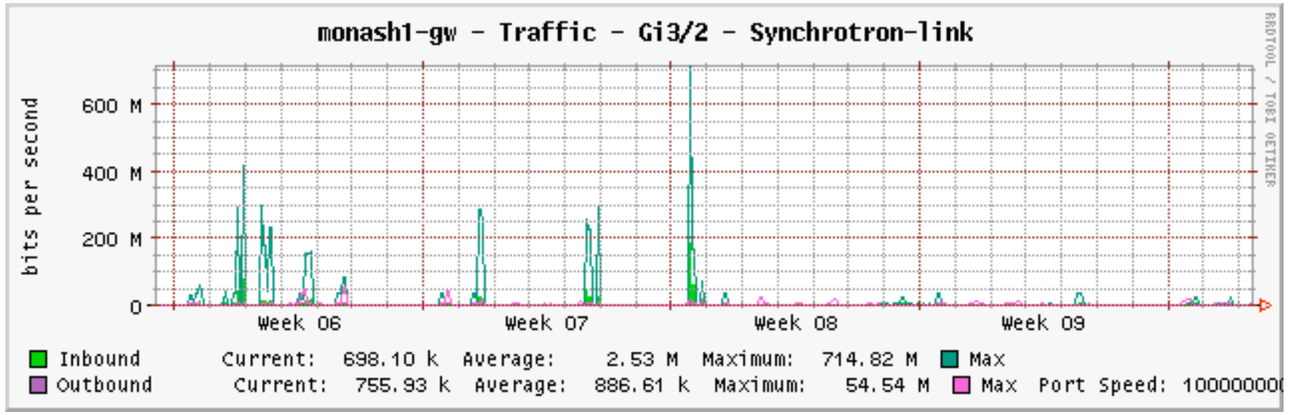
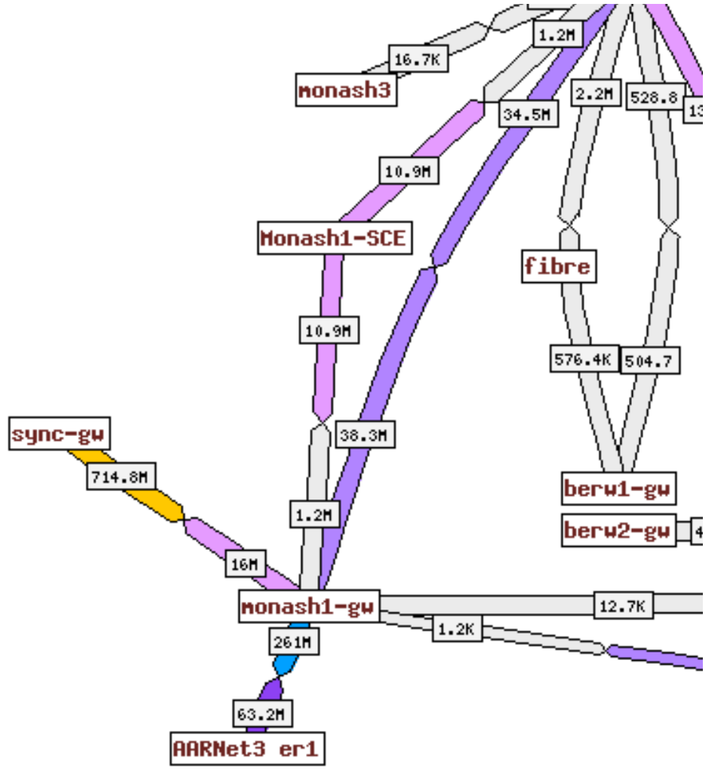
Data Transfer



- Network rates of approximately 714-Mbps where achieved using data sets produced from the Protein Crystallography 1 beamline.



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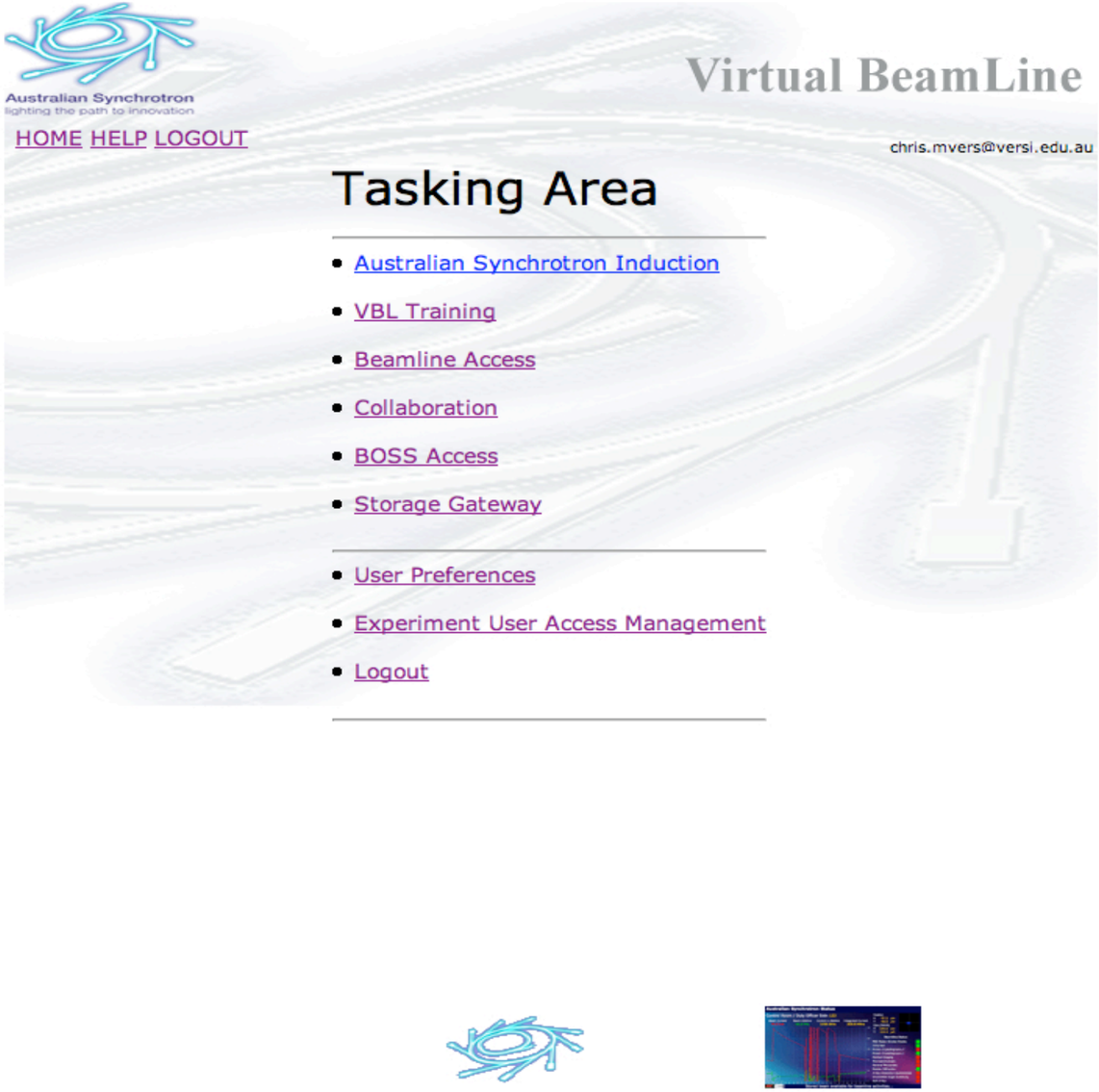
Data Transfer

- The VBL Main Menu
- This is the tasking area for all VBL activities.



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Data Transfer

- This menu allows the user to select experiments they have access to and then select the transfer method.
- GridFTP complete.
- SSL complete.
- SRB under test.

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Data Transfer

- If the user selects GridFTP.
- This page checks if the users proxy certificate is valid and how much longer it will remain valid for.
- Proxy certificates are upload via the user preferences area.

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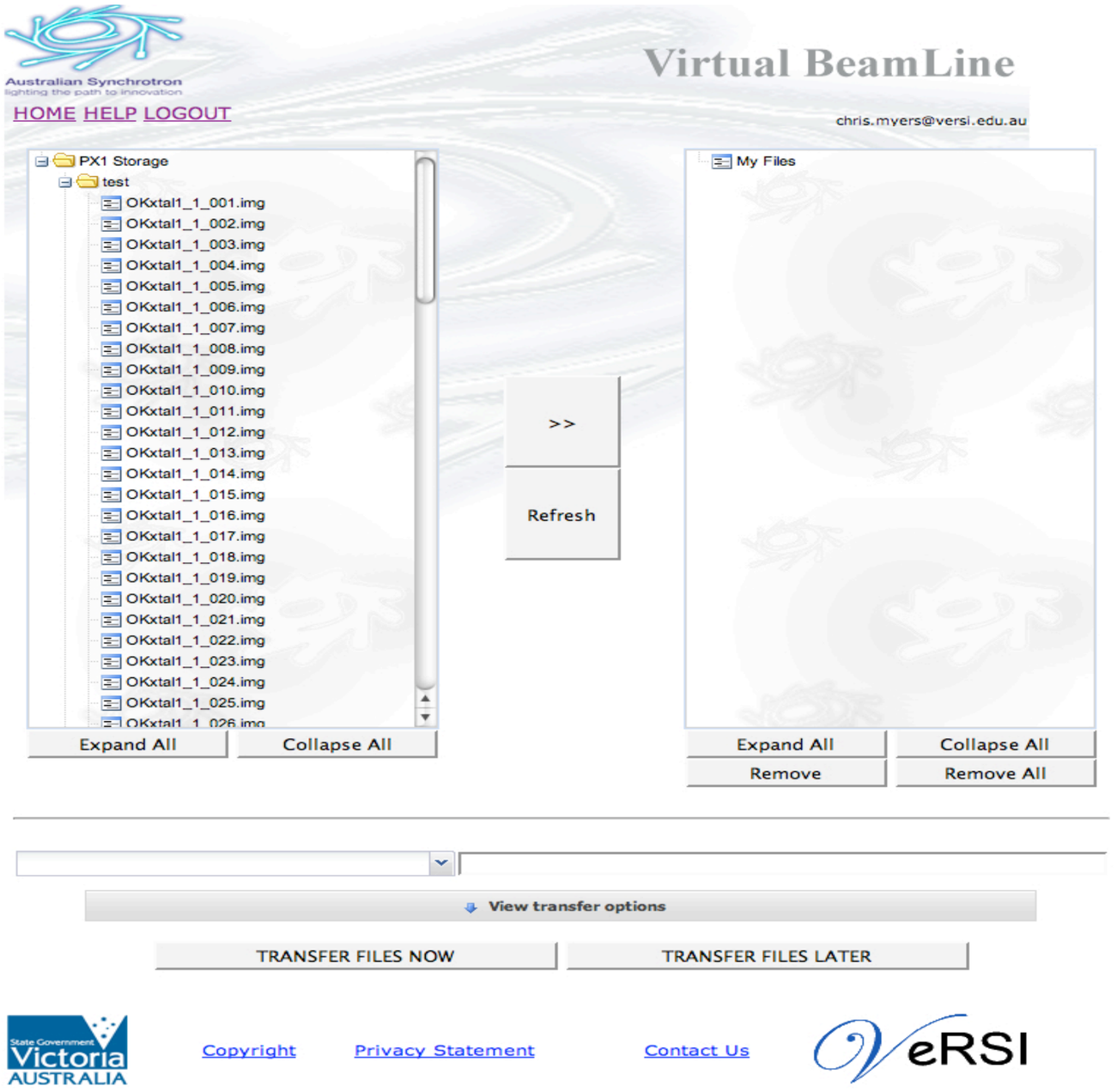
Data Transfer

- This is the main transfer page for GridFTP
- Users can drag and drop files or directories



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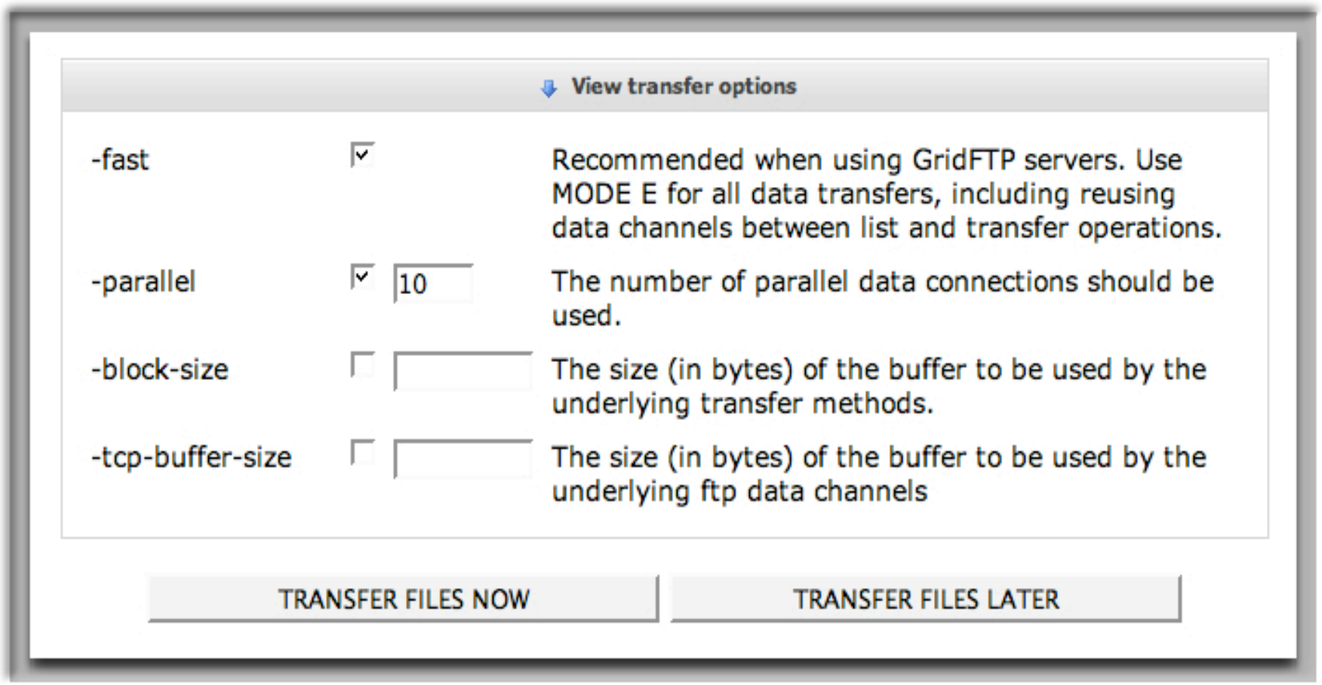
Data Transfer

- Then the users can use a pre-configured download site or just type the name or IP of their GridFTP service.



- Advanced options are available.

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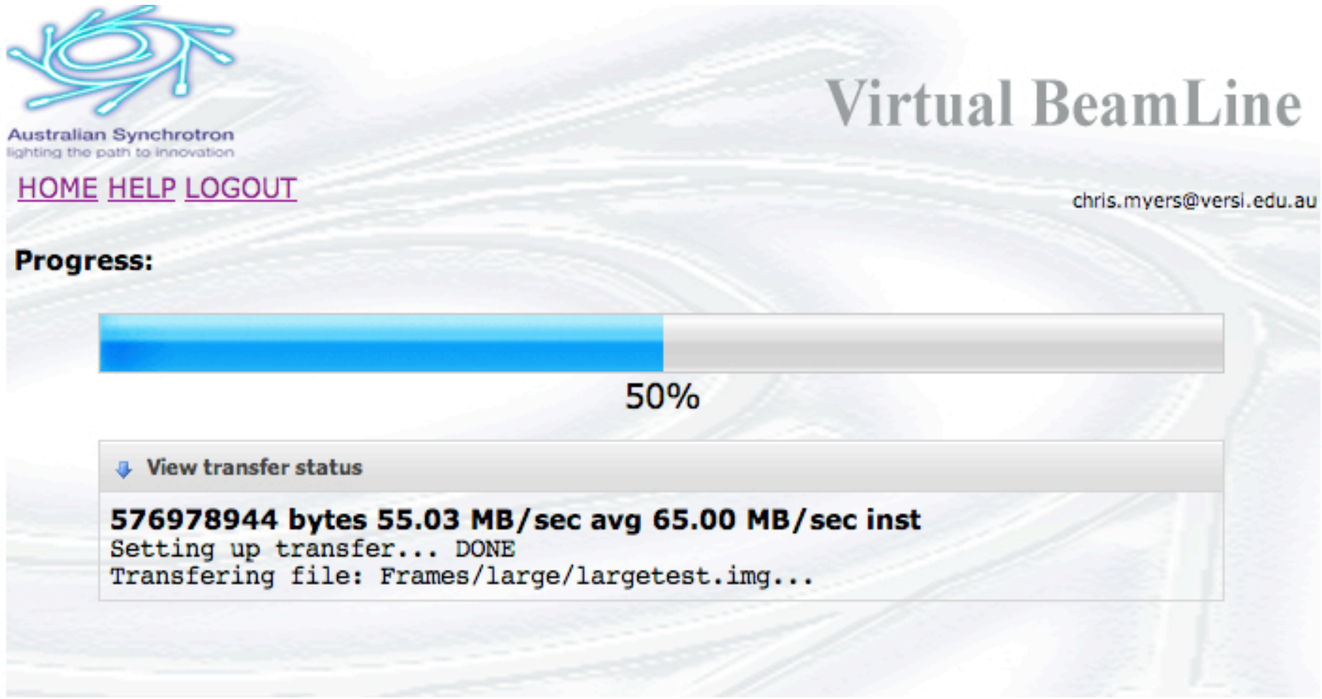
Data Transfer

- Users can transfer now and observe the transfer.



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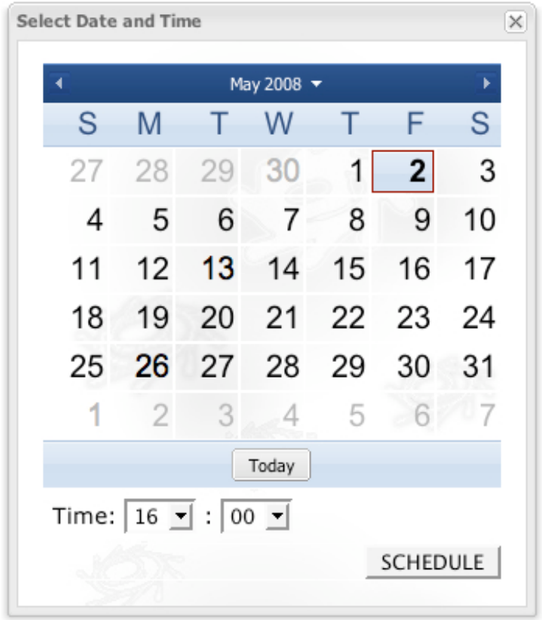
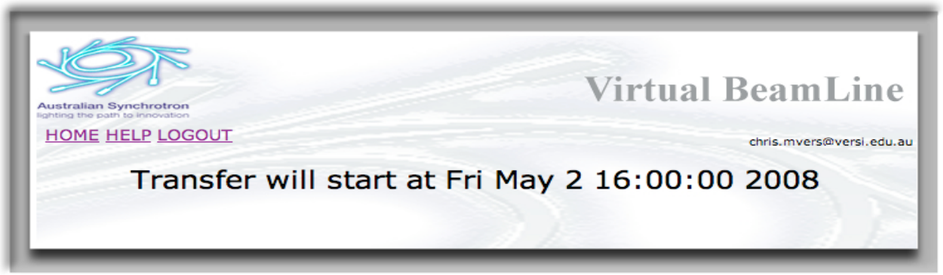
Data Transfer

- Or choose to schedule a transfer for later.





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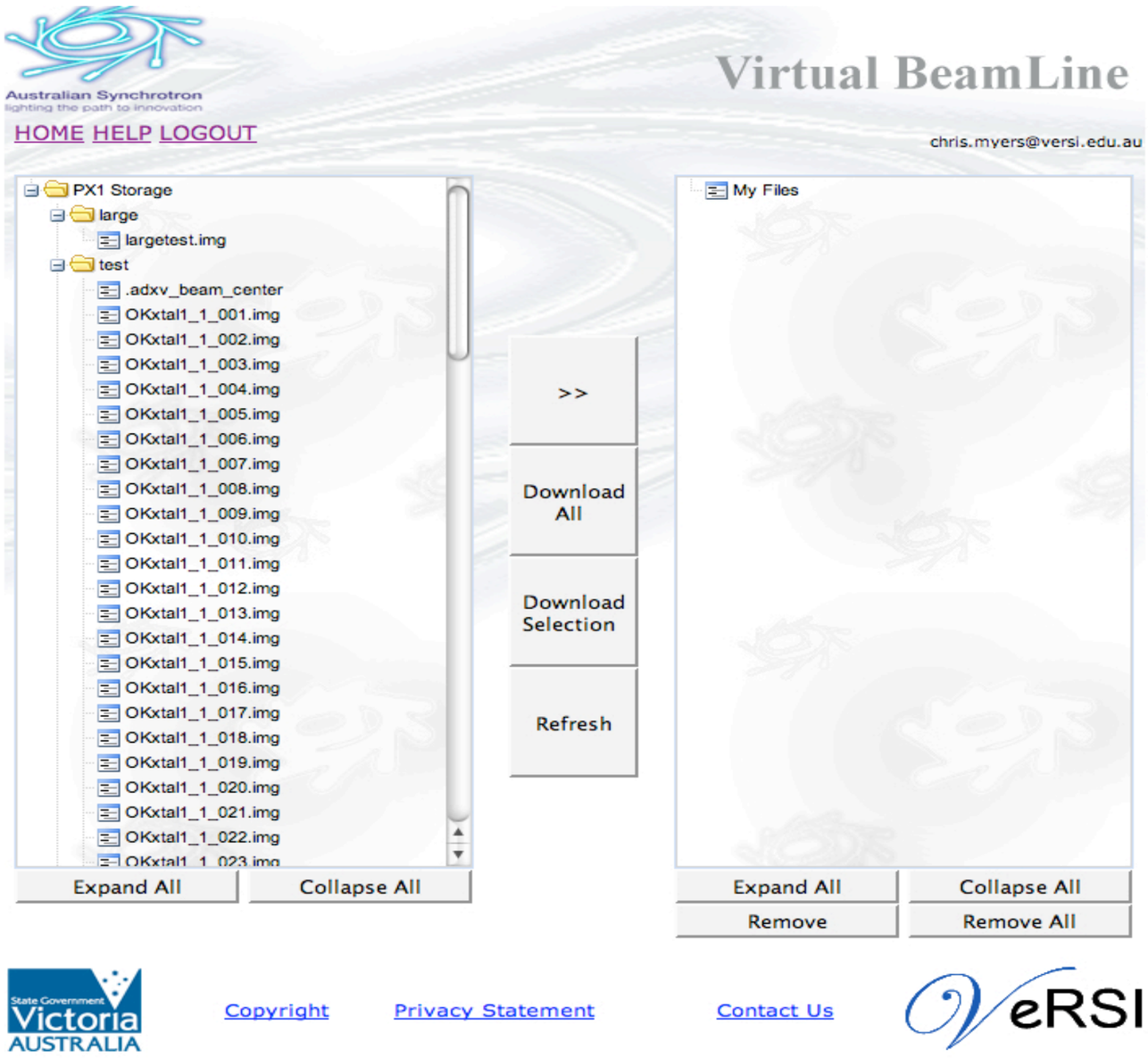
Data Transfer

- This services is available in SSL as well.
- users can drag and drop.
- download all or a selection of files.
- or double click for a single file.



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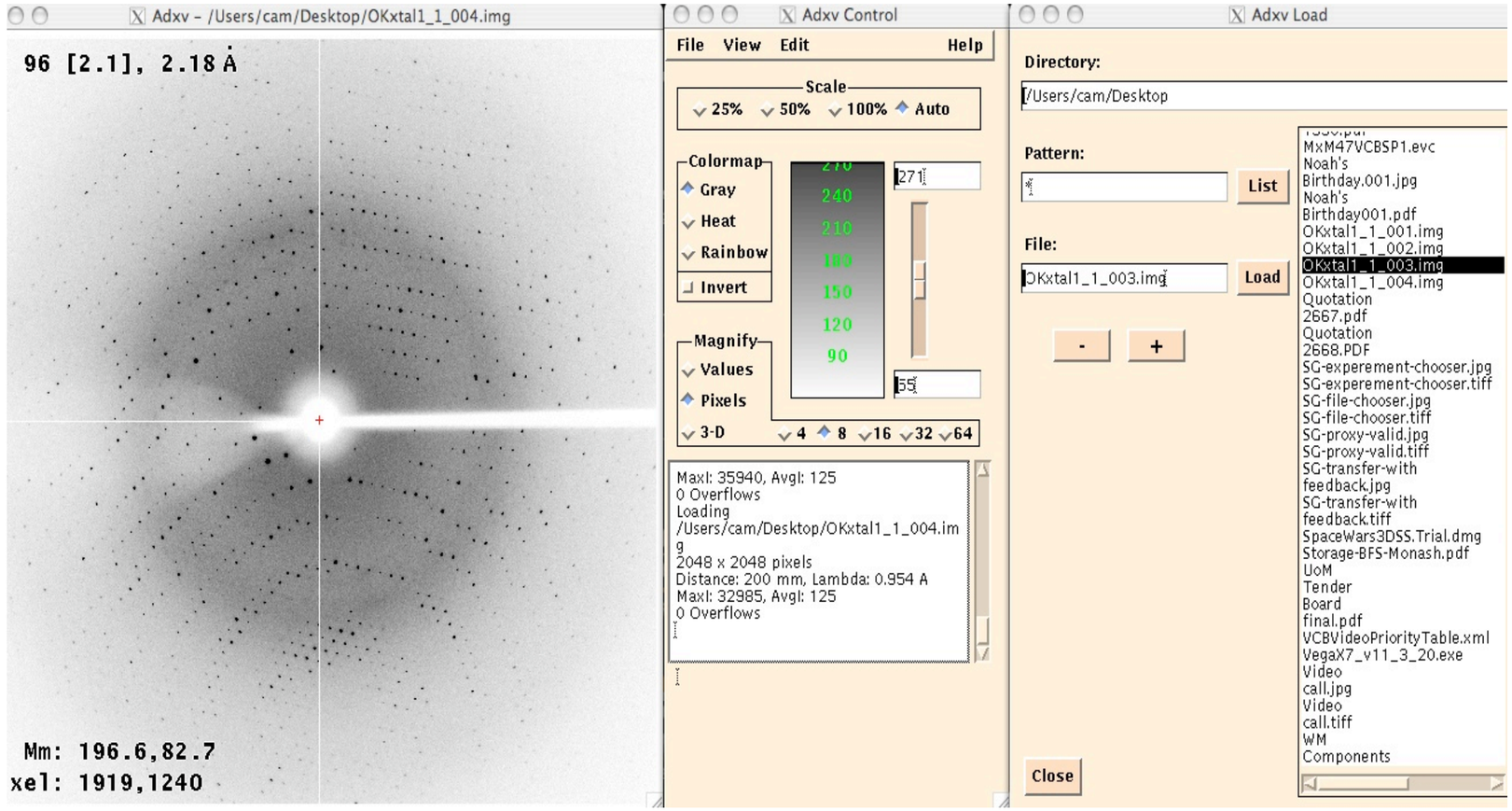
Data Transfer

- This service is all about getting the images back to the users lab for solving faster.



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Beamline Installation

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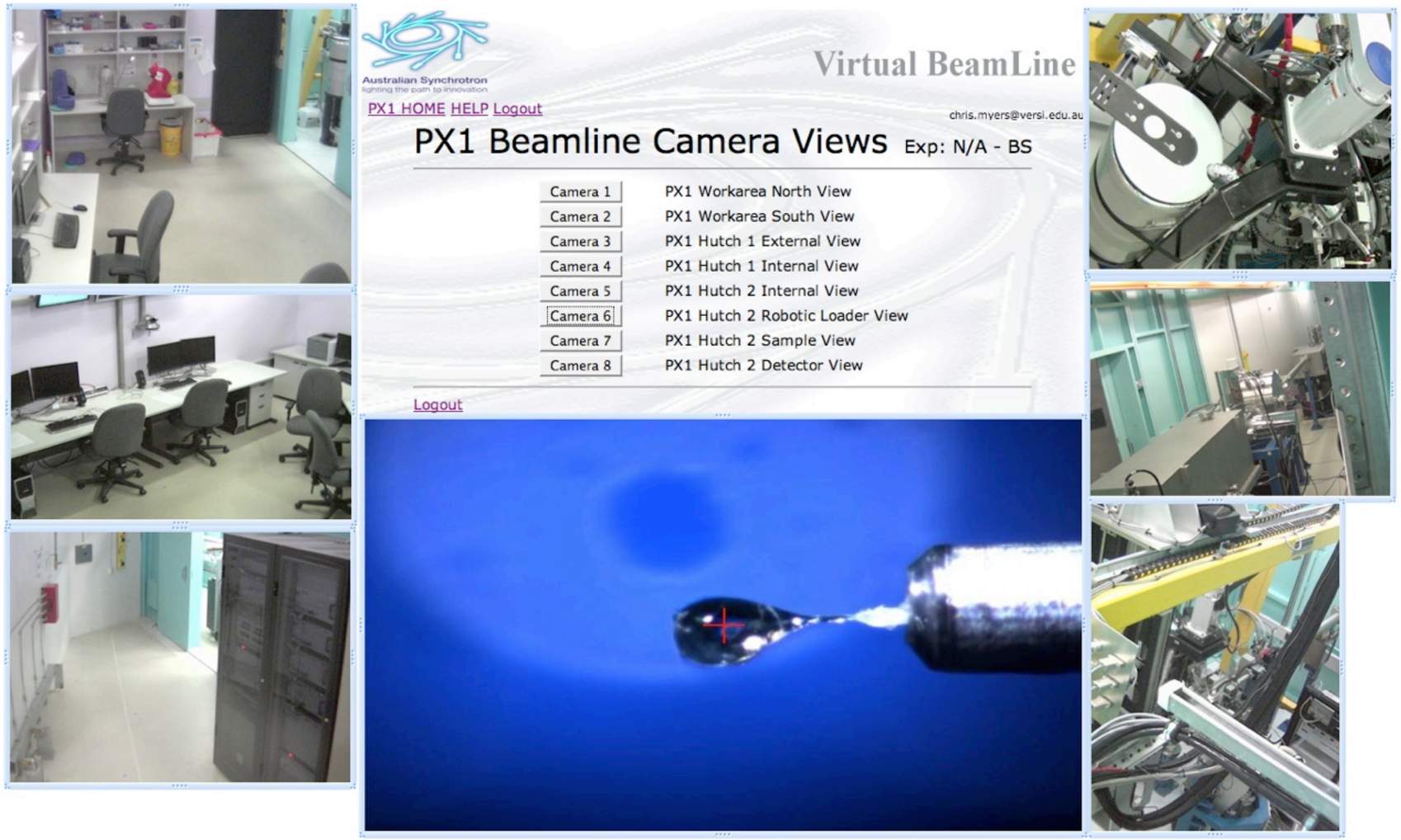
Work Area Overview

- Video captured from the PX1 beamline.
- Refreshes every 2 seconds.
- WEB 2.0
- Camera views can be moved and resized.



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Video Collaboration

- Aethra Vega X7 H323 Video conferencing unit.
- 720p HD video images.
- Requires 4M bandwidth.
- enterprise reliability.
- VCBpro HD 12 port MCU deployed.
- VpointHD soft clients deployed and managed by MXM.

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Video Collaboration

- Full web control integration.
- Displays Call Status.
- Allows camera selection local and remote
- Pan tilt functionality local and remote.
- Dual video.

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Remote Control

- PX1
  - Remote control has been developed by the beamline scientist's under Dr Adam's of the Australian Synchrotron using no machine and enabling the remote user to have full control via the blu-ice control interface.

Work done by Dr Adams, Australian Synchrotron using SSRL Blu-Ice system.

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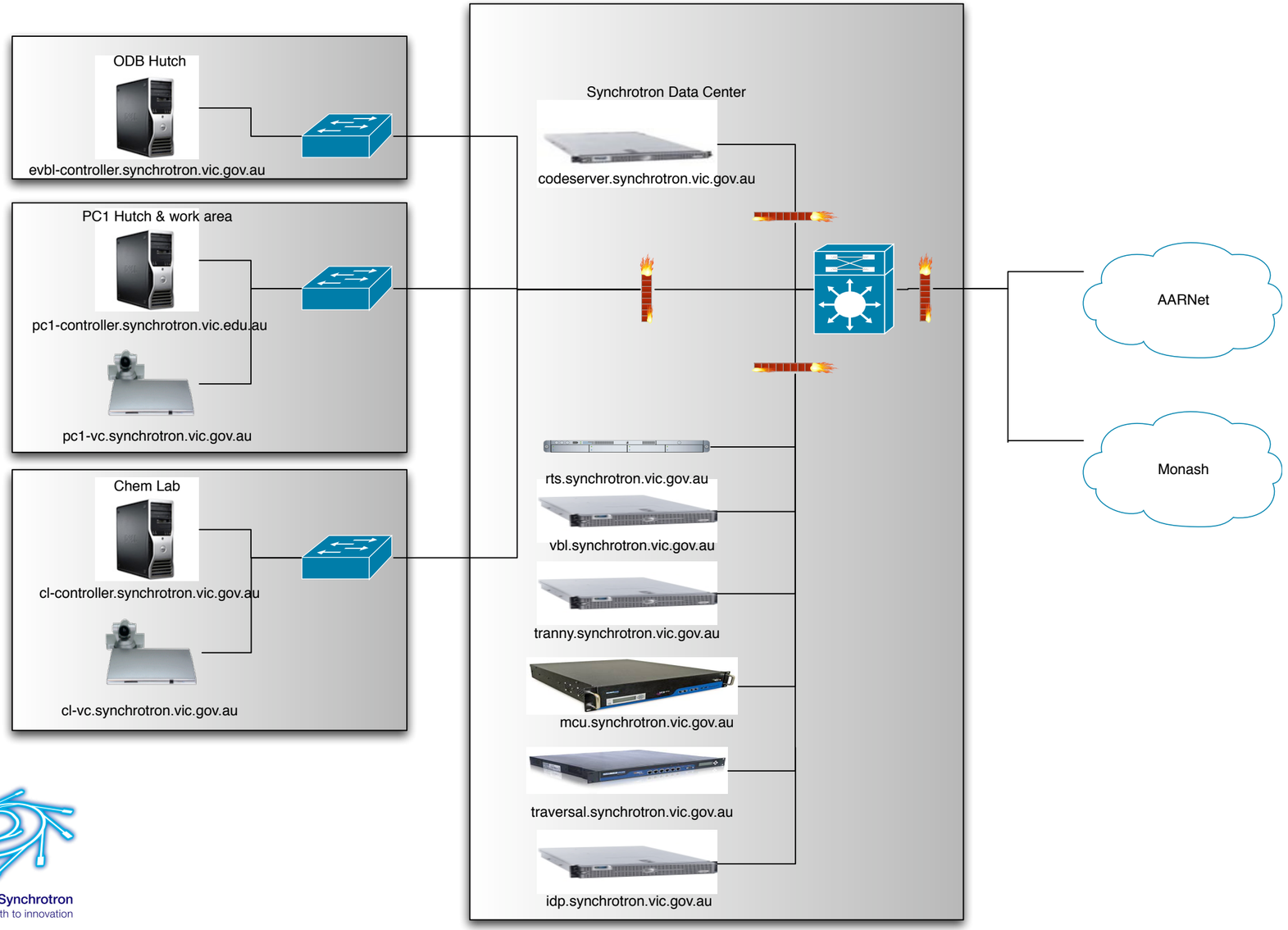
System Deployment @ Australian Synchrotron



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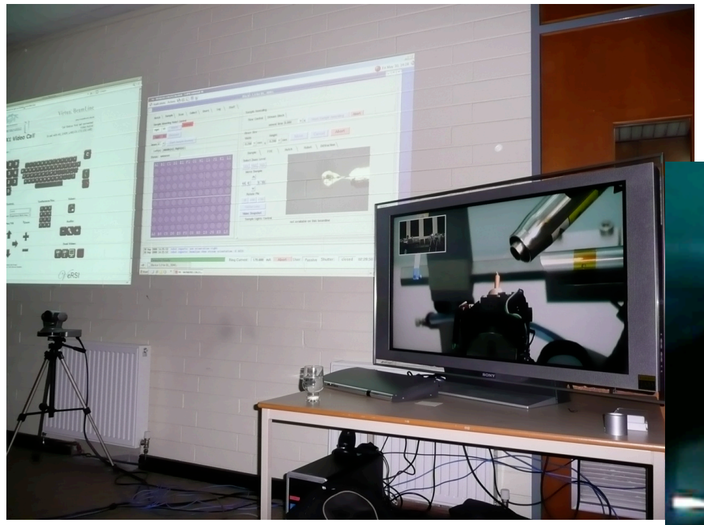
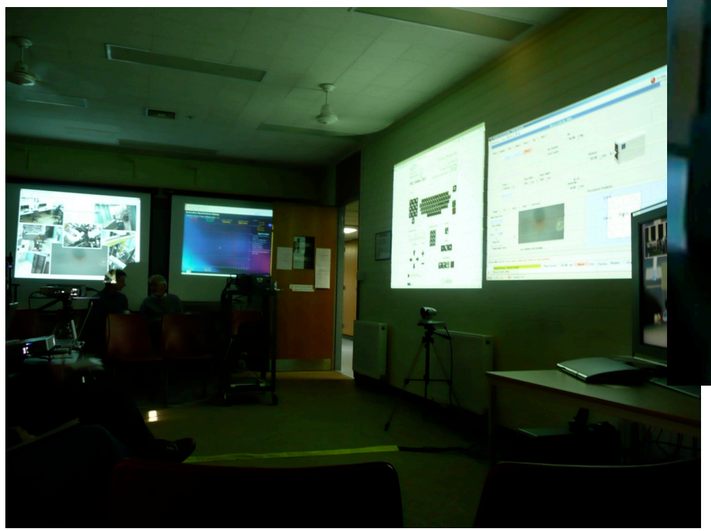
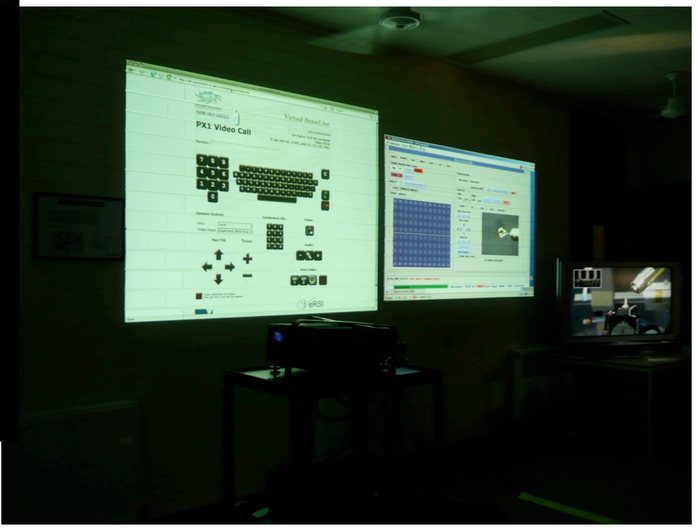
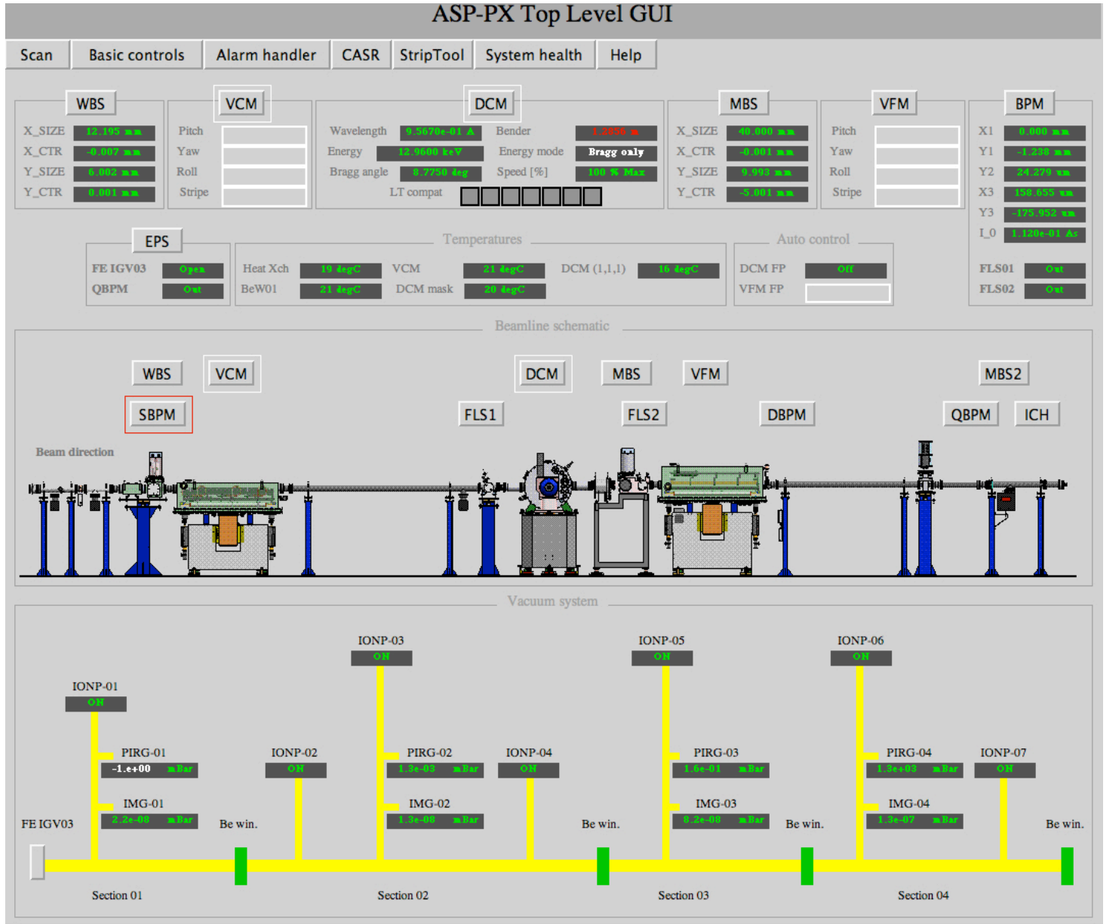
So What's Next - Demonstration to User Groups

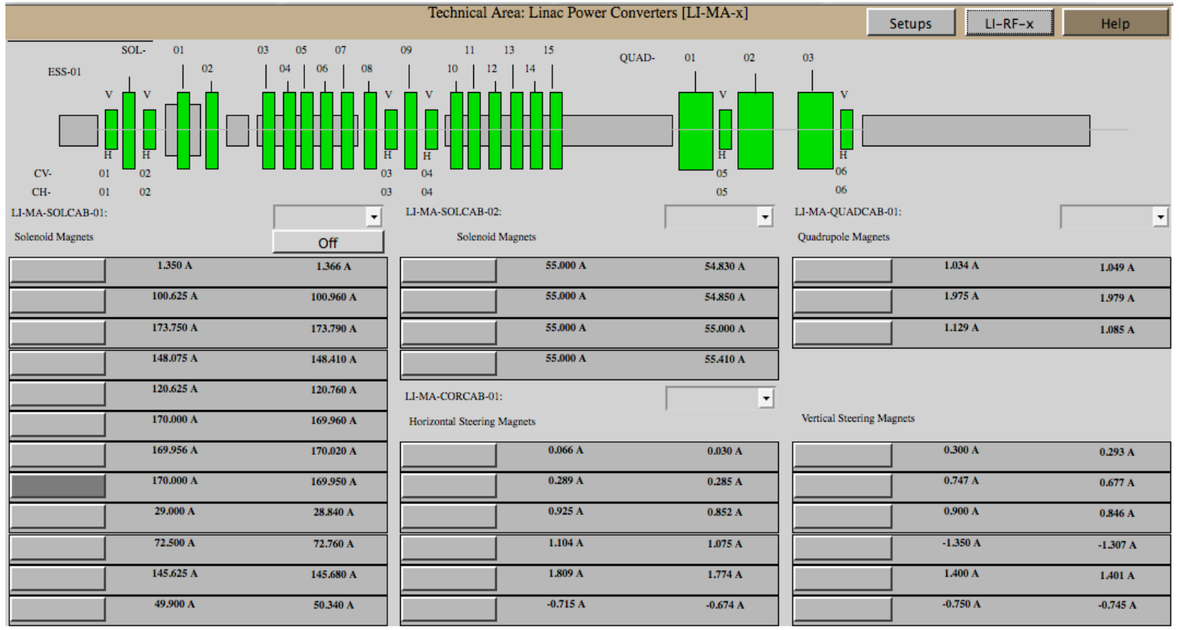






So What's Next - Web based EDM Screens





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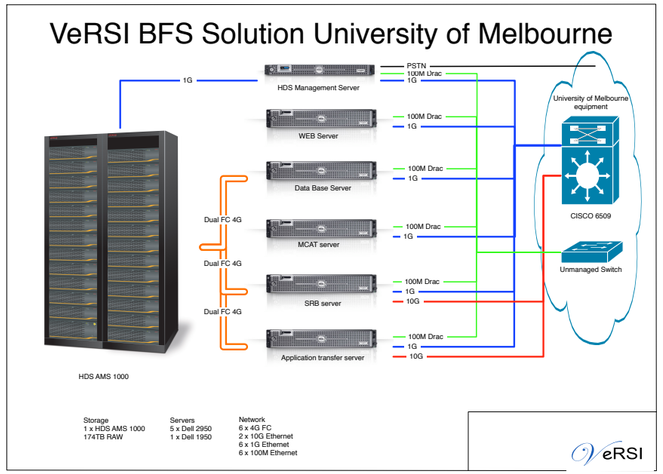
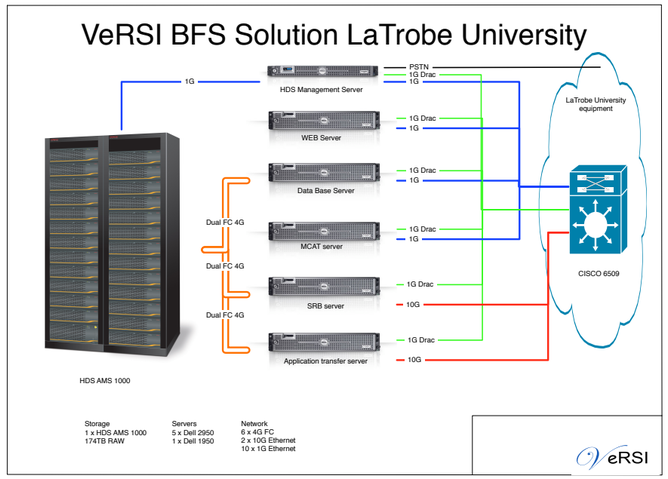
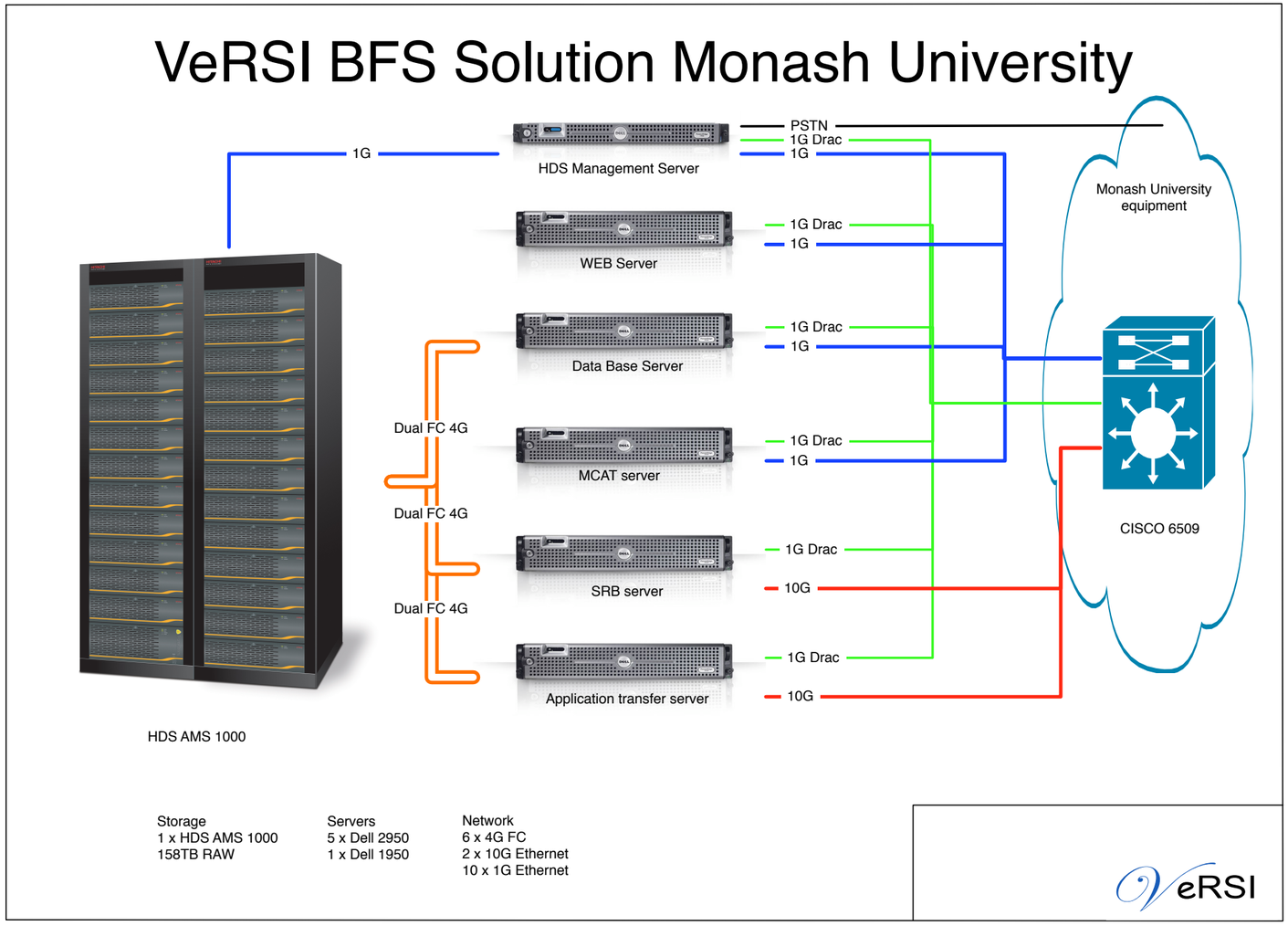
So What's Next - Secondary Grid Storage using SRB







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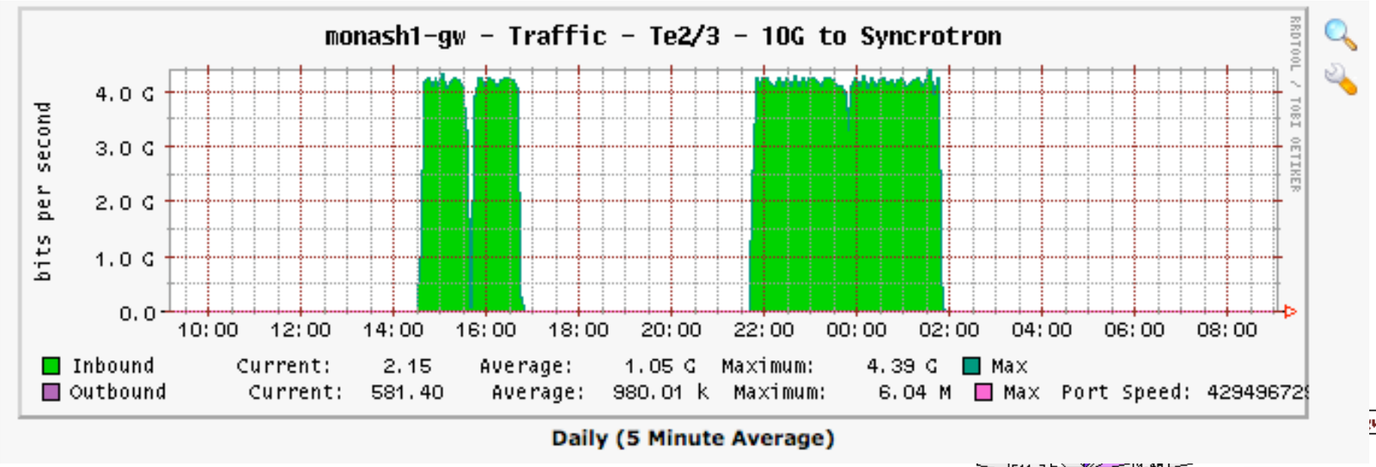
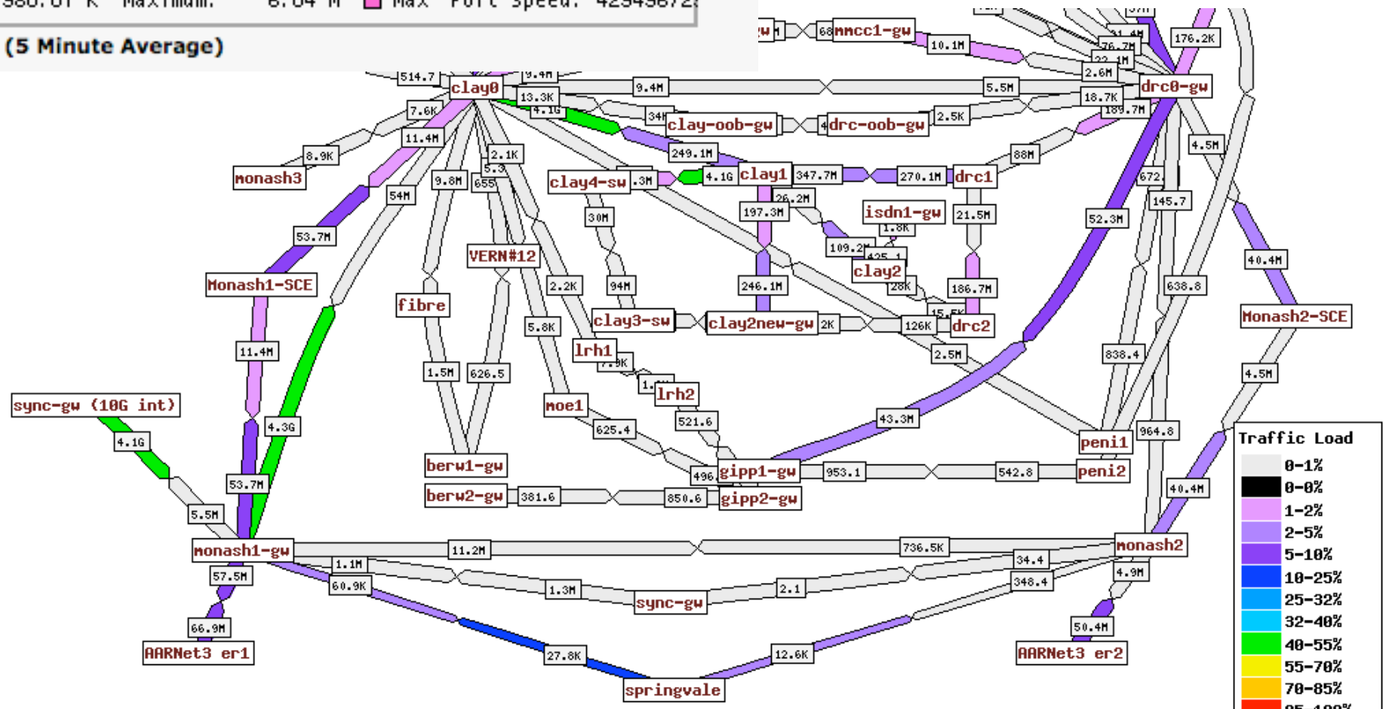
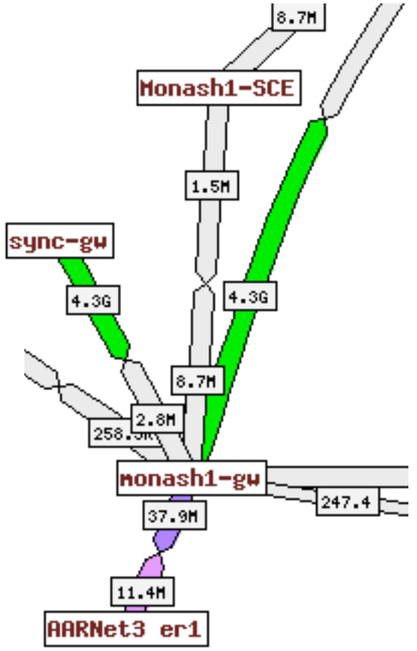
So What's Next - High capacity data flows to Monash on new 10G private link







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Thanks

- MMV - Victorian Government
- Australian Synchrotron
  - With special thanks to
    - PX Team under Dr Adams
    - Controls/network Team under Richard Farnsworth
    - Electrical engineering Team
  - Corporate

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Thanks

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Please Note: All software developed by VeRSI for the VBL Project is open source.

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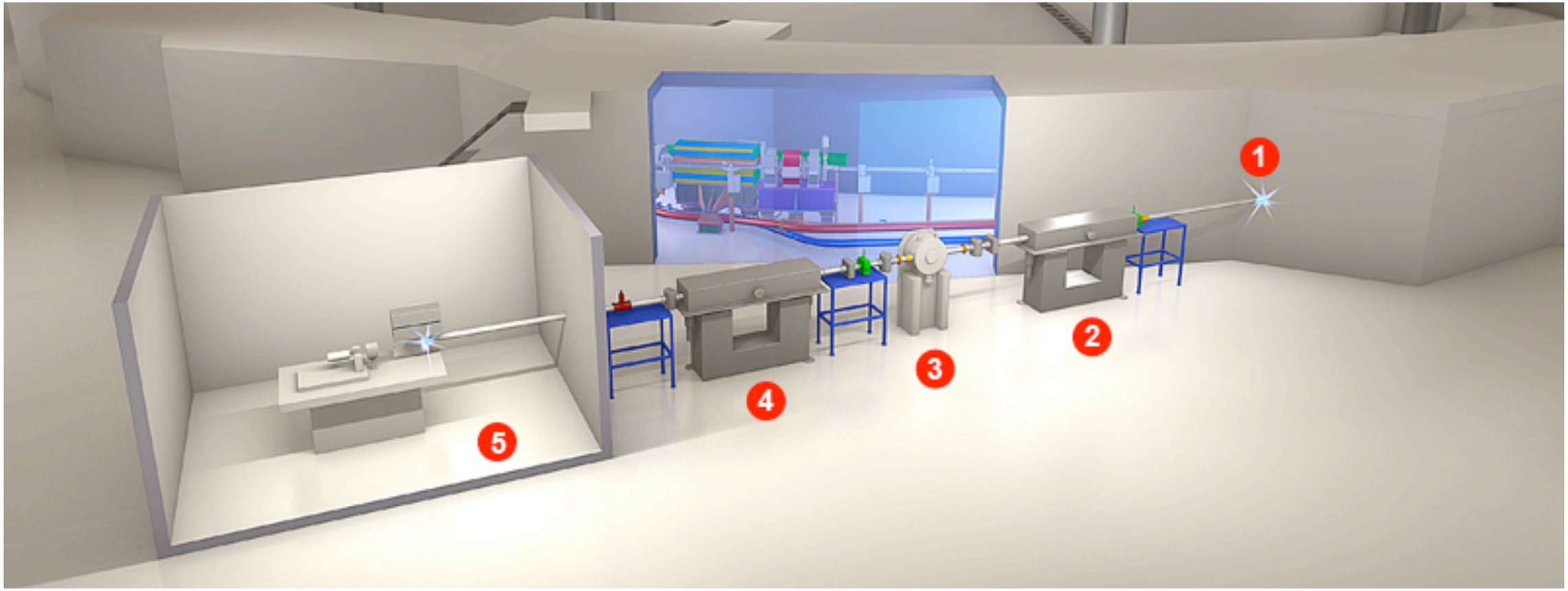

Demo Time

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