

Beamline Remote Access at the Australian Synchrotron

MXCuBE-ISPyB Joint Meeting, DLS, UK

17 - 19 November 2025

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Australian Synchrotron

Remote User Access

■ Our Users Travel to Us

- Travel from around the country, New Zealand and Singapore
- Flights are typically 2-4+ hours
- Users stay in our onsite (50-room) Guesthouse
- Carbon footprint

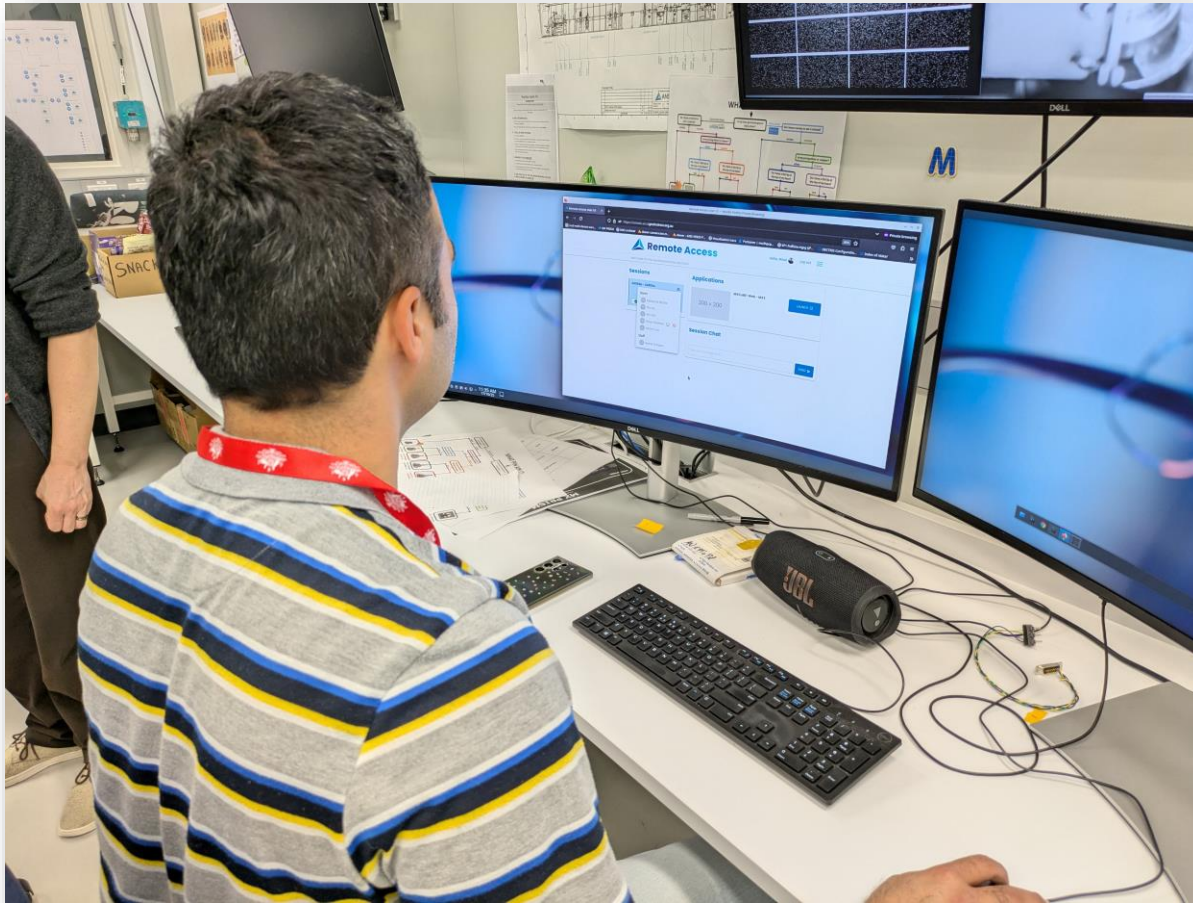
■ Remote Access

- Opens up our capabilities to more users
- Provides access to users with limited travel budget
- Allows hybrid experiments
- Reduces carbon footprint



Remote Access is in Production

First hybrid (on-site + remote) user experiment on 17th October 2025



When you don't know it is remote

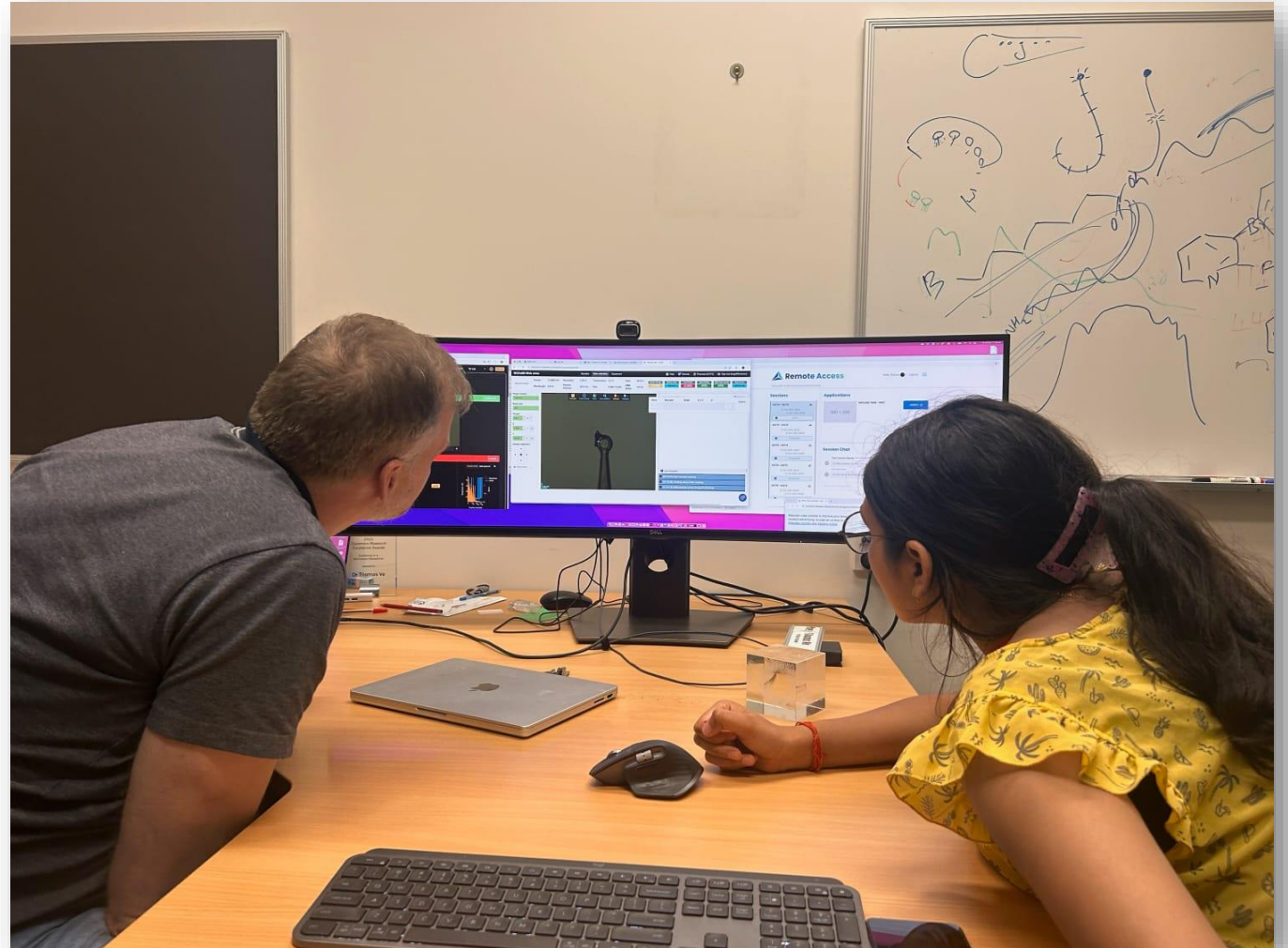
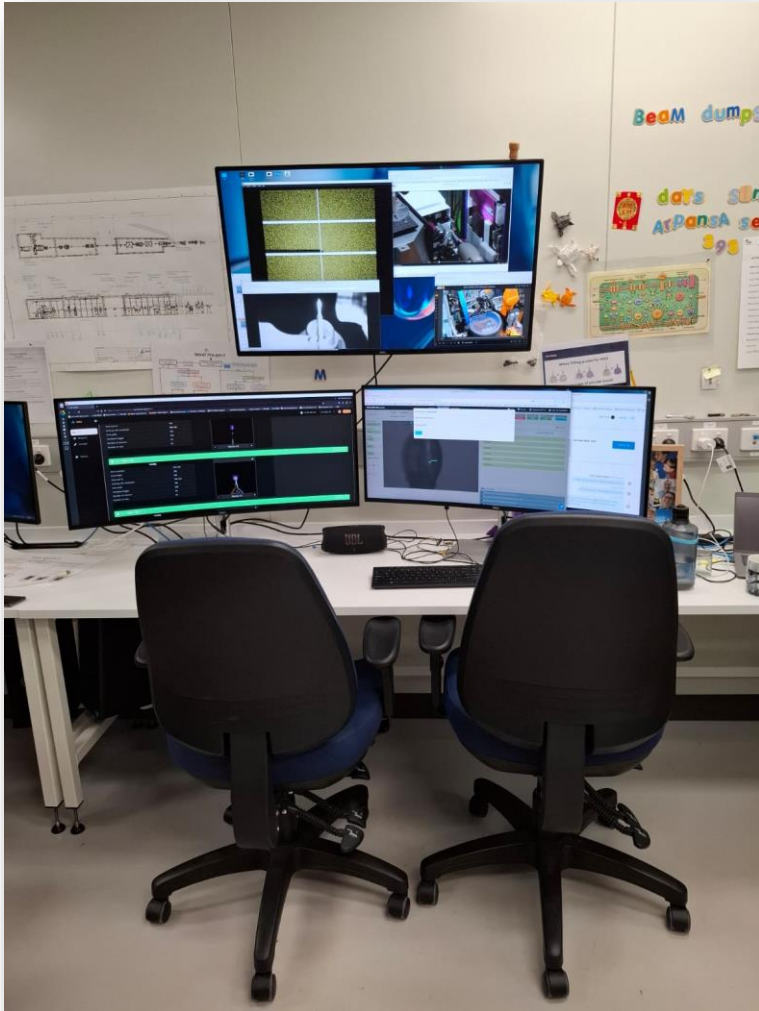
23rd October 2025



When you know it is remote

24th October 2025

Griffith Uni in Queensland





MFA for Remote Users

ASCI
AUSTRALIAN SYNCHROTRON
COMPUTING
INFRASTRUCTURE

Sign in to your
account

Username or email

Password


☐

Sign In

Mobile Authenticator
Setup

You need to set up Mobile Authenticator to activate your account.

1. Install one of the following applications on your mobile:
Google Authenticator
FreeOTP
Microsoft Authenticator
2. Open the application and scan the barcode:



[Unable to scan?](#)

3. Enter the one-time code provided by the application and click Submit to finish the setup.
Provide a Device Name to help you manage your OTP devices.

One-time code *

Device Name

☒ Sign out from other devices

Remote Access Hub

The screenshot shows the Remote Access Hub interface. At the top, the logo and name 'Remote Access' are displayed, along with the user's name 'Hello, Andreas' and a 'Log out' button. Below the header, the text 'WELCOME TO THE AUSTRALIAN SYNCHROTRON' is visible. The main content area is divided into three sections: 'Sessions', 'Applications', and 'Session Chat'. The 'Sessions' section on the left lists three sessions: 'Remote Access Test - MX3Cal20251021' (Open), 'Remote Access Test - MX3cal20251014' (Scheduled), and 'Remote Access Test - 24901b' (Scheduled). The 'Applications' section on the right shows 'MXCuBE-Web - MX3' with a 'LAUNCH' button. The 'Session Chat' section at the bottom has a text input field and a 'SEND' button. Annotations with arrows point to various elements: 'Sessions available to the user' points to the 'Sessions' header; 'Currently open session for the user to join' points to the 'Open' button; 'Upcoming sessions for the logged in user' points to the 'Scheduled' buttons; 'Applications available to the user' points to the 'Applications' header; 'Open application in either - Observer mode - Control mode' points to the 'LAUNCH' button; and 'Real-time chat with other remote users and staff' points to the 'Session Chat' header.

Sessions

- Remote Access Test - MX3Cal20251021
21 Oct 2025, 13:39 - 22 Oct 2025, 13:39
Open
- Remote Access Test - MX3cal20251014
18 Oct 2025, 09:57 - 19 Oct 2025, 09:57
Scheduled
- Remote Access Test - 24901b
18 Oct 2025, 09:58 - 19 Oct 2025, 09:58
Scheduled
- MXCuBE Production Test -

[SEE MORE](#)

Applications

MXCuBE-Web - MX3

LAUNCH

Session Chat

Type your message here... [SEND](#)

Annotations:

- Sessions available to the user
- Currently open session for the user to join
- Upcoming sessions for the logged in user
- Applications available to the user
- Open application in either
 - Observer mode
 - Control mode
- Real-time chat with other remote users and staff

Beamline Actions ▾

Energy: 13.0000 keV	Resolution: 1.164 Å	Transmission: 10.0 %	Cryo: 270.00 k	Sample Changer	Detector State	Fast Shutter	Mono Shutter	White Beam Shutter	Ring Current
Wavelength: 0.95 Å	Detector distance: 100.0 mm	Flux: 2.30e+11 ph/s	DMM Stripe: 2.0 nm	READY	READY	CLOSED	CLOSED	CLOSED	200.00 mA

Phase Control

Centring ▾

Beam size

20x20 ▾

Plate Navigation ▸

Move to Crystal

Omega

311.10 90 °

Kappa

11.0 0.1 °

Kappa Phi

22.0 0.1 °

Sample alignment

50 μm

Draw grid3-click centringFocusZoom (LEVEL1)BacklightFrontlight

Chat

But...

Settings ▾

CurrentQueued Samples (0)

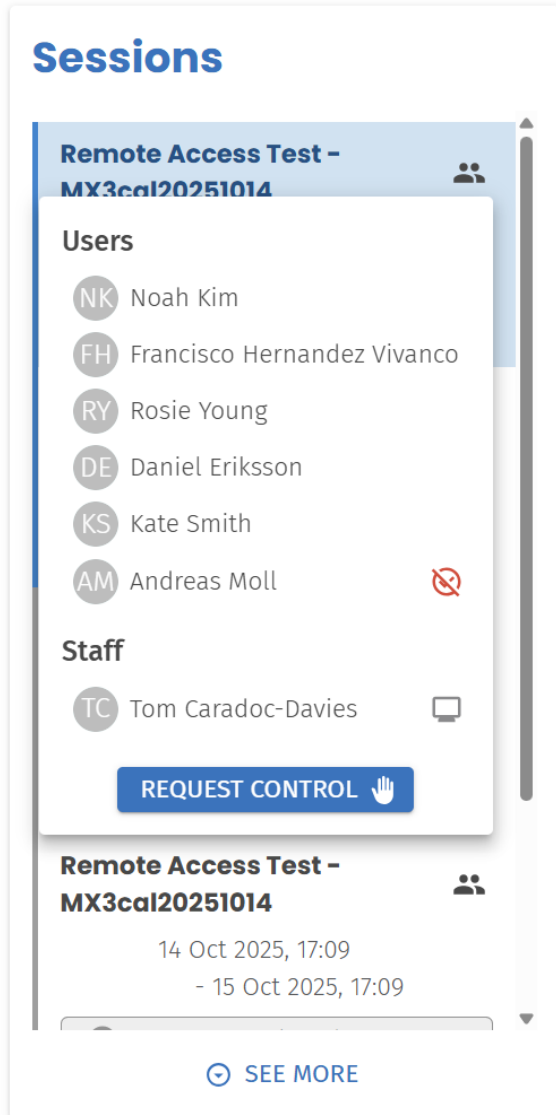
Log messages:

[02:47:17]: Flow run encountered an exception: ReadTimeout: timed out

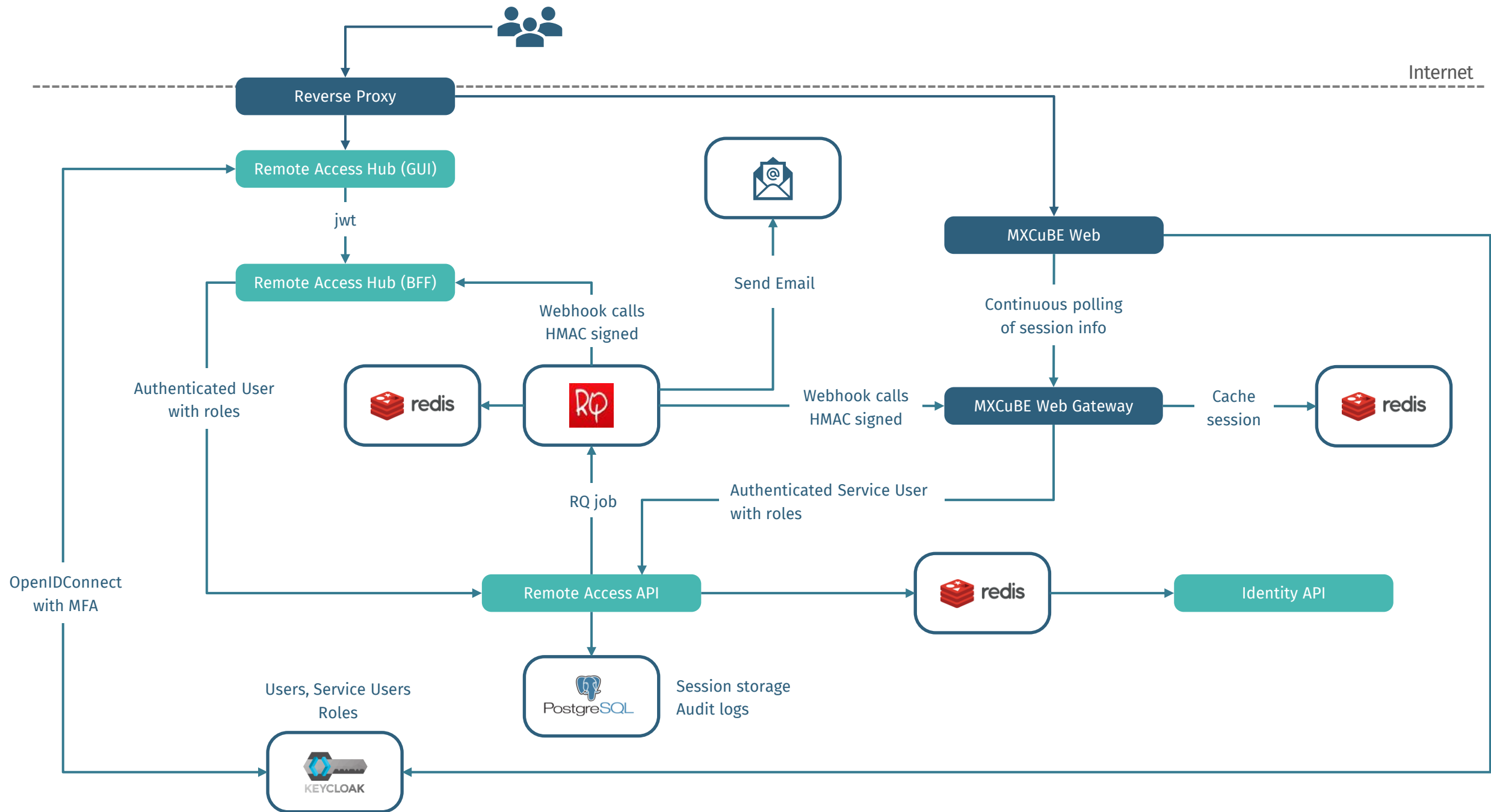
[02:46:33]: Starting workflow (One Shot), please wait.

[02:46:31]: Using default calibration points

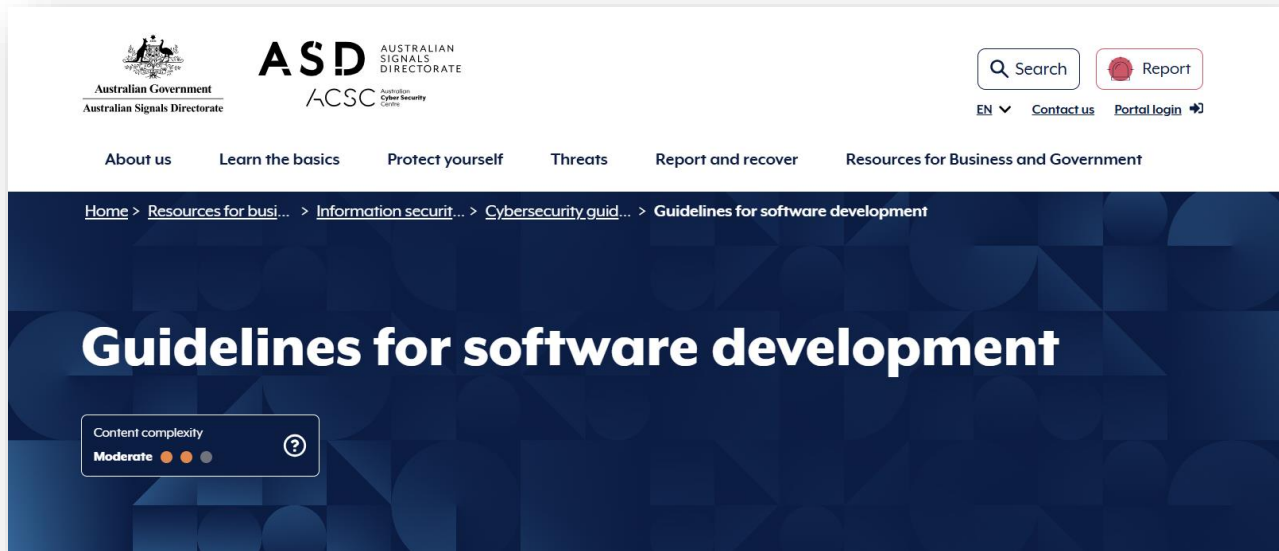
Access Control



- **Only one user in control at any time**
 - Drop down shows users in session
 - User that is in control has “screen” icon
 - Users can request control
 - User in control can hand over control
- **Hybrid Experiments**
 - Any hybrid experiment is a remote experiment
 - Authentication also for on-site users



Cyber Security Controls



- Development based on ASD Controls
- API security based on api.gov.au
 - Authentication for all endpoints
 - Role Based Access (RBAC) for all endpoints
 - HMAC signed requests
- Essential 8 Framework

Tenable on K8S

MX mxnetes

tenable-cloud-security X

Cluster >

Workloads >

CronJobs (1)

DaemonSets (1)

Deployments (1)

Jobs (2)

StatefulSets (0)

Pods (30)

Apps >

Service Discovery >

Storage >

Policy >

Monitoring >

More Resources >

Download YAML

Delete

Create

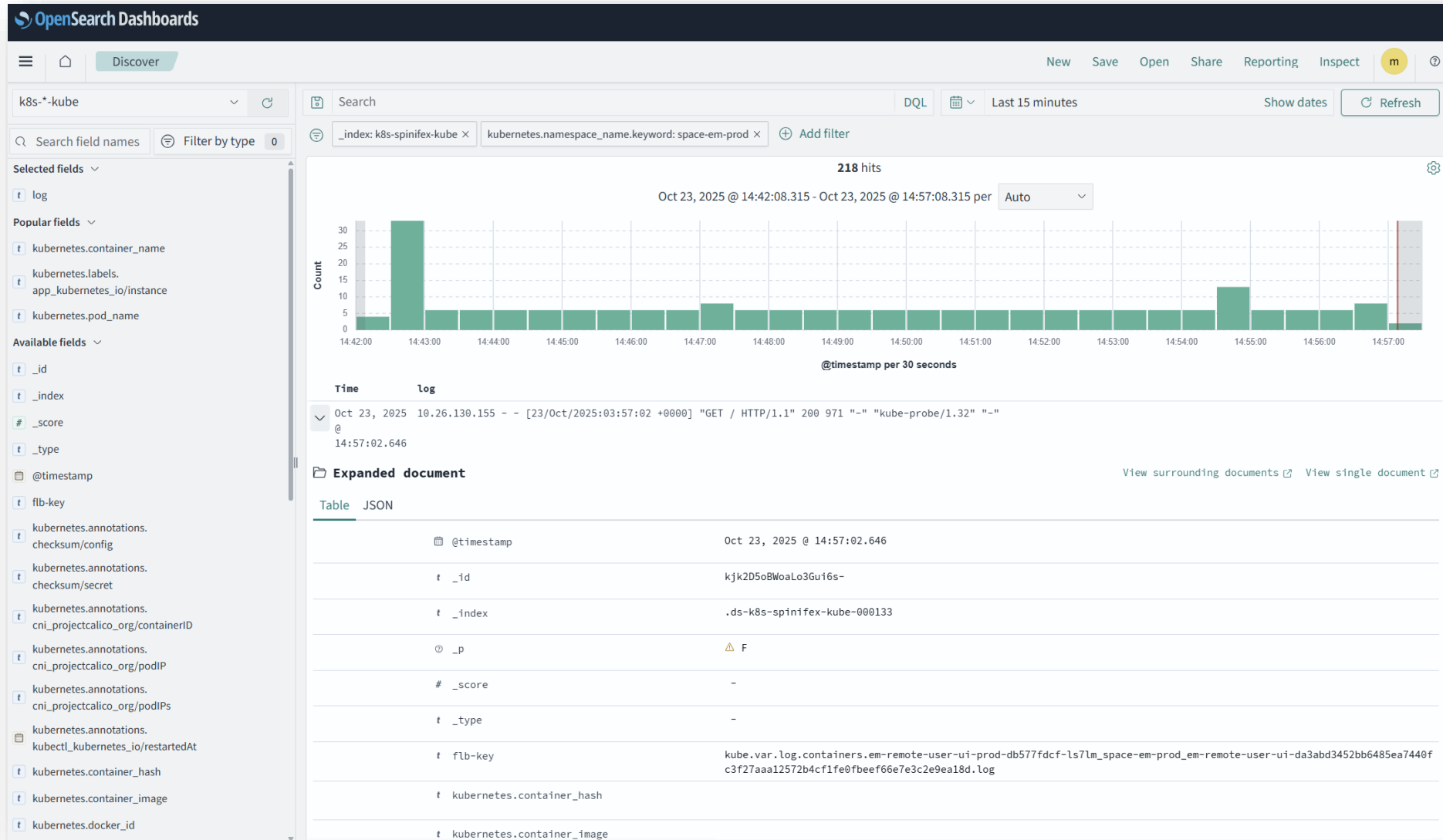
State	Name	Namespace	Image	Ready	Restarts	IP	Node	Age
Running	kubernetes-cluster-connector-deployment-66655b64b9-kl67n	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-manager:1.1	1/1	0		mxnetes-03	12 hours
Running	kubernetes-cluster-sensor-daemonset-2pttm	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx3hpcp01	12 hours
Running	kubernetes-cluster-sensor-daemonset-2slgf	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx2hpcp02	12 hours
Running	kubernetes-cluster-sensor-daemonset-4fw49	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx3hpcp06	12 hours
Running	kubernetes-cluster-sensor-daemonset-5dq5v	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx2hpcg01	12 hours
Running	kubernetes-cluster-sensor-daemonset-6sqgb	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx2hpcp01	12 hours
Running	kubernetes-cluster-sensor-daemonset-8mq29	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx2hpcp01	12 hours
Running	kubernetes-cluster-sensor-daemonset-54d9k	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mx3hpcp05	12 hours
Running	kubernetes-cluster-sensor-daemonset-9484f	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mxnetes-02	12 hours
Running	kubernetes-cluster-sensor-daemonset-bhx48	tenable-cloud-security	containers.tenable.com/cloud-security/kubernetes-cluster-sensor:1.1	1/1	0		mxnetes-01	12 hours

Tenable namespace

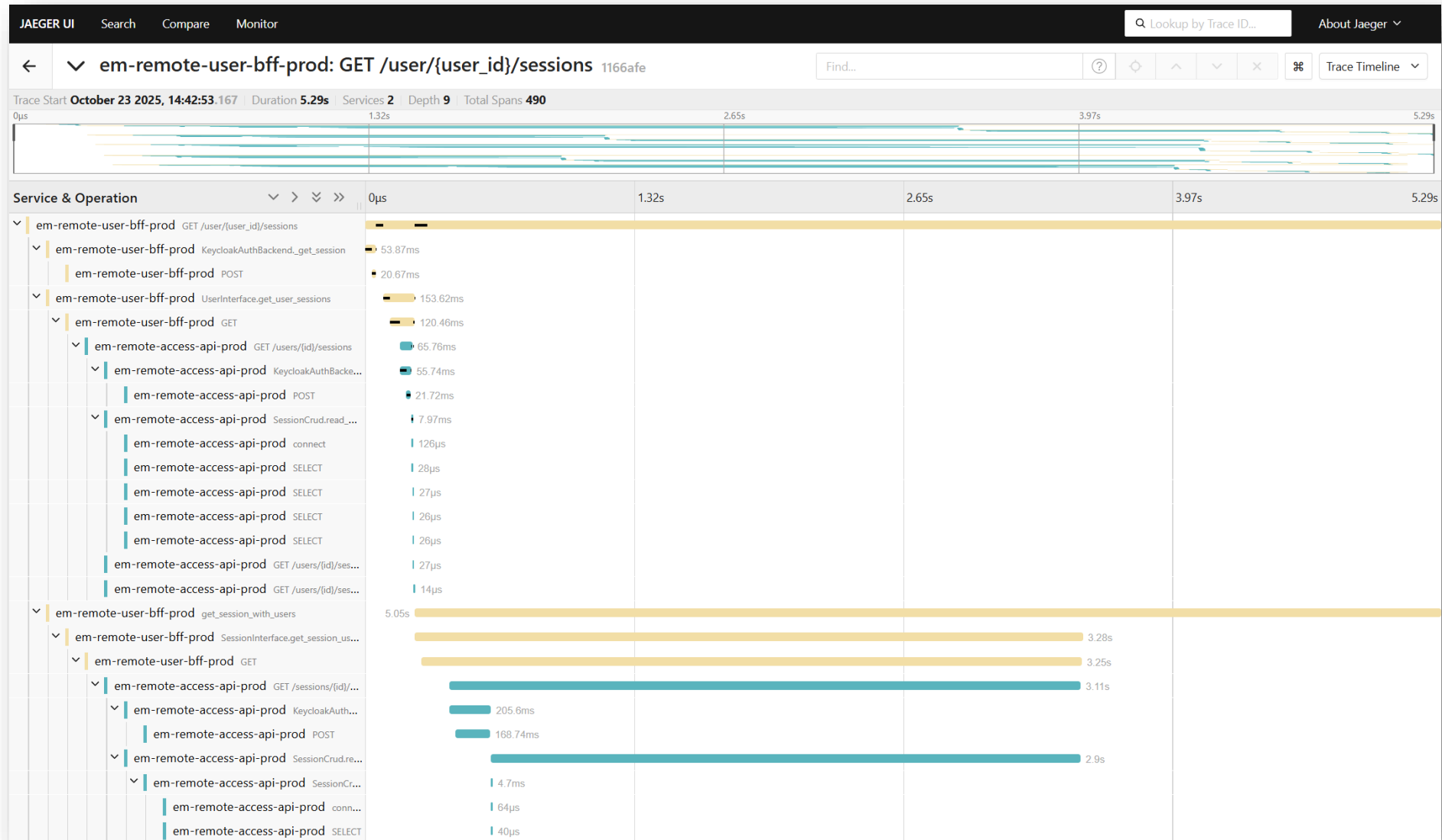
Virtual & Physical Nodes

MX1, MX2 and MX3

Observability – Logs



Observability – Tracing



Acknowledgement

- Scientific Computing

- Jacob Oldfield
- Noah Kim
- Kate Smith
- Francisco Hernandez

- MX3 Beamline Team

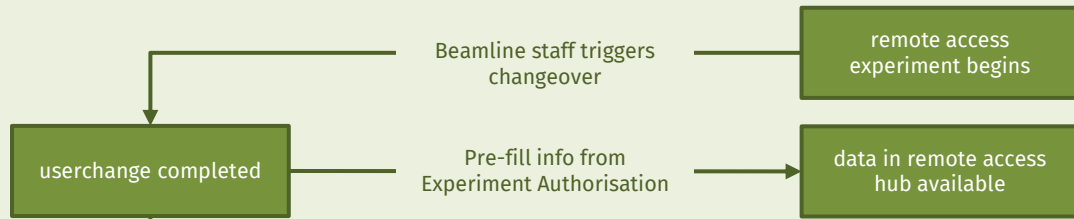
- Daniel Eriksson
- Rosie Young
- Tom Caradoc Davies

- Scientific Computing

- MX Beamline Team
- ANSTO IT
- ANSTO Cyber Security

Backup

The workflow



Grant Remote Access

User can see remote experiment but can't connect yet

Beamline staff sets up beamline

samples loaded
hutch searched

Beamline staff allows remote access

access open for users
in remote access hub

Beamline staff grants control to user

single user can
control experiment

Beamline staff grants control to another user

Beamline staff removes control

all users are observers

Beamline staff closes access

remote access
experiment ends

Open Access

User can connect to beamline software but only in observer mode

Grant Control

Single user can use beamline software to control experiment.

All other users are observers

Remove Control

Close Access