

## JAINIS (JCU And Indiana Instrument Services): A Grid Enabled Remote Access and Data Management System for X-Ray Diffraction.

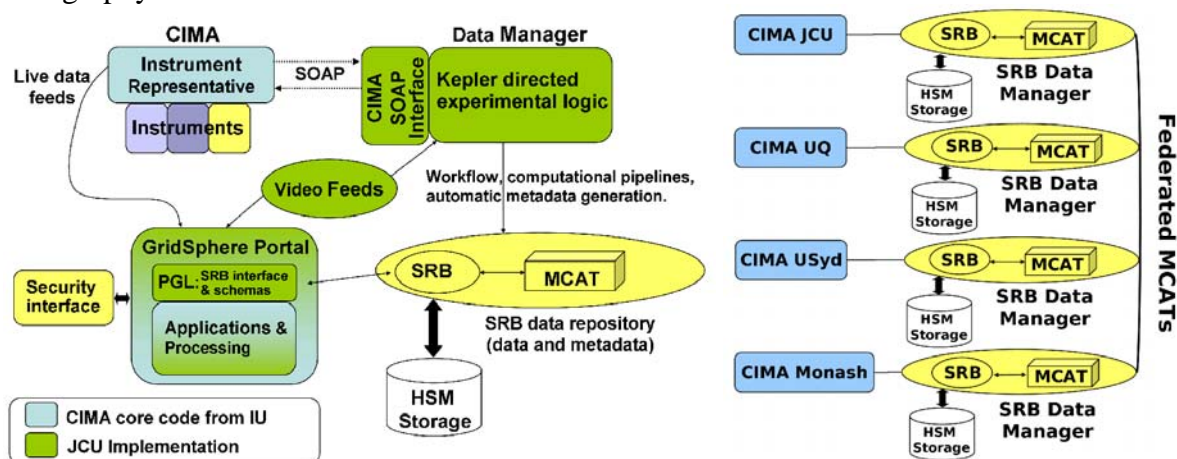
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The DART project is a DEST funded collaborative program between Monash University, the University of Queensland and James Cook University. This program has been exploring the application of e-Research tools and middlewares in support of scientific workflows. Together with MMSN collaborators at the University of Sydney, we are developing and implementing a remote access regime for both small molecule and protein diffractometers, and coupling this system with a federated data management and portal interface system; to provide an end-to-end solution for crystallography.



This system, called JAINIS, extends the Common Instrument Middleware Architecture (CIMA) model and uses a separate computer to provide proxy access to the diffractometer. A separate (and possibly remote) data manager then receives data from the proxy, as well as video streams that monitor the actual experiment. We have enhanced the CIMA model so that data (including CCD image frames) are now stored in a secure, federated Data Grid storage infrastructure (SRB or storage resource broker). A workflow system (Kepler) is being used to orchestrate the data flows within the data manager, and to automate data storage, extraction and generation of instrument and experimental metadata and provide the triggers to alert instrument operators of instrument status. Access to JAINIS is via a web portal, and provides a customisable environment that gives users access to running experiments (including latest CCD and microscope images), lab environment as well as access to experiments and their data. Comprehensive data searching as well as file uploads and downloads are also supported. Data stores from different sites can be federated to provide a single virtual data repository, and a security and rights management capability are now being implemented.