



Chemical Imaging Infrastructure

Research Team: Carina Lansing, Zoe Guillen, Kerstin Kleese-van Dam, Shaun O'Leary

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Purpose

Support real-time analysis of single and multi-modal chemical imaging experiments through data management and analysis infrastructure. It will enable easy access, sharing, and usage of compute and storage resources, analytical components, workflows, and tools.

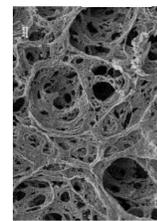
Key Successes

- Offer critical data management support for data generated by a large number of experiments
- Demonstrator project with Advanced Photon Source (APS) showcasing possibility to stream data in real time back to home group for further analysis
- New virtual tool launching capability allows users to run analytical and visual tools where the data is, but have the same user experience as if everything was on their local system

Research Applications

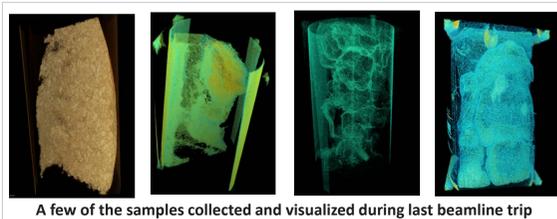
Premier Network Portal

Share, annotate, and search microscopy data sets



Automated metadata extraction for microscopy images

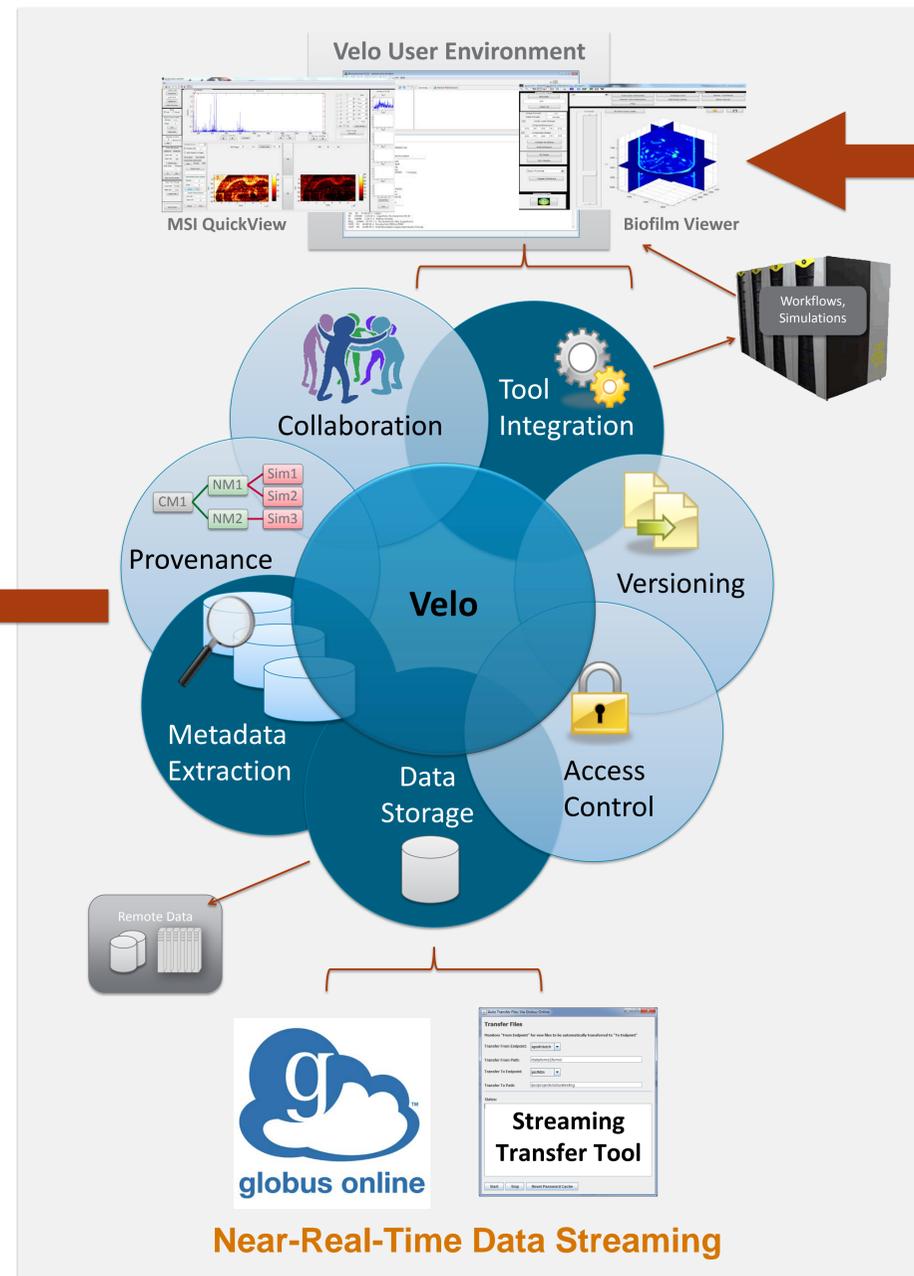
Visualization Support at APS



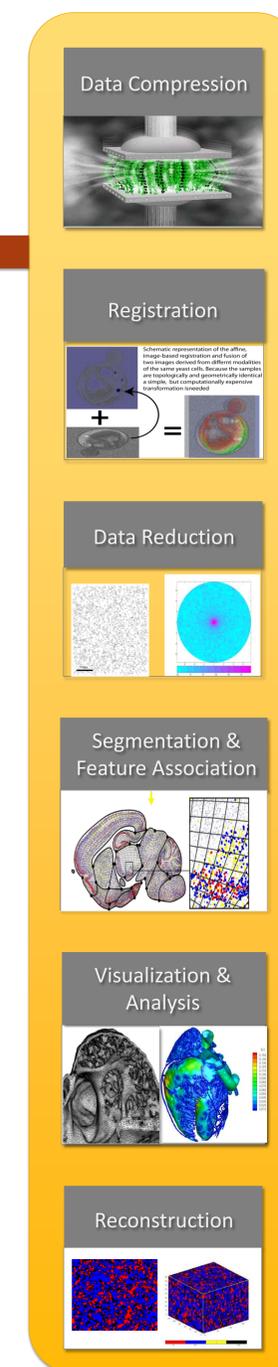
A few of the samples collected and visualized during last beamline trip

- 1.6 TB data (71 data sets)
- 17 samples reconstructed, streamed to PNNL (Globus Online)
- Reconstructed data visualized immediately for scientists to view

Data Management and Analysis Infrastructure



Components



Supporting Analysis Tool Building

Rapid Experimental Analysis (REXAN)

- Component registration via semantic metadata
- Dynamic queries create visualization pipelines based on registered components

Scientific Workflows

- High-performance pipeline execution framework
- Integrated with Velo

Next Steps

- Support DTEM data acquisition and real-time analysis for Premier Network (project 2.5)
- Web-based user interface for REXAN repository
- Velo performance improvements
- Velo deployments for CII projects 1.1 and 2.2