# A Portal-based interface for compositing multiple streams of experimental data to video

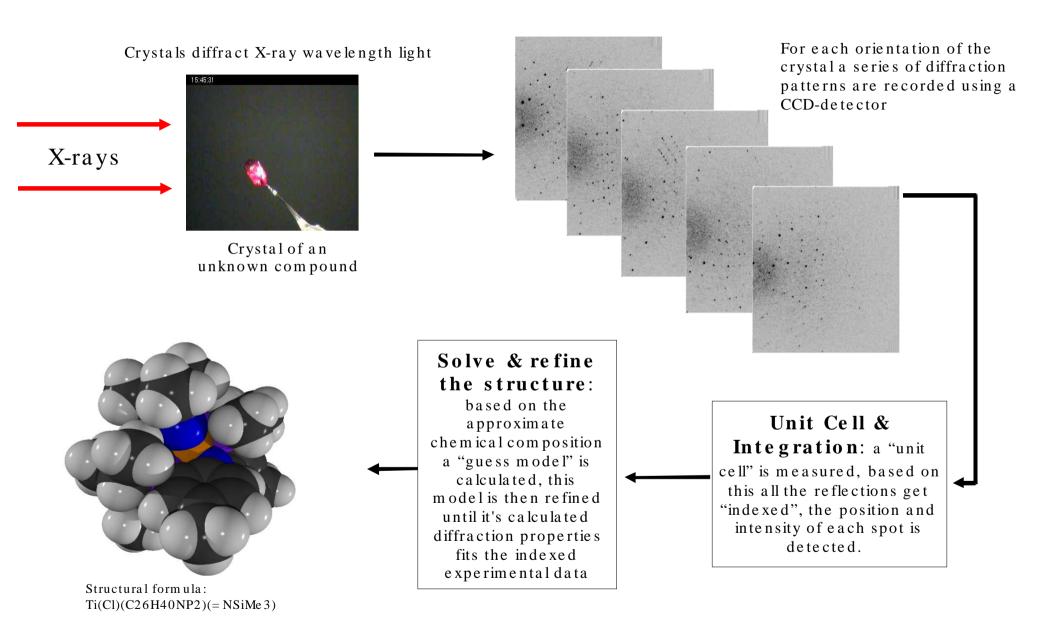
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## Overview

- CIMA (Common Instrument Middleware Architecture) allows management over data collected from remote instruments/sensors
- This information is stored in a database for future retrieval and processing via WebServices interfaces
- It can be chronologically organized such that a movie can be made outlining the progress of an experiment
- A portal-based interface allows end users to customize and create such movies, initiating a workflow over multiple data sources

#### Crystallography Workflow



Courtesy of: Bailey, B. C.; Fout, A. R.; Fan, H.; Tomaszewski, J.; Huffman, J. C.; Gary, J. B.; Johnson, M. J. A.; Mindiola, D. J.: Snapshots of an Alkylidyne for Nitride Triple-Bond Metathesis. J. Am. Chem. Soc. 2007, 129(8), 2234-2235. Lab: Indiana University Molecular Structure Center, Sample number: IUMSC 06162

### Data sources

#### CCD frame images

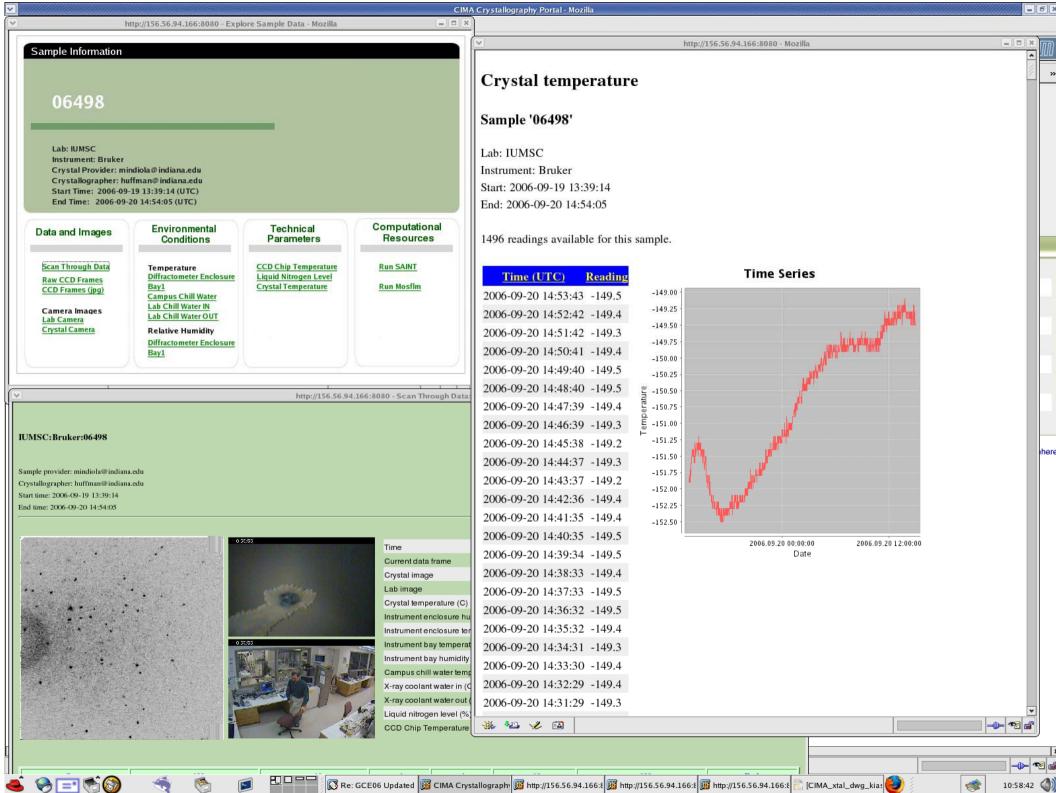
 Main source of analysis, captures X-Ray diffraction patterns from diffractometer device

#### Camera images

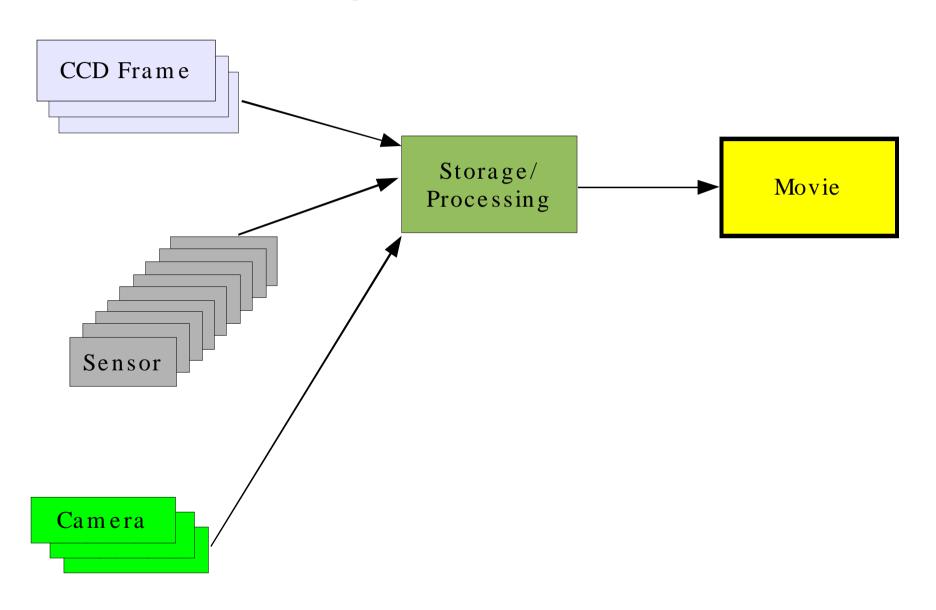
- Captured image files from live streams
- Includes cameras positioned in the lab and in the diffractometer

#### Sensor data

- Records environmental data such as CCD chip temperature, ambient temperature, humidity, and so on
- Stored as floating point values



# Collecting Data into Movies

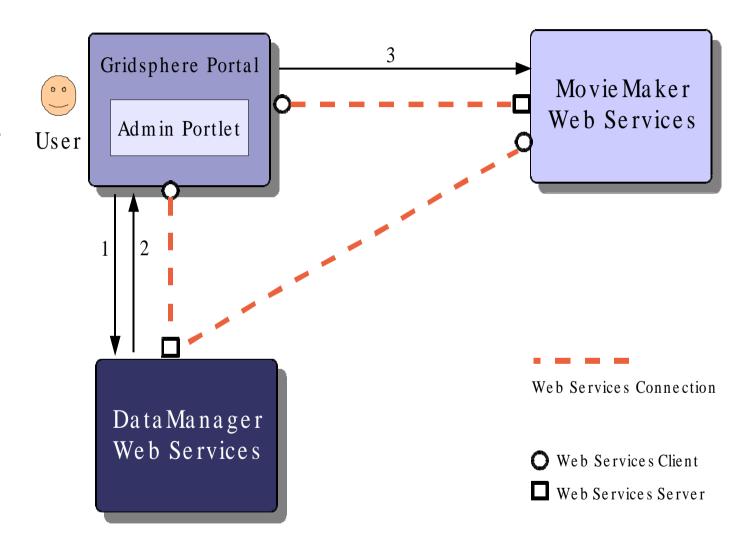


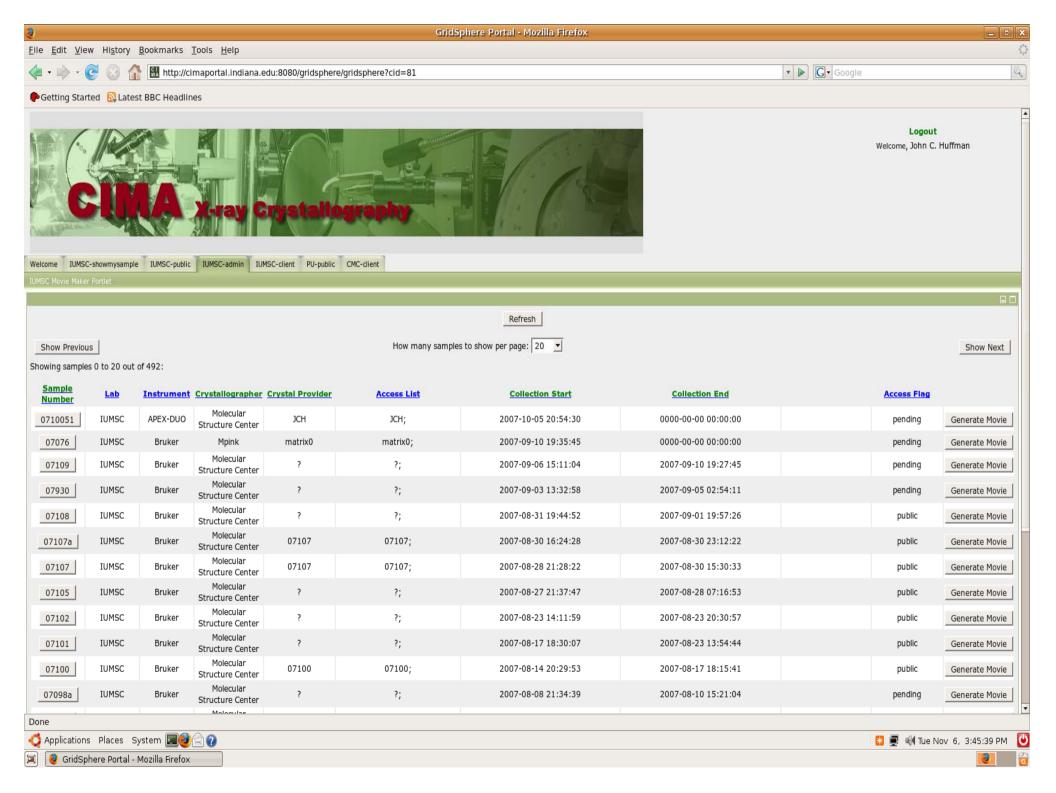
#### Portal interface

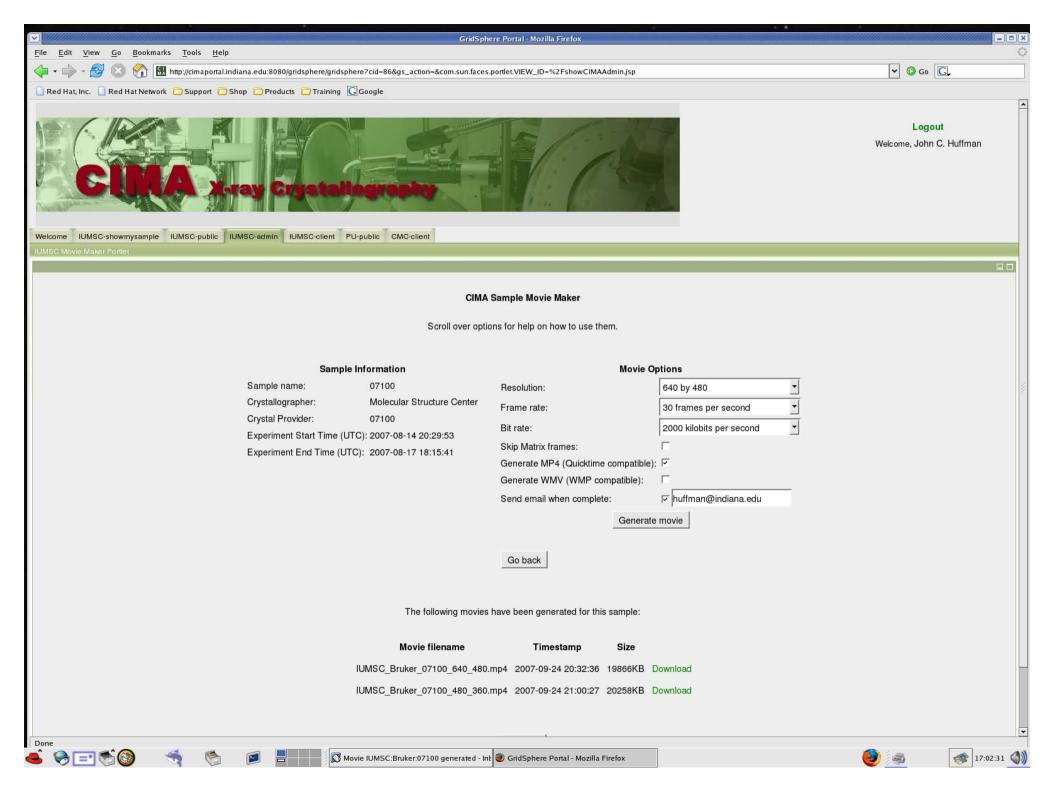
- CIMA provides a portal for managing collected experimental data through multiple portlets
- Movie maker portlet is selected via the administration portlet, here the user selects which sample to make a movie of
- Several options are provided to customize the movie
- Both WMV and MP4 movies may be made
- A list of movies already made appears at the bottom

## **Dataflow**

- 1: The user selects a sample from the Admin Portlet, which asks for a list of movies from the DM WS
- 2: DM WS sends the movie maker portlet a list of created movies
- 3: User clicks to create new movie, request is sent to MM WS







# Movie generation options

Movie C	Options
Resolution:	640 by 480
Frame rate:	30 frames per second  ▼
Bit rate:	2000 kilobits per second
Skip Matrix frames:	П
Generate MP4 (Quicktime compatible	): 区
Generate WMV (WMP compatible):	П
Send email when complete:	huffman@indiana.edu
Generat	e movie

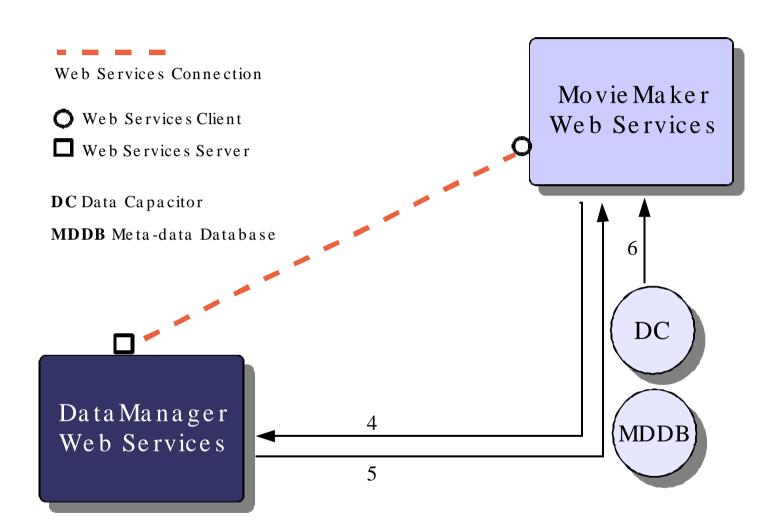
## Movies created

The following movies have been generated for this sample:

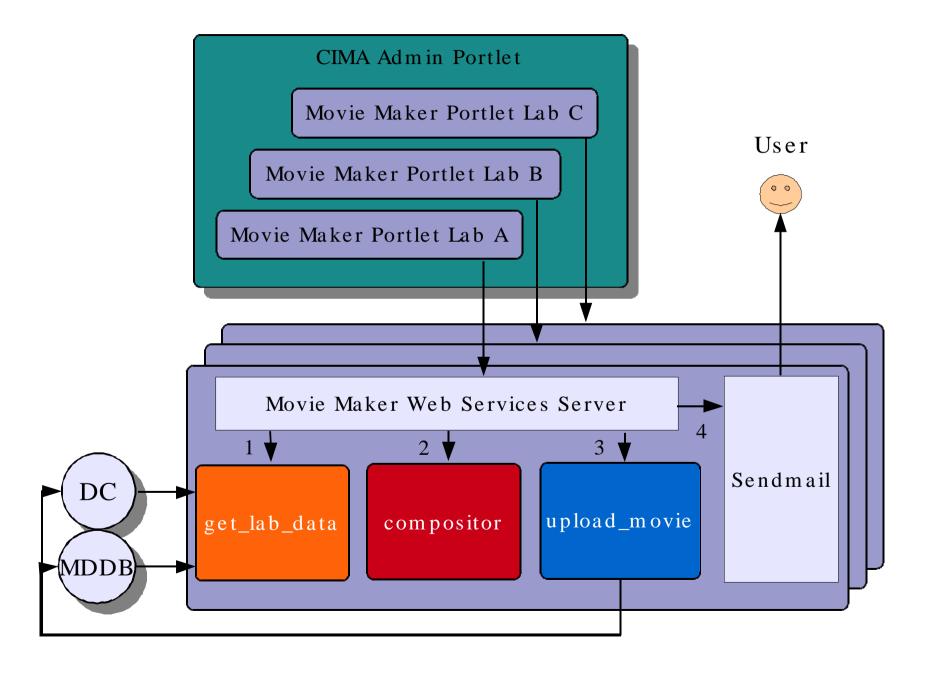
Movie filename	Timestamp	Size	
IUMSC_Bruker_07100_640_480.mp4	2007-09-24 20:32:36	19866KB	Download
IUMSC_Bruker_07100_480_360.mp4	2007-09-24 21:00:27	20258KB	Download

### **Dataflow**

- 4: MM WS requests to DM WS to be sent all information for the given sample
- 5: DM WS returns lists of: where to download image files and all sensory readings for the sample
- 6: MM WS retrieves image files from the Data Capacitor

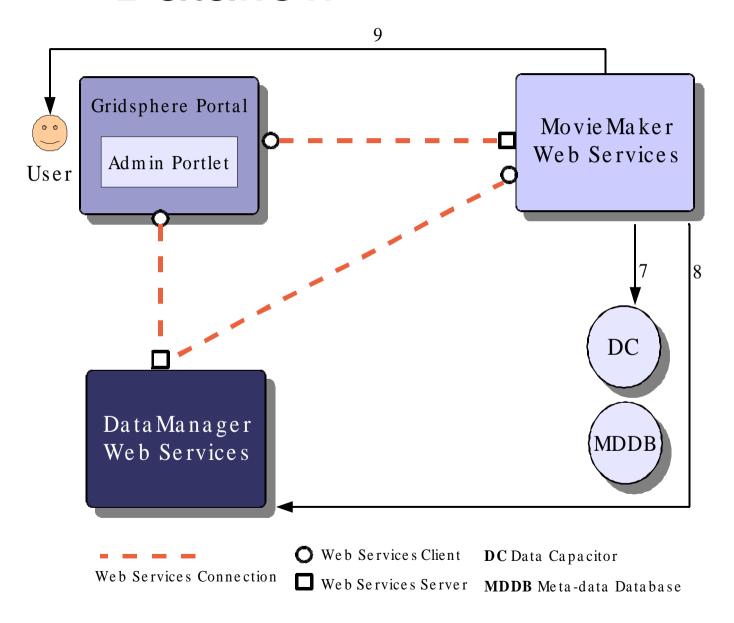


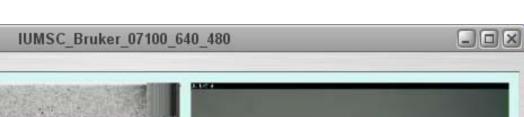
#### **Backend Procedure**

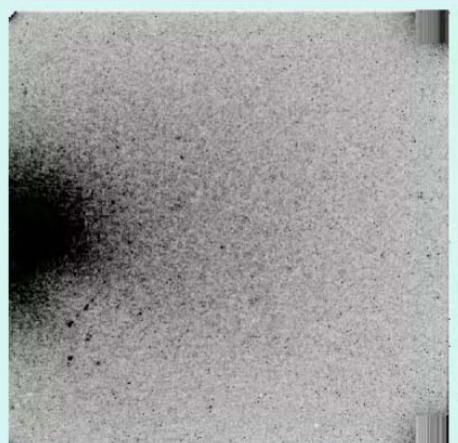


## **Dataflow**

- 7: MM WS stores the newly generated movie on the Data Capacitor
- 8: Information about the newly created movie is written to the database
- 9: The user is sent an e-mail notification with a URL where the movie can be downloaded











Time	2007-08-14 20:29:53	Campus chill water temperature (C)	12
Current data frame	071001.001.jpg	X-ray coolant water IN (C)	16.4
Crystal temperature (C)	-127.5	X-ray coolant water OUT (C)	22.7
Instrument enclosure temperature (C)	20.9	Liquid nitrogen level (%)	16.1
nstrument enclosure humidity (%)	44.5	CCD Chip Temperature (C)	-54.61
Instrument bay temperature (C)	16.1	Frame #	1
Instrument bay humidity (%)	61.1		

00:00:00

File Edit View Window Help



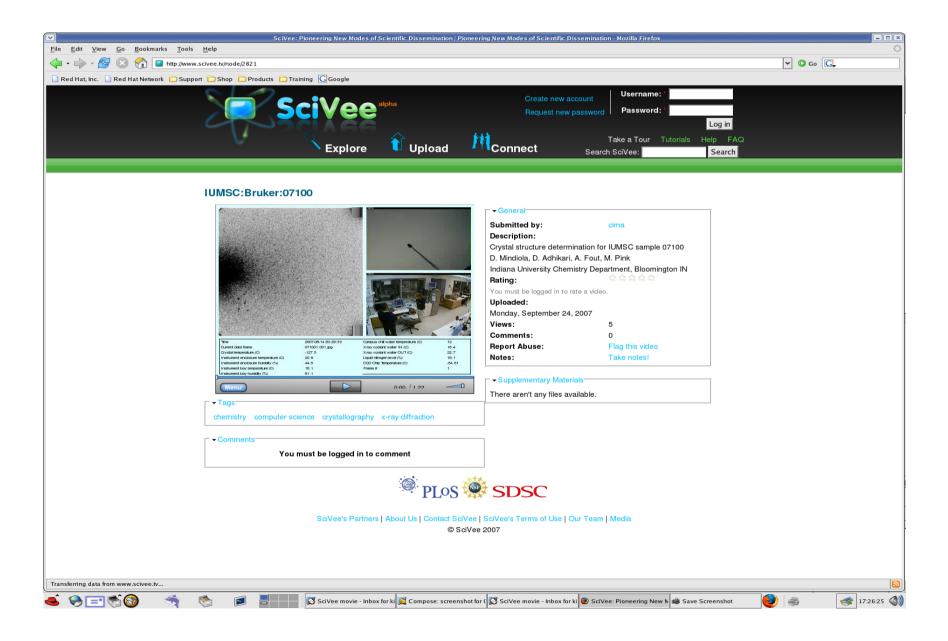








#### Generated Movie on SciVee



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## Questions/comments?