

Storage Management for OMERO/Columbus Environments

Challenge

The **Open Microscope Environment Remote Objects (OMERO)** is a modern server and client software for visualising, managing, and annotating microscope images and metadata, and for working with experimental protocols.

OMERO Storage Manager (OSM) is an innovative software tool for OMERO and Columbus Users which enables easy and efficient visualization and storage management of OMERO/ Columbus System Images.

The objective of this platform is to provide a **central, shared storage environment for microscopy labs**. This enables its users to store and share data from a large variety of different microscopes, not dedicated to specific vendor formats.

In microscopy environments, data is generated by experiments. Hence new data, requiring new storage space, is generated each day as part of the **primary business process** of the lab environment. After generation, the data is processed for analysis and in fact, when the experiment is finished, most of the data will no longer be used.

At this point the data should be either deleted from the storage or it should be archived for future reference.

Solution

DAX Archiving Solutions
OMERO Storage Manager

Summary of results:
Total projects found: 23
Total project files: 14197 files (20.90 GB)
Total archived files: 139 files (80.02 MB)
Total online files: 9957 files (20.90 GB)
Total offline files: 6210 files (83.82 MB)
(available in archive) : 27 files (83.82 MB)
(available in deep archive) : 0 files (0.00 Bytes)
(not in archive) : 6183 files (8.00 Bytes)

ID	Status	Group	User	Project Size	Archived Size	Online	Missing	Last Accessed	Last Updated	Description
06	Offline and not archived	2/default	1/columbus	132 / 718.89 MB	0 / 0.00 Bytes	132 / 718.89 MB	0	22-07-2009	22-07-2009	trainingplate_081205_cytochrome1-2009-12-05T18:35:26+0000
09	1x-online archive	2/default	1/columbus	27 / 83.82 MB	27 / 0.00 MB	0 / 0.00 Bytes	0	01-01-1970	22-07-2009	PI05-A Caspas3 Apoptosis1-2009-02-13T09:40:11+0000
38	Offline and not archived	2/default	1/columbus	108 / 389.25 MB	0 / 0.00 MB	108 / 389.25 MB	0	22-07-2009	22-07-2009	Row 0 - 2009-12-08T13:39:13+0000 1515-30archive file /Name/Columbus/OMERO/OMERO_data/Files/Div-005/3072_3274_M020825_M01_0%
57	Offline and not archived	2/default	1/columbus	384 / 475.18 MB	0 / 0.00 MB	384 / 475.18 MB	0	22-07-2009	22-07-2009	KM_000208_M01a_M00-Cytochalasin-2-2009-02-08T14:02:08+0000 control
58	Offline and not archived	2/default	1/columbus	384 / 475.18 MB	0 / 0.00 MB	384 / 475.18 MB	0	22-07-2009	22-07-2009	KM_000208_M01a_M00-Cytochalasin-2-2009-02-08T13:54:22+0000
59	Offline and not archived	2/default	1/columbus	3768 / 5.18 GB	0 / 0.00 GB	3768 / 5.18 GB	0	22-07-2009	22-07-2009	hp_1TAB_000707_LX_1-2009-07-08T13:33:31+0000
54	Offline and not archived	2/default	1/columbus	2 / 73.19 MB	2 / 73.19 MB	0	0	22-07-2009	22-07-2009	archive/KM_000125_A1_1mm_3steps19-2009-01-20T16:21:44+0000
53	Offline and not archived	2/default	1/columbus	884 / 750.46 MB	0 / 0.00 MB	884 / 750.46 MB	0	22-07-2009	22-07-2009	cam1cam1-2009-07-08T13:42:11+0000
52	Offline and not archived	2/default	1/columbus	884 / 731.51 MB	0 / 0.00 MB	884 / 731.51 MB	0	22-07-2009	22-07-2009	cam1cam1-2009-07-08T14:04:54+0000
51	Offline and not archived	2/default	1/columbus	72 / 1.87 GB	0 / 0.00 Bytes	72 / 1.87 GB	0	22-07-2009	22-07-2009	KM_000207_389-02AX_M00_Stack-col08-1-2009-07-07T14:01:45+0000

As resolutions are increasing, the amount of data generated is also vastly increasing. The ideal archive solution provides **archiving of all image data** as well as **all meta data** involved, as the plain image files themselves represent just a part of the experiment.

The **OMERO Storage Manager** provides the user an overview of the storage capacity per project or per screen. By means of a simple mouse click users can archive complete sets of data from the OMERO environment to secondary hard disk storage.

Optionally this secondary hard disk storage environment can be extended by a **full digital archive** either on LTO or on Blu-ray media.

Users can access the storage manager by means of a standard **web browser**. They can simply surf to the a web page showing storage parameters like size and date of last access. Users can simply invoke archive or restore commands by clicking on the appropriate links.

When a user archives a project, the archived project can also be made invisible in the OMERO environment, effectively cleaning up the database to the users.

When a project is restored, **all image and pixel data** are restored on the original location on the server. In addition all **describing metadata** is made available again in the OMERO database.

Benefits

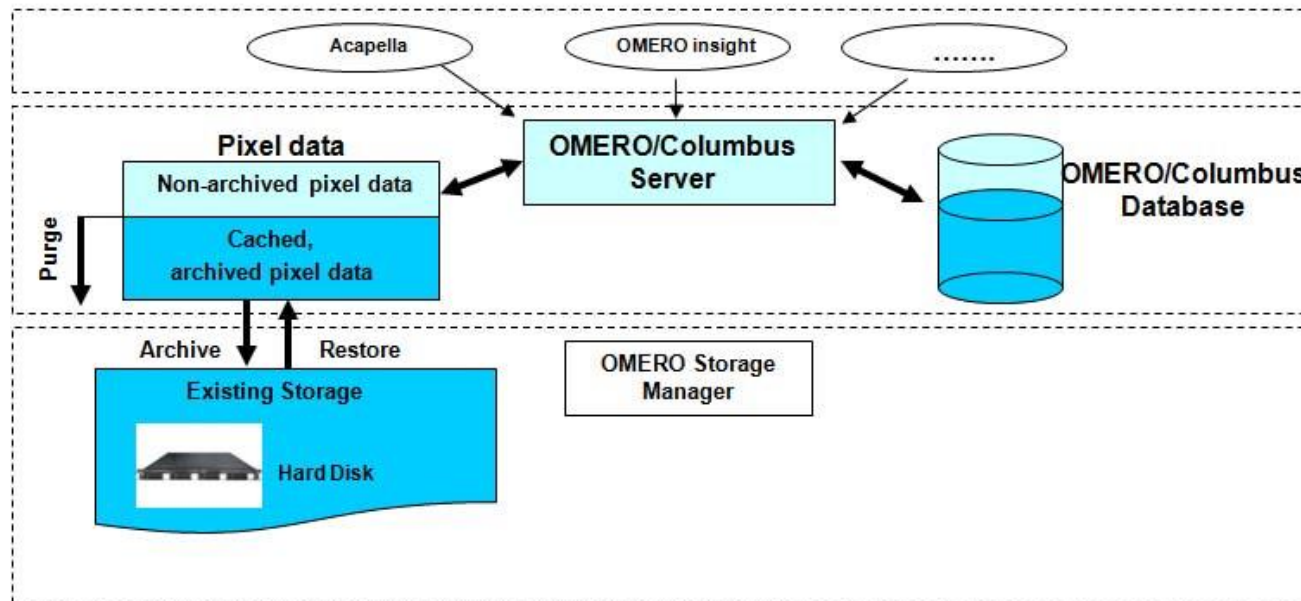
- Simple user interface gives individual users full control over archiving and restore of their own projects. Users are assured that their data is archived and can't be accidentally removed.
- Simple server-centric extension requires no change on workflow policies or adaptation of OMERO client software.
- Quota management facilitating efficient storage management in a multi-group/multi-user environment
- Cleans the OMERO database from inactive projects.
- Saves valuable hard disk storage, as inactive projects will reside in the archive.
- Reduces the back-up window as all fixed content needs to be archived only once and is eliminated from the system back-up.
- Back-up and archive can be integrated into the same hardware platform.
- Lite version freely available to Omero/Columbus Community.

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Secure the Future of your History



All clients simply access the OMERO/Columbus Server.

The OMERO/Columbus Server manages all the data as usual. Incoming data is archived using a preset policy, i.e. archiving all new datasets created after 24 hours. In order to free up space or clean the database, projects are archived by purging them from the on-line storage.

In order to restore archived projects, clients go to the web interface and invoke a restore of the project. This restores the pixel data to the original location and restores the metadata in the OMERO/Columbus Database.

The archive back-end can simply be created on any existing storage infrastructure utilizing available resources. Extended archive solutions for automatic archiving to LTO or Blu-ray are also available.

*OMERO Server: Version 3 or higher.

FEATURES / OMERO Storage Manager Version	LITE	STANDARD	EXTENDED
Solution	Software Free	Software	Software + Hardware
Storage statistics per project (or screen)	v	v	v
Summary statistics on the server or projects	v	v	v
Overview per group/user	v	v	v
Advanced filtering of projects	v	v	v
Scan statistics of selected files	v	v	v
Quota Management	v	v	v
Archive projects to secondary storage		v	v
Purging archived projects from OMERO server		v	v
Restore projects from archive		v	v
Archive projects to removeable media (LTO/Blu-ray)			v
Automatic restore from LTO/BD			v

The **Standard Version** provides the viewing functionality as well as archiving collections of images to secondary hard disk storage.

The **Lite Version** is offered for free enabling users to view their storage in a large variety of ways, where they can sort data collections, see which have been used frequently etc. This version is ideal to get to know the functionality of Omero Storage Manager before purchasing and offers the possibility to evaluate the licensed product.

The **Extended Version** offers a complete archive solution to LTO or Blu-ray Media, for the Omero/Columbus user who needs a one-stop-shop solution.