

Removing expired or deleted data

for GRAU ArchiveManager systems

The GRAU Archive Manager (in short GAM) is responsible for the files stored on the HSM file system it manages. The document describes how to delete files in all the related storage tiers.

A HSM file system can be of type regular filesystem or WORM filesystem. The entire configuration of the file system is out of scope for this document. Please check to the Users Guide ⁱ if required details.

Removing files from the HSM File System

Regular Type HSMFS

In case of a regular file system the files can just be deleted using standard operating system mechanism. This removes the relationship of the file name and the data the file contains – as usual for most file systems. If a file is deleted the file data still remains on the related media. A secondary step is then required to finally remove this data as well.

WORM Type HSMFS

If the file system is of WORM type the files are deleted based on deletion policies. Configuring deletion policies is described in Users Guide ⁱⁱ Chapter 5.5.2 Deletion policy parameters. Deletion policies are directory based and specify the maximum age of the files in the directory and its sub-directories. The life time starts when the file gets into WORM state.

A deletion job started on regular base by a scheduler removes the files according to those policies. Likewise to a regular file system type a secondary step is required for the final deletion.

If files have to be deleted before the maximum age based on the deletion policy has reached, there is a procedure called “privileged delete” which is described in a separate document for GRAU FileLock and GRAU ArchiveManager.

Removing data on the Media

A reorganization is required to finally remove the data from the media. This is a two-step process for regular media with an additional third step for WORM media. This is described in Users Guide ⁱⁱⁱ Chapter 4.3.8 Reorganizing media in detail.

NOTE: LTO Ultrium WORM media cannot be rewritten or reformatted, but they can be reorganized. However, the media space reclaimed cannot be reused.

The **first step** is to get the media statistics to select the media to be reorganized. This is called a reorg scan and it is based on the GAM partition related to the HSMFS where the files reside. The GAM system will check all media for a specific partition to collect statistics about deleted/expired data and still required data on the media.

The **second step** is to reorganize the media. It copies the still active data to another medium related to the GAM partition and same media pool. In case of regular media the medium is erased and initialized again for later use. WORM media remain in the status "recycled" and require the third step (see below). To remove all delete/expired data all media must be reorganized one by one, except for media whose slack space is "0". To avoid unnecessary reorganizations, especially for WORM media, it may be reasonable to identify which media contains to be deleted data before actually deleting the data and then reorganize only affected media.

The **third step**, required for LTO WORM media only, is to physically remove the media from the shelf and destroy the media according to the data protection standards. In Germany refer to the DIN 66399 part 2.

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- i 0412 GAM-UG-E-3100 GAM User's Guide
 - ii 0412 GAM-UG-E-3100 GAM User's Guide page 179
 - iii 0412 GAM-UG-E-3100 GAM User's Guide page 142