Copy Operation and Request State Transitions of Common Storage Resource Manager Operations

Timur Perelmutov
timur@fnal.gov
Fermi National Accelerator Lab

May 24, 2004
Version 1.0

Introduction

This document's goal is to amend the "Common Storage Resource Manager Operations version 1.0" [1] with the specification of the "copy" operation, only briefly mentioned in [1]. Also it provides a more precise description of the possible states of the SRM Requests, and events that can lead to the changes of these states. The combination of this document and Common Storage Resource Manager Operations version 1.0 is called Storage Resource Manager specification version 1.1.

Notation and Terminology is exactly the same as in [1] and is not defined here.

Copy operation

Name: copy

Arguments:

>   SURL[] sourceSURLs;

>   SURL[] destinationSURLs;

Returns:

>   RequestStatus

Description: The copy operation takes an array of source SURLs and an array of destination SURLs. The number of elements in these arrays MUST be equal. Either source SURLs or destination SURLs, or both MUST be local SRM urls. The nonlocal (remote) SURLs can be either SRM urls of some remote SRM server, compliant to [1], or urls in one of the transfer protocol, known to this SRM. SRM attempts to perform the copying of the source SURLs into the destination SURLs, first element of source SURLs array into first element of the destination SURLs array, etc. There are three possible combination of locality of each source SURL /destination SURL pair.

1. If the both source and destination SURLs are local, then SRM can perform internal

copy .

2. if one of the SURLs is non-local, and is in one of the transfer protocols supported by SRM, SRM performs copying.

3. If one of the SURLs is non-local SRM url, SRM performs either SRM get for source SURL, or SRM put for destination SURL, supplying the list of SRM supported transfer protocols, as one of the arguments to discover the transfer URL. Once the TURL is known, SRM can perform transfer of data from/to remote TURL. It is responsibility of SRM to notify the remote SRM server of the completion of transfer (in case of success or failure) by setting each RequestFileStatus to "Done" state.

Uniformity of SURLs: If one source(destination) SURL is local SURL, then all of the source (destination) SURLs are local. If one of the source(destination) SURL is remote then all of the SURLs are remote and have the same protocol, host and port parts.

Once the copy function is issued, the copy request is assigned a new unique requestId, which is returned in the RequestStatus. The state of the copy request execution can be monitored by using getRequestStatus operation. For each pair of the sourceSURL/destinationSURL a unique (within this request) request file id is assigned and one RequestFileStatus structure is created in each RequestStatus returned by copy or getRequestStatus for this request.

Copy RequestFileStatus state transitions

Initially the request file status state is "Pending". Once the processing of the copy request for this SURLs pair begins, the state becomes "Running". Once the the copying is complete the state becomes "Ready". The state changes to "Done", (once and if) the user issued the setFileStatus(requestId,fileId,"Done") command to cancel the request or to indicate that it has received the notification of the completion of the copying and the request can be disposed of by SRM. At any time, while the copying has not completed, the state of the request can become "Failed".

Copy RequestStatus state transitions

Initially RequestStatus state is "Pending". If at least one RequestFileStatus is in "Failed" state or if there is an error, preventing SRM from execution of the request,the RequestStatus state is "Failed". If none of the RequestFileStatus is in "Failed" state and there is at least one is "Running", or "Ready" the RequestStatus is "Active". If all of the RequestFileStatuses are "Done", the RequestStatus state is "Done" too.

References

[1]   Common Storage Resource Manager Operations, Ian Bird, Bryan Hess, Andy Kowalski , Don Petravick, Rich Wellner ,Alex Sim, Arie Shoshani, October 22, 2001, Version 1.0, http://sdm.lbl.gov/srm-wg/doc/srm.v1.0.pdf