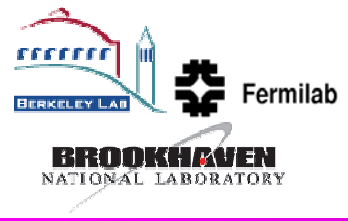


Storage Resource Managers: Essential Components for the Grid

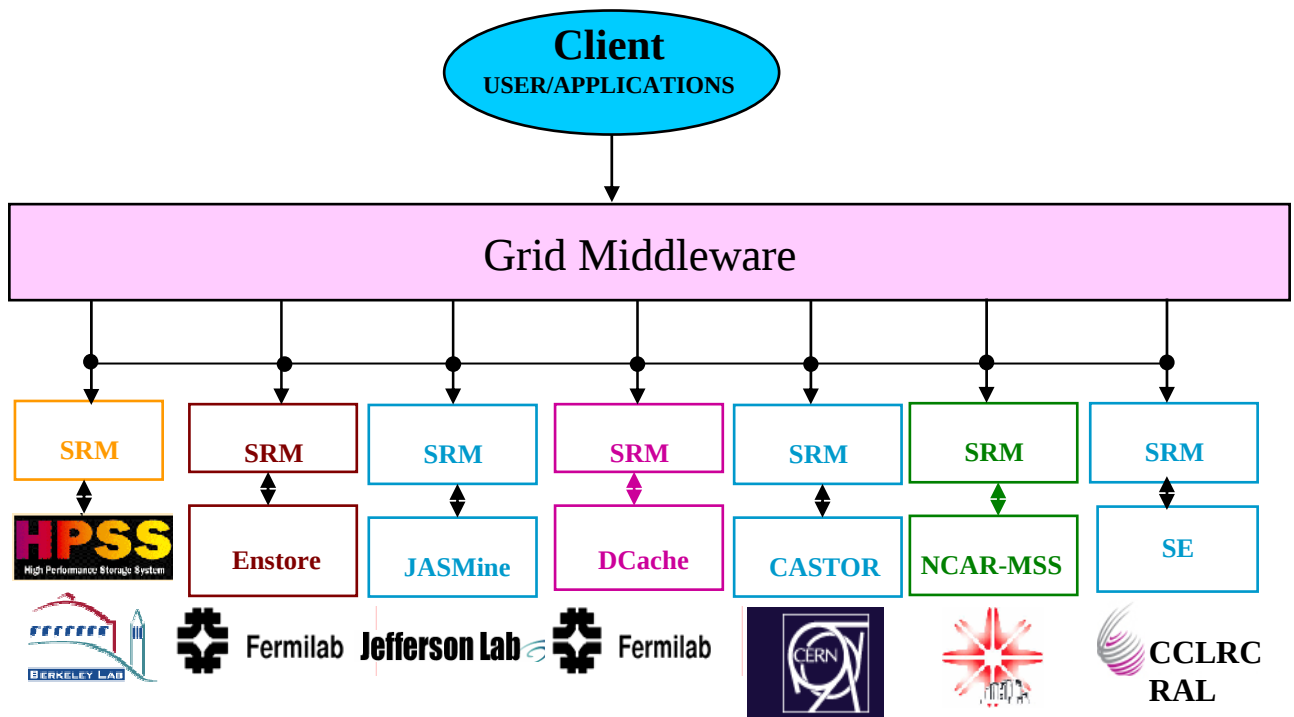


Storage Resource Managers (SRMs) are middleware components whose function is to provide dynamic space allocation and file management on shared storage components on the data grid. They complement Compute Resource Managers in providing storage reservation and dynamic information on storage availability for the planning and execution of a grid job. SRMs manage two types of resources: space and files. When managing space, SRMs negotiate space

allocation with the requesting client, and/or assign default space quotas. When managing files, SRMs allocate space for files, invoke file transfer services to move files into the space, pin files for a certain lifetime, release files upon the client's request, and use file replacement policies to optimize the use of the shared space. SRMs perform automatic garbage collection of unused files by removing files whose lifetime has expired when space is needed.

SRMs developed independently and inter-operate in multiple sites

- A common interface exposing the SRM functionality is shared by multiple systems
- A common WSDL API is used by the systems shown below
- Interoperation of multiple Mass Storage Systems on the Grid was achieved
- Implementation: by (or for) each institution separately, yet they all interoperate
- SRMs have been deployed in multiple sites of the PPDG and ESG collaboratories



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Storage Resource Managers: Essential Components for the Grid

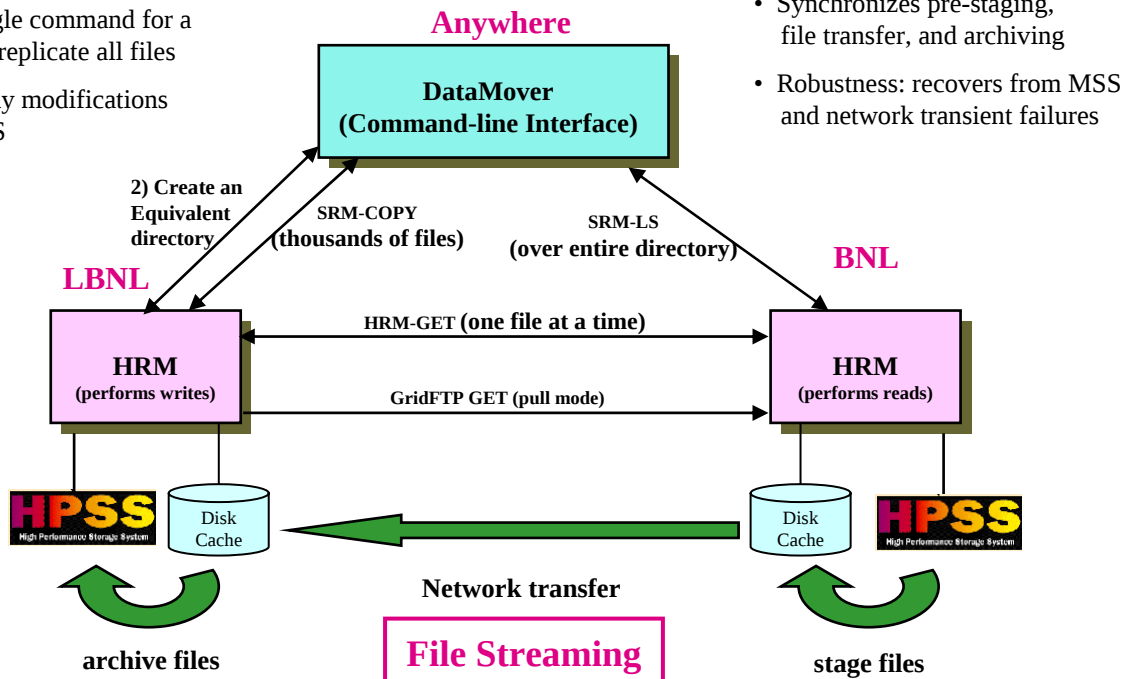
SRM Functionality

- Accepts multi-file request, manages a queue, allocates space
- Invokes GridFTP to get/put files from/to remote sites
- Pins files for a limited lifetime, accepts early release of files
- Queues staging and archiving to MSSs
- Provides automatic garbage collection
- Monitors and recovers from failures of file staging, archiving, and transfer
- SRMs can be invoked by clients, other middleware, and *other SRMs*

SRMs provide robust multi-file replication

Replicating Thousands of Files *Robustly* between
Two different remote Mass Storage Systems
used in *production* at ESG and PPDG-STAR

- Uses a single command for a request to replicate all files
- Without any modifications to the MSS



For details and demos:
please visit the LBNL booth

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