Grid Storage Management WG

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Liaisons:	to GRAAP, GFS, DAIS, OREP

http://sdm.lbl.gov/gsm

Session Agenda : GSM Charter

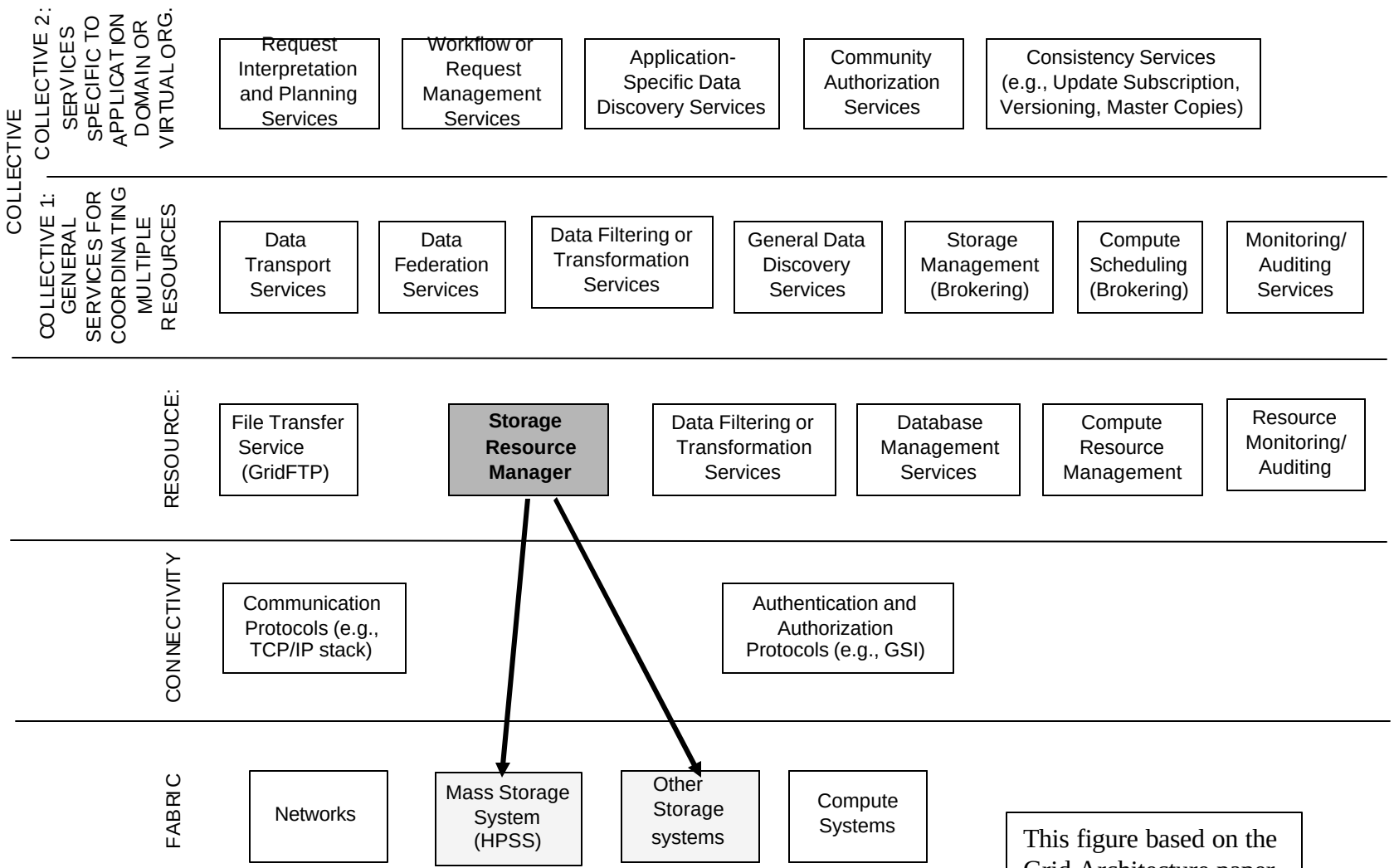
- Focus and Purpose
- Scope
- Goals
- Functionality
- Relations to other groups
- Deliverables and Milestones
  - Evolution of functionality
- Management, processes

CHARTER: GSM Focus and Purpose

- Standardization effort to define a **Storage Resource Management SRM interface**
- Storage Resource Managers are
  - Middleware components whose function is to provide dynamic space allocation and file management of shared storage components on the Grid.
  - They complement Compute Resource Managers and Network Resource Managers

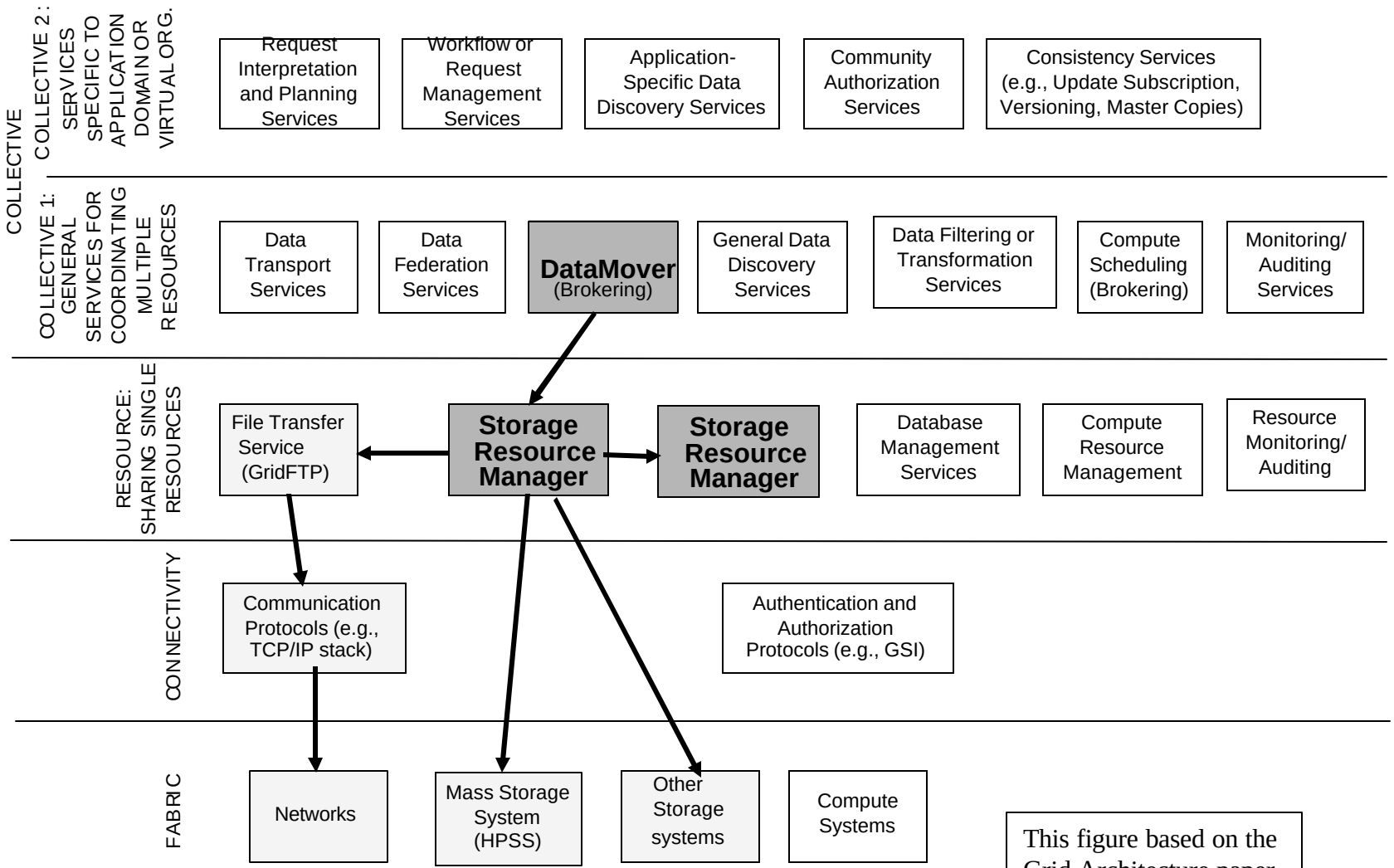
➢Group name **GSM** (to avoid conflict with Scheduling and Resource Management Area) but the *product* is the SRM interface.

Where do SRMs belong in the Grid architecture?



This figure based on the Grid Architecture paper by Globus Team

SRMs supports a brokering service by invoking transfer services



This figure based on the Grid Architecture paper by Globus Team

CHARTER: GSM Scope

- Focus on the definition of the functionality of a standard SRM interface.
- A short-term effort to have a workable interface that Grid projects could immediately make use of to resolve interoperability issues between storage interfaces.
- We solicit active participation from all interested parties
- SRM has already a strong user/provider community (see below)
  - *In our experience so far the SRM interface was one of the most successful demonstrators of the interoperability efforts between different Grid projects in the US and in Europe*.

History

- 3 year of Storage Resource (SRM) Management activity
- Experience with system implementations v.1.x
- Development of SRM v2.x spec
- GGF-BOF at GGF7
- Talk on SRM concepts in Data Workshop on Tuesday
- WG (BOF) meeting Thurs. 2:00-3:30 pm
- Use of SRMs for HENP and Robust multi-file replication

Participants in SRM effort so far

- Lawrence Berkeley National Laboratory (Berkeley CA, USA)
- Fermi National Accelerator Laboratory (Batavia IL, USA)
- European Organisation for Nuclear Physics CERN (Geneva, Switzerland)
- Deutsches Elektronen Synchrotron DESY (Hamburg, Germany)
- T. Jefferson National Accelerator Facility (Newport VA, USA)
- CCLRC Rutherford Appleton Laboratory (Oxon, UK)
- Additional sites that are deploying SRMs are:
  - Brookhaven National Laboratory (Brookhaven NY, USA)
  - National Center for Atmospheric Research (Boulder CO, USA)
  - Oak Ridge National Laboratory (Oak Ridge TN, USA)
  - Lawrence Livermore National Laboratory (Livermore CA, USA).

CHARTER: GSM Goals

- Produce a *GGF recommendation document* for SRM interfaces
  - Based on the work that has been done to date
- Description of an agreed certification test suite
  - Certify whether an implementation truly complies with the given interface recommendation.
- Aggressive timeline
  - Previous work on SRM available today
  - Draft GSM specification to follow this year

SRM Functionality list

1) Manage spaces
2) Manage files (in spaces)
3) Manage directories
4) Manage multi-file requests
5) Access remote sites for files
6) Accounting
7) Access control

SRM Functionality: details

- Manage Spaces dynamically
  - Reservation, lifetime
  - Manage multiple spaces per client
  - Negotiation (Coordinate with GRAAP)
  - Types of spaces: shared, user owned
- Manage files in spaces
  - Request to put files in spaces
  - Request to get files into spaces
  - Manage default spaces
  - Lifetime, pining of files, release of files
  - No logical name space management (rely of GFS)

SRM Functionality: details

- Manage Directory structures
  - Usual unix semantics
  - srmLs, srmMkdir, srmMv, srmRm, srmRmdir
  - A single directory for all spaces
  - File assignment to spaces is virtual
- Manage multi-file requests
  - Manage request queues
  - Manage caches
- Access remote sites for files
  - Bring files from other sites and SRMs as requested
  - Use other services: transport (GridFTP), maybe catalog registration (OREP)

SRM Functionality: details

- Accounting
  - Keep track of space usage
  - Mbytes-Hours (bytes-seconds)
  - Capability-based quota allocation assigned by a VO
  - Interfaces to enable usage reporting
- Access control
  - Manage ACLs
  - Synchronizing ACLs in replicas is an open problem
  - Master copy concept maybe necessary to enforce access control

SRM Functionality list: V1.x + V2.x

	V1.x	V2.x
1) Manage spaces	**Default**	**Yes**
2) Manage files (in spaces)	**Yes (V,P)**	**Yes (V,P,D)**
3) Manage directories	**No**	**Yes**
4) Manage multi-file requests	**Yes**	**Yes**
5) Access remote sites for files	**Yes**	**Yes**
6) Accounting	**No**	**No**
7) Access control	**No**	**No**

Relationship to DAIS

- What is “file access”
  - File movement – SRM focus
    - Get the file into my space from storage system
    - Put a file from my space into storage system
    - The file is a “bag” of bits
  - Look into the content of the file – DAIS focus (maybe)
    - Equivalent to queries to a database system
    - e.g. SQL, XQuery
    - Gateway to data systems
    - Structure of files has to be exposed

SRM phases of document specifications

Phase 1

1) Manage spaces
2) Manage files (in spaces)
3) Manage directories
4) Manage multi-file requests

Phase 2

5) Access remote sites for files

Phase 3

6) Accounting
7) Access control

GSM Deliverables and Milestones

- GGF Recommendation documents
  - One for each phase
- Targets:
  - Phase 1 – Concept document and spec draft - June 2004 (GGF11)
  - Phase 1 – final spec – October 2004 (GGF12)
  - Phase 1 – Test suite - October 2004 (GGF12)

Discussion of GSM Management and Processes

- Definition and rules of active and passive participation
  - Active
    - Core group writing document and defining specs
    - People who implement SRMs
    - People who implement clients to SRMs
    - Current core group exists – solicit new members
  - Passive
    - Mailing list by sign up
    - Can comment to core group coordinator
    - Solicit opinions on documents
- How to resolve conflicts so that we can stay in the timeline
  - Only core group members by vote
  - Details to be worked out
  - discuss

The end