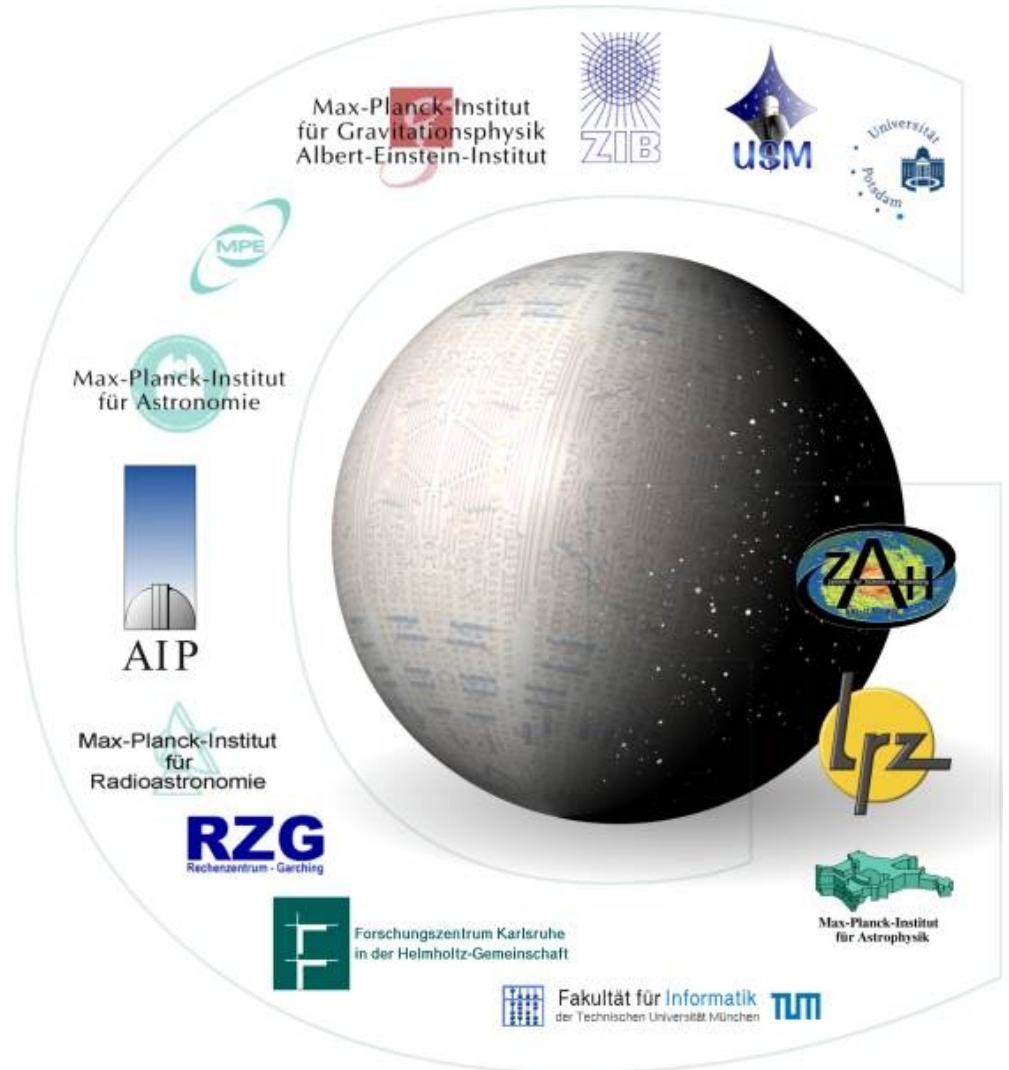
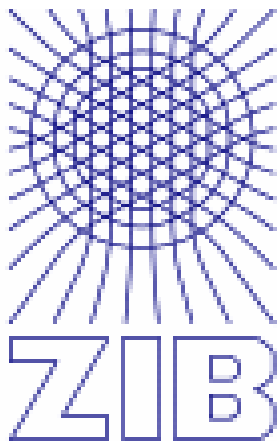




WG-3 Distributed File Management

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WG-3 Goals

- Provide software for managing files in a grid environment
 - ◆ Easy to share files (security!)
 - ◆ Efficient file transfer
 - ◆ Unified view of files stored on multiple resources
 - ◆ Use existing tools when available (Phase 1)



Detailed user requirements

- Automated staging of input/output data
 - ◆ Solution: Globus, AstroGrid-D job management
- Access to stdout/err
 - ◆ Solution: Globus, GridFTP
- Interactive access to log- and intermediate result files
 - ◆ Solution: Globus, GridFtp
- Partial access to HDF5 files
 - ◆ Solution: GridFTP + plugin



Grid File Management

- Files stored at geographically distributed resources
- Sharing of archived and non-archived data
- Resources have different policies for grid jobs
- Resource storing input/output files must be accessible during job submission



Cooperative Storage

- Share storage and network resources efficiently, not only compute resources
- Advantages of a cooperative storage
 - ◆ Aggregate storage capacity
 - ◆ Unified view of files
 - ◆ Intermediary storage for job input/output files
 - ◆ Uniform interface: PUT/GET/DELETE
 - ◆ Advanced features transparent for the user
 - Example: end-to-end integrity checking

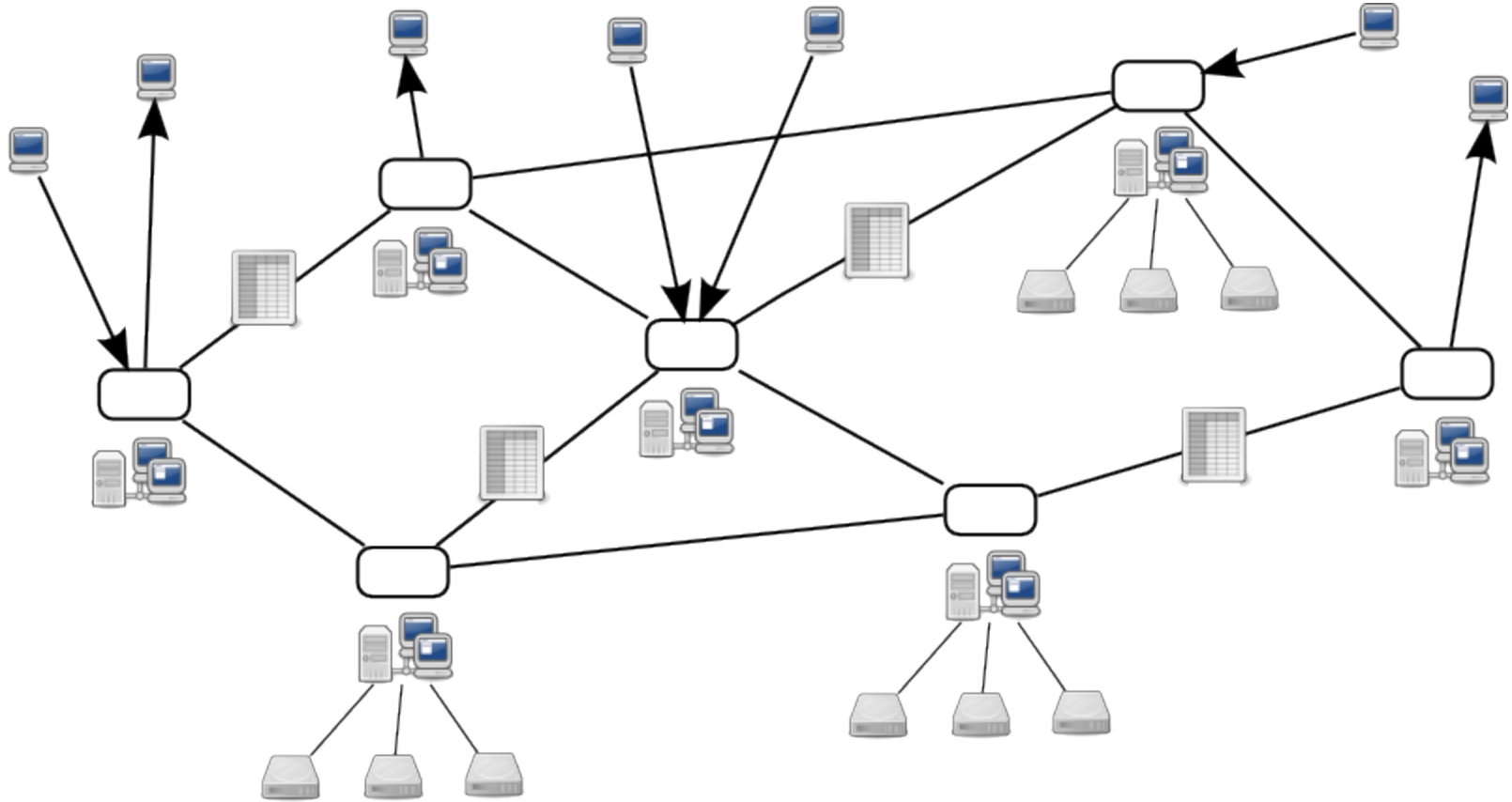


Cooperative storage approach

- Management of contributed storage
- User-defined globally unique identifiers
- Files are immutable
- File transfer with GridFTP, HTTP, ...
- Advanced features in phase 2
 - ◆ Cooperative caching
 - ◆ Parallel transfer using replicas
 - ◆ Archived files



Storage layer overview



Storage daemon



Grid resource



File



Client



File management operations

- Add a file to the storage, PUT <name> <data>
- Retrieve a file, GET <name>
- Delete a file, DELETE <name>



Finding files

- Metadata is used to find files in the grid
- Associate metadata with the filename and query via the Information Service
- Indexing of files
 - ◆ Plugin-architecture, a plugin recognize added files
 - ◆ Files are indexed automatically if a plugin exists (ex: JPEG, FITS, ...)



Current Prototype

- Distributed replica index
 - ◆ Registration and removal of replicas
- Storage manager
 - ◆ Event-based architecture
 - ◆ Share existing archives and contribute storage
 - ◆ Uses replica index to find non-local files
- Operations for PUT/GET
 - ◆ replica access is transparent
- Available in SVN



Summary and Outlook

- Specific user requirements are supported by Globus and GridFTP + extensions
- Files in the grid are harder to manage since they are distributed over many resources
- Storage layer for storage and Information Service to organize and find files
- Prototype available in the AstroGrid-D SVN
 - ◆ PUT/GET and replication



Deployment

- Run the storage node software to
 - ◆ contribute storage to AstroGrid-D
 - ◆ share your public data within collaborations
- Organize your files by assigning metadata to the file name
- Write plugins for indexing of specific file-types