Grid Data Management: Reliable File Transfer Services' Performace

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Data management has proved to be one of the hardest jobs to do in a the grid environment. In particular, file replication has suffered problems of transport failures, client disconnections, duplication of current transfers and resultant server saturation.

To address these problems the globus and gLite grid middlewares offer new services which improve the resiliancy and robustness of file replication on the grid. gLite has the File Transfer Service (FTS) and globus offers Reliable File Transfer (RFT). Both of these middleware components offer clients a web service interface to which they can submit a request to copy a file from one grid storage element to another. Clients can then return to the web service to query the status of their requested transfer, while the services can schedule, load balance and retry failures between the recieved requests.

In this paper we compare these two services, examining,

a) Architecture and features offered to clients and grid infrastructure providers.b) Robustness under load: e.g., when large numbers of clients attempt to connect in a short time or large numbers of transfers are scheduled at once.c) Behaviour under common failure conditions - loss of network connectivity, failure of backend database, sudden client disconnections.

Lessons learned in the deployment of gLite FTS during LCG Service Challenge 3 are also discussed.

Finally, further development of higher level data management services, including interaction with catalogs in gLite File Placement Service and Globus Data Replication Service is considered.

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