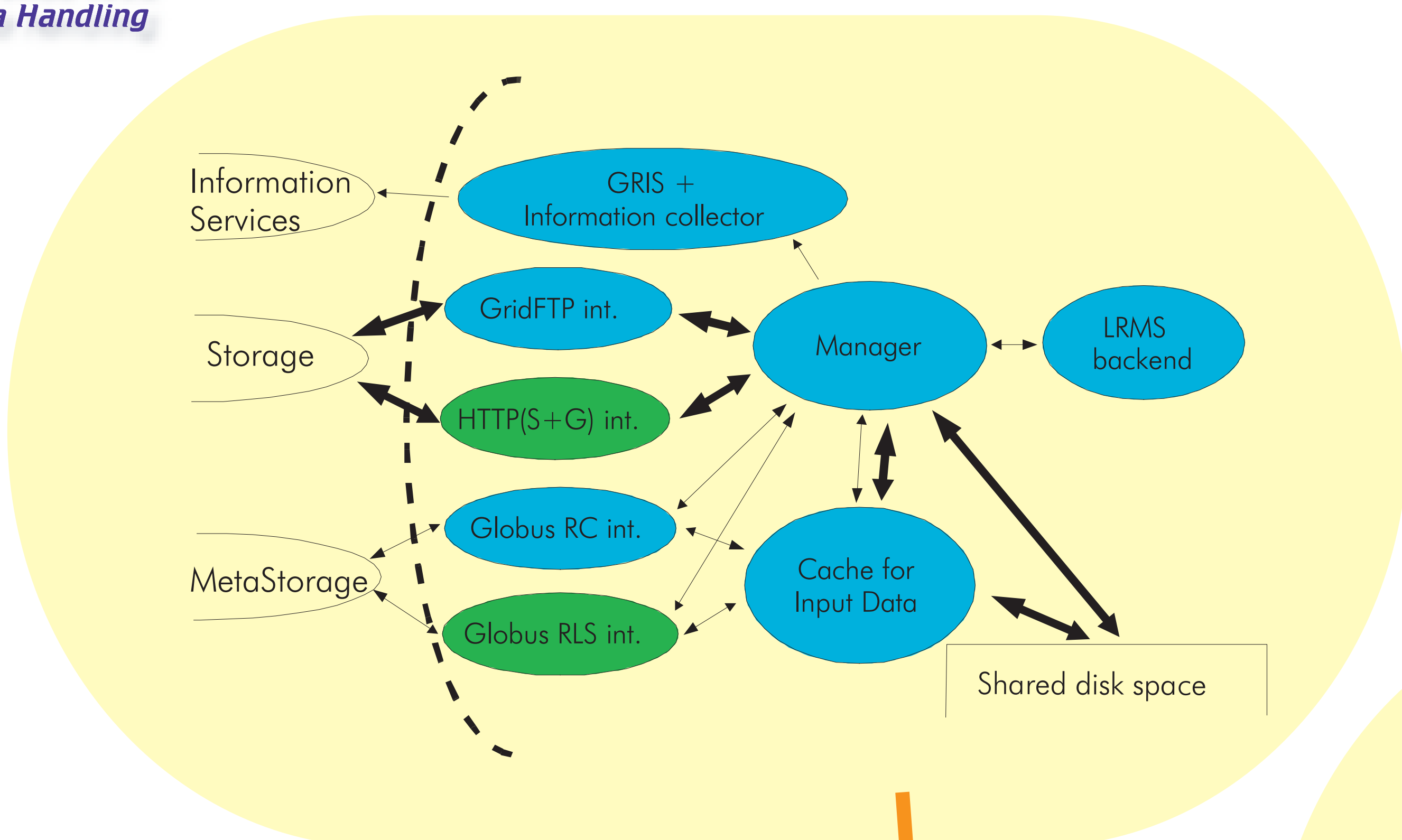


ARC Grid Middleware

NORDUGRID

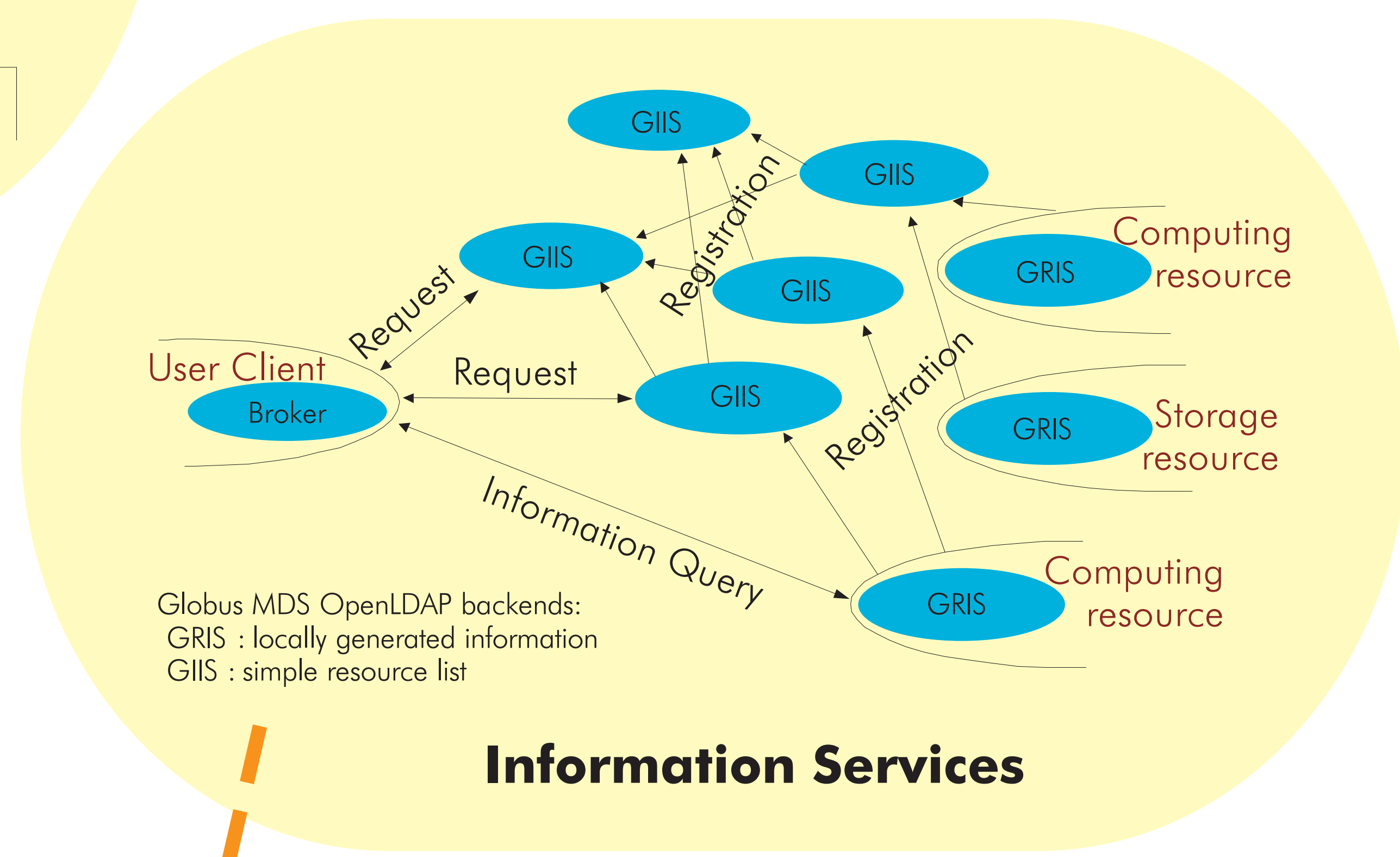
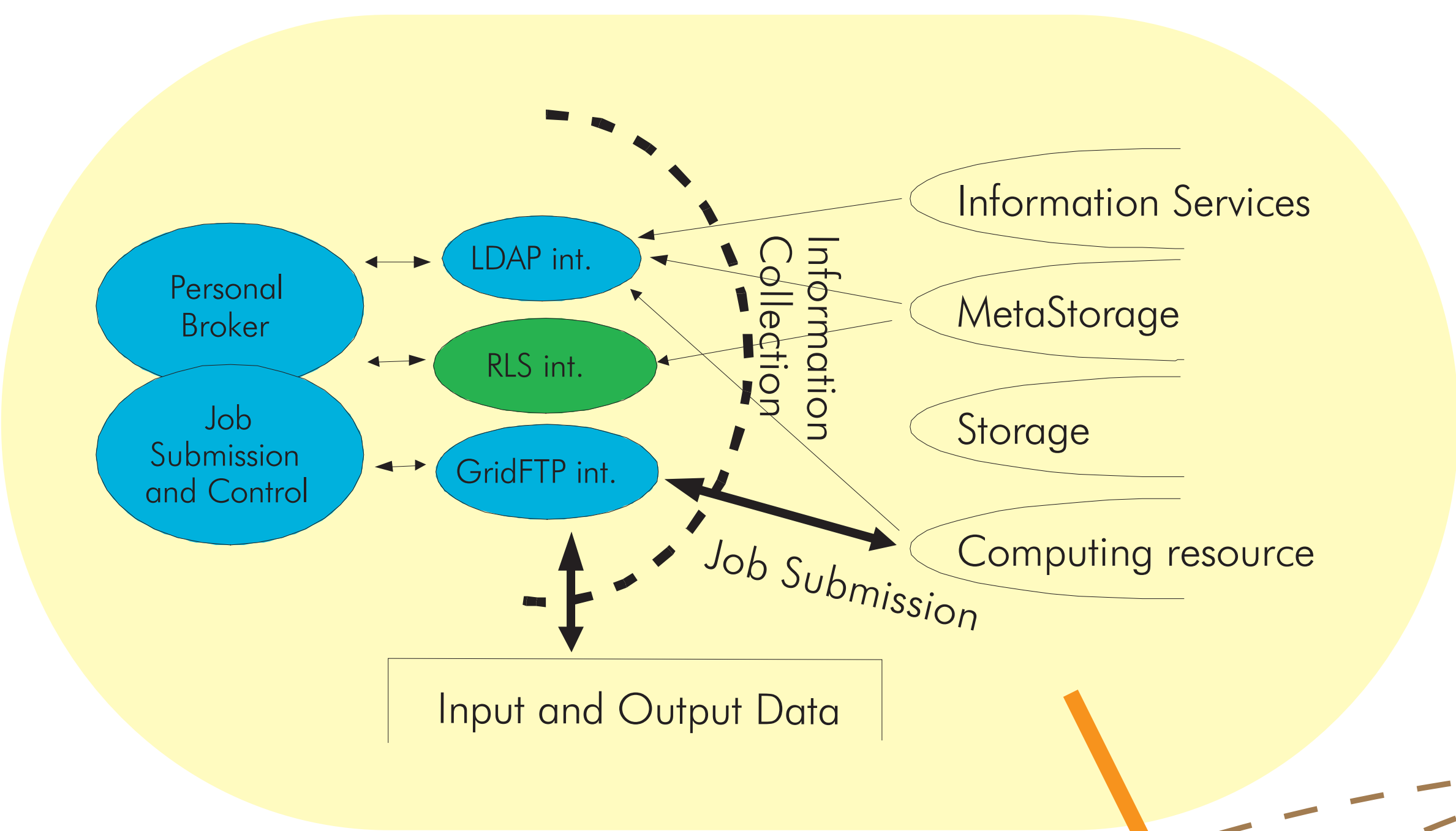
Grid Solution for Wide Area Computing and Data Handling

ARC is designed to be a scalable, non-intrusive and portable solution. The development is user- and application-driven, with the main requirements being those of performance, stability, useability and portability. As a result of this approach, the standalone client is available for a dozen of platforms and can be installed in a few minutes. The server installation does not require a full site reconfiguration. The middleware can be built on any platform where the external software packages (like GT2 libraries) are available. While being deployed on one of the largest production grids and being used by real users, the middleware is naturally undergoing continuous real life tests.



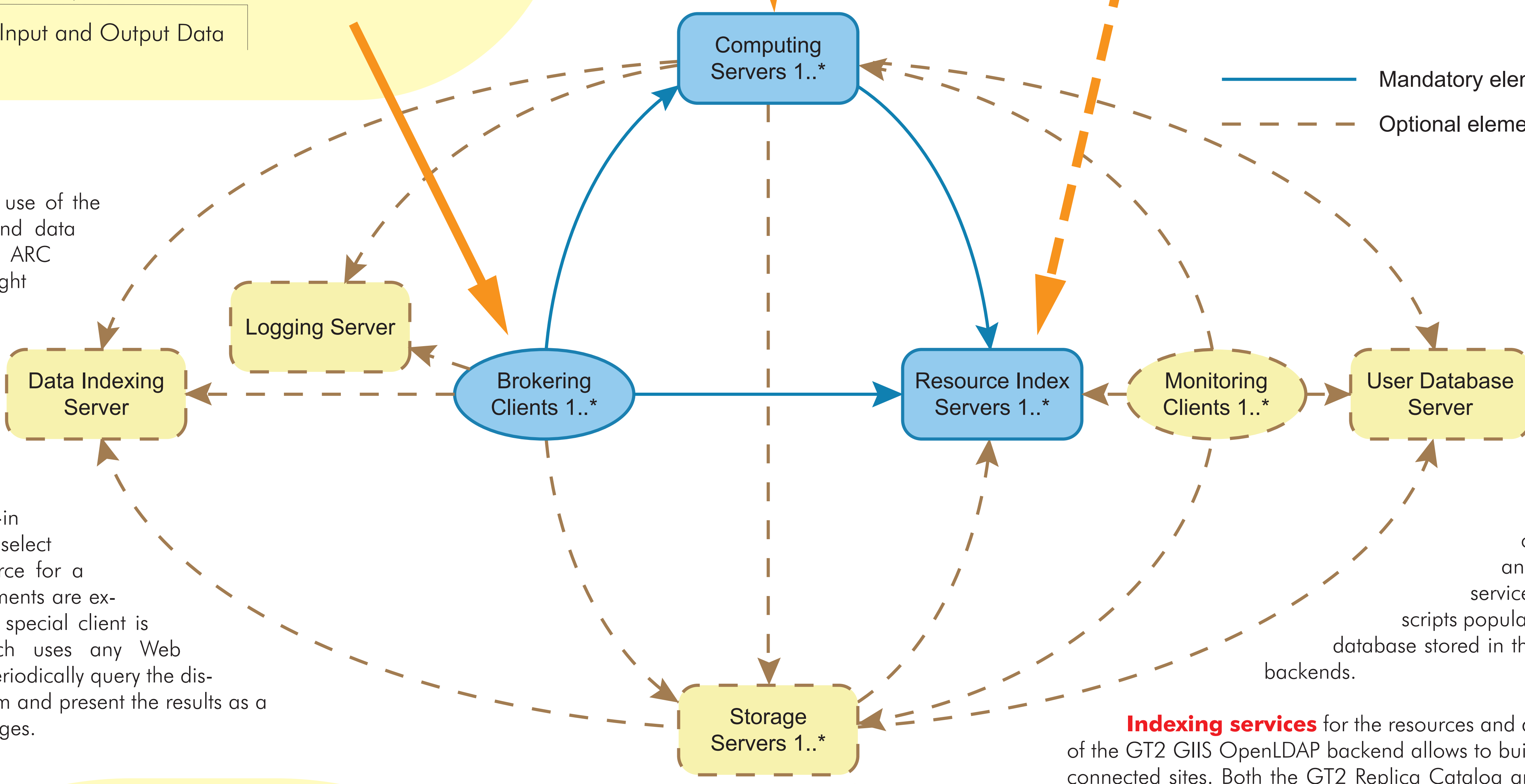
Advanced Resource Connector (ARC) provides a reliable implementation of the fundamental grid services, such as information services, resource discovery and monitoring, job submission and management, logging, brokering, data and resource management. Most of these services are provided through the security layer of the GSI. ARC builds upon standard open source software. It implements innovative solutions essential for a production quality middleware: the Grid Manager, ARC GridFTP server, ARC information model and providers (the NorduGrid schema), the User Interface and broker (a "personal" broker integrated into the user interface), extended Resource Specification Language (xRSL), as well as the monitoring and logging systems.

ARC integrates computing resources (commodity computing clusters managed by a batch system or standalone workstations) and Storage Elements, making them available via a secure common grid layer.



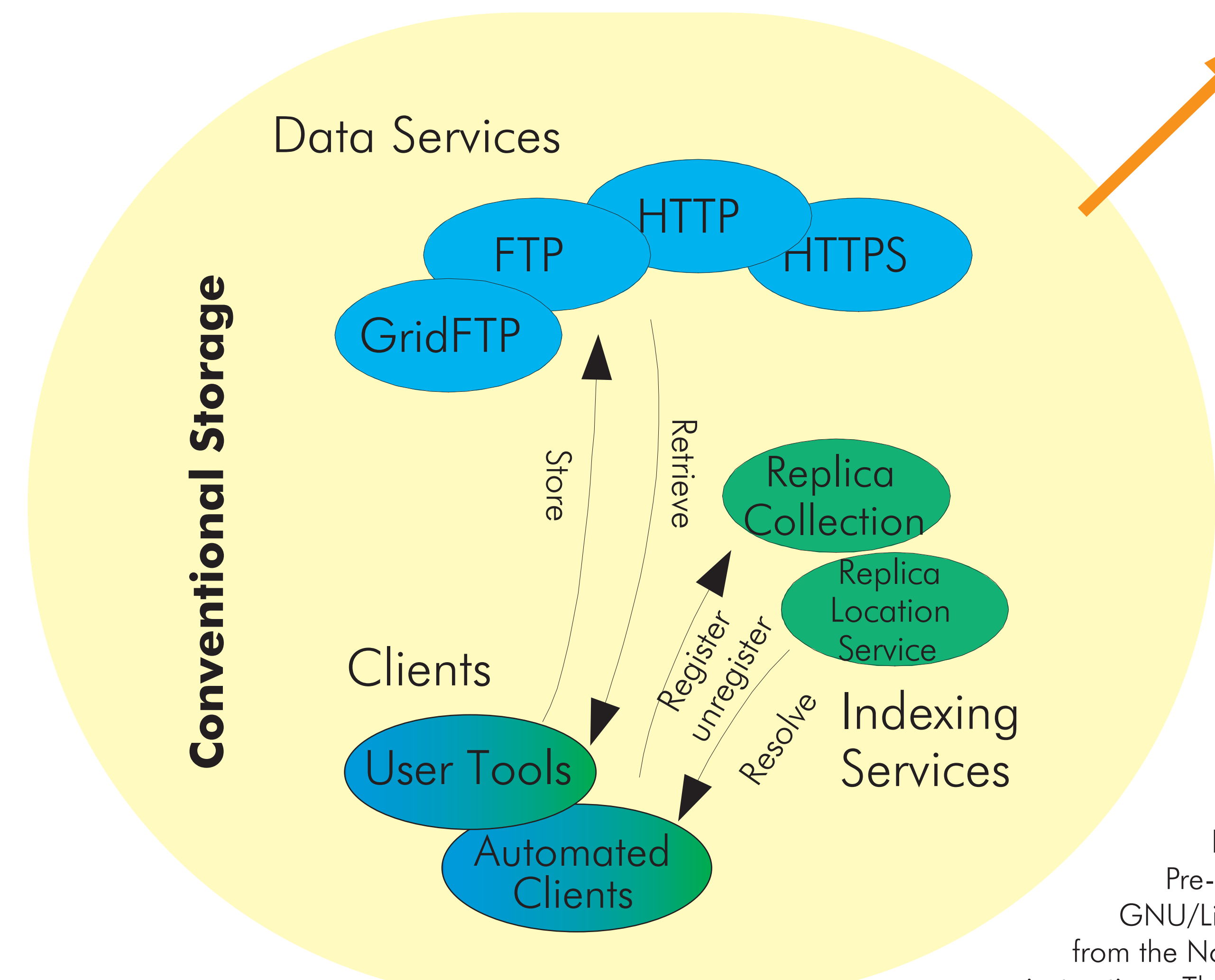
Clients make intelligent use of the distributed information and data available on the grid. ARC comes with a light-weight client, the User Interface. The ARC User Interface is a set of command line tools to submit, monitor and manage jobs on the grid, move data around and query resource information. The User Interface comes with a built-in broker, which is able to select the best matching resource for a job. The grid job requirements are expressed in xRSL. Another special client is the Grid Monitor, which uses any Web browser as an agent to periodically query the distributed information system and present the results as a set of inter-linked Web pages.

— Mandatory elements
- - - Optional elements



Grid services running on the resources: the Grid Manager, gridftp and the information services. Grid jobs are submitted to the cluster through gridftp and a separate session directory is created for each job. The grid session directories are made available through the gridftp during and after job execution. The Grid Manager is a service running on a resource taking care of jobs, session directories and the cache area. Information services are implemented as efficient scripts populating the NorduGrid information database stored in the Globus-modified OpenLDAP backends.

Indexing services for the resources and data: A special simplified usage of the GT2 GIIS OpenLDAP backend allows to build a hierarchical mesh of grid-connected sites. Both the GT2 Replica Catalog and the GT2 RLS service can be used as metadata catalogues by the ARC middleware. ARC client tools and the Grid Manager daemon are capable of interfacing to these catalogues.



Smart Storage Element (SSE) is a replacement of the current ARC gridftp-based simple storage element. SSE is based on standard protocols such as HTTPS/G and SOAP. SSE provides flexible access control, data integrity between resources and support for autonomous and reliable data replication.

The ARC middleware is free to be deployed anywhere by anybody. Pre-built binary releases for a dozen of GNU/Linux distributions can be downloaded from the NorduGrid site, along with the installation instructions. The open source development of the middleware is coordinated by the NorduGrid Collaboration. The Collaboration is open to new members. Contributions from the community to the software and the documentation is welcomed. Sources can be downloaded from the NorduGrid Web site or CVS.

