Status of the ARC Middleware

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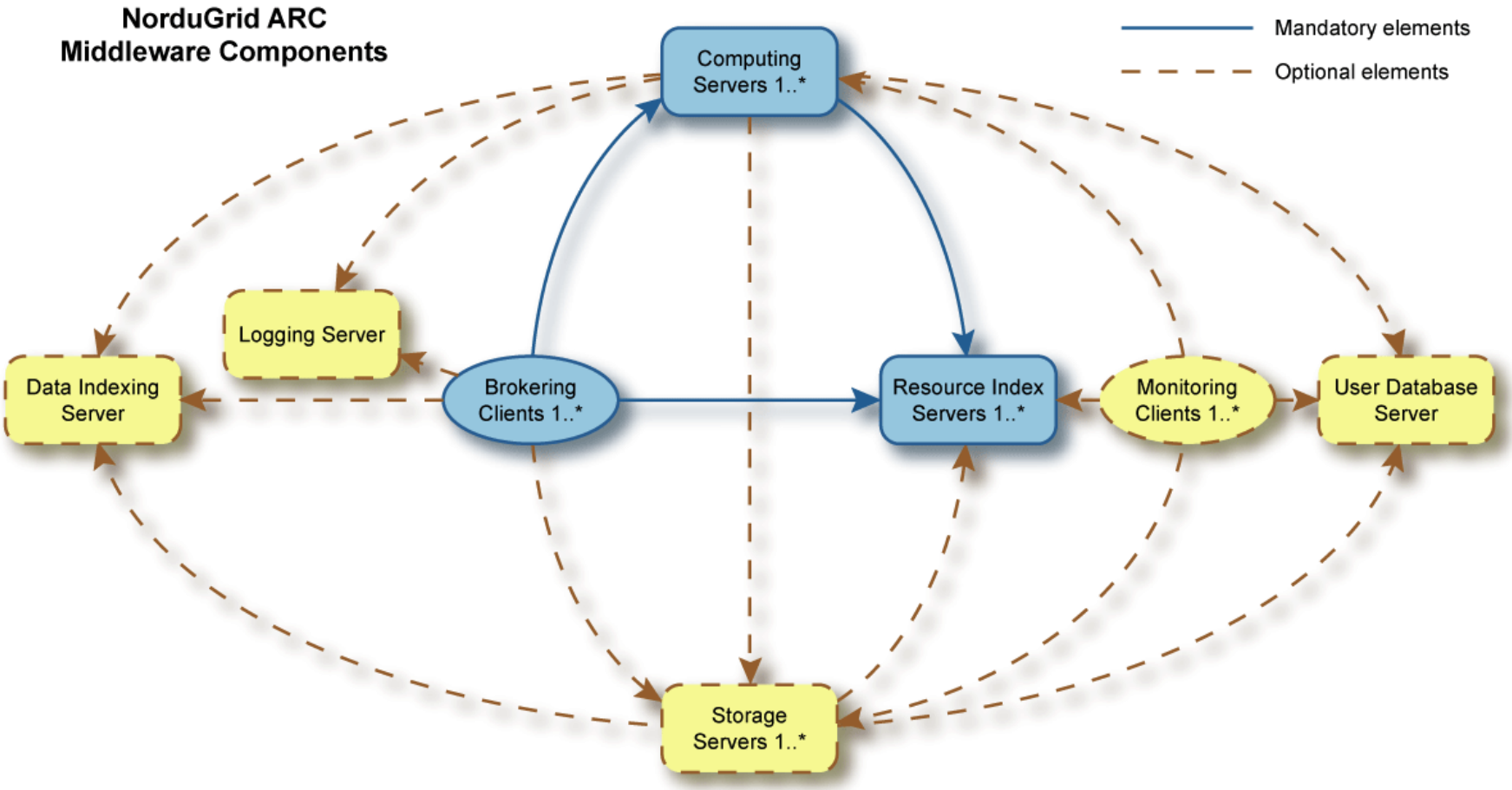
Advanced Resource Connector

- The Advanced Resource Connector is a Grid Middleware developed by the NorduGrid collaboration
  - The NorduGrid collaboration is a research collaboration between Nordic academic institutions that started in 2002
- The objective of the collaboration is to provide a “grid solution for wide area computing and data handling”
- Published in M. Ellert *et al.*, *“Advanced Resource Connector middleware for lightweight computational Grids”*, Future Generation Computer Systems **23** 219–240 (2007)

Features of ARC

- Light-weight and non-intrusive
  - resource owners retain full control
  - services can be installed on an existing cluster installation
  - cluster don’t have to be dedicated
- Portable
  - pre-compiled binaries for many Linux distributions
- Client easy to install for new users
  - available from http://ftp.nordugrid.org/

The ARC Middleware Architecture



Architecture Key Points

- Each resource has a frontend
  - Authenticates users, interprets tasks, interacts with LRMS, publishes information, moves data
  - Resources are grid enabled by the ARC layer deployed on the frontend, no middleware components behind the frontend
- Each user can have an independent lightweight brokering client (or many)
  - Resource discovery, matchmaking, job submission and manipulation, monitoring
- Grid topology is achieved by an hierarchical, multi-rooted set of indexing services
- Monitoring relies on the information system

History of ARC

- Version 0.1
  - First ever NorduGrid release 23 April 2002
- Version 0.4.5
  - Current production release
- Verison 0.5.55
  - Current development release
- Version 0.6
  - Upcoming production release

New Features in Release 0.6

- Client libraries
- Python bindings (using SWIG)
- Unified configuration file
- New job states
- Improved error messages
- Wider use of GACL
- Support for VOMS authorization
- ... and much more

Visions for the Future

- Make the middleware design more modular with well defined interfaces between modules
- More tools for data management
- Adopt and participate in the development of emerging standards
- Improved interoperability with other grid solutions

Development Continues

- ARC is an open source project
  - Sources are released using the GPL licence
- ARC is continuously being developed by
  - The developers in the NorduGrid collaboration
  - Members of supporting projects such as KnowARC and NGDF
  - Community contributions