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ARC SDK: A toolbox for distributed computing and data applications

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Grid middleware suites provide tools to perform the basic tasks of job submission and retrieval and data access, however these tools tend to be low-level, operating on individual jobs or files and lacking in higher-level concepts. User communities therefore generally develop their own application-layer software catering to their specific communities' needs on top of the Grid middleware. It is thus important for the Grid middleware to provide a friendly, well documented and simple to use interface for the applications build on. The Advanced Resource Connector (ARC), developed by NorduGrid, provides a Software Development Kit (SDK) which enables applications to use the middleware for job and data management. This paper presents the architecture and functionality of the ARC SDK along with an example graphical application developed with the SDK. The SDK consists of a set of libraries accessible through Application Programming Interfaces (API) in several languages. It contains extensive documentation and example code and is available on multiple platforms. The libraries provide generic interfaces and rely on plugins to support a given technology or protocol and this modular design makes it easy to add a new plugin if the application requires supporting additional technologies. The ARC Graphical Clients package is a graphical user interface built on top of the ARC SDK and the Qt toolkit and it is presented here as a fully functional example of an application. It provides a graphical interface to enable job submission and management at the click of a button, and allows data on any Grid storage system to be manipulated using a visual file system hierarchy, as if it were a regular file system.

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