The ARC solution for Grid middleware

The expectations of technology users seem to rise on a virtually continual basis. The user has to keep up with an innovative, sophisticated product hit the market than demand is stimulated for newer, faster, more responsive technologies. The same holds true for Grid computing. Just as cluster computing was the next step for workstation-based computing, so the ongoing evolution of Grid technologies represents an important move forward in terms of computing for advanced research. "Making a computing environment as good as the best through excellent networks Grid computing naturally extends the term 'distributed computing' from nodes in a cluster to clusters in a Grid," explains Professor Farid Ould-Saada, the chairman of NorduGrid, a collaboration working to advance Grid technologies.

"The main goal of NorduGrid is to develop, maintain and support a free open source Grid middleware, the Advanced Resource Connector (ARC) software. Although NorduGrid started as a project (2001-2002), it actually evolved into a long-term R D collaboration based on a Memorandum of Understanding between the members. ARC is a result of the cooperation between several projects initiated and supported by NorduGrid: the EU-funded KnowARC project, the Nordic DataGrid Facility, and the NorduNet3-funded NGIn project that focuses on research and education (PhD programme, Grid school)."

With the effective operation of national Grid infrastructures reliant on the underlying infrastructures, the provision of reliable middleware takes on great importance. This is a role where NorduGrid has been notably successful: "ARC has been facilitating the reliable implementation of fundamental Grid services and utilities since 2002," says Ould-Saada. "A growing number of national and international infrastructure projects have chosen the non-intrusive, reliable, lightweight ARC as their middleware. Swegrid was the first, and the decision of a national Grid infrastructure to use ARC middleware was an important milestone for NorduGrid. Other Nordic countries quickly followed, including Nordgrid in Norway, M-Grid in Finland and DESY in Denmark – all of which rely on ARC."

This ultimately led to the establishment of the NDEG, which set the goal of providing a distributed grid computing center (Tier1) for CERN computing. Only ARC middleware can make this possible, there are no other comparable distributed centres.

Having set such ambitious objectives it is clear that NorduGrid must maintain a real focus on innovation if they are to be able to fulfill them. This is something of which Ould-Saada is well aware, indeed he points to NorduGrid’s work in developing middleware capable of serving multiple platforms as an illustration of the project’s forward-looking focus. "The ARC currently being deployed runs on most Linux distributions. One of the goals of the KnowARC project (the main NorduGrid-related R D project funded by the EU) is to make ARC function on the Microsoft Windows and Mac OS platforms as well," he outlines. "The objectives of the KnowARC project are to create a novel, powerful Next Generation Grid middleware, to promote Grid standardisation and interoperability, and to increase the take-up of Grid technologies and thus bridge the gaps between business and academia in Grid development."

Ould-Saada explains how their work in improving Grid middleware will bring significant benefits to end users.