Grid Operational Supports for Middleware Deployment and User Administration

E-Science is a new scientific research methodology to process multidisciplinary data using advanced information technology in order to achieve new scientific discoveries. Utilizing various distributed resources, e.g. computers and storages, is required for e-Science. The grid is a key technology to federate resources for e-Science, and many grid infrastructures are currently operated in the world, e.g. TeraGrid, Open Science Grid, EGI, UK e-Science Grid and NAREGI. An operation of a production level grid infrastructure is not an easy task. Although a lot of grid middleware is available, deploying middleware for the production level operation is not straightforward. For instance, grid middleware in multiple sites needs to be configured consistently, and administrators need to configure settings properly communicating with administrators in multiple sites. Procedures for these settings are often complicated and error-prone. User administration in the grid infrastructure also requires complicated procedures for administrators. The grid security infrastructure (GSI) assumes that each user has local accounts in all computing resources in the grid infrastructure. It forces each user to apply user accounts to multiple sites. Furthermore, administrators need to share and maintain mapping information between user certificates and local accounts in computing resources, e.g. grid-mapfile. In this paper, we present our experience of grid operational supports in the inter- university grid infrastructure focusing on the grid middleware deployment and the user administration. We developed an installation tool of grid middleware and a user administration tool. The installation tool enables administrators in resource provider sites to install the NAREGI grid middleware and customize middleware settings, e.g. network configurations and registration of resources to information service. Our user administration tool helps administrators to register user accounts and maintain grid-mapfiles in multiple resource provider sites. We are now operating the inter-university grid infrastructure in Japan using the developed tools. The infrastructure is organized by supercomputer centers in nine universities and an operational center in the National Institute of Informatics (NII). The supercomputer centers operate computing resources and NII operates servers for grid services, e.g. the information service, the job brokering service and the grid portal. Resources in the infrastructure are connected via 10Gbps SINET3 network. We provide the user registration service, "Grid-pack", which enable a user to apply both local accounts in multiple supercomputer centers and grid certificates by submitting an application to the local registration authority (LRA) in the user's local site. We also present the current operational support procedures including the Grid-pack and discuss future issue in the grid infrastructure.

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