

Computing resource federation in grid and cloud environments

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NII has two projects of grid and cloud computing, RENKEI and edubase Cloud. The RENKEI project aims to provide grid middleware that focused on resource federation. The edubase Cloud offers platforms for educational programs and daily computing resources to educators and researchers.

The RENKEI is a joint project with some other organizations. NII leads the project and develops computing resource federation features between non-grid resources and grid resources, and between grid resources in RENKEI and different type grid infrastructures. The former feature enables to use both non-grid resource and grid resource in a single workflow without interactive operations for login and data transfer between both resources. The latter feature enables mutual job submission between RENKEI and other grids using the HPCBP international standard. The RENKEI also federates with the edubase Cloud. The edubase Cloud users can create a RENKEI LLS client tools and non-grid resources in the cloud, and can submit jobs from the LLS to the non-grid resources, and to grid resources in RENKEI and other type grids. They can run pre/post/light processes of applications on the cloud resources, and can run main/heavy processes of applications on high performance grid resources. In this presentation, architectural design of the RENKEI computing resource federation, detected problems of the HPCBP based interoperation in a prototype implementation, and some experimental results are presented.