On-demand DEM mosaic generation service on GEO Grid

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GEO Grid is an e-science infrastructure for Earth sciences, which enable us to integrate all the relevant data, such as satellite imagery, GIS maps and sensor network signals. In the framework of GEO Grid, anyone can construct virtual organization (VO) and data providers can control access to their data by authenticating and authorizing VO[1].

So far we have set up several VO, in which registered members feely utilize all the ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) data [2] provided by National Institute of Advanced Industrial Science and Technology. Since the launch in 2000, ASTER has been producing more than 150 Tbytes raw data. A peta-byte scale storage is required for the complete archive of higher level products, such as Digital Elevation Model (DEM) and orthorectified images. In GEO Grid VO, however, we store only raw data on the grid file system and higher level products are generated upon users request. Furthermore, many applications of ASTER DEM require the coverage wider than one scene (60km x 60km). The geolocation accuracy of ASTER imagery is so high [3] that we can easily construct large-scale mosaics simply by combining each scene. On the VO portal site, users can select their target area and clear scenes to be combined. The submitted jobs are processed with globus-based grid services. In this presentation, we describe the validation and actual applications of ASTER DEM mosaic in addition to the grid technology supporting the service.