Geophysical Research Abstracts,
Vol. 11, EGU2009-3479, 2009
EGU General Assembly 2009

Coverage Access Services for Earth and Space Sciences: Requirements Analysis

S. Nativi (1,2) and B. Domenico (3)

(1) Italian National Research Council, (CNR - IMAA), Tito Scalo, Italy (nativi@imaa.cnr.it, +39 0574 602524), (2) University of Florence at Prato, Piazza Ciardi 25, Prato Italy, (3) Unidata-UCAR P.O. Box 3000 Boulder, CO 80307-3000, USA (Ben@unidata.ucar.edu)

This presentation will briefly discuss the different perspectives that characterize the main geo-spatial Communities as far as the coverage data model is concerned. Then, it will present the results of a user requirements analysis for an effective coverage access service conceived to serve the use scenarios of the Earth and Space Science Community. Eventually, possible new categories of access services are described comparing them with the existing service implementations.

The coverage concept was defined by the ISO 19123 to summarise the different conceptual and physical representations of an image, going further by enlarging the variety of geospatial information that can be represented this way. In fact, a coverage is a feature that has multiple values for each attribute type, where each direct position within the geometric representation of the feature has a single value for each attribute type. The coverage concept generalizes and extends the raster structure type by referring to any data representation that assigns values directly to spatial positions –regularly and non-regularly distributed. In fact, a coverage associates a position within a domain (commonly, spatial-temporal domain) to a value of a defined data type. Hence, it realizes a function (namely, coverage function) from a domain to an attribute domain –i.e. the co-domain or coverage range. Just as the concepts of discrete and continuous phenomena are not mutually exclusive, their representations as discrete features or coverages are not mutually exclusive. The same phenomenon may be represented as either a discrete feature or a coverage. However, coverages are the prevailing data structures in Earth and Space Science community.

The analysis of software requirements for coverage access services was made adopting two methods concurrently the Critical Success Factor (CSF) analysis method, which was supplemented by the Usage Cases analysis. This methodology was chosen by the W3C for the Web Services Architecture analysis. The CSF Analysis methodology is a top-down means of determining requirements based on the needs of the organization while the Use Case approach implements a bottom-up methodology collecting users' requirements. The respective results were cross-referenced to ensure consistency. The vast majority of use cases are taken from the work of the OGC GALEON Working Group in the coverage domain. Mainly, GALEON use cases are stemming from the meteo-ocean community, or Fluid Earth Science (FES); however, they appear to cover most of the requirements characterizing the overall Earth and Space Science community.