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The Climate-G testbed: towards a large scale data sharing environment for climate change

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The Climate-G testbed provides an experimental large scale data environment for climate change addressing challenging data and metadata management issues. The main scope of Climate-G is to allow scientists to carry out geographical and cross-institutional climate data discovery, access, visualization and sharing. Climate-G is a multidisciplinary collaboration involving both climate and computer scientists and it currently involves several partners such as: Centro Euro-Mediterraneo per i Cambiamenti Climatici (CMCC), Institut Pierre-Simon Laplace (IPSL), Fraunhofer Institut für Algorithmen und Wissenschaftliches Rechnen (SCAI), National Center for Atmospheric Research (NCAR), University of Reading, University of Catania and University of Salento. To perform distributed metadata search and discovery, we adopted a CMCC metadata solution (which provides a high level of scalability, transparency, fault tolerance and autonomy) leveraging both on P2P and grid technologies (GRelC Data Access and Integration Service). Moreover, data are available through OPeNDAP/THREDDS services, Live Access Server as well as the OGC compliant Web Map Service and they can be downloaded, visualized, accessed into the proposed environment through the Climate-G Data Distribution Centre (DDC), the web gateway to the Climate-G digital library. The DDC is a data-grid portal allowing users to easily, securely and transparently perform search/discovery, metadata management, data access, data visualization, etc. Godiva2 (integrated into the DDC) displays 2D maps (and animations) and also exports maps for display on the Google Earth virtual globe. Presently, Climate-G publishes (through the DDC) about 2TB of data related to the ENSEMBLES project (also including distributed replicas of data) as well as to the IPCC AR4.

The main results of the proposed work are: wide data access/sharing environment for climate change; P2P/grid metadata approach; production-level Climate-G DDC; high quality tools for data visualization; metadata search/discovery across several countries/institutions; open environment for climate change data sharing.