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Towards Seamless Planetary-Scale Services

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Collaboration requires some minimum of common understanding, in the case of Earth data in particular common principles making data interchangeable, comparable, and combinable. Open standards help here; in case of Big Earth Data specifically the OGC/ISO Coverages standard. This unifying framework establishes a common framework for regular and irregular grids, point clouds, and meshes., in particular: for spatio-temporal datacubes. Services grounding on such common understanding can be more uniform to access and handle, thereby implementing a principle of "minimal surprise" for users visiting different portals. Further, data combination and fusion benefits from canonical metadata allowing alignment, e.g, between 2D DEMs, 3D satellite image timeseries, 4D atmospheric data.

The EarthServer federation is an open data center network offering dozens of Petabytes of a critical variety, such as radar and optical Copernicus data, atmospheric data, elevation data, and thematic cubes like global sea ice. Data centers like DIASs and CODE-DE, research organizations, companies, and agencies have teamed up in EarthServer. Strictly based on OGC standards, an ecosystem of data has been established that is available to users as a single pool, in particular for efficient distributed data fusion irrespective of data location.

The underlying datacube engine, rasdaman, enables location-transparent federation: clients can submit queries to any node, regardless of where data sit. Query evaluation is optimized automatically, including multi-data fusion of data residing on different nodes. Hence, users perceive one single, common information space. Thanks to the open standards, a broad spectrum of open-source and proprietary clients can utilize this federation, such ranging from OpenLayers and NASA WorldWind over QGIS and ArcGIS to python and R.

In our talk we present technology, services, and governance of this unique intercontinental line-up of data centers. A demo will show distributed datacube fusion live.

Peter Baumann: the rasdaman team