Motivation

Spatio-temporal sensor, image, simulation, and statistics data typically represent „Big Data” in our largely unleashed archives. The intercontinental EarthServer initiative is redefining access and analytics on Big Earth Data based on the datacube paradigm, leveraging Petascale 3-D satellite image timeseries and 4-D weather data for direct mix-and-match. The scalable rasdaman array engine provides the necessary functionality and performance.

The core federation partners offer Sentinel and Landsat data (MEEO), ocean data (PML), weather data (ECMWF), Landsat8 data (NCI Australia), planetary data (Jacobs U). As of today, the largest offering exceeds 250 TB, and early in 2017 the Petabyte frontier will be crossed. In future, EarthServer is planned to be opened for further federation partners, ultimately establishing a global Earth data federation.

Phase 1 was 2011 – 2014, phase 2 is 2015-2018.

Goals

• any query, any time, any-size spatio-temporal datacubes
• declarative retrieval, fusion, aggregation, and analytics on Petabyte+ datacubes
• seamless integration of data & metadata retrieval
• independence from data formats
• strictly standards: OGC WMS, WCS, WCPS
• scalable processing: parallelization, federation, heterogeneous hardware
• allow users to stay in their comfort zone: Leaflet, QGIS, NASA WorldWind, python, and any other standards conformant client

Service Platform: rasdaman

The rasdaman („raster data manager“) Array DBMS has been crafted rigorously for massive n-D array analytics, with each single component optimizing array through-put. A high-level declarative query language – blueprint for the forthcoming ISO SQL / MDA standard – enables flexible filtering and processing of array sets. Incoming queries undergo optimization, parallelization, and distribute-on across heterogeneous hardware, clouds, and data center federations. Effectively, rasdaman has pioneered Array Databases.

Standardization Impact

rasdaman is blueprint for ISO SQL and the OGC „Big Earth Data“ standards:
• ISO 9075 SQL Part 15: Multi-Dimensional Arrays (MDA)
• OGC Coverage Implementation Schema (CIS), Web Coverage Service (WCS) standards suite, Web Coverage Processing Service (WCPS) language
• INSPIRE WCS standard

Recognition & Awards

„The RASDAMAN product is currently the world leading environment in this domain and the standard working horse for OGC standardisation on these innovative data access interfaces.“ - G. Landgraf, Head of Ground Segment Infrastructure Engineering Section, ESA

EarthServer-2 Partners

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