



## **rasdaman Array Database: current status**

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rasdaman (Raster Data Manager) is a Free Open Source Array Database Management System which provides functionality for storing and processing massive amounts of raster data in the form of multidimensional arrays. The user can access, process and delete the data using SQL.

The key features of rasdaman are: flexibility (datasets of any dimensionality can be processed with the help of SQL queries), scalability (rasdaman's distributed architecture enables it to seamlessly run on cloud infrastructures while offering an increase in performance with the increase of computation resources), performance (real-time access, processing, mixing and filtering of arrays of any dimensionality) and reliability (legacy communication protocol replaced with a new one based on cutting edge technology - Google Protocol Buffers and ZeroMQ).

Among the data with which the system works, we can count 1D time series, 2D remote sensing imagery, 3D image time series, 3D geophysical data, and 4D atmospheric and climate data. Most of these representations cannot be stored only in the form of raw arrays, as the location information of the contents is also important for having a correct geoposition on Earth. This is defined by ISO 19123 as coverage data. rasdaman provides coverage data support through the Petascope service.

Extensions were added on top of rasdaman in order to provide support for the Geoscience community. The following OGC standards are currently supported: Web Map Service (WMS), Web Coverage Service (WCS), and Web Coverage Processing Service (WCPS).

The Web Map Service is an extension which provides zoom and pan navigation over images provided by a map server. Starting with version 9.1, rasdaman supports WMS version 1.3.

The Web Coverage Service provides capabilities for downloading multi-dimensional coverage data. Support is also provided for several extensions of this service: Subsetting Extension, Scaling Extension, and, starting with version 9.1, Transaction Extension, which defines request types for inserting, updating and deleting coverages. A web client, designed for both novice and experienced users, is also available for the service and its extensions. The client offers an intuitive interface that allows users to work with multi-dimensional coverages by abstracting the specifics of the standard definitions of the requests.

The Web Coverage Processing Service defines a language for on-the-fly processing and filtering multi-dimensional raster coverages. rasdaman exposes this service through the WCS processing extension.

Demonstrations are provided online via the Earthlook website (earthlook.org) which presents use-cases from a wide variety of application domains, using the rasdaman system as processing engine.