DISTRIBUTED SPATIAL DATA WAERHOUSE AND WEB MAPPING

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During recent years, Internet mapping technology has greatly improved public access to digital spatial data. However, the limitation for the technology is, in most cases, that a map server only accesses the data from a single data repository. In some cases current web mapping technology can only access one type of spatial data. Such limitation is a big barrier for data discovery, data navigation, data extraction, data integration and application development for the efficient use of a variety of spatial data located all over the world.

In principle, the barrier can be removed, in certain degree, by using distributed spatial data servers although it is not widely used in current Internet mapping technology. Data in the distributed data server system can be partitioned by region, data type, resolution or time. By this method, data at different locations can be accessed and shared by each other data servers.

To achieve distributed spatial data warehousing, organizations are facing many challenges including resolving critical issues related to spatial data such as data modelling, data integration, database management, data analysis, data mining, and data access. The anatomy of an emerging new product – CubeSTOR developed by CubeWerx Inc. will be used to illustrate the main technology used and invented for web mapping using distributed spatial data warehouses.

A promising new technology for distributed spatial data warehousing over the Internet allow web mapping based on newly adopted OGC Web Mapping Specifications 1.0.1, CubeWerx web mapping technology (CubeSERV) supports cascading capability to other OGC compliant map servers built by other vendors. This cascading map server capability is changing the way organizations access spatial data by connecting to map servers all around the world. This technology can not only access multiple map servers at one time, but also integrate the result of each request made to each map server within a single display view. It treats all individual OGC compliant map servers as a big virtual map server with no constraints. The technology makes the server machines as a parallel processing system, therefore, the access of multiple map servers is very efficient. Furthermore, Integration and value-added services, such as re-projection, make the spatial data warehouse very powerful.

In this paper, some critical issues of Digital Earth projects will be discussed, such as metadata and visualisation. We will conclude by presenting the idea that Digital Earth projects are ideal applications for taking advantage of this new technology.