Using Cloud Computing to Accelerate Large Spatial Data Sharing

Jiyuan Li[1,2] and Frank Z. Wang[1], Lingkui Meng[2]
[1]Future Computing Research Group, School of Computing, University of Kent, Kent CT2 7NT, UK
[2]School of Remote Sensing and Information Engineering, Wuhan University, Wuhan 430079, China
Tel: +44 (0)1227 822989, email: J.Li-398@kent.ac.uk

Following the improving of earth observation technology and development of geographic survey, a large volume of spatial data, especially remote sensing data were generated and forwarded for analysis. Due to the geographic distribution of these massive data resources, fast and secure data sharing over the Internet therefore became a highly desirable requirement. At a moment, there are three ways to share spatial data, including: 1) data distribution based on HTTP/FTP; 2) web map data viewing and editing based on 3W protocol (WMS, WCS, WFS) of OGC (Open Geospatial Consortium); 3) spatial database accessing. Attempting to share or access spatial data across the Internet proves to be a frustrating and time-consuming experience. To provide a "local-like" performance, a WAN/cloud-optimized protocol known as "**CloudJet**" developed at our lab was used as the underlying engine between servers and clients. It aims to alleviate the main problem of large latencies encountered in sharing spatial data resources over the Internet/Cloud. **CloudJet** encapsulates a dynamic multi-stream/multi-path engine, which conforms to Portable Operating System Interface (POSIX) and thereby can accelerate any POSIX-compatible GIS applications across IP based networks. And computer user can share distributed spatial data on the Internet/Cloud without having to adjust the default configuration or change the way they work [1, 2].

To evaluate the performance of the underlying engine and the effectiveness of the proposed parallel architecture for communication, the network environment from Kent to Beijing in China was simulated and a series of experiments was conducted. We designed group tests for tree types of spatial data sharing ways. The results demonstrate that **CloudJet** is capable to deal with long-distance, cross-domain, and single-image data access and transfer up to several times. Future work will be directed toward deploying the parallel engine for distributed spatial data processing.

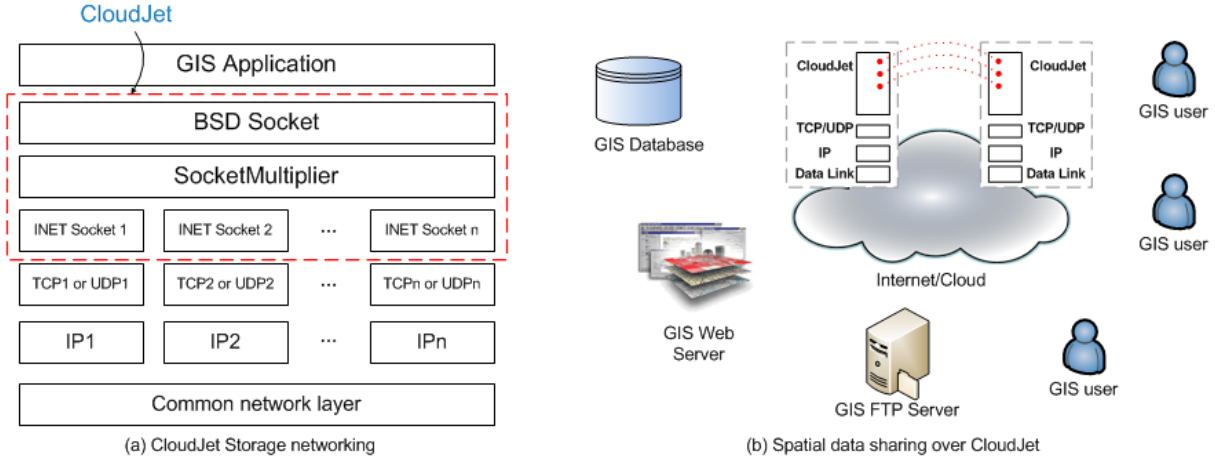

Fig.1 Architecture of CloudJet and its application on spatial data sharing over Internet/Cloud

References

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