

EARTH OBSERVATION SYMPOSIUM (B1)  
Earth Observation Data Management Systems (4)

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BUILDING A CLOUD FOR NEXT GENERATION GROUND DATA SYSTEM OF SPATIAL  
INFORMATION INFRASTRUCTURE

**Abstract**

Spatial Information Infrastructure is an integral system that comprises earth observation system, data processing system, and spatial data application system with massive geological and multi-resolution data. Spatial Information Infrastructure not only brings the remote sensing data into full play but also offers us a new perspective of the planet we are living on. China's satellite observation system and its massive image information can contribute to the construction of Spatial Information Infrastructures system in the future. Ground Data System (GDS) receives data from Earth Observation satellites of the Spatial Information Infrastructure for processing, archiving, and dissemination. The increasing amount of incoming satellite data and increases in the on-demand processing/reprocessing for massive data products are causing an excessive load on the conventional systems. and for services, Changes to the current architectures may be necessary to continue providing services efficiently to users. Cloud computing emerges as a new computing paradigm which aims to provide dynamic computing environments for storing and processing very large datasets, and provide users various resources as services. The objective of this paper is to design the new architecture within GDS that enables the Cloud of virtualized resources for providing on-demand processing and archiving services. This paper describes a high level application services framework and the underlying technology enablers, such as virtualization, automation, data and computation management, processing modeling, workflow planning, mapping and optimization. China is going to develop a new Earth observation system to meet the future demands. As an important component of global observation system, China land satellites will embrace the times of Spatial Information Infrastructure with a steady development and will provide powerful support for the construction of Spatial Information Infrastructure. GDS demonstrates the value of such a design used as a basis for developing for improving system performances. This work is an initial effort to build a new enterprise data center based on Cloud infrastructures, and also represents a major step in the evolution to the next generation Ground Data System in the future.