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CGI GeoData360: a cloud-based scalable production platform for big data-driven solutions of Earth Observation and Geospatial services.

Chandra Taposeea-Fisher, Andrew Groom, Jon Earl, and Peter Van Zetten

CGI, UK

Our ability to observe the Earth is transforming, with substantially more satellite imagery and geospatial data fuelling big data-driven opportunities to better monitor and manage the Earth and its systems. CGI's GeoData360 solves common technical challenges for those aiming to exploit these new opportunities.

Reliable monitoring solutions that run efficiently at scale require substantial ICT resources and more sophisticated data processing capabilities that can be complex and costly. Cloud-based resources enable new approaches using large, multi-tenant infrastructures, enabling solutions to benefit from massive infrastructural resources, otherwise unattainable for the individual user. GeoData360 makes these opportunities accessible to a wide user base.

GeoData360 is CGI's cloud-hosted production platform for Earth Observation (EO) and Geospatial services. GeoData360 is designed for long running, large scale production pipelines as a Platform-as-a-Service. It supports deep customisation and extension, enabling production workflows that consume large volumes of EO and Geospatial data to run cost efficiently at scale.

GeoData360 is fully scalable, works dynamically and optimises the use of infrastructure resources available from commercial cloud providers, whilst also reducing elapsed processing times. It has the advantage of being portable and securely deployable within public or private cloud environments. Its operational design provides the reliable, consistent performance needed for commercially viable services. The platform is aimed at big data, with production capabilities applicable to services based on EO imagery and other Geospatial data (climate data, meteorological data, points, lines, polygons etc.). GeoData360 has been designed to support cost effective production, with applications using only the resources that are required.

CGI has already used GeoData360 as enabling technology on EO and non-EO initiatives, benefitting from: (1) granularity, with containerisation at the level of the individual processing step, allowing increased flexibility, efficient testing and implementation, and improved optimisation potential for dynamic scaling; (2) standardisation, with a centralised repository of standardised processing steps enabling efficient re-use for rapid prototyping; (3) orchestration and automation, by linking process steps into complete processing workflows, enabling the granular approach and reducing operational costs; (4) dynamic scaling, for processing resources and for storage; (5) inbuilt monitoring with graphical feedback providing transparency on system performance, allowing to

maintain system control for highly automated workflows; (6) data access, with efficient access to online archives; (7) security, with access control and protection for third Party Intellectual Property. Example initiatives that benefit from GeoData360 include PASSES (Peatland Assessment in SE Asia via Satellite) and HiVaCroM (High Value Crop Monitoring). Both initiatives have used GeoData360 to enable data intensive production workflows to be deployed and run at national to regional scales.

GeoData360 solves the challenges of providing production-ready offerings: reliability, repeatability, traceability and monitoring. Our solution solves the scaling issues inherent in batch processing large volumes of bulky data and decoupling the algorithms from the underlying infrastructure. GeoData360 provides a trusted component in the development, deployment and successful commercialisation of big data-driven solutions.