FACT SHEET

Satellite Navigation

Navigating vehicles, tracking assets across the globe, monitoring sporting events, and synchronizing time-critical systems are all examples of how we benefit from Global Navigation Satellite Systems (GNSS) in everyday life. It's impossible to imagine a world without free access to global precise positioning and timing technologies.

CGI is involved in the development and evolution of systems providing satellite navigation signals (e.g., Galileo and EGNOS) and the use of those signals and data by commercial organizations.

Galileo and CGI

Galileo, Europe's GNSS, provides a highly accurate, guaranteed global positioning service under civilian control. CGI is the largest supplier of security systems for Galileo. Next to its open service and commercial service, Galileo offers a unique Public Regulated Service (PRS), which sends highly robust, resilient and encrypted signals via Galileo satellites, available only for government-authorized users. We support numerous Galileo programs, including:

- **Galileo Security Chains Verification Test Bench (SECVTB)** is a test bench for the security chains of the Galileo system. We co-designed and operate the test bench to verify and validate the security functions of Galileo.
- **Galileo Control Segment (GCS)** consists of a processing chain responsible for monitoring and control of the Galileo constellation. We are involved in the development, integration, verification and maintenance of a number of elements, e.g., Central Monitoring & Control Facility (CMCF), Operations Planning Facility (OPF), and Spacecraft Constellation Planning Facility (SCPF).
- **Galileo Monitoring Segment (GMS)** consists of a processing chain in charge of computing data to be broadcast in Galileo navigation messages. We are involved in the development, integration, verification and maintenance of a number of elements, e.g., Ground Assets Control Facility (GACF), Galileo Network Management Facility (GNMF) and Key Management Facility (KMF).
- **Galileo Second Generation (G2G)** is in the design phase where We contribute to various system evolutions for the ground and space segment and are involved in developing an end-to-end system modeling tool.

About Galileo

- The fully deployed Galileo system will consist of 30 satellites in orbit, of which six are in-orbit spares.
- Galileo is interoperable with GPS (USA), BeiDou (China), and GLONASS (Russia).
- While the European Space Agency (ESA) is responsible for the design, development, and deployment of Galileo, the EU Agency for the Space Programme (EUSPA) is responsible for the operations and service provision. In addition, the European Commission (EC) has the overall responsibility for the program.

EGNOS and CGI

EGNOS, the European Geostationary Navigation Overlay Service, is a Satellite-based Augmentation System (SBAS) that improves the accuracy and reliability of GNSS positioning and timing information over Europe. To support Safety of Life (SoL) applications, EGNOS relies on a dedicated integrity monitoring function that continuously evaluates the main Signal in Space (SiS) error components to provide reliable precision estimates and real-time alert messages.

- CGI is involved in **EGNOS v2** test bed used for verification of safety-critical functions using faster than real-time simulations. The platform developed by CGI stays up-to-date with the latest operational algorithms and supports evaluation of experimental and innovative algorithm improvements. In addition, we were involved in the security risk analysis of the end-to-end system.
- We contributed to the design of **EGNOS v3** phase A and B, including the security and safety aspects of this safety-critical system. During phase C/D, we are involved in the development, integration, verification and maintenance of the Command Control Facility (CCF), Maintenance & Support Facility (MSF) and the Performance Assessment Facility (PAF).
- We also contributed to **time transfer techniques**, the definition of a test bed that is in charge of monitoring and analyzing performance of time transfer techniques.

Secure tracking with CGI's S-TrackS

S-TrackS delivers reliable positioning evidence of the people and goods needed for commercial, security or judicial requirements. For example, it provides evidence of an asset's historical or current position for customs, licensing or insurance purposes. S-TrackS uses Galileo's PRS, which is only available for European government-authorized users that comply with stringent security requirements such as the police. S-Tracks also restricts the use of the secure PRS signal for organizations which cannot meet the security requirements imposed by the government. For these users, S-TrackS validates and authenticates the captured signals in a secure central server hosted by government-authorized users.

By providing near real-time, unprecedented, reliable and robust GNSS positioning and timing, S-TrackS enables a wealth of applications, including use of GNSS signals as legal evidence on positions or position tracks, and the possibility to detect spoofing.

On-site support & consultancy

For the **European Union Agency for the Space Programme (EUSPA)** CGI provides on-site and offsite high-end consultancy for Galileo in the following areas: (cyber) security, accreditation support, system re-design optimization, service engineering, service validation and reporting, (security) operations support and operator training. For the **European Space Agency (ESA)**, we provide on-site support for Galileo System Integration and Verification activities.

About CGI

Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

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