Space infrastructure provides critical information sources to intelligence services, and offers numerous mass market applications. Capgemini’s solutions cover all aspects of space infrastructure from design to operations through critical systems integration and data management.
Due to subjects such as Copernicus, GNSS, Search & Rescue and Earth Observation, the market experiences an unprecedented impulse and business opportunities once again will appear for true entrepreneurs. You should be looking out for those who will bridge the gap between science and true end-user value.

Capgemini is one of the world’s foremost providers of consulting, technology and outsourcing services. Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want.

**All over Europe**

Capgemini has offices all over Europe from where our IT and business professionals deliver and demonstrate value to our clients. We integrate industry knowledge and functional capabilities into all markets and geographies and leverage our partners’ capabilities.

Collaboration is the way we work and this experience ensures our clients that we help them to get it right from the start and achieve better, faster, more sustainable results.

**Capgemini Space Unit**

Headquartered in Toulouse, South of France, Capgemini Space Unit has been established for more than 30 years. In collaboration with Capgemini’s locally distributed Space teams in countries like Italy, Austria, Germany, Slovakia, United Kingdom, Norway, the Netherlands, Spain and Portugal, more than 200 specialists support Space Agencies, Satellite operators defence entities and manufacturers projects on a daily basis. Our main centers of expertise for the Space industry are based in Toulouse, Bayonne, Rome and Vienna.

Our Mission: Mobilizing the range of capabilities within the group (space & navigation - consulting - technology - and outsourcing services) to enhance the quality of “ease of living”, our “environment” and our “security” according to the needs and expectations of our clients being either an individual, a community, a business partner or an organization.

The **dynamics in the Space industry** are changing. On-going investments in space systems challenge the traditional actors to act and quickly deliver **innovative end-user solutions** to industry, communities and citizens. Science paved the way for a whole **new industry** which is about to emerge.
How we work

Proven track-record
Capgemini Space Unit provides products, services and solutions to meet the needs of our clients in the whole scope of space systems: Ground Segment (Monitoring & Control, Flight Dynamics, Operation Centers, Mission Centers), Satellite Navigation (EGNOS, GALILEO), Space Data Processing (Satellite imagery processing chains), Space Data Processing Systems, Big Data), User Segment and Space Applications (Search And Rescue systems, Disaster Management, Geo-information products and services).

From real-time embedded systems to end-user space applications, from design to operations complementary competencies are offered to our customers to take up the continuous challenges that the Space industry faces.

Quality and efficiency
Certified ISO 9001, Capgemini Space unit aims for the highest possible quality and cost effectiveness of our services. Our experienced quality experts are strongly involved to every project, from beginning to end, to ensure their success. Through innovation, reliable quality methods and flexibility to meet our customers’ evolving needs, Capgemini Space Unit has established a reputation as a reliable and proactive partner.

Close to our customers’ needs
Our customers’ needs and expectations are at the heart of our work. We focus on their requirements and make innovative proposals in order to give them the best results.

We daily work together to efficiently reach our common aims.
Capgemini Space Unit is strongly experienced in a wide range of areas as Earth Observation (EO), Global Navigation Satellite System (GNSS), Search And Rescue (SAR), Space Science and operations. In addition, as the largest European IT leader, we provide innovative architectures for highly specialized and technological Space market: Big Data, Cloud processing, Mobility, Safety, Long term data preservation, etc.

Our Offers at a Glance

Observing the Earth
The Space Unit is involved in every large Earth Observation program through Monitoring and Control systems, User and Mission Ground Segments development, from design to operations. Our satellite imagery processing expertise is also recognized. We complete our portfolio of activities with various science and environmental projects (SMOS, Calipso, etc).

Navigation
Early involved in Global Navigation Satellite System (GNSS) activities, the Space Unit is now recognized as an expert through numerous EGNSOS and GALILEO projects.

Search And Rescue
From its first experience with COSPASS SARSAT MCC, the Space Unit is now a recognized leader for SAR systems as prime contractor of Galileo SAR Ground Segment.

Space science
The Space Unit is involved in different kinds of space science: Mars exploration, Risks management due to space debris and satellites entrance in the atmosphere, Space Situational Awareness, etc...

Capgemini Space Unit offers

Capgemini Space Unit and defense projects

Space Unit experience
The military programs are driven by changing threats, budgetary constraints and national policies. The interests of our customers daily guide us. In this context, Capgemini Space Unit experience in defense matters has been increasing.

From HELIOS to CSO
From first experiences in Earth Observation mission simulation for French defense (Helios), Capgemini is now strongly involved in all French defense Earth Observation programs (Elisa, Cérès, Pléiades, CSO). The Space Unit also significantly contributed to the PHAROS project (satellite multi-missions portal).

Successful projects
Understanding of the challenges of our customers and our commitment to the defence sector has enabled us to successfully complete projects for National Government Ministries, Defence Forces and international Agencies in military transformation.
Innovation at Capgemini

The Scientific Office: A pool of physicists, mathematicians, and engineers
The Capgemini Scientific Office (ScO) main objective is the acceleration of complex mathematical solutions implementation. ScO experts design algorithms and develop associated probers; they also write specifications for the operational implementation of the selected solutions.

Activity domains
The ScO ensures support in three main areas such as physical simulation, optimization and data mining.

Various themes, diversified jobs
ScO eases operational implementation of scientific results, in close collaboration with customers and laboratories.

ScO realizes projects on various Earth Observation themes such as end-to-end simulators for new sensors design (SWOT, MicroCARB), or prototypes of multi-sensors (LandSAT, SPOT, MERIS,....) satellite data processing chains, that implement all processors required to transform a satellite data into a ground-taken image (Ortho-rectification, Calibration, Tiling, Resampling, Cloud detection, Fusion and Atmospheric correction).

ScO uses optimization to solve conditional problems, like satellite operations scheduling (CNES), or Air Traffic Management in the frame of SESAR.

ScO uses advanced statistics to perform data mining and predictive modelling, in association with Capgemini Business Information Management teams. In the frame of predictive maintenance, ScO recently analysed airplanes in-flight data recorders in order to predict unusual piloting events, and control data quality.

Innovation, a strategic driver
Capgemini Space Unit forecasts the implementation of new solutions to answer, in the best way, to the market needs. In this way, the ‘Innovation’ concept is aimed to optimize the production means by using the most recent technologies.

FAAPS (Fully Automatic Aqua Processing Service)
FAAPS is the way to provide flood extent maps, even in very bad weather conditions, over large areas. The innovation goal relies on the improvement of Big Data technologies and the framework to integrate scientific algorithms, in a Cloud infrastructure. Other technologies are also chosen to allow better mobility.

E-MDF: An example of genericity
MDF is an accelerator framework whose software architecture is designed as model independently of implementation technologies. The innovation concept consists in updating the existing architecture to generate, from one analysis model, products that could be deployed for Linux, Android, iOS, Windows 8.
Our references

Capgemini Space Unit is a main contributor to the success of many European space missions such as EGNOS, GALILEO, SPOT, HELIOS, PLEIADES, CSO, SMOS, NOSYCA and many more.

Navigation Solutions
The European Geostationary Navigation Overlay Service (EGNOS) is Europe’s first step in satellite navigation, paving the way for GALILEO. Capgemini’s involvement concerns the development in the ground segment of the Frond End Equipment (FEE), the Core Computer of the Navigation Land Earth Stations (NLES) and Ranging Integrity & Monitoring Stations (RIMS). The new version of EGNOS is on-going. GALILEO is Europe’s own navigation satellite system, providing a highly accurate, guaranteed Global Positioning Service (GPS) under civilian control. Capgemini is involved in GALILEO program through countries such as France, Finland, Ireland, Austria, Norway, Italy and The Netherlands.

Earth Observation Solutions
Capgemini develops the mission center for all the SPOT and PLEIADES satellites. This includes a system that ensures the handling of all customer requests related to geographical zone observations. It relies on specific algorithms developed to program satellite payloads.
Capgemini also contributed to the development of a portal to Earth Observation multi-missions for different defence entities (PHAROS).
Capgemini Space Unit also takes part to the new defence program CSO through the realization of the Mission Pro grammation Center and the user ground segment definition. The meteorological and oceanographic data furniture is also another Capgemini Space Unit focus (CISMF). Within ground segment, the process of the diverse satellite signals relies on mathematical algorithms and on specific algorithms including signal processing, image processing, optics and radiative transfer.
As satellite generations pass by, spatial agencies need to design solutions to adapt their algorithms to new physical approach. Capgemini combines scientific and information technology expertises to develop data processing algorithms, data processing chain, Image processing systems and overall mission planning systems.

Search And Rescue Solutions
From 1982 onward Capgemini has been prime contractor for the first Search & Rescue (SAR) mission and control centre in Europe, called COSPAS/SARSAT.
This system receives distress signals, locates beacons emitting signal and subsequently activates near-by rescue teams. The organization is the result of a cooperation between France, the United States, Canada and Russia. Gradually more than 40 countries joined this organization involving 48 ground stations and 24 Mission Control Centers, which activates the appropriated Rescue Control Centre (RCC).
Due to its strong experience in SAR activities, Capgemini Space Unit manages now the development of the full SAR Ground Segment for GALILEO, GPS et GLONASS.
Ground Segment Solutions
Capgemini has a long track history in ground segment Monitoring & Control systems (M&C). Our first activities started at CNES and was related to the GASCON 1st generation of M&C that started in 1989. Since then new generations have been developed ultimately resulting in the REGATES system. Capgemini developed M&C solutions for various ground stations sites in France, Portugal, Russia, Italy and French Guiana.

Due to its strong experience in M&C, the Space Unit contributed significantly to optimize the 2ghz and TTCET stations use (HOMERE).

Capgemini carries out the NOSYCA M&C system for CNES stratospheric balloons, and several projects of the altimetry domain (JASON, SIMBAD, SDS).

Capgemini built a presence in the ground Segment networking domain. We developed the ICARE intelligent network system that guarantees highly secure and reliable network connections between ground stations and ground control centers.

Furthermore we built the gateway that complies with the Space Link Extension (SLE) standards optimizing the cooperation and exchange of information between space agencies.

Space Science Solutions
Besides all these projects, Capgemini is also involved in Mars exploration with the responsibility of the Mission center for CURIOITY (FIMOC).

Other space thematics such as the meteorites and space debris entrance in the atmosphere are also studied or developed projects of Capgemini Space Unit (ESA SSA program, ELECTRA).
About Capgemini

With more than 125,000 people in 44 countries, Capgemini is one of the world’s foremost providers of consulting, technology and outsourcing services. The Group reported 2012 global revenues of EUR 10.3 billion. Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

Learn more about us at

www.fr.capgemini.com

Rightshore® is a trademark belonging to Capgemini

Contact :

Application Services France
Aerospace & Defense Business Unit
contact-space.fr@capgemini.com

© Capgemini - June 2013