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GSA GNSS
Opinion Leader:

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From Inside GNSS.

Issue September/October 2017, Vol. 12, Num. 5

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Europe pushes forward on 5G and multi-constellation GNSS

Enrico Salvatori, leader of semiconductor and telecommunications giant Qualcomm's European effort, explains how his company is leveraging multiple GNSS constellations, including Europe's recently launched Galileo, to create a broad range of powerful modem and application processor portfolios.

Multinational semiconductor and telecommunications company Qualcomm is a world leader in the design and marketing of 3G, 4G and next-generation wireless technologies. Headquartered in San Diego, California, Qualcomm has been widening its footprint in the Europe, Middle East and Africa (EMEA) region, with a core focus in Europe, including the UK.

"We expect to grow Qualcomm's presence in Europe, becoming a major EU (European Union) player in the digitization of European industries," said Qualcomm senior vice president and president of Qualcomm Europe, Enrico Salvatori, speaking to us from his base in Rome, Italy.

Part of that growth entails the company's recently announced acquisition of Dutch-based NXP Semiconductors, a leading supplier for the secure identification, automotive and digital networking industries, a deal expected to be sealed by the end of calendar year 2017.

Key European Considerations

"Accurate, reliable, and rapid position location is an important part of the mobile experience," Salvatori said. "We are currently continuing 5G standardization in 3GPP under an accelerated timeline, which will ultimately achieve results for

all use cases for extreme mobile broadband (MBB), massive Internet of Things (IoT) and mission-critical services, in line with the European Commission's 5G Action Plan."

The Commission, which is the executive arm of the EU, has been ac-

tively promoting very high-capacity networks such as 5G as Europe works to keep pace in the global wireless technologies market, citing expected worldwide 5G revenues for mobile operators in the region of €225 billion per year by 2025 (about 270 billion USD).

Salvatori said Qualcomm is proud to have established a long-lasting partnership with the European Commission (EC) and, as it happens, with the European GNSS Agency (GSA), sharing that agency's central goal of bringing Europe's global satellite navigation program, "Galileo," to full fruition.

"Here at Qualcomm," Salvatori said, "we are pursuing ongoing work on various IoT verticals, including LTE MTC/

Things you should know

3GPP—Third Generation Partnership Project, a collaboration between groups of telecommunications associations, known as the Organizational Partners.

LTE—Long Term Evolution, applying to the idea of improving wireless broadband speeds to meet increasing demand.

MTC—Machine Type Communication, also known as machine-to-machine communication, i.e. direct communication between devices.

NB-IOT—Narrow-Band Internet of Things, a Low-Power Wide-Area Network radio technology standard enabling a range of devices and services to be connected using cellular telecommunications bands.


C-V2X—Cellular Vehicle to Everything, combining features of V2V (Vehicle to Vehicle), V2I (Vehicle to Infrastructure), V2P (Vehicle to Pedestrian) and V2N (Vehicle to Network).

LTE Release 14—3GPP standards are structured as Releases. Discussion of 3GPP thus frequently refers to the functionality in one release or another.

NR—5G New Radio, aimed at bringing fiber-like performance to wireless broadband at a significantly lower cost per bit.

UMTS—Universal Mobile Telecommunications System, a third-generation mobile cellular system for networks based on the GSM standard.

HSPA—High Speed Packet Access commonly refers to UMTS-based 3G networks that support specialized data for improved download and upload speeds.



NB-IOT and in particular C-V2X. And with LTE Release 14, we believe we can lead the way toward dedicated evolutions of 5G in addition to the NR.”

Salvatori is well-positioned to speak on such matters. He oversees Qualcomm’s European strategy for ensuring that OEMs and operators drive 3G (UMTS/HSPA/LTE) adoption throughout all of Europe, in both developed and emerging markets.

Galileo in its Proper Place

For companies like Qualcomm looking to make the most of Europe’s emerging navigation and location-based services markets, the launch of live Galileo services last year was a veritable milestone.

“We were thrilled to see the European satellite system starting operations,” Salvatori said, “a real turning point for the location industry. We strongly believe that broad availability of Galileo will underpin Europe’s future innovation at home and globally, providing a backbone for the further development of the Digital Single Market and Europe’s industrial growth and competitiveness in the context of 5G, but also to the benefit of the new connected verticals.”

European authorities expect the addition of another GNSS, in the form of Galileo, will enable more accurate location performance, faster time-to-first-fix, and improved robustness all over the world, particularly in challenging urban environments where the combination of narrow streets and tall buildings can reduce accuracy.

And the launch of Galileo services was in many ways a victory for Qualcomm itself; as longstanding partners, the EC, the GSA and Qualcomm have worked in concert, with the GSA consistently highlighting Qualcomm’s role as a central player in the EU wireless technologies

arena. The first European Galileo-enabled smartphone, produced by Spanish company BQ, was based on a Qualcomm chipset.

In fact, Salvatori said, “Qualcomm Technologies began implementing hardware support for Galileo several years ago in selected chipsets. And it was our company that proposed the mobile industry’s first pervasive, end-to-end, location services platform, called IZat, for smartphone, computing, infotainment, telematics, and IoT applications.”

With optimized software enhancements, IZat now uses up to six satellite constellations concurrently without incremental device hardware or cost. “Our users now benefit from more than 80 different satellites when calculating global position for navigation or location-based applications,” he said.

Salvatori said Qualcomm’s Galileo-enabled IZat is being deployed broadly across the company’s modem and application processor portfolios. “This feature is integrated in the latest Qualcomm Snapdragon 800, 600, and 400 processors and modems,” he said. “And Galileo will be supported on smartphones and computing devices with the appropriate software release on Snapdragon 820, 652, 650, 625, 617, and 435 processors.”

The same goes for automotive infotainment solutions using Snapdragon 820A, and telematics and IoT solutions with Snapdragon X16, X12, X7, and X5 LTE modems, and Qualcomm 9x15 and MDM6x00 modems.

“This will also enable infotainment and telematics solution providers to satisfy an important component of the European eCall mandate ahead of the March 2018 deadline,” Salvatori said.



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Enrico Salvatori,
Qualcomm senior vice president
and president of Qualcomm Europe



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Photo courtesy of GSA.

Low Investment, High Benefits

Salvatori said bringing Galileo into Qualcomm's already broad location services platform presented no particular technical issues. "Supporting

a new GNSS constellation does require some R&D," he said, "but we had already implemented support for other GNSS constellations like GPS, GLONASS and BeiDou.

"For us, Galileo's introduction in the

R&D forefront

QUALCOMM IS CURRENTLY LEADING THE "CONVEX"

CONSORTIUM, which also includes Audi, Ericsson, Swarco Traffic Systems and the University of Kaiserslautern. The group's aim is to set up a test bed for first LTE Rel. 14 trials for V2X and to validate performance and feasibility.

The project combines techniques for vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), vehicle-to-person, (V2P), and vehicle-to-network (V2N) communications, which are considered key components for the implementation of advanced driving assistance systems and for automated driving.

The project is funded by the German Ministry of Transport and Digital Infrastructure (BMVI) in the program "Automated and Connected Driving on Digital Test Fields in Germany."

market at commercial scale promises more innovation and business models for the expanded connectivity needs of tomorrow. This is particularly clear to us in areas such as automotive, where Galileo's capabilities will underpin the evolution of cars toward ever greater connectivity and automation."

Salvatori said Qualcomm's support of Galileo is an essential extension of the company's work in creating and evolving vehicle-to-everything communications and 5G, working closely with the mobile and automotive industries to bring these innovations to market fast and with sustained investments. ★



The cover of the 2017 GSA Market Report features a blue background with a row of seven circular icons at the top: a smartphone, a car, an airplane, a train, a ship, a tractor, and a person with a surveying instrument. Below the icons, the title "2017 GSA Market Report" is written in large white letters, followed by the subtitle "Your key to GNSS market success" in yellow. A white text box contains the following information:

An insider look at market opportunities and technology trends across eight GNSS market segments, the GSA's 2017 GNSS Market Report is your key to successfully navigating this exciting market.

- The global GNSS market is expected to grow to an estimated **8 billion devices** by 2020.
- The GNSS downstream market is expected to produce over **€70 billion in revenue** annually, which could **more than double** when revenue from added-value services is included.
- In 2015-2020, the global core GNSS downstream market is forecast to grow by over **6 %** annually.
- By 2025, the installed base of GNSS devices in drones will reach **70 million**.

A QR code is located on the left side, and a satellite is depicted in the upper right corner. The bottom of the cover shows a stylized illustration of a cityscape with various vehicles and infrastructure.



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