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SEQUANS, MICROCHIP, AND NXP SMOOTH DEVELOPERS' PATHWAY TO MASSIVE CONNECTIVITY

by Jamie Moss

COMPLEMENTARY ABILITIES

In March 2020, connectivity semiconductor manufacturer Sequans announced strategic collaborations with the Microcontroller Unit (MCU) manufacturers Microchip and NXP. NXP will combine it's LPC5500 series of MCUs with Sequans' Narrowband IoT (NB-IoT) and LTE-M/NB-IoT communications modules, which are based on Sequans' own Monarch Cellular IoT (C-IoT) chipsets. Meanwhile, Microchip and Sequans will co-launch a development kit in the third quarter of 2020 that will pair both companies' semiconductor products, complementing each other's abilities and making it easier for IoT application developers to design devices that use them in combination. Each collaboration is a mutual promotion strategy to improve the sales of both sets of partners' products.

DEVELOPERS HAVE ACUTE NEEDS

Sequans aims to maximize the ease of development, and therefore the speed of prototyping for IoT devices, and wishes to do so horizontally for application across as many end-use markets as possible. The faster devices can be designed, the lower the research and development cost, which is critical for IoT Proof of Concepts (POCs). This enables POCs to proceed more confidently, with an emphasis on exploring new opportunities and fewer concerns about wasting money. Microchip and NXP, meanwhile, have Device-to-Cloud (D2C) strategy goals. It is in their interest to simplify and facilitate the communication of the data their MCU products collect through partnership and integration to allow the data to be of greatest use most quickly to the operators of IoT devices. This extends the reliability and usefulness of their products, enhancing competitiveness and boosting sales.

IoT developers, especially those working on MCU-based applications, have an acute need for minimal power consumption, guaranteed security, and the global viability of the equipment they design. A developer's focus is to create devices, and services leveraging those devices, that solve specific business problems. Wide-area cloud connectivity is a feature that developers need to have as a fundamental enabler embedded alongside the MCUs that power their devices. Low-cost, high volume components like MCUs are manufactured on a minimal Stock Keeping Unit (SKU) basis, so that a single SKU may be reused to maximal effect worldwide. The integration of cellular communications technology that provides maximum international coverage using bearers that generate minimum potential cost makes for a perfect match.

Integration has actively driven Sequans' Monarch design specification. In its most recent product family, the Monarch 2 chipset combines LTE-M, NB-IoT (NB1), and NB2 with an embedded secure element and an embedded Universal Integrated Circuit Card (eUICC), alongside

Sequans' proprietary "IoT-Findit" indoor and outdoor wireless location software. Integration improves power consumption and reduces cost, relative to the Bill of Materials (BOM) that would apply to purchasing each component separately. To date, Sequans has launched four Monarch products, making it one of the most active C-IoT chipset manufacturers alongside RDA Microelectronics. Sequans' current C-IoT chipset range consists of the NB-IoT-only Monarch N, the Cat M1-NB1 Monarch SX SOC, and the flagship Monarch 2.

MCUS FAR MORE NUMEROUS

The IoT is a market of partnerships. No one type of company—hardware or software, vendor or service provider—can stake a claim to ownership of it. It is a market of core competencies where suppliers are best off partnering or acquiring instead of developing beyond their proven strengths to maximize their opportunity. Sequans' collaborations with Microchip and NXP are classic examples of natural synergies, as cost-effectively monitoring low-cost hardware deployed worldwide requires similarly low-cost wide-area communications, for which the C-IoT technologies of LTE-M and NB-IoT are well suited. Strategic partnerships with MCU manufacturers also have important implications for Sequans' opportunity to scale, as the IoT is a market fundamentally driven by high volumes and humble dollar value margins per unit.

Microcontrollers are chip-form factor computers used in automated systems that are designed for embedded, application-specific purposes. MCUs are smaller, simpler, and cheaper than System on Chip (SOC) or general-purpose microprocessors but are, crucially, far more numerous. They are designed to operate predictably and to reliably perform a pre-programmed function. MCUs may be considered general-purpose in that they can be programmed for many different tasks, but application-specific in that they will only ever do that one task, with MCUs being particularly useful for controlling sensor-based data collection in the IoT. Sensor-based devices are the most likely to use chipset-based connectivity, meaning that Sequans' relationship with MCU vendors gives it a head start over its module vendor-only rivals.

Other C-IoT chipset vendors would be wise to seek relationships with high-volume MCU vendors, for the sake of serving the potentially very high-volume sensor-based IoT device market. Monitoring microcontrollers for failure and other critical events provides valuable insight to mitigate potentially expensive or dangerous problems. Similarly, any manufacturer of embedded processors for IoT applications knows the data they enable the collection of must make it to the cloud, so it would be wise to seek to expediate that process for their potential customers. Developers need not become experts in telecommunications and can focus on creating innovative IoT devices. Sequans' support of massive connectivity with its Monarch-based products, and more traditional data-heavy machine-type communications with its Calliope Cat.1 range, shows a unique level of dedication to the IoT.