Insight

A Deeper Dive into Qualcomm's IoT Portfolio and Strategy

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IDC OPINION

Qualcomm is addressing the Internet of Things (IoT) market with a multitude of new platforms that enable low-power edge computing, connectivity, interoperability, and security. The three primary tenets of Qualcomm's strategy include platforms — that address the needs of submarkets with customization as needed by the customer; portfolio — a wide variety of processing, connectivity, security, and interoperability; and partnerships with other enablers through the company's technology-agnostic positioning. Further:

- IDC views Qualcomm's strategy as sound and flexible enough to address the highly fragmented IoT market with a set of solutions that can be customized and distributed through traditional distribution channels.
- IDC notes that the IoT opportunity is still in its early stages and so it could be several generations of technology before we see IoT sectors breakout from the pack and scale sufficiently to justify technology created specifically for IoT systems and use cases and not adapted from legacy phone or PC technologies.

IN THIS INSIGHT

This IDC Insight summarizes and analyzes Qualcomm's IoT products and market strategy.

SITUATION OVERVIEW

Event Description

On July 14, 2016, Qualcomm held an industry analyst event to present its product lineup and strategy in various sectors of the Internet of Things. This event served as a significant update to Qualcomm's IoT announcements over the past few years, including announcements regarding the smart home, health, wearables, and drones.

Qualcomm's Senior Vice President and General Manager of IoT Anthony Murray described Qualcomm's strategy as addressing three major grouping of IoT sectors, including:

- Smart home, including control and automation, home entertainment, drones, connected cameras, human interface devices, virtual reality (VR), and document imaging
- Smart body, including wearables, voice, and music (e.g., headsets and speakers)
- Smart cities, including energy metering, transportation, asset tracking, and building automation

Murray went on to describe the three major tenets of Qualcomm's positioning in three major groupings of IoT sectors:

- A portfolio of technologies that enable low-power edge computing, connectivity and networking, interoperability, and security
- Platforms that organize technologies to address the needs of select IoT sectors and use cases, as well as mass market, and which customers can customize for their own end products (Murray claimed that Qualcomm supports more than 25 purpose-built and mass-market platforms.)
- Partnerships with other enablers critical to the selected mass market IoT sectors (Qualcomm emphasized that it is ecosystem agnostic – doesn't promote any particular technology, vendor, or standard but does promote consolidation around select standards and enable interoperability across products from different vendors.)

Subsequent presentations covered all of Qualcomm's three major groupings of IoT sectors. A theme throughout the presentations was that each grouping represented the application of smartphone technologies in a new way and that Qualcomm's smartphone technology portfolio extended beyond traditional cellular connectivity technologies, including computing power (CPUs), image processing, graphics (GPUs), signal processors, power management, security, firmware, and software (drivers, operating systems [OSs], software development kits). Qualcomm speakers also emphasized the company's role in supporting standards and enabling broader ecosystem efforts such as through reference designs, collaboration with distributors, and other technology companies.

Analysis

The three major tenets of Qualcomm's positioning – portfolio, platforms, and partnerships – reflect major market trends that emphasize the acquisition of intellectual property (IP) and technologies, the arrangement of the IP and technologies according to how the end system will be used, and for encouraging standards, for working with customers, and for where you don't have the necessary IP, find the right partners.

Qualcomm is approaching the IoT from its position of strength in connectivity IP for mobile phones. Including Qualcomm's acquisitions of Atheros and CSR, Qualcomm's connectivity IP portfolio extends from many flavors of cellular/WWAN connectivity to many flavors of WiFi and Bluetooth, which, collectively, mean a scalable and adaptable portfolio for serving many IoT system segments across many regions and use cases. From here, Qualcomm emphasizes an extensive IP portfolio that crosses all major subsystems of a mobile phone and, at the same time, can be applied to systems in the IoT. In processing, for example, many versions of Snapdragon are contained within Qualcomm's 25+ platforms.

In Qualcomm's approach, however, we see a major challenge of the IoT. The IoT is highly fragmented, and each segment is highly focused on specific applications and use cases. Given the early state of the IoT, it is extremely difficult to predict the actual direction of end demand and so customize technology to specific applications and use cases; where demand is and so where one should direct one's R&D resources is impossible to forecast. Thus semiconductor vendors, Qualcomm included, targeting IoT have resorted to leveraging existing IP as much as possible, redeploying technologies into fairly generic platforms that customers can adapt to their anticipated use case, and hedging on their public statements of the actual state of end demand.

The meaning of this challenge is that the IoT is still in its early stages and so it could be several generations of technology before we see IoT sectors breakout from the pack and scale sufficiently to

justify technology created specifically for IoT systems and use cases and not adapted from legacy phone or PC technologies.

Smart Home

Qualcomm's strategy in the smart home market segment includes platforms and turnkey solutions, a comprehensive portfolio of connectivity and computing technologies and support for interoperability. Key areas of innovation include appliances (gateway/hub, white goods, small appliances), home automation (HVAC, thermostats, security devices such as cameras, locks, and motion detectors and safety devices such as smoke/gas detectors and valves), and lighting (dimmable bulbs, color bulbs, multifunction fixtures and gateways). Key technologies include BT Smart Mesh, WiFi RTOS and Linux SoCs, and WiFi+BT hubs and application processors.

Home Entertainment and Robotics

On the home entertainment front, Qualcomm is repurposing mobile technologies to enable VR/AR solutions, smart home assistants, drones, connected cameras, and home media products. Key strategies include platforms such as Snapdragon Flight for drones, which enable a slew of lightweight drones, with a single motherboard and Snapdragon SoC, especially relevant for the consumer market. The Snapdragon 820 and the Snapdragon VR SDK are key products for the VR/AR markets targeting visuals, sounds, and intuitive interactions for VR/AR experiences. Platforms and technologies for building smart home assistant (equivalent to the Amazon Echo) for voice control of the smart home including a cloud-connected personal assistant are part of the Qualcomm strategy.

Voice and Music

Leveraging technologies acquired from CSR, especially aptX audio, voice, and music, form a portion of Qualcomm's IoT portfolio with significant traction. Qualcomm aptX has broad market penetration with more than 320 leading audio brands, more than 30,000 radio stations, and 20,000+ cinemas. Qualcomm is targeting aptX for low-latency audio for the video and gaming and automotive infotainment markets. Wireless speaker networking and whole-home audio for music streaming using the Qualcomm AllPlay framework is another key area of focus for the company. More importantly, Qualcomm AllPlay offers interoperability benefits such as connecting speakers from any brand to the home network. On the platform front, Qualcomm's Soundbar platform reduces BOM and development cost by providing a comprehensive set of development tools.

Qualcomm is focusing on the convergence of the various audio platforms including smart speakers, soundbars, and networked audio and is working on utilizing Snapdragon SoCs that could be used across voice and music platforms.

Smart Cities, Industrial and Commercial IoT

Qualcomm's communications and connectivity portfolio shines in this segment. With a broad range of cellular, WiFi, Bluetooth, GNSS/location, NFC, and powerline solutions, the company is targeting the connectivity fabric to support a wide range of IoT use cases. Requirements for these use cases vary widely spanning throughput, reliability, security, node density, latency, and battery life. Solutions to address challenges such as operational savings, pollution reduction, public safety, energy efficiency, public health, education, and resource management are the focus of the company. Heterogeneous connectivity enablement is a key strategy for Qualcomm, which it enables by LTE CAT4/above offerings today, new narrowband technologies including CAT1, CAT-M1, and CAT-NB1 to be offered in the near future, and NB-5G for massive IoT capabilities that are in development.

Edge intelligence using Qualcomm's Snapdragon processor portfolio is another key focus for the company targeting sensor processing, display support, DSP for algorithms, CPU/GPU for computing, and camera processing. Hardware-based foundational security using hardware firewalls to isolate security functions from the operating system, secure execution environments, secure storage, and secure boot and hardware cryptography engines is part of Qualcomm's processor offerings.

Some of Qualcomm's success stories in this space include LinkNYC (municipal WiFi and connected city services), Sensity (street lighting control and video monitoring), Cincinnati Water Works (remote data collection and asset monitoring), Veniam (WiFi mesh), and Smart Campus (building management systems currently being tested at Qualcomm's own campuses).

Wearables

Although early wearable market expectations have been significantly tempered, wearable growth continues to slowly gain momentum. Qualcomm has been one of the leaders in the wearable space with its Snapdragon wearable SoCs with a series of industry firsts, including the first Android Wear smartwatches, first connected sports watch, and the first LTE-connected kids watches. More than 100 products in 30 countries and nearly 80% of the Android Wear smartwatches are based on Qualcomm processors. The target markets for the company include smart watches, smart bands, smart headsets, smart eyewear, smart clothing, and smart accessories. One particular area of focus is kid and elderly watches offering security/safety applications in which the company has seen significant traction over the past 12 months, especially in non–United States and China markets. Qualcomm has announced two platforms for this market: The Snapdragon Wear 2100 for the general-purpose wearable market and the Snapdragon Wear 1100 for the targeted-purpose wearable market.

The Snapdragon Wear 2100 features a quad-core ARM Cortex 7; supports Android and Android Wear OS; and offers LTE CAT1, CAT3, and CAT4 support; an integrated sensor hub; and GNSS (supporting GPS, BeiDou, GLONASS, and Galileo). It also offers a rich UI to enable multiple user experiences. The platform was introduced in February 2016.

The Snapdragon Wear 1100 features a single-core ARM Cortex 7, supports Linux and RTOS, offers LTE CAT1, discrete GNSS (supporting GPS, BeiDou, GLONASS, and Galileo), an external sensor hub, and a more focused UI capability. The platform was introduced in May 2016.

Customer targets in this space include phone OEMs (Android ecosystem smartphone makers), watch OEMs (such as Swatch), eyewear OEMs (such as Luxottica), kid OEMs, and sports OEMs.

Mass Market/Embedded IoT

Qualcomm's mass market strategy is distribution focused with standalone application processors (Snapdragon 820, 600, and 410 and Krait) and connectivity modules targeted at the medical imaging, robotics, desktop and portable computers, 360-degree cameras, and digital TVs. Distribution of these products is enabled by a partnership with Arrow to both support and offer Qualcomm-embedded products.

Although we view this as the embedded space, as opposed to an IoT segment, Qualcomm includes it as a part of its IoT portfolio given that many of these devices are essentially connected "things." Offerings include a range of system on modules (SOMs) and single-board computers (SBCs) with both software and hardware support including documentation and supported/built by ODMs such as Advantech, CompuLab, and Inforce.

The software ecosystem for these products includes OS support (Android, Linux – Debian, OpenEmbedded, Ubuntu Core, Windows 10) along with middleware (AllJoyn, ROS, and IBM Watson IoT) and cloud (AT&T M2X, AWS IoT, IBM Bluemix, and Microsoft Azure) support.

One of the key products is the DragonBoard 410c community board supporting the 96Boards open hardware specification, mainline Linux support, and a partner matrix of commercial solution providers to provide a path to commercialization. The target market for the DragonBoard 410c is to influence designs at a prototype stage with the Maker community and to provide embedded customers with an evaluation platform.

Qualcomm Life

Qualcomm Life, a wholly owned subsidiary of Qualcomm, provides end-to-end solutions for in-home and in-hospital connectivity and targets the Internet of Medical Things (IoMT) market. The Qualcomm Life segment is different from the other IoT business segments within Qualcomm as it is more vertically focused and offers systems, software, and data technologies to the IoMT market. We view this structure as favorable given the relatively low number of system shipments in the medical space, which would not lend itself to monetization as a pure component provider.

Two cornerstone offerings from Qualcomm Life are the 2net gateway and the Capsule suite of medical devices, connectivity, and integration, which enables clinical data workflows for authentication and EMR integration. Qualcomm Life acquired Capsule in September 2015.

Qualcomm Life is more of a solutions provider than a component provider and is a solutions provider for some of the largest names in the medtech and pharma space, including Johnson & Johnson, Medtronic, Roche, and Hill-Rom. Health systems and providers using Qualcomm Life solutions include DaVita, HealthCare Partners, Intermountain Healthcare, Johns Hopkins, Kaiser Permanente, UnitedHealthcare, and Walgreens.

FUTURE OUTLOOK

IDC's Embedded, Intelligent, and IoT Systems Market Model tracks and forecasts nearly 300 system categories and segments for their end demand and consumption of major computing, connectivity, and sensor technologies.

We expect that in the 2016–2020 forecast period, the overall embedded/intelligent system/IoT market will grow at a CAGR of 4% through 2020. The retail industry and the systems we are tracking will show the lowest growth as the industry will have completed its major technology refresh over the next two to three years and another refresh will not be due until 2020 or 2021. The large computing and communications segments will also show low growth because of their saturation. However, other systems in specific areas such as transportation, energy, consumer, and healthcare will continue to grow at a good clip. These market segments will have CAGRs of 6%+ throughout our forecast period.

Related Research

- *Worldwide PC-Server-Phone-Tablet-eReader Microprocessor Market Shares, 2015: Convergence Forcing Competition Among Microprocessor Vendors Across Different Architectures, Regions, and System Types* (IDC #US41551316, July 2016)

- *Worldwide Top 10 Mobile Phone Chipset and Connectivity Semiconductor 1Q16 Vendor Shares* (IDC #US41536416, June 2016)

- *Worldwide Embedded and Intelligent Systems Forecast, 2016-2020: Microprocessors, Microcontrollers, Sensors, and Connectivity* (IDC #US41274516, May 2016)

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