Cool Vendors in Edge Computing, 2018

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Edge computing continues to gain significance, but its multifaceted nature creates unique challenges for enterprise architecture and innovation leaders. This research document highlights four Cool Vendors that are easing such challenges in four different areas.

Key Findings

- Increasingly small and resource-constrained edge devices are becoming capable of performing complex analytics tasks, enabled by purposely designed processors and embedded software.

- Distributing intelligence to the edge is putting strategic importance on local-area networks, as they must be able to support significant scaling of edge solutions over time.

- Edge deployments in industrial environments involve using IT infrastructure alongside legacy OT networks, which exposes the operational layer to new security threats.

- Managing and maintaining edge software in an effective and secure manner can be highly challenging, especially in deployments that must run uninterrupted for multiple years.

Recommendations

Enterprise architecture and innovation leaders planning to leverage edge computing in an Internet of Things architecture should:

- Use edge computing as close to the generated data as possible by selecting embedded devices that have been optimized for analytics at the edge.

- Design the edge architecture to accommodate large numbers of new endpoints being added incrementally by installing networking technologies that have proven their scalability.

- Mitigate cross-network security risks that stem from new edge deployments by segmenting the IT and OT networks adequately.

- Enable edge applications to be updated regularly over their entire life cycle; for example, by using software that is easy enough for business users to manage without on-site IT resources.

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Strategic Planning Assumption(s)

By 2022, more than 50% of industrial IoT analytics will be performed at the edge, up from less than 10% today.

Analysis

This research does not constitute an exhaustive list of vendors in any given technology area, but rather is designed to highlight interesting, new and innovative vendors, products and services. Gartner disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

What You Need to Know

Edge computing is attracting a growing interest among enterprises that seek ways to move the processing of information closer to the things and people that generate it. This trend is often driven by the Internet of Things (IoT), but also other domains of digital business are moving in the same direction. Many of the early adopters, however, have run into considerable challenges when experimenting with relevant solutions, as successful implementation of edge computing proves time and again more difficult than initially thought.

Consequently, enterprise architecture and innovation leaders often find themselves in a situation where placing more of a system's intelligence at the edge makes a lot of sense in theory, but doing so in practice appears too expensive or technically risky.

The outlook is starting to improve, though, as the mismatch between customer needs and available tools pulls new vendors to the marketplace. As always, there are elements of a buzzword effect, with existing solutions that have little to do with edge computing being repainted as capable of it.

Yet at the same time, technologies that have been genuinely designed for the needs of a more intelligent edge have also become noticeably easier to find than what was the case previously. Much of the innovation is happening among relatively small and emergent vendors, which tend to be generally better funded and more proven than similar companies were at the same stage a couple of years ago.

This research document highlights a number of vendors that are correspondingly cool in the edge-computing context. Their technologies involve capabilities that can credibly address some of the most pressing pain points that organizations trying to implement edge-based architectures must deal with. Enterprise architecture and innovation leaders planning to implement edge computing for IoT and other digital-business initiatives should evaluate their potential for deployment. The companies analyzed in the report include the following four:

- **Crosser** supplies a real-time analytics engine with a drag-and-drop interface designed for business users. It shows promise, particularly in the life cycle management of edge applications.

- **IoTium** provides a cloud-based solution for managing network infrastructures at the edge. The vendor's technology enhances edge security through the segmentation of IT and operational technology (OT) networks.

- **Kneron** offers processors and software to enable edge-based artificial intelligence (AI). The firm's products strengthen the autonomy of edge devices, making them less reliant on the cloud for advanced analytics.

- **Wirepas** has a wireless mesh protocol that supports very large IoT networks and runs on any hardware. Its offering ensures that edge deployments can scale in terms of networking.

Furthermore, the report has an update on an earlier Cool Vendor, **Rigado**, which was originally featured by Gartner in 2017. Since then, the company has seen further success as an innovator in edge computing, demonstrating rapid growth as well as gaining new funding.

In addition to the Cool Vendors in Edge Computing, enterprise architecture and innovation leaders involved with IoT projects should study Gartner's other Cool Vendors documents, especially:

"Cool Vendors in Digitalization Through Industrie 4.0, 2018"

"Cool Vendors in Location Services and Applications, 2018"

"Cool Vendors in Industrial IoT and OT Security, 2018"

"Cool Vendors in Acoustic Technologies for Predictive Maintenance, 2018"

"Cool Vendors in IoT Analytics, 2018"

"Cool Vendors in IoT Platforms, 2018"

"Cool Vendors in IoT Security, 2018"

"Cool Vendors in IoT Services, 2018"

"Cool Vendors in IoT 'Thingification,' 2018"

Crosser

Stockholm, Sweden (www.crosser.io)

Analysis by Aapo Markkanen

Why Cool: Crosser is cool because it offers a real-time edge analytics engine that is easy to use and update. Crosser's portfolio comprises two products. The low-footprint analytics engine, Edge Node, is deployed via containers in endpoints, gateways or local servers.

The analytics engine is complemented by Crosser Cloud, a centralized management system that includes a graphical drag-and-drop interface to configure the edge applications and automatically deploy them as groups of end nodes. It has been designed for IoT business users with no advanced programming skills instead of developers, which widens its applicability.

The capability to graphically connect prebuilt software modules helps, in particular, the management and maintenance of analytics applications, given that they tend to undergo frequent changes. This can be a major advantage for OT-facing business users, empowering them to run agile analytics applications without on-site IT staff. The company's technology is proven, being currently used in seven live deployments and more than 20 ongoing trials and evaluations.

Challenges: Targeting primarily industrial environments, Crosser must evolve its architecture to support comprehensive integration not only with IoT software from other vendors, but also with legacy enterprise systems. This will require substantial investment, considering the large and heterogeneous product ecosystem the vendor must ultimately support. Moreover, reliance on containers as the sole delivery method may hinder adoption. As a startup, Crosser will also be particularly challenged by the long sales cycles that are typical of industrial deployments.

Who Should Care: Enterprise architecture and innovation leaders that have been tasked with the ownership of an early stage IoT project should consider Crosser as a tool that allows them to get started quickly. In particular, such leaders responsible for industrial deployments that will interface directly with OT personnel should study the technology.

IoTium

Santa Clara, California (www.iotium.io)

Analysis by Godfrey Chua

Why Cool: IoTium's solution improves IoT security by isolating multiple and varied streams of IT and OT data as an easily deployable managed service. Its zero-touch provisioning simplifies implementations and enables deployments at scale. The core product, iNode, is delivered as part of a cloud-based managed network infrastructure solution. The vendor is able to address a key IoT challenge around security and data isolation/ingestion from highly varied connected assets. It does

this by utilizing a multitenant architecture that helps secure data delivery and keep data sources isolated.

IoTium targets industrial IoT deployments that face the particular problem of high data diversity resulting from the federation of new and legacy assets. Initial target segments include smart buildings, manufacturing, oil and gas, healthcare and smart cities. The firm is gaining traction with solutions deployed in more than 60 locations. Customers include CBRE (property management), Emerson (oil and gas), Obernel and Rexnord.

Challenges: The primary challenge seen with IoTium resides in the traditional constraints startups face with limited resources available to support go-to-market and thus revenue-building efforts. With a head count totaling 50, most of whom are technically oriented, business development responsibility resides primarily on the founders and a few key executives. This will be further complicated by the long sales cycles that are typical of industrial IoT deployments.

Who Should Care: Enterprise architecture and innovation leaders, along with smart city stakeholders contending with IoT projects that require federation of highly varied connected asset types, should consider IoTium's solution. Where relevant, IoTium can help to simplify and secure IoT implementations while at the same time reducing overall ongoing operational requirements.

Kneron

San Diego, California (www.kneron.com)

Analysis by Tracy Tsai

Why Cool: Kneron is cool for making AI solutions at the edge energy efficient and affordable. Facial ID for payment is a good example. Its 3D emulation for facial recognition for mobile payment can achieve high accuracy at better than 99.99%. Moreover, this is achieved at a much lower cost as its chips can auto detect if the face on a video is human or not, based on a trained model. Kneron's integrated hardware and software solutions make its solutions ready to use without spending extra time and resources to develop the software.

Kneron's solutions include AI-processors neural processing unit (NPU) and visual recognition software that adopts reconfigurable artificial neural network (RANN) technology to enable quick implementation of different AI applications. This includes face detection and recognition, body and gesture recognition, object recognition and scene recognition. Kneron's NPU, with high energy efficiency, is a dedicated AI processor rather than a digital signal processor (DSP) that most companies offer for AI applications. According to the National Science Foundation's (NSF) report, Kneron NPU's energy efficiency is 1,000 times more than microprocessors, and 100 times more than DSPs.

Challenges: A major challenge for Kneron is its go-to-market strategy. Kneron positions itself as an international company seeking different markets for opportunity. However, its main focus market is still in China. So far, its brand awareness in China doesn't get the same or even higher discussion in the media or with enterprise customers as its competitors in China — such as Cambricon or DeePhi Tech — which have more local resources. It is not clear to enterprise buyers how Kneron is different

or better than its competitors when looking for an edge computing hardware solution to optimize the inference performance at offline.

Who Should Care: Enterprise architecture and innovation leaders planning mission-critical AI applications requiring low latency or turning cloud-based applications on edge should evaluate Kneron. This includes areas such as surveillance, home appliances, smartphones, conversational AI, product image search, and translation by voice or by optical characters at offline for smart building, retail or banking.

Wirepas

Tampere, Finland (www.wirepas.com)

Analysis by Nick Jones

Why Cool: Wirepas is cool because it has developed an innovative mesh network protocol that is particularly well-suited to large-scale IoT applications. The protocol is radio frequency (RF)-agnostic and can operate on a wide range of frequencies and, as a mesh, is resilient, self-organizing and can cover large areas at a low cost. It employs a synchronization model that enables good power efficiency, supports very large-scale networks, and (with the addition of an external cloud service) can provide location sensing.

Wirepas has a small firmware footprint (less than Bluetooth, for example), making it suitable for low-cost endpoints. Wirepas sells primarily via partners that license the technology for use in their offerings. While enterprises can in theory license the protocol directly, by far the easiest way for them to start implementing it is to seek an existing Wirepas partner or encourage their suppliers to adopt it. As of 1Q18, Wirepas had 60 licensees delivering products and solutions in areas such as silicon chips, smart metering, sensing, wireless communications modules, gateways and asset tracking.

Challenges: Wirepas is a small vendor selling a proprietary protocol, and although this delivers significant technical advantages, it may deter organizations looking for the safety of standards or a large supplier. Wirepas' business model means its success and ability to scale is totally dependent on the quality of its partners. The company is still operating on venture capital, so it is possible that an initial public offering (IPO) or acquisition could happen at some point in the next three years, which might involve changes in strategy. Because Wirepas doesn't directly market to end users, awareness of its technology is limited. Organizations wanting to adopt it must find a Wirepas partner with an appropriate product.

Who Should Care: Enterprise architecture and innovation leaders that want to create innovative systems that cannot be delivered as effectively using more mature or standardized wireless protocols should assess products incorporating Wirepas. Likely application areas include tagging/tracking of equipment and people, wide area sensing and smart metering, as well as lighting. Wirepas will be particularly relevant to systems that need coverage over substantial areas where existing network infrastructure is either unavailable or not cost-effective for a specific application. Examples include smart cities, construction sites, and large buildings and factories.

Where Are They Now?

Rigado

Salem, Oregon (www.rigado.com)

Analysis by Saniye Burcu Alaybeyi

Profiled "Cool Vendors in the Internet of Things, 2017"

Why Cool Then: Rigado was cool in 2017 because its wireless device modules, wireless gateways and DeviceOps offered an integrated platform to customers designing IoT solutions in consumer (smart home, sports, health and fitness), commercial and industrial verticals. Its solution came with preconfigured plug-and-play components for low-power wireless connectivity. This enabled its customers to lower design risks and costs, speed up time to market, and scale with secure over-the-air updates for low-power wireless devices.

Where They Are Now: Rigado's focus on product innovation sparked rapid year-over-year growth for the company. Over the past year, Rigado has added more than 100 new production customers and received $5.2 million in seed funding. Rigado has leveraged that investment to open a new EMEA headquarters in London and accelerate new product development in edge computing.

Rigado now provides edge connectivity solutions to more than 300 global customers that include secure IoT gateways and certified modules for commercial IoT applications such as asset tracking, smart lighting and connected retail. Rigado recently launched its integrated solution for edge connectivity and computing, reducing the time, cost and risk of large-scale IoT deployments.

Who Should Care: Enterprise architecture and innovation leaders interested in secure and scalable edge connectivity and computing solutions within commercial IoT markets such as smart lighting, connected retail and asset tracking should care. Entities interested in secure device provisioning, updating and release management for global deployments should also review Rigado edge connectivity and computing products.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Digital Business Will Push Infrastructures to the Edge"

"Maverick* Research: The Edge Will Eat the Cloud"

"Technology Insight: Edge Computing in Support of the Internet of Things"

"Designing Servers for IoT Edge Environments"

"Market Guide for Edge Computing Solutions for Industrial IoT"

"Cool Vendors in IoT Edge Computing, 2017"

"Top 10 Strategic Technology Trends for 2018: Cloud to the Edge"

Evidence

Companies were selected for inclusion in this report through a submission process, in which Gartner analysts were able to propose Cool Vendor candidates. The vendors were selected based on the "coolness" of their underlying technology; the use or application of that technology to business issues; the company's business model; the transformative nature of their product; and the newness or novelty of that product. The vendor sections draw on information gathered from briefings with the vendors, client inquiry calls as well as interviews with end-user customers.

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