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Telit CTO Alon Segal
explains why IIoT is
set on a trajectory for
mega-volume growth



Telit

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IoT Now INDUSTRIAL IoT SUPPLEMENT 2018



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Reduced cost and streamlined processes set industrial IoT on the mega-volume growth trajectory

As embedded SIMs and new connectivity capabilities both narrow and broadband continue to be deployed, Alon Segal, the chief technology officer of Telit, tells IoT Now how he sees these innovations accelerating development and deployment of Industrial Internet of Things (IIoT) devices

IoT Now: There's a lot of interest in embedded SIMs regardless of whether they're called eSIMs or embedded universal integrated circuit cards (eUICCs). Do you think 2018 is the year in which embedded SIMs will become mainstream and is the market place hampered by conflicting terminologies?

Alon Segal: The issue is less about the form factor – because RSP (remote SIM provisioning) has completely changed how mobile network operators (MNOs) can transport their profiles onto a device. From an original equipment manufacturer (OEM) and device manufacturer perspective, and in particular in the domains of low power wide area (LPWA) networks, this needs to change because the existing provisioning model, which is derived from consumer support origins, doesn't really fit the role required by IoT devices

Industrial IoT devices have different requirements from a consumer device. These include the need to be ruggedized or comply with environmental operating considerations – for example to operate at extreme temperatures and to cope with vibrations. Addressing each of these factors forces cost onto the device manufacturer so the requirement from the business side is to find a cost effective solution.

It's hard to say when the inflection point will occur, and we're already well into 2018. However, you can see all sorts of things ranging from the Apple Watch or Samsung Gear on the consumer side that also require different form factors and those are influencing what is happening in the IoT market.

The terminology doesn't really matter, it's more about the SIM profile and the continued support for the GSMA standard and the remote SIM provisioning ecosystem.

We have to ask ourselves as an industry what is being achieved by replacing a plastic SIM card with an eSIM? It still needs to be placed and soldered onto a device so if there's a way to improve the process, we're removing one more obstacle to mass adoption and that will drive this market.

IoT Now: Do you see embedded SIMs as critical enablers for the mass-scale, low cost, low bandwidth per device IoT market?

AS: I believe this is a definite requirement for deployment at scale. It's not just the cost scenario, it's the whole model behind it that needs to change. A significant inhibitor is that to deploy at scale the industry needs to provide a better solution for OEMs otherwise the complexity remains the same and nothing changes.

Another point to be cautious about is that the IoT industry is currently making much of the ability to perform many management tasks such as upgrades over the air (OTA). There are clear benefits to this but we must also consider that in the LPWA market devices are operating on batteries which might be significantly drained with a lot of OTA communication. Remember that, in the narrowband market, an OTA communication can take a significant period – we're talking about minutes here and that may affect the lifespan of the device.

Therefore the ability to do things differently at the manufacturing stage is important. For many, OTA works well but it doesn't apply for all devices and all applications.

IoT Now: How does Telit's simWISE 2G offering play into this trend and help increase effectiveness and reduce maintenance costs for IoT deployments?

AS: We're shipping this product to customers that are enjoying a variety of immediate effects which are focused on the device manufacturer. There is an immediate positive in total cost of ownership (TCO) reduction because, for example, improving the form factor is not just about packaging. The device can be environmentally sealed and that's very appealing in harsh environments, such as for industrial gas valves – where the need to provide external access can be eliminated.

On top of this, there's streamlining of operations which means customers can do a lot more work at their premises and there's no need to perform

Industrial IoT devices have different requirements from a consumer device. These include the need to be ruggedized or comply with environmental operating considerations

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We have many customer examples where implementation of complex data collection and digitisation solutions are enabled in days when they would have previously been three month-plus projects

tasks post-deployment. This is definitely a differentiator for us and it provides us with good experience for LTE and lower bandwidth connections.

It's worth noting that simWISE compliments Telit's services offering and can be provided as a full connectivity solution to our customers – and Telit will also be able to provide bootstrap connectivity for localisation services and use cases.

IoT Now: So far we've talked about devices that only require low bandwidth connections but, at the other end of the range, you've recently launched a 1Gbps LTE mini PCIe card. What IoT apps and devices do you see needing this level of connectivity?

AS: This is our new LM960 device, and you're right, it's very much at the other end of the market because it's bringing 5G-like elements into the market. This capability is new but there are several application areas that have matching high-bandwidth requirements. One example is the growing niche of digital signage, which is seeing providers move to higher and higher resolution screens with the obvious need for higher bandwidth connectivity to support that.

Another area is routers being deployed in the field to take advantage of the increased bandwidth to connect multiple sensors to the cloud. In addition, this device supports Band 14 and is therefore ideal for FirstNet, the US first responder network that is being rolled out.

It's a natural evolution, but what has happened since the introduction of LPWA is a bifurcation of the market into applications that need more bandwidth, such as video, and those that are highly targeted and only require narrowband, aligned with the 5G concept of network slicing, to create a flexible infrastructure that supports multiple use cases.

IoT Now: Is the demand for this level of connectivity here yet or is the card aimed at helping organisations identify potential applications in advance of 5G's arrival?

AS: There are specific use cases such as those I outlined above that can definitely take advantage of the enhanced connectivity and create a niche market. In routers, I see this enabling a growing backhaul channel. In general, I see this fitting in with the direction that 5G is providing, especially in software-defined wide area network (SD-WAN) coverage to extend range. There are also advantages in the interplay between LTE-Advanced and 5G, but the build out will not be immediate.

IoT Now: Your deviceWISE IIoT portfolio has recently been recognised by Frost & Sullivan for its capability to solve interoperability issues

within manufacturing enterprises. How important is this capability for abstracting complexity out of IIoT deployments and enabling customers to sustainably grow their IoT device estates?

AS: It's critically important and it's always nice to get recognised. The origins of deviceWISE are from an acquisition we made of an IBM spin-out that had spent more than 20 years in factory automation. The factory floor is reminiscent of everything we need to do in IoT. Factory floors are full of devices from a wide variety of vendors who make controllers, robots and other machines. To achieve a true IIoT and digitisation vision, information needs to be collected and transformed from this wide variety of machines, old and new, to provide edge processing or event stream processing. Reducing the complexity for manufacturing companies can mean reducing the number of solutions and tools needed to achieve a wide range of use cases, such as multi-vendor IIoT data collection, secure remote access, condition-based monitoring, analytics and cloud on-boarding to SAP Cloud, IBM Watson and Microsoft Azure.

Solutions can all be realized on factory floors but there is complexity to take into account and address. For example, in current factory environments you might have Siemens controllers talking to Siemens devices and Mitsubishi controllers for Mitsubishi devices, and Omron talking to Omron but they can't talk to each other. A factory floor has Siemens, Mitsubishi, Omron and SCADA on the floor plus a plethora of other devices but, to get the relevant information out of this environment you need to normalise data from each. Telit's deviceWISE for factory satisfies this need.

It's the same with Wi-Fi or cellular connectivity. You need to be able to bring that data to the cloud from wherever and vice-versa. Our platform grew up in that environment and that's what it delivers, which is what Frost & Sullivan have noticed.

The results are clear in the acceleration of deployments that we enable. We have many customer examples where implementation of complex data collection and digitisation solutions are enabled in days when they would have previously been three month-plus projects. Not surprisingly, we at Telit are using these assets and capabilities to enhance our own production capabilities to facilitate advanced use cases.

IoT Now: To what extent is it important that vendors have in-depth sector-specific knowledge – such as Telit's in the factory market place – when bringing solutions to specific sectors?

AS: Clearly Telit isn't an expert in every domain of manufacturing although we have deployments in



automotive manufacturing, pharmaceuticals, oil and gas and many others. We are not providing domain-specific knowledge, but we do address the problem set I talked about earlier of dealing with multiple disparate inputs and how to handle backhaul, cloud ingestion and remote access. A key step to gaining value is to communicate with all of your data sources via a powerful IIoT enablement layer.

There are however many aspects to this and just saying: 'I can transmit data from devices to a centralised point' isn't enough. This is where Telit can really provide value as deployments grow beyond the proof of concept stage. We know all of the ancillary issues, such as disaster recovery, security and scale, as well as how to get data from an industrial environment, which is non-trivial in itself.

IoT Now: Do you think 2018 is the year in which IoT will begin to deliver on the analyst projections for a multi-billion connection market? To what extent do the technologies we have discussed finally mean that mass scale can be achieved?

AS: There are good indicators as to what is achievable. With LPWA and narrowband IoT (NB-IoT) deployments, we see clear uptake in design happening now and the market is beginning to adopt these technologies and move forward as the LPWA/NB-IoT footprint expands.

A good indicator is the Chinese market, which has embraced these technologies. A lot of the definitions of narrowband originated there and the numbers in terms of what is being rolled out dwarf the rest of the world.

The trajectory is now in place but whether it will be 2019 or 2020 before we hit those projections is open. What is certain is that, yes, we will get there. ■

Alon Segal, Telit

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The mainstream market starts now as IIoT deployment volumes accelerate

The multi-billion connection projections for IoT won't come from the consumer market, it's the Industrial IoT (IIoT) in which the volumes will truly be achieved, writes George Malim

IIoT has a lot of advantages that stem from the widely deployed estate of connected devices that have, in many cases, been in operation in industrial environments for decades. This means there's a familiarity with the possibilities but a sense that the data available hasn't been fully maximised. Now, though, the coming together of connectivity with data processing and computing power is enabling that full maximisation and IIoT is set to accommodate the largest Internet of Things deployments in the world.

"The time for the IIoT to achieve its potential is now," says Dr Manfred Kube, the head of the M2M segment at **Gemalto**. "There are already tens of thousands of IIoT applications and projects around the world. For instance, the fiercely competitive global manufacturing marketplace, which represents US\$11tn or 16% of global GDP, according to **McKinsey Global Institute**, is being fundamentally reshaped by the unstoppable progress of the Fourth Industrial Revolution and IoT. It's estimated that by 2025 the manufacturing sector will nearly triple, driven by IoT-enabled smart manufacturing, and it is projected, by **Grandview Research**, to reach more than US\$395bn, up from US\$172.34bn in 2016."

Sherry adds that GE Digital's own estimates suggest that adoption of industrial internet technologies could add between US\$281bn and US\$450bn to the UK's GDP by 2030. The wider adoption of this technology can bring greater productivity to a lot of sectors, translating into real growth. "We believe that the industrial internet will be the key arena where a lot of IIoT innovation will take place, she says. "For instance, IIoT combined with cloud computing and edge technologies is a big game changer."

Ben Salama, the director of the Industry X.O group at **Accenture**, agrees, pointing out that: "Consistently in many industrial environments, sensors and data already exist. It just wasn't being consolidated or used. IIoT has therefore taken off faster because [the challenge] is less to do with connecting things and more to do with using the data organisations already have."

That isn't to say that IIoT is not a complex and difficult arena even though decades of experience of operating connected systems already exists. "Whilst technical aspects are often cited as barriers, we believe that organisational ones also need due attention," says Dr Peter Colman, a partner at **Simon-Kucher & Partners**. "In particular, ensuring that the business case is both on sound finance footing and also clearly articulated to gain agreement from a management team. Whilst the investment costs can often be calculated, we regularly see far less rigour applied to estimating where the benefits will come from and being able to translate that to a pound-note number. Furthermore, particularly for manufacturers, the move from a transactional product-centric to a service-orientated business model - servitisation -

"The time for the IIoT to achieve its potential is now"

Industry insiders see IIoT being first with the mass volume deployments. "There is every likelihood that will be the case - we already know that in financial terms the value of the industrial internet is already going to surpass the value of the consumer internet," says Deborah Sherry, a senior vice president at **GE Digital Europe**. "Conservative estimates suggest the industrial internet market is about US\$243bn globally, compared to the consumer internet, which is about US\$184bn."



Dr Manfred Kube,
Gemalto



Deborah Sherry, GE
Digital Europe



Dr Peter Colman,
Simon-Kucher &
Partners



requires a significant change in the mindset of the organisation, as well as a range of process and system enhancements.”

Sherry at GE Digital also sees this obstacle. “Digital transformation requires a significant cultural shift and many industrial companies are not prepared to reorganise structurally and culturally quickly enough to be able to take advantage of the great opportunities the industrial internet offers,” she says. “Another challenge is that the majority of the industrial organisations are at a much earlier stage in their digital transformation journey compared to most consumer organisations.”

Aside from the cultural and organisational issues, there remain technical hurdles to be overcome. “Complexity in industrial deployments actually stems from the relatively long lifespan of the equipment,” explains Salama. “In consumer, the question is a simple one of whether we can replace a watch with an US\$1,100 health monitor but you won’t do that with an industrial gas turbine. The challenge is also at brownfield sites – how do you retrofit existing equipment to meet these needs?”

He adds that understanding of the specific needs of individual organisations and sectors is required. “If you think of asset management, it’s consistent across industries in that the same underlying technologies are used whether for a motor, a turbine, a car or something else,” he says. “However, unless you can manage technology with a deep understanding of the assets themselves it will be very hard to do anything. If you just tackle this as a technical problem I don’t think you’re going to drive business.”

Nevertheless, technological barriers still need to be addressed. “There are three main barriers to the widespread adoption of IIoT that still need to be resolved: connectivity, interoperable standards and security,” says Kube. “5G is coming closer and it will further boost the IoT ecosystem’s potential and is being matched by developments in LPWA technologies. It is already possible for a multitude of devices and sensors to efficiently communicate over long distances over extended lifecycles.”

Sherry agrees: “Industry knowledge is crucial for

getting IIoT right,” she says. “Understanding how industrial organisations operate and having sector-specific knowledge is vital for defining a clear roadmap about how IIoT technology should be implemented across the business and designing the right processes and applications to achieve the desired results. Without this knowledge industrial organisations won’t be able to make the most of the IIoT opportunity.”

Therefore, IIoT is developing with a portfolio of technologies that address cross-industry needs but require sector specific management and expertise in order for maximum value to be extracted. “Customers within different industry sectors will usually have distinct needs and requirements and will probably also perceive the value delivered to them very differently,” says Colman. “We believe that to both identify and sell in the most appropriate use case solutions, a deep understanding of the customer’s business is usually required and therefore a sector focus can help. We also often observe that the team driving the digital initiative is distinct from the day-to-day business. Our surveys have found that companies whose digitalisation initiatives didn’t make an impact on their revenue often failed to recognise the value of technology or didn’t properly integrate a dedicated digital lead into their existing organisational structure.”

Yann Guimar, the chief executive of **Sensing Labs**, says: “The first wave of massive deployment for IoT will come from B2B need and more especially from industrial needs. In our market of low power wide area (LPWA) IIoT, we see every year a change in the order of magnitude of customers’ volume. It was proofs of concepts (PoCs) in 2015, deployment by several hundred units per customer in 2016, deployment by several thousand units per customer in 2017 and it will be deployment by many tens of thousands units per customer for 2018.”

Salama agrees: “We’ve seen a lot of experimentation and proofs of concepts in 2015 and 2016 and we’re seeing clients move beyond those into scale deployments today,” he says. “2018 will see the move from the lab to the mainstream but it’s not the peak. I can’t think of a client that isn’t working on Industrial IoT projects.” ■

“Understanding how industrial organisations operate and having sector-specific knowledge is vital for defining a clear roadmap about how IIoT technology should be implemented...”



How to provide unparalleled business continuity that boosts the bottom line

Accelerated, a Digi company, puts a halt to connectivity downtime with a high-performance router solution that helps keep the modern business in action



The Accelerated CORE 1002-CM plug-in LTE modem



The Accelerated 6350-SR cellular router



The Accelerated 6330-MX cellular router



There are certain days when your children cannot rely on a singular Wi-Fi connection to stream their favorite YouTuber, so why would a business owner rely on that same connection? Since time immemorial – or at least the early 2000s, cellular networks have been synonymous with uptime; there’s always at least one cellular network working in a given area at a given time. Accelerated is putting that ultimate failover capability in the hands of its bricks-and-mortar customers that demand a backup option for internet connectivity.

Commercial locations of all types need 24/7/365 connectivity to keep their processes running like a well-oiled machine. What’s a digital signage network without media to stream? What’s a point-of-sales solution without an ability to send payments? What’s a smart vending solution without the ability to utilise its smarts? We don’t want to think about it, and fortunately, Accelerated’s customers won’t ever need to find out.

Why Telit?

Accelerated needed a cellular hardware provider with the technology portfolio to enable its global network of enterprise-grade routers to support rapidly increasing demand for high bandwidth data capabilities.

In addition, Accelerated’s router solutions are known for their hot-swappable CORE Plug-In LTE modems, which allow customers to keep the same base router form factor and simply swap hardware components based on regional and technological needs. Accelerated wanted a cellular technology partner that could assure customers that the longevity and technical support for their LTE data card products would continue in parallel with the industry-leading lifespan and adaptability of their router solutions.

Telit was that cellular technology partner.

When companies need a capable partner with years of expertise to help solve the toughest challenges in IoT, they turn to Telit. The broadly certified Telit LE910 V2 mini PCIe LTE Cat 4 data card delivers 150Mbps download speeds for high bandwidth applications like cellular backup routers.

“Continuous connectivity is mission-critical in today’s business environment – nearly every business aspect benefits from a strong, stable and fast LTE network,” says Tom Butts, the chief executive and founder of Accelerated. “We chose Telit’s LE910 data card because of key LE910’s features, including comprehensive North American Band support and the LE910’s ability to quickly switch between carriers which allows our customers to stock fewer SKUs.”

Results

The 6350-SR, 6310-DX and 6330-MX are high-performance, compact and affordable cellular routers offering complete business continuity. Differentiating features include auto-switching between carriers, WAN load balancing, automated failover, and optional Wi-Fi. Customers can upgrade to newer versions of the CORE Plug-In without replacing their routers. The Accelerated CORE 1002-CM Plug-In LTE modem is certified across all four major US carriers.

By choosing the Telit LE910 data card, Accelerated made it possible for its organisation to rapidly respond to market demands. Product management teams can draw far-reaching roadmaps knowing product support and design expertise will be provided by Telit for years to come. The executive team can confidently plan even stronger pushes abroad with the knowledge that Telit releases international variants of their modules sharing a common form factor, meaning no regional device redesign is needed. And customer service representatives rest easy with the knowledge that Telit modules boast market leading radio frequency (RF) performance driven by the most robust R&D network in the industry. ■



IoT solves the age-old problem of building a better mousetrap

How TrapMe created a rodent trap built for the digital age to solve the industry's biggest cost and time challenges.

Since the rodent control industry first began, the only thing worse than a newly-trapped rodent left uncollected has been a live rodent terrifying the location's occupants. However, most pest control companies couldn't justify the costs of making scheduled trips to check every rodent trap just to find out if it was activated. This challenge has made accepting the lesser evil of traps left uncollected an industry standard. That is, until now.

The TrapMe connected snap trap solution promises pest control companies and their customers more efficient and proactive service of their traps than has ever been possible before. TrapMe is the first to offer an out-of-the-box, 100% accurate cellular-connected trap solution with an accompanying cloud-connected software portal.

Why Telit?

Cellular products can take years to correctly design and certify. Not to mention, a cloud platform is often a six-figure investment in R&D and talent, and negotiating cellular connectivity with multiple international network operators can take up a significant amount of precious time. To bring its internationally-deployable, long-battery life solution to market at an accelerated pace, TrapMe sought a comprehensive IoT technology partner with the portfolio breadth and experience to keep up with its demands.

With its enterprise-grade hardware, connectivity solutions, and platform built from a pure-play IoT focus encompassing the past 20 years, Telit was the most competitive of all IoT solution partners in the market.

Results

Deployable in any location, any country and any situation, TrapMe truly is an adaptive, go-anywhere do-anything rat trap for the digital age. Benefiting from Telit's cellular module form-factor family concept and technological longevity promise, TrapMe is building with an agility-enabling hardware offering that allows it to adapt and support their consumers' growing demands.

Telit's secure module embedded simWISE technology completely removes the need for a separate physical SIM, eliminating that cost from the bill of materials altogether and providing greater flexibility for mobile connectivity. Telit's global cellular connectivity network is built on agreements with many of the world's leading network operators like Telefónica, Tele2 and Vodafone, ensuring individual rat traps will be



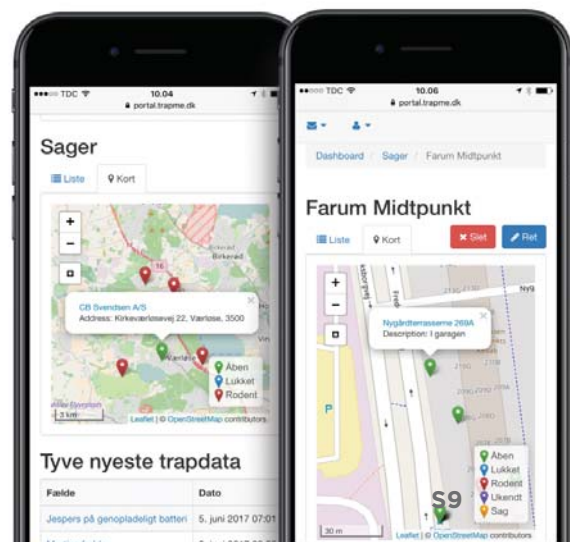
The TrapMe snap trap

able to automatically roam and connect to the network offering the most powerful signal in that location. If TrapMe wants to switch from one mobile network in the Telit IoT Connectivity plan to another, they may do so simply using simWISE. The module-software embedded SIM technology allows standardised, secure remote SIM provisioning throughout the life cycle of the device - without a service call to physically swap SIM cards.

Finally, the Telit IoT Platform is cloud-based for easy access to management of data. TrapMe receives powerful administrative tools to manage the entire network, while the pest control companies it sells to receive appropriate cloud-based administrative capabilities of their own. TrapMe is selling to some of the largest pest control companies in the world. If those companies require integration into their cloud-based systems like SAP HANA or Azure, the Telit IoT Platform offers industry-leading IoT integration.

With TrapMe's solution, it's easy to see just what a cellular-connected solution can do for the efficiency of human-maintained service networks like the ones pest control companies operate. TrapMe provides information that dramatically lowers the number of visits, and thus trained technicians, that need to be scheduled, saving considerable time and money. In addition, TrapMe clients also gain increased compliance benefits. Each spring of the trap results in an audited report that is maintained in a cloud database for the next decade. This ensures operator compliance to increasingly stringent EU laws regarding humane pest control, for example. ■

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In-app images of TrapMe

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IoT gateways have a need for speed

Over the last 12 months or so, the possibilities offered by IoT have begun to take on physical form. As more devices are launched, new applications are developed and the device market begins to expand, there is a growing need to ramp up the performance of some IoT network elements, writes Peter Dykes

For many applications this means using gateways that have data throughput capabilities in the gigabit range. For some time now, much of the hype around IoT has been about devices such as smart meters and home-based applications such as heating and lighting control which, on their own, do not necessarily generate vast amounts of traffic or are particularly latency-sensitive. However, as they become deployed in their hundreds of thousands – and eventually tens of millions, the cumulative burden they will place on bearer networks such as low power wide area (LPWA) networks will only increase. But that's only part of the problem.

The consumer market for IoT which has grown quickly is relatively easy to service and as such has been an early target for vendors. On the other hand, the market for industrial IoT (IIoT) is more complex and has an even greater requirement for high-bandwidth, real-time data throughput, something which is particularly important in sectors where public safety is at stake.

A case in point is **Taiwan High Speed Rail Corporation** (THSRC) which needed a highly reliable, cost-effective and proactive means of addressing the demanding maintenance requirements of high-speed rail transport. THSRC designed a solution, known as the Maintenance Management Information System (MMIS), to gather data from existing monitoring and telemetry systems such as supervisory control and data acquisition (SCADA), signalling systems and rolling stock sensors and integrate it into a simplified planning and maintenance workflow.

The system currently gathers information from more than 320,000 data elements in real-time from the rotation and temperature of wheels to the thickness of the overhead wire from which the train draws its power. In the case of the train wheel, for example, condition-based data is sent wirelessly, in real-time to a central repository, for comparison to normal specifications. In the event of a deviation on a particular parameter, such as excessive brake wear, an on-board monitoring system automatically sends an alarm to the MMIS system, which automatically generates the appropriate work order request which is designated as preventive maintenance, corrective maintenance or emergent repair.

It's not just public safety that is applying pressure on vendors to come up with something faster than that which already exists. IIoT in manufacturing is the leading application in the industrial market at present, with many sensors and devices already deployed. Indeed, one of the vital applications is what is known as condition monitoring, with vendors such as **Telit** leading the way. Condition monitoring involves measuring variations in indicators such as vibration, temperature, current, flow levels, pressure and others. This type of IoT-enabled monitoring helps provide insight into the performance, health and status of connected devices to help manufacturers improve resource utilisation and prevent unplanned downtime. IIoT-enabled condition monitoring solutions give manufacturers the data they need to make smarter decisions about operations.

By identifying areas for improvement, manufacturers can boost productivity and efficiency while reducing operational costs. With such systems in place, manufacturers can monitor and analyse machine performance to implement necessary upgrades or enhancements. They can also prevent the need for costly truck rolls by sending the right supplies when needed. Not only does condition monitoring allow manufacturers to determine areas for improvement, but it can also help them identify potential problems and take the necessary actions before issues occur. With condition monitoring IoT solutions, manufacturers can prevent damage and reduce maintenance costs.

Sensors track changes in vibration, temperature, and output to detect any issues with corrosion, wear, misalignment, imbalance, or lubrication, with service maintenance automatically scheduled ahead of time to prevent part failure or system damage and critical outages and unplanned downtime can be avoided by identifying potential equipment failure. But all of these advantages and improvements in efficiency come at a cost in terms of the amount of data that needs to be carried through the gateway, most of it in real-time so, given that most IIoT systems federate data at the gateway, the alternatives are to either increase the throughput capability of the gateway or in some way reduce the amount of data that needs to be federated. ►

It's not just public safety that is applying pressure on vendors to come up with something faster than that which already exists



While high-speed gateways in the gigabit range are only now beginning to emerge, the development of edge computing is advancing at a fast pace. Edge computing delivers tangible value in both consumer and industrial IoT use cases and in the process reduces connectivity costs by sending only the most important information instead of raw streams of sensor data. This is particularly valuable in fall-back situations where gateways connect via LTE/cellular. Also, when dealing with a massive amount of data produced by sensors in an industrial facility or a mining operation for example, having the ability

to analyse and filter the data before sending it can lead to huge savings in network and computing resources.

So, while gigabit-capable gateways might be considered in quarters to be the best solution to transporting the high data volumes generated by IoT systems, they are not the only one. Indeed, a combination of high-speed gateways and edge computing could vastly increase the capabilities of IoT and experience suggests that ultimately, most high-demand systems will use a combination of the two. ■

While high-speed gateways in the gigabit range are only now beginning to emerge, the development of edge computing are advancing at a fast pace



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