Massive IoT means new models, new technologies and new relationships

Interview

IoT has overcome the barriers that have inhibited its growth and emerged as a hyperscale industry. It delivers on the promise of tens of billions of connected devices, supporting vast new business cases that benefit society, businesses and individuals. Innovative technologies and components drive the momentum behind this success. These can deliver secure IoT compliant with national and sector-specific regulations.

Interview

Massive IoT has not been an overnight success. It has suffered from repeatedly missed, overambitious analyst predictions for multibillions of connected devices five or even ten years ago. On the other hand, IoT has benefitted from its roots in the machine-to-machine (M2M) communications era that began more than two decades ago.

Those delays and that heritage have provided the foundation upon which massive IoT has been built. It comprises mature technologies, effective security and smooth interoperability that can be achieved at scale. M2M's long experience and additional development time caused by massive IoT's delay contributed to today's mature, mass-scale IoT solutions marketplace.

Tens of millions of modules have already been sold today. This expansive growth also increases the attack surface. Therefore, security and safety must be considered in massive IoT.

Telit Cinterion has a substantial repository of information from its 30 years of experience. The company addresses regulatory and compliance issues alongside security to enter new markets with new services. As IoT grows, these considerations become more important. Florian Denzin, the director of IoT product strategy at Telit Cinterion, says:

"IoT has evolved and become more dynamic. As deployments grow, exposure becomes greater. If you have large fleets, you have made large investments. That means you must protect assets to be productive and maintain flexibility to grab new business opportunities."

Interview

Scale impacts security and compliance

Efficiency with compliance and security has become a priority for organisations deploying IoT at a massive scale.

There are many factors to consider if you want to integrate IoT into a business, including:

- Your application's data needs
- The communication time required
- The specifics of your market
- Manufacturers' lead times and requirements
- Chipset selection

Moving IoT to the centre of your operations requires much consideration. Telit Cinterion helps its customers execute this with hardware solutions that span various modules. The company also provides global connectivity as an MVNO, covering over 200 countries. Its dedicated IoT solutions division helps with certification, electromechanical systems (EMS) and product design.

Telit Cinterion is an end-to-end solutions provider. It guides customers through the process, from selecting technology and designing the product to providing connectivity and getting certifications.

Partnering for success

Denzin points out that even massive IoT isn't necessarily an organisation's core business activity. Although IoT opens new business models and ways of competing, many businesses don't need to build massive IoT operations. Nor do they need to create teams of IoT developers to launch or support one or two connected product lines. This is where experts like Telit Cinterion help accelerate time to market and streamline development. The company delivers cost-efficient solutions supported worldwide and backed by the company's decades of experience.

"You need someone close to you to do all this. We have field application engineers and salespeople in more than 100 locations. We also have more than 1,100 people and a very large engineering base. This is essential for deployments that could be in the field for a very long time."

That model frees organisations to focus on their business and the new IoT-enabled model they are adopting. They don't need to reinvent the wheel or compete to build in-house IoT capabilities that are often only needed for a project's development and rollout phases.

For long-life deployments like smart meters, an in-house approach leaves the organisation with an expensive team of IoT experts it doesn't need once design and deployment are complete. Moreover, a single solution in one industry wouldn't justify building and retaining an IoT team. There is also concern that creating a small internal team might not result in the cross-industry IoT vision that a large vendor partner can provide.

"It starts with technology selection, then product design with network evolution and life cycle for the long term in mind. Technology can be activated across different features at various times. A strategy for rolling out fleets of devices must be set. It's not always a simple calculation of when to add more functionality. Issues like power consumption and battery life must be considered. Balance must be achieved to deliver performance, cost-efficiency and lifespan."

As the hyperscale IoT era continues, the pressure will not lift. Supply chain challenges initiated during the pandemic affect component availability. This further constrains an organisation's ability to roll out fleets at a massive scale. These issues can be mitigated by careful component selection from vendors that have assured their supply chains. However, this adds a layer of complexity to the massive-scale IoT deployment challenge.

Shared risk and reward

Telit Cinterion recognises massive scale and has ensured its products are available in the customers' desired volumes. The company is also willing to share the risks of massive IoT deployment for appealing business cases with its IoT as a service approach. Denzin and his team envision models under which Telit Cinterion will supply a module and connectivity and share revenue from end-user subscriptions.

"There is an element of risk, but it's a no-pain-no-gain situation. We'll take some risk where we see interesting business prospects in the market that are stifled by the challenges of financing projects up front. It's a way for us to help scale the market by building a successful business model that is a win for us and our customers."

IoT maturity takes it past the mass-scale tipping point

2023 represented a tipping point for IoT when the sector stepped out from under the shadows of over-ambitious market size predictions and started to deliver on the promise of an IoT-enabled world. There's still a long way to go but mass-scale deployments are routinely happening and tens of billions of IoT connections are being added each year. This is being enabled by the confluence of available technology, wider choice of connectivity, especially in the cellular market, and more maturity in IoT security, certification, compliance and business models.

Mass-scale IoT has also benefitted from the flywheel effect of successful deployments fostering greater confidence in the landscape and, in turn, supporting further investment. On the flipside, the larger the deployments, the greater the investment required so work continues to optimise efficiency and reinforce the mass IoT business case. Overall though, IoT is more proven, more secure, more robust and more flexible than ever before and awareness of this is enabling organisations to commit to large-scale projects with confidence.

Although once bitten and twice shy, predictions relating to market size are returning. Analyst firm IoT Analytics has predicted the global number of IoT connections will double from 2022-2027. The firm reports that global IoT connections increased by 18% to 14.3 billion active endpoints in 2022, while for 2023, the firm predicted a further 16% growth to 16 billion active endpoints. At the end of its current prediction horizon, it estimates there will be more than 29 billion active IoT endpoints.

As always, such numbers should be taken with caution and definitions are important. Others have projected the size of the cellular IoT market alone. Omdia, for example, predicts there will be 5.4 billion cellular IoT connections by 2030. The firm sees 5G-related technologies such as 5G Red Cap and 5G Massive IoT driving much of this growth.

It is, however, clear that wider choice of technology is arriving in the cellular space. Red Cap is set to democratise access to 5G-like latency in a lower cost format, while LTE Cat 1 bis adds greater capability to LTE Cat 1, extending the applicability of LTE and opening up a range of IoT applications for the technology. The advanced cellular technologies available now widen choice and mean that organisations can select connectivity that provides a better fit than ever before for their use case.

This is an important driver for mass-market IoT because it means there is less wastage and organisations can readily make the trade-offs between cost, performance, security and power consumption for various cellular connectivity and select the option that matches their deployment best. This removes complexity from the IoT design and development phase and provides greater visibility into the whole-life costs of a deployment. This clarity aids financing and increases confidence of what return on investment looks like.

Mass-scale IoT has also benefitted from the flywheel effect of successful deployments fostering greater confidence in the landscape and, in turn, supporting further investment

Market Review

At the same time provisioning of connectivity has become radically simplified with the introduction of embedded and integrated SIM (eSIM and iSIM). These technologies allow the SIM to be embedded or integrated into the device at the point of manufacture with the connection initiated automatically at the point of deployment. This removes the need for a plastic SIM, the cost of a SIM tray and the management complexities of installing local operator SIMs at the point of deployment. This streamlining of the SIM process removes a further significant barrier to mass scale IoT.

With connectivity options at last becoming clearer and simple propositions now widely offered, organisations are now focusing on other critical capabilities. Security is an obvious concern because the more connected devices that make up a deployment, the greater the threat surface and the larger the risk. Security by design is embedding secure functions within devices before deployment and providing better security than retrofitted solutions, which are often too expensive or impractical for many IoT use cases to bear.

Security is significant not only for the obvious need to prevent hacks and frauds but also to assure connected device identity and inextricably link the data from the device that collected it and transmitted it. Confidence in IoT data that can be trusted is an essential part of the IoT value proposition and this is now well understood with effective solutions in place.

With connectivity simplified and security being continuously addressed, scalability challenges still exist. IoT organisations need to be able to access economies of scale in order to justify business cases and this means they need to accelerate and simplify certification, which is needed in national, regional and vertical markets in order for devices to be deployed. Certification and regulatory compliance still presents a significant bottleneck but organisations are increasingly relying on vendors to draw on their experience and smooth out the process.

There's a growing awareness that much of this can be replicated from one device to another and it's not necessary for every business that is engaging in IoT to become certification experts.

Similarly, organisations recognise they don't need to be device makers and are outsourcing their IoT device manufacturing to partners. This helps them to get to market fast and handle the scale of massive IoT.

This demonstrates a new willingness to collaborate within IoT. Where once organisations would focus on attempting to do everything themselves, they now realise that this is too slow, too expensive and too complicated. Instead, there is greater appetite to partner with experts from device design to deployment and beyond. By tapping into providers of IoT as-a-service, organisations can access optimised solutions for device development and certification, manufacturing, connectivity, roll-out and support and security. There is also greater willingness to share the risk and reward.

Turning to partners that can cope with mass IoT scale and bring in-depth understanding of IoT intricacies such as power consumption, cellular network variants or security, can radically accelerate time-to-market, result in significantly improved performance and deliver transformed business value. The bigger the volumes, the greater the risk but also the richer the reward is now the attitude that IoT innovators stepping into the hyperscale era of mass IoT are taking. It's an exciting landscape and the participants will get to success faster by travelling together.

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Case Study

Lantech®

Lantech: Establishing a LINC® between People, Process and Machine

In 1972, Lantech made a worldwide impact by inventing the stretch wrapper and changing how businesses package and protect their products for shipment. Today, Lantech builds a full line of equipment for:

- Case and tray handling
- Stretch wrapping
- Pallet conveying

The company has manufacturing facilities in the United States and the Netherlands. In addition, it has sales and technical support worldwide.

Every year, billions of pallet loads are secured using the original Lantech concept for stretch wrapping. Lantech customers span a wide range of products, including:

- Household
- Automotive
- Converters and printers
- Industrial chemicals
- Corrugators
- Machine builders
- Fabricators
- Food
- E-commerce
- Beverage
- Towel and tissue
- Health care
- Pet and livestock

Case Study

The Challenge:
Addressing Machine Challenges for a Smarter Factory

Over the years, the business has been built on innovation, customer support and a mission to reduce global shipping damage. Without proper stretch wrapping, loads can shift or fail during shipment. Load damage can be costly and wasteful and harm a company's brand image and the environment.

Lantech's innovative spirit led the research team to seek new technology solutions to address several customer needs:

- Machine uptime
- Machine performance
- Load quality
- Shipment costs
- Environmental impact measurement

The Telit Cinterion Advantage:
Using IoT to Drive Actionable Insights

Lantech's challenge was to develop a technology that revolutionizes how companies leverage stretch wrappers and case equipment. Lantech selected us as a technology partner to help create Lantech Intelligent Network Connection® (LINC®).

LINC® is Lantech's first IoT-driven software as a service (SaaS). It enables customers to view critical machine analytics anytime, anywhere, which is a foundational element for smart factories. LINC® is powered by our IoT enablement products, including:

- deviceWISE® EDGE and deviceWISE CLOUD, powered by Telit Cinterion
- IoT connectivity solutions
- Cellular LTE modules

Case Study

The Results:
Increased Uptime, Performance and Load Quality and Reduced Film Cost and Environmental Impacts

Empowering the right people to view data to improve uptime and productivity is often complex. deviceWISE simplifies the process by providing industrial drivers and enabling advanced edge logic, cloud connectivity and secure remote access.

LINC® includes machine data, analysis and alerts to allow users to monitor machine performance remotely. It is a data visibility solution that allows subscribers to monitor machine data and real-time performance from anywhere. In addition, LINC® provides actionable intelligence to improve system uptime, productivity and load quality while reducing financial and environmental costs.

Learn how IoT is creating real-time data access and analysis for manufacturing companies. Watch this IoT Central podcast episode with Telit Cinterion and Lantech, "How IoT Creates a More Visible Process and Sustainable Product for Manufacturers."

"Through our partnership with Telit Cinterion, LINC® allows users to set and monitor performance targets and receive event-based notifications. This allows wrapping systems to become part of the team by notifying users when important events occur. Thanks to LINC®, Lantech stretch wrappers are helping customers produce millions of safe-to-ship loads every year at the lowest possible financial and environmental cost."

— DIRECTOR OF CUSTOMER CARE, LANTECH, LLC

"We believe our customers and partners will continue to trust Lantech for cutting-edge tools that save resources and protect products throughout the shipment journey. LINC® (officially launched for all L-series automatic stretch wrappers) will further the value of our machines and improve our ability to service machines in the field."*

— LINC® PRODUCT MANAGER AND SUSTAINABILITY ANALYST, LANTECH, LLC

*LINC® for Case Erectors is available on new orders for CI-2000, CI-1000, C-2000, C-1000 machines with Siemens or Rockwell PLCs. LINC® for Stretch Wrappers is available on new orders for L-Series Automatic machines, including: RLA, SLA, SLC & QLA machines. LINC® is also included as a part of Total Care Plans and select retrofits.