MOBILE EUROPE | Insight report
Internet of Things

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Kerlink: Seizing the IoT Opportunity Requires Mastering Network Essentials

The Internet of Things presents a historic opportunity for mobile network operators, *writes Yannick Delibie, Kerlink's co-founder and CTIO, and CEO of Kerlink Inc*. But capitalising on it has its own unique challenges, in part because the IoT's structure, scale and requirements are unprecedented in telecommunication, or even the wider internet.

Enabling tens of billions of devices to talk to the cloud, and managing those untold gigabytes of data so businesses, farms, cities and government agencies can put all that information to work, introduces unique efficiencies, service improvements and connections between network operators and end-users.

We are beginning to see and hear about the variety of exciting use cases the IoT is enabling. Users of Kerlink-powered networks worldwide are reporting unprecedented opportunities to collect and use data for fleet management, asset tracking, meter reading, smart-city applications, crop monitoring and maintenance, and smart health.

But behind these stories are the less exciting but essential components of cost-effective connectivity, such as scalable and reliable networks and automated, powerful monitoring and management tools, as well as the challenge of selecting a network platform and provider.

Network operators continuously seek partners and solutions that differentiate their connectivity services, streamline their global performance, generate new revenue streams and improve customer experience. The challenge MNOs must overcome early on is choosing a partner that provides those essentials, that ensures that the seamless addition of a new, dedicated IoT network alongside an existing broadband network reduces time-to-market, enables rapid service monetisation and controls overall project return on investment.

Equally important, but less-often mentioned, are four crucial features that can ensure the operator will implement and operate low-power, wide-area connectivity that competitors may lack. These essential features are high service reliability, security access and management, backhaul management and device management.

Kerlink leverages its experience with tier-one operators around the world to show MNOs, as well as MVNOs and cable operators, how to quickly capitalise on IoT opportunities. We have helped operators quickly and successfully design, launch, manage and monetise dedicated LoRaWAN™ networks that not only allow billions of devices to phone home through the cloud, but also include enhanced services such as geolocation and remote device management. We began offering remote connectivity well before the IoT became the next big thing.

A brief history and the four essential services for telcos

Kerlink's success story, which is still in its early chapters, is a case study of engineering excellence combined with entrepreneurial vision. Founded in 2004, the company anticipated a future market for communication solutions dedicated to devices, and foresaw the role that RF communication technologies and their associated support platforms could play in fleet management, freight tracking and telemetry. It soon added solutions for wirelessly connecting gas-and-water meters and enabling remote metering. All these new low-bandwidth SIM-less M2M solutions significantly expanded the communication capability of objects, compared to traditional SIM-based technologies.

A co-founder and board member of the LoRa® Alliance, Kerlink specialises in end-to-end IoT network solutions for LoRaWAN™'s Low Power Wide Area technology and its cost-effective, energy-efficient and long-distance connectivity. The company designed the world's first commercially available product range of outdoor carrier-grade LoRaWAN™ gateways for IoT dedicated networks. Kerlink's success, including its rapid international expansion, has been an engine of growth for the implementation of LoRaWAN™, and for worldwide IoT adoption.

Leveraging this expertise and successful deployments with tier-one telcos in Europe, south Asia, South America and New Zealand, Kerlink ensures operators, as a trusted network vendor, that their LoRaWAN™ networks deliver the following four essential services, which are often overlooked.

High service reliability

A carrier-grade network requires high service reliability to ensure Service-Level Agreements (SLAs) for critical vertical applications like smart metering. These types of vertical applications and related devices have long lifetimes, in some cases more than 15 years.

The underlying network should have several components. The first is carrier-grade base stations with very high (e.g., more than 20-year) SLAs associated with mean-time-between-failures. The second is software versioning functionality to provide security alerts, manage maintenance programs, seamlessly handle network corrective measures and adapt to performance improvement over time. Finally, continuous validation to ensure hardware and software sustainability and scalability over time.

The benefits are fivefold. Operators can offer SLAs and quality of service guarantees to customers, they can guarantee network sustainability, monitor and optimise service performance, provision network services instantly and efficiently, and rapidly and easily scale IoT networks and services to speed monetisation

Security Access and Management

Operators must maximise the security of the IoT network to guarantee its performance, to maintain end-customer data privacy and to avoid fraud or unauthorised use of the infrastructure. To maximise the security of an IoT network, network architecture should include key

Yannick Delibie, Kerlink's co-founder and CTIO, and CEO of Kerlink Inc

and certificate management (including radio side keys, wireless WAN/backhauling access and encryption), secure boot functionality (including high-level authentication procedures) and secure storage (including physical protection of security assets).

This architecture needs to also offer software/hardware isolation using unique security signatures, integrity-checked firmware and hardware/software pairing to prevent unauthorised software updates. Another recommendation is to have a systematic way to avoid local access to the network by instituting highly secured maintenance procedures, factory-burned architecture, independent from the base station manufacturer, and finally trusted third-party support allowing network roaming.

The benefits for operators is the ability to ensure a carrier-grade, secure network architecture and appropriate management layers for enterprise customers, offer secure end-to-end key management processes for OEMs, equipment/device manufacturers and mobile operators, in which each player in the value chain manages its own secure key, as well as isolate the flow of date for certain critical applications.

Backhaul Management

While radio networks are commonly able to provide "best effort" quality of service, operators that can propose higher network guarantees are likely to exceed market expectations for introduction and sales of new services. A high network guarantee can be a key differentiator for new IoT applications and connected assets.

In order to provide enhanced network quality associated with backhaul management, operators should implement target Service Level Objectives (SLOs) by deploying appropriate tools to manage core performance and rapidly take action to optimise backhaul. They should also install highly secured tunnels to offer transparent and market-grade standard interfaces for application integration with very high management of latency and round-trip delay to ensure the best feasible performance.

Additionally, operators should distribute high levels of connectivity by managing all backhaul sessions available, including public land mobile networks (PLMN), private local-area networks, open public infrastructure, cloud-oriented architecture, on-premises networks and hybrid networks. Finally, operators need procedures to optimise the global cost of wireless wide-area network transfers, especially for PLMNs by using compression technology and transfer of essential data.

By doing so they can ensure high service reliability, anywhere and anytime, increase global SLAs by raising SLOs related to the radio network and targeting critical applications, and improve network performance with real-time infrastructure monitoring, troubleshooting and optimisation.

Device Management (Base Station Control)

Operators must ensure their carrier-grade network is monitored to maintain an enhanced quality of service. They should proactively address all maintenance that requires detailed technical intervention. Without a very high level of infrastructure compatibility, successful network monitoring and management are very difficult. Equally important, operators must monitor, test, diagnose and repair all software, hardware and radio network problems remotely.

In order to manage a network of this quality, operators should create a unique, secure and seamless firmware update procedure, including signed and integrity-checked firmware, provide protection against "man-in-the-middle" attacks, maintain local software profiles with operator parameters to ensure full service continuity, and check equipment integrity, hardware identity and software identity to guarantee complete control of the infrastructure.

They also need to provide highly secured remote access with authentication and encryption, as well as enable real-time monitoring of critical key performance indicators, including access, resources, radio usage, backhaul data overages, hardware/software failure, installation defaults and local technology repairs with dedicated procedural plans for remediation.

Again, the benefits are manifold. Operators can avoid all software failures for the network and have back-up plans in place, they can remotely diagnose and resolve service issues, and automate monitoring processes and reduce response time. Other advantages include determining asset/network state in real-time and running relevant optimisations, accelerating time to market and scalability, and reducing global maintenance costs through bulk and batch operational updates.

Kerlink: at the heart of LoRa®

Strategically positioned at the centre of the LoRa® ecosystem, Kerlink crystalises a strong network of partners around its IoT network solutions to both unlock the creativity for designing connected devices and trigger development of innovative applications that can improve the lives of people worldwide.

It is growing its business by establishing partnerships with MNOs and other major clients, and expanding into new markets. It established a subsidiary in Singapore to support its expansion in Asia Pacific in early 2016, launched a U.S. subsidiary in January 2017 and established an office in India in September 2017 where it partners with Tata Communications to deploy the world's largest LoRaWAN™ network.

For more information, visit www.kerlink.com, email contact@kerlink.com or follow us on Twitter @kerlink_news