Pipeline
Technology for Service Providers.
www.pipelinepub.com Volume 14, Issue 2

The Modernization of IoT Networks

By: Dave Kjendal

In recent years, we've seen a combination of technologies converge to become the foundation of change across the network landscape. Cloud computing has become more dynamic in its capabilities, creating new opportunities for application and service creation and delivery. Virtualization, microservices and adaptive security models have also become key elements of modern network design as the digitization and connectedness of our world moves forward at a rapid pace.

These cornerstone technologies have also been driving factors behind the growth of the Internet of Things (IoT). As we move toward a world in which everything is connected, it is no surprise that the legacy networks designed primarily for high-bandwidth applications have proven to be sub-optimal in price and performance for many of the emerging machine-to-machine (M2M) applications that need to send and receive small amounts of data while consuming almost no power. The changing architecture of these networks has also meant a change in the way they need to be managed. With dynamic performance management and application optimization becoming increasingly important, network management is being reinvented and is motivating a range of companies to offer new protocols, pricing structures and customer engagement models suited to low bandwidth M2M Internet of Things (IoT) communication.

Next Generation OSS/BSS Platforms: Built for IoT

A key component of network connectivity and management—often transparent to end users—are the Operational Support System (OSS) and Business Support System (BSS) platforms. Focused on the network and services, an OSS is typically used by network planners, service designers and engineering teams. It orchestrates and automates the 'back-office' network management functions. Business Support Systems comprise a separate set of applications supporting commercial, revenue and customer-relationship activities. Combined, OSS and BSS deliver the full set of capabilities a service provider needs to operate a network and sell services.

Being able to securely connect, activate and monitor IoT devices at massive scale, in a multi-tenant and multi-vendor environment—and across a broad range of applications—is the new standard for network operators. Network providers need to be able to manage the OSS/BSS features of the network server, packet core, data streaming, security, performance of the Radio Access Network (RAN) and End Device adaptive data rates (RF tuning). In addition, the IoT application management environment provided by the network operator must efficiently enable gateway deployment and provide scalable, secure, end-device onboarding, application service provisioning and visualization tools.

While some operators struggle to transform their monolithic legacy systems to support these requirements, many are gaining a competitive advantage by opting to have their network managed by a network services provider with an OSS/BSS built for IoT. At a time when the landscape is so rapidly changing— when IoT applications are being envisioned and built daily—what should operators consider?

Open Standards-Based Technology: The OSS/BSS must combine innovative and open

standards-based technologies, enabling the IoT Application Provider to leverage the operational experience of the network provider. This partnership between the network provider and IoT application provider mitigates much of the risk often associated with the adoption of new technologies.

Built for the Scale of IoT: The OSS/BSS offering must be secure, cost effective and scalable, providing operational efficiencies that scale to support billions of connected devices. It must also support technology that enables the highest levels of network reliability, service level excellence and be backed by a responsive support organization, ensuring the IoT provider's service offering is predictable and reliable wherever it is being offered.

Built for Market Expansion: The capabilities and services should provide IoT Application Providers with the ability to rapidly and economically move from concept to pilot and massive scale commercial deployments. The network offering must be capable of providing rapid 'time to coverage,' meeting the Application Provider's goals for expansion beyond its traditional areas of service.

As-a-Service Cost Efficiencies: An OSS/BSS designed with the optimal set of functionalities for operating a LPWA network will always have a significant cost advantage derived through a scalable cloud deployed "as a service" product offering.

Organic IoT Network Expansion

Just as carriers are moving away from legacy OSS/BSS technology in order to support the scale and operational complexities of IoT, they are also recognizing the need for new engagement models across the IoT ecosystem to gain a competitive advantage. The "if you build it, they will come" network deployment and customer engagement models designed for personal mobile communications are not well-suited to scaled machine-to-machine communication. In addition, they are being replaced by new models designed to grow through partnerships and application expansion. This approach is creating new business opportunities for companies of all types to participate in the IoT economy.

With this model, application and solution providers can connect to a network where it is available and then partner with the network operator to contribute to the buildout of the network by purchasing and deploying low cost LPWAN gateways in areas where additional coverage is required. Similarly, system integrators can strategically build their IoT businesses by providing their growing base of customers with low-cost connectivity services when and where needed on an application-by-application basis. In each of these examples, the network is managed by the operator, and those contributing to the network buildout can benefit from a revenue share based on the role they play in the larger network ecosystem.

This same model extends to network operators that have yet to establish an IoT practice or have determined that a combination of IoT connectivity services is the best approach for them. By sourcing network management services from a proven IoT partner, cellular, cable, wireless and fiber providers can augment their connectivity portfolio by deploying LPWAN gateways on their

existing tower or building assets and extending their branded services well beyond their existing footprint.

Lastly but equally importantly, this model creates opportunities for partnerships between critical infrastructure and service providers—such as municipalities, utilities, cable and cellular network operators and large enterprise organizations—and the citizens they serve. One of the most important opportunities the Internet of Things offers is delivering economic, environmental, and societal improvements. Whether it is reducing energy consumption in cities, reducing water loss through smart metering and water management solutions, monitoring crop conditions to improve yield or optimizing the cold chain for medical product safety, all parties now have an opportunity to participate in the IoT economy for the greater good of the environment and the welfare of the world's population.

Conclusion

The promise of billions of connected IoT devices is not only coming from expected areas of opportunity such as asset tracking, energy and utilities, and smart cities, but also from applications that instrument the ordinary or hidden business activities but yield revolutionary results. Successfully commercializing these opportunities requires transformative enabling technologies and service models, including best-in-class OSS and BSS platforms.

Similarly, traditional engagements in which service creation and delivery have been a one-way relationship between the communication service provider and the customer no longer apply. Today's businesses seek value-exchange in order to realize the full potential the Internet of Things. This value and success in IoT will be driven by cooperation between network operators, end device manufacturers, solution providers and others looking to proactively and organically expand their roles in the IoT services economy.