The Internet of (Intelligent) Things

The IoT is Here — and It's Smarter Than Simple Sensors

Anywhere from 20 to 40 billion devices connected by the end of the decade. Economic benefits in the trillions of dollars. Projections for the Internet of Things (IoT) vary, depending on how it is defined and the analyst doing the prognosticating, but all agree — it's going to be huge. Much of the conversation, however, has been around Internet-enabling households with connected refrigerators and light bulbs, thermostats and weight scales. However, there are also plenty of business applications. While home-based IoT is in its infancy, the business IoT has already arrived.

The fact is, unattended, machine-to-machine applications have been part of the Internet fabric for more than 20 years. It has been estimated that more than a billion connected machines and devices are already in use, doing the sorts of tasks that are associated with the IoT. Whether those devices consist of a simple sensor plus a communications uplink, or are built around a fully loaded CPU with a mainstream operating system, they are all IoT.

So why all the buzz — and why now? In short, the explosive growth in mobile devices and the widespread availability of mobile data networks. Wireless connectivity and the IoT don't just go hand-in-hand — they are married to each other.

What's at Stake? Often, the Business

A survey of more than 250 business leaders and early-IoT-adopters revealed that they have achieved increases in customer responsiveness, collaboration within the business, market insight and employee productivity. Many went further, saying the IoT enabled their organizations to change their core strategy and business model. So the IoT is more than an adjunct that improves the business. It is the business. That means a lot is riding on it — not just on the "things" that have received so much of the focus, but on the Internet connections on which they depend.

Today's IoT: Rich and Ready

While everyday objects connected to the Internet are what most people associate with IoT, the reality is, many of the more-proven and successful implementations are built around fully-loaded computing devices running rich applications and large data streams.

Fleet Management. Field-service, transit agencies and other organizations that operate vehicle fleets were among the earliest adopters of Internet-connected machine-to-machine technology. They use GPS to track vehicle location and monitor movement, in conjunction with cellular data connectivity for communicating to headquarters. These installations promote more-efficient routing and greater safety, and save thousands of dollars per vehicle per year. Emerging uses take advantage of connections with the vehicle's on-board Engine Control Unit for monitoring vehicle performance and determining the need for service.

Optimization, Acceleration and Security for IoT Data

Data security over wireless networks is an important consideration for IoT; in fact, privacy and regulatory compliance are the biggest concerns with IoT projects among enterprises. In addition, connected IoT devices carry high-value transactions in real-time, often over wireless networks that the organization doesn't control, running unattended with no one to intervene if the hardware, applications or the connection fails.

Mobile Performance Management software handles both the security and reliability demands of the business-critical IoT. Connections persist through coverage drops when vehicles are in motion, and over marginal or variable signal conditions in remote locations. It also automatically switches between Wi-Fi and cellular data networks when necessary, which is important for resiliency. The more that the business relies on the IoT for its fundamental operations, the more important Mobile Performance Management becomes.

Traffic Optimization ensures applications and resources are optimized for weak and intermittent network coverage, and workers can roam freely between networks as conditions and availability change.

Adaptive Policies fine-tune mobile network utilization, prioritizing applications and network access based on network, situation and location parameters specified by IT.

Performance Analytics and Diagnostics deliver constantly updated analytics on data use by devices, applications and networks, so IT can fine-tune and optimize the mobile investment. Root-cause detection quickly pinpoints problems for fastest troubleshooting and maximum uptime.

Security supports highly flexible and programmable secure access capabilities. IT can configure secure tunnels per-app or device-wide, securing access to enterprise applications and resources

Connected Cars. Increasingly, automobiles are being equipped with cellular data connections for use in getting directions and transmitting vehicle diagnostics, and serving up Wi-Fi for use by passengers. While currently less than 10% of vehicles are so-equipped globally, 25% of car buyers say connectivity is a desirable feature.

Kiosks. At shopping centers, transit centers, airports and other public locations, kiosks provide access to information such as schedules, directions and retail offers, and require reliable connectivity. Even when at a fixed location with Wi-Fi available, using cellular connections as a backup is less expensive than dispatching a service technician.

Vending Machines. Running unattended, vending machines need PCI-compliant security for accepting payment cards; moreover, the business models demand consistent, reliable connectivity so they can continue to validate payment cards and generate revenue if the primary connection goes down.

Digital Signage. Highway signs with variable messages and airport flight status displays are familiar examples. Advertising displays with complex imagery are their more highly visible cousins, and typify the rich content streams demanded by some IoT applications. Future applications could tap into intelligence gathered from smartphones and other connected devices, and deliver highly relevant and personalized offers based on who is in the vicinity.

Bank Terminals. Banks are beginning to experiment with self-service tablets that they deploy within their branches, using Wi-Fi as the primary uplink and cellular service for business continuity and disaster-recovery purposes.

Point-of-Sale Terminals. For tableside use in restaurants as well as at fairs and other outdoor events, mobile point-of-sale terminals integrate payment-card readers and all the functionality of a fixed-point device.

The scenarios above are just examples, but they illustrate a fundamental truth: the value of the IoT is the value of the data riding on it. The more data, the more valuable it is. The more valuable the data, the more important it is to optimize, accelerate and secure the connections that deliver it.

Conclusion

While much of the hype around the IoT is around connected home appliances, thermostats and the like — with scenarios such as refrigerators calling to order a milk delivery — the real promise of the IoT is around businesses creating new services, operating more efficiently and developing all-new business models. The more that IoT capabilities become the fundamental DNA of businesses, the more those businesses depend on connectivity. Mobile Performance Management software that optimizes, accelerates and secures data traffic over both Wi-Fi and cellular data networks is the perfect fit for data-rich IoT implementations.

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