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Supporting IoT's Push to the Edge

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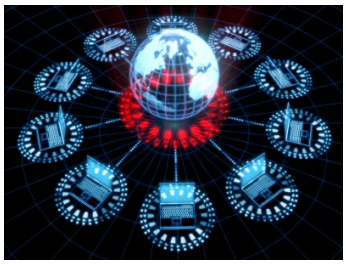

We're living in a fascinating time to watch data networks evolve.

It wasn't long ago that the industry was taken by storm by cloud computing, and now—before many enterprises have even begun to leverage that model—we're on to the next thing, turning the cloud approach on its head with talk of edge and fog computing.

In just a few years, edge has started to take hold—at least of conversations and, increasingly, budgets.

"It's really gone from a conceptual idea to something that people are working on and rolling out, trialing," Caroline Chan, Vice President and General Manager of the 5G Infrastructure Division at Intel, said in **this recent discussion**. "It's becoming real; now we need to go into the implementation phase."

And of course, the way internet infrastructure evolves has everything to do with the changing workloads that networks must store and process, and one of the most revolutionary shifts with regard to the amount and complexity of network data comes with the advent of IoT. Though IoT isn't the only burgeoning trend that edge computing will support (the list also includes OTT video, streaming media, 5G and more), it is arguably the most substantial application for the near term.

IoT Travels to the Edge

IDC has predicted that we'll have 30 billion connected "things" by 2020 and a $1.7 trillion revenue opportunity on our hands. Are we really seeing the market movement to back that up?

According to a 451 Research report commissioned by Vertiv, 98 percent of 700 enterprise decision-makers reported having IoT projects underway or in the pre-deployment phase. Nearly three-fourths of them estimated that up to 75 percent of their IT capacity will power IoT initiatives.

The survey results also put numbers to a significant expected shift in IoT data storage: 71 percent of participants reported storing IoT data on premises currently, and that number is expected to drop to 27 percent in only one year. Enterprises are migrating their IoT data out of company-owned facilities—and fast.

That's because the conventional, centralized model for data storage and compute simply won't work for IoT. For applications and workloads that require ultra low latency, "the direct device-to-cloud model is insufficient or uneconomical," the report states.

IoT Drivers

Vertiv also identified four archetypes that account for most edge use cases:

- **Data Intensive:** applications requiring a reduction in bandwidth costs or latency between the cloud and endpoints
- **Human-Latency Sensitive:** latency negatively affects humans' experience when using a technology or service in these applications

- **Machine-to-Machine Latency Sensitive:** similar to the above, but machines require even lower latency than humans
- **Life Critical:** these applications affect human safety or health

You can see how use cases from autonomous vehicles and augmented and virtual reality to smart cities and wearable technology could fit into these categories. This breakdown illustrates the main benefits of edge computing, and the reason why it's so integral to the success of IoT. Lowering latency, minimizing bandwidth costs and boosting data privacy is all made possible by processing and storing more data on edge devices and gateways versus sending all of it to the cloud. Since sustainable IoT networks require the most efficient bandwidth use possible (especially considering the sheer volume of IoT data that will be churning through networks worldwide) and extreme levels of privacy and security, the benefits edge computing provides fit the bill perfectly.

Edge computing is being driven by three factors: the need to process data closer to the end user to avoid latency, operators' demand to densify their networks, and virtualization, which lowers costs and promotes shared infrastructure.

Edge vs. Cloud

When you start to discuss the edge, one question inevitably comes up: what does it mean for cloud computing? Will the edge eat the cloud? Are they competing architectures? And when industry players continue to tout the benefits of a centralized cloud model, why are some of us saying to distribute the network?

Roger Pink of IEEE contemplates this in a recent article, "The cloud has introduced significant efficiencies and has steadily reduced costs. Thus it is understandable if a trend towards decentralization in storage and processing seems counterintuitive. However, given the bandwidth limitations of networks and the huge amount of data the IoT is going to produce, it makes sense that the IoT shouldn't necessarily work out of the cloud."

We're simply in a different place now, with new and more complex data to work with. There's room for traditional cloud computing and shifting workloads to the edge—and a big appetite for hybrid approaches—but IoT simply doesn't work without a faster, more distributed network.

The Security Question

Another question mark in everyone's mind is security, one of the biggest concerns regarding distributed IoT networks. Depending on who you talk to, edge computing can fall in different places on the security spectrum. While data is more private by definition if it's processed and stored on a device versus the internet, edge infrastructure also adds exponentially more endpoints that could potentially be susceptible to attack.

According to Gartner, almost 20 percent of organizations recently surveyed witnessed one or more IoT-based attacks over the last three years. The firm predicts that IoT security spending will reach $1.8 billion this year, which is 28 percent more than 2017.

Tackling IoT security is more of a challenge than traditional IT security for several reasons, as this IEEE article points out. The consequences are more serious, the adversaries are different than ever before and the devices are often a vulnerable patchwork of software, hardware and firmware built by various companies.

What Now?

We still have a lot to work through when it comes to IoT, whether it's the supporting architecture or the growing security concerns. And we're seeing many new market players emerge and existing organizations adjust strategy to address those pain points.

At 365 Data Centers, we have been laser-focused on hybrid, edge data center solutions that support high performance, low latency, intensely secure requirements, because we see that as the

way the market is heading. We're proud to provide hybrid data center solutions in eight key U.S. edge markets—Boca Raton, Buffalo, Detroit, Fort Lauderdale, Indianapolis, Nashville, Philadelphia and Tampa—plus additional connectivity through our Chicago and New York data centers and 15 other network points of presence nationwide. Our customers, from enterprises to carriers, and content and cloud providers, are demanding the expansion of fast and reliable edge networks.

We're confident that 365 Data Centers and other service providers will continue to address the opportunities and challenges that IoT presents with the appropriate technical and business acumen. Collectively, we will provision and maintain the next generation of edge networks.