How Operators Can Gain an Edge with Mobile Edge Computing

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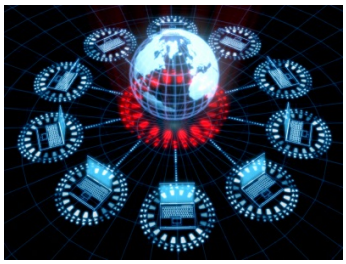

The Internet of Things (IoT) opened the door for organizations to collect, analyze and leverage data from a seemingly unlimited array of connected assets, enabling the creation of new products and services. Adding edge computing—coming soon with 5G—to the equation considerably expands those opportunities.

Instead of sending raw data generated from IoT devices to the cloud for analysis and storage, edge computing moves those processes closer to the network edge, where the data originates. This decentralized approach minimizes latency and sharply reduces bandwidth demands, ultimately reducing costs and streamlining operations.

Edge computing is particularly valuable for tasks that don't tolerate delays of any kind. Consider, for example, the importance of network latency for healthcare, where a London-based surgeon could remotely operate on patient in a Paris-based hospital using a robotic scalpel. The import is equally evident for connected cars, where a slight network delay could disable a vehicle from braking in an emergency situation.

While edge computing is still in its infancy, the edge computing market is predicted to reach $6.72 billion by 2022. Edge computing broadly falls into four categories:

1. **Enterprise edge** includes data processing, storage and communication, and it takes place onsite in enterprise environments.
2. **Mobile edge** computing encompasses all network assets, from base stations to customer premise equipment (CPE).
3. **IoT edge** computing takes place in onsite gateways; for instance, in an automated factory environment in which analytics on IoT sensor feedback impacts the manufacturing process.
4. **Device edge** computing moves data processing and computing to the IoT assets, including industrial sensors, surveillance cameras and other IoT-enabled devices.

While adapting this computing paradigm isn't a simple process, the innovations it fosters within open source ecosystems should make adaptation increasingly manageable. What's more, the benefits, including significant monetization opportunities, make incorporating edge computing well worth the expense and effort.

Monetization opportunities

Edge computing generates enormous volumes of analyzed, actionable data right at the source, creating monetization opportunities for savvy developers that can quickly and flexibly integrate open source development techniques. For instance, IoT edge applications in the financial sector can be applied to the streams of data and analysis generated from ATMs and kiosks to facilitate the development of apps that better align with customer needs.

Likewise, healthcare providers can benefit from the IoT edge to expand their reach to populations in underserved areas using devices that collect and analyze real-time data. For instance, medical kiosks could analyze multiple metrics in real time, giving patients immediate feedback about their medical conditions while also simultaneously routing that information securely to the appropriate physician.

For the automotive industry, the IoT edge will play a vital role in making widespread consumer use of autonomous vehicles possible. Sensors on self-driving cars will perform real-time data processing using the IoT edge, ensuring driving decisions are based on seamless, latency-free information from a myriad of devices within and around vehicles.

Furthermore, IoT edge computing can be incorporated into the manufacturing sector, driving effective maintenance and lean operations for equipment—and ultimately improving product design and reliability.

Addressing portability challenges

Transitioning to these newer, more efficient processes will inevitably present challenges for operators. While some IT organizations are already implementing leading-edge ideas and methods, the majority of programmers and IT staff remain firmly entrenched in silos, with little communication or cooperation between them. Transitioning from such environments requires shifts in thinking, in practice, and—perhaps most importantly—in the culture that envelops the two.

Overcoming those entrenched processes requires teams to embrace approaches like DevOps and Agile, which should be viewed as best friends as opposed to feuding neighbors. These approaches go a long way toward the creation of flexible, cloud-native environments, wherein containerized apps and elastic infrastructure are implemented to facilitate a far more nimble approach to development, deployment and updates.

Additionally, many organizations will benefit from incorporating third-party developers into the transition, as they are free from the cultural and political attitudes and processes that often are ingrained into permanent staff. Careful selection of third-party personnel will result in the addition of people who already are accustomed to more streamlined approaches, resulting in an influx of fresh, new ideas.

This new culture and its attendant philosophy will also yield operations that are poised to meet the challenges of the evolving edge in a timely and far more seamless fashion. As the need for increased amounts of data processing and computing at the edge grows, a modern, flexible approach will drive speed and reduce waste, ultimately translating into increased opportunities for monetization and greater profit margins.

Developing a strategy

As edge paradigms are integrated, organizations should create a strategy that addresses the integration of open source, security and interoperability.

Open source is certain to become a key element in this new edge paradigm, further speeding resolution of issues, porting to different platforms and executing continuous delivery models. Related ecosystems will incorporate a plethora of different expertise and aptitudes, turning a process that would have taken weeks or months in an isolated internal environment into a shared, standardized process that takes merely days or weeks.

As evident in countless examples, openness drives such innovation. OpenStack, a now-mature platform, is growing more popular, while StarlingX is drawing this community toward the edge. Containerization platforms like Docker and Kubernetes are wildly popular among developers, and this modularity drops perfectly into the new paradigm, a cog at home in a well-oiled machine built for portability.

Security is another key facet that should be considered, especially in this era of major breaches and privacy invasions. Security must be addressed at the beginning of an edge strategy, rather than being treated as an afterthought. New edge environments must be developed with robust security, especially the IoT edge, which creates a plethora of security issues because of the volume of devices involved.

While some of these devices are in widespread use and conform to industry standards, many are custom-built with granular specificity, resulting in a veritable “Wild West” for devices. To prevent this, organizations must educate and train with insistent vigor. Vulnerability assessments are a mandatory step in the development and deployment of IoT devices, a step that must preclude connection to the IoT edge. Trusted software supported by blockchain and signed images should be ubiquitous. Once deployment occurs, real-time detection and visualization of security breaches should be a given.

Naturally, the strategy must ensure that all moving parts work together. As 5G networks come online, mobile players will clamor to monetize the benefits, such as low latency. Central offices for both fixed and wireless operators will morph headends and distribution hubs into local data centers.

Consideration should be given to incorporating infrastructure as a service (IaaS), platform as a service (PaaS) and orchestration architectures that allow integration of these different edge elements into a cooperative and transparent alignment.

Gaining the edge

Innovation in edge computing is set for an explosive near-future that will revolutionize countless aspects of how we go about our daily lives. Savvy organizations should develop strategies now to incorporate edge computing and drive increased opportunities to monetize IoT.

Telecom operators have a clear advantage with mobile edge computing: their connectivity infrastructure. OTTs, however, are closing in on this. Amazon has dipped its toes into telecom services and Project Fi from Google is another example of the threat posed by OTTs. Unless operators monetize 5G, they could end up being funnels for OTT content.