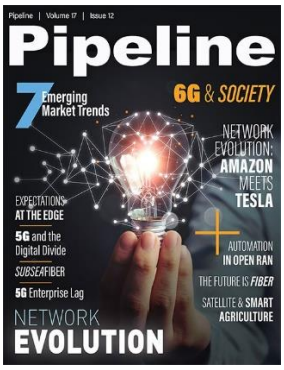

www.pipelinepub.com
Volume 17, Issue 12

Network Evolution: Expectations at the Edge

By: Eric Watko

The importance of planning cannot be underestimated. As an avid runner, I frequently prepare for marathons and relay races. When training, I always plan and map out routes before runs. This critical step ensures I select the right distance and terrain to maximize my efforts, so I can be ready for my next event.

The same principle can be applied to network planning. Enterprises must prepare their network today for increased elasticity, so they can adequately realize the potential of 5G and the Internet of Things (IoT) applications, which will present exciting opportunities to not only increase business efficiency but also create new business. 5G is driving network evolution. It is becoming more distributed, bringing data closer to where it is consumed or generated, to increase efficiency. This migration to the "edge" is here.

What is edge collocation?

Edge collocation—the practice of processing data at the "edge," closer to end users—is growing in popularity. The rise of 5G, which enables faster data transmission, is creating a greater need for the edge. However, demand for edge data centers is also growing, because of the rise of data-intensive applications and the increased benefits of locating data closer to where it is generated or consumed. With more aggregation points at edge data centers around the U.S., users can transmit data faster—which is ideal for low-latency applications.

5G also comes with a corresponding boost in demand for bandwidth. 5G delivers more content at a faster rate, but the promise of more comes with the need for a robust distributed

infrastructure system. The growing edge data center market is helping to meet this demand by putting compute power closer to end users at the edge, which facilitates processing data faster. However, for 5G to truly become ubiquitous, a distributed network architecture must be adopted.

Planning and looking ahead

Edge, or distributed architecture, is the natural network progression. Many small- to medium-sized businesses are already experiencing the benefits of increased network elasticity and reliability. Network elasticity enables the seamless changing demands, with flexible processing, memory, and storage resources. A network that adapts workloads automatically to the natural ebb and flow of their business improves operations.

Many industries are leveraging edge for increased network reliability, with a redundant or hybrid approach—using both edge collocation and the public cloud. This provides the flexibility of using cloud services while still having control over certain critical resources and elements of the network that are not exposed to potential risks. This hybrid model is becoming popular with enterprise industries where data is vital, such as financial services and manufacturing.

The distributed network architecture is inevitable. Planning for the shift and having the edge in place will help to future-proof and safeguard critical business assets—the network and data. When advanced, low-latency applications are ubiquitous, enterprises that are prepared with critical infrastructure in place will have one leg up on their competition.

Benefits of edge collocation

With data being stored and processed at the edge closer to their facilities, employees can benefit from a seamless wireless experience when sharing data. In addition to faster access, enterprises can experience several immediate benefits:

Improved network elasticity

Network elasticity—or the ability to quickly increase or decrease capacity without affecting a network's stability, performance, or security—is important. Elasticity allows businesses to automate the expansion and contraction of service-level agreements (SLAs) in real time.

Scalability to grow with the business

Edge facilities tend to have the latest, most cutting-edge technology available, which is ideal for responding to enterprises' expanding workloads. Additionally, by expanding outward into off-site infrastructure, enterprises can increase the number of people they reach.

Accessibility

When working with an off-site collocation facility, the ability and speed to access your infrastructure when needed is extremely important. Edge facilities are often closer toan enterprise's headquarters than larger core data centers, which lowers data transmission latency and decreases the amount of time and money IT employees spend traveling to and from the edge data center.

Enhanced disaster recovery with network redundancy

Storing data in an off-site edge collocation facility allows enterprises to continue operating, even if their primary storage facility experiences an outage. The network redundancy is crucial to business continuity during unexpected weather or other unplanned events that cause an outage to primary IT infrastructure.

Increased data security and privacy

Edge collocation gives you another place to store data, decentralizing your network. If another part of an IT system experiences a breach, data stored in the edge facility won't be affected, because it's stored separately. Edge collocation provides a necessary extra layer of security for sensitive data.

Edge collocation comes with many advantages that can take immediate effect. IT managers rely on a physical space for storage, but managing an on-premise facility can strain resources. Collocation facilities are a great alternative, providing a solution that has lower cost, extremely high reliability, high-bandwidth savings, the ability to scale with ease, and more, all with a high level of control and accessibility. As a result, additional (technical) benefits include redundant systems that scale with ease; dedicated servers, allowing enterprises to monetize up to nine servers in a ¼ rack; access to off-premise storage that is strictly controlled and protected for maximum security; high-performance scalable cloud solutions for growing cloud storage and cloud compute needs; and locations in areas at lower risk of experiencing severe weather that can mirror data at locations nationwide

Edge use cases

Numerous small- and medium-sized enterprises with a rising need for data storage can benefit from edge collocation. In fact, as 5G matures and becomes more widely adopted by consumers, new advanced applications will emerge that demand lower latency and better network performance.

These use cases and applications are wide-ranging. They include content delivery networks (CDNs) for website content, video and audio streaming, software downloads, and data records as well as applications in the entertainment and gaming sectors for large-format event experiences, augmented reality and virtual reality (AR/VR), and event streaming. Use cases can

include industry-specific functions such as customer data, banking, and accounting in the financial services industry, or enabling wearables, scanners, monitoring, and hi-definition imaging for healthcare. In agriculture, they can include sensors, autonomous farming, water sensors, and crop management; in manufacturing, for IoT, process automation, and optimized supply chains. The retail and lodging sectors can enable real-time demographics, inventory management, and dynamic personalization. In smart cities and on smart campuses, edge collocation makes transportation, grids, and water management possible. Other applications include 5G and IoT for telecom and autonomous transport and advanced mapping for the transportation sector.

Further, consider driverless automobiles. A self-driving car approaches an intersection, and the traffic light turns red. The edge node needs to be able to tell the car to stop within mere seconds—connecting people in motion with the computers they may be relying on to save lives, with near-zero latency.

There are, of course, many other use cases, including IoT. For example, in a household with low-latency 5G connectivity, today's smart devices (essentially smartphone-class computers) could be replaced with “dumb terminals” that get their instructions from nearby edge computing systems. The role played today by IoT hubs, in fact, may ultimately be played by 5G transmitters in the neighborhood acting as service hubs for all the households in their coverage areas.

As 5G matures and becomes more widely adopted by consumers, new advanced applications will emerge that demand lower latency and better network performance. Hosting the data closer to the consumer will become a necessity for that optimized experience.

All about the distance

The distributed network is here. It doesn’t matter if you’re talking about space or a wide-area network (WAN)—there’s an edge consideration that seems to permeate everything. By installing edge data centers collocated to tower sites, telcos can start to change network architecture and bring intelligent decision-making closer to its application. Whether you’re reducing data distance with edge or training for a long-distance run, both require effective planning to maximize efficiency and results.