Arrcus Connected Edge: Platform for the New Edge

Introduction: The New Edge Is the Key to Digital Transformation

It has been a remarkable couple of years for global enterprises and organizations. Radical changes in business and delivery models, much of them driven by the pandemic crisis, have caused a complete rethinking of how organizations conduct business and deliver services and products to end users.

You've read the news: Workplaces shuttered as organizations pivoted to work from home. Global supply chains were disrupted. Industries reconsidered whether their technology was prepared for disruption. Retail companies and restaurants quickly adopted better digital ordering and delivery models to deliver safe, touch-free services such as curbside pickup. Cloud products and services surged with accelerated demand for digital solutions.

With the world trying to regain some sense of normal order, many things won't go back to the way they were before. Workplaces, businesses, and society have discovered new ways to function with digital technology, and some of these practices are here to stay.

At the heart of these changes is an accelerated drive to digital transformation — part of the larger effort to make every organization nimble, responsive, and competitive. The implementation of better digital services has already differentiated many businesses across all markets, including healthcare, retail, finance, and manufacturing.

Many new applications — from smart manufacturing, to omnichannel retail experiences and financial services — will be enabled by new advanced services such as public and private 5G access, which will boost the reach of both public and private communications. That said, the edge isn't just about 5G. Upgrades in cloud infrastructure, broadband access, and technologies such as WiFi means that virtually everything will be connected and interacting with cloud services — generating a pervasive, real-time fabric for anywhere connectivity.

As just one example, the accelerated digital needs brought about by the pandemic have driven retailers to seek more powerful edge applications to enable omnichannel experience, real-time analytics, curbside pickup, and anywhere returns.

As a core part of digital transformation, a new network edge will be key strategic piece of the puzzle. The "edge," as it has been defined in the past by technology experts, is both amorphous and specific.

In general, the edge has been defined as the point where organizations and enterprises access global cloud services and data, and where their customers plug into digital and cloud services. The edge can be the WiFi in your local café, a local 5G communications hub, a digital touchpoint in a retail parking lot, or even your automobile. But the edge evolves into an important catalyst for digital transformation; it will have to adopt modern characteristics to become the new edge. For example:

The Old Edge:

- Static

- Hard to scale

- Manually configured and managed

- Networking connectivity distinct from the cloud (traditional networking)

- Telecommunications distinct from compute cloud

The New Edge:

- Dynamic

- Scalable across both network and compute

- Fully automated

- Integrated with the cloud (modern, open networking)

- Convergence of telecommunications and compute cloud

This new edge will be the key to enabling digital transformation by providing more immediate and dynamic ways to connect, manage, and deliver applications to people or things.

Arrcus has developed its Arrcus Connected Edge (ACE) platform to deliver on the needs for the new edge. This includes the capabilities to dynamically and automatically provide networking services for edge devices, wherever they reside, as well as powerful automated management tools to quickly deploy and manage services at the edge.

Arrcus Connected Edge (ACE)™
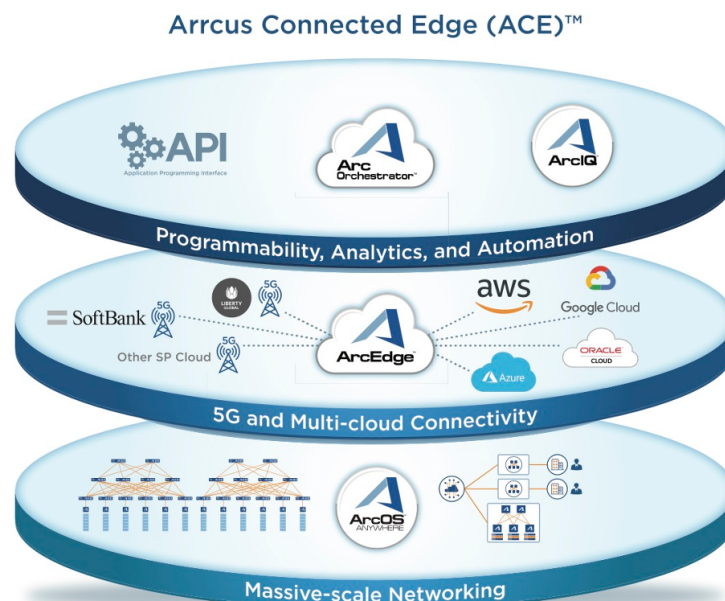
ACE is part of a wave of next-generation networking solutions that can adapt to high-scale, manageability, and flexibility needs of the new edge.

What's in the New Edge?

As this new edge becomes a key driver of digital transformation, what are the components that will deliver on the new promises of this mobile, extensible, connected infrastructure?

The new edge includes technologies designed to serve the demand for new, mostly cloud-based applications, which have high bandwidth and low latency requirements.

The new edge will be comprised of the following technology components and services:

- Convergence between public communications networks and the cloud
- Rapid, automated technology architectures for deploying services from cloud service providers and enterprises
- The arrival of 5G (public and private), secure access service edge (SASE), and mobile edge compute (MEC)
- Important new applications such as URLLC, real-time analytics, AR/VR, sensors, IIoT and connected vehicles
- Unprecedented data velocity and volume

The new technology platforms of the edge must be automated and scale to adapt to unprecedented demand. It looks something like the illustration below:
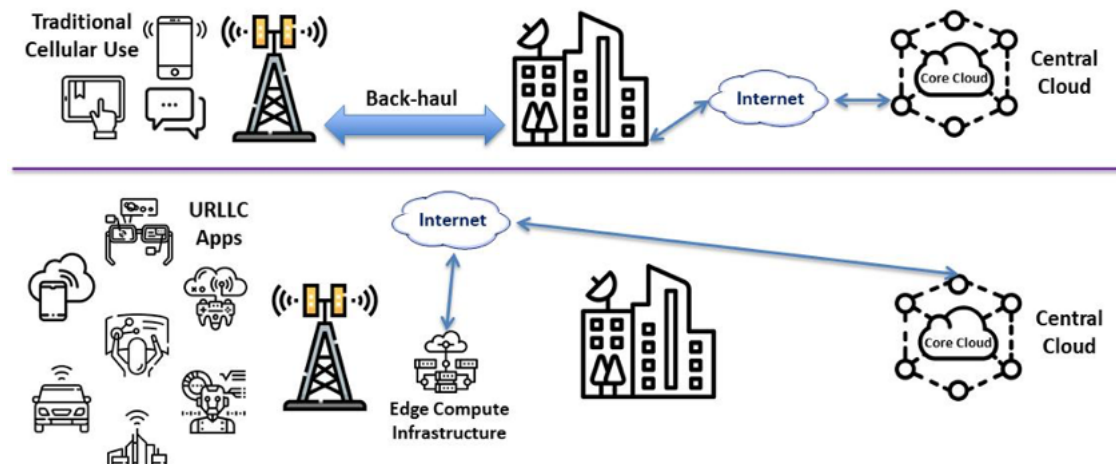
Source: Futuriom

Key Network Requirements for the New Edge

To build this new edge infrastructure, modern cloud networking must be deployed. Cloud networking is different from traditional networking in that cloud technologies were built to scale, and traditional networking and data-center technologies will not suffice to deliver the demands for speed, automation, and scale needed at the edge.

Networking technology, of course, is crucial to the success of the new edge. Next generation networking platforms must be built on cloud-based software such as microservices and deliver high connection density, security, low latency, low power consumption, high bandwidth, and network slicing.

For example, just looking at 5G requirements alone jumps orders of magnitude in data rates and latency requirements.

	4G/LTE	5G
Peak Data Rate	1 Gbps	20 Gbps
Latency	10 ms	<1 ms
Peak Connection Density	70K devices/km^2	1M devices/km^2
Network Slicing	No	Supported in standalone (SA) configuration

- Enterprises want a simpler, cost-effective way to deploy Mobile Edge Compute (MEC) and networking to support advanced applications
- New edge platforms need to be cost effective, open, and multi-vendor. Vertically integrated proprietary solutions are too expensive
- The new 5G edge must deliver unprecedented scale with low cost. This includes compute, storage, and networking technologies

Futuriom research with end users indicates that service providers, webscale cloud providers, and large enterprises that behave like service providers are all interested in deploying edge services to generate new business and revenue streams. But they need to build a new responsive, scalable technology architecture to accommodate these requirements.

A flexible software-based networking operating system (NOS) will be crucial for building this virtualized platform, including the 5G core. The new edge NOS needs to provide scalable networking and routing functions.

But a flexible and scalable NOS isn't all that is needed. Customers building edge capabilities want an entire networking and compute edge stack. This stack needs to include features for multi-cloud connectivity, API-first integration and programmability, analytics, and automation.

Arrcus: Delivering a New Edge Solution with ACE

Arrcus has long been an innovator and pioneer in networking. It has built a collection of networking, analytics, and management technology that is suited for open, scalable, and multivendor solutions at the edge. It's now integrating its technology into an even more expansive edge platform.

The ACE platform brings together a set of solutions geared at building edge-native features, API-based programmability, and automated management functions to quickly deploy and manage services at the edge. Technologies bundled into ACE include Arrcus's industry-leading network operating system (NOS), ArcOS, network automation and orchestration tool (ArcOrchestrator), integrated analytics platform for visibility and observability (ArcIQ), and a converged platform for telecommunications and compute (ArcEdge).

This comprehensive platform is built with extensive APIs, which enable quick integration for many use cases and vertical markets. The most important aspect of the API and automation capabilities is that it enables businesses to build specific solutions using logic and policy. One of the important trends in the development of the edge is the emergence of high-performance, multi-vendor solutions. The ACE platform is based on open standards and protocols and can be in implemented in multi-vendor environments to develop customized solutions for different edge use cases.

ACE is already being deployed at the edge in several markets for a variety of use cases. Some examples include:

• Retail solutions: Retailers are deploying ACE to enable omnichannel experience, real-time analytics, curbside pickup, and anywhere returns
• Manufacturing: Use cases include factory automation, robotics, autonomous vehicles, cameras and sensors
• Financial services: The financial industry is adopting ACE for AI-based information analytics and inference driving trading actions and transactions
• Content and Media: The media industry is using ACE to handle low-latency content delivery, maintenance, and management of distributed datacenters
• Telecommunications: Telecommunications providers can use ACE to deliver a converged platform for communications and compute services, including 4G or 5G private or public wireless