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# Partnerships Are Key for Rural Telecom Operators in Burgeoning Edge Computing Market



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## Inside...

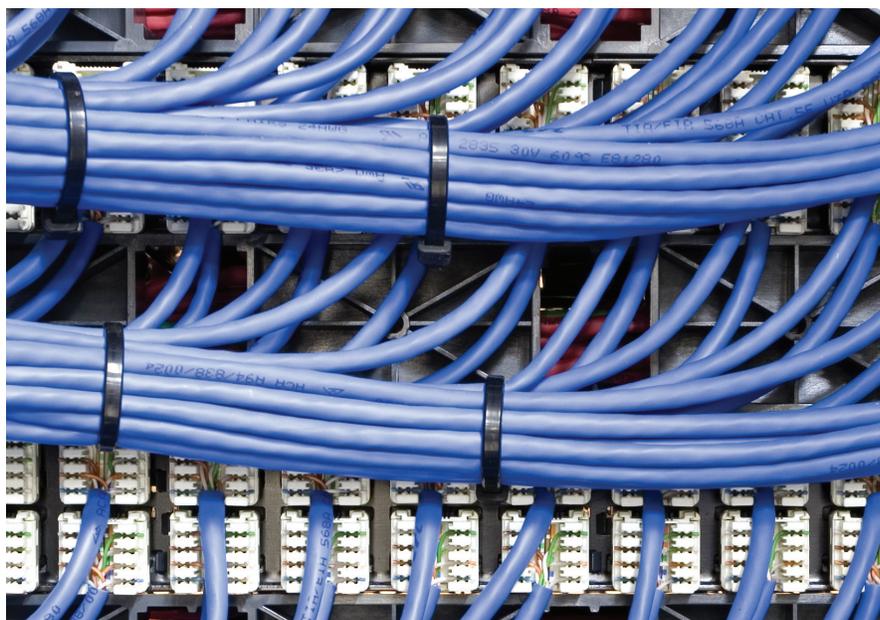
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### Key Points:

- Edge computing is distributed information technology (IT) architecture where data is stored and/or processed at locations close to where the applications are being used.
- Edge computing has been on the come for several years, but the growth in machine learning and AI technologies are enabling new applications that depend on edge computing.
- The global edge computing market is expected to grow at a compound annual growth rate (CAGR) of 37.3% between 2022 and 2031, according to Transparency Market Research.
- The advantage of edge computing is two-fold: cost and latency. New applications need ultra-low latency network performance to operate properly, and it might be cheaper to store and process data in a more decentralized fashion versus in the cloud.
- For rural telecom operators, edge computing offers some new business opportunities. But partnerships will be key – a “build it and they will come” approach is probably not the right strategy.

### Introduction

Edge computing has been on the come for a while and has yet to meet the lofty expectations set several years ago. But thanks to the likes of emerging machine learning applications, network virtualization, and the pandemic-induced digital transformation, data storage and computing is now becoming more decentralized. For rural operators looking to take advantage of this trend, partnerships will be key to their success. Taking a “build it and they will come” approach may not be the right strategy. Instead, the opportunity could be in partnering with “hyperscalers” (massive companies like Google, Facebook, and Amazon) that are looking to deploy edge computing equipment in rural America but don’t have the local resources/capabilities to do so. In this report we look at the forces and applications driving edge computing and ways in which rural operators can gain exposure to this part of the business.



is the time that elapses between a user request and the completion of that request. Robots in a manufacturing plant and virtual reality goggles are examples of applications that require low latency. Moving data centers closer to where these applications are used will help reduce latency and ensure applications operate properly.

The volume of data being processed at the edge is set to explode. By 2025 more than 50% of enterprise-managed data will be created and processed outside of a data center or cloud, according to Gartner, a business research consulting firm. And a good bit of this data will be

fleeting – it may never leave the edge. It will be generated, processed, analyzed, destroyed, and may never even be stored.

## What is Edge Computing?

Edge computing is somewhat of a nebulous term but essentially is a distributed information technology (IT) architecture in which client data is processed at the periphery of the network, as close to the originating source as possible. Traditionally, computing and storage have been done in a handful of major metros where massive, hyperscale datacenters are located. With edge computing, the idea is to move to a more decentralized environment where storage and computation tasks are performed closer to where the applications are being used. This is happening for two reasons: cost and latency.

On the cost side, it might be cheaper to store and process data on premise, or at a nearby co-location edge computing location than to do it in the cloud. The costs boil down to transporting: The longer the data has to travel, the more it costs to send it. Therefore, by shortening (or eliminating) data transportation, cost savings can be realized.

As for latency, highly automated artificial intelligence applications are now being deployed, and these applications require low-latency network support. Latency

## Applications Driving the Edge

A number of applications are behind the growth in edge computing, and they will certainly grow over time. This report, however, covers some of the main forces currently driving edge computing and ones that could have a profound impact on its growth rate.

### C-RAN

Traditional wireless networks consisted of a macro tower with a cabinet located at the bottom to house the baseband unit and all the electronics needed to support the access point (*Exhibit 1*). Next generation wireless network architectures are virtualized and more collaborative in nature, where radio frequency resources are shared across multiple access points (*Exhibit 2*). C-RAN (Cloud Radio Access Network) is the centralized, cloud computing-based architecture for radio access networks. With C-RAN, much of the RF (radio frequency) electronics housed at the bottom of the tower in the

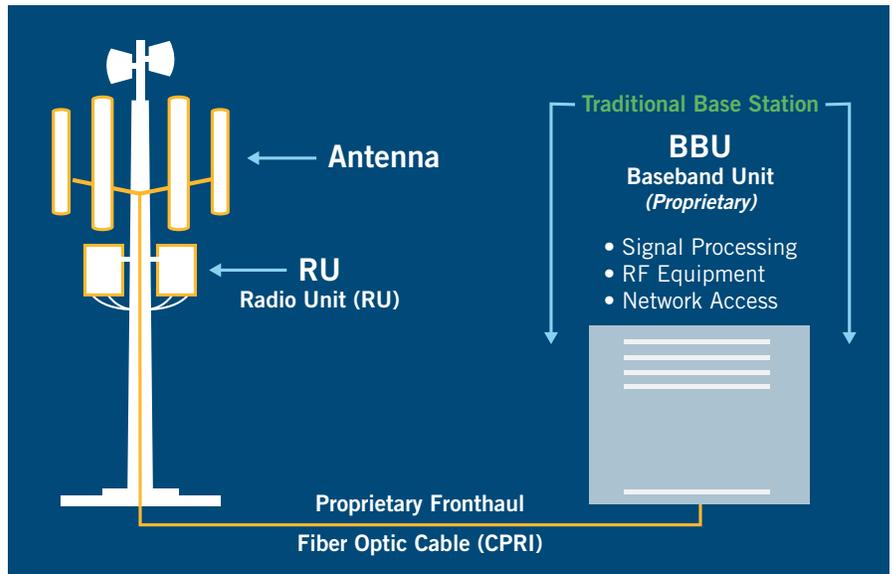


### EXHIBIT 1: Traditional Architecture

traditional architecture are now found at an edge data center on a server. This architecture increases network efficiencies, which reduces capex/opex. Wireless operators are in the process of deploying C-RAN, but it takes time. Dish Networks is emerging as the posterchild for C-RAN; because it is building from scratch, Dish can deploy the most efficient architecture. It will take longer for the likes of Verizon and AT&T to catch up, but they will be deploying C-RAN at large scale for the efficiency gains.

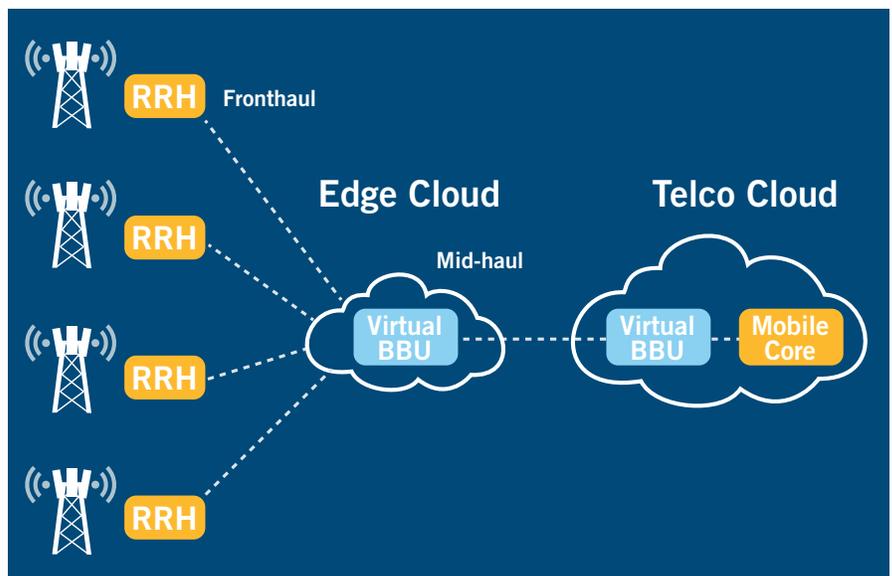
#### Private Wireless

Private wireless is emerging as a core driver of edge computing, so much so that the major cloud providers Amazon and Microsoft are investing in private wireless. Last year Amazon announced its own private wireless edge platform, AWS Private 5G. And Microsoft's acquisition of Affirmed and Metaswitch has enabled it to build a formidable private wireless/edge platform. The advent of shared spectrum in the Citizens Broadband Radio Service (CBRS) band has democratized owning and operating wireless networks. Organizations can build carrier-grade wireless networks at costs that were unthinkable a few years ago. Many of these networks are being built to support advanced applications that require low network latency, making edge computing platforms a perfect fit. Alternatively, private wireless networks are being deployed in rural markets that suffer from poor or no wireless coverage.



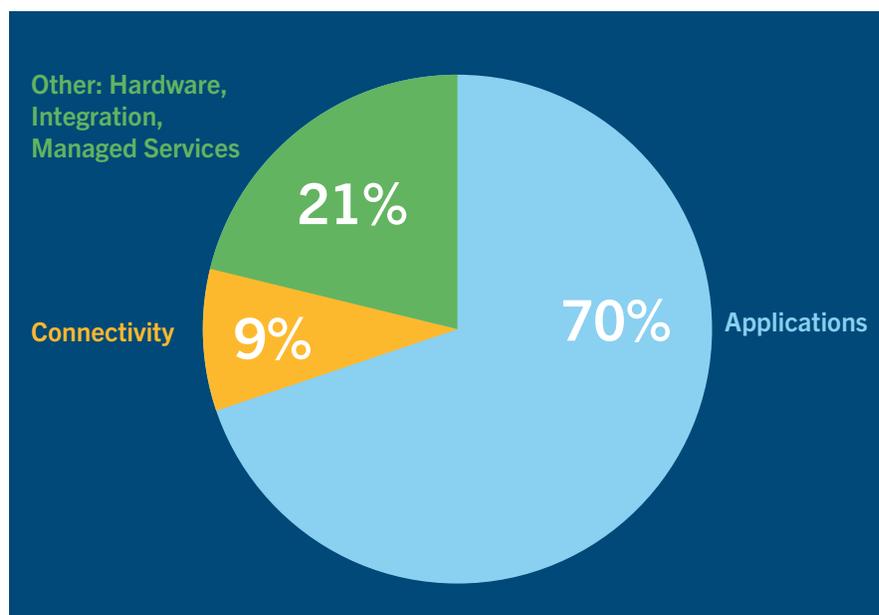
Source: CoBank

### EXHIBIT 2: C-RAN Architecture



Source: CoBank

### EXHIBIT 3: Edge Computing Opportunity



Source: STL Partners

These include oil and gas companies, mining operations, and farmers/ranchers. In these instances, storing and processing data at the edge makes sense as it reduces transport costs and network latency.

#### IoT (Internet of Things)

According to Gartner, 99% of the raw data generated by IoT sensors is discarded because the cost to collect and transport this data is not justified. With edge computing, this lost data can be more economically collected and stored, leading to a curation of insights and patterns through the use of artificial intelligence. According to Transparency Market Research, IoT is expected to play a major role in growing the global edge computing market at a compound annual growth rate (CAGR) of 37.3% over the next nine years.

#### Self-driving EVs

Given the regulatory focus/incentives and consumer demand for electric vehicles, which are a precursor to self-driving EVs, the impact that autonomous vehicles will have on the edge computing data center market is profound. According to the Automotive Edge Computing

Consortium (AECC), self-driving EVs may eventually need to offload as much as 5,000 gigabytes (GB) per hour of operation. To put that into perspective, in 2020 the average person worldwide generated about 150GBs per day. And according to Holon Investments, the global datasphere will surge from 64 zettabytes (ZB) in 2020 to a whopping 10,000-15,000ZBs in 2035 just from self-driving EVs.

#### Opportunities for Telecom Operators

While the lion's share of revenue at the edge is expected to go to application providers (*Exhibit 3*),

telecom operators are still exposed to about 20% of the market via connectivity, managed services, hosting, integration, etc.

Partnerships are the key to success in this market – a “build it and they will come” approach is probably not the right strategy. For example, a rural telecom operator could partner with a hyperscaler that needs help building out edge computing locations. Edge computing is becoming a larger focus for the hyperscalers and the reality is they need help building and managing these networks in rural America. This could involve using existing central office real estate, providing connectivity, or perhaps some kind of managed services for security, construction, maintenance, etc.

Another option could be in the private wireless market. In this scenario, rural telecom operators could build and manage a private wireless network for the agriculture market. And given that these networks will be in remote places, the demand for edge storage and computation services should be high. And as such, this model could involve a colocation data center approach where rural carrier assets are used across multiple customers leading to cost savings for farmers and ranchers.

And lastly, as C-RAN technology evolves and increases the distance RF can be front-hauled from a data center to an access point, the technology might start being deployed in less dense cities. We doubt C-RAN will be deployed in rural America, but for operators in tier two or tier three markets, opportunities for hosting and fiber transport services with the national wireless operators might start to develop.

## Conclusion

Edge computing is an exciting new data center architecture that will help enable new applications and technologies that otherwise would not be possible. And with these new technologies come new business models and opportunities for telecom operators – especially those operating in less dense/rural cities. In many cases, the large hyperscalers who are building out parts of the edge do not have the necessary resources and infrastructure in these parts of the country to execute their business plan. Rural operators do, or are in a position to build what is needed to fill this need. We also think the agriculture market is another area where edge computing and private wireless networks represents opportunity. These two technologies go hand in hand and can deliver a tremendous amount of value to farmers and ranchers through reduced (cost) inputs and increased yields. ■

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