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Jul 21, 2021

# **GigaOm Radar for Edge Colocation** v2.0

Edge & Networking

# GigaOm Radar for Edge Colocation

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# 1. Summary

The edge market has been growing by leaps and bounds, despite the fact that many people remain uncertain about what “the edge” is and which technology components enable edge applications. With the rollout of 5G wireless technology and the explosion of Internet of Things (IoT) devices, the market for edge enablement technology is projected to expand exponentially. Industries and municipalities have taken notice of the potential use cases of edge applications and are starting to explore possible deployment models. Edge applications need a place to run, and that place will often be some iteration of the infrastructure edge.

Edge infrastructure is an extension of existing infrastructure found in the public cloud or on-premises data centers, located in close proximity to edge devices and IoT gateways. Applications running on edge infrastructure can perform operations such as:

- Data aggregation and summarization
- Machine learning analysis
- Localized breakout
- Real-time data processing

The infrastructure edge can be broken down into three categories established in our Key Criteria for Edge Infrastructure report: physical infrastructure, core systems, and platform systems. This Radar report focuses on physical infrastructure, also referred to as edge colocation, using the key criteria and evaluation metrics found in the Key Criteria for Edge Colocation report.

Physical infrastructure encompasses the physical resources required for edge solutions, including physical space, power, cooling, and network connectivity. These are resources that a typical colocation facility might provide, but are found in an edge context.

While the use cases for the edge are varied and still unfolding, the need for an edge colocation solution is clear. The transformation of edge applications relies on suitably provisioned locations that support their compute, network, storage, and security requirements. The Radar used in tandem with the Key Criteria report can help you evaluate which solutions meet the unique requirements of your edge application.

## HOW TO READ THIS REPORT

This GigaOm report is one of a series of documents that helps IT organizations assess competing solutions in the context of well-defined features and criteria. For a fuller understanding consider reviewing the following reports:

**Key Criteria report:** A detailed market sector analysis that assesses the impact that key product features and criteria have on top-line solution characteristics—such as scalability, performance, and TCO—that drive purchase decisions.

**GigaOm Radar report:** A forward-looking analysis that plots the relative value and progression of vendor solutions along multiple axes based on strategy and execution. The Radar report includes a breakdown of each vendor's offering in the sector.

**Solution Profile:** An in-depth vendor analysis that builds on the framework developed in the Key Criteria and Radar reports to assess a company's engagement within a technology sector. This analysis includes forward-looking guidance around both strategy and product.

## 2. Market Categories and Deployment Types

For a better understanding of the market and vendor positioning (**Table 1**), we categorized solutions for edge colocation by the target market segment (small-medium, large enterprise, and ISP/MSP) and by the expected deployment model (access edge or regional edge).

### Market Segment

- **Small-medium enterprise:** The best solutions in this category will meet the needs of very small businesses, and can grow to address those of medium-sized infrastructures. They also can be solutions adopted by large enterprises for departmental use cases. Organizations with limited resources and skill sets can adopt solutions that do well in this category.
- **Large enterprise:** Solutions in this category are usually adopted for larger and business-critical projects. Solutions that excel here have a strong focus on scale, security, and experience working with larger companies. Globally available footprints and low TCO will be major differentiators.
- **ISP/MSP:** Edge colocation facilities will be heavily utilized by service providers in the telecommunications and cloud services industries. The networking, coverage, and flexibility of each solution are critical for meeting the unique needs of these industries. Many of these rollouts will need to scale beyond the current facilities, and solutions can differentiate themselves on the basis of their regional density and rapid rollout capabilities.

### Deployment Model

We also recognize two deployment models for solutions in this report: access edge and regional edge.

- **Access Edge:** Vendors in this deployment model are focused on building a rich network of small edge sites in select metropolitan areas, generally targeting a single high density geographic area. They may choose to partner with data center providers for additional capacity and network exchange points to enable public cloud and private data center connectivity.
- **Regional Edge:** Vendors in this deployment model already have a robust number of large data centers in major metropolitan areas. They are focused on building out the capabilities of these existing properties for edge use cases and applications. They tend to have a global presence and reduced density at the local level. They may choose to partner with or acquire access edge vendors.

Table 1: Vendor Positioning

	MARKET SEGMENT			DEPLOYMENT MODELS	
	SMB	Enterprise	ISP/MSP	Access Edge	Regional Edge
CoreSite	++	++	+	-	++
Digital Realty	+	+++	+++	+	+++
EdgeConneX	+++	++	+++	+	++
EdgeMicro	++	++	+++	++	-
Equinix	++	+++	++	+	+++
Vapor IO	+++	++	+++	+++	-
SBA Edge	+	+	+++	+++	-

+++ Exceptional: Outstanding focus and execution  
 ++ Capable: Good but with room for improvement  
 + Limited: Lacking in execution and use cases  
 - Not applicable or absent

Source: GigaOm 2021

### 3. Key Criteria Comparison

Following the general indications introduced with the “Key Criteria for Evaluating Edge Colocation,” **Table 2** summarizes the performance of each vendor included in this research in the areas we consider differentiating and critical in this sector. **Table 3** then offers insight into evaluation metrics—top-line characteristics of each product that help define their value and impact on the organization. The objective is to give the reader a snapshot of the technical capabilities of different solutions and define the perimeter of the market landscape.

Table 2. Key Criteria Comparison

	KEY CRITERIA					
	Dense Regional Coverage	Global Available Footprint	Consumption-Based Pricing	Rapid Rollout Capability	Flexible Model	Automated Issue Resolution
CoreSite	++	+	++	++	++	++
Digital Realty	+++	+++	++	+	++	++
EdgeConneX	++	++	-	++	+++	++
EdgeMicro	++	+	++	++	+++	++
Equinix	++	+++	++	+	+++	++
Vapor IO	+++	+	++	+++	++	+++
SBA Edge	+++	++	++	++	+	++

+++ Exceptional: Outstanding focus and execution  
 ++ Capable: Good but with room for improvement  
 + Limited: Lacking in execution and use cases  
 - Not applicable or absent

Source: GigaOm 2021

Table 3. Evaluation Metrics Comparison

	EVALUATION METRICS				
	TCO	Time to Value	Capacity and Scalability	Partner Ecosystem	Roadmap and Growth
CoreSite	++	++	++	++	++
Digital Realty	++	+++	+++	+++	+++
EdgeConneX	+	++	+++	+	++
EdgeMicro	+++	++	+	++	+++
Equinix	++	+++	+++	++	++
Vapor IO	+++	+++	++	++	+++
SBA Edge	++	++	+++	+	+++

+++ Exceptional: Outstanding focus and execution  
 ++ Capable: Good but with room for improvement  
 + Limited: Lacking in execution and use cases  
 – Not applicable or absent

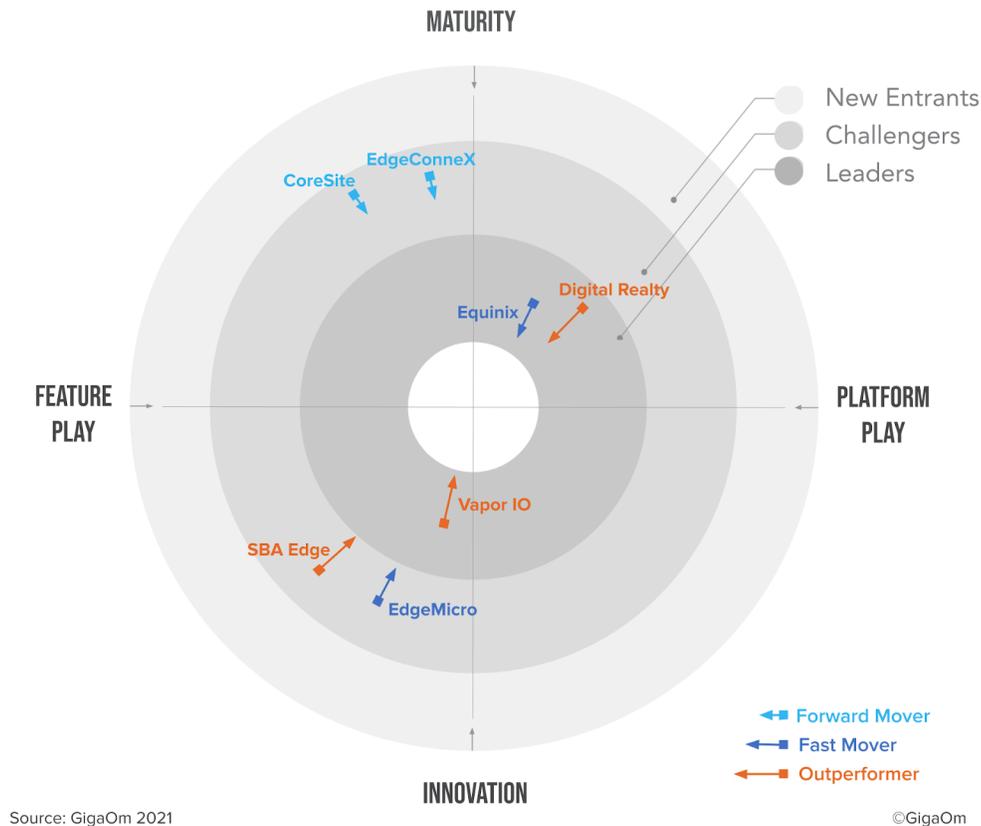
Source: GigaOm 2021

In some cases, the vendor's pricing model data was not shared, so the Consumption-Based Pricing row has been left blank.

By combining the information provided in **Table 2** and **Table 3**, the reader should be able to get a clear idea of the market and the available technical solutions.

## 4. GigaOm Radar

This report synthesizes the analysis of key criteria and their impact on evaluation metrics to inform the GigaOm Radar graphic in **Figure 1**. The resulting chart is a forward-looking perspective on all the vendors in this report, based on their products' technical capabilities and feature sets.



*Figure 1: GigaOm Radar for Edge Colocation*

The GigaOm Radar plots vendor solutions across a series of concentric rings, with those set closer to center judged to be of higher overall value. The chart characterizes each vendor on two axes—Maturity versus Innovation, and Feature Play versus Platform Play—while displaying an arrow that projects each solution's evolution over the coming 12 to 18 months.

As you can see in the Radar chart in **Figure 1**, access edge vendors tend to take more of a features approach, whereas the regional edge vendors are more focused on creating a platform. We believe that Vapor IO is looking to expand its capabilities into more of a platform play through internal development and partnerships.

Innovation is essentially a rejection of the status quo, so it's no surprise that access edge vendors are strong innovators in the edge colocation sphere. Digital Realty also seems to be working hard to

develop a robust edge networking solution to tie multiple sites into a single fabric.

We believe the regional edge vendors will continue to build broader platforms as their offerings mature. We also expect new challengers will arrive on the scene, especially around the access edge. As more edge projects are approved, the demand for access to the edge will increase both in the U.S. and abroad.

## INSIDE THE GIGAOM RADAR

The GigaOm Radar weighs each vendor's execution, roadmap, and ability to innovate to plot solutions along two axes, each set as opposing pairs. On the Y axis, **Maturity** recognizes solution stability, strength of ecosystem, and a conservative stance, while **Innovation** highlights technical innovation and a more aggressive approach. On the X axis, **Feature Play** connotes a narrow focus on niche or cutting-edge functionality, while **Platform Play** displays a broader platform focus and commitment to a comprehensive feature set.

The closer to center a solution sits, the better its execution and value, with top performers occupying the inner Leaders circle. The centermost circle is almost always empty, reserved for highly mature and consolidated markets that lack space for further innovation.

The GigaOm Radar offers a forward-looking assessment, plotting the current and projected position of each solution over a 12- to 18-month window. Arrows indicate travel based on strategy and pace of innovation, with vendors designated as Forward Movers, Fast Movers, or Outperformers based on their rate of progression.

Note that the Radar excludes vendor market share as a metric. The focus is on forward-looking analysis that emphasizes the value of innovation and differentiation over incumbent market position.

## 5. Vendor Insights

### CoreSite

CoreSite is a data center operator in eight U.S. markets with 24 purpose-built colocation facilities. The company focuses on providing colocation, cloud, and interconnection to a community of more than 1,375 customers. This company should be considered a regional edge provider, offering excellent networking capabilities and partnerships with the major public cloud providers like Amazon Web Services and Microsoft Azure.

CoreSite has seen a steady increase in two use cases: Healthcare and virtual desktop infrastructure (VDI). Healthcare providers, especially hospitals, are interested in moving their data centers off-site to increase the space available for providing medical services. They still require low-latency access to their systems, making CoreSite an excellent option for metropolitan areas where the company has a presence.

VDI deployments have exploded, due in part to the effects of the COVID-19 pandemic and an increase in remote work. The power and cooling requirements of a VDI environment are much greater than traditional workloads, creating an untenable situation for aging data centers. CoreSite has been able to provide the necessary space, power, and cooling for VDI environments, along with a low-latency connection to most end users in a given metropolitan area.

CoreSite provides colocation services from a single cabinet to a private cage or even a custom suite, giving customers a high degree of flexibility and the ability to grow as their application demands increase. The company's size and scale give it a high score on capacity and scalability and make it an attractive option for regional edge services in areas where the company has a significant presence. It does not yet have edge-specific services or formal partnerships with access edge providers to expand its reach. They are working with major cloud providers and cellular tower providers to function as an interconnection point for the access edge.

CoreSite also specializes in carrier-neutral peering and internet exchange sites. Peering, cloud exchanges, and inter-site connectivity from CoreSite help organizations set up a more efficient network architecture and support multi-cloud connectivity by accessing multiple vendors through a single connection with the CoreSite Open Cloud Exchange (OCX). Access edge deployments will need a way to connect back to the public cloud or private data center. CoreSite can provide this connectivity while serving as a centralized point for additional data processing and application communication routing.

**Strengths:** CoreSite has a strong background in data center operations and managed services, which fits nicely with the skills gap at some small-to-medium businesses (SMBs). It has multiple data centers in each region, providing a high level of connectivity.

**Challenges:** CoreSite is currently expanding its edge presence, and may not have sufficient coverage

for edge applications with low-latency requirements outside of its metropolitan areas. It also lacks an international physical footprint.

## Digital Realty

Digital Realty is a global company with hundreds of data centers around the world. While it is a major player in the colocation space, it has not focused on building a platform until recently. The company announced the PlatformDIGITAL brand in an attempt to move beyond basic colocation services and provide edge-to-core-to-cloud solutions around networking, operations, storage, and security. Digital Realty views its role as providing exceptional connectivity options to the public cloud, private data center, and access edge locations. This new and directed focus has given Digital Realty an excellent rating for roadmap and growth.

PlatformDIGITAL is a software-defined platform working at a global scale across all of Digital Realty's metropolitan areas. It is composed of solutions tailored to enterprise use cases: Network Hub, Control Hub, Data Hub, and SX Fabric. Each component helps manage a different aspect of the data center stack across multiple locations. Digital Realty's full suite of colocation options is positioned to effectively support growing hybrid IT deployments supporting edge computing infrastructure. Many edge applications will use hundreds, if not thousands, of sites. Creating a platform capable of managing multiple sites with software-defined networking, storage, and access controls will be especially useful for the operators of those edge applications.

Digital Realty would be considered a regional edge player, due to the presence of data centers in multiple major metropolitan areas. It may not have sufficient density in a given market to provide access edge services, but it can certainly work with access edge partners to create a comprehensive solution. To that end, Digital Realty has partnered with Vapor IO to extend PlatformDIGITAL to the access edge by integrating Vapor IO's Kinetic Edge Exchange offering into the Network Hub. Digital Realty has also partnered with tower companies and mobile network operators to act as a hub for network interconnection and local breakout.

**Strengths:** Digital Realty boasts a global footprint that will appeal to particular companies and workloads. Its emerging platforms-centric services promise rapid and flexible deployments in its data centers.

**Challenges:** Digital Realty has a large number of data centers, but lacks a presence at the access edge. The company hopes its partnership with Vapor IO will fill the gap to support low-latency edge applications.

## EdgeConneX

EdgeConneX offers an interesting mix of both hyperscale and what the company likes to call "hyperlocal" operating facilities, ranging from 10 kilowatts (kW) to 100-plus megawatts (MW). With such a large breadth of offerings, EdgeConneX received high marks for having a flexible consumption

model. The company currently operates data centers in more than 30 markets across three continents. The publicly available data centers are characteristic of a regional edge provider, with one or two facilities in a given market.

The EdgeConneX Far Edge product line offers single-tenant, turn-key solutions that augment the provider's existing public data centers. Far Edge can refer to access edge facilities within 10 kilometers of the device edge or to a micro-data center at the device edge itself. The EdgeConneX Far Edge product seems to be targeted at the latter, due to its single-tenant nature and proximity to edge devices.

EdgeConneX has a robust monitoring and self-service operating system called EdgeOS. This helps users view the status of all their sites—from hyperscale to access edge—from a single UI. A unified management solution from a single vendor such as this one, for both regional edge and access edge deployments, improves the TCO for running an edge application.

**Strengths:** The mix of both regional and access edge offerings lets customers work with a single vendor for all their edge needs. EdgeConneX has great flexibility in ways to access edge facilities designed and deployed in the field.

**Challenges:** Access edge facilities appear to be single-tenant and not a colocation arrangement. The company's wide focus across hyperscale, regional edge, and access edge may lead to deficiencies in execution.

## EdgeMicro

EdgeMicro operates modular data centers providing leasable space, power, and cooling in a compact, EIA-standard, pre-built form factor. Each unit is prefabricated and built offsite, then installed in a prepared location. EdgeMicro focuses on deploying sites across the United States and is increasing density based on customer demand. It is targeting markets underserved by the larger colocation companies. The form factor lends itself to the rapid rollout of new sites to increase capacity, with a mobile deployment option available to create immediate capacity.

EdgeMicro is laser-focused on building robust and secure physical locations with the proper power, cooling, and network options, and without interfering with the customer. The corporate leadership of EdgeMicro has extensive experience with carriers, hyperscalers, and content delivery networks, which are the primary target for EdgeMicro's products and services. The company is also working with mobile network operators to help build out Open RAN deployments for 5G networks. Due to its high level of focus, the company has forged multiple partnerships to create a complete solution for clients, earning EdgeMicro high marks in the partner ecosystem category.

EdgeMicro solutions are not opinionated in terms of network and application design. This provides flexibility for the primary target customers, but less sophisticated customers may prefer a more directed and managed approach.

**Strengths:** EdgeMicro can deploy new capacity rapidly to an existing or new region. Its sites have especially robust networking resources, making it ideal for telecom and CDN solutions that require high levels of upstream and downstream bandwidth.

**Challenges:** The offering from EdgeMicro seems to focus on highly technical customers and not traditional SMBs or enterprises. It also provides a low level of site density in most regions where it is deployed, although that may change based on customer demand.

## Equinix

Equinix is one of the world's largest data center providers, with more than 229 data centers in 63 metropolitan areas across 26 countries. Such an extensive and unmatched global presence has earned it the highest marks for a globally available footprint. The company has traditionally focused on robust connectivity options for internet exchange and network peering points. The company's large global presence in metropolitan markets allows it to function as a regional edge provider. Unlike with an access edge provider, the smallest data centers at Equinix are around 5,000 square feet.

Equinix has unparalleled peering connectivity to all the major and minor carriers, as well as the public cloud. They have developed an offering called the Equinix Fabric, which helps businesses build a virtual fabric across all Equinix sites. Theoretically, such a virtual fabric could be extended to both edge sites and branch offices, providing a uniform control and management plane for all networking services. A unified network fabric for edge sites would greatly simplify the administration and deployment of edge applications.

Equinix continues to evolve and expand the offerings in its service catalog around edge computing. Network Edge helps customers purchase, configure, and deploy virtual network services at the edge in minutes; SmartKey provides encryption as a service to edge locations; Precision Time helps edge locations with time keeping beyond traditional NTP; and Equinix Metal is a bare metal as-a-service offering evolving from the company's acquisition of Packet in 2020. Taken together, these offerings demonstrate a dedication to edge computing that earns Equinix high marks in flexibility and time to value.

Equinix also has a mature monitoring platform for data center infrastructure management (DCIM) called IBX SmartView. As workloads approach the edge, locations tend to become more diverse. Equinix offers IBX SmartView as a regular part of operations for colocation services to implement proper monitoring and alerts.

**Strengths:** The Equinix Fabric offering enables businesses to build a virtual fabric across all Equinix sites in close proximity to edge locations. Equinix continues to expand its edge services and capabilities, and has a robust self-service portal and monitoring solutions with multiple integrations, including ServiceNow.

**Challenges:** Equinix lacks a true access edge presence (a problem for the most demanding real-time enterprise and low-latency applications). At the same time, its large data center footprint can slow the

expansion of sites into new or existing regions. Equinix could augment its offering by partnering with an access edge player.

## SBA Edge

SBA Edge is a wholly-owned subsidiary of SBA Communications, the tower site operator with more than 17,000 locations across North America and thousands more in South America and South Africa. Most locations can be outfitted with one or more edge data centers, each serving approximately 50 kW across nine standard racks. In addition to the cellular towers, SBA Edge owns and operates a handful of traditional data centers that serve as a hub for some of the tower locations. While not all tower locations are hosting edge data centers currently, the potential for density and capacity growth is tremendous, earning SBA Edge the highest marks on the Dense Regional Coverage Key Criteria.

The edge data centers in each location are stackable, provided there is sufficient space and power. SBA Edge controls the land upon which its towers are located, streamlining the process of rolling out new edge data center units. Since the tower already has power and network connections readily available, SBA Edge can roll out a new unit within 10 days depending on availability of the prefabricated units.

SBA Edge functions as a traditional colocation operator, providing power, cooling, and space at its tower locations. While each location is fed by multiple fiber lines, clients typically use their own carrier for network connectivity. SBA Edge can provide space as small as a half rack, which is billed based on power and space usage. Clients are able to meter their own power if desired, creating some flexibility in terms of pricing.

At the moment, SBA Edge does not have any official partnerships with upstream or downstream providers. While the company does work with many of the major carriers and cloud providers, SBA Edge empowers its clients to choose whichever providers they prefer. SBA Edge is focused on being an *equal opportunity* colocation service, and it is not looking to branch out into advanced network solutions or build a portfolio of preferred partners. Though an agnostic approach can be pragmatic, it did lower their score on the partnership criteria.

SBA Edge provides ample security and monitoring options so clients can track the location status in terms of temperature and power. Each site has cameras, locked racks, and a customized security solution for providing physical access to the site. Beyond basic monitoring of power and cooling, clients are welcome to deploy their own monitoring solution for any equipment they place in the racks. Again, SBA Edge is doing its best to stay out of its clients' ways by simply providing space, power, cooling, and connectivity.

**Strengths:** SBA Edge's abundance of potential locations coupled with rapid deployment and a willingness to add edge data centers to new locations based on client demand make it an excellent candidate for customers looking to deploy equipment in the field. SBA Edge can provide locations for deploying Open RAN and 5G, particularly for carriers and service providers.

**Challenges:** SBA Edge’s lack of partnerships and the simplicity of its offering are likely to be attractive to more sophisticated customers. Less technical customers, like an SMB or an enterprise, may desire a bit more handholding and support for management and connectivity.

## Vapor IO

Vapor IO focuses on deploying micro data centers at the access edge layer, each providing network connectivity and up to 180 kW of power. Vapor IO works closely, though not exclusively, with Crown Castle International—a real estate investment trust—for sourcing deployment sites and local market fiber. This relationship helps Vapor IO quickly procure real estate and networking for new sites across the country. Vapor IO locations provide space, power, and cooling in a compact, stackable form factor called Vapor Edge Modules (VEM) that are assembled off-site.

Vapor IO combines multiple sites in a region to form what it calls the “Kinetic Edge.” From the Kinetic Edge, it can offer distributed colocation and networking services, presenting multiple sites as a single, virtual data center. Currently, coverage is limited to regions in the United States where Vapor IO plans to deploy facilities in 36 cities by the end of 2021, focusing on site density and networking for each deployed region to create a virtual data center with extremely low network latency. Each tenant receives two 10Gb ports, and any data moved within the Kinetic Edge will be free of transport charges. As of June 2021, Vapor IO had six fully operational regions for its Kinetic Edge, with the other 30 locations in various stages of construction and deployment. Its plans for scalability and growth have earned Vapor IO excellent marks in the roadmap and growth category.

As an extension of the Kinetic Edge, Vapor IO has announced the “Kinetic Grid,” which will link Kinetic Edge regions together using dedicated private fiber runs. The six markets currently in service are part of the Kinetic Grid, and each market added will join the grid as it comes online. Tenants will be able to leverage the Kinetic Grid to build a flat, Layer 2 network both within and across the market.

Vapor IO also provides a monitoring and management system using the Synse open source protocol. This integrates well with third-party systems and helps customers monitor and manage the resources it has deployed in Vapor IO data centers in ways that complement and enhance current management toolsets. For example, VMware recently announced it has adopted the Synse protocol and is integrating its Telco Cloud Platform with the Kinetic Grid, using Synse data to automate workload placement and resilience. Vapor IO also offers the Kinetic Edge Portal, a web-based service providing Vapor IO customers with capacity planning, site configuration, monitoring, and troubleshooting.

In 2020, Vapor IO announced a partnership with Digital Realty, a major data center operator, to offer the Vapor IO Kinetic Edge as a network service in Digital Realty’s PlatformDIGITAL solution. This adds functionality to the Digital Realty portfolio and introduces Vapor IO to a large swath of existing Digital Realty customers.

**Strengths:** Vapor IO’s robust blend of modules and managed networking appeals to service providers, CDNs, and industries deploying edge infrastructure and hardware across a metropolitan area. Vapor IO also does an excellent job providing monitoring.

**Challenges:** Vapor IO is focused strictly on cities in the U.S. for the moment; therefore it lacks a global presence.

## 6. Analyst's Take

As demand for low-latency, high-bandwidth edge applications increases, so does the need for physical space to host those applications. The edge colocation marketplace is divided into two distinct categories of providers: access edge and regional edge.

The access edge providers focus on smaller individual site deployments and building a mesh network out of those sites for a given region. The strength of this approach is the ability to achieve ultra-low latency at the device edge and continue to maintain the same network profile as a device changes location. Not all applications will require this type of disaggregated solution, and those that do need to pay a premium for the lower latency and smaller hosting footprint.

Regional edge providers are generally using their existing colocation facilities to provide edge-friendly solutions. The focus for these providers appears to be on creating a platform for managing networking and security around an edge deployment. Whereas access edge providers are supplying space and connectivity, the regional edge providers want to build a platform that expands beyond physical infrastructure into the realm of *core systems*—the second of three tiers in our edge infrastructure taxonomy.

As the edge market grows, we believe the two categories will continue to differentiate along the same lines. Access edge providers will look to build a dense network of local sites to provide the best possible performance for edge applications. Regional edge providers will attempt to create a multi-tier platform service that overlays the cloud, data center, and edge. We expect to see additional partnerships between players in the two categories, and between the access edge providers and the major cloud hyperscalers as well.

We believe most customers will consume an edge colocation service through a partnership with a core system or platform system provider. Readers who are planning to deploy their own physical infrastructure in an edge colocation facility should evaluate the requirements of their edge applications across the dimensions of networking, security, and operations to determine which category of physical infrastructure edge provider is best for you.

## 7. About Ned Bellavance

Ned Bellavance is an IT professional with almost 20 years of experience. He has worked with Fortune 500 companies and SMBs across multiple verticals, developing and deploying both on-premises and cloud-based architectures. Ned has authored books on the Azure Kubernetes Service and on HashiCorp Terraform and holds several industry certifications from vendors, including Microsoft, VMware, AWS, and Citrix.

## 8. About GigaOm

GigaOm provides technical, operational, and business advice for IT's strategic digital enterprise and business initiatives. Enterprise business leaders, CIOs, and technology organizations partner with GigaOm for practical, actionable, strategic, and visionary advice for modernizing and transforming their business. GigaOm's advice empowers enterprises to successfully compete in an increasingly complicated business atmosphere that requires a solid understanding of constantly changing customer demands.

GigaOm works directly with enterprises both inside and outside of the IT organization to apply proven research and methodologies designed to avoid pitfalls and roadblocks while balancing risk and innovation. Research methodologies include but are not limited to adoption and benchmarking surveys, use cases, interviews, ROI/TCO, market landscapes, strategic trends, and technical benchmarks. Our analysts possess 20+ years of experience advising a spectrum of clients from early adopters to mainstream enterprises.

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