

The Keys to Overcoming Edge Computing Challenges

Streamline Your Path to Integrated Micro Data Center Solutions

Distributed IT has quickly become the standard operating model. But supporting edge computing comes with unique challenges. Solving them means going beyond traditional means of selecting, configuring, assembling, operating, and maintaining systems at the edge of the network. Embracing a new, emerging model that's all about building an integrated ecosystem of cooperative partners, vendors, and end users can help streamline the process. With APCTM by Schneider Electric and Howard Technology Solutions, you can build your own integrated micro data center solution to overcome edge computing challenges.

The Limitations of a Centralized Data Center Architecture

Digital transformation initiatives have given business users access to the Internet of Things, machine learning, artificial intelligence, virtual/augmented reality, advanced data analytics, and more. These technologies deliver essential business benefits but a centralized data center architecture can't support them all.

The latency, bandwidth, autonomy, and security demands that come along with a modern, digital business have stretched traditional data centers to their limits — and that's why local edge sites have become critical to operations.

However, supporting edge computing and distributed IT requires robust equipment and a tightly integrated technology organization that has evolved from cost center to value broker. Achieving these requirements is often easier said than done when dealing with a lack of IT staff on-site across a high volume of local edge sites. To ensure business-critical applications remain available and employee productivity is uninterrupted, IT leaders must mitigate the key challenges of designing, implementing, and managing edge sites.

The Primary Challenges of Edge Sites

In a way, the challenges that IT leaders face with edge computing are similar to the ones they've always faced with a traditional data center. You have to make decisions when selecting, configuring, deploying, and maintaining the IT infrastructure. With edge computing, you're doing it across multiple locations with minimal (if any) on-site staff.

From this perspective, edge computing ecosystems present a few primary challenges:

- **Selection and Configuration:** Systems must support intended applications while also fitting with the site's conditions. One mistake can propagate to hundreds of installations if it isn't identified early on. In these cases, IT teams can struggle against a wrong-sized UPS for the expected IT load, insufficient output receptacles on rack PDU/UPS, lack of U space in rack, and more.
- **Deployment:** This is a logistical challenge above all else. From finding wall space for mounting cabinets to site prep, lost parts during assembly, and improper electrical wiring, it's easy for edge computing initiatives to be delayed.
- **Operation and Maintenance:** Post-installation, managing multiple micro data centers can be a challenge for IT. Troubleshooting remotely, monitoring large volumes of alarms, and dealing with a wider variety of vendors can hurt your efficiency.

As IT is asked to do more with less, it's unlikely that teams will be able to throw more money or personnel at these challenges. An improved model is emerging that addresses these problems by embracing standardization, integration, cooperative partnerships, and cloud-based management. It's essential to take a new approach that hinges on an integrated ecosystem of partners that help overcome these primary challenges.

Preconfigure tech platforms and devices before shipment with an integrated approach to edge computing and help your team:¹

REDUCE
field engineering
costs up to

40%

INCREASE
order processing
speed by

20%

REDUCE
maintenance
costs by

7%

Pillars of an Edge Computing Partner Ecosystem

Overcoming edge site challenges isn't just about deploying powerful equipment in siloes. Reducing complexity requires a mix of partners tightly integrated into an ecosystem that creates micro data center solutions at the edge. With every partner focused on your specific site requirements, you'll be able to deliver and manage micro data centers in standardized, predictable, efficient, and reliable ways.

There are four distinct pillars of an edge computing ecosystem, each of which is satisfied by a different type of partner.

1. The IT Vendor

This partner provides the servers, storage, networking gear, and software necessary to run your business applications. In many cases, it's the IT vendor's responsibility to deploy converged or hyperconverged infrastructure solutions that put servers, storage, network switches, and the firewall all in one hardware device. Among other things, the IT vendor should be expected to:

- Develop reference designs based on specific edge use cases and applications
- Offer simple configurations to tailor solutions to unique needs
- Drive interoperability with other hardware and software at the edge site
- Create management tools with public APIs for greater data accessibility

2. The Physical Infrastructure Vendor

This partner simplifies deployment and operations through configurators, reference designs, resilient infrastructure, and management tools. Equipment from this vendor includes physical racks, UPSes, rack PDUs, and more. Expect your physical vendor to:

- Create rule-based configurator tools based on your IT stack needs
- Develop reference designs for the micro data center
- Provide options that address environmental, physical security, and management concerns
- Enable off-site integration and testing to minimize damages or delays

3. The Systems Integrator

This partner adds value through the complete integration of IT hardware, software, and physical infrastructure. It acts as the coordinator of all parties involved by:

- Translating business needs to IT requirements
- Offering expertise on your industry and required technologies
- Having alliances with IT and physical infrastructure vendors
- Determining the physical infrastructure needs for IT based on capacity, dimensions, weight, plug-types, etc.

When searching for a systems integrator, be sure to find a partner that has broad knowledge of a wide range of vendors. Instead of being locked into a specific partner's products, you'll be able to leverage the best-of-breed solutions for your specific needs.

4. The Managed Service Provider

This partner helps you operate and maintain edge infrastructure through management tools and digital services. Because on-site staff is often limited, an MSP can keep the edge site up and running to ensure the ecosystem continues to satisfy IT requirements. With open APIs from every other partner, the MSP is able to efficiently manage the micro data center and ensure you get the most out of edge computing.



Key Attributes of an Effective Micro Data Center at the Edge

When you've created the right ecosystem of partners, you'll be able to reap the benefits of effective integrated micro data center solutions. In the end, IT teams get a data center-in-a-rack with systems that are preconfigured, tested, and installed before delivery to the site. As a result, you can reduce errors, site work, and disruptions at individual edge sites on a continuous basis.

But what exactly goes into this micro data center solution? Some key attributes include:

- **Rack Enclosure:** House and secure the IT and support infrastructure
- **Rack Power Distribution Unit (rack PDU):** Distribute and control AC power to individual IT equipment
- **Uninterruptible Power Supply (UPS):** Provide battery backup power, voltage regulation, and surge protection to ensure uninterrupted operation of the IT equipment, regardless of utility power
- **Active or Passive Cooling Units:** Ensure IT equipment doesn't shut down due to overheating
- **Security and Environmental Monitoring:** Cameras, locks, and sensors to monitor and protect the micro data center from environmental threats
- **Cloud-Based Software:** Enable unlimited scalability and automatic maintenance
- **Digital Services:** Connect MSPs and infrastructure vendors for improved maintenance
- **Management of Notifications:** Provide root cause analysis with alarm prioritization to determine which notifications are most critical and require your attention

- **Open APIs:** Pull necessary system data into remote monitoring and management tools to get a complete view of the IT and infrastructure stacks
- **Analytics and AI Technology:** Gain actionable insights for MSPs that go beyond traditional tools that only provide surface-level data

The combination of these assets and others help maintain visibility and control over all assets at the edge, ensuring you maintain the resiliency necessary for modern edge sites. The only challenge left is coming up with a strategy to get all these moving parts of a successful edge computing approach right.

Conclusion

In today's hybrid data center architectures, the edge of the network requires the same high resiliency as centralized or cloud data centers. But without trained on-site staff and a high volume of widely distributed sites, maintaining that resiliency can seem almost impossible. Partnering with an expert can provide the support needed to handle the unforeseen challenges of edge computing with an affordable, top-quality product that exceeds your expectations.

About Howard Technology Solutions

Howard Technology Solution brings to market cutting-edge technology that is high quality, reliable, and affordable. From our own Howard manufactured products, such as desktops, notebooks, servers, kiosks, and medical carts to partner products from other leading technology innovators, such as Lenovo, HP, and Microsoft, you can be sure when you buy from Howard that you are getting the most for your technology dollars. Howard Technology Solutions' mission is to provide an affordable, top-quality product that exceeds your expectations, and our highly trained team of network professionals can provide you with installation, procurement, consulting and many other services to meet your needs.



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¹ World Wide Technology, "Supply Chain and Integration Services," Oct 2019.