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Critical Requirements for Edge Networks

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Abstract: Organizations are rapidly deploying applications and the infrastructure to support them in edge environments. Careful research and planning are required to ensure the underlying infrastructure, especially the network, can accommodate current and future needs. Dell Technologies provides innovative, cost-effective, and proven network solutions, as well as a portfolio of full stack solutions for the edge, all backed by global service and support and made affordable through Dell Financial Services.

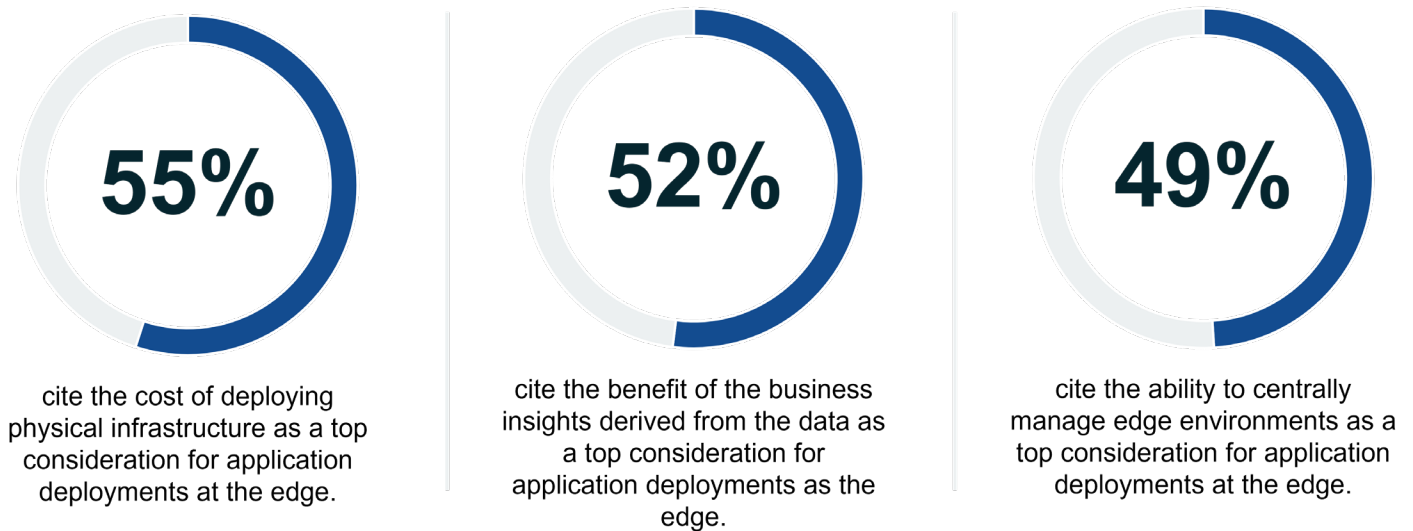
The Edge Imperative

To become more agile, modern IT environments have deployed applications across private data centers, public clouds, and, increasingly, the edge. Indeed, TechTarget's Enterprise Strategy Group research indicates that 94% of all organizations state that edge computing is now a top ten priority.¹ These edge sites often deploy two or more applications to perform the required objectives.

But why is the edge so important? Why are organizations deploying multiple applications at the edge? According to our research, the top reasons organizations cited for deploying at the edge were the ability to significantly improve a process (65%) and the ability to perform real-time analysis of the data generated there (54%). This makes sense, as bringing data back to a centralized location often incurs too much latency to have an immediate impact on a process.

Furthermore, we wanted to understand what influences an organization's decision-making process regarding where applications are deployed. We found some of the top considerations included the cost of deploying physical infrastructure (55%), the benefit of the business insights derived from the data (52%), and the ability to centrally manage edge environments (49%).

¹ Source: Enterprise Strategy Group Complete Survey Results, [Distributed Cloud Series: Digital Ecosystems](#), August 2022. All Enterprise Strategy Group research references in this showcase are from this survey results set.

Figure 1. Criteria for Edge Deployments

Source: Enterprise Strategy Group, a division of TechTarget, Inc.

It is important to understand that organizations don't want to build out new data centers at the edge but rather deploy the minimal amount of infrastructure required to process the data. Given the need to connect to all the devices generating the data and for corporate and cloud locations to have cost-effective, reliable connectivity to these edge sites, it is important that the network environment is able to support both current and future requirements to deliver the desired outcomes.

The Network Plays a Critical Role

The network has always been instrumental in connecting edge locations to centralized data centers or public clouds. However, with organizations deploying applications to the edge, the network's role takes on an increased level of importance in collecting and processing data at the edge. More specifically, organizations need to ensure their network can accommodate all current and future requirements, including:

- Flexible, per-port bandwidth options to support data growth. With machines, sensors and cameras creating most of the data at the edge, an organization's network must be able to accommodate this growth at the edge, where the data is collected, requiring more applications to analyze that data. More importantly, the network needs to accommodate data growth without ripping and replacing the network infrastructure with high-capacity switches.
- A sufficient number of Power over Ethernet (PoE) ports to support current and future demand for power devices. As organizations deploy additional IoT and IIoT devices, it is extremely beneficial to be able to leverage PoE, PoE+, and PoE++ ports on the network switch to power digital security cameras, point of sale devices, digital signage, and sensors over the ethernet connection, eliminating the need for power outlets. In addition to the IoT devices, additional ports would also be needed to connect and power Wi-Fi access points.
- SD-WAN to transport insights and processed data. As mentioned, edge environments need to be connected to both private data centers and public clouds. SD-WAN technology has proven to be highly effective in enabling organizations to leverage bandwidth from multiple service providers while prioritizing and segmenting applications to ensure performance for critical apps and to minimize risk. While data is collected and processed at the edge, it does not remain there. The majority of organizations (54%) only keep data at the edge for up to one week, often transporting it back to a centralized data lake or data ocean for more comprehensive or historical analysis.

- Greater operational efficiency leveraging common network management. Skilled IT resources are scarce in edge environments, so it would be beneficial if the network devices could be controlled with a common management platform also used in the corporate data center and/or cloud. This will facilitate not only Day 0 and Day 1 activities, but also all Day 2 activities.
- A minimal footprint with maximum ports. Space for IT infrastructure is often very limited in edge locations, so network devices need to have high density port counts to enable organizations to deploy fewer networking devices. As noted, having multi-rate ports provides investment protection and eliminates the need to add additional network devices or rip and replace existing technology.
- Energy efficiency. In addition to being short on space, these edge locations are often power constrained. Network devices must demonstrate the lowest possible power per Gb. It should be noted that power availability is not the only factor here; as organizations put more effort into sustainability or environmental, social, and governance (ESG) initiatives, the ability to deploy energy efficient infrastructure will become increasingly important.

Dell Edge Networking Solutions

Dell Technologies is a leading provider of IT infrastructure for data centers, public clouds, and edge environments. Dell has developed network solutions specifically for edge environments, including:

- Dell PowerSwitch E3200-ON series. This is a new switch series with 1Gb and 10Gb versions of its first model, the E3248P-ON and E3248PXE-ON. This series has been designed to meet the dynamic needs of modern edge environments. The switches provide:
 - Multi-rate support. The switches can scale to meet increasing data growth, with the E3248P-ON supporting 48 10/100/1000Mbps ports with four-port 10Gbps and two-port 100Gbps uplinks and the E3248PXE-ON supporting 48 1/2.5/5/10Gbps ports with four-port 25Gbps and two-port 100Gbps uplinks. This flexibility provides organizations with investment protection, as the switches don't have to be replaced to accommodate additional bandwidth.
 - PoE. Both switches provide autosensing standards-based PoE in each port. The E3248P-ON delivers up to 30 watts (W) and the E3248PXE-ON delivers up to 90W to accommodate Type-4 devices. Organizations can select which switch best fits their needs based on the types of devices they are supporting today and those they will be supporting in the future. Typically, Wi-Fi 6/6E access points, point of sale devices, and digital signage require Type-4 devices.
 - Power efficiency. Most edge sites have limited power and cooling capabilities, so organizations require energy efficient IT solutions. Since space is typically at a premium, keeping the device footprint to a minimum is helpful. The high density, 48-port E series switches fit into one RU and have the ability to leverage up to two internal power supplies units, as well as a third external unit to accommodate consumption and redundancy.
 - SONiC capability. The -ON in the E-series switch stands for Open Networking, which Dell has supported since 2014. The E-series deploys the latest generation technology supporting Enterprise SONiC Distribution by Dell Technologies at the edge. This will enable enterprises to run SONiC in the data center and leverage those resources to manage the edge environment using a common management platform. Given the scarcity of skilled IT resources at edge locations, the E-series' SONiC capability drives operational efficiency.
- Dell Virtual Edge Platform (VEP). This technology was created to enable edge environments for SD-WAN or as universal customer premises equipment (uCPE). Leveraging Intel CPUs, the VEP's open platform can host different network and security solutions, reducing hardware complexity at the edge. Dell has an ecosystem of partners that provide a range of solutions depending on the customer's need. The VEP enables organizations to have:
 - Flexible SD-WAN/SASE options. Leveraging the VEP and preconfigured and validated solutions from VMware and Versa enables organizations to quickly deploy an SD-WAN or SASE solution. Additionally, by selecting ESXi or ADVA software, organizations can access as many as 60 different virtual network functions that can be deployed in an edge environment.
 - Proven technology. Dell partners like Verizon use Dell VEPs for the uCPE they deploy in their customers' locations.

- **Full Stack Edge Solutions.** Dell Technologies has more than just networking solutions for the edge. Dell has a full portfolio of compute, networking, storage, streaming data platforms, gateways, etc., to build an edge solution to fit the needs of an organization's unique business. This includes solutions for manufacturing, retail, healthcare, transportation, telecom, and more. By working with Dell and their partners to provide a complete, fully validated solution, organizations can accelerate the time to deploy a solution and recognize the value from it.
- **Global service and support.** Given that edge environments are typically distributed regionally, nationally, or globally, working with a company that can fully service and support these distributed locations is critical for an organization's ongoing success. Dell Technologies' service and support teams cover over 160 countries globally.
- **Financial assistance.** Dell Financial Services assists customers to deploy the solutions they need today to meet their business needs in a challenging macroeconomic environment.

Conclusion

Organizations are rapidly building out edge computing environments to harness real-time business insights and provide better products, differentiated experiences, and streamlined processes.

To do this, organizations need IT infrastructure capable of supporting the applications they deploy to the edge without being overly concerned about the cost and operational aspects of edge computing environments. Given the role the network plays in collecting, processing, and transporting the data, it's important that organizations get the network architecture right the first time. This ensures reliable data collection and that there is sufficient bandwidth to send the data back to the appropriate data repository.

Dell Technologies offers a robust edge networking portfolio that includes the new PowerSwitch E3200-ON edge switch series and proven VEP technology. In addition, organizations can affordably leverage Dell Technologies for full stack solutions at the edge and take advantage of their global service and support.

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