DELLTechnologies

BREAKING THROUGH WITH DATA AT THE EDGE:
How real-time data makes the impossible possible

Real-time data captured at the edge is transforming customer experiences across industries, resulting in explosive business growth. However, to effectively capture real-time data at the edge, businesses must overcome a few challenges - most notably speed, scale and security.

Speed: real-time data is often only valuable for a few seconds or less before it's no longer useful.

Scale: data is being generated in more places than ever and IT infrastructure must be able to keep up and adapt to its changing needs.

Security: there is a vast amount of data in unsecured locations, some of which may include private or business-sensitive details.

The design of an effective edge computing strategy can solve these problems. With computing power at the edge, organizations can run intelligent analytics on data right where it's created, in real time.

"Organizations that have an edge strategy in place are already seeing significant improvements to business outcomes like productivity," says Gil Shneorson, senior vice president of edge solutions, Dell Technologies. "By unlocking access to real-time insights from edge data, businesses can do things that would have been impossible just a few years ago. From the latest 'just walk out' retail technologies that require zero checkout to automated manufacturing systems that proactively identify improper use of safety gear in a factory resulting in near-zero risk to workers, the right edge strategy can transform your business."

Deriving insights—and responding to these insights in milliseconds—requires infrastructure at the edge that can analyze and sort data without sending it elsewhere for processing. To be successful, organizations must simplify their edge with a simple and unified approach.

However, edge computing requires an IT team that's comfortable with paradigm shifts. It's a technology, people and process challenge all rolled into one—but it's worth the effort. Here's what CIOs need to know to capitalize on their data where speed matters most.

Dell's Breakthrough study, based on 10,500 respondents from 40+ countries, uncovers some of the **barriers to edge computing, in IT specifically and throughout the organization:**

52%
of IT decision-makers say they might be left behind because they **don't have people with the right skills** to shift to a hyper-distributed model

51%
of IT decision-makers fear their organization might be left behind because they'll **struggle to adjust their processes** to support new technologies

49%
say they might be left behind because they **don't have the right technology** to shift to a hyper-distributed model
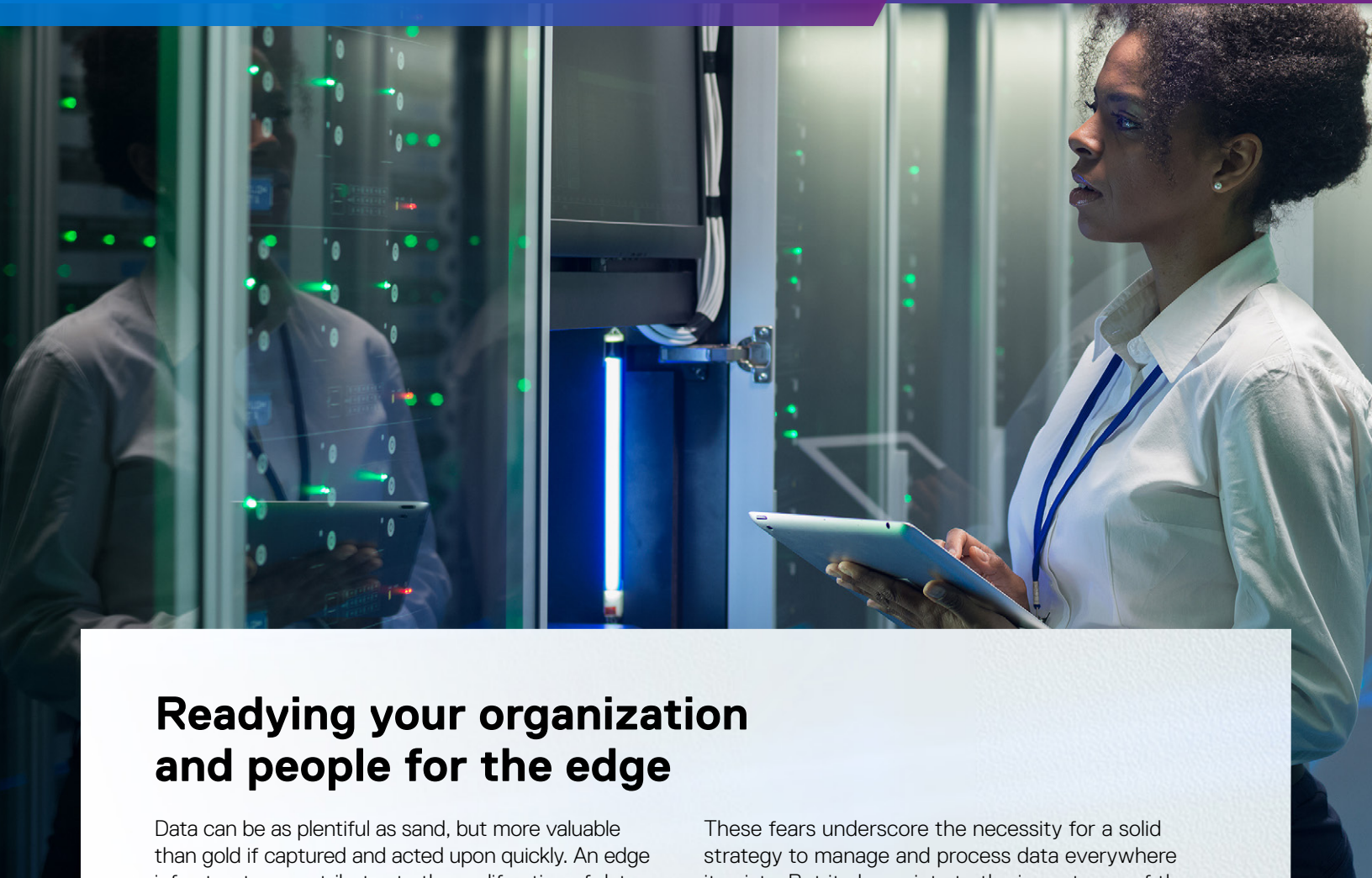
Readying your organization and people for the edge

Data can be as plentiful as sand, but more valuable than gold if captured and acted upon quickly. An edge infrastructure contributes to the proliferation of data. It takes organization and planning to get the value from the data without getting buried in the sheer volume.

According to our Breakthrough study, 56% of workers fear a hyper-connected world. They worry they'll be overwhelmed by the velocity, volume and variety of data. What's more, they fear all that data will create mundane data discovery work that will lower morale and waste human resources.

These fears underscore the necessity for a solid strategy to manage and process data everywhere it exists. But it also points to the importance of the human element.

An organization needs people that have the expertise to implement an edge strategy, the enthusiasm to embrace change and the ingenuity to act on the insights.

Customer example showcasing the immense benefits of the edge:
Sentara

→

To move forward, you need a unified approach to simplify your edge. These should be your north stars:

Generate insights when you need them: With real-time data analysis and processing at the edge, your organization can act faster. Generate insights instantly and support your data management, AI and analytics operations wherever they perform best. Choose infrastructure optimized for AI and data analytics.

Consolidate as you expand your edge: As you expand your data analytics capabilities at the edge, you can avoid the creation of data, management, and operational silos by modernizing your edge technology foundation with consistent hybrid cloud architectures, operations, and management to enable you to easily scale.

Bring intrinsic security to the edge: Distributed applications, data and infrastructure expand your attack surface and can create operational inefficiencies that hinder your employees' abilities to innovate. Standardize intrinsically secure, trusted and automated technologies across your environment, so you can expand your edge faster with greater confidence, control and visibility.

Q **As CIO, it is up to you to formulate a winning strategy to capitalize on data at the edge. To do this, you will need to answer some important questions:**

▶ Do you have an edge plan that takes you all the way to innovative and sustainable data-driven outcomes for your organization?

▶ How are you connecting your edge to the core and cloud?

▶ How do you intend to reduce the management and data burden of operating across many edge locations?

Speed: Generate insights where you need them

With real-time data analysis and processing at the edge, you can act faster to drive differentiated and sustainable outcomes.

Choose infrastructure optimized for AI and data analytics to maximize the value of your data everywhere it lives, with simplicity, speed and scale.

Duostech uses edge processing for freight cars on the go

Speed and simplicity drove the team at Duostech to explore edge computing. The organization's inspection portals are built over railways to scan freight cars with lidar, infrared, and visual cameras while the train is at top speed.

The system captures images from all four sides of each train car, then transmits the data to onsite servers for AI analysis. Customers rely on receiving this analysis within five minutes of its acquisition; edge processing makes that possible.

Sentara speeds up response times to save lives

When it comes to healthcare, seconds — even milliseconds — matter. Sentara employs edge processing to reduce response times, increase efficiency and empower quick decision making.

The organization now has an infrastructure with sub-millisecond response times, helping to save millions by increasing IT efficiency. For example, a report that previously took 15 hours to run now takes only 2.

Manufacturing uses edge processing to detect defects and keep workers safe

Edge is transforming manufacturing. Innovative manufacturers are gathering, analyzing and instantly acting on information flowing in from devices, sensors, assembly lines and other data sources in their factories and supply chains.

Already, computer vision solutions that capture and analyze real-time data can recognize defects at faster rates than humans can.

Welding and welding quality checks are being improved with self-adjusting high-precision robot arms that learn from feedback based on quality data fed into artificial intelligence/machine learning applications.

"Co-bots," such as autonomous mobile robots, carry parts and assemblies to where they are needed, saving workers time, improving process flows, and reducing physical labor and the risk of injury.

Modern companies are deploying extended reality technologies to immerse workers in virtual spaces where they can observe and practice new tasks in a safe environment, without impacting production operations.

These examples only touch on the potential that edge computing has to make manufacturing infinitely safer, more economical and productive.

Q To realize edge's value, consider these questions:

▶ How are you maximizing the value of your data with AI?

▶ How can you generate insights at the appropriate location for where the data is needed?

▶ As you prepare to meet data where it lives, how are you concurrently reviewing your data management strategies: i.e., looking deeper into the performance stack to re-architect how you process and use data, consolidating your data lakes, and reviewing your data back-up methods?

Scale: Consolidate as you expand your edge

One major hazard to scaling edge successfully: complexity.

Many edge solutions create silos because they are designed to solve single problems, not scale to address multiple use cases.

This complexity comes with a hefty management burden for IT teams, monopolizing time and energy, leaving little of either for more innovative work. And, of course, complexity begets further inefficiencies.

It doesn't have to be this way. You can be intentional about pursuing an edge infrastructure, expanding to include new locations and new use cases, while at the same time consolidating your operations, data stores, and infrastructure as you go. Choose a partner that can meet you where you need them (locally, regionally, or globally) to build edge foundations that start small and scale horizontally as your workloads grow.

For instance, grow your IT solutions and operations as you expand your data analytics capabilities at the edge. In so doing, stay focused on eliminating single points of failure and silos and as a byproduct, you will reduce your overall IT footprint.

Merging multiple edge use cases onto a modern technology foundation will maximize the value of your data across use cases, sites and clouds. For example, click through to see how La Poste used this strategy to do more with less.

Q When expanding your edge, consider these questions:

▶ How are you planning a consistent architecture and leveraging intelligent automation to reduce the management burden of edge locations?

▶ Does your edge foundation enable the following:

- ◆ IT/OT convergence
- ◆ Edge application modernization
- ◆ Data services that span edge to cloud

▶ How are you ensuring the infrastructure at the edge functions reliably under multiple physical and environmental constraints, which might include large temperature gradients, dust, moisture and physical shock?
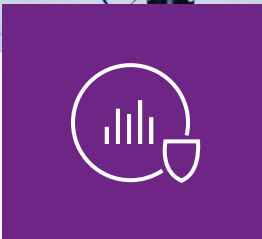
Security: Bring intrinsic security to the edge

The proliferation of connected devices and applications is happening now and will only continue to increase over time. Distributed applications, data and infrastructure expand the attack surface for bad actors.

According to Breakthrough,

72%
of IT decision-makers fear their business will be exposed to cyberattacks, given the increase in attack surface.

It is vital to make intrinsically secure, trusted and automated technologies, across your environment, a standard operating practice. Part of the solution is using encrypted data tunnels, firewalls and zero trust access control to secure your operational environments. You'll need to secure applications beyond the network layer as well. That security should encompass proactive threat detection and patching.

Q **There are three layers of security at the edge: physical, operational and application. As you draw up a strategy to secure all three layers, consider the following:**

▶ At the edge, servers and other IT infrastructure are likely to be housed in a utility cabinet, under a desk or at a remote location with no regular IT staff on-site. How are you controlling infrastructure and devices throughout the end-to-end lifecycle and preventing access to people without permissions?

▶ At an operational level, edge environments tend to lack dedicated IT staff, and servers and devices are often deployed and maintained by nontechnical personnel. How are you spinning up infrastructure and securing the environment?

▶ Data travels far and wide at the application level. How are you securing external connection points while allowing application traffic from known resources only, without compromising functionality?

Living on the edge

Across industries, edge is the link to connect data to actionable value. For retail, the edge is the point of transaction, whether that is the store or mobile device. For manufacturing, it's the assembly line in your factories. In healthcare, it's in the ambulance and examination room. If you're in agriculture, it might be out in the fields. Regardless of the industry, or edge location, the conclusion remains the same - speed and precision are critical.

Dell Technologies is committed to helping you discover your unique data advantage at the edge. As a trusted, end-to-end partner, we can simplify your edge so you can generate more value from your data. We bring scalable infrastructure and applications closer to where data is captured and curated for intelligent use. We can help you architect and operate your edge for maximum efficiency and embed resilience and security throughout.

Learn more at dell.com/cio

Learn more about the Breakthrough study at dell.com/breakthrough

Learn more about simplifying your edge at dell.com/edge

D∈LL Technologies