Four considerations on the road to edge computing

Edge computing has been gaining a great deal of traction over the past few years. Moving the location of the computing process closer to the source — and use — of the data in question enables faster decision-making.

Lenovo's recent survey of IT executives and managers[1] found that edge computing solutions are an urgent priority, and their deployment is on a fast track.

Retailers, for example, are implementing automated checkouts, dynamic signage, and real-time store monitoring for traffic, inventory, and fulfillment. Manufacturers are further automating assembly lines with predictive maintenance alerts and utilizing smart cameras for safety and quality inspections. Healthcare is leveraging edge computing for remote patient monitoring and medical device integration. The edge is becoming more critical and complex than ever. In fact, it's estimated that by 2025, 75% of enterprise-generated data will be processed at the edge.[2]

However, despite numerous implementations and proof-of-concept projects in the works, edge computing is still a relatively new arena. Standards are few and far between since the majority of early implementations have been "one-offs" developed in-house or by SIs and ISVs to meet specific application needs.

Deploying edge solutions that deliver measurable ROI and lasting value requires careful consideration and planning.

In that spirit, we present four considerations on the road to edge computing, based on Gartner's 2021 *Strategic Roadmap for Edge Computing*.

Among Lenovo survey respondents:

59% stated they were looking to implement **new edge computing** solutions within the next 6 months.

82% said **real-time data collection** and analysis were making the most impact on their business.

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CONSIDERATION #1

Finding value at the edge

Why do companies invest in edge computing? The reasons can vary as widely as the applications where edge computing solutions are implemented — improved customer service in a retail setting, more uptime for a manufacturing line, or faster responses to changing patient conditions in an ICU.

In a more general sense, according to Gartner there are four core imperatives that determine the value of edge computing: latency, bandwidth, security, and autonomy.

Latency. One of the most often cited reasons for deploying edge computing is speed. Moving the compute function physically closer to the source of the data can significantly reduce the time it takes to make critical decisions. In cases like a high-speed manufacturing line, the ability to respond quickly and locally when out-of-spec conditions are detected can be critical.
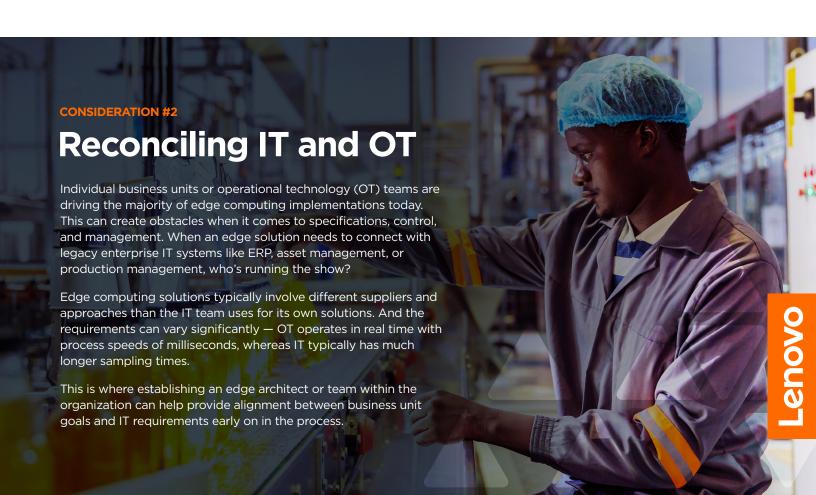
Bandwidth. Processing data locally reduces the amount of traffic to and from the cloud. One client referenced by Gartner reduced WAN costs by half and improved resilience when they implemented an edge solution.
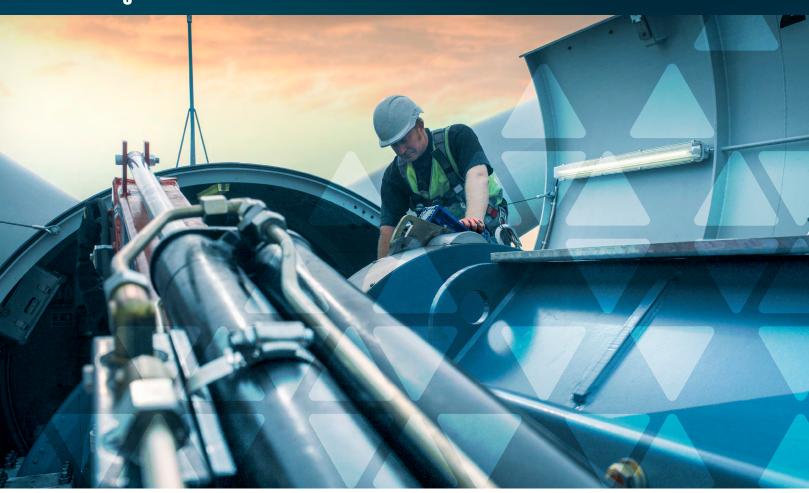
Security. Edge computing also allows organizations to process sensitive information locally rather than sending it out to the cloud. At the same time, edge computing can introduce additional security considerations, which we'll get to shortly.

Autonomy. For devices, processes, or applications that need to operate autonomously, edge computing can be a critical enabling component that allows for faster decisions.

CONSIDERATION #2

Reconciling IT and OT

Individual business units or operational technology (OT) teams are driving the majority of edge computing implementations today. This can create obstacles when it comes to specifications, control, and management. When an edge solution needs to connect with legacy enterprise IT systems like ERP, asset management, or production management, who's running the show?

Edge computing solutions typically involve different suppliers and approaches than the IT team uses for its own solutions. And the requirements can vary significantly — OT operates in real time with process speeds of milliseconds, whereas IT typically has much longer sampling times.

This is where establishing an edge architect or team within the organization can help provide alignment between business unit goals and IT requirements early on in the process.

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Security at the edge

While edge computing can help keep the processing of sensitive data local, edge computing has added complexities of physical insecurity — for example, an increased number of attack surfaces, a lack of end-to-end security solutions, and underequipped endpoint devices.

In many current use cases, traditional security models are being force-fit into edge applications, which can result in vulnerabilities.

That's why incorporating zero-trust models — including hardware root-of-trust options — and implementing a secure access service edge (SASE) should be considered mandatory for edge computing implementations.

Edge security requirements

Zero trust
Operating model where *all* network connections are verified before granting access.

Hardware root of trust
Protective hardware that provides a trusted execution environment for authorized software to operate.

SASE
An architecture that combines wide area networking security with zero trust to identify users and devices to apply policy-based access to data.

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CONSIDERATION #4

Lease or buy?

One of the biggest deployment challenges for edge computing is the absence of broadly accepted infrastructure and operation models. Organizations (or their SIs/ISVs) are forced to piece together edge solutions from still-emerging technology stacks. And the last thing any business wants is to choose the wrong solution and risk an edge solution dead end.

With an edge-as-a-service model, the edge platform — or even the edge applications themselves — are offered through provider-owned and operated assets. The provider can be a communication services provider, a cloud provider, or the SI/ISV. This model can reduce risk and help shield an organization from technical and market volatility.

Consider Lenovo for edge computing solutions

Lenovo is committed to supporting the evolution of edge computing with rugged, reliable, innovative edge computing devices powered by the Intel vPro® platform for industrial computing. Our portfolio of ThinkEdge devices gives you the flexibility to specify what you need today with the value to include processing capacity to grow for future functionality. The same commitment to continuous innovation that drives our global leadership in PC manufacturing provides the foundation for our edge device roadmap.

Lenovo ThinkEdge devices are supported by a growing portfolio of industry-leading ISVs, OEMs, and system integrators delivering devices that become a seamless part of your overall ecosystem. ThinkEdge Certified Solutions Partners include SAS, Microsoft, IMS Evolve, Telit, Iconics, and more.

Visit www.lenovo.com/ThinkEdge today to learn more.

SOURCES

1 Lenovo 2020 survey details

2 Rob van der Meulen, "What Edge Computing Means for Infrastructure and Operations Leaders," Gartner.com, October 2018

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