



# Edge Computing: Services for Manufacturing

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# Executive Summary

**Manufacturers know that machine-to-machine communication and data exchange are nothing new, but the industrial Internet of Things (IIoT) and cloud-based analytics are enabling new methods of optimizing production and delivering services to customers through Industry 4.0 use cases and capabilities.** These opportunities exist where data and connectivity extend beyond traditional boundaries to new audiences and decision-makers. Yet reduced latency, reliability, and data security become risks if this connection is not executed in an intelligent way.

In manufacturing, IDC asserts that a company cannot have a cloud strategy without an edge strategy. This critical exchange addresses the latency, reliability, and security requirements of industrial operations while opening the world of possibilities that remote connectivity offers. The new use cases that edge computing enables can increase Industry 4.0 maturity and support the resilient decision-making necessary to thrive in today's markets.

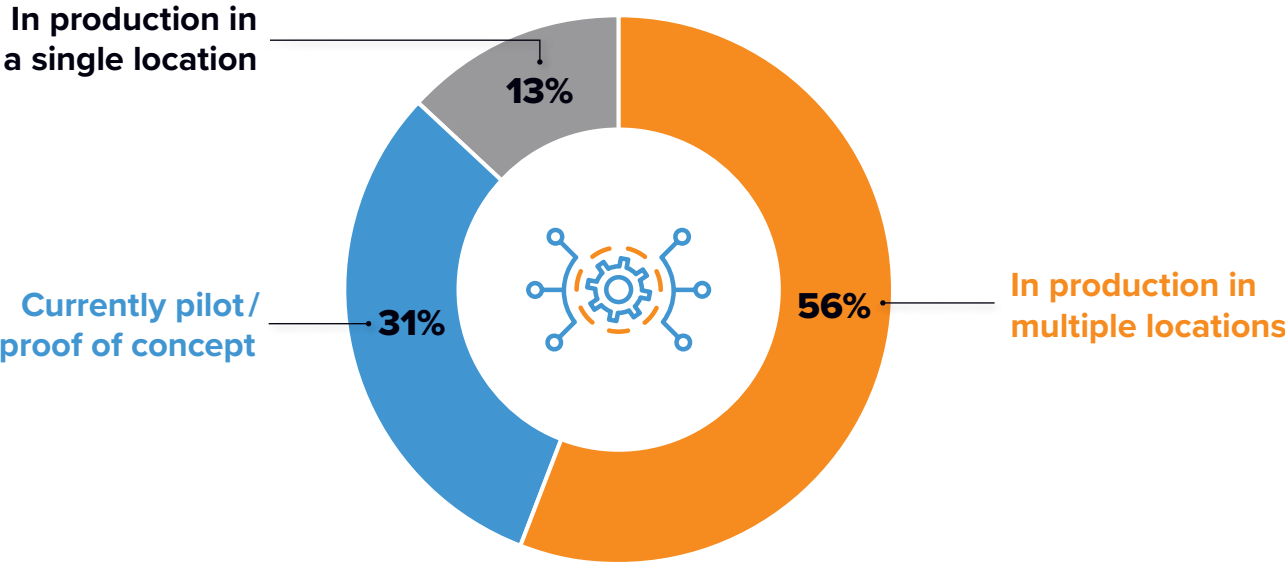
## Key Findings:

- ▶ Optimizing operational throughput is the top outcome to be driven by use cases such as predictive maintenance, quality inspection and assurance, and process optimization, which are enabled by edge-computing initiatives.
- ▶ Security, reliability, and latency are the critical requirements of any Industry 4.0 initiative or use case, and these requirements are directly addressed by edge solutions.
- ▶ Over 75% of edge solutions deployed by manufacturers are either fully managed or comanaged through a services model, enabling greater flexibility and confidence.

# Edge Computing Is Key to Connecting Operational Data and Assets

Edge computing is a distributed computing paradigm that includes the deployment of infrastructure and applications outside of centralized datacenters and public clouds, closer to where data is acquired, analyzed, and acted on.

Q. Which of the following best represents your organization’s adoption of edge solutions?



Note: Managed by IDC’s Quantitative Research Group. Data weighted by GDP. Use caution when interpreting small sample sizes. % corresponds to number of respondents; total will not sum to 100%. n = 335 (manufacturing only), Source: *Worldwide IT/OT Convergence Survey, 2020*

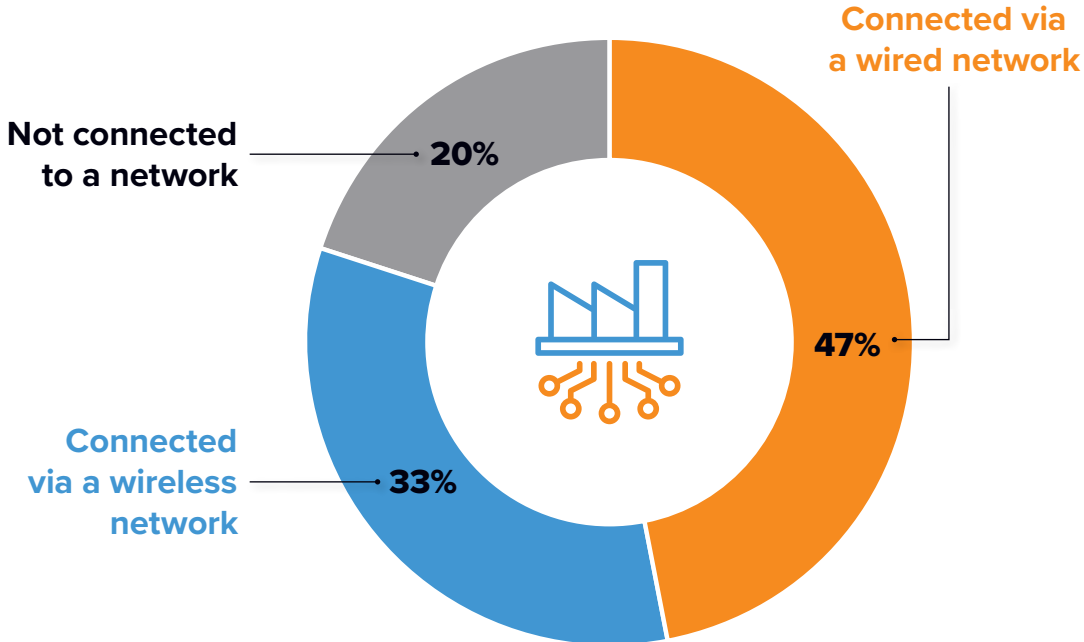
**Operational technology (OT)** is hardware and software that detects or causes a change, through the **direct monitoring and/or control of industrial equipment, assets, processes, and events.**



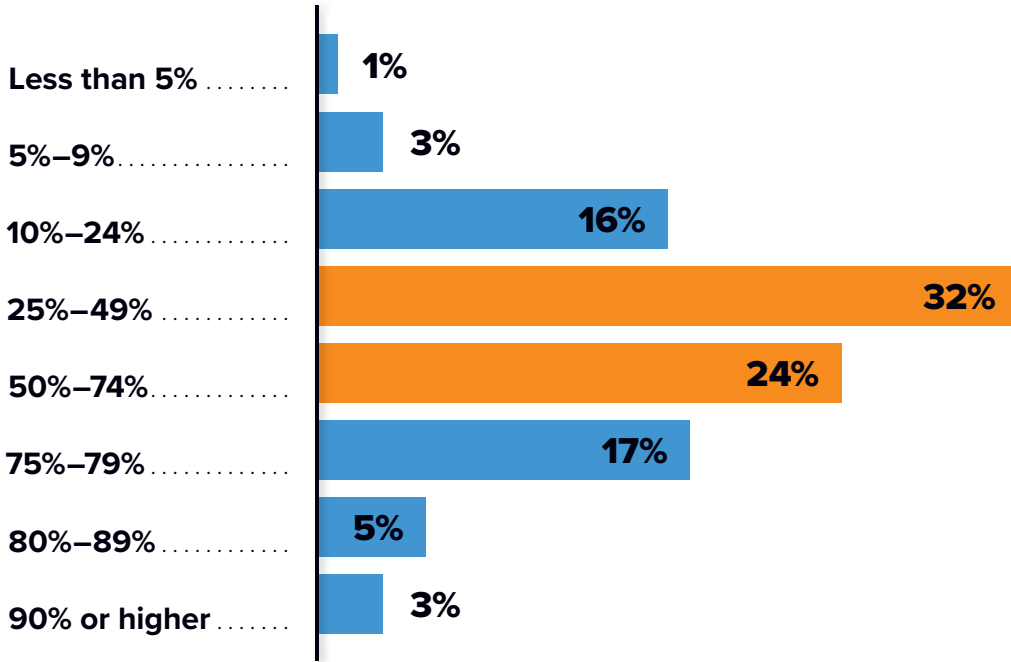
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# Edge Computing Is Key to Connecting Operational Data and Assets *(continued)*

Q. What percentage of the instrumented operational equipment is connected in the following ways?



Q. Thinking about all of your plants/delivery systems/mines/logistics, about what percentage of the operational equipment is instrumented (PLCs, DCSes, sensors, meters, etc.)?



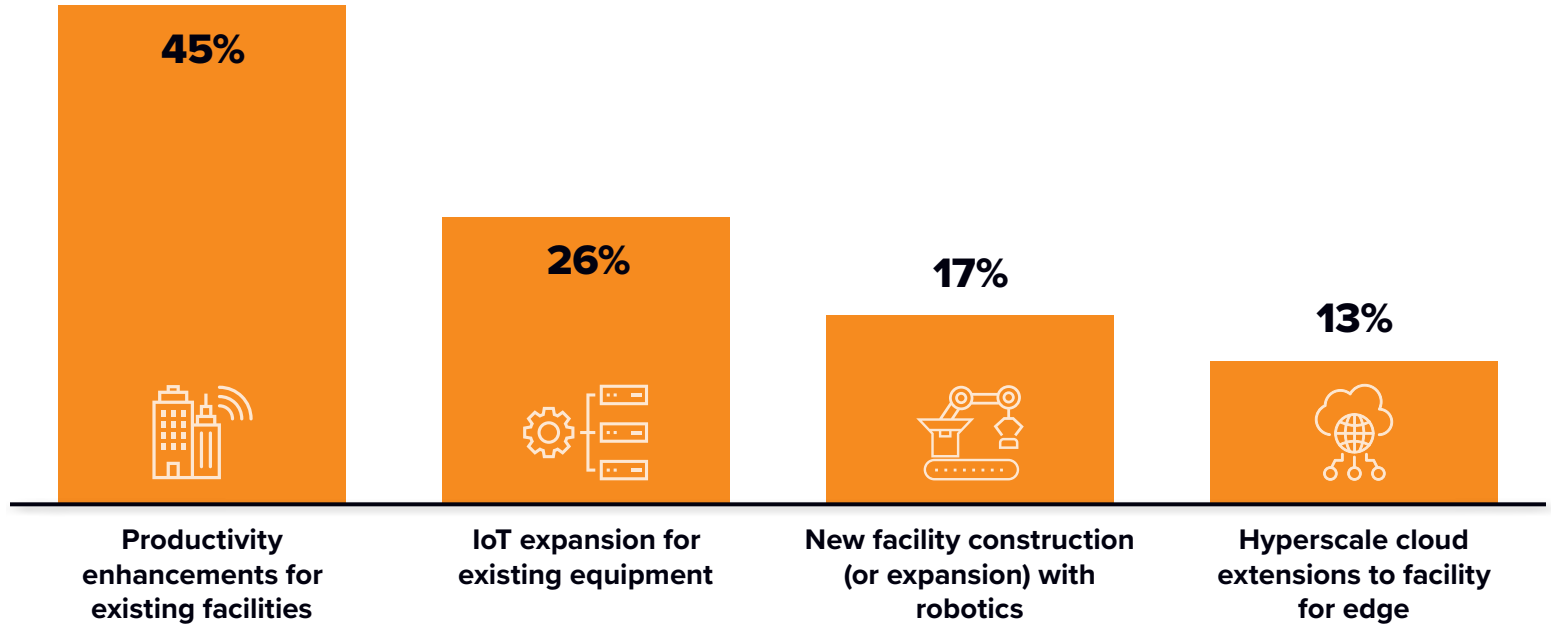
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# Manufacturing Operations Is a Brownfield Edge Setting in Need of IT and OT Integration

This integration advances Industry 4.0 use cases that impact assets and productivity:

- ▶ Predictive maintenance
- ▶ Quality inspection and assurance
- ▶ Production and process optimization

Q. Which use case is the highest priority to your industry?



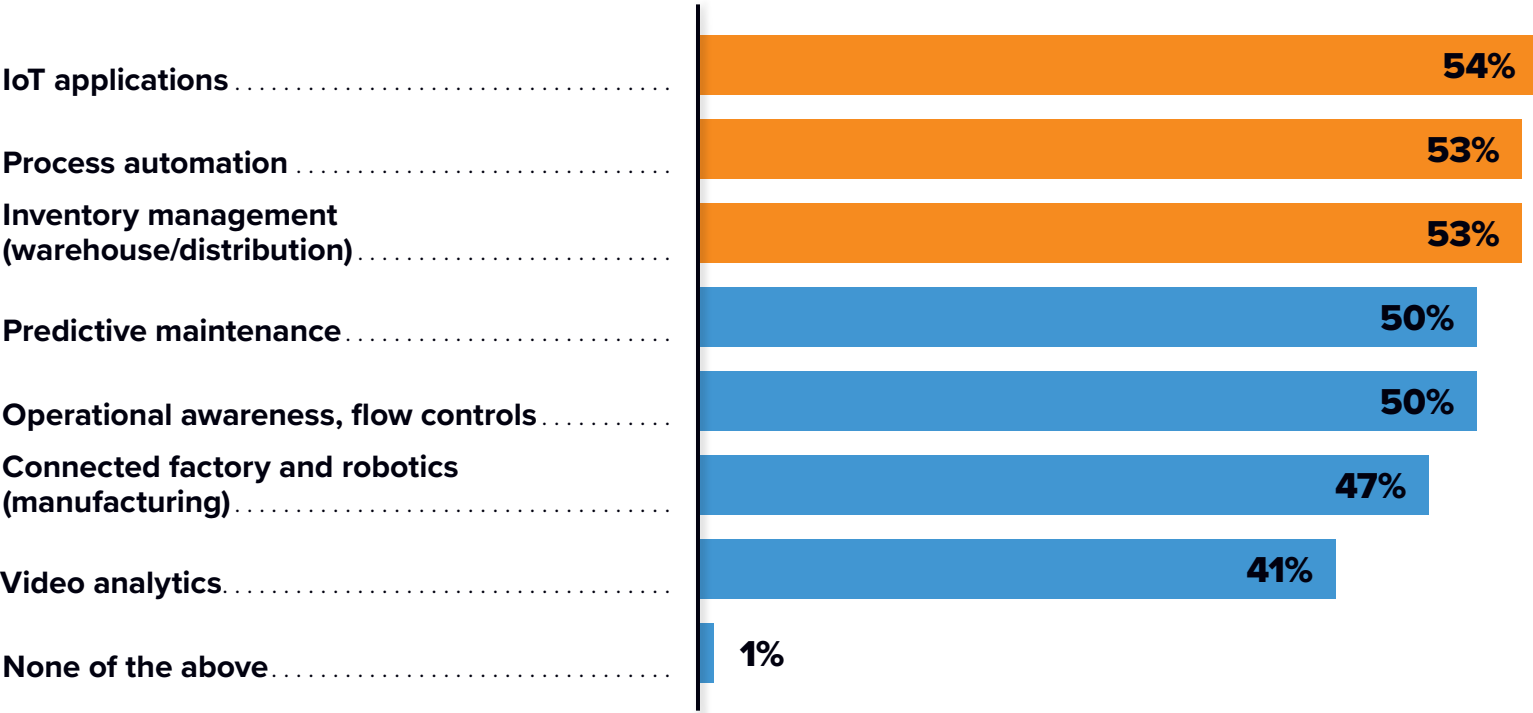
**\$113,099**  
per hour

is the average cost of downtime in manufacturing, according to IDC's 2020 IT/OT Convergence Survey.

Note: Managed by IDC's Quantitative Research Group. Data not weighted. Use caution when interpreting small sample sizes. % corresponds to number of respondents; total will not sum to 100%  
n = 101, Base = all respondents, Source: IDC Edge Services Thought Leadership Survey, September 2020

# Top Industry 4.0 Use Cases Can Be Deployed as a Service

Q. What are the main use cases your organization is considering in regard to intelligent solutions (edge) services?



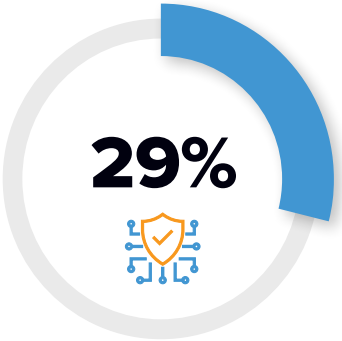
Intelligent solution (edge) services are targeted at asset-intensive or interaction-intensive industries to process data efficiently for key business workloads and very low latency requirements.



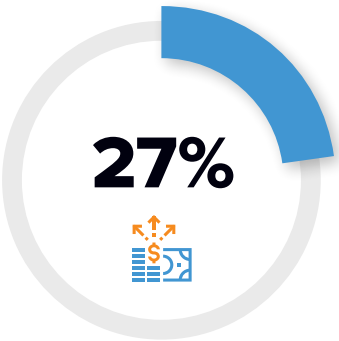
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# Leaders Expect Edge to Offer Security and Lower Costs

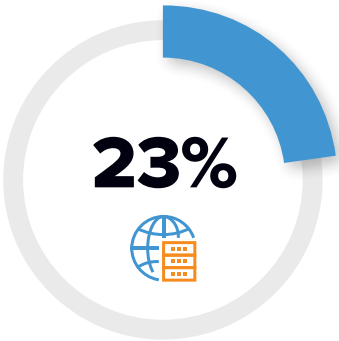
Q. What is your organization’s primary motivation for deploying edge solutions?



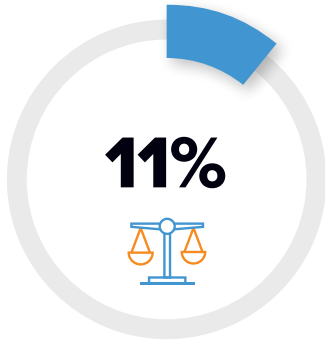
**Security/data protection related to negative impact on operations/applications**



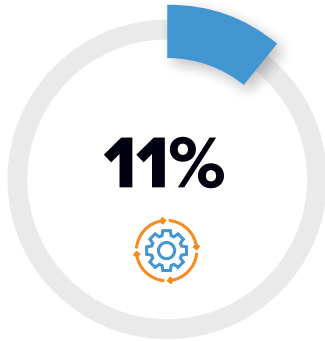
**Cost of bandwidth and centralized infrastructure can be prohibitive**



**Deterministic latency and distance limitations**



**Compliance with sovereign entities and industry regulations**



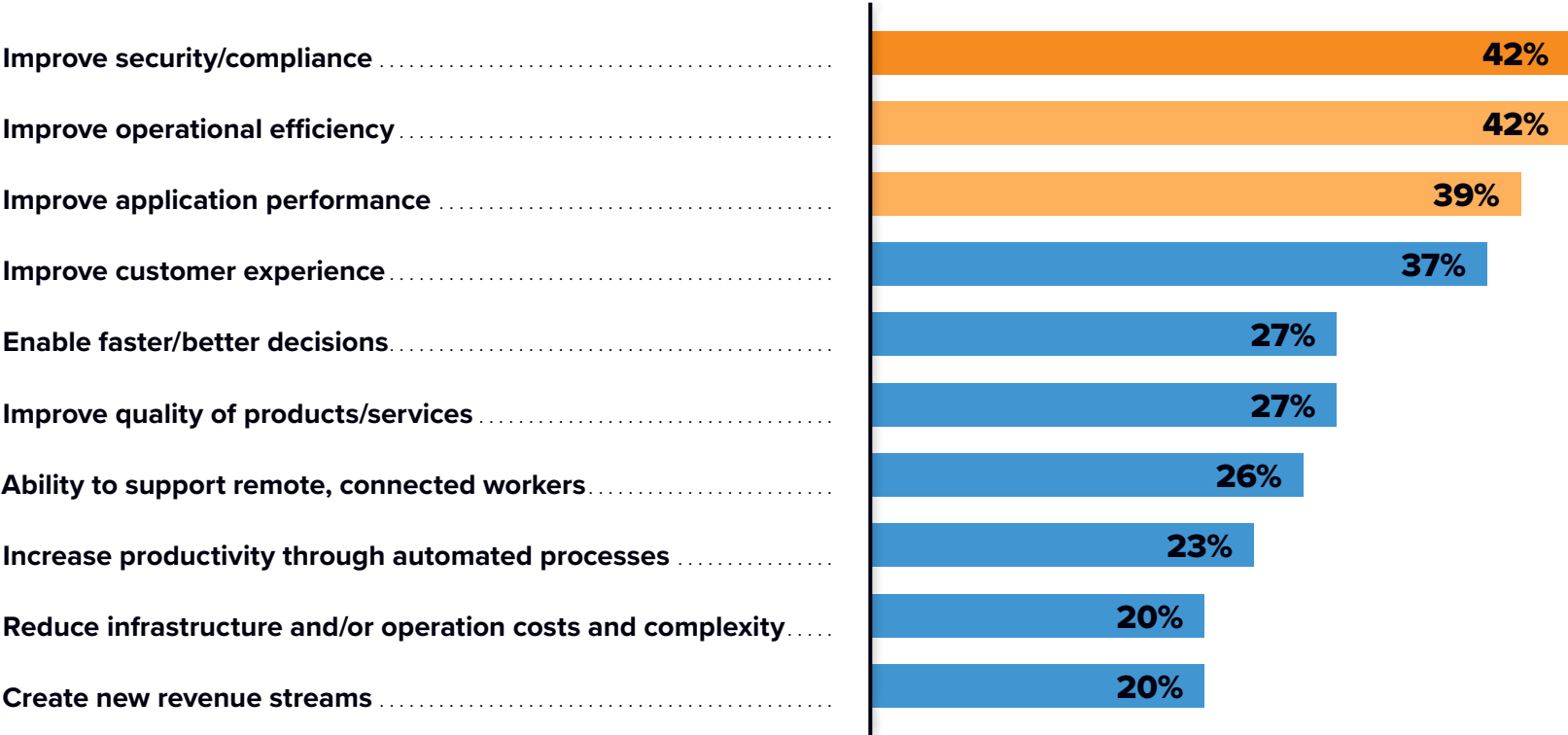
**Continuous operation if network access is interrupted**

Note: Managed by IDC’s Quantitative Research Group. Data not weighted. Use caution when interpreting small sample sizes. % corresponds to number of respondents; total will not sum to 100%. n = 101, Base = all respondents, Source: IDC *Edge Services Thought Leadership Survey*, September 2020



# Security and Data Protection Drive the Deployment of Edge Solutions

Q. What benefits do you expect edge adds/will add to your organization?



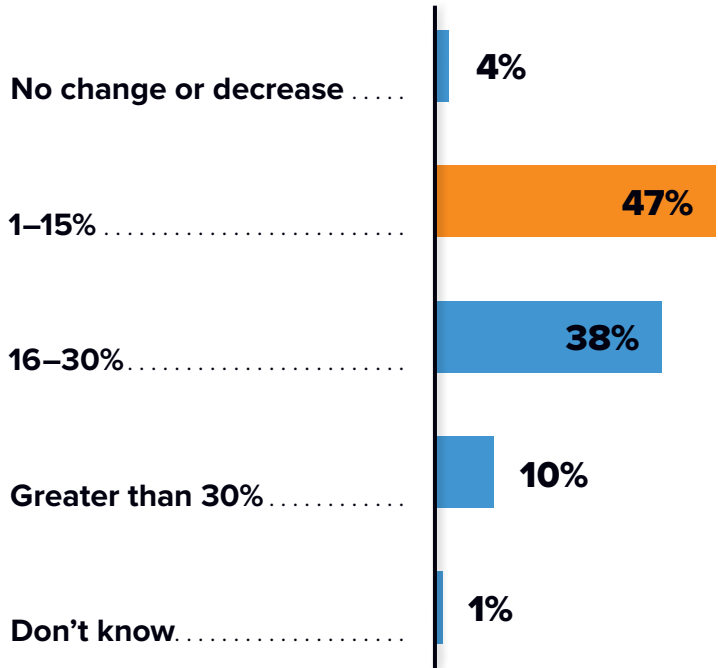
Edge computing offers improved security, latency, and reliability which can provide organizations with operational resilience.



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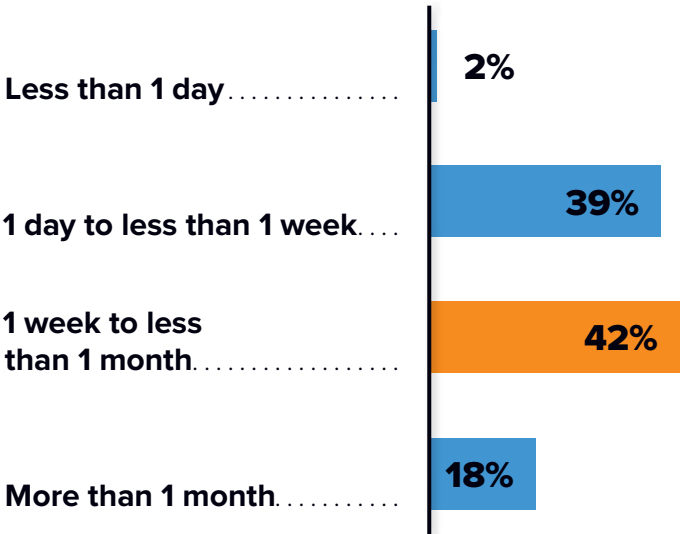
# Growing Amounts of Data Lead to Varied Architecture Choices

Q. How do you expect operational data (TB/day) to grow over the next 12 months?



Note: Managed by IDC's Quantitative Research Group. Data weighted by GDP. Use caution when interpreting small sample sizes. % corresponds to number of respondents; total will not sum to 100%. n = 335 (manufacturing only), Source: Worldwide IT/OT Convergence Survey, 2020

Q. What is the typical retention time for this data at the edge?



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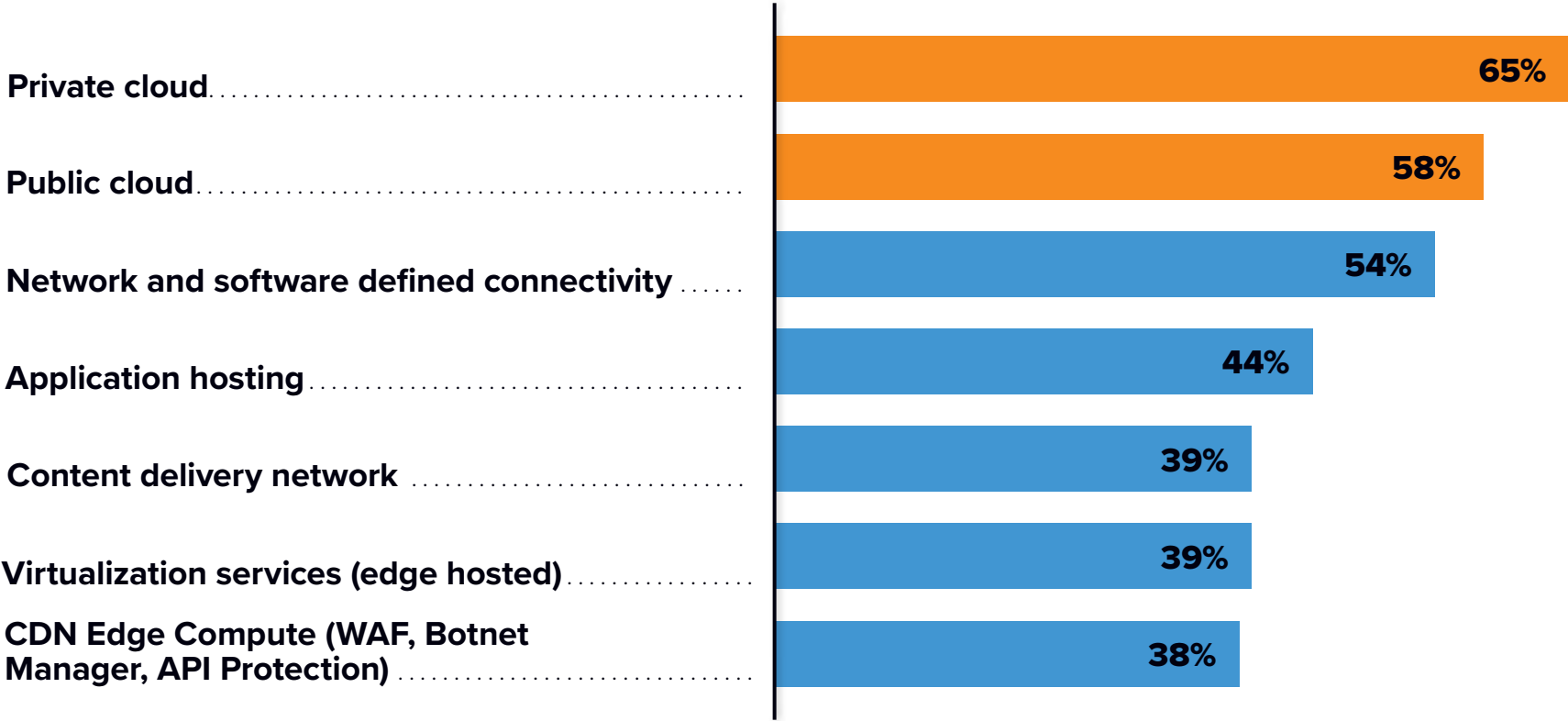
**74%**

of operational data will be **acquired, analyzed, and acted on within the factory**, according to IDC data. This data also enables **cloud-based use cases like remote monitoring and diagnostics.**

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# Growing Amounts of Data Lead to Varied Architecture Choices *(continued)*

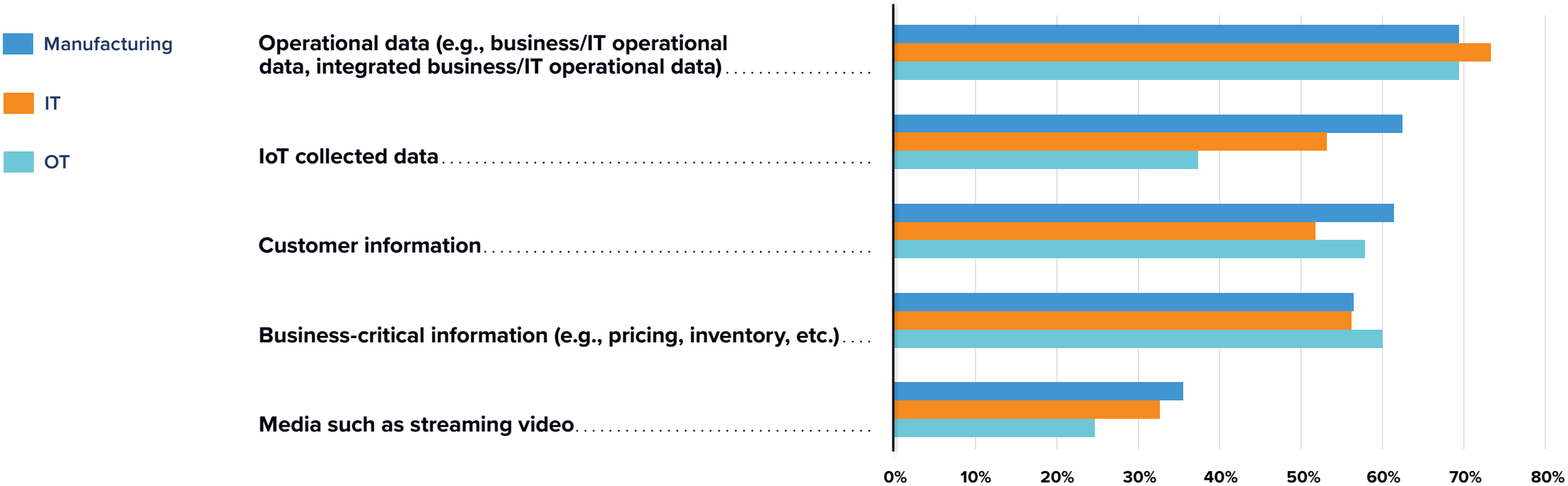
Q. What key enabling technologies are relevant to your environment?



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# A Wide Variety of Manufacturing Data Exists at the Edge

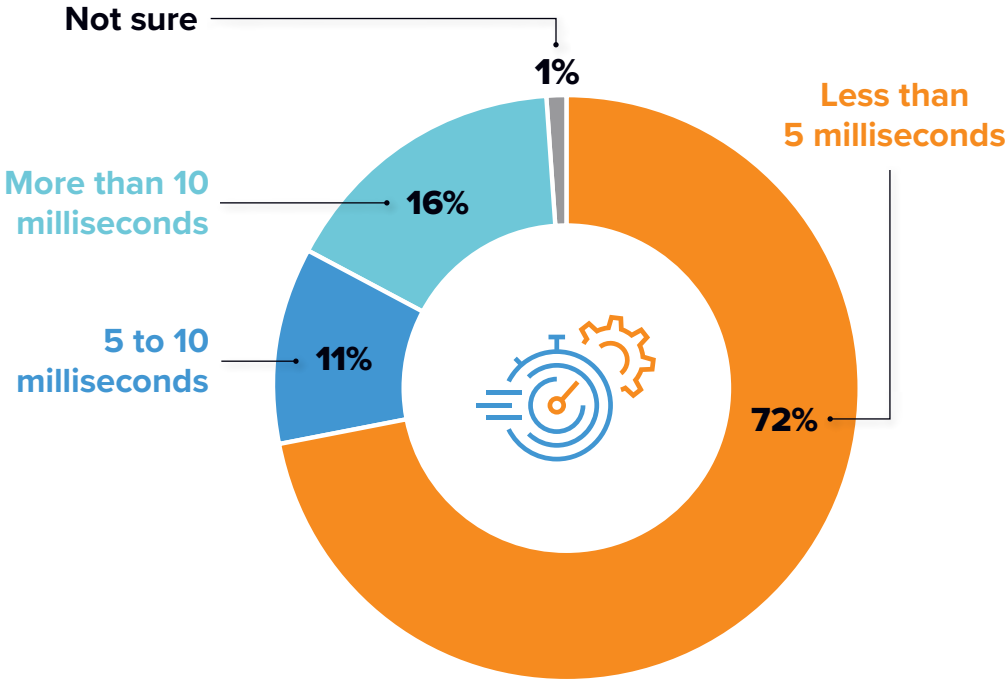
Q. What type of data or information does your organization plan on keeping at the edge?



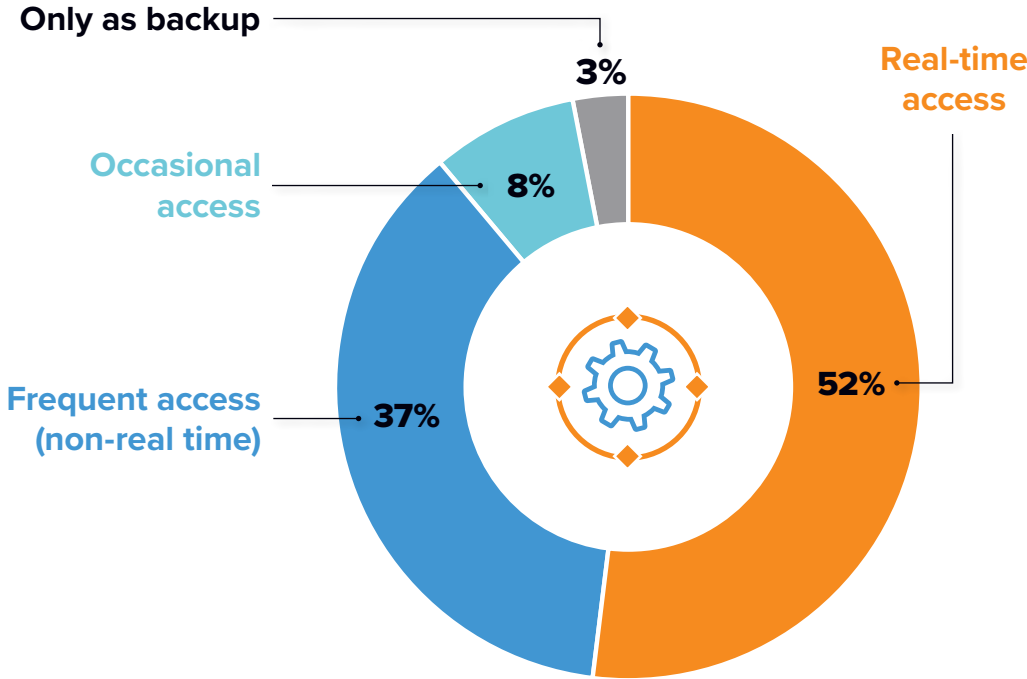
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# Real-Time Data Requires Real-Time Access

Q. What is the maximum latency required for your organization's edge initiatives?



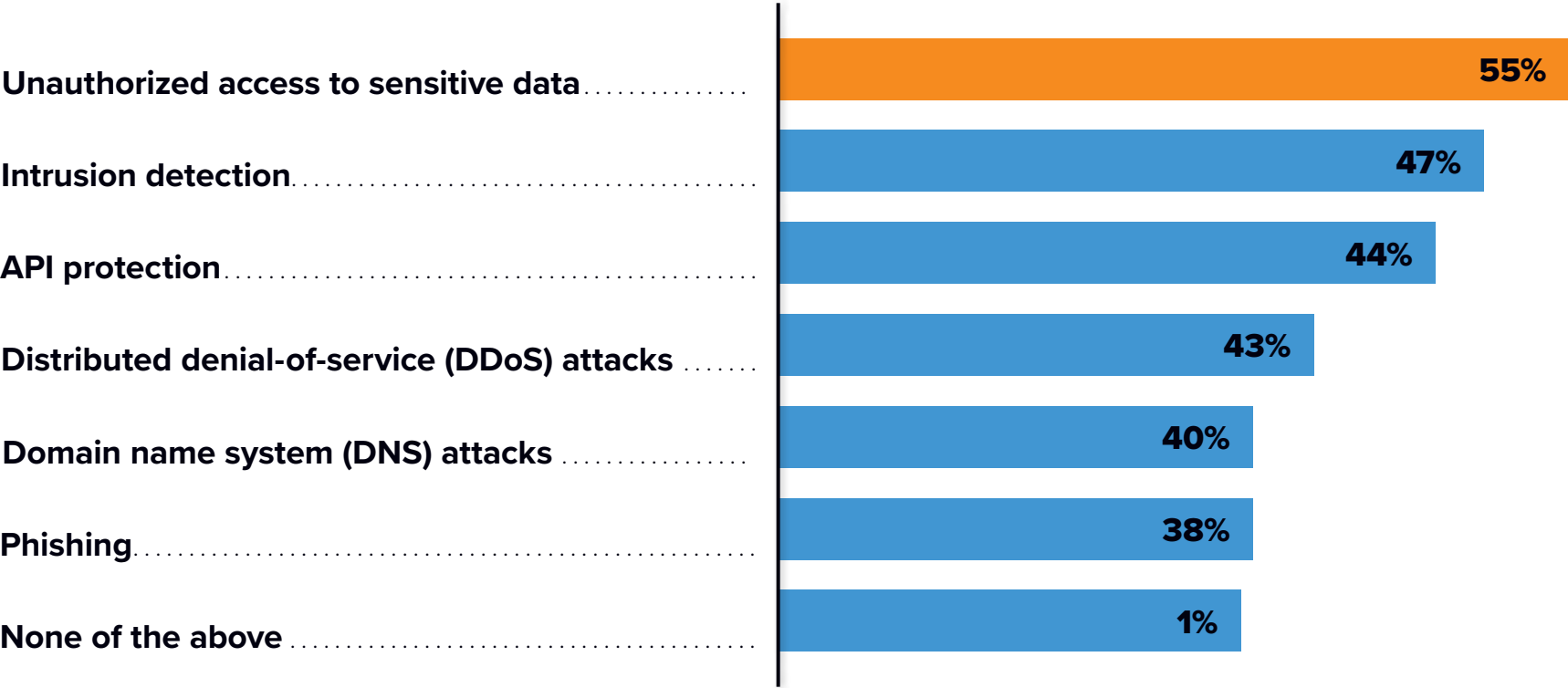
Q. How often do you expect to access this data at the edge?



Note: Managed by IDC's Quantitative Research Group. Data not weighted. Use caution when interpreting small sample sizes. % corresponds to number of respondents; totals will not sum to 100%. n = 101, Base = all respondents, Source: IDC Edge Services Thought Leadership Survey, September 2020

# Cloud-Connected Data Requires Strong Security to Manage Access and Mitigate Threats

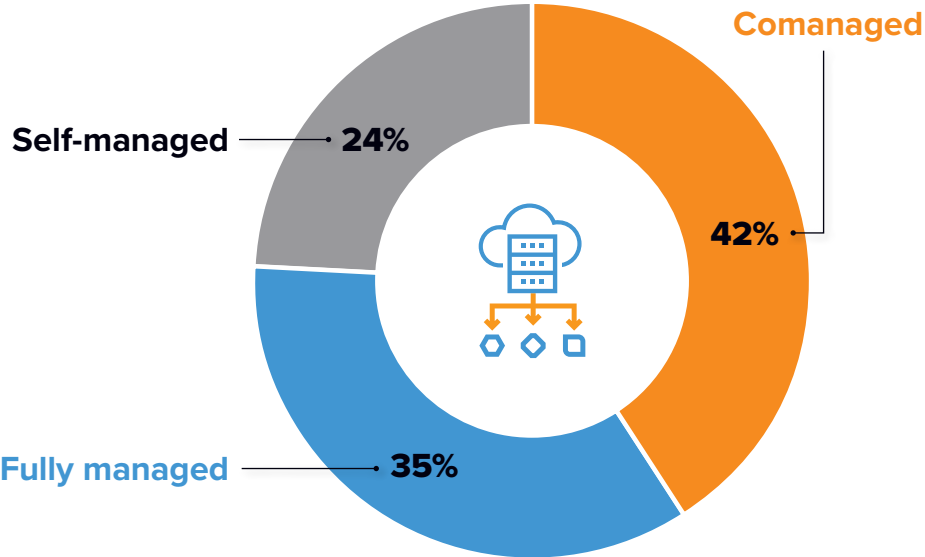
Q. What types of security vulnerabilities are most important to mitigate?



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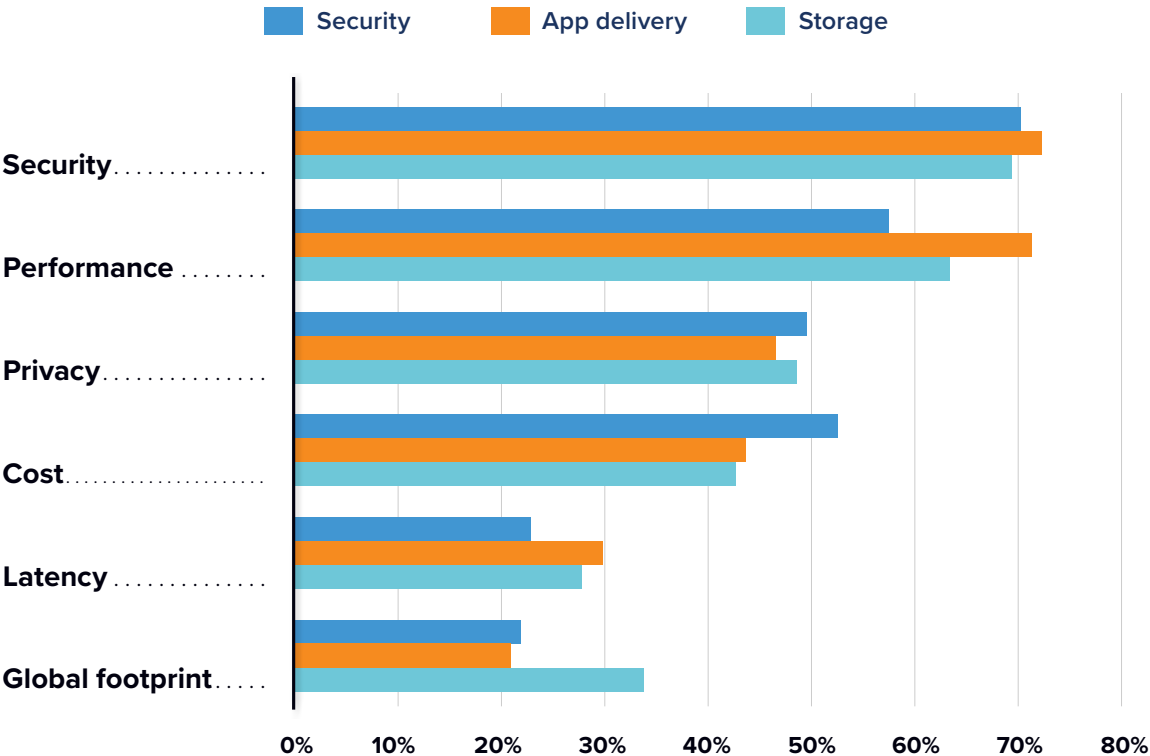
# Secure Edge Services Are Most Often Deployed with a Service Partner

Q. Who manages your organization's edge solutions?



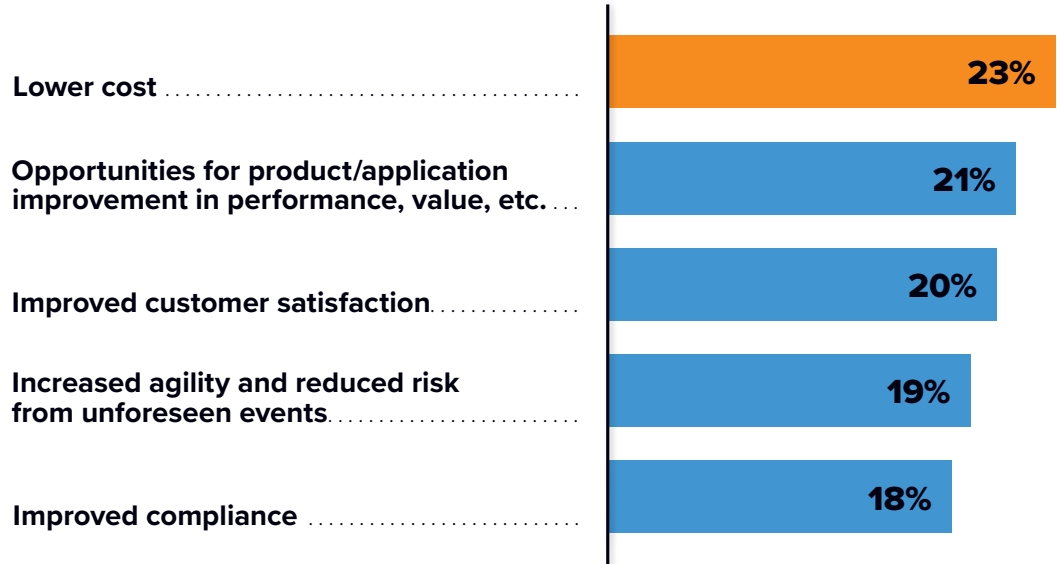
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Q. What key considerations are important to your organization regarding (edge) services?

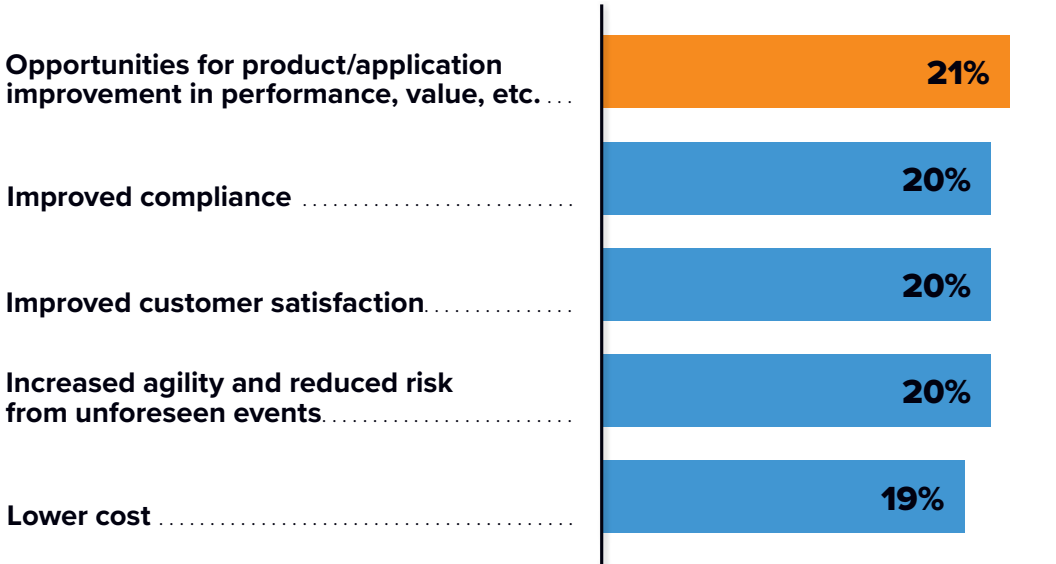


# Edge Services Can Reduce Costs and Complexity While Improving Confidence in Edge Solutions

**Q.** What percentage improvement in the following has your organization realized or expects to realize from storage (edge) services?



**Q.** What percentage improvement in the following has your organization realized or expects to realize from security (edge) services?



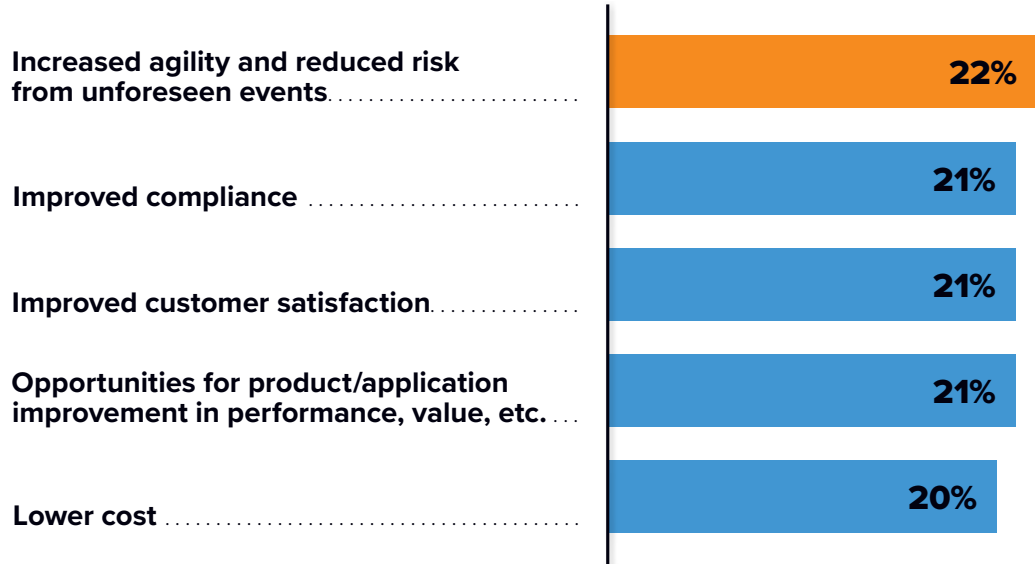
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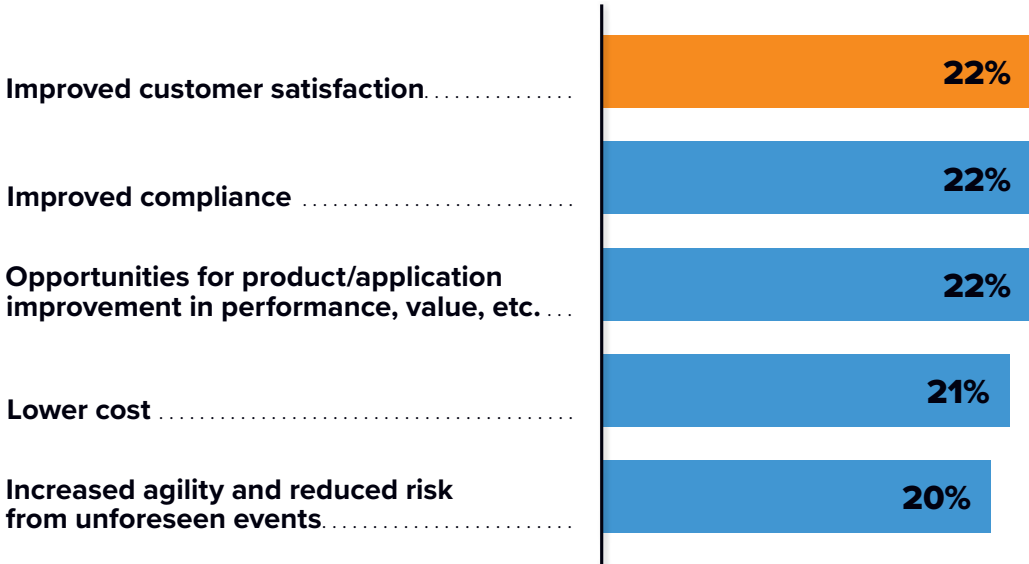


# Edge Services Can Reduce Costs and Complexity While Improving Confidence in Edge Solutions *(continued)*

**Q.** What percentage improvement in the following has your organization realized or expects to realize from app delivery (edge) services?



**Q.** What percentage improvement in the following has your organization realized or expects to realize from intelligent solutions (edge) services?



Note: Managed by IDC's Quantitative Research Group. Data not weighted. Use caution when interpreting small sample sizes. % corresponds to number of respondents; totals will not sum to 100%. n = 101, Base = all respondents, Source: IDC *Edge Services Thought Leadership Survey*, September 2020

# Essential Guidance



**Begin Industry 4.0 initiatives with an assessment of your asset inventory**, including connectivity, security, and instrumentation.



**Include operations and IT stakeholders** to align on infrastructure requirements and to build a data governance and access model that will be adopted and maintained by operations.



**Leverage edge computing to aggregate and broker operational data to cloud and on-site systems** while maintaining the critical operational requirements of security, latency, and reliability.



**Utilize partners in your technology ecosystem for expertise and capabilities** that drive progress and fill gaps through managed services.

# About the Analyst



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Jonathan Lang is Research Manager for IDC Manufacturing Insights responsible for the IT/OT Convergence Strategies practice. Mr. Lang's research focuses on digital transformation strategies in environments where operations technologies are deployed including Manufacturing, Utilities, Oil & Gas and Healthcare Provider settings. As IT capabilities redefine and extend the core value drivers of operations technologies, Mr. Lang's research examines strategies, roadmaps, and governance models to drive this convergence and manage the new data and processes it requires.

[More about Jonathan Lang](#)

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