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Edge Computing: Transforming Government Operations

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Navigating this InfoBrief

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Executive Summary

Network edge locations in government systems can produce huge amounts of data. Sensors, video cameras, scanners, and other connected resources are being added every week, and the amount of data generated by these devices is skyrocketing.

For government, big data is most valuable when it's extracted and analyzed in a timely manner. When this process is automated, recommended action also can be delivered promptly.

Video data in particular can have long transfer times when shuttled to a central location, and other data sources (transactions, local social media, geographical data) can also generate substantial volume. Network latency can be an issue — milliseconds matter for some types of analysis.

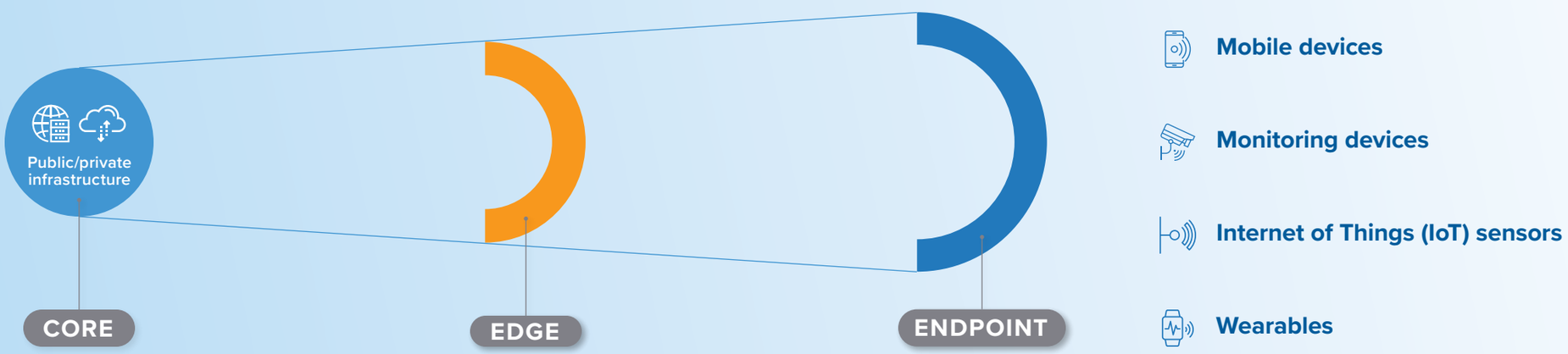
Key Findings:

- Edge systems can extract value and insights from data right at the location where it is generated, even at peak data volume.
- In many circumstances, datacenter-class processing capabilities may be needed at the edge, and advanced data analytics and artificial intelligence (AI) can be a game changer when it comes to understanding data trends.
- AI solutions can interact with, analyze, and enhance decision-making, right near the data source.
- Stakeholders have access to more immediate and richer insights versus what was previously possible.

Edge Computing Can Help Address Public Sector Challenges

- Internet of Things (IoT) devices, including traffic sensors, security cameras, and building security devices, will soon create 95% of the growth in network traffic.
- Edge computing, embedded analytics, and distributed AI capabilities are already growing rapidly.
- Data collection raises multiple privacy, ethical, and legal concerns. Compliance rules for what is retained and how personably identifiable the data is can be built into edge processing.
- Governments are becoming increasingly concerned with how companies leverage consumer data. Edge processing offers an advantage with security and adjustable compliance rules based on location and use case. Edge also facilitates environmental compliance and sustainability.

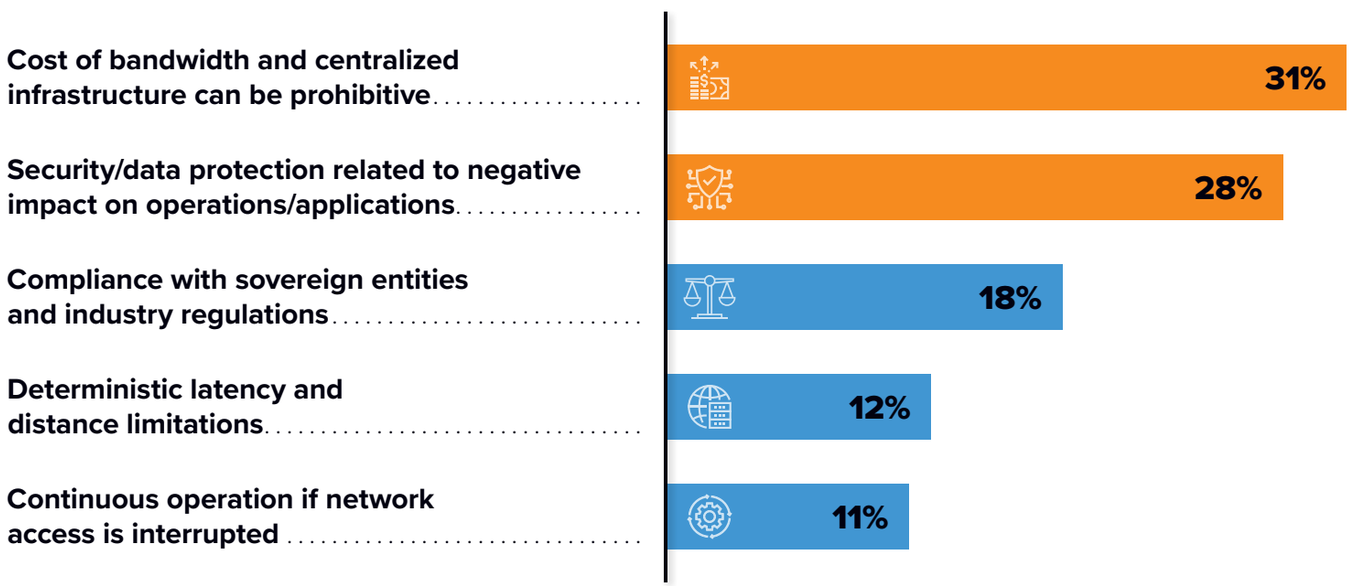
Edge Computing: Processing that's done at or near the source of data, reducing data transport time and network traffic.



Infrastructure and Security Drive Edge Deployments

Thanks to Internet of Things (IoT), the data collected by government networks is skyrocketing. Some are seeing triple-digit growth in just two years.

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



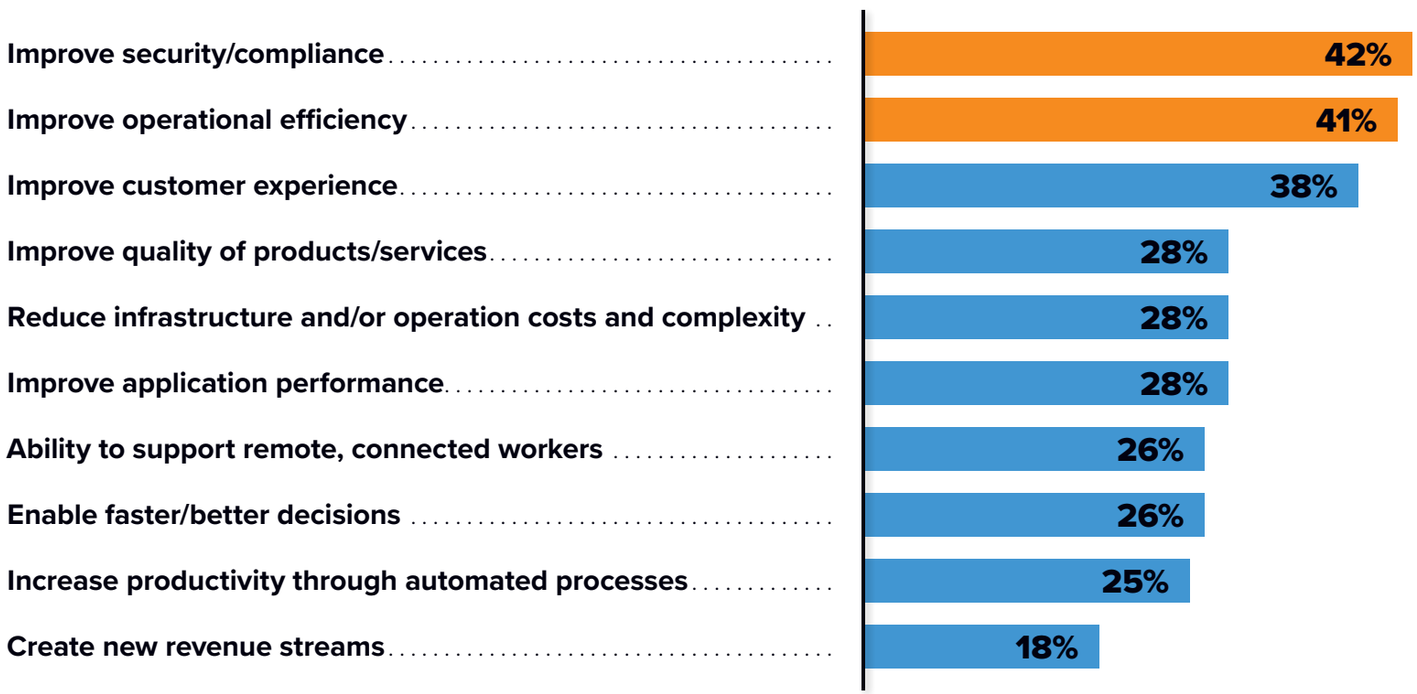
Notes: Managed by IDC's Quantitative Research Group; data not weighted; use caution when interpreting small sample sizes.
% corresponds to number of respondents; total may not sum to 100% due to rounding.
n = 100, Source: IDC's *Edge Services Thought Leadership Survey,* September 2020

- Government networks are bogged down by edge data that has to be sent to a datacenter. Edge computing may be cheaper than broad network upgrades.
- Edge security should be part of the conversation during the planning and buying process for computer network solutions.
- Consider a software-defined perimeter (SDP) rather than a VPN. An SDP can improve support for a zero-trust framework for networking and security segmentation at micro levels. This in turn can provide secure enclaves for entities requesting network resources.

Government Expects Edge to Bring Benefits

U.S. federal government agencies spent $212.6 million on edge security in 2019 and are forecast to grow to $281.9 million by 2024. State and local governments will increase from $94.2 million to $132.7 million.

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



- Unified threat management at the edge is moving toward automated zero trust with AI-controlled connections that dynamically apply security policies and support zero-trust connections for devices and end users.
- Adding data analytics and AI at the edge help improve the citizen experience by speeding important decisions that can have immediate citizen impact. Supporting the right APIs can help the edge system interact with traffic lights and other resources to improve government operations.

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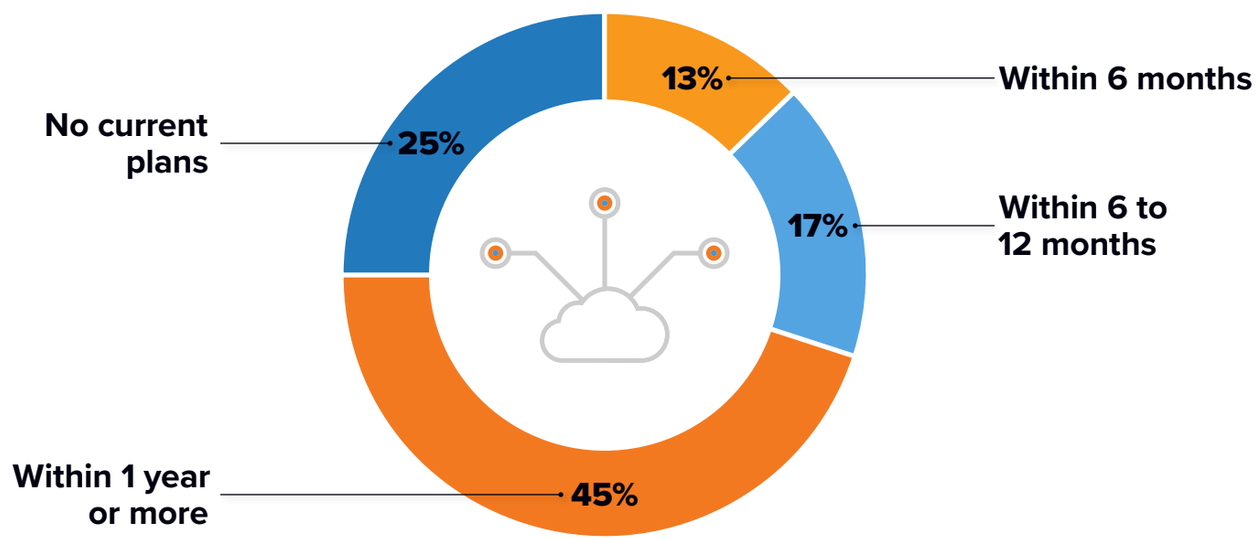
Investment Planning Horizon for Government Agencies

Moving computing to the edge can happen quickly, but proper planning is needed. Agencies need to identify the problems that need to be solved and all teams should be part of the planning process.

Q. When is your organization planning its next investment in edge solutions?



Solutions should be customized to the agency's needs. One size does not fit all. For example:

- Stationary systems may operate in harsh environments.
- Small devices are constantly on the move. An edge solution provides the ability to distribute infrastructure.

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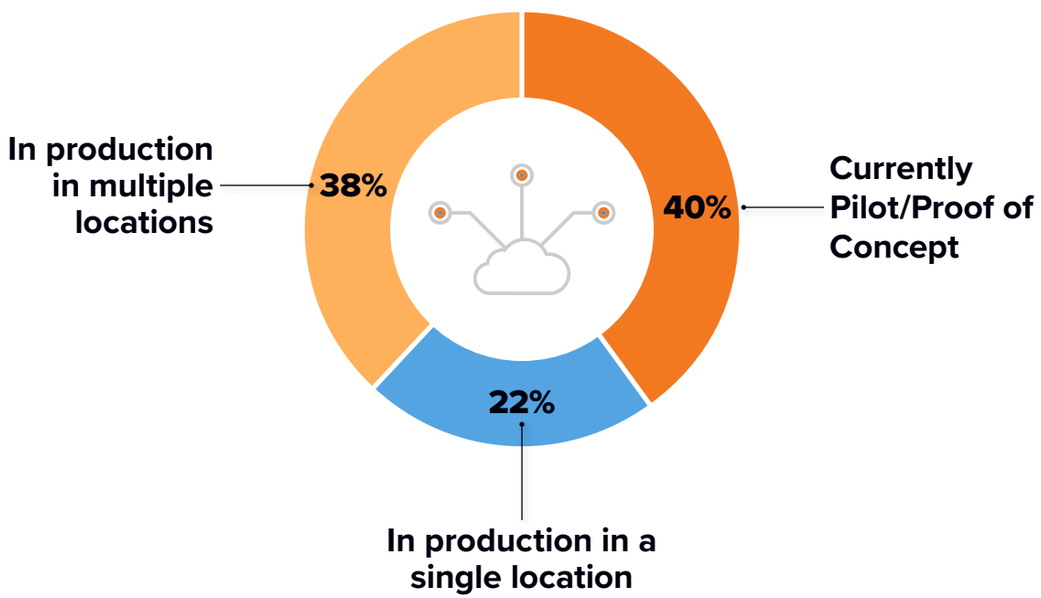
How and Where Government Organizations Deploy Edge Solutions

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



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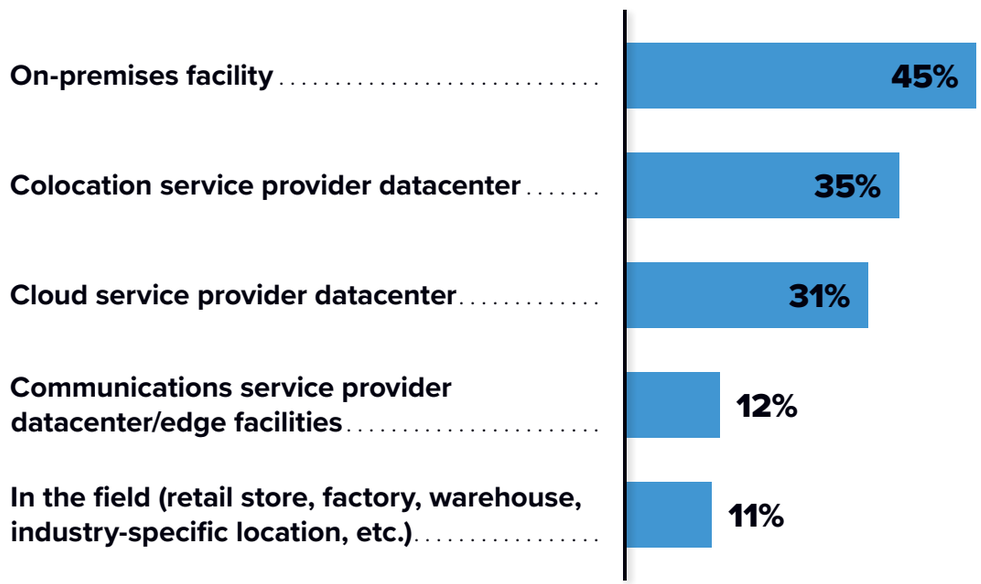
Q. Where are your organization's edge solutions deployed?



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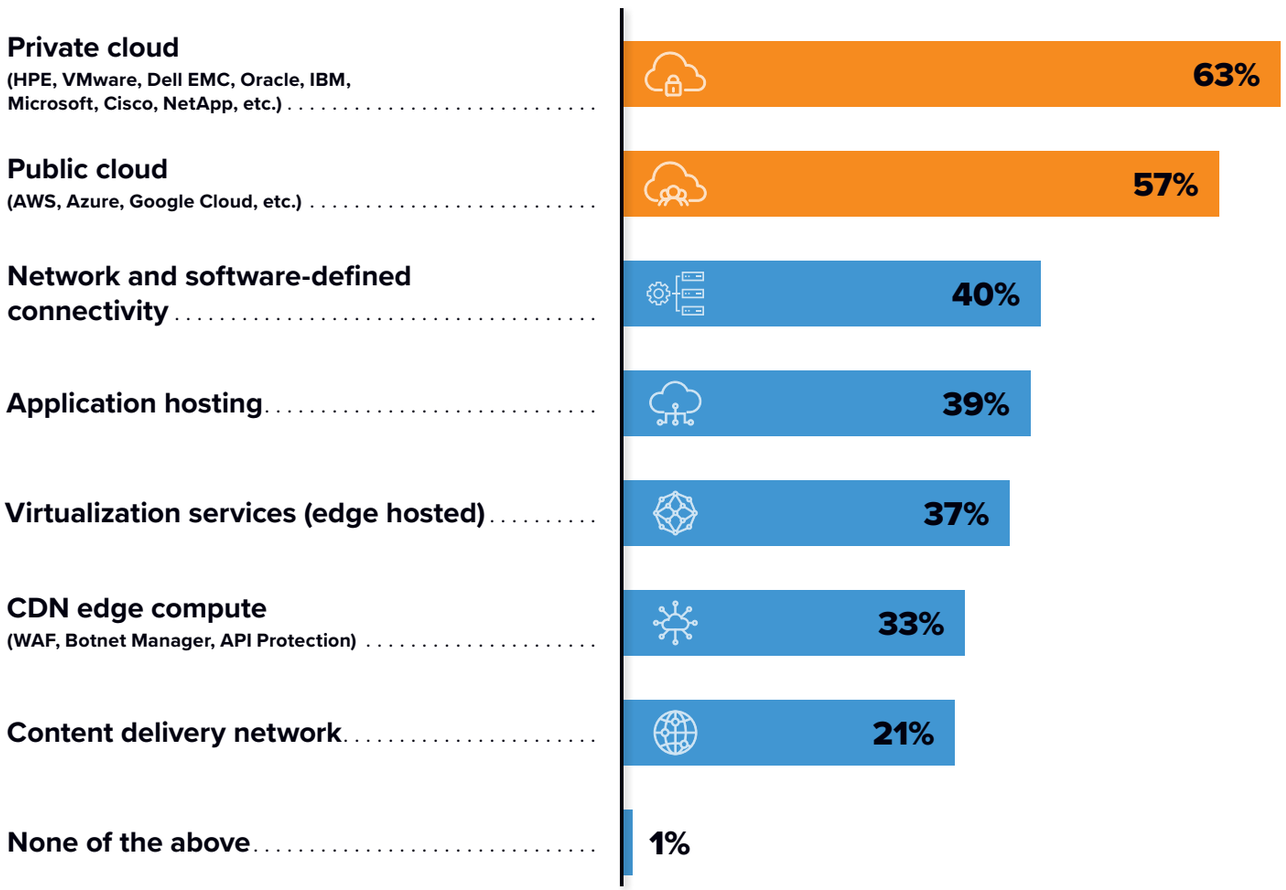
Private Clouds Preferred Over Public Ones

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



- Telecommunications providers are playing a larger role in distributed infrastructure. They may support 5G networks or enable new enterprise services like multi-access edge computing (MEC).
- There will be greater adoption of virtualized network functions and cloud-native network functions.
- Content delivery networks (CDNs) offer distributed general compute services that augment cloud service providers and extend the reach of cloud.

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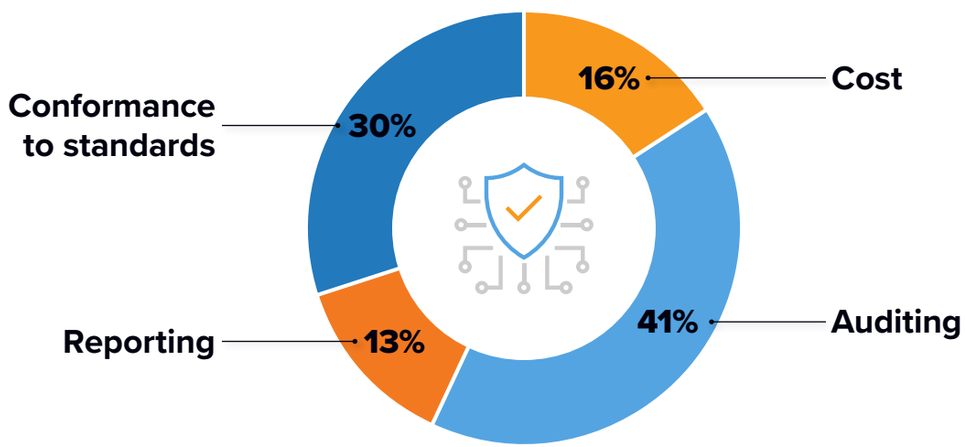
Edge Solutions Strengthen Compliance and Security

Q. What key compliance benefits would security (edge) services provide?



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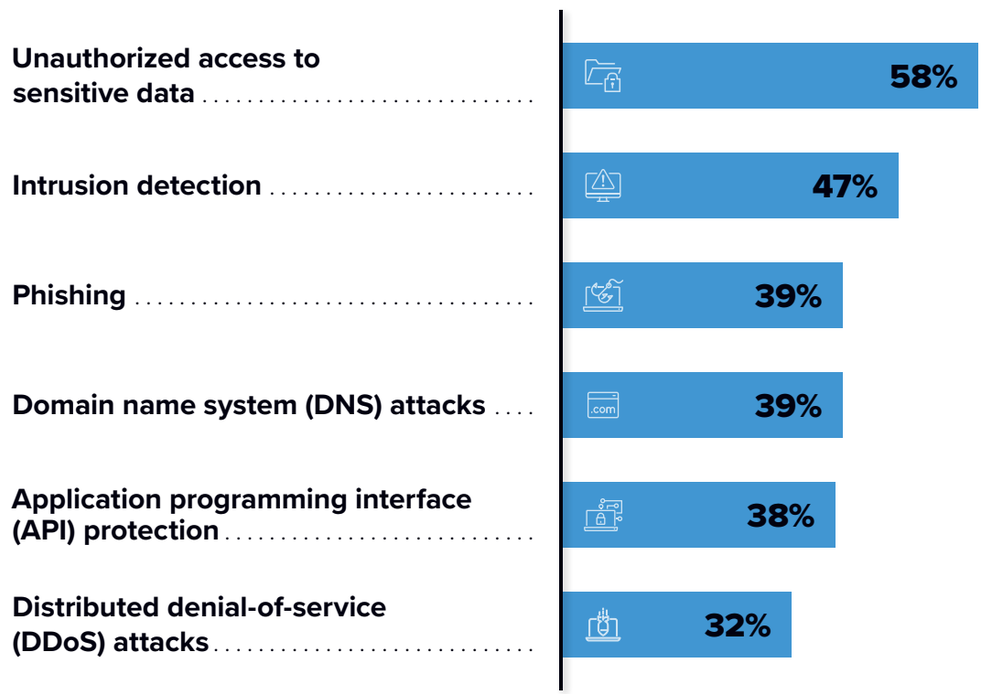
Q. What types of security vulnerabilities are most important to mitigate?



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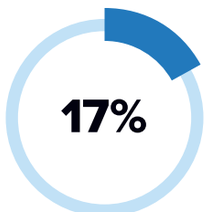
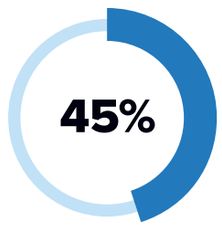
Let's Get Started: The Strategic Road Map for Edge Computing



of government organizations are **planning their next investment in edge computing within 6 to 12 months.**

while



of government organizations **will make such plans within 1 year or more.**

WHY:

Edge computing **improves bandwidth, latency, and security,** enabling public sector organizations to **increase their operational resilience.**

WHAT:

A distributed computing architecture features **processing and storage resources closer to where data is generated and consumed.**

WHO:

CIOs, CTOs, CISOs, and key line-of-business executives, traffic engineers, and security experts should help define requirements.

HOW:

All critical stakeholders and domain experts **define key performance metrics by use case** to justify the investment.

Essential Guidance

Agencies are not using data that would otherwise be useful in order to save time, effort, or network stress. **Edge processing can help make that data accessible and valuable.**

Agencies need to **determine what additional data sources would be added, how they would be used, and the point at which the data collected would exceed the agency's ability to deal with it using direct human interaction.** They should also consider what decisions an AI system would need to make when examining the data.

The most successful government use cases achieve a positive return on investment compared to older systems. Organizations should **study the costs, the equipment used by other successful operations, and how the various pieces of the systems have been integrated.**

Some cities already have seen success from edge deployment of AI, such as fewer traffic deaths, parking revenue, and regulatory compliance. It's almost certain **government AI adoption and growth at the edge will continue.**

Flourishing government operations continuously monitor and improve their edge deployments. Agencies need to **establish processes to enable ongoing maintenance and upgrades beyond the initial setup,** especially to deal with patching and new security issues.

Creating new, data-driven services leads to measurable benefits to citizens, including health monitoring, quick reaction to events, border monitoring, defense perimeters, and more.

About the Analyst

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Shawn is responsible for collecting and assessing government market data, providing IT investment and positioning strategies for both government and vendors, and market sizing for tech suppliers. His core coverage area includes U.S. federal and state and local IT budgets, agency-level technology priorities and government enterprise architecture standards. He also covers government use of blockchain solutions. He manages the IDC Government Insights: United States Government Infrastructure and Systems Optimization Strategies research advisory service, which includes technology recommendations and key industry forecasting for government IT systems. He also issues IDC's semi-annual U.S. Government IT Spending Guides (federal, state and local and education).

More about Shawn P. McCarthy

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