Why edge computing is
THE NEW FRONTIER

The key to better security, decision-making and productivity exists at the farthest edge of the IT network

THE PROLIFERATION OF internet-of-things sensors and an increasingly mobile workforce were dispersing government IT operations farther from the data center long before the coronavirus struck. But the pandemic has spotlighted agency employees' increasing need for robust, secure capabilities in the field — or at home, as remote work continues — and decision-makers need fast access to data analytics in a wide variety of situations.

All those factors are driving interest in computing at the network edge.

Gartner defines edge computing as "solutions that facilitate data processing at or near the source of data generation." In other words, the edge exists far beyond the data center and even the cloud, and it encompasses a collection of interconnected devices, such as sensors, video cameras and wearable technology.

The benefits of edge computing

The government collects more data than any other industry, and much of that data is now collected at the edge, according to IDC, which views edge computing as a high-growth area. Similarly, Gartner predicts that the amount of enterprise data that is processed at the edge will rise from 10% in 2018 to 75% by 2025.

A key benefit of edge computing is reduced latency. Because data has less distance to travel for processing, analysis and insights can happen much faster, which speeds decision-making and action. Reduced latency is essential in areas such as robotics and drone automation, autonomous vehicles, and augmented and virtual reality, according to a report by the Federal Communications Commission (FCC).

"Edge technologies make it feel like every device is a supercomputer," the FCC report states. "Digital processes become lightning fast. Critical data is processed [at] the edge of the network, right on the device. Secondary systems and less urgent data are sent to the cloud and processed there."

Edge computing facilitates more efficient use of information and can help agencies limit the volume of data that they store, which saves money. Those potential savings are a draw at any time but especially as the country recovers from the pandemic-related recession.

In addition, when agencies process at the edge only the data they need, they can eliminate the rest rather than storing everything. As a result, they need to hold onto and protect a smaller amount of sensitive data, such as financial, medical and personally identifiable information. And because data is being processed at the source, it doesn't have to travel across networks, which makes it less vulnerable to interception.

At the same time, however, edge computing can increase agencies' attack surfaces by adding more endpoints. To boost security, agencies must ensure that they have a complete picture of their inventory of edge devices and a way to continuously monitor them.

The implications for government missions

Edge computing has profound implications for a wide range of government missions, including those related to military operations, health care, disaster relief and agriculture. For example, edge computing is helping the Army better analyze data and prepare soldiers for modern warfare, and it's enabling the Air Force to save almost $1 million a week in tanker refueling costs.

At the local government level, smart-city initiatives rely heavily on IoT and edge computing for activities such as traffic and energy management. Denver created its Enterprise Data Management system to support a more holistic approach to analyzing and acting on the city's data. "Built for integration and interoperability, the IoT platform compiles real-time data on transportation, environmental health, weather and freight," according to the city's website. "This drives smarter decision-making,

emphasizing safety and security."

In San Francisco, police recently tracked down a person who was taking random shots at vehicles on multiple days and in multiple locations by deploying portable gunshot sensors equipped with video cameras, said Shawn McCarthy, a research director at IDC Government Insights, during a recent web conference on the subject of edge computing, 5G and artificial intelligence. The sound of a shot triggered video capture of nearby cars, enabling officers to locate and apprehend a suspect.

In fact, the emerging 5G network is one of the biggest enablers of IoT and edge computing. The fastest 5G networks are expected to be at least 10 times faster than 4G LTE. "When paired with 5G, which promises faster speeds and lower latency, edge computing offers a future with near-real-time back-and-forth connections," the FCC report states.

'Save time, effort and network stress'

As agencies consider incorporating IoT and edge computing into their operations, McCarthy recommends they evaluate factors such as how much data they collect, how they store it and additional data sources they are likely to add. If agencies are not making the most "of the data that would otherwise be useful in order to save time, effort and network stress," it is time to consider processing that data at the edge, he added.

Local computing is not a new concept, but "edge computing has emerged because technologies, such as content delivery networks and local edge devices and gateways, can now aggregate IoT sensor and mobile device insights to enable on-demand actions where people and physical processes exist, need them and benefit from them," wrote James Staten, a principal analyst at Forrester Research, in a blog post.

In a recent survey of FCW readers, 47% of respondents said their agencies are already taking advantage of edge computing to speed data analysis and decision-making. In addition, almost 38% said collecting and analyzing data at the network edge is essential to achieving their missions, while only 14% said it's not important.

Agencies at all levels of government are discovering that edge computing can provide better data protection while facilitating faster, more efficient insights and a seamless user experience. In short, it offers agencies the security, scalability and flexibility they need in a rapidly changing IT environment. ■

Edge computing
BY THE NUMBERS

41.6 billion
Projected number of connected IoT devices by 2025

79.4 zettabytes
Data that will be collected by IoT devices in 2025

20%
Amount of data cities currently process at the edge

70%
IoT deployments that will include autonomous or edge decision-making by 2023

62%
FCW respondents who said budget constraints are the biggest barrier to edge computing

Sources: FCW, IDC