

CLOUD, EDGE COMPUTING AND ANALYTICS: A POWERFUL COMBINATION

State and local governments use these tools to drive insights and smart applications.

The combination of cloud, edge computing and data analytics will make state and local governments smarter, safer and more citizen-centric than ever before. These technologies are critical to unlock the power of the Internet of Things (IoT), which will enable agencies to collect and operationalize vast new quantities of information generated by just about everything around us.

Edge computing devices located near data sources — mounted in vehicles and on traffic signals, for example — will deliver real-time insights like detecting the location of a gun shot or spotting a wrong-way driver. These devices also will feed data to powerful cloud-based computing resources which will crunch massive data sets for deeper analysis of crime trends or traffic patterns.

Ultimately, this powerful combination of technologies will help government leaders improve citizen services, boost program performance and lower costs. The transition already is underway.

The Kentucky Department of Transportation, for instance, uses data collected from sensors in roads and on snowplows, along with weather forecasts, to more precisely manage its anti-icing and snow-removal activities.¹ Algorithms

developed for the initiative analyze how fast cars are traveling, the number of vehicles on a road at a given time, temperature, wind speed, cloud cover and more.

In all, the technology examines more than 80,000 records of information every 60 seconds, enabling the department to make snow removal decisions in real time. As a result, anti-icing and plowing activities are more effective, saving the department 5 to 10 percent on snow and ice removal costs.

Cloud and edge computing increasingly will work together to power innovative IoT-driven use cases. Bob Woolley, former chief technical architect for the

Utah Department of Technology Services who is now a Center for Digital Government senior fellow, says the combination of cloud, edge and analytics is poised for significant growth, especially as smarter and faster network technologies become available.

“Today about one-fifth of data is generated by edge devices connected to government networks,” Woolley says. “Some writers have suggested that with the implementation of 5G networks that number could be as high as four-fifths of all data by 2023.”

Growing State and Local Adoption

The Center for Digital Government’s 2018 Digital States and Digital Cities surveys reflect

USE OF EDGE COMPUTING IS GROWING THROUGHOUT STATE AND LOCAL GOVERNMENT. HERE ARE THE MOST POPULAR STATE GOVERNMENT USES FOR THIS TECHNOLOGY.

79% 

Environmental
Sensors

77% 

Transportation
Systems
Monitoring

68% 

Public Safety
Surveillance

66% 

Infrastructure
Monitoring



this trend, showing strong public sector movement toward IoT and edge computing.

Seventy-four percent of Digital States respondents say they now factor IoT into their IT strategic planning. They also say they've begun deploying IoT and edge computing solutions for key functions, including conducting public safety surveillance, tracking the condition of transportation systems and other infrastructure, and monitoring environmental factors. Among Digital Cities respondents, 41 percent say they've implemented IoT and edge computing solutions, and another 24 percent say they're piloting these technologies.

Results from the state and city surveys also indicate that edge devices increasingly will connect with cloud-based computing and analytics resources. Although the bulk of state and city respondents have moved 30 percent or less of their computing workloads to the cloud today, they expect those percentages to jump dramatically in the future. Nearly 70 percent of state respondents and almost 50 percent of city respondents expect the cloud to ultimately handle more than half of all their computing needs.

As they adopt these technologies, states and localities are actively

experimenting with cloud, edge computing and analytics to prove their value in managing real-world issues and challenges.

Last year, the city of Las Vegas launched a pilot project to deploy sensors across 30 city blocks to gather information about how vehicles, bikes and pedestrians move around downtown and then offer predictive insights into how transportation behavior is likely to occur in the future, given certain situations and variables.²

Intelligent edge devices — in this case smart video cameras — will work in concert with central computing and analytics resources to help city leaders understand, for example, when and where wrong-way driving incidents are likely to occur.

“The business challenge of that is, you don't know how many people are going the wrong way, because there's been really no way to effectively count that occurring. So what we're doing is having a video camera that's able to analyze traffic and tell us how many wrong-way drivers we're having on a one-way street,” says City CIO Michael Sherwood.

The city will then compare these occurrences against weather data, time-of-day and other variables.

“And so over time — and we're getting to the point now where we can start predicting the times of day that we might have a wrong-way driver — that allows us to maybe make changes in the layout of the street, or provide enforcement,” Sherwood says.

Building the Foundation

But to implement these technologies and take full advantage of them, state and local IT leaders will need to master new skills and capabilities.

On the technology side, states and localities will need infrastructure that enables them to easily move data from on-site computing resources to the cloud and share that information among multiple clouds. They'll also need tools that let them manage and secure this complex, distributed, hybrid, multi-cloud landscape. And they'll need to make smart business decisions about where data should be aggregated and processed based on specific application and agency requirements.

Finally, as governments collect and analyze data at IoT scale, privacy will become a key issue. State and federal lawmakers are focused

Spending on Analytics and Cloud Will Grow

State and local governments combined will spend an estimated \$107 billion on technology in 2019. Analytics and cloud computing rank at or near the top of IT spending priorities for states, cities and counties.

State IT Spending Priorities

Analytics/Business Intelligence

Cybersecurity

Shared or Collaborative Services

Cloud Computing

Healthcare

City IT Spending Priorities

Cloud Computing

Disaster Recovery

Analytics/Business Intelligence

Cybersecurity

Citizen Engagement/Experience

County IT Spending Priorities

Analytics/Business Intelligence

Cloud Computing

Shared or Collaborative Services

Cybersecurity

Networking and Broadband

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on giving citizens better protection and more control over their personal information. As states and localities harvest and examine more data in more locations faster than ever before, applying complex privacy rules to this massive new wave of information won't be easy — and it will drive demand for sophisticated data and identity management tools and techniques.

Still, the move toward an IoT-connected world powered by cloud, edge computing and analytics is well underway. State and local leaders are developing and refining innovative use cases for these technologies that will strengthen government effectiveness and efficiency — and make our communities safer and better places to live.

¹ <https://www.govtech.com/computing/Will-Edge-Computing-Change-How-Government-Operates.html>

² <https://www.govtech.com/fs/automation/Las-Vegas-Partners-with-NTT-to-Study-IoT-Impact-on-transportation.html>