


Optimizing Network Operations to Meet Modern Demands


State and local government IT staff are stretched to the limit as the ongoing challenges and responsibilities of work—and life in general—pull them in every direction. With network connectivity underlying practically everything that agencies and their branches do, IT teams are under constant pressure to ensure people and processes have the fast, secure, reliable connectivity they need. As the number of users, endpoints, applications, and network environments continues to grow, ‘too many demands and not enough resources’ has become an urgent refrain—especially when it comes to bandwidth.


Limited bandwidth is one of the top barriers to the high-quality user experience that organizations need to deliver. To address this gap, more than 94 percent of state and local government respondents in a recent CDG survey plan to do some form of network modernization in the next two years, with capacity upgrades being the top choice (60 percent).¹ However, organizations also understand that simply adding capacity is not enough to sustain growth and meet demand. To use time and resources as efficiently and cost-effectively as possible, organizations must also optimize network operations.


Stretched to capacity


The following trends are driving the need for network optimization.


 **Limited bandwidth.** Real-time video footage (for example, from drones surveying power lines or body worn cameras), remote workforce collaboration, complex workflows, data analytics, and other data-rich processes can monopolize bandwidth. Organizations struggle to have enough bandwidth for peak usage without overpaying for excess bandwidth. In the CDG survey, 65 percent of respondents said bandwidth on demand is somewhat or very important.

 **Cybersecurity concerns.** Greater use of citizen data for digital services, along with the new network ‘edge’ created by the massive shift to remote work, have expanded organizations’ vulnerability to breaches. In the CDG survey, respondents said security was their most pressing challenge.

 **Lack of skilled staff.** Attracting and retaining a strong IT bench (despite the IT industry’s notoriously high turnover rates) is an ongoing issue that is exacerbated by competition from the private sector, a wave of retirements, and pandemic-related hiring freezes and furloughs. To minimize the impact of staff shortages and new-hire learning curves, organizations need to streamline and simplify network planning, development, and management.

 **Hybrid cloud adoption.** As organizations migrate to hybrid cloud scenarios to share data, applications, and other resources more easily with multiple, disparate locations and entities—including other agencies, geographically distributed campuses, and their remote workforce—they must manage increasingly complex connectivity requirements related to bandwidth, performance, security, network configuration, and mode of connection.

 **Latency-sensitive,** bandwidth-intensive applications. To enable video, machine learning, real-time website interactions, Next-Generation 911 (NG911) calls, Internet of Things (IoT), and other modern digital operations, organizations must flexibly meet requirements for availability, massive bandwidth, and high performance.

 **Flat budgets.** Even though network demands are growing, most respondents in the CDG survey report either no change or a decrease in their broadband, branch network, and core data center budgets—meaning organizations will have to find ways to do more with less. The American Rescue Plan Act and other federal funding programs can help state and local governments invest in broadband infrastructure and other aspects of their networks, but organizations will have to move quickly to meet program deadlines.


Tactics and technologies for network optimization


Network optimization helps address resource challenges and network complexity so state and local agencies can deliver a faster, more reliable, and more secure user experience; cost-effectively ensure sufficient bandwidth; free up IT staff for


higher-value work; and consistently apply threshold policies and service level agreements.

Optimization tactics

Network optimization focuses on the following tactics:

 **Intelligent bandwidth allocation.** By intelligently allocating unused bandwidth to applications and processes on demand, organizations expand their bandwidth capacity by maximizing existing investments instead of having to invest in additional bandwidth.

 **Internally defined traffic prioritization.** Prioritizing applications and then automating resource allocation based on predefined thresholds ensures mission-critical applications and services have the network resources they need, when they need them.

 **Data center consolidation.** Physical consolidation of data centers saves money and reduces complexity associated with having multiple physical footprints, redundant servers and connectivity, separate teams to manage each center, and more.

The optimization toolbox

Optimization often starts by converging disparate networks into a single enterprise architecture. The underlying technology is based on the Adaptive Network™ approach that includes the following components.

Programmable infrastructure allows IT staff to manage disparate devices, layers of infrastructure, and multiple domains from a single pane of glass so they can easily adjust bandwidth, processing, routing, and other resources to meet the demands of applications and services running on top of the infrastructure.

An analytics and intelligence platform monitors and analyzes massive amounts of traffic and performance data coming from network devices to provide actionable, data-driven insights. Network teams can more accurately predict congestion, outages, or other issues and proactively adapt to changing needs in real time.


Software-based control and automation accelerates deployment of network services, simplifies network management, and reduces errors by automating routine tasks based on data and software-defined prioritization of performance, security, costs, and other factors.


Built-in network security uses multiple layers of defense to help organizations identify and protect against threats despite increasingly amorphous network perimeters, disparate endpoints, and thousands of users. Data is encrypted at the fiber/optical layer to render personally identifiable information (PII) and other sensitive data unreadable while it is in transit across the network.


Zero trust network access control employs behavioral analysis, multi-factor authentication, and other tactics to ensure users are who they say they are and can only access resources for which they have been authorized.


Getting the most from optimization

The following approaches can help organizations maximize their investment in network optimization.

 **Prioritize.** Identify areas of poor network access or application performance and prioritize remediation based on each application's criticality. Along with customer experience metrics, the following types of questions can help identify these areas: Where does the IT team get the most complaints? Where do constituents and other users abandon processes due to poor availability or slow application response time? Do videos 'jitter' due to low bandwidth?

 **Move forward incrementally.** Look for low-hanging fruit and start with small manageable chunks. For example, consider optimizing one section of the network, or one agency's network, at a time. Build on wins to encourage adoption and maintain momentum.

 **Choose the right technology.** Search for network technologies like Dense Wavelength Division Multiplexing (DWDM) that can maximize the performance of existing fiber assets or packet technologies that can run alongside legacy technologies to modernize networks without having to resort to a disruptive 'rip-and-replace' project.

 **Quantify optimization strategies.** As much as possible, quantify the potential impact of planned optimization strategies across the enterprise. Doing so will help the organization determine where to focus its investment. Once solutions have been implemented, continue to quantify the impacts, and use this information to finetune deployments and plan for the future.

Lightening the load

Network optimization is an essential tactic for ensuring organizations have the on-demand connectivity, availability, and performance that modern applications and services require. While the right technology is an essential component of an optimization strategy, technology alone cannot ensure the success of optimization efforts. The pace of change and the complexity of today's networks often require a level of focus and expertise that may be difficult to sustain in house. Now more than ever, it is important to team with reliable, committed partners who can provide the guidance, technology, and support to ensure an organization's connectivity needs are met through thick and thin.

This piece was written and produced by the Center for Digital Government Content Studio, with information and input from Ciena.

1. Center for Digital Government, Networks Survey of 195 state and local government decision-makers, April 2021.