The Inevitable Rise of Voice, Video and Data: How Agencies Can Keep Up

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Executive Summary

Driven by requirements for greater efficiency and improved constituent services, federal agencies are moving full-speed ahead with voice-, video- and data-intensive applications. The technologies that enable these capabilities, including videoconferencing, Voice over IP (VoIP), and room-based communication and collaboration systems, benefit government in many ways, including:

- Better constituent engagement through video-enabled contact centers

- Better collaboration and information-sharing between office- and home-based workers

- More effective distance learning and conference offerings

Although the benefits are clear, using these applications effectively can require more speed, scalability, flexibility and bandwidth than some agencies currently can deliver. Even agencies that have begun to modernize their network infrastructure are still likely to have some legacy time-division multiplexing (TDM) technology.

To learn more about how agencies can gain the flexibility, scalability and performance they need to take advantage of what today's voice, video and data applications can offer, GovLoop teamed with Juniper Networks, a networking solutions provider, and Comcast on this report. Together, Juniper Networks and Comcast Business have developed a solution that addresses this issue.

"Agencies with services such as Ethernet-based networks and software-based IP phones were able to operate efficiently as their workforce shifted to full-time tele-work. They took advantage of scalable bandwidth to quickly meet increased network requirements without the need for physical or onsite changes. This agility is an advantage of advanced infrastructure and cloud-deployed applications."

– **Laura Stanton**, **Assistant Commissioner of the Office of Information Technology Category (ITC) in the General Services Administration's (GSA) Federal Acquisition Service (FAS).**

By The Numbers

67%

of agencies say that their legacy network infrastructures can't keep pace with the changing demands of cloud and hybrid networks.

87%

of government affairs executives say that it will become more common to use videoconferencing for lobbying than in-person meetings.

$30 billion

is the estimated amount that agencies spend to support legacy systems, said Sen. Maggie Hassan (D-New Hampshire), Chairwoman of the Senate Subcommittee on Emerging Threats and Spending Oversight.

85%

of federal IT professionals recognize that network visibility can enable their transitions to cloud infrastructure.

47%

of federal agencies are either using or considering using managed services within the next five years.

90%

of federal IT decision-makers say that their networks are moderately to highly complex.

79%

of federal tech professionals say that their existing IT systems are preventing them from delivering adequate services.

82%

of U.S. government officials say their agency isn't as technologically advanced as it needs to be to cope with new challenges and opportunities.

New Demands Require New Solutions

The Challenge:
Shifting Network Requirements

Several trends are forcing agencies to look for new networking solutions. They include:

Soaring voice, data and video requirements. Doing business today requires almost constant connectivity and the ability to access and share large data, video and audio files. It also requires the ability to collaborate via videoconference and meeting technology. All that takes a lot of bandwidth to ensure smooth uploads and downloads. For example, Microsoft recommends at least 58 KB bitrate upload and download speeds for audio meetings, 2,500 KB upload/4,000 KB download bitrate for video and 2,500 KB upload and download for screen sharing. Without these speeds, traffic can start buffering and possibly even be dropped.

A demand for scalability and flexibility. In the past, network bandwidth requirements were largely stable and predictable, making it easy for agencies to decide how much capacity they needed to buy. That is no longer the case, as the proliferation of network-based services leads to frequent and unpredictable surges in demand.

Interest in outsourcing. Some agencies, especially the Defense Department (DoD), are looking to outsource circuits and solutions, rather than dedicating so many resources to supporting network equipment. The challenge is doing so without compromising the user experience.

The Solution:
Ethernet-Based Networking

The need for scalability, flexibility, adaptability and resiliency will only increase over time, and moving to an Ethernet-based network supports that.

"When you look at the speed associated with TDM, you're talking about 1.544 megabits for a T1 or 45 megabits for a DS3," said Greg Bourdelais, DoD Regional Sales Director at Juniper Networks. "Essentially, a 1G Ethernet connection is equivalent to 625 T1 lines."

Agencies are particularly interested in the idea of the Ethernet Virtual Private Line (EVPL), a service that works much like TDM, but is powerful, flexible and feature-rich, providing high-capacity, multipoint connectivity. Important features to look for in an EVPL solution include:

- **A dedicated circuit with redundancy.** A dedicated circuit means having the path requirements so that data, video, audio and other types of communications get through. When it includes redundancy, traffic can automatically reroute if it encounters poor connectivity, competition with other traffic or a component failure.

- **The ability to multiplex multiple Ethernet virtual connections on a single user network.** With this capability, multiple users or organizations at the same location can run different applications across the same Ethernet circuit. "It's about creating logical or virtual circuits over the physical circuit, and then segregating those virtual circuits to individual users or customers," explained Greg Taylor, Senior Director of DoD Sales at Comcast Government Services.

- **Customizable speeds.** Some communications and workloads need to be prioritized, or are more bandwidth-hungry than others. The network should reflect that. With a dynamic Ethernet-based network, it's easy to allocate bandwidth as needed, prioritize workloads and make sure everything gets to its destination quickly.

Best Practices in Modernizing the Network

Offload the hard stuff

Maintaining a network is a full-time job that requires knowledgeable staff and the budget to buy and maintain equipment over time. That's why more agencies are considering the managed services approach, which offloads the day-to-day management to a third party.

See, measure and quantify

When moving to any new technology, it's important to see everything that's happening and analyze data collected from the new environment. It's the best way to truly understand how well these new technologies are working in your environment and meeting service-level agreements, and whether you need to adjust settings or expectations.

Take your time

Getting it right is just as important as deciding to transition in the first place. Consider transitioning in stages, based on a well-thought-out migration strategy. One way to structure the migration is through a migration tool that uses software circuit provisioning to enable organizations to connect part of their high-bandwidth applications to Ethernet, while continuing to use TDM for other applications, at least temporarily. This method allows agencies to test and get comfortable with the technology instead of ripping and replacing the entire network at once.

Put the user experience first

Even if you are migrating only a few applications to Ethernet at a time, it's critical to make the user experience as smooth as possible. Ideally, users will not even know networking technology has changed, but they will notice better performance and other benefits of their connections. That buy-in is critical to expanding the use of Ethernet agencywide.

Case Study: DoD Reaps Benefits of a More Robust Network

To protect national interests, the nation's military services and combatant commands, DoD support organizations must be able to communicate efficiently, analyze and exchange large amounts of data and quickly deploy services to their mission partners. Traditionally, these organizations have relied on legacy TDM technology, adding circuits and T1 lines to increase bandwidth when required.

The Defense Information Systems Agency (DISA), which is responsible for providing enterprise network and IT infrastructure to DoD, began looking into ways to upgrade its network to an Ethernet-based infrastructure, region by region. Additionally, DISA wanted to align with Joint Information Environment (JIE) objectives for upgrading to IP-based network infrastructure.

The result was DISA's Commercial Ethernet Gateway (CEG) contract, designed to replace 17,000 point-to-point public switched telephone network (PSTN) circuits with Ethernet-based services across seven regions in the 48 contiguous states and the District of Columbia. Once finished, DISA will have the underlying network infrastructure to enable voice, video and data services for its mission partners. Several DISA regions are underway, using Comcast Business's EVPL service.
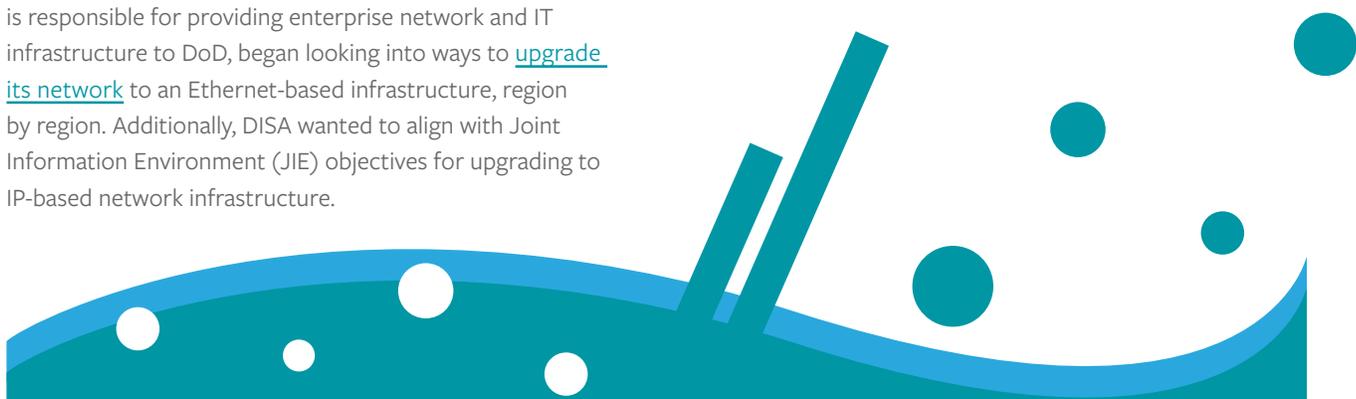
HOW COMCAST AND JUNIPER NETWORKS HELP

Comcast Business's dedicated U.S. government and public-sector group provides the network foundation agencies need to run bandwidth-intensive applications. Its EVPL services help improve application performance across networks with a private, point-to-multipoint network design between multiple locations, and they are an ideal alternative to wide-area network (WAN) technologies such as T1 lines, Multiprotocol Label Switching (MPLS), frame relay, asynchronous transfer mode and private lines.

Juniper Networks provides networking technology that helps agencies transition to automated multi-cloud environments and develop AI-driven networks. Juniper has a long history of supporting federal agencies' specialized networking and security requirements and provides intelligence community (IC) and /DoD-certified solutions.

For more information about Juniper Networks, visit: juniper.net/federal-government

For more information about Comcast, visit: business.comcast.com/FedGov

Conclusion

May 31, 2020 was an important date for communications in the federal government. That was the date agencies were urged to sunset their copper-based circuits and TDM switches. The GSA was clear: "Agencies are strongly encouraged to replace TDM-based voice solutions with transformative solutions including voice-over-IP or wireless."

While some agencies have complied, others still rely on legacy TDM technology that may prevent them from scaling bandwidth quickly, much less taking advantage of newer solutions such as multi-cloud and software-defined WAN (SD-WAN) deployments.

For many, a powerful alternative is an EVPL service, which provides high-speed, point-to-multipoint connectivity across the network. This model is flexible and adaptable. For agencies, it also can serve as an effective, advanced solution for other building blocks, such as multi-cloud environments and SD-WANs.

The idea of switching network technologies can cause anxiety, but most agencies recognize that it's not a matter of if, but when. The key is working with experts who can help create a migration path that takes things step by step, so users and decision-makers can see the benefits.

Special thanks to Juniper Networks and Comcast for making this resource possible.

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ABOUT GOVLOOP

GovLoop's mission is to "connect government to improve government." We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to connect and improve government.

For more information about this report, please reach out to info@govloop.com.