Reduce Network Strain through Network Modernization

The demands on agency networks have never been greater than they are today. The strain is due to many factors, including greater use of productivity-enhancing tools for collaboration; a move to cloud-based, bandwidth-hungry applications; and an overall need for greater flexibility, scalability and performance. The abrupt shift to remote work due to the current pandemic has only escalated network strain, which has further increased congestion, network bottlenecks and capacity issues.

Agencies that use more expensive and less flexible private networks are bearing the brunt of the problems. According to one survey, about two-thirds of federal IT professionals say their legacy network infrastructure can't keep pace with mission requirements.

"Traditional networks were built on getting things from Point A to Point B utilizing a fully private infrastructure, which is very inflexible and often requires Command Line Interface (CLI) gurus to work magic at the individual device level," explained Marlin McFate, public sector chief technology officer at Riverbed Technologies.

Human error during changes is one of the most common causes of enterprise outages and issues. According to IDC, a single enterprise outage at a data center or failure of a critical application can cost over $1,000,000 per hour for a large enterprise. "Applying a single erroneous command or configuration could be the difference between something working correctly and something completely failing. There is just too much room for human error. Modern network operations can leverage intelligent software-defined policies to avoid these painful legacy challenges and streamline operational costs," McFate added.

Toward a more modern network

With the need for greater capacity, scalability and performance expected to rise over time, agencies are looking for a better way. Some have found it by replacing existing network architecture with software-defined networking in the form of an SD-WAN. This intelligent, software-based architecture allows agencies to replace manual processes with automated actions based on policies. A common intent-based policy might direct certain types of traffic along specific routes based on importance, time-sensitivity, cost or security policies.

SD-WAN solutions are ideal for environments with multiple WAN transport types, such as MPLS, LTE, broadband and even SATCOM. With an SD-WAN, intent-based path selection policies will automatically direct application traffic down the optimal path or use multiple paths concurrently for load balancing or packet racing purposes.

"For example, you might send your most time-sensitive, critical applications down your MPLS path, but want your less time-sensitive applications, like patches, desktop security monitoring,

printing or backups sent via a more cost-effective Internet path," said Sean Applegate, chief technology officer at Swish Data, a Service-Disabled Veteran-Owned and HUBZone certified Small Business provider of technology solutions and engineering services to the Federal Government. "By doing it this way, events like mission-critical virtual meetings or the performance of critical applications won't be affected by bandwidth intensive desktop patching, replication jobs, or recreational video consumption such as watching the news or NCAA finals."

SD-WAN even works well in communications-on-the-move deployments. On a ship, for example, an SD-WAN network has the intelligence to use LTE and SATCOM connections together without any users involved. Legacy networks would require an engineer to make that change manually.

This more efficient transport method also eliminates wasted capacity, which can be expensive. According to one report, a 100 branch investment in an SD-WAN can pay back an enterprise in less than 12 months, while a 1,000 branch investment will pay back an organization within 10 months and deliver more than a 600 percent return over five years.

Because a more modern network architecture is better integrated with users' identities and monitors application performance, it can provide more analytics and greater insight. For example, in a remote work environment, a manager can easily see how users are using resources in real time. If an issue arises, the system will proactively identify the issue and initiate a fix. Advanced analytics are also the reason behind better application performance, because the SD-WAN monitors and analyzes the users and traffic traversing specific links at all times. With this information, it can switch resources to different paths to optimize performance and eliminate bottlenecks.

Many agencies are beginning to see the value of modernized networks. Some components in the Department of Homeland Security, for example, are adopting internet-based wide area networks with SD-WANs to better manage performance and optimize their WAN cost per megabit per second (Mbps). By doing so, they are also freeing themselves from a single carrier network and are able to compete carriers against each other to reduce costs while achieving high-availability.

Multiplying the value

To gain even greater value from SD-WANs, some agencies are pairing them with TIC 3.0, a federal cybersecurity initiative designed to improve performance and enhance network and perimeter security. The combination is particularly helpful in enabling remote users and branch offices to access cloud resources quickly and securely, without sacrificing performance. That's especially important for bandwidth-intensive cloud-based applications like Microsoft Office 365.

The importance of TIC 3.0

The latest version of the government's Trusted Internet Connections (TIC) initiative is designed to help agencies secure data, network and boundaries while maintaining full visibility into network traffic. According to OMB, the most important use cases are for cloud and multi-cloud environments, branch offices, and remote users. To ensure security, it groups networks into "trust zones" of assets with comparable protection requirements.

Strategic program goals include:

- Flexible frameworks to handle varied types of network boundaries
- Accommodation for cloud, mobile and encrypted applications, services and environments
- Risk-based to accommodate varying risk tolerance
- Environment-agnostic
- Dynamic and readily adaptable
- Automatic metric collection

By combining modern network technologies like SD-WAN with TIC 3.0, agencies can improve productivity and the employee experience while also improving their security capabilities.

The combination of SD-WAN and TIC 3.0 allows agencies to better control how end users get to applications by creating more direct paths and implementing security policies that don't impede use. McFate pointed to one example within the Justice Department where Riverbed did just that, optimizing and accelerating application access.

"In virtually every case, agencies that start small with SD-WANs tend to ramp up quickly after they see the results," McFate said. "Once they get the first few going and they see how happy employees are with more bandwidth and better performance, they continue down the path."

Advanced SD-WANs include valuable next-gen security capabilities such as Auto-VPN, next-gen firewalls, IPS, anti-virus and rich analytics. In addition, leveraging an advanced SD-WAN solution, such as Riverbed SteelConnect EX, allows service chaining and universal CPE integration with third-party capabilities at the branch such as WAN optimization and session border controls.

To get the best value out of a modernized network architecture, Applegate recommends making sure that an agency's TIC 3.0 and SD-WAN strategies are tightly aligned. "There is a lot of coordination that has to happen, but there is significant strategic value. Most agencies find it well worth the time and effort," he said.

When starting down the path, Applegate also recommends discussing enterprise architecture between the networking, security and cloud teams. "The tighter your relationship across the aisle, the more creative and collaborative an organization can be. Having a highly cooperative generative culture is a quality of the highest performing organizations."