Engineering and Construction Firm Achieves Server Consolidation and Collaboration with Juniper Application Acceleration Solutions

Organization:
BE&K Engineering Company

Industry:
Architectural/Engineering/Construction

Challenge:
Consolidate Exchange servers to reduce expenses and cost-effectively improve performance of engineering collaboration tools and other applications

Solution:
Juniper Networks WXC application acceleration platforms

Benefits:

- Centralize email and other servers to lower overhead costs and improve reliability and security
- Roll out an AEC collaboration application to the Houston office without investing in $45,000 worth of new servers or any additional WAN bandwidth
- Efficiently share Excel and other applications across multiple offices

Steve Melendez had a problem. Employees in the Washington, D.C. office of BE&K Engineering Company were complaining that application performance was unbearably slow. Project managers at this top engineering and construction firm needed to share vital spreadsheets across multiple offices, but latency and limited bandwidth issues were significantly impacting performance across the wide-area network (WAN).

Melendez, BE&K's network manager, and Ernie Pritchard, the company's WAN analyst, set out to solve the problem. "There's a way to share Excel files as our users were doing," says Melendez, "but it puts a crimp in network bandwidth and increases latency."

Application performance is critical for BE&K, an engineering, construction and maintenance firm headquartered in Birmingham, AL. The privately held firm, which serves a broad range of capital-intensive industries such as automotive, power, process and chemical, pulp and paper, and telecom, has more than $1 billion in sales.

"When we centralized servers in Birmingham, we knew that, without an application acceleration solution, we would have to beef up bandwidth between Birmingham and Delaware. Juniper has helped us avoid recurring WAN expenses, but more important, we sped up the applications and made them palatable to users. Our users are much happier."

Steve Melendez
Network Manager
BE&K

The Solution

To solve their pain point in the Washington, D.C. office, Melendez and Pritchard began exploring their options. While adding bandwidth was one potential solution, it was quickly rejected as too expensive.

The BE&K team then turned to application acceleration as a viable option and began looking at products from different vendors. One, a major networking provider, offered a wide-area file services (WAFS) solution that could only accelerate applications based on the Common Internet File System (CIFS) protocol, which was too restrictive. Another solution, from a vendor that specializes in application acceleration, was not "network-aware" enough to provide the application prioritization and bandwidth allocation features that BE&K really needed, according to Pritchard.

Enter Layer 3 Communications, Juniper's Elite partner in Alabama. Alan Bruton, the firm's vice president, and senior engineer Doug Minderhout suggested that Melendez and Pritchard take a look at Juniper Networks, which offered an industry-leading WAN application acceleration and optimization solution. "We stepped in, quickly secured the evaluation units, facilitated a product demonstration and moved the process forward in an efficient manner," says Bruton.

After an in-depth analysis, BE&K agreed the Juniper WXC application acceleration platforms offered the scalable approach they were looking for to improve application performance, increase WAN capacity, and enable application prioritization and visibility. The WXC platforms speed application delivery over the WAN by eliminating redundant transmissions, accelerating TCP and application-specific protocols, prioritizing and allocating access to bandwidth, and ensuring high availability at sites with multiple WAN links.

For the initial deployment, a WXC 250 platform was installed in the Washington D.C. office and a WXC 500 platform at the Birmingham headquarters. Melendez and Pritchard were duly impressed with the results. "The Juniper boxes didn't just save us bandwidth, they sped everything up," says Melendez. "It was a much better end-user experience."

In fact, the results were so impressive that Melendez decided to expand the deployment and install Juniper WXC platforms at five different offices spread across Texas and the Southeastern U.S. BE&K has deployed Juniper Networks WXC 500 platforms in its Birmingham, AL headquarters and its Newark, DE office as well as WXC 250s in its Richmond, VA, Houston, TX and Washington, D.C. offices.

The Benefits

Since the WXC platforms were installed, application performance over the WAN has improved across the board at BE&K. Not only has the company saved a tremendous amount of WAN bandwidth, it has been able to consolidate servers for greater cost efficiency and reliability, roll out new resource-intensive collaborative engineering applications, and avoid more than $45,000 in server upgrades.

- ***Increased WAN Capacity:*** Working with large files such as engineering drawings and complex project schedules are a matter of course at BE&K. Application acceleration is absolutely critical to maintaining efficient performance, and the WXC platforms have enabled BE&K to realize a 3x increase in WAN capacity. "Our technical managers say that using large drawings remotely is as fast as when they access them locally," says Melendez.

  For example, before the Juniper solutions were installed, transferring a 20MB file over BE&K's WAN took at least two minutes every time. With the WXC platforms in place, while the first, or "cold," transfer took about the same amount of time as before, the second "warm" transfer took a mere 19 seconds—a tenfold performance increase.

That's because the WXC platforms eliminate redundant transmissions across the WAN using powerful compression and caching techniques. Molecular Sequence Reduction™ (MSR™), the flagship compression algorithm employed by the Juniper solutions, recognizes repeated data patterns and replaces them with labels before forwarding across wide-area links, dramatically reducing WAN traffic volumes. The MSR technology benefits a broad cross-section of applications, including both short, chatty applications such as Citrix and HTTP, as well as larger data patterns, such as Word files.

The Network Sequence Caching technique employed by the WXC platform is similar to the MSR technology in that it recognizes and blocks repetitive data patterns. However, unlike MSR – which operates entirely in memory – sequence caching uses onboard hard drives to retain and recognize much larger data patterns over longer periods of time, even if they were last seen days or even weeks earlier. The sequence caching technology is ideal for particularly large files, such as engineering drawings, or backup and replication traffic.

- ***Server Centralization:*** Server centralization, says Melendez, was a major driver of the company-wide WXC platform deployment. BE&K wanted to get the cost of server ownership under control and centralization allowed them to reduce the total number of servers while also improving reliability, simplifying maintenance and management, and enhancing security.

  "The initial purchase of a remote server is just the tip of the iceberg," says Melendez. "Ongoing costs associated with maintaining and backing up remote servers adds up."

  The centralization initiative at BE&K began with the consolidation of Microsoft Exchange servers in the Birmingham data center. To maintain LAN-like Exchange performance for the branch offices, BE&K uses the WXC platform's Application Flow Acceleration™ (AppFlow™) technology, which transparently speeds the performance of certain protocols that are especially impacted by WAN latency: the Messaging API (MAPI) used by Microsoft Exchange, CIFS (used by Microsoft file services), and HTTP (for web applications).

  The AppFlow technology delivers a three- to 100-fold improvement in performance for these applications, enabling BE&K to avoid expensive infrastructure upgrades. "When we centralized servers in Birmingham, we knew that, without an application acceleration solution, we would have to beef up bandwidth between Birmingham and Delaware," says Melendez. "Juniper has helped us avoid recurring WAN expenses, but more important, we sped up the applications and made them palatable to users. Our users are much happier."

  Now that the WXC platform has proven its ability to deliver efficient application performance over the WAN, Melendez says BE&K's ultimate goal is to provide centralized services for all offices with 50 employees or less.

- ***Facilitate Collaboration:*** The Juniper WAN acceleration solutions also played a major role in facilitating the use of an engineering project management application called Bentley ProjectWise throughout BE&K. When the company expanded the use of this critical Web-based application to employees in its Houston office, Melendez knew they would have to make IT investments to support the resource-intensive nature of engineering collaboration. In fact, Melendez estimated that they would need to purchase three additional servers, costing more than $45,000, plus upgrade the WAN links between the company's Birmingham headquarters and its Houston office.

"We looked for a way to avoid the server purchases and make the WAN connection robust enough to handle the application," says Melendez. By rolling out the Juniper WXC platform, BE&K ensured that ProjectWise would run smoothly over the WAN while avoiding the cost of the additional servers and WAN bandwidth.

In addition, using the WXC platform's unique Policy-based Multipath feature, BE&K dramatically improved WAN availability between the Houston, Birmingham and Delaware offices, where multiple WAN links are available. In these locations, BE&K uses the Multipath feature to define which applications should traverse which link. The system software monitors the performance of each path and automatically diverts applications from one path to the other if performance no longer meets acceptable levels.

Juniper's bandwidth management capabilities also provided BE&K a way to provide QoS over the WAN today and in the future. BE&K plans to eventually migrate to MPLS, and the WXC platforms give them the flexibility to define their QoS policies as needed. "When we move to MPLS, we can use the WXC to place different applications in different streams," says Pritchard.

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In the final analysis, Melendez and Pritchard say, the decision to go with Juniper as the foundation for their application acceleration strategy hinged on three important attributes: the ability to accelerate a broad range of applications; support for Quality of Service (QoS) and bandwidth management capabilities; and the company itself.

"We chose Juniper because of the quality of the product and stability of the company," says Melendez.

And last but not least, from the initial product trial to everyday operations, "Juniper's support services have been impressive," says Pritchard. "We were under the gun to get the box working at the first installation in Washington D.C., and Juniper's support helped us configure the box late at night so we could solve the immediate problem – and we weren't even technically a customer yet. That meant a lot."

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