

Leading 3D Architecture/ Engineering Firm Boosts Application Performance for CAD and Microsoft Exchange and File Services

GHAFARI

Customer:

GHAFARI

Industry:

Architecture/Engineering/Construction

Challenge:

Improve application performance and provide employees the ability to easily, securely and efficiently send very large 3D CAD drawings between headquarters, branch offices and building project sites

Solution:

Juniper Networks application acceleration platforms, routers and SSL VPN solutions

Benefits:

- 150%+ increase in throughput in general WAN traffic and 3D/4D CAD applications
- Increased network stability from headquarters to branch offices
- Gained visibility into peak and average traffic loads over the WAN
- Avoided WAN bandwidth upgrades
- Enabled mobile employees to easily and securely access applications and download large files while on the road

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Robert Bell
Director of IT
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It's no secret that everything is bigger today. Documents are bigger. Presentations are larger. Email boxes are bursting. For companies on the cutting edge of 3D/4D design, like the architecture/engineering firm GHAFARI Associates, L.L.C. the content moving across their corporate networks is already really big – and getting bigger.

"A single CAD file averages 3MB to 5MB," says Robert Bell, director of IT at GHAFARI.

GHAFARI, headquartered in Dearborn, MI, is a 24-year-old firm that prides itself on an integrated approach to architectural engineering, cutting-edge technology innovation and outstanding client service. The company is a single-source provider of architecture and engineering services, manufacturing engineering and professional staffing services.

GHAFARI specializes in the design and engineering of industrial and manufacturing systems and processes. Its expertise lie in the ability to integrate everything three-dimensionally to provide a clear view of how everything in a building fits together, long before the first concrete is poured. The final integration occurs between the architects, engineers, general contractor and subcontractors with a real-time, 3D digital model. The result is a higher quality design that is not delayed during construction because of rework.

GHAFARI's award-winning work ranges from renovating K-12 schools in Detroit to designing and building DaimlerChrysler's headquarters in Mexico. The firm is consistently recognized with top honors for its design and innovation. Engineering News Record ranked GHAFARI #123 in the Top 500 Design Firms, #5 in Manufacturing Plant Design and #1 in Automotive Plants Design.

As a technology innovator, GHAFARI is a leader in the use of 3D high-definition surveying and 3D/4D building information modeling (BIM), which helps the firm provide high levels of quality to clients as well as save significant time and money.

"We're one of the few A/E's that are doing 3D BIM, and it's opened up additional business opportunities, which has helped us grow as a corporation," says Bell.

Keeping up with rapid growth meant hiring more staff at its Dearborn, MI headquarters, as well as at branch offices in Chicago, IL and Indianapolis, IN. As more and more branch-office users began accessing centralized applications running in the Dearborn data center, performance became an issue. Because many common applications, such as Microsoft Exchange and Windows file services, are designed to run on a LAN, performance is seriously hampered by the latency and limited bandwidth of WAN links.

"Our users started to complain that when they called up a CAD file from the Chicago or Indianapolis office, it was much slower than it was locally here in Dearborn," says Bell.

Bell's first reaction was to add more WAN bandwidth, but the price tag to go from dedicated T-1s to dedicated T-3s between the three offices gave him quite a shock. "The cost of upgrading the bandwidth was significantly more than we realized," says Bell. "So we looked at other options."

The Solution

With technology ingrained in its business processes, GHAFARI relies on a state-of-the-art IT infrastructure. GHAFARI uses Juniper Networks WXC application acceleration platforms to improve application performance to branch offices, J-series routers for a high-performance network infrastructure and SSL VPN to give mobile employees access to critical business applications using any Web browser.

Since bulking up on WAN bandwidth wasn't economically feasible, Bell decided to consider an application acceleration solution instead. GHAFARI initially tested a WAN optimization solution from a WAN acceleration startup, but the deployment was fraught with trouble. The box worked in fits and starts, and it sometimes completely dropped the WAN connection between offices. "We thought we had it settled and that we had a workable solution. We did not," Bell recalls.

Still convinced that application acceleration could solve the performance problems he was having with his CAD, Windows file services, Microsoft Exchange email and other business applications, Bell continued to search for the right solution.

Previously, GHAFARI had worked with SunTel Services, a Juniper Elite partner, for its voice and data networking requirements to install both J-series routers and the SSL VPN solution to upgrade the company's network infrastructure. So when it came to identifying an application acceleration solution, GHAFARI again turned to SunTel, which recommended the Juniper Networks WXC application acceleration platforms.

"We are pleased that we have another case of bringing a strong Juniper Networks solution to one of our valued, long-term customers," says Don Jackson, SunTel's executive vice president. "We can always count on the Juniper Networks team and their products to live up to the reputation we have established for SunTel Services."

The Benefits

The Juniper WXC platforms are delivering strong benefits for GHAFARI. “Our business depends on those connections between our offices,” says Bell. “The applications have to perform all the time. Otherwise, our satellite offices can’t function.”

Excellent application performance at all locations is exactly what GHAFARI got, leaving users satisfied while allowing the company to avoid expensive investments in additional WAN bandwidth. The WXC platform’s Molecular Sequence Reduction™ (MSR™) compression, Network Sequence Caching and Application Flow Acceleration (AppFlow™) technologies deliver a dramatic increase in throughput, allowing GHAFARI to send an average of 80GB of data per month over its T-1 lines. Users in Chicago and Indianapolis get LAN-like performance from centralized applications, including Microsoft Outlook and CAD. A 5MB CAD file that once took several minutes to load over the WAN now takes 45 to 50 seconds the first time it’s called up, and just two to four seconds on subsequent downloads, even if changes were made to the file.

Thanks to the WXC application acceleration platforms, GHAFARI employees can work efficiently from any location, reducing travel between satellite offices, saving on airfare and hotel expenses. It’s a win-win situation, says Bell; users are extremely satisfied with performance and the company avoided the expense of additional WAN investments.

GHAFARI uses the WXC platform’s AppFlow technology to transparently speed the performance of protocols that are especially impacted by WAN latency, including the Messaging API (MAPI) used by Microsoft Exchange, the Common Internet File System (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.

In fact, the AppFlow technology inadvertently led to another significant IT benefit for GHAFARI: server centralization. Originally, the Chicago and Indianapolis branch office were so small that the company operated off a single, centralized Exchange server in the Dearborn data center. As those offices grew, says Bell, he assumed they would have to deploy dedicated Exchange servers in the branch offices to serve the local users. With the WXC platforms in place, however, that is no longer necessary.

“When you use Microsoft Outlook from the Indianapolis or Chicago office, there’s no difference in performance compared to Dearborn,” says Bell. As a result, GHAFARI has been able to centrally maintain its Exchange servers, ensuring stronger security, easier administration and lower overhead – with no sacrifice in performance.

The Juniper MSR compression algorithm, which has its roots in DNA pattern matching, enables enterprises to realize up to a 10-fold increase in WAN capacity. The MSR technology recognizes repeated data patterns and replaces them with labels, dramatically reducing WAN transmissions for a broad cross-section of application types, from short, chatty applications such as HTTP to larger data patterns, such as Word files.

The Juniper sequence caching technology, similar to the MSR compression feature, also identifies data patterns at the IP layer and replaces them with labels for transmission across the WAN. Unlike the MSR technology, however – which operates entirely in memory – sequence caching uses onboard hard drives to retain and recognize larger data patterns over longer periods of time. Available only on the WXC application acceleration platforms, sequence caching is particularly useful for large files like CAD drawings, large presentations, and data backup and replication.

The WXC platform's bandwidth management features, including both Quality of Service (QoS) and bandwidth allocation capabilities, were instrumental in the decision to go with Juniper. "The competitive solution doesn't offer Qo, and we believe that was why it kept failing," says Bell. "It just didn't know which applications or files to accelerate."

With the Juniper QoS and bandwidth allocation tools, Bell says IT can prioritize business-critical and latency-sensitive applications to ensure they always get sufficient bandwidth. And Bell particularly appreciates the WXC platform's wizard/template-based approach to setting up QoS, which makes it extremely easy.

Bell uses the Juniper WebView software to understand what applications are traversing the WAN, how much bandwidth they're consuming and how congestion is impacting performance. "WebView gives me a good handle on what's going on in the WAN, which I didn't have before," he says.

The modular design of the JUNOS operating system allows it to run multiple functions in parallel on assigned processing resources. The result is high stability with the flexibility to enable advanced routing, QoS, security and management policies with predictable performance.

Workers need access to critical applications from work sites – sometimes even before ground is broken. A temporary office, whether it lasts a few months or two years, must have secure, reliable connectivity back to the home office.

GHAFARI enables that access with the Juniper SSL VPN Secure Access 4000. Bell switched from an older IPsec VPN, because he can provide secure connectivity to more users with less management effort. With an SSL VPN delivered by SunTel, Bell doesn't need to hassle with client-side software deployments, changes to internal servers, and costly ongoing maintenance and desktop support.

"Whether people are at home or on the road, they can get access to their applications like email and timecards from any Web browser," says Bell. "And with the Juniper SSL VPN, I know it's secure."

GHAFARI continues to roll out application acceleration to keep up with its growing, increasingly mobile workforce. "I'm so pleased with the Juniper application acceleration products that I want to implement a Juniper WXC any time we have an office or team deployed away from the main office, so we can get the benefits of improved connectivity," says Bell.



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