Manufacturing Services and Trading Company Accelerates Cloud Applications

Toyota Tsusho Deployed Cisco Virtual WAAS to Enhance Performance

TOYOTA TSUSHO AMERICA, INC.

EXECUTIVE SUMMARY

Customer Name: Toyota Tsusho America Inc.

Industry: Manufacturing Trading, Import and Export Services

Location: Georgetown, Kentucky

Number of IT Users: 1,500 users in 36 locations across North America

BUSINESS CHALLENGES

- Maintain business application performance as applications move to private and public clouds
- Increase IT cost-effectiveness by reducing recurring and capital expenses for network bandwidth and server infrastructure

SOLUTION

- Cisco Virtual WAAS on VCE vBlock private-cloud infrastructure
- WAAS appliances for remote sites approaching bandwidth upgrade thresholds
- Retain local branch services with Windows Server on WAAS

BUSINESS RESULTS

- Application centralization eases regulatory compliance
- Rapid return on WAAS investment (6 to 8 months) via deferred bandwidth upgrades
- Enhanced productivity with up to 4X improvement in application response times

CHANNELS/INTEGRATOR PARTNER(S)

- Boice, New Albany, Indiana

Business Challenge

Toyota Tsusho America Incorporated (TAI), based in Georgetown, Kentucky, has thousands of IT users located in 36 sites across North America. Large sites include the Georgetown headquarters and data center, the Manhattan, NY administrative office, and several manufacturing and warehousing facilities. The North American presence includes sales and customer support offices.

As a wholly-owned subsidiary of the global Toyota Tsusho Corporation, TAI is required to conform to Information Technology General Controls (ITGC) driven by their financial audit requirements as well as JSOX, or the Japanese implementation of the Sarbanes-Oxley rules for accounting, IT process, and data protection. TAI faced the business challenge of compliance with data distributed in branches across the North American continent. Centralizing data at headquarters enables cost-effective data protection and regulatory compliance.

TAI's network architecture delivers the global Internet, internal cloud applications such as Microsoft Exchange for email, on-demand virtual server hosting, virtual desktops, JD Edwards, web filtering, and desktop security. The network also delivers public cloud-based applications such as fixed asset tracking, shipping and logistics scheduling, and import/export compliance software to users around the world through the Georgetown data center.

As with all large organizations, "centralized data and Internet access collides with an explosion of data growth", says Chris Jones, manager of infrastructure and operations at TAI. Many TAI branch locations were approaching their limit of available bandwidth with the T-1 (1.5 Mbps) connections to the corporate Multiprotocol Label Switching (MPLS)-based network. One notable challenge facing TAI network staff involved antivirus updates for one branch user burdening the network enough to compromise voice quality for another branch user. Another example involved users pulling many common forms and documents from centralized file servers.

Solution

TAI data and application server centralization initiatives contributed to a decision in 2011 to stop experimenting with server virtualization and commit to a goal of reaching 80 percent virtualization penetration in the Georgetown data center. The initiative began with a refresh of core computing and networking. TAI staff perceived that vBlock infrastructure platforms, from VCE, the Virtual Computing Environment Company, could deliver an integrated information technology offering best-in-class virtualization, networking, computing, storage, security, and management technologies with end-to-end vendor accountability. Among other components, vBlocks include Cisco Unified Computing System™ (UCS™), Cisco Nexus® Switching, and VMware vSphere virtualization infrastructure. "Cisco UCS smokes," says Jones. "It's fast, it's set up well, and we like the compute and memory density of the blades from a technical and budgetary perspective, and the footprint and power consumption are attractive as well."

With the data center refreshed, TAI staff turned to the challenge of helping ensure comprehensive application performance and fast access to centralized data. To address this challenge while simultaneously resolving bandwidth challenges and keeping the costs of the MPLS network stable, TAI selected Cisco® Wide Area Application Services (WAAS) solutions.

Virtual WAAS versus Physical WAAS Appliance Choices

For the Georgetown data center, TAI decided on Virtual WAAS (vWAAS) rather than WAAS appliances. The vBlock platforms include SAN storage for fast I/O, along with extensive redundancy features for high availability. vWAAS can leverage the SAN for Data Redundancy Elimination (DRE), the mechanism that delivers much of application acceleration and bandwidth reduction. DRE builds application-aware caches of data, and small tokens replace redundant data on the WAN. At TAI, WAN optimization performance becomes fault-tolerant: Upon any failure, a new vWAAS instance can utilize the existing cache stored on the SAN.

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> — Chris Jones, Manager of Infrastructure and Operations, Toyota Tsusho America Inc.

"We were an early adopter of vWAAS," says Jones, "and we perceived value in placing WAN optimization close to the data rather than near the WAN edge. In particular, we felt we could have lower-cost high availability (HA) for WAN optimization by leveraging the vBlock HA. And we perceived operational simplicity in the event of failure, compared with replacing a physical appliance and rebuilding the cache."

TAI then focused on the 18 of 36 sites in North America that were approaching the limitations of the T-1 circuits that connected them to the private MPLS network serving TAI and its subsidiaries. TAI's deployment right-sizes WAAS appliances for each site. The largest branch site, New York City, utilizes a Wide Area Engine (WAE) 674 appliance. Other branch sites use Wide Area Virtualization Engine (WAVE) 274 appliances. Most branch appliances are deployed in line for simplicity. "It's pretty easy, just a matter of getting them out there and walking an end user through a very quick wiring change. The simplicity saved us a significant amount of costs associated with sending an IT resource onsite," says Jones.

Virtualization Solutions in the Branch

TAI is successfully using Cisco Windows Server on WAAS, a solution that enables them to retain critical branch services provided by Microsoft Windows Server 2008, running on Virtual Blades provided by Cisco WAE 674 and

WAVE appliances, rather than a dedicated server. Retained branch services include authentication, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), and print services.

TAI and Cisco together relied upon Boice, a Cisco Systems Silver Partner, for the success of the WAAS deployment. Jon Wiesner, consulting engineer at Boice, designed and implemented vWAAS for Tsusho. "WAAS was a pretty clear and obvious fit. With the new virtual environment we had just finished implementing, it was clear to me that a virtual solution in the data center would be an immediate payoff for the customer," says Wiesner.

Virtualization for Management

vBlock efficiency allows compute cycles for other purposes. Virtual WAAS Central Manager, a virtual appliance edition of the technology that all WAAS customers use to manage policies, configurations, monitor and troubleshoot, installed easily on vBlock UCS servers, reducing device footprint and the associated cabling, power, and cooling requirements. Consistent management is provided for WAAS virtual and physical solutions, including WAAS modules and WAAS Express software in Cisco Integrated Services Routers.

> "Cisco WAAS is an excellent business and technical proposition where the actual return on investment is less than a year."
> — Chris Jones, Manager of Infrastructure and Operations, Toyota Tsusho America Inc.

Business Results

TAI expects to see the return on investment (ROI) within a year. With WAAS, TAI avoided the US$8000 per year per site additional recurring costs, reduced email traffic to its largest location by more than 65 percent, and deferred for the foreseeable future expensive bandwidth upgrades at many of its locations. And TAI generally prefers capital investments in solutions rather than increasing operational expenditures, in particular if the ROI is so fast. "ROI in a year is a pretty strong business proposition," says Jones.

In addition, retiring branch servers is expected to yield significant cost reductions. Although costs vary widely, many industry analysts estimate the total cost of each branch server at $10,000 per year, accounting for amortized purchase price, warranty and maintenance agreements, and administrative costs. Having Windows Server on WAAS in each branch, combined with centralized application servers in Georgetown, is expected to save $160,000 in three years.

The main benefit of WAN optimization is fast application performance, which can enhance IT user productivity. The TAI deployment of Cisco vWAAS and WAAS appliances is delivering significant application performance gains for web-based applications that use HTTP (Figure 1).

Figure 1. Estimated HTTP Response Time Gains, (percent) [Over Seven Days, to a Large Branch Site]
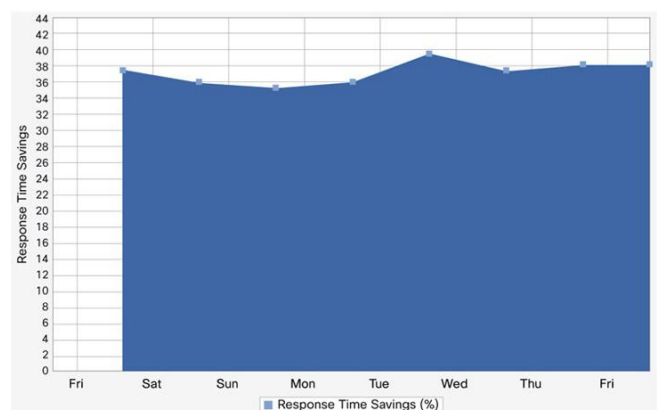
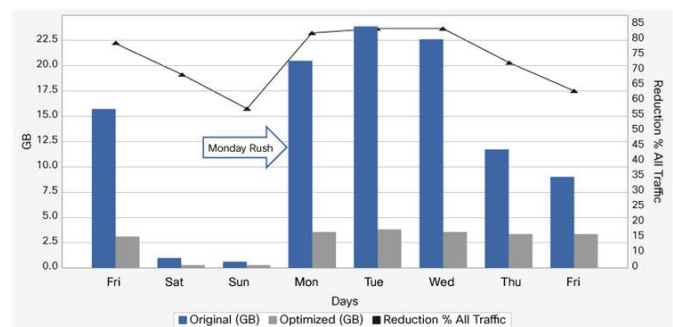WAN optimization delivers bandwidth optimization that can

1. Immediately reduce costs for bandwidth, which costs extra during bursts, and can defer expensive bandwidth upgrades. Figure 2 shows an average of 70% data reduction which in effect triples available bandwidth.

2. Reduce both latency and round trips to complete data transfer, which together accelerates application performance.

Figure 2. Compression Summary by Traffic Type [Over Seven Days, to a Large Branch Site]
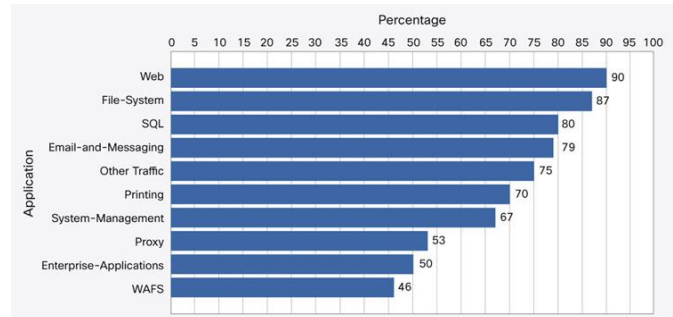
A key WAN optimization benefit is the mitigation on bandwidth consumption during the huge traffic burst on Mondays, when employees arrive at work and email attachments come to their mailboxes. Figure 3 shows actual bandwidth consumption well below what applications would have required. Monday bursts, for many organizations, result in overage charges.

Figure 3. Actual Bandwidth Savings in GB [Over Seven Days, to a Large Branch Site]

Next Steps

At this early stage, TAI recognizes that it is utilizing only a narrow range of Cisco WAAS features, while already realizing performance and cost benefits. Near-term plans include:

- Leveraging WAAS WAN optimization to enable more public-cloud-based services.

- Leveraging vWAAS on vBlock and their refreshed core to become more of a private cloud-services provider to additional TAI subsidiaries on the continent and beyond.

- Leveraging WAAS to significantly increase virtual desktop computing throughput for remote locations and remote access alternatives.

- TAI directs traffic to vWAAS using Cisco Web Cache Communications Protocol (WCCP). Cisco Nexus 1000V virtual switches offer vPath, a service routing that is transparent to application server virtual machine mobility. vPath offers the possibility of elastic on-demand orchestration of vWAAS in a private cloud-services set-up. A possible next step will be to deploy Nexus 1000V on vBlock.

- Expanded use of Windows server on WAAS in more branches.

For More Information

To find out more about the Cisco WAAS, go to: http://www.cisco.com/go/waas. On the right of that page, you will find a link to the WAAS ROI calculator to calculate your own WAN optimization return on investment.