

# DENSO BOOSTS GLOBAL WAN PERFORMANCE WITH WX SERIES

## Summary

**Industry:** Automotive Manufacturing

**Challenge:** To improve the performance of the WAN that connects Denso's operations in 30 countries around the world.

**Selection Criteria:** Data compression ratio and performance

**Network Solution:** Juniper Networks WX20 and WX50 Application Acceleration Platform

**Results:** 1.8 times improvement in WAN performance. High compression ratios achieved for FTP file transfers (60 percent), client/server applications using the HTTP protocol (55-65 percent), and the Lotus Notes groupware application including email (30-40 percent).

Denso Corporation is a world leader in the manufacturing of automotive components and one of the core businesses supporting the Toyota Group. Its main products include engine control systems, vehicle climate control systems, vehicle body components, and information and communications systems such as car navigation systems and electronic toll collection systems.

## Challenges

As a global corporation, Denso has operations in more than 30 countries around the world. Each Denso unit works closely with the local automobile manufacturers and suppliers in areas ranging from design and development to production and sales, in order to deliver finished goods that are adapted to the needs of each region. Denso is also building a product development platform that will bring together the technologies that are being built in these different locations.

At the same time, the company is looking to consolidate the management of its overseas subsidiaries. "Financial information from these overseas groups is being aggregated in real time on the server at the head office," said

Mr. Kimihide Kobayashi, IT manager at Denso.

The company also deploys regional systems for production management, instead of handling this at the plant level. "For example, we have a system in place whereby the plants in North America access the Detroit location in the United States to obtain production information," said Mr. Kobayashi.

In addition, the network supports the flow of information from other systems such as the company's IBM Lotus Notes groupware, computer-aided design (CAD) data file transfers and video conferencing systems.

Given these requirements, the WAN that connects Denso's different branches worldwide plays a critical role in ensuring the smooth running of the global business, and one of the challenges that the company faces is to ensure that the WAN performs at an optimal level.

"Response speeds are extremely important on a network that is used for a wide range of applications," said Mr. Kobayashi. "At the Toyota Group, we use a just-in-time production system known as the Kanban System. If line speeds slow down too much, the system runs into difficulties."

To address this, the company has specified a required response time of five seconds or less after a request has been entered into the system. However, as the amount of data flowing across the network increased, it had to take urgent measures to ensure that this requirement could be met and to improve the overall performance of the WAN.

## Selection Criteria

Denso looked into different ways by which it could increase the line speed across the WAN. As Mr. Kobayashi explained, "At Denso, communications expenses are handled as a fixed cost. If we installed more line capacity as the amount of data increased, this would invariably lead to an increase in fixed costs. To keep these fixed costs down, we adopted a 'trial and error' approach to finding the right solution."

Benchmarking tests were conducted on a range of products, which were also subject to technical tests to find out how they would cope with worst-case scenarios such as a system malfunction after an upgrade. This helped Denso to predict the degree of improvement that could be expected with the deployment of a particular solution.

As a result of these tests, Denso zeroed in on the Juniper Networks® WX Series Series Application Acceleration Platforms for WAN acceleration. The WX Series is a best-in-class application acceleration platform which provides broad support for Web-based, client/server, custom software, voice and video applications. It delivers the performance and scale to support large application deployments in geographically distributed environments. A comprehensive management system centrally manages, monitors and troubleshoots application and network performance.

The data compression ratio and performance of the WX Series were among the deciding factors for Denso, said Mr. Kobayashi. "We drew up a list of parameters which we then compared across all products. We narrowed down the choices by comparing catalog values with our requirements specifications in terms of performance and quality. In the end, we chose the Juniper solution for its superior compression ratio and performance."

Once the decision was made to go with Juniper Networks, a WAN simulation environment was built in collaboration with Denso's telecommunications service provider KDDI, and tests were conducted using actual data.

Describing the findings, Mr. Kobayashi said, "In the beginning, we expected a line acceleration of approximately 1.5 times, but we found that even though the results varied with the applications, we could expect improvements of over 1.6 or 1.7 times on average. We also calculated that we could shave about 10 percent off our costs. For example, if it cost 100 yen to accelerate the lines, installing Juniper Networks WX Series brought the cost down to 90 yen."

## Solution

Of Denso's 94 overseas locations, a total of 60 in North and South America, Europe, Asia (except China) and Australia were targeted for the deployment of the Juniper Networks WX Series. The decision was made to exclude locations from the upgrade that had relatively low bandwidth utilization of 20 percent or less.

The application acceleration solution was also installed at Denso's data center at the head office, which was connected to the overseas WAN.

For the locations which were upgraded, installing the WX Series provided network redundancy and enabled them to meet Denso's stringent business continuity requirements. These requirements specified that in the event of any disruption, the network had to be restored within four hours. Since it would be difficult to reach some of the overseas locations within four hours, extra precautions were taken by creating redundancy for both lines and equipment.

The deployment of WX Series began in October 2006 and was completed in April 2007.

**"Since the deployment of the WX Series, we have seen the speed of communications improve by 1.8 times on average."**

Kimihide Kobayashi,  
IT Manager, Denso Corporation

## The Results

"Since the deployment of the WX Series, we have seen the speed of communications improve by 1.8 times on average," said Mr. Kobayashi.

The biggest impact has been on FTP file transfers where a compression ratio of about 60 percent was achieved. This was followed by client/server applications using the HTTP protocol, which achieved a ratio of 55-65 percent, and the Lotus Notes application, including email, which achieved a compression ratio of about 30-40 percent.

Said Mr. Kobayashi, "I have personally tried to access the mail server in Japan from locations in the United States, and found that in terms of perception of speed, it was no different from accessing the server from the local area network (LAN) at the head office. End users have also told us that the network is faster than before, so I can safely say that the upgrade has been effective."

Beyond enhancing performance, the WX Series is also being used to monitor and analyze network operations by providing a visual representation of how applications are used and the utilization rates for each application. This information can be shared with IT systems managers at each location.

## Next Steps and Lessons Learned

Going forward, Denso is planning to leverage the WX's ability to analyze application efficiency in its application development efforts. As Mr. Kobayashi explained, "At Denso, we are developing a range of applications. If we can provide guidelines to the application development departments on the protocols that can support improved communication speeds, development periods can be shortened because it will be possible to omit some of the network stress testing."

Meanwhile, efforts continue to further enhance the performance of the WAN in line with the company's long-term business strategy—the Denso Vision 2015. Denso has set the goal to achieve zero latency for its global network by 2015. To achieve this, it has come up with the concept of a virtual head office to reduce latency at the sites. "In order to implement this, we need to improve the speed of communications between locations even more," said Mr. Kobayashi.

## About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at [www.juniper.net](http://www.juniper.net).

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