DENSO DELIVERS AUTOMOTIVE INNOVATION WITH NVIDIA QUADRO vDWS

Graphics-accelerated virtual workstations increase productivity, collaboration, and application adoption.

ABOUT DENSO

DENSO is one of the largest global automotive suppliers of advanced technology, systems, and components, with more than 8,900 patents and 23,000 employees in the US, Canada, and Mexico. The company designs groundbreaking technology and components for the automotive industry by closely partnering with customers right from the start to develop state-of-the-art systems and products. With a wide range of customers, from Ford to Harley Davidson to Toyota and General Motors, DENSO takes pride in looking to new technologies to deliver better products.

FIVE REASONS FOR NVIDIA QUADRO vDWS

> Delivers virtual workstations that perform as well as physical workstations

> Improved efficiency and productivity for engineers and designers working with large data sets

> Quadrupled usage for the VDI environment

> Enables experts from around the world to collaborate on projects

> Streamlines management and maintenance by reducing the amount of physical hardware IT has to support

SUMMARY

> Automotive supplier, DENSO was challenged with management complexity of physical workstations with six different boot environments.

> The team wanted to consolidate the multi-boot environments so engineers could work efficiently and desktop management was more streamlined

> With NVIDIA Quadro® Virtual Data Center Workstation (Quadro vDWS), DENSO's IT team delivered virtual workstations that performed just like physical workstations when dealing with large data sets and graphics intensive software

> Users are so satisfied with the new virtual workstation environment that DENSO has seen a 250% uptick in usage for the VDI environment

CUSTOMER PROFILE

DENSO Crafting the Core

Organization	Industry	Location	Employees	Website
DENSO International America	Automotive	US, Canada, and Mexico	23,000	www.denso.com/us-ca

Graphics Acceleration:
NVIDIA Quadro® Virtual
Data Center Workstation
(Quadro vDWS)

Hypervisor: VMware vSphere
on Horizon

GPU: NVIDIA Tesla® M60

Server: Cisco UCS C240

CHALLENGE

When it comes to delivering products and closely collaborating with customers, DENSO knew early on that it needed to move toward a virtual environment. A growing engineering team and customer environments presented a unique challenge for IT.

"From an IT standpoint, especially our engineering IT group, it was an administrative nightmare. With our existing system, engineers would have multi-boot workstations—meaning six different boot environments, our internal environment and five other environments for the different customers. If a user had to do any work, they had to literally reboot their machine to the different environment, go into it, and do the work. It also meant that if we needed to do any updates, we had to basically boot every machine into that environment to perform the update. Occasionally, the update had to be performed manually. There was a lot of time and resources wasted just trying to keep these environments the same. Especially with monthly customer updates, it would take eight to sixteen hours of work for multiple people over a weekend going through and updating every machine," explained Wesley Struble, CAD system administrator, North American Information Technology Services, at DENSO International America.

The promise of virtualization was a perfect fit for this team and, after an in-depth proof-of-concept, the team settled on VMware as their virtualization platform.

> **"Since adding NVIDIA Quadro vDWS, we have seen a 250% uptick in usage. That is quadrupled usage for the VDI environment since adding the virtual GPU."**
>
> Wesley Struble, CAD system administrator, North American Information Technology Services, at DENSO International America

"We were trying to get to a point where we did not have all these physical machines to support. And we're now moving in that direction," Struble said.

Originally, the team didn't deploy NVIDIA virtual GPU technology because VDI alone was good enough for the users to be able to sign into the customer environment, download data, move it into an environment and work. Just the time savings of rebooting the machines alone more than covered the initial POC.

"The beginning of the project was really about time savings for engineers and designers," he said.

While it met the needs for medium and small data, virtualization alone was not meeting the needs of large data sets at all.

"Our users were pushing us to make this work. They would say they wanted this environment and could see the benefit, but it needed to be improved in order for them to actually be able to work in it," Struble clarified.

SOLUTION

The team wanted the virtual workstations to perform just like physical workstations when dealing with large data sets and graphics intensive design software. In addition, they wanted to consolidate the multi-boot environments to make it easier for their engineers to get work done. Struble and his team deployed NVIDIA Quadro® Virtual Data Center Workstation (Quadro vDWS) to handle the workload.

"Before NVIDIA Quadro vDWS, users were logging into the customer's environment, downloading data, and moving it over without opening or manipulating it. Now, both our occasional and dedicated users can actually go into VDI, open the data in the DENSO environment with our own tools, and do the work they need," Struble explained. "Since adding NVIDIA Quadro vDWS we have actually seen a 250% uptick in usage. That is quadrupled usage for the VDI environment since adding the virtual GPU."

> "NVIDIA Quadro vDWS made it so that 98–99% of our users could use the virtual environment just like a physical machine sitting in front of them. Users are actually reporting back that it performs exactly the same as a physical machine."

Wesley Struble, CAD system administrator, North American Information Technology Services, at DENSO International America

RESULTS

For Struble and his team the results spoke for themselves.

"The summary is that NVIDIA Quadro vDWS made it so that 98–99% of our users could use the virtual environment just like a physical workstation sitting in front of them. Users are actually reporting back that it performs exactly the same as a physical workstation. And the advantage to us is we don't have to roll out as much high-end hardware. So, there's an additional cost savings there as well."

INCREASED PRODUCTIVITY

Struble further explained that many of the DENSO engineers take pride in their high-end physical workstations, so their acceptance of virtualization was especially important.

"They have the latest and greatest, most powerful desktops. So, we showed them the benefits of graphics accelerated virtualization—like the time savings of not having to reboot your machine and going to grab coffee, then coming back to log into the customer environment, download the data, and then rebooting again," he said.

Leveraging NVIDIA Quadro vDWS also delivered some unexpected productivity gains. Today there are some DENSO engineers working on physical machines and on VDI at the same time.

"My monitoring systems show that one of our engineers is on her physical machine and two VDI pools right now. She is doing regular work while also working in two customer environments at the same time. We have doubled her capacity."

APPLICATION ADOPTION

With the success of 3D CAD VDI, DENSO started implementing VDI for CAE applications. The increase in use was immediate. One application in particular didn't have a lot of dedicated users, so the company had designated workstations for the application.

Struble explained, "Users would use walk ups for this one particular CAE application. The users who didn't have access from their regular desktop suddenly began using the application a lot from their virtual desktop.

NVIDIA Quadro vDWS has enabled them to have the tools right there at their desk that they didn't have before. I don't think there's an application at this point that we support, which we haven't virtualized on the desktop now."

GLOBAL COLLABORATION

More importantly, NVIDIA Quadro vDWS has helped DENSO bring together experts from around the world onto projects.

Struble explained, "On one project in particular, we're working to set up global standards for a CAD product lifecycle management. With graphics accelerated virtualization, we're collaborating closely with them to spin up a development environment and then create a pool of client machines that connect to that environment, giving access to it from Japan. Now if they develop code, we can implement that code, and then they can test it in a virtual client from Japan."

WORKING FROM HOME

In addition, DENSO has a work-from-home policy. However, engineers and designers on physical workstations didn't have access to CAD software from home.

"If you don't have access, then that policy really doesn't apply to you. Now they can do all their work from home. They can log in from home and take advantage of that policy for a better work-life balance," Struble said.

LOOKING TO THE FUTURE

For DENSO, GPU accelerated virtualization has really taken off and plays heavily in IT's ability to deliver new applications to their users.

"We want to get to the point where it's essentially a 24-hour a day design center. We are not at that point yet, but NVIDIA Quadro vDWS is something that will get us there. It's already delivering more efficiency to engineers. Using our high-end designers and engineers more efficiently means they're able to complete more projects," Struble explained.

GPU accelerated virtualization with NVIDIA Quadro vDWS has been so successful that Struble and his team discovered they have a lot more work ahead of them.

"The downside is that we are outperforming the hardware, and can deploy pools of virtual machines with agility that you just can't get with physical workstations. Other groups want to know if they can move to virtual desktops. They are asking 'Can we do simulations? Can we do software development systems there? Can we do an ECAD system in there too?' We are a victim of our own success!"

In the end, Struble and his team think that virtualization with NVIDIA Quadro vDWS will allow the company to continue as a leader in automotive innovation.

"I think graphics-accelerated virtualization is the future desktop for us," Struble concluded.

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