LG Electronics Uses NICE DCV to Accelerate Product Design with Remote Access to CAE Tools

As the engineers at global manufacturer LG Electronics (LGE) became increasingly spread out across disparate locations, the company wanted to find a way to give them remote access to on-premises software. Remote access would enable engineers to use computer-aided engineering (CAE) tools necessary for product design and deployments from anywhere. A longtime customer of Amazon Web Services (AWS), LGE chose NICE DCV, a high-performance remote display protocol that provides users with a secure way to deliver remote desktops and application streaming from any cloud or data center to any device, over varying network conditions.

LGE used NICE DCV on premises to enable remote access to its CAE applications running in its on-premises data centers. As a result, its engineers can remotely, simply, and efficiently access their CAE applications.

Challenges to Enable Remote Work

One of the largest enterprise users of AWS in Korea, LGE manufactures consumer electronics, home appliances, and vehicle component solutions. Its brand LG ThinQ delivers smart, connected devices that feature artificial intelligence technology, so they can communicate with each other while learning about their users' behavioral patterns and environments. The company employs more than 75,000 people who work in over 120 operations, including 80 subsidiaries around the world. Some engineers work onsite at LGE's two data centers, while others work from home across several regions.

LGE's engineers use CAE tools running on premises to generate computer simulations to help design LG ThinQ products. After the simulations, the engineers must display models and results remotely. However, LGE's previous remote access tool did not efficiently use GPU power and was limited in displaying models remotely. Most users had to download data from the server to their local desktops, which could take hours for a complex model. "There was a geographical challenge," says Woosung Kim, high performance computing (HPC) professional engineer at LGE. "Many users were working remotely, but the network was not sufficient for heavy users who handle big models on HPC infrastructure."

In 2013, LGE tested two other remote display solutions, but NICE DCV was the highest performing and offered the best value. "NICE DCV had the best performance for speeding up graphic resolution and low latency, and it was simple to manage for HPC," says Kim. Helping LGE select NICE DCV was HPC solutions consultant [International Solution Business Consulting](#) (ISBC), an AWS Registered Consulting Partner. "ISBC has a long history of using NICE DCV, and it has strong skills and background in Linux and HPC," says Kim.

Seeing High Performance, Flexibility, and Cost Savings on AWS

With the help of ISBC, LGE built a proof of concept in 2013 and started the production service the following year. Using NICE DCV, LGE engineers can remotely access CAE software and supercomputing systems running in an on-premises data center, and these systems can interact seamlessly. ISBC helped LGE set up and use NICE DCV alongside the CAE software as well as customize [NICE EnginFrame](#), which simplifies the process of setting up and running technical and scientific applications that take advantage of the power, scale, and flexibility on AWS.

The solution has resulted in significant cost savings because it can be

simply configured to optimize efficiency. GPU resource use improved by 70–90 percent on Linux systems because NICE DCV enables multiple sessions to share a single GPU, leading to savings on server infrastructure costs. More than 2,000 workstations share the NICE DCV solution, and each GPU server supports 10–15 users simultaneously. In 2016, LGE began to support the [NICE DCV Windows client](—)—a stand-alone application that runs natively on the Windows operating system—enabling engineers to expand their simulation projects and data. "The NICE DCV Windows client delivers nice performance," says Kim.

Because the solution offers remote 3D streaming, CAE users don't need to upload or download from HPC storage, and they can share screens with each other to collaborate, which increases the efficiency of network resources and staff productivity. Additionally, the solution enables engineers to work remotely, giving them flexibility.

LGE's data is centralized and secure on premises, and using NICE DCV and other services on AWS helps LGE keep that data secure while enabling remote functionality. No user has direct access to the data stored in the data centers; only display data can stream to users' screens. Also, LGE has fine-grained access control over different features of NICE DCV, enabling it to configure what users can do or access. For example, LGE can disable the ability to copy and paste or the use of USB drives for certain users.

Powering Artificial Intelligence Initiatives

Ultimately, LGE used NICE DCV to enable engineers to remotely access the on-premises CAE software they needed to design LG ThinQ products. This solution helped LGE save costs through GPU sharing and improve collaboration between engineers, all while staying secure. It also increased LGE's flexibility and agility, enabling it to adapt quickly during the COVID-19 pandemic.

In future, the company plans to use NICE DCV for artificial intelligence models in development on TensorFlow, an open-source solution for machine learning, to further improve its development efforts. "Our collaboration with ISBC has delivered significant benefits to LGE's HPC team for over 8 years," says Kim. "ISBC not only helped us use NICE DCV but also acts as a consultant for architecting infrastructure and building other solutions using AWS services."

About LG Electronics

LG Electronics is a global manufacturer of consumer and commercial products ranging from TVs, home appliances, air solutions, mobile devices, service robots, and automotive components. Its four companies saw sales of over $56 billion in 2020.

Benefits of AWS

- Enabled engineers to remotely access on-premises software
- Cut costs through GPU sharing
- Supports 10–15 users per GPU
- Scales to support over 2,000 CAE workstations
- Cut costs of manufacturing smart, connected devices
- Improved collaboration between engineers

AWS Services Used

NICE DCV

NICE DCV is a high-performance remote display protocol that provides customers with a secure way to deliver remote desktops and application streaming from any cloud or data center to any device, over varying network conditions.

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Get Started

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NICE EnginFrame

NICE EnginFrame is an advanced web front-end that provides a secure, intuitive, service-oriented interface for users to manage their HPC clusters, data, licenses, batch & interactive applications.

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