About X-ISS Inc.
www.X-ISS.com

X-ISS has been providing cross-platform management and analytics solutions for the High Performance Computing (HPC) and Big Data industry for more than 10 years. With a reputation for the highest levels of quality and customer satisfaction, X-ISS has been helping customers make effective use of their HPC and Big Data investments through software and services that cater to their specific needs. The solutions include a full-service remote cluster management service called ManagedHPC® that removes the worry from customers about managing their cluster environment effectively. Additionally, X-ISS provides DecisionHPC®, a smart business analytics SaaS product that allows customers to keep their clusters operating at maximum efficiency.

X-ISS
2190 North Loop W
Suite 415
Houston, TX 77018
713.862.9200
x-iss.com

Affordable, Efficient Remote 3D Visualization Solution

Visualization of 3D graphics can provide an enormous benefit for organizations that deal with large volumes of visualization data and whose users are geographically dispersed. One such example is a company that provides seismic data processing services to oil & gas clients.
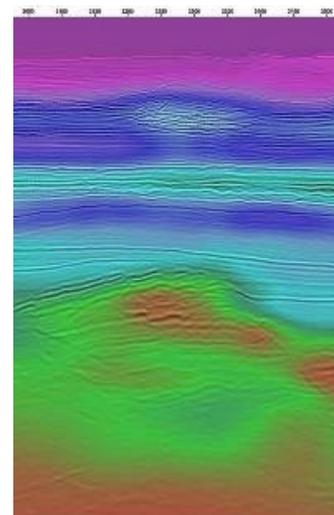
The Challenge

As a long-time HPC services provider to the oil & gas industry, X-ISS was asked to develop and implement a Remote 3D Visualization solution that was both efficient and affordable for one of their Houston-based clients. They wanted to make it easy for their customers and partners to collaborate on large image models.

HPC technology is frequently relied upon today by oil & gas companies to handle the CPU-intensive processing, modeling and analysis of large data sets. For many of these applications, especially related to seismic survey data, the output of these processing jobs is a 3D model that will be viewed by engineers, scientists, and researchers. For X-ISS's client, the 3D models are viewed by internal staff as well as their external customers.

Small section cut from a seismic model.

The outputs files can be huge, ranging from multi-gigabytes to several terabytes of data. Many companies that provide processing services, however, keep their HPC clusters at remote datacenters and not the users' offices due to the unique power, cooling and space requirements of the HPC environment. The data itself is also stored at the remote location where it will be processed to avoid the bandwidth issues of constantly transferring large files.

The challenge is making those 3D models available for visualization by the technical staff on standard workstations at remote offices or even at customers' sites.

ProjectHPC

The Challenge continued

3D models of this size can usually only be rendered for viewing on high-end workstations with powerful GPUs. Some organizations have installed dedicated workstations at their offices just to visualize 3D models, an expensive alternative that also requires installation of additional bandwidth for delivery of the files from the data center. This is not always possible or economical. A common solution to this bandwidth challenge is to deliver the processed 3D models on hard drives or other media, which involves obvious associated security risks.

Remote access is not an issue confined to 3D data. Conventional solutions related to 2D data access exist, but they typically lack the ability to effectively render 3D models in a remote session. In this case a 3D-specific solution had to be implemented.

The Solution

Only a handful of 3D solutions exist, and X-ISS examined alternatives that could be used by internal personnel as well as customers. X-ISS ultimately chose the NICE EnginFrame with the VDI plugin because it creates an environment that allows users to securely log into the visualization portal from their own desktop computers using either Windows or Linux sessions.

The remote visualization sessions use the NICE Desktop Cloud Virtualization (DCV) to render and compress 3D OpenGL graphics locally in the datacenter which are then displayed remotely as 3D images on the remote client's screen. It's important to note the NICE EnginFrame can accommodate other 3D remote visualization products, but for this use case, DCV was determined to have the best fit.

The key criteria for success included user experience from various locations, concurrent user sessions to the same system, and customization of security to make sure unauthorized access to data was not possible. X-ISS tested and benchmarked these with another leading product, and found that in the client's environment the NICE DCV product used about one third the bandwidth. DCV has been optimized to deliver an improved user experience even when operating on lower bandwidth and higher latency connections.

Just as important to the client, which is a large organization with many technical employees and customers, the NICE DCV product enables multiple concurrent user sessions on the same physical host.

Lastly, X-ISS performed extensive customization of the DCV solution to accommodate the particular needs of the client's business environment. The client processes data for many customers at once, and keeping the data sets and 3D models separate was imperative. The X-ISS team set up customized access controls to ensure isolation of user sessions and data, while not impacting the production environment. This arrangement permitted the client's customers to access their 3D models from outside the network as well.

> The challenge is making 3D models available for visualization on standard workstations at remote offices or even at customers' sites.

The Results

The client's partners and customers can collaborate securely and efficiently from remote locations. This in turn has led to increased productivity for the client as getting timely feedback produced quicker turnaround of results.

ProjectHPC