Santos sponsors Open Source software for better reservoir visualization

Australian energy company Santos is sponsoring Open Source technology that is improving collaboration between its geoscientists, who can now work on their subsurface data models from just about anywhere.

In 2010 Santos became a major sponsor of VirtualGL and TurboVNC to enable employees to use their laptop PCs to interpret geoscience data visualized by servers running Paradigm software. Paradigm is a leading supplier of exploration and development software to the oil and gas industry.

Whether in a regional office, at home or in an airport lounge, users can reconnect to the same high-performance 3D graphics session that had been running at their regular desk.

It enables real-time national and international collaboration and peer support between remote geoscience colleagues, irrespective of the number of participants or their locations.

Feedback from geoscientists shows that using this new technology via laptops easily rivals the performance of more expensive workstations, Santos says. This has led to many users swapping their traditional geoscience hardware in favour of running TurboVNC on their laptop to display data and application images produced by Paradigm and VirtualGL in Santos’ Adelaide headquar ters.

The company’s users across Australia and south-east Asia now have shared access to more processing power than was previously provided by individual high-end workstations at the users’ desks, Santos says.

Benefits

The software is used to locate new oil and gas reserves and optimise production from discovered reservoirs by creating dynamic digital models of the Earth’s subsurface.

The Open Source technology being pioneered by Santos displays seismic data from prospective oil and gas fields, as well as models of existing fields, to Santos’ offices in Australia and Asia.

Significant investments in data are de-
Combining Paradigm products with VirtualGL and TurboVNC enables Santos to serve its interpretation data and applications from its headquarters in Adelaide, South Australia.

The stability of the solution allows Santos to rely on this technology for the success of its widely dispersed operations but the real magic is in how fast the Open Source technology can render and deliver 3D graphics back to a user’s desktop thousands of kilometres away.

The move towards Open Source is saving Santos – Australia’s leading natural gas producer – over $1 million a year in operating costs, the company estimates.

At the same time it is increasing the speed with which data is interpreted and models are analysed.

Darren Stanton, Geoscience Systems Specialist and the architect of the Santos solution, said the most exciting part of centralising seismic interpretation was the freedom it afforded Santos’ geoscience teams and the ability to collaborate between offices.

“Now that the processing power is housed in the same server room as our storage, much faster network technologies can significantly reduce seismic data access times.” Mr Stanton said.

“Our annual sponsorship of the TurboVNC and VirtualGL projects gives us direct access to the Open Source technical brains that have made this all possible. Any bug-fixes or feature enhancements are dealt with quickly, and it’s not uncommon to have a new version of code sitting in our inbox ready for testing the morning after emailing a request to the programmers.”

“The move to Open Source thin client deployment has been a huge success for us in so many ways, and we would encourage other companies to adopt and support Open Source technology.”

VirtualGL and TurboVNC
To make it work, Santos has been sponsoring development work on Open Source software packages VirtualGL and TurboVNC, which can enable high performance 3D graphics software (such as Paradigm’s geoscience interpretation suite) to work with a thin client (such as someone’s remote laptop computer).

VirtualGL is an Open Source program which redirects the 3D rendering commands from Unix and Linux OpenGL applications to 3D accelerator hardware in a dedicated server and displays the rendered output interactively to a thin client located elsewhere on the network.

TurboVNC accelerates the JPEG encoding paths. It can deliver a dual screen image (3840 x 1200 pixels @ 20 frames per second) over local and wide-area networks including the Internet. Santos has seen outstanding results using TurboVNC in its Jakarta, Indonesia, office to display Paradigm projects running in Adelaide.

When Paradigm software is used together with TurboVNC and VirtualGL, Santos’ geoscientists can view all their visualisations on any PC in a high performance 3D graphics view regardless of their location.

Open Source refers to software in which source code is made publicly available for use or modification by others. Open Source software is usually developed by public collaboration to progress information technology.

Through its ongoing annual sponsorship, Santos provides the Open Source team with the necessary financial resources to further develop and improve TurboVNC and VirtualGL.

IT setup
Santos uses IBM X3650 M3 servers running Red Hat EL5 with NVidia Quadro Plex 2200 S4 graphics hardware to create a VirtualGL server farm which runs the Paradigm application suite in Santos’ Adelaide server room.

Santos’ Turbo VNC servers - enabling remote access to 3D reservoir visualisation software

The images generated are transmitted on a dedicated graphics subnet within the company’s network or via the Internet and displayed on standard Windows laptops running the TurboVNC client.

Santos developed its own web portal to initiate the TurboVNC session and configure appropriate compression settings based on the user’s network connection. The portal also allows users to create and resume their own TurboVNC sessions without logging on and off as they move between desks or offices.

This new thin client technology has greatly simplified many aspects of data management, Santos says.

All Australian-based users now share one common set of applications, databases and seismic data, removing the need for discrete islands of infrastructure and overnight synchronisation of data between Santos sites.

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