|| Parallels™

"High-performance virtualization on Intel Xeon processor 5500 series-based workstations is a game-changing capability. We can allocate multiple cores, up to 64 GB of memory and a dedicated graphics card to each virtual machine. The results are spectacular."

— Russ Sagert, Geoscience Technical Advisor – North America, Schlumberger

Intel® Virtualization Technology and Parallels Bring Native Graphics Innovation to Virtual Machines

Visualizing complex multi-OS workloads concurrently

Geoscientists and engineers in the oil and gas industry require multiple workstations, each running a different operating system and different business-critical applications. It's an expensive computing strategy; it hampers a user's ability to efficiently sift through complex information and it drives up power consumption and IT maintenance costs per user. Now there's a more productive and cost-effective way to operate in these resource-intensive, graphical workflow-driven environments.

With workstations based on the latest Intel® Xeon® processor 5500△ series and Parallels Workstation Extreme* virtualization software, engineers and geoscientists can run multiple high-end Linux* and Windows* applications concurrently on a single workstation and realize near-native performance (95 to 100 percent of a dedicated workstation). Even complex graphics are rendered at full speed, since Intel® Virtualization Technology° for Directed I/O (Intel® VT-d) enables fully accelerated graphics performance in a virtualized environment. Users can run all their applications on a single system and experience the power of a high-end workstation for each application. It's a more productive and satisfying way to work, and it can dramatically reduce IT costs.

Unprecedented performance in a virtualized workstation

To validate the power of this new paradigm, engineers from Schlumberger, the world's leading oil field services provider, ran performance tests for two of their most demanding applications, GeoFrame* and Petrel.* These applications help engineers analyze complex geologic and geophysical data to evaluate reservoir potential and optimize production strategies. GeoFrame runs on Linux. Petrel runs on Windows. Normally, Schlumberger's engineers run these applications on two separate workstations.

To test concurrent performance, GeoFrame and Petrel were run together on an Intel® Xeon® processor-based workstation. Petrel was run on a Windows Vista* 64-bit host operating system. Geo-Frame was run in a virtual machine, using Parallels Workstation Extreme and Red Hat Enterprise Linux 5.3.

- **Test 1: Running on an Intel® Xeon® processor 5400 series-based workstation:** Petrel ran at full native speed, but performance for GeoFrame was massively degraded, with graphic refresh rates of only 1 frame every 19 seconds (versus 30 frames per second for Petrel).

- **Test 2: Running on the latest Intel Xeon processor 5500 series-based workstation:** Both applications ran at full native speed, with graphics refresh rates of 30 frames per second, a 570x improvement for the virtualized application. According to Russ Sagert, Schlumberger's Geoscience Technical Advisor for North America, "Our engineers were blown away by the performance. We hammered these machines with extreme workloads that stressed every aspect of the system. Amazingly, the new workstation based on the Intel Xeon processor 5500 series provided performance enabling this multiple OS, multiple application environment to be usable for the first time."

The Next Generation of Workstation Innovation

It took coordinated innovation on several fronts to deliver this massive increase in virtualized workstation performance.

- **The Intel Xeon processor 5500 series:** With its larger and more efficient cache, greater memory capacity (up to 192 GB), and 3.5x boost in system bandwidth, this processor provides extreme scalability for technical workloads. It also supports Intel VT-d in the chipset, which enables direct assignment of graphics and network cards to virtual machines.

- **Parallels Workstation Extreme:** This innovative virtualization software leverages the Parallels FastLane* Architecture, Intel Virtualization Technology (including Intel VT-d), and dynamic resource allocation to deliver unprecedented performance for high-end applications running concurrently. It also provides quick access to data and a great multi-OS user experience with Parallels SmartX* technologies.

570x performance increase
for an application running in a Parallels virtual machine with emulated graphics vs. assigned graphics
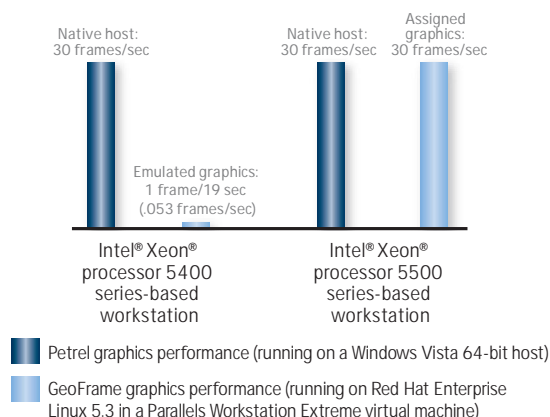

Figure 1. Breakthrough graphics performance in a virtual machine – An Intel Xeon processor 5500 series-based workstation running Parallels Workstation Extreme delivers near native performance for high-end applications running in virtual machines.[1]

- **Optimized Workstations and Graphics Cards:** For current supported configurations including workstation platforms, graphic cards, and host/guest OSs, visit www.parallels.com/products/extreme

Better Productivity at Lower Cost

If you have engineers or geoscientists juggling multiple workstations, consider consolidating those systems onto a fully configured Intel Xeon processor 5500 series-based workstation running Parallels Workstation Extreme. Creativity and productivity will be unleashed with a powerful workstation upgrade that streamlines the work interface, reduces office noise and clutter, and delivers major performance gains. Your IT organization will also benefit, through lower capital, management, support, space and energy costs, plus the ability to standardize on a single OS image while easily addressing alternative requirements.

Learn More

www.intel.com/products/workstation/processors/index.htm

www.parallels.com/products/extreme