Far More with Less

Maximizing G&G application performance and lowering TCO simultaneously

Contributed by David Holmes, Chief Industry Executive and CTO, EMC Global Oil & Gas Program

Interpretation and modeling applications tend to be heavily workstation-oriented where individual users are equipped with expensive self-contained computing resources. When data is required, a low-latency high-bandwidth transfer from network storage to the workstation is imperative to achieve useful productivity levels.

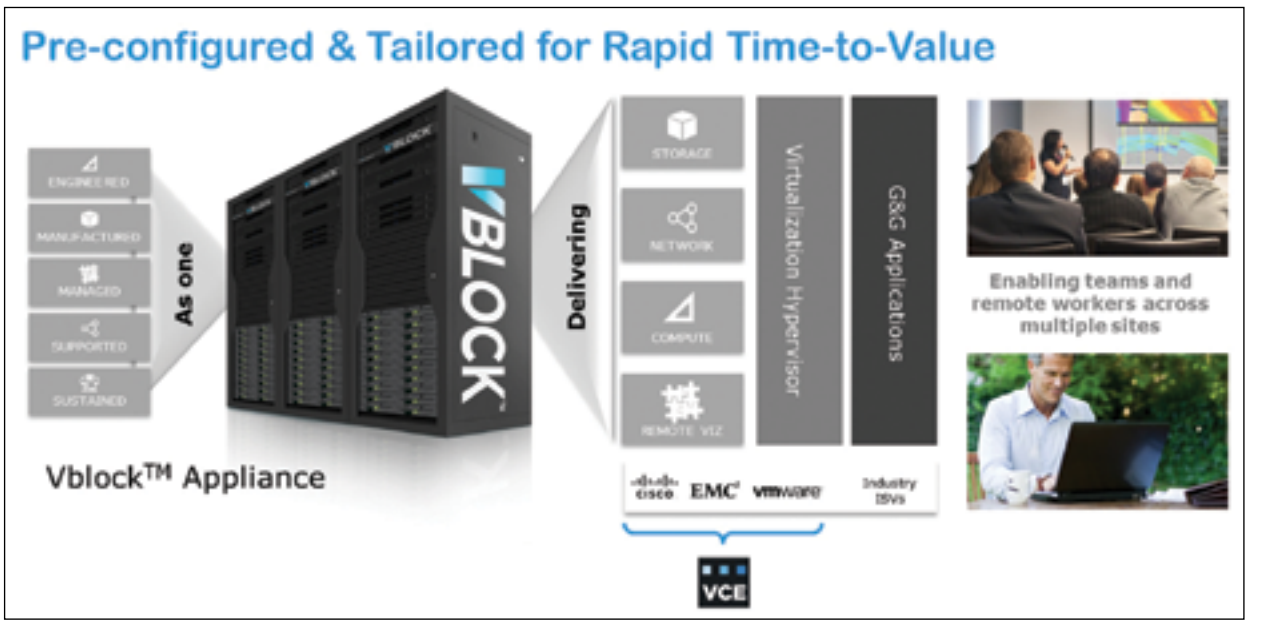
However as data velocity and volume increase, sustaining workstation-based applications is a challenge. Individual workstations need ever-increasing levels of computing power, memory, and storage, and delivering the required high-bandwidth low-latency I/O becomes eye-wateringly expensive.

This rather expensive exercise places IT under pressure to deliver computing resources to meet the largest expected workload at the time, which means workstations often are either overspecified compared to average expected workloads or underspecified, leading to user frustration and inefficient working practices. The overall result is that computing power, storage, and memory cannot be correctly balanced to workloads, since the high-end resources are not always needed and cannot be shared.

Workload throughput also is hampered. We have observed cases where geoscientists must wait as long as 30 minutes to load projects into their applications. This has a negative impact on team productivity and agility, particularly when seismic data forms a critical part of the workflow.

The core strategy to address these challenges is the centralization of computational resources (both CPU and GPU) inside the data center using converged infrastructure. Essentially, this approach takes the enormous amount of computational power that is out on workstations and relocates it back into the data center. This is beneficial for a couple of key reasons:

- Operational Efficiency: The workstation-oriented approach leaves much of the computing resource underutilized and requires an expensive IT support mechanism. Having a shared set of central resources enables better provisioning of appropriate resources to users.
- Efficient Network Utilization: By co-locating computation resources with the data, we remove the need to shift large volumes of data over networks to individual workstations.

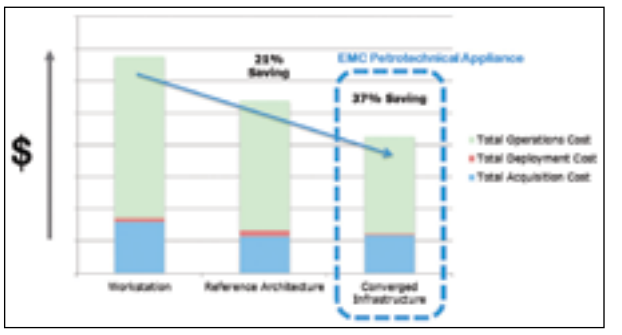


EMC Petrotechnical Appliance, based on VCE Vblock.

Total cost of ownership studies have shown that EMC's Petrotechnical Appliance can achieve cost savings in excess of 35% by migrating from distributed workstation computing to centralized computing delivered through virtual desktop infrastructure (VDI). Simultaneously, end-users are able to experience a more consistent delivery of computing resources to match individual workload demands without needing expensive workstation upgrades.

The EMC Petrotechnical Appliance is based on the converged infrastructure technology from VCE called Vblock. Vblock integrates compute, network, storage, and security technologies from industry leaders Cisco, EMC, VMware, and RSA to provide a single turnkey appliance for applications.

VCE has pretested and validated several E&P geological and geophysical software applications on Vblock, leveraging VDI solutions to present 2D and 3D virtual desktops by means of accelerated graphics technology. For more information on the Petrotechnical Appliance, visit EMC in booth 2511. ■



EMC TCO comparison over three years.

Work Smarter, Not Harder

Software can lower the cost of BOE through workflow and computer-science innovation

Contributed by Diderich Buch, CEO, Headwave Inc.

A well-established rule is that the value of intellectual property (of software) is the income it generates over time. But what is a good way to model that, and how do different software packages fare?

Software should provide elements of innovation, both with respect to geoscience as well as computer science. That innovation should empower users to make qualified decisions and to make such decisions faster.

Consider the following: If a given software package was to provide feature parity with other packages, at a price similar or lower to that of other packages, yet provide a productivity benefit of 10x over other packages, then the user could either carry out his or hers work in one-tenth the time or model 10 times as many scenarios. Both are clearly useful, and both represent step-changes in productivity from (more or less) identical workflows.

In addition to step-changes in productivity, innovation generally implies new and improved workflows and methods. In imaging, RTM has largely become the gold standard. In interpretation, such workflow innovation is rare. As an example, practically every geologic and geophysical package provides horizon interpretation. However, only a few packages would provide the tools to guide the interpreter as to which structures are meaningful to interpret.

At this year's SEG, John P. Castagna and Lumina Geophysical are introducing a novel method named "phase decomposition," which specifically guides users to hydrocarbon-bearing structures. Combine this with AvO (Castagna is a leading innovator) for exploration derisking and to define the extent of existing reservoirs, and interpret all this within a geologically consistent framework enhanced by high-resolution spectral decomposition (Lumina's CLSSA offers the highest resolution). In such a way, users can build the interpretation/model and simultaneously high-grade their exploration. These are examples of step-changes in workflows, will which eventually replace the current de facto way of doing things.

There are multiple software packages on the market that will perform spectral decomposition. What is worth considering is the geoscience — e.g. quality of said spectral decomposition method and workflows — and also the productivity aspect — e.g. the time a certain package requires to calculate spectral decomposition on a full survey and how fast users can access that data. Third-generation geoscience software that takes full advantage of graphics cards for calculations could deliver results on-the-fly with no precomputation required.

It also is well worth considering when an oil company could perform certain services in-house instead of externally. By using software packages that provide step-change productivity, it may be many times more productive and cost-efficient to carry out certain services in-house. In some cases, that also may result in a quality improvement. This assumes that the competency is available, and only makes economic sense if software that offers step-change productivity is employed.

In summary, when innovations in geoscience workflows and innovations in productivity can be combined, oil company management has significant opportunity to drive down cost of BOE in their organizations. Oil company management should enable geoscientists to be as productive as possible through software that offers them the highest level of productivity and workflow innovation.

In a recent report, Wood Mackenzie concluded that while operators are seeking an average cost reduction of 20% to 30% on projects, supply chain savings through squeezing the service sector will only achieve around 10% to 15% on average.

In other words, the balance must be achieved from adopting smarter ways of working.

To learn more about innovative geoscience that allows geoscientists to work the way they want to, visit Headwave at booth 725. ■