

Doing More with Less

Investing in cutting-edge technologies will help energy companies drastically reduce costs and improve software and end-user efficiencies.

CONTRIBUTED BY HEADWAVE

With oil prices hovering at about \$60/bbl, oil and gas companies face the challenge of how to provide the best possible earnings with fewer resources available. How can upstream technology play a role during this downturn?

Applied correctly, upstream software can help reduce costs, primarily through an increase in efficiency and the productivity of geoscientists.

In the pursuit of cost reductions, it is important to recognize which corners can be cut. It would be short-sighted to compromise on quality, but avoiding that might not be trivial. Consider that most shops have spent hundreds of millions of dollars to obtain seismic data. Choosing to use software that might deteriorate the quality of the seismic data would thus be a poor decision. Legacy software packages often default to 8-bit or 16-bit data storage, as this traditionally meant less data to handle. Today, that is an ill assumption because current packages, such as Headwave's, always handle data as full 32-bit yet provide significantly faster data handling than legacy packages. This is a key point.

Subsurface data and how they are handled on a day-to-day basis are important to the overall productivity of E&P companies. Software can ensure fast data access so that geoscientists can spend their time analyzing data instead of waiting for data transfers to complete.

Headwave's next-generation geoscience platform Headwave 3 has been written from scratch during the past three years and is the only new platform that can take full advantage of acceleration chips. Compared to one of the most popular industry applications, Headwave 3 offers 10 to 30 times faster data access. During a typical workday, this can be translated into an end user of the popular industry application losing one or more hours of work that could be spent on other important tasks. Such discrepancies matter even more when resources are scarce.

Beyond fast data handling of terabytes on a regular workstation, the graphics processing unit (GPU) computing is one example that is transforming E&P workflows. In Headwave 3, the time GPU acceleration allows algorithms to run on, e.g., 5,000 to 6,000 cores (on the GPU) compared to four to eight central processing unit cores, which typically offers an increase in speed of 15 times to 25 times. Translated into time, this allows a given attribute to be computed in 2½ minutes instead of one hour. This truly changes how geoscientists can work.

Just with the two examples cited above, all else being equal, the geoscientist could save one to three hours per day. That is dramatic and almost unheard of yet fully achievable by choosing the right software.

EAGE App Allows Greater Interactivity

During this year's EAGE Conference & Exhibition, delegates will have the ideal navigation tool at their fingertips. EAGE has built a mobile event app to ensure attendees get the most out of the event.

The app will help conference delegates follow the interactive floor plan, network with fellow attendees, build their own schedule and find specific exhibitors.



Information in the app will be updated regularly during the show. The app also will contain a voting system that can be used at several sessions. This makes the sessions more interactive, and results will be shown immediately during the discussion. An overview of the session, which will include the votes, will follow.

The EAGE 2015 app will be available for all Apple and Android devices, Blackberry phones and as a web app. Just download the app in the App Store or the Google Play Store under "EAGE 2015." ■

Dataset	Read/Compress/Write	Ratio On Disk
Quad 34GB Post-stack	<1 minute	5:1
Quad 1.2TB Prestack	<35 minutes	5:1

Example of data compression benefits: workstation performance (with 2x NVIDIA GPU to/from SSD). (Source: Headwave)

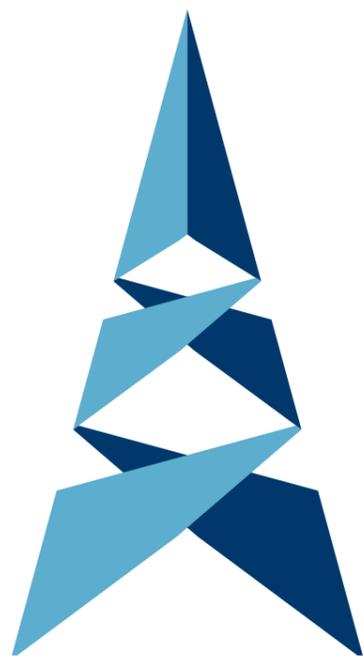
Most analysis and decision making require real-time interaction with data. However, the majority of software packages on the market are not designed for the level of interactivity required by the users. The best quality is obtained by users seeing a direct response to their parameterizations and choices. Many software packages, however, simply fall short when it comes to feedback with their traditional and inefficient "click, wait for result, change parameters, repeat" approach. Experts in geoscience should, rather, be assisted by software as opposed to the current approach where it is the software that drives the users. Software should keep data live at all times and provide entirely dynamic workflows that honor the acyclic nature of geoscience, improving productivity. Very few software packages manage this well. Headwave 3, designed from the bottom up, aims to lead this paradigm shift, relying on HueSpace and NVIDIA technologies to ensure excellent interactivity, practically regardless of size.

For example, there are operators who use Headwave 3 with 35-terabyte to 50-terabyte wide-azimuth surveys on a workstation. Dataset sizes and time pressure no longer prohibit timely access to data; with a data-driven workflow approach, data can be easily available for interpreters any day of the week. Headwave 3 is substantially faster than any competing software due to real-time data (de-) compression. Benchmarked performance gain ranges from five times to 25 times.

In 2012, Headwave's Geoscience Adviser Dr. Ron Masters introduced a new amplitude-vs.-offset (AVO) approach. The method can unequivocally identify AVO anomalies, even if they have not previously been recognized as prospects or mapped. It does not require any prior knowledge about local conditions in the subsurface or which AVO class is locally likely to indicate reservoirs and hydrocarbons. Data-driven workflows such as this AVO approach represent step changes in productivity for end users.

By investing in cutting-edge technologies that are prepared to tackle the challenges of tomorrow, energy companies can drastically reduce costs and improve software and end-user efficiencies now and in the future.

Please visit Headwave at EAGE at booth 725 for more information. ■



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