



Heriot-Watt University case study

Esteem extends pioneering oil and gas research at Heriot-Watt University's Institute of Petroleum Engineering with High Performance Computing (HPC) solution

Benefits:

- Industry leading processing that reduces computational processing times
- Reduced costs, and increased availability for large volumes of critical data
- Flexibility to cope with growth in processing and storage requirements as the needs of researchers increase

Heriot-Watt University's Institute of Petroleum Engineering runs a research programme, the Edinburgh Time-Lapse Project (ETLP), which relies on data that has been provided by industry sponsors, such as BP and Shell. The Institute recognised that its IT infrastructure could no longer provide the processing power or storage space that the research team needed for accessing and storing vital information for its pioneering research.

The University required a specialist High Performance Computing partner to facilitate a solution that focused on scalability, availability and rapid deployment while providing 100 terabytes of disk space to archive data. Following consultation with systems integrator, Esteem Systems, the Institute asked Esteem to design and implement a High Performance Computing (HPC) Cluster based on Sun Microsystems technology. With the solution now in place the Institute has seen many benefits.

The Institute of Petroleum Engineering

Edinburgh-based Heriot-Watt University is recognised internationally as a centre for high calibre research and teaching innovation. The Institute of Petroleum Engineering (IPE), a specialised centre for providing fundamental research in the oil and gas industry, is a key sector of the University.

PE relies heavily on a wide range of research projects; one of which is the Edinburgh Time-Lapse Project (ETLP). This project specialises in the development of analysis tools for quantitative interpretation of 4D seismic data.





Delivering higher levels of performance

Working with growing amounts of data, the IPE was frustrated with the limited processing power of its existing IT. Built around eight networked servers, the solution was adequate in the earlier phases of the project, but as it matured, the amount of archived data increased dramatically, considerably slowing productivity which became problematic for the system's users (PHD students and Fellow Associates at the University).

Dr Ian Chisholm, Director of Computing at Heriot-Watt University's Institute of Petroleum Engineering, explains, "We needed a solution that would provide world class performance and data storage in order to ensure our researchers remain at the forefront of research in the oil and gas sector. Ensuring the ETLP team's environment of study is as professional as their academic work was also a key focus for me."

Engineering a relationship

Data processing and storage were key objectives for IPE and there was also a need for scalability. Esteem therefore focused its solution on a high performance processing and storage solution tailored to the IPE's specific requirements.

Following an extremely competitive selection process, Esteem was awarded the contract and was given a 60-day deadline to design, build and implement the HPC Cluster with Storage.

"Esteem's proposal was extremely impressive and really outshone its competitors. The team demonstrated they could design a tailored, balanced infrastructure that would fulfil our requirements exactly and provide ongoing support after the roll out," says Chisholm.

Build and implementation

Working in partnership with Sun Microsystems, Esteem designed and built the HPC Cluster based on 56 compute nodes, each with two quad-core AMD CPUs and Sun's HPC software suite. Using Sun technology, Esteem boosted storage capacity by integrating a subsystem based on Sun's Lustre parallel file-system. This was specifically designed to vastly improve performance throughout the HPC facility and eliminate bottlenecks when accessing data from the system.





Chisholm comments, “Esteem’s ability to build and integrate a tailored solution off-site and implement it within the deadline, all with minimal downtime for our team, was very impressive. The transition was smooth and the new solution has made a significant impact on all our users. In fact, I think the stress levels have dropped for everybody at the IPE.”

Seeing the benefits

Heriot-Watt University’s IPE now benefits from increased storage space and gives the team of researcher’s faster access to electronic resources through the new HPC facility, vital to the success of the ETLP programme. Through enhanced processing powers, IT performance has vastly improved, reducing user login and data computation times, and providing quick access to archived data.

Chisholm says, “Esteem understood the need to increase our IT system’s speed and storage space so our team can continue to undertake new research for the oil and gas industry. We need to be able to concentrate on our work without worrying about whether our data servers were able to keep up. Thanks to Esteem, this is exactly what we have.”

With Esteem’s ongoing support for the IPE’s HPC facility, maximum performance is ensured while still allowing staff to retain control over the system.

“We now have a secure future proof infrastructure that allows for scalability. We expect the amount of data processed will grow tenfold over the next three years of its life, and providing a scalable solution that can accommodate this was a key part of Esteem’s mission, which has been successfully achieved,” concludes Chisholm.

For further information about Esteem please visit, www.esteem.co.uk

