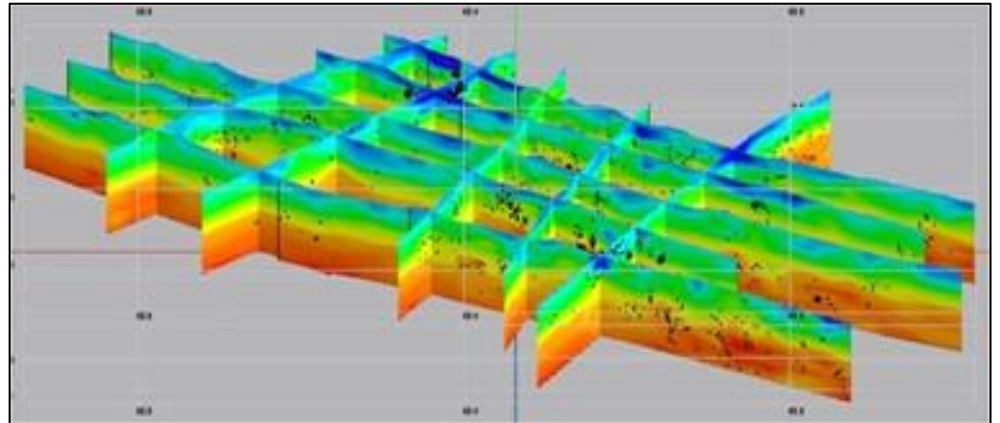




Petrobras Acquires Supernano Servers Integrated by Atos To Reduce Costs and Increase Exploration Accuracy

Supernano Systems Power Petrobras to the #33 Position in the Top500, November 2022 Rankings



INDUSTRY

Energy Exploration

CHALLENGES

- Reduce Costs
- Identify More Accurate Drilling Locations

Introduction

Petrobras is one of the world's largest energy producers, primarily engaged in exploring, extracting, producing, and refining oil and gas products. Petrobras has developed leading-edge exploration techniques with a proven reserve base and the ability to locate energy reserves in ultra-deep-water locations worldwide. In addition, with the use of modern High-Performance Computing technology, Petrobras can reduce costs and speed time to finding hydrocarbon deposits and then extraction

Challenges

The cost of drilling for hydrocarbon deposits in the wrong location, especially offshore, can be extremely high. A dry well wastes valuable capital and uses valuable compute cycles that could be set to better use. Petrobras geoscientists and engineers are constantly using the latest technologies to locate and plan to extract oil and gas. As new CPU and GPU technologies become available, Petrobras geoscientists and software engineers quickly modify algorithms to take advantage of new capabilities, which speed up processing times and also enable the development of new HPC solutions.

Most of the HPC applications Petrobras uses are internally developed in the exploration and production area. There are also real-time monitoring systems, which are critical when overseeing hundreds of active wells and thousands of refining and distribution systems.

SOLUTION

Supermicro SuperServer

AS -4214GO-NART+

BENEFITS

Faster location of energy deposits

New and innovative applications

Solution

Petrobras conducted a bid to upgrade its HPC facility to take advantage of recent CPU and GPU technology advantages. Atos won the bid, and the compute nodes provided are the Supermicro SuperServer AS -4214GO-NART+, which contains dual AMD EPYC™ 7513 processors and eight NVIDIA A100 80GB GPUs.



Supermicro SuperServer AS -4214GO-NART+

Petrobras' IT team worked closely with ATOS to integrate several Supermicro servers for their latest cluster, named Pégaso. This large cluster consists of over 250 servers and is ranked #33 on the Top 500 list of the fastest computer systems available in the world today¹. Each computing system contains 2TB of memory and is connected via an InfiniBand HDR networking system, running at 200Gb/s, allowing a wide range of applications to be run that takes advantage of many systems at once.

SUPERMICRO

Supermicro is a global leader in high performance, green computing server technology and innovation. We provide our global customers with application-optimized servers and workstations customized with blade, storage, and GPU solutions. Our products offer proven reliability, superior design, and one of the industry's broadest array of product configurations, to fit all computational need.

For more information, visit <https://www.supermicro.com>



Figure 1 – Pégaso Supercomputer with Supermicro Servers

Image Courtesy of FELIPE GASPAR / Agência Petrobras

Benefit

Petrobras' geophysicists are experts at determining where hydrocarbon deposits may lie beneath the surface, relying on a combination of technologies. First, a process called seismic acquisition collects raw data from the subsurface. Then, seismic processing geophysicists use this significant amount of computing power to generate higher-resolution subsurface images, increasing reliability and locating the deposits more precisely, as well as allowing better productivity of existing O&G reservoirs. Newer

systems with GPU technology as part of the workload also reduce the time to analyze a given data set. As a result, more data sets can be looked at in a given time frame, increasing the accuracy of drilling in the correct location and extracting the oil or gas. Finally, using powerful servers that are designed to crunch through massive amounts of data, geophysicists can better decide where to drill, increasing accuracy and profitability at the same time.

Summary

New technologies enable a wide range of analyses of sound waves to locate oil and gas deposits. Advanced CPUs with more cores at higher frequencies than ever before, combined with GPU processing performance for specific algorithms, are reducing the time to complete an analysis or increasing the resolution to reduce the costs and risk of energy exploration. As a result, Supermicro and ATOS together have enabled Petrobras to build the 33rd fastest supercomputer globally, reducing risks and increasing profits.

References

1 <https://top500.org/system/180127/>