



SILICON DESIGN IN THE CLOUD

MELLANOX SCALES UP EDA CLUSTER CAPACITY WITH ON-DEMAND HYBRID CLOUD

About the Customer

Mellanox Technologies is a leading supplier of end-to-end Ethernet and InfiniBand intelligent interconnect solutions for servers, storage, and hyper-converged infrastructure. Half the world's top 500 fastest supercomputers employ Mellanox solutions including high-performance network and multicore processors, network adapters, switches, cables, software, and silicon. A combination of high-level customer service and continuous innovation has fueled Mellanox's tremendous growth since 1999. Accelerating further success required innovation in the Mellanox team's cluster management approach, coupled with the ability to tap cloud computing resources.



By extending Altair Grid Engine to the Microsoft Azure cloud, we gained practically infinite capacity from our hybrid cloud solution in a very cost-effective manner. The impact to our engineering teams is noticeable in terms of throughput and turnaround time, even though use of the cloud is completely transparent to them.

Doron Sayag, IT Enterprise Computing Services Sr. Manager, Mellanox



Their Challenge

Mellanox needed a robust cluster management and scheduling solution from a trusted partner, leveraging hybrid cloud. They needed a highly stable engineering cluster for silicon design — one that could perform exceptionally well in their on-premises high-performance computing environment and burst transparently to the Microsoft Azure cloud during critical tape-out periods. The Mellanox HPC cluster runs computationally intensive EDA design pipeline software and simulation for next-generation product development, so **superior workload orchestration is critical**. Having previously used open-source workload scheduling, Mellanox knew an enterprise-grade solution would improve stability and performance and would allow them to enjoy advanced features to help maintain their leading-edge design work. Explains Doron Sayag, senior manager for IT enterprise computing services, “We were running an open-source job scheduler, but it presented stability issues. We wanted to replace it with a **robust enterprise-supported solution that was cloud-enabled.**”

Mellanox needed a robust, enterprise-grade scheduling and management solution for their HPC cluster

Our Solution

In assessing potential solutions, the Mellanox team analyzed performance, features, and costs, ultimately selecting Altair NavOps™ and Altair® Grid Engine®, proven solutions that offered the shortest implementation effort with leading price/performance metrics. NavOps seamlessly enabled Mellanox’s existing on-premises infrastructure and workflows to encompass the cloud. Explains Sayag, “By extending Altair Grid Engine to the Microsoft Azure cloud, we **gained practically infinite capacity from our hybrid cloud solution in a very cost-effective manner**. The impact to our engineering teams is noticeable in terms of throughput and turnaround time, even though use of the cloud is completely transparent to them.” NavOps enabled Mellanox to increase the efficiency of its on-premises data center usage while addressing unmet peak performance needs with a cloud-bursting “pay-as-you-go” scenario — a hybrid model that augments local compute resources with those of Microsoft Azure, able to simultaneously run as many jobs as required, boosting productivity for engineers.

Results

By **intelligently leveraging the cloud during peak-usage periods**, the team has reduced time-to-market, gained capacity without buying or maintaining additional infrastructure, and reigned in costs with a reliable enterprise-grade solution for managing their HPC cluster resources. Sayag estimates that the Altair solution saves one third of the time of a skilled full-time employee, and that the full benefits of implementing Altair Grid Engine and NavOps were realized in less than 2 fiscal quarters. He says, “The Altair team is **highly professional and always available**, willing to support and improve our usage of their software and tools.”