# HIGH-PERFORMANCE JOB SCHEDULING FOR DISTRIBUTED HPC ENVIRONMENTS

## Altair Accelerator™ and Dell EMC Isilon

### ESSENTIALS

**FOR DESIGNERS**

- Sub-second job latency for best performance & user experience
- Intelligent job submission via resource profiling
- Reduced turn-around time via high performance storage architecture that eliminates common I/O bottlenecks

**FOR INFRASTRUCTURE**

- Scalable small footprint for best resource utilization
- Ease of job management with visual workload monitoring and customizable alerts & notification
- Ease of storage management via OneFS single file system
- Automated, transparent tiering with different node types to match with the value of your data
- Easy storage expansion in minutes with no downtime
- High performance all-flash tiers

**FOR MANAGEMENT**

- Billions of jobs scheduled per day via high capacity scalable architecture
- Improved predictability via scale-out storage architecture
- Lowest TCO with highest disk utilization (up to 80%)

## Enterprise grade job scheduling for EDA

Today's System-on-Chip (SoC) designs are so large that multiple engineering teams must work in parallel in a highly distributed global environment. Scheduling job submission and running complete SoC verification prior to tape-out is a massive challenge, involving billions of simulation cycles a day. Shrinking geometries are driving gate counts higher, which in turn drives complexity. As a result, verification complexity is now growing 4x every two years.[1] In addition, SoC development teams are experiencing compressed development schedules and tightening budgets.

These pressures create challenges for infrastructure management. Increasing Engineering Design Automation (EDA) batch workloads translate to high performance compute (HPC) infrastructure requirements that are "never enough" (speed, availability, storage, etc.). IT professionals need solutions to architect future-proof compute infrastructures for maximum performance and efficiency and lowest total cost of ownership (TCO).

Today's SoC/EDA workload infrastructure challenges can be addressed by choosing the right storage and batch schedulers. You need a storage platform that scales easily to eliminate common EDA compute bottlenecks as workloads grow, expands with no downtime, is globally accessible, has robust data protection, and lowers TCO to stay within shrinking budgets. In addition, you need a low-latency, high-performance job scheduler that's capable of managing the largest, most complex HPC environments.

## Altair Accelerator & Dell EMC Isilon

Dell EMC Isilon® scale-out NAS (Network Attached Storage) reduces costs and improves operational efficiency by consolidating divisions, projects, and entire EDA workflows into a unified storage solution, eliminating common EDA performance bottlenecks. Featuring the OneFS® operating system, Isilon storage scales from 10s of terabytes to 10s of petabytes capacity in a single file system – expanding with no downtime as EDA workloads grow. Altair Accelerator provides a cost-effective highly adaptable solution that takes advantage of Isilon's features and is capable of managing compute infrastructures from small dedicated server farms to complex distributed HPC environments.

Altair Accelerator is a high-performance enterprise grade job scheduler designed for distributed HPC environments such as those deployed for the most complex SoC/EDA workloads. By deploying Altair Accelerator, leading semiconductor companies gain the ability to maximize their compute infrastructure resource utilization and throughput, leading to faster turn-around times and better EDA tool license utilization.

## Maximizing throughput

Altair Accelerator is designed to manage complex EDA workload environments. Able to run billions of simulation cycles per day, Altair Accelerator's scalable event-driven architecture, combined with its small memory footprint and sub-second dispatch latency, accelerates design throughput and maximizes capacity utilization, which is critical for maximizing EDA tool license ROI.

## Resource management and profiling

Altair Accelerator's "Job Profiling" feature provides users with greater visibility into the resources required by their jobs – allowing them to keep track of CPU, memory and license usage. Unique visualization and failure identification capabilities provide "at a glance" views of jobs that have completed, failed, and/or are waiting – enabling users and administrators to optimize resources by selecting queues that better fit their job profile.

**Figure 1.      Resource Profiling**
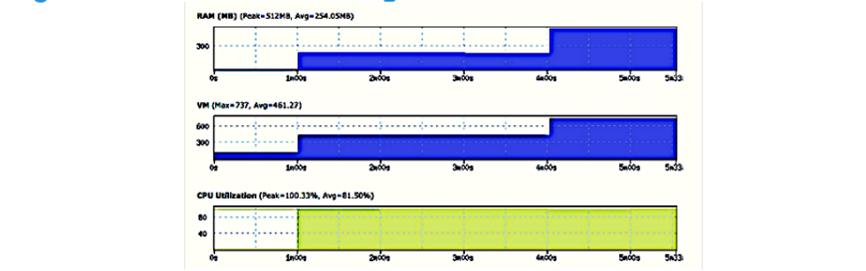


## About Altair (NASDAQ: ALTR)

Altair transforms design and decision making by applying simulation, machine learning and optimization throughout product lifecycles. Our broad portfolio of simulation technology and patented units-based software licensing model enable Simulation-Driven Innovation™ for our customers. With more than 2,000 employees, Altair is headquartered in Troy, Michigan, USA and operates 71 offices throughout 24 countries. Altair serves more than 5,000 customers across broad industry segments. To learn more, please visit www.altair.com.

## About Dell EMC Isilon

Dell EMC Isilon provides an Enterprise grade, scale-out NAS platform that scales from 10s of terabytes to 10s of petabytes capacity in a single file system – enabling the sharing of EDA project data across the entire design workflow – accelerating time-to-market. Isilon's OneFS file system has unmatched storage efficiency with utilization capacity up to 80% and enterprise features such as data deduplication to save even more space that further lowers overall TCO. Isilon has industry-leading data protection with the ability to lose up to four nodes and still operate with no data corruption or loss of data. And Isilon stays simple to manage, regardless of how your environment grows – allowing you to manage design development – not storage.

## TAKE THE NEXT STEP

Contact your Dell EMC sales representative or authorized reseller to learn more about how Isilon solutions can benefit your organization.

Shop Dell EMC Isilon to get more information about Isilon products and solutions.

[1]Synopsys, INC. (2016), *Synopsys Unveils Breakthrough Parallel Simulation Performance Technology for VCS*

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