Cypress Semiconductor

Bringing advanced technology to market faster and at lower cost with IBM Platform Computing

Overview

The need
To bring new products to market ahead of competitors' offerings and reduce design costs, Cypress must constantly cut total cycle time (TCT), to increase both potential revenues and profit margins.

The solution
Removed storage bottlenecks by deploying IBM® General Parallel File System (GPFS™) to support global chip design and simulation HPC clusters managed by IBM Platform™ Load Sharing Facility (LSF®).

The benefit
10x better performance on the same hardware, cutting time to market; reduced TCT provides major annual savings; better resiliency keeps simulation jobs running and cuts administration time and cost.

Cypress Semiconductor, headquartered in San Jose, CA, is a leading global designer and manufacturer of mixed-signal, programmable solutions. These include system-on-chip families for use in consumer, communications, industrial and military applications. The company employs 3,500 people.

The storage bottleneck
In the semiconductor industry, a critical business metric is total cycle time (TCT)—the elapsed time between an initial idea and the finished product. By cutting its TCT, Cypress can bring new or refined solutions to market earlier and reduce design costs. Getting to market ahead of the competition naturally increases revenue opportunities, while cutting costs improves margins.

For both product enhancements and new products, the design cycle at Cypress relies on electronic design automation (EDA) software running on clusters managed by IBM Platform LSF in six global design centers.

Cypress expected dramatic performance improvements and cost savings, but the added resiliency was an unexpected extra benefit. "It is fantastic to see a cluster reporting that all our jobs are still running even when one or more nodes have gone down. The designers are happy, and our sysadmins sleep much better at night," says Alan Malek, Director of IT, Cypress Semiconductor.
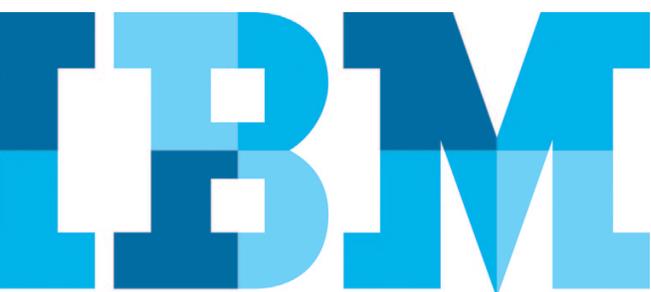
Solution components

Software
- IBM® General Parallel File System (GPFS™)
- IBM Platform™ Load Sharing Facility (LSF®)
- IBM Platform License Scheduler
- IBM Platform RTM

"Simulating and verifying the schematics for new integrated circuits is I/O intensive, and storage had always been a complicated piece that did not work properly," says Alan Malek, Director of IT at Cypress. "We were storing data on workstations, which was risky, or deploying network file servers. Once you have ten isolated storage servers, day-to-day management is a major problem. And if you run out of space in the middle of a 48-hour simulation, you need to start over, raising costs and extending TCT."

With storage performance and capacity problems affecting its ability to get products to market in a timely and cost-effective way, Cypress needed a centralized and more scalable approach.

Sharing the load

To better manage storage for simultaneous cluster computing jobs, Cypress selected IBM General Parallel File System (GPFS), a parallel file system designed to deliver high-performance access to a common set of data from multiple servers.

"We wanted to be able to add capacity to a single logical pool of storage, and it needed to be split across multiple distributed servers to meet our needs for performance and parallel access," says Malek. "With GPFS, we can improve storage performance by sharing the load across newly added servers. We initially looked at an open-source distributed file system, but—unlike GPFS—it could not handle the extremely large files we use just before fabrication."

Cypress uses GPFS natively on CentOS as its sole file system, providing a globally addressable namespace for all clusters in its data centers. To avoid the cost of additional licenses, workstations access common data using the built-in clustered NFS component of GPFS.

"We are seeing an order of magnitude performance improvement on the same hardware versus the previous distributed file system," says Malek. "The faster the processing, the more we can achieve with the same number of LSF licenses. Faster processes helps cut TCT and get products to market faster and at lower cost."

Speed, resiliency, scalability

With a globally addressable namespace, multiple teams of chip designers can easily share the central filestore.

"Having all files in one place is a big deal; there is no more hunting around," says Malek. "Jobs run more reliably, with better performance and more equal distribution between data centers."

More predictable storage performance enables Cypress to size its capacity requirements more accurately—in one case leading to a 50 percent performance boost. GPFS also ensures high availability for business-critical EDA processes.

"Downtime is extremely costly for us, leaving designers unable to do their jobs and impacting TCT," says Malek. "With GPFS, we can completely eliminate unplanned downtime as hardware failures are non-disruptive. We did some planned maintenance, taking nodes offline without impacting LSF jobs—a huge win for us. The architecture empowers our sysadmins, because they don't have to worry about failures."

High reliability means low TCO, a decisive factor in choosing GPFS versus a free alternative. Malek explains, "It's easy to be blinded by a zero-dollar acquisition price tag—more significant are the ongoing management costs, which are very low for the IBM solution. GPFS is working very well for us. This is the best shape we've ever been in, storage-wise."

For more information

To learn more about IBM solutions, contact your IBM sales representative or IBM Business Partner, or visit us at: **ibm.com**/platformcomputing

IBM