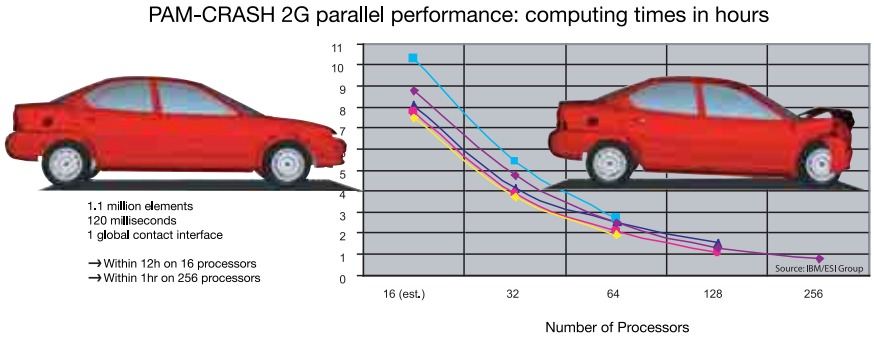
ESI Group's PAM-CRASH 2G on IBM BladeCenter JS21 solution



PAM-CRASH 2G parallel performance

Highlights

- *Enables reduction in the number of physical prototypes*
- *Allows better insight into energy absorption mechanisms*
- *Allows more crash test scenarios to be investigated*
- *Reduces time to market*

The ongoing needs for safer vehicles, along with the increasingly stringent regulatory requirements for passenger safety, have caused an upsurge of crash test evaluations. Simulated crash testing via virtual prototypes can significantly improve product performance in less time and at significantly lower testing costs when compared to live prototype testing.

Introducing ESI Group's PAM-CRASH 2G[1] on BM BladeCenter JS21 solution, a powerful solution designed to deliver high-throughput performance and competitive pricing.

An affordable way to manage high-throughput workloads

The PAM-CRASH 2G solution set can be used to analyze and validate the robustness and performance of components and assemblies via high-performance computerized simulations at an affordable cost. The new generation of ESI Group's leading crashworthiness simulation software is an essential element of the crash and safety value chain. It enables engineers to reduce the need for physical prototypes and focus their efforts in creating, evaluating and managing virtual prototypes under modeled realistic conditions in their efforts to design within the latest safety regulations.

Companies relying upon Computer Aided Engineering (CAE) are requiring greater value in their investments. Cost-optimized cluster computing is now a viable option. ESI Group's PAM-CRASH 2G on the IBM BladeCenter® JS21 blade server,

BladeCenter H Chassis with JS21 Blades

along with IBM System Storage™ solutions, can be a cost-effective and a less power-hungry option than traditional server alternatives. Fee services are available for migration to a BladeCenter solution, including implementation and integration within your environment. The resulting solution's aggregate compute power, flexibility and performance can easily compare with higher-priced options.

The IBM BladeCenter technology offers ease of installation and upgradeability. In addition, its integrated infrastructure makes it easy to add capacity and to consolidate servers, storage and networking into just a few "super-dense" racks. As CAE computational requirements grow either by using more sophisticated analysis methodologies or by advancing to multi-disciplinary CAE simulations, the BladeCenter solution along with System Storage offerings is designed to meet these growth goals. Overall, the affordable PAM-CRASH 2G on BladeCenter JS21 crash analysis enables researchers, developers and testers to do more evaluations for less expenditure.

Capability to solve a wide variety of problems

PAM-CRASH 2G allows physics-based crash test simulation for time-critical applications in a collaborative environment. It encompasses pre/post processors and a finite element solver, which offers many interfaces with other solutions.

Features include:

- *Rupture prediction, which answers car manufacturers' needs for simulating the extended plasticity range of new materials*
- *Coupling of process and product virtual prototyping, which eliminates the need for physical prototype characterization, paving the way to full virtual prototype*
- *Integration of safety restraint system and crashworthiness simulation that enables appropriate strategic decision-making. It facilitates collaborative engineering for the continuous improvement of virtual prototypes.*

The BladeCenter JS21 blade server uses the IBM PowerPC® 970MP processor that leverages leading-edge IBM Power Architecture™ technology. A single blade can contain up to four cores, each of which has 64-bit data paths and memory addressing, yet it is natively compatible with 32-bit PowerPC software. The PowerPC 970MP is an affordable package with powerful built-in capabilities. For example, the PowerPC processor includes AltiVec™ extensions—the single-instruction multiple-data (SIMD) operations—and can significantly accelerate data-intensive tasks.

Also the BladeCenter JS21 is the first blade server to offer built-in, optional Advanced POWER™ Virtualization and the Virtual I/O Server technology.

Tailored for Crash requirements

PAM-CRASH 2G on an IBM BladeCenter JS21 can meet the requirements for a typical high-throughput crash analysis environment. Its solver can be run in sequential, shared memory or distributed memory parallel modes, and easily switched from one mode to another. Users of CAE applications may find that the BladeCenter JS21 server delivers more compute power for the price than other traditional computing alternatives.

Scalability, flexibility and advanced integration

The BladeCenter solution integrates high-performance components in an innovative infrastructure, helping to reduce overall costs and the system footprint. The BladeCenter design enables the combination of up to 14 server blades in a single 7U chassis. This allows up to 84 servers in a standard 42U rack. In fact, almost two teraflops of compute power can be packed into a single rack. Optionally, BladeCenter JS21 servers can be installed in a more powerful 9U IBM BladeCenter H chassis[2], giving twice the channels to every blade and an increase of bandwidth by a factor of 10.

The modular design of the BladeCenter solution is ideal for high-throughput workloads. It adapts to handle mixed job streams and application workloads. Jobs can be initiated on servers when they become available, avoiding the constraints associated with dedicating jobs to specific servers. This same modular design enables you to easily scale-up processors, storage and networking capacity.

As a result, you have the flexibility to incrementally expand high-throughput computing capacity as the modular design enables Intel® Xeon® processor-based blade servers and PowerPC 970MP processor-based blade servers to coexist in the same chassis. This mixed blade capability helps create workload and configuration flexibility and supports multiple operating system environments.

Applications can be mapped to the hardware architecture that works best, optimizing the overall system. For example, 32-bit applications can continue to run on Intel Xeon processor-based blades while PowerPC 970MP processor-based blades are added. This provides the flexibility to

BladeCenter JS21 Server

choose processors and the operating system that workloads demand, while gaining the advantages of a single infrastructure to manage. The BladeCenter solution can scale to meet the challenges that accompany growing CAE workloads.

IBM Director, an intelligent systems management software tool, is available to manage the entire mixed operating system environment, helping simplify and automate tasks. With IBM Director, you deploy, configure, manage and maintain dozens or even hundreds of blade servers. Expanding capacity may be completed in just a few minutes, rather than hours.

What's more, the IBM BladeCenter chassis can be pre-loaded with extra blades to easily add computing capacity as needed. The standby blades are paid for only when they are activated. These capabilities make it easier to achieve greater density, allowing consolidation of laboratory workloads into a single infrastructure.

Whether your requirements include design, analysis, simulation or test, the IBM BladeCenter JS21 solution can demonstrate immediate value. Participants in this solution include IBM Business Partners who offer applications, middleware, hardware and services designed specifically for CAE, to which IBM has a sustained and growing commitment.

For more information

To learn more about ESI Group's PAM-CRASH 2G on IBM BladeCenter JS21 solution, please contact your IBM marketing representative or IBM Business Partner, or visit the following Web sites:

- **ibm.com**/systems/p/solutions/index.html
- **ibm.com**/bladecenter/js21
- **ibm.com**/servers/storage
- For details on PAM-CRASH 2G, contact ESI Group at crash2G@esi-group.com or visit www.esi-group.com

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When referring to storage capacity, 1TB equals total GB divided by 1000; accessible capacity may be less.

[1] PAM-CRASH 2G is available from ESI Group. IBM does not sell or distribute PAM-CRASH 2G. See www.esi-group.com/SimulationSoftware/crash.html.

[2] For BladeCenter H chassis, the maximum BladeCenter JS21's per 42U rack is 56.

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