ESI GROUP
THE VIRTUAL TRY-OUT SPACE® COMPANY

Customer Profile

ESI Group is a pioneer and leading world-wide provider of digital simulation software for professionals in the field of applied mechanics. ESI Group has developed a suite of coherent, industry-oriented applications that can realistically simulate a product's behavior during testing. PAM-CRASH 2G, a virtual engineering solution for the automotive industry, provides a collaborative environment for virtual prototype development. It offers a fully integrated solution for crash test simulation and the design of occupant safety systems.

The Challenge

Virtual prototypes play an increasingly important role in the area of automotive product development. New safety regulations governing crashworthiness mandate a significant increase in the number of physical tests that must be performed on new product innovations. While simulation software has greatly reduced the costs associated with physical testing, computation speed has now become a key area for shortening product development lead-times.

Solution

In response to the expansion of market requirements, ESI Group introduces PAM-CRASH 2G, a comprehensive solution enabling virtual product and process integration. The PAM-CRASH 2G environment facilitates model preparation and analysis while its leading edge solver architecture offers a highly scalable parallel version. In addition, its multi-model coupling enables significantly reduced processing time for models with detailed parts. When run on Microsoft Windows Compute Cluster Server, the combination creates a cost-effective, scalable, high-performance solution that is capable of performing intensive calculation of detailed models at enhanced processing speeds, providing an opportunity to gain a competitive edge in the marketplace.

Benefits

- Extremely refined model handling
- Reduced calculation time
- Improved quality management
- Lower cost

Overview

Crashworthiness simulation software is an essential element of the crash and safety value chain. ESI Group's simulation software, PAM-CRASH 2G, enables engineers to virtually eliminate physical prototypes and focus their efforts on creating, evaluating and managing prototypes under realistically simulated conditions.
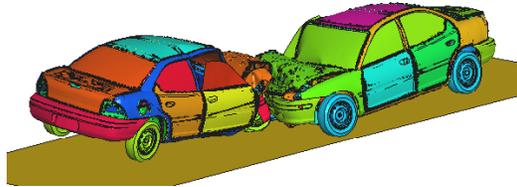
For professionals solving complex computational problems, such as finite element analysis, Windows Compute Cluster Server 2003 accelerates time-to-insight by providing a high-performance computing (HPC) platform that is simple to deploy, operate, and integrate with existing infrastructure and tools.

PAM-CRASH 2G

PAM-CRASH 2G is a comprehensive, physics-based solution that facilitates model set-up and analysis of structural mechanical design. Its state-of-the-art materials library contains dedicated models for honey- comb, composites, glue or super-elastic materials, and many others. Combined with its advanced rupture modelling capabilities, PAM-CRASH 2G helps you evaluate material properties and part performance, even at severe loading conditions.

New features of PAM-CRASH 2G include multi-scale modelling for structures with detailed parts , and integrated CFD analysis for airbag deployment. PAM-CRASH 2G also includes a fully validated dummy and human model library for both multi-body (MBS) and finite-element (FE) solution schemes.

Windows Compute Cluster Server 2003

Microsoft Windows Compute Cluster Server (CCS) 2003 is a high-performance computing platform that is simple to deploy, operate and integrate with existing data-processing infrastructures and tools. It includes prescriptive setup procedures, a complete suite of management tools, and contains an integrated Job Scheduler.

The Combination

PAM-CRASH 2G and Microsoft Windows Compute Cluster Server 2003 accelerates calculation speed and provides a powerful and cost-effective platform for running crash analysis simulation. Windows CCS allows customers to benefit from the performance of the Distributed Memory Processing version of PAM-CRASH 2G on clusters of industry standard 64-bit hardware.

This technology combination offers a cost-effective parallel processing solution for testing that would otherwise require large system resources. PAM-CRASH 2G and Windows CCS enable engineers to handle very large models – more than 4.5 millions finite elements – that require more than 3 to 4 Gigabits of memory. This high speed simulation provides the flexibility to modify and adapt prototypes to perform within today's changing regulations boundaries.

> *"The collaboration between Microsoft and ESI Group has come up with the release of PAM-CRASH 2G, the leading crash simulation solution, on Windows Compute Clusters Server 2003. This combination delivers a cost effective industrial solution which takes advantage of the Distributed Memory Processing version of PAM-CRASH on high performance clusters of industry standard 64-bit hardware, and helps to converge towards a uniform Windows based simulation environment."*
>
> Vincent Chaillou, President and Chief Operating Officer, Product Operations, ESI Group

Microsoft®

Automotive Application Areas

The new generation of ESI Group's leading crashworthiness simulation software, PAM-CRASH 2G, combined with Microsoft Windows Compute Cluster Server's high-performance computing platform, provides an essential component of the crash and safety value chain in the following application areas:

- Occupant Behavior Prediction
- Car Interior Component Design
- Structural Analysis of Body in White

- Design of Advanced Restraint Systems
- Synthesis of restraint Systems within the Fully Equipt Car Body

CCS Architecture

Windows CCS uses off-the-shelf, readily available components.

The Windows Compute Cluster Server 2003 head node:

- Controls and mediates all access to the cluster resources.
- Is the single point of management, deployment, and job scheduling for the compute cluster.
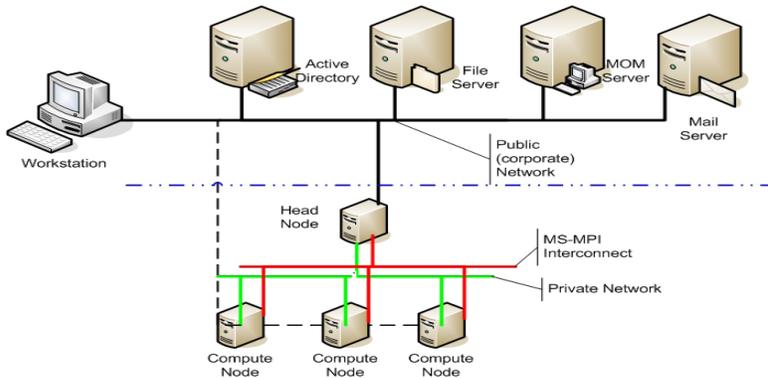
Windows Compute Cluster Server 2003 uses the existing corporate infrastructure and Active Directory for:

- Security
- Account management
- Operations management

System Requirements:

CPU Requirement:	64-bit architecture computer Intel Pentium, or Xeon family with Intel Extended Memory 64 Technology (EM64T) processor architecture, or AMD Opteron family, AMD Athlon family, or compatible processor(s).
Minimum RAM:	512 MB
Maximum RAM:	32 GB
Multiprocessor Support:	Up to 4 processors
Disk Space for Setup:	4 GB
Disk Volumes:	Head node requires a minimum of two volumes (C:\ and D:\). For additional roles, additional partitions are recommended. Compute node requires a single volume. RAID 0/1/5 may be used, but is not required.
Network Interface Cards:	All nodes require at least one. Each node may require additional network interface cards as appropriate for the network topology, for public network access or in support of an MPI network.

More Information

For more information about Windows Compute Cluster Server 2003, please visit http://www.microsoft.com/hpc.

For more information about ESI Group and PAM-CRASH 2G, please visit http://www.esi-group.com.

For information about purchasing Microsoft Windows Compute Cluster Server 2003, please email hpcinfo@microsoft.com

To join the HPC Community, please visit http://www.windowshpc.net.

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