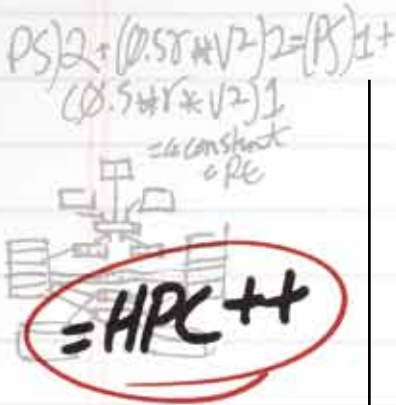


LY PRODUCTIVE HIGH PERFORMANCE COMPUTING



PARTNER PROFILE

Milliman, Inc., is among the world's largest independent actuarial and consulting firms, with 48 offices in key locations worldwide.

Milliman serves the full spectrum of business, financial, government, and union organizations and has consulting practices in employee benefits, health care, life insurance, financial services, and property and casualty insurance.

Worldwide, top insurance and financial firms depend on Milliman's MG-ALFA® (Asset Liability Financial Analysis) software to perform financial projections to support product development, financial reporting, risk management, and decision analysis.

WINDOWS® HPC—HELPING ACHIEVE SPEED AND MORE CERTAINTY IN CAPITAL MODELING

MG-ALFA® ACTUARIAL SOFTWARE AND WINDOWS HPC SERVER 2008 HELP INSURANCE FIRMS GAIN GREATER CONFIDENCE IN THEIR DECISION MAKING

SITUATION

Computational modeling is widely used in the insurance industry. However, competitive pressures and regulatory changes in the life insurance industry require the ability to analyze larger models that include a thousand or more scenarios, and to perform that analysis more frequently.

These challenges require more sophisticated actuarial tools, and dedicated high-performance computing (HPC) capability. For example, a 1,000-scenario model, with reserves and capital based on 1,000 paths at each valuation point for a 30-year monthly projection, requires the cash flows for each policy to be projected 360 million times. Computation on this scale could require 200 hours on one system versus two hours on 100 systems. Access to a parallel computing cluster provides the mission-critical capacity that models of this scale require, with cluster processor counts numbering in the hundreds or thousands.

Until now, the cost and expertise required to deploy and maintain HPC clusters has been a barrier to adoption. The challenge is to deliver a solution that seamlessly integrates actuarial tools with a Windows®-based HPC platform that is cost-effective, easy to deploy and maintain, and allows companies to leverage their existing Windows-based infrastructure and expertise.

SOLUTION

MG-ALFA is a Windows-based system that generates financial projections to support decision and risk analysis. MG-ALFA was designed for actuaries, and by actuaries, with an understanding of the real-world

needs and requirements of a system to meet insurance industry demands, including the ability to audit, analyze, and justify results and assumptions from large models.

Windows HPC Server 2008 is the HPC platform that provides the distributed computing power necessary to run demanding computational models in the most productive and cost-effective manner.

For the life insurance industry, running MG-ALFA on the Windows HPC Server 2008 platform can provide a complete solution.

MG-ALFA

The MG-ALFA actuarial projection system delivers performance in setup, run time, and analysis. Its formula database uses a logical scripting language that requires no special programming skills. This flexibility increases productivity and allows companies to quickly empower their staff.

MG-ALFA scales extremely well, allowing it to readily and efficiently support the industry demand for stochastic and nested stochastic analysis. The compatibility of MG-ALFA with Windows HPC Server 2008 allows seamless distribution of jobs to clusters ranging from a single node to several hundred.

Additional controls help users and administrators alike allocate resources, such as the number of engines assigned to each job, whether or not to segment a cluster, or sharing nodes for multiple jobs. Also, to help users troubleshoot, there is additional information available to facilitate efficient problem solving.

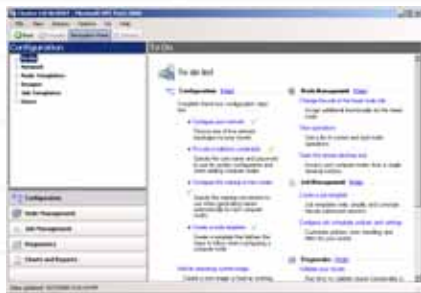


WINDOWS HPC SERVER 2008

Windows HPC Server 2008 combines the power of a 64-bit Windows Server® platform with rich, out-of-the-box functionality to improve the productivity, and reduce the complexity, of an HPC environment.

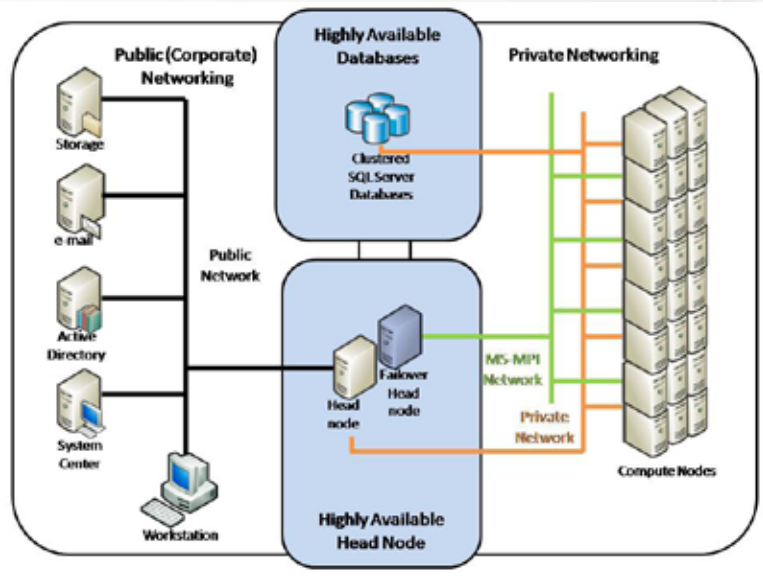
Windows HPC Server 2008 enables broader adoption of HPC, and increases productivity by providing numerous end-user, administrator, and developer features and tools.

- **End users** experience a rich and integrated environment that scales easily from the desktop application to the clusters.



The To Do List simplifies cluster configuration tasks.

- **Administrators** can use Microsoft management tools to centrally manage the Windows Server infrastructure. Windows HPC Server 2008 includes wizards, tools, built-in management consoles, and a To Do List to simplify the provisioning of compute nodes.
- **Administrative groups.** Administrators can also create groups based on hardware, software, or networking characteristics. Groups allow for simplified administration and allow optimal utilization by mapping jobs requirements to an appropriate set of servers.
- **Failover services.** Windows Server 2008 Enterprise includes Failover Services. The combination of Windows Failover Services and Microsoft SQL Server® database clustering provides head node redundancy in the event of a hardware failure.



- **Job scheduler.** The Windows HPC Server 2008 job scheduler is multi-core aware, allowing sophisticated scheduling by core, by socket, or by server.
- **Developers** can use familiar development tools, such as the native parallel debugger in Microsoft Visual Studio®, to develop and troubleshoot parallel programs, including support for standard interfaces such as OpenMPI, Message Passing Interface (MPI), and Web Services.

ARCHITECTURE

A typical Windows HPC Server 2008 architecture is shown above. The Windows HPC Server 2008 head node controls and mediates all access to the cluster resources, acts as the single point of management, deployment, and job scheduling for the cluster, and can failover to a backup head node in the case of failure.

Windows HPC Server 2008 uses the existing corporate infrastructure and Microsoft Active Directory® Domain Services for security, account management, and Operations management using tools such as Systems Center Operations Manager 2007.

BENEFITS

Faster, more accurate decisions

The Windows HPC Server 2008 and MG-ALFA solution delivers HPC for financial modeling capability to help insurance firms gain greater confidence in their decision-making.

Help maximize your IT investments

Windows HPC Server 2008 and MG-ALFA offer a complete solution for firms that want to maximize HPC hardware and actuarial software investments.

Improved productivity

More accurate models that run faster shorten the time to insight, resulting in improved productivity.

Affordable, full-featured HPC

Windows HPC Server 2008 brings simple deployment, operation and IT integration to HPC at a price point that allows companies to successfully deploy HPC applications.

Scalable, highly secure HPC

Windows HPC Server 2008 provides the scalability of Windows Server 2008, and includes support for Windows Server 2008 security features.

FURTHER INFORMATION

For more information about Windows HPC Server 2008 and HPC, please visit <http://www.microsoft.com/hpc>

For more information about MG-ALFA, please visit <http://www.milliman.com>