



Windows HPC—Achieving Speed and Certainty in Capital Modeling

Microsoft® Windows® Compute Cluster Server 2003 Powers MG-ALFA® Software



Windows® Compute Cluster Server 2003



Milliman

Partner Profile

Milliman, Inc., is among the world's largest independent actuarial and consulting firms, with 47 offices in key locations worldwide. Milliman serves the full spectrum of business, financial, government, and union organizations, and has consulting practices in employee benefits, healthcare, 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.

The Challenge

The competitive pressures and regulatory changes of the life insurance industry are driving increased complexity in products and analysis, requiring more sophisticated actuarial tools, and dedicated high-performance computing (HPC) capability. Computational modeling is widely used in the insurance industry; however, competitive pressures and new regulations require the ability to analyze larger models that include thousands of scenarios, more frequently. This will require most companies to deploy new infrastructure to support HPC. Until now, the cost and expertise required to deploy and maintain HPC clusters has been a barrier. 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. Windows® Compute Cluster Server (WCCS) 2003 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 platform can provide a complete solution.

Benefits

MG-ALFA and WCCS can help you:

- Meet the demands of new and emerging regulations.
- Increase confidence in your information through larger models and more scenarios.
- Improve competitiveness by bringing sophisticated products to market on time.

Overview

The life insurance industry is demanding more sophisticated computational techniques and therefore greater computing capacity. 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 2 hours on 100 systems. MG-ALFA was designed by, and for, actuaries with an understanding of the real-world needs and requirements of a system to meet these demands, including the ability to audit, analyze, and justify results and assumptions from models of this scale

Having access to a parallel computing cluster provides the necessary, mission-critical, capacity as executing models of this scale requires dedicated clusters with processor counts numbering in the hundreds or thousands. WCCS provides the platform for running these demanding computational models. Also, WCCS is easy to deploy and integrate with existing infrastructure.

MG-ALFA

MG-ALFA is a Windows-based actuarial projection system that delivers the ultimate performance in setup, run time, and analysis. Its formula database uses a logical scripting language that requires no 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 integration of MG-ALFA with WCCS allows seamless distribution of jobs to clusters ranging from a single node to several hundred.

Scenario	Tabular Reserve	Net PV of Pre-Ins Profit	Embedded Value w/ Tabular Reserve	Change in EV Based Upon:		
				Stochastic Reserve Criteria	Stochastic Surplus Criteria	Economic Capital Criteria
001	-3,250.24	1,899.97	1,018.92	-292.47	-455.97	1,694.18
002	-3,250.24	2,034.08	1,078.04	-295.89	-508.59	1,331.03
003	-3,250.24	1,895.07	1,087.93	-298.81	-502.32	1,262.82
004	-3,250.24	2,018.48	1,114.97	-305.16	-507.59	1,395.37
005	-3,250.24	2,250.28	1,109.46	-304.01	-501.72	1,420.00
006	-3,250.24	2,180.08	1,068.24	-315.92	-474.40	1,444.00
007	-3,250.24	2,031.76	1,055.63	-311.34	-439.64	1,321.30
008	-3,250.24	2,020.02	1,040.05	-248.89	-426.32	1,261.29
009	-3,250.24	2,143.86	1,070.37	-288.66	-476.60	1,324.39
Min	-3,250.24	1,895.07	1,018.92	-330.18	-507.59	1,284.18
Max	-3,250.24	2,250.28	1,114.97	-248.89	-426.32	1,444.00
Mean	-3,250.24	2,064.69	1,071.61	-286.60	-483.70	1,318.71
StdDev		122.88	30.34	27.03	42.53	107.18

The MG-ALFA Nested Stochastic Analyzer (shown above) provides summary information, as well as the ability to drill down into the details of stochastic and nested stochastic results.

Windows Compute Cluster Server 2003

Windows CCS is a highly productive platform for deploying, developing, and accessing dedicated HPC clusters. With essential management tools and integration with Microsoft Visual® Studio, the WCCS HPC platform helps reduce cost and complexity with a solution that is simple to deploy, operate, and integrate with existing IT infrastructure investments. A Windows-based cluster supports integration with desktop applications to provide cost-effective scale-out capabilities; WCCS can leverage your existing Windows infrastructure and administrator's skill-set for managing the HPC system. Through the WCCS integrated Job Scheduler, both job creation and submission can be performed directly from a desk-side application, providing a fully integrated experience for the end user

The Combination

The WCCS and MG-ALFA solution delivers HPC for financial modeling capability to help insurance firms gain greater confidence in their decision-making. WCCS and MG-ALFA offer a complete solution for firms that want to maximize HPC hardware and actuarial software investments and rapidly increase productivity.





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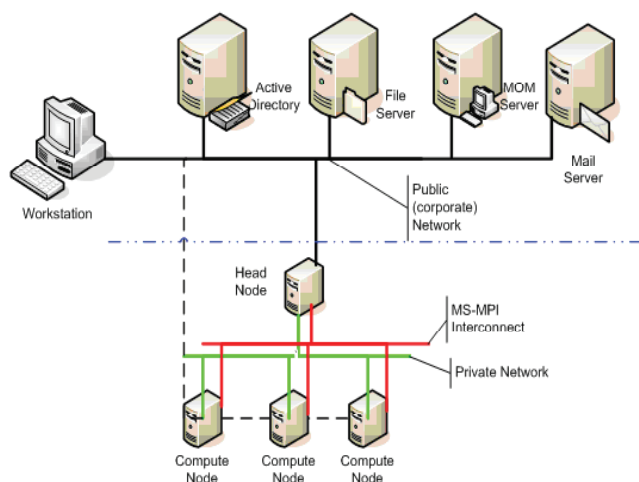
WCCS Architecture

The WCCS head node:

- Controls and mediates all access to the cluster resources.
- Provides a single point of management, deployment, and job scheduling for the compute cluster

WCCS uses the existing corporate infrastructure and the Microsoft Active Directory® domain service for:

- Security features
- Account management
- Operations management



WCCS 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 MG-ALFA from Milliman, Inc., please visit <http://www.milliman.com>

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

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

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