



Actuarial Firm Works to Transform Insurance Industry with Cloud-based Solution

Overview

Country or Region: United States
Industry: Financial Services

Partner Profile

Milliman is a leading independent actuarial firm that provides both software and consulting services. The Seattle-based company has about 2,500 employees and is a Microsoft HPC (High-Performance Computing) Global ISV.

Business Situation

Milliman was approached by an insurance industry customer seeking a more affordable and scalable way to manage compute-intensive actuarial and reporting tasks.

Solution

Milliman moved core components of its flagship application, MG-ALFA, to Windows Azure for greater scalability, availability, and high performance.

Benefits

- Provides massive scalability on demand
- Cuts IT costs by 30 percent or more
- Delivers reliability, enhanced security

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Patricia Renzi, Global Practice Leader for MG-ALFA, Milliman

With increased regulation of insurance companies—including the upcoming [Solvency II Directive](#) in the European Union—the insurance industry has a strong need to control the cost and complexity of IT systems used for actuarial analysis and regulatory reporting. To help insurance companies manage their high-performance computing needs, [Milliman](#), a global provider of actuarial software and consulting services, launched a client project that uses [Windows Azure](#) to distribute highly complex, mission-critical computing tasks across cloud-based resources. The result is supercomputer-level processing capability that is enormously scalable and powerful, yet can be delivered at a lower cost and with fewer IT resources than through traditional on-premises IT deployments.



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Situation

Milliman is one of the world’s largest independent actuarial and consulting firms. The Seattle-based company has 55 offices around the world that provide actuarial and risk management advice and solutions to a full spectrum of business, financial, government, union, education, and nonprofit organizations.

The firm’s flagship software solution for the life and financial services industry is [MG-ALFA](#), a sophisticated financial modeling tool used around the world. MG-ALFA, which was first released in the mid-1990s, helps insurance firms with tasks such as product pricing, risk management analysis, and responding to regulatory reporting requirements.

Due to the nature of the risks that are part of insurance products and the interactions with the assets backing them, MG-ALFA uses stochastic simulations to measure the financial results. Stochastic analysis involves evaluating financial outcomes across thousands of randomly generated economic scenarios that might play out over 30 or more years. This kind of actuarial analysis requires very high-performance grid-computing capabilities, which in turn require a specialized—and expensive—IT infrastructure.

“For a typical company doing advanced actuarial modeling using an on-premises deployment or a traditional hosting provider, the cost of a grid—including hardware, electricity, cooling, rack space, IT support staff, and other costs—can reach \$3 million or more per year,” says Brian Reid, MG-ALFA Global Sales Director at Milliman.

It’s an expense that insurance companies must manage carefully to compete in the industry. The challenge is not only the scale

required, but also the uneven nature of the demand. Usage tends to spike during reporting periods and at variable other times, depending on the customer’s business. Insurance companies face the dilemma of whether to provide IT resources for the peaks and suffer the cost of low utilization, or to provide a lower level of capacity and then deal with delays in obtaining results.

The dilemma has reached the crisis point for many insurers. In Europe, for example, insurance companies are preparing for the Solvency II Directive, a European Union measure that goes into effect in 2014. Solvency II includes vastly increased model complexity, imparts a strict timeline for results, and mandates quarterly reporting.

“Solvency II leads to even greater needs for computing power, which creates more financial challenges for insurance firms,” says Patricia Renzi, Global Practice Leader for MG-ALFA at Milliman. “It puts a lot of pressure on companies to balance the cost versus timely and accurate information to manage their business effectively. Our clients are looking to us for solutions.”

In late 2009 a Milliman client—the [Phoenix Group](#), which is based in the United Kingdom—was considering its options for managing the Solvency II requirements but did not like any of the choices available. Phoenix and Milliman collaborated to design an innovative solution that provides significant value to both Phoenix and Milliman.

“What Phoenix recognized,” says Renzi, “is that the workloads required to meet the new regulations would be significantly higher than anything they were currently doing, but they would be intermittent. The size of the infrastructure required each quarter would be quite significant, but it

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would be idle for the rest of the year. The result would be a major cost for an infrastructure that would be terribly underutilized."

Solution

Milliman developed a proof of concept with MG-ALFA running on [Windows Azure](#) in the summer of 2009 and presented it to Phoenix as a potentially cost-effective solution for the computationally intensive work required to manage its business effectively. "As we reviewed the concept, one thing became clear," says Renzi. "Windows Azure offered a powerful cloud-based solution that not only meets the needs of one insurance company, but also could transform the way that the entire industry performs compute-intensive, mission-critical work."

Milliman took a strategic approach in designing how its MG-ALFA application would work on Windows Azure. The development team used the core elements of the existing MG-ALFA software so that companies already running MG-ALFA on the desktop could also run jobs in the cloud.

The technologies used for the solution include Windows Azure Compute, which provides highly available compute capacity that allows application code to run in the cloud, and [Windows Azure Storage](#), which is used to store persistent data. The solution was crafted to include web-based workflow, assumption management, versioning, resource management, and other capabilities that are critical for making efficient use of the increased computing capacity. In this way, the solution became not only a new product for the desktop version of MG-ALFA, but also introduced a web-based modeling paradigm.

"For Phoenix, we used the desktop version of MG-ALFA to customize the mathematics behind their specific calculations and the business logic used to make projections on their assets and liabilities," says Renzi. "That part of their solution is built and maintained on the desktop, and then sent to the cloud for the calculations."

The company also designed the solution so that third-party system integrators and customers' internal enterprise developers can write software that provides input to the MG-ALFA cloud system for model details, such as economic scenarios or the value of assets and liabilities on a specific valuation date. "Working out the details in advance enables full automation of the process, eliminating potential human error and wasted time that can happen with the manual updating of models," says Renzi.

The Milliman solution is architected to distribute compute tasks across the Windows Azure global network of Microsoft data centers to achieve the best possible performance. To date, the company has scaled up to more than 8,000 compute nodes simultaneously.

To ensure high availability for the pilot project for the U.K.-based Phoenix Group, Milliman hosts its MG-ALFA application at a Microsoft data center in Ireland and mirrors it to another data center in the Netherlands. The application is designed so that hundreds or even thousands of jobs are rapidly distributed across Microsoft data centers around the world to take advantage of virtualized grid-computing network.

Benefits

By turning to Windows Azure, Milliman helped one client tackle a significant IT and regulatory challenge—and in the process, created a solution that can help insurance

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companies transform the way they handle mission-critical actuarial work. The cloud-based version of MG-ALFA is massively scalable, providing enormous flexibility for companies that must deal with the ebb and flow of their actuarial computing needs. It is cost effective, helping companies save money over traditional IT infrastructure solutions. It also provides the kind of reliability and enhanced security needed for critical business operations involving confidential data.

"Windows Azure offered the platform to create a powerful cloud-based solution that not only meets the needs of one insurance company," says Renzi, "but also could transform the way that the entire industry performs compute-intensive, mission-critical work."

Provides Massive Scalability on Demand

MG-ALFA is a complex, powerful software solution that can distribute calculations across thousands of processors. By porting the solution to Windows Azure, Milliman eases computational workloads for its business clients by taking advantage of Windows Azure Compute capabilities, which can be scaled up or down as needed.

Van Beach, Product Manager for MG-ALFA at Milliman, notes that a typical Solvency II reporting cycle can involve over 2 million simulations involving a complex range of variables.

"The Solvency II process involves incredibly complex calculations requiring intense computing capabilities to meet the prescribed reporting deadlines. That further intensifies the computing capacity crunch," he explains. "For Phoenix and other companies complying with Solvency II, that means every three months there will be a massive spike in demand. With Windows Azure, our clients can quickly scale up for

the massive computations involved in running scenarios, and then just as quickly scale down when the processing is not needed."

Cuts IT Costs by 30 Percent or More

With the MG-ALFA cloud-based solution, Milliman clients pay only for the processing and storage capabilities they need, without having to deploy, manage, and upgrade hardware.

"We estimate that if a grid is used 60 percent of the year, running MG-ALFA operations on Windows Azure can cut the traditional \$3 million cost for a traditional on-premises system by at least one-third," says Reid. "With Windows Azure, companies avoid large capital expenses, because the MG-ALFA solution can access high-performance computing resources on demand at a small fraction of what it would cost to own and operate those resources."

Delivers Reliability and Enhanced Security

Security and reliability are major concerns for financial services companies. That is why Windows Azure, which is run in Microsoft data centers, is a good choice for an industry solution, says Renzi.

"Windows Azure is an enterprise-grade platform with attendant security and reliability," she says. "And, because Microsoft has data centers worldwide, information can be hosted in jurisdictions appropriate to the client."

Milliman employs numerous measures to maintain high availability of its computing resources. Milliman staff provides 24x7 monitoring of services using proprietary diagnostics, event management, and other service management techniques. With the built-in replication functionality in Windows Azure, Milliman can quickly recover from

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any individual data-center service interruptions in the rare event of an outage.

Renzi says the solution delivered an impressive performance running on Windows Azure. During a six-month period beginning in late 2011, Phoenix had several periods during which it operated 10,000 compute engines on Windows Azure for multiple days and ran smaller jobs in between.

"The jobs had a 99.98 percent completion rate," says Renzi. "Windows Azure delivers great reliability while freeing companies like Phoenix from the processing bottlenecks that occur in single hosted services. Windows Azure was instrumental in helping us deliver a robust, dynamic risk management solution that stretches the boundaries of what is possible in enterprise computing."

Microsoft Cloud Services

Microsoft offers a complete set of cloud-based solutions to meet business needs, including solutions for advertising, communications (email, meetings), collaboration (document storage, sharing, workflow), business applications (customer resource management, business productivity), data storage and management, and infrastructure services. In addition, customers can take advantage of an entire ecosystem of solution providers and Microsoft partners.

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Software and Services

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