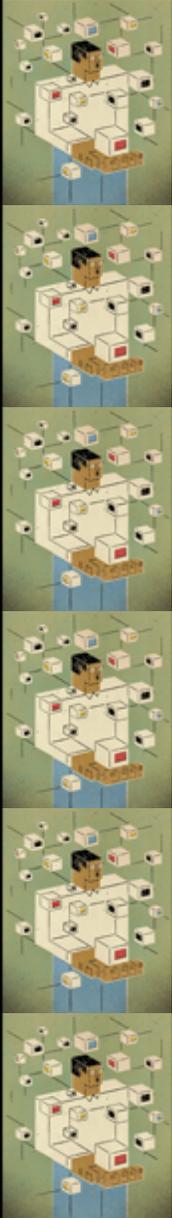


Get in to the Grid Game with MG-ALFA and WCCS

Presented by
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Patricia Renzi - Milliman

April 23, 2008



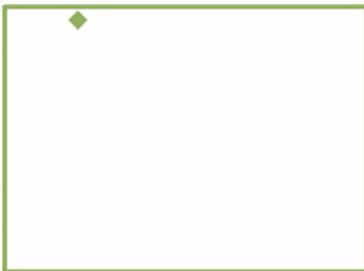
Historical Actuarial computing needs

Early
1980's

Mid - Late
1980's

1990's

2005



1 projection

7 projections

50 projections

1000 projections

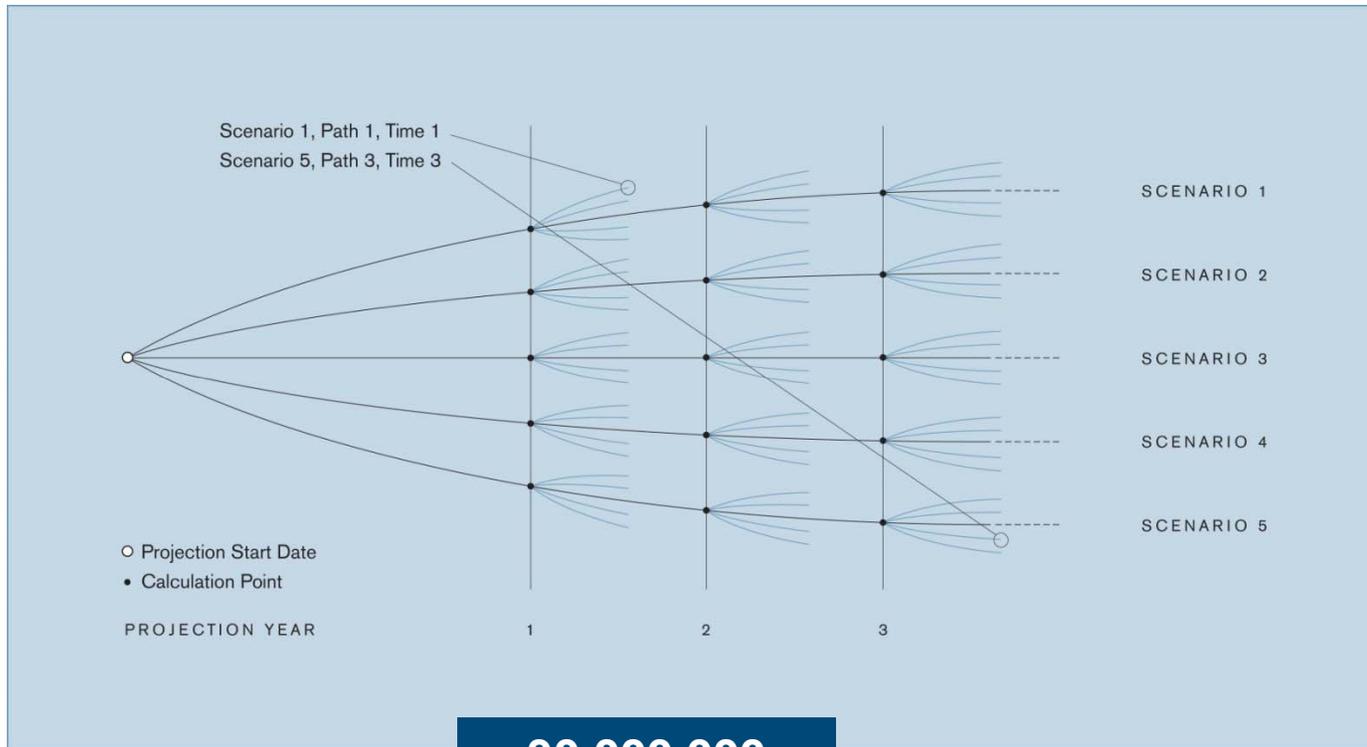
**Single desktop
computer**

“Sneaker Net”

**Application
Distribution**

**High
Performance
Computing**

Current and future actuarial computing needs



**30,000,000
projections**

Considerations in building a grid

- Initial costs
 - Hardware
 - Software
 - Personnel
- Maintenance costs
- Scalability of the applications
- Effort to expand to other applications

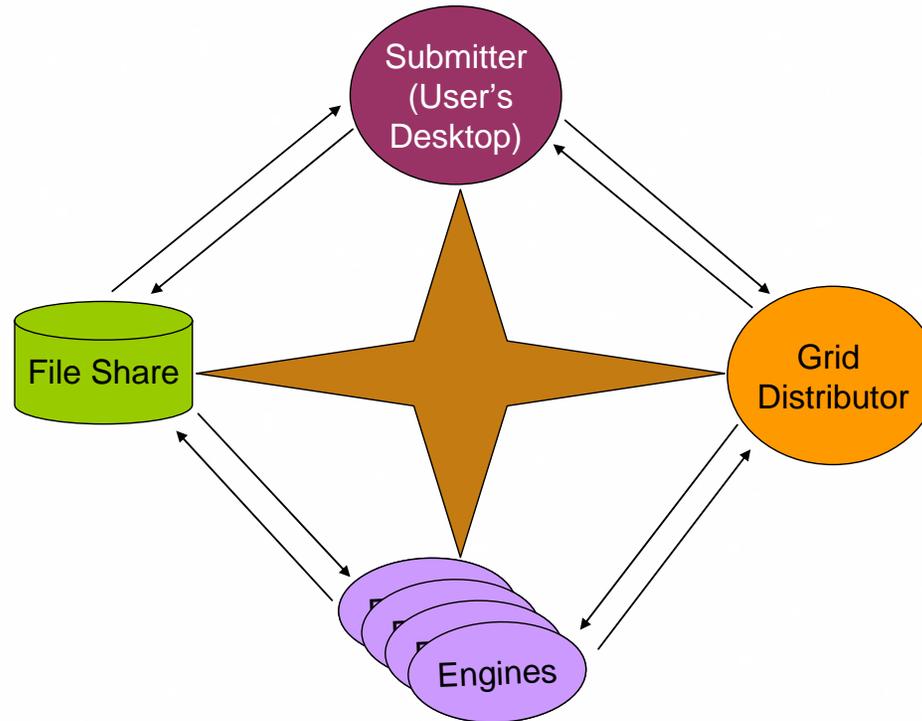
MG-ALFA implementation

The screenshot displays the MG-ALFA software interface. The main window is titled "MG-ALFA Version 6.6.200 - [Project input file--C:\Mgalfa\Ver66\Usa\Projects\Sample.Ain]". The menu bar includes "File", "Utility", "Options", "Window", and "Help". The toolbar contains icons for "Save", "Add", "Delete", and "Run". The "Projection Run Request" dialog box is open, showing a list of requests to run (Run.001, Run.002) and various configuration options. The "Seamless Distributed Processing (SDP) Run Parameters" dialog box is also open, showing settings for distribution type, priority, target number of engines, and number of scenarios per task.

Easy selection

Choices to Maximize scalability

High performance computing



3-tier design:

1. Job submitted to the grid distributor from the user's desktop
2. The grid distributor allocates work to the engines
3. Engines process tasks and report results back

Windows Compute Cluster Server 2003

- Complete, integrated platform for computational clustering
- Built on top the proven Windows Server 2003 platform
- Integrated development environment



Windows Server 2003, Computer Cluster Edition

- Secure, Reliable, Tested
- Support for high performance hardware (x64, high-speed interconnects)

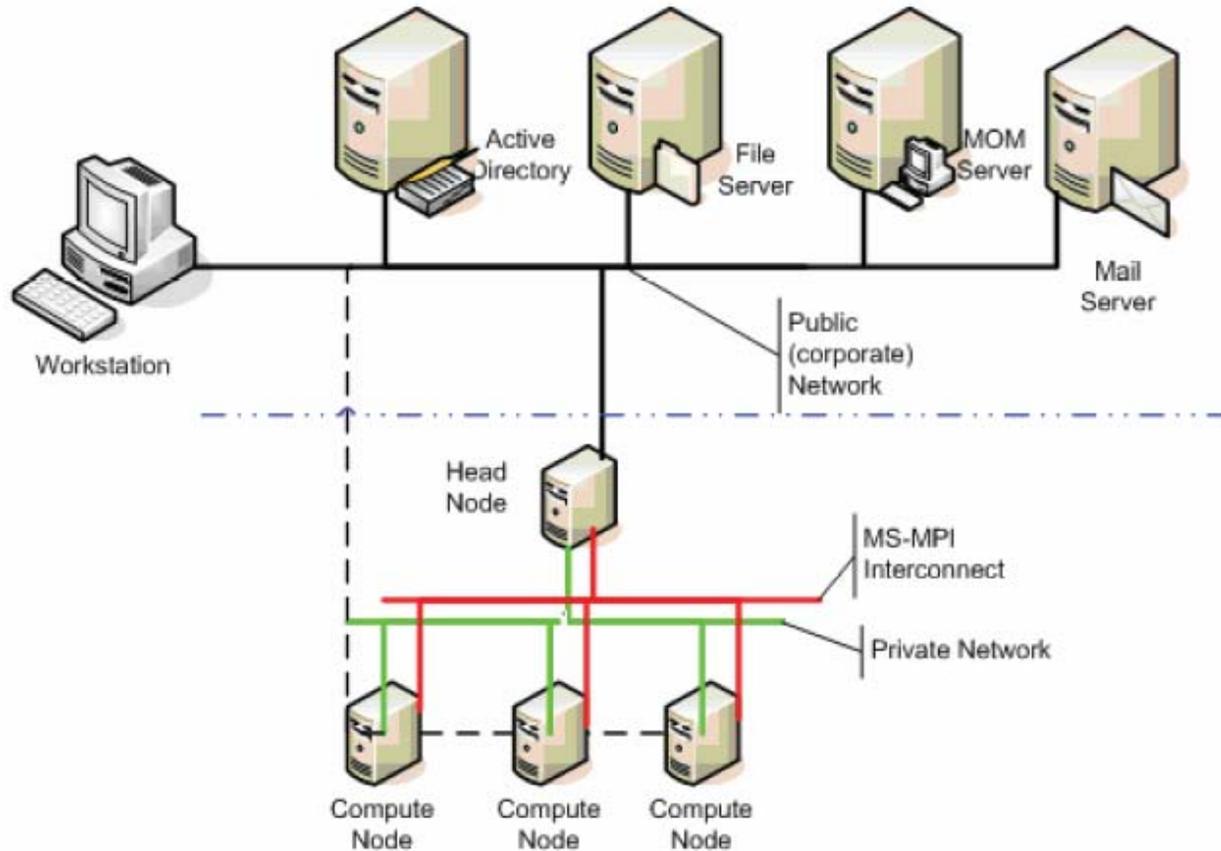
Compute Cluster Pack

- Job Scheduler
- Resource Manager
- Cluster Management
- Message Passing

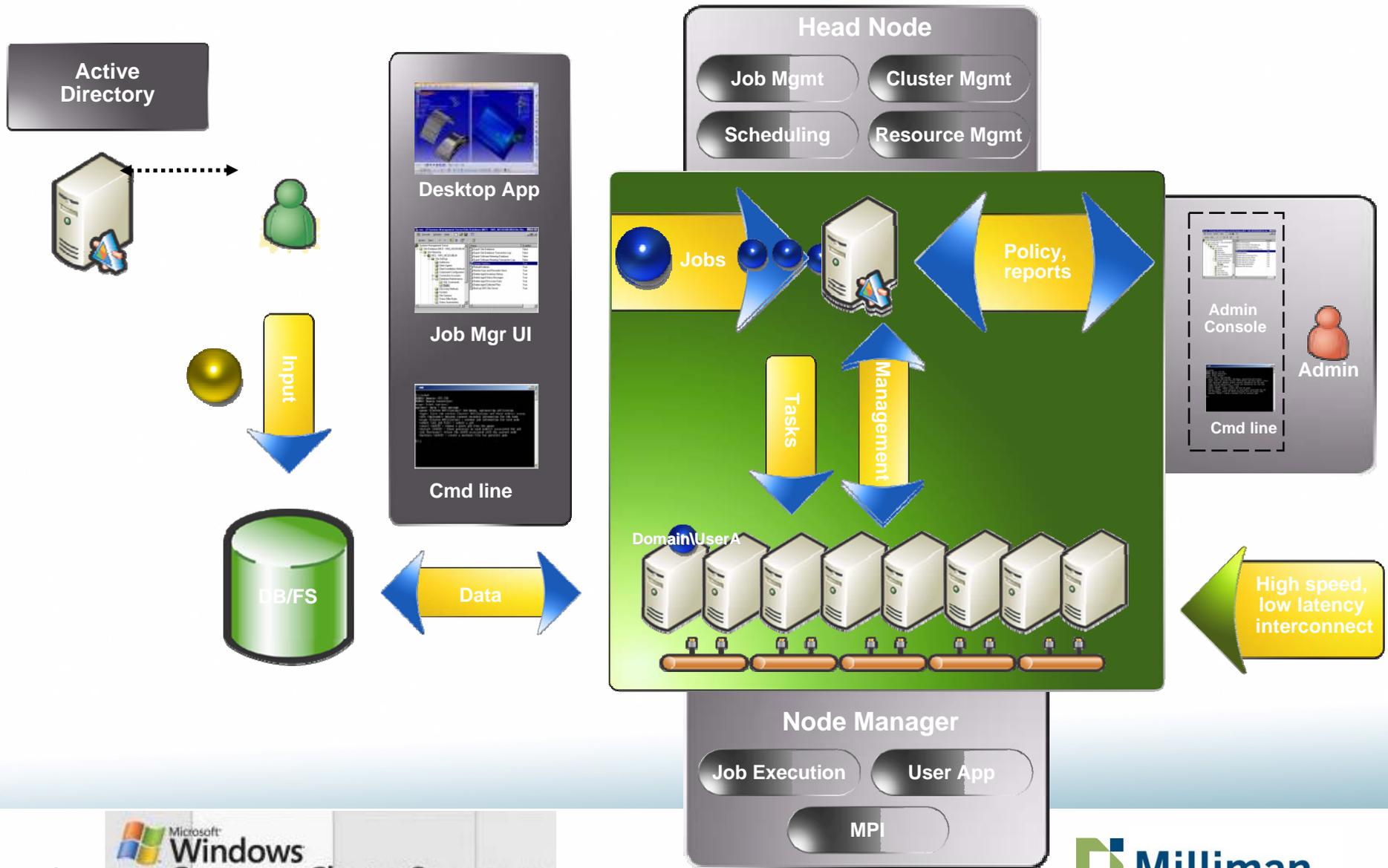
Microsoft Windows Compute Cluster Server 2003

- Integrated Solution out-of-the-box
- Leverages investment in Windows administration and tools
- Makes cluster operation easy and secure as a single system

MG-ALFA & WCCS Integration



Windows Compute Cluster Server 2003



Integration Requirements

Software

- Microsoft Windows Compute Cluster Server 2003
- MG-ALFA Version 6.5 or later with CCS Integration License

Hardware

- Dedicated Machines for Nodes
- 64-Bit Compatible CPUs
- 512 Mb – 2 Gb RAM (per CPU)
- All Nodes on Common Network
- Multi-Core/Multi-Processor Most Cost Effective

Scalability Data – Test A

Number of Compute Engines	Elapsed Time in Seconds (includes non-parallel components)	Performance Improvement	Efficiency of application on the grid
1	27567	1.00	100.00%
8	3834	7.19	89.88%
20	1556	17.72	88.58%
100	329	83.79	83.79%
200	173	159.35	79.67%

Scalability Data - Test B

Number of Compute Engines	Elapsed Time in Seconds (includes non-parallel components)	Performance Improvement	Efficiency of application on the grid
1	32747	1.00	100.00%
8	4554	7.19	89.88%
20	1848	17.72	88.58%
100	391	83.75	83.75%
200	206	158.96	79.48%

Licensing and Costs

WCCS

- License Microsoft Windows Compute Cluster Server 2003 for Nodes
- Significant Discount Relative to Standard or Enterprise version of the Operating System
- Promotional Program available until 6/28/08.

MG-ALFA

- Addendum to MG-ALFA Agreement to License WCCS Integration
- Additional Annual License Fee Includes Maintenance & Support

Extremely Cost Effective Solution

Case study – Aviva USA

- Initial grid project plan leveraged existing hardware and introduced a third party job scheduler
- Opportunities to Reduce costs:
 - Use more cost effective version of Windows Server
 - Leverage Job scheduler in Windows Compute Cluster Server
 - Eliminate training/Int. requirements for third party Scheduler
- Opportunities to increase return on MG-ALFA investment.
 - Per system cost for cluster dramatically reduced allowing more systems to be used and more frequent iteration of models
 - Verification of models under MG-ALFA environment more rapidly proven reducing time to return on investment.
 - More Scenarios run reduces business risk.

Case study – Aviva USA

■ How it unfolded

- Introduce WCCS and WCCE on a limited set of existing hardware
 - Prove valid results on MG-ALFA and other assorted applications
- Microsoft worked with Aviva IT to integrate automated deployment of WCCS on hundreds of CPU's
- WCC Pack was deployed on users desktops for support of job submission.
- Latest Version of MG-ALFA deployed to support WCCS
- Production Success 😊

Case study – Aviva USA

■ Results

- Large Cost Savings achieved with full functionality
- Possibility for future enhancements based on WCCS
 - Next generation of Windows HPC server enhances business scheduling policy
 - Next generation of Windows HPC server enhances range of application types supported by the Grid.
- Grid Use expanded
 - ALM application introduced on second cluster
 - Other potential applications identified for third cluster

Resources

- Microsoft HPC web site
 - <http://www.microsoft.com/hpc/>
- Microsoft Windows Compute Cluster Server 2003 community site
 - <http://www.windowshpc.net/>
- Windows Server x64 information
 - <http://www.microsoft.com/64bit/>
 - <http://www.microsoft.com/x64/>
- Windows Server System information
 - <http://www.microsoft.com/wss/>
- More Information on Milliman
 - <http://www.milliman.com/expertise/life-financial/products-tools/mg-alfa/>