

RiskAgility Financial Modeller

Powerful financial modelling for life and composite insurers

RiskAgility Financial Modeller (RiskAgility FM)

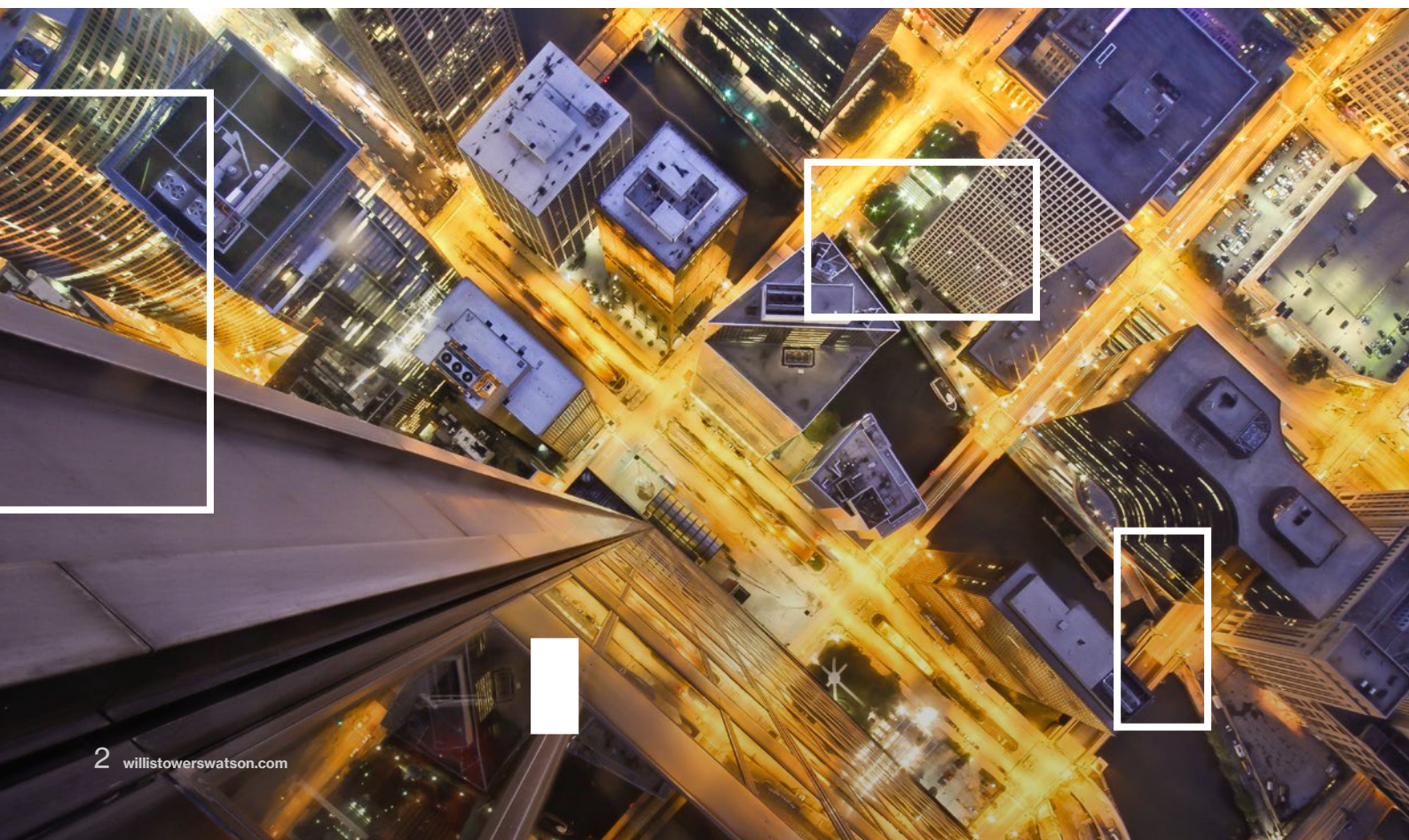
RiskAgility FM is a flexible software solution that enables life insurers to run financial models that accurately reflect their company's products in ways that are easily adapted to their business processes.

RiskAgility FM blends the power of commercial programming tools with the actuarial expertise of Willis Towers Watson to deliver enhanced performance and ease of use. The open modelling environment supports accurate calculations and tight reconciliations today and into the future, as product designs, company practices and regulatory requirements evolve. In RiskAgility FM, modelling functions have been designed so that you can easily adapt the system to your way of doing things, rather than forcing your company to conform to rigid software requirements.

We offer global templates and a number of specific applications and regional templates for RiskAgility FM to give you a quick start in modelling product types common in various markets (see box for example). These applications are fully built out with extensive functionality. Use them as is, or tailor them to reflect your company's distinctive product designs and business practices.

RiskAgility FM: C-ALM

The Central Asset/Liability Management (C-ALM) suite provides a well-structured asset/liability framework for implementing dynamic stochastic projections for profit-sharing business, including monitoring and managing both book and market values of assets. Versions are available for French, German and Italian markets, along with a generic version for other territories within and beyond Europe. These applications provide fully featured modelling templates that enable you to quantify and measure value, economic capital, risk and earnings, and to meet new regulatory demands, such as Solvency II and IFRS 17.

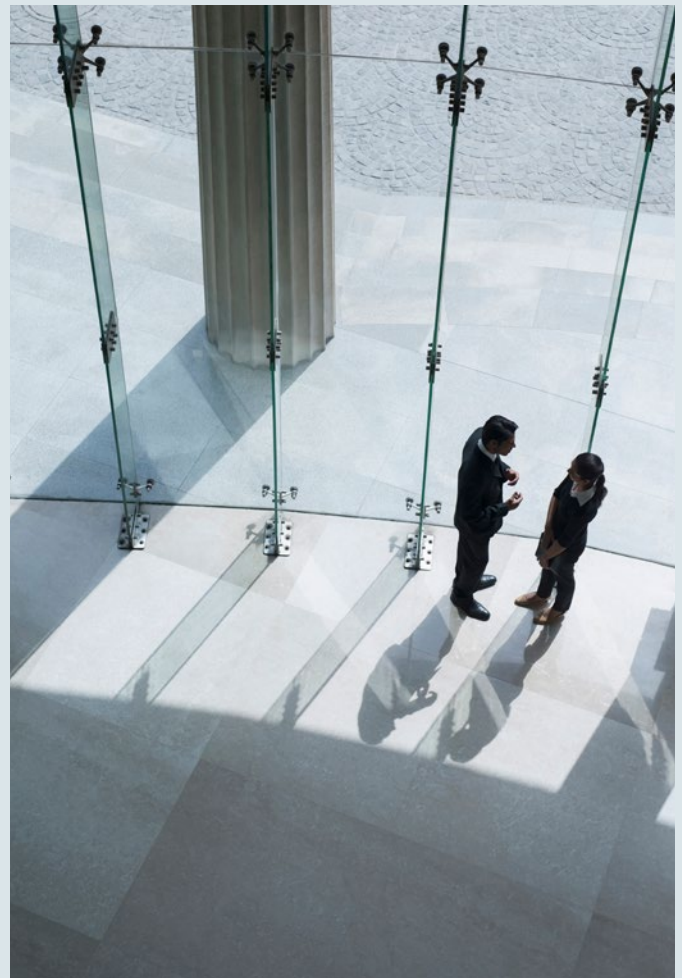


Why RiskAgility FM?

- Enables your company to deploy sophisticated analytical calculations based on realistic economic principles, thereby improving risk and capital management
- Uses open, transparent applications to help you confidently understand exactly how the calculations model your business
- Delivers the power and accessibility of standard programming languages to model anything, augmented with domain specific features to assist actuaries.
- Optional integration with Version Control platforms to deliver true collaborative development
- Flexible software is easily adapted to your products and business processes to increase productivity
- Includes powerful input management tools to link variables to any external sources, including Excel spreadsheets, text files or databases
- Offers the ability to organise variables into user-defined groups that allow assumptions and projections to be managed easily
- Enables easy set up and management of multiple projections by mixing and matching different groups of inputs, run parameters and output parameters
- Provides flexible organisation and orchestration of projections, allowing for dependencies between the projections
- Supports powerful distributed processing in-house with Microsoft Windows HPC, in the cloud with Microsoft Windows Azure or with Willis Towers Watson vGrid – our Software as a Service scalable virtual grid solution designed specifically for use with RiskAgility FM
- Embodies the thought leadership and expertise of Willis Towers Watson

You can use RiskAgility FM for a variety of purposes including:

- Product development
- Liability modelling
- Asset/liability management
- Regulatory capital (e.g. Solvency II)
- Market consistent/traditional embedded value
- Pricing of options and guarantees
- Economic capital calculation
- Financial reporting (e.g. IFRS-17/GAAP)
- Reinsurance optimisation



Separation of modelling functions makes the system easy to use, understand and learn

In RiskAgility FM, we have separated the modelling functions into logical groups. Modellers create reusable objects within these functions that are then available throughout the system. This makes it easy to create a modelling process that works well across your business environment and to integrate it with workflow management processes.

For example, a modeller can use sensitivity assumptions defined in the Input Manager (Figure 1) to create a series of waterfall projections or stress tests in the Run Manager with a few clicks of the mouse.

This separation and grouping of tasks helps you adapt the system to your company's business practices, which makes everyone's job easier, reduces the learning curve, and improves model governance and control.

The Output Manager in RiskAgility FM allows users to define the format of the output, with users having full control over the fields and time periods accumulated and reported. Standard output is in accessible text-file format to avoid unnecessary file conversion steps and custom file formats can also be produced to meet other needs. Reporting can be performed using an Excel add-in.

Modelling functions are organised into groups to easily adapt the system to your company's business practices.

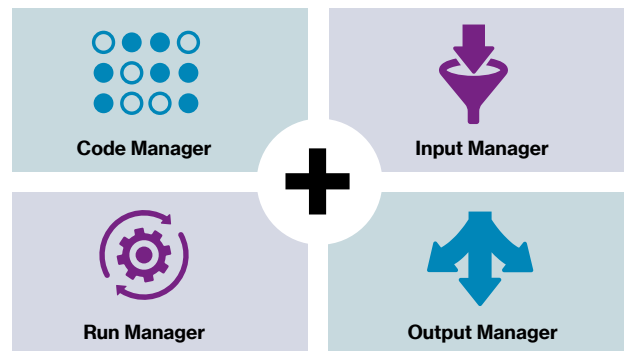


Figure 1. Input management

Name	Description	Default	4Q_2020	1Q_2020 Base Exp...
Commissions				
comm_modal_loading_defn	Classification of modal loading:	Noncommissionable	Noncommissionable	Noncommissionable
comm_pot_fee_defn	Classification of policy fee:	Noncommissionable	Noncommissionable	Noncommissionable
comm_pct_prem	Commission percent premium:	0	0	0
comm_fy_prem_pct_annualzd	Percent first year annualized:	0	0	0
comm_chargeback_defn	Commission chargeback definition:	Not Applicable	Not Applicable	Not Applicable
comm_chargeback_basis	Commission chargeback basis:	First Year Commission	First Year Commission	First Year Commission
comm_chargeback_pct	Commission chargeback percent:	0	0	0
comm_rider_defn	Rider commissions definition:	Commissionable	Commissionable	Commissionable
Adjustment				
exp_adj_mult	Expense multiple by date:	1	1	1
inf_start_date	Inflation start date:	9999/12	9999/12	9999/12
gaap_pad_maint_exp_per_pol_mult	PAD maintenance expense per policy multiple:	1	1	1
gaap_pad_maint_exp_per_pol_addn	PAD maintenance expense per policy addition:	0	0	0
gaap_pad_maint_exp_per_unit_mult	PAD maintenance expense per unit multiple:	1	1	1
gaap_pad_maint_exp_per_unit_addn	PAD maintenance expense per unit addition:	0	0	0
gaap_pad_maint_exp_pct_prem_mult	PAD maintenance expense percent of premium multiple:	1	1	1
gaap_pad_maint_exp_pct_prem_addn	PAD maintenance expense percent of premium addition:	0	0	0
gaap_pad_maint_exp_other_mult	PAD other maintenance expense multiple:	1	1	1
Acquisition				
acq_exp_per_pol	Acquisition expense per policy:			
acq_exp_per_unit	Acquisition expense per unit:			
acq_exp_pct_annualzd_prem_fy	Acquisition expense percent annualized first year premium:			
capzd_acq_exp_pct_per_pol	Capitalized per policy acquisition expense:			

Figure 2. Run management

Name	Baseline	Expense Changes	Expense and Economic Changes	Exp, Econ and Mort Changes
Input Pages				
Company	Baseline	Baseline	Baseline	Baseline
Economy	Baseline	Previous Economic	Previous Economic	Previous Economic
Investment	Baseline	Baseline	Baseline	Baseline
Reinsurance	Baseline	Baseline	Baseline	Baseline
TradProduct	Baseline	Baseline	Baseline	Baseline
TradDilution	Baseline	Baseline	Baseline	Baseline
TradDividends	Baseline	Baseline	Baseline	Baseline
TradMortality	Baseline	Baseline	Baseline	Previous Mortality
TradExpenses	Baseline	Previous Expense	Previous Expense	Previous Expense
TradPolicyholder	Baseline	Baseline	Baseline	Baseline
Riders	Baseline	Baseline	Baseline	Baseline
RidersValuation	Baseline	Baseline	Baseline	Baseline
TradData	Default	Default	Default	Default
TradReinsData	Default	Default	Default	Default
TradRiderData	Default	Default	Default	Default
EpiData	Default	Default	Default	Default
BondData	Default	Default	Default	Default
MtgData	Default	Default	Default	Default
EpaData	Default	Default	Default	Default
Referenced Files				
Parameter Sets				
Run Parameter Set	Proj Portfolio Default	Proj Portfolio Default	Proj Portfolio Default	Proj Portfolio Default
Output Parameter Set	Proj Portfolio ALL 360	Proj Portfolio ALL 360	Proj Portfolio ALL 360	Proj Portfolio ALL 360
Goal Seek Parameter Set				

Your business. Your models. Your way

RiskAgility FM simplifies modelling dynamic and embedded projections to build complex ALM and capital projections from basic reusable components.

RiskAgility FM delivers powerful advanced capabilities for building reusable modelling components delivering improved ease of use and productivity, with a modern look and feel.

Models are built with a combination of C++ code (widely known, enabling auto-complete, syntax guidance and debugging), actuarial modelling objects and links to your own functions and existing libraries.

Together these allow modular development and testing, as well as the ability to step through the code and trace calculations with the visual Dependency Viewer, which makes everyone's job easier, reduces the learning curve, and improves model governance and control.



Full projected balance sheet capabilities are available in the Standard Edition.

RiskAgility FM editions

RiskAgility FM is available in Foundation, Standard and Team editions. All editions run any RiskAgility FM model and offer all of the functionality described above. The RiskAgility FM Team edition includes increasingly sophisticated version control, audit, security and governance functionality on top of that provided by the Standard edition. These editions allow you to manage and control models, projections and results across your company.



Efficient, collaborative development

RiskAgility FM Team edition enables insurers to achieve efficient development and manage multiple versions of their models in a collaborative multi-user environment.

The Team edition builds on the Standard edition and works closely with features of Microsoft Team Foundation Server (TFS) to deliver a multi-user collaborative environment that enables your company to track, manage and control the development of your models. With the Team edition, your company can:

- Manage versions of models over time for improved backup, documentation and audit capabilities
- Control user access to models or parts of models for improved governance and security
- Coordinate changes to models among multiple users for improved quality and efficiency of model development efforts

Many modelling teams know what they need to do, but technology constrains them to having model owners working late in the evenings merging code across multiple model versions, often with alternative implementations of the same routines where multiple modellers have simply got in each other's way. Team edition of Risk Agility FM changes that, allowing optimal allocation and collation of the work of your modelling team.

A well-managed model development team can now efficiently deliver consistent and well-integrated code and

will ensure those using the models can reliably pick up exactly what they need whether using the latest projects, or accessing old models to reproduce historic calculations

Manage versions

RiskAgility FM Team edition helps users maintain a complete history of model versions. Want to see the model version that was used to support the last year-end processing? Team edition features make it easy to store and retrieve versions for improved audit readiness.

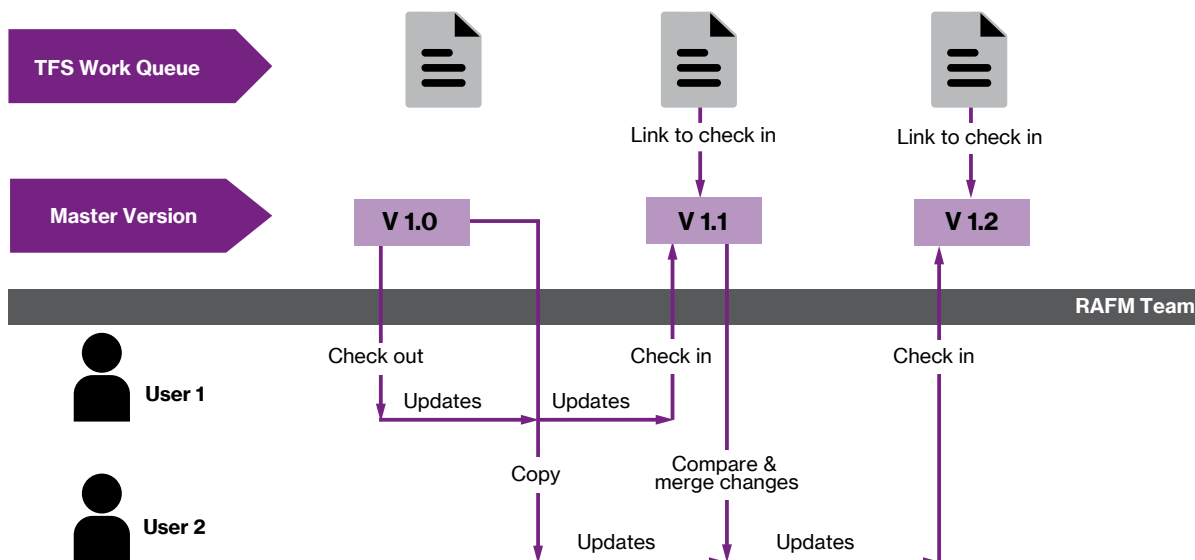
Control user access

Model governance is stronger when user access to production models is kept under control. The Team edition makes this easy, by working with TFS to control access to each model, or portions of models, by user or role.

Coordinate changes

RiskAgility FM Team edition makes it easy for your modellers to coordinate their efforts smoothly and efficiently, with high quality afforded by clear ownership of portions of the work and easy-to-use features to compare and merge versions. These features help your team fully realise the benefits of specialisation and collaboration in creating and maintaining your models.

Figure 3. **RAFM Team delivers low cost collaborative development between modellers**





Provides efficient, scalable distributed processing

High-performance grid computing in combination with efficient compilation enables you to avoid compromises between accuracy and speed.

In a cost-conscious world, with ever increasing demand for faster close and more complex and accurate calculations, the desire to find fast, efficient, and scalable means to perform the calculations is at the front of everyone's mind. It's no longer a case of doing the best you can with the resources you have, but instead around delivering more, in less time, at a lower cost.

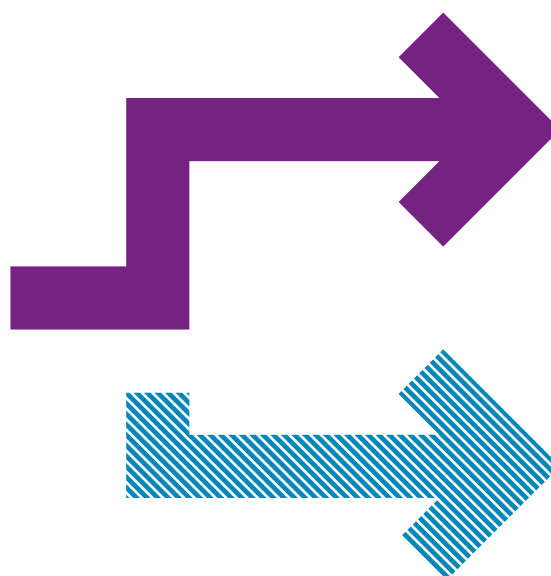
With RiskAgility FM, models can be run in your company datacentre using Microsoft Windows HPC, in the cloud with Microsoft Windows Azure or with Willis Towers Watson vGrid – our Software as a Service scalable virtual grid solution designed specifically for use with RiskAgility FM.

This gives you flexible, scalable options for distributed processing so you can get precise calculation results when you need them; and opening up the world of nested stochastic capital projections.

Even the smallest users are looking for more, moving from the risk-fraught desktop scavenging to small compute grids or SaaS alternatives.



RiskAgility Financial Modeller supports a number of options; delivering cheaper, faster and better risk analysis.



Microsoft HPC

The industry standard solution to managing a large compute environment, or hybrid of multiple environments is Microsoft HPC. RAFM takes advantage of this, ensuring calculations can be smoothly and efficiently distributed across large compute grids, with some clients running many thousands of cores regularly. The topology allows IT-compliant configurations where the nodes aren't laden with resource-hungry security and scanning software. The proven grid-management technology ensures the environment is robust, and hardware can be shared between jobs, and with other applications.

Further, it allows use of more complex configurations, integrating multiple data centres, DR sites, cloud environments, and even desktop scavenging. Our clients can get the most out of their hybrid environment configurations.

Using HPC grids allows sharing of the precious resources between applications when needed, without prejudicing business critical activities. Further HPC is more efficient and reliable than using peer-to-peer distributed desktop computers.

Microsoft HPC Azure

To ensure cost-effective use of cloud environments, RAFM adapts its integration with HPC to allow cloud-computing to be used in the elastic manner it was intended. Cloud environments deliver the best savings when turned on and off as required. Data is intelligently packaged and transferred to start the calculations and return the nodes for shut-down as quickly as possible. Further the licensing model is based on cloud-based license servers, allowing users to increase their consumption and reduce the run-times for the same costs.

Figure 4. **Isolated Network Topology**

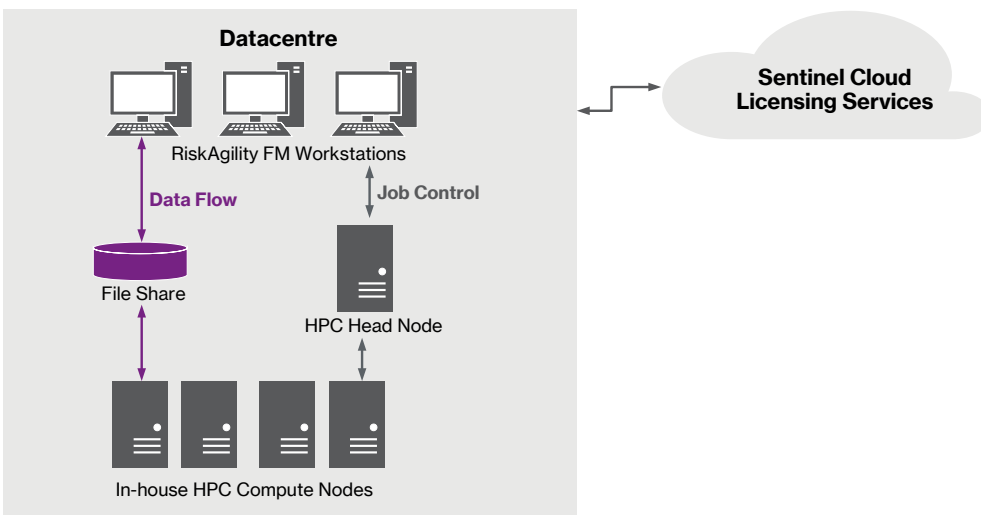
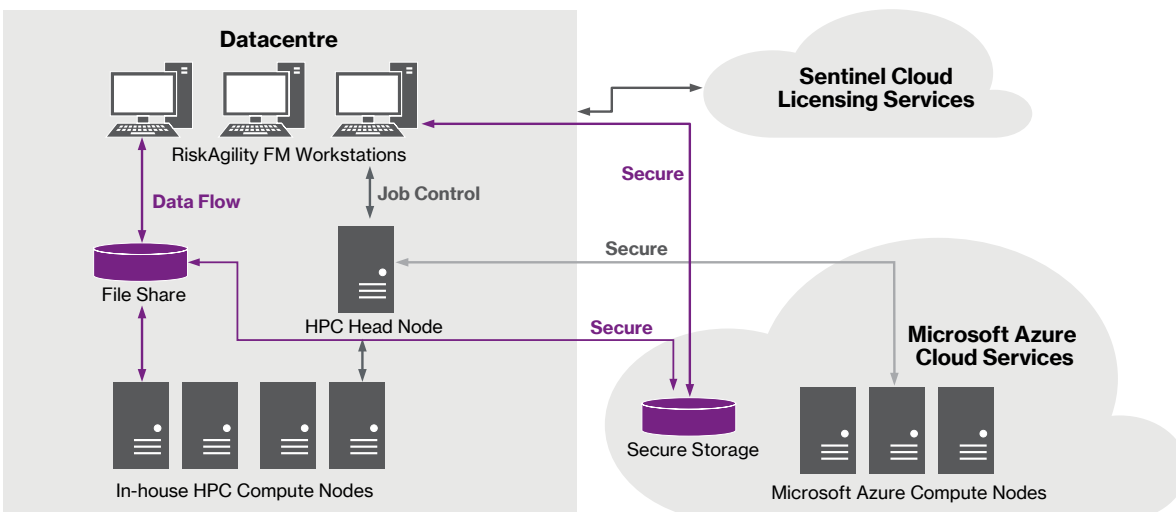


Figure 5. **HPC+Azure Topology**



vGrid Compute as a Service

Automating and managing large compute environments can be a headache for any IT department, with often inconvenient outages as the multiple tenants need to coordinate time for upgrades. The new dynamics of cloud computing, combined with the technical innovation of RAFM, allows Willis Towers Watson to provide a highly-available “compute as a service” offering. With minimal local IT management needed, and costs attractive to both the smallest and largest clients, those using every day or bursting in exceptional circumstances and those looking only for Disaster Recovery options, vGrid is a tempting alternative.



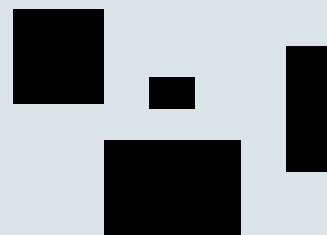
Whether you're looking to achieve the most from your current hardware, scale into public cloud to cope with the peaks and troughs of modern regulatory reporting, or even break away from the constraints of your IT provider, RiskAgility FM offers attractive alternatives.

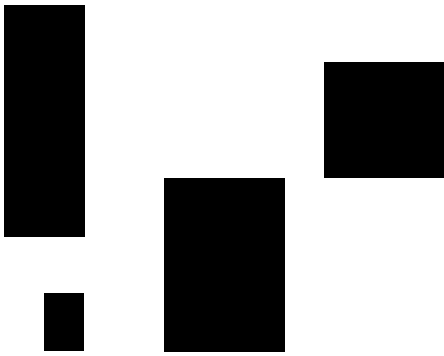


RiskAgility Financial Modeller and Solutions for Life

RiskAgility Financial Modeller (RiskAgility FM) is part of our Solutions for Life portfolio of integrated software, technology and consulting services – a holistic solution to managing the end-to-end risk modelling process.

For more information on Solutions for Life, visit:
www.willistowerswatson.com/solutions-for-life





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