



### Fast Facts

**Company:** Merrill Lynch  
**Web Site:** www.ml.com  
**Number of Employees:** 60,000  
**Country or Region:** Global  
**Industry:** Financial Services

### Company Profile

Merrill Lynch is one of the world's leading wealth management, capital markets and advisory companies, with offices in 40 countries and territories and total client assets of approximately \$1.6 trillion.

### Software and Services

- Windows Server 2008
- Visual Studio 2008
- SQL Server 2008

### Hardware

HP Proliant DL580 G2

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[www.microsoft.com/casestudies](http://www.microsoft.com/casestudies)

## Merrill Lynch uses Microsoft as a platform for innovation

“We have seen two key benefits to date. The first is that when new projects come along we have been able to provision their development much faster. And the second is that we are able to get at data more quickly.”

Mark Greville, Architect for the Merrill Lynch RDI Centre

The Merrill Lynch Research, Development and Innovation (RDI) Centre is located at the firm's Central Park campus in Dublin, Ireland. This centre of excellence serves the needs of one of the world's leading wealth management, capital markets and advisory companies. With offices in 40 countries and client assets of almost \$2 trillion, Merrill Lynch uses the RDI Centre to enhance processes and develop innovative IT projects on behalf of the firm globally.

### Situation

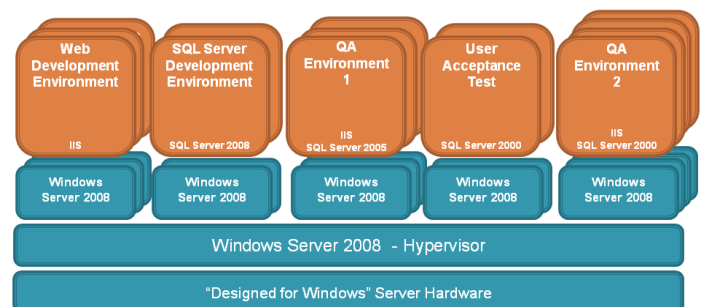
The RDI Centre is the first of its kind for Merrill Lynch. This €30 million investment assists the firm in targeting new applications and enhancing procedures associated with the procurement, set-up and deployment of IT solutions. The business demands that innovation, coupled with speed, accuracy and agility are core attributes of the RDI Centre's work on mission-critical development projects.

Some of these undertakings require several server configurations to be running at the

same time with the various development and test environments isolated from each other. The maintenance of dynamic environments has the potential to be a costly and time consuming activity. For example, because of the lengthy testing associated with the financial sector, an upgrade from software running on IIS 5.0 and .NET 1.1 to IIS 6.0 and .NET 3.0 would require the maintenance of full development, QA, User Testing and Production environments for both the old and new environments.

Furthermore, creating and testing on the in-between permutations of server versions and

### Merrill Lynch RDI - HyperV Architecture



.NET framework may also be required to isolate the cause of a particular issue during test.





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“There is a traditional view about the provisioning of hardware that doesn’t work in a fast moving and agile innovation process,” explained Mark Greville, Lead Architect for the RDI Centre, “so we began to look at virtualisation to help us provision things more effectively.”

The advent of virtualisation technologies has been a huge boon for development and testing environments. Using virtual machines, development teams can create and test a wide variety of scenarios in a safe, self-contained environment that accurately approximates the operation of physical servers and clients. A single platform can host machine configurations that can be built and taken down in hours rather than days.

### Solution

As a significant user of Microsoft technologies, the RDI Centre inevitably found itself weighing up the merits of Windows Server 2008. For the RDI Centre a key selling point was Hyper-V, the virtualisation feature. Hypervisor-based server virtualisation technology makes it possible to run multiple different operating systems - Windows, Linux, and others - in parallel, on a single server, and fully leverages the power of 64-bit computing. It maximises the utilisation of test hardware by reducing costs, improving life cycle management and improving test coverage.

Combined with Microsoft’s other next-generation infrastructure and application platform products - Microsoft Visual Studio 2008 and Microsoft SQL Server 2008 - developers and IT professionals can benefit from a rich and agile development environment.

Visual Studio 2008 is the latest version of Microsoft’s IDE (Integrated Development Environment), a comprehensive set of tools for rapid application development. Some development teams at the RDI Centre are in the process of moving to Visual Studio 2008 from Visual Studio 2005. Similarly to the way in which virtualisation allows Merrill Lynch to run several different runtime environments on a single server, Visual Studio 2008 allows Merrill Lynch developers to develop several different .NET environments from a single toolset. Developers can now target .NET 2.0, NET 3.0 or .NET 3.5 with the new multi-framework targeting feature.

Another .NET platform capability supported out of the box by Visual Studio 2008 is Windows Communication Foundation (WCF), which is used in one of Merrill’s projects in particular. In the context of a large firm like Merrill Lynch with a considerable variety of data and data sources, WCF allows the development of Services which are consumable by other .NET applications, SOA based systems and any caller using the WS\* standards.



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Originally the WCF based project was developed in Visual Studio 2005 (with the WCF support add-on). Migrating the project to Visual Studio 2008, which has WCF support out of the box, was straightforward. "Moving the WCF project was a simple case of installing Visual Studio 2008 and opening the project," said Greville.

Another product that can be used as part of a more versatile environment is Microsoft SQL Server 2008. The latest iteration of the Microsoft data platform enables developers to be more productive, and create new and robust database solutions more easily.

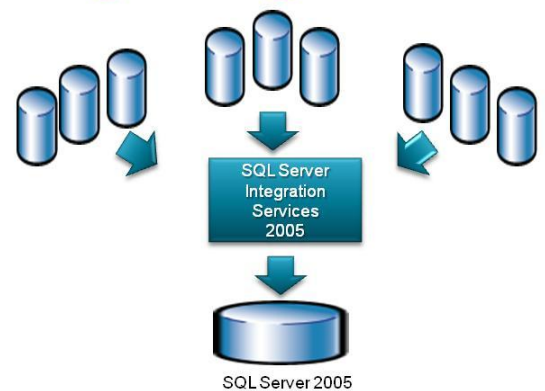
Cormac Keogh, Architect, at Microsoft Ireland, stressed the significance of having a product suite: "Because it all comes from a single vendor it means we are able to offer an end-to-end portfolio where the products are built to connect with each other. With other developer platforms and tools there are a lot more integration challenges."

### Benefits

The RDI Centre leverages Windows Server 2008's virtualisation capabilities to initiate new development projects. It provides many different development, test and pre-production environments from a single high-end server, allowing Greville and his team to focus on development work that drives the business, removing layers of administration around buying and setting up new hardware.

Processes around ordering, racking and

### Merrill Lynch RDI Margin Management ETL



configuring a server for use in a development project can now be completed in less than four hours. By having virtual machines with the main application building blocks pre-installed and configured, the only install required to get an environment deployed and ready for purpose is the software for the specific project requirements.

Mark Greville anticipates benefits from Microsoft SQL Server 2008, based on his experience with the product roadmap since SQL Server 2000. For an application project around the Merrill Lynch's margin management he recently moved over to SQL Server 2005, taking multiple feeds from different sources within the organisation that ranged from client profiles to economic and trade data.



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The ETL (Extraction, Transformation and Load) process for this application had previously been written in Java and took 40 minutes to execute. Using SQL Server 2005 Integration Services it has been reduced to 6 minutes. “In a fast moving industry getting data as early as possible is paramount,” said Greville.

New features in Windows Server 2008 means that full disk encryption - where every bit of data is encrypted - is inherent in the operating system and integral when new applications are rolled out. This removes another headache for the developers. Similarly, SQL Server 2008 facilitates encryption to an entire database, data files, and log files, without the need for application changes.

For a large enterprise operating on a 24/7 basis around multiple and disparate data sources, Visual Studio 2008 will also play an important role in allowing the development of web services which are consumable by other .NET applications and SOA based systems. Mark Greville is particularly interested in exploring how Visual Studio 2008 can help deliver mission critical applications to mobile devices.

### Summary

The objective of the Microsoft virtualisation project was to give the RDI Centre greater agility and the ability to meet the demands of the heterogeneous environments found in Merrill Lynch offices around the world. It has been successful, with increased time and money savings expected in the future.

“We have seen two key benefits to date,” said Greville. “The first is that when new projects come along we have been able to provision their development much faster. And the second is that we are able to get at data more quickly.”

This means that the RDI Centre can focus more resources on new innovations to increase revenue and further reduce costs across Merrill Lynch. Going forward, the virtualisation features of Windows Server 2008 will also enable the RDI Centre to get a taste of things to come, installing early versions of a new technology in a sandbox environment where they can be safely evaluated.