

Firestorm – using Grid technology to save time and money for data audit and testing processes

Welsh e-Science Centre Grid expertise has enabled Firestorm, a powerful application for audit and testing experts, to keep pace with ever growing data growth rates. By taking a Grid network approach, Firestorm, from Informavores, can now tackle more complex queries involving separate databases in shorter timescales.

The Audit World

Data audit is a costly and time-consuming business. Complex software tools are available to automate the process, but choosing the right one to suit a particular area of business, or to integrate with existing systems, is complex. Much repetitive and painstaking audit work is still carried out 'by hand', by skilled auditors.

Many staff can spend days checking data records, from different databases in a variety of formats, line by line (or more often taking a small sample of data and making assumptions about the rest). Such audits are costly for clients while the margins are low for auditing firms. Also there is increasing pressure from the authorities to improve the quality of their audits, with recent scandals bringing the profession under intense scrutiny.

Automating audits should make the process more consistent, less prone to human error and more cost effective for all concerned. Key issues are:

- replicating the specialist knowledge of the auditor and applying the knowledge intelligently
- keeping software up-to-date with constantly-changing legislation
- analysing large volumes of data from diverse databases
- keeping audit trails of all decisions and corrections

The Data Deluge

Companies are being increasingly challenged by explosive data growth rates. Every 18 months the processing capacity of the world doubles, but at the same time data has been doubling every nine months. A company's total data may be held in a number of different formats and stored in many different locations. Organisations need next-generation approaches to manage such data and extract the necessary information in a timely and cost effective manner. This is where Firestorm and Grid technology come in..

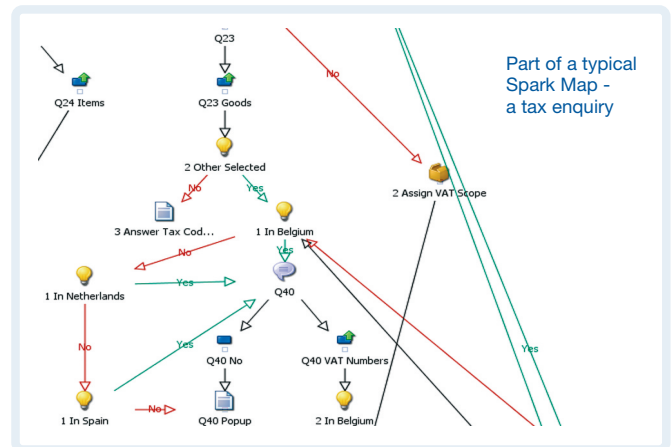
Using business rules for data auditing

Cardiff-based company Informavores has launched Firestorm, a software tool which tackles these issues head on. Firestorm enables auditors

to directly create and deploy sophisticated software applications - Sparks - which analyse, audit and correct large volumes of



data from diverse databases. An auditor simply maps his or her knowledge, the steps they take to perform an audit - as a flow diagram. The flow diagram, or Spark Map which is a series of rules and logical operations, can include formulae, data look-ups, calculations, embedded logic and dynamically-generated documents



The Spark Map automatically generates a powerful application for batch processing large numbers of data records which may be kept in a variety of databases. It rapidly tests existing data according to the rules mapped out in the flow diagram. Erroneous records can be corrected, while keeping a complete audit trail of all 'decisions' made to perform corrections.



Grid technology allows people in research and commercial organisations, when they have a need, to use their local computers to draw upon resources of computers from anywhere in the world via a network or 'Grid'. This can be spare number crunching ability, databases, analytical tools and services, and specialist instruments in a variety of combinations. It enables collaborative working, wherever people or resources are located geographically.

The Grid approach is already being employed on a global scale for academic research to produce results from experimental data in areas such as particle physics, environmental science, bio-science and engineering. Grid computing enables such data to be processed more quickly by utilizing many different computers made available via a



networked Grid. Welsh e-Science Centre, (WeSC) the Grid computing research centre for Wales based at the School of Computer Science, Cardiff University has, sponsored by Welsh Assembly Government, created a Grid for Wales Test Bed.

WeSC specialists are helping Welsh technology companies to develop and test their products in a Grid computing environment.

Grid-enabling Firestorm

Publishing a Spark Map automatically produces a rules engine (or Spark) which can be applied to databases.

For complex audit work flows with many decision points (e.g. tax calculations) on very large collections of diverse and distributed data, processing may take hours or even days.

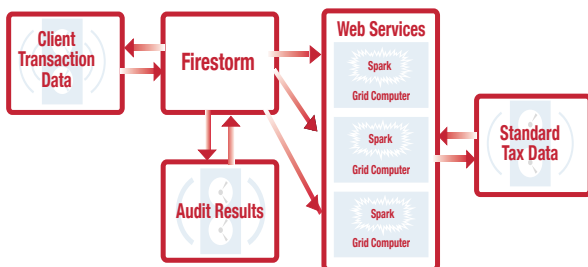
Grid computing enables such data to be processed more quickly by utilizing a number of different computers made available via a networked Grid.

WeSC Grid technology specialist Jon Giddy has been working with co-founder of Informavores, Steve Wood, to Grid-enable Firestorm so that it will control a number of instances of Spark running on a number of computers in a Grid network.

The Sparks apply the rules to each record in a database, referring to other databases where necessary and by running on separate computers to speed up the total time it takes to perform the audit.

Steve Wood says "Firestorm is a leap forward for our core technology. Using Firestorm, subject matter expertise can be rapidly propagated across a Grid, made to carry out work on data and the results of this work collected and collated - all without constantly installing software across the grid. It's safe, standards based, fast - and most importantly - easy to use for non-technical people. Firestorm uses our patent pending 'Insertion' technology to create complex web services using web services - we think it rocks."

The Grid Approach to Firestorm



Using Firestorm to carry out tax calculations for a clients purchases

A company providing audit services is asked by a client to perform a tax inquiry for each of the client's purchase transactions and write the result back to the transaction database. The auditor creates a Spark

Map defining the rules for the inquiry which can include references to standard tax data, maintained by the audit service. Firestorm publishes a number of instances of this Spark Map as rules engines or Sparks in the form of web services on a number of computers in a Grid network.

When all is ready, Firestorm fetches each transaction record from the client database and allocates it to an available Spark. The Spark performs the query, referring to the appropriate tax data, as applicable to that transaction. The result is returned to Firestorm which writes it back to the appropriate record in the client employee database and records the audit result.

By running Sparks in parallel the overall time it takes for such an audit has been reduced by up to X%.

The client data is located with the client. The audit service maintains and applies the rules. Sparks and details they need to refer to are held and maintained separately, e.g. Tax Rules, which change regularly, removing the need for multiple updates when changes occur. Firestorm keeps audit results separately.

From a service point of view, the audit company can focus on providing a flexible, responsive audit service for their clients, while allowing a company such as Informavores to provide web services necessary to run multiple Sparks.

Firestorm and Grid

- A Grid approach for Firestorm has shown that overall time for complex audits can be reduced by up to X%.
- Ownership and management of data can be streamlined. Client data sits with the client and audit rules and fundamental reference data such as tax rules are held and maintained more easily by the audit service.
- A more service oriented approach is offered which allows Firestorm customers to be able to provide a more responsive and flexible service to their clients.
Informavores may offer web services to their customers to process their clients' data to complement the Firestorm product.

Grid for Wales

- Grid technology allows people to use their local computers to draw upon resources of computers from anywhere in the world via a network or 'Grid'.
- WeSC was set up in 2001 with funding from the Department of Trade and Industry, Engineering and Physical Sciences Research Council, the former Welsh Development Agency and Cardiff University.
- WeSC retains over 40 experts with strong links to global players and is engaged in many collaborative projects.
- With help from the Welsh Assembly Government, a Grid for Wales Test Bed has been created, helping Welsh technology companies to develop and test their products in a Grid computing environment.



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



If you would like to find out more about e-Science, Grid Computing and work going on in Wales you may visit the Welsh e-Science Centre web site at <http://www.wesc.ac.uk>

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