customers. Often, banks may purchase lists and acquire external data to improve their models. This data, although useful, can be expensive to acquire and will require additional resources for cleansing, integration and analysis.

Because acquiring new customers is more expensive than keeping existing ones, and because customer bases are under constant attack from competitors, customer retention is a key issue. Banks must be able to predict which customers are likely to leave, what incentives would urge them to stay and when to stop investing in an unprofitable customer. As well, banks are trying to expand existing customer relationships and create cross-sell or upsell opportunities without further driving attrition.

To be successful, then, banks must understand and predict customer needs by combining products and services and applying them consistently through appropriate distribution.
IBM has created an integrated grid-based technology and service offering that can enhance a bank’s competitiveness by accelerating customer insight applications. A grid-enabled infrastructure reduces the cycle time for executing statistical models, leading to more sophisticated analyses and increased accuracy of customer acquisition, retention, cross-sell and upsell by enabling a larger number of modeling iterations in a shorter timeframe.

IBM Grid Offering for Analytics Acceleration: Customer Insight in Banking

The IBM Grid Offering for Analytics Acceleration provides an efficient, scalable and standards-based solution to the most pressing issues facing banks today. IBM, working with key partner SAS, the first enterprise business intelligence vendor to join the Global Grid Forum, built a new grid offering for customer insight in the banking industry. The SAS® Credit Scoring application, part of SAS Banking Intelligence Solutions, showed that complex credit scoring applications can be grid-enabled.

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The IBM offering provides a cost-effective model for acquiring, deploying and managing resources. Because the existing infrastructure that supports customer insight does not need to be replaced, firms can leverage their existing capital investments, optimizing the efficiency of their customer insight business and applications while migrating to a...
higher performance, lower cost, standards-based infrastructure. In addition, this grid infrastructure can be used for compliance, fraud detection and other risk management functions.

The IBM Grid Offering for Analytics Acceleration allows businesses to run their existing analytics software, whether custom-built management systems, best-of-breed commercial applications or a combination thereof. The offering’s open, flexible infrastructure supports a wide range of packaged and custom analytical applications, including SAS application software.

The IBM offering centers around grid computing, an architectural approach that enables distributed computing over the Internet, an intranet, a virtual private network or some combination thereof. This approach can help aggregate disparate IT elements such as compute resources, data storage and filing systems to create a single, unified system and to address fluctuating workload requirements.

As required by an opportunity manager’s analyses, the grid makes additional compute capacity available on a full-time or part-time basis. It helps banks leverage available, under-utilized compute capacity within their existing IT infrastructures, thus helping them to reach end results far more rapidly than within conventional computer environments. Compared to a non-grid solution, the required compute resources are fewer and easier to manage—contributing to reduced total cost of ownership (TCO). The IBM offering also provides a level of resilience to help guarantee workload execution.

**Use case: gaining a competitive edge through target modeling**

IBM and SAS developed a means to extend the value of the SAS Credit Scoring application to the grid environment, as demonstrated in a real-world scenario involving a financial services institution that offers a full range of banking products and services to its member customers, including wireless and Internet banking, loans, credit card services and savings and investment services. Having already acquired more than 70 percent of its established market in its geographic area, the institution wanted to expand its membership charter to the larger community. However, to compete effectively in this new market space, the financial services institution needed to understand how to attract new prospective members and tailor profitable products to meet their needs.
IBM first assessed the business processes, available customer information and IT infrastructure of the financial services institution. The results of the assessment determined that the financial services institution had a wealth of information about its current customer base, but needed to acquire additional customer information from a third party. The institution needed to organize this data so that it could be accessed using business intelligence tools that generate target modeling applications. IBM further determined that running the target modeling applications in a grid environment would give the financial institution a greater degree of flexibility for fine-tuning the models, because it would be able to run these models on demand.

The institution’s customer insight application was enabled to leverage computational services by using the DataSynapse GridServer™ application programming interface (API) to connect and parallelize application service requests to scale effectively when distributed across an available infrastructure. The solution implemented the policy-driven management functions of GridServer to handle application workload servicing, resiliency and service provisioning. The grid infrastructure used UNIX® systems—Sun Solaris and IBM AIX®-based servers—along with the Microsoft® Windows® operating system, Linux-based IBM @server™ BladeCenter™ servers and Linux-based workstations to satisfy the performance, scalability and systems management integration requirements.

IBM @server BladeCenter was integrated with the grid by GridServer to create an on demand, dynamic provisioning capability that could assure the right resources were available at the right time to meet the runtime servicing requirements of the risk applications. In addition, the IBM WebSphere® Application Server was integrated with GridServer and Avaki Data Grid to provide portals for grid users. These portals were developed using the WebSphere Studio Application Developer tools.

**Improved productivity and efficiency through a multistage implementation**

Banks can take their existing virtual pool of compute resources for customer insight and gradually grow it into an integrated, highly efficient grid system. As shown in Figure 1, an existing customer insight infrastructure may comprise disparate islands
Before Applying Grid Analytics

Figure 1. Customer insight infrastructure before applying the grid
of statisticians, administrators and heterogeneous compute and storage resources, along with various versions of a customer insight application. Additionally, users (subscribers) cannot monitor the progress of a statistician’s analyses.

Using its existing infrastructure, a bank deploying the SAS Credit Scoring application can utilize integrated SAS technology to parallelize the application across heterogeneous computers and data. The result is a SAS application that runs significantly faster by distributing the workload across the compute and storage resources supporting that application.

By adding middleware from DataSynapse and Avaki (Figure 2), a grid is created by joining disparate application installations, heterogeneous computers and data (Figure 3). Statisticians can access these resources through a single, common interface. In addition, a single administrator can manage the grid through an administrative portal. All subscribers can access the grid to view their results and actively participate in the development of the information product, leading to a tighter interaction with the business process. Finally, based on established priorities and rules, a shared pool of resources can be provisioned when needed to handle the peak requirements of the combined group. The run time for the application can be dramatically improved in a linear fashion.

The bank can then apply the same process with another application, for example, a simulation application for customer value modeling. Over time, all applications can become completely grid-enabled; all compute and storage resources across the enterprise pool become one large resource pool for the applications.

IBM services to support grid computing

IBM Global Services provides world-class, worldwide support for all elements of the grid architecture—servers, storage, operating systems, middleware and networks—with a full range of grid-related services. As a first step toward grid implementation, IBM Global Services offers assessment services that help identify whether an application qualifies for grid enablement. An assessment will look at historical resource consumption by identified applications, the application architecture and the supporting infrastructure platform. In addition, the IBM grid valuation tool,
Figure 2. Adding grid middleware to virtualize resources
The end solution: consolidated heterogeneous environment with central grid administration and easier access to data and pool of resources.

**Figure 3.** Customer insight infrastructure after applying the grid
IBM Grid At Work, can perform a high-level cost-benefit analysis on the migration to a grid computing platform.

If a grid infrastructure is warranted, IBM Global Services creates a comprehensive implementation plan, which includes architectures and designs for application enablement, data modeling, grid middleware, infrastructure and management tools, grid management process and support-organization skill requirements. IBM Global Services, working with IBM Business Partners, then tests and installs the various components of the grid system, including a portal, grid middleware, scheduler and security. In addition, IBM Global Services will enable existing hardware and aid in skills transfer.

**Technologies powering the grid**

The workhorses of the IBM analytics acceleration grid infrastructure are the grid engines—desktop PCs or servers that run the UNIX, Microsoft Windows or Linux operating systems. These compute resources execute various jobs submitted to the grid, and have access to a shared set of storage devices.

To accelerate an application, the compute and storage resources supporting that application must be virtualized. For SAS applications, SAS technology exploits the power of many computers in a network to solve problems requiring a large number of processing cycles and involving huge volumes of data. Grid middleware provides dynamic, policy-based scheduling so that applications can run much more efficiently across the grid, drawing idle capacity from the virtualized resources. Centralized scheduling also improves the application’s resiliency; in case of machine failure, the grid simply moves a job from one server to another.

The IBM Grid Offering for Analytics Acceleration can include SAS technology and relies on grid middleware from DataSynapse and Avaki to create distributed sets of virtualized resources. SAS is a market leader in providing a new generation of business intelligence software and services that create true enterprise intelligence. This project builds on a quarter century of successful SAS and IBM collaborations.
Grid Computing

The production-proven, award-winning DataSynapse GridServer application infrastructure platform extends applications in real time to operate in a distributed computing environment across a virtual pool of underutilized compute resources. GridServer application interface modules allow customer insight applications and next-generation development of customer insight application platforms to be grid-enabled.

For the virtualization and integration of distributed data, the IBM Grid Offering incorporates the Avaki Data Grid information integration software. This application enables fast, easy and secure access to structured and unstructured data across departments, locations and companies. The software also lets users and customer insight applications access data directly from distributed production sources, transparently and in real time.

IBM as a leader in grid computing
IBM is committed to open standards and is working with The Globus Alliance open source development community, the Global Grid Forum and the Interoperable Informatics Infrastructure Consortium (I3C) to promote the adoption of open standards and accelerate the availability of grid technology.

IBM is a strong supporter of The Globus Alliance, a multi-institutional research and development effort to address the technical and business challenges of grid computing. Founded by a team of technicians and researchers, The Globus Alliance has defined an open source grid reference architecture and a set of tools to assist grid deployment.

IBM Design Centers use the latest grid technologies, including the Open Grid Services Architecture (OGSA), which merges the open protocols used for grid computing with the protocols used for Web services. IBM Design Centers provide access to the latest software from leading grid software companies, such as DataSynapse and Avaki, and the latest open source grid technologies from The Globus Alliance.

A strong foundation for successful customer insight
IBM is the industry-leading supplier of grid solutions, services and expertise to the scientific and technical communities, as well as to the financial services sector. IBM Grid Computing is
currently engaged with more than 20 major financial institutions in North America, Europe and Japan, and more than 100 organizations worldwide. Leveraging its considerable experience in implementing commercial grids worldwide, IBM has created the IBM Grid Offering for Analytics Acceleration: Customer Insight in Banking to meet the unique grid computing needs of the banking industry.

In an ongoing effort to support the establishment of open standards, IBM is designing its systems to participate in grid computing. Leveraging the breadth and depth of the company's wide array of products and services—as well as its multiplatform expertise—IBM is taking an integrated and comprehensive approach to this new computing paradigm.

Years of experience and solid expertise enable IBM Global Services to help banks adapt grid computing to serve their unique business environments. IBM Global Services has trained grid computing technology experts in the Americas, Asia Pacific and Europe, allowing companies worldwide to take advantage of a comprehensive range of IBM assessment, design, implementation, optimization and support services.

In addition, IBM has established strong working relationships with leading-edge partners, including SAS, Avaki and DataSynapse. Thanks to these relationships, IBM can provide banks with a full set of tools and capabilities to enable a grid solution.

Backed by IBM, companies worldwide are discovering how grid computing enables them to capture customer loyalty and value and to generate sustainable competitive advantage in financial services.
For more information
To learn more about grid computing for analytics acceleration in banking, contact your IBM representative or IBM Business Partner, or visit ibm.com/grid.