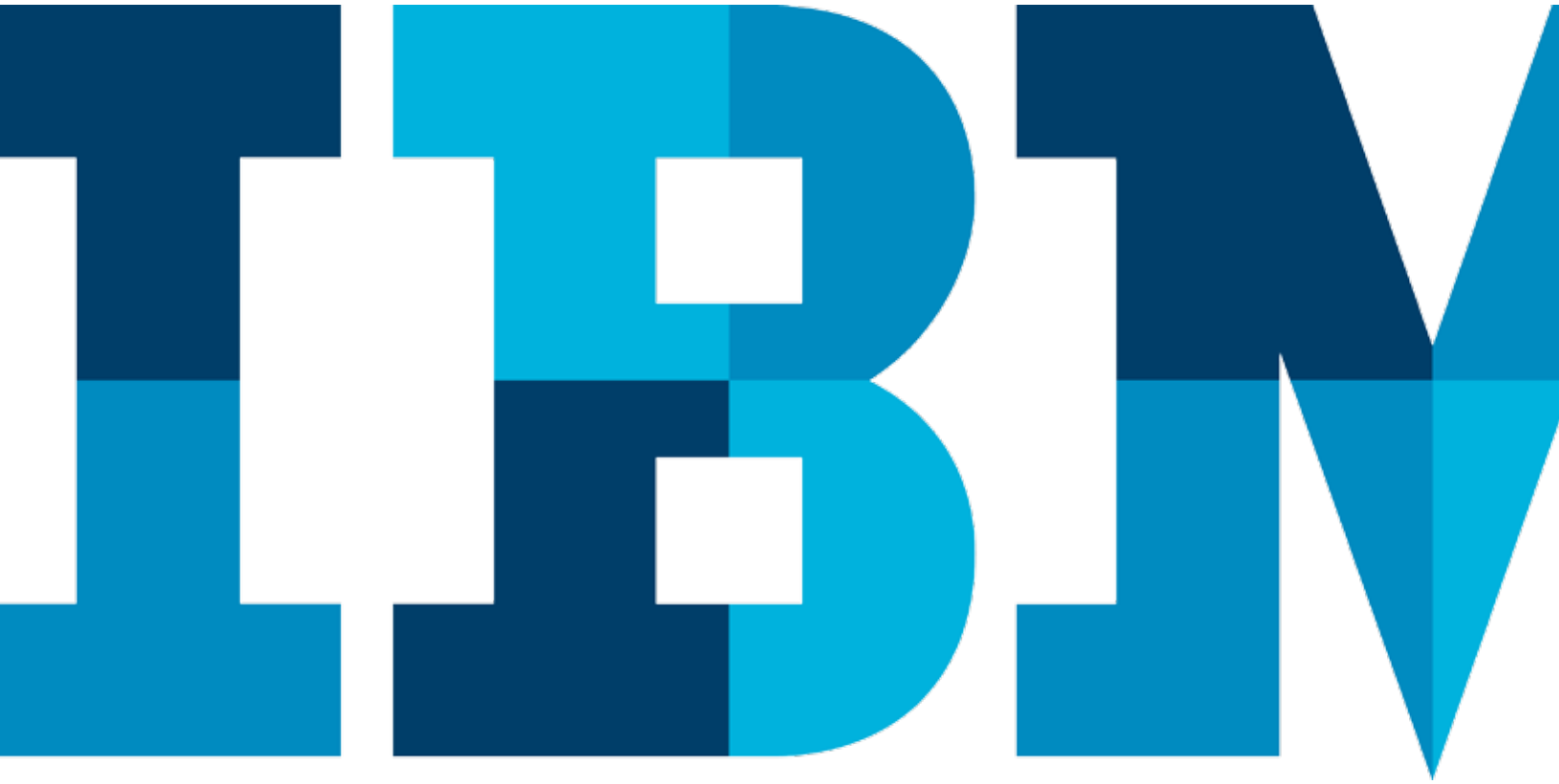
IBM DB2 Analytics Accelerator for z/OS, V 2.1

Timely, accurate and highly secure access to business information, powered by IBM Netezza technology



Since the early days of data warehousing, the common statement from every vendor and pundit was that decision systems and transactional systems were vastly different and required separate platforms. Those days are over!

With the wealth of data available today, organizations are no longer willing to relegate information to the back office. Instead, they are demanding access to customer purchase histories, customer behaviors, and trends of product sales at the time of contact or time of sale. This creates new challenges, because it is not enough for an enterprise to capture massive amounts of data; it must also sift through the data, extract information and transform it into actionable knowledge. And this must be done quickly, while the information is still relevant and actionable.

Data transformed into intelligence gives you more than a window into your current operations. It provides a likely view of what is just around the corner as well as further down the road. It enables leaders to view—with confidence—what has happened, is happening and might happen to every aspect of the enterprise. Spotting the key patterns, extracting critical insights from data, and taking latency and cost out of making and implementing the right decision defines companies that are industry leaders—and laggards.

The world we live in is increasingly instrumented, interconnected and intelligent. We are experiencing a revolution, and information is at the heart of it. Businesses are taking full advantage of this new wealth of data by extracting information to make timely, fact-based decisions. They are managing large volumes of information as it arrives, incorporating analytics and predictive modeling, collecting and sharing information across the entire value chain and speeding time to value by delivering trusted, accurate and timely information to the right decision makers.

However, a company's survival may depend on the age of the data used to obtain an answer to critical business questions. With slow sales cycles, cutbacks, reluctant clients and intense competition, business leaders are feeling the heat to act and act fast—but a single bad decision can be fatal.

The key to working smarter is having the right information and insight at the right time to drive smarter business outcomes. Working smarter means your front-line business leaders know where to find new revenue opportunities and which product or service offerings are most likely to address the market requirements. It means business analysts can quickly access the right data points to evaluate key performance and revenue indicators to build successful corporate growth strategies. And it means corporate risk and compliance units can recognize regulatory, reputation and operational risks before they become realities.

The IBM® DB2® Analytics Accelerator gives your organization the speed to create the insights it needs to work smarter. It puts the right answers in the hands of your decision makers today—and puts your business in the best position to answer the questions of tomorrow.

IBM DB2 Analytics Accelerator: Speed analytics delivery

A high-performance analytics accelerator appliance for IBM System z®, the DB2 Analytics Accelerator is designed to deliver dramatically faster complex business analysis transparently to all users.

Customers see immediate value through this easy-to-deploy appliance. It enables "train of thought" analysis, where people are no longer constrained by the speed of the system. It transparently accelerates the most complex analyses from a wide variety of applications and tools such as IBM Cognos® 10, and it opens opportunities for new approaches and new applications, enabling organizations to become information-led. The DB2 Analytics Accelerator speeds delivery of business-changing analytics to decision makers in an environment of industry-leading security and availability, taking the risk out of operational business analytics.

Superior performance, availability and scalability

The DB2 Analytics Accelerator is a workload-optimized appliance add-on that enables companies to integrate business insights into operational processes to drive winning strategies. It combines the System z quality of service and IBM Netezza® hardware-accelerated analytics, enabling it to speed up complex queries and deliver unprecedented response times in a highly secure and available environment (see Figure 1).

Rapid deployment and expansion

The solution is uniquely designed with new breakthrough technologies to reroute queries typically found in business intelligence (BI) and data warehousing applications from the System z environment to a workload-optimized platform. The DB2 Analytics Accelerator plugs into your IBM DB2 for z/OS® environment, complementing its traditional query processing. It extends the standard IBM BladeCenter® server with several hardware and software extensions, interfacing directly with DB2 to enable deeply embedded capabilities behind the application layer and providing full transparency to applications that submit queries to DB2 for z/OS. The DB2 Analytics Accelerator can speed up a substantial percentage of queries and make dramatic improvements in cost and performance, all transparently to the end user or applications.

The accelerator is fast and easy to deploy, and it can be easily activated and deactivated with the setting or clearing of a software switch.

Figure 1: The DB2 Analytics Accelerator leverages the strengths of System z and IBM Netezza hardware-accelerated analytics to speed complex query processing.

The forgotten query

Most organizations struggle with complex, long-running queries that become the bane of database administrators. They have invested hours, even days tuning, adding additional indices, hints or materialized query tables (MQTs) only to decide that the query cannot be run within reasonable resources and remove it from the system. The DB2 Analytics Accelerator enables processing of these complex, long-running queries without requiring additional tuning or System z resources—increasing time to value while decreasing resource requirements.

Reduced cost and complexity

Because users and applications see only a DB2 for z/OS interface, they continue to use their existing skills and applications without requiring the type of conversion or retraining normally attributed to deploying new technologies. The DB2 Analytics Accelerator requires no indices and no index maintenance. It accelerates workloads in a DB2 for z/OS environment with high-performance data warehouse query processing software and hardware that leverages streaming hardware technology. It is optimized to provide fast response times for typical data warehouse or OLAP-specific workloads, such as aggregations or large data scans.

IBM DB2 Analytics Accelerator: Business benefits

Extreme performance for complex business analysis

- Rapidly delivers analytic information to decision makers through breakthrough technologies
- Enables decision makers to perform previously unavailable business analysis processes to highlight trends, predict outcomes and produce better business results

Database performance appliance

- Supports fast deployment at low cost and delivers value quickly with application transparency
- Eliminates the need to change applications—just install and begin reaping the benefits of high performance
- Substantially reduces operational costs by removing the need for complex query tuning
- Drives immediate value to the bottom line by facilitating the rapid addition of new applications and/or user requirements
- Helps reduce costs by leveraging the price/performance of multiple system technologies and combining them into an integrated and optimized solution

Proven operational characteristics

- Capitalizes on the System z quality of service in security and availability, enabling operational BI to deliver business-changing analytics
- Helps reduce complexity by extending System z manageability across the entire system
- Leverages the experience gained from high-performance computing, grid, IBM DEEP BLUE®, IBM Blue Gene® and many other IBM technologies and solutions

A deeper look inside

The DB2 Analytics Accelerator is optimized for data warehouse–type querying. Its efficient, hardware-accelerated query engine is designed to stream data to achieve maximum speed.

The DB2 Analytics Accelerator uses copies of the DB2 for z/OS database tables that are stored in the accelerator. This provides the best of both worlds: legendary DB2 for z/OS performance for transactional queries and industry-leading IBM Netezza performance for analytical queries. Queries are performed by the IBM Netezza Asymmetric Massively Parallel Processing (AMPP) engine, a unique architecture that uses special-purpose hardware accelerators to decompress and filter data for relevance to the query before it is loaded into memory and given to the processor for aggregation. The result: elimination of the I/O wait time and processing overhead that normally result in query bottlenecks. This new approach also removes the need for tuning and cuts down the time required to design and maintain the indexes and materialized views and to collect statistics whenever the data changes.

Breakthrough technology: Hardware acceleration

Each node (blade) in the DB2 Analytics Accelerator is an independent server containing multi-core CPUs. Each CPU core is teamed with its dedicated storage drive, gigabytes of random access memory and a hardware accelerator with a multiengine field-programmable gate array (FPGA). These FPGAs are used for data decompression, data filtering and early SQL projections and restriction. The nodes are configured in a shared-nothing environment, which means each of the CPUs has its own memory, and has no need to communicate with other nodes for record locking and lock resolution.

IBM DB2 Analytics Accelerator: Technical highlights

Extreme performance for complex business analysis

- Exploits hardware accelerators (a multiengine FPGA) to deliver unprecedented query speed
- Marries the best of System z with IBM Netezza technologies
- Utilizes zone maps on data parcels to reduce I/O on compressed data

Database performance appliance

- Enables faster time to value through easy-to-deploy, scalable appliance format
- Delivers unprecedented response times to enable "train of thought" analyses
- Plugs into an existing DB2 for z/OS environment to dramatically improve query processing
- Provides transparency to applications that submit queries to DB2 for z/OS, without requiring application changes

Proven operational characteristics

- Extends System z manageability, security and availability to BI and data warehouse workloads
- Uses DB2 for z/OS to maintain data, taking advantage of its industry-leading capabilities in continuous availability and scalability through IBM Parallel Sysplex® and DataSharing technologies

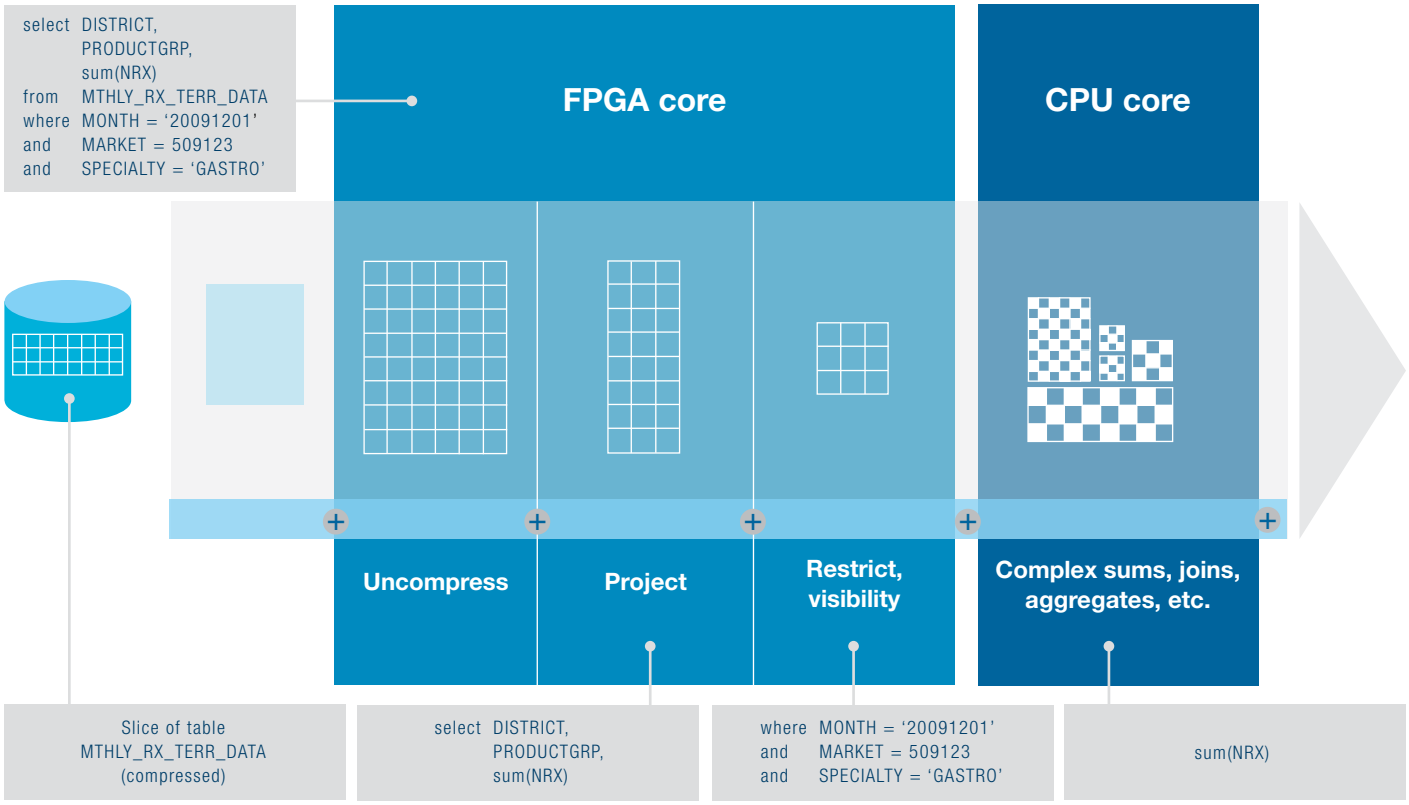


Figure 2: Each blade in the DB2 Analytics Accelerator has a CPU core teamed with an FPGA core to accelerate processing of data before it reaches the CPU.

FPGAs accelerate processing of data before it reaches the CPU (see Figure 2). Each FPGA completes its work with enormous efficiency, drawing little power and generating little heat. The focus of the system's optimization is to enable streaming processing; in effect, processing and retiring analytic operations as rapidly as the relevant information for them can be read from the many parallel disk drives in the system. The typical impact of this work is a reduction of 95 percent or more in the data required for further processing by the on-board CPU cores and memory.

Designed to meet the needs of business and IT leaders in any industry

The DB2 Analytics Accelerator leverages the power of System z and DB2 for z/OS to offer significant value for any organization seeking to drive smarter business outcomes faster. From dashboards to trend-based analytics, it provides high-performance analytics to support business executives who need fast, accurate answers to critical business questions. The DB2 Analytics Accelerator delivers the answers you need, where and when you need them.

DB2 Analytics Accelerator: A natural extension to IBM Smart Analytics System 9700 and 9710

If you have created a data warehouse or other decision support system on your System z server, you can easily extend the functionality and performance of the solution with the DB2 Analytics Accelerator.

If you are struggling to meet service-level agreements with departmental reporting systems that are difficult to maintain, rethink your strategy and consider the value you can gain from an IBM Smart Analytics System 9700 or IBM Smart Analytics System 9710 coupled with an integrated DB2 Analytics Accelerator.

Drawing on Cognos 10, IBM Smart Analytics System offers a full range of BI capabilities including reporting, analysis and dashboarding. A turnkey analytic solution, the system delivers this leading BI software fully optimized for high-performance server and storage hardware—so it is business-ready in days, not months.

The IBM Smart Analytics System 9700 leverages the IBM zEnterprise™ 196 (z196) server, which scales to 3 TB of real memory and has a 96-core design—80 of which can be configured by end users—delivering massive scalability for secure data serving and query processing.

The IBM Smart Analytics System 9710, based upon the new IBM zEnterprise 114 platform, delivers the quality of service of System z at an entry-level cost. Customers can now deploy an IBM z/OS solution that can scale to meet the requirements for data marts and full-size data warehouses for entry-level customers.

IBM has assembled an industry-leading, comprehensive portfolio of information management, hardware, software and services capabilities. As part of that portfolio, the IBM Smart Analytics System and DB2 Analytics Accelerator appliances provide an ideal solution for organizations that rapidly accelerating complex data analysis. Visit **ibm.com/**software/data/infosphere/smart-analytics-system/9700 to learn more about the IBM Smart Analytics System models and how they work with DB2 Analytics Accelerator.

Make smarter business decisions with powerful, flexible data warehousing capabilities

Maintaining a competitive edge means using all the information at your disposal to create actionable insights that drive smarter decision making. Because data warehousing forms the foundation for business analytics systems, IT departments must ensure that their strategy and infrastructure align with their goals, as well as with the goals of the business as a whole. IBM data warehousing and business analytics solutions on System z provide an end-to-end solution on a single platform that is capable of scaling to meet the breadth of business user requirements for complete and accurate business information—quickly and securely, with outstanding availability and performance.

For more information

To learn more about the IBM DB2 Analytics Accelerator, please contact your IBM representative or visit: **ibm.com/**software/data/db2/zos/analytics-accelerator

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Produced in the United States of America
October 2011

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IMB14125-USEN-00