



**Resilient, available and
higher-value database servers
as the foundation for IBM
Information On Demand**

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The information you need, when you need it

Companies today are prolific gatherers and producers of information. Information by itself, however, has little value. Providing access to information – for all those who need it when they need it – is the challenge of organizations as they strive to integrate business processes, enterprise wide, with key partners, suppliers and customers. Creating business value by integrating, analyzing and optimizing heterogeneous types and sources of information throughout their lifecycle to manage risk and create new business insight is what IBM calls information on demand. On demand businesses require insight to adapt and respond with speed to any customer demand, market opportunity or threat. They are committed to providing seamless flows of information to customers, business partners and employees – while demanding the highest utilization of resources and people.

To make the best use of their information assets, companies require scalable, cost-effective, secure, and resilient information-management systems to ensure that vital information is complete, accurate and available. They also need applications that put all their information within a single virtual reach in order to integrate their business processes without investing in new IT applications and infrastructure. These enterprises look to business intelligence applications to leverage information for insight; content management applications to store, manage and distribute unstructured content; and master data management to organize domain information such as products, customers and employees.

IBM can help your organization meet the challenges of information on demand. Only IBM offers an integrated information infrastructure with industry leading software products that:

- Organize the vital information your company needs so that you have access to it when you need it.
- Provide you with business insights into your customer base or other corporate constituents.
- Manage and deliver all forms of unstructured content such as documents, records, e-mails, videos and other multimedia content.
- Enable you to access your information regardless of where it is stored.
- Store and manage information.

Business Resilience

As businesses expand globally and rely on the Internet for 24x7 operations to fulfill the needs of customers and employees, it is more essential than ever that applications and systems be available regardless of what happens. Natural and man-made disasters, hacker attacks, or a huge influx of new customers during the holiday season—nothing can be allowed to shut down business operations. Business resilience includes secure data protection as well as the ability to spring back quickly from disruptions. Business transactions and information must be secure, reliable and responsive to regulatory guidelines. Companies must be able to back-up information and recover quickly without curtailing operations.

Foundation for information management

Database servers are the foundation of IBM's information infrastructure.

Companies demand first and foremost that these solutions be resilient, secure, reliable and cost effective. IBM database offerings meet these needs, providing:

- A resilient and security-rich information management infrastructure that maximizes availability while minimizing planned outages.
- A scalable, powerful solution that handles mixed workloads and spikes in demand to fully leverage your resources and help you fulfill service-level agreements (SLAs).
- A productivity-boosting system with autonomic features that enable your information technology (IT) staff to work efficiently – maximizing resources and helping you to keep down the total cost of ownership.
- Database servers that plug easily into your existing IT architecture.

To maintain information integrity, resilience, security and scalability, and to help your knowledge workers be as efficient as possible, you need to leverage the strengths of IBM databases.

This white paper focuses on IBM DB2® Universal Database™ for z/OS®, IBM DB2 Universal Database for Linux®, UNIX® and Windows®, IBM Informix® Dynamic Server and IBM Cloudscape™—four database software products that provide resiliency to your information management operations, security for your assets, help you meet SLAs and keep total cost of ownership low. By combining your IBM database software with other components of IBM's information infrastructure, you'll be able to provide your employees, business partners and customers with the seamless and secure flows of accurate, real-time information. IBM can help your company thrive in today's on demand world.

Service-level Agreements

More and more companies rely on their systems and information to be continuously available. Following a trend adopted by service bureaus, clients are demanding Service Level Agreements (SLAs) to clearly define the IT services their business units expect, and when those services will be available. This includes focus on what is expected for planned outages, as well as recovery times for unplanned outages. Whereas, in the past, business customers had to wait to get the attention they needed from the help desk or the data center, now IT departments have little choice but to provide business units with the level of service that has been negotiated. As a result, IT organizations are requiring a resilient infrastructure that is optimized to reduce planned and unplanned outages, as well as systems that provide performance and scalability needed to meet service levels.

Databases to fit your specific needs

Whether you're a large company managing petabytes of information or a small organization with megabytes – or a developer looking for a database to embed in applications to solve specific client demands, IBM has a product that is just right for you. Each of IBM's information management offerings has a unique set of characteristics that make it suitable for a particular set of size and user requirements. IBM's database offerings have been designed, tested and proven to meet the need for resilience, availability, security, scalability and reliability as well as low total cost of ownership.

IBM is a leader in self-managing database servers, making IBM databases easy to learn and efficient to maintain. Many routine database administration tasks have been eliminated using advanced autonomies built into the latest IBM databases. Database administrators (DBAs) are able to focus on higher-level tasks that provide direct benefit to the business, not tasks that can be automated and simplified.

Built on open standards, IBM's databases can easily scale to take advantage of increases in processing power and can move to alternative server platforms to meet the demand for growth. Developers will also discover that IBM offers the richest set of developer tools and resources in the industry. No matter which integrated development environment you use, whether it is .NET, IBM Rational® Application Developer or Eclipse and no matter which development language you prefer, whether it's Java™, EGL, PHP or C/C++, IBM supports your choice. This flexibility enables you to protect your existing investment in applications and to select the next generation environment that best meets your needs. For example, if you are using Quest's Toad with Oracle, the same package works with the DB2 family, preserving your skill set and making it easy for the same talent pool to support multiple databases.

You'll find an IBM database solution for all of these platforms, whether from IBM or other vendors. And IBM's own software environment consisting of Tivoli®, WebSphere® and Rational products provides you with tools and services that can help you take advantage of the world of IBM Business Partner applications.

Rather than compete with its Business Partners, IBM offers them world-class technical and marketing support, and access to worldwide markets, to help them build this ecosystem of applications. Through multiple channels—such as developerWorks, Web-based and classroom training, and partner programs and facilities such as IBM Innovation Centers, on-site packages and IBM teaching centers—IBM provides the skills and training that developers and Business Partners need in order to serve the market with new innovation.

IBM DB2 Universal Database for z/OS: Delivers the highest availability and security with near-linear scalability for today's information infrastructure requirements

To implement an information infrastructure that supports multiple applications, scales to petabytes of information and responds to virtually unlimited user demands, IBM offers DB2 Universal Database for z/OS (DB2 for z/OS). DB2 for z/OS is the logical choice for companies with soaring data volumes and rich sets of workloads that include online transactional processing (OLTP) systems, enterprise resource planning (ERP), customer relationship management, supply chain management or human resources applications.

In fact, according to Winter Corporation's 2005 TopTen Award Winners, DB2 Universal Database for z/OS comes out on top in largest database size and largest normalized data volumes for OLTP workloads.¹

By helping you to respond in real time to the demands of a changing marketplace – and to the needs of your customers, partners, suppliers and employees – DB2 for z/OS provides resiliency that enables you to achieve your business goals with the highest availability and security. Powerful enough to serve as the foundation for data center environments, DB2 for z/OS cost-effectively delivers information to your users, helping you to fulfill the information needs of your company's largest e-business operations. The autonomic features of DB2 for z/OS, such as the Configuration Advisor and Design Advisor, enable you to accelerate repetitive DBA tasks and free up your DBAs for more critical tasks – increasing productivity while enabling the highest service levels and lowest total cost of ownership.

Postbank Systems AG supports customer growth with the highest availability and business resilience

Handling extreme workloads requires business resilience and rapid recovery in the event of a disaster, as Postbank Systems AG (Postbank) knows. Postbank is a large retail bank and financial services institution in Germany with more than 12 million clients. To provide customers with increased services and true 24x7 capabilities, Postbank realized that it needed to revamp its banking applications. Working with IBM Business Partner SAP AG, Postbank replaced its systems with an advanced transactional banking system featuring business resilience and fast recovery – critical requirements for the banking industry.

Postbank selected IBM DB2 for z/OS because it provides full redundancy and business resilience in combination with the IBM Geographically Dispersed Parallel Sysplex™ system. The new SAP® R/3 ERP system, which also leverages IBM TotalStorage® Enterprise Storage Server® and zSeries® mainframes, helps ensure the highest availability, reduces outages and enables rapid recovery if needed. As Postbank's workload increases, DB2 for z/OS provides the ability to run in a single partition or scale to multiple servers – all while keeping the data available. Banking institutions such as Postbank are finding that, as the demands for high availability and business resilience continue to grow, the combination of DB2 and the zSeries platform rises to meet the challenge.

IBM DB2 Universal Database for Linux, UNIX and Windows: Flexibility and power in today's distributed environments

IBM DB2 Universal Database for Linux, UNIX and Windows (DB2) also powers information management environments for data centers across diverse, multiplatform environments. Like its counterpart designed for the mainframe, DB2 can meet heavy data management demands while automating and streamlining many of the tasks that occupy DBAs' time. DB2 is the performance leader according to many industry benchmark studies.² These performance benchmarks represent the flexible operational characteristics of this database server with workloads such as business intelligence and OLTP applications.

At the top of the range for scalability, availability and performance for distributed environments is DB2 Universal Database Data Warehouse Edition. Not only does this provide the full functionality of DB2 Universal Database Enterprise Server Edition, but it also provides enhanced usability with business intelligence features for real-time insight and decision making.

To help organizations keep down the total cost of ownership of their data management operations, DB2 features a broad array of autonomic capabilities that free up DBA time to focus on driving business value. In smaller implementations, these autonomic capabilities can even eliminate the need for dedicated administrators.

In addition to Design Advisor and Configuration Advisor that support the DB2 family, DB2 offers automated statistics profiling to make the process of statistics collection and maintenance completely transparent to the end user. This also improves the performance of DB2, so that the database optimizer can always choose the best access plan. And the Autonomic Object Maintenance feature automatically performs policy-based administration and maintenance functions, such as table reorganization, statistics collection and database backup. In addition, DB2 offers automatic storage management and object maintenance to perform routine administration tasks based on established operational policies. These efficiencies combined with the attractive license costs deliver low total cost of ownership to satisfy even the most constrained budget.

DB2 integrates with key development tools that also help programmers to be more efficient than ever. It improves productivity by allowing developers to choose their programming environment. As with all IBM databases, DB2 provides developer productivity tools and drivers for the most common IDEs and programming languages. Open standards are utilized throughout the IBM database servers including SQL, JDBC, ODBC, XML and Web services. There is no need to learn proprietary technologies and languages to achieve an information on demand infrastructure.

ACCPAC optimizes time to value for enterprise applications

One of the thousands of developers who leverage IBM DB2 to support their applications, ACCPAC provides business software for small-to-medium-size businesses, with a focus on accounting. Most of ACCPAC's customer base is made up of smaller companies with small IT staffs or none at all. ACCPAC requires that its own software and the software it depends on be cost effective and easy to deploy and maintain. DB2 is the perfect solution.

ACCPAC and DB2 provide a solution that is focused on simplifying and automating many of the DBA processes, allowing businesses to focus on deriving meaningful data from their applications. The DB2 Health Center maintains the performance and health of the database, while the built-in high availability features ensure continuous access. With a multitude of choices in terms of editions, platforms and clustering options, DB2 can grow with the needs of ACCPAC's clients.

IBM Informix Dynamic Server: The powerhouse behind the scenes

For many years, companies have relied upon the speed and scalability of IBM Informix Dynamic Server (IBM IDS) to run their OLTP systems. Organizations such as hotel chains, government tax bureaus and credit card operations serve vast communities of users.

Performance and availability are paramount for such institutions. Processing more transactions creates higher revenues, while high availability is essential for round-the-clock operations. IBM IDS delivers the performance to satisfy these demands. IBM IDS is built on Dynamic Scalable Architecture which responds quickly and seamlessly to unexpected events to provide uninterrupted service levels and keep management costs low. With this architecture, customers can confidently deploy thousands of instances of IBM IDS anywhere in the world and support them centrally without an army of DBAs. These features have enabled IBM Business Partners to embed IBM IDS in consumer electronics, network management equipment, telecommunications service assurance equipment, emergency response systems, retail systems, medical systems and thousands of other applications that require high performance and reliability without the expense and trouble normally associated with managing enterprise database systems.

Recent improvements have pushed the performance of the database to new heights. Moreover, with the database's high-availability data replication (HDR) and enterprise replication (ER) capabilities, customers are able to architect resilient solutions that can handle a variety of interruptions, from a temporary server outage to a large scale disaster. Companies with applications based on IBM IDS can provide customers with the convenience of On Demand Business, knowing that they can depend on the resiliency of IBM IDS.

Wicked Frog leaps into high performance, low administration costs

Wicked Frog, a subsidiary of I-Race Ltd., is a world leader in virtual racing games. Leveraging state-of-the-art tools and talent from next-generation video game studios, I-Race provides a portfolio of virtual, real-time and near-photorealistic events for its customers and partners around the globe. Wicked Frog allows you to own, train and race your own virtual horse. Its games are designed for delivery via a number of vehicles, including TV and the Internet.

To make the game appealing to users, Wicked Frog wanted the performance of each virtual horse to be an accurate reflection of the user's interactions, the virtual environmental conditions and up-to-the-minute historical form (past performance) calculations. To deliver this level of realism, Wicked Frog needed an embedded object-relational database management system that could handle complex data and even more complex statistical analysis in real time. The company chose IBM Informix Dynamic Server because it combines low administration with high scalability. Informix DataBlade™ also allows Wicked Frog to build custom-tailored business logic that is integrated into the very core of the engine, delivering unparalleled application functionality and outstanding performance.

Not only is this Informix feature fast, reliable and low in overhead and administration costs, it also enables Wicked Frog to provide its virtual racing video streams online from a single, easily managed environment.

IBM Cloudscape: No-cost license, small in footprint, big in reliability

A small business or a corporate project with a modest budget may not need a database that scales to millions of tables and hundreds of thousands of users. Within this so-called "lightweight" category, no database system on the market can compete with the advantages provided by IBM Cloudscape.

Cloudscape is free, with a no-cost license. It is a standards-based Java database server that has evolved since its introduction to the market in 1997. In 2004, Cloudscape was contributed to the Apache Software Foundation (ASF) as the Derby project. Apache Derby is now a thriving developer and user community and for a fee of US\$499 per year, companies can rest assured that IBM's world class support team is available to assist in Cloudscape database deployments. The Cloudscape database can be embedded in a wide variety of desktop systems, including Linux, Microsoft® Windows and Mac OS X. Cloudscape is an ideal embedded database for Java applications, and with a meager two megabyte footprint, deployment is a breeze. In a client/server environment, Cloudscape powers a high-performance database that enables robust data management and fast query results for Java and non-Java applications such as PHP Web applications.

When it comes to stability, availability and reliability, the lightweight giant is truly a contender. Cloudscape also includes crash recovery features that restore data in the event of an outage, providing even small companies with business resiliency. And to facilitate migration to a larger database, IBM provides a database migration tool that can make the work practically disappear.

Gluecode Software finds a high-value Java database

Gluecode Software, now an IBM company, provides small-to-medium-size businesses with an application infrastructure based on open-source code. Its Java application server, Gluecode Standard Edition, combines the innovation of community-driven open source code with the reliability of commercial support to provide a readily accessible, flexible, rapidly deployable foundation for building Java applications.

For its embedded and Web-based applications, Gluecode needed a full-featured, robust, small footprint database server that is simple to deploy and low in cost. The attractive licensing terms of Cloudscape were ideal for an ISV such as Gluecode. With advanced transaction support, row-level locking, database-level encryption and robust database recovery capabilities, Gluecode finds Cloudscape to be is a resilient and security-rich database server for mobile desktop Java applications that require a persistent data store. Cloudscape can also be used to serve the needs of lightweight transactional client/server and Web application workloads built with Java or PHP scripts.

Quality comes in all sizes with IBM database servers

Small and large businesses alike need to make sure that they are protected against outages and rising costs as they seek information management solutions that are low in maintenance costs and high in reliability. IBM offers these qualities in all of its database servers, along with open standards for easy integration across platforms. And small or large, IBM delivers databases that supply plenty of headroom for seasonal business spikes. Resiliency, availability, security and stability are part of the standard features you receive with all the IBM database offerings. From DB2 for z/OS to Cloudscape, quality is never optional with IBM database servers.

For more information

Please contact your IBM representative or IBM Business Partner or visit ibm.com/software/data



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Silicon Valley Laboratory
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San Jose, CA 95141
U.S.A.

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¹http://www.wintercorp.com/VLDB/2005_TopTen_Survey/2005TopTenWinners.pdf

- ²• #1 in TPC-C* Performance Leading Industry Standard OLTP Benchmark by 2x over Oracle
- #1 in 10TB TPC-H* Performance Largest Data Warehousing Benchmark Leading Oracle by 21% Using 1/2 the Number of CPUs
- #1 in SAP SD* 3-tier Performance Leading SAP R/3 Performance Benchmark by 68% Over Oracle

This white paper includes illustrations of how customers use IBM products. Many factors have contributed to the results and benefits described. IBM does not guarantee comparable results. All information was provided by the featured customers. IBM does not attest to its accuracy.