



I D C A N A L Y S T C O N N E C T I O N



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Mainframe Database Administration Challenges in a World of Exploding Data

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Companies are challenged by the dramatic growth in data volumes caused by the demands of the digital economy, as well as data from new sources and the need to manage an increasingly complex environment. The rapidly growing volumes of database transactions demanded by Web and mobile applications and the requirement for faster, always-available data are putting tremendous pressure on mainframe databases. While in the past, a significantly higher amount of transactions were revenue generating, today's transactions are often more likely to be status checking. These types of transactions do not generate revenue and yet must be managed at a time when IT budgets are flat or shrinking. In addition, while database administrators (DBAs) are required to manage existing data together with the data in emerging data management systems, traditional tools were not designed to meet the needs of digital business. Addressing these challenges, while optimizing investments, requires proper management of mainframe performance and processes, as well as integration with all enterprise IT resources. A key factor in mainframe performance and resource management is DB2, which manages most of the data driving key enterprise applications. Efficient management of DB2 can make the mainframe environment more cost effective and more responsive to the challenges of the digital economy.

The following questions were posed by BMC Software to Carl Olofson, research vice president for IDC's Application Development and Deployment service, on behalf of BMC's customers.

Q. The proliferation of applications, mobile computing, the Internet of Things, and the explosive growth of data are having a dramatic impact on IT infrastructures including mainframes. What are some of the other business trends you see affecting IT?

A. All this demand for data-driven service and the capture of so much data results in huge volume growth, including unstructured data. These changes require a unique approach to management in the database management system (DBMS). At the same time, all of this data is often coming from nonschematic sources such as Hadoop or a NoSQL database. The very nature of such sources means that the process of data management is most likely ill-defined and ungoverned. This is a problem both from a general privacy perspective and in terms of compliance with government regulations such as Dodd-Frank, Basel II, and HIPAA.

At the same time, end users, including business customers, now have unprecedented access to data and are making demands on databases at a tremendous rate. Some databases have seen huge spikes in transaction rates because of mobile technology. In one case, a bank reported a 16-fold increase in query transactions against its main accounts database because of frequent

balance checks through smart phone apps. Supporting increasing transaction rates means careful tuning and the ability to understand, control, and manage workloads more effectively, especially in a mainframe environment. In this environment, too much load on a system can result in major increases in mainframe monthly license charge (MLC) costs for IBM products, such as DB2, IMS, CICS, and MQ. These data requests are coming in around the clock, which complicates matters. For users on mobile device apps and Web apps, there can be no downtime, and that makes database maintenance a challenge.

Q. How are organizations trying to manage these challenges now?

- A. One simple thing they can do is upgrade to the latest version of the mainframe, which is designed to handle this new workload. A number of optimizations are available to improve the manageability of workloads and increase query speeds for DB2. Likewise, the latest storage systems have increased capabilities for optimizing data throughput. Given the increasing sophistication of mobile apps, however, and the demand for better performance in conjunction with other systems, that may not be enough.

To keep up with demands for more effective use of available data, manage the various forms of data used to support customer engagement, analyze competitive opportunities, and detect risk, enterprises have turned to technologies such as Hadoop for large-scale data collection and sophisticated new mobile applications. However, when they want to move Hadoop data to the mainframe DB2 for analysis, the database size explodes and data-hungry mobile applications cause transaction rates to skyrocket. Companies need to manage their DB2 environment extremely well to ensure that they get the most from the mainframe without inefficiencies that could generate excess licensing costs, cause applications to slow down, impact data integrity, require too much storage space in which to run, and require more DBA resources. Unfortunately, the basic database management tools of yesterday do not meet the demands of the digital economy; therefore, companies are looking for data management utilities that can help them keep pace with changing requirements.

Q. What is the effect of inefficient data management on the business?

- A. If enterprise databases are mismanaged, transaction rates may slow down, queries are not answered in a timely manner, and the business suffers. Business could be lost, key intelligence may be unavailable, and the enterprise becomes less competitive. Today's cost of downtime can be measured in lost customers, which impacts future and present revenue. Sometimes companies respond by expanding their hardware spend and building up computing capacity, storage, and memory to boost the overall power of the database. But if they don't also look at the types of innovative capabilities that data management utilities should provide to manage and optimize data, they will spend far more than necessary, both on hardware and on MLC software licensing, while still missing critical service-level agreements (SLAs).

Enterprise databases must be always available and optimized and have rock-solid data integrity. To ensure that these requirements are met, companies must do more than boost the physical environment; proper data management procedures, supported by the right management tools, are also essential. And because consistency over time is important, it's also vital that the provider of tools be a trusted partner. Such a vendor must offer database management tools and utilities that keep pace with the changing and increasingly demanding requirements of enterprise databases. For example, these tools must be able to scale to meet the needs of digital business and ensure that data is optimized and available at all times.

Q. How do the demands of the digital economy increase a company's expense and risk?

A. The expense aspect involves two common issues. One is the tendency, by "throwing hardware at the problem," to fail to properly manage and tune the database to make the most of the resources already in place. This situation can result in potentially excessive software licensing costs. When this happens, it gives the false impression that the entire platform is too expensive when in reality it is simply not being properly utilized. The other issue is that an underperforming database may slow down critical applications, causing a loss of business and displeasing customers, partners, and critical stakeholders. When SLAs are not met, DBAs may have to perform firefighting maintenance, which impacts their productivity and forces them to schedule disruptive outages.

The risk aspect involves two issues. One is the fact that errors in the application, coupled with schema issues and a lack of detection, can result in data integrity problems that are not noticed until a fault occurs in another application. At this point, IT is in reactive mode and must backtrack to fix the problem. The other issue has to do with the unexamined ingestion of unstructured data that may leave the company liable to legal and regulatory violations, especially if personal identifying information is present. If IT is constantly in reactive mode, necessary checks of the data are often not employed because of lack of time or fear of making performance worse. In these cases, it is much more difficult for IT to perform data management processes and best practices because it is too focused on completing the bare minimum of management tasks.

Q. What can businesses do to overcome these challenges?

A. If it has not already been done, a thorough audit of data management practices should be carried out. This audit needs to look at procedures and tools used to manage the database and consider DBA expertise levels. Are they ensuring the best possible performance at the lowest possible cost? Are they ensuring data integrity during normal operation and recovery? Are data management practices designed to support the business, or are they designed to meet the limitations in the current data management software? What risks may be represented by the issues detected in such an audit, and how much could they cost the business? Do current tools anticipate the increasing demands for database size and performance in an increasingly complex environment? If not, what processes or best practices need to be eliminated or developed to meet data growth that traditional data management methods just can't handle?

Another key consideration is that the mainframe DBA workforce is aging. Those hired to replace retiring DBAs may not have the skills and experience to properly tune and maintain a production DB2 database. This means that they must have tools and utilities that are easy to understand and that have built-in intelligence to automate common tasks and auto-detect common database management problems before they become too costly. These tools should be able to manage and optimize the demands of the digital economy today and in the future.

ABOUT THIS ANALYST

Carl Olofson manages IDC's Database Management Software service, as well as advising and guiding the Data Integration Software service. Mr. Olofson's research involves following sales and technical developments in the structured data management (SDM) markets, including database management systems (DBMSs), database development and management software, and distributed cache services managers, including the vendors of related tools and software systems. Mr. Olofson also contributes to the Big Data Overview report series.

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