Solving today's data maintenance challenges

Highlights

- Ongoing IBM investment to respond to evolving data needs for the 21st century

- Industry-leading, day-one support for new releases of DB2 for z/OS with additional focus on reducing costs and improving performance

- Leading-edge technology in DB2 tools and solutions for increased performance and return on investment (ROI)

- Synergy between IBM DB2 Utilities Suite for z/OS and DB2 Tools with features that reduce complexity and deliver more automation

Enhanced, integrated, cost-effective portfolio

As your business needs change and grow in the 21st century, data is still viewed as a core business asset. According to IDC, the amount of data is exploding. Structured data is growing 32% per year, unstructured data is growing 63% and replicated data is growing 49%. There are demands placed on the accessibility, availability and performance of that data to ensure your business goals are met in today's global changing economy. The era of having a weekend to complete batch maintenance is for most gone.

IBM offers a comprehensive set of utilities and tools to assist with the management of IBM® DB2® for IBM z/OS® data responding to today's data challenges, helping you to reduce your total cost of ownership (TCO) by maximizing business performance and IT staff efficiency. IBM continues to invest in the DB2 Tools to offer the most complete utilities management portfolio in the market, with your choice of standalone products or an integrated solution to drive down software costs:

- IBM DB2 Utilities Suite for z/OS
- IBM DB2 Sort for z/OS
- IBM DB2 Utilities Enhancement Tool for z/OS
- IBM High Performance Unload for z/OS
- IBM DB2 Automation Tool for z/OS

Overview

The IBM DB2 Utilities Suite for z/OS is a comprehensive set of tools for managing all DB2 data maintenance tasks. The DB2 Utilities are always evolving and being enhanced to respond to not only the exponential growth of data, but other changes such as new versions of DB2 for z/OS, applications needs for data warehousing or business analytics and complex data types such as Large Objects (LOBs) and XML.

The most recent addition to the Utilities Management portfolio is IBM DB2 Sort for z/OS. DB2 Sort is designed for customers who need the highest degree of performance with significant reductions in elapsed time and CPU during utility sort processing. When using DB2 Sort and the DB2 Utilities Suite in conjunction, customers are able to eliminate the need for duplicate utilities from various ISVs, reducing overall TCO and use of system resources.

The DB2 Utilities Enhancement Tool for z/OS enhances the manageability of the maintenance window and utility processing by providing superior control over DB2 threads for both local and remote subsystems. The Utilities Enhancement Tool also monitors and enforces company-wide utility syntax standards, as well as improving time-to-market enhancements for use with the DB2 Utilities Suite.

IBM High Performance Unload for z/OS is a flexible, easy-to-use high performance unload accelerator that provides a fast and efficient tool to unload and extract data for movement across enterprise systems or for in-place reorganizations.

IBM DB2 Automation Tool for z/OS provides more control over DB2 utility maintenance. Users can set up conditions stored in easy-to-use profiles, then can control when, how, or even if a utility is run. They are able to set policy rules that help establish standards ranging from individual objects to policies that are enterprise-wide. Junior-level IT personnel can become as efficient as more experienced staff by using the automated utility features. By streamlining utility maintenance, companies are able to increase availability because of shorter, more efficient batch windows that save not only staff resources, but also system resources such as CPU and DASD.

Using advanced technology to lower costs

One of the biggest concerns today is the need to reduce costs and still remain competitive with an edge on the market. Even if you have the luxury of a maintenance window, most companies are faced with economic pressures to reduce costs. Each release of the DB2 Utilities Suite for z/OS focuses on lowering operating costs, and improving performance by reducing CPU usage and elapsed time during processing.

The DB2 Utilities led the DB2 utility market in 2006 with zIIP support by offloading utility maintenance, specifically the BUILD portion of LOAD, REORG and REBUILD utilities, to the zIIP processor. Investments to lower your CPU costs have continued with the DB2 Utilities ability to leverage DB2 Sort to further increase the use of zIIP processors during the sort phase of utility maintenance. In DB2 10 for z/OS, RUNSTATS has been enhanced with the ability to update views and deliver new autonomic features that determine when and how RUNSTATS should be run, DB2 10 also offers page sampling and auto-sampling rates for RUNSTATS, as well zIIP offload support to reduce CPU and improve performance.

The DB2 Utilities continue to focus on other CPU reductions besides zIIP offload. With the DB2 Utilities support for DB2 9 for z/OS, there were significant CPU reductions, mostly in the area of index processing, of anywhere from 10 – 70% depending on the utility and the workload. With DB2 10 for z/OS, IBM is again leading the DB2 utility market through its use of IBM FlashCopy® technology for backup, recovery and more.

Flashcopy is supported on a number of IBM and non-IBM storage devices. The technology makes it possible to create nearly instant point-in-time copies of entire logical volumes or data sets. Prior to DB2 10 for z/OS, if you wanted to create transaction-consistent image copy data sets, you would run the COPY utility as share level reference and prevent update access to the data while the COPY utility was processing. This may have resulted in an undesirable application outage. In DB2 10 for z/OS, COPY, RECOVER, REORG, LOAD and REBUILD INDEX provide data set level FlashCopy support. With DB2 10 for z/OS, you can run the same COPY utility online, and create an image copy data set to be a transaction-consistent image copy data set with no application outage. This keeps your data and underlying DB2 applications available and further reduces CPU usage.

Faster data access

One of the features in DB2 10 for z/OS is the ability to quickly access data over previous methods, called hash data or hash data access. In earlier releases of DB2 for z/OS, the access to data was through a table space scan, index access, or direct row access with a row ID column. Hash data access allows you more direct access with a defined hash key that is hashed to provide a unique value that equates to a particular page within the table space. The REORG utility has been enhanced with the ability to REORG immediately after a table has been converted to hash or to REORG if a table has been converted out of hash format.

Hash support in DB2 10 for z/OS is enhanced with use of the DB2 Utilities Suite for z/OS, DB2 Sort for z/OS and the DB2 Utilities Enhancement Tool for z/OS. You can take advantage of the LOAD PRESORT option in DB2 Utilities Enhancement Tool and DB2 Sort. This allows you the ability to presort data based on the hash key. The net result will be a much faster LOAD using fewer system resources and providing greater application availability.

Another feature in DB2 10 for z/OS that leads to fast data access is the ability to perform a list prefetch of index leaf pages. Previously when an index was disorganized, performance could be affected, because more gaps existed between index leaf pages. However, DB2 10 for z/OS provides the ability to perform a list prefetch of index leaf pages based on non-leaf page information. This enhancement can greatly reduce

synchronous I/O waits for long-running queries that are accessing disorganized indexes. This enhancement is realized in the IBM DB2 Utilities that need to access index leaf pages to extract the index key values by reducing the number of synchronous I/O waits and elapsed time. The DB2 10 for z/OS utilities providing this support includes REORG, REORG INDEX, CHECK INDEX and RUNSTATS.

Increased parallelism increases availability

When DB2 Utilities require sort processing, there are many cases when multiple sorts from a single utility are run in parallel to reduce the elapsed time of the utility. This is referred to as "intra-regional parallelism." DB2 Sort for z/OS communicates with the IBM REORG Utility, for example, and is able to determine the optimal number of sorts to run in parallel. DB2 Sort for z/OS assesses the availability of system resources and communicates with the REORG Utility to optimize the allocation of resources for each sort based on the data characteristics. By choosing the most effective use of resources for each sort, DB2 Sort for z/OS can increase the number of sorts that can be run simultaneously. This higher degree of parallelism results in lower elapsed time for utility processing.

Establishing company-wide utility syntax

Each company's IT department enforces standards to protect business processes required to conduct business that are critical to the company's bottom line. These standards might include monitoring a user's actions against certain database objects, limiting user access to specific data or controlling the kinds of DB2 utilities that can be run against objects pertinent to daily business activity.

The Utility Monitor is a feature of the DB2 Utilities Enhancement Tool. It can assist IT professionals by enforcing company standards and policies about how DB2 utilities are processed. By defining rules within an intercept Policy, IT staff can control the authority to execute IBM DB2 utilities as well as enforce which parameters are used with specific DB2 utilities or objects. DB2 Utilities can also be purposely failed if they violate the rules defined within the Policy.

For example, a company can create a standard that no REORG utility should run without the KEEPDICTIONARY parameter, or that no LOAD utility should run with the LOG YES parameter. Creating rules such as these within the Policy ensures that each DB2 utility that is run matches the definition of the Policy. And if they don't, the Utility Monitor can either change the utility syntax to match the company standards, or fail the utility.

The DB2 Utilities Enhancement Tool for z/OS provides the Utility Monitor to address the needs of companies who wish to streamline their utility processing. The Utility Monitor allows you to establish and maintain company-wide DB2 utility syntax policies. It provides senior-level DB2 professionals the confidence to know that utility jobs can be set and executed by junior-level staff, reducing effort and errors. It also provides a mechanism to assist with auditing DB2 utility processes.

Improving data maintenance

For databases in the 21st century, the very nature, size and complexity of the data they manage makes data maintenance a difficult challenge. With the rapid and dramatic changes faced by utilities, maximizing operational efficiency is a primary objective. To the DB2 applications that support your business, it can mean the difference between profit and loss.

The REORG utility in DB2 10 for z/OS enhances support for both LOB and XML data. DB2 10 for z/OS improves the performance of applications that access LOB data with the concept of inline LOB. This allows a portion of LOB data, depending on size, to be stored along with data from other non-LOB columns. This means that you do not need to access the LOB table space or auxiliary indexes to process LOB data. Other significant enhancements to the REORG utility in DB2 10 for z/OS include:

- Improved performance for part-level REORG with non-partitioning indexes and REORG INDEX that can reduce elapsed time by up to 60%
- Online (SHRLEVEL CHANGE) REORG support to support the re-structure of both the catalog and the directory in order to reduce contention for concurrent DDL bind and prepare operations
- Online (SHRLEVEL CHANGE) REORG support for LOB table spaces for both LOB YES/NO with no mapping table required
- Improved availability and removal of previous restrictions for LOB support for greater ease of use

The DB2 Utilities Enhancement Tool help you ensure that you can cancel threads immediately before the switch phase for DB2 10 online REORGs. Many customers avoided using online REORG because they could not obtain the necessary drain to process writers in a timely manner. This enhancement in the DB2 10 for z/OS REORG utility allows you to cancel the writer prior to the switch phase. This can significantly reduce the outage and make online REORG possible to applications where previously the REORG would have been taken offline. Using the Syntax Monitor of the DB2 Utility Enhancement Tool, you can ensure that your online REORGs are always executed with the FORCE option.

Reducing the need for utility maintenance

The improved performance and availability enhancement from DB2 10 for z/OS and the Utilities Suite and the utility management tools will result in immediate savings. To achieve even greater savings, is to eliminate the need to perform utility maintenance.

In DB2 10 for z/OS, the REORG utility is able to build a compression dictionary during insert processing. In previous releases of DB2 for z/OS, a compression dictionary needed to be built either with the LOAD or the REORG utilities. In DB2 10 for z/OS, if compression is defined, depending on the amount of data available during the insert processing, the compression dictionary can be built during insert processing, thus reducing the need to execute the REORG utility to build the compression dictionary.

A new real-time statistics column called REORGCLUSTERSENS also reduces the need to run the REORG utility. With this enhancement, real-time statistics (RTS) is improved so that it will determine how data is accessed from applications. RTS is also aware of the order of the clustering data. If your application accesses data through a single index, it will not matter if your data is clustered or not and therefore eliminate the need to REORG that table space to improve the clustering.

The DB2 Automation Tool for z/OS allows you to set up reoccurring utility jobs for conditional and routine DB2 maintenance tasks. You will be able to benefit from all the improvements made to DB2 10 for z/OS utilities using the DB2 Automation Tool. For example, you can specify that the COPY utility generates an image copy Flashcopy data set. The tool not only automates common utility tasks, but allows you to define criteria for your DB2 objects to determine when and if utility maintenance should occur, saving valuable system and staff resources. For example, in DB2 10 for z/OS, the DB2 Automation Tool, can generate a REORG against a LOB table space that has exceeded the fragmented space conditions you have specified. You can also specify that the REORG is SHRLEVEL CHANGE to keep your application available. The tool automatically generates JCL for those objects that require maintenance, removing the manual effort and errors that could occur. User exits allow custom processing that can respond to unique environmental conditions for generating jobs. Pre- and post-generation user exits allow greater flexibility when generating utility JCL. For example, you can influence the order of the objects within a utility, or add a custom post-utility process.

Summary

The IBM DB2 for z/OS Utilities and utility management tools are the most comprehensive on the market. They are unique in that they provide critical solutions to today's most complex business problems across many functional areas to deliver the highest ROI from your software investment.

DB2 for z/OS has a very robust history of providing efficiency, resiliency, and growth for your critical business applications. The IBM DB2 Utilities and Utilities Management Tools not only provide Day One support for new releases of DB2 for z/OS, but allow you to accelerate your time to value for migration and use of new releases. Your staff will be able to make use of new features in every DB2 for z/OS release with more confidence and less time and error. You'll be able to implement new versions of DB2 applications into production faster with out-of-the box savings and increased performance.

For more information on any of the products in the IBM DB2 Utilities tools and products, go to our website at:

ibm.com/software/data/db2imstools/products/db2-zos-tools. html