



IBM IMS Tools Autonomics and Modernization: Putting Information to Work



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About this White Paper

This white paper summarizes the latest significant milestones in IBM's ongoing commitment to the evolution of IMS and IMS Tools.

Building upon the recent delivery of IMS Tools solution packs, which provide comprehensive solutions to particular database needs, the latest enhancements to the IMS Tools portfolio move IMS database administration further toward automation, freeing up database administrator skills for more important tasks. With experienced DBA skills in high demand, the ability to automate high-priority monitoring and performance-related tasks, as well as routine maintenance tasks, frees up those valuable DBA skills so that they can be put to better use developing new applications, pursuing new technologies, and growing your business.

Additionally, IBM's focus on modernizing tried-and-true products by redesigning them to take advantage of current technologies has resulted in graphical user interface (GUI) alternatives to traditional ISPF interfaces.

Increased Automation for Increased Productivity

IBM Tools Base Autonomics Director for z/OS provides automation of ongoing IMS database monitoring and maintenance tasks based on a detailed understanding of the current state of your IMS databases. Autonomics Director uses various data collection points to build an understanding of your particular environment, and then makes simple Yes or No recommendations to the DBA about when databases should be reorganized.

```
Menu View Help
-----
IAVPXML Autonomics Director Monitor List
Command ==>

Locale . . . : $IMSV12 Group type . : DATABASE

Action: 's' View the IMS Database attributes
        'v' View recommendations
        'X' Select a Database Partition/Area for sched
        'h' View Evaluation history

Act Reorg DBDName PartName Eval-Date Eval-Time Snsr
v_ N ARTDB Jul 25, '11 11:00:04 Jul
```

Various notification methods are available, including email and text.

Specifically, Autonomics Director:

- Provides a scheduling mechanism that allows you to control how frequently sensor data is collected and how frequently policies are evaluated. The Autonomics Director scheduler allows you to be flexible, working around peak workloads and not interfering with production throughput or response. The Autonomics Director scheduler can be used along with existing job schedulers as well.
- Exploits the power of the IMS Sysplex to provide redundant Autonomics Director servers to ensure the highest level of availability, spreading data collection and resulting workload based on system capacity and status.
- Provides a simple installation and customization process based on automatic discovery of databases and existing database groups in your environment.
- Supports user-customizable database groupings. All DBRC group types are supported, including HALDB databases and partitions and Fast Path DEDBs and areas.
- Provides an intuitive interface to suit all needs, including a full ISPF interface and integration with IMS Administration Console graphical interface.

Integration with IMS Tools as a Solution

Autonomics Director integrates seamlessly with other IMS Tools to ensure efficient use of system resources as well as providing real-time database status. Autonomics Director collects and stores database status information that can be used to calculate growth and trend projections. You can also view summary performance data for databases by using the IMS Administration Console.

Autonomics Director leverages the sensor data that is collected by either the stand-alone utilities that are provided with IMS Database Solution Pack for z/OS and IMS Fast Path Solution Pack for z/OS or by the integrated data collectors that are provided with several key IMS Tools, including IMS HP Image Copy, IMS HP Pointer Checker, and IBM IMS Fast Path Solution Pack for z/OS: IMS High Performance Fast Path Utilities.



Autonomics Director is available with the IBM Tools Base Pack, a no-charge product.

Recognizing the Importance of Modern User Interfaces

















As IMS enters its fourth decade as the premier transaction and hierarchical database management system that nearly all Fortune 1000 companies rely on to run critical pieces of their business, IMS Tools are evolving to meet new demands and expectations. In the past, interaction with IMS Tools has been largely through ISPF interfaces and JCL that programmers and administrators either wrote themselves or created with the assistance of an IMS Tool. A new tool, **IBM Tools Base Administration Console**, highlights the efforts that are being made to design and deliver graphical user interfaces (GUIs) that provide a richer user experience, that convey more robust and usable information, and that reduce the need for deep IMS knowledge in order for database administrators to be productive.

IBM Tools Base Administration Console, which is a new addition to the no-charge IBM Tools Base, represents the next leap forward for IMS Tools product interfaces. Through close integration with other IBM Tools Base components (such as IBM Autonomics Director, Distributed Access Infrastructure, IBM Tools Knowledge Base, and Policy Services) and other IMS Tools (such as IMS Reorganization Expert), Administration Console provides you with a comprehensive view of the health of your IMS environment from a single, easy-to-use, graphical web interface.

Specifically, Administration Console:

- Provides comprehensive and customizable views of your IMS environment. You can view summary performance data for your DBRC RECON groups as well for those databases that are defined in your *monitor list*, which is a list that is defined in IBM Tools Base Autonomics Director for z/OS to enable databases for automatic monitoring and maintenance. You can create a customized view by creating groups of databases. For example, you can create a group of the databases that begin with a particular prefix, and you can view summary performance data about that group, as shown in the following figure. You can then drill down, looking at details about specific

databases to determine which ones are using the most resources or which ones are not performing to your expectations. These holistic views increase your efficiency by reducing the amount of time that you spend running and analyzing reports to obtain the information that you need.

Summary		
Resource	Type	Overall
 High-priority database	group	
 DBFSAMD1	dedb	
 DOHI0001	database	
 DOHI0002	database	
 DOHI0003	database	
 DOHI0004	database	
 DOHI0005	database	
 DOHI0006	database	

- Organizes and displays exception notifications. These exception notifications are generated when database states cross threshold values that are defined in policies that are created by using IBM Tools Base Policy Services for z/OS. The ability to define a custom set of policies in Policy Services, and to then use Administration Console to monitor those policies, provides you with peace of mind that you will be notified long before any of your monitored databases experience disruptive problems. This ability also allows you to focus on only those databases that need your attention, eliminating unnecessary manual analysis and routine preemptive tuning.
- Building on the exception notification capabilities provided by Policy Services, Administration Console also works closely with Autonomics Director to provide you with automatic recommendations to address certain types of database exceptions. These recommendations, provided by Autonomics Director through Administration Console, reduce some of the overhead that's otherwise required to analyze a problem, allowing you to move more quickly from a potential problem to a resolution.
- Provides centralized access to reports that are generated by many IBM IMS Tools and that are stored in the IMS Tools Knowledge Base repository, which is a central



repository that is provided by IBM Tools Base IMS Tools Knowledge Base for z/OS. You can search for reports by using a variety of search criteria including database name, job name, report name, or completion code. You can save frequently used search criteria so that the reports that you need are always just a click away.

- Uses a combination of SSL and your existing RACF (or SAS equivalent) authentication to provide a secure user experience. SSL ensures secure end-to-end communication, while your existing z/OS authentication method, coupled with built-in application class and group authorization, controls who can log in to Administration Console. All z/OS actions are performed as the logged-in user, which means that users who log in to Administration Console have the same abilities that they have when they log in through TSO —no more, no less.
- Includes a robust integrated help system that provides IMS DBAs of all experience levels with the information they need. Experienced IMS DBAs will appreciate having ready access to the details that they need to analyze performance issues, and newer DBAs will appreciate the extensive explanations of key IMS concepts.

By providing aggregate statistics, exception notifications, and historical data visualizations, Administration Console reduces the amount of time that DBAs spend collecting and analyzing data to find actionable insights. As an analysis accelerator, Administration Console is a strategic tool for the modern IMS shop, which must contend with an increasing workload while confronting a decreasing number of experienced DBAs.

Putting it All Together

To illustrate how the IMS Tools autonomics and modernization strategy can be applied to simplify the task of keeping an IMS system running at its optimal levels, consider the following scenario:

An IMS DBA might start by using Policy Services, which is also a component of the no-cost IBM Tools Base for z/OS, to define policies to evaluate specific database conditions, such as the current rate of space utilization or the

percentage of CI and CA splits. The DBA assigns threshold values (warning, severe, and critical) to a database condition and defines the action to take when a threshold value is reached. For example, you can define a policy that sends an email to a group of users when a policy reaches its warning-level threshold and that further recommends a database reorganization when it reaches its critical-level threshold. The flexibility afforded by Policy Services makes it easy to create a monitoring strategy that is perfectly tailored to your particular database environment. The policies are used by Autonomics Director to determine the health of a database resource.

After policies are defined, the DBA uses Autonomics Director to automate many of the routine monitoring tasks that are required to ensure that a database environment is performing at its optimal level. The DBA will start by creating a *monitor list*, which is a list of resources to be monitored and that can include databases, partitions, and areas. The monitor list is populated automatically through the use of the Discovery Utility. The DBA can fine-tune the monitor list by adding, modifying, and deleting entries. The DBA will then use Autonomics Director's robust scheduling feature to monitor the system automatically at user-defined intervals. For example, to avoid the performance impact running Autonomics Director during peak operating times, a DBA might want to run it only at night and on weekends. When the DBA has customized the Autonomics Director environment, Autonomics Director:

- Monitors the system only during the time periods defined by the DBA, and monitors only those resources that are defined in the monitor list
- Automatically collects *sensor data* by using either the standalone utilities that are provided with IMS Database Solution Pack for z/OS and IMS Fast Path Solution Pack for z/OS or by using integrated data collectors that are provided with IMS HP Image Copy, IMS HP Pointer Checker, and IMS Fast Path Solution Pack: IMS High Performance Fast Path Utilities (sensor data is information captured at an instance in time that represents the condition, or state, of one or more databases)
- Compares the sensor data against the policies and rules



- When thresholds are reached, notifies the appropriate people or recommends actions based on the parameters that are defined in the related policies

Now that policies have been defined and Autonomics Director is actively monitoring the health of your IMS system, you can use Administration Console to extend the benefits of Autonomics Director and of other IBM Tools Base components to provide you with a graphical web interface that represents your IMS environment.

A DBA can run the IMS Tools Discovery Utility from within Administration Console to easily build and manage a list of IMS resources that you want to work with in Administration Console. These resources are displayed in the Administration Console interface. After resources have been identified, the DBA can:

- View aggregate and detailed information about IMS resources at a glance
- View graphical charts of historical data that is captured during sensor data collection
- Search for and access all IMS Tools reports that are stored in the IMS Tools Knowledge Base report repository
- Conveniently view the state of all of monitored resources and know when a resource is approaching or has exceeded a threshold
- In situations that require intervention, such as when Autonomics Director determines that a database needs to be reorganized, initiate a database reorganization by using IMS Database Reorganization Utility

For example, in a matter of minutes a DBA can open Administration Console, quickly view the states of all monitored resources, research those resources that are approaching a threshold or that have exceeded a threshold by accessing related reports, and take corrective action. In cases in which Autonomics Director has recommended an action, a DBA could simply perform that action to resolve the exception.

Conclusion

So you see that IBM IMS Tools are continuing to evolve to meet the demands of a changing workplace. Our focus on automation and modernization is aimed at making life simpler for the IMS DBA, both new and experienced, by providing automation capabilities in an integrated package and delivering these capabilities in a modern graphical user interface environment.

Resources

IBM Tools Base (including Autonomics Director, Administration Console, and Policy Services)

<http://www.ibm.com/software/data/db2imstools/imstools/ims-base-solution-pack/features.html>

IMS Database Solution Pack

<http://www.ibm.com/software/data/db2imstools/imstools/ims-database-solution-pack/features.html>

IMS Fast Path Solution Pack

<http://www.ibm.com/software/data/db2imstools/imstools/ims-fastpath-solution-pack/features.html>

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