THRUPUT MANAGER®
AND
WORKLOAD MANAGER

For over 15 years, ThruPut Manager has been the leading technology in the area of batch automation solutions for MVS, OS/390 and now z/OS installations with JES2. ThruPut Manager automates the management of batch workload standards, batch throughput, resource-based workload routing in a Parallel Sysplex and resource utilization.

With OS/390 Version 2, IBM introduced new batch technologies for Workload Manager and JES2. This document describes how ThruPut Manager continues to complement, enhance and exploit the batch management facilities of JES2 and Workload Manager, making Workload Manager work for you.

WLM Managed Initiators

IBM's WLM-managed initiators offer a number of advantages for batch management over that provided by JES2. These include management of the queue time for batch jobs and management of the number and optimal placement of initiators required to meet your goals, all based on your Service Class definitions.

However, WLM also offers many challenges. For example, it has no control over the standards for such parameters as Job Class and Service Class that have a major impact on the decisions made by WLM and therefore on your ability to meet your goals. How ThruPut Manager is the solution to many of the challenges Workload Manager still presents is described in the rest of this document.

Job Class

The Job Class is a key element in the world of WLM-managed initiators, as it is used to determine whether the job will be managed by JES2 initiators or WLM-managed initiators. The Job Class is also a primary factor in the derivation of the Service Class, along with Priority, Performance Group, Jobname, Account, Userid and Scheduling Environment. Leaving this up to the user community to specify leaves the data center without control of their batch.

ThruPut Manager takes the execution class out of the users' hands and places it in your control. Your rules, based on ThruPut Manager's analysis of the job and knowledge of its resource requirements, determine whether this job should be managed by JES2 or WLM and set an appropriate job class. As well, you can set the Priority and Performance Group, thus ensuring that the Service Class is derived correctly.

Service Class

The Service Class is also a key element in Workload Manager, since it specifies the goals for the job.

ThruPut Manager, as shown above, can ensure that the parameters from which the service class is derived are set correctly; but it can do more than that! It can also set the Service Class directly. This allows

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Automation
Designed
for Batch

your service classes to reflect the resource requirements of the job, such as the number of tape drives required, mounts or recalls, or perhaps the amount of CPU requested.

Workload Routing

WLM-managed initiators provide a major step forward in the automation of batch workload. However, they give rise to a new problem, that of routing the workload to where you want it to run. Previously, you could control this by defining initiators of certain classes where you wanted that workload to run, as for example placing production classes on your fastest processor or putting BMP classes where the IMS region is running. With WLM-managed initiators this solution is not possible.

IBM's solution is Resource Affinity Scheduling, a JCL-based facility to route work within a multi-access spool complex. ThruPut Manager offers a more automated, user-independent means of achieving a solution to the routing problem, known as Job Binding Services.

Scheduling Environment

WLM's Resource Affinity Scheduling provides a facility to route work within a multi-access spool complex. However, this facility requires the user to specify a Scheduling Environment, using a new parameter on the Job statement, SCHENV=.

Rather than relying on your users to select the correct scheduling environment you can set it automatically within ThruPut Manager, based on knowledge of the real resource requirements of the job. In addition, ThruPut Manager with Job Binding Services can override any user-specified system affinity, avoiding conflicting directives and providing a richer, user-independent, automated solution to the problem of workload routing.

Management of Consumable Resources (e.g., Tape Drives)

A common problem with WLM-managed initiators is that they do not manage consumable resources such as tape drives and neither do they allow you to easily control their usage by the traditional means of appropriate resource-based job classes. This leads to allocation recovery situations and consequent processing delays.

ThruPut Manager's Drive Booking Services allows you to automatically restrict WLM from initiating new jobs, and thereby wasting valuable system resources, when tape drives are not available.

Enqueue Contention

Another issue with WLM-managed initiators is that they do not manage dataset enqueue contention and therefore may initiate jobs that simply sit in an initiator waiting for a dataset to become available, meanwhile holding enqueues on other datasets.

ThruPut Manager's TM/Dataset Contention Services™ will eliminate contention from static allocations in batch jobs. When contention would occur, the job is held back in a DCS hold until such time as the dataset becomes available, freeing the initiator for useful work.

Minimizing Delays

With WLM-managed initiators and Service Class goals such as turnaround and velocity, any unnecessary delays can cause WLM's statistics to be skewed, resulting in service classes missing their goals

or perhaps in inappropriate corrections by WLM. Many of these delays can be avoided with ThruPut Manager.

For example, HSM recalls can be completed, often in parallel, before the job begins initiation. "Pull Lists" can be generated so that the required volumes are on the floor before the job begins, minimizing mount time. "Entry Lists" can be generated for volumes required to be in a Robotics library, so they can be entered before the job is allowed to begin. Allocation recovery situations can be avoided by the use of Job Limiting Services for tape drives. Dataset enqueue contention can be avoided. All of these improve the overall efficiency of your operation and allow WLM to more effectively manipulate initiators to help you meet your goals.

Datacenter Control

Many datacenters are concerned about their loss of control with WLM initiators. For example, they can no longer change a job's queue position by changing its priority; they cannot have a system reserved primarily for online but with a small amount of batch. ThruPut Manager provides these controls, through automated means and manual overrides, so that datacenters have the control they need.

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In conclusion, IBM's solution for automated batch workload management in z/OS is JES2 with it's many historic limitations in combination with the batch oriented enhancements to Workload Manager. But Workload Manager was designed for the online world and IBM's attempt to extend WLM architecture to the world of batch is wanting. As noted above, in a basic JES2/WLM environment, many essential functions of a true "system managed batch" solution are missing.

ThruPut Manager completes the picture. With JES2, Workload Manager and ThruPut Manager working together, the perfect batch management solution is a reality. ThruPut Manager makes Workload Manager work for you!

This document assumes the reader is familiar with ThruPut Manager. Only certain highlights of the product have been discussed here. For further information, please contact us as noted on the first page.

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