ThruPut Manager®

AND JES3

*Bringing the best of **JES3** to **JES2** installations*

This paper will be useful for any JES3 installation considering a conversion to JES2. It explains the relevant functionality in the ThruPut Manager base product as well as that under JES3 Compatibility Services, Dataset Contention Services, Job Binding Services, Job Limiting Services, Drive Booking Services, Job Setup Services, and Job Timing Services.

ThruPut Manager does not run with JES3. However, it can be of invaluable assistance to an installation converting from JES3 to JES2 by providing equivalent function to some of the JES3 capabilities which would otherwise be lost, or which pose a significant challenge, on such conversion.

This document compares and contrasts JES3, JES2, and **ThruPut Manager**, under the topics of:

- JCL Compatibility,
- Dependent Job Control,
- Resource Management,
- Deadline Scheduling,
- Dynamic Support Programs and JES Exits, and
- Job Selection Mode and Job Groups.

JCL Compatibility

JES3

JES3 provides numerous //*-type JCL statements which generally fall into three categories:

- Those irrelevant to JES2, such as the //*MAIN statement.
- Those pertaining to functionality not available with JES2, such as the //*NET statement.
- Those where JES2 uses different syntax to provide similar functionality, such as the //*FORMAT statement.

JES2

If a JES3 jobstream was submitted without change to a JES2 system, the JES3 statements would be ignored as comments, yielding entirely unsatisfactory results. For example, all the jobs would run in the default JES2 Jobclass and jobs with //*NET dependencies would run out of sequence.

ThruPut Manager

JES3 Compatibility Services automatically invokes equivalent JES2 facilities "on the fly" where applicable. For example, this facility will invoke JES2 //OUTPUT DD services when //*FORMAT statements are encountered, without requiring any change to the actual JCL.

Further, when the **ThruPut Manager** automated analysis encounters JES3 control statements, it creates Job Action Language (JAL) descriptors for most of the JES3 parameters. JAL rules can further direct and customize the handling of the job by **ThruPut Manager**. For example, the WLM Service Class for the job could be automatically assigned based on the 8-character JES3 CLASS parameter of the //*MAIN statement.

JES3 Compatibility Services eliminates any requirement to convert JES3 JCL to meet JES2 standards.

Dependent Job Control

JES3

JES3 provides a mechanism for users to control the execution sequence of a group of jobs based on JECL statements within the jobs. JES3's Dependent Job Control (DJC) supports complex networks of jobs, with conditional execution of jobs depending on completion codes of predecessor jobs.

JES2

JES2, on the other hand, provides none of this, which is where **ThruPut Manager** comes in.

ThruPut Manager®

THE LEADER IN BATCH AUTOMATION

ThruPut Manager

JES3 Compatibility Services provides a dependent job network facility which has full syntax compatibility with JES3 //*NET statements. No JCL changes are required when converting from JES3 to JES2.

Resource Management

JES3

JES3 provides management of real (as distinct from logical) resources, including datasets and devices. This means that JES3 automatically determines, after conversion, which datasets a job needs to access, which volumes these datasets are on and which devices it needs to access.

- For datasets, JES3 ensures that the required enqueue can be successfully made.

- For devices, it ensures that the high water mark of devices is available.

- Both the above conditions must be satisfied before the job is allowed to initiate.

- JES3 also provides "pull lists" of mountable volumes required by the job.

JES2

Again, standard JES2 provides none of this.

ThruPut Manager

ThruPut Manager provides functionality which is effectively equivalent to JES3.

- For datasets, **Dataset Contention Services (DCS)** will not allow a job to start unless all the datasets it requires can be successfully enqueued, either shared or exclusive as required.

- Devices (typically tape drives) can be handled in a somewhat equivalent way by **Job Limiting Services (JLS)** which counts devices and ensures that enough are available before allowing the job to initiate. Note that **JLS** is simply counting logical entities whereas JES3 is allocating real devices. In addition, of course, the logical limiting (concurrent access control) provided by **JLS** gives a host of other benefits to the datacenter.

- A more comprehensive solution for tape drives is provided by **Drive Booking Services (DBS)**. It knows all drives defined on the system, including manual, virtual and automated, and keeps track of the actual availability at all times. As jobs are submitted it maps their requirements to this availability.

- Pull lists are handled by the **Job Setup Services (JSS)** with its Job Volume Lists. **JSS** also provides Consolidated Volume Lists which are pull lists for a group of jobs.

Deadline Scheduling

JES3

JES3 provides a JCL-based deadline scheduling mechanism. It allows a user to i) specify a completion date and time for his job and ii) associate the job with a set of rules that specify how long the job runs and how to increase the priority of the job to ensure it meets the deadline.

For example, a job is estimated to take 15 minutes to run and must be complete by 15:00. The priority management rules might specify that beginning 45 minutes prior to its completion deadline, if the job is not yet at the top of its queue, the job's priority is to be increased by 1 every 5 minutes. Further, if the priority crosses a system-defined threshold, let's say 14, no other work will begin until that job is initiated.

JES2

JES2 itself provides none of this function. Most job scheduling products provide something fairly similar for scheduled production workload only. Typically, they use their own tracking to determine when a job must be submitted with the expectation that classes, initiator setup, and the like is such that the job will execute almost instantly on submission. This may or may not be the case.

ThruPut Manager

JES3 Compatibility Services provides a deadline scheduling compatible with the JES3 facility. Also, **ThruPut Manager** provides the **Job Timing Services (JTS)** function, which provides a JECL-based "hold until date/time" mechanism for non-scheduled jobs.

Dynamic Support Programs and JES Exits

JES3

Dynamic Support Programs (DSPs) are processes that are scheduled by the system to operate on a job. They include the Reader, the Converter and potentially a number of user-written processes. These are somewhat similar to exits but are more powerful.

JES3 also provides traditional exits.

JES2

JES2 of course has numerous exits but no mechanism equivalent to DSPs. In a JES3 to JES2 conversion, JES3 exits and DSPs would have to be eliminated or re-written as JES2 exits.

ThruPut Manager

Many enhancements, particularly those of a standards enforcement nature, which had been implemented as JES3 exits or DSPs can be replaced with **ThruPut Manager** rules, using its Job Action Language or JAL. On conversion to JES2 with **ThruPut Manager**, an installation may be able to eliminate user-written DSPs and JES exits altogether.

One very common reason that JES2 installations acquire **ThruPut Manager** is to eliminate JES2 exits, which are becoming increasingly difficult to maintain due to a lack of time and available expertise.

Job Selection Mode

JES3

Job classes in JES3 are defined as belonging to particular Job Groups, each of which is associated by definition with a job selection mode.

Each processor in a JES3 complex has one or more Job Selection Modes set for it, which determine which Job Groups, and therefore which jobs, may be selected. For example, some job selection modes may be called SHIFT1, SHIFT2, and SHIFT3 and are made eligible for a particular processor by an operator command. Job class DEFER may belong to job group CHEAPBCH which may be selected by

selection modes SHIFT2 and SHIFT3.

JES3 can dynamically start and stop initiators on any eligible processor to get work through, so this mechanism, together with DJC and resource management, is used to determine where a given job may be started.

JES2

JES2 again has nothing, although WLM-managed initiators and Resource Affinity Scheduling provides some equivalent function.

ThruPut Manager

Job Binding Services (JBS) allows an installation to associate a job with a particular resource such as a database region, or an abstract 'resource' such as SHIFTx. **JBS** is much more flexible, since the association can be based on far more than just the Job Class. It is also more automated and less dependent on users than either JES3 or Resource Affinity Scheduling.

Should an installation choose to use WLM's Resource Affinity Scheduling to deal in part with this significant JES3 vs. JES2 difference, **ThruPut Manager** can assist by automatically determining and setting the WLM "Scheduling Environment" for each job, based on the installation's standards. This will ensure that Scheduling Environments are always provided when needed, and are always correct – without any user involvement or JCL change.