

ThruPut Manager is an unprecedented z/OS JES2 batch workload automation solution. This paper discusses three ways ThruPut Manager automation can positively impact the datacenter's budget this year and each year hereafter.

A datacenter can reduce the cost of service in a variety of ways such as application tuning, refining network response times, implementing automated operators and stepping up to more modern equipment. Datacenters are continually undertaking such measures.

Batch is another area that gives excellent payback for the effort involved. It is a significant portion (20-50%) of most mainframe workloads and the improvements to be had are generally greater than with online. (The online arena has been tuned and enhanced for many years). In general, these savings follow from using **ThruPut Manager** to automate and optimize the z/OS management of the batch system.

Automation is the Key to Batch Savings

The batch process has retained many of its characteristics from the early days of mainframes. It is still driven by JCL and requires much manual intervention to guide the workload through to completion. In short, batch processing is ripe for automation and the benefits it can bring.

At MVS Solutions, we have developed an unprecedented service-oriented automation solution for batch.

ThruPut Manager takes the service goals for each job and uses them to manage the overall workload.

ThruPut Manager's automation algorithms optimize throughput and resource utilization for all batch jobs. It

manages the workload and resources to meet your service targets and to give preference to more important jobs. It automatically invokes escalation mechanisms when necessary to handle increased workloads or outages.

This allows the datacenter to get more out of what it already has. Further, when capacity is squeezed, the datacenter can rest assured the most important work is being serviced first.

This paper discusses four cost-saving strategies a datacenter can readily implement within their own span of control. Using **ThruPut Manager**, a batch-oriented approach can be undertaken for each without an elaborate implementation project. Firstly, you can reduce software licensing costs (MLC) by overcoming the obstacles to licensing fewer images. procedures.

Secondly, you can defer CPU upgrades by reducing batch elapsed time thereby recovering capacity in the systems you already have, improving load distribution to fill in the peaks

Cost Saving Strategies facilitated by ThruPut Manager	Monthly costs	Monthly value of savings	Yearly Value of Savings
Reduce software licenses			
Defer CPU upgrades			
Lower sub-capacity thresholds			
TOTAL savings			

Figure 1 - Sources of Savings Buried in Mainframes

Using ThruPut Manager, a datacenter can expect to realize savings in these three areas. They are easy for a datacenter to implement without incurring a lengthy cross-departmental project. However the strategy is unusual in that it involves looking to your batch processing for across-the-board savings.

and valleys of utilization and deferring less important batch work until later.

Thirdly, you can lower sub-capacity pricing thresholds to virtually reduce the capacity you are paying for.

1. Reduce Software Costs

Licensing without ThruPut Manager

Traditionally, software products have been licensed on every machine. However, as systems have grown in capacity, multiple LPARs on a system have increasingly become the norm, and LPAR-based pricing models are now offered by many vendors. Accordingly, there are significant savings to be had by licensing a reduced number of LPARs.

When scaling back the number of licensed LPARs, the datacenter must decide between two approaches to product installation.

The first is to install the products only on the licensed systems. Although this ensures compliancy with the license agreements, it complicates the task of software maintenance and makes it difficult to quickly switch to a backup system in the event of an outage.

The alternative is to leave the software on all systems, which solves the maintenance and recovery problems. However the datacenter must then control where jobs and TSO sessions that access that software run in order to be compliant with the license and avoid contractual penalties.

With either approach, users have to know which products their job will use and on which systems they are licensed. If they route their jobs incorrectly, in the first approach jobs will fail and, in the second, license compliancy will be compromised.

Licensing with ThruPut Manager

ThruPut Manager overcomes these obstacles. With it, you can install licensed software on all systems for convenience and pay for just the licenses you need.

- **ThruPut Manager** automatically determines what product(s) a job requires and ensures it runs on a licensed system.
- In the case of TSO, it prevents users from using the wrong systems and directs them to the correct one.
- It facilitates immediate rerouting of workload when a particular system is down.
- A reduction of licenses can be undertaken with no added burden or involvement from your users.

ThruPut Manager does all this automatically while ensuring license compliancy and removing any risk of penalties.

A Single LPAR for Maximum Savings

Because the **ThruPut Manager** solution is transparent to users, and routing jobs to a licensed system is fully automatic, you can consider creating an LPAR just for the purpose of licensing a particular product. By applying this approach to their most expensive software, one **ThruPut Manager** customer reduced their software costs by tens of thousands of dollars per month.

2. Defer CPU Upgrades

A CPU upgrade is necessitated by unacceptable response times for online systems or unacceptable service times for batch, especially production batch. **ThruPut Manager** helps by optimizing batch throughput to reduce elapsed time and recover capacity and by managing the workload to ensure that the available batch cycles go to the work that matters. **ThruPut Manager** helps online indirectly by keeping the amount of batch at a level that can be processed and by distributing batch workload to other LPARs with latent capacity.

These approaches allow you to squeeze more work out of your existing equipment and thus defer an upgrade.

One customer uses ThruPut Manager to run their most expensive licensed software on only one LPAR, saving them tens of thousands of dollars per month.

Batch Delays are a Latent Source of Capacity

CPU capacity is like time – it's a resource you can never get back, so you have to make good use when it's available.

ThruPut Manager modernizes your batch processing. It uses queue time to prepare jobs to run; it manages dataset conflicts and tape drive conflicts between jobs; it eliminates most if not all of the run-time delays caused by these resource issues. And at each stage it uses its knowledge of the workload to favor more important and urgent jobs.

The result is batch jobs complete in less time, making datasets, database locks, tape drives and initiators available for other workload. Processor capacity is better utilized, effectively recovering capacity for other use.

One other area of inefficiency is initiator management. JES2 initiators, for example, are manually controlled. A common operations reaction to slow batch throughput is to open up more initiators. WLM initiators are automatic but tend to overload the system and let the execution-time WLM management control who gets access to the CPU. The result in either case is to have additional system overhead and low priority work holding resources for potentially long periods of time.

ThruPut Manager automatically manages initiators such that it does not overload the system and will not start a job if it determines the job will not get service. In addition it distributes workload to available LPARs to avoid overloading any system. The result is faster overall throughput, less system overhead and better resource availability.

Since these optimizations apply to every job, the whole workload, regardless of the application characteristics, runs faster and CPU capacity is available for other use.

Prioritize the Workload

Because **ThruPut Manager** can identify priority jobs, its automation techniques ensure the most important workload is delivered on time, and favor the more important workload when volumes are high or capacity is restricted, as in an outage. **ThruPut Manager** will easily outperform what even the best operator can do.

How Much Can You Save?

ThruPut Manager allows you to be more aggressive about deferring a CPU upgrade than you could ever consider without **ThruPut Manager**. The potential for savings is substantial.

Further, in addition to the immediate saving of an upgrade, certain software such as the operating system, compilers and so on are priced according to the hardware it runs on. Every month of deferring a CPU upgrade also saves the incremental cost in the associated system software. This can save thousands of dollars per month, and in the case of medium to large datacenters, tens of thousands of dollars per month.

3. Lower Sub-capacity Pricing Thresholds

IBM allows customers to pay for certain software based on the highest rolling 4-hour average (R4HA) of usage in a month. You pay as if the system's capacity was the level reached by the highest average. IBM also gives you the ability to define the capacity of any system or group of systems. This means if a system reaches this defined level it becomes constrained as to the amount of processing it can do. A datacenter's challenge is to set the defined level as low as possible and still meet its service targets.

Steps to Software Licensing Savings

Step 1: *Identify software with potential for use on fewer LPARs. Batch/TSO software products such as EZtrieve, SAS, and Focus may be good candidates.*

Step 2: *License just the images needed.*

Step 3: *Use ThruPut Manager to define the licensed system(s) to the Software Access Control (SAC) table. In an outage, a simple change is all that is needed.*

ThruPut Manager automatically routes dependent jobs to the appropriate LPAR. It automatically sorts out routing for jobs with multiple software products. A message tells TSO users the correct system for the product they are trying to access.

How Does ThruPut Manager Save Money?

With **ThruPut Manager** you can lower your defined capacity level while delivering the same service and realize the associated savings. This is analogous to deferring an upgrade, but rather you are (virtually speaking) downsizing your existing system.

Firstly, **ThruPut Manager** runs your batch workload more efficiently, making better use of the existing capacity. The recovered capacity enables you to lower the defined level.

Secondly, whenever the system is very busy, **ThruPut Manager's** selection mechanism ensures the batch work that *is* selected is comprised of the most important jobs, deferring less important batch until later.

Thirdly, with its Automated Capacity Management (ACM), **ThruPut Manager** keeps track of the rolling 4-hour average, anticipates it reaching the desired limit, and stops selecting batch jobs of lesser importance, ensuring that only online and the most important batch work are using system resources. This allows the defined capacity to be set lower without affecting the performance of critical work. The resulting MSU savings can be significant, as seen in Figure 2.

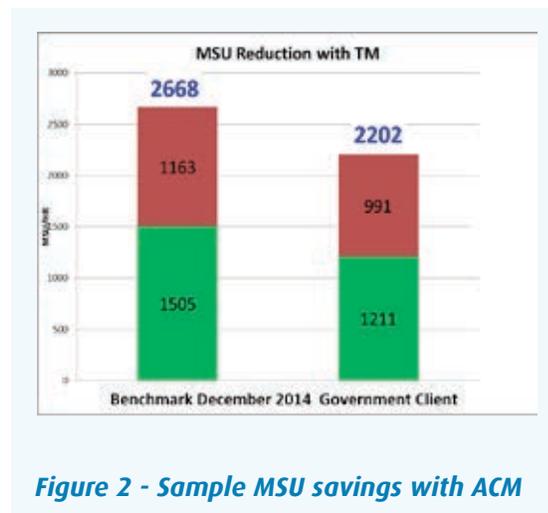


Figure 2 - Sample MSU savings with ACM

Simply put, with **ThruPut Manager** you can do more with less, and with less impact to your service levels.

Mine the Savings Buried in Your Datacenter

ThruPut Manager is an all encompassing batch automation solution that is easy to implement and brings immediate benefits to your datacenter. Each of the three strategies discussed produce additional savings in ancillary budget items such as space, power, and support personnel. In addition, using **ThruPut Manager** has several organizational impacts which will produce savings.

ThruPut Manager is the batch management solution to realize the savings waiting to be mined in your datacenter.

See **ThruPut Manager and Software License Savings** for more information about how the software licensing features operate; and, **ThruPut Manager and Dynamic Initiators** for more information on the automated functionality. Both are available at www.mvssol.com.