Mine the **savings** buried in your datacenter

ThruPut Manager® AE and Datacenter Savings

ThruPut Manager AE (Automation Edition) is an unprecedented z/OS batch workload automation solution. This paper discusses four ways ThruPut Manager AE 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.

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

Figure 1- Sources of Savings Buried in Mainframes: Using ThruPut Manager, a datacenter can expect to realize savings in these four 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.

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 by overcoming the obstacles to licensing fewer images.

8300 Woodbine Avenue
4th Floor
Markham ON Canada
L3R 9Y7

905.940.9404
905.940.5308 (fax)

marketing@mvssol.com
www.mvssol.com

MVS solutions inc.

ThruPut Manager AE

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 and valleys of utilization and deferring less important batch work until later. Thirdly, you can lower subcapacity pricing thresholds to virtually reduce the capacity you are paying for. Fourthly, you can defer tape resource upgrades by improving utilization of existing equipment. Each of these strategies is discussed in more detail.

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.

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

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 while ensuring license compliancy and removing any risk of penalties.

Steps to Software Licensing Savings

1. Identify software with potential for use on fewer LPARs. Batch/TSO software products such as EZtrieve, SAS, and Focus may be good candidates.
2. License just the images needed.
3. Setup ThruPut Manager's Software Access Control (SAC) table to define the licensed system(s). 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.

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 in the batch window.

ThruPut Manager helps batch directly and can indirectly help online systems too. It helps batch by optimizing batch throughput to reduce elapsed time and recover capacity and by managing the workload to make sure that the available batch cycles go to the work that matters. It helps online by keeping the amount of batch down to 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.

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 use of capacity 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 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 Subcapacity Thresholds

IBM allows customers to pay for certain software based on the highest four-hour rolling average of usage in a month. You pay as if the system's capacity was that 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.

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.

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

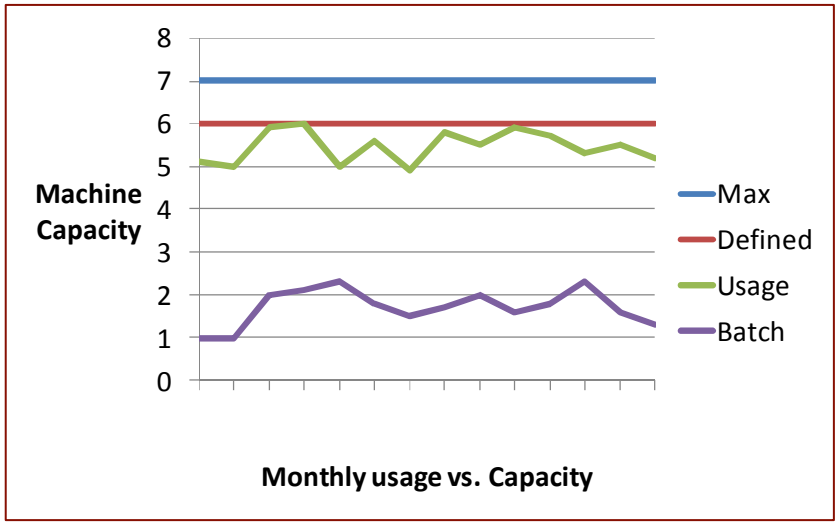

Figure 2 – Usage of an LPAR with Defined Capacity: the graph shows monthly usage versus capacity. It shows the LPAR's' maximum capacity, its defined capacity, its four-hour rolling average usage, and its batch usage for the same period.

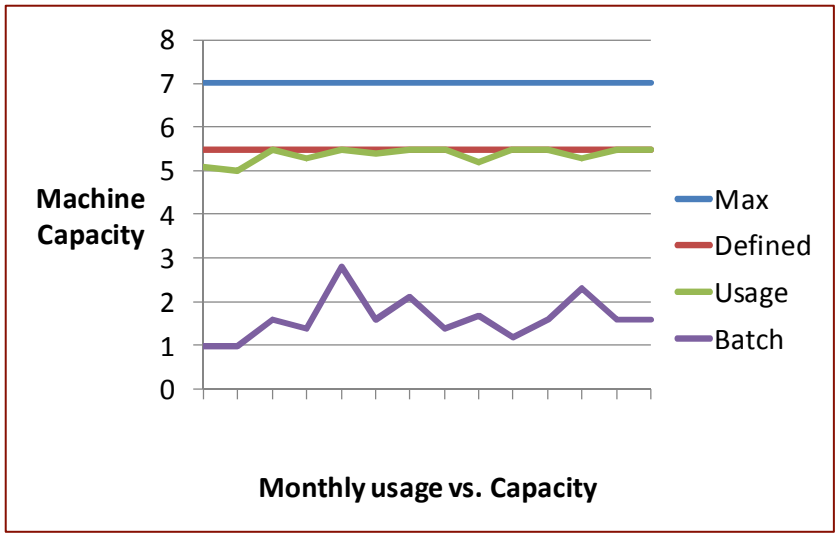

Figure 3 – Usage of an LPAR with a Lower Defined Capacity: This graph shows the same workload with a lower defined level. The overall usage is smoothed out. While batch throughput is choppier, online is still meeting its service targets. With ThruPut Manager, only the less important batch work is deferred if necessary.

Secondly, once the defined level is reached, ThruPut Manager's selection mechanism only selects batch jobs that will receive some level of service (i.e., the more important jobs). Other batch work is not selected and interference with online is minimized. ThruPut Manager ensures that it is the lower priority batch workload which will be deferred. Simply put you can do more with less. See Figure 2 and 3 for a conceptual view of this approach.

4. Defer Upgrades of Tape Resources

Just as ThruPut Manager makes better use of CPU capacity, it also makes better use of your tape resources – capacity that otherwise would be wasted. Since batch jobs run faster, tape drives are freed up more quickly and are available for other jobs to use. You can get more work done with your existing equipment and defer your next upgrade.

Mine the Savings Buried in Your Datacenter

ThruPut Manager AE is an all encompassing batch automation solution that is easy to implement and brings immediate benefits to your datacenter. Each of the four 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 AE is the batch management solution to realize the savings waiting to be mined in your datacenter.

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

This document assumes the reader is familiar with ThruPut Manager AE (Automation Edition). 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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