Given the different approaches of Capacity Planning and Finance, we'll discuss how they can co-exist and be complementary to each other.

ThruPut Manager AE

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- Founded 1988
  - 200 current z/OS customers worldwide
  - IBM Partner in Development
- The Leader in Batch Innovation
  - ThruPut Manager, Version 7.1
  - Manages z/OS Batch to your business goals
  - Automation Edition

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2

MVS Solutions' total focus is on batch in the world of MVS through to z/OS

ThruPut Manager AE

About the Speaker

- Martin Wills has been in datacenters since 1968
- Operator, systems programmer, datacenter manager, software designer and developer, instructor
- ThruPut Manager expert since 1990
- MVS product manager

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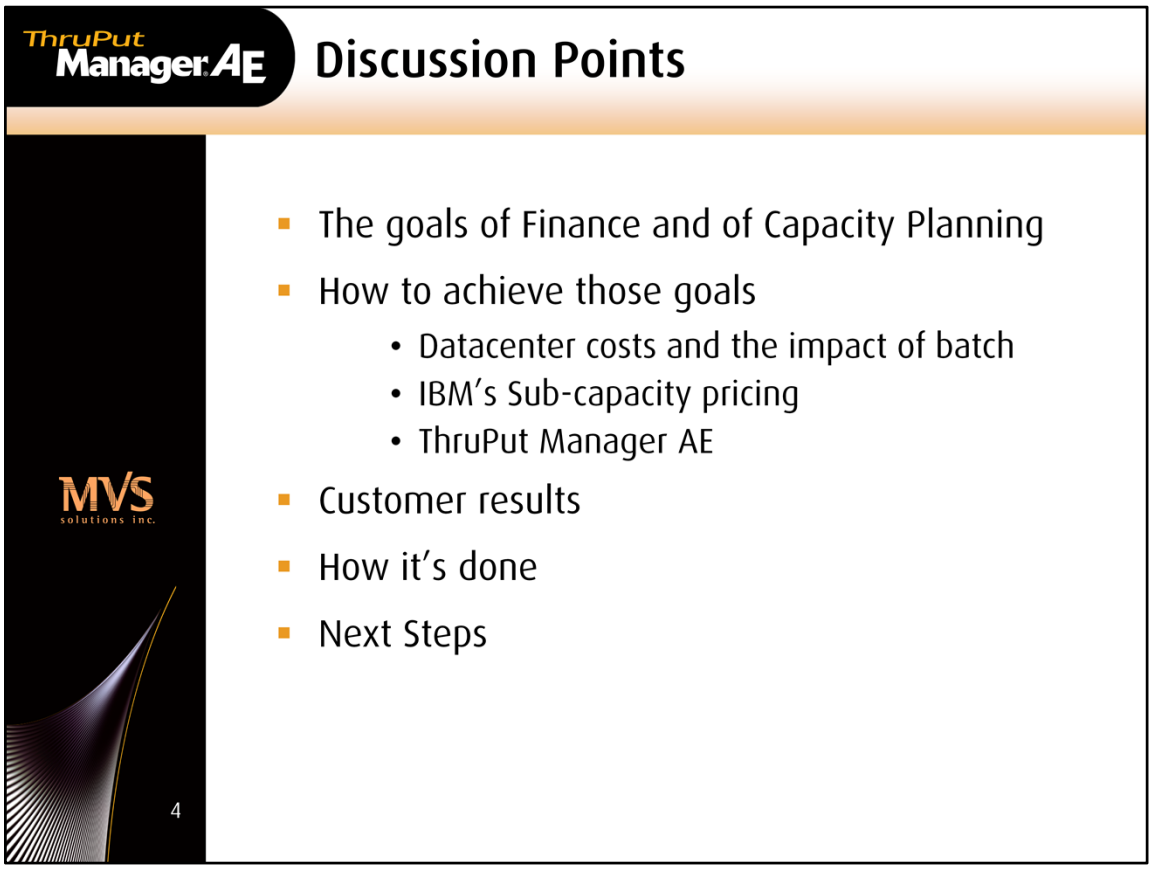
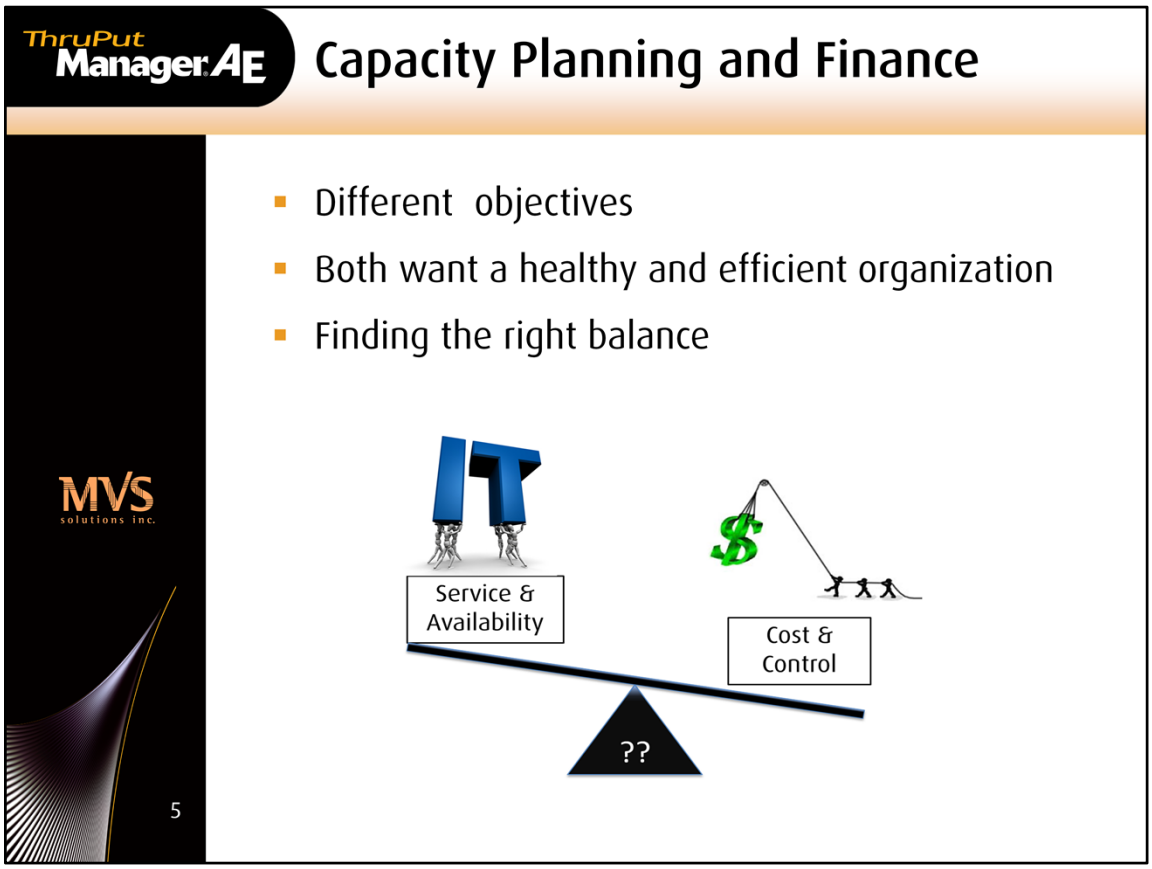
3



We'll show that even though these professionals are coming from different perspectives, they are both on the same team and have a great deal of overlap in their objectives.
We'll show you how you can achieve those objectives in a way that benefits the organization.



Many datacenters today are feeling tremendous pressure to reduce costs while improving service.

Given our druthers as IT people we'd have sufficient power to meet all our objectives and give great service to customers, business departments, programmers, everyone.

Finance, however, would like controls in place so that costs are managed and the organization can meet its overall goals.

Finding the right balance is the key.

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How many of you collaborate with Finance?

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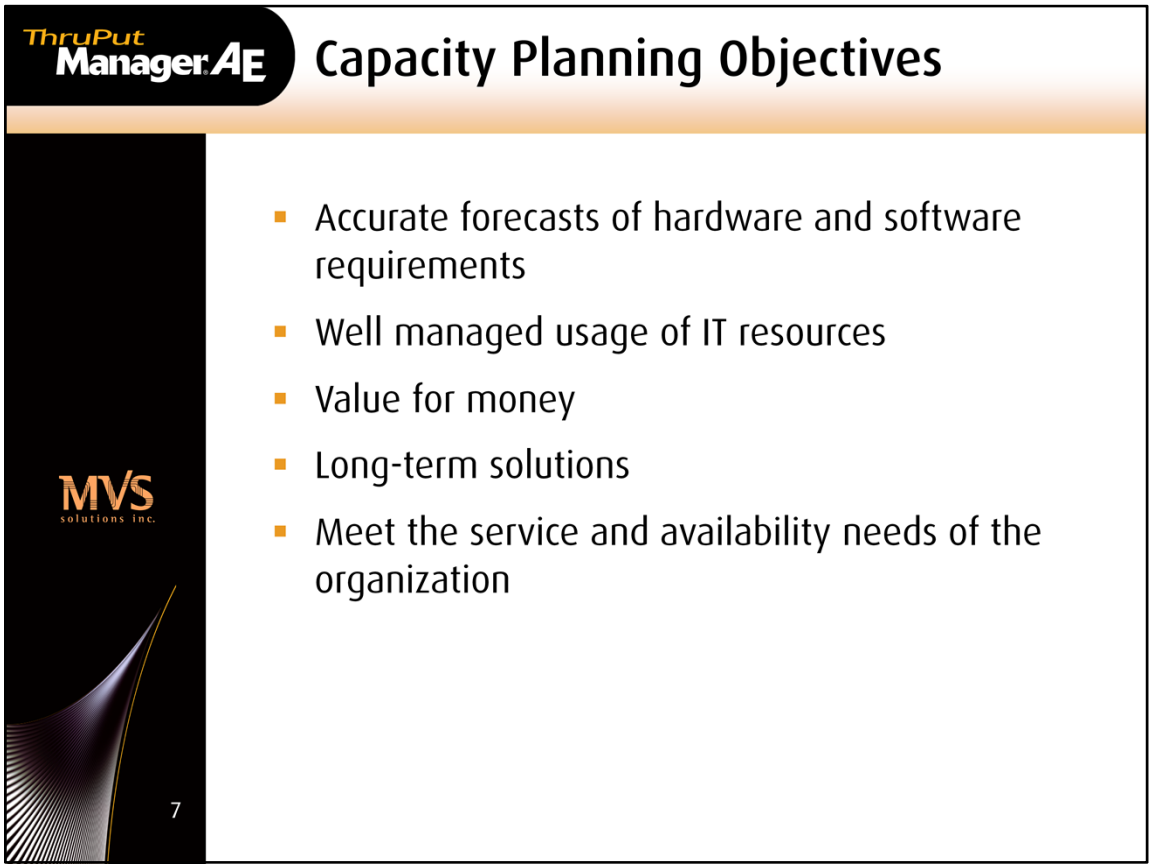
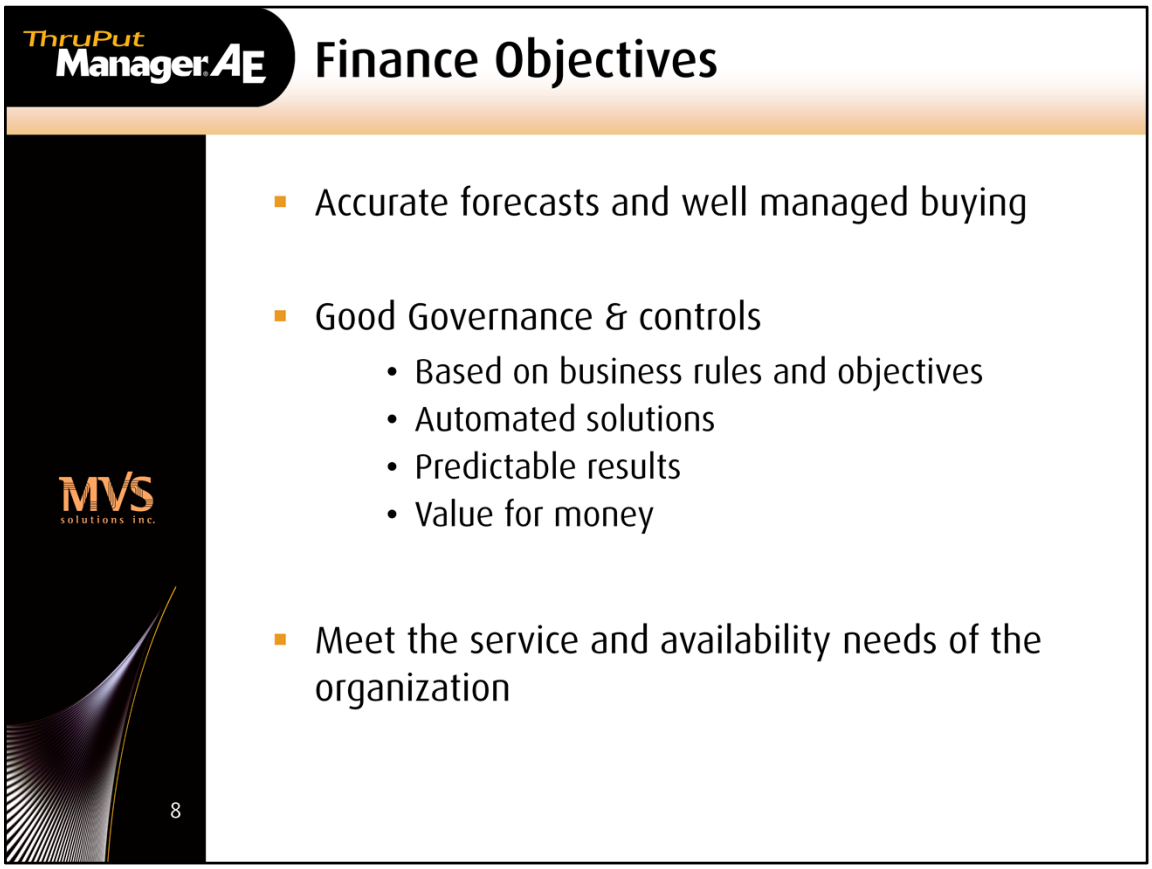


The job of capacity planning is to make sure:

a) that there is sufficient computer power available to meet the peak processing needs of the organization, whether that peak occurs once a year or once a month.

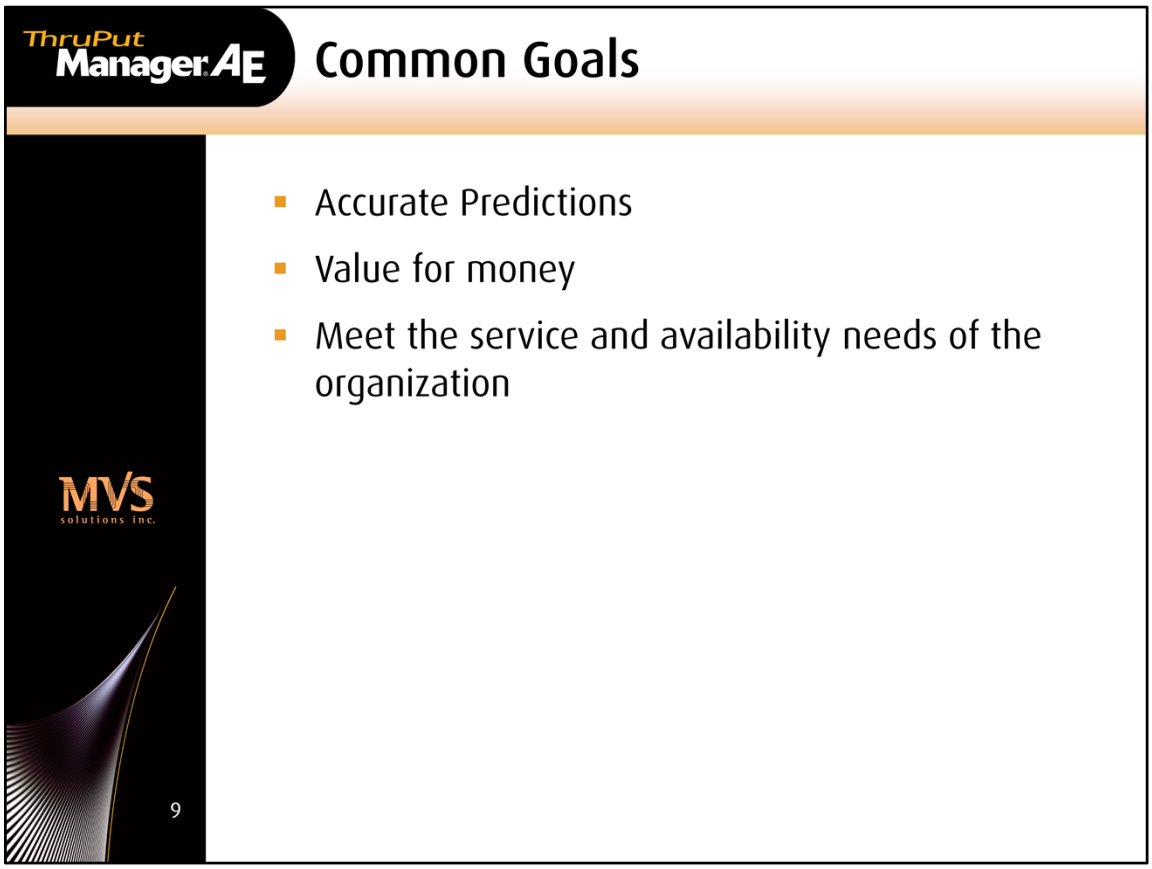
b) that in the event of a machine failure there is sufficient power remaining to carry out the critical functions of the organization

c) that any solution is long-term and sustainable



The job of Finance is to make sure:

a) that forecasts are accurate and provide a firm financial base
b) the needs of the organization are met
c) there are proper controls in place to ensure that any issues become apparent long before they are critical
d) the controls provide automated, predictable results and sustainable benefits



Both groups want their forecasts to be accurate and to avoid fire-fighting, seat-of-the-pants decisions, and chopping and changing.
Both want solutions that are long-term.
Both want the needs of the organization to be met

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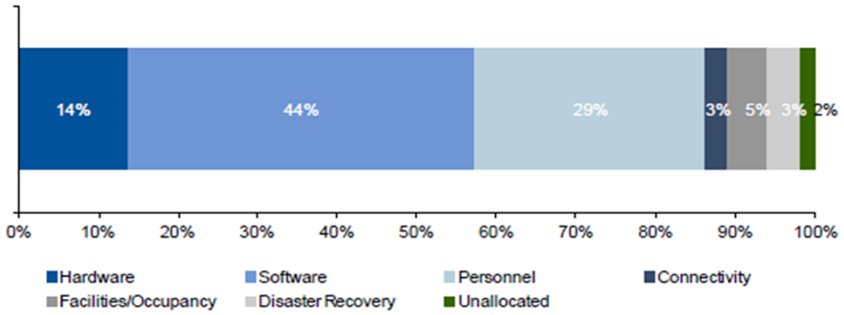
Managing Mainframe Costs

Figure 2. Distribution of Mainframe Costs



Source: Gartner IT Key Metrics Data 2013

Reduce hardware !!

- Need capacity for peaks
- Need availability and performance for critical systems

Reduce staff !!

- Been done
- Most datacenters close to the bone
- Lose knowledge and experience
- Not sustainable

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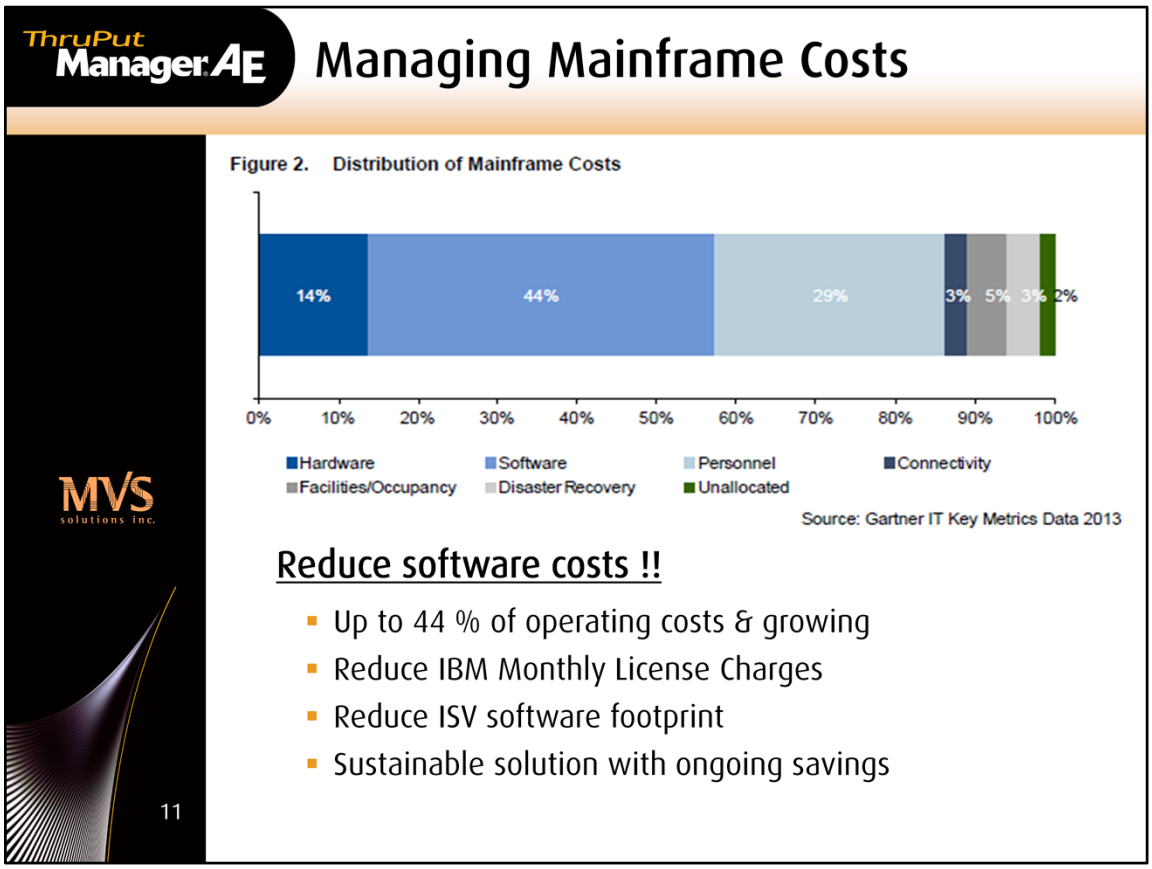
10

The cost distribution chart, from Gartner, shows that hardware accounts for only about 14% of mainframe costs, whereas software accounts for 44% and personnel for 29%.

Significant pressure on management to reduce costs.

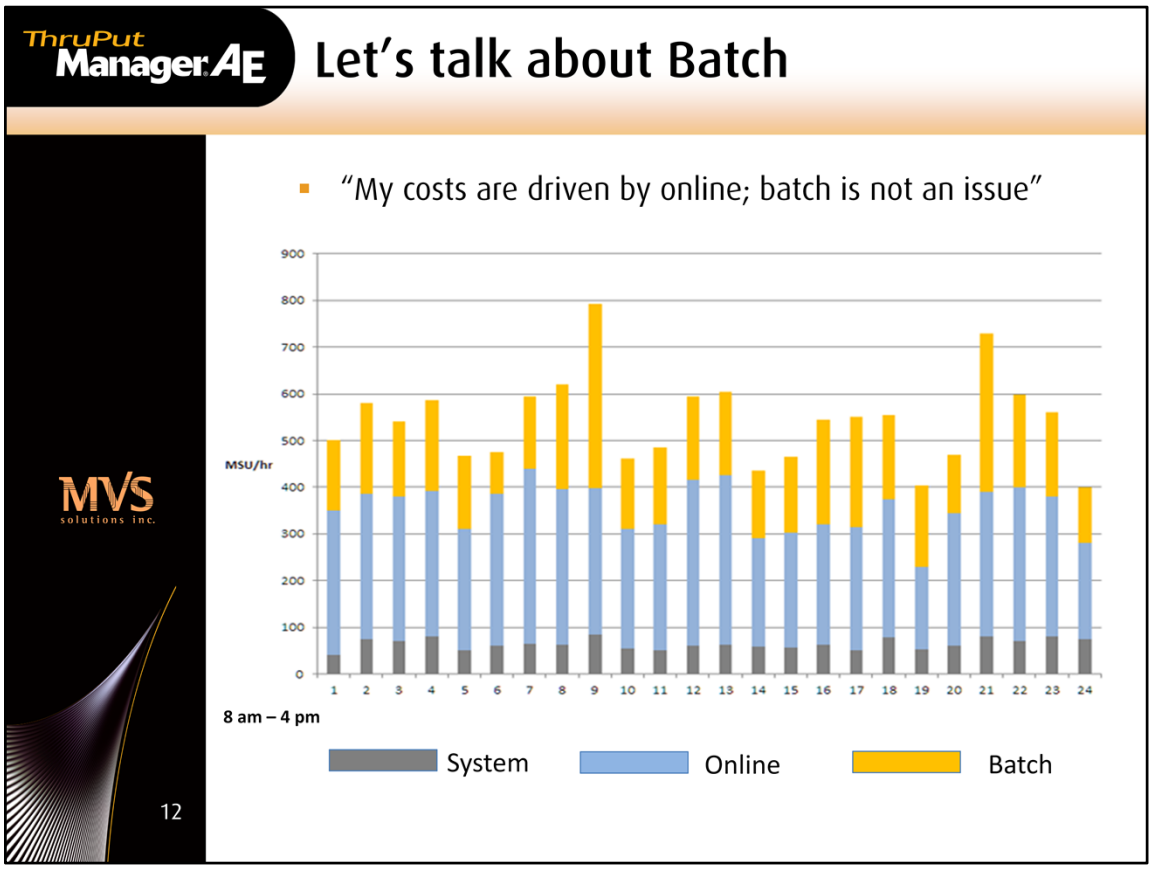
> Hardware is difficult to reduce, since you need headroom for service peaks and can't afford to risk availability
>
> Most datacenters have already cut staff as far as they can
> Many have used outsourcing as a way to reduce staff.



Software costs offer the best opportunity for reduction without risk.

You can reduce IBM monthly license charges and fees for ISV software in a sustainable and controllable manner.

Everybody is talking about this and negotiating the best deals they can, but we'll show you how to reduce costs significantly without affecting service to onlien and your critical applications.



We're talking about batch because we know batch. That's our world. And we know that ALL workloads contribute to your software bill – including batch. In surveys of our customers we found that batch contributes about 30% of the peaks and therefore 30% of the monthly software cost on average.

This chart shows weekday day shift peaks for one month on one large LPAR at a customer site. The grey area is system overhead, the blue sections are online and the yellow sections are batch.

As you can see, batch is a significant proportion of the high processing days – day 9 and day 21 – in particular. Our customers are telling us that Batch actually matters and automating Batch can provide controls and save costs.

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Batch for Finance

- Batch comprises 18%-37% of 4HRA peaks
- Average is 30%
- Some can be slowed or deferred
- Managing the 4HRA requires manual effort

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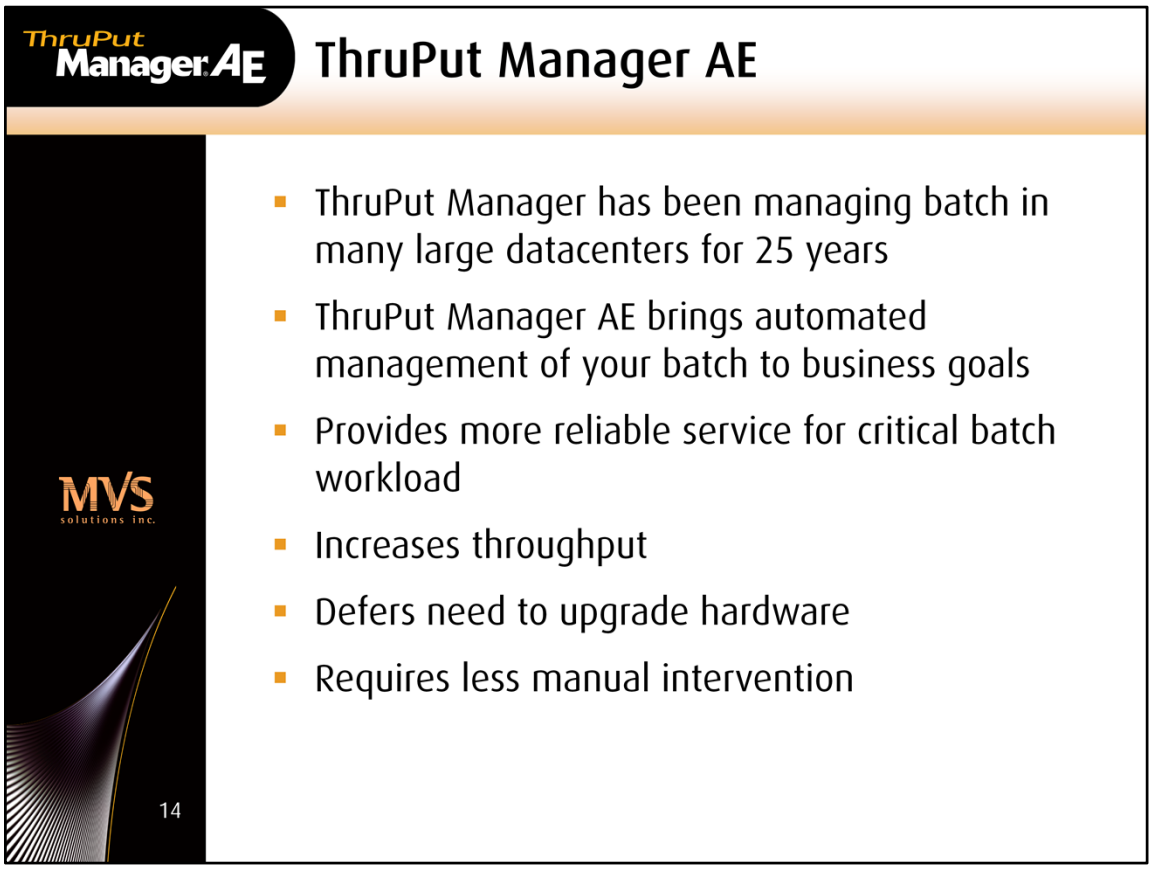
- Deferring Batch can save $millions
- Deferring Batch also means you can defer capital expenditures

13

Finance people know they can't risk affecting online systems very much, since these are time-sensitive and highly visible to senior management and to customers.

But batch offers real opportunities for cost reduction. As you manage your batch and reduce your peaks you will save hundreds of thousands each year.



ThruPut Manager AE (Automation Edition) automatically manages your batch according to your business goals and the availability of processing power. It uses queue time to prepare jobs to run so that jobs in initiators are active, not waiting for a dataset to be available, which improves throughput. This makes the best use of your hardware and enables you to defer the need to upgrade while maintaining good service to your users.

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IBM's Sub-Capacity Pricing

- Measures the usage of the hardware and charges for eligible software by the highest 4-hour rolling average (4HRA) of the month
  - Includes z/OS, JES2, IMS, DB2, ...
- Covers IBM and some ISV software
- Cap (restrict) the 4HRA to what you need

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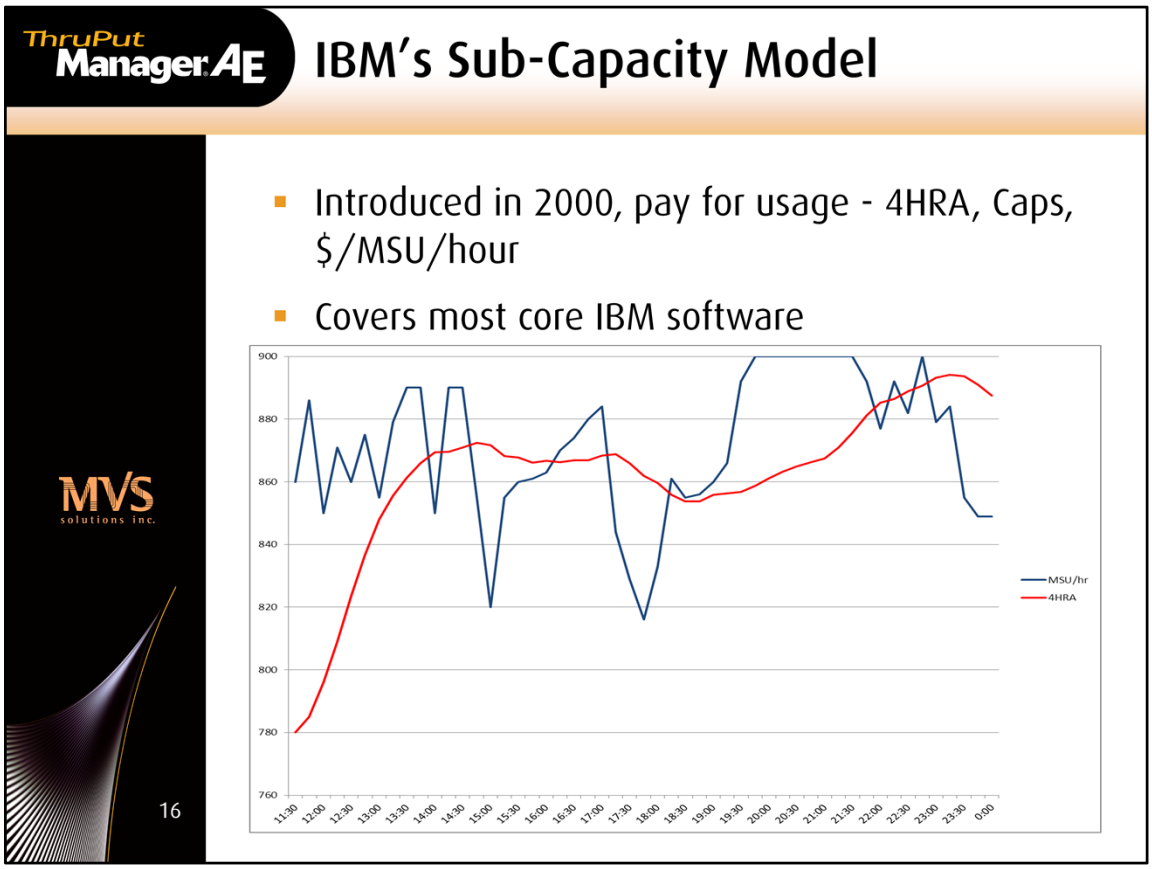
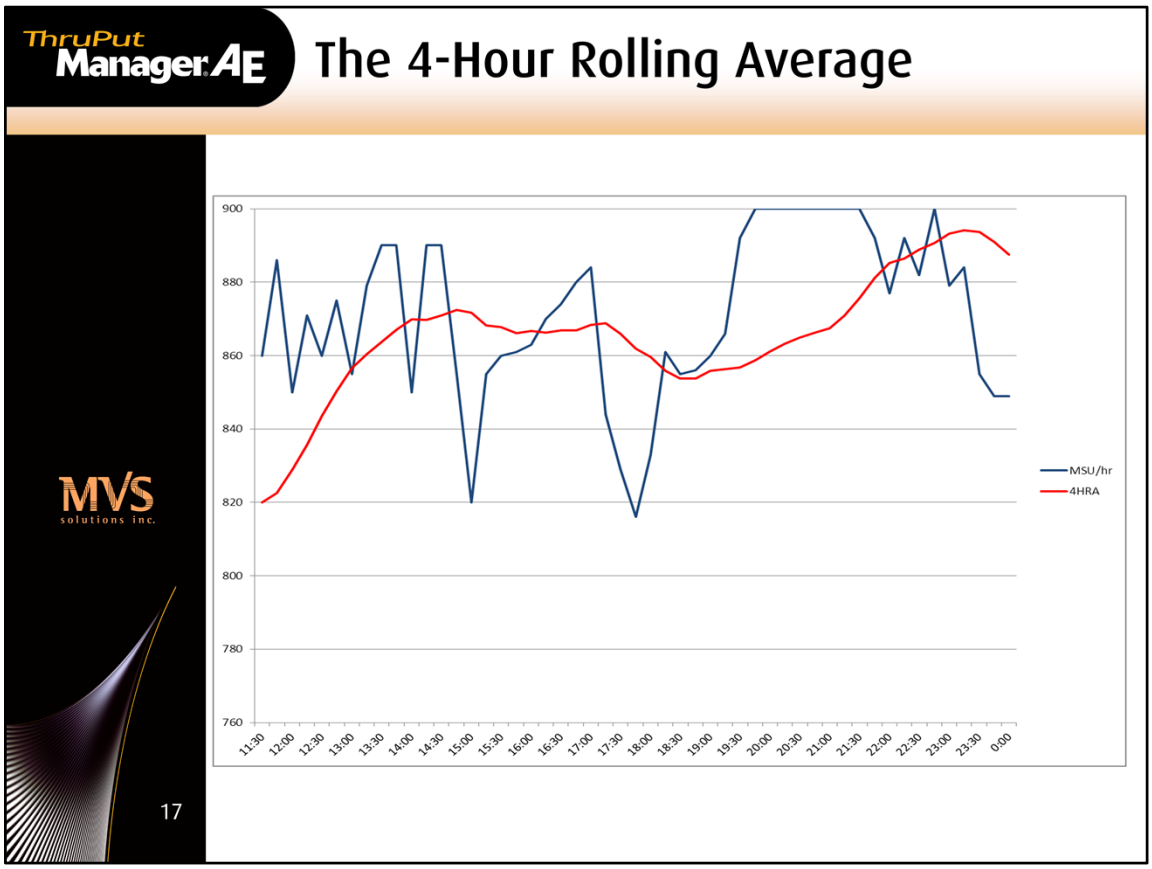
IBM's Sub-capacity Pricing allows you to pay based on the highest 4HRA usage of the month, rather than on the size of the hardware.



The chart shows the instantaneous usage in MSUs/hour, shown by the Blue line, and the 4-hour rolling average, show by the red line. Charging is based on the 4HRA, not the hardware size or the usage, which can save a lot of money.

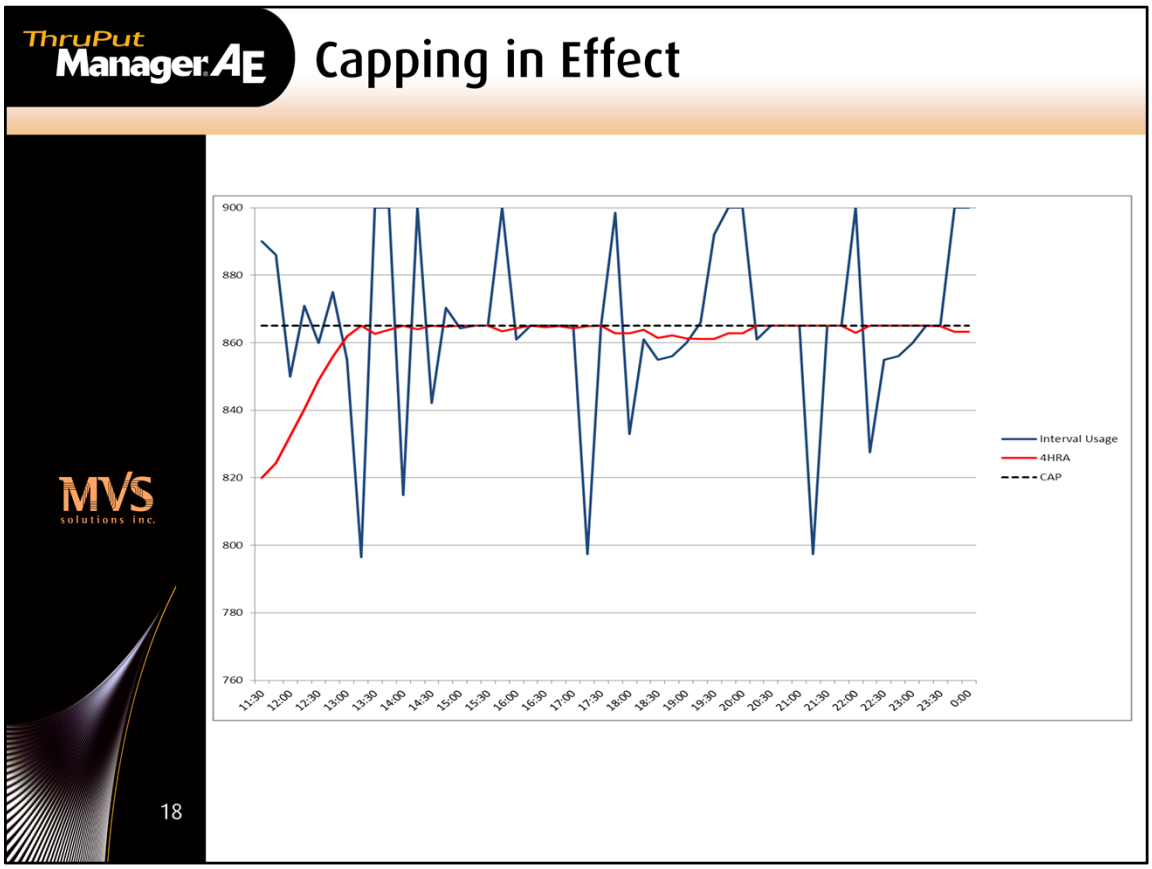
It also allows you to set a cap on the 4-hour rolling average. In that case you will pay at the cap level.



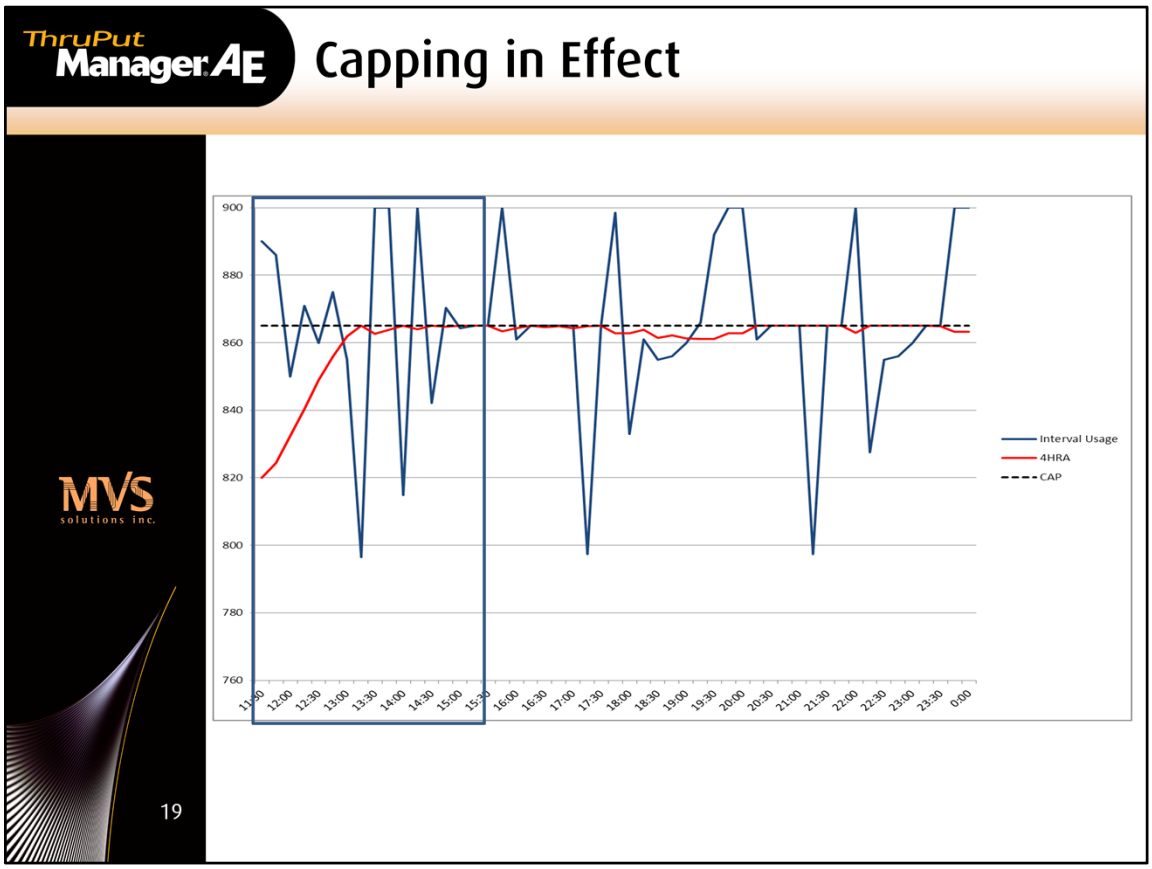
Take a closer look at this chart. The period is from 11:30 am until midnight, and you can see the little drop as day workers go home and then the climb as the evening production begins.

The load is very high in the evening, so the instantaneous usage is at the maximum of the machine. Since the load is so high for so long, the 4HRA is very high too.

In order to save money you would have to set a cap. What happens when capping kicks in?



Setting the 4HRA at 865 results in the cap being hit a great deal of the time, causing the usage to be suppressed



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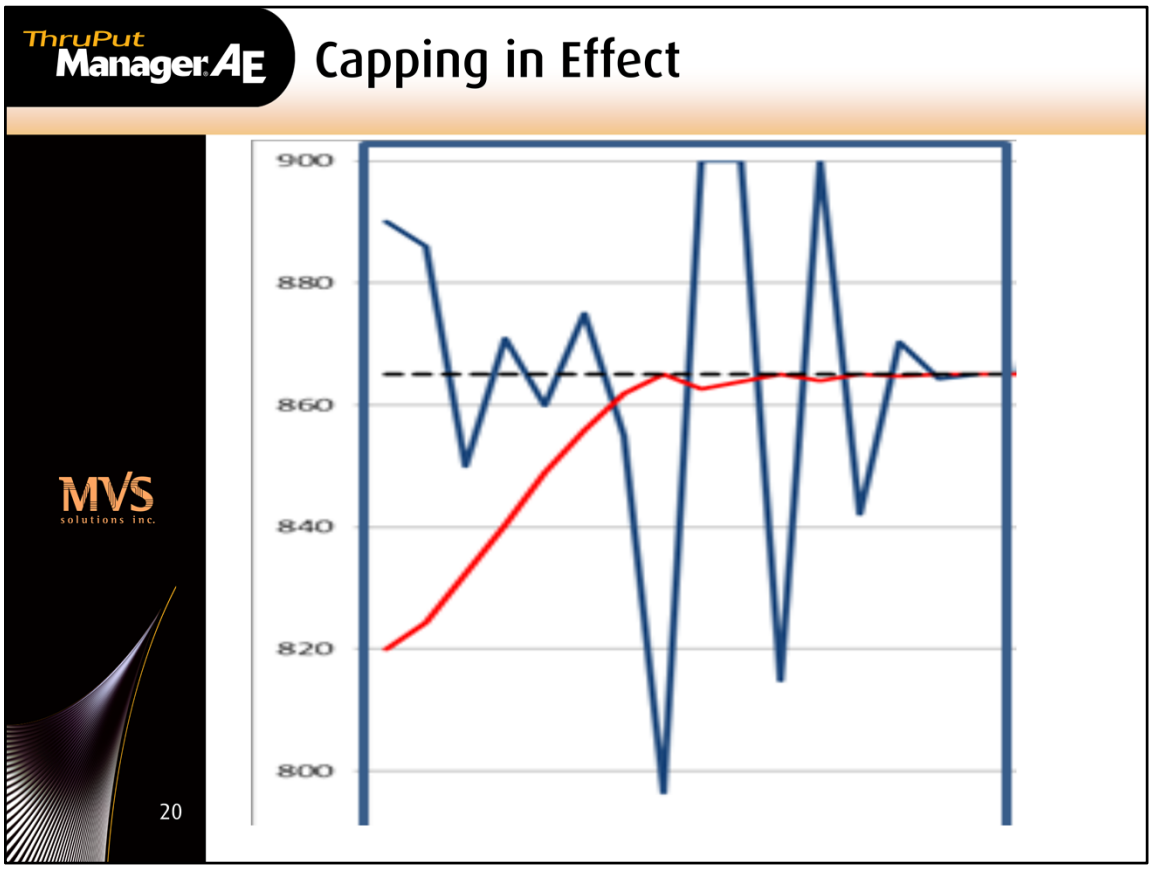
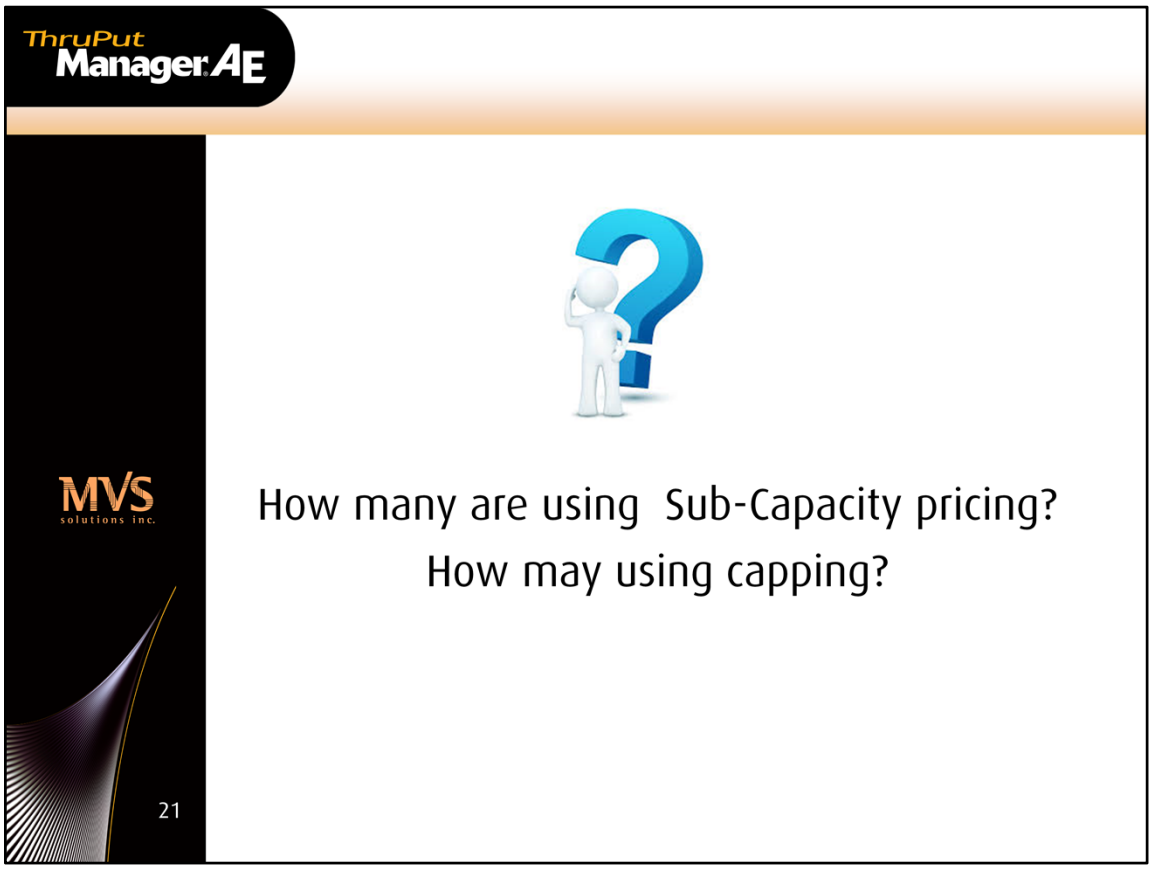


Setting the 4HRA at 865 results in the cap being hit a great deal of the time, causing the usage to be suppressed. When an LPAR has its usage suppressed it is not dispatched by PR/SM as often as it would like.



Recent surveys say > 80% are using sub-capacity pricing.

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IBM Capping Options

- Initial capping – "hard cap"
  - Max capacity, no averaging
- Defined capping – "soft cap"
  - Usage level may vary above or below cap as long as 4HRA stays under
  - Cap at the LPAR level – 'Defined Capacity'
  - Cap a group of LPARs in the same CEC - 'LPAR Group Limit'

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Defined Capacity provides a MSU/hr charging limit for the 4HRA on a single LPAR running z/OS native.

Not ideal for consolidated environments
May leave cycles on the table
LPAR A busy but capped
LPAR B not busy
But CEC has available cycles and work is delayed

LPAR Group Limit provides an MSU/hr charging limit for the 4HRA for a group of LPARs on the same CEC
LPARs may be in different JESplexes and Sysplexes
Very efficient option for products licensed on all z/OS LPARs
Makes best use of the available cycles
may be used in combination with Defined Capacity

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Why Isn't Everyone Capping?

- IBM introduced sub-capacity pricing in 2000
- Many shops are concerned about the impact of capping on online workloads
- An automated method is needed to manage the capacity so critical workloads are protected

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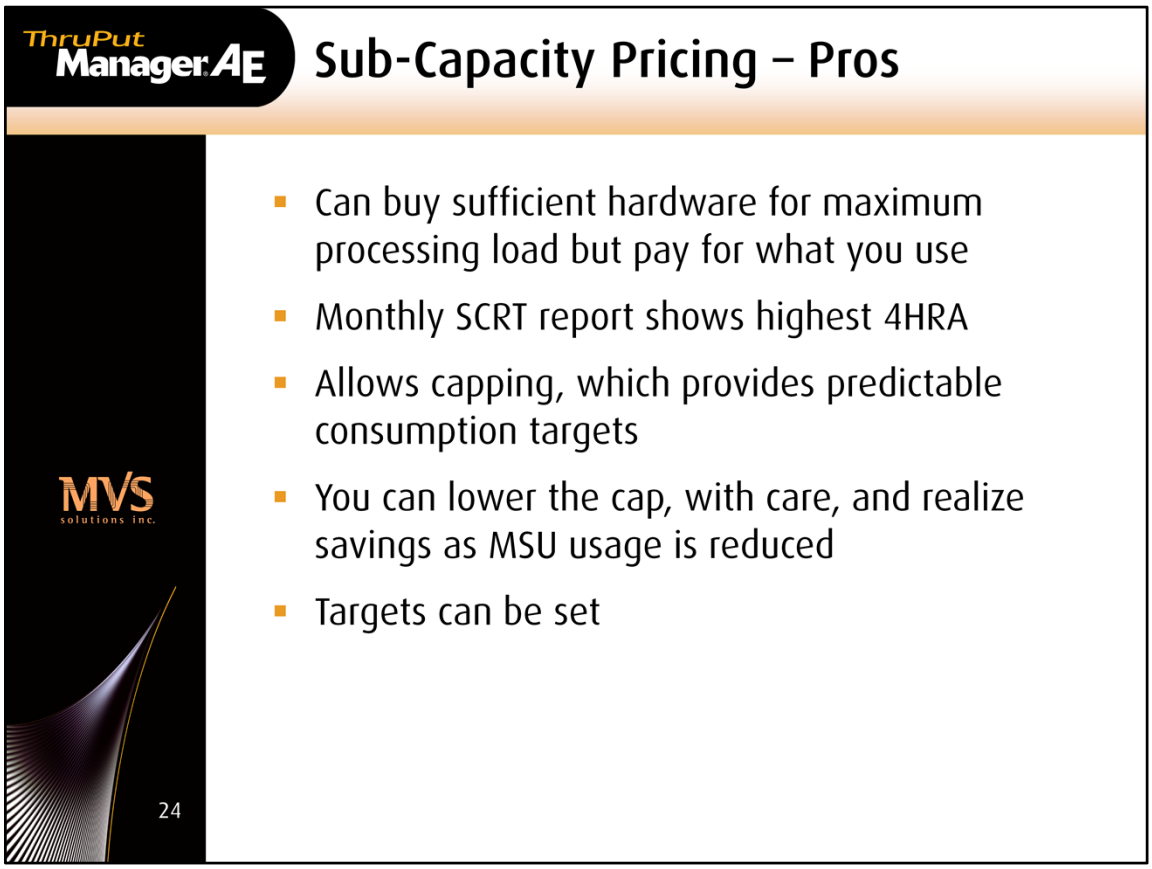
The acceptance of sub-capacity pricing has been slow but is now fairly high. However the concerns about the impact on business-critical batch and online systems are still valid.



Each month you get a SCRT (sub-capacity reporting tool) report that shows you the highest 4HRA peak of the month and is used to calculate your costs.

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Sub-Capacity Pricing – Cons

- Consumption and costs become unpredictable without capping
- Capping has risks - if cap is set too low, can affect on-line and critical production systems
- All service may be affected when the cap is reached
  - Service hits are unpredictable - who gets hit?
  - SomeOne gets constrained
  - Workloads get delayed
  - High priority work slows down
  - The organizational cost of saving money may be too great

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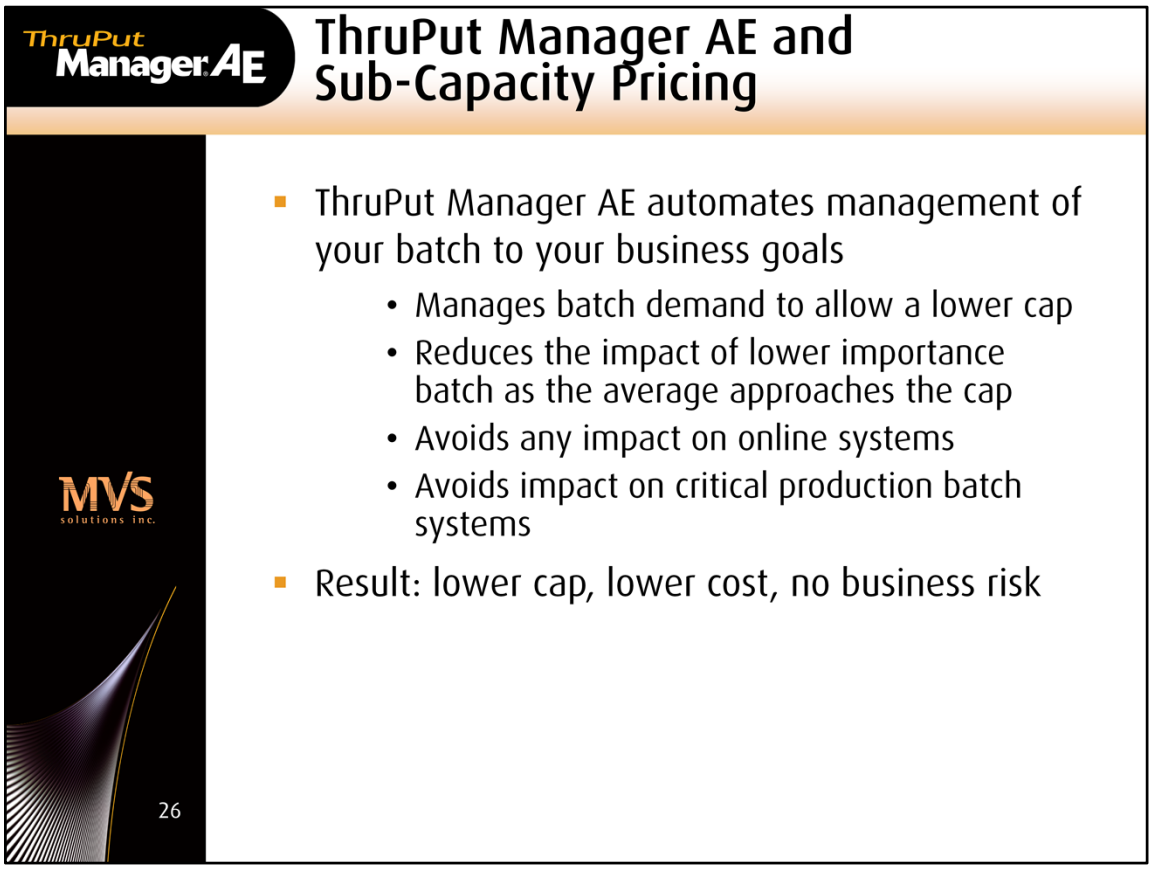
If the cap is set too low it can impact online and your critical batch work, so care must be taken.

The problem is that the LPAR is not dispatched by PR/SM as frequently as it would otherwise be. What work is waiting to use the processors while it's waiting for dispatch? It could be anything, including your most critical online transactions.

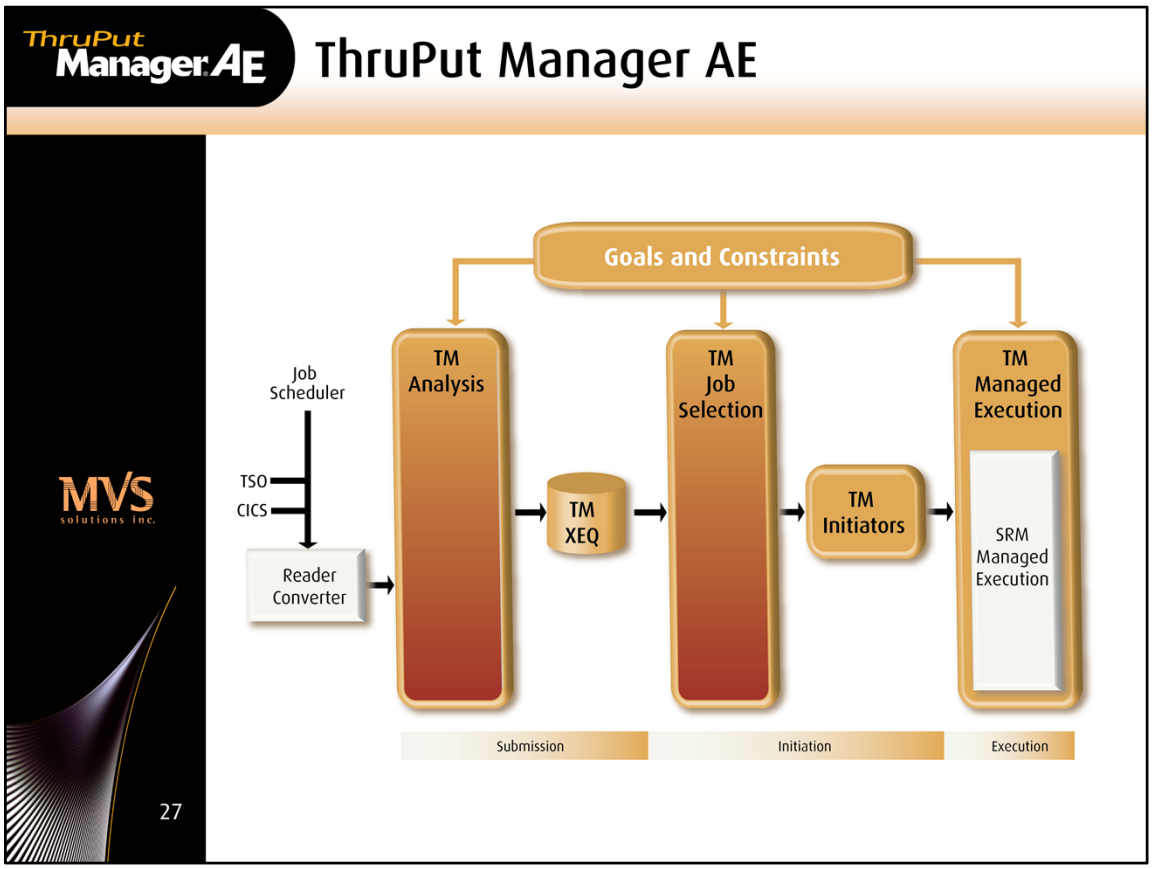


The best solution is to combine ThruPut Manager AE and Sub-capacity pricing.

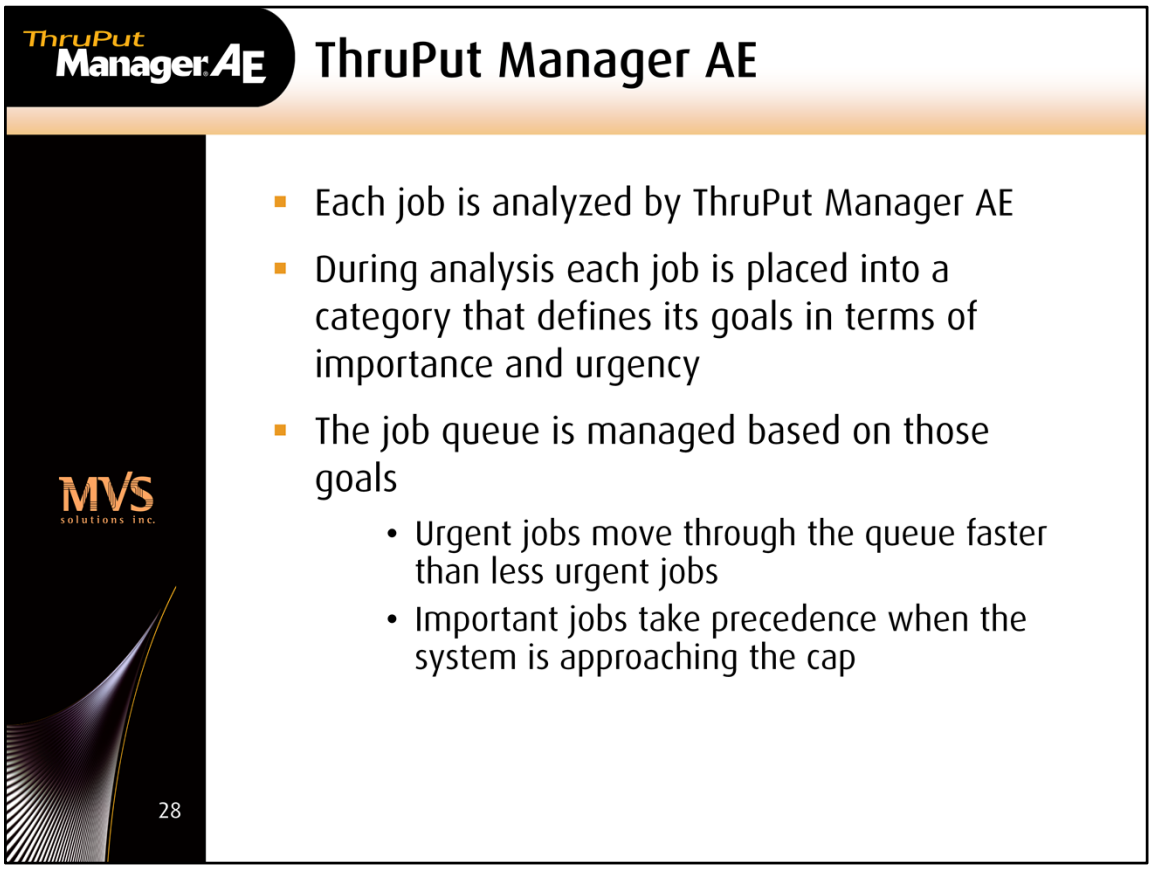
TM AE includes a feature that is specifically designed to work with sub-capacity pricing. It is always cognizant of the cap and the 4HRA, and modifies its selection and management policy, as specified by the installation, as the 4HRA approaches the cap.

Rather than 'hitting the wall' hard, which causes violent swings in service and affects all workload, it gradually approaches the wall and affects only the batch workloads you have indicated to avoid any negative impact to the service provided to your online and critical batch workloads.

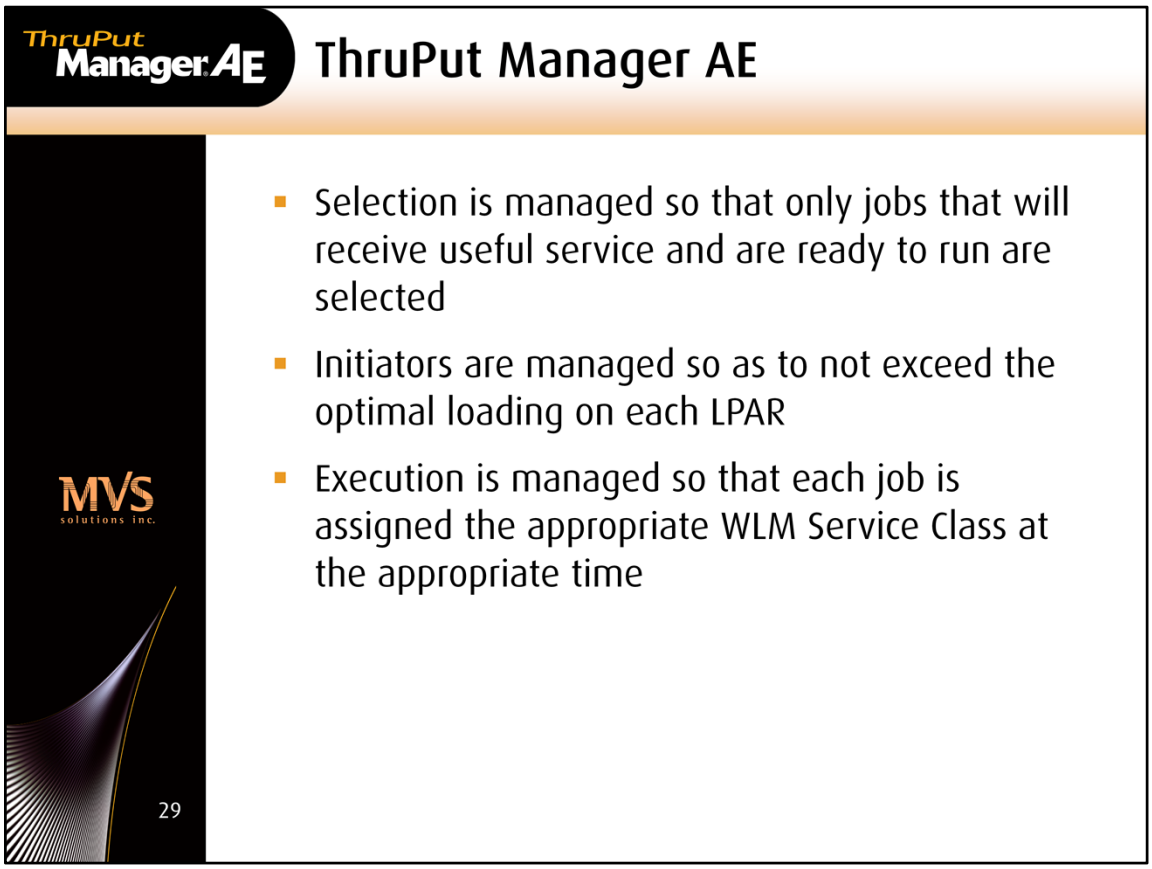
Any risk to those business-critical workloads is minimized.



This is how ThruPut Manager AE fits into the z/OS-JES2 environment. There are five key engines – analysis, queue management, selection, initiator management, and execution management – that are all informed by your goals and constraints.



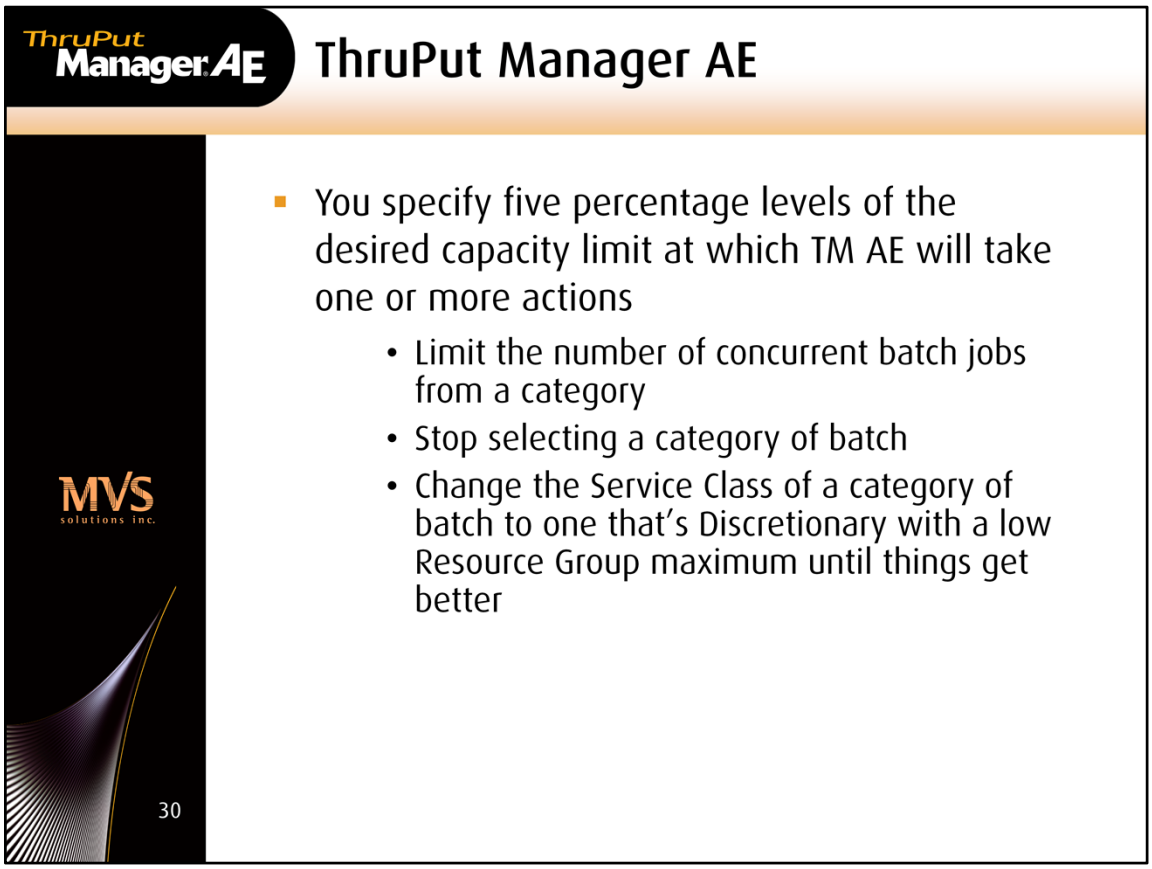
Analysis is the key to understanding the needs of each job and the category in which it belongs. The goals for the category determine how the job is managed while in the job queue, when it is selected and how it is managed during execution.



If a job will be assigned to a Service Class that is performing poorly there is no point in allowing that job to start.

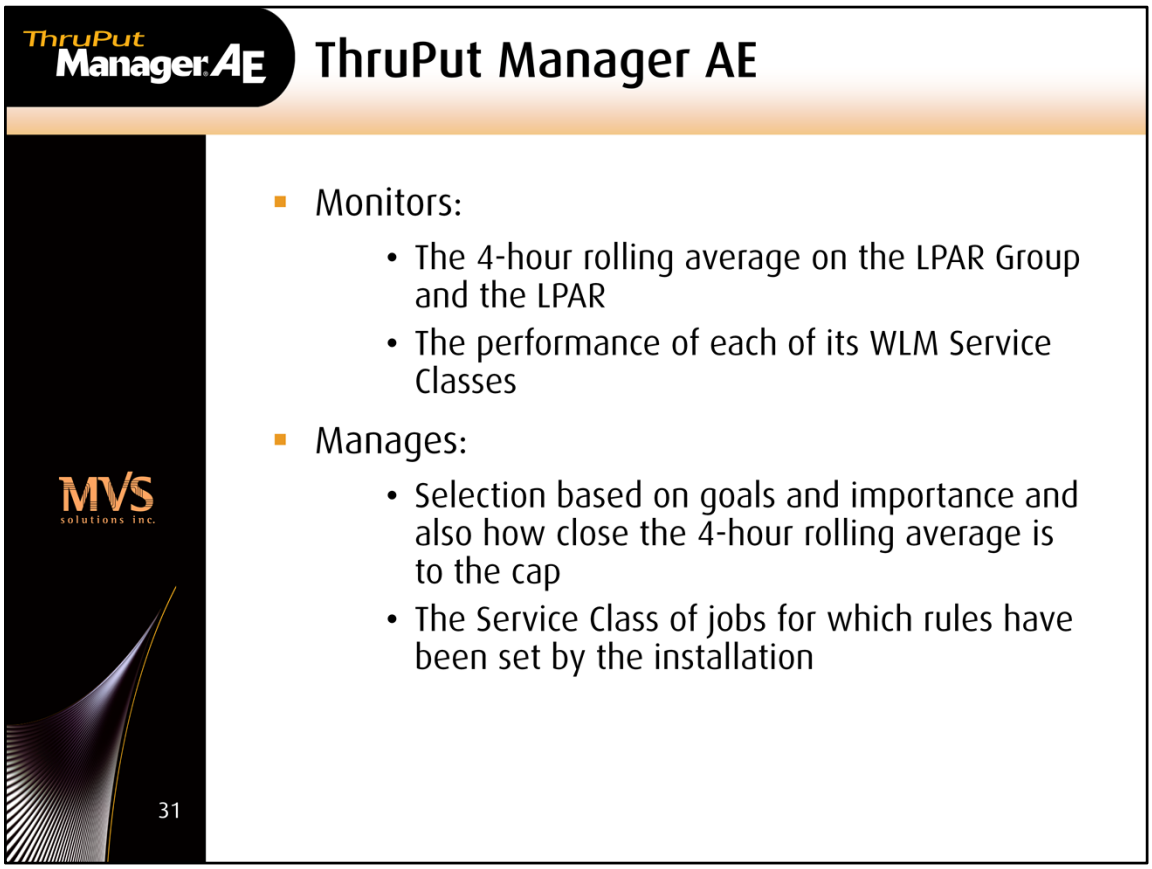
ThruPut Manager AE manages a set of dedicated JES2 initiators that it starts and stops as appropriate.

The Service Class of a job may be dynamically changed if the installation has so specified.



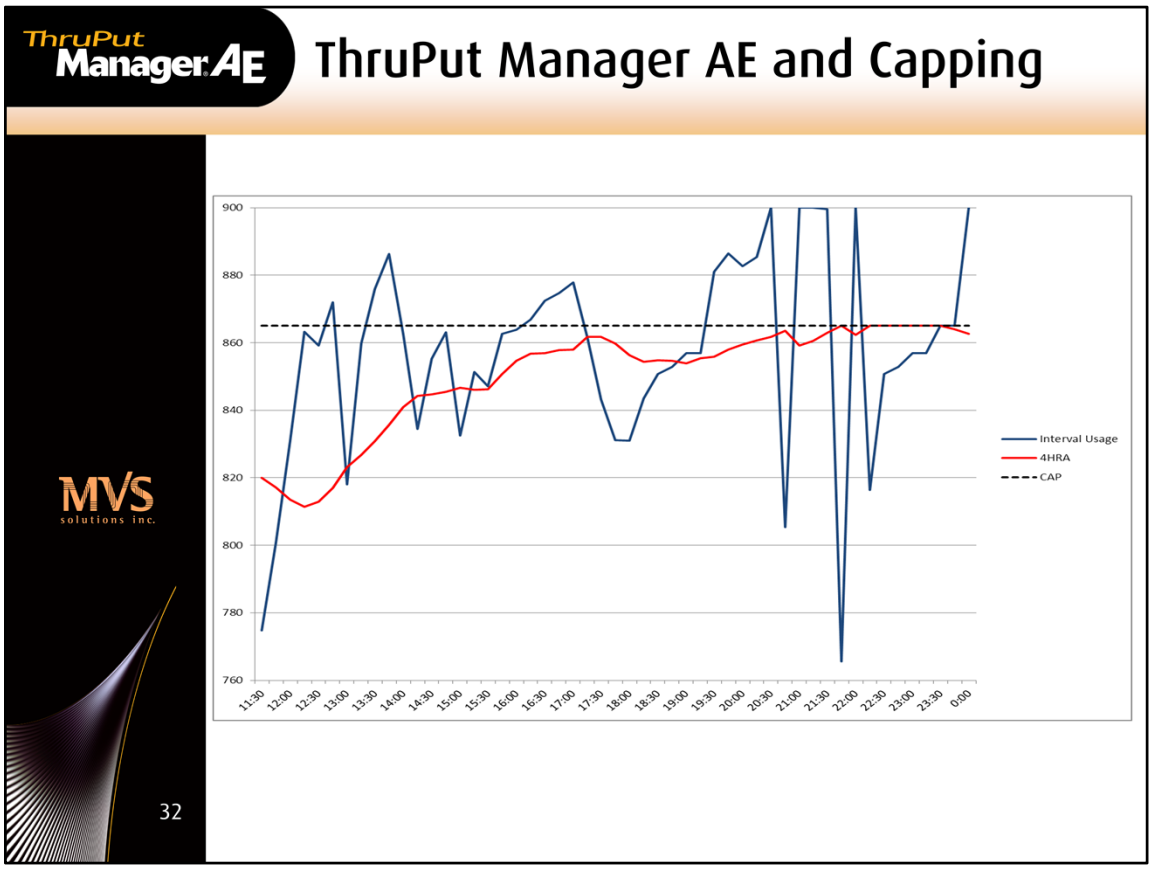
You determine which categories of your batch will be affected as you approach the cap level and what actions ThruPut Manager AE should take.

You choose the percentage levels to use and specify the actions to take. ThruPut Manager AE's automation uses that data to manage batch and allow you to meet your desired cap.
The savings can be dramatic.

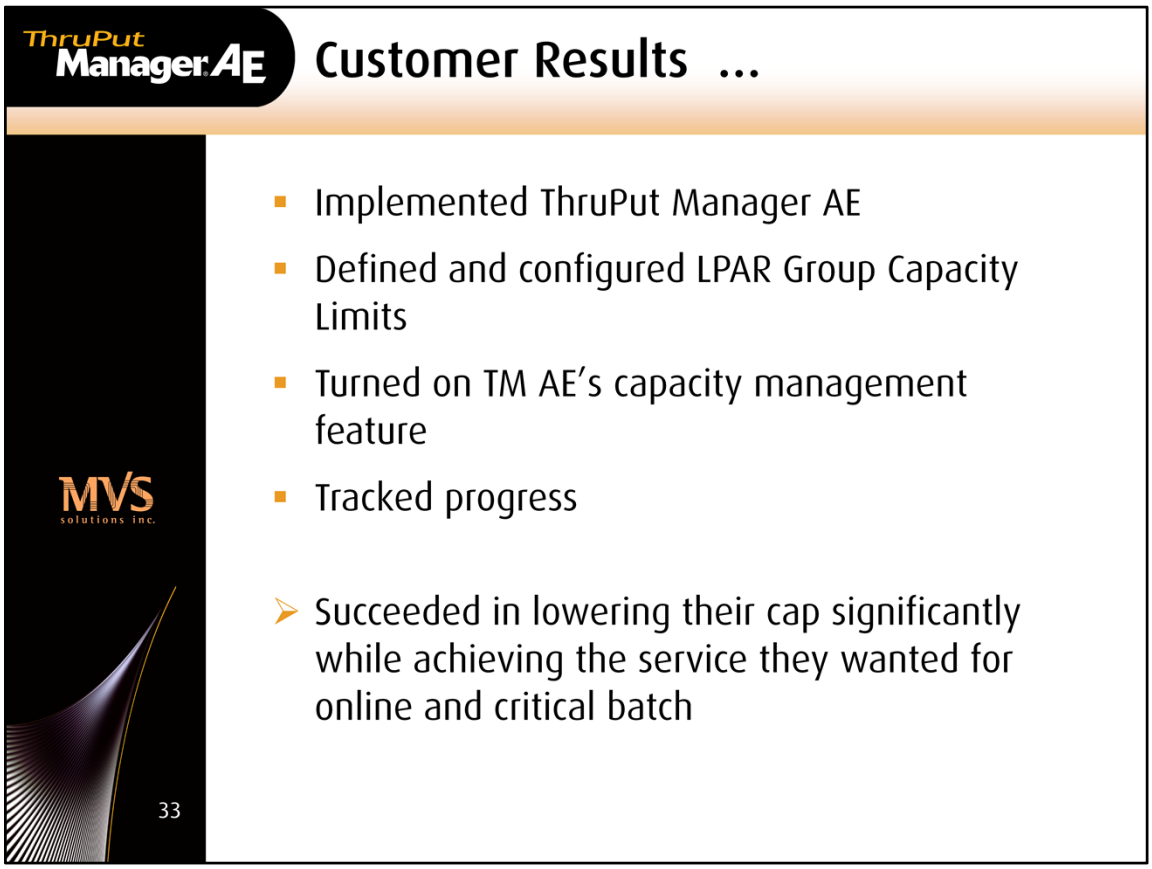


TM AE monitors the 4HRA and its dedicated service classes and uses that information, together with the installation rules, to control selection of jobs and determine which service class to use and when to use it.

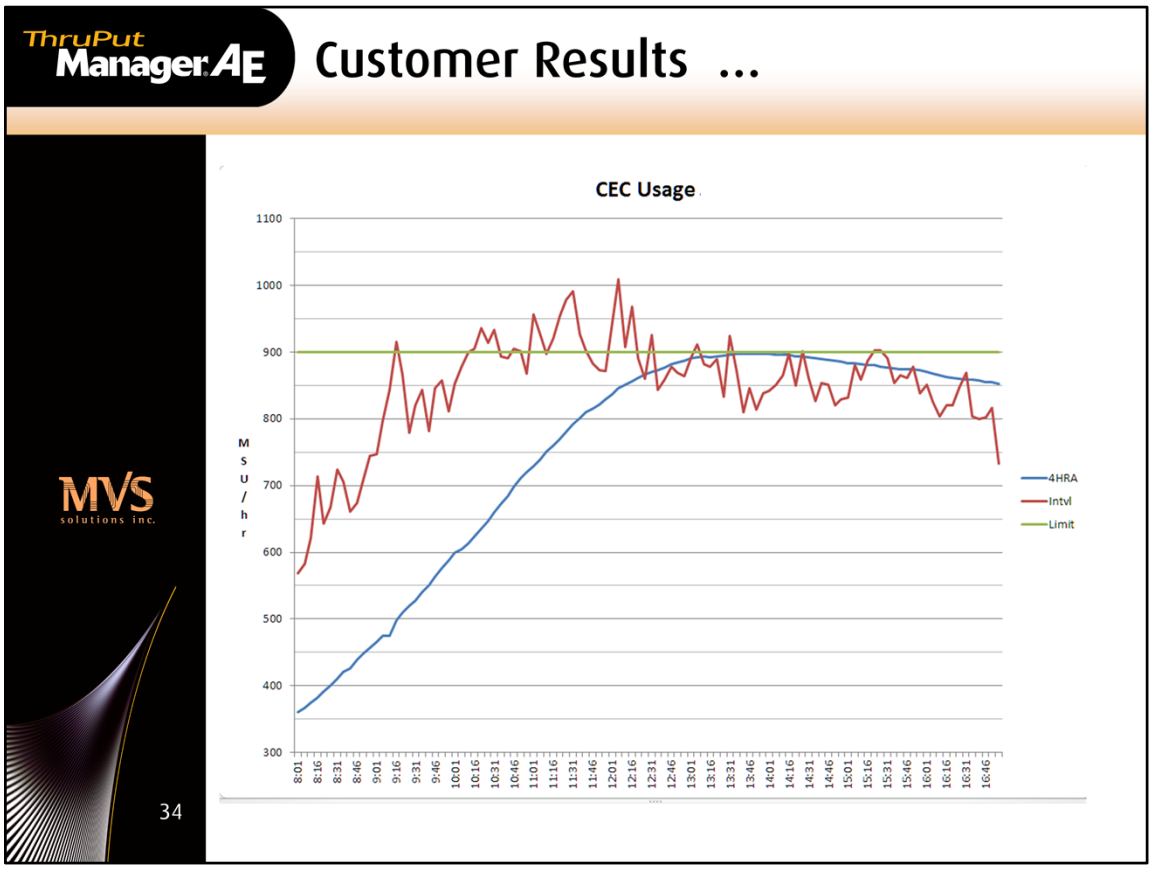
Its fully automated approach, based on business objectives, provides predictable results and appropriate service for your business-critical work.



This is how the earlier graph would look with ThruPut Manager AE managing the load using typical percentages.
There is only one short period when the cap is reached, meaning there is little, if any, impact on online and critical batch.



Some customers have shared their experiences with us.
Here's one example where the customer had already implemented sub-capacity pricing and were having difficulties because of hitting the cap too hard. They implemented TM AE, turned on its capacity management feature, and set some rules describing how to manage their batch workload as the 4HRA approached the cap.



The 4HRA grazed the cap level without running hard into it. The potential impact was anticipated and avoided by automatically deferring batch that the installation had identified as deferrable as the 4HRA approached the cap level. The result was that they achieved the desired cap – lower than they had previously been able to achieve - without impacting their online and critical batch systems.

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Results = Savings Over Sub-Capacity pricing

CEC	Max Original CEC Peak	Max New Peak with 25% Batch Reduction	Potential Montly MSU Savings	Potential Monthly Savings at $250/MSU
A	1169	996	173	$43,250
B	703	633	70	$17,500
C	901	896	5	$1,250
D	903	893	10	$2,500
Total		MSU Savings	258	$64,500.00

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Potential to save > $750,000 Annually

And/or avoid costly hardware capacity upgrades

35

This data was taken from a customer's SMF records. Over their 4 CECs, using a fairly low figure of $250/MSU hour, we can safely predict that they will save $750,000 per year, every year, over and above what they could save with sub-capacity pricing alone.

Depending on the software they license from IBM, they may be able to save more. Recent surveys say that the cost per MSU can easily exceed $300 if the installation runs typical software such as IMS, DB2, MQ Series and CICS. We have customers who have told us they're saving in 7 figures.

Both Finance and Capacity Planning meet their objectives while the organization saves money and receives the service it needs to meet its business goals.

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Said another way...

Marginal Cost of Products - Example

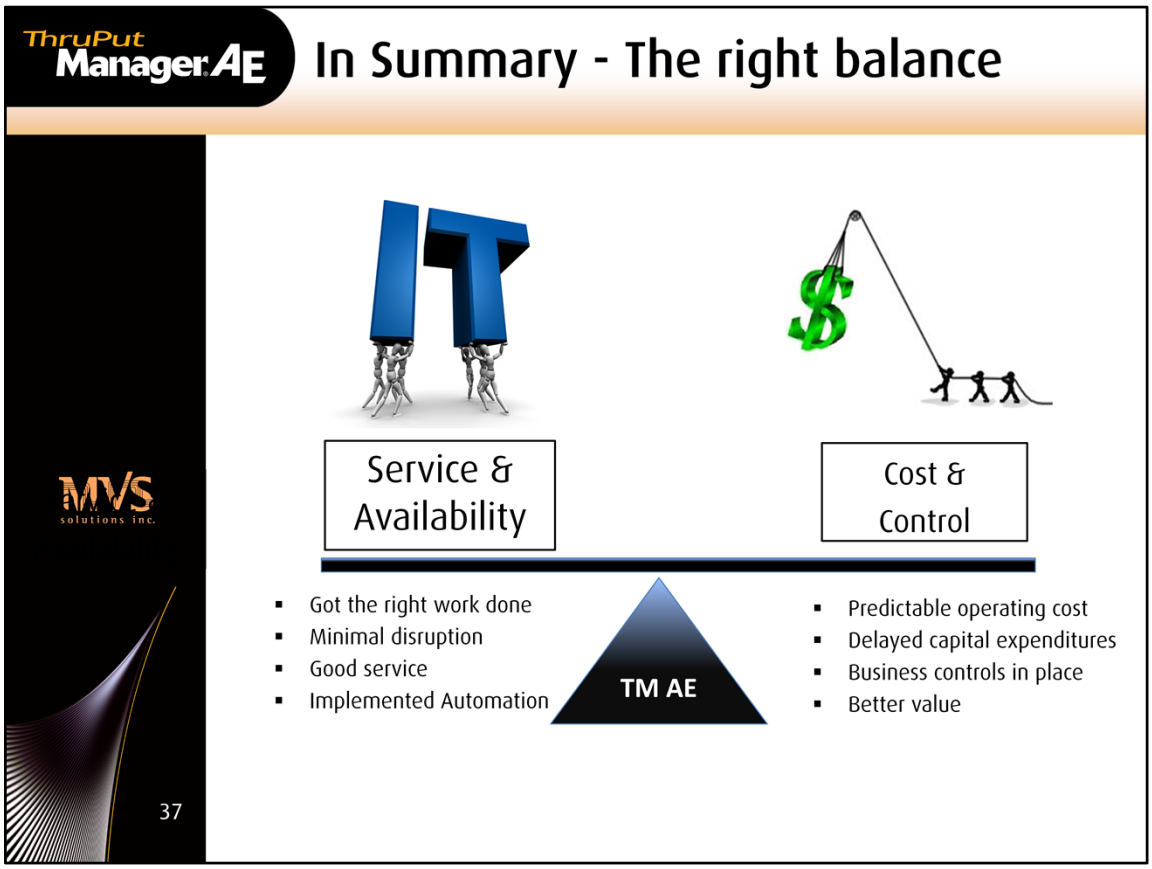
$ / MSU / Month	
IMS V12	$122
CICS V4	$61
DB2 V10	$54
z/OS V1	$49
MQ V7	$26
Netview	$14
Total	$326

Complete your sessions evaluation online at SHARE.org/BostonEval

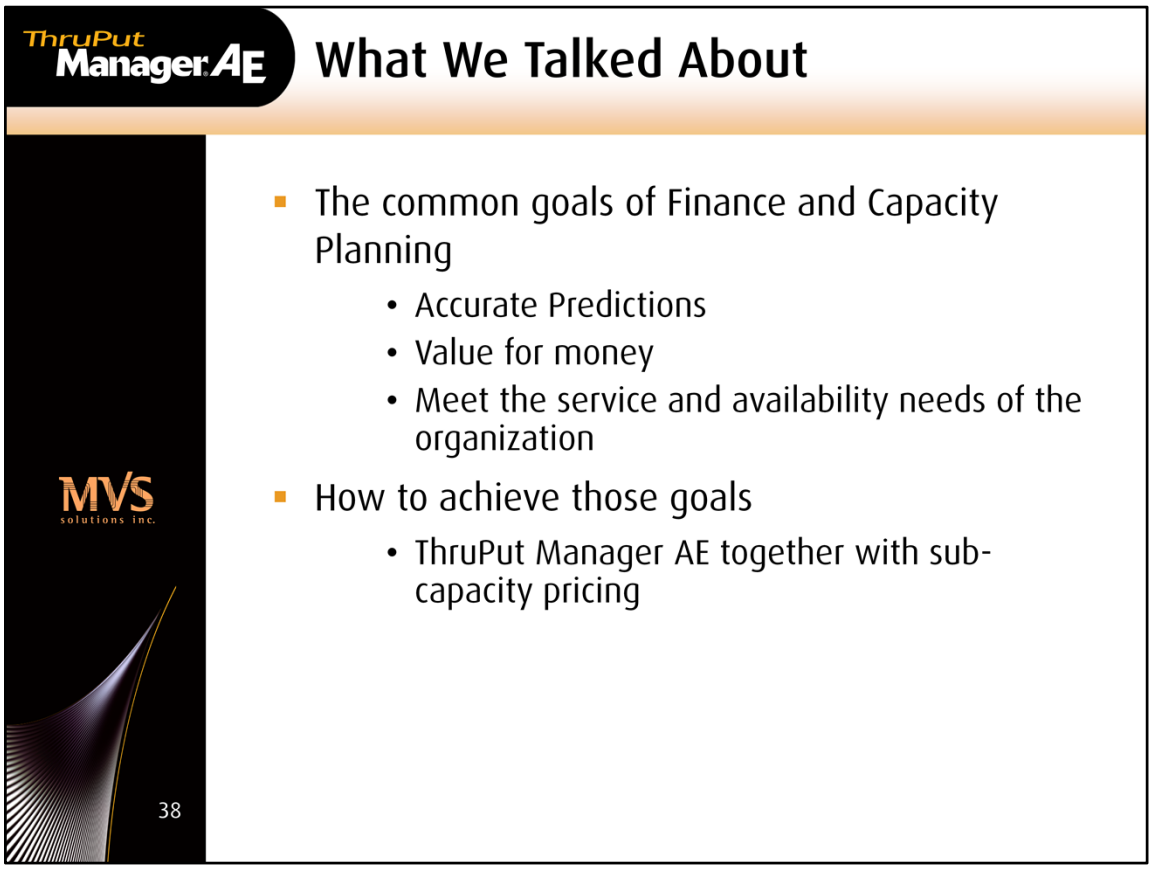
Annual MSU Savings value = $ 1,009,296

36

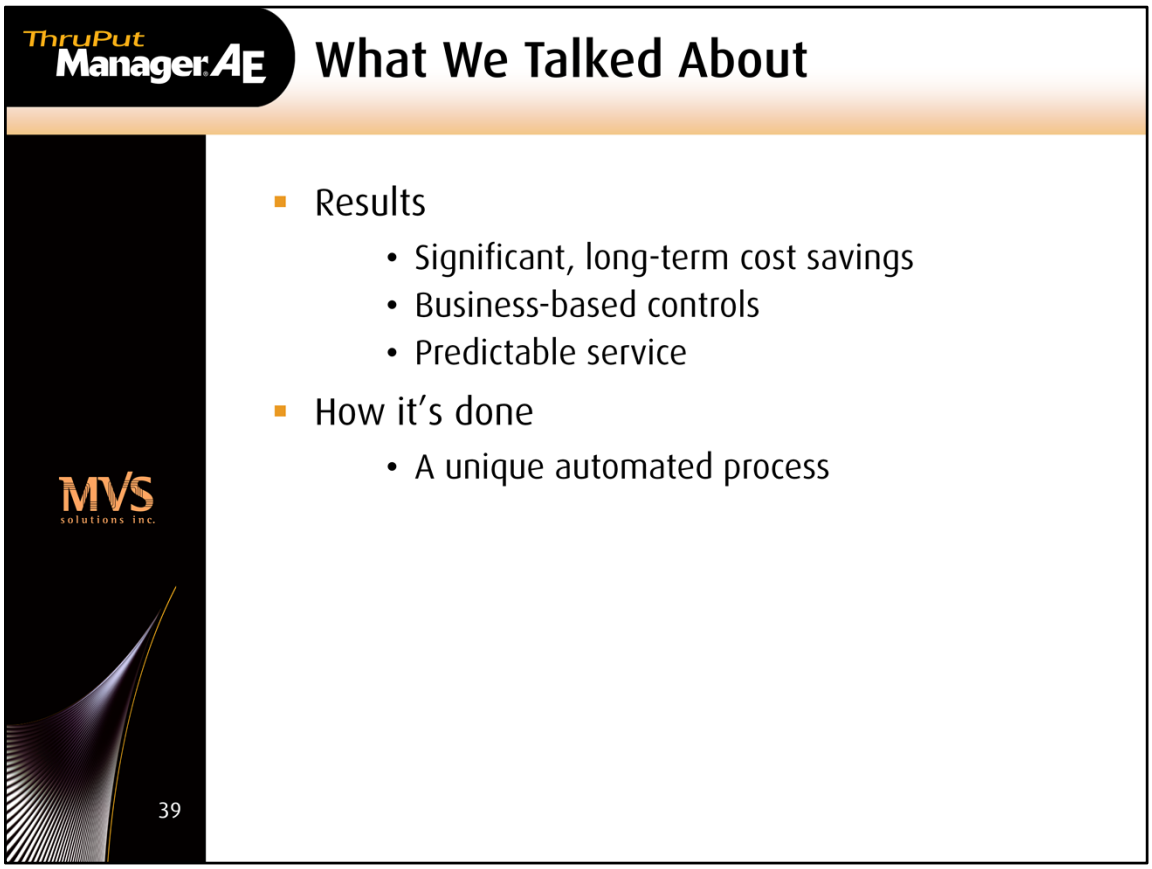
These figures are from SHARE in Boston and show that if **this** charging rate applies to the installation, they could achieve considerably higher savings with the previous usage figures.



The balance can be achieved in a way that satisfies both the Finance person and the Capacity Planner, providing the service and availability the organization needs together with a better value proposition, reduced costs and appropriate controls.



So as we discussed, Finance and Capacity Planning do have common goals and those goals are readily achievable with ThruPut Manager AE combined with sub-capacity pricing.



The results satisfy Finance and Capacity planning objectives and provide good and predictable service to the workloads that really matter, through ThruPut Manager AE's unique automated process.

ThruPut Manager AE

Making your own case

- Utilize MVS Solutions' Batch MSU Calculation Tool
  - Reads MXG to capture CPU and WLM (SMF 70, 72) stats for a typical month
  - Analyzes the makeup of the total load in each RMF reporting interval
  - Identifies Batch MSU component during the peak 4HRA
  - Produces a customizable report where you can set your monthly MSU $ rates based on your IBM contract
  - Produces your estimated MLC savings

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40

Virtually all of our customers have SAS and MXG and use them to analyze their RMF records, so it made sense to use the same facilities.

The QR code will show you the abstract and allow you to download the Evaluation Form.