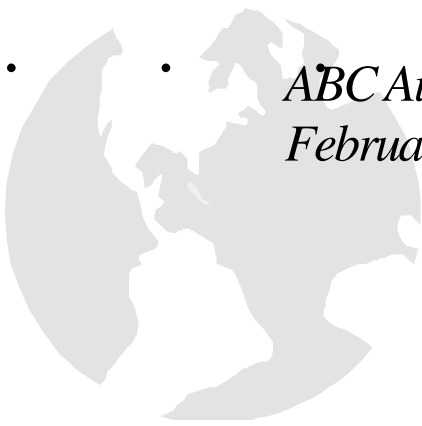


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Pickett Computer Services Pty Ltd

Capacity Plan



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ABC Australia
February 2003



Capacity Plan

ABC Australia

Overview

This report is prepared in a request from John Dimitriadis to assess the capacity required to accommodate additional workloads in future.

Summary and recommendations

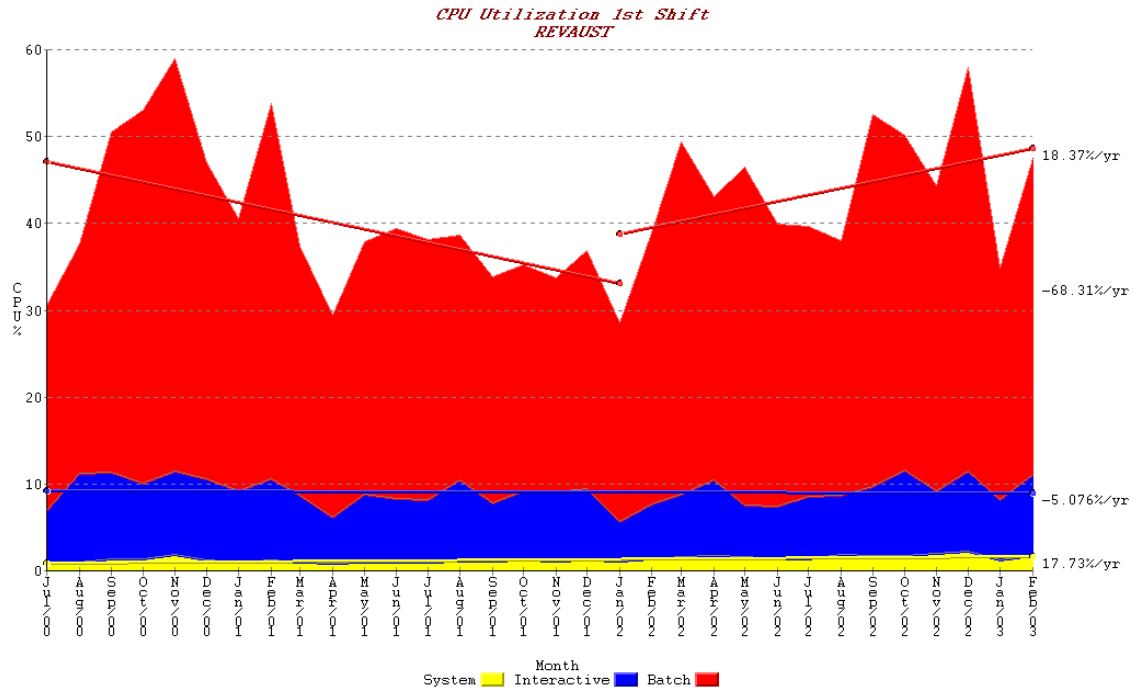
The current system has some spare capacity which should be able to absorb some of the additional workloads, but it is likely that an upgrade in processing capacity is required to accommodate all additional workloads.

Disclaimer

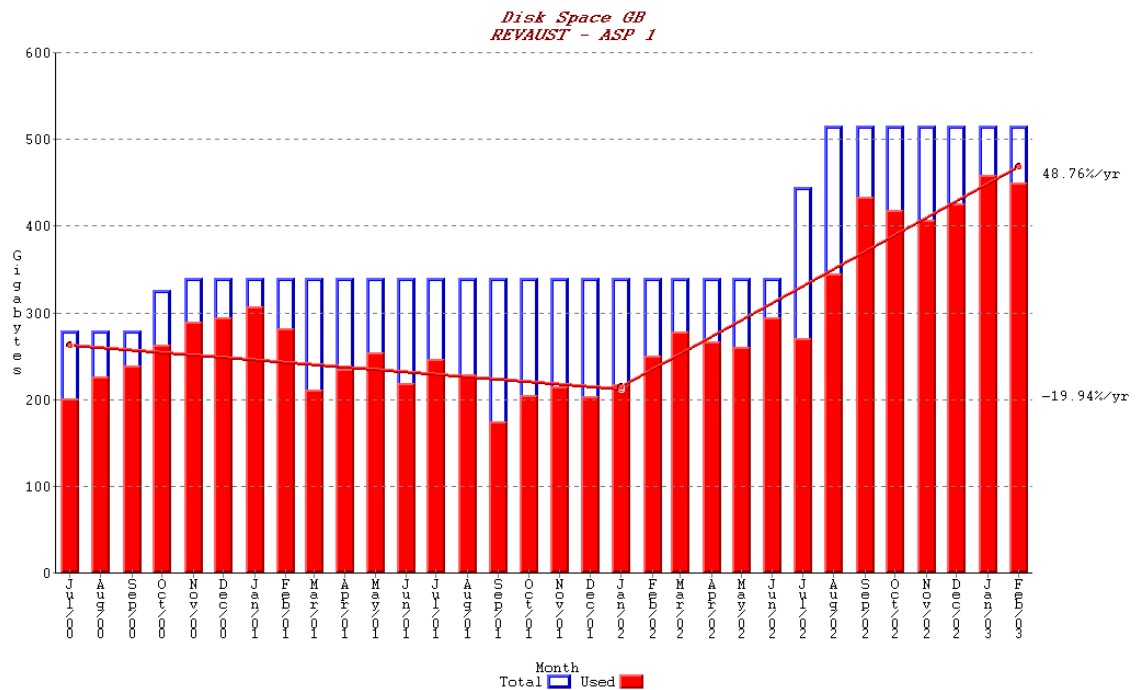


Current Status

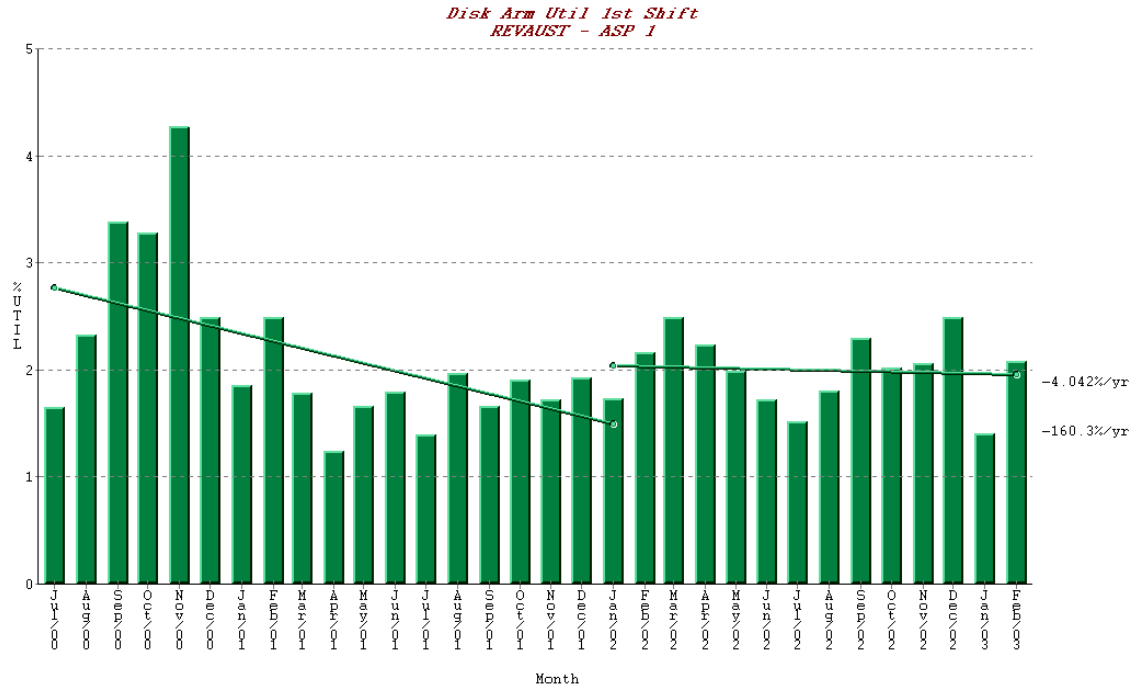
The long term CPU utilisation trend is only slight, but the trend since January 2002 is significant. However after discussion a flat rate of 10% is used for prediction purposes as the underlying trend.



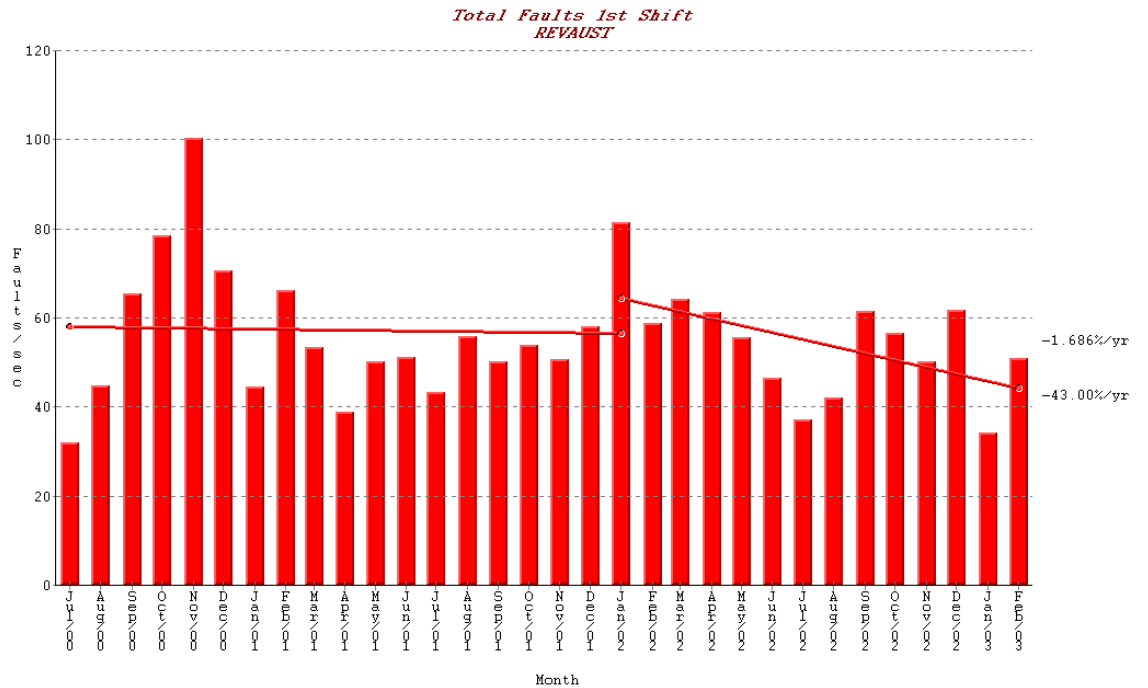
The rate of disk space occupied is growing at the rate of 19.5GB per month since January 2002.



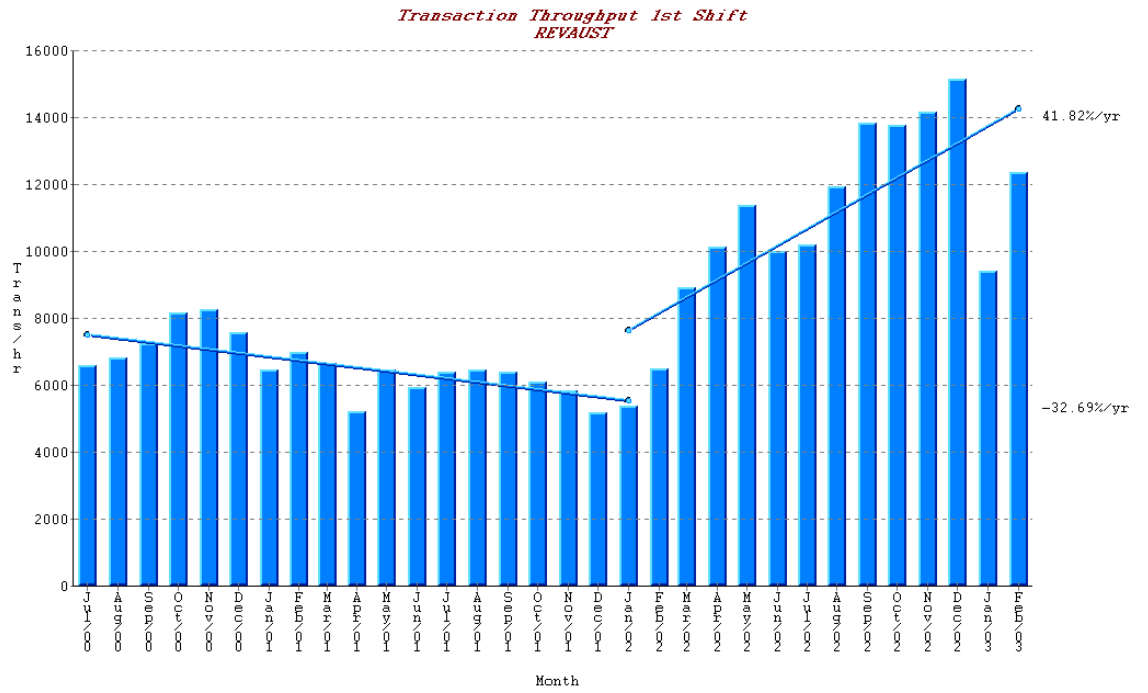
Disk arm utilisation over the same period is well under the IBM guideline of 20% and negatively trending.



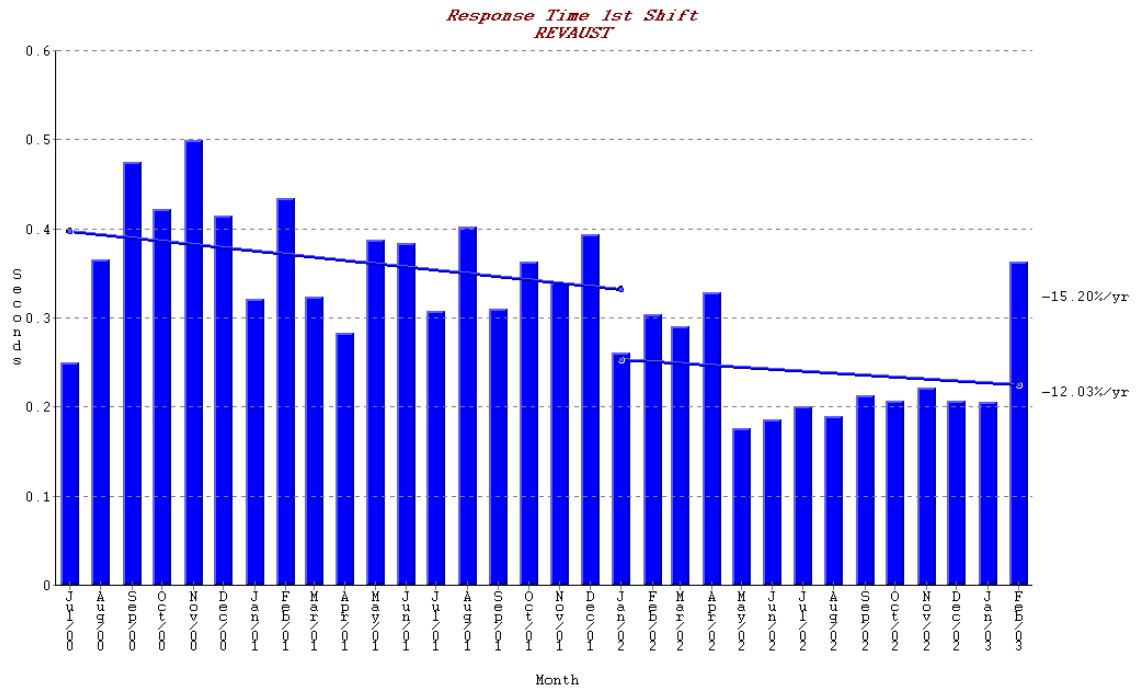
The faulting rates are well below the 768 fault per second rating for this model.



The 5250 transaction workload is growing significantly.

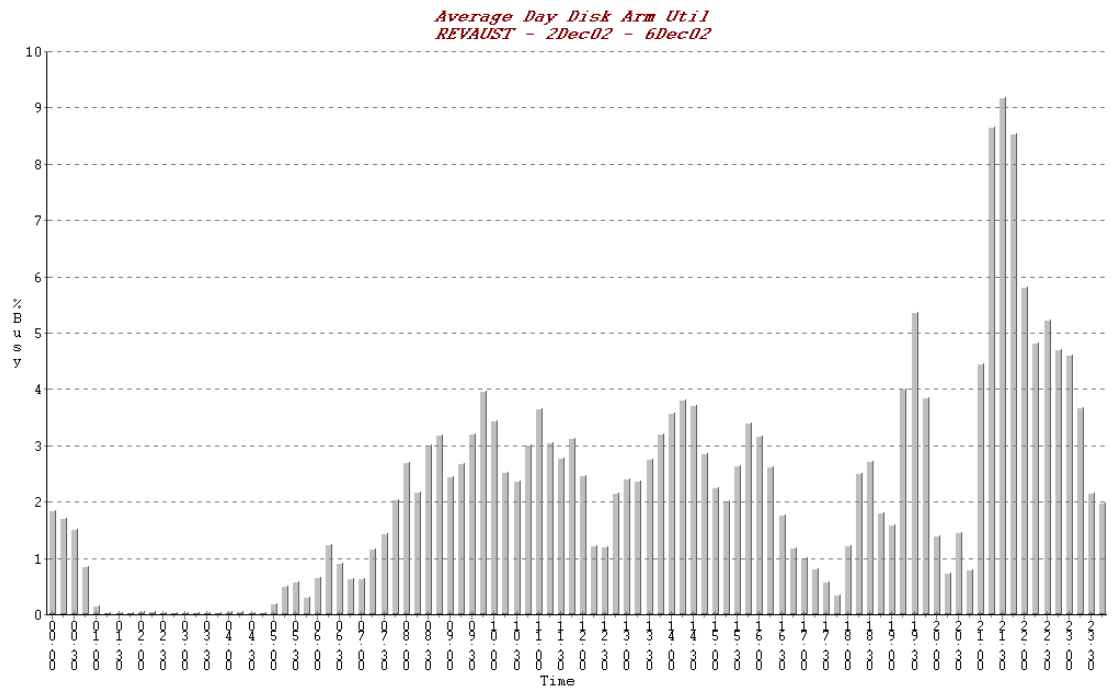
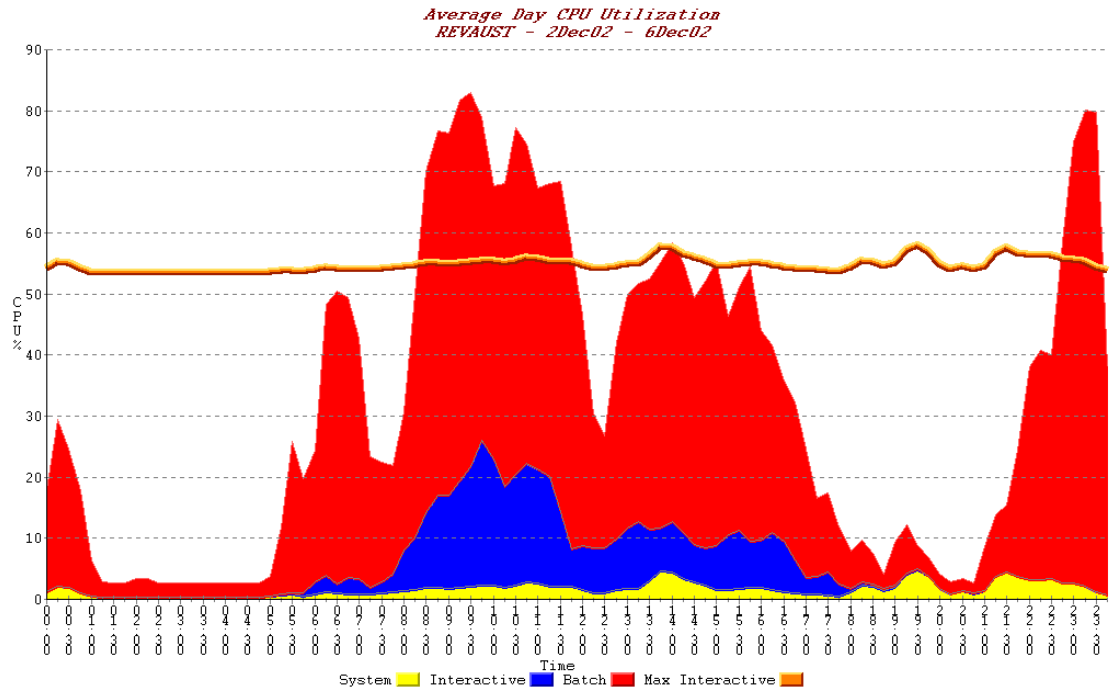


Yet response times have improved, most likely due to a reduction in resources used by the average transaction.



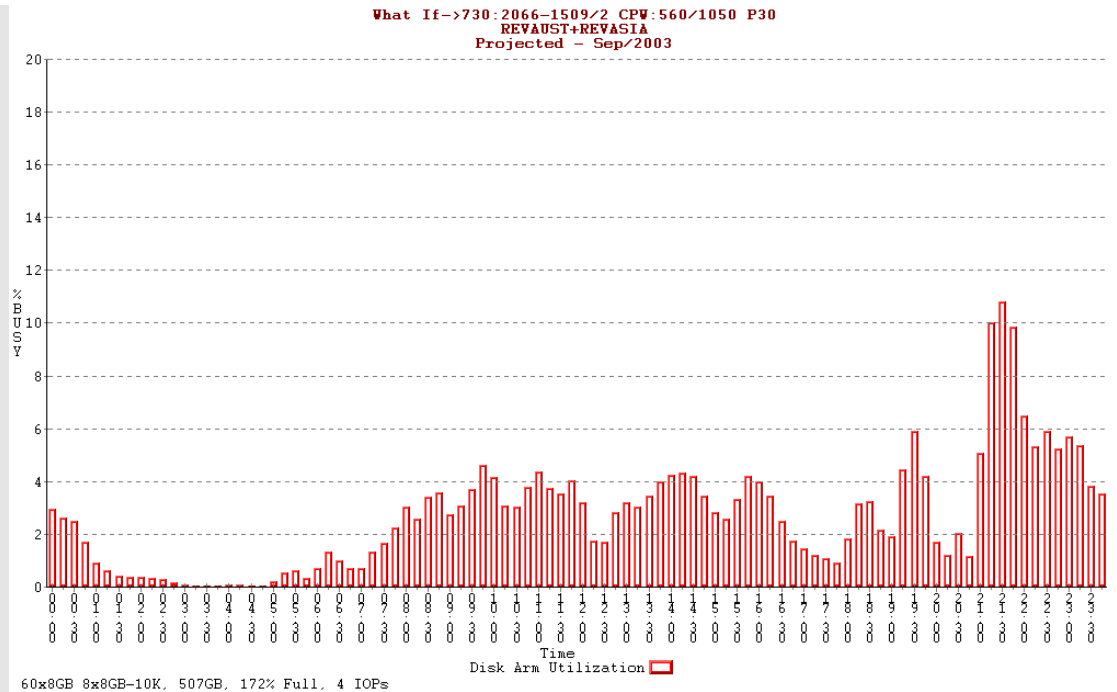
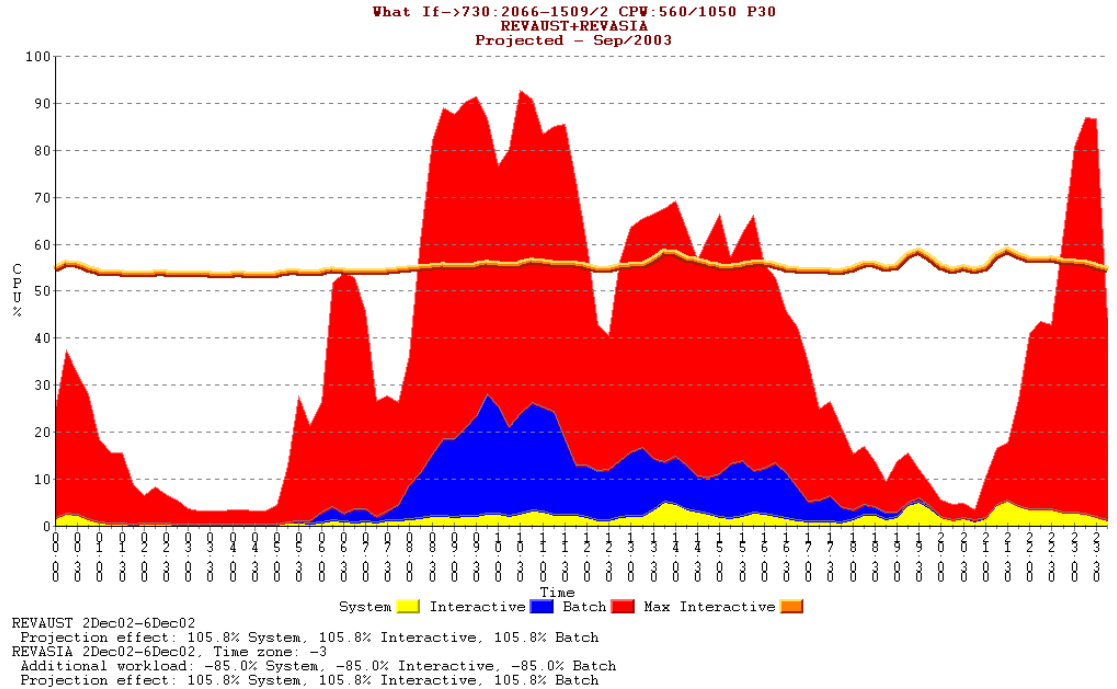
Current profiles

The base profile has been taken from a representative busy period of December 2-6 2002 and shows there is not much overall capacity left during the morning peak. At this time of the day there would be some delays in processing of batch jobs as they are at lower priority.



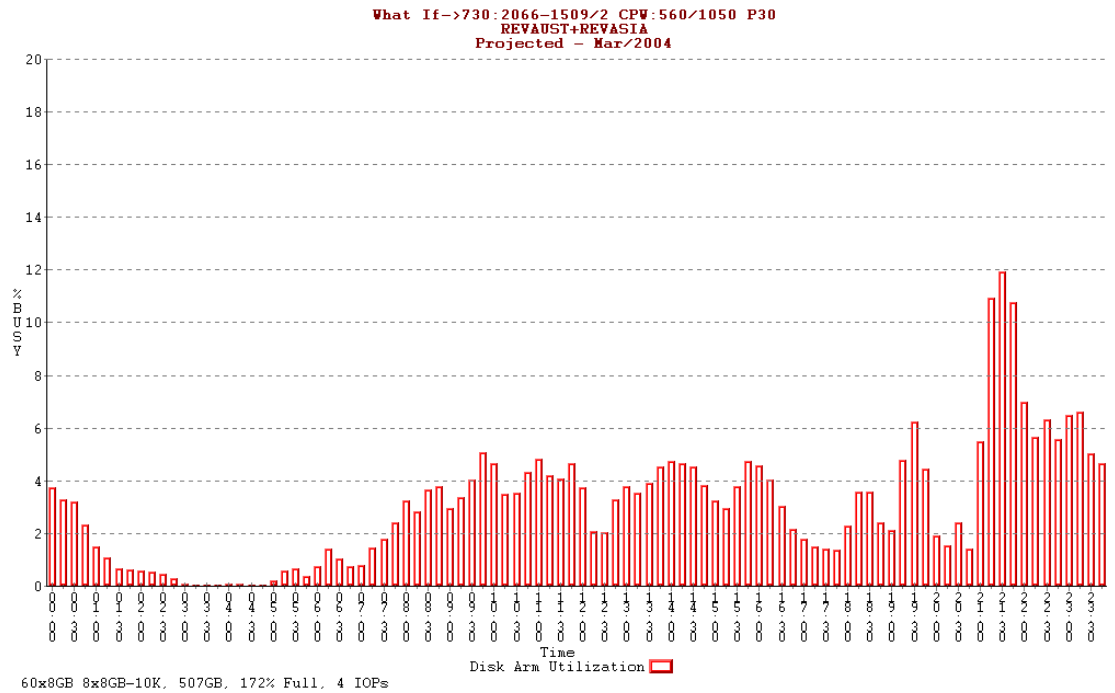
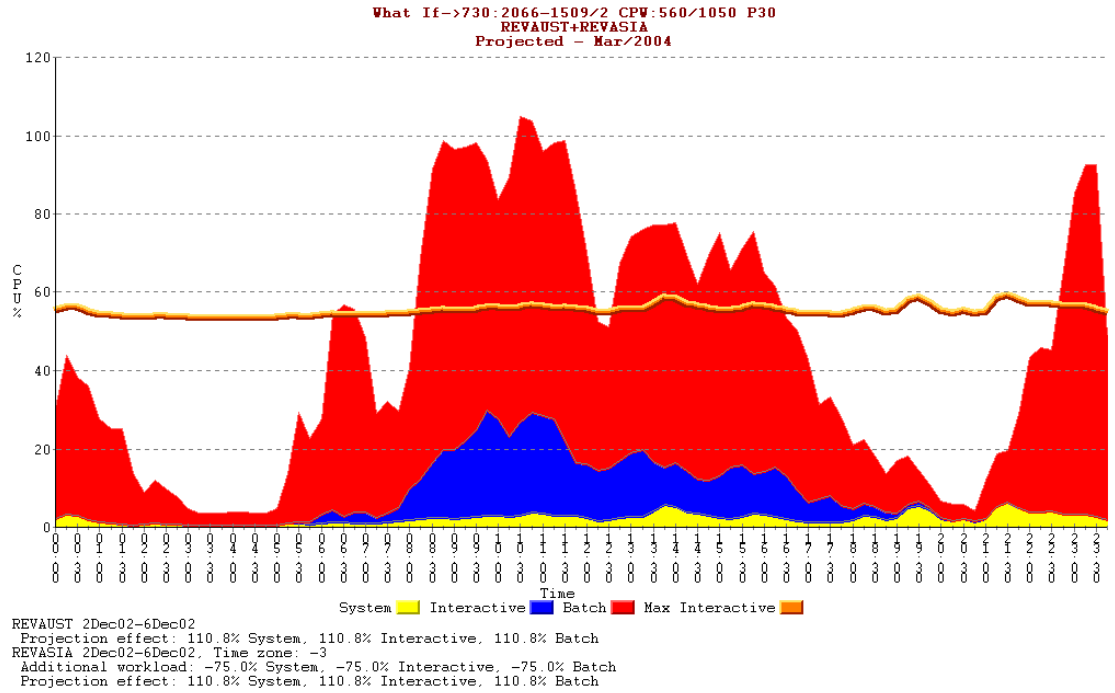
2003-09 with China

The peak workload is offset, but there is only limited capacity left at this time.



2004-03 with China and Hong Kong

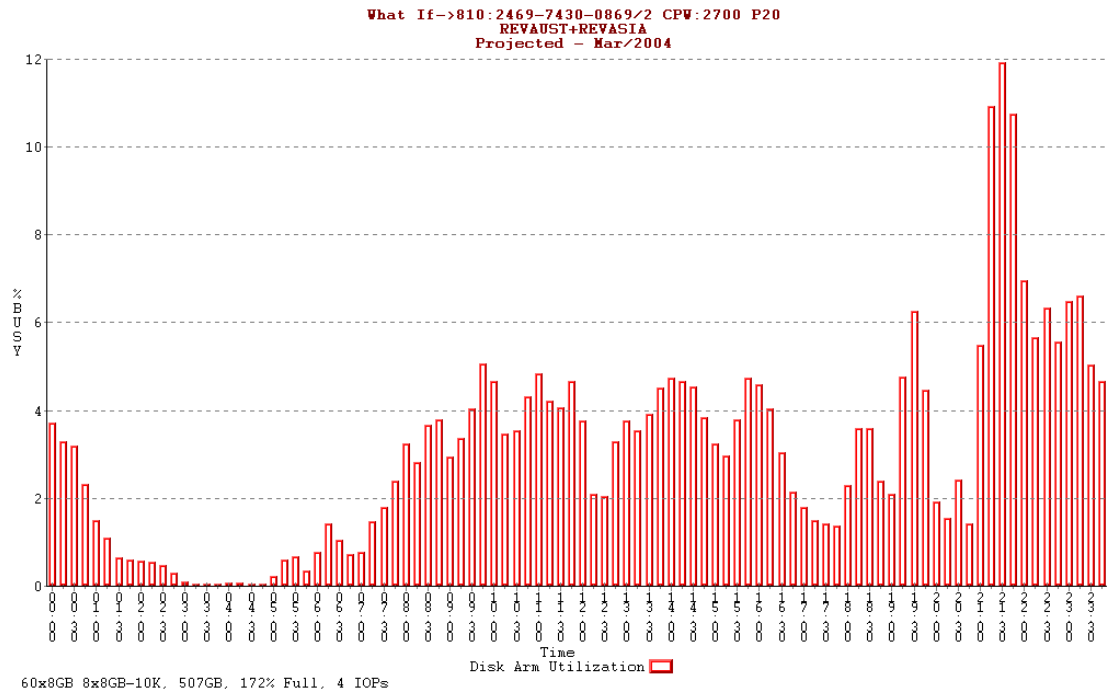
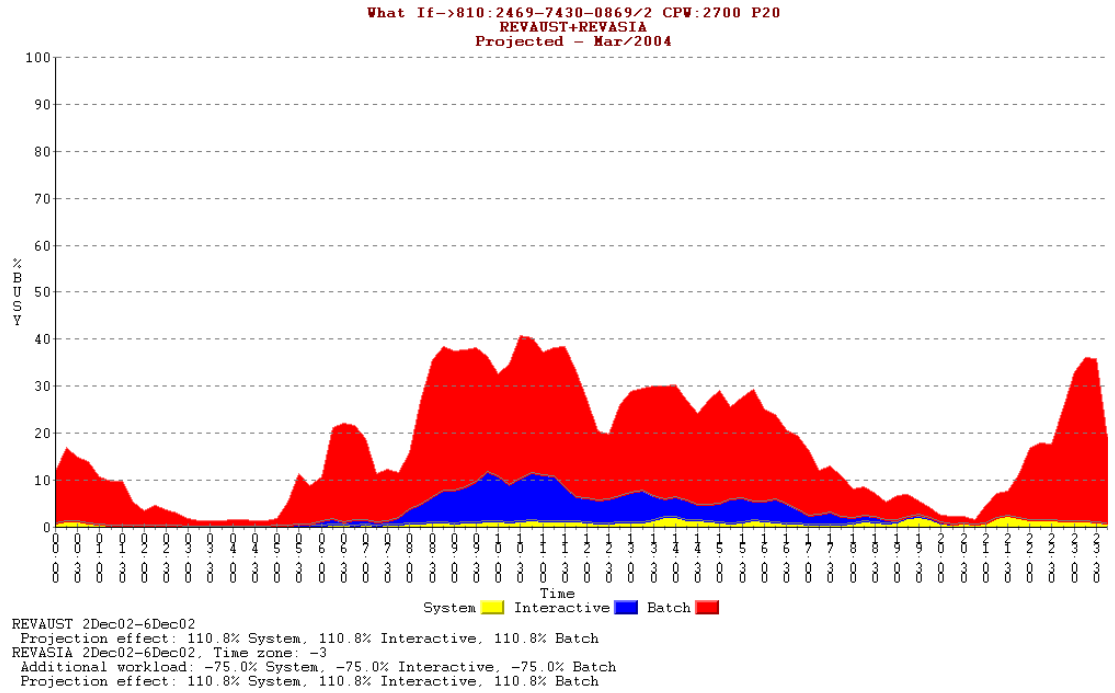
The workload will not fit without extended delays in batch job execution although disk arm utilisation is still satisfactory:



2004-03 with China, HK on 810 system

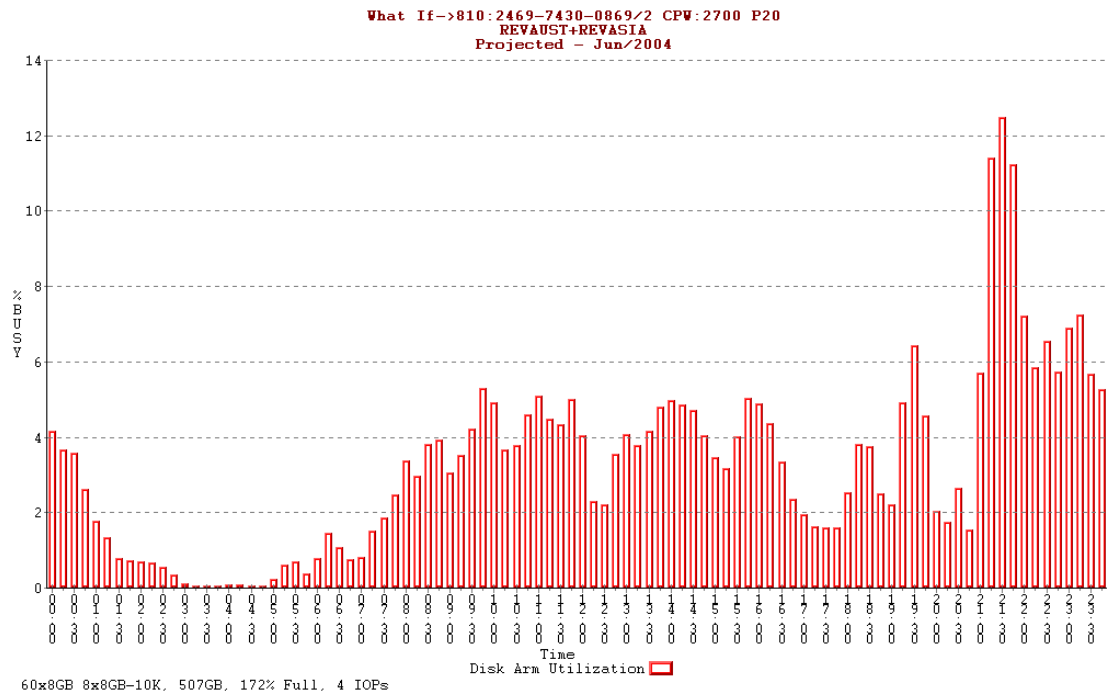
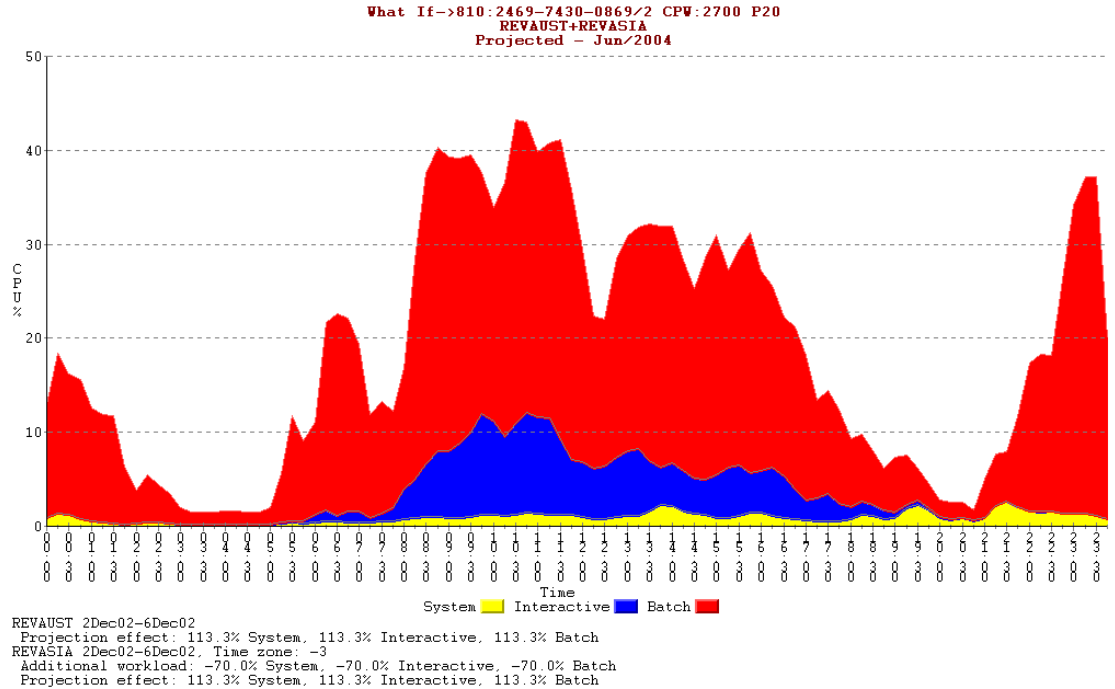
The most likely upgrade path to alleviate the lack of capacity could occur with upgrade to an 810 system and disk arm activity remains satisfactory:

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2004-06 with China, Hong Kong and Taiwan on 810

There is only a slight uplift.

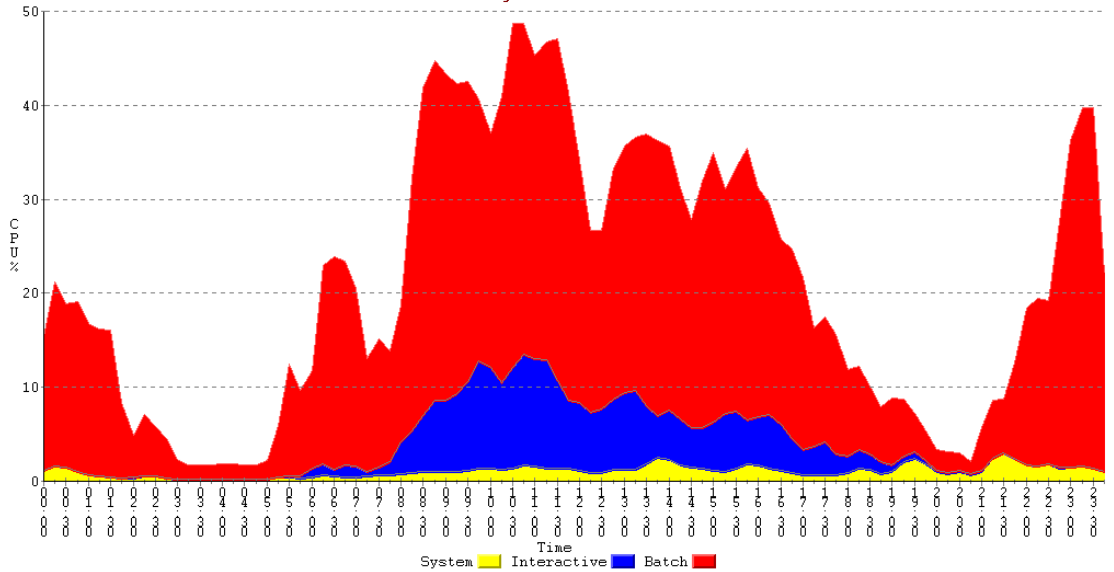


2005-01 with China, Hong Kong, Taiwan and Japan on 810

The system will still have plenty of room for growth.

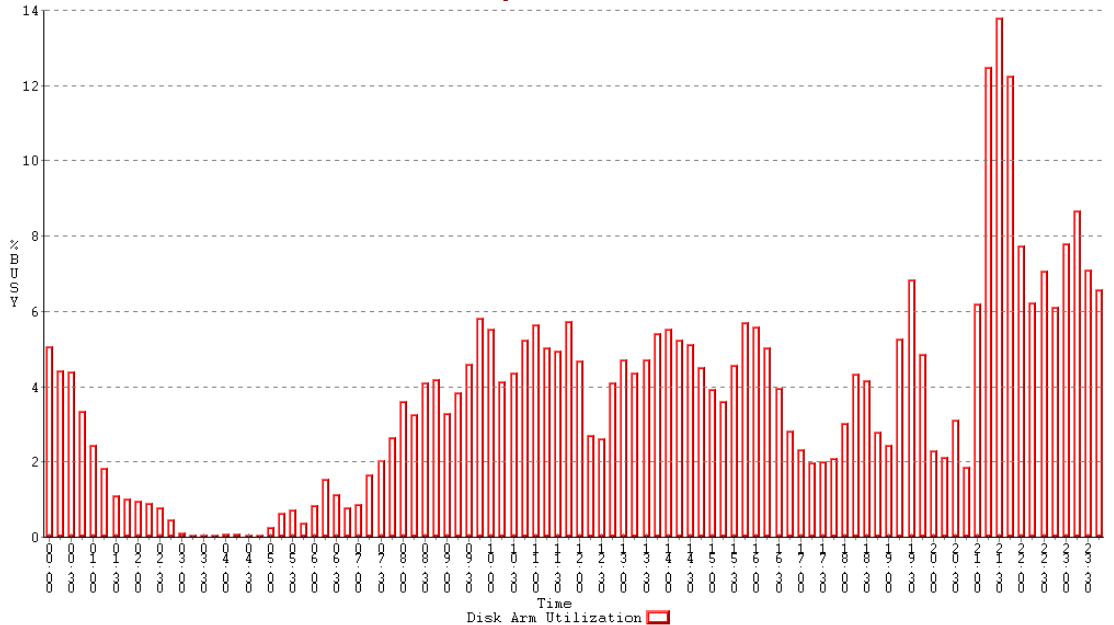
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What If->810:2469-7430-0869/2 CPW:2700 P20
REVAUST+REVASIA
Projected - Jan/2005



REVAUST 2Dec02-6Dec02
Projection effect: 119.2% System, 119.2% Interactive, 119.2% Batch
REVASIA 2Dec02-6Dec02. Time zone: -3
Additional workload: -60.0% System, -60.0% Interactive, -60.0% Batch
Projection effect: 119.2% System, 119.2% Interactive, 119.2% Batch

What If->810:2469-7430-0869/2 CPW:2700 P20
REVAUST+REVASIA
Projected - Jan/2005



60x8GB 8x8GB-10K, 507GB, 172% Full, 4 IOPs

DASD considerations

The above upgrades have assumed use of existing disk configuration on REVAUST and current growth rate of 19.5GB per month. No calculation of the Asian disk requirements is taken into account. However it is likely you will want to replace the older 8GB disks with faster and larger disks and the newer controllers, the details of which will have to be discussed with your iSeries supplier. However some guidelines to assist you with these discussions are provided here.

Date	GB Req @ 70%	8.58GB	17.54GB	35GB	70GB	For perf with #2748 and 15K
Feb 03	642.1	74.8	36.6	18.3	9.2	15
Mar 04	1031.7	120.2	58.8	29.5	14.7	16
Jun 04	1116.1	130.1	63.6	31.9	15.9	18
Jan 05	1312.7	153	74.8	37.5	18.8	18

Memory considerations

It is unlikely that additional memory will be required to accommodate the additional workloads.

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Appendix A – Explanation of Performance Navigator graphs

Graphs can show by month, week, day or hour for the periods listed on the bottom axis. Some graphs show for an average day for selected date ranges listed on the graph concerned. Graphs may appear for first shift and/or second shift. First shift generally applies to daytime activity and second shift generally applies to night-time activity¹.

CPU utilisation by job type

Shows amount of CPU being consumed by system overheads, batch jobs or interactive jobs. IBM guidelines are for overall CPU utilisation to be less than 90% at busy times and interactive to be less than 60% of the interactive allowance (or slightly higher in n-way processors).

A yellow line appears on this graph for server models that indicates the “knee” of the curve where interactive utilisation will degrade and also severely impact batch throughput on older AS/400s.

CPU utilisation by priority

Shows amount of CPU being consumed by system overheads, high and low priority jobs. Low priority is normally priority 21 or more, but may be different on your system². IBM guidelines are for overall CPU utilisation to be less than 90% at busy times and system+high priority to be less than 60% (or slightly higher in n-way processors).

Transaction throughput

Shows rate of transactions per hour. An AS/400 transaction applies only to 5250 (green screen) applications and covers the events that occur after an interactive user presses the keyboard’s enter key or a function key.

Response Time

Shows average internal³ response for each transaction between the time the user presses the enter key or a function key and when the keyboard becomes unlocked again for further input.

Trends

Some graph show trend percentages in the right hand margin. Note that these trend rates describe the projected specific rate of growth rate of the component concerned *at the time of the last period in the trend line*. The trend lines are calculated using a *linear* regression algorithm based on the period of history selected. For example, if the last disk occupation is 100GB and projected to grow at the rate of 20% pa, it will become 120GB in 12 months and 140GB in 24 months; likewise, if the last batch CPU utilisation was reported as 25% and the

¹ To check your shift times on the AS/400 use the following commands:

ADDLIBLE MPGLIB

GO PN400

Select menu option 6 – work with customisation

The next screen will tell you the shift times.

² To check your high priority setting on the AS/400 use the following commands:

ADDLIBLE MPGLIB

GO PN400

Select menu option 6 – work with customisation

The next screen will tell you the priority setting.

³ Internal response is all that is measured by the IBM performance collection services used by MPG’s software.

Actual external, (sometimes known as end-to-end) response depends upon the network speed and traffic, and is not measured by the IBM collection services.

trend projected as 100% pa, then it will use 50% of the CPU in 12 months and 75% in 24 months.

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Appendix B – Guidelines and assumptions used

- Overall CPU utilisation to be less than 67% at predictably busy times to allow for ‘unplanned growth’ or sustained periods of higher workload than normal..
- Interactive CPU utilisation to be less than 67% of its allowance at predictably busy times to allow for ‘unplanned growth’ or sustained periods of higher workload than normal.
- Memory faulting to be less than 70% of the IBM rating for the model/LPAR at predictably busy times.
- Disk arm utilisation to be less than 20% at predictably busy times.