Current Performance Analysis

"State of the Union"

By: MPG

For: Midrange Performance Group, Inc.

System Analyzed: test

Report Date: 1/7/2015 -------- Time: 10:23

This document contains the 'State of the Union' for your system. It is an analysis of the current CPU, disk and memory performance. Separate jpg files are attached which cover the What-If analysis.

System Specifications - test

Frame Specs	
Model	5209406
Feature Code	8327-7357
Serial Number	10-33ACE
i5/OS Release	V6R1
P-Group / MHz	P10 / 1900
Total Processors	1
Total Partitions	3
CPW Rating	60/3800 (2%)
Total Frame Memory (GB)	16.0

LPAR DASD Specs			
Total Disk (GB)	917		
Total ASPs	1		
Total Arms	16		
Disk % (ASP 1)	69.3%	Used GB	Total (GB) Installed
		636	917

LPAR 1 Properties			
Processing Units	0.70		
Virtual Processors	1		
CPW Rating	2660		
LPAR Memory (GB)	12.0		
Dedicated	☐	Shared	☑
Capped	☐	Uncapped	☑
Virtual Shared Pool ID	N/A		
# of Cores In Shared Pool	N/A		
Collection Interval	5 Min		

User Licensing Information*	
Unique *Interactive* Users	5
Unique *Other* Users	7
Total Unique	12
Max Interactive *Concurrent* Users	2
Max Other *Concurrent* Users	10
Max *Concurrent* Users	11
HTTP Active (Ext lic may be required)	Active
Domino Active (Add Lic may be required)	Active

* Additional licenses may be required.

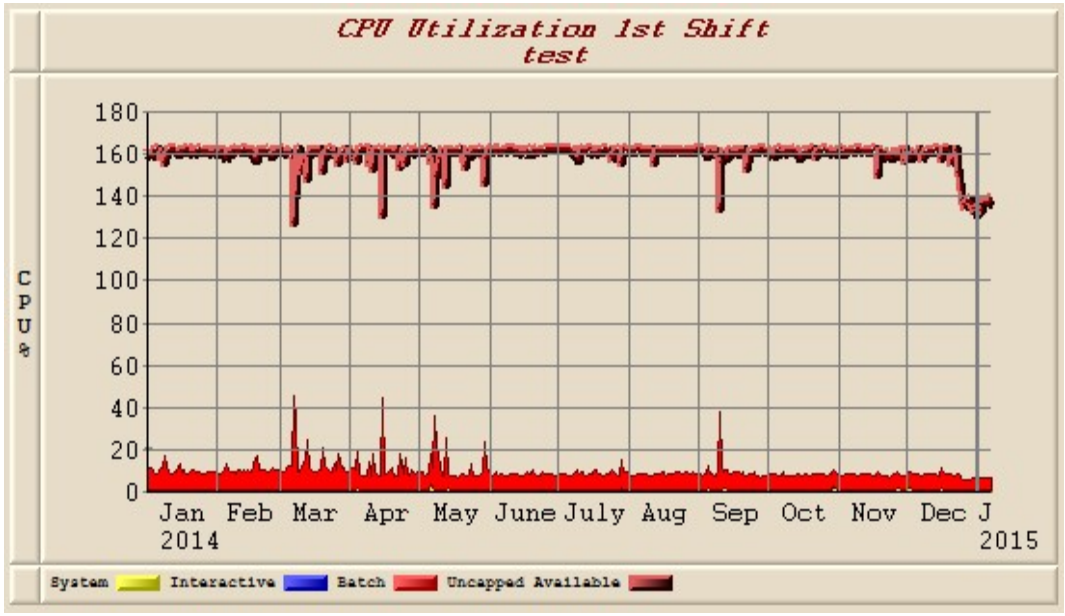
CPU Daily Averages - test

Historical Daily CPU%
1/1/2014 - 1/6/2015 (370 days)

Average Interactive CPU%	0.0%
Average Batch CPU%	9.3%

This graph gives us a view of historical daily CPU usage which if more than 90 days we can use for trending data. Below, we indicate the CPU usage for both workloads (Interactive vs. Batch):

For the period measured (370 days), the average CPU% was 10.3% (Interactive: 0.0%; Batch: 9.3%; System: 1.0%). During this period, the maximum CPU% was 45.9%, and it occurred on 3/6/2014.

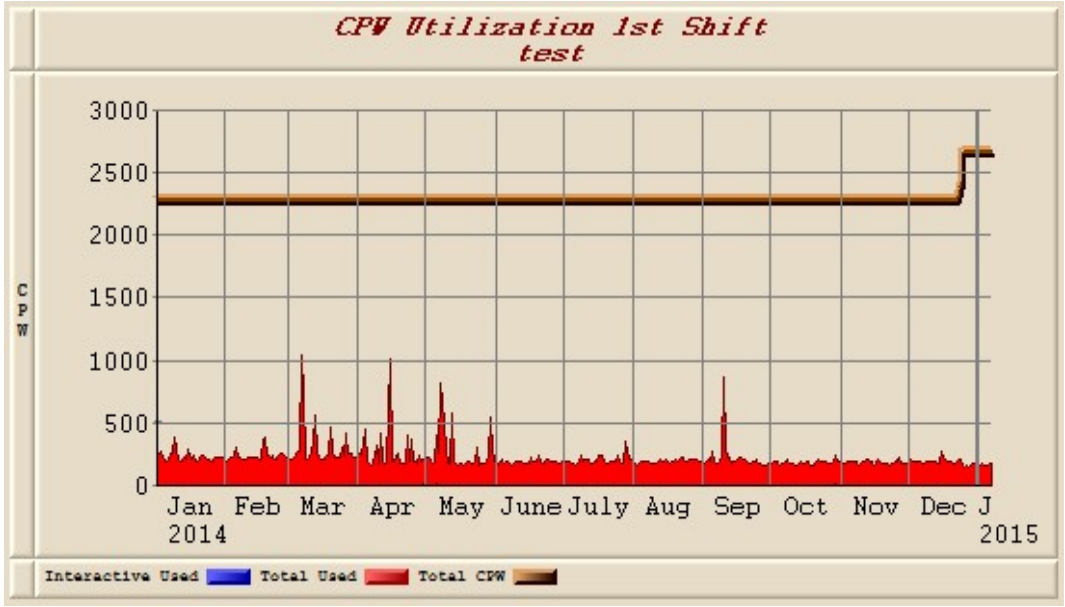


Historical Daily CPW
1/1/2014 - 1/6/2015 (370 days)

Interactive CPW Average	0.6
Batch CPW Average	234.2

This graph gives us a view of historical daily CPW usage which if more than 90 days we can use for trending data. Below, we indicate the CPW usage for both workloads (Interactive vs. Batch):

For the period measured (370 days), the average CPW was 235 (Interactive: 1;Batch: 234). During this period, the maximum CPW was 1047, and it occurred on 3/6/2014.



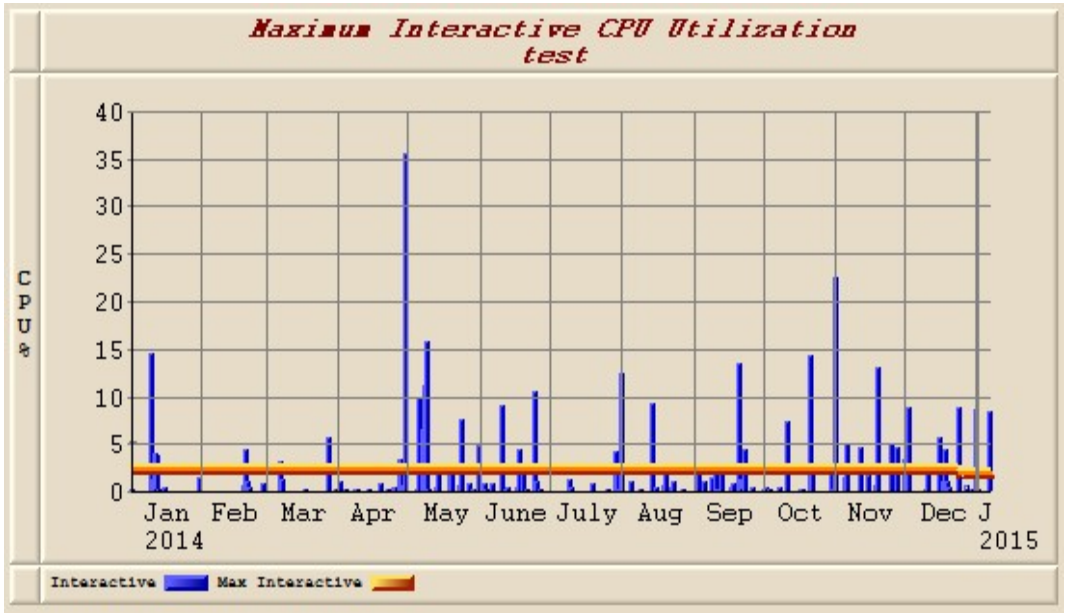
Maximum CPU% - test

Maximum Interactive CPU%
1/1/2014 - 1/6/2015 (370 days)

Max Interactive CPU%	35.6%
Peak Date	4/29/2014

Maximum interval graphs provide a quick way to see the maximum interval (usually 15 minutes) value for any performance metric each day. In this case, this graph indicates the maximum interactive CPU% reached:

For the period measured (370 days), the maximum interactive CPU% was 36%, and it occurred on 4/29/2014.

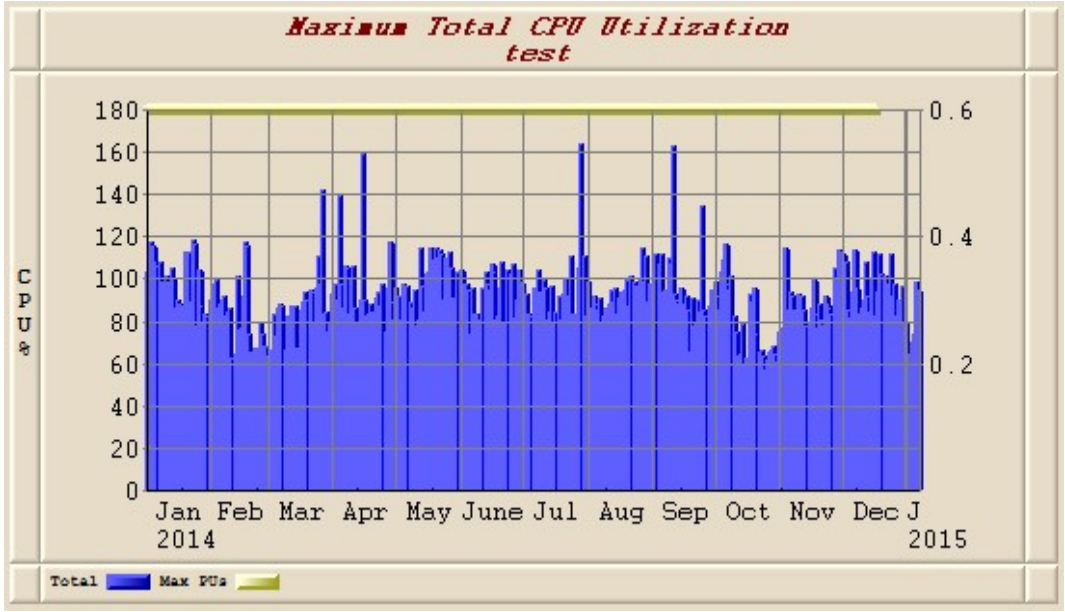


Maximum Total CPU
1/1/2014 - 1/6/2015 (370 days)

Max Total CPU%	163.5%
Peak Date	7/28/2014

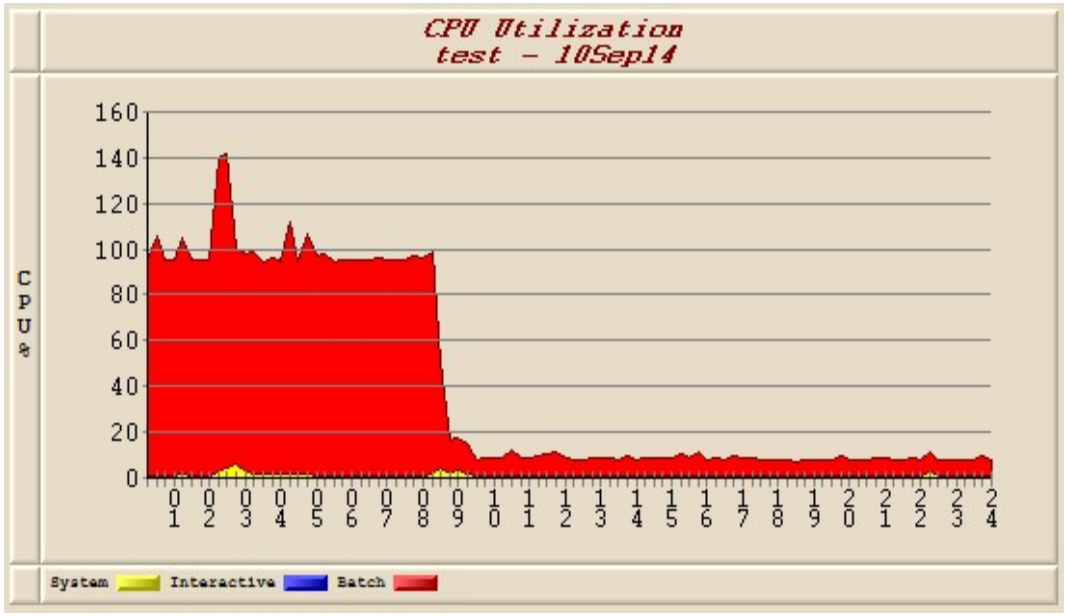
Maximum interval graphs provide a quick way to see the maximum interval (usually 15 minutes) value for any performance metric each day. In this case, this graph indicates the maximum total CPU% reached:

For the period measured (370 days), the maximum total CPU% was 163%, and it occurred on 7/28/2014.

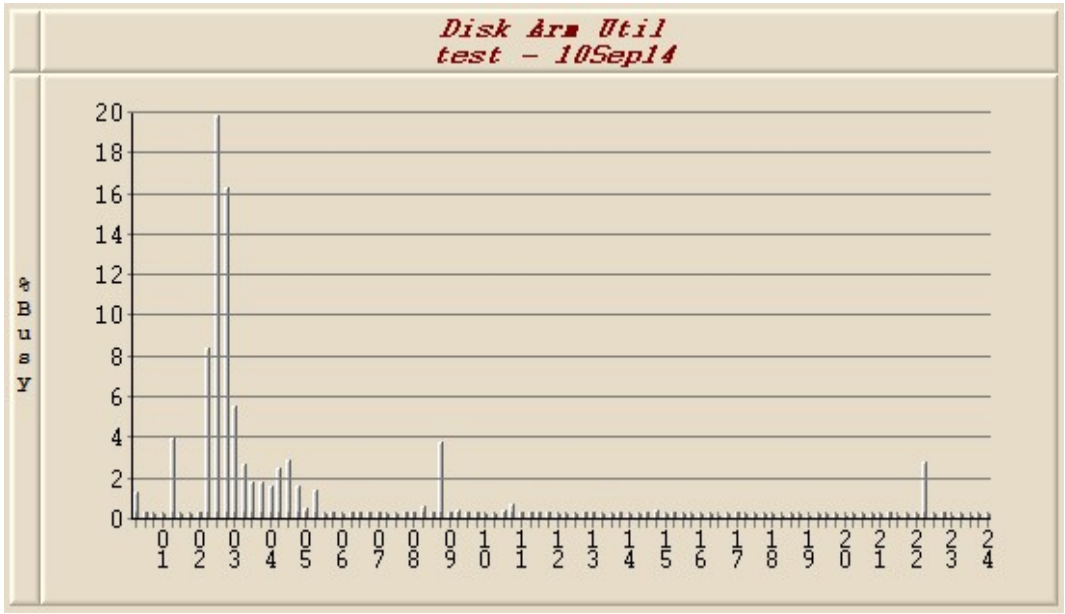


Peak Day "Baseline" Data (Used For What If ®) - test

Peak Date CPU% Statistics Peak Date: 9/10/2014	
Avg Interactive CPU%	0.0%
Avg Batch CPU%	40.7 %
Interactive CPU% (Busiest Interval)	6.0 %
Interactive CPU% Interval Time	02:45
Batch CPU% (Busiest Interval)	141.7 %
Batch CPU% Interval Time	02:30



Peak Date Disk Arm % Peak Date: 9/10/2014	
Avg Disk Arm % Busy	1.0%
Disk Arm % Busy (Busiest Interval)	19.8%
Disk Arm % Busiest Interval Time	02:30



One of the features of Performance Navigator is the ability to search the historical data and select the day that used the most CPU and disk resources. The peak day selected was 9/10/2014, and for that day:

The average CPU% was 40.7%. The maximum CPU% was 141.7, and it occurred at 02:30.

The average disk arm % was 1.0%. The maximum disk arm % was 19.8%, and it occurred at 02:30.

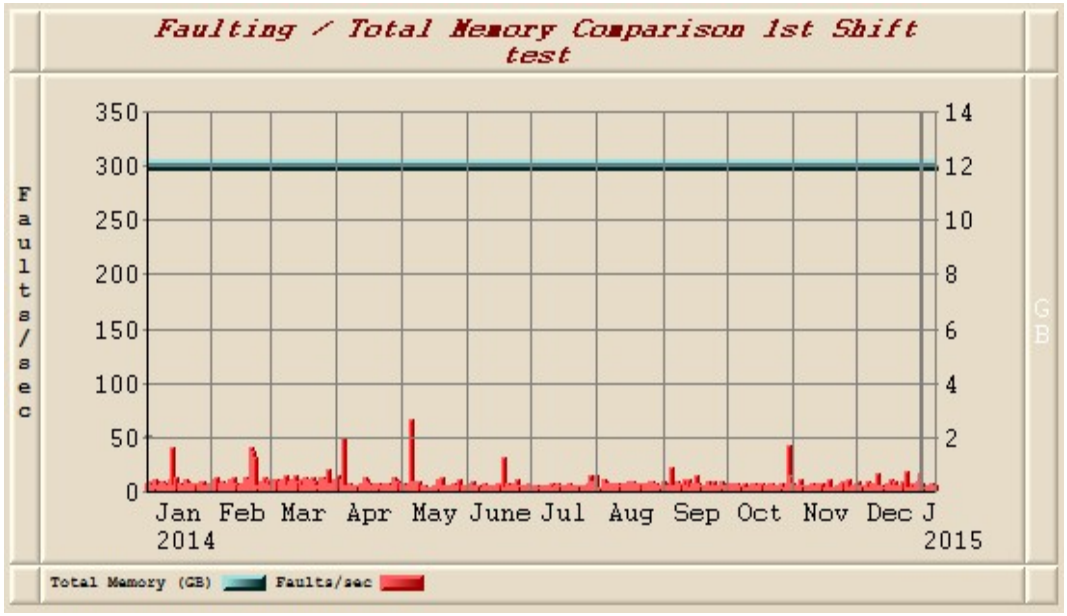
Memory Analysis - test

Total Faults / Sec
1/1/2014 - 1/6/2015 (370 days)

Average Faults / Sec	8.4
Peak Faults / Sec	67.0

To understand if your environment has a performance issue in regards to memory, one must start with looking at the fauling rate for the entire system:

For the period measured (370 days), the total system faulting rate was 8.4 faults /Sec. The maximum faulting rate was 67.0 faults /Sec.

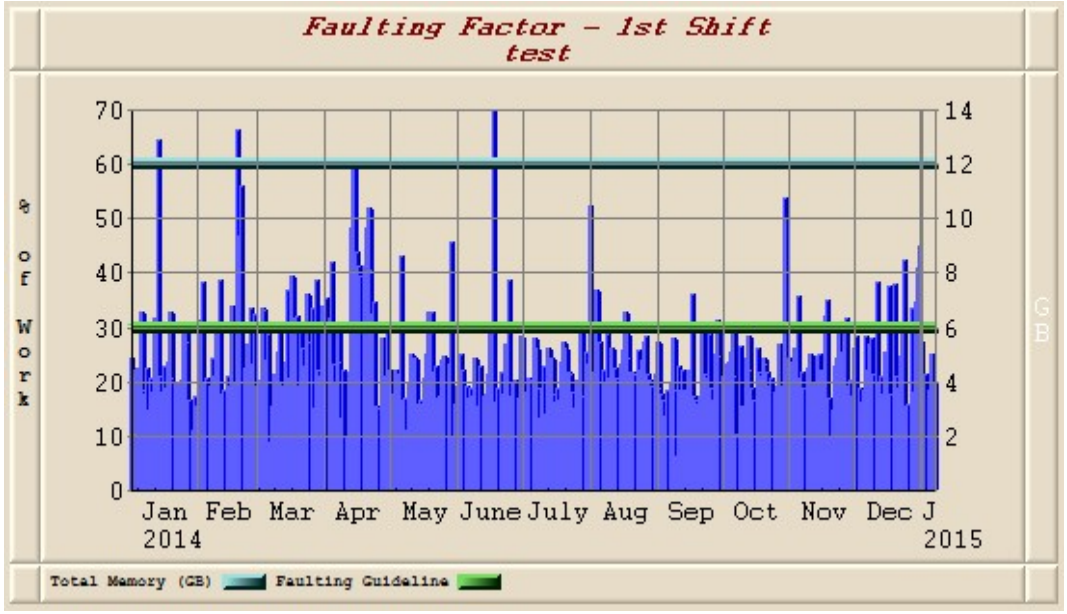


Faulting Factor
1/1/2014 - 1/6/2015 (370 days)

Avg % of Time Faulting	23.4%
Peak % of Time Faulting	69.8%

Another metric to understand if your environment has a performance issue in regards to memory, is to look at the percentage of time your system is faulting. We call this your systems faulting factor:

For the period measured (370 days), the total system faulting factor was 23.4%. The maximum faulting factor percentage was 69.8%.



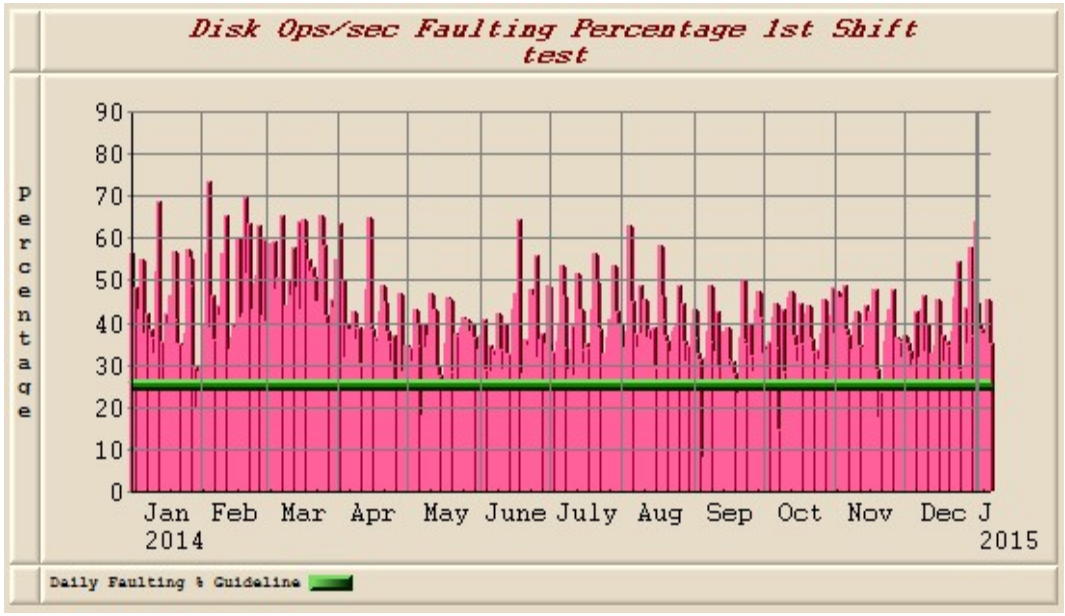
Memory Analysis (cont) - test

Disk Ops / Sec Faulting Percentage
1/1/2014 - 1/6/2015 (370 days)

Average Disk Ops / Sec %	38.0%
Peak Disk Ops/ Sec %	73.2%

In addition to measuring your systems faulting factor, another metric to understand your memory environment is to look the percentage of the total disk operations that are simply due to faulting:

For the period measured (370 days), the total disk ops /Sec faulting pct was 38.0%. The max disk ops /Sec faulting pct was 73.2%.

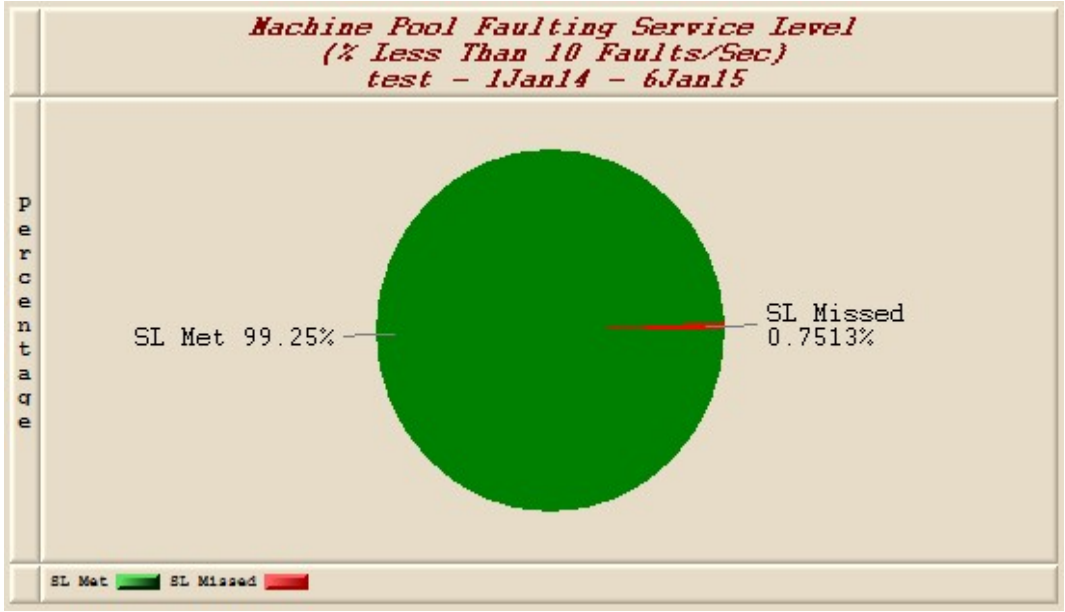


Machine Pool Service Level

% Under 10 Faults /Sec	99.2%
% Over 10 Faults /Sec	0.8%

The most important memory pool on the system is the machine pool. The best practice guideline to keep this memory pool under 10 faults /Sec 95% of the time:

For the period measured (370 days), the machine pool faulting rate was under 10.0 faults/sec 99.2% of the time.

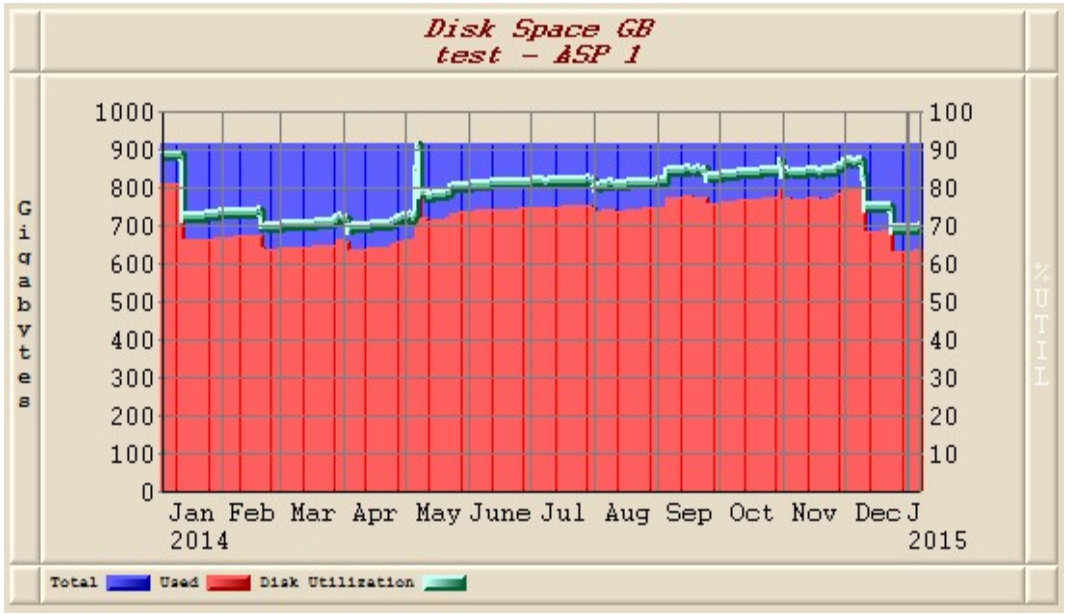


Disk Usage Analysis - test (ASP 1)

Disk Usage (GB)		
Total Installed	917	
Total Used	636	69.3%
Total Unused	282	30.7%

As of 1/6/2015, there is 917 GB of installed disk.

Total Disk Used (GB): 636 (69.3%); Total Available Disk (GB): 282 (30.7%)



Analysis Notes / Explanations of Graphs

Memory Graph Explanations

Faulting Factor:

The faulting factor is a relationship of the amount of time spend faulting vs time spent doing productive work. For example, if the faulting factor for a given day was 20%, this means that for every hour of productive work the system did 12 minutes of faulting. Note the guideline of 30%. As this number approached the guideline, it is an indication more memory is needed to maintain optimal performance. How much memory is more of a question of hardware configuration. However, a general guideline is to double the memory if less than 12GB or add 25% more if more than 12GB.

Disk Ops / Sec Percentage:

This graph shows the percentage of the total disk operations that are simply due to faulting. If this percentage is high (+30%), this is a good indication that more memory is needed on the system. Keep in mind, that this metric in isolation can not be used to determine the need for more memory.

Machine Pool Faulting:

Machine pool faulting is the most important memory pool on the system. As a result, it is imperitive that the machine pool faulting rate remains low (under 10 faults per second). The above graph shows the machine pool faulting service level percentage. The best practice guideline is to meet this service level 95% of the time (with the other 5% simply being anomalies)

Disclaimer / Thank You

The following analysis was done using MPG's Performance Navigator ®

The Performance Navigator System i code is free and very valuable because it keeps years of historical performance data in a few hundred MBs. Free access to your CPU by Priority and Disk Space graphs is available for trending and planning. For a temporary key to unlock the hundreds of other graphs and reports in Performance Navigator, please contact your IBM Business Partner or contact MPG by email at support@mpginc.com or call (800) 457-6744.

To see how Performance Navigator can manage all facets of system performance, see our demo page at: www.mpginc.com/demos

Disclaimer: This capacity plan was performed using MPG's Performance Navigator. The results are based on historical data, assumptions, and interpretation of the graphs. A thorough knowledge of System i performance and capacity planning is required.? No guarantee is made as to the actual result.