Performance and Capacity Reporting
Using TDS/z and SAS

Date: April, 2016
Agenda

• Background information
• Tools for reporting
• Development of the Performance and Capacity management website
• Overview on reporting
• Highlight typical graphs and the SAS code
Background

- Internally developed capacity planning website using SAS / MXG and a home grown database
- TDS/z was newly introduced at the time
- Over time, the website has been expanded many times with new enhancements, contents and looks
- Currently, website is used by management, planners, operations, support, developers, performance and capacity management personnel
- Centralized access for monitoring and reporting on infrastructure
- Adhere to ITIL best practices for capacity management reporting
Tools

- TDS/z (Tivoli Decision Support)
- SAS
- MXG
- VEHSTATS (IBM’s tool)
- Omegamon XE
- RMF
- Excel
- BMC Performance Assurance
- Teamquest Surveyor
Website Mainframe Processing

- SMF tapes from all LPARs loaded into the TDS/z database shortly after they are created
- Near real time reporting capability
- SAS jobs send outputs to our website
- Inputs from other sources such as Tandem, logfiles, TSM reports, Teamquest generated Dashboards
- Built on automation
Infrastructure Performance and Capacity Website
Windows explorer style left menu / Tab across

Performance and Capacity Reporting

<table>
<thead>
<tr>
<th>WEEK OF</th>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
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</table>

zSeries CPU Utilization: Daily charts cycle for 6 weeks (Updated every day by the computer.)
Click on the picture to expand your view.
Performance and Capacity Reporting

Thumbnail View

zSeries CPU Utilization

Daily charts cycle for 6 weeks (Updated every day by the computer.)
Click on the picture to expand your view.

WEEK OF Sun Mon Tue Wed Thu Fri Sat

13MAR2016

06MAR2016

28FEB2016

21FEB2016

14FEB2016

07FEB2016
ActiveX Chart with drill-down

MIPS by LPAR / 10-minutes
Tuesday, March 15, 2016: Peak 9.5=13466 MIPS Avg 2.3=10978 MIPS
Line at 16130: (85% of Installed 18975 MIPS)

Source: TDS
Customized application reporting

Performance and Capacity Reporting

MIPS (GCP & zIIP)

Peak 3-5 = 1772 MIPS, 723 TPS
Avg. 2-3 = 1289 MIPS, 755 TPS
Avg 2-3 GCP = 598 MIPS, zIIP = 671 MIPS

Source: TDS

Title: "Optimizing "MIPS (GCP & zIIP)"
'MPS: x=blue "h=3.5 pct"
'OPTIMIZER: "MIPS (GCP & zIIP)", x=blue "h=3.5 pct"
'MIPS: x=blue "h=3.5 pct"
'Avg 3-5 1772 MIPS: x=red "&avg;" c=blue "h=3.5 pct"
'Avg 2-3 1289 MIPS: x=red "&avg;" c=blue "h=3.5 pct"
'Avg 2-3 GCP 598 MIPS: x=red "&avg;" c=blue "h=3.5 pct"
'Avg 2-3 zIIP 671 MIPS: x=red "&avg;" c=blue "h=3.5 pct"
'Surface Graphs are Accumulative;'
'Footnote: " weekends only" c=blue "h=2.8 pct" 'Source: TDS';
proc gplot data=all24;
where name_='MIPS';
format time time;
label wk1 = 'WK1';
wk2 = 'WK2';
wk3 = 'WK3';
wk4 = 'WK4';
wk5 = 'WK5';
wk6 = 'WK6';
wk7 = 'WK7';
wk8 = 'WK8';
wk9 = 'WK9';
wk10 = 'WK10';
wk11 = 'WK11';
plot wk1 *time
wk2 *time
wk3 *time
wk4 *time
wk5 *time
wk6 *time
wk7 *time
wk8 *time
wk9 *time
wk10 *time
wk11 *time
/ overlay
haxis=axis1;
vaxis=axis2;
area=11;
frame
name='OPT\&week\&dayofwk'
legend=legend1
vref=(0 500 600 900 1200 1500)
lvref=2
cyref=aqua;
plot2 scale=times=1
/ overlay
haxis=axis1;
vaxis=axis3;
legend=legend2
frame
lvref=2
cyref=aqua;
runt;
Storage class response time map

Performance and Capacity Reporting
Drop-down menu with enhanced drop-down list

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<td>2016-03-01 Tue **</td>
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<tr>
<td>2016-02-08 Mon</td>
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<tr>
<td>2016-02-07 Sun</td>
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</table>

* denotes Canadian holiday

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```javascript
function msgate()
{
    date1 = document.dateform.daten.selectedIndex;
dateval = document.dateform.daten.options(date1).value;
if (dateval == 'c') return;
new=window.open( 'b3 + dateval + '.htm');
}
```

---

Performance and Capacity Reporting
Workload Trending analysis

zSeries CPU Workload Trending
Charts updated Daily

Workload Aggregation across LPARs - Click on the picture to expand your view.

Drill-down & ActiveX Chart

Workload Trending analysis

Performance and Capacity Reporting
CPU Trend
CPU Trend with ability to download data in CSV format

![Graph showing CPU Trend](chart.png)

Daily 2–3 Avg/1HRA/Max MIPS vs Installed
Monday – Friday, less Holidays
Performance and Capacity Reporting

LPAR CPU Busy/MIPS chart

CPU Usage (of physical box): 10-minute Intervals
z19-705: 6993 MIPS
Tuesday, March 8, 2016

--- Define the titles ---

proc gplot data=daily ;
format time times. ;
plot cpubusy = time
/ overlay
haxis=axis1
vaxis=axis2
name="CPU&week&dayofwk"
areas=1
frame
vref=(0 10 20 30 40 50 60 70 80 90 100)
lref=2
vminor=1
ctext=blue
cvref=aqua;
plot2 lim *time=2/overlay
haxis=axis1
vaxis=axis22
lref=2
vminor=1
;
run;
Top 20’s

Top 20 Tape Jobs by tape mounts
Thursday, March 10, 2016
Monitoring PPRC link in near real time mode

ESS PPRC Link Statistics -
Tuesday, March 15, 2016
CU = BIDE02

Source: TDS
Monitoring batch job delays for virtual tape

Accumulated Delay due to attempted throughput greater than Capacity during overnight batch window (00:00—06:00)

MONTH

Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul

Mins. Delayed

0 10 20 30 40 50 60 70 80 90

Bandwidth upgrade

CL0  CL2
Questions? Comments?