



Analizing/Monitoring Performance Of z/OS I/O Operations: DASD and Tape - Performance View

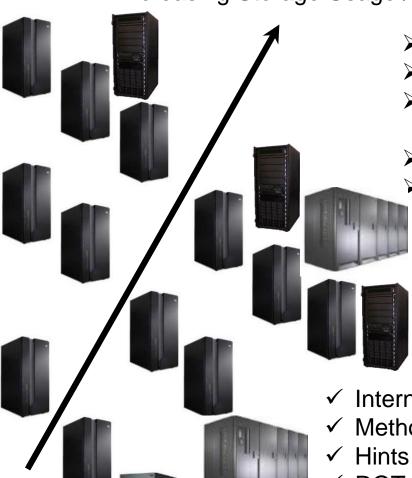
Z. Meral Temel
Garanti Technology
8 August 2012
11491



WHY?



Increasing Storage Usage / Increasing Workloads



- Performance Was An Issue
- > Performance Is An Issue
- Performance Will Continue To Be An Issue
- Even More Important Than Ever
- For Some Cases Much Harder Than Ever

- ✓ Internals How Are Things Working? Life Of I/O?
- ✓ Methods Used To Analize/Monitor Performance Of I/O
- ✓ Hints To Do Performance Management
- ✓ ROTs That Are Used



Agenda





WHO IS GT?



GT- MAINFRAME CONFIGURATION

GT- MAINFRAME DASD CONFIGURATION

GT- MAINFRAME TAPE CONFIGURATION



LIFE OF I/O

LIFE OF I/O DASD LIFE OF I/O IN XRC ENVIRONMENT –XRC I/O FLOW LIFE OF I/O TAPE



PERFORMANCE METRICS OF MVS I/O



METHODS USED TO ANALIZE DASD PERFORMANCE



Agenda





DASD PERFORMANCE REPORTS



REPORTS/METHODS USED TO ANALIZE TAPE PERFORMANCE



REFERENCES



MORE SAMPLES/SLIDES/CONFIGURATION PARAMETERS



Who Is Garanti Technology?





- A wholly-owned subsidiary of Garanti Bank, the second largest private bank in Turkey owned by Doğuş Group and BBVA.
- One of the largest private internal IT service providers in Turkey
- Most up-to-date IT infrastructure
- Tightly integrated and fully in-house developed, custom-fit IT solutions
- Uninterrupted transaction capability and infrastructure security
- Well-reputed as a company of "firsts"
- Visionary and continuous investment in technology since 90's







- Fast decision making and strong communication from top to down
- Centralized management reporting systems, enable management to take timely actions
- Advanced CRM applications
- Paperless banking



Who Is Garanti Technology?



















TÜV TURK

Who Is Garanti Technology?



SHARE



CMG

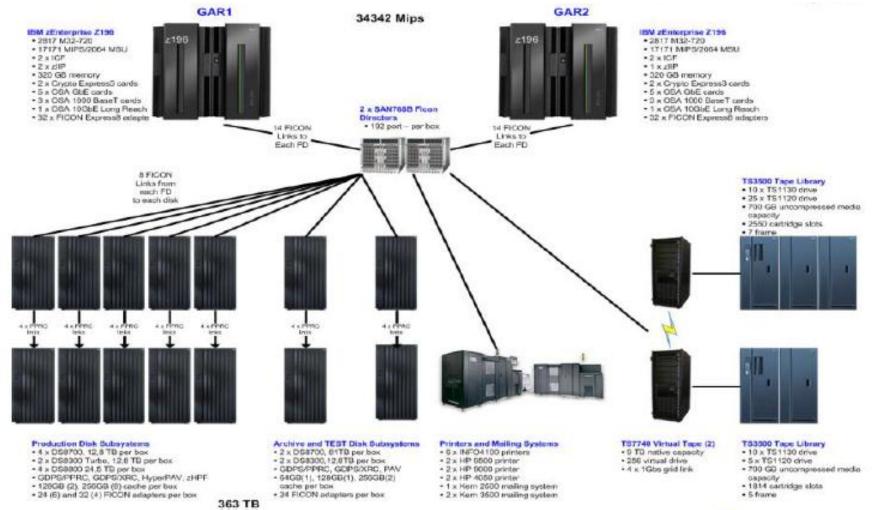


- GDPS Design Council
- zBLC



GT- Mainframe Configuration

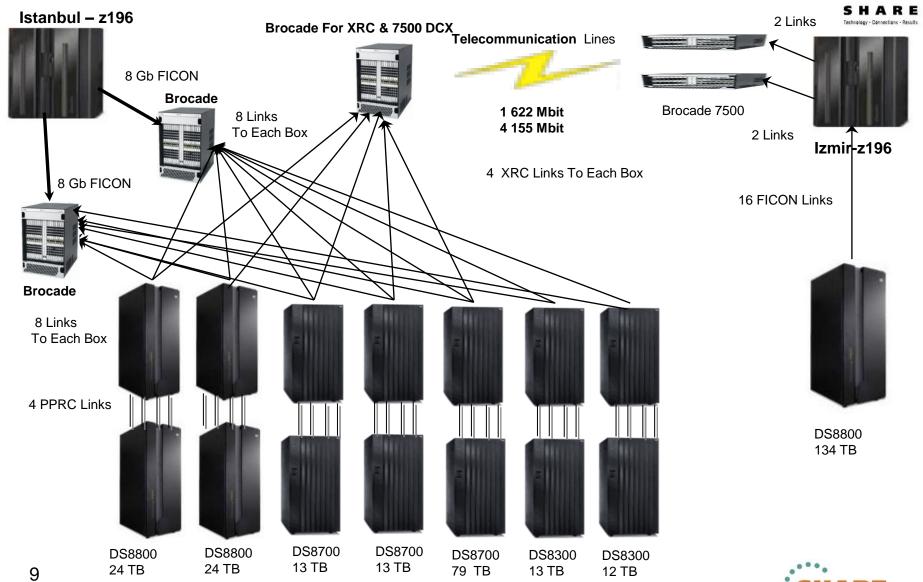






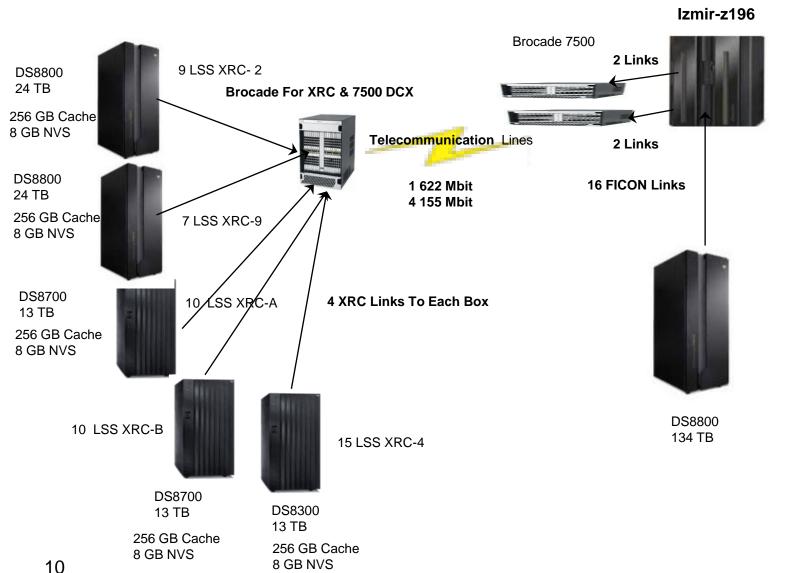
GT- Mainframe Storage Configuration- DASD





GT-XRC Configuration





GRTS
ANTAS001
ANTAS002
ANTAS003
ANTAS004
ANTAS005
ANTAS006
ANTAS007
ANTAS008
ANTAS009

GT- Mainframe Storage Configuration- TAPE





9000 GB

Backend Drives: 10 TS1130 (3592-E06)

Encryption Enabled

41 Gbit GRID Links



2550 Storage Slots

1 L23 , 6 D23 Frames : Total 7 Frames 10 TS1130 (3592-E06) Backend Drives

5 TS1120 (3592-E05) Z/OS Native Drives (Encrpt. Enabled)

20 TS1120 (3592-E05) Open Platform TSM Drives



9000 GB

Backend Drives: 10 TS1130 (3592-E06)

Encryption Enabled



1814 Storage Slots

1 L23, 4 D23 Frames: Total 5 Frames 10 TS1130 (3592-E06) Backend Drives

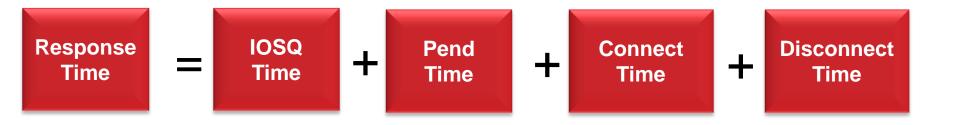
5 TS1120 (3592-E05) Z/OS Native Drives Encret. Enabled)

11

Complete your sessions evaluation online at SHARE.org/AnaheimEval

ResponseTime Component

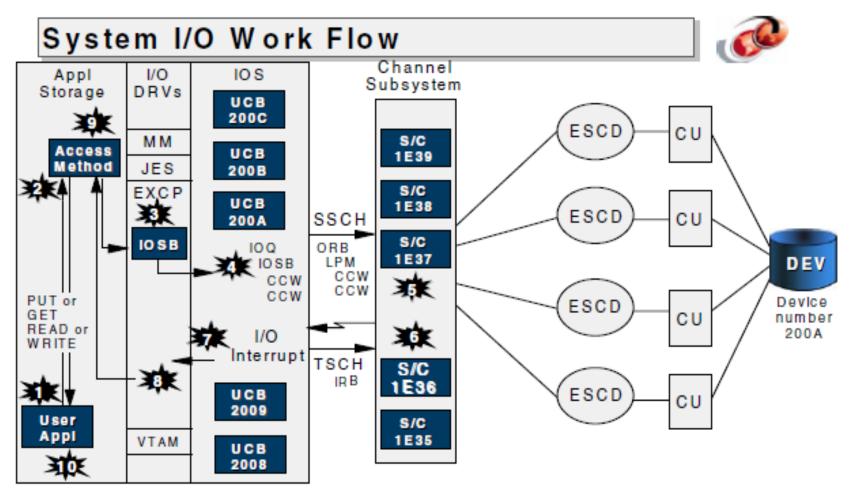




Life Of I/O – Original Diagram



From IRD Redbook....-Book that I recommend to my students as one of the first must read.



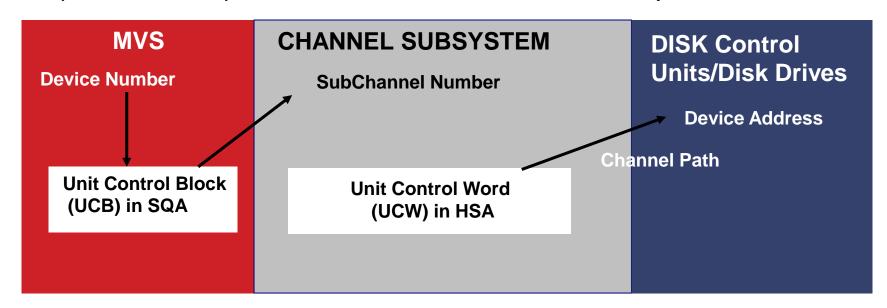
Life Of I/O – TERMs To Remember



- □ Each Device Has UCB in SQA in MVS
- ☐ Each Device Has Corresponding Subchannel Number maintained by Channel Subsytem
- ☐ UCB contains subchannel number, device type,

List of users that have outstanding request for I/O on device

- ☐ Channel Subsystem Identifies Device Through Subchannel Number
- UCW are created during POR /dynamic IODF activation,located in HSA
- □ UCW(Unit Control Word) contains control blocks with subchannel description & status



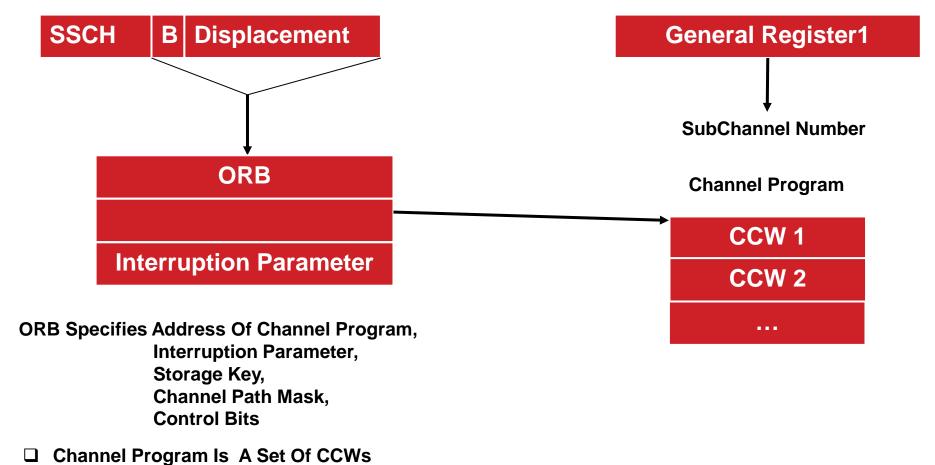


Life Of I/O – TERMs To Remember



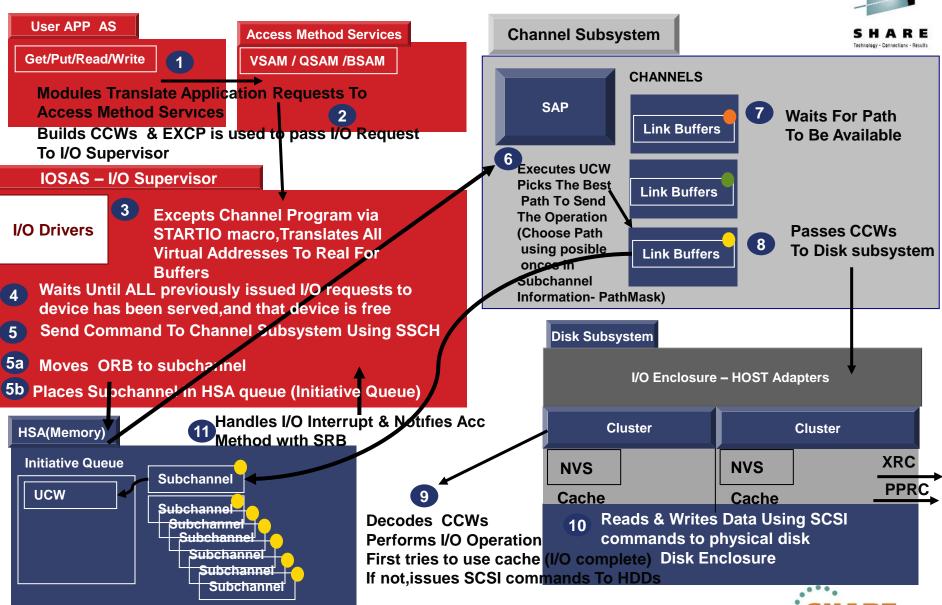
☐ SSCH: Start Subchannel Instruction - Created By IOSAS

Specifies SubChannel Number & ORB (Operation Request Block)





Life OF I/O Flow



Complete your sessions evaluation online at SHARE.org/AnaheimEval

Which Period Of Time Causes I/O ResponseTime Components? **User APP AS Channel Subsystem** Access I 5 - 3Get/Put/Read/Write **VSAM IOSQTime Data Transfer ConnectTime Modules Translate Application Requ** SAP **Access Method Services Waits For Path Link Buffers** Builds CCWs & EXCP is used to pass I/O Request To Be Available To I/O Supervisor Executes UCW **IOSAS – I/O Supervisor Picks The Best Link Buffers** Path To Send **Excepts Channel Program via** The Operation I/O Drivers **Passes CCWs** STARTIO macro, Translates All (Choose Path 9.10 +using posibi-To Disk subsystem Virtual Addresses To Real For onces ii PPRCCopyTime+XR **Buffers** subch Waits Until ALL previously issued I/O requests to C-WP Infor⁷ device has been served, and that device is free DisconnectTime Send Command To Channel Subsystem Using SSCH *10-Cache Miss (Subchannel is busy Moves ORB to 9-6 but device is not ters **Pend Time** 5b Places Subchank ative Queue) connected) Handles I/O Interrupt & Notifies Acc Cluster Cluster HSA(Memory) Method with SRB **DeStaging Initiative Queue XRC NVS NVS Subchannel PPRC UCW** Cache Cache Subchannel **Reads & Writes Data Using SCSI Decodes CCWs** commands to physical disk Performs I/O Operation First tries to use cache (I/O complete) Disk Enclosure Staging If not, issues SCSI commands To HDDs Subchanne Complete your sessions evaluation online at SHARE.org/AnaheimEval

XRC I/O Flow Izmir Istanbul SDM-ANTAS001-2-3.. Address Space 5 2 6 **N**VS NVS NVS Cache SideFile 9 Cache Cache Cache Cache



Sec Dev

Journals



SecFC Dev

I/O Enclosures

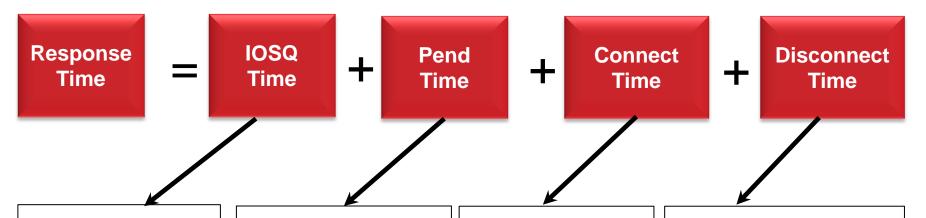
/O Enclosures

Istanbul-DS8X

Items That Effect Each ResponseTime Component



What Are The Possible Reasons? Where To Look? What To Do?



Queuing at host level.
I/O is queued on LPAR Level.
Lack of PAVs
Long busy condition.

Action Add more PAV Use HyperPAV Use much faster Stg Device Check reason of LB condition Queing on HW –
DB Delay+CMR Delay+CH Delay
FICON Director Port Utilization
Host Adapter Port Utilization
CMR Delay
IOP process utilization
Device Busy Delay

Action
Don't use more than 2 of HA
Check FICON director port util
Add more IOP
Add more connection path

Connect Time during transfer FICON saturation High DDM Utilization Contention on FICON ports

Action
Remove the bottleneck
Causing Pend Time,
Disconnect Time

Read Miss Ratio NVS Full Condition Lack Of Cache XRC-WP,PPRC effect Rank busy condition

Action
Distrubute workload
Add more Cache
Improve perf of XRC.PPRC



Resources To Analize/Monitor DASD Performance - SW |

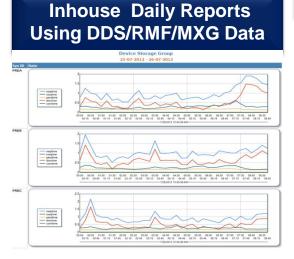


RMF Panels RMF Resource Report Selection Menu Enter selection number or command for desired report. Processor 1 PROC Processor delays 1A PROCU Device 2 DEV Device delays (DR 3 DEVR Device resource 3A DSND .. Data set level by DSN 3B DSNV .. Data set level by volume Enqueue 4 EN0 Enqueue delays (ER 5 ENOR Enqueue resource Storage 6 STOR Storage delays for each job 7 STORF Storage usage by frames (SM) **7A STORM** Storage usage by memory objects 8 STORR Storage usage for each resource 9 STORS Storage summary for each group 10 STORC Common storage summary 11 STORCR Common storage remaining I/O Subsystem 12 CHANNEL Channel path activity 13 IOQUEUE I/O queuing activity

| | | | | | | R | MF | | R | e | p | or | t | 5 | | | | | | \leq |
|------------------|-------|-----------|--------|------------------|----------------|-------|--------------------|-------|-------|-------------|----------------|-------|-------|--------|------|------|------|------------|-------|--------|
| | ε. | /08 V1R12 | | | SYSTE RPT V | | PRDA V V1R12 RI | sr. | | E 07/: | 1/201 15.00 | 2 | | INT | FAUL | 40 | | | | |
| TOTAL S | MPLES | - 900 | IODF | - 60 | CR-DA | TE: O | 7/17/2012 | | TIME: | | | | | TIVATE | | | | | | |
| - | | | | | | | DEVICE | AVG | AVG | AVG | AVG | AVG | AVG | AVG | 4 | k. | 4 | AVG | k . | 4 |
| STORAGE | NUM | TYPE | OF CYL | VOLUME | PAV | rcn | RATE | | | DLY | DLY | | DISC | | CONN | DEV | RESV | ALLOC | ANY | NT |
| GROUP | | 33903 | 1113 | PCPLO4 | | | 0.064 | .65B | | DLY .022 | .000 | | | | 0.00 | 0.00 | 0.0 | 6.0 | 100.0 | |
| - n | ASIC | 33303 | 1113 | PCPEGA | 1.Uh | ODBC | 39.138 | 1.30 | | | .000 | | .813 | | 0.05 | 0.16 | 0.0 | 851 | 100.0 | |
| DSGDBII2 | 4600 | 33909 | 65520 | DBP267 | 1.08 | | 0.179 | .960 | | .010 | .000 | | | | 0.00 | 0.10 | 0.0 | 49.8 | 100.0 | |
| SGDBU2 | | 33909 | 65520 | DBP091 | | | 1,109 | .585 | | | ,000 | | .264 | | 0.02 | 0.05 | 0.0 | 75.7 | 100.0 | |
| SGDBU2 | | 33909 | 65520 | DBP430 | | | 0.137 | .552 | | | ,000 | | .229 | | 0.00 | 0.01 | 0.0 | 33.8 | 100.0 | |
| SGDBII2 | A603 | 33909 | 65520 | DBP237 | | | 1.267 | 454 | .000 | | .000 | | ,150 | | 0.02 | 0.04 | 0.0 | 54.5 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP238 | | | 1.782 | .352 | .000 | | .000 | | .130 | | 0.02 | 0.04 | 0.0 | 38.2 | 100.0 | |
| SGDBU2 | A605 | 33909 | 65520 | DBP239 | 1.0H | OOBE | 4.048 | 1.55 | .000 | .007 | .000 | .110 | 1.30 | .138 | 0.06 | 0.58 | 0.0 | 57.6 | 100.0 | 0.0 |
| SGDBU2 | A606 | 33909 | 65520 | DBP210 | 1.0H | COBE | 1.211 | 4.36 | .000 | .037 | .000 | .137 | 3.94 | .283 | 0.03 | 0.51 | 0.0 | 65.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP342 | | | 0.137 | | | | .000 | | 1.47 | | 0.00 | 0.02 | 0.0 | 46.0 | 100.0 | |
| SGDBUZ | | 22808 | 65520 | DBP343 | | | 1.304 | | .000 | | .000 | | .929 | | 0.01 | 0.13 | 0.0 | 71.0 | 100.0 | |
| SGDBUZ | | 22808 | 65520 | DBP240 | | | 0.250 | 1.59 | | | .000 | | 1.52 | | 0.01 | 0.04 | 0.0 | 46.1 | 100.0 | |
| SGDBUZ | | 32305 | 65520 | DBP243 | | | 0.179 | 1.47 | | | .000 | | | | 0.00 | 0.02 | 0.0 | 43.7 | 100.0 | |
| SGDBU2 | | 33909 | 65520 | DBP244 | | | 1.484 | | | .002 | .000 | | 6.44 | | 0.01 | 0.97 | 0.0 | 50.6 | 100.0 | |
| SGDBU2 | | 33909 | 65520 | DBP245 | | | 1.667 | 5.21 | | .002 | .000 | | 4.97 | | 0.02 | 0.85 | 0.0 | 36.5 | 100.0 | |
| SGDBU2 | | 33909 | 65520 | PDGY09 | | | 0.899 | | | | .000 | | 1.82 | | 0.01 | 0.17 | 0.0 | 35.0 | 100.0 | |
| SGP2LX | | 33909 | 10017 | P2LXK6 | | | 0.001 | .128 | | | .000 | | .000 | | 0.00 | 0.00 | 0.0 | 4.0 | 100.0 | |
| SGP2LX | | 33909 | 10017 | P2LXK7 | | | 0.001 | .384 | | | .000 | | | | 0.00 | 0.00 | 0.0 | 1.0 6.0 | 100.0 | |
| SGP2LX SGDBU2 | | 33909 | 10017 | P2LXK8 PDGG13 | | | 0.001 | 1.31 | | | .000 | . 128 | .000 | | 0.00 | 0.00 | 0.0 | 32.1 | 100.0 | |
| SGDBU2 | | 33909 | 10017 | PDG013 | | | 0.243 | 1.40 | | | .000 | | . 630 | | 0.01 | 0.03 | 0.0 | 19.7 | 100.0 | |
| SGDBU2 | | 33909 | 10017 | PDG014 | | | 0.070 | | | | .000 | | . 226 | | 0.00 | 0.01 | 0.0 | 15.0 | 100.0 | |
| SGDBUZ | | 33909 | 10017 | PDG019 | | | 0.002 | .120 | | .000 | .000 | .064 | | | 0.00 | 0.00 | 0.0 | 17.0 | 100.0 | |
| SGDBUZ | | 33909 | 10017 | PDG030 | | | 0.219 | 2.71 | | | .000 | | 2.05 | | 0.01 | 0.06 | 0.0 | 31.0 | 100.0 | |
| SGDBUZ | | 33808 | 10017 | PDG032 | | | 0.058 | | | | .000 | | | | 0.00 | 0.00 | 0.0 | 26.0 | 100.0 | |
| SGPZLX | | 33909 | 10017 | PZLXLS | | | 0.001 | .128 | | .000 | .000 | .128 | .000 | | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | |
| SGP2LX | | 33909 | 10017 | P2LXL6 | | | 0.001 | .256 | | .000 | .000 | .128 | | | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | |
| SGP2LX | | 33909 | 10017 | P2LXL7 | | | 0.001 | .128 | | | .000 | .128 | .000 | | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | |
| SGBATER | 261A | 33903 | 3339 | PBTX07 | 1.0H | OOBE | 0.001 | .256 | | .128 | .000 | .128 | .000 | .128 | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | 0.0 |
| SGBATER | | | 3339 | PBTX37 | | | 0.001 | .384 | | | .000 | .128 | | | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | |
| | A610 | 33903 | 1113 | PCPL03 | 1.0H | | 0.113 | | .000 | | .000 | | ,000 | | 0.01 | 0.01 | 0.0 | 2.0 | 100.0 | |
| 0 | | | | LCU | | OOBE | 16.411 | 2.30 | | .010 | .000 | | 2.02 | | 0.01 | 0.12 | 0.0 | 857 | 100.0 | |
| 03GDBU2 | | 33909 | 65520 | DBP246 | | | 1.202 | 3.81 | | | .000 | | 3.55 | | 0.02 | 0.44 | 0.0 | 61.2 | 100.0 | |
| SGDBUS | | 33909 | 65520 | DBP247 | | | 1.549 | 2.17 | | | .000 | | 1.90 | | 0.02 | 0.32 | 0.0 | 53.4 | 100.0 | |
| SGDBUS | | 33909 | 65520 | DBP129 | | | 0.417 | 1.23 | .000 | .029 | .000 | | .765 | | 0.01 | 0.05 | 0.0 | 40.0 | 100.0 | |
| SGDBUZ | | 33909 | 65520 | PDG048 | | | 0.046 | | | .003 | .000 | | 5.62 | | 0.00 | 0.03 | 0.0 | 47.9 | 100.0 | |
| SGDBUZ | x704 | 22808 | 65520 | DBP245 | 1.08 | unca | 0.920 | . /41 | .000 | .032 | .000 | . 130 | .459 | .144 | 0.01 | 0.06 | 0.0 | 40.5 | 100.0 | 0.0 |



| | | | | N | IXG | | | | | $\overline{}$ |
|---------|----------------------------|-----------------|-------------------|----------------|-------------|--------------|--------------|--------------|--------------|---------------|
| type42d | is • | | | | | | | | | |
| Filter | r and Sort 🛂 Query Builder | Data - Describe | • Graph • Analyze | • Export • Seg | ıd To ▼ 📳 | | | | | |
| | | AVGCUQMS 🗿 | AVGDAOMS 🗿 | CACHCAND 😥 | CACHHITS 3 | CACHRATE 🗿 | CHITPCT 🔞 | CIOPCT 🌖 | DASDMPL (8 | DASDRATI |
| 1 | SCSTD | 0.000 | 0.0 | 23 | 17 | 0.0000426607 | 73.913043478 | 100 | 1.2559316E-7 | 0.000057717 |
| 2 | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 2 | 5.1988358E-7 | 0.000290113 |
| 3 | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 2 | 3.7134542E-7 | 0.000290113 |
| ı | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 2 | 3.3421088E-7 | 0.00029011 |
| 5 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 7.6422887E-7 | 0.00028431 |
| 3 | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 1.8867924528 | 3.9362612E-7 | 0.00030752 |
| 7 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 4.2481913E-7 | 0.00030171 |
| 3 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 8.1101834E-7 | 0.00030171 |
| } | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 3.8619921E-7 | 0.00030171 |
| 10 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 6.1791853E-7 | 0.0003017 |
| 11 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 5.4067872E-7 | 0.0003017 |
| 2 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 5.0205881E-7 | 0.00030171 |
| 13 | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 1.8867924528 | 5.1171379E-7 | 0.00030752 |
| 4 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 4.8274884E-7 | 0.00029011 |
| 15 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 4.0847979E-7 | 0.00029011 |
| 16 | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 1.9607843137 | 4.9240382E-7 | 0.000295915 |
| 17 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 3.3421074E-7 | 0.00029011 |
| 8 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 3.9362612E-7 | 0.00030752 |
| 9 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 2.7553829E-7 | 0.000307520 |
| 20 | SCSTR4 | 0.000 | 0.0 | 1 | 0 | 0 | 0 | 1.8518518518 | 4.8126364E-7 | 0.000313322 |
| 21 | SCSTR4 | 0.000 | 0.0 | 0 | 0 | 0 | | 0 | 4.7235135E-7 | 0.00030752 |







Resources To Analize/Monitor DASD Performance



SMF RECORDS

SMF- RMF Records 74,78 SMF 30 Records IO Related Fields SMF42 Dataset Activity Records

RMF Monitor III Panels

Device Resource Panel
Device Delay Panel
Cache Summary Panel
Cache Detail Panel
Device Trend Panel

RMF PostProcessor Reports

RMF Summary Report
RMF Device Activity Report
Cache Report
Link,RANK,ExtentPool Report
IOQ Report
FICON Activity Report

Other Subsystems SMF Records

DB2 SMF Records RMF Workload Reports

XRC Performance Data

XRCMon Data – Write Pacing, Cache Utilization



Other Important Metrics – Just A Few Of Them...



| Random Read Rate | Random Miss Read Rate | WRITE PROM |
|---------------------------|------------------------------|----------------------------|
| Sequential Read Rate | Sequential Miss Read Rate | DFW ByPASS Count |
| Random Write Rate | Random Write Rate | Write Inhibit |
| Sequential Write Rate | Sequential Write Rate | RANK Read Response Time |
| FICON Channel Utilization | Queuing Intensity | I/O Intensity |
| CMR Delay | DB Delay | |

About ResponseTime – Top To Down Approach



Source LPAR Level DASD SMF 74 / RMF Monitor III ResponseTime Source SMF 74 / RMF Monitor III **Box Base ResponseTime** Source SMF 74 / RMF Monitor III LSS Base ResponseTime Source SMF 74 / RMF Monitor III **Device Base ResponseTime** Source SMF 42 / RMF Monitor III Delays **Dataset Base ResponseTime**



XRC – Write Pacing Level – WritePacing Level6 Explanation



| WP1-7 | → | 0.02 | 0.04 | 0.1 | 0.2 | 0.5 | 1 | 2 | ms |
|------------|--------------|------|------|-----------------------|------|-----|---|---|----|
| WP8-B | | 5 | 10 | 25 | 50 | | | | ms |
| WPC-F | | 100 | 200 | 500 | 1000 | | | | ms |
| WP6 | _ | 0.02 | 0.04 | 0.1 | 0.2 | 0.5 | 1 | 2 | |
| ***** | | 0.02 | | | | | - | | |
| WrtPacingl | ResidualCnt(| 80) | | eak injec 0*64=512 | | | | | |

Level6 Inject 1 ms when 5120 unread recordsets

Level5 Inject 0.5 ms when 5120*(5/6) = 4266 unread recordsets

Level4 Inject 0.2 ms when 5120*(4/6) = 3413 unread recordsets

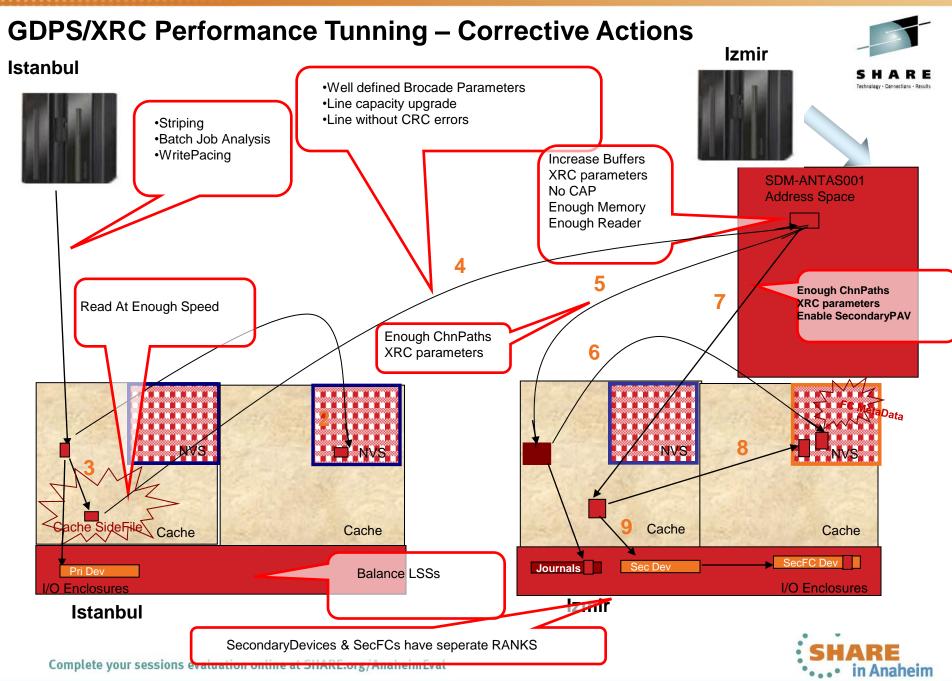
Level3 Inject 0.1 ms when 5120*(3/6) = 2560 unread recordsets

Level2 Inject 0.04 ms when 5120*(2/6) = 1706 unread recordsets

Level1 Inject 0.02 ms when 5120*(1/6) = 853 unread recordsets

NO PACING below 853 unread recordsets





Things To Remember



- Knowing Your I/O Workload Characteristics
- Need To Know Normal Values To Differentiate Abnormal Onces
- Be Aware Of ROTs
- Trend Is Always Usefull
- Get Ready For Performance Troubleshooting
- Automate As Much As You Can
- Always Look For More/New Information/Methods
- ☐ Divide Time Period According To Workload Differences (00-09 / 09-18 / 18-24 Hour Periods)
- Average IS AVERAGE!



Do You Know Your Workload Characteristics



- What is your Activity Rate?
- What is your Write Ratio ?
- What is your Sequential Read/Random Read % ?
- What is your ResponseTime Difference Between Batch And Online?
- Do you know your workload characteristics difference between Batch And Online? Write Ratio, Random/Sequential Read Ratio?
- What is the effect of I/O workload in your environment?
- Which Volumes Are The Most I/O Intensitive Onces?
- Which Volumes Are The Most Queuing Intensitive Onces ?
- How Is Your Activity Rate Differences Between Batch & Online ?
- □ How Is Your Activity Rate Differences Between Normal Day & Peak Workload Days EOM ,BOM?

RMF records In SMF related to DASD



SMF 74 SubType 1 : Device Activity

SMF 74 SubType 5: Cache Subsystem Device Activity

SMF 74 SubType 7: FICON Director Statistics

SMF 74 SubType 8 : Enterprise Disk Subsystem Statics

(Link,Rank.Array,ExtentPool Statics)

SMF 78 SubType 3 : I/O Queuing Activity



RMF Device Activity Report



Z/OS V1R12 SYSTEM ID PRDA DATE 07/21/2012 INTERVAL 15.00.013

RPT VERSION V1R12 RMF TIME 23.45.00 CYCLE 1.000 SECONDS

| - | | | | | | | | | | | | | | | | | | | | |
|----------|-------|--------|--------|--------|--------|--------|-----------|------|--------|------|------|------|------|--------|------|------|------|--------|-------|-----|
| TOTAL SA | MPLES | = 90 | O IODF | = 60 | CR-DAT | LE: O. | 7/17/2012 | | -TIME: | | | | | TIVATE | | | | | | |
| - | | | | | | | DEVICE | AVG | AVG | AVG | AVG | AVG | AVG | AVG | * | * | * | AVG | * | * |
| STORAGE | DEV | DEVICE | NUMBER | VOLUME | PAV | LCU | ACTIVITY | | _ | CMR | DB | | DISC | | DEV | DEV | DEV | NUMBER | ANY | MT |
| GROUP | NUM | TYPE | OF CYL | SERIAL | | | RATE | TIME | TIME | DLY | DLY | TIME | TIME | TIME | CONN | UTIL | RESV | ALLOC | ALLOC | |
| _ | A51C | 33903 | 1113 | PCPLO4 | 1.OH | | 0.064 | .658 | .000 | .022 | .000 | .163 | .000 | .494 | 0.00 | 0.00 | 0.0 | 6.0 | 100.0 | 0.0 |
| 0 | | | | LCU | | OOBC | 39.138 | 1.30 | | .006 | | | .813 | .376 | 0.05 | 0.16 | 0.0 | 851 | 100.0 | 0.0 |
| OSGDBU2 | | 33909 | 65520 | DBP267 | | | 0.179 | .960 | | .010 | | | .662 | .176 | 0.00 | 0.02 | 0.0 | 49.8 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP091 | | | 1.109 | .585 | .000 | .011 | | | .264 | .195 | 0.02 | 0.05 | 0.0 | 75.7 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP430 | | | 0.137 | .552 | .000 | | .000 | | .229 | .200 | 0.00 | 0.01 | 0.0 | 33.8 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP237 | | | 1.267 | .454 | | | .000 | | .150 | .168 | 0.02 | 0.04 | 0.0 | 54.5 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP238 | | | 1.782 | .352 | | | .000 | | .130 | .105 | 0.02 | 0.04 | 0.0 | 38.2 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP239 | | | 4.048 | 1.55 | | .007 | | | 1.30 | .138 | 0.06 | 0.58 | 0.0 | 57.6 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP218 | | | 1.211 | 4.36 | .000 | .037 | | | 3.94 | .283 | 0.03 | 0.51 | 0.0 | 65.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP342 | | | 0.137 | 1.91 | | .032 | .000 | | 1.47 | | 0.00 | 0.02 | 0.0 | 46.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP343 | | | 1.304 | | | .003 | .000 | | .929 | .086 | 0.01 | 0.13 | 0.0 | 71.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP240 | | | 0.250 | 1.89 | .000 | .003 | .000 | | 1.52 | | 0.01 | 0.04 | 0.0 | 46.1 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP243 | | | 0.179 | | .000 | .008 | .000 | | 1.12 | .227 | 0.00 | 0.02 | 0.0 | 43.7 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP244 | | | 1.484 | | .000 | .002 | .000 | | 6.44 | .092 | 0.01 | 0.97 | 0.0 | 50.6 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP245 | | | 1.667 | | .000 | .002 | .000 | | 4.97 | | 0.02 | 0.85 | 0.0 | 36.5 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | PDGY09 | | | 0.899 | 2.05 | .000 | .003 | .000 | | 1.82 | .113 | 0.01 | 0.17 | 0.0 | 35.0 | 100.0 | 0.0 |
| SGP2LX | | 33909 | 10017 | P2LXK6 | | | 0.001 | .128 | .000 | .000 | .000 | .000 | | .128 | 0.00 | 0.00 | 0.0 | 4.0 | 100.0 | 0.0 |
| SGP2LX | | 33909 | 10017 | P2LXK7 | | | 0.001 | .384 | | .128 | .000 | | .000 | .128 | 0.00 | 0.00 | 0.0 | 1.0 | 100.0 | 0.0 |
| SGP2LX | | 33909 | 10017 | P2LXK8 | | | 0.001 | .128 | | .000 | .000 | .128 | | .000 | 0.00 | 0.00 | 0.0 | 6.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 10017 | PDG013 | | | 0.243 | | .000 | .018 | | | | .285 | 0.01 | 0.03 | 0.0 | 32.1 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 10017 | PDG014 | | | 0.070 | 1.40 | | .075 | | | .630 | | 0.00 | 0.01 | 0.0 | 19.7 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 10017 | PDG017 | | | 0.044 | .694 | | .019 | .000 | | | .230 | 0.00 | 0.00 | 0.0 | 15.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 10017 | PDG019 | | | 0.002 | .128 | .000 | .000 | | | .000 | .064 | 0.00 | 0.00 | 0.0 | 17.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 10017 | PDG030 | | | 0.219 | 2.71 | | .036 | | | 2.08 | .472 | 0.01 | 0.06 | 0.0 | 31.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 10017 | PDG032 | | | 0.058 | .825 | .000 | .030 | | | .300 | .374 | 0.00 | 0.00 | 0.0 | 26.0 | 100.0 | 0.0 |
| SGP2LX | | 33909 | 10017 | P2LXL5 | | | 0.001 | .128 | .000 | .000 | .000 | .128 | | .000 | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | 0.0 |
| SGP2LX | | 33909 | 10017 | P2LXL6 | | | 0.001 | .256 | | .000 | | .128 | .000 | .128 | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | 0.0 |
| SGP2LX | | 33909 | 10017 | P2LXL7 | | | 0.001 | .128 | .000 | .000 | .000 | .128 | .000 | .000 | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | 0.0 |
| SGBATXRO | | | 3339 | PBTX07 | | | 0.001 | .256 | | .128 | .000 | .128 | .000 | .128 | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | 0.0 |
| SGBATXRO | | | 3339 | PBTX37 | | | 0.001 | .384 | | .000 | | .128 | | .256 | 0.00 | 0.00 | 0.0 | 0.0 | 100.0 | 0.0 |
| _ | A61C | 33903 | 1113 | PCPLO3 | 1.OH | | 0.113 | .827 | | .011 | | | .000 | .670 | 0.01 | 0.01 | 0.0 | 2.0 | 100.0 | 0.0 |
| 0 | | | | LCU | | OOBE | 16.411 | 2.30 | .000 | .010 | | | 2.02 | .159 | 0.01 | 0.12 | 0.0 | 857 | 100.0 | 0.0 |
| OSGDBU2 | | 33909 | 65520 | DBP246 | | | 1.202 | 3.81 | | .008 | .000 | | 3.55 | .140 | 0.02 | 0.44 | 0.0 | 61.2 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP247 | | | 1.549 | 2.17 | | .010 | .000 | | 1.90 | .147 | 0.02 | 0.32 | 0.0 | 53.4 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | DBP129 | | | 0.417 | 1.23 | .000 | .029 | .000 | | .765 | .326 | 0.01 | 0.05 | 0.0 | 48.0 | 100.0 | 0.0 |
| SGDBU2 | | 33909 | 65520 | PDG048 | | | 0.046 | 5.88 | .000 | .003 | .000 | | 5.62 | .150 | 0.00 | 0.03 | 0.0 | 47.9 | 100.0 | 0.0 |
| SGDBU2 | A704 | 33909 | 65520 | DBP248 | 1.OH | ooco | 0.920 | .741 | .000 | .032 | .000 | .138 | .459 | .144 | 0.01 | 0.06 | 0.0 | 40.5 | 100.0 | 0.0 |



RMF Monitor I Cache Report

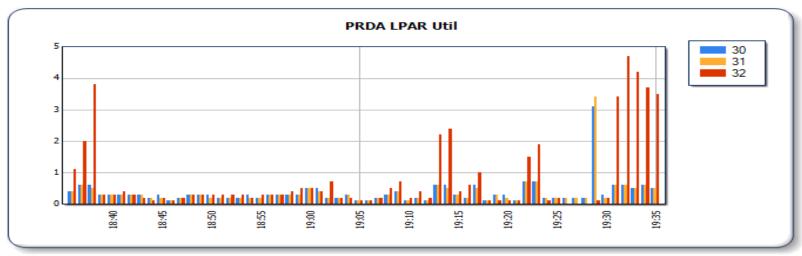


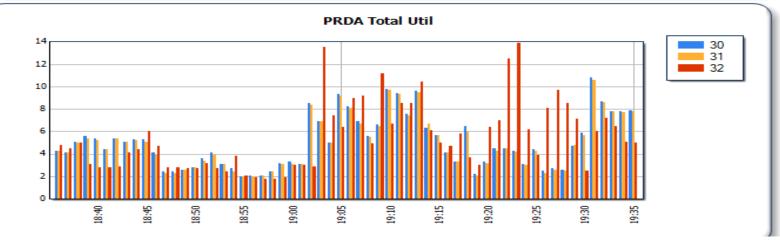
| 1 | | | | | сасн | E | sυ | B S Y S T | ем ас | T I V | ITY | | | | D3.0 | 777 - 4 |
|--------------------------|----------|---------|----------|----------|-------------------|-------|----------------|-------------------------|------------|---------|--------------|---------|--------|----------|------------|---------|
| | z/08 V1R | | | EM ID PR | | 12 RM | DATE TIME | 07/24/201 | L2 | | INTERVAL | 14.59.9 | 29 | PAG | E 1 | |
| OSUBSYSTEM TYPE-MODEL | 2107-951 | MANUI | TBM | SS PL | ID 2000 ANT 75 | | CDATE SERIA | 07/24/20 ML 00000002 | 12 CTI | | .00.01 | CINT | 14.59 | | | |
| 0 | | | | | | | CAC | HE SUBSYST | | | | | | | | |
| OSUBSYSTEM S | STORAGE | | NON-VOI | ATILE | STORAGE | | SI | TATUS | | | | | | | | |
| OCONFIGURED | | | | TRED | 4096.0 | M | Ci | ACHING | | _ | ACTIVE | | | | | |
| AVAILABLE | | | PINNED | | 0.0 | | | N-VOLATILE | | | ACTIVE | | | | | |
| PINNED | 0. | | | | | | | ACHE FAST W | | | ACTIVE | | | | | |
| OFFLINE | 0. | | | | | | | T DEALCE W | | | res | | | | | |
| 0 | | | | | | | CACI | E SUBSYSTE | M OVERVIEV | ī | | | | | | |
| OTOTAL I/O | 3000K | | | | САСИЕ О | | | 0 | | | | | | | | |
| TOTAL H/R | 0.947 | CACHE 1 | t/R 0 | . 947 | | | | | | | | | | | | |
| -CACHE I/O | | RI | O\I GAS | REQUES | TS | | | | | ти | RITE I/O | REQUEST | 's | | | ъ |
| REQUESTS | COUNT | RAT | l.E | HITS | RATE | | H/R | COUNT | RATE | F | AST | RATE | HITS | RATE | H/R | READ |
| ONORMAL | 1735K | 193 | 30 1 | 579K | 1756 | 0 | . 910 | 228964 | 254.7 | 228 | 964 2 | 254.7 | 228964 | 254.7 | 1.000 | 88.3 |
| SEQUENTIAL | 857830 | 954. | .2 85 | 5068 | 951.1 | 0 | . 997 | 178497 | 198.6 | 1784 | 197 1 | L98.6 | 178497 | 198.6 | 1.000 | 82.8 |
| CFW DATA | 0 | 0. | . 0 | 0 | 0.0 | | N/A | 0 | 0.0 | | 0 | 0.0 | 0 | 0.0 | N/A | N/A |
| OTOTAL | 2593K | 288 | 34 2 | 434K | 2708 | 0 | . 939 | 407461 | 453.2 | 4074 | 161 4 | 153.2 | 407461 | 453.2 | 1.000 | 86.4 |
| | | САСН | MISSES | ; | | | | - | | ж | ESC | | | NO | N-CACHE I/ | /0 |
| REQUESTS | READ | RATE | WRITE | RAT | E TRACK | S | RATI | 3 | | | | RATE | | | COUNT | RATE |
| | | | | | | | | | DEM BADE | | | | | ICL | 0 | 0.0 |
| NORMAL | | 173.5 | 0 | | 0 17544 | | 195.2 | | CFW BYP | | | | | BYPASS | 0 | |
| SEQUENTIAL | | 3.1 | 0 | 0. | 0 31721 | 4 | 352.9 | • | DFW INHO | BIT | (| 0.0 | | TOTAL | 0 | 0.0 |
| CFW DATA | 0 | 0.0 | 0 | 0. | 0 | | | | ASYNC (T | rks) | 141752 | 2 157.7 | | | | |
| OTOTAL | 158726 | RATE | 176.6 | | | | | | | | | | | | | |
| CKD STAT | TISTICS | | -RECORD | CACHIN | G | | | | ност | ' ADAP' | | VITY | | DIS1 | ACTIVITY- | |
| | | | | | | | | | | | | BYTES | | RES | | BYTES |
| WRITE | 3 | | AD MISSE | | _ | | | | | | |) /SEC | | TIB | · | /SEC |
| WRITE HITS | 2 | WRI | TE PROM | 23 | 4256 | | | | READ | | | 48.7M | | D 4.26 | | 27.7M |
| | | | | | | | | | WRITE | | 9.31 | 4.2M | WRI | TE 24.88 | 30 73.8K | 5.6M |



Daily Reports – FICON Channel Utilization









FICON Channel Utilization – Alert



Threshold Set To %30 - CEC Based –Not LPAR LEVEL Utilization

From: Performans Yönetimi - Online Monitoring Uygulaması [mailto:PerfMonAlerts@garanti.com.tr]

Sent: Tuesday, July 17, 2012 12:12 AM

To: GT-Depolama Mainframe Cc: Meral Temel (Garanti Teknoloji)

Subject: Channel Utilization Alert (GAR1), (Max Değer: 30), Gerçekleşen: 35.1

PERFORMANS YÖNETİMİ

Online Monitor Uygulaması Uyarıları

MFCHAN

(GAR1), (Max Değer: 30)

Gerçekleşen değer : 35.1 Zaman : 17.07.2012 00:12:01

Channel Utilization değeri belirlenen uyarı değerinin üzerine çıktı.

Mail id:187



DFWBYPASS COUNT- Alert



From: Performans Yönetimi - Online Monitoring Uygulaması <PerfMonAlerts@garanti.com.tr>

To: Meral Temel (Garanti Teknoloji)
Cc: Meral Temel (Garanti Teknoloji)

Subject: Disklerde NVS cache i bypass etmek zorunda kalan I/O lar olustu. (PTMN72-AE03) 86 adet I/O request NVSi bypass etmek zorunda kaldı.

PERFORMANS YÖNETİMİ

Online Monitor Uygulaması Uyarıları

DFWBypass

(PTMN72-AE03)

Gerçekleşen değer : 86 adet I/O request NVSi bypass etmek zorunda kaldı.

Zaman: 31.07.2012 02:38:40

Disklerde NVS cache i bypass etmek zorunda kalan I/O lar olustu.

Mail id:62

Online Monitor sayfalarına http://SLM üzerinden On-Line Monitoring menüsünü seçerek ulaşabilirsiniz.

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız.

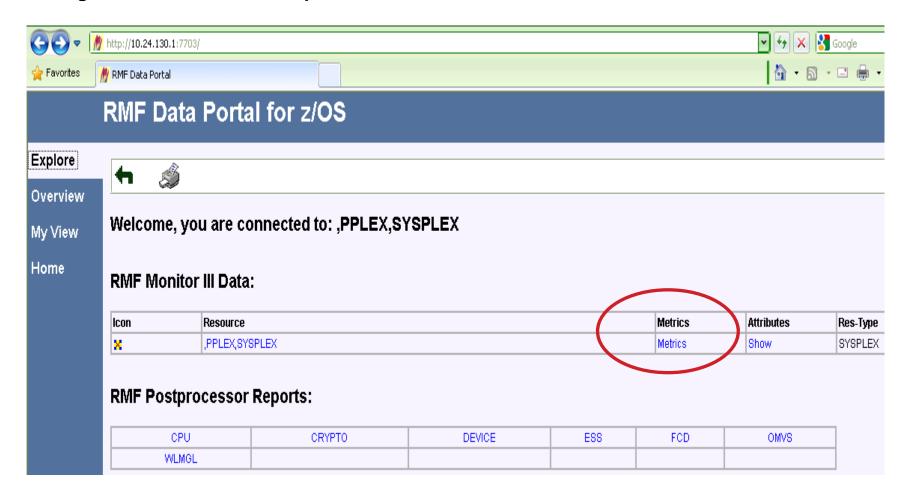
Performans Yönetimi grubuna mail atmak için: Performans Yönetimi Mail



Getting Data From RMF Monitor III Using RMF-DDS



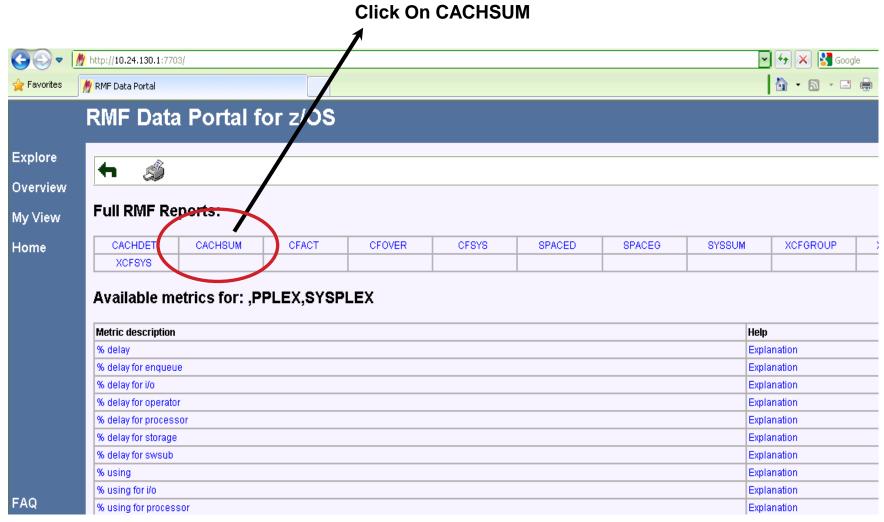
Using Main Panel, Click On Explore, Then Click On Metrics





Getting Data From RMF Monitor III Using RMF-DDS







Getting Data From RMF Monitor III Using RMF-DDS



| re iew ew | RMF Report | 🇳 t [,PPLE | X,SYSPLEX | l for z/C | Contro | I Unit C | ache S | ummary | <i>)</i> | | | | | | ← | - | | ≯ I | | 201207 | /18 <u>/</u> 2341: | 20 [| 3 C |
|-----------------|-----------------|---------------|-------------|-------------------|-------------|----------|-------------|-----------------------|-----------------------|-----------|--------------------|---------------|-------------|------------------------|-------------------------------|-------------------------|-------------------------|------------|--------------------------------|--------------------------|--------------------|------|------------------------|
| | Time Range: | 07/18/20 | 12 23:41:20 | - 07/18/2012 23:4 | 41:40 | i | i | 1 | i | i | i | i | i | i | i | i | i | | i | i | i | i | |
| | Subsystem ID | | Type Model | | I/O Rate | Hit % | Hit Rate | Total Miss Rate | Stage Miss Rate | Read % | Sequential Rate | Async Rate | Off Rate | Normal Read Rate | Normal Read Hit Rate | Normal Read Hit % | Normal Write Rate | | Normal Write Hit Rate | Normal Write Hit % | | | Sequentia Read Rate |
| | 2000 | 2008 | 2107-951 | 124000000000 | 911.3 | 94.2 | 858.6 | 52.6 | 52.6 | 70.6 | 6.9 | 34.3 | 0.0 | 608.9 | 556.3 | 91.4 | 187.3 | 187.3 | 187.3 | 100 | 76.5 | 54.8 | 34.5 |
| | 2100 | 2127 | 2107-951 | 1240000000000 | 852.6 | 97.0 | 827.1 | 25.4 | 25.4 | 89.5 | 24.3 | 7.4 | 0.0 | 639.4 | 614.1 | 96.0 | 27.4 | 27.4 | 27.4 | 100 | 95.9 | 29.7 | 123.8 |
| | 2200 | 220F | 2107-951 | 1240000000000 | 1142 | 96.1 | 1097 | 45.1 | 45.1 | 83.8 | 11.7 | 37.5 | 0.0 | 814.9 | 770.1 | 94.5 | 48.5 | 48.5 | 48.5 | 100 | 94.4 | 46.5 | 141.6 |
| | 2300 | 2326 | 2107-951 | 1240000000000 | 645.2 | 90.7 | 585.4 | 59.8 | 59.8 | 83.6 | 7.6 | 8.1 | 0.0 | 525.4 | 465.8 | 88.7 | 59.1 | 59.1 | 59.1 | 100 | 89.9 | 61.9 | 14.0 |
| | 2400 | 2405 | 2107-951 | 1240000000000 | 1177 | 95.0 | 1119 | 58.5 | 58.5 | 78.7 | 81.0 | 6.9 | 0.0 | 746.3 | 690.3 | 92.5 | 168.5 | 168.5 | 168.5 | 100 | 81.6 | 60.0 | 180.4 |
| | 2500 | | 2107-951 | 1240000000000 | 515.1 | 89.8 | 462.5 | 52.6 | 52.6 | 83.5 | 3.8 | 0.8 | 0.0 | 397.1 | 344.5 | 86.8 | 49.8 | 49.8 | 49.8 | | 88.8 | 54.0 | 32.8 |
| | | | 2107-951 | 1240000000000 | | 96.4 | 868.5 | 32.3 | 32.3 | 74.2 | 3.5 | 3.0 | 0.0 | 654.0 | 621.8 | 95.1 | 158.2 | 158.2 | 158.2 | | 80.5 | 35.3 | 14.8 |
| | | | 2107-951 | 1240000000000 | | 95.2 | 1015 | 51.3 | 51.3 | 86.7 | 30.3 | 20.0 | 0.0 | 755.9 | 704.8 | 93.2 | 62.9 | 62.9 | 62.9 | | 92.3 | 55.8 | 168.3 |
| | | | 2107-951 | 1240000000000 | | 93.9 | 572.0 | 37.1 | 37.1 | 84.2 | 16.9 | 6.3 | 0.0 | 442.5 | 405.5 | 91.6 | 72.0 | 72.0 | 72.0 | | 86.0 | 37.9 | 70.7 |
| | | | 2107-951 | 1240000000000 | | 100 | 635.7 | 0.0 | 0.0 | 88.3 | 557.8 | 94.1 | 0.0 | 2.3 | 2.3 | 100 | 1.3 | 1.3 | 1.3 | | 63.0 | 0.7 | 559.3 |
| | 2A00 | 2A10 | 2107-951 | 1240000000000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 100 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 100 | 0.0 | 0.0 |



Perfomance Analiz Methods - Queuing Intensity (Excel Version)



QUEUING INTENSITY = ActivityRate * (ResponseTime – ConnectTime)

SHARE Technology · Connections · Results

For Date 24/7/2012

| Date | Time | sggroup | devnum | volser | activityrate | resptime | iosqtime | cmrdly | pendtime | disctime | conntime | QI |
|-----------|----------|----------|--------|--------|--------------|----------|----------|--------|----------|----------|----------|------|
| 7/24/2012 | 3:30:00 | SGDBU2 | 4808 | PDGYG3 | 377.568 | 29.3 | 0 | 0.146 | 9.49 | 15.1 | 4.72 | 9281 |
| 7/24/2012 | 3:30:00 | SGDBU2 | B103 | PDGY23 | 433.925 | 17.9 | 0 | 0.02 | 4.26 | 12.2 | 1.46 | 7134 |
| 7/24/2012 | 0:15:00 | SGDBU2 | A300 | PDRX01 | 886.756 | 2.73 | 0 | 0.022 | 0.34 | 0.897 | 1.5 | 1091 |
| 7/24/2012 | 0:15:00 | SGBATXRC | B215 | PBTX30 | 55.798 | 16.4 | 0 | 0.052 | 0.186 | 15.6 | 0.616 | 881 |
| 7/24/2012 | 6:30:00 | SGP2WN | 4F08 | P2WN35 | 118.222 | 9.12 | 0.536 | 0.052 | 0.308 | 6.02 | 2.25 | 812 |
| 7/24/2012 | 5:45:00 | SGDBU2 | 2506 | PDGXD1 | 209.463 | 4.03 | 0.43 | 0.1 | 1.66 | 1.41 | 0.541 | 731 |
| 7/24/2012 | 6:15:00 | SGP2WN | 4F08 | P2WN35 | 106.712 | 8.77 | 0.406 | 0.05 | 0.4 | 5.78 | 2.19 | 702 |
| 7/24/2012 | 3:30:00 | SGDBU2 | 2409 | PDGY08 | 385.813 | 2.38 | 0 | 0.022 | 0.202 | 1.59 | 0.587 | 692 |
| 7/24/2012 | 3:30:00 | SGDBU2 | B706 | PDGX47 | 373.196 | 2.36 | 0 | 0.022 | 0.185 | 1.64 | 0.533 | 682 |
| 7/24/2012 | 16:15:00 | SGP2WN | BD09 | P2WN46 | 58.1 | 14.2 | 7.84 | 0.089 | 1.87 | 1.45 | 3.06 | 647 |
| 7/24/2012 | 0:15:00 | SGDBU2 | 220C | PDGY80 | 69.134 | 9.83 | () O | 0.06 | 0.171 | 8.99 | 0.664 | 634 |
| 7/24/2012 | 3:30:00 | SGDBU2 | A20B | PDGX90 | 109.304 | 6.16 | 0 | 0.009 | 0.124 | 5.62 | 0.408 | 629 |
| 7/24/2012 | 5:45:00 | SGDBU2 | A308 | PDG201 | 96.483 | 6.98 | 0 | 0.079 | 5.65 | 0.849 | 0.478 | 627 |
| 7/24/2012 | 3:30:00 | SGDBU2 | A609 | DBP240 | 78.792 | 8.32 | 0 | 0.014 | 0.142 | 7.45 | 0.726 | 598 |
| 7/24/2012 | 3:30:00 | SGDBU2 | A20A | PDGX82 | 80.673 | 7.79 | 0 | 0.009 | 0.143 | 7.21 | 0.432 | 594 |
| 7/24/2012 | 3:30:00 | SGDBU2 | A50B | PDG145 | 82.897 | 7.55 | 0 | 0.017 | 0.146 | 6.88 | 0.526 | 582 |
| 7/24/2012 | 3:30:00 | SGDBU2 | 910B | PDG195 | 108.12 | 5.67 | 0 | 0.064 | 0.166 | 5.2 | 0.302 | 580 |
| 7/24/2012 | 3:30:00 | SGDBU2 | A509 | PDG173 | 107.208 | 5.57 | 0 | 0.01 | 0.122 | 5.05 | 0.398 | 554 |
| 7/24/2012 | 3:30:00 | SGDBU2 | B207 | PDGYA1 | 61.84 | 9.55 | 0 | 0.021 | 0.442 | 8.48 | 0.628 | 552 |
| 7/24/2012 | 4:15:00 | SGDBU2 | 2513 | PDGY98 | 60.28 | 9.42 | 0 | 0.069 | 0.672 | 8.4 | 0.355 | 546 |

Severe Defined As QI > 300 S> 1 And RT > 3

High IOSQ Time On DB2
Batch Work Datasets' Volume



Performance Analiz Method – Queuing Intensity



For Date 25/7/2012

| Date | Time | sggroup | devnum | volser | activityrate | resptime | iosqtime | cmrdly | pendtime | disctime | conntime | QI |
|------------|------|----------|--------|--------|--------------|----------|----------|--------|----------|----------|----------|------|
| 2012-07-25 | 0.03 | NULL | 4610 | PBET10 | 231.00 | 11.70 | 0.00 | 0.11 | 2.32 | 9.15 | 0.18 | 2660 |
| 2012-07-25 | 0.25 | SGDBU2 | 2506 | PDGXD1 | 210.23 | 8.03 | 2.71 | 0.18 | 3.09 | 1.54 | 0.70 | 1541 |
| 2012-07-25 | 0.01 | SGDBU2 | 4501 | PDGXO3 | 164.71 | 8.39 | 0.00 | 0.09 | 0.25 | 7.91 | 0.24 | 1343 |
| 2012-07-25 | 0.01 | SGDBU2 | 4B00 | PDGXS8 | 163.57 | 8.24 | 0.00 | 0.09 | 0.24 | 7.76 | 0.24 | 1308 |
| 2012-07-25 | 0.01 | SGDBU2 | 4307 | PDGYD7 | 162.55 | 8.08 | 0.00 | 0.10 | 0.26 | 7.59 | 0.23 | 1275 |
| 2012-07-25 | 0.13 | SGDBU2 | B001 | DBP050 | 313.68 | 4.65 | 0.00 | 0.02 | 1.18 | 2.70 | 0.77 | 1217 |
| 2012-07-25 | 0.01 | SGDBU2 | B200 | DBP088 | 181.07 | 7.27 | 0.00 | 0.02 | 0.16 | 6.54 | 0.57 | 1213 |
| 2012-07-25 | 0.13 | SGDBU2 | A000 | PDGX36 | 344.10 | 4.18 | 0.00 | 0.02 | 1.01 | 2.35 | 0.83 | 1154 |
| 2012-07-25 | 0.02 | SGDBU2 | 4304 | PDGY47 | 120.80 | 9.66 | 0.00 | 0.10 | 0.27 | 9.18 | 0.22 | 1141 |
| 2012-07-25 | 0.01 | SGDBU2 | A300 | PDRX01 | 863.27 | 2.75 | 0.00 | 0.02 | 0.36 | 0.88 | 1.51 | 1070 |
| 2012-07-25 | 0.02 | NULL | 4610 | PBET10 | 37.10 | 27.70 | 0.00 | 0.16 | 4.40 | 23.20 | 0.15 | 1022 |
| 2012-07-25 | 0.01 | SGBATXRC | B217 | PBTX34 | 54.07 | 18.40 | 0.00 | 0.05 | 0.18 | 17.60 | 0.63 | 961 |
| 2012-07-25 | 0.02 | SGDBU2 | B200 | DBP088 | 119.82 | 8.58 | 0.00 | 0.01 | 0.13 | 7.80 | 0.65 | 951 |
| 2012-07-25 | 0.02 | SGDBU2 | 220F | PDGY83 | 105.43 | 9.16 | 0.00 | 0.11 | 0.25 | 8.49 | 0.43 | 921 |
| 2012-07-25 | 0.15 | SGDBU2 | A20B | PDGX90 | 150.87 | 5.76 | 0.00 | 0.02 | 0.13 | 5.17 | 0.45 | 801 |
| 2012-07-25 | 0.25 | SGDBU2 | B107 | DBP535 | 396.75 | 2.27 | 0.17 | 0.21 | 1.39 | 0.38 | 0.32 | 772 |
| 2012-07-25 | 0.15 | SGDBU2 | 910B | PDG195 | 119.20 | 6.49 | 0.00 | 0.07 | 0.18 | 6.07 | 0.25 | 744 |
| 2012-07-25 | 0.15 | SGDBU2 | A509 | PDG173 | 122.74 | 6.37 | 0.00 | 0.01 | 0.12 | 5.84 | 0.40 | 732 |
| 2012-07-25 | 0.96 | SGDBU2 | 9118 | PDG125 | 197.37 | 4.01 | 0.00 | 0.03 | 0.30 | 3.31 | 0.40 | 714 |
| 2012-07-25 | 0.02 | SGDBU2 | A300 | PDRX01 | 1262.69 | 1.42 | 0.00 | 0.06 | 0.23 | 0.33 | 0.86 | 706 |



Daily Reports - Queuing Intensity (Severe Alert QI>300)





Queueing Intensitiy

27-07-2012

Main Reason – Disconnect Time

| 2, 0, | 2012 | | | | | | | | 1 | | |
|-------|---------|--------|--------|------------------|----------|----------|--------|----------|----------|----------|-------|
| Time | sggroup | devnum | volser | activity rate | resptime | iosqtime | cmrdly | pendtime | disctime | conntime | QI |
| 12:07 | | 4110 | PBET09 | 152.8440 | 26.5000 | 0.0000 | 0.2140 | 5.7100 | 20.6000 | 0.1340 | 4,030 |
| 03:07 | SGDBU2 | 280B | PDGXZ6 | 364.0860 | 9.6400 | 0.0000 | 0.0780 | 3.2700 | 4.9500 | 1.4200 | 2,993 |
| 03:07 | SGDBU2 | 2106 | PDGXK2 | 249.3560 | 12.1000 | 0.0000 | 0.0760 | 4.0100 | 6.2900 | 1.7600 | 2,578 |
| 01:07 | SGDBU2 | 9203 | PDG280 | 351.8550 | 7.5500 | 0.0000 | 0.0850 | 0.2070 | 7.0400 | 0.3070 | 2,548 |
| 01:07 | SGDBU2 | 9406 | PDG324 | 350.3370 | 7.5700 | 0.0000 | 0.0860 | 0.2090 | 7.0100 | 0.3500 | 2,529 |
| 01:07 | SGDBU2 | 9302 | PDG299 | 348.3500 | 7.4900 | 0.0000 | 0.0860 | 0.2040 | 7.0200 | 0.2640 | 2,517 |
| 01:07 | SGDBU2 | 9503 | PDG331 | 346.5630 | 7.4400 | 0.0000 | 0.0840 | 0.1980 | 6.9900 | 0.2520 | 2,491 |
| 03:07 | SGDBU2 | 9117 | PDG124 | 440.8480 | 5.5500 | 0.0000 | 0.0400 | 1.4200 | 3.5600 | 0.5680 | 2,196 |
| 03:07 | SGDBU2 | 261B | DBP220 | 241.5450 | 9.9800 | 0.0000 | 0.0730 | 2.6700 | 6.2300 | 1.0800 | 2,150 |
| 03:07 | SGDBU2 | A00D | PDGY02 | 172.0540 | 10.1000 | 0.0000 | 0.0210 | 0.2050 | 9.2000 | 0.6670 | 1,623 |
| 03:07 | SGDBU2 | A502 | PDG248 | 166.7330 | 10.2000 | 0.0000 | 0.0110 | 0.1830 | 9,4900 | 0.4900 | 1,619 |
| 03:07 | SGDBU2 | 210F | PDGXG7 | 108.0590 | 20.5000 | 0.2160 | 0.0540 | 3.7400 | 10.9000 | 5.7100 | 1,598 |
| 01:07 | SGP2WN | 4310 | P2WN23 | 185.2380 | 9.9200 | 5.1600 | 0.0250 | 1.9600 | 1,3650 | 1.4300 | 1,573 |
| 03:07 | SGDBU2 | A108 | PDGX65 | 156.5030 | 10.5000 | 0.0000 | 0.0100 | 0.1970 | 9.7400 | 0.5610 | 1,555 |
| 03:07 | SGDBU2 | A808 | PDGX58 | 160.2440 | 10.0000 | 0.0000 | 0.0180 | 0.1940 | 9.2100 | 0.6130 | 1,504 |
| 03:07 | SGDBU2 | 4706 | PDGYF6 | 102.4820 | 19.9000 | 0.0000 | 0.0720 | 3,6000 | 10.5000 | 5.7800 | 1,447 |
| 12:07 | SGDBU2 | 4501 | PDGXO3 | 174.9460 | 8.0100 | 0.0000 | 0.0880 | 0.2840 | 7.4800 | 0.2430 | 1,359 |
| 12:07 | SGDBU2 | 4B00 | PDGXS8 | 173.4620 | 8.0000 | 0.0000 | 0.0880 | 0.2790 | 7.4600 | 0.2610 | 1,342 |
| 12:07 | SGDBU2 | 4307 | PDGYD7 | 173.5140 | 7.8100 | 0.0000 | 0.0880 | 0.2820 | 7.2900 | 0.2460 | 1,312 |
| 12:07 | SGDBU2 | B200 | DBP088 | 173.5130 | 7.5400 | 0.0000 | 0.0110 | 0.1390 | 6.9100 | 0.4880 | 1,224 |



Daily Reports – I/O Intensity

SHARE

I/O INTENSITY = ActivityRate * ResponseTime



I/O Intensitiy

27-07-2012

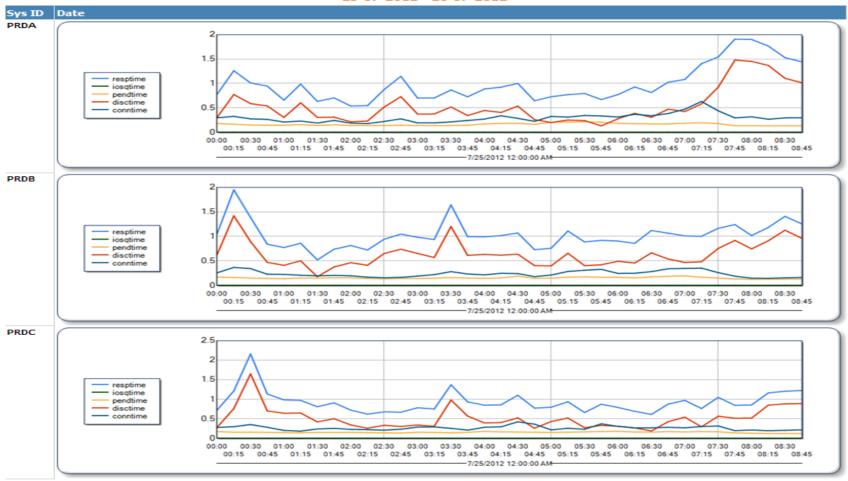
| Time | sggroup | devnum | volser | activity rate | resptime | iosqtime | cmrdly | pendtime | disctime | conntime | I/O I |
|-------|---------|--------|--------|------------------|----------|----------|--------|----------|----------|----------|-------|
| 12:07 | | 4110 | PBET09 | 152.8440 | 26.5000 | 0.0000 | 0.2140 | 5.7100 | 20.6000 | 0.1340 | 4,050 |
| 03:07 | SGDBU2 | 280B | PDGXZ6 | 364.0860 | 9.6400 | 0.0000 | 0.0780 | 3.2700 | 4.9500 | 1.4200 | 3,510 |
| 03:07 | SGDBU2 | 2106 | PDGXK2 | 249.3560 | 12.1000 | 0.0000 | 0.0760 | 4.0100 | 6.2900 | 1.7600 | 3,017 |
| 01:07 | SGDBU2 | 9203 | PDG280 | 351.8550 | 7.5500 | 0.0000 | 0.0850 | 0.2070 | 7.0400 | 0.3070 | 2,657 |
| 01:07 | SGDBU2 | 9406 | PDG324 | 350.3370 | 7.5700 | 0.0000 | 0.0860 | 0.2090 | 7.0100 | 0.3500 | 2,652 |
| 01:07 | SGDBU2 | 9302 | PDG299 | 348.3500 | 7.4900 | 0.0000 | 0.0860 | 0.2040 | 7.0200 | 0.2640 | 2,609 |
| 01:07 | SGDBU2 | 9503 | PDG331 | 346.5630 | 7.4400 | 0.0000 | 0.0840 | 0.1980 | 6.9900 | 0.2520 | 2,578 |
| 03:07 | SGDBU2 | 9117 | PDG124 | 440.8480 | 5.5500 | 0.0000 | 0.0400 | 1.4200 | 3.5600 | 0.5680 | 2,447 |
| 03:07 | SGDBU2 | 261B | DBP220 | 241.5450 | 9.9800 | 0.0000 | 0.0730 | 2.6700 | 6.2300 | 1.0800 | 2,411 |
| 03:07 | SGDBU2 | 210F | PDGXG7 | 108.0590 | 20.5000 | 0.2160 | 0.0540 | 3.7400 | 10.9000 | 5.7100 | 2,215 |
| 03:07 | SGDBU2 | 4706 | PDGYF6 | 102.4820 | 19.9000 | 0.0000 | 0.0720 | 3.6000 | 10.5000 | 5.7800 | 2,039 |
| 01:07 | SGP2WN | 4310 | P2WN23 | 185.2380 | 9.9200 | 5.1600 | 0.0250 | 1.9600 | 1.3600 | 1.4300 | 1,838 |
| 03:07 | SGDBU2 | A00D | PDGY02 | 172.0540 | 10.1000 | 0.0000 | 0.0210 | 0.2050 | 9.2000 | 0.6670 | 1,738 |
| 03:07 | SGDBU2 | A502 | PDG248 | 166.7330 | 10.2000 | 0.0000 | 0.0110 | 0.1830 | 9.4900 | 0.4900 | 1,701 |
| 03:07 | SGDBU2 | A108 | PDGX65 | 156.5030 | 10.5000 | 0.0000 | 0.0100 | 0.1970 | 9.7400 | 0.5610 | 1,643 |
| 03:07 | SGDBU2 | A808 | PDGX58 | 160.2440 | 10.0000 | 0.0000 | 0.0180 | 0.1940 | 9.2100 | 0.6130 | 1,602 |
| 12:07 | SGDBU2 | 4501 | PDGXO3 | 174.9460 | 8.0100 | 0.0000 | 0.0880 | 0.2840 | 7.4800 | 0.2430 | 1,401 |
| 12:07 | SGDBU2 | 4B00 | PDGXS8 | 173.4620 | 8.0000 | 0.0000 | 0.0880 | 0.2790 | 7.4600 | 0.2610 | 1,388 |
| 12:07 | SGDBU2 | 4307 | PDGYD7 | 173.5140 | 7.8100 | 0.0000 | 0.0880 | 0.2820 | 7.2900 | 0.2460 | 1,355 |
| | | | | | | | | | | | |



Daily Reports - Device Storage Group RespTime- Weighted Avg



Device Storage Group 25-07-2012 - 26-07-2012





ROTs



Response Time Of Logical Volume

RT> 3 ms

RT> 10 ms

RT> 3 ms QI> 300

DFWByPass Count

Ideal Especially In This Technology = 0

Remember This Means Write To DDMs Directly Bypassing Cache

Reason: NVS Full Condition

> %1 You Definitely Need To Something

Channel Utilization

> %30

> % 40 You Definitely Need To Do Something



ROTs



RANK Read Response Time

> 30 ms Per Operation – Not Good > 35 ms Per Operation You Definitely Need To Do Something

Read Hit Ratio

< 90

< 80



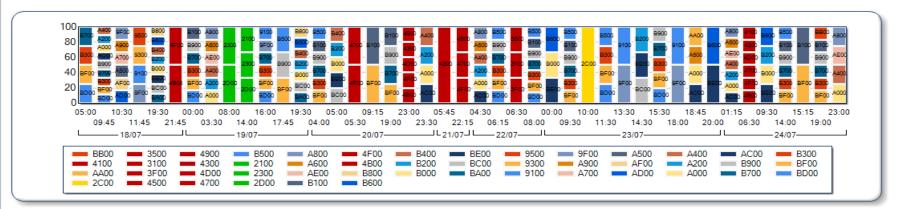
Daily Reports - DFW ByPass Count





Dasd Fast Write ByPass

18-07-2012 - 25-07-2012



| stmtname | time | evenodd | Value |
|----------|------------------|---------|-------|
| 2100 | | | |
| | 19-07-2012 14:00 | Odd | 12 |
| 2300 | | | |
| | 19-07-2012 08:00 | Odd | 2 |
| | 19-07-2012 14:00 | Odd | 4 |
| 2C00 | | | |
| | 23-07-2012 10:00 | Even | 56 |
| 2D00 | | | |
| | 19-07-2012 08:00 | Odd | 3 |
| | 19-07-2012 14:00 | Odd | 282 |

ROT: For Best Performance no DFWbypass Count
If happens at least Check whether it is %1 of what is being done
> %1 PROBLEM!



Different Ways To Check The Same Data



- Using RMF, There are many ways to check the same item
- Based On What Is Suitable For Your Current Aim, You Can Use One Of Them
- Lets Look At DFWByPass Count As Sample
- EVEN YOU HAVE ONE, CHECK THE DEFINITION OF FIELDS IN BOOKS FOR DIFFERENT METHODS, YOU WILL GET MORE INFORMATION!!!



How To Check DFWByPass Count?



Using RMF PostProcessor REPORTS(CACHE)

| 1 | | | | (| сасн | E SUB | SYST | EM AC | TIVITY | | | | 77.0 | |
|--------------|-----------|---------|-----------|---------|----------|---------------|-----------|-----------------------|-------------|-----------|----------|---------|------------|-------|
| | z/OS V1R1 | L2 | | | M ID PRD | B 1R12 RMF | | 07/24/201 01.15.00 | 2 | INTERVAL | 15.00.02 | 2 | PAG | E 1 |
| OSUBSYSTEM | 2107-01 | CU-ID | AE15 | SSII | D AEOO | CDATE | 07/24/20 | 12 CTI | ME 01.15.00 | CINT | 15.00 | | | |
| TYPE-MODEL | | | IBM | | NT 75 | | 000000T | | | | | | | |
| 0 | | | | | | САСН | E SUBSYST | EM STATUS | | | | | | |
| OSUBSYSTEM S | TOPACE | | NON-VOLA | | | STA | | | | | | | | |
| OCONFIGURED | 126656 | | CONFIGUR | | 4096.0M | | HING | | - ACTIVE | | | | | |
| AVAILABLE | 112788 | | PINNED | | 0.0 | | -VOLATILE | STORAGE | - ACTIVE | | | | | |
| PINNED | 0.0 | | | | | | HE FAST W | | - ACTIVE | | | | | |
| OFFLINE | 0.0 | | | | | | | VAILABLE | | | | | | |
| 0 | | | | | | | | | | | | | | |
| | | | | | | | | M OVERVIEW | | | | | | |
| OTOTAL I/O | | CACHE I | | | CACHE OF | | 0 | | | | | | | |
| TOTAL H/R | 0.984 | CACHE H | I/R 0. | 984 | | | | | | | | | | |
| -CACHE I/O | | RE | AD I/O R | EQUEST: | s | | | | WRITE I | O REQUEST | 'S | | | ભ |
| REQUESTS | COUNT | RAT | ъ н | ITS | RATE | H/R | COUNT | RATE | FAST | RATE | HITS | RATE | H/R | READ |
| ONORMAL | 6106 | 6. | 8 2 | 118 | 2.4 | 0.347 | 5461 | 6.1 | 5461 | 6.1 | 5461 | 6.1 | 1.000 | 52.8 |
| SEQUENTIAL | 160940 | 178. | 8 158 | 351 | 175.9 | 0.984 | 248322 | 275.9 | 248322 | 275.9 | 248322 | 275.9 | 1.000 | 39.3 |
| CFW DATA | 0 | 0. | 0 | 0 | 0.0 | N/A | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | N/A | N/A |
| OTOTAL | 167046 | 185. | | 469 | 178.3 | | 253783 | 282.0 | 253783 | 282.0 | 253783 | 282.0 | 1.000 | 39.7 |
| | | | | | | | | | 1111111 | | | NO | N-CACHE I/ | |
| REQUESTS | READ | RATE | WRITE | RATE | TRACKS | RATE | | | | NT RATE | | | COUNT | RATE |
| | | | | | | | | DEW BYPA | | 60 0.4 | | ICL | 0 | |
| NORMAL | 3988 | 4.4 | 0 | 0.0 | | | | CFW BYPA | • | 0 0.0 | | BYPASS | 0 | |
| SEQUENTIAL | 2589 | 2.9 | 0 | | 594954 | 661.1 | | DFW INHI | | 0.0 | | TOTAL | 0 | 0.0 |
| CFW DATA | 0 | 0.0 | 0 | 0.0 | | | | ASYNC (T | RKS) 105 | 1K 1167 | | | | |
| OTOTAL | 6577 | RATE | 7.3 | | | | | | | | | | | |
| CKD STAT | ISTICS | | RECORD C | ACHING- | | | | ност | ADAPTER AC | | | | ACTIVITY- | |
| | | | | | _ | | | | | ES BYTES | | RES | | BYTES |
| WRITE | 17 | | ID MISSES | | 0 | | | | /R | | | TIM | | /SEC |
| WRITE HITS | 17 | WRI | TE PROM | 949 | 964 | | | READ | | 2K 34.4M | READ | | | 36.7M |
| | | | | | | | | WRITE | 221. | 8K 62.5M | WRIT | E 210.0 | 5 545.0K | 66.9M |



How To Check DFWByPass Count?



Using RMF Overview Report OVW(DFWBAE00(CASDFWB(SSID(AE00))))

 $0.4X900 \sec = 360$ as Count

| μ | | RMF OVE | RVIEW RI | EPORT | 1 |
|-------------------------|-------------------|-----------------|----------------|-----------------|-----------------------|
| z/OS V1R12 | SYSTEM | ID PRDB | START 07/24 | 1/2012-01.00.00 | O INTERVAL 0.15.00 |
| | RPT VEH | SION VIR12 RMF | END 07/24 | 1/2012-02.45.00 | O CYCLE 1.000 SECONDS |
| 0 | | | | | |
| NUMBER OF INTERVALS 7 | TOTAL LENG | TH OF INTERVALS | 01.45.00 | | / \ |
| -DATE TIME INT | DEWBA000 DEWBA200 | DFWBA400 DFW | BA600 DFWBA800 | DEWBAROO DEV | VBACOO DEWBAEOO |
| MM/DD HH.MM.SS HH.MM.SS | | | | | / |
| 07/24 01.00.00 00.14.59 | 0.000 0.000 | 0.000 | 0.000 0.000 | 0.000 | 0.000 0.000 |
| 07/24 01.15.00 00.15.00 | 0.117 0.031 | 0.024 | 0.002 0.020 | 0.000 | 0.028 0.400 |
| 07/24 01.30.00 00.14.59 | 0.000 0.000 | 0.000 | 0.000 0.000 | 0.000 | 0.000 0.000 |
| 07/24 01.45.00 00.15.00 | 0.000 0.000 | 0.000 | 0.000 0.000 | 0.000 | 0.000 0.000 |
| 07/24 02.00.00 00.14.59 | 0.000 0.000 | 0.000 | 0.000 0.000 | 0.000 | 0.000 0.000 |
| 07/24 02.15.00 00.15.00 | 0.000 0.000 | 0.000 | 0.000 0.000 | 0.000 | 0.000 0.000 |
| 07/24 02.30.00 00.15.00 | 0.000 0.000 | 0.000 | 0.000 0.000 | 0.000 | 0.000 0.000 |
| | | | | | |



How To Check DFWByPass Count?



Using RMF Monitor III CachSum Panel – PopUp Report

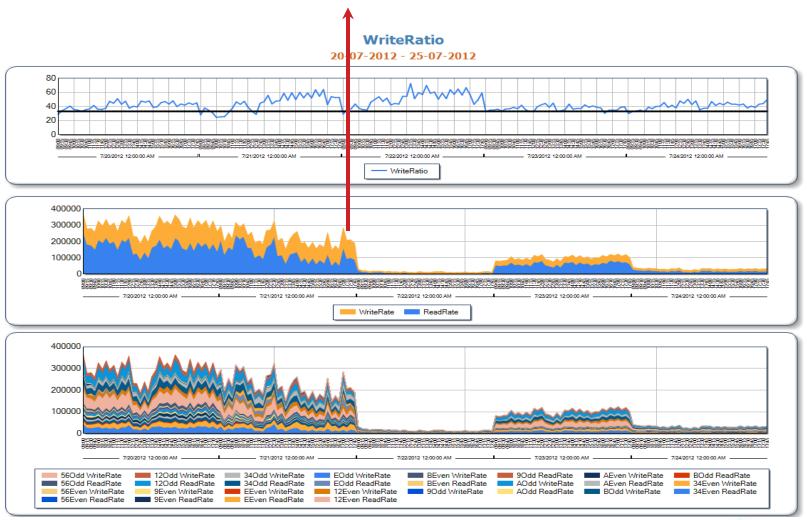
```
Samples: 20
                Systems: 8 Date: 07/26/12 Time: 07.35.00 Range: 20
                                                                           Sec
                             CDate: 07/26/12 CTime: 07.34.56 CRange: 0
                                                                           Sec
Vol
                              RMF Cache Volume Detail
XAL
     The following details are available for Volume P2WN45 on SSID BD00
жNО
     Press Enter to return to the Report panel.
*CA
P2W
     Cache: Active
                          DFW: Active
                                             Pinned: None
PB0
            ----- Read -----
P2L
                                 ----- Write -----
                                                             Read
                                                                    Tracks
P2L
                     Hit
                          Hit%
                                  Rate
                                         Fast
                                                 Hit
                                                      Hit%
                                                               %
             Rate
                                  32.8
                                         32.8
                                                              0.5
PNO
     Norm
              0.1
                     0.1
                           100
                                                32.8
                                                       100
                                                                       0.2
                   435.3
PB0
            435.3
                           100
                                 818.0
                                        818.0
                                               818.0
                                                       100
                                                             34.7
                                                                     509.3
     Seq
                                   0.0
     CFW
              0.0
                           0.0
                                          0.0
                                                 0.0
                                                       0.0
                                                              0.0
PUO
                     0.0
PB0
      Total
            435.4
                   435.4
                           100
                                 850.8
                                        850.8
                                               850.8
                                                       100
                                                             33.9
PTM
     ----- Misc
                         - Non-Cache - --- CKD ---- - Record Caching -
PUO
     DFW Bypass :
                                   0.0 Write:
                                                 0.0 Read Miss :
P2W
                   11.5
                         ICL
                                                                    0.0
P2W
     CFW Bupass :
                    0.0
                         Bupass:
                                   0.0 Hits:
                                                 0.0 Write Prom:
                                                                   2180
PGO
     DFW Inhibit:
                    0.0
      F1=Help
                    F2=SplitScr F3=End
                                               F6=RMFHelp F9=SwapScr
     F12=Return
```



Write Ratio Global & Even/Odd LSS Base - Daily Trend Report



Workload Change Reason Was: DB2 group doing some tests for the EAV problem



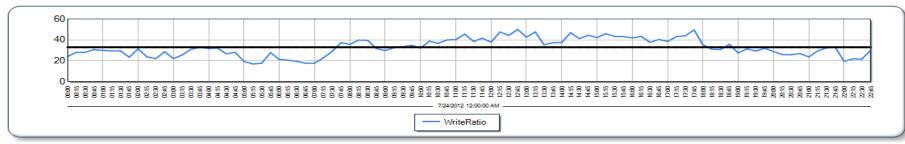


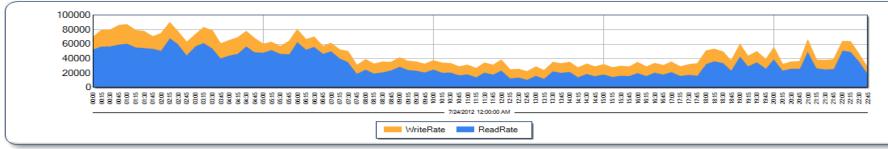
Write/Read Ratio Global & Even/Odd LSS Base – One Day

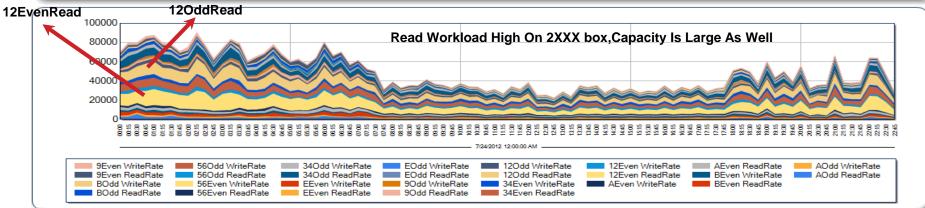




24-07-2012 - 25-07-2012









Daily Reports - DASD Summary Report



DASD_Summary

24-07-2012 00:00 - 24-07-2012 23:59

| | | | | | | Mainfra | me DASD | | | | | |
|-----------------|------------------|------------------|------------------|---|--------|------------------|------------------|------------------|------------------|------------------|------------------|---------------|
| | 00:00- | 08:59 | 09:00- | 17:59 | 18:00- | 23:59 | Ave | rage | Total (A | verages) | То | tal |
| | Response Time | Activity Rate | Response Time | Activity Response Activity Re Rate Time Rate | | Response Time | Activity Rate | Response Time | Activity Rate | Response Time | Activity Rate | |
| PRDA | 0.89 | 7192.06 | 0.78 | 2240.69 | 0.77 | 3055.22 | 0.81 | 4162.66 | 2.44 | 12487.97 | 77.80 | 409,849 |
| PRDB | 0.89 | 9586.31 | 0.95 | 3700.17 | 0.73 | 5983.61 | 0.86 | 6423.36 | 2.57 | 19270.08 | 83.00 | 615,936 |
| PRDC | 0.91 | 12537.36 | 0.83 | 4401.00 | 0.90 | 5618.13 | 0.88 | 7518.83 | 2.64 | 22556.49 | 83.40 | 738,998 |
| PRDD | 0.95 | 9220.22 | 0.95 | 6634.78 | 0.76 | 7903.43 | 0.89 | 7919.48 | 2.66 | 23758.43 | 86.00 | 752,559 |
| PRDE | 1.00 | 8951.69 | 0.71 | 10167.83 | 0.57 | 9463.30 | 0.76 | 9527.61 | 2.28 | 28582.83 | 74.50 | 905,959 |
| PRDF | 0.79 | 11577.86 | 0.74 | 3761.29 | 0.73 | 10835.13 | 0.75 | 8724.76 | 2.26 | 26174.28 | 71.80 | 801,418 |
| PRDG | 0.87 | 14986.92 | 0.78 | 7470.08 | 0.62 | 10767.13 | 0.75 | 11074.71 | 2.26 | 33224.13 | 73.40 | 1,056,09 6 |
| PRDW | 0.84 | 11453.39 | 0.73 | 2991.31 | 0.70 | 8532.48 | 0.76 | 7659.06 | 2.27 | 22977.17 | 72.70 | 716,256 |
| Average | 0.89 | 10688.23 | 0.81 | 5170.89 | 0.72 | 7769.80 | 0.81 | 7876.31 | | | | |
| Total(Averages) | 7.14 | 85505.81 | 6.46 | 41367.15 | 5.78 | 62158.43 | | | 19.38 | 189031.39 | | |
| Total | 257 | 3,078,20 9 | 233 | 1,489,21 8 | 133 | 1,429,64 4 | | | | | 623 | 5,997,07 1 |

| | | | | | | DB2 LOGCO | DPY Volume | es | | | | |
|-----------------|-----------------------------|---------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | 00:00- | 08:59 | 09:00- | 17:59 | 18:00- | 23:59 | Avei | rage | Total (A | verages) | Total | |
| | Response Activity Time Rate | | Response Time | Activity Rate | Response Time | Activity Rate | Response Time | Activity Rate | Response Time | Activity Rate | Response Time | Activity Rate |
| PRDA | 1.03 | 68.14 | 0.77 | 37.34 | 0.88 | 32.50 | 0.89 | 45.99 | 2.68 | 137.98 | 4,004 | 224,797 |
| PRDB | 0.97 | 93.41 | 0.75 | 59.77 | 0.84 | 66.85 | 0.85 | 73.34 | 2.55 | 220.03 | 4,980 | 435,942 |
| PRDC | 1.00 | 73.35 | 0.71 | 99.95 | 0.75 | 104.93 | 0.82 | 92.74 | 2.47 | 278.22 | 11,579 | 1,337,23 8 |
| PRDD | 1.09 | 73.07 | 0.67 | 96.00 | 0.75 | 67.51 | 0.84 | 78.86 | 2.52 | 236.58 | 8,046 | 838,337 |
| PRDE | 1.14 | 83.85 | 0.71 | 34.08 | 1.02 | 36.85 | 0.96 | 51.59 | 2.87 | 154.78 | 5,996 | 363,253 |
| PRDF | 1.23 | 67.88 | 0.82 | 63.31 | 0.85 | 89.76 | 0.97 | 73.65 | 2.91 | 220.95 | 4,340 | 317,120 |
| PRDG | 1.09 | 123.23 | 0.84 | 99.41 | 0.91 | 72.24 | 0.95 | 98.29 | 2.84 | 294.88 | 9,372 | 1,019,71 0 |
| PRDW | 1.14 | 122.60 | 0.88 | 57.64 | 1.04 | 95.17 | 1.02 | 91.81 | 3.06 | 275.42 | 6,171 | 593,204 |
| Average | 1.09 | 88.19 | 0.77 | 68.44 | 0.88 | 70.73 | 0.91 | 75.78 | | | | |
| Total(Averages) | 8.70 | 705.53 | 6.16 | 547.49 | 7.05 | 565.81 | | | 21.90 | 1818.83 | | |
| Total | 25,810 | 2,177,66 7 | 16,847 | 1,808,79 8 | 11,832 | 1,143,13 6 | | | | | 54,488 | 5,129,60 1 |

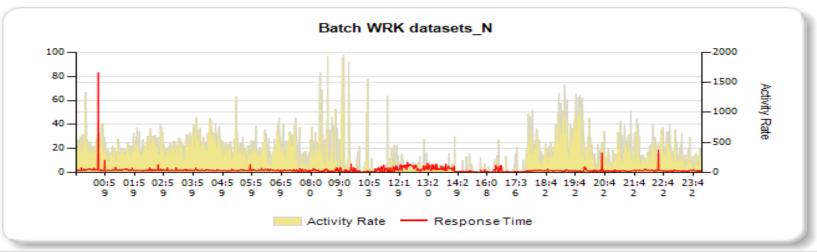
| | DASD SMS Gro | оир |
|------------|--------------|-------------|
| Free Space | Used Size | Total Size |
| 77,306,019 | 84,743,520 | 162,049,539 |

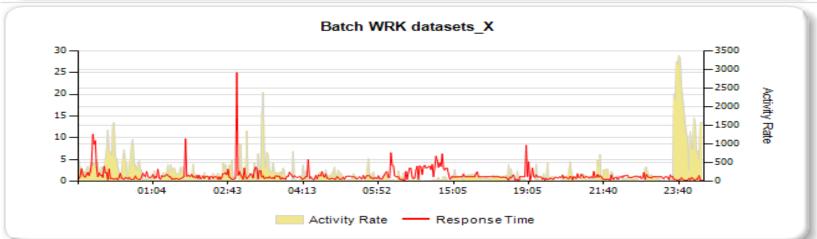


Daily Reports - Storage Group Base Response Times



Source: RMF Monitor III Data



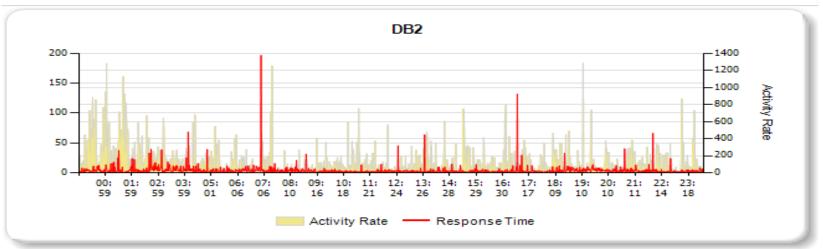


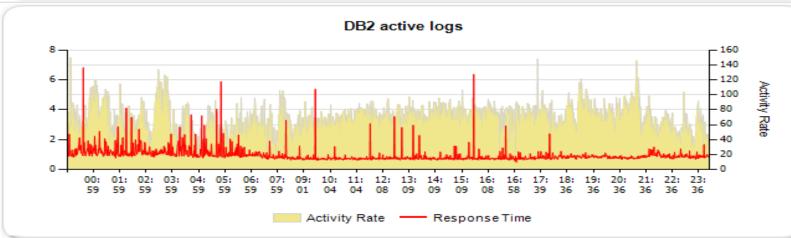


Daily Reports - Storage Group Base ResponseTimes



Source: RMF Monitor III Data





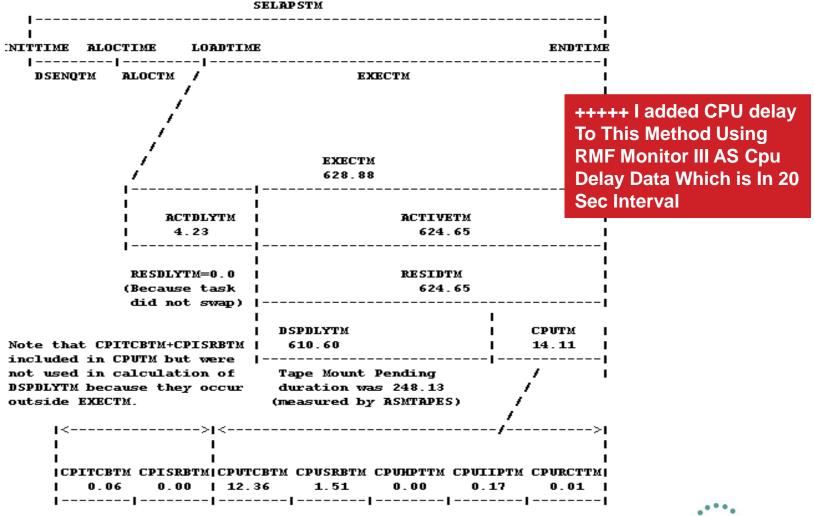


Analizing I/O Effect On Batch RunTime



Using Barry Merrill's Job ElapseTime Components Method + Adding CpuDelay As Seconds

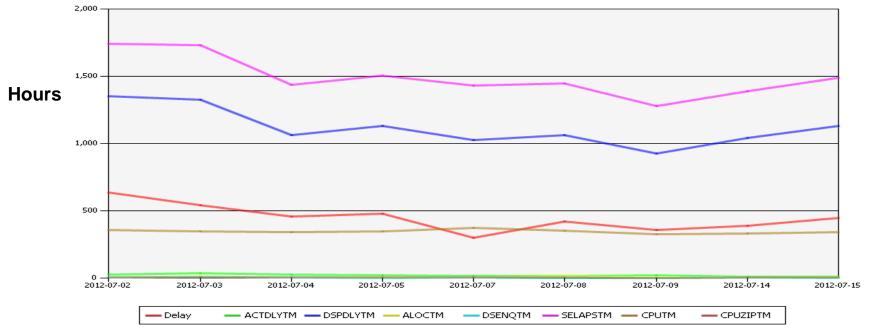




Daily Reports - Job ElapseTime Components



Sum Up All Jobs As If They Run In Sequence - Daily Base



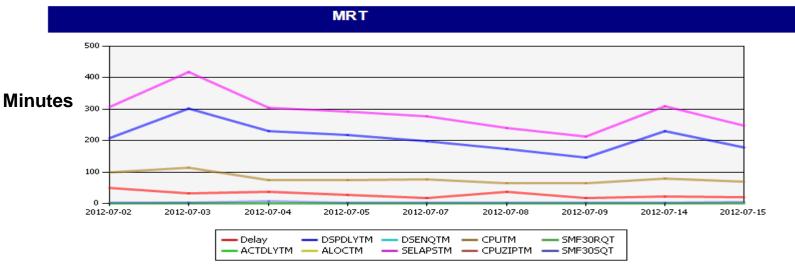
| JINTTIME | SELAPSTM | DSENQTM | ALOCTM | ACTDLYTM | СРИТМ | DSPDLYTM | CPUDELAY | CPUZIPTM |
|------------|----------|---------|--------|----------|-------|----------|----------|----------|
| 2012-07-02 | 1,743 | 3 | 6 | 26 | 356 | 1,352 | 635 | 2 |
| 2012-07-03 | 1,733 | 9 | 13 | 34 | 349 | 1,328 | 541 | 2 |
| 2012-07-04 | 1,435 | 2 | 3 | 24 | 343 | 1,064 | 457 | 2 |
| 2012-07-05 | 1,502 | 1 | 3 | 18 | 349 | 1,129 | 480 | 2 |
| 2012-07-07 | 1,434 | 2 | 3 | 15 | 373 | 1,025 | 301 | 2 |
| 2012-07-08 | 1,447 | 1 | 16 | 14 | 354 | 1,061 | 418 | 3 |
| 2012-07-09 | 1,281 | 0 | 6 | 20 | 324 | 928 | 359 | 1 |
| 2012-07-14 | 1,388 | 2 | 2 | 10 | 331 | 1,044 | 389 | 2 |
| 2012-07-15 | 1,488 | 0 | 6 | 10 | 342 | 1,130 | 444 | 2 |



Daily Reports - Critical Path Jobs ElapseTime Components



Sum Up All Jobs - They Run In Sequence



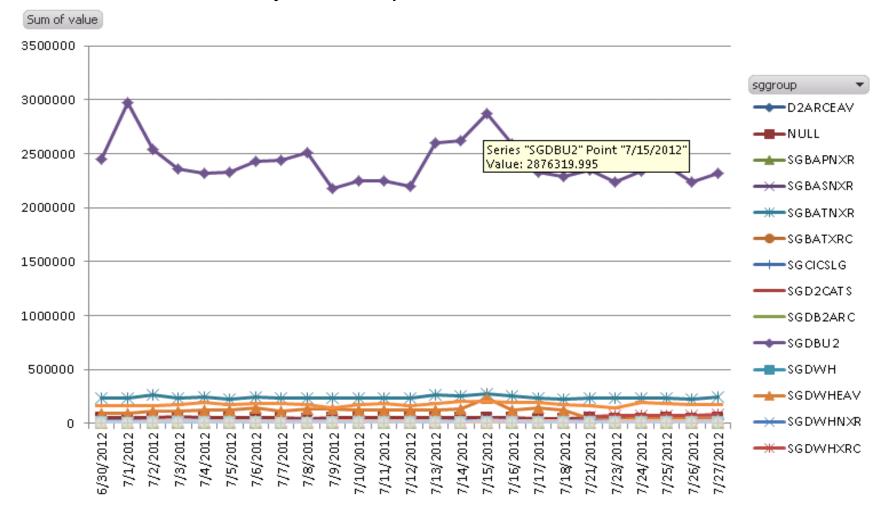
| JINTTIME | SELAPSTM (Dk) | DSENQTM (Dk) | ALOCTM (Dk) | ACTDLYTM (Dk) | CPUTM (Dk) | DSPDLYTM (Dk) | CPUDELAY (Dk) | CPUZIPTM (Dk) | SMF30RQT (Dk) | SMF30SQT (Dk) |
|------------|------------------|-----------------|----------------|------------------|---------------|------------------|------------------|------------------|------------------|------------------|
| 2012-07-02 | 308 | 0 | 0 | 0 | 100 | 208 | 49 | 0 | 2 | 3 |
| 2012-07-03 | 418 | 0 | 0 | 0 | 115 | 303 | 34 | 0 | 4 | 3 |
| 2012-07-04 | 305 | 0 | 0 | 0 | 75 | 230 | 38 | 0 | 1 | 7 |
| 2012-07-05 | 291 | 0 | 0 | 0 | 74 | 217 | 29 | 0 | 1 | 2 |
| 2012-07-07 | 277 | 0 | 0 | 0 | 78 | 199 | 17 | 0 | 1 | 2 |
| | | | | | | | | | | |
| 2012-07-08 | 240 | 0 | 0 | 0 | 66 | 174 | 37 | 0 | 0 | 3 |
| 2012-07-09 | 212 | 0 | 0 | 0 | 65 | 147 | 17 | 0 | 1 | 3 |
| 2012-07-14 | 310 | 0 | 0 | 0 | 79 | 231 | 22 | 0 | 1 | 2 |
| 2012-07-15 | 249 | 0 | 0 | 0 | 69 | 179 | 21 | 0 | 2 | 7 |



What is The Workload % For Each Storage Group



Source: Device Activity Rate Report Time Period 00:00 – 09:00

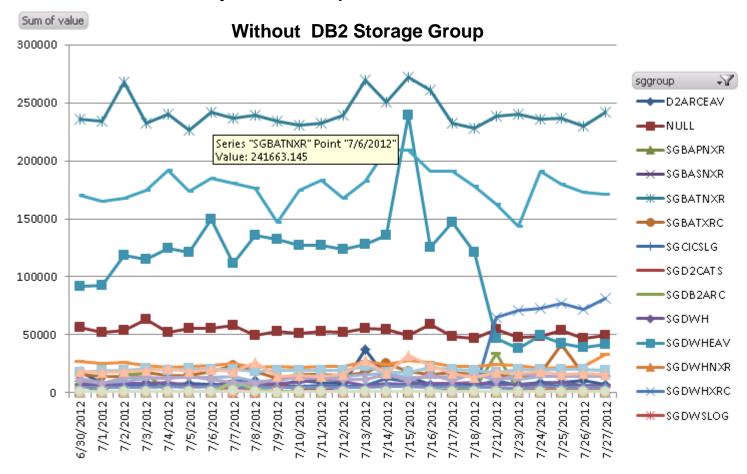




What is The Workload % For Each Storage Group



Source: Device Activity Rate Report Time Period 00:00 – 09:00





What is The Workload % Of Each Storage Group During Batch RunTime?



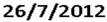
Source: Device Activity Rate Report Time Period 00:00 – 09:00

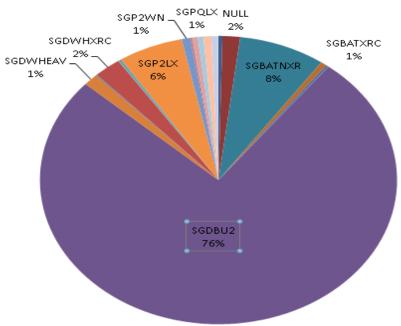
Answer:

% 76 For XRC DB2 Volumes

% 8 For Batch NonXRC Work Datasets

% 6 For DB2 Log Copy Volumes





RMF Rank Report



✓ Read Operation ResponseTime < 30</p>

| L ESS RANK STATISTICS PRG | | | | | | | | | | | | DAC1 | | |
|---------------------------|------|------|-----------------------|-----------------|-------|----------------------------|----------|--------------------|---------------------|---------|-------|-------|-------|--------|
| z/OS V1R12 SYSTEM ID PRDB | | | npnp | DATE 07/21/2012 | | | | INTERVAL 14.59.996 | | | PHG | | | |
| z/0S V1R12 | | | RPT VERSION V1R1 | | | RMF TIME 00.00.00 | | | CYCLE 1.000 SECONDS | | | | | |
|)SERIAL NUMBER 00000TB071 | | | TYPE-MODEL 002107-941 | | | | 7/21/201 | | T)(T) 0.0 | 00.01 | | 14.59 | | |
|) | | | READ OPERATIONS | | | CDATE 07/21/2012 CTIME 00. | | | 00.01 | CINI | 14.33 | | | |
| - | | OPS | BYTES | BYTES | KTIME | OPS | BYTES | BYTES | RTIME | ARRA | ٧ | MIN | RANK | RAID |
| ID TYPE | RRID | /SEC | /OP | /SEC | /OP | /SEC | /OP | /SEC | /OP | SSD NUM | | | CAP | TYPE |
|)0000 CKD 1Gb | 0000 | 0.2 | 8.5K | 1.3K | 8.2 | 33.1 | 194.9K | 6.5M | 99.6 | 33D NOM | WD116 | | 876G | RAID 5 |
| 70000 CKD 1GD | 0002 | 0.2 | 8.5K | 1.6K | 10.5 | 33.0 | 246.6K | 8.1M | 54.1 | 1 | _ | | 876G | RAID 5 |
| | 0002 | 0.2 | 8.4K | 1.9K | 11.9 | 45.6 | 230.8K | 10.5M | 70.7 | 1 | 7 | | 1022G | RAID 5 |
| | 0004 | 0.2 | 8.2K | 1.3K | 8.2 | 43.7 | 229.6K | 10.0M | 85.6 | 1 | , | | 1022G | RAID 5 |
| | 0008 | 0.2 | 8.3K | 1.5K | 9.4 | 45.3 | 156.4K | 7.1M | 76.4 | 1 | 6 | | 876G | RAID 5 |
| | 000A | 0.2 | 7.5K | 1.2K | 7.1 | 41.2 | 175.9K | 7.3M | 68.1 | 1 | 6 | | 876G | RAID 5 |
| | 000K | 0.2 | 8.5K | 1.7K | 7.5 | 44.7 | 165.2K | 7.4M | 69.7 | 1 | 7 | | 1022G | RAID 5 |
| | 000E | 0.2 | 8.0K | 1.9K | 6.0 | 36.7 | 254.7K | 9.4M | 78.9 | 1 | 7 | | 1022G | RAID 5 |
|) | POOL | 1.5 | 8.3K | 12.4K | 8.6 | 323.4 | 204.7K | 66.2M | 75.3 | 8 | 52 | | 7592G | RAID 5 |
|)0001 CKD 1Gb | 0001 | 0.1 | 7.6K | 437.4 | 12.3 | 30.3 | 110.6K | 3.4M | 61.7 | 1 | 6 | | 876G | RAID 5 |
| 70001 CKD 1GD | 0003 | 0.1 | 6.4K | | 13.1 | 17.2 | 128.0K | 2.2M | 34.5 | 1 | 6 | | 876G | RAID 5 |
| | 0005 | 0.1 | 7.9K | | 5.1 | 28.2 | 118.2K | 3.3M | 57.1 | 1 | 7 | | 1022G | RAID 5 |
| | 0007 | 0.1 | 8.1K | 874.8 | 13.7 | 31.7 | 109.8K | 3.5M | 49.2 | 1 | , | | 1022G | RAID 5 |
| | 0009 | 0.1 | 8.7K | 583.2 | 15.2 | 19.2 | 68.5K | 1.3M | 36.3 | 1 | 6 | | 876G | RAID 5 |
| | 000B | 0.1 | 7.5K | 583.2 | 7.1 | 20.1 | 83.6K | 1.7M | 39.4 | 1 | 6 | | 876G | RAID 5 |
| | 000D | 0.1 | 9.0K | 1.0K | 11.9 | 20.8 | 186.1K | 3.9M | 32.9 | 1 | 7 | | 1022G | RAID 5 |
| | 000E | 0.1 | 7.5K | 583.2 | 8.0 | 19.2 | 115.7K | 2.2M | 26.4 | 1 | , | | 1022G | RAID 5 |
| | POOL | 0.7 | 7.9K | 5.4K | 10.6 | 186.7 | 114.9K | 21.5M | 44.5 | 8 | 52 | | 7592G | RAID 5 |
| | | | | | | | | | | | | | | |

ROT For RANK Read ResponseTime > 30 / > 35 ms as 'not good'



RMF Rank Report



PROBLEM :Read Operation ResponseTime > 35
Specific Peak Workload

| SERIA | L NUMBER | 00000TB0 | 71 | TYPE-MOD | EL 00210 | 07- 94 1 | CDATE 0 | 8/01/201 | 2 C | |
|-------|----------|----------|------|-------------|-----------|-----------------|-----------------|-------------|--------|--|
| | | | | | RATIONS - | | WRITE OPERATION | | | |
| EXT | ENT POOL | | OPS | BYTES | BYTES | RTIME | OPS | BYTES | BYTES | |
| ΙD | TYPE | RRID | /SEC | / 0P | /SEC | ∕ OP | /SEC | / 0P | /SEC | |
| 0000 | CKD 1Gb | 0000 | 0.0 | 5.2K | 145.6 | 44.8 | 21.6 | 99.7K | 2.2M | |
| | | 0002 | 0.0 | 10.9K | 291.3 | 4.7 | 23.6 | 100.6K | 2.4M | |
| | | 0004 | 0.0 | 14.6K | 145.6 | 5.3 | 12.5 | 108.5K | 1.4M | |
| | | 0006 | 0.0 | 8.7K | 145.6 | 6.4 | 18.8 | 110.5K | 2.1M | |
| | | 0008 | 0.0 | 13.1K | 145.6 | 14.4 | 14.7 | 108.6K | 1.6M | |
| | | 000A | 0.0 | 14.6K | 145.6 | 5.3 | 13.1 | 44.5K | 581.2K | |
| | | 000C | 0.0 | 13.1K | 291.3 | 26.4 | 13.4 | 76.5K | 1.0M | |
| | | 000E | 0.0 | 10.5K | 291.3 | 8.3 | 21.7 | 75.5K | 1.6M | |
| | | POOL | 0.2 | 10.5K | 1.6K | 16.8 | 139.3 | 91.9K | 12.8M | |
| 0001 | CKD 1Gb | 0001 | 0.0 | 8.7K | 145.6 | 5.3 | 11.3 | 72.4K | 818.3K | |
| | | 0003 | 0.0 | 0.0 | 0.0 | 5.3 | 14.0 | 70.9K | 991.9K | |
| | | 0005 | 0.0 | 0.0 | 0.0 | 8.0 | 8.8 | 138.1K | 1.2M | |
| | | 0007 | 0.0 | 0.0 | 0.0 | 19.6 | 12.7 | 160.7K | 2.0M | |
| | | 0009 | 0.0 | 26.2K | 145.6 | 6.4 | 9.3 | 75.7K | 702.5K | |
| | | 000B | 0.0 | 0.0 | 0.0 | 6.8 | 7.8 | 73.0K | 568.0K | |
| | | 000D | 0.0 | 9.4K | 145.6 | 8 0 | 21.3 | 99.7K | 2.1M | |
| | | 000F | 0.0 | 10.9K | 145.6 | 6.7 | 15.3 | 213.6K | 3.3M | |
| | | POOL | 0.1 | 6.8K | 582.5 | 8.1 | 100.5 | 116.8K | 11.7M | |

ROT For RANK Read ResponseTime > 30 / > 35 ms as 'not good'

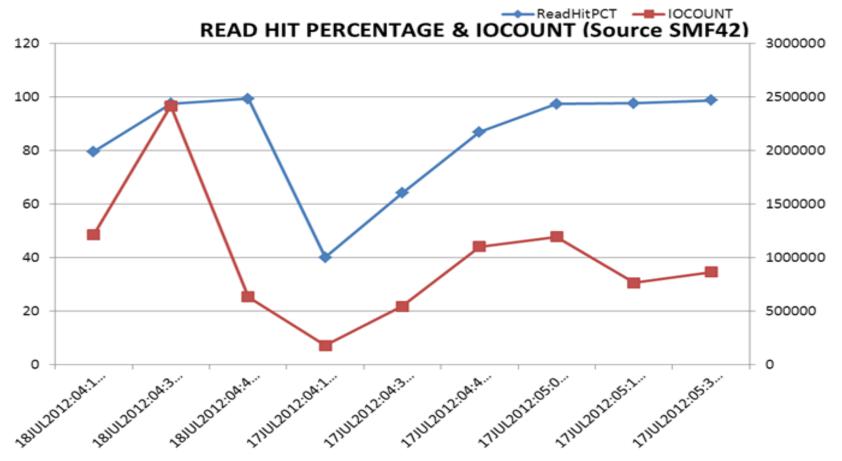


SMF42 Dataset Statistics



Sample Study: Batch Job ElapseTime Difference.

DB2 Table - I/O performance analized using SMF42 (MXG Formated)



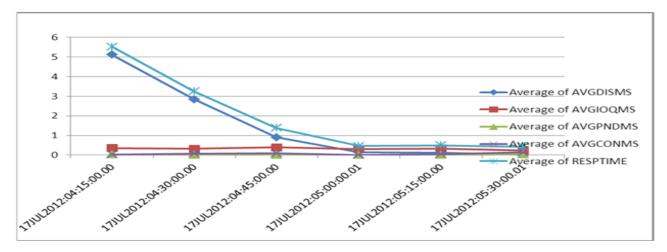


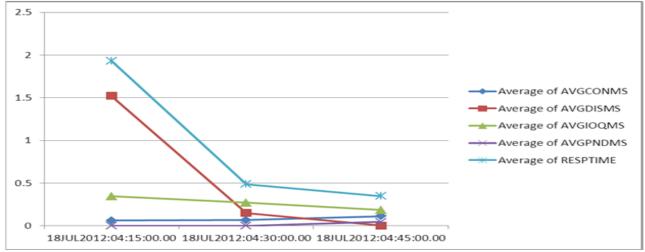
SMF42 Dataset Statistics



Sample Study: Batch Job ElapseTime Difference.

DB2 Table - I/O performance analized using SMF42 (MXG Formated)







zHPF



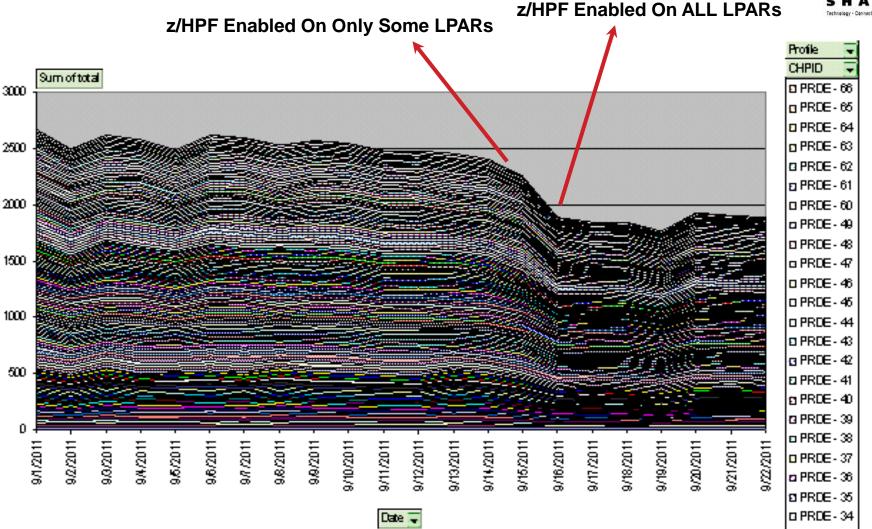
zHPF Evolution

Single domain, single track I/O DS8100/DS8300 with R4.1 Reads, update writes Media manager exploitation z10 processor o z/OS R8 and above σ 9 Multi-track, but <= 64K 0 Multi-track any size z196 processor О 2 0 Format writes, multi-domain I/O DS8700/DS8800 with R6.2 QSAM/BSAM/BPAM exploitation z196 FICON Express 85 (FEx85) z/OS R11 and above



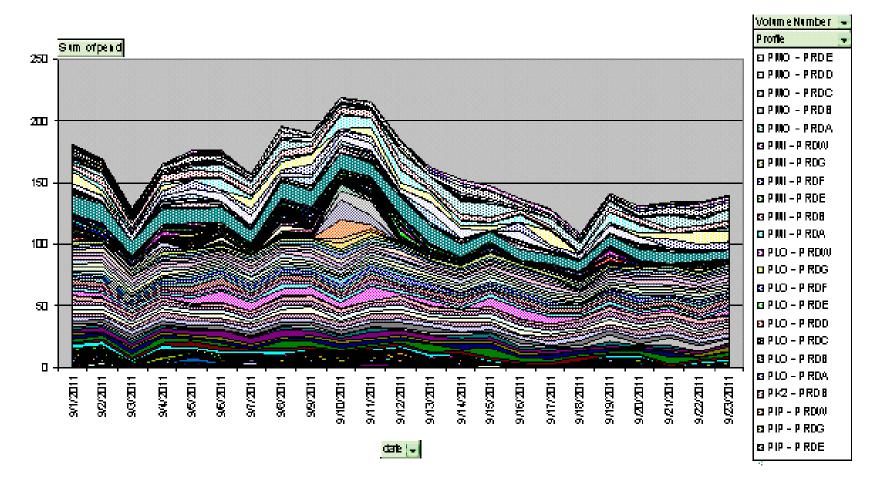
zHPF Effect / Channel Utilization Drop





zHPF Effect / Pend Time Drop

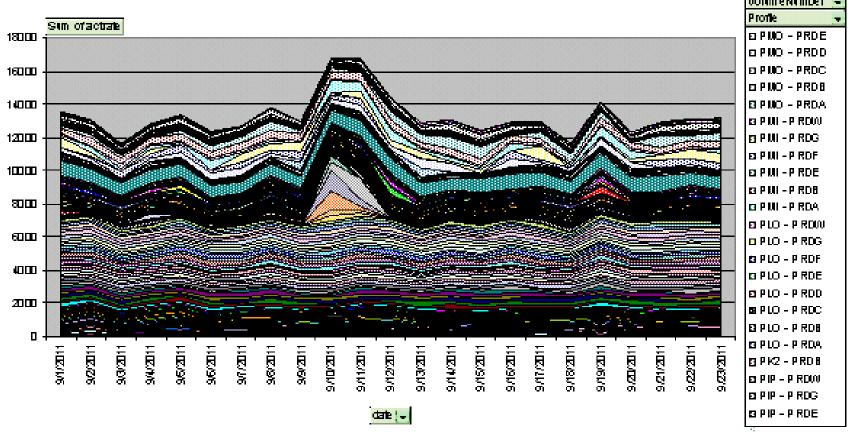


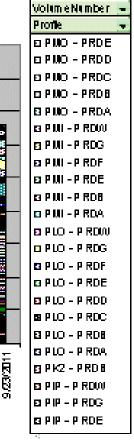




z/HPF Effect Activity Rate



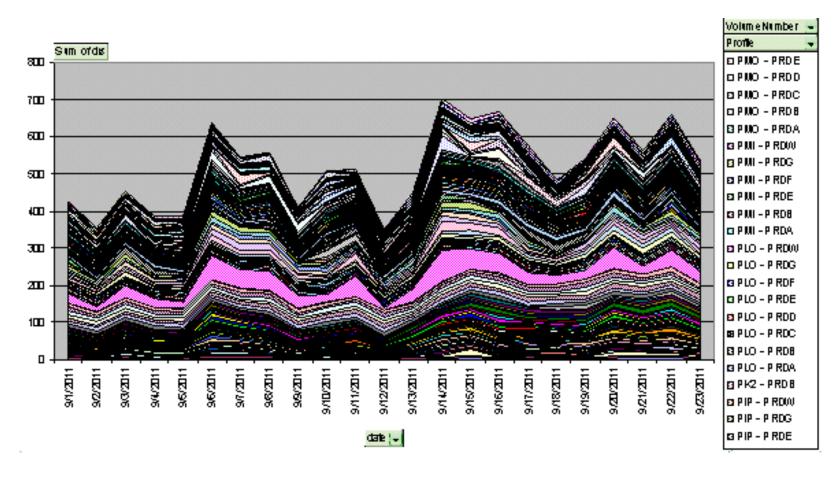




Possible Reason For Not Seeing Same Throughtput Increase



Face With Another Bottleneck That Caused DisconnectTime Increase



SPECIFIC ITEMS RELATED TO TAPE WORKLOAD



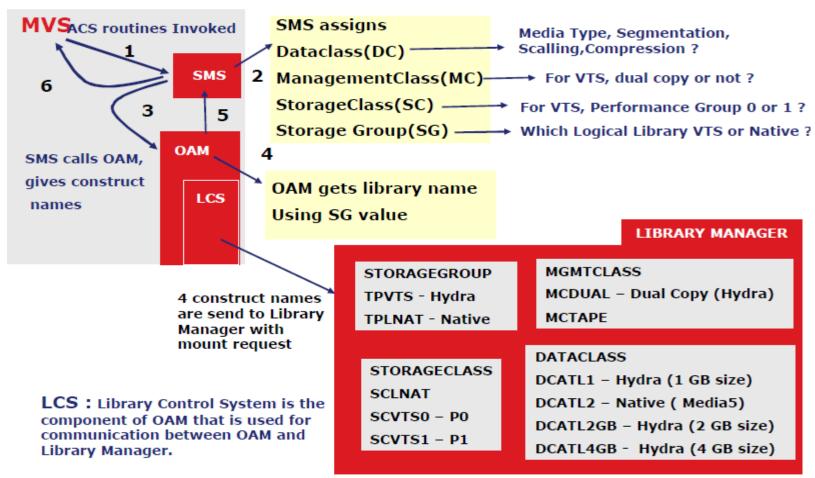
- **□** CONSIDER THE TAPE TECHNOLOGY DETAILS
- IT IS FREE AND REALLY NICE!



Tape I/O Flow - High Level



SMS Managed Tape – How Is It Working?

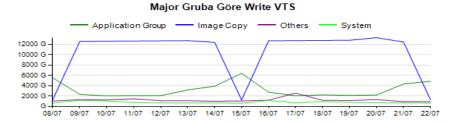


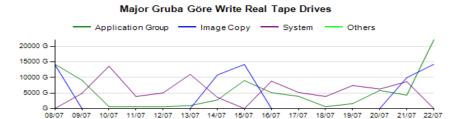


Daily Reports - Tape Write Workload Report

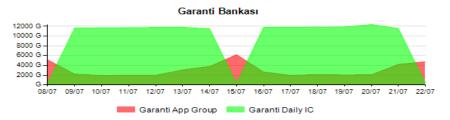


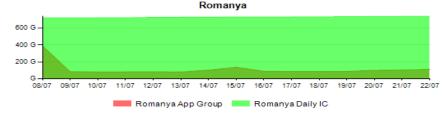
Tape Write Workload Analysis Major





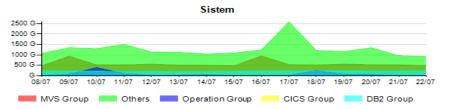
Tape Write Workload Analysis - VTS Tape Drives











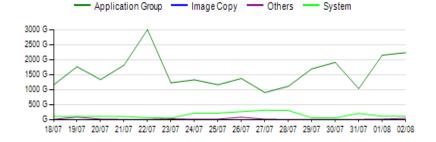


Daily Reports - Tape Read Workload Report



Tape Read Workload Analysis Major

Major Gruba Göre Read VTS

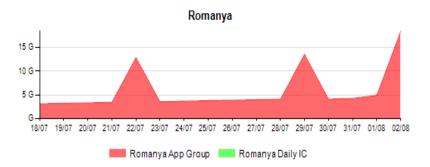


Major Gruba Göre Read Real Tape Drives



Tape Read Workload Analysis - VTS Tape Drives

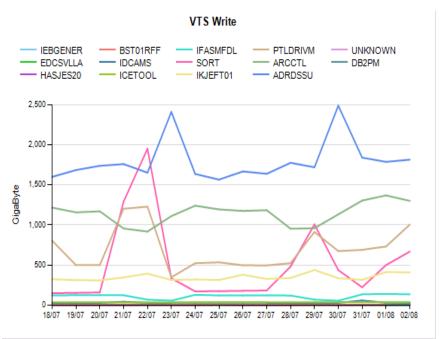


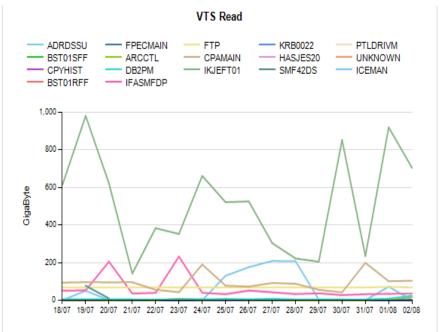


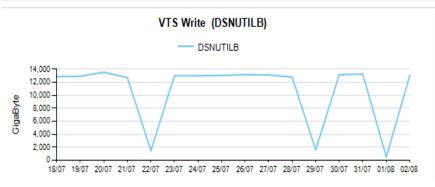


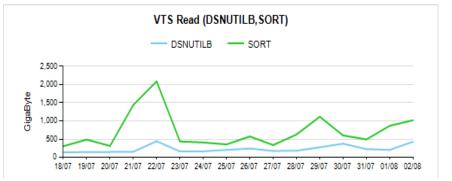
Daily Reports - Tape Write Workload Report Group By Program













Tape Workload Report - Source



IBM Tape Tool TapeWise Report - JOBRPT DD

| 1 (C) IBM 1 OSL=SP7.1.2 | REPORT=JOBRP FROM = 19 | | TAPEWISE MOUNTED & OPENED BY JOBNAME WITHIN TGROUP 9:36:36 TITLENAME TAPEWISE | | | | | RUN ON 23JUL2012 F 5:13:35 LATEST TIMESTAMP = 22JUL2012 F 23:59:52 | | | |
|----------------------------|---------------------------|-----------|---|---------|---------|-------------|-------------|---|--------------|---------------|----------|
| OTGROUP=3490 | FROM - 15 | DOLZOIZ F | 7.30.30 | | | ME IMPENISE | | LRIESI | THESTRUP - 2 | 500F5015 F 53 | . 35. 32 |
| JOB NAME | DIFFJOB | SPC OPN | SCR OPN | TOT OPN | %OF TOT | ACCUM | ACUIM% | MBREAD | MBWRITE | MBTOTAL | |
| OBETA92 | 1 | 6 | 0 | 6 | 301 101 | 6 | 110 01111 0 | 19 | 0 | 19 | |
| EDBKIMGD | 3 | ő | 3 | 3 | | 9 | | 0 | 1 | 1 | |
| EDISPOSE | 1 | ň | 1 | 1 | | 10 | | ň | 1 | 1 | |
| EDNSVISA | 2 | ň | 2 | 2 | | 12 | | ñ | 30 | 30 | |
| EDOPPDEL | 1 | ň | 1 | 1 | | 13 | | ñ | 8 | 8 | |
| EMBCLMDU | 1 | ň | 1 | 1 | | 14 | | ň | 11 | 11 | |
| EMBCRWAD | 1 | ō | 1 | 1 | | 15 | | Ō | 14 | 14 | |
| EMBKALLA | 1 | ō | 1 | 1 | | 16 | | Ō | 1893 | 1893 | |
| EMBKALLB | 1 | Ō | 1 | 1 | | 17 | | Õ | 370 | 370 | |
| EMBKELDA | 1 | o | 1 | 1 | | 18 | | 0 | 180 | 180 | |
| EMBKFLDB | 1 | 0 | 1 | 1 | | 19 | | 0 | 180 | 180 | |
| EMBKETPD | 1 | 0 | 1 | 1 | | 20 | | 0 | 34 | 34 | |
| EMBK01YD | 1 | 0 | 1 | 1 | | 21 | | 0 | 374 | 374 | |
| EMBK07DD | 1 | 0 | 1 | 1 | | 22 | | 0 | 245 | 245 | |
| EMBK10YD | 1 | 0 | 1 | 1 | | 23 | | 0 | 12 | 12 | |
| EMBK35DD | 1 | 0 | 2 | 2 | | 25 | | 0 | 690 | 690 | |
| EMNSDBGO | 1 | 0 | 1 | 1 | | 26 | | 0 | 31 | 31 | |
| EMNSEOD 0 | 1 | 0 | 1 | 1 | | 27 | | 0 | 98 | 98 | |
| EMNSUNL3 | 1 | 0 | 1 | 1 | | 28 | | 0 | 1 | 1 | |
| ENOPPCI1 | 1 | 0 | 1 | 1 | | 29 | | 0 | 309 | 309 | |
| нѕмра | 2 | 8 | 2 | 10 | | 39 | | 35 | 33 | 68 | |
| нѕмрр | 1 | 1 | 0 | 1 | | 40 | | 1 | 0 | 1 | |
| HSMPF | 2 | 2 | 68 | 70 | | 110 | | 0 | 54750 | 54750 | |
| НSMPG | 2 | 3 | 1 | 4 | | 114 | | 0 | 1240 | 1240 | |
| HSMPW | 2 | 0 | 575 | 575 | | 689 | | 0 | 883912 | 883912 | |
| JES2 | 1 | 0 | 1 | 1 | | 690 | | 0 | 4309 | 4309 | |
| KDBKIMGD | 1 | 0 | 1 | 1 | | 691 | | 0 | 0 | 0 | |
| KDISPOSE | 1 | 0 | 1 | 1 | | 692 | | 0 | 1 | 1 | |
| KDOPPDEL | 1 | 0 | 1 | 1 | | 693 | | 0 | 14 | 14 | |
| KMBKALLA | 1 | 0 | 2 | 2 | | 695 | | 0 | 7115 | 7115 | |
| KMBKALLB | 1 | 0 | 1 | 1 | | 696 | | 0 | 950 | 950 | |
| KMBKFLDA | 1 | 0 | 1 | 1 | | 697 | | 0 | 6 | 6 | |
| KMBKFLDB | 1 | 0 | 1 | 1 | | 698 | | 0 | 6 | 6 | |
| KMBKETPD | 1 | 0 | 1 | 1 | | 699 | | 0 | 2 | 2 | |
| KMBK07DD | 1 | 0 | 1 | 1 | | 700 | | 0 | 534 | 534 | |
| KMBK10YD | 1 | 0 | 1 | 1 | | 701 | | 0 | 3 | 3 | |
| KMBK35DD | 1 | 0 | 3 | 3 | | 704 | | 0 | 6192 | 6192 | |
| PCICTA01 | 1 | 11 | 0 | 11 | | 715 | | 49923 | 0 | 49923 | |
| PDB2SSAL | 1 | 0 | 4 | 4 | | 719 | | 0 | 34671 | 34671 | |
| PDEFWOX1 | 1 | 0 | 1 | 1 | | 720 | | 0 | 5510 | 5510 | |
| PDRFDDX1 | 1 | 0 | 23 | 23 | | 743 | | 0 | 297647 | 297647 | |
| PDRFDOXA | 1 | 0 | 3 | 3 | | 746 | | 0 | 41998 | 41998 | |
| PDRFDOX1 | 1 | 0 | 6 | 6 | | 752 | | 0 | 78533 | 78533 | |



Analizing Performance Of Tape Workload



IBM Tape Tool TapeWISE & IOSTAT Report - With New Fields Related To CPU Usage

| 1 (C) IBM H | REPORT=JOBRP | T (12201) | TAPEWI | SE MOUNTED | & OPENED I | BY JOBNAME WI | THIN TGROUP | RUI | ON 23JUL201 | L2 1 23:35:36 | 2 | | | | |
|--------------|--------------|-------------|------------|------------|--------------------|---------------|----------------|--------|---|---------------|----------|----------|--|--|--|
| OSL=SP7.1.2 | FROM = 13 | JUL2012 Þ : | 23:30:07 _ | | TITLENAME TAPEWISE | | | | LATEST TIMESTAMP = 14JUL2012 F 23:59:44 | | | | | | |
| OTGROUP=3490 | | | | | | | | | | SMF30TCB | SMF30SRB | | | | |
| JOB_NAME | DIFFJOB | SPC_OPN | SCR_OPN | TOT_OPN | %OF TOT | ACCUM | ACUIM % | MBREAD | MBWRITE | MBTOTAL | HH:MM:SS | HH:MM:SS | | | |
| OPDREDOX7 | 1 | 0 | 3 | 3 | | 906 | | 0 | 40687 | 40687 | 0:01:06 | 0:00:03 | | | |
| PDRFDOX8 | 1 | 0 | 4 | 4 | | 910 | | 0 | 42241 | 42241 | 0:01:09 | 0:00:03 | | | |
| PDRFDOX9 | 1 | 0 | 5 | 5 | | 915 | | 0 | 41974 | 41974 | 0:01:12 | 0:00:04 | | | |
| PDSFW0X1 | 1 | 0 | 11 | 11 | | 926 | | 0 | 143226 | 143226 | 0:03:30 | 0:00:15 | | | |
| PD2CATBC | 1 | 0 | 7 | 7 | | 933 | | 0 | 79348 | 79348 | 0:01:47 | 0:00:05 | | | |
| PD2CDGDW | 1 | 0 | 1 | 1 | | 934 | | 1 | 3278 | 3279 | 0:00:00 | 0:00:00 | | | |
| PD2CDGOP | 1 | 0 | 3 | 3 | | 937 | | 1 | 39523 | 39524 | 0:00:00 | 0:00:00 | | | |
| PD2CDRDW | 1 | 0 | 1 | 1 | | 938 | | 1 | 1233 | 1234 | 0:00:00 | 0:00:00 | | | |
| PD2CDROP | 1 | 0 | 1 | 1 | | 939 | | 1 | 11470 | 11471 | 0:00:00 | 0:00:00 | | | |
| PD2DT01 | 1 | 8 | 0 | 8 | | 947 | | 2688 | 0 | 2688 | 0:00:07 | 0:00:00 | | | |
| PD2FD0XA | 2 | 0 | 87 | 87 | | 1034 | | 0 | 952283 | 952283 | 0:21:47 | 0:01:29 | | | |
| PD2FD0XB | 1 | 0 | 84 | 84 | | 1118 | | 0 | 985692 | 985692 | 0:23:55 | 0:01:44 | | | |
| PD2FD0XC | 1 | 0 | 99 | 99 | | 1217 | | 0 | 956338 | 956338 | 0:23:13 | 0:01:42 | | | |
| PD2FD0X1 | 1 | 0 | 83 | 83 | | 1300 | | 0 | 987610 | 987610 | 0:22:39 | 0:02:02 | | | |
| PD2FD0X2 | 2 | 0 | 84 | 84 | | 1384 | | 0 | 1003841 | 1003841 | 0:13:38 | 0:01:15 | | | |

This is Sample – It will be publish soon with new IBM Tapetool Code...

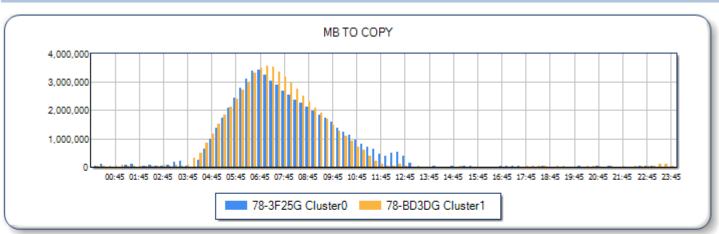
Thanks To Denise Haight From US.IBM TapeTool Team For Accepting Recommendation

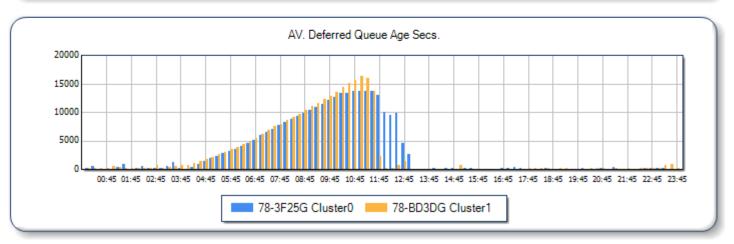


Daily Reports - VTS Grid Performance



TS7700 Grid Performance Reports







Daily Reports - VTS Grid Performance- Source IBM TapeTool VEHSTAT Pgm H33GRID DD Average DEF Queue Ages (Seconds)



| 1(C) IBM | REPORT=F | | 2065) | | | | CAL PEER- | |
|-----------|----------|------------|-----------|--------|---------|----------|-----------|--------|
| GRIDÖ=B00 | | [_LIB_ID= | | _ID= 0 | NODE_ | SERIAL=C | CL03F25G | VE_COD |
| | | d, MB is 1 | | | 1.201.0 | N.D. | | N. C. |
| 28JUN12TH | | MiB | AV_DEF | | | MB | LVOLS | L |
| | TO | TO | QUEAGE | | TOT | | TO_TVC | |
| 00.00.00 | RECEIVE | RECEIVE | SECC | | | _COPY | DEF_C | |
| 00:00:00 | 1 | 5992 | 126 | 0 | 0 | 0 | 0 | 0 |
| 00:15:00 | 66 | 102697 | 443 | 0 | 0 | 0 | 0 | 0 |
| 00:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00:00 | _0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:15:00 | 73 | 102000 | 439 | 0 | 0 | 0 | 0 | 0 |
| 01:30:00 | 3 | 4589 | 999 | 0 | 0 | 0 | 0 | 0 |
| 01:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00:00 | 2 | 3181 | 116 | 0 | 0 | 0 | 0 | 0 |
| 02:15:00 | 63 | 91894 | 427 | 0 | 0 | 0 | 0 | 0 |
| 02:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 0 |
| 02:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00:00 | 0 17 | 0 | 4.5.5 | 0 | 0 | 0 | 0 | _ |
| 03:15:00 | 1 (| 39258 | 466 | 0 | 0 | 0 | 0 | 0 0 |
| 03:30:00 | 2 | 2207 | 414 69 | 0 | 0 | 0 | 0 0 | 0 |
| 04:00:00 | 2 | 0 4709 | 135 | 0 | 0 0 | 0 | 0 | 0 |
| 04:15:00 | 61 | 238652 | 425 | 0 | 0 | 0 | 0 | 0 |
| 04:15:00 | 125 | 616214 | 877 | 0 | 0 | 0 | 0 | 0 |
| 04:45:00 | 185 | 975779 | 1342 | 0 | 0 | 0 | 0 | 0 |
| 05:00:00 | 246 | 1338924 | 1799 | 0 | 0 | 0 | 0 | 0 |
| 05:15:00 | 327 | 1704074 | 2147 | 0 | 0 | 0 | 0 | 0 |
| 05:15:00 | 385 | 2051646 | 2648 | 0 | 0 | 0 | 0 | 0 |
| 05:45:00 | 440 | 2404417 | 3087 | 0 | 0 | 0 | 0 | 0 |
| 06:00:00 | 486 | 2719867 | 3525 | 0 | 0 | 0 | 0 | 0 |
| 06:15:00 | 563 | 3037627 | 3836 | 0 | 0 | 0 | 0 | 0 |

VTS Grid Performance-Throttling



Write Throttling, Copy Throttling, Defered Copy Throttling

| -DEFER | R_COPY_ | _THROTTI | LING- | | | | PREFI | ERENCI | E_GROU | JP_0 | | |
|--------|---------|----------|-------|-------|-------|-------|-------|--------|--------|-------|-------|------|
| MUM | NUM | AVG | | VIRT | GiB | GiBTO | GiBTO | ROLL | ING_A\ | /_MAX | | |
| 15MIN | 30SEC | SEC | BASE | VOLS | RES | PRE | COPY | -TIMI | EIN0 | CACHE | -VIRT | r_vo |
| INTVL | SMPLS | /INTVL | SECS | CACHE | CACHE | MIG | OUT | 4HR | 48HR | 35DA | 4HR | 48H |
| | R1 | l.5 | | | | R1.5 | R1.5 | - ON | THE_HO |)UR | ON_ | _THE |
| 1 | 2 | .008 | . 125 | 1 | 1 | 8 | 4 | 16M | 99M | 180M | 230 | 4 |
| • | • | . 000 | . 125 | 1 | 0 | 2 | 0 | 16M | 99M | 180M | 230 | 4 |
| 1 | 1 | . 004 | . 125 | 42 | 58 | 73 | 0 | 16M | 99M | 180M | 230 | 4 |
| 1 | 4 | .016 | . 125 | 14 | 22 | 8 | 0 | 16M | 99M | 180M | 230 | 4 |
| 1 | 1 | . 004 | . 125 | 1 | 1 | • | 0 | 15M | 98M | 180M | 267 | 4 |
| 1 | 2 | .008 | . 125 | 0 | 0 | 14 | 1 1 | 15M | 98M | 180M | 267 | 4 |
| 1 | 2 | .008 | . 125 | 43 | 64 | 97 | 0 | 15M | 98M | 180M | 267 | 4 |
| 1 | 1 | . 004 | . 125 | 22 | 37 | 7 | 5 | 15M | 98M | 180M | 267 | 4 |
| 1 | 5 | .020 | . 125 | 3 | 7 | 15 | 5 | 16M | 98M | 179M | 283 | 4 |
| 1 | 7 | .029 | . 125 | 8 | 21 | 23 | 5 | 16M | 98M | 179M | 283 | 4 |
| 1 | 5 | .020 | . 125 | 60 | 101 | 90 | 1 1 | 16M | 98M | 179M | 283 | 4 |
| 1 | 7 | .029 | . 125 | 39 | 78 | 55 | 10 | 16M | 98M | 179M | 283 | 4 |
| 1 | 9 | .037 | . 125 | 9 | 42 | 34 | 5 | 20M | 98M | 179M | 302 | 4 |
| 1 | 22 | .091 | . 125 | 20 | 100 | 116 | 58 | 20M | 98M | 179M | 302 | 4 |
| 1 | 19 | .079 | . 125 | 41 | 141 | 121 | 54 | 20M | 98M | 179M | 302 | 4 |
| 1 | 12 | .050 | . 125 | 83 | 217 | 256 | 87 | 20M | 98M | 179M | 302 | 4 |
| 1 | 30 | . 125 | . 125 | 108 | 417 | 367 | 273 | 19M | 99M | 179M | 296 | 3 |
| 1 | 30 | . 125 | . 125 | 84 | 394 | 481 | 463 | 19M | 99M | 179M | 296 | 3 |
| 1 | 30 | . 125 | . 125 | 131 | 750 | 706 | 723 | 19M | 99M | 179M | 296 | 3 |
| 1 | 30 | . 125 | . 125 | 165 | 950 | 994 | 1029 | 19M | 99M | 179M | 296 | 3 |
| 1 | 30 | . 125 | . 125 | 231 | 1355 | 1251 | 1292 | 34M | 99M | 179M | 274 | 3 |
| 1 | 30 | . 125 | . 125 | 265 | 1564 | 1561 | 1596 | 34M | 99M | 179M | 274 | 3 |
| 1 | 30 | . 125 | . 125 | 329 | 1951 | 1826 | 1865 | 34M | 99M | 179M | 274 | 3 |
| 1 | 30 | . 125 | . 125 | 363 | 2150 | 2166 | 2189 | 34M | 99M | 179M | 274 | 3 |

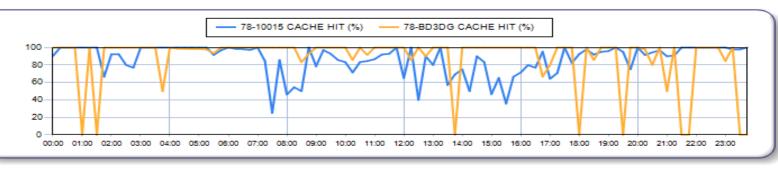


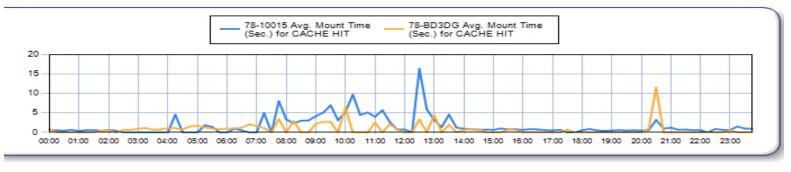
Daily Reports-VTS Grid Performance-Throttling

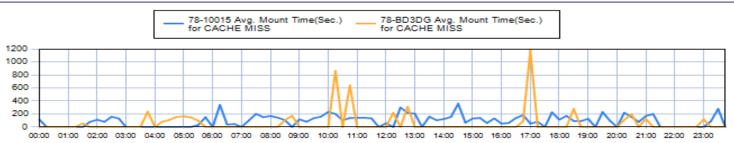


Source: IBM Tape Tool VEHSTAT Program









References



■ MVS I/O Subsystems Gilbert E. HouteKamer, H.Pat Artis Thanks To Pat Artis & Gilbert HouteKamer For This Greate Book DS8800 Performance & Tunning Redbook – Updated June 2012 IRD Redbook Thanks To Writers Of This Greate Redbook DS8000 InfoCenter TS3500 InfoCenter TS7700 InfoCenter SHARE Prezentations - Thanks To SHARE For Nice Detail Sessions... Check Previous SHARE & This SHARE for more about zHPF,I/O RelatedItems □ MXG Documents Thanks To Barry Merill For The Method Of Job ElapseTime Components Thanks To Cheryl Watson For the checking of Idea About CpuDelay part

THANKS TO ...



LEE LA FREESE INTELLIMAGIC

TOM BERETVAS BERETVAS PERFORMANCE CONSULTANTS, EPSTRATEGIES

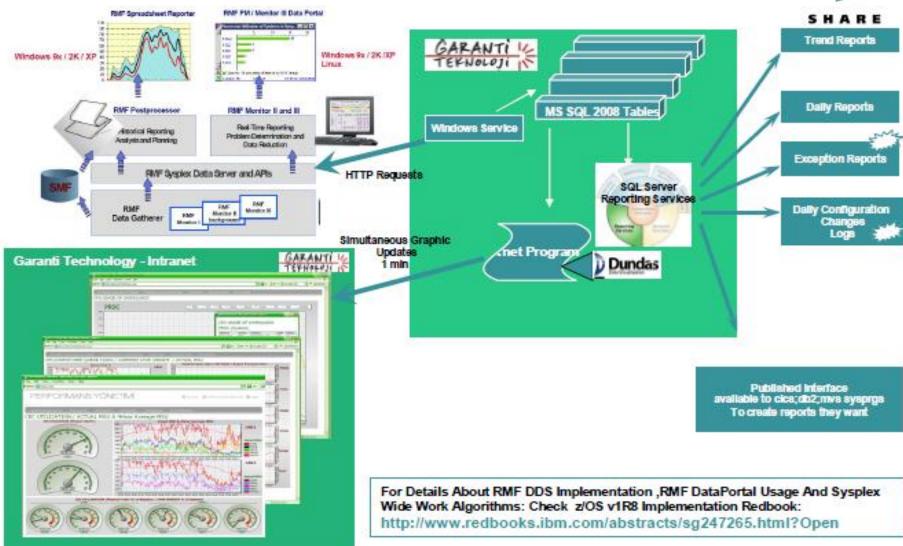
BARRY MERILL MERILLE CONSULTANT (MXG)

CHERYL WATSON WATSON&WALKER



GT-Inhouse Designed Platform Using RMF DDS







Monitoring WritePacing Value

R:2012207.173456.9000-05.0000812

R:2012207,173528,A300-03,0000714 R:2012207.173559,2500-05.0001136

D:2012207,173528,A302,PBOX01,6,1,0.0 D:2012207,173528,A606,DBP218,6,37,2.8

D:2012207,173630,241F,PBET0A,6,1,0.0 D:2012207,173630,A501,PDG256,6,2,0.0 D:2012207,173630,A606,DBP218,6,20,0.3



```
//ANTWPMN1 JOB MSGLEVEL=(1,1),TIME=(1439,0),MSGCLASS=X,REGION=64M,CLASS=S
//GO EXEC PGM=ANTWPMON.PARM='2880 30 S'
//STEPLIB DD DSN=SYS2.ZOS.LINKLIB,DISP=SHR
//*
//* INPUT PARAMETERS: PARM='AAAA BB C'
//*
//* AAAA (DEC) NUMBER OF INTERVALS TO PROCESS
//* BB
      (DEC) INTERVAL DURATION, IN MINUTES
        INTERVAL UNITS, M=MINUTES S=SECONDS
//* C
//*
//REPORT DD SYSOUT=*.DCB=BLKSIZE=80
//DATAOUT DD DSN=SYS3.GSDM1.ANTWPMON.DISP=SHR
 R:2012207,173425,A600-01,0003215
 D:2012207,173456,B711,PRMP49,6,1,0.0
 D:2012207.173456,A302,PBOX01,6,2,0.0
 D:2012207,173456,A606,DBP218,6,8,0.5
```



THANK YOU



THANK YOU!

