

Performance and Tuning an XRC (zGM) Environment

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eXtended Remote Copy (XRC)

- IBM rebranded XRC as z/Global Mirror (z/GM), but nearly everyone who has worked with the product for more than 5 years still refers to it as XRC.
- The IBM publications never completely made the transition to the new name
 - The Advanced Copy Services manual still refers to the product as XRC
 - GDPS/XRC manuals still use the XRC name
- Point: There are two names for the same product. This presentation will refer to this product as XRC.

Basic Rules to Keep XRC Running Efficiently

- The System Data Mover (SDM) address spaces need to have sufficient MIP's and memory
- There should be sufficient cache on the primary disk subsystems
- There should be sufficient bandwidth between the primary and secondary sites to handle the peak I/O levels
- I/O's should be balanced across all SDM's as much as possible
- Write pacing should be used to level out the I/O spikes
- Use Hyper-PAV's on the secondary DASD
- The XRC journals should be allocated as striped data sets

Optimizing Each SDM

- Pagefix 35MB of storage for each reader
- XRC enhanced readers should be implemented to improved the efficiency of the readers
- Each SDM should have 2 – 4 processors
- Specify BuffersPerStorageControl(25000) and TotalBuffers(25000) to make sure the SDM has sufficient buffers to do the work
- Keep MaxTotalReaderTasks set low enough to avoid reducing the time group formation rate and over committing the data movement buffers

Tools to Manage & Monitor XRC Performance

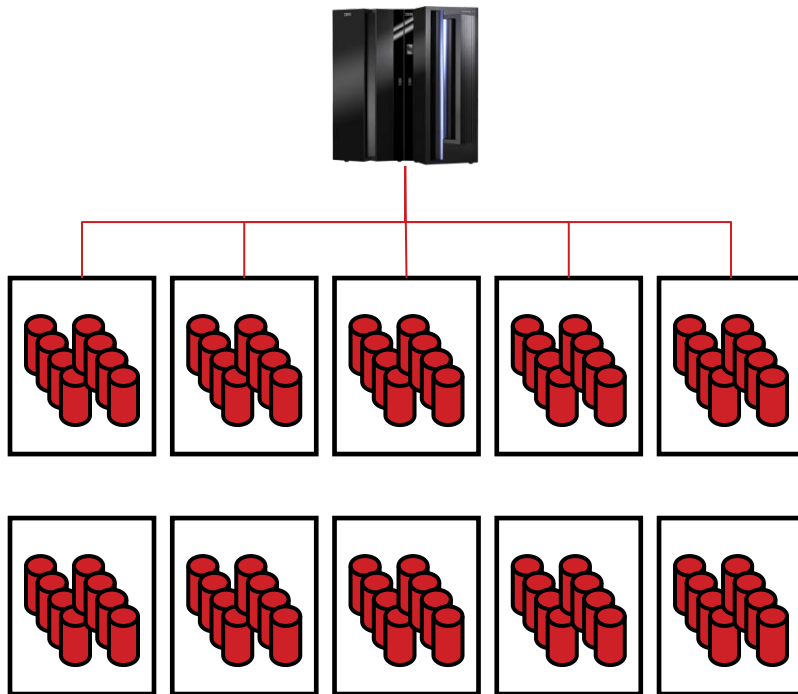
- XRC Performance Monitor
- The following tools are now part of the GDPS/XRC Performance Toolkit
 - History Formatter and Delay Reason Analyzer
 - Write Pacing Monitor
 - Write Pacing History Collector
 - Hyper-Active Volume Checker
- The GDPS/XRC Performance Toolkit will be supported by the GDPS development team

XRC Performance Monitor

- The XRC Performance Monitor provides the following statistics at preset intervals
 - Did any device blocking occur
 - Did any long busy conditions occur
 - The rate the SDM was reading data from the primary control units in MB/sec, and the MB/sec for each reader
 - Number of fixed buffers available for the SDM
 - Number of non-fixed buffers available for the SDM
 - Delay time for the SDM
 - Maximum data loss exposure time
 - Residual counts
 - Cache in use
- These statistics can be viewed real time or from some interval in the past

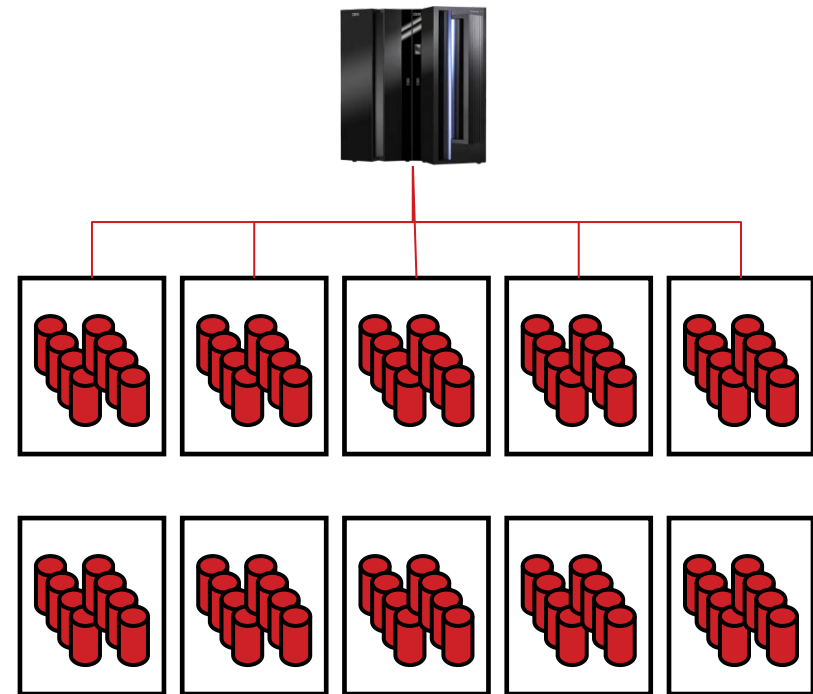
Configuration the Examples Came From

Primary Site



- 440TB
- DS8300's & DS8700's
- 21,393 volumes

Secondary Site



- Primary site * 2
- 30 SDM's on 8 LPAR's

XPM Real Time Monitor - Clusters

DUP= 21393 CPY= 0 PND= 0 SUS= 0 SEQ= 0 UTL= 272 TOT= 21665

Combined MB per sec Read Rate from Primary = 653.50 RecNo = N/A
 Combined Total GB Read During Interval = 7.03

CMD	SDMNAME	K	B	Read Rate	Fix Buf	NFix Buf	Delay	Exposure	Record Time
*CLUSL003	N N	65.80	41B8	0000	00:00:04.35	00:00:04.32	15:57:17-05/02/2012		
*CLUSL004	N N	65.59	2412	0000	00:00:04.59	00:00:04.40	15:57:21-05/02/2012		
*CLUSL005	N N	42.20	5AB7	0000	00:00:03.78	00:00:03.21	15:57:29-05/02/2012		
*CLUSL006	N N	84.00	3CA6	0000	00:00:04.50	00:00:04.48	15:57:57-05/02/2012		
*CLUSL007	N N	91.70	544B	0000	00:00:04.43	00:00:04.41	15:58:03-05/02/2012		
*CLUSL008	N N	26.89	4D61	0000	00:00:03.05	00:00:02.76	15:57:41-05/02/2012		
*CLUSL009	N N	119.45	4C3D	0000	00:00:03.79	00:00:03.53	15:58:05-05/02/2012		
*CLUSL00A	N N	157.87	590E	0000	00:00:04.48	00:00:04.40	15:57:52-05/02/2012		

XPM Real Time Monitor – SDM's

```

V1.0 0A21097 ----- XRC Monitor SDM Detail ----- Row 1 to 10 of 36
COMMAND ==> _____ SCROLL ==> CSR

  DUP= 1133  CPY= 0    PND= 0    SUS= 0    SEQ= 0    UTL= 9    TOT= 1142

Read Rate   = 03.37    Delay = 00:00:03.40    Exposure   = 00:00:01.980312
Write Rate  = 03.47    PTG pSec = 0.84        Record Time = 16:39:38-05/02/2012
Tot MB Xfer = 152.00    Session ID= SDMP31    Monitor Int = 45.12 Secs
Available Buffers:  Fixed   = 1AE8    Non-Fixed   = 450C
Non-Zero Queues = XGATE=0E                                RecNo = N/A

      SC SC In Residual Cache  I/O      TOT      Long Busy B  DDM  Utility
CMD SSID ID MN Ct Count   In Use  TIME  M-BYTES  MBs  60PCT 63K K  TIMER  Vol
-----
_  0783 02 DD 00 0038      0  5.65   37.65   6.66   N  N  N  120  UP2180
_  0783 04 DD 00 0032      0  5.67   37.83   6.67   N  N  N  120  UP2180
_  0783 03 DD 00 0032      0  5.66   36.95   6.53   N  N  N  120  UP2180
_  0783 01 DD 00 0009      0  5.70   39.28   6.89   N  N  N  120  UP2180
_  0788 01 II 00 0000      0  5.36    0.00   0.00   N  N  N  120  UP2400
_  0788 03 II 00 0000      0  5.35    0.00   0.00   N  N  N  120  UP2400
_  0788 02 II 00 0000      0  5.38    0.00   0.00   N  N  N  120  UP2400
_  0788 04 II 00 0000      0  5.35    0.00   0.00   N  N  N  120  UP2400
_  0787 01 HH 00 0000      0  5.40    0.00   0.00   N  N  N  120  UP2380
_  0787 02 HH 00 0000      0  5.36    0.00   0.00   N  N  N  120  UP2380
  
```

XPM Batch Monitor

```
//XRCMON52 PROC SDM=  
//CSCXJBAT EXEC PGM=IKJEFT01,DYNAMNBR=200  
//STEPLIB DD DISP=SHR,DSN=SYS1.CSC.SCSCMODS  
//SYSPRINT DD SYSOUT=*  
//SYSTSPRT DD SYSOUT=*  
//SYSOUT DD SYSOUT=*  
//SYSPROC DD DISP=SHR,DSN=SYS1.CSC.SCSCEXEC  
//XXSTATE DD DISP=SHR,DSN=XRC.XCOPY.&SDM..STATE(MONITOR1)  
//SYSTSIN DD DISP=SHR,DSN=XRC.XPM.PARMS(MONITOR)
```

XRC.XPM.PARMS(MONITOR) –

CSCXMBAT DT=180 RT=C999 WT=15 CT=80 PACE=Y

DT = Delay Threshold

RT = Residual Threshold

CT = Cache Threshold

WT = Wait Time

XPM Alerts When Thresholds Are Exceeded

CSC0066W Cache threshold exceeded for *SDMP52* at 80% 360B AA

CSC0070W Delay threshold exceeded on *SDMP52*, delay = 00:03:17.473102

CSC0071W High residuals detected on *SDMP52* for 360B AA

XPM History Collector

```
//XRCHST52 PROC SDM=  
//CSCXJBAT EXEC PGM=IKJEFT01,DYNAMNBR=200,  
//   PARM=('%CSCXMHIS N=8640,T=10,HQ=XRC.&SDM,DR=Y,FINISH=23:59)  
//STEPLIB DD DISP=SHR,DSN=SYS1.CSC.SCSCMODS  
//SYSPROC DD DISP=SHR,DSN=SYS1.CSC.SCSCEXEC  
//DDIN DD DISP=SHR,DSN=XRC.XCOPY.&SDM..STATE(MONITOR1)  
//SYSTSIN DD DUMMY  
//SYSPRINT DD SYSOUT=*  
//SYSTSPRT DD SYSOUT=*  
//SYSOUT DD SYSOUT=*  
//SNAP DD SYSOUT=U  
//SYSUDUMP DD SYSOUT=U
```

XPM History Monitor – Show Delay

```

V1.0 OA21097 ----- XRC Monitor SDM Summary1 ----- Row 1 to 2 of 2
COMMAND ==> _____ SCROLL ==> CSR

  DUP= 830   CPY= 0   PND= 0   SUS= 0   SEQ= 0   UTL= 16   TOT= 846

Combined MB per sec Read Rate from Primary = 19.01           RecNo = 8495
Combined Total MB Read During Interval      = 882.00

      B L  Read   Fix  NFix
CMD  SDMNAME K B  Rate  Buf  Buf  Delay           Exposure           Record Time
-----
_   SDMP51   Y N 10.47  0000 0000 00:02:55.82  00:02:55.37  23:35:20-05/03/2012
_   SDMP52   Y N  8.54  0000 0000 00:03:17.47  00:03:02.72  23:35:31-05/03/2012
***** END OF DISPLAY *****
  
```

XPM History Monitor – Delay Reason

```

V1.0 OA21097 ----- XRC Monitor SDM Summary2 ----- Row 1 to 2 of 2
COMMAND ==> _____ SCROLL ==> CSR

  DUP= 830   CPY= 0   PND= 0   SUS= 0   SEQ= 0   UTL= 16   TOT= 846

Combined MB per sec Read Rate from Primary = 19.01           RecNo = 8495
Combined Total MB Read During Interval      = 882.00

CMD  SDMNAME      Delay              Non-Zero Queues
-----
_   SDMP51        00:02:55.82      XGATE=1C
_   SDMP52        00:03:17.47      XCGCO=1B XLOPE=02
_
***** END OF DISPLAY *****
  
```

Non-Zero Queues

- XGATE – Waiting on another SDM
- XCGCO – There are consistency groups waiting to be combined before data is written to the secondary volume
- XLOPE – The maximum size of this queue is two. If more than two consistency groups are eligible to be written to the secondary volumes, they are queued in the XCGO queue which can grow to any limit.

XPM History Monitor – Delay Details

```
V1.0 0A21097 ----- XRC Monitor SDM Detail ----- Row 1 to 9 of 48
COMMAND ==> _____ SCROLL ==> CSR

  DUP= 415   CPY= 0   PND= 0   SUS= 0   SEQ= 0   UTL= 8   TOT= 423

Read Rate   = 8.54      Delay = 00:03:17.47   Exposure   = 00:03:02.726060
Write Rate  = 13.58     PTG pSec = 0.37      Record Time = 23:35:31-05/03/2012
Tot MB Xfer = 396.00   Session ID= SDMP52   Monitor Int = 46.37 Secs
Available Buffers: Fixed   = 0000   Non-Fixed   = 0000
Non-Zero Queues = XCGCO=1B XLOPE=02                               RecNo = 8495

      SC SC In Residual Cache   I/O      TOT      Long Busy B  DDM  Utility
CMD  SSID ID NN Ct Count      In Use  TIME  M-BYTES  MBs  60PCT 63K K  TIMER  Vol
-----
  3609 02 AB 00 55C0          20  0.36   6.21  17.25   N  N   N   110  UP3A40
  3609 06 AB 00 55AD          20  0.41   7.77  18.95   N  N   N   119  UP3A40
  3609 04 AB 00 5531          20  0.46   8.28  18.00   N  N   N   119  UP3A40
  3609 03 AB 00 551E          20  0.31   7.50  24.19   N  N   N   115  UP3A40
  3609 05 AB 00 54FA          20  0.43   7.64  17.77   N  N   N   119  UP3A40
  3609 01 AB 00 5426          20  0.42   6.85  16.31   N  N   N   115  UP3A40
  3608 05 AA 00 1252          10  0.16   0.02   0.13   N  N   N   119  UP3A00
  3608 04 AA 00 1243          10  0.15   0.02   0.13   N  N   N   119  UP3A00
  3608 01 AA 00 1240          10  0.11   0.01   0.09   N  N   N   119  UP3A00
```



History Formatter & Delay Reason Analyzer

```
//STEP010 EXEC PGM=XRCHFPD2,PARM='000,-0500'  
//STEPLIB DD DSN=SYS4.XRCTOOLS.LINKLIB,DISP=SHR  
//REPORT DD DSN=XRC.XRCPDA.SDMP52.D0503,  
//      DISP=(NEW,CATLG,DELETE),  
//      SPACE=(TRK,(12,5),RLSE),  
//      DSORG=PS,RECFM=FB,LRECL=120,BLKSIZE=0  
//HIST DD DSN=XRC.SDMP52.MON.HISTORY.D12123.T2359,  
//      DISP=SHR
```

History Formatter Output

```
124 22:33:58 S SDMP52 360F,P2P2BE:B 360F,P2P2BE:B 3609,FSP00F:0 UP3A40 15,2309,06 062,0077,46 075,006,000 15-3609 2:29
124 22:34:44 S SDMP52 360A,FSP005:0 360D,FIP03F:B 3609,FSP00F:0 UP3A40 11,1847,06 064,0151,46 066,020,000 17-3609 2:48
124 22:35:31 S SDMP52 360F,P2P2BE:B 360F,P2P2BE:B 3609,FSP00F:0 UP3A40 17,2822,06 051,0068,46 052,009,000 20-3609 3:17
124 22:37:04 S SDMP52 3609,FSP010:0 360F,P2P2BE:B 3609,FSP010:0 UP3A40 12,2670,04 059,0099,46 083,052,001 15-3609 2:53
```

```
124 22:58:51 T SDMP52 01444 0165 06782
124 06:55:02 * SDMP52 360E,FSC42C:0 360E,FSC42C:0 360E,FSC42C:0 UP3B80 51,0981,53 049,0101,46 100,353,019 00-3608 0:05
124 00:25:21 + SDMP52 3609,FSP102:0 360D,FIP03F:B 3609,FSP010:0 UP3A40 20,3240,06 073,0169,49 093,112,000 05-360D 0:29
124 22:35:31 % SDMP52 360F,P2P2BE:B 360F,P2P2BE:B 3609,FSP00F:0 UP3A40 17,2822,06 051,0068,46 052,009,000 20-3609 3:17
124 22:35:31 # SDMP52 360F,P2P2BE:B 360F,P2P2BE:B 3609,FSP00F:0 UP3A40 17,2822,06 051,0068,46 052,009,000 20-3609 3:17
```

J = delay at journal

S = delay at secondary

C = CG combining delay

R = reader delay

? = other delay

* and + are "best performance" indicators

* = most bytes and + = most buffers processed by this data mover across all the monitor samples

% and # are "highest stress" indicators

% = highest cache utilization and # = highest aggregate residuals for this data mover across all samples

Hyper-Active Volume Checker

- Primarily used when for implementing XRC
- Reports and optionally suspends volumes that are getting excessive WRITE I/O's and start getting a significant amount of WRITE Pacing

Write Pacing Monitor and History Collector

- Provides data about what volumes are being write paced and about record set creation
- Helps identify the impact of XRC on the production environment
- Helps identify hot LCU's and/or volumes
- Helps diagnose reader delay problems
- Assists with capacity planning

Running the Write Pacing Monitor

```
//MONITOR EXEC PGM=ANTWPMN2,PARM='2359 15 S 0500 E'  
//STEPLIB DD DSN=SYS4.XRCTOOLS.LINKLIB,DISP=SHR  
//*  
//* INPUT PARAMETERS:  
//*  
//* 2359 JOB END TIME (0000-2359)  
//* 15 INTERVAL DURATION, IN MINUTES OR SECONDS  
//* S INTERVAL UNITS, M=MINUTES S=SECONDS  
//* 1500 VOLUME REPORTING THRESHOLD (RECORDSETS PER SECOND)  
//* E DATAOUT MODE, C=CREATE E=EXTEND  
//*  
//REPORT DD SYSOUT=*,DCB=BLKSIZE=80  
//DATAOUT DD DSN=XRC.WPACING.DATAOUT,  
// DISP=SHR
```

Write Pacing Monitor Output

D:2012124,233455,E7B9,PLP224,B,1,17.78,678

D:2012124,233455,3659,GLP13B,B,2,50.00,270

D:2012124,233455,366B,GLP612,B,8,50.04,570

D:2012124,233455,3676,P2P31A,B,5,22.09,241

D:2012124,233455,368F,P2P1C7,B,4,49.81,920

R:2012124,233455,104C,4,51743

S:2012124,233455,9,1430,182,22,003

S:2012124,233455,A,1337,27,24,893

S:2012124,233455,B,5793,985,205,116

S:2012124,233455,C,5496,900,161,090

Write Pacing Output Record Format

- One Pacing detail record is written for each volume that experienced write pacing during the interval. It has this format:

D:yyyyddd,hhmmss,device,volser,pacingLevel,complexity,avgdelay,pacingScore

- One Pacing summary record is written per interval for each pacing level that has been assigned to one or more volumes. It summarizes statistics across all volumes that have been assigned the specific pacing level, and has this format:

S:yyyyddd,hhmmss,pacingLevel,defined,active,delayed,pacingScore

- One Peak residual record is written per interval. It identifies the LSS that had the highest average residual count per reader at the end of the interval, and has this format:

R:yyyyddd,hhmmss,ssid,readerCount,rdrResidual

- If no residuals exist for any LSS, a record is written to indicate an idle period:

R:yyyyddd,hhmmss,IDLE

- One LSS activity record is written for interval for each LSS that had an average recordset creation rate per reader above the specified reporting threshold. It has this format:

L:yyyyddd,hhmmss,ssid,readerCount,rdrRSCrate,rdrResidual

- For each LSS activity record that is written, one or more Volume activity records are written, identifying each volume that created at least 5% of the recordsets for the LSS during the reporting interval. It has this format:

V:yyyyddd,hhmmss,ssid,device,volser,pacingLevel,volRSCrate

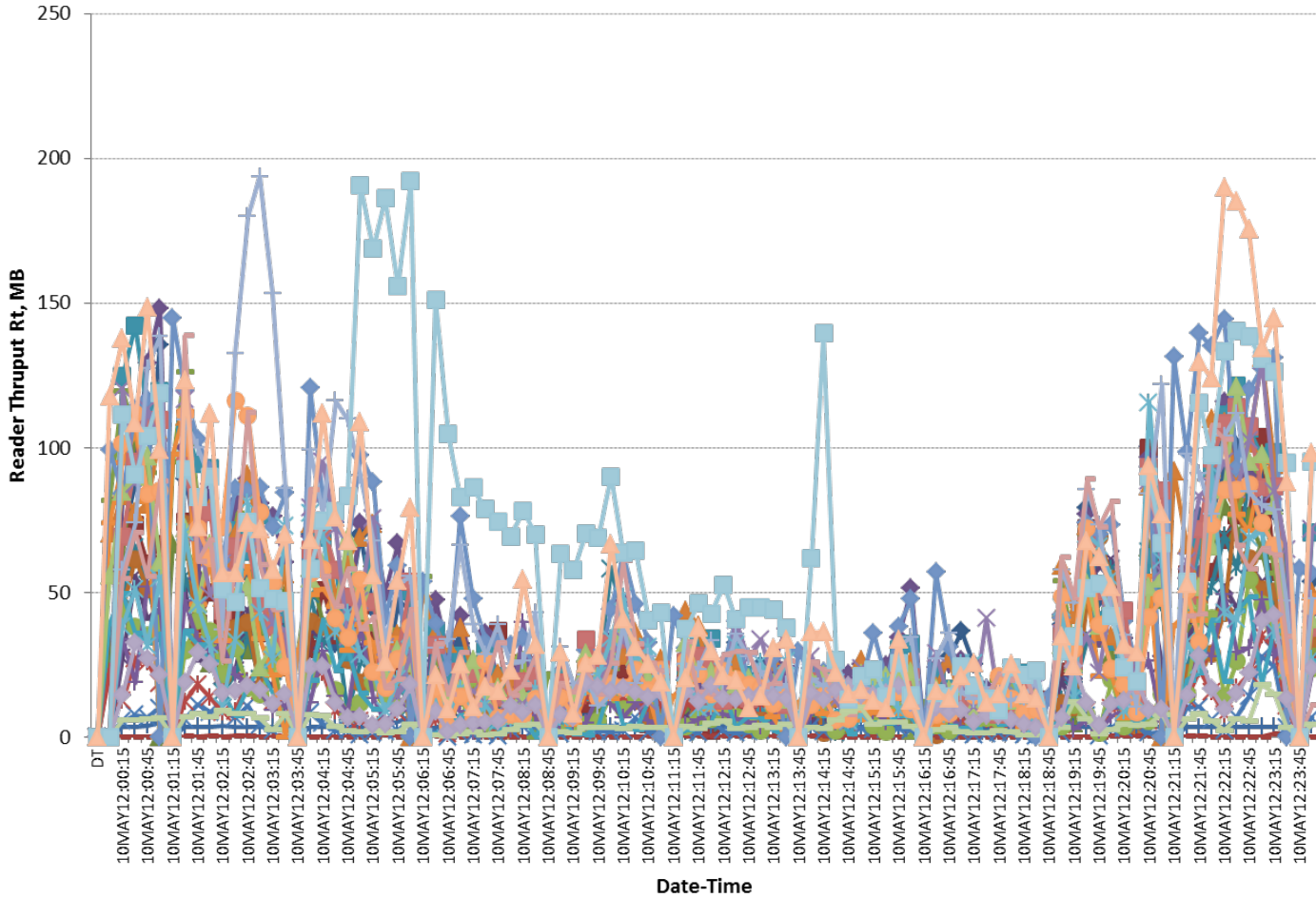
Analyzing the Data from the XRC Performance Tools

- SAS is used to read the data and create a PDB
- CSV files are created and imported into Excel

Daily Reports:

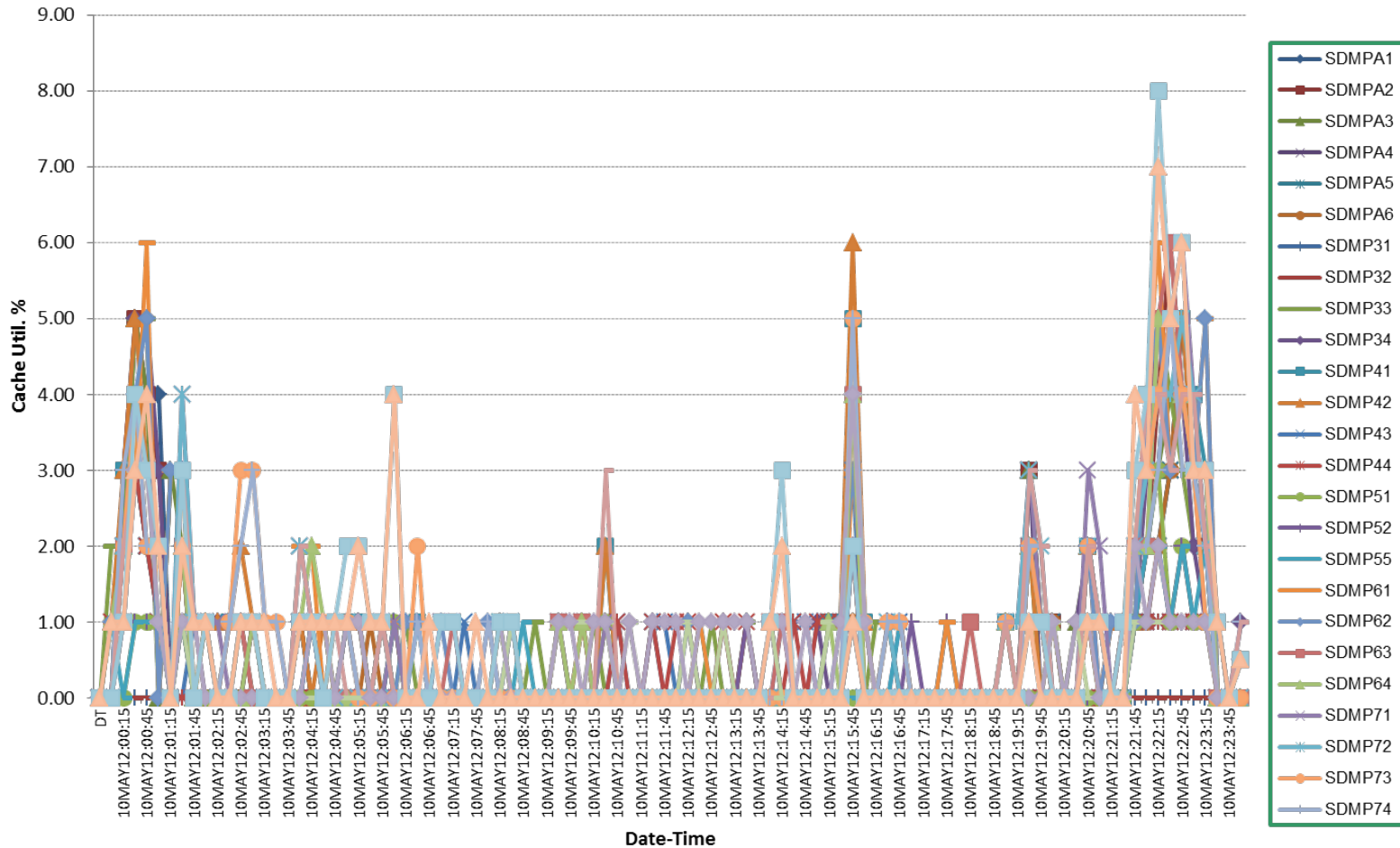
- Rate per Member by CPU
- XCF CTC Signal Rt & Xfr Tm
- XCF Transport Class Counts
- XCF Group-Member gt 100000
- Peak Rate Trends
- XCF CTC Signals & Avg Xfr Tm
- XCF Transport Class Trends
- XCF Group-Member GT 100000
- XRC Throughput Rates
- XRC Delays
- XRC Peak Cache Utilization
- XRC Buffer Utilization
- XRC Duplexed Volumes
- XRC Daily Summary Report
- XRC PDA Report
- XRC PDA Total Report
- WP Residual by Reader
- WP Level Summary

XRC Thruptut Rates All 5/10/2012 - Avg. Read Rate

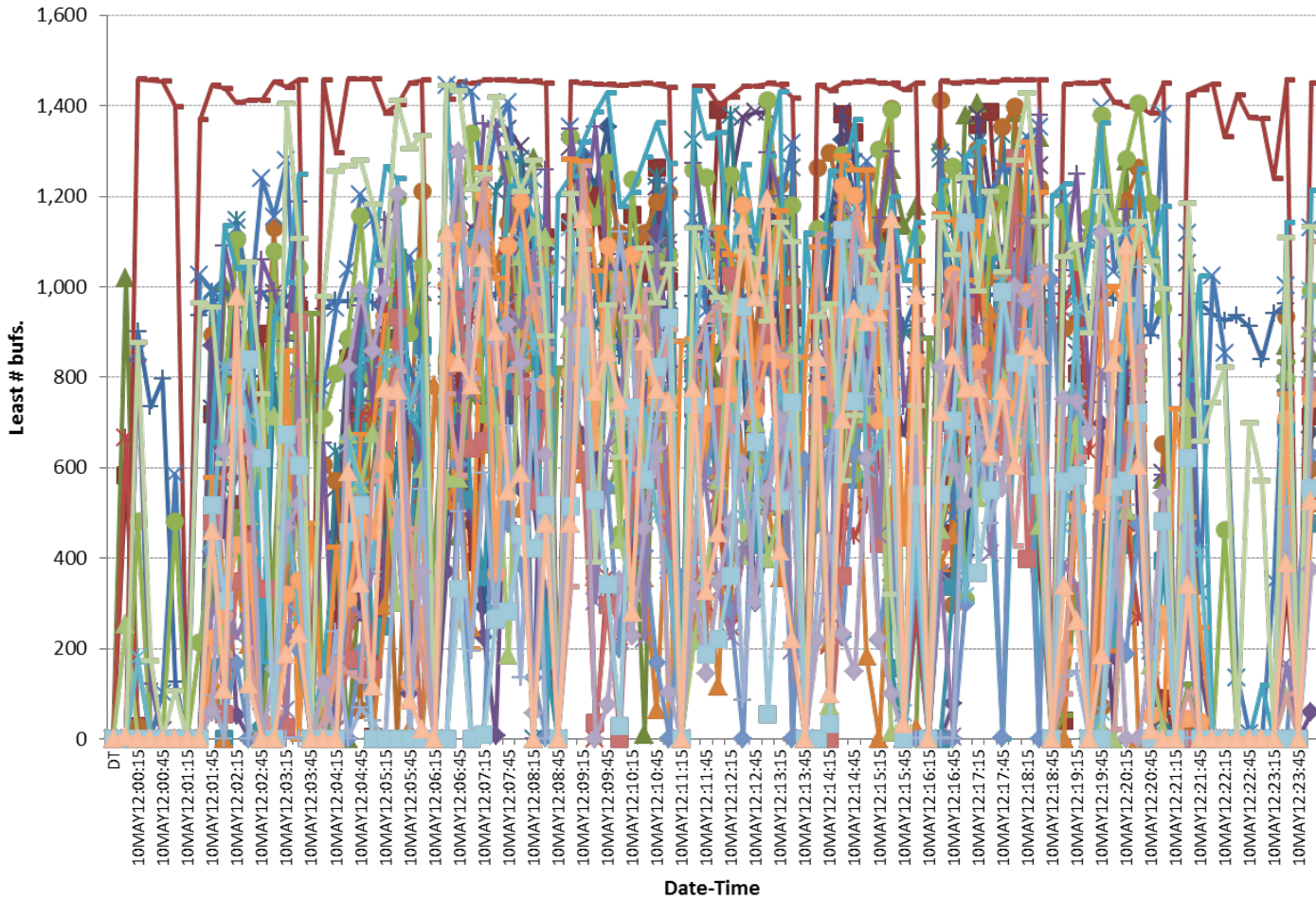


- SDMPA1
- SDMPA2
- SDMPA3
- SDMPA4
- SDMPA5
- SDMPA6
- SDMP31
- SDMP32
- SDMP33
- SDMP34
- SDMP41
- SDMP42
- SDMP43
- SDMP44
- SDMP51
- SDMP52
- SDMP55
- SDMP61
- SDMP62
- SDMP63
- SDMP64
- SDMP71
- SDMP72
- SDMP73
- SDMP74

XRC Peak Cache Util.
All
5/10/2012 - Peak Cache Util

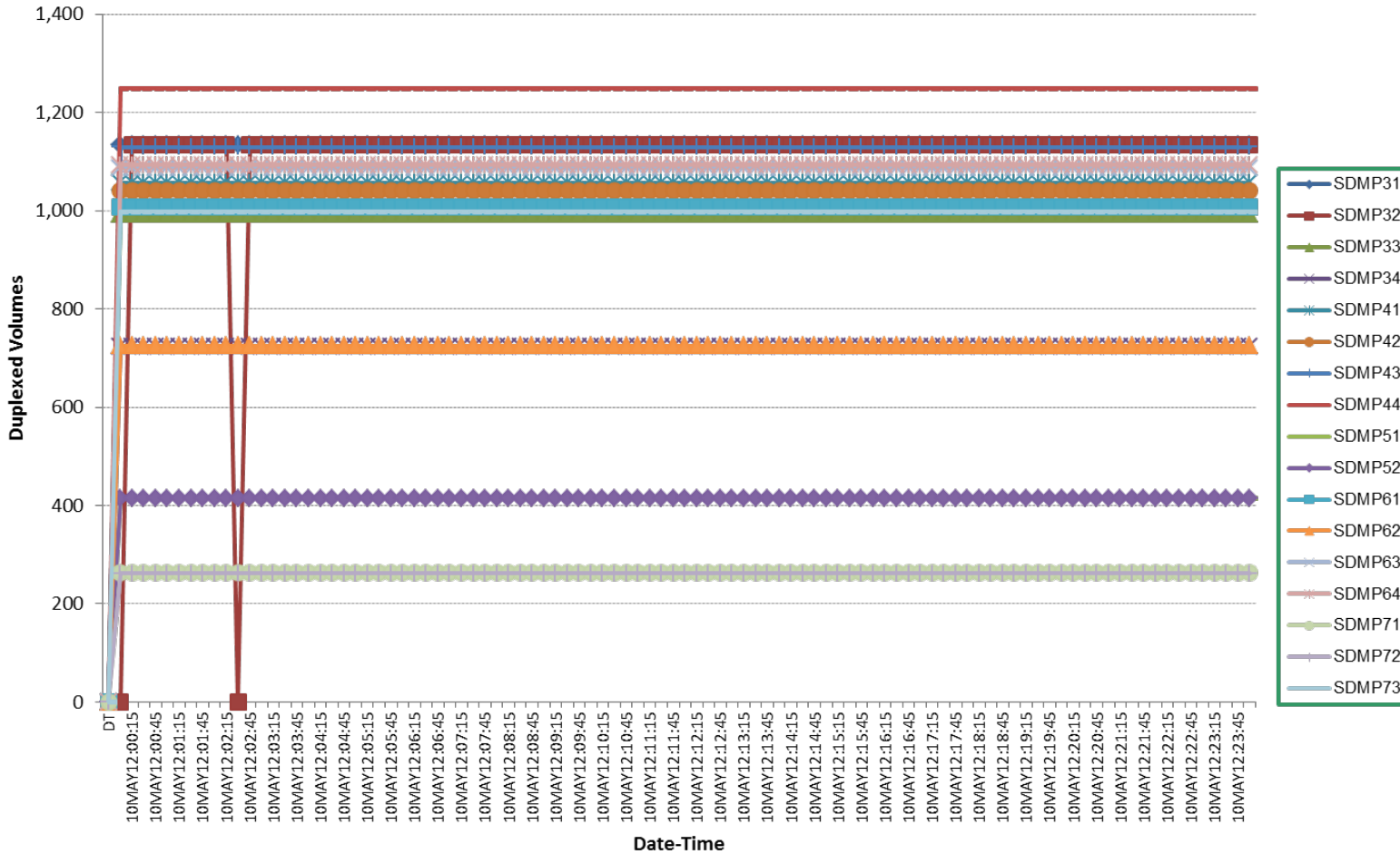


XRC Buffer Util.
All
5/10/2012 - Least Buffers



- SDMPA1
- SDMPA2
- SDMPA3
- SDMPA4
- SDMPA5
- SDMPA6
- SDMP31
- SDMP32
- SDMP33
- SDMP34
- SDMP41
- SDMP42
- SDMP43
- SDMP44
- SDMP51
- SDMP52
- SDMP55
- SDMP61
- SDMP62
- SDMP63
- SDMP64
- SDMP71
- SDMP72
- SDMP73
- SDMP74

XRC Duplexed Volumes All 5/10/2012 - Duplexed Vols



XRC Daily Summary Report

SDM	Peak Cache Util	Peak Dly	Avg. Dly	Peak Exp.	Avg. Exp.	Peak Read Rate	Avg. Read Rate	Peak Write Rate	Avg. Write Rate	Total MB
SDMPA1	5%	0:00:23	0:00:04	0:00:21	0:00:04	242	37	235	36	3172979
SDMPA2	6%	0:00:20	0:00:04	0:00:20	0:00:03	149	29	155	28	2565194
SDMPA3	5%	0:00:21	0:00:04	0:00:20	0:00:04	183	28	174	27	2423626
SDMPA4	5%	0:00:23	0:00:04	0:00:23	0:00:04	154	22	147	21	1862953
SDMPA5	5%	0:00:22	0:00:04	0:00:22	0:00:03	148	24	150	23	2059195
SDMPA6	5%	0:00:21	0:00:04	0:00:21	0:00:04	137	22	143	22	1912021
SDMP31	0.00%	0:00:19	0:00:03	0:00:17	0:00:02	13	4	10	4	301295
SDMP32	0.00%	0:00:19	0:00:02	0:00:17	0:00:01	8	0	8	0	13055
SDMP33	5%	0:00:21	0:00:04	0:00:21	0:00:04	249	38	243	37	3229386
SDMP34	5%	0:00:22	0:00:04	0:00:22	0:00:04	250	46	244	45	3879546
SDMP41	5%	0:00:22	0:00:04	0:00:22	0:00:04	230	43	231	42	3685288
SDMP42	6%	0:00:22	0:00:05	0:00:21	0:00:04	247	44	231	41	3855624
SDMP43	3%	0:00:22	0:00:03	0:00:22	0:00:02	66	4	62	4	366537
SDMP44	3%	0:00:22	0:00:03	0:00:21	0:00:03	85	12	79	9	987667
SDMP51	3%	0:00:21	0:00:04	0:00:20	0:00:03	142	15	143	15	1285392
SDMP52	2%	0:00:21	0:00:04	0:00:20	0:00:03	120	15	118	14	1266145
SDMP55	2%	0:00:20	0:00:03	0:00:20	0:00:02	179	14	174	13	1160087
SDMP61	6%	0:00:22	0:00:04	0:00:22	0:00:04	181	31	180	31	2715927
SDMP62	5%	0:00:23	0:00:05	0:00:23	0:00:04	260	58	264	57	4970956
SDMP63	6%	0:00:23	0:00:05	0:00:22	0:00:04	202	40	191	38	3418993
SDMP64	5%	0:00:21	0:00:04	0:00:21	0:00:04	182	36	181	33	3078613
SDMP71	6%	0:00:20	0:00:04	0:00:20	0:00:04	227	41	226	40	3443158

XRC PDA Report – Write Pacing

Sample Date	Sample Time	Session Id	Status Explained		PriVol Wt Updts SSID	PriVol Wt Updts Volser	PriVol Wt Updts Pace Lvl	PriVol Wt Bytes SSID	PriVol Wt Bytes Volser	PriVol Wt Bytes Pace Lvl	PriVol Rd Bytes SSID	PriVol Rd Bytes Volser	PriVol Rd Bytes Pace Lvl	Bsy Rdr Utility Volser
05/10/2012	5:00:15	SDMPA5	Dly,Rdr	R	'033	P2P4EE	B	'033	P2P4EE	B	'033	SYPD00	0	UPD240
05/10/2012	5:01:42	SDMP43	Dly,Pipe	q	'104	BTPE83	C	'104	BTPC6C	C	'104	BTPC4C	?	UPB26F
05/10/2012	5:02:19	SDMPA2	Dly,Rdr	R	'020	VCP108	A	'020	VCP108	A	'020	VCP108	A	UP6180
05/10/2012	5:02:42	SDMPA4	Dly,Rdr	R	'033	FOP04A	0	'033	SYPR7B	0	'033	SYPR4A	0	UPD0F0
05/10/2012	5:03:31	SDMPA4	Dly,Rdr	R	'033	P2P0A6	0	'033	P2P0A6	0	'033	LPP0A0	0	UPD060
05/10/2012	5:05:00	SDMP91	Dly,Jrnl	J	'340	P2P341	0	'340	P2P341	0	'340	GLP113	0	UP35F0
05/10/2012	5:05:46	SDMP91	Dly,Jrnl	J	'340	P2P341	0	'340	GLP113	0	'340	GLP113	0	UP35F0
05/10/2012	5:05:56	SDMPA4	Dly,Rdr	R	'033	VHP122	A	'033	VHP122	A	'033	DTP0FC	C	UPD000
05/10/2012	5:07:18	SDMP91	Dly,Secdry	S	'340	P2P38B	0	'340	P2P3E9	0	'340	P2P38B	0	UP35B0
05/10/2012	5:07:30	SDMPA4	Dly,Rdr	R	'033	VFP10B	A	'033	VFP10B	A	'033	T2P4E6	9	UPD000
05/10/2012	5:07:49	SDMP31	HSt,Cch Ut	%	'078	VTP014	B	'078	SYPS08	0	'078	VTP014	B	UP2000
05/10/2012	5:07:49	SDMP31	HSt,AgRsdl	#	'078	VTP014	B	'078	SYPS08	0	'078	VTP014	B	UP2000
05/10/2012	5:08:07	SDMP61	Dly,Rdr	R	'030	VHP068	A	'030	VHP068	A	'030	VHP068	A	UPB87E
05/10/2012	5:09:04	SDMPA4	Dly,Rdr	R	'033	DTP090	C	'033	DTP090	C	'033	DTP090	C	UPD030

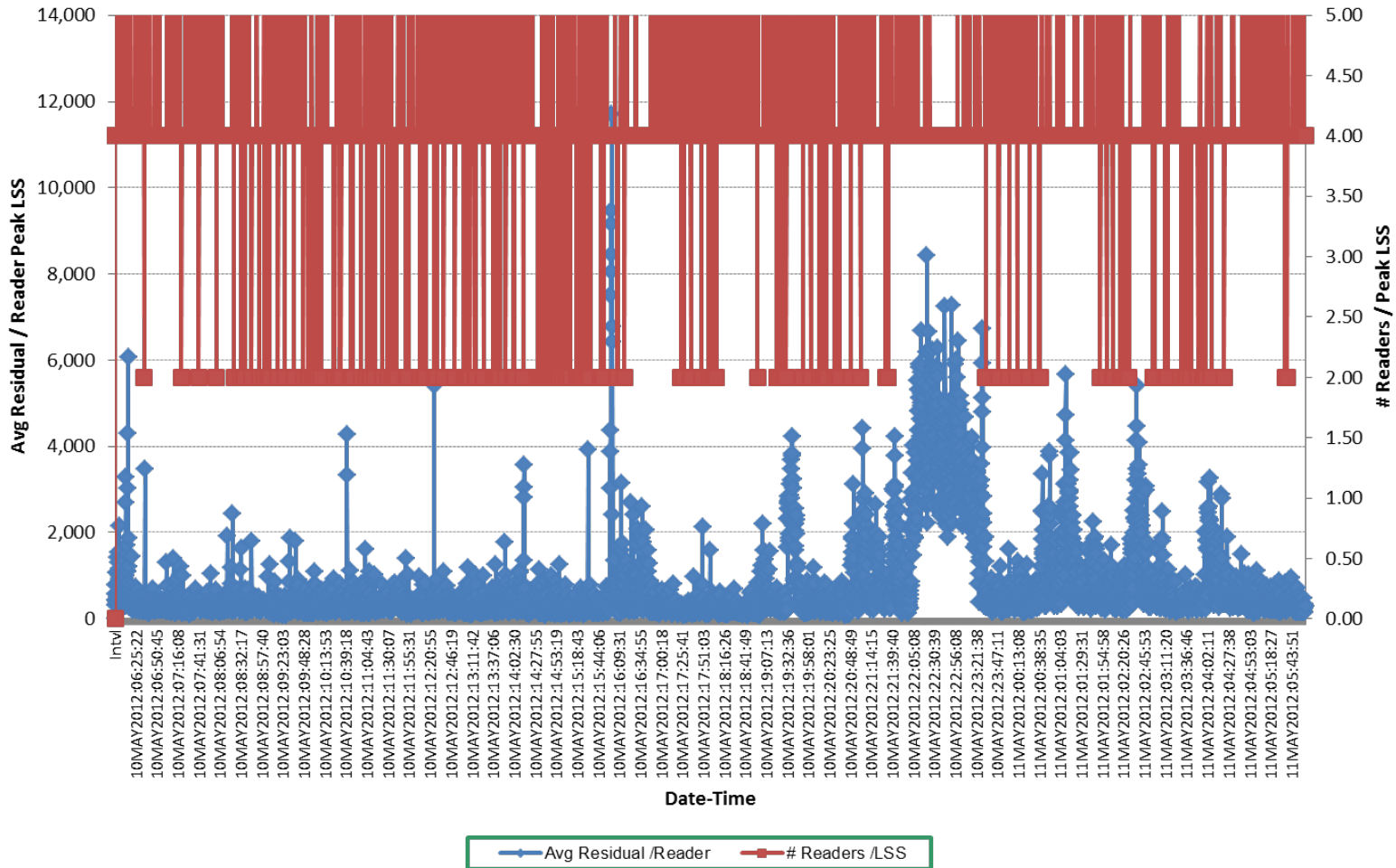
XRC PDA Report – Session Delays

Bsy Rdr Data Mv MB Rte	Bsy Rdr Data Mv Buf Rte	Bsy Rdr Data Mv Buf Avg	Bsy Rdr Srv Tm Avg ms	Bsy Rdr Srv Tm Max ms	Bsy Rdr Srv Tm Intv sec	Bsy Rdr Tm Gp % Prtcp	Bsy Rdr Tm Gp # Prtcp	Bsy Rdr Tm Gp #Tk Bsy	Dt Mvr LSS %Mx Cch	Dt Mvr LSS SSID	Sess Delay Sec	Sess Delay Desc
1	49	36	40	166	47	99	186	0	0	'033	3	Delay
0	0	4	51	146	47	98	199	0	0	'105	2	Delay
25	606	42	51	150	46	98	260	1	0	'020	2	Delay
4	152	26	39	201	46	99	181	0	0	'033	2	Delay
0	11	3	45	172	49	99	180	1	0	'033	4	Delay
34	703	49	70	312	46	100	282	77	1	'340	6	Delay
35	766	47	64	443	45	99	310	74	1	'340	7	Delay
18	557	33	64	541	48	92	259	15	0	'033	4	Delay
34	1187	29	61	172	45	98	300	59	0	'340	5	Delay
3	196	16	45	363	47	98	226	2	0	'033	3	Delay
3	788	4	40	74	46	98	239	3	0	'078	4	Delay
3	788	4	40	74	46	98	239	3	0	'078	4	Delay
10	271	39	41	96	45	100	202	0	0	'030	3	Delay
14	474	30	43	107	46	100	229	3	0	'033	3	Delay

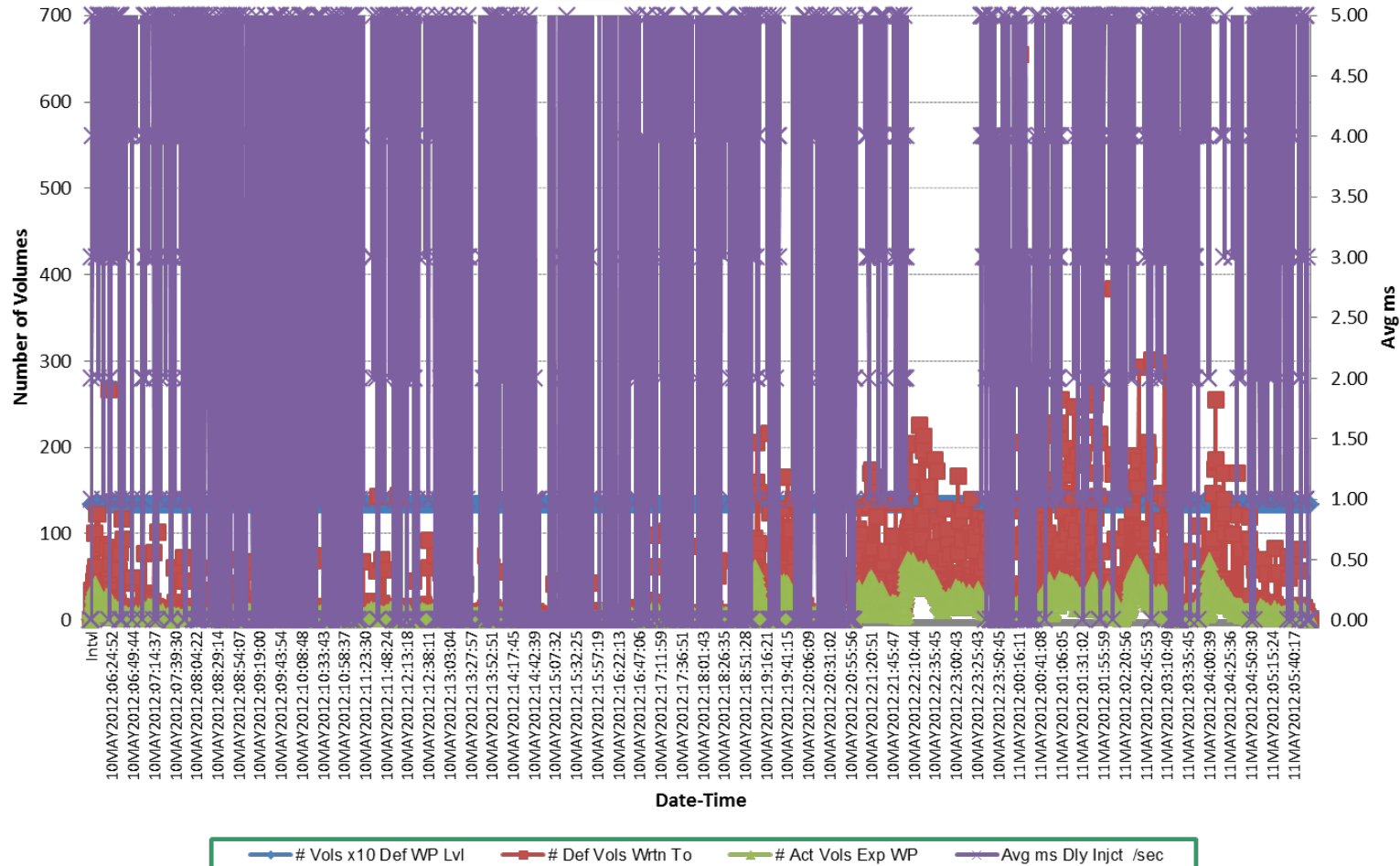
XRC PDA Total Report

Sample Date	Sample Time	Session Id	Status Explained	Total GB Read In Duplex	Peak MB Rate Read Monitor	Peak Buf Rate Read Monitor
05/10/2012	22:58:32	SDMP51	Ttls Rcrds T	1,333	141	5,406
05/10/2012	22:58:32	SDMP52	Ttls Rcrds T	1,304	120	5,197
05/10/2012	22:58:33	SDMPA6	Ttls Rcrds T	1,922	137	4,091
05/10/2012	22:58:33	SDMP75	Ttls Rcrds T	3,408	225	6,068
05/10/2012	22:58:37	SDMP32	Ttls Rcrds T	13	8	723
05/10/2012	22:58:42	SDMP55	Ttls Rcrds T	1,169	198	3,814
05/10/2012	22:58:48	SDMPA4	Ttls Rcrds T	1,868	154	4,639
05/10/2012	22:58:49	SDMP61	Ttls Rcrds T	2,683	181	5,695
05/10/2012	22:58:50	SDMP71	Ttls Rcrds T	3,522	226	5,577
05/10/2012	22:58:51	SDMPA2	Ttls Rcrds T	2,526	148	4,713
05/10/2012	22:58:51	SDMPA5	Ttls Rcrds T	2,047	148	4,789
05/10/2012	22:58:51	SDMP83	Ttls Rcrds T	391	57	2,895
05/10/2012	22:58:52	SDMP64	Ttls Rcrds T	3,084	182	6,398
05/10/2012	22:58:55	SDMP84	Ttls Rcrds T	1,226	78	6,920
05/10/2012	22:58:57	SDMPA1	Ttls Rcrds T	3,189	241	5,707
05/10/2012	22:58:57	SDMPA3	Ttls Rcrds T	2,393	183	4,895

WP Residual by Reader
All
05/10/2012 - XRC Wrt Pacing Residual/Reader Peak LSS



WP Level Summary
All
05/10/2012 - A



XRC Performance Must Be Monitored

- Because your z/OS environment is dynamic, your XRC environment will also be constantly changing.
- Watch the trends as they can be early indications that you will need to make some adjustments in the near future.
- Try to keep the WRITE I/O's balanced across SDM's.
- Do not be afraid to use Write Pacing to level out the spikes, but monitor it to make sure you it is not adversely impacting the performance of your applications.

XPM Requirements

- XPM needs to support showing details for more than 14 SDM's at one time (both in the Real Time Monitor and in the History Monitor)
- When viewing the statistics at the cluster level, there should be a drill down capability to display the individual SDM's associated with a particular cluster
- XPM needs to provide the ability to specify a beginning date/time (instead of record number) to start viewing records in the history data, and the ability to scroll backwards to the previous interval needs to be provided
- XPM needs to provide a parameter that would cause it to terminate the current history data set and allocate a new one instead of terminating the task to do this

Write Pacing Monitor Requirements

- The Write Pacing Monitor needs to provide a more reliable way to history data sets. Something similar to the way HSM utilizes the LOGX and LOGY data sets would be one possible solution.

XRC Documentation

- *z/OS V1R13.0 DFSMS Advanced Copy Services*
- *GDPS/XRC Performance Toolkit Guide*
- *GDPS/XRC Installation and Customization Guide*

Questions ? ? ?

