Introduction to Statistical SMF data

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Agenda

- What is SMF?
- What is MQ SMF?
- Overview of MQ statistical SMF
- Controlling the generation of the data
- Processing the data
- What you get and how it is used
  - Subtype 1
  - Subtype 2

What is SMF?

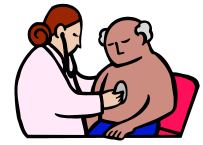
- System Management Facility
- Defined on Wikipedia as
  - **"IBM System Management Facility (SMF)** is a component of IBM's z/OS for mainframe computers, providing a standardised method for writing out records of activity to a file (or data set to use a z/OS term). SMF provides full "instrumentation" of all baseline activities running on that IBM mainframe operating system, including I/O, network activity, software usage, error conditions, processor utilization, etc. "
  - "SMF forms the basis for many monitoring and automation utilities. Each SMF record has a numbered type (e.g. "SMF 120" or "SMF 89"), and installations have great control over how much or how little SMF data to collect. Records written by software other than IBM products generally have a record type of 128 or higher. Some record types have subtypes - for example Type 70 Subtype 1 records are written by RMF to record CPU activity. "

What is MQ SMF?

- MQ generates two SMF types:
  - MQ Statistical data – SMF115
    - QMGR level resource usage and activity
    - Contains information from the resource managers
    - Two Subtypes:
      - Subtype 1 includes the storage manager and log manager information
      - Subtype 2 includes the message manager, data manager, buffer manager, lock manager, DB2 manager, CF manager, topic manager and SMDS manager information
  - MQ Accounting data – SMF116
    - Task level resource usage and activity
    - Contains information from each task that uses the queue manager
    - Three Subtypes:
      - Subtype 0 includes the message manager information
      - Subtype 1 includes thread level identification, thread level accounting, and queue level accounting
      - Subtype 2 includes additional thread level accounting and queue level accounting (if needed)

What is the MQ Statistical SMF used for?

- Checking the overall health of the queue manager
- Gross underlying resources use
- Initial performance review
- Initial problem determination
- Capacity planning



What is the MQ Statistical SMF used for?

- Checking the overall health of the queue manager
  - This include evaluating bufferpool and pageset use
  - Log usage
  - Etc
- Gross underlying resources use
  - Is there real I/O going on between the bufferpool and pagesets?
  - I/O rates for persistent message logging
- Initial performance review
  - Overall evaluation of how things are running
- Initial problem determination
  - 'Why did we start missing SLAs?'
  - 'What went wrong?'
- Capacity planning
  - Can more workload be absorbed, or do we need additional queue managers?

Gathering the data

- Turning on the data collection:
  - SMFSTAT=YES in the CSQ6SYSP macro
  - +cpf START TRACE(STAT) DEST(SMF)
- Timing the record generation
  - SMF stats are always collected
  - Records are generated:
    - At STATIME if specified in the CSQ6SYSP
      - STATIME=15 will generate the SMF records every 15 minutes
    - At the system SMF interval if not specified or set to 0
      - STATIME=00
      - z/OS SMF parameter INTVAL(60) – will generate the SMF records every hour
- Where is the data stored
  - Traditionally the 'MAN' datasets
    - MPXCAT.SMF.&SYSNAME..MANX
  - System logger
    - High volume customers have found benefits to this technique

Gathering the data - Notes

N O T E S

- The SMF115 data is very lightweight – 2 records per queue manager per interval
- The MVS logger has been shown to be very helpful wen generating a lot of SMF data.

Processing the MQ SMF Data

- CSQ4SMFD - Delivered with MQ
  - Dump format of all records

```
 Class 3 accounting - Queue specific accounting data
--W-Q-------H-E-X---P-R-I-N-T----
Address  = 13F285F0
00000000 : F7020AE0 E6D8E2E3 00000006 5A0247F0 <7..\WQST....!..0>
00000010 : C95B78F9 DFA95022 5A08CD28 5A078C80 <I$.9.z&.!...!...>
00000020 : E6D4D8C6 E3C54BC3 F9F5C3F2 F6F9C3F3 <WMQFTE.C95C269C3>
00000030 : C3F3C2F8 F6C3F040 40404040 40404040 <C3B86C0         >
00000040 : 40404040 40404040 40404040 40404040 <                >
00000050 : E6D4D8C6 E3C54BC3 F9F5C3F2 F6F9C3F3 <WMQFTE.C95C269C3>
00000060 : C3F3C2F8 F6C3F040 40404040 40404040 <C3B86C0         >
00000070 : 40404040 40404040 40404040 40404040 <                >
00000080 : C95C269C 798A1F7A F9F5C3F2 F6F9C3F3 <I*..`..:95C269C3>
00000090 : 00000001 00000000 00000000 00000000 <................>
```


CSQ4SMFD - Notes

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S

- This is a simple dump format of the SMF data
- Ugly and not typically useful, except if another processing program is not generating a particular field.

Processing the MQ SMF Data

- SupportPac MP1B
  - The new version is substantially different than the old version
    - There were four report programs delivered in the older version:
      - MQ1150 – report on the SMF115 data
      - MQ1160 – report on the SMF116 class 1 data
      - MQ116S – report on the SMF116 class 3 data
      - MQCSMF – report on all the SMF data, column formatted data produced
    - There is a single report program delivered in the V7.1 version
      - MQSMF – report on all the MQ SMF data in both standard report form and CSV files for most of the record subtypes
      - The report files for the SMF115 data look much like the sections that were part of the MQ1150 report from earlier versions.

Processing the MQ SMF Data

- SupportPac MP1B
  - There is new information extracted by the new report generator
    - For example, SMDS information
  - There is information missing from the new reports
    - This has been reported, but will take time to fix
    - For example, the CSV file for the buffer manager does not include the Short on storage, DWT and DMC fields
  - If you have the older version, keep it
    - If you do not, ask me and I can provide it

MQ Stats - Subtype 1

- SMF 115 Subtype 1
  - CSQDQSST – Storage manager statistics
    - Fixed and variable storage pool usage
    - Getmain and Freemain counts
    - Short on storage indicators

```
z/OS:MPX1  MQ QMGR:QML1  Time: 2012304 18:28:29.69
Storage manager : QSST
  Fixed pools   : Created       351,  Deallocated       351
  Fixed segments: Freed           0,  Expanded          7,  Contracted         7
  Varbl pools   : Created       432,  Deallocated       432
  Varbl segments: Freed        4555,  Expanded       4575,  Contracted        25
  Getmains       751,  Freemains       744,  Non-zero RCs         0
  SOS bits         0,  Contractions         0,  Abends         0
```


MQ Stats - Subtype 1, CSQDQSST Notes

N O T E S

- The storage manager reports on the use of storage within the queue manager address space
- The important fields to look at include:
  - Non-Zero return codes from storage requests
  - SOS – count of short on storage events –
    - If not zero there may be a serious problem. Overallocation of bufferpools may be a culprit.
  - Contraction count (not per pool, but overall)
    - If not zero it indicates that there was a real problem, this could be an early indictor that the workload needs to be divided across multiple queue managers
  - Abend count
    - If not zero it indicates that there was a real problem, this could be an early indictor that the workload needs to be divided across multiple queue managers

MQ Stats - Subtype 1

- SMF 115 Subtype 1
  - CSQDQJST – Log manager statistics
  - Good indication of persistent messaging use
    - Some of the counts are not complete, the checkpoints does not include those from queue manager switching
    - Some useful information is missing, for example the number of log switches done during an interval

```
Log manager      : QJST
  Write_Wait          0,  Write_Nowait        51,  Write_Force         1,  WTB         0
  Read_Stor           0,  Read_Active          0,  Read_Archive        0,  TVC         0
  BSDS_Reqs           0,  CIs_Created          2,  BFWR                7,  ALR         0
  ALW                 0,  CIs_Offload          0,  Checkpoints         0
  WUR                 0,  LAMA                 0,  LAMS                0
  Write_Susp          7,  Write_Reqs           9,  CI_Writes           9
  Write_Serl          0,  Write_Thrsh          0,  Buff_Pagein         0
  Data compression  : 1
  Comp_Req            0,  Comp_fail            0,  Decomp_req          0,  Fail        0
  Compression:   Before                0,  After                0    0%
  Decompression: Before                0,  After                0    0%
```

QMGR	wr_wait	wr_nwait	Aug09 Force Writes	Aug09 Log Buffer Waits	read_buf	read_act	read_arc	r_delay	N_CheckP	Aug09 Num I/O	Aug09 Control Intervals Written	paging
QML1	0	569925	339	1	0	0	0	0	0	22020	241748	0
QML1	0	621641	337	0	0	0	0	0	0	23758	230944	0
QML1	0	753611	363	1	0	0	0	0	0	27490	285402	0

Log Manager Statistics

N O T E S

- This first data shown was taken from the log manager output from the MQ1150 format and print program.
- The second is from the log output from the MQCSMF format and print program, that was downloaded to a speadsheet.
- The log buffer waits indicates the number of times during the interval there were not free log buffers. This is somewhat tunable, but most production environments have it set to the recommended 40,000. If this count goes very high and the maximum number of buffers are allocated, then the queue manager may be saturated.
- Another critical factor is the I/O rate that can be achieved

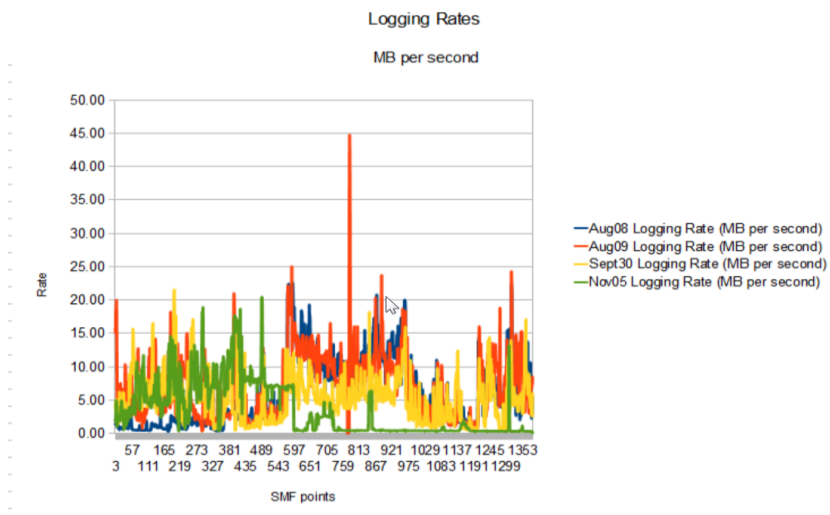
MQ Stats - Subtype 1

- CSQDQJST – Log manager statistics – continued
  - Log manager – I/O rate
    - The I/O rate is calculated as
      - The number of CIs written * 4096 (CI size)
      - Divided by 1 M (1024*1024)
      - Divided by the number of seconds in the interval
    - The I/O rate is the throttle for many queue managers

```
Log manager  : QJST
  Write_Wait          0,  Write_Nowait       51,  Write_Force        1,  WTB          0
  Read_Stor           0,  Read_Active        0,   Read_Archive       0,  TVC          0
  BSDS_Reqs           0,  CIs_Created        0,   Buff_Gen           5,  ALR          0
  ALW                 0,  CIs_Offload        0,   Checkpoints        0
  WUR                 0,  LAMA               0,   LAMS               0
  Write_Susp          7,  Write_Reqs         9,   CI_Writes          9
  Write_Serl          0,  Write_Thrsh        0,   Buff_Pagein        0
  Data compression  : 1
  Comp_Req            0,  Comp_fail          0,   Decomp_req         0,  Fail         0
```

Aug08 Control Intervals Written	Aug08 Logging Rate (MB per second)	Aug09 Control Intervals Written	Aug09 Logging Rate (MB per second)	Sept30 Control Intervals Written	Sept30 Logging Rate (MB per second)	Nov05 Control Intervals Written	Nov05 Logging Rate (MB per second)
20658	1.34	241748	15.74	58938	3.84	33492	2.18
22446	1.46	230944	15.04	70570	4.59	25822	1.68
22550	1.47	285402	18.58	46630	3.04	27688	1.80
20870	1.36	266212	17.33	79076	5.15	76658	4.99
23458	1.53	307780	20.04	53588	3.49	74088	4.82

Logging Rates - Charted



MQ Stats - Subtype 2

- SMF 115 Subtype 2 – many more managers reporting on this
  - CSQDQMST – Message Manager statistics
  - CSQDQIST – Data Manager statistics
  - CSQDQPST – Buffer Manager statistics
  - CSQDQLST - Lock Manager statistics – Not discussed in detail
  - CSQDQ5ST – DB2 manager statistics – Not discussed in detail
  - CSQDQEST – Coupling Facility manager statistics
  - CSQDQTST – Topic Manager statistics
  - CSQDQESD – SMDS statistics

MQ Stats - Subtype 2 – Message Manager statistics

- Good indication of queue manager usage
  - This is only a count of API calls, not one of successful calls
    - Volume trends can be approximated from the MQPUT and MQPUT1 calls, as these are generally successful
    - MQGETs may or may not have data returned
  - Sample report from the MQ1150 report (V7.0.1)

```
Message manager : QMST
  MQOPENs        9,  MQCLOSEs        9,  MQGETs       186, MQPUTs         260
  MQPUT1s        1,  MQINQs         12,  MQSETs         0, Close_all        0
```

  - Sample information from the MQCSMF report (LOG file output V7.0.1) downloaded to a spreadsheet

QMGR	Open	Close	Get	Put	Put1	Inq	Inq1	Set	Total API calls	Total Puts
QML1	160	151	2,925,084	3,417,313	0	1	0	0	6,342,709	3,417,313
QML1	248	228	2,256,084	3,150,666	0	5	0	0	5,407,231	3,150,666
QML1	897	895	3,468,114	3,093,355	0	50	0	0	6,563,311	3,093,355

Message Manager Statistics

N O T E S

- This first data shown was taken from the message manager output from the MQ1150 format and print program.
- The second is from the log output from the MQCSMF format and print program, that was downloaded to a spreadsheet.

MQ Stats - Subtype 2 – Message Manager statistics - continued

- Reports from the V7.1 MQSMF program
  - The first is from the MSG file output

```
Message Manager
MPX1,QML3,2013/09/19,09:09:47,VRM:710,
   MQOPENs        44,  MQCLOSEs       44,  MQGETs      194,  MQPUTs     1866
   MQPUT1s         0,  MQINQs         51,  MQSETs        0   C ALL H      0
   MQSUBs          3,  MQSUBRQs        0,  MQCBs        14
   MQCTLs        158,  MQSTATs         0,  Publish    1802
```

  - The second is from the MSGCSV file.
    - Note that only the puts and gets are included in the CSV file currently

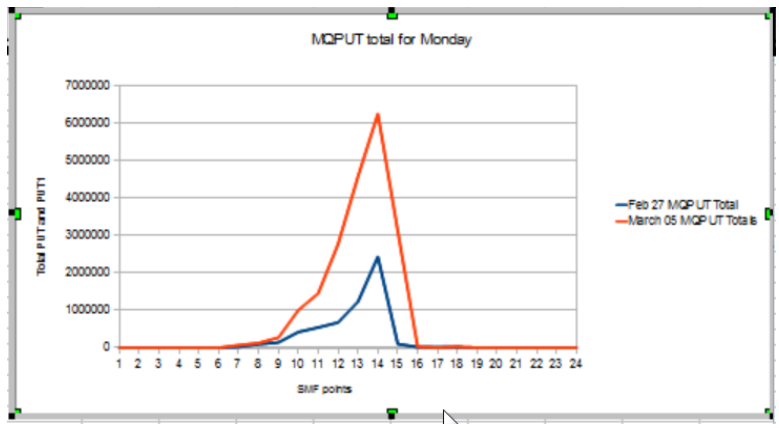
```
'MVS','QM','Date','Time    ','     Puts','    Put1s','     Gets
MPX1,QML3,2013/09/19,09:09:47,      1866,          0,      194
```

Message Manager Statistics

N O T E S

- If looking for statistical information about publications and subscriptions, the new report generator will give you that in the report file.
- ‘C ALL H’ is ‘close all handles’ which happens at the end of a task.
- Publish includes all MQPUT and MQPUT1 requests to a topic rather than a queue.
- Note that the CSV file does not contain any data other than the gets and puts. A request has been made to include at least the ‘old’ APIs in the CSV file so similar reports can be generated.

Message Manager - Trend Chart



MQ Stats - Subtype 2 – Data Manager

- The data manager statistics show access to MQ objects
  - Locating a queue for example
- Sample MQ1150 (V7.0.1) Data manager report:

```
Data manager    : QIST
  Creates         0,  Puts           0,  Deletes        59,  Gets        72
  Locates        37,  Stgclass       0
```

- Sample MQSMF (V7.1) Data Manager report
  - Of particular interest might be the Read Ahead I/O

```
MPX1,QML1,2013/09/19,10:15:04,VRM:710,
  Obj Cre         0, Obj Puts        0,  Obj Dels      314,  Obj Gets      547
  Locates       341, Stgclass        0,  Enum          365
  Msg Gets     1960, Msg Puts     3867
  Lock MM         0, Rel MM          1,  Delete MM       0
  Read Ahead:IO   0,:Buffer          0,  Gets:disk       0,       BP       126
```


MQ Stats - Subtype 2 – Data Manager Notes

N O T E S

- Object creates may be an indication that an application is using temporary dynamic queues
- Locates typically means that an application has opened a queue
- Read ahead can be important to Queue Replication customers

MQ Stats - Subtype 2 – Buffer Manager statistics

- Good bufferpool and pageset tuning for private queues often results in an increase in throughput, a decrease in CPU usage, and at times both!
- In the next two slides the sample reports from the V7.0.1 and V7.1 versions of the SupportPac are shown.
- In slides following, problem areas (red and yellow flags) are shown from an example of a bufferpool under stress
  - First the raw SMF data for two weeks was processed thru the MQCSMF and the MQ1150 format and print programs
  - The Buffer Manager statistics from the MQCSMF were downloaded into a spreadsheet
    - The output DD is labeled BM
  - The spread sheet was sorted to find:
    - Non-Zero Short on storage counts
    - Non-Zero DMC counts
    - Percent of free pages

MP1B – Samples from reports

- The MQ1150 report sample for bufferpools looks as follows (V7.0.1):

```
Buffer manager  : QPST
> 00 Buffs     50000  Low     49984  Now     49984  Getp        51  Getn         2
  00 Rio           0  STW        46  TPW         0  WIO          0  IMW          0
  00 DWT           0  DMC         0  STL         0  STLA         0  SOS          0
> 01 Buffs     20000  Low     19999  Now     19999  Getp         0  Getn         0
  01 Rio           0  STW         0  TPW         0  WIO          0  IMW          0
  01 DWT           0  DMC         0  STL         0  STLA         0  SOS          0
```

- The Buff report from MQCSMF (V7.0.1)

Date	Time	QMGR	BP	NumBuff	%now	%low	dwt	dmc	stl	stla	sos
2013266	08:47:36.32	QML3	0	50000	99	99	0	0	0	0	0
2013266	08:47:36.32	QML3	1	20000	99	99	0	0	0	0	0
2013266	08:47:36.32	QML3	2	50000	99	99	0	0	0	0	0
2013266	08:47:36.32	QML3	3	20000	97	97	0	0	0	0	0

MQ Stats - Subtype 2 – Buffer Manager statistics - continued

- Reports from the V7.1 MQSMF program
  - The first is from the BUFF file output

```
Buffer statistics
MPX1,QML1,2012/04/04,12:49:57,VRM:710,
= BPool    0, Size 50000,%full now  0, Highest %full  0, Disk reads     0
 > 00 Buffs     50000  Low     49984  Now     49984  Getp         51  Getn          2
   00 Rio           0  STW        46  TPW         0  WIO           0  IMW           0
   00 DWT           0  DMC         0  STL         0  STLA          0  SOS           0
= BPool    1, Size 20000,%full now  0, Highest %full  0, Disk reads     0
 > 01 Buffs     20000  Low     19999  Now     19999  Getp          0  Getn          0
   01 Rio           0  STW         0  TPW         0  WIO           0  IMW           0
   01 DWT           0  DMC         0  STL         0  STLA          0  SOS           0
```

  - The second is from the BUFFCSV file.

```
'MVS','QM','Date','Time','BP','size','lowest free','# get new pg','# get old pg','# read I/Os','# pg writes','# write I/Os','# sync
write'
MPX1,QML1,2012/04/04,12:49:57,  0,50000,49984,    2,   51,    0,    0,    0,    0
MPX1,QML1,2012/04/04,12:49:57,  1,20000,19999,    0,    0,    0,    0,    0,    0
MPX1,QML1,2012/04/04,12:49:57,  2,50000,49995,   16,   71,    0,    0,    0,    0
```


MQ Stats - Subtype 2 – Buffer Manager statistics

- **Red Flags for Bufferpools**
  - SOS

QMGR	BP	NumBuff	%now	%low	dwt	dmc	stl	stla	sos
QML2	3	70000	18	0	109	198906	922354	1	50
QML2	3	70000	19	0	68	143872	367873	1	13

  - Freepages at 5% or less

Date	Time	QMGR	BP	NumBuff	%now	%low	dwt	dmc	stl	stla	sos
201133	408:15:21	QML1	3	70000		98	5	9	27	32557	0	0
201133	420:41:19	QML1	3	70000		95	5	2	364	61145	0	0

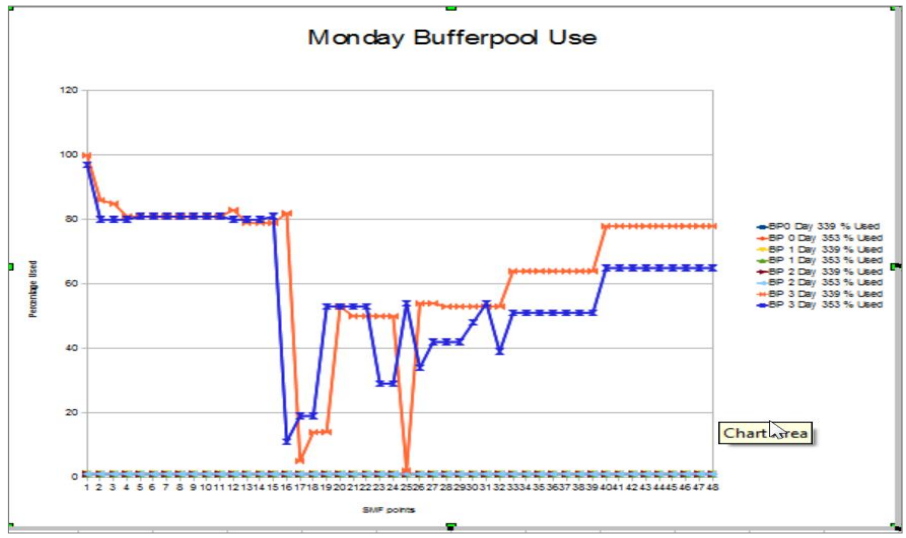
MQ Stats - Subtype 2 – Buffer Manager statistics

- **Red Flags for Bufferpools** - Continued
  - DMC – synchronous write process kicks off

QMGR	BP	NumBuff	%now	%low	dwt	dmc	sti	stla	scs
QML3	3	70000	16	0	58	210092	853991	1	0
QML3	3	70000	22	3	132	36526	1232774	2	0

- The DMC count should be used in conjunction with the IMW field from the SMF115 report to see how many synchronous writes were actually performed.

MQ Stats - Subtype 2 – Buffer Manager statistics – Trends and Patterns



SMF115 – Bufferpool Trends and Analysis - Notes

N O T E S

- In the chart shown two high volume days were compared to see if there was a pattern to the BP use.
- BP 0, 1 an 2 showed almost no utilization.
- BP 3 was in very heavy use, some of the time.
- BP 3 is under some stress.
- Having multiple days worth of data is vital, had there just been one heavy day it may have been an anomaly. Data from longer periods of time, when compared like this can be very useful in tracking usage, etc.
- In this case there was a clear pattern of overuse of bufferpool 3, in further evaluation the SMF116 data showed that all the queues that were being used for this queue manager were defined on the same pageset/bufferpool. By moving some of the queues to another resource pool, the stress was reduced, work flowed faster and the CPU usage was reduced.
- In attempting to replicate the issues, the information on the previous slides was used to create the charts, but also to show that charting the pattern might be helpful in the evaluation.

MQ Stats - Subtype 2 – Coupling Facility Manager

- CF Report from MQ1150 (V7.0.1)

```
 manager      : QEST
  Structure #   0,  Name CSQ_ADMIN    ,  Structure-fulls         0
  Single         160,  Elapsed time 0000000001F3D6E2,  Retries          0
  Multiple         0,  Elapsed time 0000000000000000,  Retries          0
  Max entries      552,  Max elements       4343
  Structure #   1,  Name CSQSYSAPPL   ,  Structure-fulls         0
  Single           0,  Elapsed time 0000000000000000,  Retries          0
  Multiple        59,  Elapsed time 00000000007CB40C,  Retries          0
  Max entries        0,  Max elements          0
  Structure #   3,  Name LARGMSGS     ,  Structure-fulls         0
  Single           0,  Elapsed time 0000000000000000,  Retries          0
  Multiple         1,  Elapsed time 000000000001F084,  Retries          0
  Max entries        0,  Max elements          0
  Structure #   4,  Name SMDSMSGS     ,  Structure-fulls         0
  Single        8000,  Elapsed time 000000004F00B7BC,  Retries          0
  Multiple       320,  Elapsed time 0000000004D16980,  Retries          0
  Max entries      8041,  Max elements      16143
```

- CF report from MQCSMF (V7.0.1)

Date	Time	Jobname	E_calls	E_redrive	Avg_E_time	M_calls	M_redrive	Avg_M_time
2013266	09:11:16.11	ELKINSC3	8160	0	40	320	0	61

MQ Stats - Subtype 2 – Coupling Facility Manager Notes

N O T E S

- The MQ CF activity reports should be used in conjunction with the RMF Coupling Facility Activity report for a complete picture of what is going on
- The 'Retries' aka 'Redrives' is an indication of the number of requests that were too large for the current buffer being used. That can indicate rapid changes in message sizes. There was a change made in V7.0.0 that smoothed out this processing.

MQ Stats - Subtype 2 – Coupling Facility Manager

- CF Report from MQCSMF (V7.1) – CF file

```
cf     statistics
MPX1,QML3,2013/09/23,08:47:36,VRM:710,
  CSQSYSAPPL  , Structure-fulls      0
    Multiple     59, avg et in uS    34, Retries      0
  LARGMSGS    , Structure-fulls      0
    Multiple      1, avg et in uS    29, Retries      0
  SMDSMSGS    , Structure-fulls      0
    Single        2, avg et in uS    46, Retries      0
    Max entries         41,  Max elements        159
```

- CF Report from MQCSMF (V7.1) – CFCSV file

```
'MVS','QM','DATE','TIME','Structure','Full','Max entries','Max elements','avg S','avg M','Num S','Num M'
MPX1,QML3,2013/09/23,08:47:36,CSQSYSAPPL  ,     0,     0,     0,0,34,0,59
MPX1,QML3,2013/09/23,08:47:36,LARGMSGS    ,     0,     0,     0,0,29,0,1
MPX1,QML3,2013/09/23,08:47:36,SMDSMSGS    ,     0,    41,   159,46,0,2,0
```

MQ Stats - Subtype 2 – SMDS Notes

N O T E S

- SMDS is new with V7.1, and not included in the earlier reports.
- Important is the real I/O that may have to be done

MQ Stats - Subtype 2 – SMDS Manager

- CF Report from MQCSMF (V7.1) – SMDS file part 1

```
SMDS buffer pool activity:
  Acquired buffers                8250
    Got valid buffer                         0 (  0%)
    Got matching, empty buffer               0 (  0%)
    Got free, empty buffer                 100 (  1%)
    Stole a saved buffer                  8150 ( 98%)
  No buffer available                        0
  Waited for free buffer                     0 (  0%) avg time 0.000000s
  Waited for busy buffer                     0 (  0%) avg time 0.000000s
  Buffer read issued                      8250
    Data already valid                       0 (  0%)
    Data partly valid                        0 (  0%)
    Data read from disk                   8250 (100%)
  Freed valid buffer                      8250
  Marked buffer deleted                      0
  Buffer write issued                        0
```

- There is no corresponding CSV file

MQ Stats - Subtype 2 – SMDS Manager

- CF Report from MQCSMF (V7.1) – SMDS file part 2

```
SMDS I/O statistics:
  SMDS data set usage:
    High allocated CI              25740
    High formatted CI              25740
    Control interval size           4096
    Control area size             737280
  SMDS I/O activity:
    Type           Requests    4K pages pages/req  avg I/O time  avg wait time
    Format                0           0      0.0      0.000000s      0.000000s
    Write                 0           0      0.0      0.000000s      0.000000s
    Read (local)          0           0      0.0      0.000000s      0.000000s
    Read (Other)       8250       24000      2.9      0.000391s      0.000353s
```

- There is no corresponding CSV file

MQ Stats - Subtype 2 – Topic Manager statistics

- Topic Report from the MQ1150 (V7.0.1)

```
Topic Manager   : QTST
  Subscriptions: Total         3, Durable         0, Expired         0
     API      :  HW mark         0, LW mark         0
     ADMIN    :  HW mark         0, LW mark         0
     PROXY    :  HW mark         0, LW mark         0
  Total msgs to Subscriber queues:        53
  Total publication requests:
  -- API:         53, ADMIN:         0, PROXY:         0
  Publication fanout information:
  -- HW mark per publish:         1
  -- LW mark per publish:         1
  -- No subscribers:              1
  -- HW mark publish elapse time:         1 m/s
  -- Average Publish elapse time:        53 m/s
```

MQ Stats - Subtype 2 – Topic Manager statistics

- Reports from the MQSMF (V7.1) program
  - The first is from the TOPIC file output

```
Topic statistics
MPX1,QML3,2013/09/19,09:09:47,VRM:710,
 Total Subs            3 Durable Subs          0 Expired Subs        0
 Total messages       53 Single publish       53
  API     sub HW        0 Sub LW                0 Tot Pub            53
  ADMIN  :Sub HW        0 SUB LW                0 Tot Pub             0
  PROXY  :Sub HW        0 SUB LW                0 Tot Pub             0
  Single PUB HW:        1 Pub LW                1 Pub Nosub        1749
  Max Pub time        123 Avg pub time         57
```

  - Note that there is no TOPIC CSV file.

MQ Stats - Subtype 2 – Topic Manager statistics

N O T E S

- Particularly interesting here is the number of publications made where there was no subscription. This could be very useful in a situation where someone is reporting that 'MQ is losing messages/publications.' This couls indicate a mismatch between the:
  - Topic string on the publications and subscriptions
    - A typo is a terrible thing to track down
  - The expectation that a subscription is durable or not
  - The administration to a defined subscription has not ben done properly

MQ Statistics – SMF115

- In summary:
  - SMF115 is very lightweight
  - Contains come of the information used to check the overall health and well being of the z/OS queue manager
  - Is used in conjunction with the JES logs
  - DO NOT TURN it off!

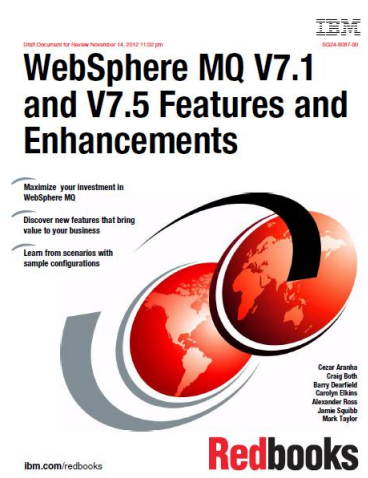
More information

- Performance is a huge topic, we have only scratched the surface. There is a lot more investigation that can be done, and more information being published regularly.
- There are a number of SupportPacs available:
  - MP16 - Capacity Planning and Tuning for WebSphere MQ for z/OS
  - MP1H - Performance Report - WebSphere MQ for z/OS V7.1
  - MP1G - Performance Report - WebSphere MQ for z/OS V7.0.1
  - MP1F – Performance Report - WebSphere MQ for z/OS V7.0.0
  - MP1B - Interpreting accounting and statistics data WebSphere MQ for z/OS

More information

- There are a number of SupportPacs available:
  - MP16 - Capacity Planning and Tuning for WebSphere MQ for z/OS
    - http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg24005907&loc=en_US&cs=utf-8&lang=en
  - MP1H - Performance Report - WebSphere MQ for z/OS V7.1
    - http://www-01.ibm.com/support/docview.wss?uid=swg24031663
  - MP1G - Performance Report - WebSphere MQ for z/OS V7.0.1
    - http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg24024589&loc=en_US&cs=utf-8&lang=en
  - MP1F – Performance Report - Performance Report - WebSphere MQ for z/OS V7.0.0
    - http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg24020142&loc=en_US&cs=utf-8&lang=en
  - MP1B - Interpreting accounting and statistics data WebSphere MQ for z/OS
    - http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg24007421&loc=en_US&cs=utf-8&lang=en

Shameless Promotion



Questions & Answers