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Digging Into the MQ SMF – Session 17900

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Is MQ sick? What can we do about it!

"Some patients like the magic wand prop."

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Granularity Matters!

- What is your MQ Statistics Interval?
  - STATIME on the queue manager
  - Ideally 15-30 minutes, or coordinated with global SMF interval
  - If too long:
    - Unable to determine peak or problem periods in statistics
    - Unable to get an accurate view of long running tasks
    - May produce inaccurate results when using the MP1B SupportPac or other processing tools
  - If too short:
    - May produce “extra” SMF 116 record for long running tasks

Granularity Matters - notes

- Some users have set very long STATIME intervals in the hope of reducing the impact of the large SMF116 class 3 records.
- The records are cut at:
  - End of task
  - Each SMF interval if the task is still running
  - If most tasks are short lived, setting a very long SMF interval will not impact the volume of SMF116 records.
- We have seen intervals of as much as 24 hours. We could say, ‘there is something wrong, but we don’t know when’

Granularity Matters!

- Know the units of measure!
  - If CPU is rounded up to full seconds
    - Persistent = Nonpersistent CPU time
    - Client = local bindings
    - Multiple MQPUT1s = proper loop

Granularity Matters - notes

- When CPU and Elapsed times are kept in the SMF 116 class 3 records, it is always in microseconds
- Some processing/print programs may round those values up to the nearest second.
  - So a transaction doing an MQPUT of a persistent message may use 75 cpu microseconds
  - Another transaction doing an MQPUT of a nonpersistent message may use 40 cpu microseconds
  - Some processing and print programs would round each up to 1 CPU second
  - For a few messages, it won't matter.
  - For MILLIONS it will!

What is a MQ for z/OS Health Check?

- A health check is a point in time evaluation of the queue manager and channel initiator.
  - It is to provide singular focus and evaluation
  - It digs into the MQ SMF data
- It does not replace:
  - Real time monitoring
    - Queue manager and Object Status
    - Queue Depths
    - Processing program status
  - Regular reviews done by systems admins
    - Review of MQ statistics
    - Reviews of accounting data

What is a MQ for z/OS Health Check?

- Regular reviews of MQ Statistics will show:
  - Increase in queue manager utilization
  - ‘Gross’ trends
  - May be helpful in capacity planning

- Regular reviews of the Class 3 account data
  - Increase in workload, per queue
  - Problems in code
  - Etc.

Objectives

- This session is to delve a bit deeper into how the team formerly known as ATS (now something less easy to remember) perform a health check and how you can perform your own.
- It is almost exciting as watching moss grow.

What data needs to be collected/reviewed?

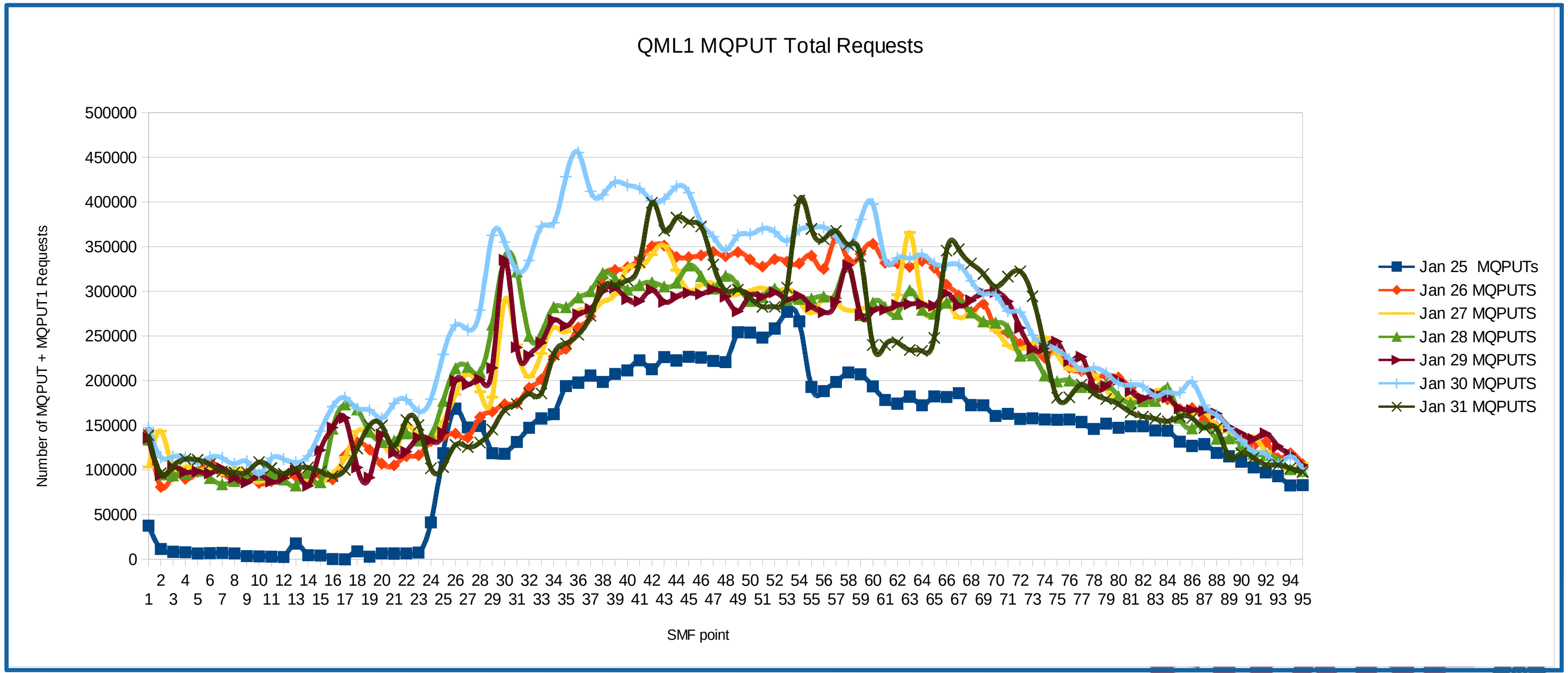
- The data typically requested for an MQ for z/OS health check typically includes:
  - One week of MQ Statistics data – SMF 115
    - For customers on MQ V8 this should include classes 1 and 4
    - For customers prior to V8, if gathering data about channels using the MQCMD program (or similar) if using is also helpful
  - One high volume day's JES logs for the queue manager and channel initiator

What data needs to be collected? More

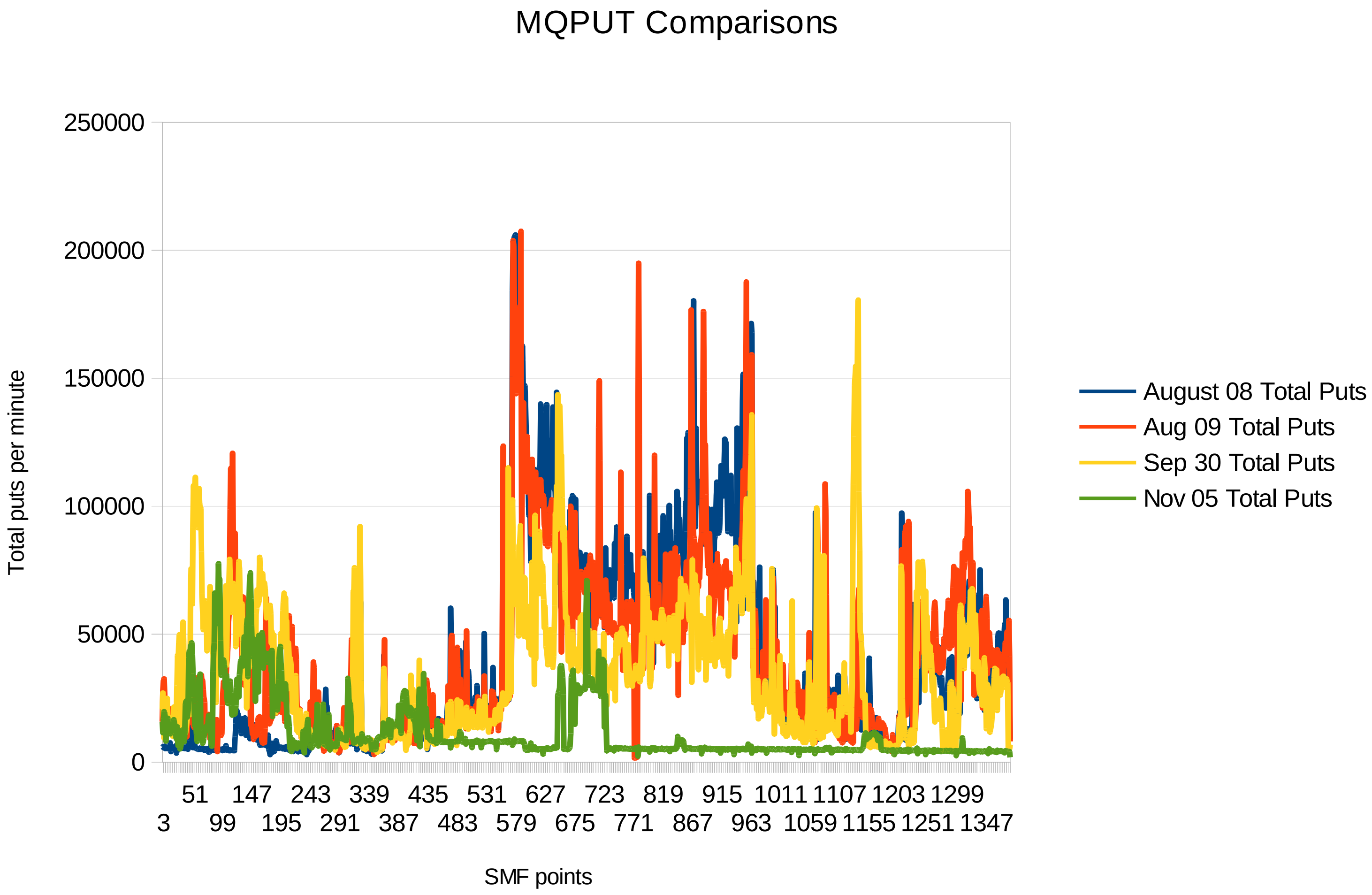
- Class 3 accounting for one or more busy, but not peak SMF intervals
  - If there are multiple peaks during a day, this data should be gathered during either the typical ‘ramp up’ or ‘ramp down’
  - A good cross section of tasks using MQ resources is necessary to evaluate the application’s use of MQ
- If on V8, Class 4 accounting for one or more busy but not peak SMF intervals.

What is a ‘busy but not peak period’?

- A sample week of MQPUT and MQPUT1 may illustrate patterns of use



Another example of workload patterns



How do I find a ‘busy but not peak period’?

- Keep in mind (aka do as I say not as I do)
  - There may be multiple well defined peaks during a day
    - Batch and online workloads can show very different peak times and volumes
    - Multiple samples may be required to demonstrate all use
  - Some queue managers may have less well defined peaks – the message rates are more constant than the illustrated queue managers
  - Others may have well defined and predictable peaks

Finding the Symptoms

- To find out how healthy an individual queue manager is, there are a number of important steps:
  - Review the JES logs
    - Look for specific messages that indicate issues, some examples:
      - CSQJ032E - APPROACHING END OF THE LOG RBA RANGE OF FFFFFFFFFFFF. CURRENT LOG RBA IS .
      - CSQJ111A - OUT OF SPACE IN ACTIVE LOG DATA SETS
      - CSQJ112E - INSUFFICIENT ACTIVE LOG DATA SETS DEFINED IN BSDS
    - Calculate the number of log switches during a peak interval using the CSQJ033I message

Finding the Symptoms - continued

- JES log evaluation continued:
  - Track the storage use by capturing the CSQY220I messages
    - Example:
      CSQY220I QML1 CSQSCTL Queue manager storage usage: 110 local storage: used 597MB, free 1141MB: above bar: used 1GB, free >10GB
  - Look for long running applications:
    - Long running UOWs reported via CSQJ160I
    - Log shunting reported via CSQR026I
  - Look for messages that you have never seen before!
    - Your real time alerting system may not be looking at all the important messages.

Finding the Symptoms - Notes

- We have seen 2 customers overwrite their log RBA, which caused not only an outage but the only time we have seen MQ actually lose persistent messages
  - In both cases the customer was highly dependent on software that monitored the operlog and alerted when certain messages were reported – not just MQ, but all major subsystems. In both cases the messages that should have alerted the MQ Admins about the log RBA issue were not detected by the monitoring software, and went unreported and the situation un-addressed. While V7.1 and V8 contain code to prevent this particular problem, there could be other messages that are almost as bad.
  - Review automation rules and the ‘raw’ JESLOGs periodically!

Finding symptoms - Review of SMF115

- The SMF 115 data is the statistical information produced by a MQ for z/OS queue manager.
  - Primarily used to track major trends and resolve performance problems with the queue manager
  - Very lightweight
  - Broken down into the major ‘managers’ within MQ
  - SupportPac MP1B, no matter which version, provides at least 2 views into the MQ statistics
    - Report form
    - Column or CSV form
      - This is used to import into spreadsheets for analysis
    - Both are necessary because the CSV form may be missing fields you need to review when looking for a problem.

Finding the symptoms - Review of SMF116 – Class 3 data

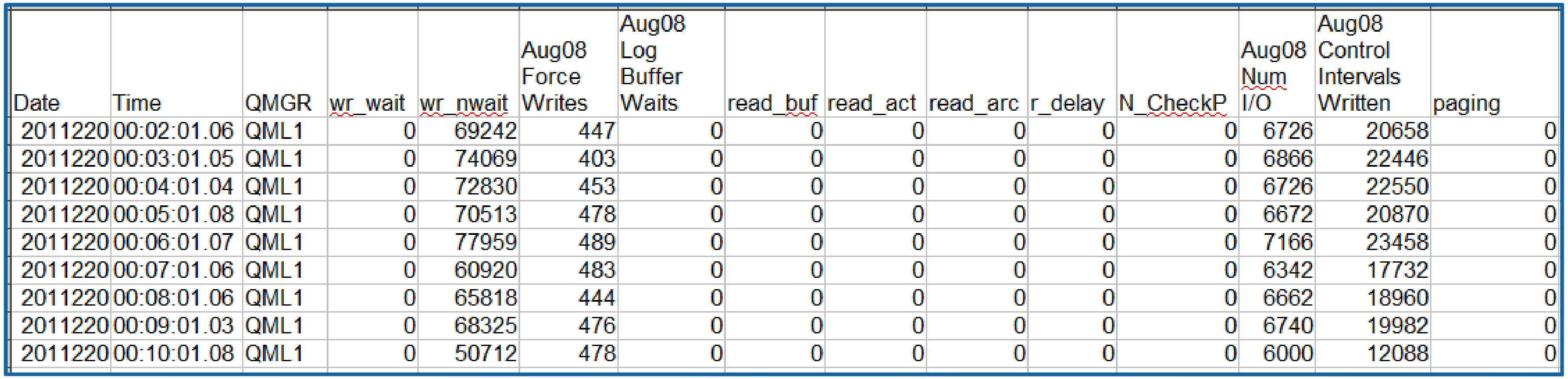
- The SMF 116 data is the accounting information produced by a MQ for z/OS queue manager.
  - Primarily used to determine what is going on within MQ workload
  - Heavyweight
  - Broken down into the transactions within MQ
  - The “old” MP1B provides several views into the data:
    - MQ1160 – prints the SMF116 class 1 report
    - MQ116S – prints the detailed SMF116 class 3 report, including the queue information
    - MQCSMF – extracts specific information from SMF115 and 116 in a column format
      - Particularly useful for building spreadsheets
  - The new MP1B provides:
    - The ‘TASK’ output
      - Somewhat like the MQ116S report
      - Differences between new and old for a CICS transaction are documented in https://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD106135
    - Other files, much like the ‘old’ MQCSMF output

Determining the health

Are you now, or have you ever been an MQ administrator????

SMF 115 – using the data

- The CSV file or the column format can be downloaded from z/OS and then imported into a spreadsheet for evaluation.
- For example, the log data loaded into a spreadsheet looks as follows:

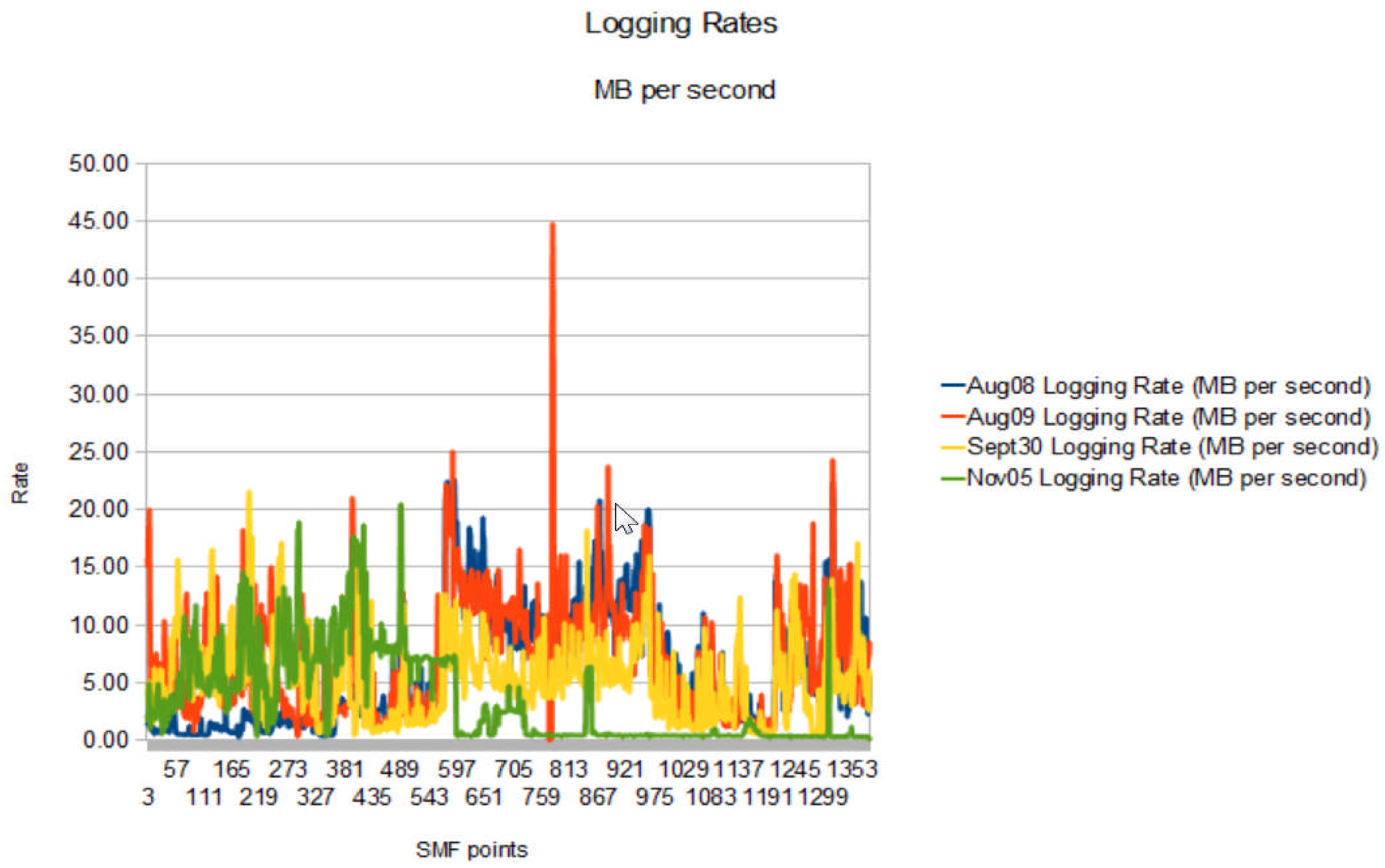


Date	Time	QMGR	wr_wait	wr_nwait	Aug08 Force Writes	Aug08 Log Buffer Waits	read_buf	read_act	read_arc	r_delay	N_CheckP	Aug08 Num I/O	Aug08 Control Intervals Written	paging
2011220	00:02:01.06	QML1	0	69242	447	0	0	0	0	0	0	6726	20658	0
2011220	00:03:01.05	QML1	0	74069	403	0	0	0	0	0	0	6866	22446	0
2011220	00:04:01.04	QML1	0	72830	453	0	0	0	0	0	0	6726	22550	0
2011220	00:05:01.08	QML1	0	70513	478	0	0	0	0	0	0	6672	20870	0
2011220	00:06:01.07	QML1	0	77959	489	0	0	0	0	0	0	7166	23458	0
2011220	00:07:01.06	QML1	0	60920	483	0	0	0	0	0	0	6342	17732	0
2011220	00:08:01.06	QML1	0	65818	444	0	0	0	0	0	0	6662	18960	0
2011220	00:09:01.03	QML1	0	68325	476	0	0	0	0	0	0	6740	19982	0
2011220	00:10:01.08	QML1	0	50712	478	0	0	0	0	0	0	6000	12088	0

SMF115 – Using the data

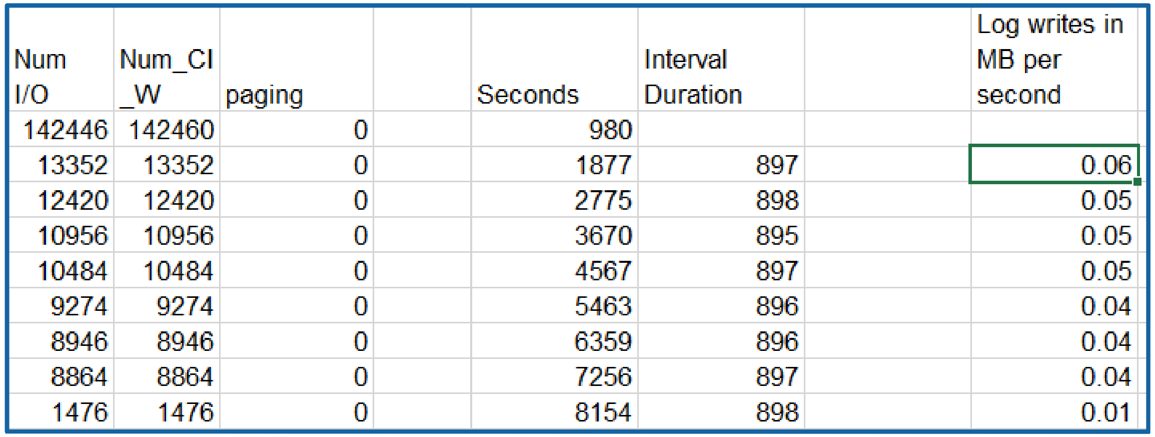
- By itself the SMF 115 data for many of the internal component managers are useful, but some manipulation of the raw data can make it much more consumable and useful.
- Examples include:
  - The message manager summaries as shown earlier
  - Calculating the log data written per second
  - Charting, making it easier to spot patterns and trends
- Some of the calculated data is done for you in the ‘new’ MP1B, but beware – it uses hard coded values for intervals, etc. which can skew results.

Logging Rates - Charted



SMF115 – Using the data – continued

- Example of using a spreadsheet to calculate the log writes:



Num I/O	Num_CI _W	paging		Seconds	Interval Duration		Log writes in MB per second
142446	142460	0		980			
13352	13352	0		1877	897		0.06
12420	12420	0		2775	898		0.05
10956	10956	0		3670	895		0.05
10484	10484	0		4567	897		0.05
9274	9274	0		5463	896		0.04
8946	8946	0		6359	896		0.04
8864	8864	0		7256	897		0.04
1476	1476	0		8154	898		0.01

- The formulas used to calculate seconds and duration:
  - Seconds =SUM(HOUR(B2)*3600,(MINUTE(B2)*60),SECOND(B2))
  - Interval duration =(Q3-Q2)
  - Interval crossing a date =SUM((86399-Q96),Q97)
- The formula for log writes in MB/Second
  - =ROUND(((N3*4096)/(1024*1024))/(R3),2)
  - Where N3 = the number of CI Writes column and R3 is the Interval duration

Logging Rates Charted - Notes

- These rates were charted from days when there were reported slowdowns.
- Notice the huge spike in the Aug 09 data, that is an anomaly caused by a change to the SMF interval in the middle of the day. This led to doing an actual calculation of the SMF interval instead of relying on a ‘known’ value (i.e. 15 minutes). It is left in to illustrate that spikes do happen and should be investigated. They may not indicate a sudden growth rate, but can indicate a problem with the data itself.
- In looking at the data, the logging rate is frequently at the 20/25 MB per second rate. For the environment, this was quite high. It was discussed with the capacity planning team. At the time they were looking into the purchase of a new hardware, which was rated at up to 100 MB/second. This information provided additional emphasis on the need to upgrade, which has since been done to good effect.

Reviewing the SMF 115 data – Are there problems?

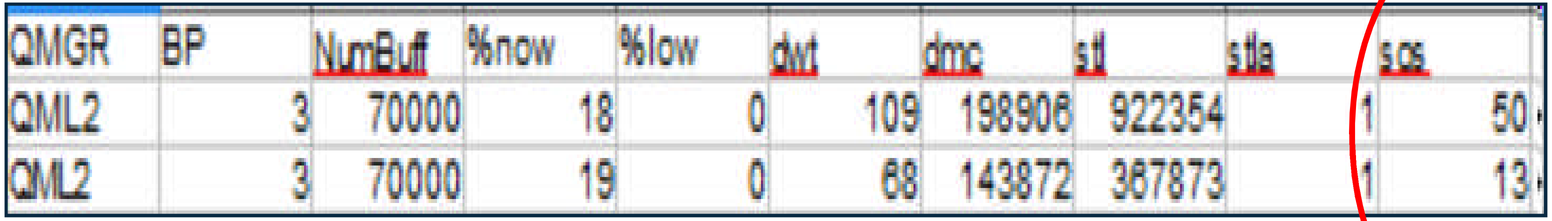
- While not always the culprit, tuning the buffer pools has been a never ending cycle of opportunities
  - Lazy queue definitions
    - I copy what works, might not be what is best for the queue manager
  - Workload pattern changes
    - What flows today, might become a log jam without any warning
      - Well except the business knew they were opening 2600 new branches on Tuesday

SMF 115 data – Urgent symptoms

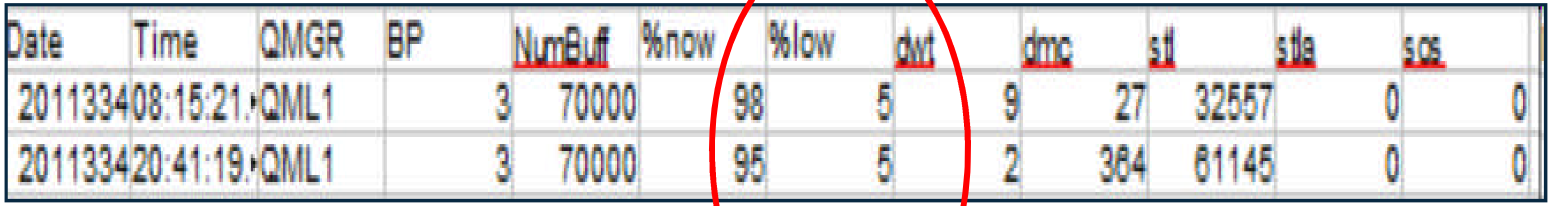
- In the next few slides, an analysis of a bufferpool under stress is shown
- First the raw SMF data for two weeks was processed thru the “old MP1B” MQCSMF and the MQ1150 format and print programs
- The Buffer Manager statistics were downloaded into a spreadsheet
- The spread sheet was sorted to find:
  - Non-Zero Short on storage counts
  - Non-Zero DMC counts
  - Percent of free pages
- This showed the areas that needed to be looked at in greater detail, and it became apparent that there were some processing patterns that need evaluation

SMF 115 data – Urgent symptoms – Call 911

- **Unless there has been an unexpected spike in volume, this should never been seen!**
  - SOS
  - Freepages at 5% or less



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

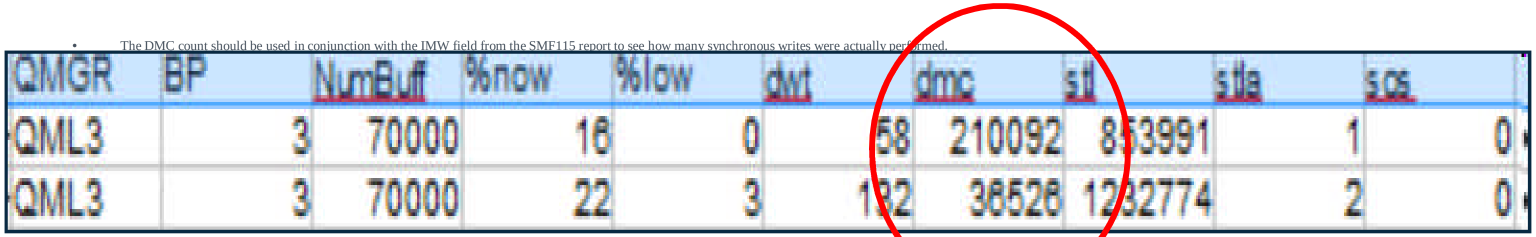


Date	Time	QMGR	BP	NumBuff	%now	%low	dwt	dmc	stl	stla	sos
2011334	08:15:21.	QML1	3	70000	98	5	9	27	32557	0	0
2011334	20:41:19.	QML1	3	70000	95	5	2	364	61145	0	0

SMF 115 data – Urgent symptoms

- **Red Flags for Bufferpools** - Continued
  - DMC – synchronous write process is requested
    - Note that it did not run this often, but this is the number of times that conditions were right!

- 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.



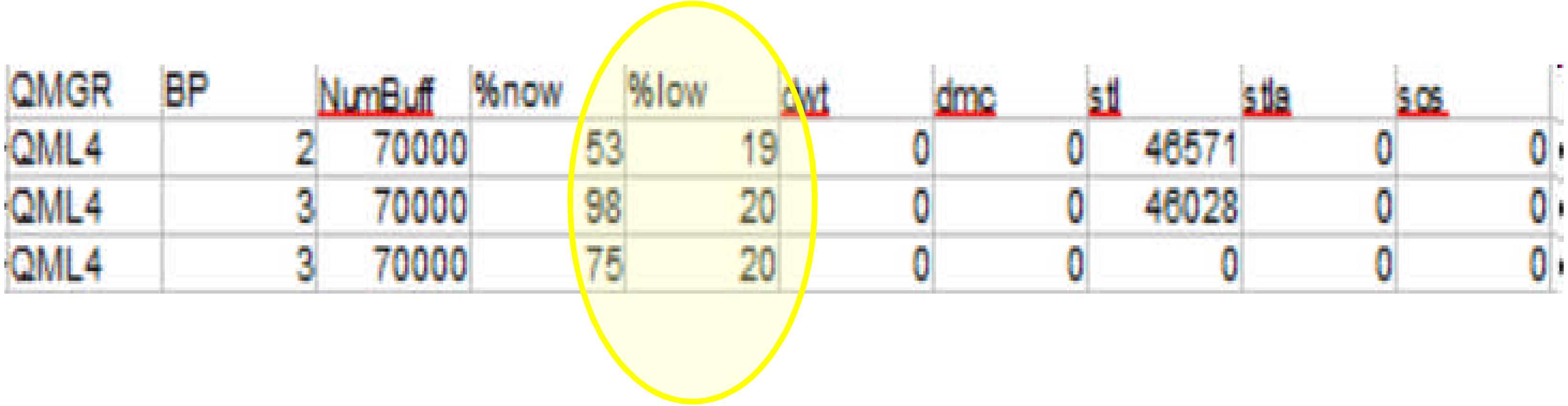
QMGR	BP	NumBuff	%now	%low	dwt	dmc	stl	stla	sos
QML3	3	70000	16	0	58	210092	853991	1	0
QML3	3	70000	22	3	132	36526	1232774	2	0

SMF115 – Bufferpool Trends and Analysis - Notes

- 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.

SMF 115 data – Clairvoyance – Ask Doctor

- **May be approaching a problem**
  - Consistently Approaching/Achieving 20 % Free pages



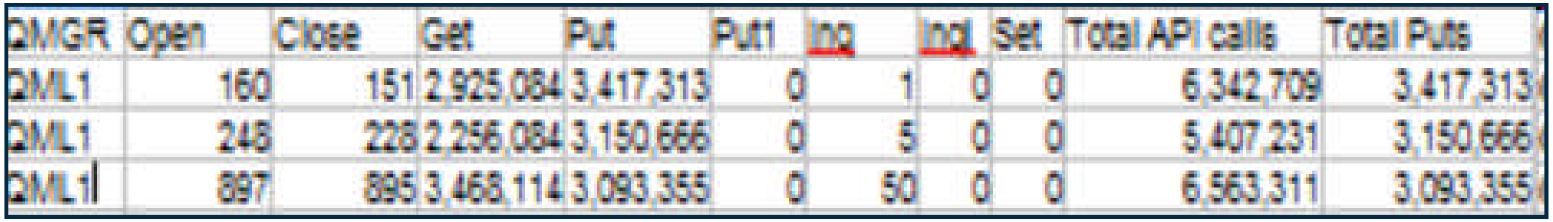
QMGR	BP	NumBuff	%now	%low	dwt	dmc	stl	stla	sos
QML4	2	70000	53	19	0	0	46571	0	0
QML4	3	70000	98	20	0	0	46028	0	0
QML4	3	70000	75	20	0	0	0	0	0

Bufferpool Use - Warnings

- In the data shown, two bufferpools were approaching the 20% freepage threshold.
- At 20% the async write task is initiated, which is not catastrophic, but if it can be avoided it should be.
- In this case, when several weeks worth of data were examined the 20% threshold was being broken on a regular basis. After evaluation fo the SMF116 class-3 data it was found this was batch oriented workload, and messages were expected to queue up for long periods of time this was not a problem. It is something to watch.

SMF 115 data – Reviewing the Message Manager information for gross use numbers

- Message Manager Information
  - 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

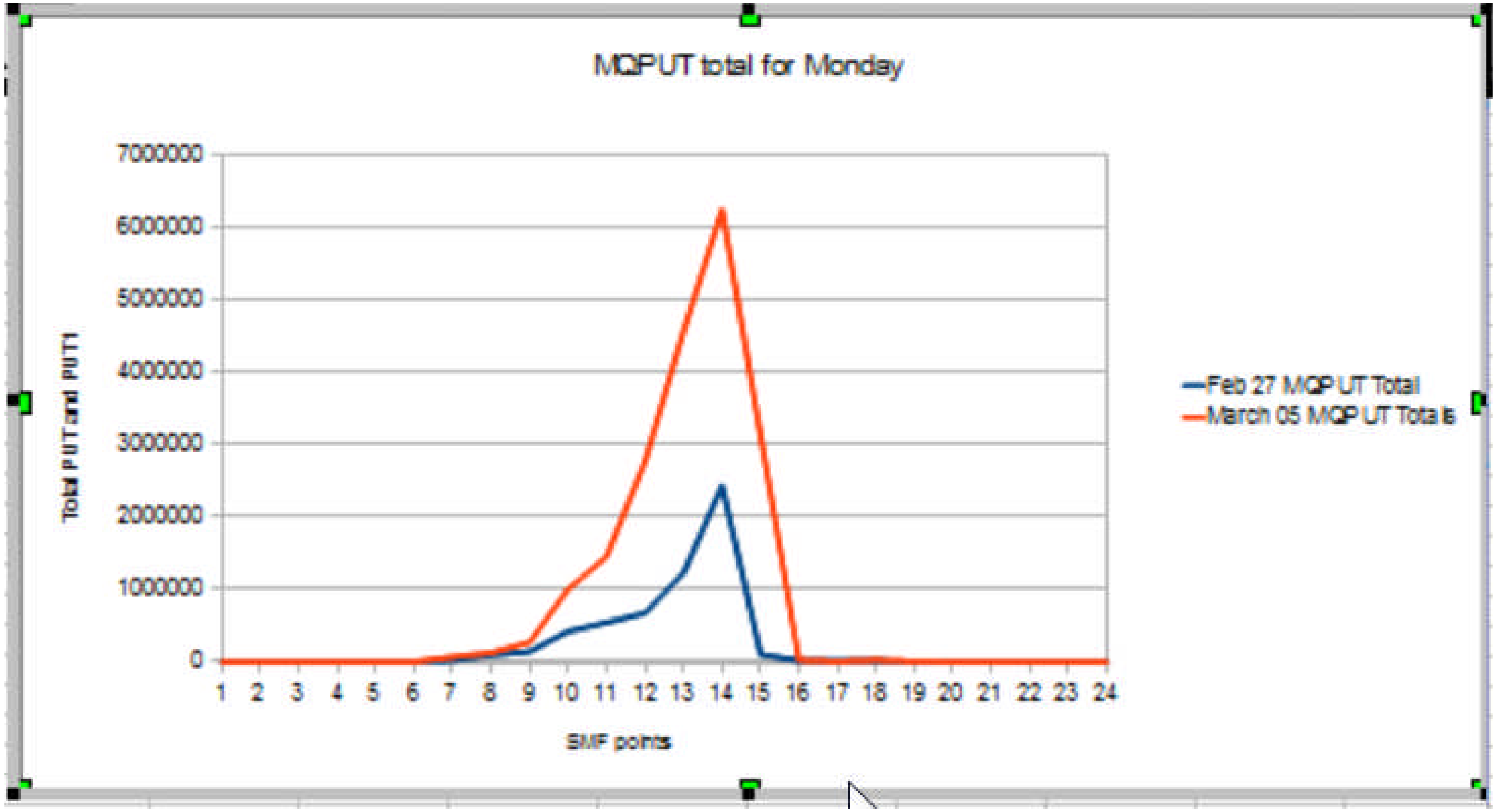


QMGR	Open	Close	Get	Put	Put1	Inq	Inql	Set	Total API calls	Total Puts
QML1	160	151	2,925,084	3,417,313	0	1	0	0	6,342,709	3,417,313
QML1	248	228	2,256,084	3,150,666	0	5	0	0	5,407,231	3,150,666
QML1	897	895	3,468,114	3,093,355	0	50	0	0	6,563,311	3,093,355

Message Manager Statistics

- This data was taken from the message manager output from the old MQCSMF format and print program.
- Two columns were added to calculate the Total API calls and Total Puts (sum of MQPUT and MQPUT1 calls)
- When charted over a few weeks an upward curve was noticed.

Message Manager - Trend Chart

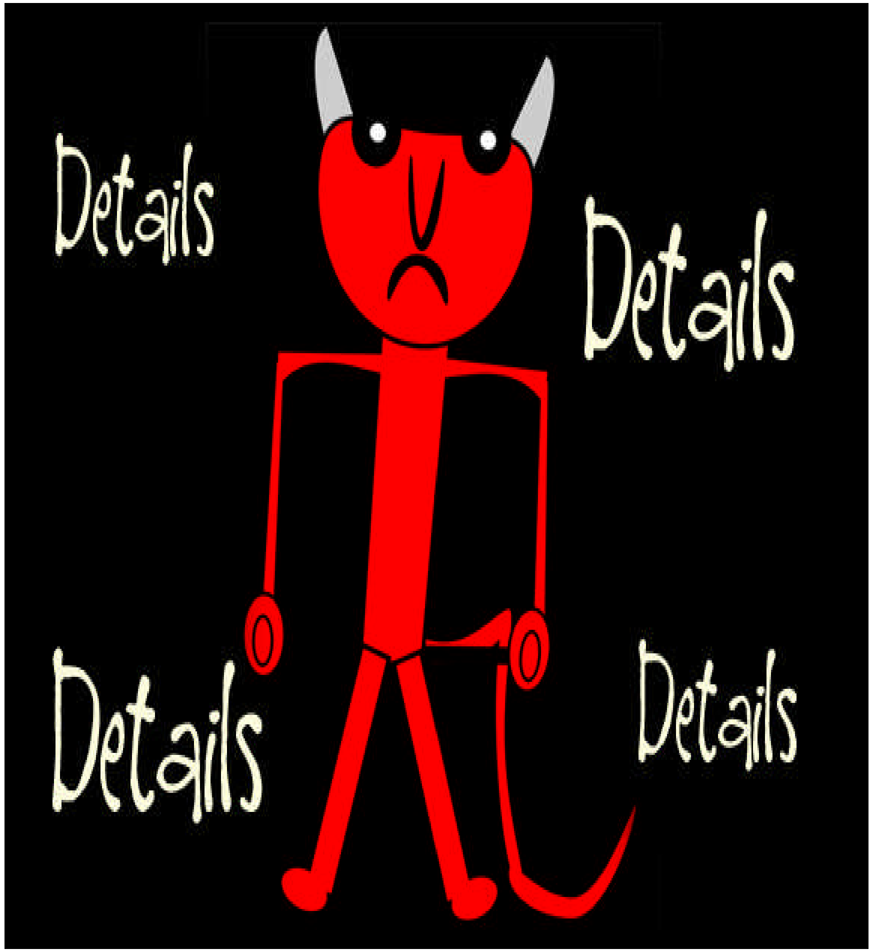


Message Manager Trend Chart

- Two days data is not really a trend analysis, but it’s a start
- If more Mondays are charted, a real trend may emerge and show that volume is increasing allowing a good admin to plan for additional workload.
- This is an overall count for the queue manager, individual queue activity can be evaluated from the SMF116 class 3 data.

Looking for more symptoms? Try the SMF116 Class 3 data

- Reviewing this copious data can feel like searching for the spell to turn lead into gold. Better to think of it as panning for gold
- As an MQ admin, you have more information at your fingertips about your environment than we at IBM reviewing this data will have. There are a number of things that we do to look for patterns or particular problems that are discussed.



SMF116 – Looking for things that make us less healthy

- The SMF 116 class 3 data may provide information about the health of the queue manager and the applications using MQ
  - For example, this data can be used:
    - Identify heavily used queues that can benefit from splitting across resource pools
    - Identify shared queues that should be on the same structure
    - Identify queues that should be indexed
    - Identify overly long response times, typically from I/O
    - Identify applications that are consuming excessive CPU due to bad verbs

What queues are being used and how?

- SMF116 class 3 data shows the use of queues
- Helpful because even as an MQ admin, it may be a challenge to find out where the queues are.
  - For example, if an application opens an alias, that points to another…this data provides the base name of the object
- Some specific opportunities for prevention:
  - Non-indexed queues
  - High volume request/reply queues in same resource pool
  - Overuse of Temporary dynamic queues

What queues are being used and how?

- We have seen some specific problems/issues at a number of customers that were addressed with an evaluation of the SMF116 data.
- In this section we are going to show some of the more common ones, and how the SMF data lead to the improvment

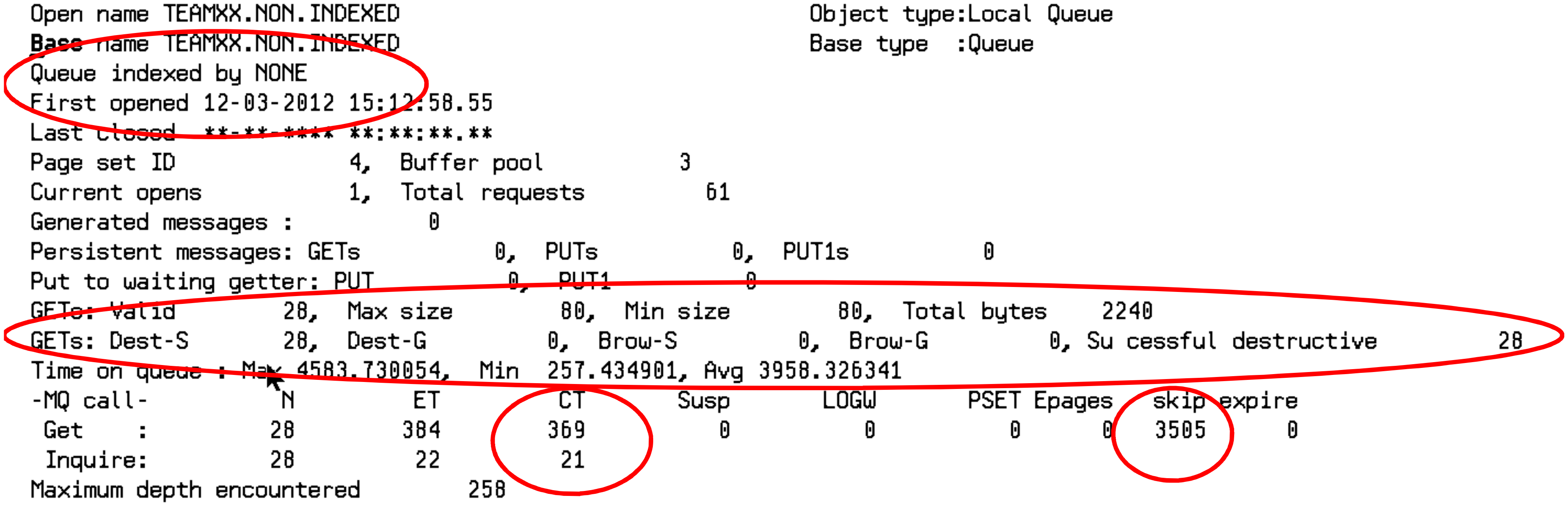
Queue Indexing – an opportunity to reduce the CPU fever

- Queue Indexing
  - Messages that are retrieved using an index-able field benefit from being indexed even when the depth is not high.
    - Message ID
    - Correlation ID
    - Token
    - Group ID
  - The greater the depth of the queue the greater the benefit.
  - The SMF116 queue records show when messages are retrieved using a 'known' field

Queue Indexing - Notes

- Queue indexing is unique to MQ on z/OS
- The use of a proper index can substantially improve performance an CPU consumption, as will be shown
- Anecdotally, we’ve heard of it making a difference when queue depths were as low as 5 on a busy system
- Often the first report of a problem is when there has been a slowdown elsewhere and queue depths have grown unexpectedly

Non-Indexed Queue retrieval

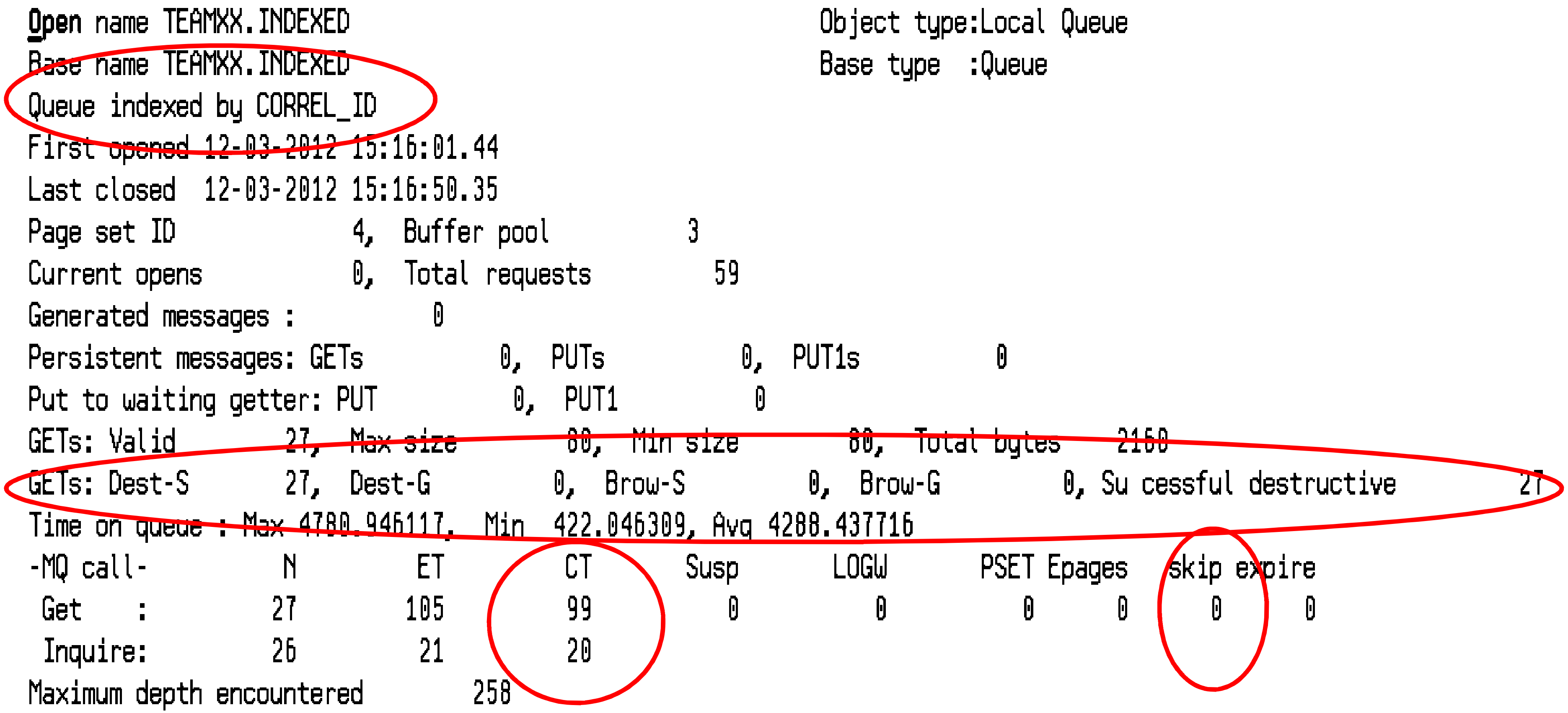


```
Open name TEAMXX.NON.INDEXED                               Object type:Local Queue
Base name TEAMXX.NON.INDEXED                               Base type  :Queue
Queue indexed by NONE
First opened 12-03-2012 15:12:58.55
Last closed  **-**-**** **:**:**.**
Page set ID             4,  Buffer pool          3
Current opens           1,  Total requests         61
Generated messages :          0
Persistent messages: GETs          0,  PUTs          0,  PUT1s          0
Put to waiting getter: PUT          0,  PUT1          0
GETs: Valid        28,  Max size        80,  Min size        80,  Total bytes    2240
GETs: Dest-S       28,  Dest-G         0,  Brow-S         0,  Brow-G         0, Su cessful destructive         28
Time on queue : Max 4583.730054,   Min  257.434901, Avg 3958.326341
-MQ call-          N         ET         CT       Susp       LOGW       PSET Epages   skip expire
 Get    :         28        384        369          0          0          0      0   3505      0
 Inquire:         28         22         21
Maximum depth encountered        258
```

Non-Indexed Queue retrieval - Notes

- In the SMF record, the fields of interest are:
  - The Queue Indexing
  - The Type of GET request being made, those with a '-S' are for specific messages (Get by correlid, get by message id, etc.)
  - The total CPU expenditure for the successful gets – the 'CT' column highlighted
  - The number of pages skipped while finding matching messages

Indexed Queue Retrieval



```
Open name TEAMXX.INDEXED                                    Object type:Local Queue
Base name TEAMXX.INDEXED                                    Base type  :Queue
Queue indexed by CORREL_ID
First opened 12-03-2012 15:16:01.44
Last closed  12-03-2012 15:16:50.35
Page set ID            4,  Buffer pool         3
Current opens          0,  Total requests        59
Generated messages :         0
Persistent messages: GETs          0,  PUTs          0,  PUT1s          0
Put to waiting getter: PUT          0,  PUT1          0
GETs: Valid        27,  Max size          80,  Min size          80,  Total bytes     2160
GETs: Dest-S       27,  Dest-G          0,  Brow-S          0,  Brow-G          0, Su cessful destructive         27
Time on queue : Max 4780.946117,  Min  422.046309, Avg 4288.437716
-MQ call-          N          ET          CT          Susp          LOGW          PSET Epages  skip expire
 Get    :         27         105          99             0             0             0      0      0      0
 Inquire:         26          21          20
Maximum depth encountered        258
```

Indexed Queue retrieval - Notes

- In the SMF record, the fields of interest are:
  - The Queue Indexing
  - The Type of GET request being made, those with a ‘-S’ are for specific messages (Get by correlid, get by message id, etc.)
  - The total CPU expenditure for the successful gets – the ‘CT’ column highlighted
  - The number of pages skipped while finding matching messages

Indexed vs Non - comparison

- Comparing the CPU time, both queues with the same max message depth:
  - Indexed 27 messages at 99 CPU microseconds
  - Non-indexed 28 messages at 369 CPU microseconds
  - An average of 270 microseconds less expensive per get
  - What's a microsecond or two between friends?
- Comparing the number of pages that had to be skipped
  - Indexed = 0
  - Non-indexed = 3585

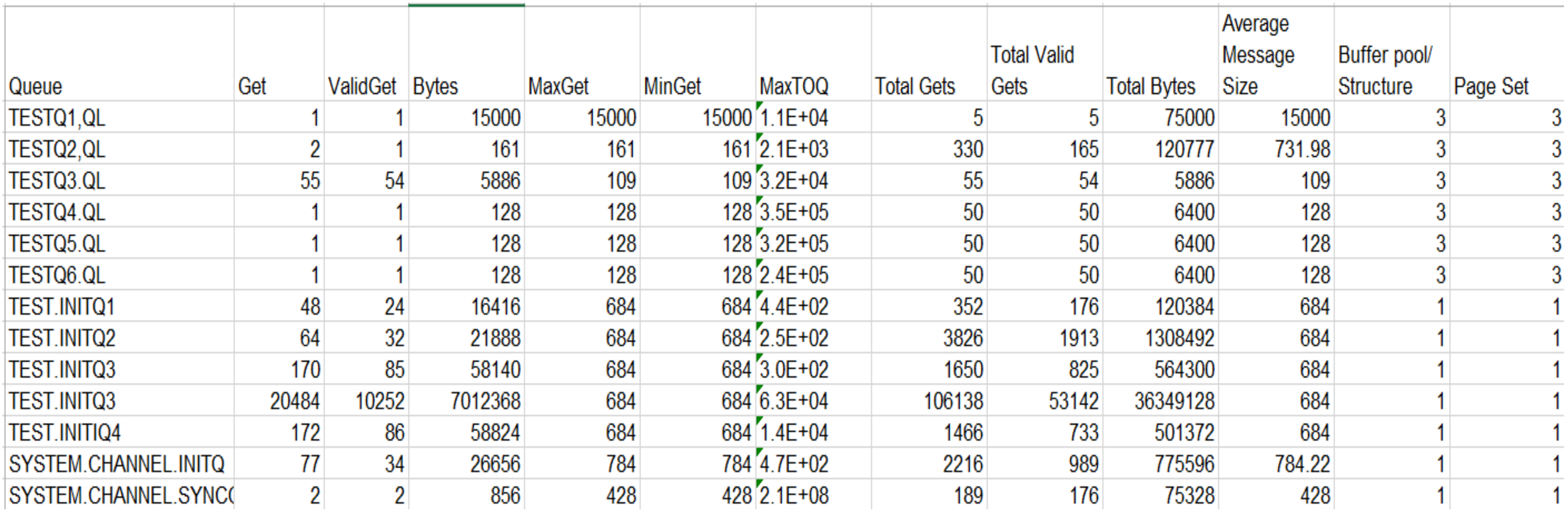
Another infection – concentration of resources

- High volume request and reply queue in the same resource pool
  - This is a case of ‘define like’ run amok
  - The request queue and reply queue for a high volume application were defined in the same storage class (same bufferpool and pageset)
  - By moving the reply queue to a different storage class, the resource usage was better distributed

High volume request and reply queue in the same resource pool

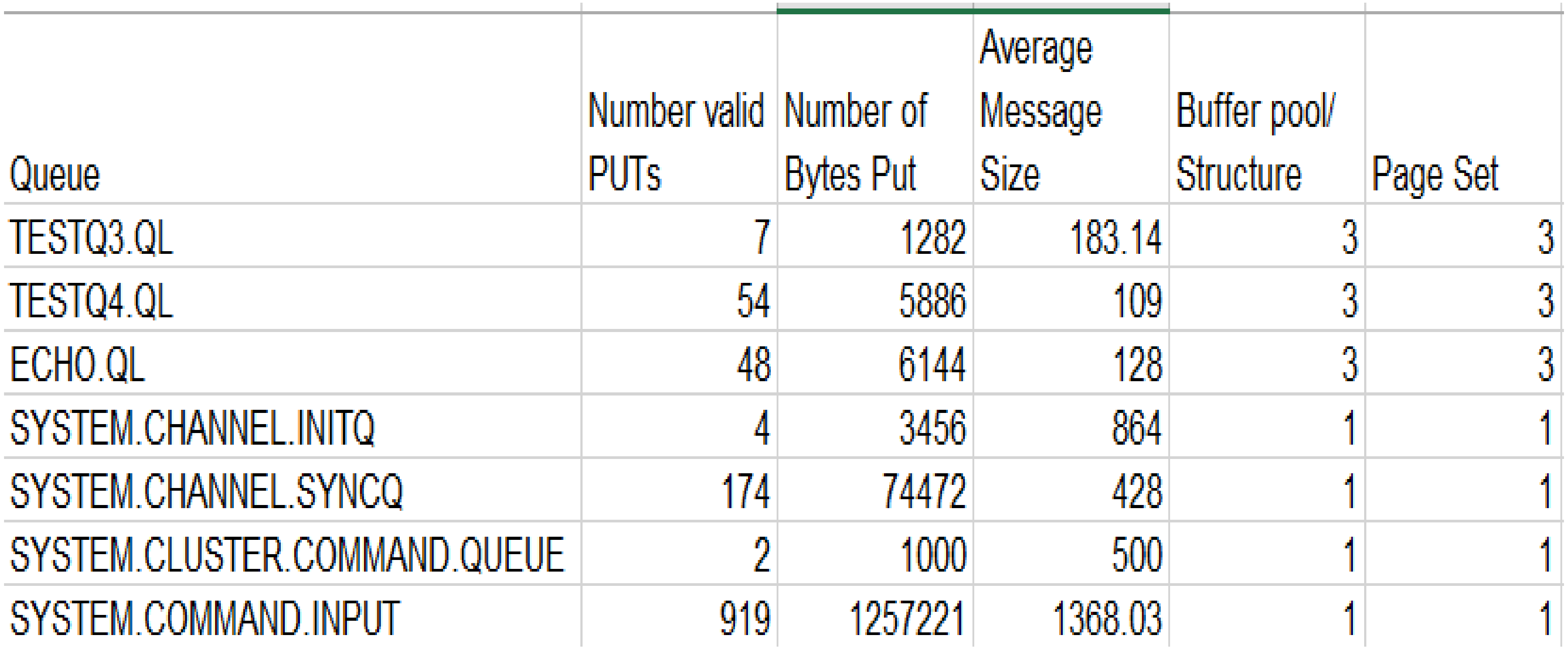
- Note this is often not seen until there is stress in one or more bufferpools due to volume.
- The SMF 116 reports give lists of queues that are used per task, using spreadsheets allows admins to consolidate that information to give a better view of use

GET queue use from SMF 116 class 3 data



Queue	Get	ValidGet	Bytes	MaxGet	MinGet	MaxTOQ	Total Gets	Total Valid Gets	Total Bytes	Average Message Size	Buffer pool/ Structure	Page Set
TESTQ1,QL	1	1	15000	15000	15000	1.1E+04	5	5	75000	15000	3	3
TESTQ2,QL	2	1	161	161	161	2.1E+03	330	165	120777	731.98	3	3
TESTQ3.QL	55	54	5886	109	109	3.2E+04	55	54	5886	109	3	3
TESTQ4.QL	1	1	128	128	128	3.5E+05	50	50	6400	128	3	3
TESTQ5.QL	1	1	128	128	128	3.2E+05	50	50	6400	128	3	3
TESTQ6.QL	1	1	128	128	128	2.4E+05	50	50	6400	128	3	3
TEST.INITQ1	48	24	16416	684	684	4.4E+02	352	176	120384	684	1	1
TEST.INITQ2	64	32	21888	684	684	2.5E+02	3826	1913	1308492	684	1	1
TEST.INITQ3	170	85	58140	684	684	3.0E+02	1650	825	564300	684	1	1
TEST.INITQ3	20484	10252	7012368	684	684	6.3E+04	106138	53142	36349128	684	1	1
TEST.INITIQ4	172	86	58824	684	684	1.4E+04	1466	733	501372	684	1	1
SYSTEM.CHANNEL.INITQ	77	34	26656	784	784	4.7E+02	2216	989	775596	784.22	1	1
SYSTEM.CHANNEL.SYNC(	2	2	856	428	428	2.1E+08	189	176	75328	428	1	1

PUT queue use from SMF 116 class 3 data



Queue	Number valid PUTs	Number of Bytes Put	Average Message Size	Buffer pool/ Structure	Page Set
TESTQ3.QL	7	1282	183.14	3	3
TESTQ4.QL	54	5886	109	3	3
ECHO.QL	48	6144	128	3	3
SYSTEM.CHANNEL.INITQ	4	3456	864	1	1
SYSTEM.CHANNEL.SYNCQ	174	74472	428	1	1
SYSTEM.CLUSTER.COMMAND.QUEUE	2	1000	500	1	1
SYSTEM.COMMAND.INPUT	919	1257221	1368.03	1	1

What queues are actually in use? Continued - Notes

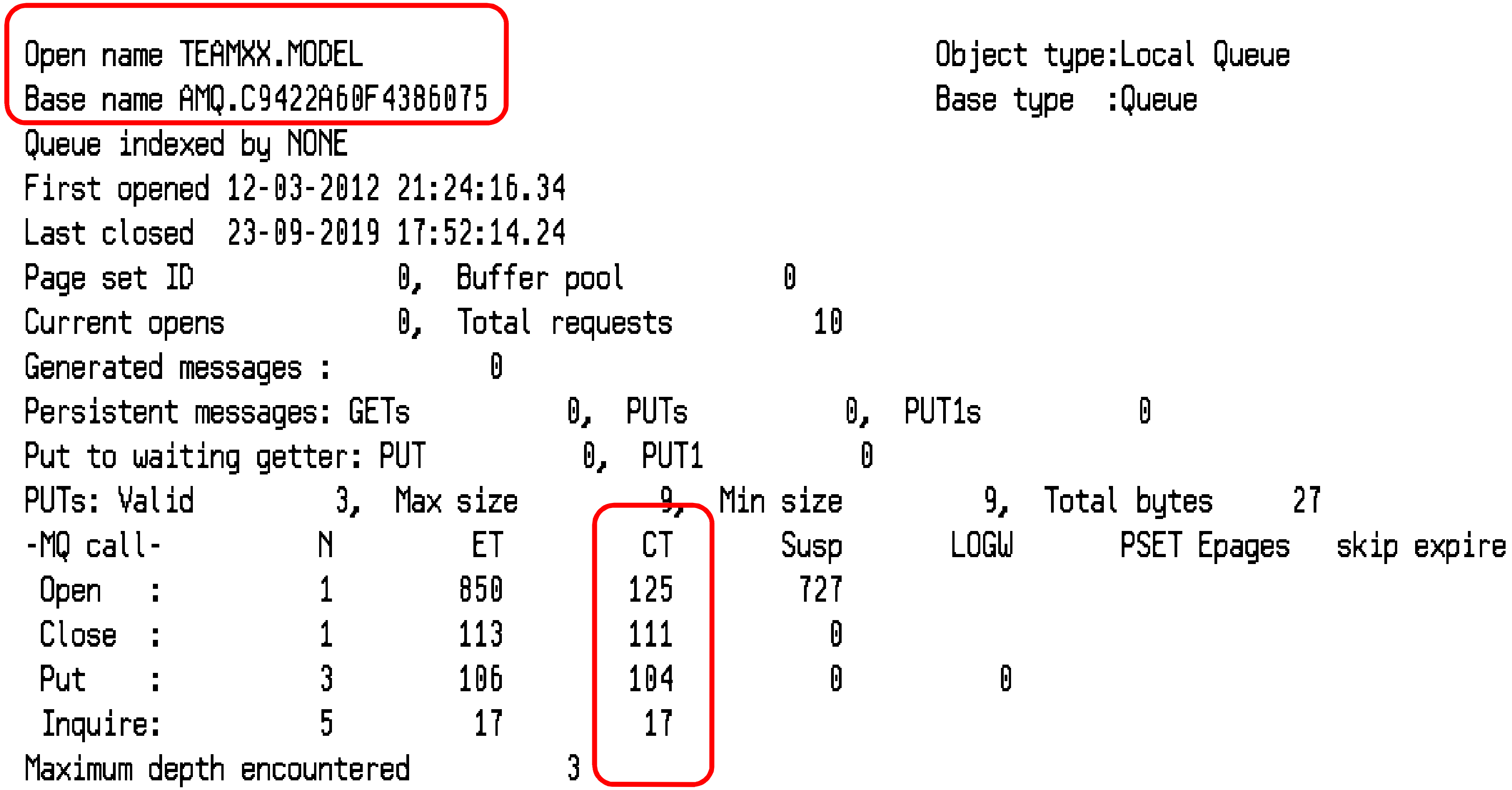
- The GET and PUT spreadsheets should be sorted by queue name before creating a sheet to do the consolidation.
- They can also be loaded into a database and then SQL used for consolidation
- The spread sheet used a number of formula to get the totals, an example of the formula to calculate the number of GET references is: =COUNTIF(AllGets.D03:D22219;A3)
- The formula to calculate the number of Valid GETs is: =SUMIF(AllGets.$D03:$D22219;A3;AllGets.$E03:$E22219)
- The bufferpool, pageset, and CF structure information was manually drawn from the SMF 116 print program

Possibly mild, possibly virulent symptom

- Use (or overuse) of Temporary dynamic queues
  - Often used for responses on both RYO and traditional monitoring tools
  - All queues created will be in the same resource pool
  - Quite expensive in CPU
- Temp dynamic queues are identifiable by their name
  - For example for the MQExplorer uses temporary dynamic queues. The name looks like this

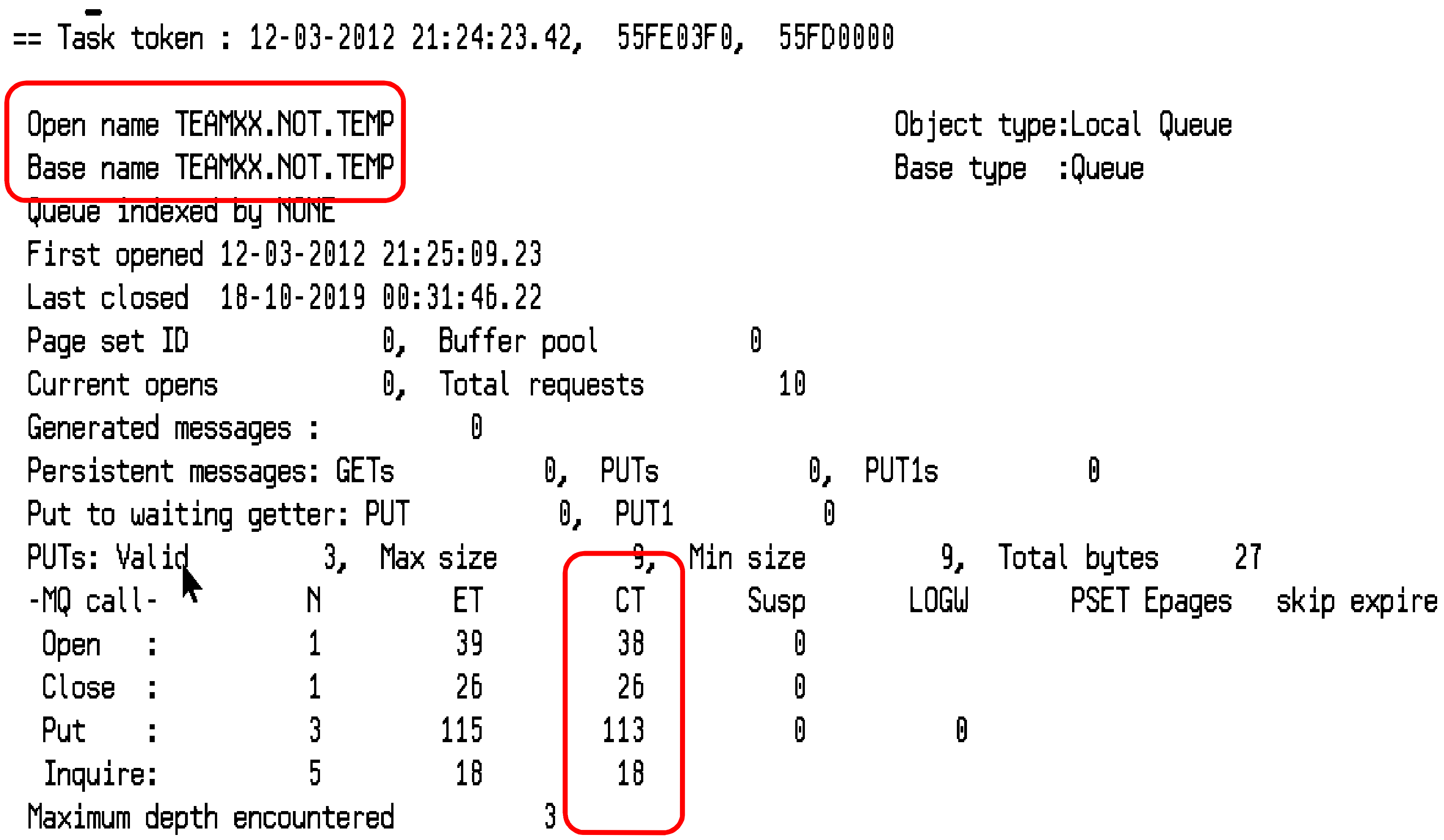
AMQ.MQEXPLORER.C1363497285

Temporary Dynamic Queues



```
Open name TEAMXX.MODEL                                   Object type:Local Queue
Base name AMQ.C9422A60F4386075                           Base type  :Queue
Queue indexed by NONE
First opened 12-03-2012 21:24:16.34
Last closed  23-09-2019 17:52:14.24
Page set ID             0,  Buffer pool          0
Current opens           0,  Total requests        10
Generated messages :          0
Persistent messages: GETs         0,  PUTs          0,  PUT1s          0
Put to waiting getter: PUT         0,  PUT1          0
PUTs: Valid         3,  Max size         9,  Min size          9,  Total bytes      27
-MQ call-          N          ET          CT        Susp       LOGW       PSET Epages   skip expire
 Open   :          1         850         125         727
 Close  :          1         113         111           0
 Put    :          3         106         104           0          0
 Inquire:          5          17          17
Maximum depth encountered          3
```

Permanent Queues



```
== Task token : 12-03-2012 21:24:23.42,  55FE03F0,  55FD0000

 Open name TEAMXX.NOT.TEMP                                 Object type:Local Queue
 Base name TEAMXX.NOT.TEMP                                 Base type  :Queue
 Queue indexed by NONE
 First opened 12-03-2012 21:25:09.23
 Last closed  18-10-2019 00:31:46.22
 Page set ID            0,  Buffer pool         0
 Current opens          0,  Total requests        10
 Generated messages :         0
 Persistent messages: GETs         0,  PUTs          0,  PUT1s         0
 Put to waiting getter: PUT         0,  PUT1          0
 PUTs: Valid         3,  Max size          9, Min size         9,  Total bytes     27
 -MQ call-          N         ET          CT         Susp        LOGW        PSET Epages   skip expire
  Open   :          1         39          38            0
  Close  :          1         26          26            0
  Put    :          3        115         113            0           0
  Inquire:          5         18          18
 Maximum depth encountered         3
```

Complete your session evaluations online at www.SHARE.org/Orlando-Eval

Temp vs. Permanent

- The CPU cost comparison

Verb	TDQ	Permanent
Open	125	38
Close	111	26
Put	104	113
Inquire	17	18

- The Elapsed Time comparison

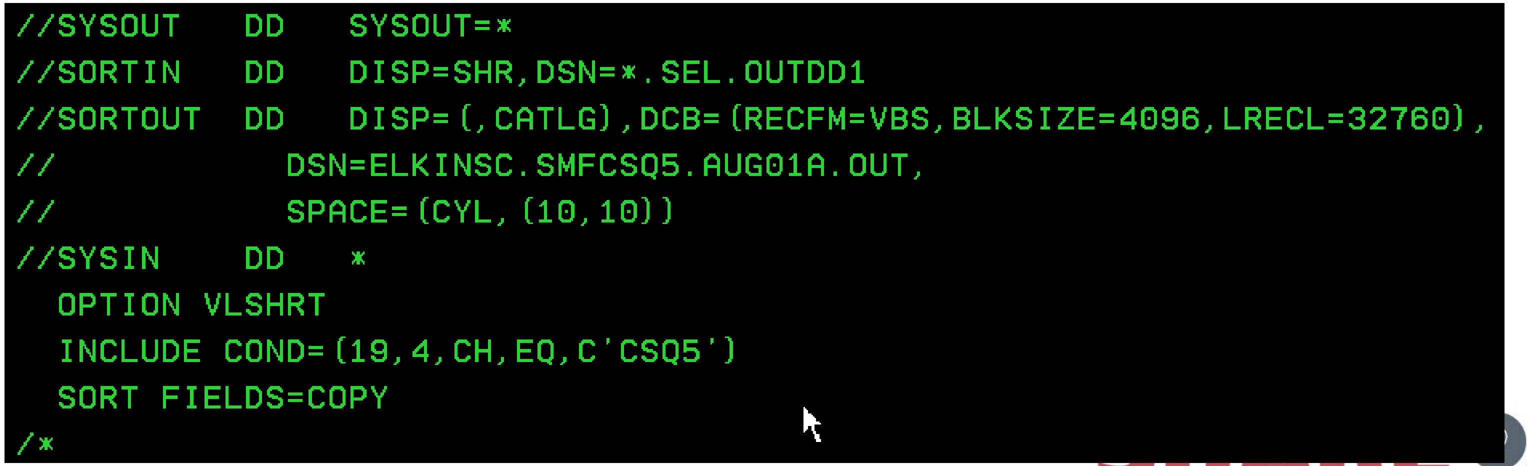
Verb	TDQ	Permanent
Open	850	39
Close	113	26
Put	106	115
Inquire	17	18

Possibly mild, possibly virulent notes

- Unfortunately, this CPU use often becomes a problem when:
  - There is an unexpected spike in volume and everyone is refreshing a monitor view at the same time
    - We have seen examples including 97% of the transaction workload come from the monitors due to too many people continuously refreshing their look at queue depths
    - This did not help the problem at all.
  - The transaction using the temp queue becomes prom queen
    - One example had the transaction initially being executed 1-2 times an hour, going up to millions of times an hour

Looking for a specific microbe – or one CICS transaction in the SMF116 data

- Many times you want to look at the information from a CICS transaction or batch job
  - No way to turn SMF116 class 3 on for just one queue, transaction, or job
  - Use SORT
    - Remember you will have to omit the short records that the SMF dump program always includes – use the VLSHRT option.

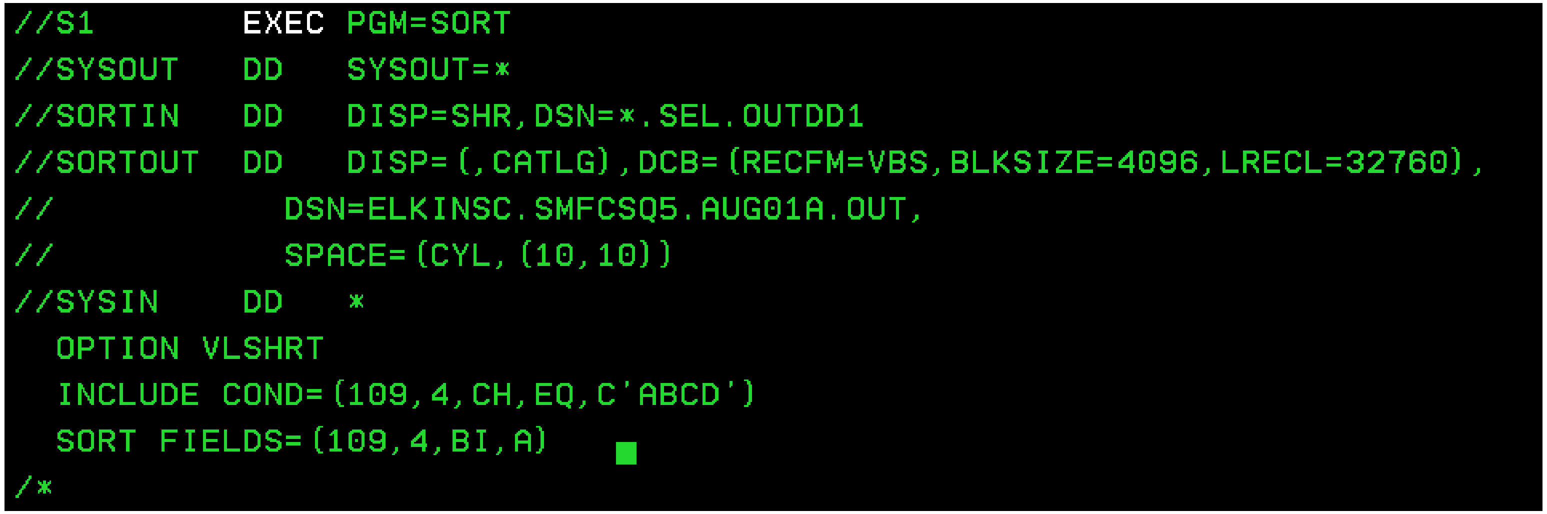


```
//SYSOUT    DD    SYSOUT=*
//SORTIN    DD    DISP=SHR,DSN=*.SEL.OUTDD1
//SORTOUT   DD    DISP=(,CATLG),DCB=(RECFM=VBS,BLKSIZE=4096,LRECL=32760),
//             DSN=ELKINSC.SMFCSQ5.AUG01A.OUT,
//             SPACE=(CYL,(10,10))
//SYSIN     DD    *
  OPTION VLSHRT
  INCLUDE COND=(19,4,CH,EQ,C'CSQ5')
  SORT FIELDS=COPY
/*
```

Finding a specific transaction or batch job

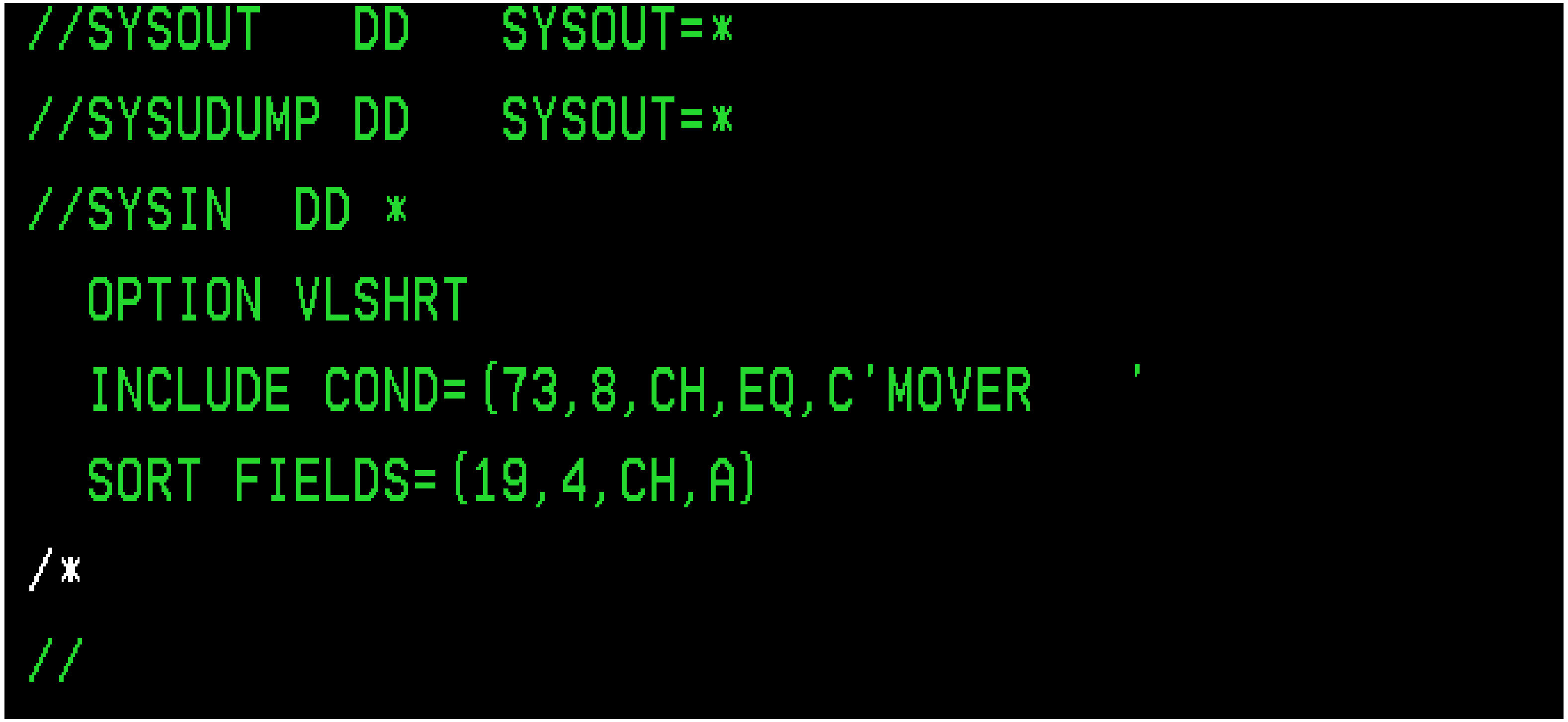
- In a group of millions of records, pulling the information for a specific transaction to ‘map’ it’s behavior can be critical in both problem resolution and performance issues
- The SMFDUMP program has few options for getting subsets of the data
- Using a simple sort is a quick solution to dividing up this massive volume into manageable groups

Finding a transaction



```
//S1       EXEC PGM=SORT
//SYSOUT   DD   SYSOUT=*
//SORTIN   DD   DISP=SHR,DSN=*.SEL.OUTDD1
//SORTOUT  DD   DISP=(,CATLG),DCB=(RECFM=VBS,BLKSIZE=4096,LRECL=32760),
//              DSN=ELKINSC.SMFCSQ5.AUG01A.OUT,
//              SPACE=(CYL,(10,10))
//SYSIN    DD   *
  OPTION VLSHRT
  INCLUDE COND=(109,4,CH,EQ,C'ABCD')
  SORT FIELDS=(109,4,BI,A)
/*
```

Finding a Batch job



```
//SYSOUT   DD   SYSOUT=*
//SYSUDUMP DD   SYSOUT=*
//SYSIN  DD *
  OPTION VLSHRT
  INCLUDE COND=(73,8,CH,EQ,C'MOVER   '
  SORT FIELDS=(19,4,CH,A)
/*
//
```

Summary

- Performing your own periodic MQ health checks can help you focus on existing issues, or sharpen your foretelling.

- Thank you

This was session ???? - The rest of the week ……

	Monday	Tuesday	Wednesday	Thursday	Friday
08:30			MQ for z/OS, Using and Abusing New Hardware and the New v8 Features	Nobody Uses Files Any More Do They? New Technologies for Old Technology, File Processing in MQ MFT and IIB	Monitoring and Auditing MQ Securing MQ Initiated CICS Workload
10:00	Introduction to MQ - Can MQ Really Make My Life Easier?	MQ for z/OS: The Insider Story	IBM Integration Bus MQ Flexibility	Common Problems and Problem Determination for MQ z/OS	IBM MQ and IBM Integration Bus - from Migration and Maintenance to Continuous Enhancements, How and Why to Stay Current
11:15	Introduction to IBM Integration Bus on z/OS	Introduction to the New MQ Appliance	MQ V8 Hands-on Labs! MQ V8 with CICS and COBOL! MQ SMF Labs!		
12:15					
1:45	What's New in the Messaging Family - MQ v8 and More		Getting Started with Performance of MQ on z/OS	IBM MQ: Are z/OS & Distributed Platforms Like Oil & Water?	
3:15	What's New in IBM Integration Bus	Live!: End to End Secu y You Are HERE! Application Programmi g with MQ Verbs	Digging into the MQ SMF Data	MQ Parallel Sysplex Exploitation, Getting the Best Availability from MQ on z/OS by Using Shared Queues	
4:30	MQ Security: New v8 Features Deep Dive	Live!: What's the Cloud Going to Do to My MQ Network? The Do's and Don'ts of IBM Integration Bus Performance	Giving It the Beans: Using IBM MQ as the Messaging Provider for JEE Applications in IBM WebSphere Application Server	Challenge the MQ & IIB Experts?	