MQ V8
Channel Accounting for a client Lab
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Lab Objectives

This lab is to introduce the new channel accounting System Management Facility (SMF) data from a client application. This data is captured in the SMF 116 subtype 10 records.

Prior to MQ V8 the information available about the channels was limited to what could be found in the SMF 116 class 3 task records. This lab will include relating the channel account records to the task records.

This lab does not include gathering the data. The data has been gathered in another environment.

The tests were using direct client connections to queue manager. Each test included multiple executions of amqsputc and amqsgetc to queues defined in below and above the bar buffer pools.

An example of the test bat files look as follows:

```
set MQSERVER=SHARE.SVRCON01/TCP/wtsc61.itso.ibm.com(1521)
amqsputc SHARE.TEST.PS02 CSQ5 <c:\TEST_MSg_IN.txt
amqsgetc SHARE.TEST.PS02 CSQ5 >c:\SHARE_TEST_PS02_MSg_OUT.txt
amqsputc SHARE.TEST.PS02 CSQ5 <c:\TEST_MSg_IN.txt
amqsgetc SHARE.TEST.PS02 CSQ5
amqsputc SHARE.TEST.PS02 CSQ5 <c:\TEST_MSg_IN.txt
amqsgetc SHARE.TEST.PS02 CSQ5
```
The TEST_MSg_IN.txt file contains 100 short messages.
The MQ Trace Settings

To gather the channel initiator statistical data the trace has to be started. This is done via the START TRACE command as shown:

+cpf START TRACE(STAT) CLASS(04)

Note that we expect the base statistic trace to always be on.

Once started the output of the display trace looks as follows:

```
RESPONSE=SC61
CSQW127I -CSQ5 CURRENT TRACE ACTIVITY IS -
 TNO TYPE CLASS DEST USERID RMDID
 01 GLOBAL 01 RES * *
 02 STAT 01,02 SMF * *
 03 STAT 04 SMF * *
 04 ACCTG 04 SMF * *
 05 ACCTG 03 SMF * *
 00 CHINIT * RES * *
END OF TRACE REPORT
```
General Lab Information and Guidelines

1) Any time the labels TEAM00 or TEAMXX are used, please replace the ‘00’ or ‘XX’ with your team ID (TEAM01 – TEAM20).
2) The passwords for the user IDs are provided by the lab leaders.
3) Any difficulty with connectivity should be reported, but please remember that the connections may be slow.
SMF116 data – reviewing the channel data

1) In the output files select the DCHS file as shown.

<table>
<thead>
<tr>
<th>SHARE</th>
<th>DCHS</th>
<th>S1</th>
<th>136 ELKINSC $ LOCAL</th>
<th>28.500</th>
<th>2M</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCHSCSV</td>
<td>S1</td>
<td>137 ELKINSC $ LOCAL</td>
<td>1</td>
<td>87</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

2) There is quite a bit of data in the detail channel accounting records. This lab will just concentrate on the information about the first SVRCONN channel from the report.

| SHARE.SVRCONN1 | 9.76.78.104 | Connection name | 9.76.78.104 |
| SHARE.SVRCONN1 | 9.76.78.104 | Channel disp | PRIVATE |
| SHARE.SVRCONN1 | 9.76.78.104 | Channel type | SVRCONN |
| SHARE.SVRCONN1 | 9.76.78.104 | Channel status | INACTIVE |
| SHARE.SVRCONN1 | 9.76.78.104 | Remote qmgr/app | Sphere MQ\bin64\amqsputc.exe |
| SHARE.SVRCONN1 | 9.76.78.104 | Channel started date & time | 2014/08/01 19:26:47 |
| SHARE.SVRCONN1 | 9.76.78.104 | Channel stopped time | 2014/08/01 19:27:03 |
| SHARE.SVRCONN1 | 9.76.78.104 | Channel status collect time | 2014/08/01 19:27:05 |
| SHARE.SVRCONN1 | 9.76.78.104 | Last MQI request time | 2014/08/01 19:27:02 |
| SHARE.SVRCONN1 | 9.76.78.104 | Active for | 15 seconds |
| SHARE.SVRCONN1 | 9.76.78.104 | Dispatcher number | 2 |
| SHARE.SVRCONN1 | 9.76.78.104 | Number of MQI requests | 104 |
| SHARE.SVRCONN1 | 9.76.78.104 | Number of persistent messages | 0 |
| SHARE.SVRCONN1 | 9.76.78.104 | Buffers sent | 106 |
| SHARE.SVRCONN1 | 9.76.78.104 | Buffers received | 108 |
| SHARE.SVRCONN1 | 9.76.78.104 | Current shared connections | 0 |
| SHARE.SVRCONN1 | 9.76.78.104 | Message data | 0 0 B |
| SHARE.SVRCONN1 | 9.76.78.104 | Persistent message data | 0 0 B |
| SHARE.SVRCONN1 | 9.76.78.104 | Non persistent message data | 0 0 B |
| SHARE.SVRCONN1 | 9.76.78.104 | Total bytes sent | 51,476 50 KB |
| SHARE.SVRCONN1 | 9.76.78.104 | Total bytes received | 53,336 52 KB |
| SHARE.SVRCONN1 | 9.76.78.104 | Bytes received/message | 512 512 B |
| SHARE.SVRCONN1 | 9.76.78.104 | Bytes sent/message | 494 494 B |
| SHARE.SVRCONN1 | 9.76.78.104 | Bytes received/second | 3,355 3 KB/sec |
| SHARE.SVRCONN1 | 9.76.78.104 | Bytes sent/second | 3,431 3 KB/sec |
| SHARE.SVRCONN1 | 9.76.78.104 | Compression rate | 0 |
| SHARE.SVRCONN1 | 9.76.78.104 | Exit time average | 0 uSec |

3) The questions that follow are from the report.
4) What is the connection name?

5) What is the channel type?

6) How long was the channel active?

This information can be very helpful when looking for clients that should be using persistent connections, but are not.

7) How many MQ API requests were made?
8) What queue manager or program was used?

9) Each execution of the amqsputc program puts 100 messages to the queue. What MQ API calls might make up the difference between that number and the count of API calls reported?

10) What was the dispatcher number used for this channel? ________________

11) Search the file, were there other dispatcher tasks used? ________________
    One note the dispatcher number in this report differs from the channel initiator statistics report, this is being corrected. On the statistics the report numbers the dispatchers from 0, on this report from 1.

12) Were there any persistent messages? ___________________________

13) At this time the CSV file is not being populated.
SMF116 data – Equating the channel data with the task information

The channel data can be quite useful by itself, but it is anticipated that most often it will be used in conjunction with the detailed task accounting data to get a full picture of what queues are being used. This is especially true for client connections. In this section the associated task data will be reviewed.

1) Split the TSO screen using the F2 key, if it is not already split.
2) Navigate to the SDSF ST panel on the second screen, and select the SMF print output.
3) Select TASK output as shown.

```
  TASKSUM  S1  117 ELKINS  $ LOCAL  2
    TASK   S1  118 ELKINS  $ LOCAL  53,249
   TASKCSV  S1  120 ELKINS  $ LOCAL  14
```

4) The display should look something like this:

```
Task statistics

  1 SC61,CS05,2014/08/01,15:26:17,VRM:800.
  1 CS05 MOVER Jobname:CS05CH1N Userid:STC
  1 Start time Aug 1 15:26:18 2014 Started this interval
  1 Interval Aug 1 15:26:18 2014 - Aug 1 15:26:18 2014 : 0.002318 seconds
  1 Other reqs : Count 0
  1 Other reqs : Avg elapsed time 0 uS
  1 Other reqs : Avg CPU 0 uS
  1 Other reqs : Total ET 0.000075 Seconds
  1 Other reqs : Total CPU 0.000075 Seconds
  1 Commit count 0
  1 Commit avg elapsed time 0 uS
  1 Commit avg CPU time 0 uS
  1 Backout count 1
  1 Backout avg elapsed time 47 uS
  1 Backout avg CPU time 47 uS
  1 Suspend Count 1
```

5) Search for the connection name found in the previous section in the task file.

```
SDSF OUTPUT DISPLAY ELKINSQ4 JOBID:0277 D3ID:118 LINE 0 COMMAND INPUT ==> F 9.76.78.104
****************************************************************************** TOP OF DATA ***********
Task statistics

  1 SC61,CS05,2014/08/01,15:26:17,VRM:800,
  1 CS05 MOVER Jobname:CS05CH1N Userid:STC
```
6) The connection name is not unique in either file, but is the one relationship that can be easily spotted between the two types of data. In a production environment the relationship between the task records and the channel records might be more difficult to establish. Especially because the records are produced at different times.

7) The results of the find command should look like this:

```
19 Channel SHARE.SVRCONN1 9.76.78.104
19 Start time Aug 1 15:24:32 2014 Started this interval
19 Other reqs : Count 3
19 Other reqs : Avg elapsed time 20 uS
19 Other reqs : Avg CPU 17 uS
19 Other reqs : Total ET 0.000061 Seconds
19 Other reqs : Total CPU 0.000053 Seconds
19 > Latch 24, Total wait 0 uS, Waits 1, Name LMXL1
19 > Latch 24, Avg wait 0 uS, Max 0 uS, LMXL1
19 Avg Latch time per UOW 0 uS
19 Commit count 1
19 Commit avg elapsed time 3 uS
19 Commit avg CPU time 3 uS
19 Backout count 1
19 Backout avg elapsed time 47 uS
19 Backout avg CPU time 47 uS
19 Open name SHARE.TEST.PS02
19 Queue type:QLocal SHARE.TEST.PS02
```

8) The ‘19’ is an indicator of the task record. This is not the beginning of the record, page back and bring the start of the task record to the top.

```
19 SC61,CSQ5,2014/08/01,15:28:28,VRM:800,
19 CSQ5 HOVER Jobname:CSQ5CHIN Userid:STC
19 Channel SHARE.SVRCONN1 9.76.78.104
19 Start time Aug 1 15:24:32 2014 Started this interval
19 Other reqs : Count 3
19 Other reqs : Avg elapsed time 20 uS
19 Other reqs : Avg CPU 17 uS
19 Other reqs : Total ET 0.000061 Seconds
19 Other reqs : Total CPU 0.000053 Seconds
19 > Latch 24, Total wait 0 uS, Waits 1, Name LMXL1
19 > Latch 24, Avg wait 0 uS, Max 0 uS, LMXL1
19 Avg Latch time per UOW 0 uS
19 Commit count 1
19 Commit avg elapsed time 3 uS
19 Commit avg CPU time 3 uS
19 Backout count 1
19 Backout avg elapsed time 47 uS
19 Backout avg CPU time 47 uS
```
9) The task record gives a great deal of detail about all that happened during the channel activity, and the resources used. The following questions are from the task record and will require paging thru the entire record.
10) Was the channel started during this interval? ____________
11) Was there a commit done? ____________________
12) What was the CPU time associated with the one backout request? ________________
13) What queue name was referenced in this task? _______________________________
14) How many MQPUT requests were issued, and what was the average CPU time? ________________
15) How big were the messages? ________________________________
16) What was the maximum current depth during this task? ________________________________
17) What was the total CPU time used during this task? ________________________________
18) What bufferpool and pageset are reported for the queue? ________________________________

Please note that this information is not accurate, but until some type of internal queue manager processing is done, the logic to populate these fields has not been executed.