MQ V8
Channel Accounting for a client Lab

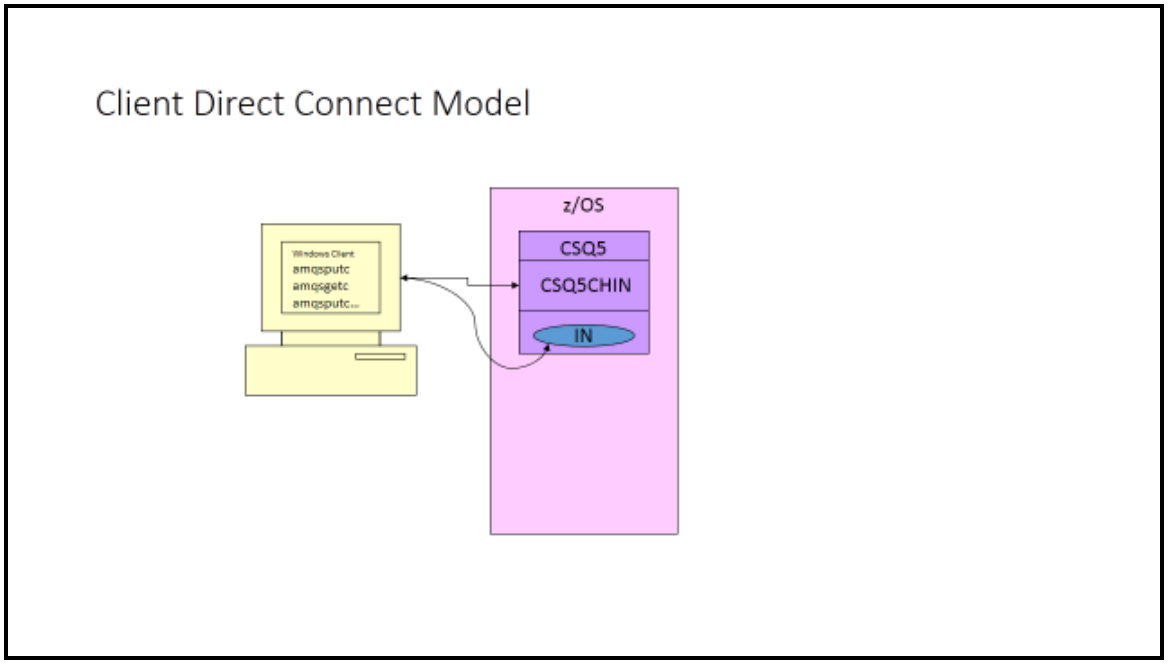
Lab Objectives

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
```

```
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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   RMID
 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.

```
      DCHSSUM  S1              135 ELKINSC  S LOCAL            53            3,186  1
s_    DCHS     S1              136 ELKINSC  S LOCAL        28,500              2M     1
      DCHSCSV  S1              137 ELKINSC  S LOCAL             1              97  1
```

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.SVRCON01       9.76.78.104     Connection name              9.76.78.104
SHARE.SVRCON01       9.76.78.104     Channel disp                 PRIVATE
SHARE.SVRCON01       9.76.78.104     Channel type                 SVRCONN
SHARE.SVRCON01       9.76.78.104     Channel status               INACTIVE
00000000 : CD8A6A79 00000000                  ò«¦`....          ..jy....
SHARE.SVRCON01       9.76.78.104     Remote qmgr/app              Sphere MQ\bin64\amqsputc.exe
SHARE.SVRCON01       9.76.78.104     Channel started date & time  2014/08/01,19:26:47
SHARE.SVRCON01       9.76.78.104     Channel stopped time         2014/08/01,19:27:03
SHARE.SVRCON01       9.76.78.104     Channel status collect time  2014/08/01,19:27:05
SHARE.SVRCON01       9.76.78.104     Last MQI request time        2014/08/01,19:27:02
SHARE.SVRCON01       9.76.78.104     Active for                      15 seconds
SHARE.SVRCON01       9.76.78.104     Dispatcher number                    2
SHARE.SVRCON01       9.76.78.104     Number of MQI requests             104
SHARE.SVRCON01       9.76.78.104     Number of persistent messages        0
SHARE.SVRCON01       9.76.78.104     Buffers sent                       106
SHARE.SVRCON01       9.76.78.104     Buffers received                   108
SHARE.SVRCON01       9.76.78.104     Current shared connections           0
SHARE.SVRCON01       9.76.78.104     Message data                         0     0  B
SHARE.SVRCON01       9.76.78.104     Persistent message data              0     0  B
SHARE.SVRCON01       9.76.78.104     Non persistent message data          0     0  B
SHARE.SVRCON01       9.76.78.104     Total bytes sent                51,476    50 KB
SHARE.SVRCON01       9.76.78.104     Total bytes received            53,336    52 KB
SHARE.SVRCON01       9.76.78.104     Bytes received/message             512   512  B
SHARE.SVRCON01       9.76.78.104     Bytes sent/message                 494   494  B
SHARE.SVRCON01       9.76.78.104     Bytes received/second            3,555     3 KB/sec
SHARE.SVRCON01       9.76.78.104     Bytes sent/second                3,431     3 KB/sec
SHARE.SVRCON01       9.76.78.104     Compression rate                     0
SHARE.SVRCON01       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?

   _____

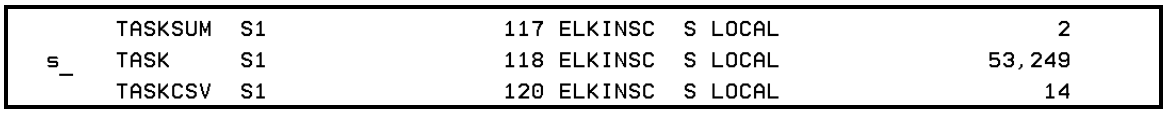
8) What queue manager or program was used?
   _____
9) Each execution of the amqsputc program puts 100 messages to the queue. What MQ API calls might make up the difference between that number and the count of API calls reported?
   _____

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

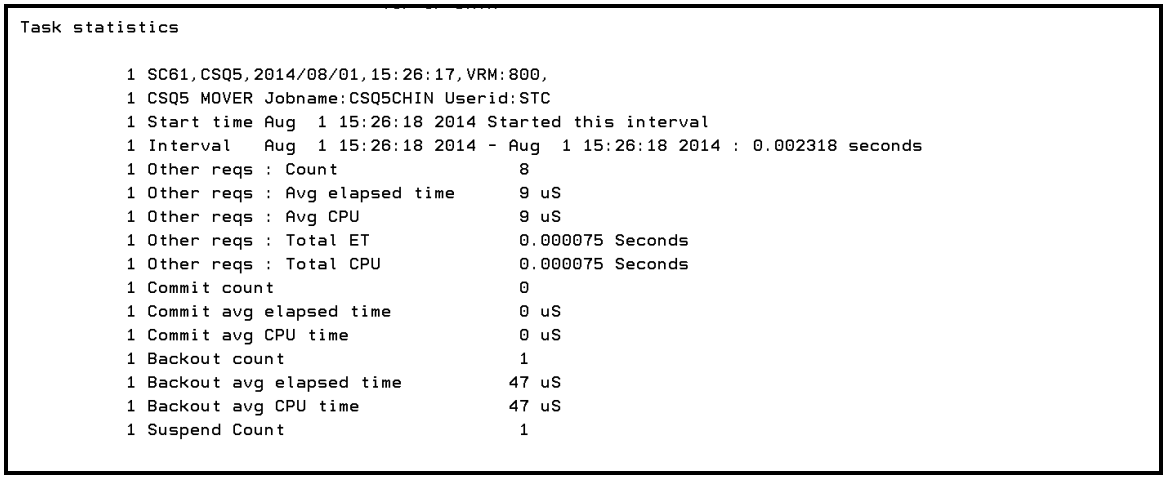
The channel data can be quite useful by itself, but it is anticipated that most often it will be used in conjunction with the detailed task accounting data to get a full picture of what queues are being used. This is especially true for client connections. In this section the associated task data will 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 ELKINSC  S LOCAL                    2
 s_   TASK     S1                118 ELKINSC  S LOCAL               53,249
      TASKCSV  S1                120 ELKINSC  S LOCAL                   14
```

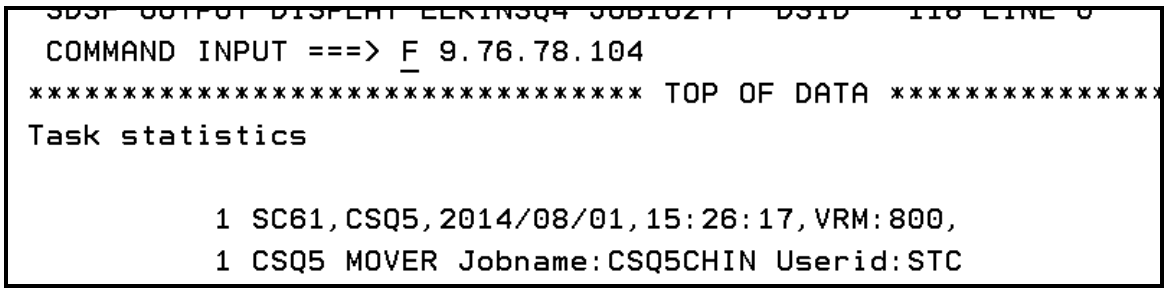
4) The display should look something like this:



```
Task statistics

         1 SC61,CSQ5,2014/08/01,15:26:17,VRM:800,
         1 CSQ5 MOVER Jobname:CSQ5CHIN 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                8
         1 Other reqs : Avg elapsed time     9 uS
         1 Other reqs : Avg CPU              9 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.



```
 COMMAND INPUT ===> F 9.76.78.104
******************************** TOP OF DATA ***************
Task statistics

         1 SC61,CSQ5,2014/08/01,15:26:17,VRM:800,
         1 CSQ5 MOVER Jobname:CSQ5CHIN 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.SVRCON01       9.76.78.104
19 Start time Aug  1 15:24:32 2014 Started this interval
19 Interval   Aug  1 15:24:32 2014 - Aug  1 15:26:27 2014 : 114.966568 seconds
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,CSQ5,2014/08/01,15:26:26,VRM:800,
19 CSQ5 MOVER Jobname:CSQ5CHIN Userid:STC
19 Channel SHARE.SVRCON01       9.76.78.104
19 Start time Aug  1 15:24:32 2014 Started this interval
19 Interval   Aug  1 15:24:32 2014 - Aug  1 15:26:27 2014 : 114.966568 seconds
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.