Problem Determination using JES logs

Audience level: knowledge of MQ or z/OS
Skillset: z/OS Systems Programming, MQ Administration

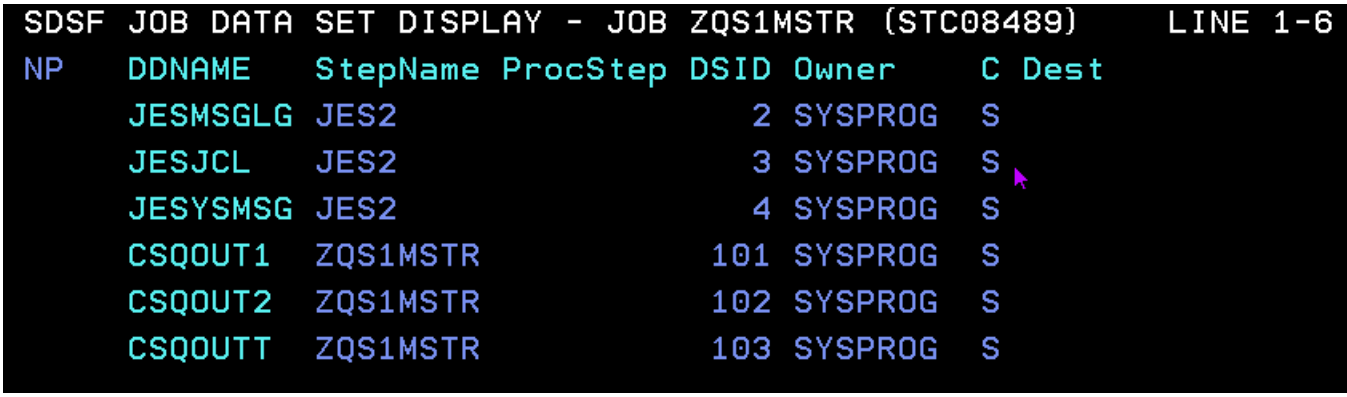
Introduction

This lab is designed to be an introduction to problem determination and fixes. It will use the Queue Manager JES log for PD and to verify the solution, and CSQUTIL to enter the corrective commands.

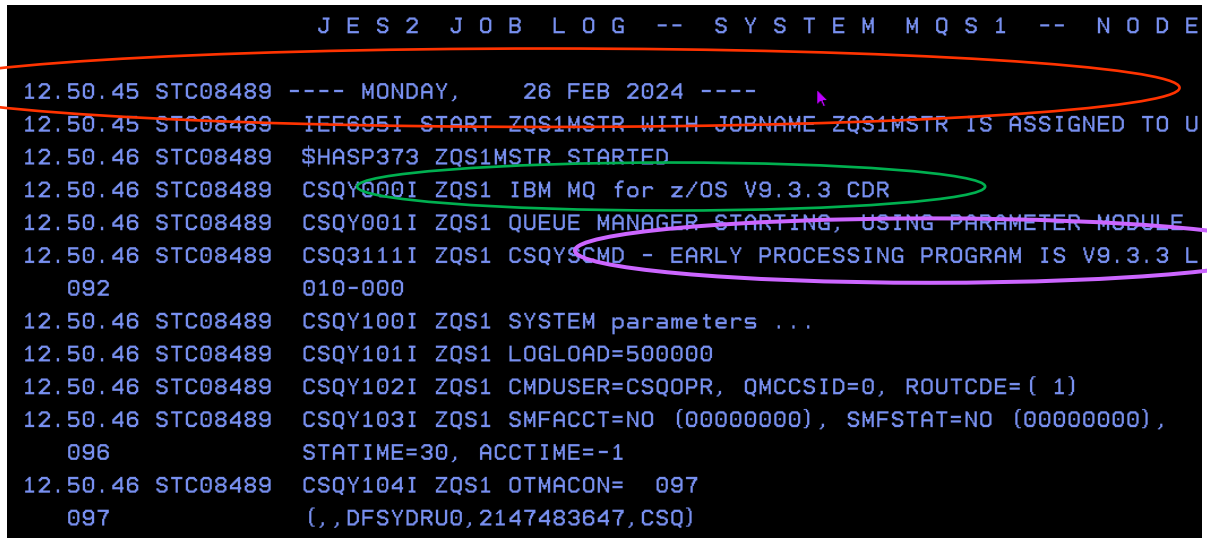
Lab Steps

1) If you have shut down the PCOMM connection to the MQS1 LPAR, please refer back to Lab 1 to re-establish the connection.
2) From the SDSF DA panel, please use a '?' (question mark) beside the ZQS1MSTR running instance, as shown.

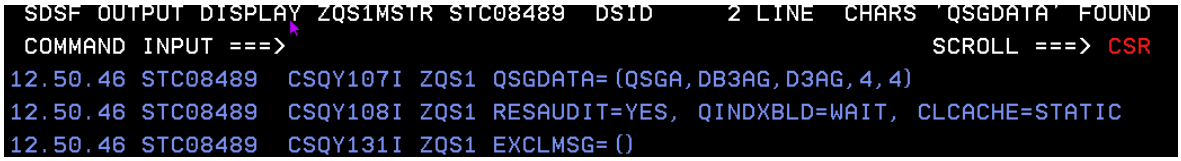
3) The outputs from the queue manager steps (from start-up thru anything going on right now) are displayed.



4) Use an 's' under the 'NP' column to select the JESMSGLG. First we will look at some general information about the queue manager that shows up during queue manager start-up:
    a. Some important bits of information about the queue manager are in the very first part of the display. When doing problem determination it can be critical to know some of the details found here:



b. The first piece of information is the start-up date and time (circled in Orange above). This can be especially helpful if the queue manager was supposed to have been cycled or started recently but shows an older date and or time.
c. The version of the queue manager is next, in this case showing that we are on V 9.3.3 – the Continuously Delivery release. It is circled in Green. Note that what you may see will indicate a higher CD version that this.
d. The early code version is also given, and is circled in purple. Quite regularly this is at a higher version level than the queue manager code, as when migrating between releases and CD versions the early code version is applied first.
e. The system parameters are next – this contains the 'z-parms' or the results of the assembly and link of the macros that direct the queue manager start-up. In this case we are looking for the QSGDATA, to make sure it is correct for this queue manager instance.
f. Entering "F QSGDATA" on the command line and hitting the enter key finds that queue manager attribute. It should look as follows:



These attributes are the Queue Sharing Group (QSG) name, or QSGA; the Db2 data sharing group name, or DB3AG; the Db2 group attach name, or D3AG; the number of Db2 server threads to start, which defaults to 4; and the number of Db2 Blob tasks to start, which again defaults to 4.

g. Enter F 'RESTART COMPLETED' command to make sure the queue manager was successful in the start-up. It should show up like this:

```
 SDSF OUTPUT DISPLAY ZQS1MSTR STC08489  DSID     2 LINE  CHARS 'COMPLETE' FOUND
 COMMAND INPUT ===>                                        SCROLL ===> CSR
13.01.29 STC08489  CSQR002I ZQS1 RESTART COMPLETED
13.01.29 STC08489  CSQP018I ZQS1 CSQPBCKW CHECKPOINT STARTED FOR ALL BUFFER POOL
13.01.29 STC08489  CSQP019I ZQS1 CSQPDWP2 CHECKPOINT COMPLETED FOR BUFFER  401
   401             POOL 1, 2 PAGES WRITTEN
```

h. There may be these error messages following the RESTART COMPLETED messages. They need to be addressed, as lengthy times between the BACKUP CFSTRUCT commands will impact a queue manager's resilience. Note which structures need to be backed-up (I do not believe there are 4, but you have the space):

_____

_____

_____

_____

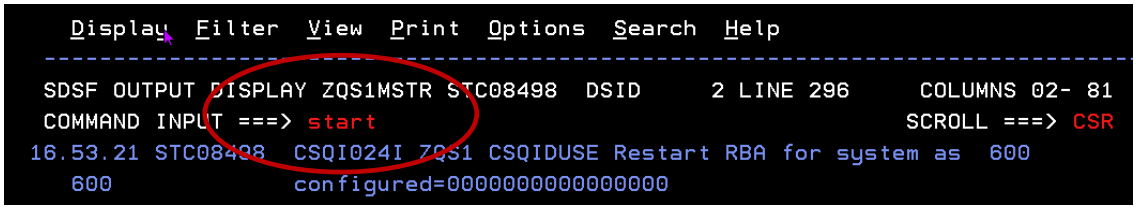
i. To back-up the Coupling facility structures, commands can be entered directly into the queue manager, like the +cpf START QMGR command, or we can use a batch job to send the commands to the queue manager. The advantage to the batch job is that is can be used again. Before building the batch job, let's look for another error to correct.

j. In the JESMSGLG for the queue manager, search for SYSTEM.QSG.TRANSMIT.QUEUE. You might see this:

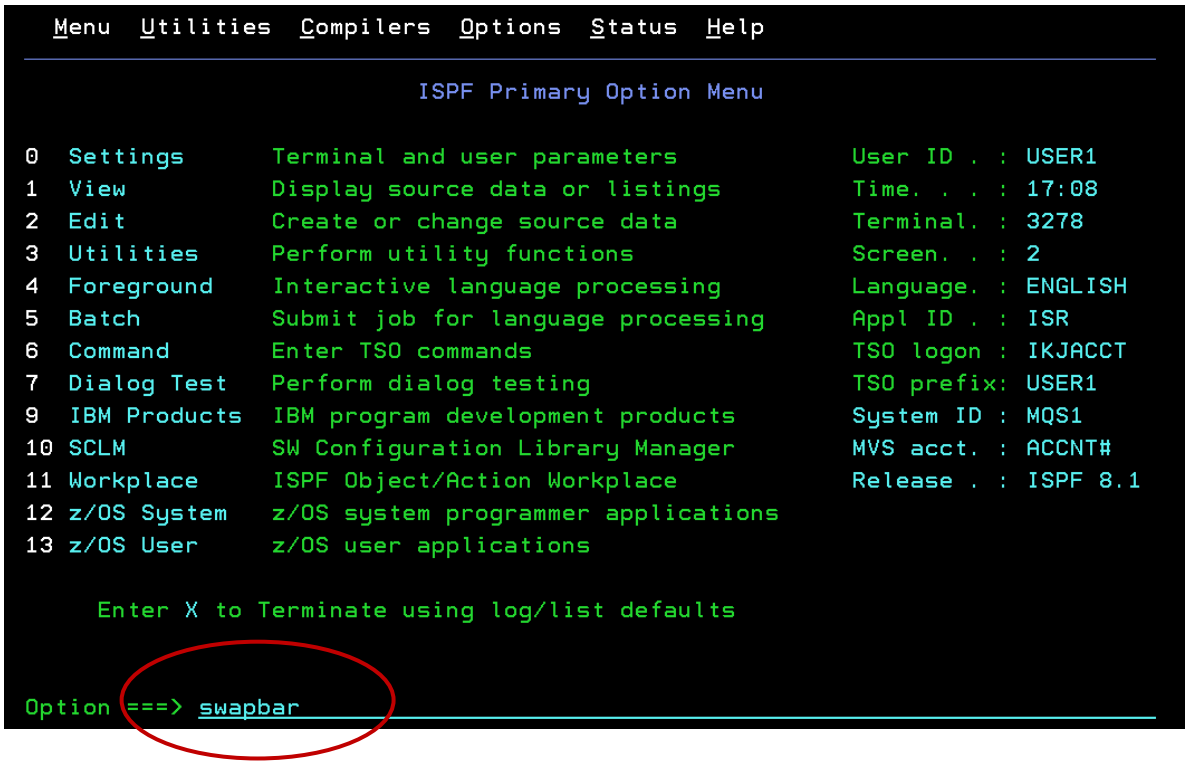
```
16.53.21 STC08498  CSQM056E ZQS1 CSQMIGQA MQOPEN failed for queue  606
   606             SYSTEM.QSG.TRANSMIT.QUEUE, MQRC=2085 (MQRC_UNKNOWN_OBJECT_NAM
```

What this means is that a standard SYSTEM queue used for QSGs has not been defined. It should be defined in these test environments, just in case there is a need to test the QSG transmission option.

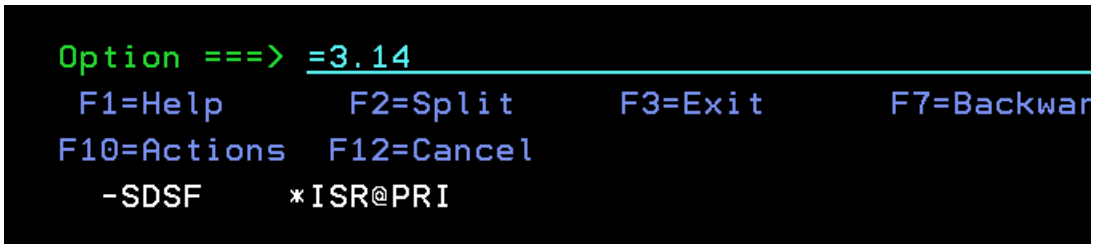
k. To make things a bit easier, please enter the START command on the command line. This will start a 2nd session, allowing a split screen so to reduce the typing necessary.



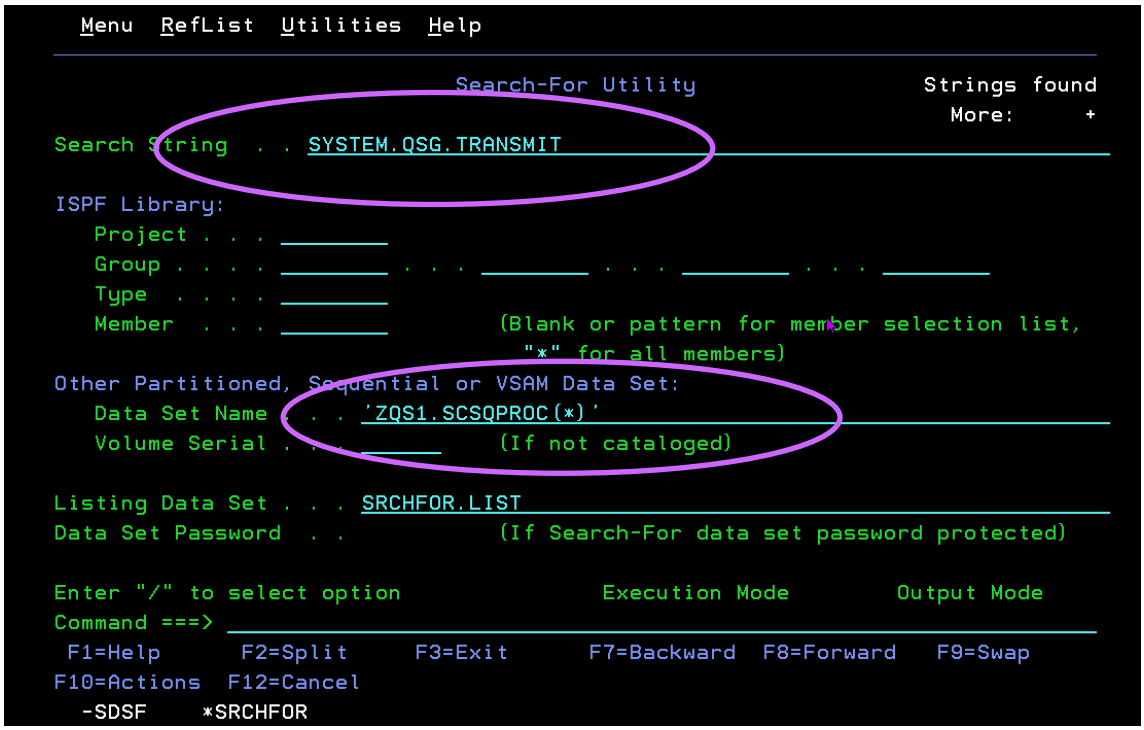
l. When the normal ISPF Primary Options menu appears, use the command 'swapbar.' This will display the sessions, allowing an easy toggle method between them.



m. The swapbar looks like what is shown, the sessions are in white on these displays (- before the session type shows the last session used, the * indicates the current session). To toggle between the sessions, put the cursor on your selection and use the enter key. On the command line, enter an '=3.14' (without the quotes) to help find the missing queue definition. This will take us to the 'Search for' facility.

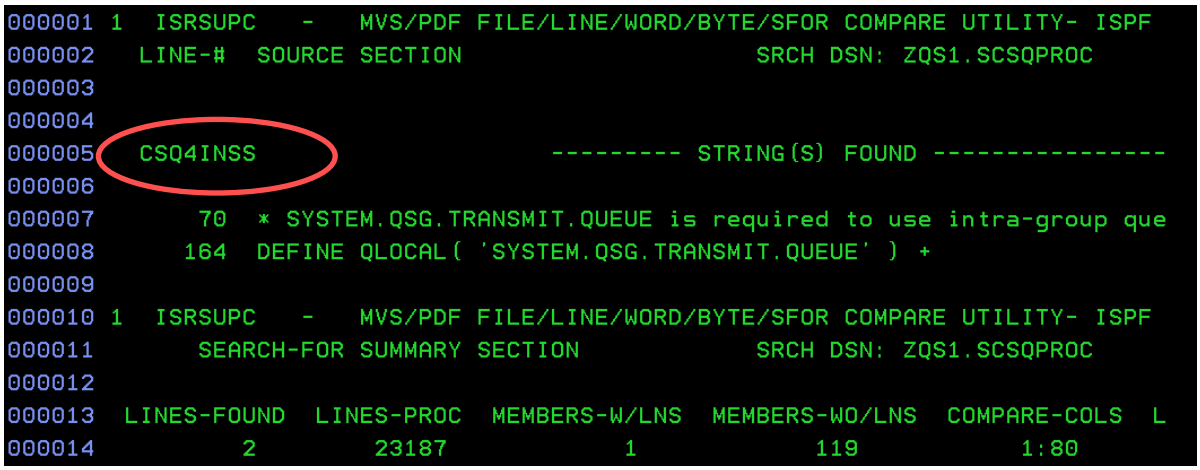


n. To search for the missing queue name, please enter the partial queue name (copy from the SDSF session where it was found) and search the SCSQPROC library for this queue manager.

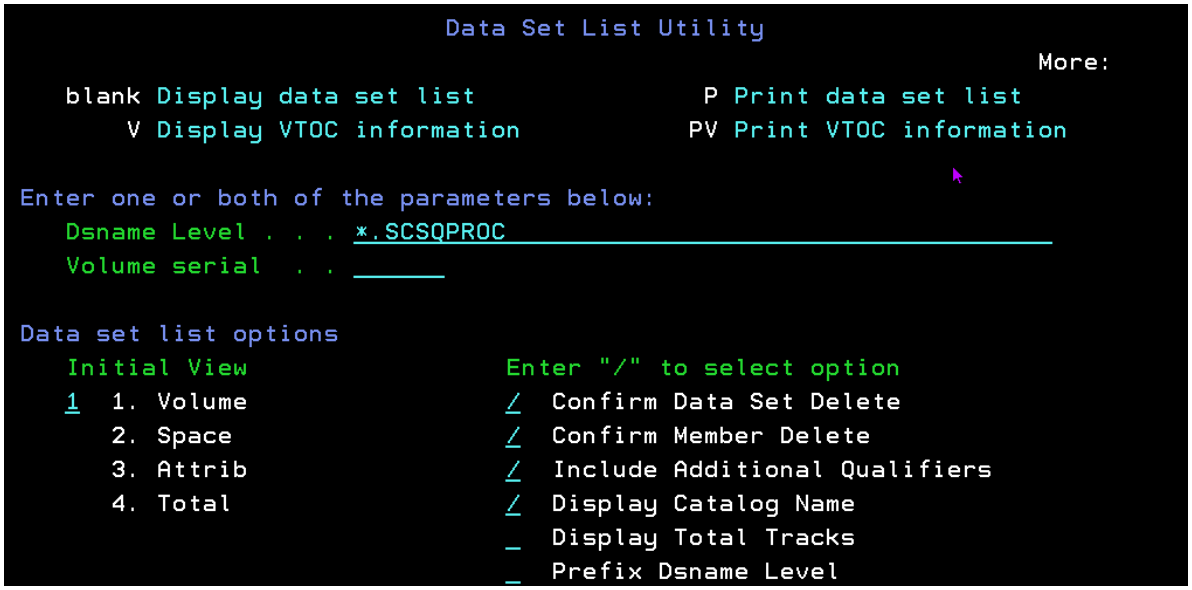


The search string is the partial name of the queue, as it does not have any blanks or special characters it does not require quotes. The dataset name must be in quotes and the member specified as (*) to search every member in the PDS.

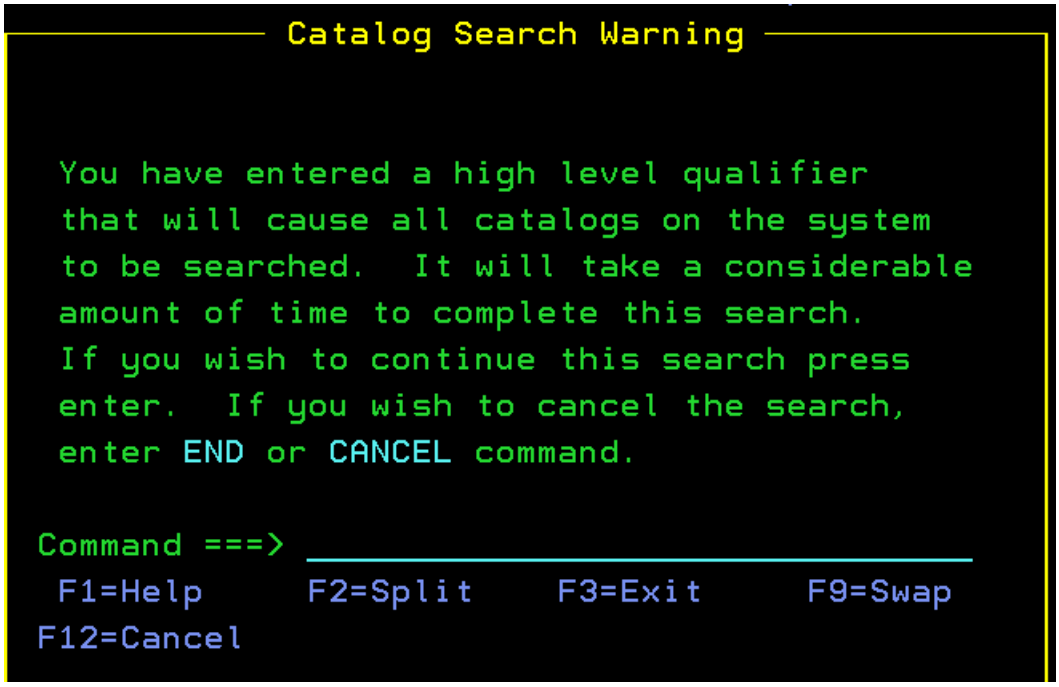
o. The search command returns one member, so it should be easy to add this queue or correct the issue with its definition. Please make a note of this member name.



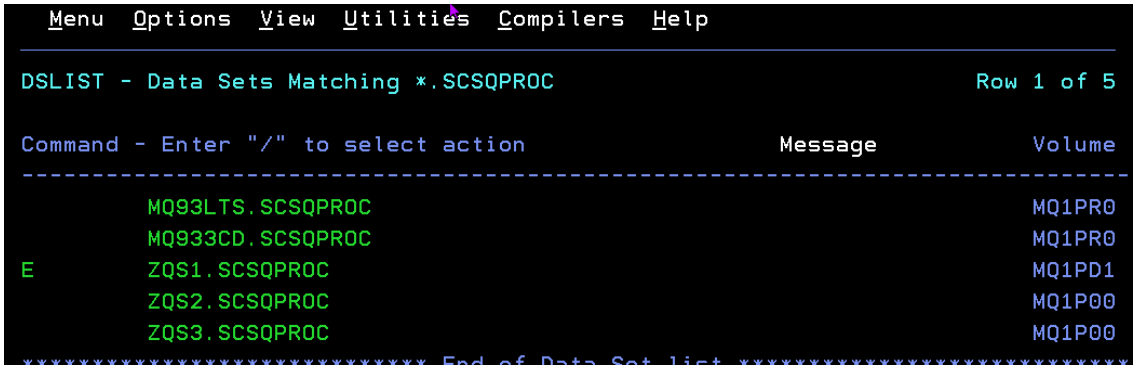
p. Enter '=3.4' on the command line (no quotes) and use the enter key to navigate to the Dataset List Utility. On this panel enter the data set name level as *.SCSQPROC, please do not use quotes and once again use the enter key.



q. You will see the following warning, please just use the enter key again to get the list.



r. The list of datasets includes the base libraries for both the LTS and CD versions of MQ, as well as the libraries created for the individual queue managers. In this case we are going to edit the ZSQ1.SCSQPROC library. Please put an E in the Command column by the dataset name and use the enter key to bring up the list of members



s. Select the member containing the queue definition:

```
          CSQ4BCPD
Command ===> s CSQ4INSS                                          Scro
 F1=Help     F2=Split    F3=Exit     F5=Rfind    F7=Up       F8=Down
```

t. As this member is typically included in the queue manager CSQINP2 concatenation, it may be that there is an error in the queue definition. Find the SYSTEM.QSG.TRANSMIT queue definition using the Find command as shown:

```
EDIT       ZQS1.SCSQPROC(CSQ4INSS) - 01.00                Columns 00001
****** ********************************* Top of Data ************************
000001 ************************************************************************
000002 *
000003 * IBM MQ for z/OS
000004 *
000005 * NAME: CSQ4INSS
000006 *
000007 * CSQINP2 sample for SYSTEM objects for queue-sharing groups
000008 *
000009 ************************************************************************
000010 *
000011 * <copyright
000012 * notice="lm-source"
000013 * pids="5655-MQ9"
000014 * years="1993,2022"
000015 * crc="248478253" >
000016 * Licensed Materials - Property of IBM
Command ===> f SYSTEM.QSG.TRANSMIT                          Scroll ===>
```

u. The first instance of the name is not the definition, but in the comments. Use the F5 key to search again.

```
EDIT       ZQS1.SCSQPROC(CSQ4INSS) - 01.00          CHARS 'SYSTEM.QSG.TRANSM
000069 * SYSTEM.QSG.CHANNEL.SYNCQ is required to use shared channels.
000070 * SYSTEM.QSG.TRANSMIT.QUEUE is required to use intra-group queueing.
000071 * SYSTEM.QSG.UR.RESOLUTION.QUEUE is required to use transactions
000072 *   with a GROUP unit of recovery disposition - it must reside on
000073 *   the CSQSYSAPPL CF structure.
```

After using the F5 key the queue definition should be displayed:

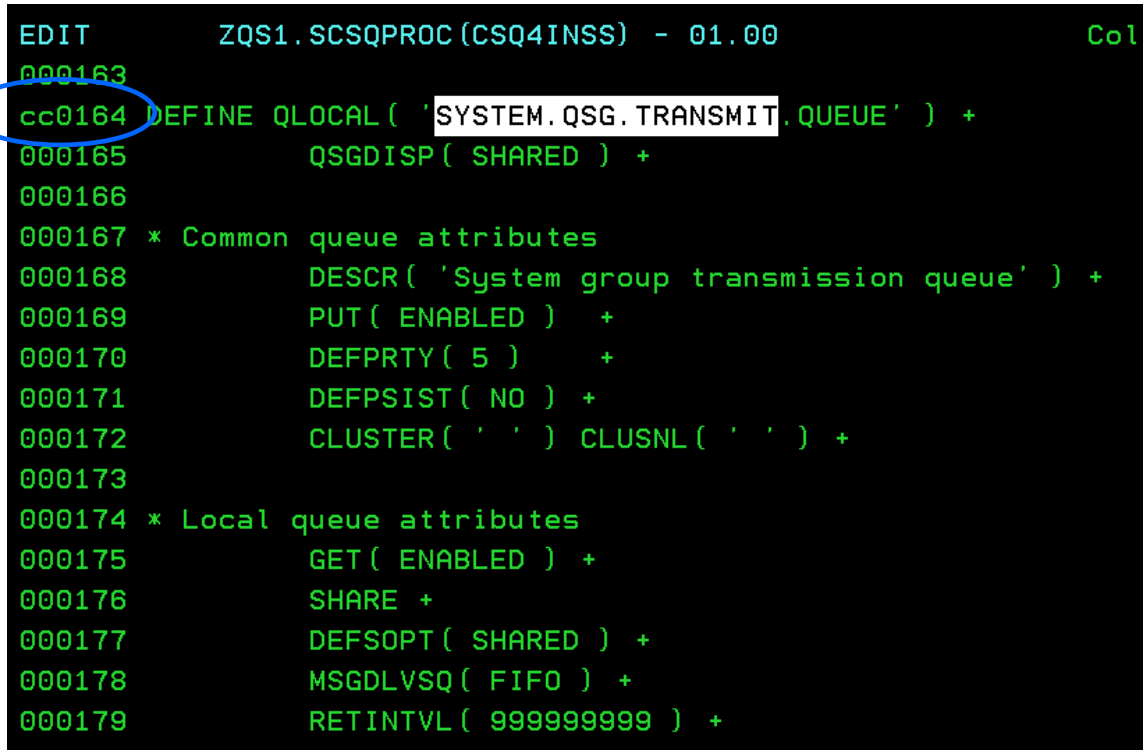
```
EDIT       ZQS1.SCSQPROC(CSQ4INSS) - 01.00            CHARS 'SYSTEM.QSG.T
000163
000164 DEFINE QLOCAL( 'SYSTEM.QSG.TRANSMIT.QUEUE' ) +
000165          QSGDISP( SHARED ) +
000166
000167 * Common queue attributes
000168          DESCR( 'System group transmission queue' ) +
000169          PUT( ENABLED )  +
000170          DEFPRTY( 5 )    +
000171          DEFPSIST( NO ) +
000172          CLUSTER( ' ' ) CLUSNL( ' ' ) +
000173
000174 * Local queue attributes
000175          GET( ENABLED ) +
000176          SHARE +
000177          DEFSOPT( SHARED ) +
000178          MSGDLVSQ( FIFO ) +
000179          RETINTVL( 999999999 ) +
```

v. Other definitions from this member were accepted by the queue manager, so there must be an error/typo in this one queue. Use the F8 key to page forward, and the error is easy to spot- the CF structure declaration is incorrect. It still contains the ++ variable name for the CF structure. To fix this, a new member shall be created to contain the corrected definition and used as input to a batch update job known as CSQUTIL.

```
EDIT       ZQS1.SCSQPROC(CSQ4INSS) - 01.00              Columns 00001 00072
000180          MAXDEPTH( 999999999 ) +
000181          MAXMSGL( 64512 ) +
000182          NOHARDENBO +
000183          BOTHRESH( 0 ) +
000184          BOQNAME( ' ' ) +
000185          STGCLASS( ' ' ) +
000186          USAGE( XMITQ ) +
000187          INDXTYPE( CORRELID ) +
000188          CFSTRUCT( '++cfstructure++' ) +
000189          MONQ( OFF ) ACCTQ( OFF ) STATQ( OFF ) +
000190          STREAMQ( ' ' ) STRMQOS( BESTEF ) +
```

w. Use the F7 key to page back to the beginning of the queue definition. On the 'Define QLOCAL' line, use 'cc' in the line number to indicate a copy of multiple

lines as shown.



x. Page forward until the last line of the queue definition is shown (usually 2 F8 keystrokes), enter 'cc' in the line number and the command 'create QSGDEF' as shown. Use the enter key to complete the command.

```
EDIT       ZQS1.SCSQPROC(CSQ4INSS) - 01.00            Block command in
000197           QDEPTHLO( 40 ) +
000198           QSVCIEV( NONE ) +
000199           QSVCINT( 999999999 ) +
000200
000201 * Trigger attributes
000202           NOTRIGGER +
000203           TRIGTYPE( NONE ) +
000204           TRIGMPRI( 0 ) +
000205           TRIGDPTH( 1 ) +
000206           TRIGDATA( ' ' ) +
000207           PROCESS( ' ' ) +
000208           INITQ( ' ' )
cc0209
000210 ************************************************
000211
000212 DEFINE QLOCAL( 'SYSTEM.QSG.UR.RESOLUTION.QUEUE' ) +
000213           QSGDISP( SHARED ) +
Command ===> create QSGDEF                              Scroll =
```

y. You should see `Member QSGDEF created`

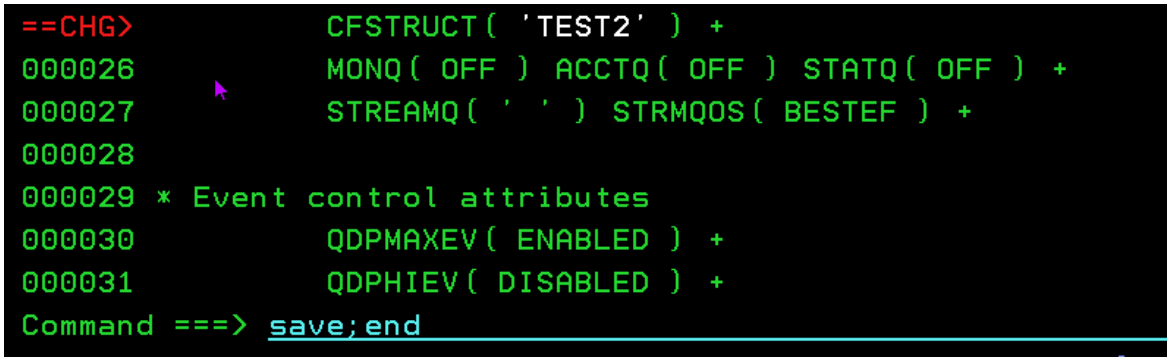
z. Use F3 to return to the member list of ZQS1.SCSQPROC and select QSGDEF using 'S qsgdef' on the command line and use the enter key.

```
_________ CSQ4IVPX
_________ CSQ4LFMT
_________ CSQ4LOGJ
Command ===> s qsgdef
```

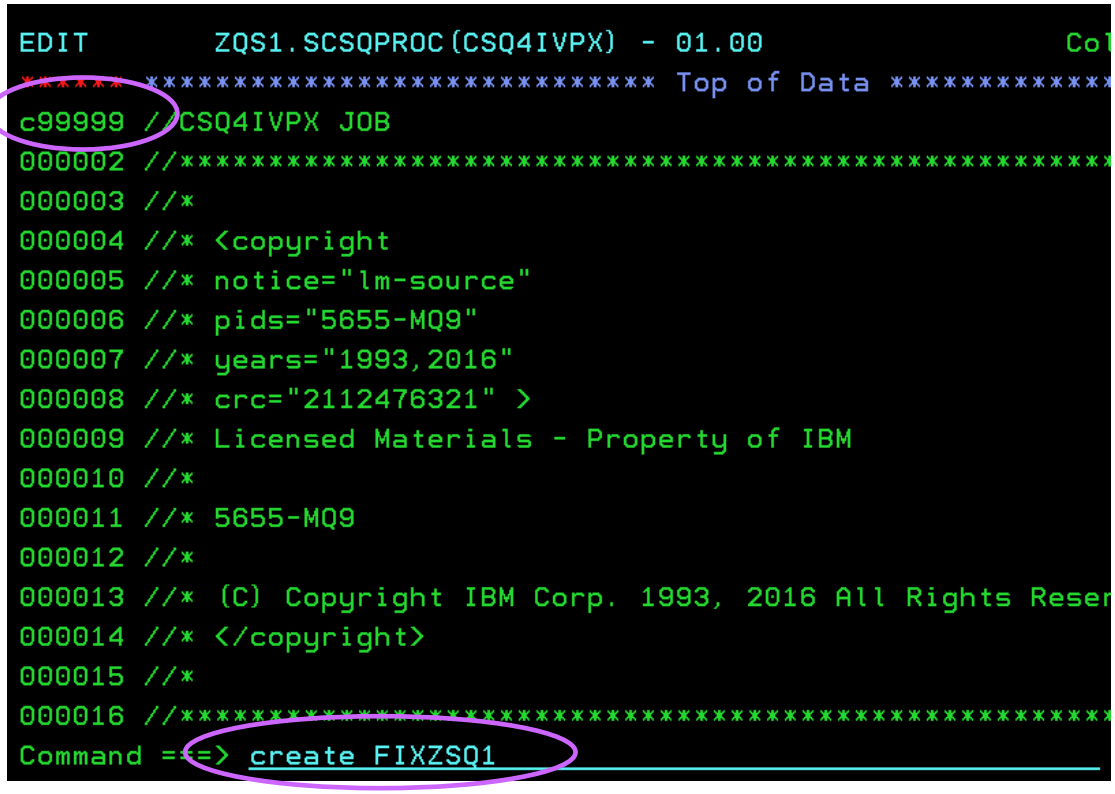
aa. Change the structure variable to TEST2, as this application CF structure is defined in this Sysplex.

```
000029 * Event control attributes
000030           QDPMAXEV( ENABLED ) +
000031           QDPHIEV( DISABLED ) +
Command ===> c ++cfstructure++ TEST2 all
```

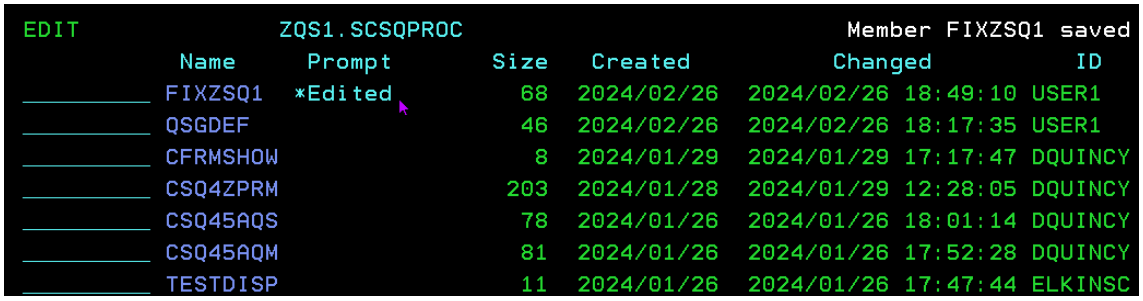
bb. Once that is changed, save the member and return to the member list. This can be done in one command 'save;end' where the semi-colon is the delimiter for commands in this environment.



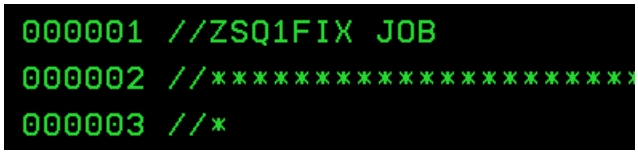
cc. The next step is to create a job using CSQUTIL to add this repaired definition and to backup the CF Structures. Start by selecting member CSQ4IVPX, copy the whole member and create member FIXZQS1.



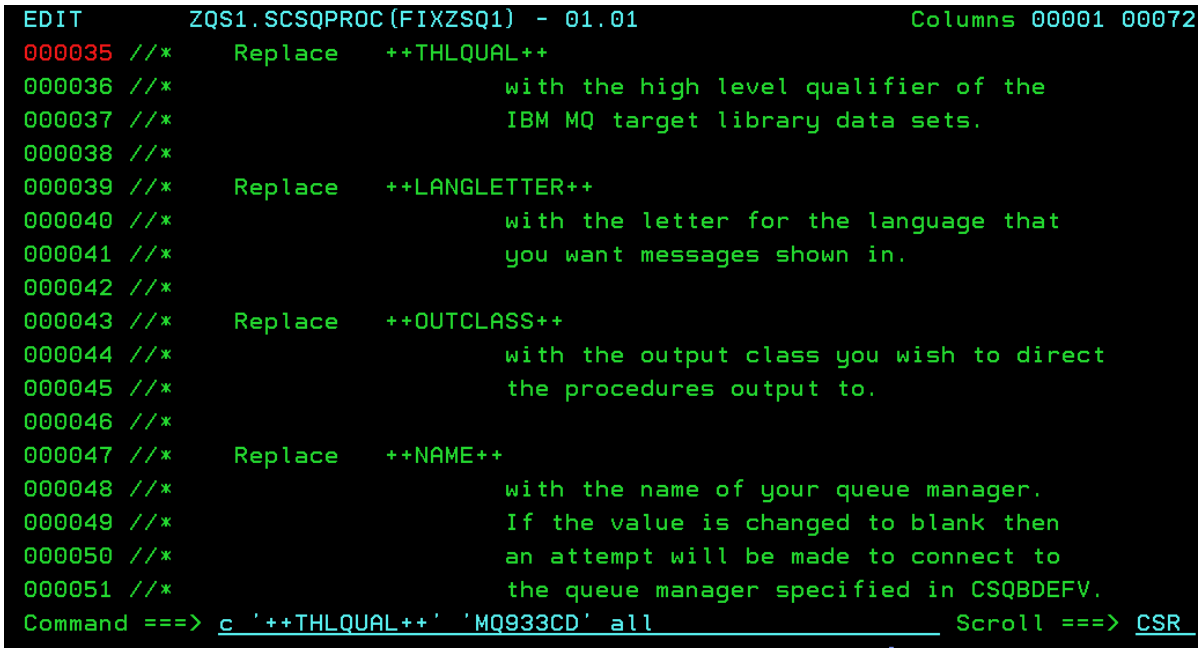
dd. End the edit session by entering 'end' on the command line. At the member list, use the command 'Refresh' to refresh the list of members. Then use the SORT CHANGED command to bring the changed members to the top. It should look something like the image below. Note that FIXZSQ1 should be first and QSGDEF should be second.



ee. Select the FIXZSQ1 member to edit it. The first thing to change is the job name, this does not have to be done, but can make it a bit simpler to find in the output.



ff. Page forward (use F8) until you get to the first ++ variable. Enter the commands below to start changing the variables for the execution of CSQUTIL.



i. Commands:
   c '++THLQUAL++' 'MQ933CD' all
   c '++LANGLETTER++' 'E' all
   c '++OUTCLASS++' '*' all
   c '++NAME++' ZQS1 all
   Save the member after these changes have been made

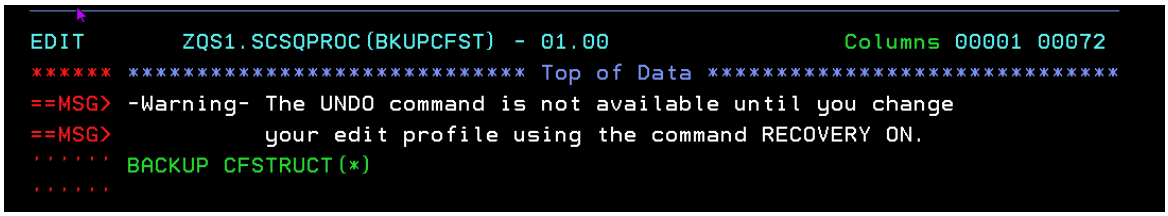
gg. Page forward until you find CSQUCMD DD statement. It will probably be around line 63 and looks like this -
   //CSQUCMD DD * line

hh. Change this line to a real data set input, to pull in the QSGDEF member. To do this, first delete the current input lines that are directives to the CHIN:
   START CHINIT
   DISPLAY CHINIT
   STOP CHINIT
   Use a D in the line number to delete them individually.

ii. Now please alter the statement to look like the DD statement below – this tells CSQUTIL where to get the commands for the queue manager. Then save the member and end. DO NOT SUBMIT IT YET. Please note that the DSN should be ZQS1.SCSQPROC(QSGDEF)

```
000062 /*
000063 //CSQUCMD   DD DISP=SHR,DSN=ZSQ1.SCSQPROC(QSGDEF)
000064 /*
000065 //
```

jj. Back on the member list, select member BKUPCFST – we will be creating this new member to contain the BACKUP CFSTRUCT command needed. This one line member looks like this:



Save the member and end to return to the list of members.

kk. Select FIXZSQ1 again and add this new member to the concatenation for input to CSQUTIL.

```
000063 //CSQUCMD   DD DISP=SHR,DSN=ZQS1.SCSQPROC(QSGDEF)
000064 //          DD DISP=SHR,DSN=ZQS1.SCSQPROC(BKUPCFST)
000065 /*
```

ll. Save and submit the member by using the 'save;submit' command stack on the command line.

mm. From the switchbar, put the cursor on SDSF and use the enter key. Use F3 to return to the options list (there may be multiple hits needed) and select ST

```
SDSF MENU 3.1    MQPLEX1   MQS1
NP   NAME     Description              Group    Status
     DA       Active users             Jobs
     I        Input queue              Jobs
     O        Output queue             Output
     H        Held output queue        Output
     ST       Status of jobs           Jobs
     JG       Job groups               JES
     SYM      System symbols           System
     LOG      System log               Log
     SR       System requests          Log
     MAS      Members in the MAS       JES
     JC       Job classes              JES
     SE       Scheduling environments  WLM
     RES      WLM resources            WLM
     ENC      Enclaves                 WLM
     PS       Processes                OMVS
     SYS      System information       System
COMMAND INPUT ===> st
```

nn. Find the ZSQ1FIX job and expand the output with a ?

```
     ZQS1MSTR STC08489 SYSPROG     1 PRINT          327
?    ZSQ1FIX  JOB08501 USER1       1 PRINT      A   329
```

oo. Select the SYSPRINT member to review the changes to the queue manager.
Warning: When using CSQUTIL the return code will be zero, even if commands have failed. It is critical to review the SYSPRINT output to make sure the changes took effect.

```
  Display  Filter  View  Print  Options  Search  Help
------------------------------------------------------------------------------
SDSF JOB DATA SET DISPLAY - JOB ZSQ1FIX  (JOB08501)    LINE 1-4 (4)
NP    DDNAME   StepName ProcStep DSID Owner    C Dest              Rec-Cnt Page
      JESMSGLG JES2                2 USER1    S LOCAL                  16
      JESJCL   JES2                3 USER1    S LOCAL                  63
      JESYSMSG JES2                4 USER1    S LOCAL                  61
s     SYSPRINT IVPX              102 USER1    S LOCAL                  61
```

pp. Note that the information about the execution is at the top of the SYSPRINT file:

```
 CSQU000I CSQUTIL IBM MQ for z/OS V9.3.3
 CSQU001I CSQUTIL Queue Manager Utility - 2024-02-26 19:55:47
 COMMAND
 CSQU127I  Executing COMMAND using input from CSQUCMD data set
 CSQU120I  Connecting to ZQS1
 CSQU121I  Connected to queue manager ZQS1
 CSQU055I  Target queue manager is ZQS1
DEFINE QLOCAL( 'SYSTEM.QSG.TRANSMIT.QUEUE' ) +
         QSGDISP( SHARED ) +
* Common queue attributes
         DESCR( 'System group transmission queue' ) +
```

qq. Page forward (F8) until the last attribute of the queue being added is shown and the reason and return codes are displayed. They should both be zero.

```
* Trigger attributes
         NOTRIGGER +
         TRIGTYPE( NONE ) +
         TRIGMPRI( 0 ) +
         TRIGDPTH( 1 ) +
         TRIGDATA( ' ' ) +
         PROCESS( ' ' ) +
         INITQ( ' ' )
CSQN205I   COUNT=        2, RETURN=00000000, REASON=00000000
CSQ9022I ZQS1 CSQMAQLC ' DEFINE QLOCAL' NORMAL COMPLETION
```

rr. Page forward again to see the output from the BACKUP CFSTRUCT command. It should look like this:

```
BACKUP CFSTRUCT(*)
CSQN205I   COUNT=       5, RETURN=00000000, REASON=00000000
CSQE105I ZQS1 CSQELRBK BACKUP task initiated for structure CSQSYSAPPL
CSQE105I ZQS1 CSQELRBK BACKUP task initiated for structure TEST1
CSQE105I ZQS1 CSQELRBK BACKUP task initiated for structure TEST2
CSQ9022I ZQS1 CSQELRBK ' BACKUP CFSTRUCT' NORMAL COMPLETION
 CSQU057I  2 commands read
 CSQU058I  2 commands issued and responses received, 0 failed
 CSQU143I  1 COMMAND statements attempted
 CSQU144I  1  statements executed successfully
 CSQU148I CSQUTIL Utility completed, return code=0
```

Congratulations! You have successfully de-bugged and fixed problems associated with an almost brand-new Queue Manager.