IMQ09 - IBM MQ V9 for z/OS Wildfire Workshop

L21 – CICS Publish/Subscribe

Version V6.0

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Lab Objectives

This lab has the following objectives:

1) To demonstrate the use of the publication and subscribing features of WMQ in a COBOL/CICS/WMQ program.
2) To give examples of different delimiters that may be used with topic strings in the z/OS environment.
3) The lab will familiarize the users with the sample transactions and programs developed for TechDoc **PRS4852**. The TechDoc may be found at: http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS4852

Due to time constraints for the session, you are not going to be asked to code a COBOL program, or even part of it, but you do have the source to review.

General Lab Information and Guidelines

- Information required to complete this exercise will be provided on a 'worksheet' prior to the start of this exercise. Refer to this worksheet for which user identity and password are to be used and for other values, for example:

  - ✓ As a reminder, when a value from your worksheet should be used, the values in the instructions will be in red rather than black.
  - ✓ ***Bold italicized*** text indicates values that need to be entered on a screen.
  - ✓ *Italicized* text indicates values that are constants or names that appear on a screen.
  - ✓ **Bold** text indicates the name of buttons or keyboard keys that need to be pressed.
  - ✓ This exercise uses data set *USER1.QSU2.JCL*.

LAB – Part 1 - Defining your resources

In this step you will be defining a number of resources to the queue manager, including process definitions and queues. This will be done by altering definitions generated by CSQUTIL MAKEDEFs to match your team ID and running the job to create the definitions.

____1. Edit data set *USER1.QSU2.JCL*.

____2. Select member *DEFMQ*.

```
//USER1DS JOB 'DEFINES',NOTIFY=&SYSUID,REGION=0M
//*
//*
//* CHANGE THE QUEUE MANAGER TO THE ONE YOUR CICS REGION CONNECTS TO
//* CHANGE THE USER1 TO YOUR TEAM ID
//*
//DEFQS    EXEC PGM=CSQUTIL,PARM='QMZ1'
//STEPLIB  DD DISP=SHR,DSN=MQ900.SCSQANLE
//         DD DISP=SHR,DSN=MQ900.SCSQAUTH
//         DD DISP=SHR,DSN=MQ900.SCSQLOAD
//SYSIN    DD  *
  COMMAND DDNAME(CMDINP)
//CMDINP   DD DISP=SHR,DSN=USER1.QSU2.JCL(QPU2PROC)
//         DD DISP=SHR,DSN=USER1.QSU2.JCL(QPU2QUES)
//         DD DISP=SHR,DSN=USER1.QSU2.JCL(QSU2PROC)
//         DD DISP=SHR,DSN=USER1.QSU2.JCL(QSU2QUES)
//SYSPRINT DD  SYSOUT=*
//DEFTP    EXEC PGM=CSQUTIL,PARM='QMZ1'
//STEPLIB  DD DISP=SHR,DSN=MQ900.SCSQANLE
```

____3. Submit this JCL. You should get a zero return code, if not please contact the instructor.

____4. Once the JCL has run cleanly, exit this member. The queues and process needed by the subscription and the publication transactions are now in place.

LAB – Part 2 - Testing

Test 1 – PUTXTST1

The first test illustrates:

a) Use of an open parenthesis character (‘(‘) as a delimiter so that spaces can be embedded in topic strings.
b) How the subscription and publication transactions behave when there are an equal number of publications and subscriptions specified.

Running Test 1

____1. Edit the *USER1.QSU2.JCL* data set and select the *PUTXTST1* member.

____2. Submit the job stream using the submit command as shown.

```
EDIT       USER1.QSU2.JCL(PUTXTST1) - 01.00              Columns 00001 00072
Command ===> SUB                                           Scroll ===> PAGE
****** ***************************** Top of Data ******************************
000001 //USER11 JOB (????,????),'OEMPUTX    ',NOTIFY=&SYSUID
000002 //*
000003 //*****************************************************************
```

____3. You should see two jobs submitted.

```
IKJ56250I JOB USER11(JOB02611) SUBMITTED
IKJ56250I JOB USER12(JOB02612) SUBMITTED
***
```

____4. Hit the **ENTER** key, then navigate to SDSF using the ***=D.H*** command. If not already set, please set the prefix to *USER1**. Your list of jobs may be different. Select the subscription task (it has a '*1*' as the last character), using the question mark as shown.

```
SDSF HELD OUTPUT DISPLAY ALL CLASSES LINES 777         LINE 1-3 (3)
 COMMAND INPUT ===>                                        SCROLL ===> PAGE
 NP   JOBNAME  JobID    Owner    Prty C ODisp Dest              Tot-Rec  Tot
      USER1DS JOB02619 USER1    144 K HOLD  LOCAL                 415
      USER12  JOB02621 USER1    144 K HOLD  LOCAL                 164
 ?    USER11  JOB02620 USER1    144 K HOLD  LOCAL                 198
```

____5. Select the *SYSPRINT* file as shown to review the output.

```
SDSF JOB DATA SET DISPLAY - JOB USER11  (JOB02620)    LINE 1-4 (4)
COMMAND INPUT ===>                                        SCROLL ===> PAGE
NP   DDNAME   StepName ProcStep DSID Owner    C Dest              Rec-Cnt Page
     JESMSGLG JES2                2 USER1   K LOCAL                  19
     JESJCL   JES2                3 USER1   K LOCAL                  69
     JESYSMSG JES2                4 USER1   K LOCAL                  31
s    SYSPRINT                   102 USER1   K LOCAL                  79
```

____6. Page down until you reach the reply information. The status message should give the number of subscriptions, the topic object and the resolved topic string. It should look something like what is shown below.

```
ReplyToQ        :USER1.QSU2.STATUS.QUEUE
ReplyToQMgr     :
UserIdentifier  :USER1
AccountingToken
<0BD6C5D4D7E4E3E7404040400000000000000000000000000000000000000000>
ApplIdentityData:
PutApplType     :00000002
PutApplName     :USER11
PutDate         :20180831 PutTime         :12315848
ApplOriginData  :
** MESSAGE DATA (80 of 80 bytes printed) **
00000000 : F26BE4E2 C5D9F14B D8E2E4F2 4BE2E4C2  2,USER1.QSU2.SUB
00000010 : 4BD8E4C5 E4C56BE4 E2C5D9F1 4BD8E2E4  .QUEUE,USER1.QSU
00000020 : F24BE3D6 D7C9C36B 4D6BE3C5 E2E361D3  2.TOPIC,(,TEST/L
00000030 : C5E5C5D3 40F1404D 6B406BD8 E2E4F260  EVEL 1 (, ,QSU2-
00000040 : E3C5E2E3 F1404040 40404040 40404040  TEST1
<<<< END OF MESSAGE PUT TO REQUEST QUEUE ** 1 ** >>>>
```

____7. Return to the list of jobs and select the publication job. It will end with a '*2*'.

____8. Select the *SYSPRINT* file and page down to the status message. The results should look something like what is shown.

```
** MESSAGE DATA (513 of 513 bytes printed) **
00000000 : D7E4C2D3 C9C3C1E3 C9D6D5E2 40D4C1C4  PUBLICATIONS MAD
00000010 : C57E4040 F0F0F0F0 F240C6D6 D940E3D6  E=  00002 FOR TO
00000020 : D7C9C340 7E404040 40404040 40E4E2C5  PIC =        USE
00000030 : D9F14BD8 E2E4F24B E3D6D7C9 C3404040  R1.QSU2.TOPIC
00000040 : 40404040 40404040 40404040 40404040
00000050 : 40404040 40404040 40404040 4040D9C5                RE
00000060 : E2D6D3E5 C5C44040 7E404040 40404040  SOLVED  =
00000070 : 40E4E2C5 D9F161D8 E2E4F261 E3C5E2E3   USER1/QSU2/TEST
00000080 : 61D3C5E5 C5D340F1 40404040 40404040  /LEVEL 1
00000090 : 40404040 40404040 40404040 40404040
000000A0 : 40404040 40404040 40404040 40404040
000000B0 : 40404040 40404040 40404040 40404040
000000C0 : 40404040 40404040 40404040 40404040
000000D0 : 40404040 40404040 40404040 40404040
000000E0 : 40404040 40404040 40404040 40404040
000000F0 : 40404040 40404040 40404040 40404040
00000100 : 40404040 40404040 40404040 40404040
00000110 : 40404040 40404040 40404040 40404040
00000120 : 40404040 40404040 40404040 40404040
00000130 : 40404040 40404040 40404040 40404040
00000140 : 40404040 40404040 40404040 40404040
```

____9. To answer the following questions, review the input to the subscription step, from the JCL PDS it is member *QSU2TST1*, against the definition of the area as defined in the program QSUB2CBL in the SUBSCRIPTION-PARMS fields. The *QSU2TST1* contents look as shown

2,USER1.QSU2.SUB.QUEUE,USER1.QSU2.TOPIC,(,TEST/LEVEL 1 (,,QSU2-TEST1

a. Does the topic string contain embedded blanks? Yes/No
b. How many messages should be read from the subscription queue before closing the queue?

   _____

c. Is there a valid subscription name? If so, what is it?

   _____

Test 2 – PUTXTST2

The second test illustrates:

a. Use of a low value (x'00') as the delimiter for topic strings.
b. How the subscription and publication transactions behave when there are an unequal number of publications and subscriptions specified. In this example there are many more publications than subscriptions.

Running Test 2

____1. Edit data set *USER1.QSU2.JCL* and select the member *PUTXTST2*.

____2. Submit the job using the submit command, like what was done for the first test.

____3. When both jobs have completed, check the *USER1.QSU2.SUB.QUEUE* depth.

a. Is it zero? Yes/No
b. If not, how many messages are on the queue?

_____

c. If there are messages on the queue, why do you think they may be there? (hint – look at the program QSUB2CBL)

_____
_____
_____

____4. When the jobs have completed, navigate to SDSF and open the *SYSPRINT* files for both jobs to respond to these questions. The publication status message should look like what is shown here:

```
** MESSAGE DATA (513 of 513 bytes printed) **
00000000 : D7E4C2D3 C9C3C1E3 C9D6D5E2 40D4C1C4  PUBLICATIONS MAD
00000010 : C57E4040 F0F0F9F0 F040C6D6 D940E3D6  E=  00900 FOR TO
00000020 : D7C9C340 7E404040 40404040 40E4E2C5  PIC =        USE
00000030 : D9F14BD8 E2E4F24B E3D6D7C9 C3404040  R1.QSU2.TOPIC
00000040 : 40404040 40404040 40404040 40404040
00000050 : 40404040 40404040 40404040 4040D9C5                RE
00000060 : E2D6D3E5 C5C44040 7E404040 40404040  SOLVED  =
00000070 : 40E4E2C5 D9F161D8 E2E4F261 E3C5E2E3   USER1/QSU2/TEST
00000080 : 61D3C5E5 C5D340F1 40404040 40404040  /LEVEL 1
00000090 : 40404040 40404040 40404040 40404040
000000A0 : 40404040 40404040 40404040 40404040
000000B0 : 40404040 40404040 40404040 40404040
000000C0 : 40404040 40404040 40404040 40404040
000000D0 : 40404040 40404040 40404040 40404040
000000E0 : 40404040 40404040 40404040 40404040
000000F0 : 40404040 40404040 40404040 40404040
00000100 : 40404040 40404040 40404040 40404040
00000110 : 40404040 40404040 40404040 40404040
00000120 : 40404040 40404040 40404040 40404040
00000130 : 40404040 40404040 40404040 40404040
00000140 : 40404040 40404040 40404040 40404040
00000150 : 40404040 40404040 40404040 40404040
00000160 : 40404040 40404040 40404040 40404040
```

The subscription status message should look much like this:

```
** MESSAGE DATA (513 of 513 bytes printed) **
00000000 : E2E4C2E2 C3D9C9D7 E3C9D6D5 40D4E2C7  SUBSCRIPTION MSG
00000010 : E27E4040 F0F0F0F5 F040C6D6 D940E3D6  S=  00050 FOR TO
00000020 : D7C9C340 7E404040 40404040 40E4E2C5  PIC =        USE
00000030 : D9F14BD8 E2E4F24B E3D6D7C9 C3404040  R1.QSU2.TOPIC
00000040 : 40404040 40404040 40404040 40404040
00000050 : 40404040 40404040 40404040 4040C6D6                FO
00000060 : D940D9C5 E2D6D3E5 C5C4407E 40404040  R RESOLVED =
00000070 : 40E4E2C5 D9F161D8 E2E4F261 E3C5E2E3   USER1/QSU2/TEST
00000080 : 61D3C5E5 C5D340F1 40404040 40404040  /LEVEL 1
00000090 : 40404040 40404040 40404040 40404040
000000A0 : 40404040 40404040 40404040 40404040
000000B0 : 40404040 40404040 40404040 40404040
000000C0 : 40404040 40404040 40404040 40404040
000000D0 : 40404040 40404040 40404040 40404040
000000E0 : 40404040 40404040 40404040 40404040
000000F0 : 40404040 40404040 40404040 40404040
00000100 : 40404040 40404040 40404040 40404040
00000110 : 40404040 40404040 40404040 40404040
00000120 : 40404040 40404040 40404040 40404040
00000130 : 40404040 40404040 40404040 40404040
```

a. What was the publication count? _____
b. What was the subscription count? _____
c. What was the resolved topic string for both?
   _____

Test 3 – PUTXTST3

The third test illustrates:

a. Use of a low value (x'00') as the delimiter for topic strings.
b. How the subscription and publication transactions behave when there are an unequal number of publications and subscriptions

Running Test 3

____1. Clear any messages from the *USER1.QSU2.SUB.QUEUE* using the MQ Explorer.

____2. Edit the data set *USER1.QSU2.JCL PDS* and select member *PUTXTST3*.

____3. Submit the job using the submit command, like what was done for the first test.

____4. When both jobs have completed, check the *USER1.QSU2.SUB.QUEUE* depth; where the '*ZZ*' is your team number.
   a. Is it zero? Yes/No
   b. If not, how many messages are on the queue?
      _____
   c. If there are messages on the queue, why do you think they may be there? (hint – look at the program *QSUB2CBL*)
      _____
      _____
      _____
   d. When the jobs have completed, navigate to SDSF and open the SYSPRINT files for both jobs to respond to these questions. The publication status message should look similar to what is shown here:

```
** MESSAGE DATA (513 of 513 bytes printed) **
00000000 : D7E4C2D3 C9C3C1E3 C9D6D5E2 40D4C1C4  PUBLICATIONS MAD
00000010 : C57E4040 F0F0F9F0 F040C6D6 D940E3D6  E=  00900 FOR TO
00000020 : D7C9C340 7E404040 40404040 40E4E2C5  PIC =        USE
00000030 : D9F14BD8 E2E4F24B E3D6D7C9 C3404040  R1.QSU2.TOPIC
00000040 : 40404040 40404040 40404040 40404040
00000050 : 40404040 40404040 40404040 4040D9C5                RE
00000060 : E2D6D3E5 C5C44040 7E404040 40404040  SOLVED  =
00000070 : 40E4E2C5 D9F161D8 E2E4F261 E3C5E2E3   USER1/QSU2/TEST
00000080 : 61D3C5E5 C5D340F2 40404040 40404040  /LEVEL 2
00000090 : 40404040 40404040 40404040 40404040
000000A0 : 40404040 40404040 40404040 40404040
000000B0 : 40404040 40404040 40404040 40404040
000000C0 : 40404040 40404040 40404040 40404040
000000D0 : 40404040 40404040 40404040 40404040
000000E0 : 40404040 40404040 40404040 40404040                              00000130 :
40404040 40404040 40404040 40404040
```

The subscription status message should look something like this:

```
** MESSAGE DATA (513 of 513 bytes printed) **
00000000 : E2E4C2E2 C3D9C9D7 E3C9D6D5 40D4E2C7  SUBSCRIPTION MSG
00000010 : E27E4040 F0F0F0F0 F140C6D6 D940E3D6  S=  00001 FOR TO
00000020 : D7C9C340 7E404040 40404040 40E4E2C5  PIC =        USE
00000030 : D9F14BD8 E2E4F24B E3D6D7C9 C3404040  R1.QSU2.TOPIC
00000040 : 40404040 40404040 40404040 40404040
00000050 : 40404040 40404040 40404040 4040C6D6                FO
00000060 : D940D9C5 E2D6D3E5 C5C4407E 40404040  R RESOLVED =
00000070 : 40E4E2C5 D9F161D8 E2E4F261 E3C5E2E3   USER1/QSU2/TEST
00000080 : 61D3C5E5 C5D340F1 40404040 40404040  /LEVEL 1
00000090 : 40404040 40404040 40404040 40404040
000000A0 : 40404040 40404040 40404040 40404040
000000B0 : 40404040 40404040 40404040 40404040
000000C0 : 40404040 40404040 40404040 40404040
000000D0 : 40404040 40404040 40404040 40404040
000000E0 : 40404040 40404040 40404040 40404040
000000F0 : 40404040 40404040 40404040 40404040
00000100 : 40404040 40404040 40404040 40404040
00000110 : 40404040 40404040 40404040 40404040
```

a. What was the publication count? _____
b. What was the subscription count? _____
c. What was the resolved topic string for both?

   _____

   _____

d. Why is there a difference between the publication and subscription counts?

   _____

   _____

   _____

Program Review Questions – QSU2CBL

The source for the subscription sample is in the JCL library. The source and the InfoCenter, may be used to respond to the following questions.

1) What subscription options are supported by the sample program?

_____
_____
_____
_____

2) Why is the correlation ID specified by the subscription, not the publication?

_____
_____
_____
_____

3) When would be default topic be used?

_____
_____
_____
_____

4) Are the subscriptions durable or non-durable? Where is that specified?

_____
_____
_____
_____

5) The sample program allows a subscription name to be specified. Why is this important?

_____
_____
_____
_____