John Dar Man John John John Man John

Migration to IBM MQ for z/OS

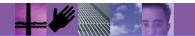
Lyn Elkins – <u>elkinsc@us.ibm.com</u> Mitch Johnson – <u>mitchj@us.ibm.com</u>





Agenda

- IBM MQ for z/OS Installation
- Customizing a Queue Manager
- Integrating with CICS and IMS
- Migrations Paths
- Summary



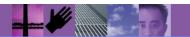


IBM MQ for z/OS Installation Information

- MQ for z/OS is installed using a standard SMP/E installation
 - FMID HMS9100 z/OS Base
 - FMID Subsets (LTSR/CD):
 - JMS9101
 U.S. English (ENU)
 - JMS9102

 Japanese (JPN)
 - JMS9103

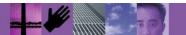
 Simplified Chinese (CHS)
 - JMS9104
 — Upper Case English (ENP)
 - JMS9105– French (FRA)
 - JMS9108/JMS9118 Unix Services Components for IBM MQ, including JMS and HTTP
- MQ Advanced VUE for z/OS
 - FMID HAMS910 MQ Advanced Message Security
 - FMID HMF9910 MQ Managed File Transfer
 - FMID HUE9100 IBM MQ for z/OS Value Unit Edition





Areas involved in configuring/upgrading a queue manager on z/OS

- MQ Administration
 - Implementation project ownership
- MVS System Programmers
 - APF authorization and other system changes
 - Allocation of HFS/ZFS
 - Allocation of CF list structures for QSG
- Security Administrator
 - User IDs /Groups
 - Infrastructure planning and environment controls
- Network Administrators
 - IP addresses and ports
 - DNS entries/Firewalls
- CICS, IMS and/or WebSphere system programmers/administrators
 - Implementation of adapters and bridges
- DB2 DB2 resources (STOGROUP, DATABASES, etc) needed for QSG
- Applications
 - Planning queue and queue manager objects needed
 - Reviewing and implementing Change Management
- Automation





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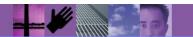


Customizing a Queue Manager

- Customizing a 'stand alone' z/OS queue manager is simple:
 - Define system resources, e.g. subsystems, authorized data sets, OMVS mounts
 - Copy and tailor the sample JCL
 - Define the security resources
 - Submit the tailored jobs
 - Start the Queue Manager (MSTR)
 - Start the Channel Initiator (CHIN)

With sufficient authority, this can take an hour

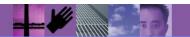
Especially if you have 'patterns' to use





JCL for the Queue Manager & CHIN Customization

- Sample members include:
 - CSQ4BSDS Creates and activates the IBM MQ Bootstrap, creates and formats the queue manager log files
 - CSQ4PAGE Creates and formats the IBM MQ Pagesets
 - CSQ4ZPRM Creates the queue manager initiation attributes modules (zPARM)
 - CSQ4INYG Commands to define objects that are normally required
 - For example the DLQ is defined as '++qmgr++.DEAD.QUEUE'
 - CSQ4INPX Sample commands related to the channel initiator
 - For example START LISTENER TRPTYPE(TCP) PORT(++port-number++)
 - CSQ4CHIN Sample Channel Initiator JCL Procedure
 - CSQ4MSTR Sample Queue Manager JCL Procedure
- Other JCL members
 - Many samples not included here, some to 'undo' creation to define additional objects, etc.







SCSQPROC NEW Members since 9.0

- New SCSQPROC members
 - CSQ4DSPM Sample JCL to run CSQUDSPM, queue manager status for the LPAR
 - CSQ4WEBS Sample started task for the Liberty profile
 - CSQ4XCDB Sample job to create the DB2 database
 - CSQ4XCSG Sample job to create the DB2 storage group
 - CSQ4XCTB Sample job to create the DB2 tables
 - CSQ4XCTS Sample job to create the DB2 tablespaces
 - CSQ4XDDB Sample job to delete the DB2 database
 - CSQ4XDSG Sample job to delete the DB2 storage group
 - CSQ4XDTS Sample job to delete the DB2 tablespaces



SCSQPROC Removed Members since 9.0

- New SCSQPROC members
 - CSQ4570T Migrate Db2 table definitions from 7.0
 - CSQ4571T Migrate Db2 table definitions from 7.1



SCSQPROC members changed from V9.0

- CSQ4INSG:
 - SYSTEM.DEFAULT.AUTHINFO.IDPWOS changed
 - ADOPTCTX(NO) to ADOPTCTX(YES)
 - Added SYSTEM.REST.REPLY.QUEUE
- CSQ4INYG ALTER QMGR was changed to add:
 - CERTLABL('ibmWebSphereMQ++qmgr++') +
 - CERTQSGL('ibmWebSphereMQ++qsgname++') +
 - REVDNS(DISABLED)
- CSQ4MSRR & CSQ4MSTR removed the user exit DDs
- CSQ4ZPRM OPMODE was removed
- CSQ45BPK, CSQ45BPL, CSQ45GEX Db2 Name changes
- CSQ7IPCS MQ version number changes



Customization the Samples provided in SCSQPROC

- The samples will not run as delivered, they must be tailored for your environment
- Fields that need to be replaced are enclosed by leading and trailing '++' characters
- Examples include:
 - ++HLQ++ high level qualifier (HLQ) for the BSDS, pagesets and logs
 - ++THLQUAL++ IBM MQ library HLQ
 - ++LANGLETTER++ Letter indicating the language for message display
- Your environment may require additional customization
 - For example you may want pagesets and logs to have a different HLQ so they will get allocated on different physical devices.





To make customization a bit easier!

- We use a REXX to make customization simpler
 - Includes most of the '++' variables used in the sample JCL to create a queue manager and channel initiator
- Provide upon request

```
File Edit Edit_Settings Menu Utilities Compilers Test
                                                          Help
          WMQ710.QML#.SCSQPROC(QML#EDIT) - 01.00
UIEW
                                                      Columns 00001 00072
Command ===>
                                                         Scroll ===> PAGE
000001 ISREDIT MACRO NOPROCESS
000002 ADDRESS ISREDIT
000003 "change '++THLQUAL++' 'WMQ710' all"
000004 "change '++HLQ++' 'SYS1.MQM710' all"
000005 "change '++LANGLETTER++' 'E' all"
000006 /* **** BSDS CHANGES **** */
000007 "change '++VOLBSDS1++' 'Q70001' all"
000008 "change '++VOLLOG1A++' 'Q70002' all"
000009 "change '++VOLLOG1B++' 'Q70003' all"
000010 /* **** PAGE CHANGES ****
000011 "change '++V0L0++' 'Q70001'
000012 "change '++V0L1++' 'Q70001' all"
000013 "change '++V0L2++' 'Q70002' all"
000014 "change '++V0L3++' 'Q70003' all"
000015 "change '++VOL4++' 'Q70002' all"
000016 /* **** ZPRM CHANGES **** */
000017 "change '++HLQ.USERAUTH++' 'WMQ710.++QML#++.AUTHLIB' all"
000018 "change '++NAME++' 'OML#ZPRM' all"
000019 /* **** MSTR CHANGES **** */
```

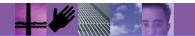






IBM MQ - Modifying Queue managers

- Queue Manager changes needed in response to environment or volume changes
 - zPARM changes require an outage
 - Typically only for adding to a Queue Sharing Group
 - Do not turn off SMF Statistics (SMFSTAT=YES)





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Adding IBM MQ to CICS

- For current versions of use the CICS provided MQ interface code
 - The threadsafe version of the adapter and bridge code is now owned and delivered by CICS
 - Noticeably better performance
 - Uses the same TCB as DB2
 - Resource definitions provided in CICS group DFHMQ (remove groups CSQCAT1 and CSQCKB from any group lists.)

Adding IBM MQ to a CICS region

Update the CICS region startup JCL:

```
//STEPLIB DD DSN=&INDEX1..SDFHAUTH,DISP=SHR
//
     DD DSN=&INDEX1..SDFJAUTH,DISP=SHR
//
     DD DSN=SYS1.MQ910.SCSQANLE,DISP=SHR
                                              (CICS TS V3.x only)
     DD DSN=SYS1.MQ910.SCSQAUTH,DISP=SHR
//DFHRPL DD DSN=&INDEX1..SDFHLOAD,DISP=SHR
     DD DSN=SYS1.LEMVS.SCEECICS,DISP=SH
//
//
     DD DSN=SYS1.LEMVS.SCEERUN2,DISP=SH
//
     DD DSN=SYS1.LEMVS.SCEERUN,DISP=SHR
//
     DD DSN=SYS1.MQ910.SCSQCICS,DISP=SHR
                                              (IBM MQ CICS Samples)
//
     DD DSN=SYS1.MQ910.SCSQLOAD,DISP=SHR
//
     DD DSN=SYS1.MQ910.SCSQANLE,DISP=SHR
                                              (CICS TS V3.x only)
II
     DD DSN=SYS1.MQ910.SCSQAUTH,DISP=SHR
//
     DD DSN=DSNA10.RUNLIB.LOAD.DISP=SHR
```

 Note: Consider using a CICS LIBRARY resources to define the DFHRPL data sets so they are dynamically allocated

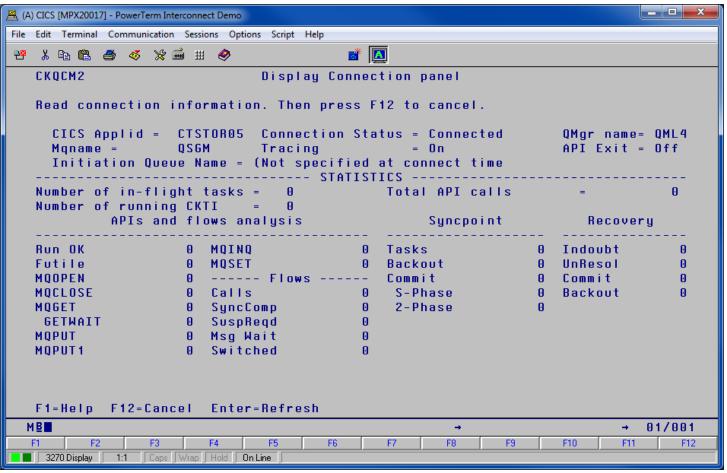
Adding IBM MQ to a CICS region

- For CICS TS V4.x and later
 - Define a MQCONN resources in the CSD
 - DEFINE MQCONN(QSGM) MQNAME(QSGM) INITQNAME(CICS01.INITQ)
- Cycle CICS to pick up changes



Adding IBM MQ to a CICS region

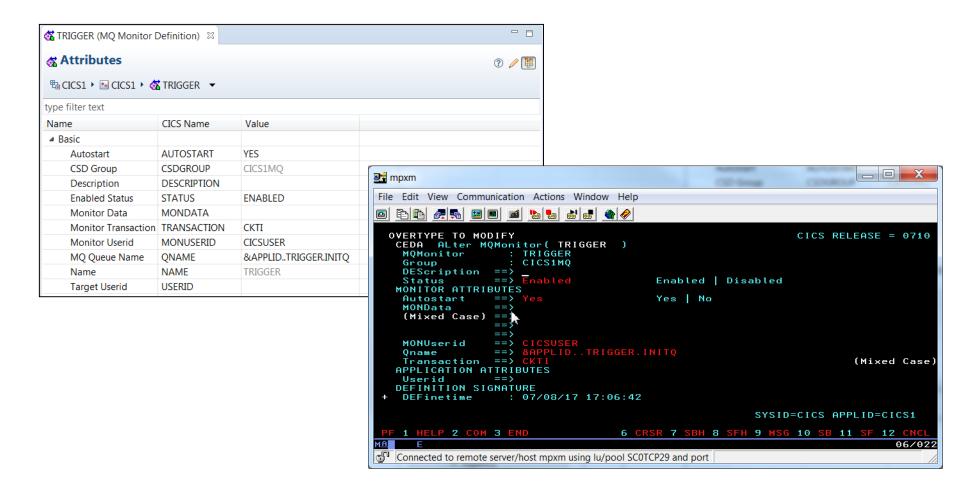
 Use CICS transaction CKQC to start, stop, modify and display connection details





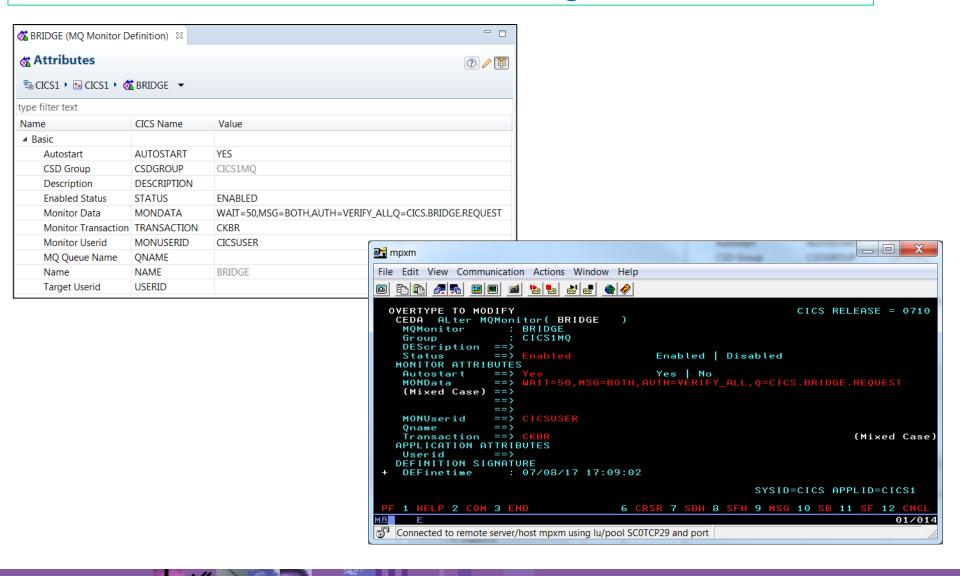


MQMonitor - CKTI





MQMonitor – CICS MQ Bridge



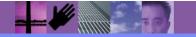


Adding IBM MQ to IMS

- Update the IMS control region and dependent (BMP,MPP) region's JCL
 - Add MQ910.SCSQNLE and MQ910.SCSQAUTH to DDNAME
 - STEPLIB if all other data sets in the list are authorized otherwise add to
 - DFSESL if one of the data sets in the STEPLIB sequence is not authorized
 - Create a subsystem member (SSM) in the IMS PROCLIB (e.g. IMSBQML1) including a line for each queue manager that will be accessed.

```
QML1,MQMX,CSQQESMT,,R,
QML1,MQM1,CSQQESMT,,R,
QML3,MQM2,CSQQESMT,,R,
QML5,MQM3,CSQQESMT,,R,
QML7,MQM4,CSQQESMT,,R,
QML9,MQM5,CSQQESMT,,R,
```

 Add the SSM parameter (SSM=QML1) to the program parameter list for the control region (IMS PROCLIB(DFSPBxxx), where SUFFIX=xxx) and dependent region's execution JCL





Adding IBM MQ to IMS

- The IMS adapter cannot access the IMS PROCLIB so the names of the IBM MQ queue managers and their corresponding LITs must be defined in the queue manager definition table, CSQQDEFV.
- An MQCONN or MQCONNX call associates the name input parameter and the hoonn output parameter with the name label and, therefore, the LIT in the CSQQDEFV entry. Further MQ calls passing the hoonn parameter use the LIT from the CSQQDEFV entry identified in the MQCONN or MQCONNX call to direct calls to the WebSphere MQ queue manager defined in the IMS SSM PROCLIB member with that same LIT.
- In summary, the name parameter on the MQCONN or MQCONNX call identifies a LIT in CSQQDEFV and the same LIT in the SSM member identifies a WebSphere MQ queue manager.





Adding IBM MQ to IMS

 Assemble and link-edit CSQQDEFV to add support for local queue managers. Add the load module library to STEPLIB or DFSESL as above.

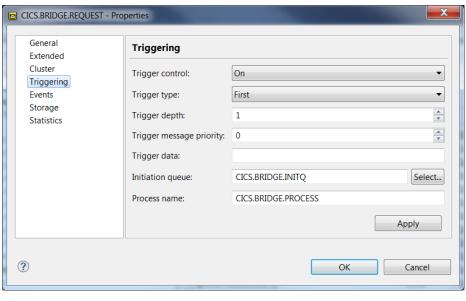
```
CSQQDEFV AMODE 31
CSQQDEFV RMODE ANY
CSQQDEFX TYPE=DEFAULT,NAME=QML1,LIT=MQMX,
CSQQDEFX TYPE=ENTRY,NAME=QML1,LIT=MQM1
CSQQDEFX TYPE=ENTRY,NAME=QML3,LIT=MQM2
CSQQDEFX TYPE=ENTRY,NAME=QML5,LIT=MQM3
CSQQDEFX TYPE=ENTRY,NAME=QML7,LIT=MQM4
CSQQDEFX TYPE=ENTRY,NAME=QML9,LIT=MQM5
CSQQDEFX TYPE=END
END CSQQDEFV
```



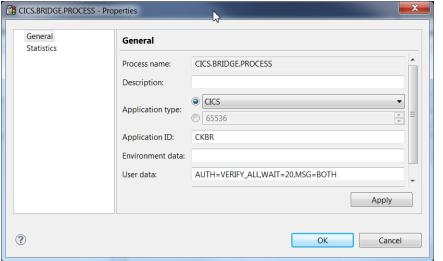


MQ Resources for the CICS MQ Bridge

Request Queue - Triggering



- CICS Bridge Process
 - CKBR transaction
 - Configure security

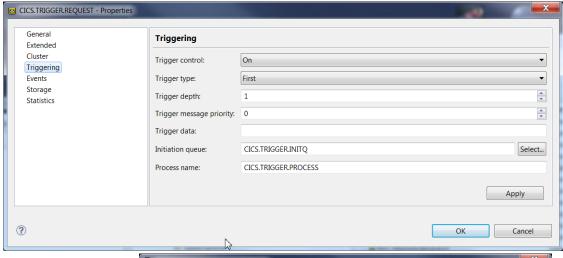




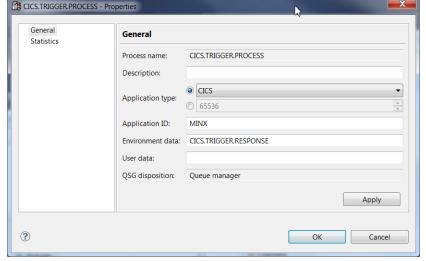


MQ Resources for the CICS Trigger Monitor

Request Queue - Triggering



- CICS Trigger Monitor Process
 - User transaction



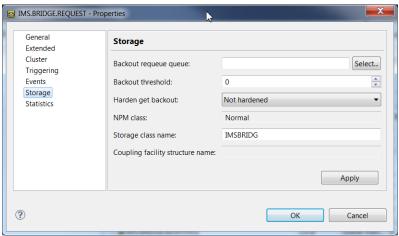




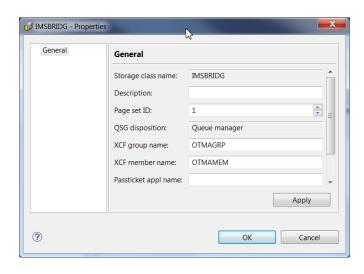


MQ Resources for the IMS Bridge

Request Queue – Storage Class Properties



Storage Class



Queue Manager's zPARM Module

CSQ6SYSP Macro OTMACON=(OTMAGRP,,DFSYDRU0,2147483647,CSQ),

IMS PROCLIB DFSBPxxx member

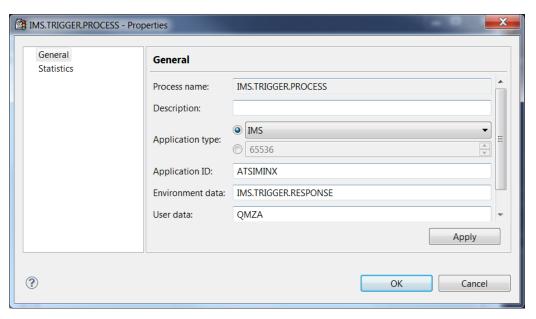
OTMA=Y, OTMAMEM=OTMAMEM OTMASE= GRPNAME=OTMAGRP,





MQ Resources for the IMS Trigger Monitor

IMS trigger process



IMS batch trigger JCL

```
//CSQQTRMN EXEC PROC=IMSBATCH, MBR=CSQQTRMN, PSB=CSQQTRMN, IMSID=IMSB,
// SOUT='*', NBA=6, OBA=5, TIME=60, SSM=QMZA
//DFSSTAT DD SYSOUT=*
//G.DFSESL DD DISP=SHR, DSN=IMS110.SDFSRESL
// DD DISP=SHR, DSN=MQ910.MQM.SCSQAUTH
// DD DISP=SHR, DSN=MQ910.SCSQAUTH
// DD DISP=SHR, DSN=MQ910.SCSQAUTH
//CSQQUT1 DD *
QMGRNAME=
INITQUEUENAME=IMS.TRIGGER.INITQ
CONSOLEMESSAGES=YES
LTERM=PMASTER
//CSQQUT2 DD SYSOUT=*
```

MQ CSQUTIL - MAKEDEFs

```
//CSQUTIL EXEC PGM=CSQUTIL, PARM='QMZA'
//STEPLIB DD DISP=SHR, DSN=MQ910.SCSQANLE
//
           DD DISP=SHR, DSN=MQ910.SCSQAUTH
//
           DD DISP=SHR, DSN=MO910.SCSOLOAD
//MDOUT
           DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSIN
           DD *
  COMMAND DDNAME (CMDINP) MAKEDEF (MDOUT)
//CMDINP DD
             *
DISPLAY QUEUE (CICS.BRIDGE.*) ALL
DISPLAY QUEUE (IMS.BRIDGE.*) ALL
DISPLAY PROCESS (CICS.TRIGGER.PROCESS) ALL
DISPLAY PROCESS (IMS. TRIGGER. PROCESS) ALL
DISPLAY PROCESS (ODM. PROCESS) ALL
```

- Generates corresponding "DEFINE" commands for the resources displayed
- Useful for saving resource definitions in a repository or for recreation in another queue manager.



WebSphere Application Server Considerations

- Update the WebSphere property variables MQ_INSTALL_ROOT to the IBM MQ V9.0 installation directory
 - Set MQ_INSTALL_ROOT to /usr/lpp/mqm/V9R0M0
- Binding Mode connection requires the presence of the directory containing the Java Native Interface (JNI) code in the system library path. Set the Native Library Path property when configuring the IBM MQ messaging provider. Update this property to the directory location.
 - Set Native Library Path to /usr/lpp/mqm/V9R0M0/java/lib
- If necessary, the IBM MQ resource adapter (wmq.jmsra.rar) can be installed from location /usr/lpp/mqm/V9R0M0/java/lib/jca

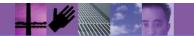
Normally the WebSphere MQ resource adapter provided by the WebSphere Application server service stream is used





Agenda

- IBM MQ for z/OS Installation
- Customizing a Queue Manager
- Integrating with CICS and IMS
- Migration Considerations
- Summary





Migration Considerations

MQ V9.1 for z/OS



Deprecations on z/OS

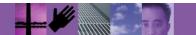
- Buffer pools located below the bar
- MAKECLNT CSQUTIL tool
- Use of queue sharing groups with DB2® table spaces of any type other than universal table spaces
- Using hexadecimal strings in the SSLCIPH attribute





Migration Considerations

- MQ V9.1 for z/OS Removed feature
 - Support for the MQ Service Provider in z/OS® Connect V1
 - Well not so much we are migrating to the V2 Service Provider





MQ V9.1 New Messages

- Message Manager Messages added:
 - CSQM102E csect-name SSLCIPH sslciph IS A WEAK OR BROKEN CIPHERSPEC
 - The following are dealing with the Reporting Service (I think)
 - CSQM572E -
 - CSQM573E
 - CSQM574E
 - CSQM575E
 - CSQM576E
 - CSQM577E
 - CSQM578I
 - CSQM062I csect-name INDXTYPE(index-type) not allowed for shared transmission queue shared-xmitq



MQ V9.1 New Messages

Distributed Queue Messages Added:

- CSQX674E csect-name Channel channel-namespecified a weak or broken SSL CipherSpec sslciph
- CSQX690I csect-name Cipher specifications based on the SSLv3 protocol are disabled
- CSQX691I csect-name Cipher specifications based on the SSLv3 protocol are enabled
- CSQX692I csect-name Weak or broken SSL cipher specifications are disabled.
- CSQX693I csect-name Weak or broken SSL cipher specifications are enabled.
- CSQX694I sect-name Cipher specifications based on the TLS V1.0 protocol are disabled.
- CSQX695I sect-name Cipher specifications based on the TLS V1.0 protocol are enabled.
- CSQX967I csect-name Weak or broken SSL cipher specifications blocked by listener.
- CSQX968I csect-name Listener will only negotiate System SSL default cipher specifications.





MQ V9.1 New Messages

- Distributed Queue Messages Added:
 - The detailed messages are not currently documented for these in the 9.1 documentation.
 The lab has been notified:
 - CSQX193I
 - CSQX194E
 - CSQX198E

-





MQ V9.1 – New Messages

- Agent Services Messages
 - CSQV460I csect-name Cluster workload exits are disabled but CLWLEXIT is set.
 - CSQV461D Reply Y to continue startup with CLWLEXIT not enabled, or N to shutdown.





MQ V9.1 Removed Messages

- Buffer Manager:
 - CSQP057E Buffer pool n is suspended because of the current value of OPMODE
 - CSQP058E Buffer pool n has had its LOCATION forced to BELOW because of the current value of OPMODE
 - CSQP059E Page set n is suspended because it uses suspended buffer pool n
- Distributed Queueing:
 - CSQX295E csect-name Cluster transmission queue restricted, channel channel-name, transmission queue xmitq-name





ZPARM Considerations – V9.0

This table shows how OPMODE affects capabilities

OPMODE value in ZPARM	Available Functions
COMPAT,900	All V7.1 and earlier functions
NEWFUNC,900	All functions

Migrating from MQ V7.1 to MQ V9

OPMODE value in ZPARM	Available functions	Release queue manager can fail back to
COMPAT,710 or NEWFUNC,710 or COMPATH,900	All V7.1 and earlier functions	V7.1
NEWFUNC,900	All functions	None – OPMODE prevents backward migration.





ZPARM Considerations – V9.0

• Migrating from MQ V8 to MQ V9

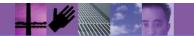
OPMODE value in ZPARM	Available functions	Release queue manager can fail back to
COMPAT,800 or NEWFUNC,900	All V7.1 and earlier functions	V8
NEWFUNC,800	All functions	V8
NEWFUNC,900	All functions	None – OPMODE prevents backward migration.





ZPARM Considerations – V9.1

- Migrating from MQ V8 or MQ V9.0 to MQ V9.1
 - IF in a QSG, all queue managers must be in NEWFUNC mode before migrating to MQ V9.1



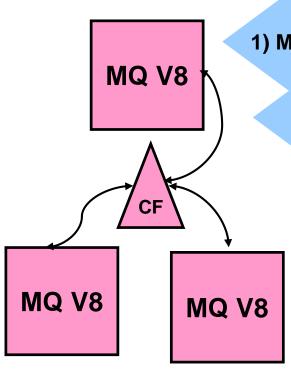


MQ V8 to V9 Migration

1) Install V9 ERLY code MQ V8 2) Apply Coexistence PTFs 3) Restart & Test V8 QMGR **MQ V9.1** 4) Start QMGR with V9.1 Code



MQ V8 or V9.0 QSG to V9.1 QSG Migration



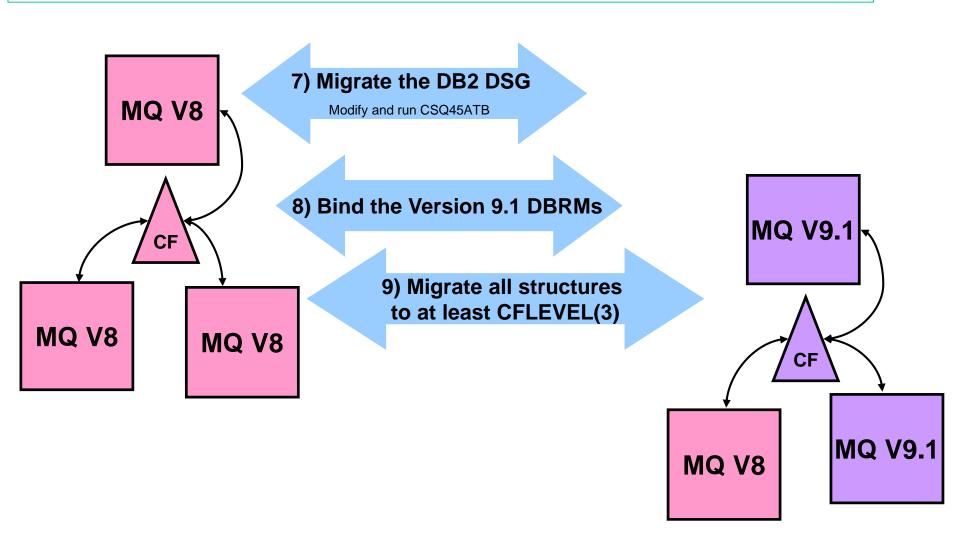
1) Move to NEWFUNC mode

- 2) Install V9 ERLY code on all LPAR
 - 3) Apply Coexistence PTFs on all queue managers
 - 4) Bind new version plans
 - 5) Grant execute authority
 - 6) Cycle queue managers and Test





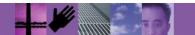
MQ V8 QSG to V9 QSG Migration





Other areas to review

 Migration should include a review of new and changed MQ Messages





Summary

- IBM MQ for z/OS Installation
- Customizing a Queue Manager
- Integrating with CICS and IMS
- Migrations Paths
- Questions?

