

IBM MQ for z/OS Version 8.0.0 : Migration and Queue Sharing Group Co-existence

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September 2014

Abstract

This document discusses considerations and procedures for migration to IBM MQ for z/OS Version 8.0.0 in such a way that it is possible, if required, to backward-migrate (or fall back) to prior releases. The same APARs that provide the backward migration function, also allow co-existence of lower version queue managers in a queue sharing group which also contains a queue manager running at Version 8.0.0 .

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1.0 Introduction

The migration and fallback capability and process is documented in the IBM MQ for z/OS Version 8.0.0 section of the IBM Knowledge Center located at http://www.ibm.com/support/knowledgecenter/SSFKSJ_8.0.0/maps/WelcomePagev8r0.html. This document is intended to supplement the IBM Knowledge Center by providing additional information such as APAR numbers and testing experiences. Reference is made below to specific backward migration APARs. For the latest information on migration APARs please refer to WebSphere MQ Support, Migration PTFs at <http://www.ibm.com/support/docview.wss?uid=swg27006519>.

The backward migration scenario

After installation of a new release of MQ, the queue manager migration is effected by stopping the queue manager, which is running with the prior release of code, and restarting using the new release of code.

Customers tell us that often MQ is upgraded as part of a ServerPac installation, and often many components in the z/OS image are changed at one time. There will then be some period of running usual workload with the new releases of software, including MQ, to regression test against a known workload.

In the event of any issues arising, standard practice is to back out the most recent maintenance and fall back to the prior release while the issues are investigated and resolved. MQ provides backward migration PTFs on supported earlier releases to support fallback to that earlier release.

Rolling maintenance in a queue sharing group

Capability is provided so that in a queue sharing group, individual queue managers can be migrated forwards to Version 8.0.0, while those which remain at either Version 7.0.1 or Version 7.1.0 can continue to function. This allows queue sharing group queue managers to be upgraded to Version 8.0.0 at different times, maintaining the high availability of the queue sharing group. The function required to enable lower level queue managers to tolerate Version 8.0.0 additions to QSGDISP(GROUP) and QSGDISP(SHARED) objects is incorporated in the same APARs which provide backward migration capability.

Code levels for backward migration

First class migration support is provided for customers migrating from both IBM MQ Version 7.0.1 and IBM MQ Version 7.1.0 to IBM MQ for z/OS Version 8.0.0.

The backward migration APAR for IBM MQ for z/OS Version 7.0.1 is PI19721. PTFs for this APAR must be applied on Version 7.0.1 prior to attempting fallback from IBM MQ for z/OS Version 8.0.0. PTFs for this APAR are the 'Migration and Toleration PTFs for Version 8.0.0' described in http://www.ibm.com/support/knowledgecenter/SSFKSJ_8.0.0/com.ibm.mq.mig.doc/q118450_.htm.

The backward migration APAR for IBM MQ for z/OS Version 7.1.0 is PI19721. PTFs for this APAR must be applied on Version 7.1.0 to attempting fallback from IBM MQ for z/OS Version 8.0.0 . PTFs for this APAR are the 'Migration and Toleration PTFs for Version 8.0.0 ' described in http://www.ibm.com/support/knowledgecenter/SSFKSJ_8.0.0/com.ibm.mq.mig.doc/q118450_.htm.

Service has been discontinued for IBM MQ for z/OS versions 6.0.0 and 7.0.0 and no queue sharing group toleration nor backward migration capability is available for these versions.

The IBM MQ for z/OS Version 8.0.0 early code installed in the LPA is downward compatible, it supports queue managers running at Version 7.0.1 and Version 7.1.0 . Once updated to the Version 8.0.0 level, and the queue manager subsystem refreshed (via the REFRESH QMGR TYPE(EARLY) command), the early code need not be changed for any subsequent forward or backward migration activity. Message

```
CSQ3111I <cpf> CSQYSCMD - EARLY PROCESSING PROGRAM IS V8.0.0 LEVEL 007-001
```

is displayed during startup in the queue manager joblog and indicates that the queue manager is using the correct level of early code.

Limitations and restrictions

IBM MQ for z/OS Version 8.0.0 uses a migration switch to support backward migration by preventing use of certain new functions, which cannot be backward migrated, until the installation confirms that backward migration is no longer required. The migration switch is configured via a change to ZPARM using the OPMODE parameter of CSQ6SYSP. While OPMODE is set to COMPAT, it is possible to backward migrate, though certain new functions are not available. Once OPMODE is set to NEWFUNC, all new functions are available, but it is no longer possible to perform backward migration.

The MQSC command DISPLAY SYSTEM shows the current value of OPMODE. It displays two values, the operation mode, either COMPAT or NEWFUNC, and a version number. When the operation mode is COMPAT, then the version number indicates which version of MQ you can fall back to. *The value of OPMODE displayed during startup in message CSQY101I reflects the operation mode requested via ZPARM. Queue manager initialization evaluates the requested operation mode in combination with local state and other members of the queue sharing group, to determine the actual operation mode displayed with DISPLAY SYSTEM.*

It is not possible to backward migrate a queue manager newly created at Version 8.0.0 to a prior release. A queue manager migrated forward to Version 8.0.0 'remembers' where it was migrated from, and it is only possible to fall back to that 'remembered' prior version.

Certain connection types (IMS, BATCH and RRSBATCH used by WAS and DB2 stored procedures) allow an application to connect to multiple queue managers concurrently. If required, these queue managers can be running different levels of MQ code. In such a scenario, the adapter code (usually referenced via a STEPLIB DD statement or environment variable) must be loaded from libraries corresponding with the highest level of the queue managers connected. This ability for the adapter code to support connections to older queue managers means that in a backward migration scenario it is possible to just restart the MSTR and CHIN procedures with the back level code, and not change connecting jobs.

The operations and controls ISPF panels, CSQOREXX, from IBM MQ for z/OS Version 8.0.0 , is able to connect to



and administer queue managers from a prior release. However, the ISPF panels from lower releases are not able to connect to IBM MQ for z/OS Version 8.0.0 . When migrating, or during fall back, either use the same version ISPF panels as the level of code the queue manager is running, or, use CSQOREXX from the higher release of code. In a mixed level queue sharing group, the IBM MQ for z/OS Version 8.0.0 panels must be used to administer Version 7.1.0 or Version 7.0.1 queue managers, as ISPF panels from earlier releases do not tolerate responses from any Version 8.0.0 queue managers.

2.0 Migration to IBM MQ for z/OS Version 8.0.0

Queue sharing groups

Prior to migrating any queue manager in a queue sharing group to IBM MQ for z/OS Version 8.0.0 you must ensure that all the queue managers in the queue sharing group are at the same version and release. That is, they must all be at Version 7.0.1 or, all at Version 7.1.0 . Once you have started the migration process to IBM MQ for z/OS Version 8.0.0 for queue managers in a queue sharing group, it will not be possible to backward migrate any other queue manager to an earlier release, as this would lead to 3 different versions in the queue sharing group which is not permitted.

Version 7.0.1 specifics

This section relates to migration from and fall-back to Version 7.0.1 .

PTFs for the backward migration APAR must be applied on Version 7.0.1 prior to attempting fallback from IBM MQ for z/OS Version 8.0.0 .

First start at Version 8.0.0

As a result of additional attributes added to MQ Queue objects, during the first startup of an existing Version 7.0.1 queue manager at Version 8.0.0 an attempt will be made to convert all the queue objects internally. The internal conversion will not be successful for queues which have in-doubt units of work associated with them during this startup. If this happens, then a new message, CSQI970E, will be issued with the name of the problem queue. Additionally, if there was a problem migrating any queues, a further new message, CSQY023A, will be written to the console. Queue manager startup will be suspended until any single character response to the WTOR is received, e.g.

R nn,U

The intent of the WTOR is to draw attention to the outstanding actions required on the queues named in CSQI970E messages to complete migration.

Normally, the resolution of in-doubt units of work will be completed once the queue manager has started and the transaction managers such as CICS and IMS have reconnected. Once the in-doubt units of work have been resolved, it is necessary either to alter the affected queue objects (e.g. toggle PUT(DISABLED) and back to PUT(ENABLED)) or to restart the queue manager, either action will re-drive the queue conversion process. In either case, when the queue has been successfully migrated, new message CSQI971I will be issued naming the queue.



Fall-back to Version 7.0.1

It will NOT be possible to backwards migrate to Version 7.0.1 from Version 8.0.0 if the new functions available in Version 8.0.0 have been activated by the OPMODE parameter. Refer to the "Controlling new functionality and backward migration using the OPMODE property" section of the Migration Manual for more details.

If Version 8.0.0 has been started with OPMODE=NEWFUNC then any attempt to restart the queue manager at Version 7.0.1 will result in abnormal termination of the queue manager with reason code 5C6-00C90D01.

When reverting to Version 7.0.1 after running a queue manager at Version 8.0.0 the following should be considered:

- CHLAUTH objects are stored on the SYSTEM.CHLAUTH.DATA.QUEUE. They will not be visible at Version 7.0.1 but will reappear when the queue manager is subsequently restarted at Version 8.0.0 .
- New object attributes introduced in Version 8.0.0 will not be present in Version 7.0.1 , and when you subsequently migrate to Version 8.0.0 they will be reset to default values.
- If you are using the MQ Explorer to administer your queue manager then after migration between releases the following Explorer actions must be performed:
 - Remove the migrated z/OS queue manager (From the V6 Explorer, the queue manager must be hidden before it can be removed)
 - Add Remote Queue Manager
- AUTHINFO objects with AUTHTYPE(IDPWOS) will be deleted on backward migration. Any QSGDISP(GROUP) AUTHINFO objects with AUTHTYPE(IDPWOS) will be invisible to a Version 7.0.1 queue manager in a mixed Version 8.0.0 and Version 7.0.1 queue sharing group.
- TOPIC objects with CLROUTE(TOPICHOST) attribute set will be deleted on backward migration. Any QSGDISP(GROUP) TOPIC objects having CLROUTE(TOPICHOST) attribute set are hidden from a Version 7.0.1 queue manager in a mixed Version 8.0.0 and Version 7.0.1 queue sharing group.
- Proxy subscriptions created on behalf of remote subscribers for TOPICs defined with CLROUTE(TOPICHOST) attribute will be deleted when the TOPIC object is removed on backwards migration.
- When there are subscribers on the queue manager being backward migrated, for TOPICs defined with CLROUTE(TOPICHOST) on different queue managers, the proxy subs for these subscribers will be left on the queue managers hosting the topic. If the queue manager hosting the TOPIC is also backwards migrated, then the proxy subs will be deleted. These subscriptions can be identified by issuing `DISPLAY SUB (SYSTEM.PROXY_2*) SUBTYPE (PROXY)` on the remote host queue managers and looking for subscriptions with a DESTQMGR matching the local queue manager which is being backwards migrated. They can then be deleted as for any administrative subscription using the DELETE SUB command.

Version 7.1.0 specifics

This section relates to migration from and fall-back to Version 7.1.0 .

Fall-back to Version 7.1.0

It will NOT be possible to backwards migrate to Version 7.1.0 from Version 8.0.0 if the new functions available in Version 8.0.0 have been activated by the OPMODE parameter. Refer to the "Controlling new functionality and backward migration using the OPMODE property" section of the Migration Manual for more details. A Version 7.1.0 queue manager which reads a ZPARM module, built at Version 8.0.0 with OPMODE=(NEWFUNC, 800) will ABEND during startup with reason code 5C6-00E800B2.

If Version 8.0.0 has been started with OPMODE=NEWFUNC then any attempt to restart the queue manager at Version 7.1.0 will result in abnormal termination of the queue manager with reason code 5C6-00C90D01.

When reverting to Version 7.1.0 after running a queue manager at Version 8.0.0 the following should be considered:

- New object attributes introduced in Version 8.0.0 will not be present in Version 7.1.0, and when you subsequently migrate to Version 8.0.0 they will be reset to default values.
- If you are using the MQ Explorer to administer your queue manager then after migration between releases the following Explorer actions must be performed:
 - Remove the migrated z/OS queue manager (From the V6 Explorer, the queue manager must be hidden before it can be removed)
 - Add Remote Queue Manager
- AUTHINFO objects with AUTHTYPE(IDPWOS) will be deleted on backward migration. Any QSGDISP(GROUP) AUTHINFO objects with AUTHTYPE(IDPWOS) will be invisible to a Version 7.1.0 queue manager in a mixed Version 8.0.0 and Version 7.1.0 queue sharing group.
- TOPIC objects with CLROUTE(TOPICHOST) attribute set will be deleted on backward migration. Any QSGDISP(GROUP) TOPIC objects having CLROUTE(TOPICHOST) attribute set are hidden from a Version 7.1.0 queue manager in a mixed Version 8.0.0 and Version 7.1.0 queue sharing group.
- Proxy subscriptions created on behalf of remote subscribers for TOPICs defined with CLROUTE(TOPICHOST) attribute will be deleted when the TOPIC object is removed on backwards migration.
- When there are subscribers on the queue manager being backward migrated, for TOPICs defined with CLROUTE(TOPICHOST) on different queue managers, the proxy subs for these subscribers will be left on the queue managers hosting the topic. If the queue manager hosting the TOPIC is also backwards migrated, then the proxy subs will be deleted. These subscriptions can be identified by issuing `DISPLAY SUB(SYSTEM,PROXY_2*) SUBTYPE(PROXY)` on the remote host queue managers and looking for subscriptions with a DESTQMGR matching the local queue manager which is being backwards migrated. They can then be deleted as for any administrative subscription using the `DELETE SUB` command.



3.0 Notices

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