



IBM Software Group

WebSphere MQ z/OS a-z

z/OS MQ Administration Advanced

An IBM Educational Approach



WebSphere MQ z/OS Administration Adv

Agenda

- Utilities
- SMP
- Queue Sharing
- Clustering
- Bridges
 - IBM
 - CICS
- Sample Programs

WebSphere MQ z/OS Administration Adv

Utilities

- [WebSphere MQ utility program \(CSQUTIL\)](#)
- [The change log inventory utility \(CSQJU003\)](#)
- [The print log map utility \(CSQJU004\)](#)
- [The log print utility \(CSQ1LOGP\)](#)
- [The queue-sharing group utility \(CSQ5PQSG\)](#)
- [The active log preformat utility \(CSQJUFMT\)](#)
- [The dead-letter queue handler utility \(CSQUDLQH\)](#)
- [The migrate publish/subscribe configuration utility \(CSQUMGMB\)](#)

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Utilities - CSQUTIL

- Page set management
- Command management
- Queue management

```
//*****  
/*  Format the page sets  
//*****  
//FORM  EXEC PGM=CSQUTIL,COND=(0,NE),REGION=4M  
//STEPLIB DD DSN=++THLQUAL++.SCSQANL++LANGLETTER++,DISP=SHR  
//      DD DSN=++THLQUAL++.SCSQAUTH,DISP=SHR  
//CSQP0000 DD DISP=OLD,DSN=++HLQ++.PSID00  
//CSQP0001 DD DISP=OLD,DSN=++HLQ++.PSID01  
//CSQP0002 DD DISP=OLD,DSN=++HLQ++.PSID02  
//CSQP0003 DD DISP=OLD,DSN=++HLQ++.PSID03  
//CSQP0004 DD DISP=OLD,DSN=++HLQ++.PSID04  
//SYSPRINT DD SYSOUT=*  
//SYSIN  DD *  
FORMAT  
/*
```



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Utilities – CSQJU003

Change log inventory utility runs as a z/OS® batch job to change the bootstrap data set (BSDS).

- NEWLOG
- DELETE
- ARCHIVE
- CRESTART
- CHECKPT
- HIGHRBA

```
/*  
/* DEFINE ACTIVE LOGS  
/*  
//LOGDEF EXEC PGM=CSQJU003,COND=(0,NE)  
//STEPLIB DD DSN=++THLQUAL++.SCSQANL++LANGLETTER++,DISP=SHR  
//      DD DSN=++THLQUAL++.SCSQAUTH,DISP=SHR  
//SYSUT1 DD DISP=OLD,DSN=++HLQ++.BSDS01  
//SYSUT2 DD DISP=OLD,DSN=++HLQ++.BSDS02  
//SYSPRINT DD SYSOUT=*,DCB=BLKSIZE=629  
//SYSIN DD *  
NEWLOG DSNAME=++HLQ++.LOGCOPY1.DS01,COPY1  
NEWLOG DSNAME=++HLQ++.LOGCOPY1.DS02,COPY1  
/*
```

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Utilities – CSQJU004

Batch utility program used to print log data information.

The WebSphere® MQ print log map utility runs as a z/OS® batch program to list the following information:

- Log data set name and log RBA association for both copies of all active and archive log data sets
- Active log data sets available for new log data
- Contents of the queue of checkpoint records in the bootstrap data set (BSDS)
- Contents of the quiesce history record
- System and utility time stamps
- Passwords for the active and archive log data sets

```
//JU004    EXEC PGM=CSQJU004
//STEPLIB DD DISP=SHR,DSN=thlqual.SCSQANLE
//          DD DISP=SHR,DSN=thlqual.SCSQAUT
//SYSPRINT DD SYSOUT=*,DCB=BLKSIZE=629
//SYSUT1   DD DISP=SHR,DSN=bsds.dsname
```



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Utilities – CSQ1LOGP

The log print utility

Use this utility to print and extract information contained in the WebSphere® MQ log data sets or the BSDS.

```
//PRTLOG EXEC PGM=CSQ1LOGP
//STEPLIB DD DISP=SHR,DSN=thlqual.SCSQANLE
//      DD DISP=SHR,DSN=thlqual.SCSQLOAD
//BSDS   DD DSN=qmgr.bsds.dsname,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSSUMRY DD SYSOUT=*
//SYSIN   DD *
* extract records for pageset 3. Produce both summary and detail reports
PAGESET(3)
SUMMARY(YES)
/*
```

Sample	Description
thlqual.SCSQLOAD(CSQ4LOGS)	Sample C program to report on the UOW activity and object manipulation
thlqual.SCSQC37S(CSQ4LOGS)	Source for sample C program
thlqual.SCSQC370(CSQ4LOGD)	C header file to map records generated when using the EXTRACT(YES) function of CSQ1LOGP
thlqual.SCSQPROC(CSQ4LOGJ)	Sample JCL to run program CSQ4LOGS



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Utilities – CSQ5PQSG

Queue-Sharing Group Utility

- add queue-sharing group and queue manager definitions
- verify the consistency of DB2 object definitions

```
ADD QMGR--,qmgr-name,qsg-name,dsg-name,DB2-ssid
ADD QSG--,qsg-name,dsg-name,DB2-ssid
REMOVE QMGR--,qmgr-name,qsg-name,dsg-name,DB2-ssid
REMOVE QSG--,qsg-name,dsg-name,DB2-ssid
MIGRATE DSG--,dsg-name,DB2-ssid
MIGRATE QSG--,qsg-name,dsg-name,DB2-ssid
FORCE QMGR--,qmgr-name,qsg-name,dsg-name,DB2-ssid
VERIFY QSG--,qsg-name,dsg-name,DB2-ssid
```

```
//S001      EXEC PGM=CSQ5PQSG,REGION=4M,
//          PARM='ADD QMGR,QM01,QSG1,DSN510PG,DB2A'
//STEPLIB   DD DSN=thlqual.SCSQANLE,DISP=SHR
//          DD DSN=thlqual.SCSQAUTH,DISP=SHR
//          DD DSN=db2qual.SDSNLOAD,DISP=SHR
//SYSPRINT DD SYSOUT=*
```



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Utilities – CSQJUFMT

You can use the CSQJUFMT utility to format active log data sets before they are used by a queue manager.

```
//JOBLIB DD DISP=SHR,DSN=thlqual.SCSQANLE
// DD DISP=SHR,DSN=thlqual.SCSQAUTH
//*
//JUFMT11 EXEC PGM=CSQJUFMT
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD DISP=OLD,DSN=hlq.LOGCOPY1.DS01
//*
//JUFMT21 EXEC PGM=CSQJUFMT
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD DISP=OLD,DSN=hlq.LOGCOPY2.DS01
```



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Utilities – CSQUDLQH

Dead-Letter queue handler utility

You can use the default dead-letter utility (CSQUDLQH) to handle message written to the dead-letter queue.

A dead-letter queue (DLQ) is a holding queue for messages that cannot be delivered to their destination queues. Every queue manager in a network can have an associated DLQ.

In JCL

```
//READQ EXEC PGM=CSQUDLQH,  
//          PARM='CSQ1.DEAD.QUEUE CSQ1'
```

In Rules Table

```
INPUTQ(CSQ1.DEAD.QUEUE) INPUTQM(CSQ1)
```

```
//READQ EXEC PGM=CSQUDLQH,  
//          PARM='CSQ1.DEAD.QUEUE CSQ1'  
//STEPLIB DD DSN=thlqual.SCSQAUTL,DISP=SHR  
//          DD DSN=thlqual.SCSQLOAD,DISP=SHR  
//          DD DSN=thlqual.SCSQANLE,DISP=SHR  
//SYSOUT DD SYSOUT=*  
//SYSIN DD *  
    INPUTQM(CSQ2)  
    INPUTQ('CSQ2.DEAD.QUEUE')  
    ACTION(RETRY)  
/*
```

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Utilities – CSQUMGMB

Migrate Publish/Subscribe Configuration Utility

Migrates the Publish/Subscribe WebSphere® Event Broker Version 6.0 or WebSphere Message Broker Version 6.0 or 6.1 to WebSphere MQ Version 7.0.1 and later versions

- Subscriptions
- Subscription points. (Subscription points are supported only when RFH2 messages are used.)
- Streams
- Retained publications

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System Management Facility (SMF) Records

- Use SMF to collect statistics and accounting information
- Parameters must be set in z/OS® and in WebSphere® MQ
- Record Types
 - Type 115
 - Type 116
- You must also set the SMFSTAT and SMFACCT parameters to YES

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System Management Facility (SMF) Records (cont)

SMF Reporting Approaches

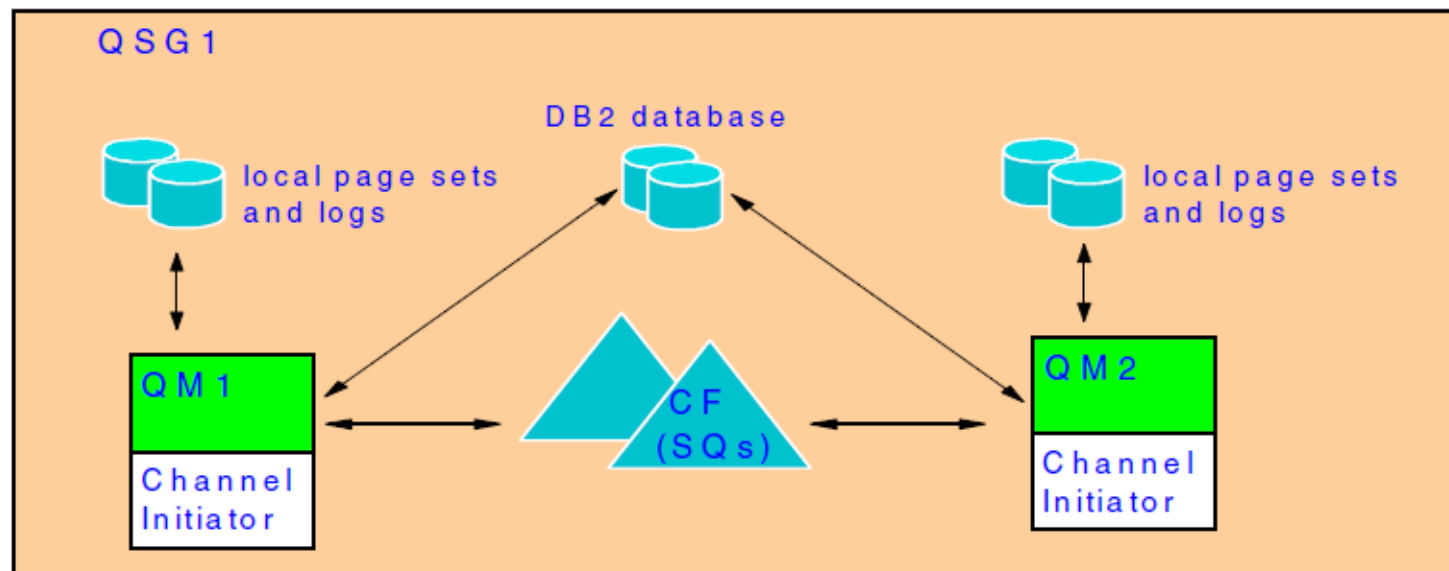
- Application program
- Resource Measurement Facility Resource Management Facility (RMF™) Record
- Tivoli® Decision Support for z/OS
- CICS® monitoring facility
- MP1B Support Pack



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Queue Sharing Groups

- Only on z/OS® queue managers
- Queue managers that can access the same set of shared queues form a group called a *queue-sharing group* (QSG), and they communicate with each other using a coupling facility (CF) that stores the shared queues
- Group of Queue Managers accessing the same queue data
- QSG are displayed in MQExplorer
- A shared queue is a queue that has been defined on a queue manager in a queue-sharing group and has the queue-sharing group disposition of **Share**



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Queue Sharing Groups (cont) Managing QSG

- Adding a queue-sharing group to the DB2 tables
- Adding a queue manager to a queue-sharing group
- Removing a queue manager from a queue-sharing group
- Removing a queue-sharing group from the DB2 tables
- Validating the consistency of DB2 definitions

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Queue Sharing Groups (cont) Managing Shared Queues

- Recovering shared queues
- Moving shared queues
- Migrating non-shared queues to shared queues
- Suspending a DB2 connection

```
//UTILITY      EXEC PGM=CSQUTIL,PARM=('CSQ1')
//STEPLIB      DD DSN=thlqual.SCSQANLE,DISP=SHR
//              DD DSN=thlqual.SCSQAUTH,DISP=SHR
//SYSPRINT     DD SYSOUT=*
//SYSIN        DD *
COMMAND DDNAME(MOVEQ)
/*
//MOVEQ        DD *
ALTER QL(QUEUE_TO_MOVE) PUT(DISABLED)
DELETE QL(TEMP_QUEUE) PURGE
DEFINE QL(TEMP_QUEUE) LIKE(QUEUE_TO_MOVE) PUT(ENABLED) GET(ENABLED) QSGDISP(QMGR)
MOVE QLOCAL(QUEUE_TO_MOVE) TOQLOCAL(TEMP_QUEUE)
DELETE QL(QUEUE_TO_MOVE)
DEFINE QL(QUEUE_TO_MOVE) LIKE(TEMP_QUEUE) CFSTRUCT(NEW) QSGDISP(SHARED)
MOVE QL(TEMP_QUEUE) TOQLOCAL(QUEUE_TO_MOVE)
DELETE QL(TEMP_QUEUE)
/*
```



Queue Sharing Groups (cont)

Managing the coupling facility

- 

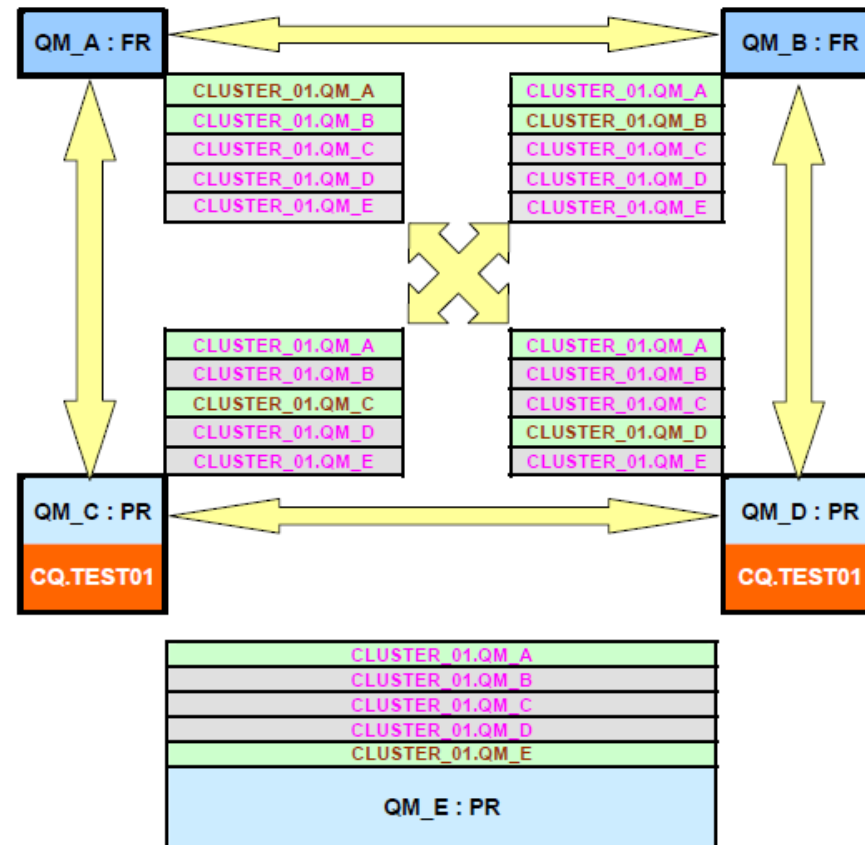

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Clustering - Overview

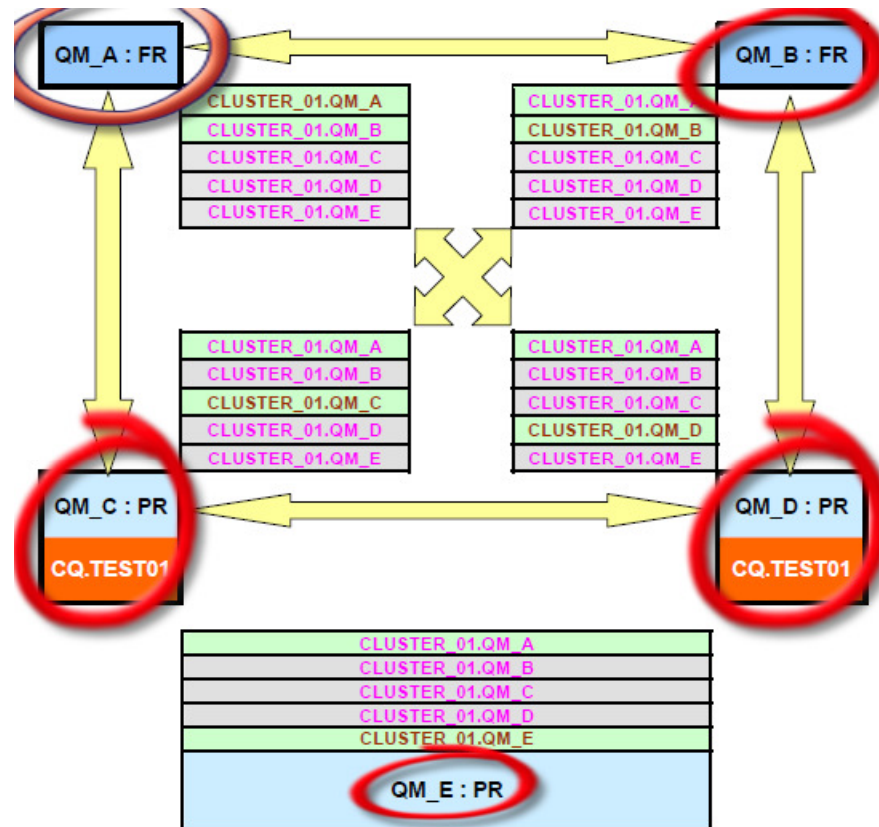


Legend

- Explicit Defined Cluster-Receiver Channel
- Explicit Defined Cluster-Sender Channel
- Auto Defined Cluster-Sender Channel

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Clustering – QMGR Roles



Legend	
Explicit Defined Cluster-Receiver Channel	
Explicit Defined Cluster-Sender Channel	
Auto Defined Cluster-Sender Channel	

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Clustering – Communication

Queue Manager Name	Cluster Receiver Channel Name
QM_A	CLUSTER_01.QM_A
QM_B	CLUSTER_01.QM_B
QM_C	CLUSTER_01.QM_C
QM_D	CLUSTER_01.QM_D
QM_E	CLUSTER_01.QM_E



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Clustering – Communication

Queue Manager Name	Cluster Sender Channel Name
QM_A	CLUSTER_01.QM_B - Explicit CLUSTER_01.QM_C - Auto CLUSTER_01.QM_D - Auto CLUSTER_01.QM_E - Auto
QM_B	CLUSTER_01.QM_A - Explicit CLUSTER_01.QM_C - Auto CLUSTER_01.QM_D - Auto CLUSTER_01.QM_E - Auto
QM_C	CLUSTER_01.QM_A - Explicit CLUSTER_01.QM_B - Auto CLUSTER_01.QM_D - Auto CLUSTER_01.QM_E - Auto
QM_D	CLUSTER_01.QM_A - Explicit CLUSTER_01.QM_B - Auto CLUSTER_01.QM_C - Auto CLUSTER_01.QM_E - Auto
QM_E	CLUSTER_01.QM_A - Explicit CLUSTER_01.QM_B - Auto CLUSTER_01.QM_C - Auto CLUSTER_01.QM_D - Auto



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Clustering – Queues

```

List Cluster Queues - WMQA                                     Row 1 of 42

Type action codes, then press Enter.
1=Display queue

Queue name      Put Type      Disposition
Cluster name    Base queue type
Base queue manager name

<> *           QCLUSTER -      WMQA
- MQWFLO.MQWGRP.ADM Y QCLUSTER -      WMQA
-   MQWFCLST      QALIAS  QMGR
-   WMQA
- MQWFLO.MQWGRP.CLE Y QCLUSTER -      WMQA
-   MQWFCLST      QALIAS  QMGR
-   WMQA
- MQWFLO.MQWGRP.EXE Y QCLUSTER -      WMQA
-   MQWFCLST      QALIAS  QMGR
-   WMQA
- MQWFLO.MQWGRP.EXE.XML Y QCLUSTER -      WMQA
-   MQWFCLST      QALIAS  QMGR

Command ==>
F1=Help    F2=Split    F3=Exit    F4=Filter    F5=Refresh    F7=Bkwd
F8=Fwd     F9=SwapNext F10=Messages F12=Cancel

```

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Clustering – Building

```

List Cluster-queue-manager Channels - WMQA                               Row 1 of 9

Type action codes, then press Enter.  Press F11 to display connection status.
1=Display  5=Perform  6=Start  7=Stop

Channel name      Connection name      State
Type             Cluster name      Suspended
Cluster queue manager name      Disposition

<>  *              -          WMQA
-   TO.QMPH        PATH(1414)              RETRY
-   CLUSSDRB      PHCLUSTER                N
-   QMPH          -          WMQA
-   CLUSTER.TO.WMQA  demomvs.demopkg.ibm.com(1414)
-   CLUSRCVR      PHCLUSTER                N
-   WMQA          -          WMQA
-   TO.WMQA.DNET461 demomvs.demopkg.ibm.com(1414)
-   CLUSRCVR      CARINA                  N
-   WMQA          -          WMQA

***** End of list *****

Command ==>
F1=Help    F2=Split    F3=Exit    F4=Filter    F5=Refresh    F7=Bkwd
F8=Fwd     F9=SwapNext F10=Messages F11=Status  F12=Cancel

```

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Clustering – Building, Full Repository

```
Display a Queue Manager - 3

Press F7 or F8 to see other fields, or Enter to refresh details.

More:  - +

Queue manager name . . . . . : WMQA

Cluster workload
  Exit name . . . . . :
  User data . . . . . :
  Message length . . . . . : 100          0 - 104857600
  Max used channels . . . . : 999999999  1 - 999999999
  Queue use . . . . . : L  A=Any, L=Local

Repository management
  Cluster name . . . . . :
  Cluster namelist name . :

Queue manager identifier . : WMQA.B803A514F9039463

Command ==>

F1=Help      F2=Split      F3=Exit      F7=Bkwd      F8=Fwd      F9=SwapNext
F10=Messages F12=Cancel
```



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Clustering – Building, Full Repository connectivity

1. Cluster Receiver

```

Channel name . . . . . TO.WMQA.DNET461
Disposition . . . . . : QMGR      WMQA
Description . . . . . :

Transport type . . . . . : T  L=LU6.2, T=TCP/IP
Connection name . . . . . : demomvs.demopkg.ibm.com(1414)
  
```

2. Cluster Sender

=	SYSTEM.DEF.CLUSSDR	CLUSSDR	QMGR	WMQA	INACTIVE
-	TO.QMPH	CLUSSDR	QMGR	WMQA	RETRY

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Clustering – Building, Cluster Queue Managers, Partial

1. Cluster Receiver

```

Channel name . . . . . TO.WMQA.DNET461
Disposition . . . . . : QMGR      WMQA
Description . . . . . :

Transport type . . . . . : T  L=LU6.2, T=TCP/IP
Connection name . . . . . : demomvs.demopkg.ibm.com(1414)
  
```

2. Cluster Sender

=	SYSTEM.DEF.CLUSSDR	CLUSSDR	QMGR	WMQA	INACTIVE
-	TO.QMPH	CLUSSDR	QMGR	WMQA	RETRY

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Clustering – Define a Cluster Queue

```
Queue name . . . . . : MQWFLO.MQWFGRP.ADM
Disposition . . . . . : -          WMQA
Description . . . . . : Alias Queue for Administration S
                        erver Input Queue
Put enabled . . . . . : Y  Y=Yes, N=No
Default persistence . . . . : Y  Y=Yes, N=No
Default priority . . . . . : 0  0 - 9
Default bind . . . . . : N  0=Open, N=Notfixed
Base queue manager name . . : WMQA
Queue manager identifier . . : WMQA_B803A514F9039463
Cluster name . . . . . : MQWFCLST
Cluster workload - Rank . . : 0  0 - 9          Priority . . : 0  0 - 9
Base queue type . . . . . : QALIAS  QMGR
Cluster time . . . . . : 2002-09-18 09.24.52
Last alteration time . . . . : 2002-09-18 10.24.53
```

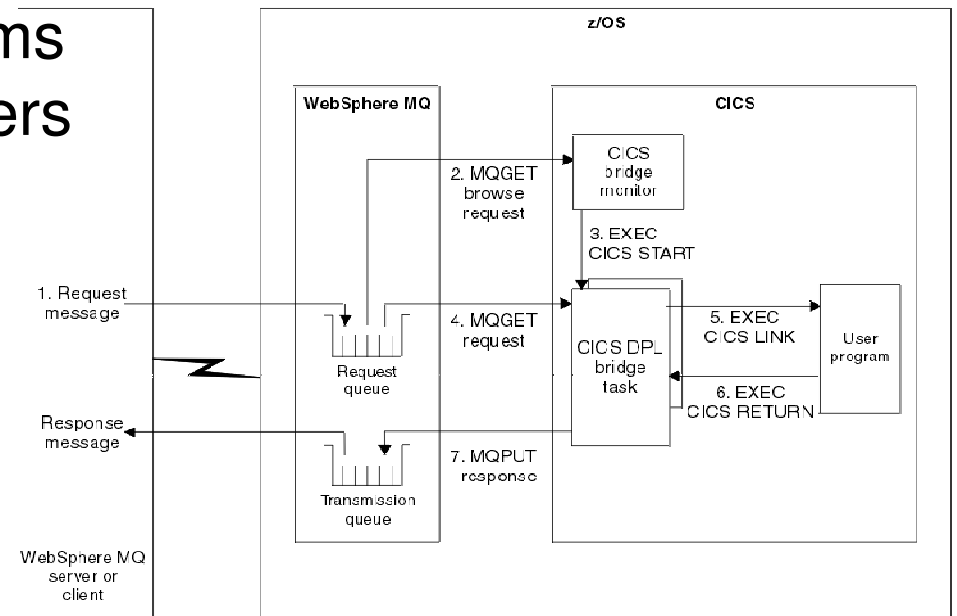


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z/OS MQ Bridges

CICS

1. STEPLIB concatenation
2. DFHRPL concatenation
3. Install an MQCONN resource
4. CICS-WebSphere MQ adapter auto connect
5. (IRC) to remote CICS systems
6. coded character set identifiers
7. CICS CSD
8. CSQ4SAMP sample
9. WebSphere MQ definitions

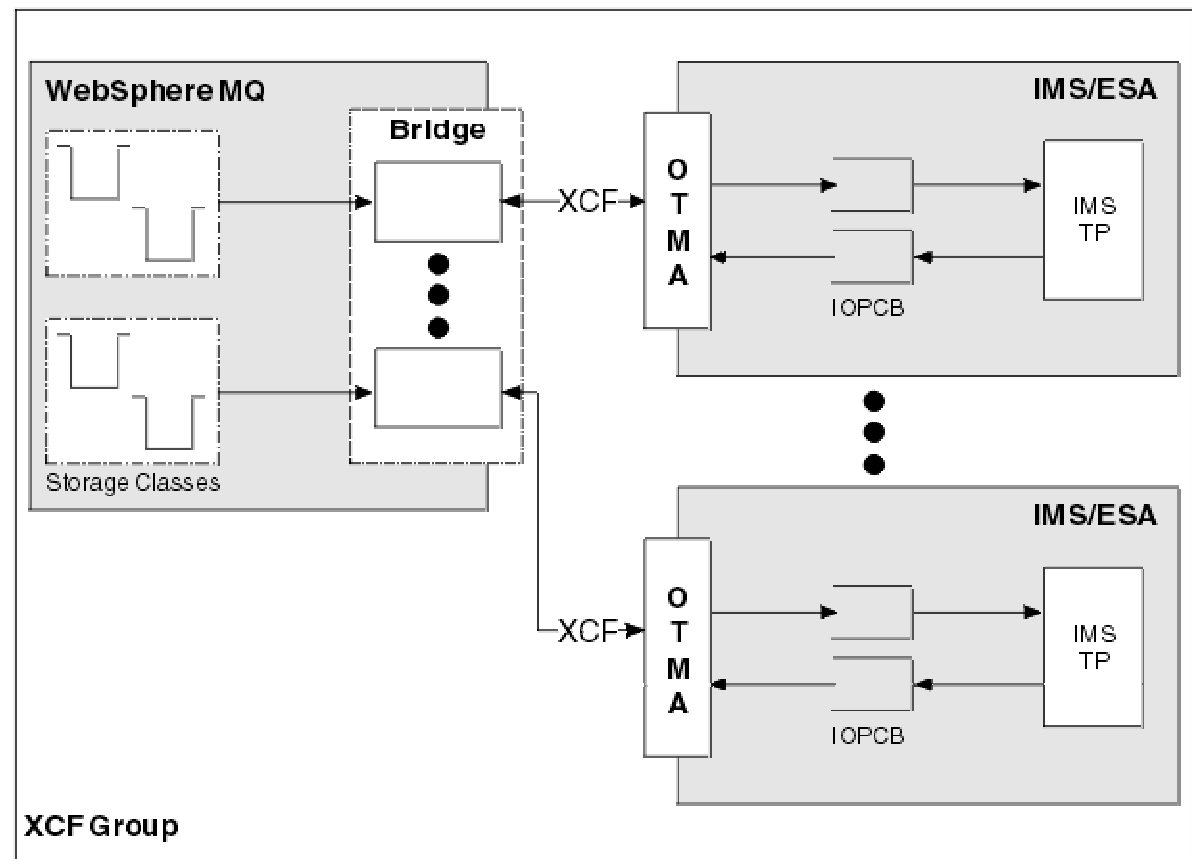


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z/OS MQ Bridges

IMS

- Libraries
- Copy Programs
- Dumps
- Dynamic calls
- Trigger Monitor
- XCF & OTMAS



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Sample Programs

- WebSphere MQ provides an abundant list of samples to provide support and to help start programming
- The [InfoCenter List of Tables](#) provides ;links to load and source modules
- Application support
- Program languages

- [The Put samples](#)
- [The Get samples](#)
- [The Browse sample](#)
- [The Print Message sample](#)
- [The Queue Attributes sample](#)
- [The Mail Manager sample](#)
- [The Credit Check sample](#)

- [The Message Handler sample](#)
- [The Asynchronous Put sample](#)
- [The Batch Asynchronous Consumption sample](#)
- [The CICS Asynchronous Consumption and Publish/Subscribe sample](#)
- [The Publish/Subscribe Sample](#)
- [The Set and Inquire message property sample](#)



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