IBM Software Group

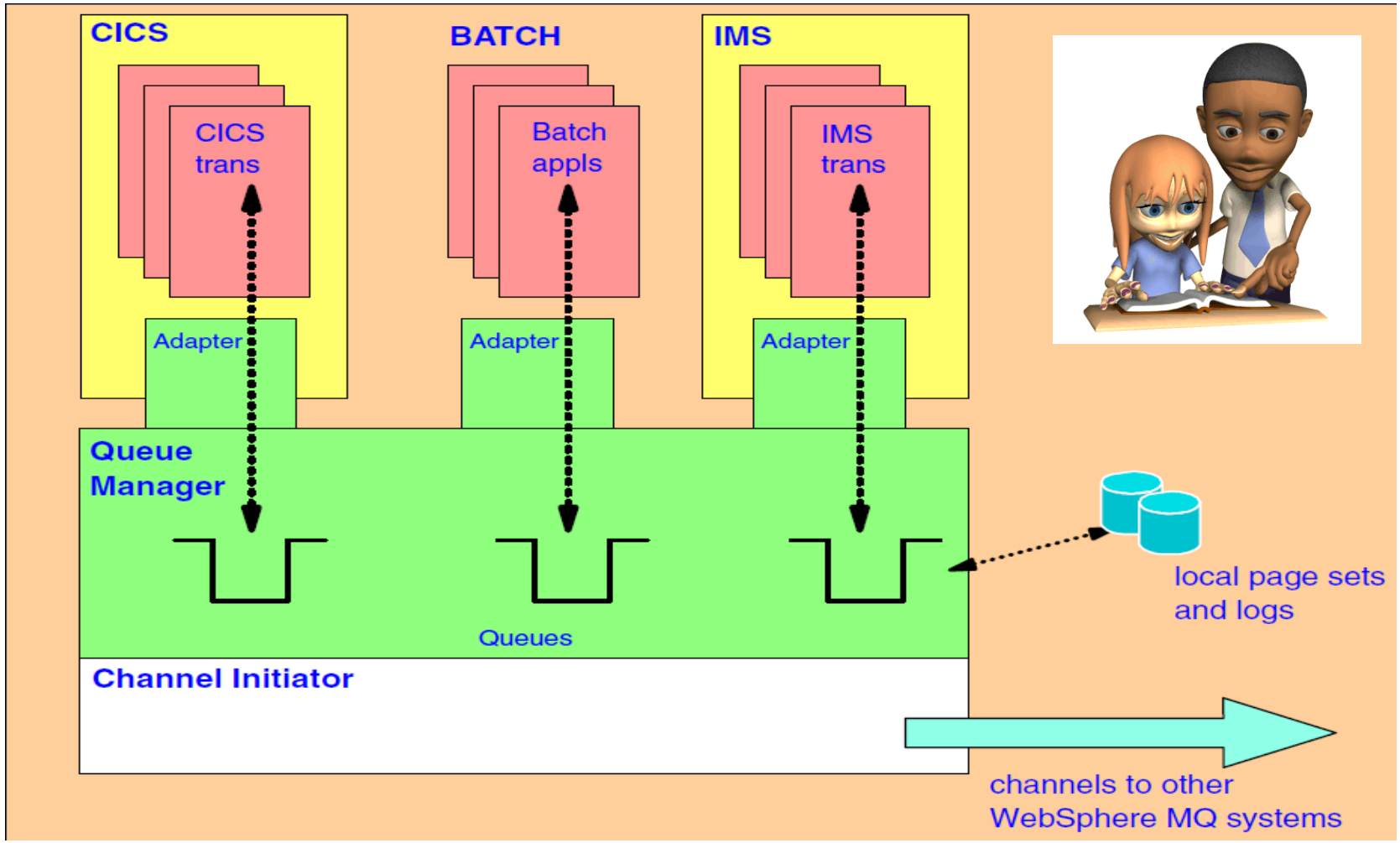
WebSphere MQ z/OS a-z
Proof of Technology

MQ for z/OS v7.1 Customization

An IBM Educational Approach

MQ z/OS v7.1 Customization

Overview



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Libraries

thlqual.SCSQANLE	Contains the load modules for the U.S. English (mixed case) version of WebSphere MQ
thlqual.SCSQASMS	Contains source for assembler sample programs
thlqual.SCSQAUTH	The main repository for all WebSphere MQ product load modules; it also contains the default parameter module, CSQZPARM
thlqual.SCSQCICS	Contains extra load modules that must be included in the CICS DFHRPL concatenation
thlqual.SCSQCOBC	Contains COBOL copybooks, including copybooks required for the sample programs.
thlqual.SCSQCOBS	Contains source for COBOL sample programs.
thlqual.SCSQEXEC	Contains REXX executable files to be included in the SYSEXEC or SYSPROC concatenation if you are using the WebSphere MQ operations and control panels
thlqual.SCSQINST	Contains JCL for installation jobs
thlqual.SCSQLOAD	Load library. Contains load modules for non-APF code, user exits, utilities, samples, installation verification programs, and adapter stubs
thlqual.SCSQPROC	Contains sample JCL and default system initialization data sets

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Customization Steps for a new Queue Manager

Task 1: Identify the z/OS system parameters
Task 2: APF authorize the WebSphere MQ load libraries
Task 3: Update the z/OS link list and LPA
Task 4: Update the z/OS program properties table
Task 5: Define the WebSphere MQ subsystem to z/OS
Task 6: Create procedures for the WebSphere MQ queue manager
Task 7: Create procedures for the channel initiator
Task 8: Define the WebSphere MQ subsystem to a z/OS WLM service class
Task 9: Select and set up your coupling facility offload storage environment
Task 10: Set up the coupling facility
Task 11: Implement your ESM security controls
Task 12: Update SYS1.PARMLIB members
Task 13: Customize the initialization input data sets
Task 14: Create the bootstrap and log data sets
Task 15: Define your page sets
Task 16: Add the WebSphere MQ entries to the DB2 data-sharing group
Task 17: Tailor your system parameter module
Task 18: Tailor the channel initiator parameters
Task 19: Set up Batch, TSO, and RRS adapters
Task 20: Set up the operations and control panels
Task 21: Include the WebSphere MQ dump formatting member
Task 22: Suppress information messages

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Task 1: Identify the z/OS system parms

- Updating the z/OS® system parameters
- *Perform this task once for each z/OS system*
- SYS1.PARMLIB(IEASYSpp) module list
- Entries to find
  - Task 2
  - Task 3
  - Task 4
  - Task 5:

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Task 2: APF authorize the WebSphere MQ load libraries

The **authorized program facility** or **APF** is used to allow the installation to identify system or user programs that can use sensitive system functions. To maintain system security and integrity, a program must be authorized by the APF before it can access restricted functions, such as supervisor calls (SVC) or SVC paths. APF helps to avoid integrity exposures; the installation identifies which libraries contain special functions or programs. These libraries are then called APF libraries.

Libraries for MQ must be APF Authorized

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Task 3: Update the z/OS link list and LPA

The Link Pack Area (LPA) is a collection of programs and fixed tables that appear to be programs that are loaded into storage when the system is started, or to use our quaint term, IPLed. These programs and tables can be used by any program at any time.

- Add MQ code to the LPA
- LPALSTmm member of SYS1.PARMLIB
- LPA required Code for MQ
  - thqual.SCSQLINK
    - CSQ3INI
    - CSQ3EPX
  - thqual.SCSQSNL*x*,
    - CSQ3ECMX
    - CSQ8UERL
- Issue SETPROG to make available
- Refresh Early code

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Task 4: Update the z/OS program properties table

```
PPT  PGMNAME(CSQYASCP) /* CSQ - THIS IS REQUIRED FOR WEBSPHERE MQ */
             CANCEL              /* CAN BE CANCELLED                    */
             KEY(7)              /* STORAGE PROTECTION KEY              */
             SWAP                /* PROGRAM IS SWAPPABLE                */
             NOPRIV              /* NOT PRIVILEGED                      */
             DSI                 /* REQUIRES DATA SET INTEGRITY         */
             PASS                /* NOT ALLOWED TO BYPASS PASS PROT     */
             SYST                /* SYSTEM TASK SO NOT TIMED            */
             AFF(NONE)           /* NO PROCESSOR AFFINITY               */
             NOPREF              /* NO PREFERRED STORAGE FRAMES         */

PPT  PGMNAME(CSQXJST)  /* CSQ - MAKE WEBSPHERE MQ MOVER NON-SWAPPABLE */
             CANCEL              /* CAN BE CANCELLED                    */
             KEY(8)              /* STORAGE PROTECTION KEY              */
             NOSWAP              /* PROGRAM IS NON-SWAPPABLE            */
```

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Task 5: Define the WebSphere MQ subsystem to z/OS

- Sub-Tasks
  - Updating the subsystem name table
  - Defining command prefix strings (CPFs)
  - CPFs in a sysplex environment

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Task 6: Create procedures for the MQ queue manager

- Queue Manager defined by a Catalogue Procedure
- Migration concerns
- Create one or use supplied
- Supplied procedures,
  - CSQ4MSTR
  - CSQ4MSR

  resides in thlqual.SCSQPROC
- Shared Queue DB2 Requirement

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Task 7: Create procedures for the channel initiator

- Create the procedure from thlqual.SCSQPROC(CSQ4CHIN)
- Migration concerns
- Tailor the copied procedure
- SSL requirement
- TCPIP requirements

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Task 8: Define MQ subsystem to z/OS WLM service class

- Performance Improvements
- Define Queue Manager and CHIN policies to WLM
- Activate Policy

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Task 9: Set up coupling facility offload storage env

- MQ Access to DB2
- Sample JCL for QSG setup
- Customize the 5 JCL procedures:
  - CSQ45CDB
  - CSQ45CTS
  - CSQ45CTB
  - CSQ45BPL
  - CSQ45GEX
- Failure

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Task 10: Set up the coupling facility

- Required Structures
  - Define ADMIN Application Structure
  - Define APPL tructure
  - Message structure
- Sample control statements for IXCMIAPU
- Activate CFRM

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Task 11: Implement your ESM security controls

Implement security controls for queue-sharing groups, the channel initiator, and all queue managers accessing the coupling facility list structures.

- *Repeat this task for each WebSphere® MQ queue manager or queue-sharing group.*
- *You might need to perform this task when migrating from a previous version. For details, see Migration paths:WebSphere MQ for z/OS.*

This setup is covered in a separate module on Security

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Task 12: Update SYS1.PARMLIB members

- Permanent updates
- update some members of SYS1.PARMLIB
  - IEFSSNss
  - IEASYSpp for
    - PROGxx or IEAAPFaa
    - LNKLSTkk or LPALSTmm
      - SCHEDxx
      - IEFSSNss

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Task 13: Customize the initialization input data sets

- Initial System Definitions
- Input Datasets (PDS) o the Procedure
- In - CSQINP1, CSQINP2, CSQINPT, CSQINPX
- Out - CSQOUT1, CSQOUT2, CSQOUTT, CSQOUTX
- Samples Provided

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Task 13: Initialization input data sets (cont)

CSQINP1

- Samples Provided
  - CSQ4INP1
  - CSQ4INPR
- Pageset Definitions
- Dynamic buffer pool / Pageset changes

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Task 13: Initialization input data sets (cont)

CSQINP2

CSQ4INSG	System object definitions.
CSQ4INSA	System object and default rules for channel authentication.
CSQ4INSX	System object definitions.
CSQ4INSS	Customize and include this member if you are using queue-sharing groups.
CSQ4INSJ	Customize and include this member if you are using publish/subscribe using JMS.
CSQ4INSR	Customize and include this member if you are using WAS or the queued publish/subscribe interface supported either by the queued publish/subscribe daemon in MQ V7 or WMBroker V6.
CSQ4INYC	Clustering definitions.
CSQ4INYD	Distributed queuing definitions.
CSQ4INYG	General definitions.
CSQ4INYR	Storage class definitions, using multiple page sets for the major classes of message.
CSQ4INYS	Storage class definitions, using one page set for each class of message.

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Task 13: Initialization input data sets (cont)

CSQINPX

- Input commands for the CHIN
- Output goes to CSQOUTX

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Task 13: Initialization input data sets (cont)

CSQINPT

CSQ4INST	System default subscription definition
CSQ4INYT	Publish/Subscribe definitions

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Task 14: Create the bootstrap and log data sets

- CSQJU003 creates the BSDS and Log datasets
- Control statements in CSQ4BSDS)
- Customize for this Queue Manager
- BSDS is referred in the Queue Manager Procedure

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Task 15: Define your page sets

- Pageset Use
- Samples
  - CSQ4PAGE
  - CSQ4PAGR
- Customize
- Started Procedure Pageset Reference
- Dynamic expansion
- Naming
- Large Pageset size

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Task 16: Add MQ entries to the DB2 data-sharing group

- Use utility CSQ5PQSG to add entries
- Add each Queue Manager
- Perform actions

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Task 17: Tailor your system parameter module

The system Parm, CSQPARM, controls many features of MQ
The system parameter module has three macros as follows:

Macro name	Purpose
CSQ6SYSP	Specifies the connection and tracing parameters, see Using CSQ6SYSP
CSQ6LOGP	Controls log initialization, see Using CSQ6LOGP
CSQ6ARVP	Controls archive initialization, see Using CSQ6ARVP

- Create parm for specific needs
- Start Queue manager pointing to new parm

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Task 17: Tailor your system parameter module (cont)

Using CSQ6SYSP

Parameter	Description	Default	SET
CLCACHE	Specifies the type of cluster cache to use.	STATIC	
CMDUSER	The default user ID for command security checks.	CSQOPR	
CONNSWAP	Specifies whether jobs that are issuing certain MQ API calls are swappable or non-swappable.	YES	
EXITLIM	Time (in seconds) for which queue-manager exits can run during each invocation	30	
EXITTCB	How many started server tasks to use to run queue manager exits.	8	
LOGLOAD	Number of log records written by WebSphere® MQ between the start of one checkpoint and the next.	500,000	X
MULCCAPT	Determines the Measured Usage Pricing property which controls the algorithm for gathering data used by Measured Usage License Charging (MULC).		
OPMODE	Controls the operation mode of the queue manager.	See parameter description	
OTMACON	OTMA connection parameters	See parameter description	

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Task 17: Tailor your system parameter module (cont)

Using CSQ6SYSP

Parameter	Description	Default	SET
QINDXBLD	Determines whether queue manager restart waits until all indexes are rebuilt, or completes before all indexes are rebuilt.	WAIT	
QMCCSID	Coded character set identifier for the queue manager.	Zero	
QSGDATA	Queue-sharing group parameters.	See parameter	
RESAUDIT	RESLEVEL auditing parameter	YES	
ROUTCDE	Message routing code assigned to messages not solicited from a specific console.	1	
SERVICE	Reserved for use by IBM	00	X
SMFACCT	Specifies whether SMF accounting data is to be collected when the queue manager is started.	NO	
SMFSTAT	Specifies whether SMF statistics are to be collected when the queue manager is started.	NO	
STATIME	Default time, in minutes, between each gathering of statistics.	30	X

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Task 17: Tailor your system parameter module (cont)

Using CSQ6LOGP

Parameter	Description	Default	SET
COMPLOG	Controls whether log compression is enabled.	NONE	X
DEALLCT	Length of time an archive tape unit remains unused before it is deallocated.	zero	X
INBUFF	Size of input buffer storage for active and archive log data sets.	60 KB	
MAXARCH	Max num of archive log volumes that can be recorded.	500	X
MAXRTU	Max num of dedicated tape units alloc to read arch log tape vols concurrently	2	
OFFLOAD	Archiving on or off.	YES (ON)	
OUTBUFF	Size of output buffer storage for active and archive log data sets.	4 000 KB	
TWOACTV	Single or dual active logging	YES (dual)	
TWOARCH	Single or dual archive logging	YES (dual)	
TWOBSDS	Single or dual BSDS	YES (dual BSDS)	
WRTHRSH	Number of output buffers to be filled before they are written to the active log data sets.	20	X

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Task 17: Tailor your system parameter module (cont)

Using CSQ6ARVP

Parameter	Description	Default value	SET command
ALCUNIT	Units in which primary and secondary space allocations are made.	BLK (blocks)	X
ARCPFX1	Prefix for first archive log data set name.	CSQARC1	X
ARCPFX2	Prefix for second archive log data set name.	CSQARC2	X
ARCRETN	The retention period of the archive log data set in days.	9999	X
ARCWRTC	List of route codes for messages to the operator about archive log data sets.	1,3,4	X
ARCWTOR	Whether to send message to operator and wait for reply before trying to mount an archive log data set.	YES	X
BLKSIZE	Block size of archive log data set.	28 672	X
CATALOG	Whether archive log data sets are cataloged in the ICF.	NO	X
COMPACT	Whether archive log data sets should be compacted.	NO	X
PRIQTY	Primary space allocation for DASD data sets.	25 715	X
PROTECT	Whether archive log data sets are protected by ESM profiles when the data sets are created.	NO	X
QUIESCE	Maximum time, in seconds, allowed for quiesce when ARCHIVE LOG with MODE(QUIESCE) specified.	5	X
SECQTY	Secondary space allocation for DASD data sets. See the ALCUNIT parameter for the units to be used.	540	X
TSTAMP	Whether the archive data set name should include a time stamp.	NO	X
UNIT	Device type or unit name on which the first copy of archive log data sets is stored.	TAPE	X
UNIT2	Device type or unit name on which the second copy of archive log data sets is stored.	Blank	X

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Task 18: Tailor the channel initiator parameters

- Alter QMGR to set parameters
- Customize input DS CSQ4INYG
- Relationship between:
  - Adapters
  - Dispatchers
  - Max Channels
- One dispatcher per 50 channels
- TCPIP max 50 dispatchers
- Production Recommendation
- USS
  - MAX Chls
  - Usage

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Task 19: Set up Batch, TSO, and RRS adapters

- Batch Adapter
  - STEPLIB Configuration
- TSO
  - STEPLIB Configuration TSO Logon Proc
- CSQSNAP DD statement
- Assemble CSQBDEFV

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Task 20: Set up the operations and control panels

- TSO Libraries
- National Language
- MQ panel libraries permanently to your ISPF library setup
- Test (CSQOREXX)
- Update ISPF Menu
- Update Function Keys

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Task 21: Include the MQ dump formatting member

To be able to format WebSphere® MQ dumps using the Interactive Problem Control System (IPCS), you must update some system libraries.

You need to perform this task once for each z/OS® system where you want to run WebSphere MQ.

You need to perform this task when migrating from a previous version. For details, see Migration paths:WebSphere MQ for z/OS.

To be able to format WebSphere MQ dumps using the Interactive Problem Control System (IPCS), copy the data set thlqual.SCSQPROC(CSQ7IPCS) to SYS1.PARMLIB. You should not need to edit this data set.

If you have customized the TSO procedure for IPCS, thlqual.SCSQPROC(CSQ7IPCS) can be copied into any library in the IPCSPARM definition. See the *MVS™ IPCS Customization* manual for details on IPCSPARM.

You must also include the library thlqual.SCSQPNLA in your ISPPLIB concatenation.

To make the dump formatting programs available to your TSO session or IPCS job, you must also include the library thlqual.SCSQAUTH in your STEPLIB concatenation or activate it using the TSO TSOLIB command (even if it is already in the link list or LPA).

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Task 22: Suppress information messages

- Reduce messages in heavy system
- Controlled by MPFLSTxx
- CSQ4MPFL sample
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धन्यवाद
Hindi

多謝
Traditional Chinese

Grazie
Italian

ขอบคุณ
Thai

Спасибо
Russian

Obrigado
Brazilian Portuguese

Merci
French

Gracias
Spanish

شكراً
Arabic

多谢
Simplified Chinese

Danke
German

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다

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