# IBM MQ z/OS System Administration Training

Duration: **3 Day**

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This newly revised and upgraded three-day course covers the operation, administration and support of IBM MQ systems and applications in a z/OS environment. Segments on RACF-based security and SSL are also included in this course.<br>The course is taught combining formal classroom tuition with demanding hands-on practical exercises.<br> Regularly updated to reflect the new releases of the product, this course covers the administration of IBM MQ up to and including Version 8x.<br><br>This course is also available for one-company, on-site presentations and for live presentation over the Internet, via the Virtual Classroom Environment service.

## Prerequisites

Attendees must be familiar with IBM MQ at a conceptual and terminological level. This can be achieved by attending the course **Technical Introduction to IBM MQ**, or through prior practical experience. Attendees must also have a working knowledge of TSO/ISPF and JCL and a conceptual-level knowledge of the z/OS computing environment.

## What You Will Learn

- investigate how IBM MQ PSIDs, storage classes and buffer pools have been set up in your installation
- define and manage MQ objects such as queues and channels using ISPF panels, MQ script commands and the MQ Explorer
- set up triggered queues
- establish distributed queuing channels both directly to an adjacent Queue Manager and indirectly through one or more intermediate Queue Managers
- inspect and process messages on the Queue Managers dead letter queue
- troubleshoot distributed queuing problems
- implement a basic MQ cluster
- create connections between an MQ client and an MQ Queue Manager using both an environment variable and a client channel connection table
- list the benefits of queue sharing groups
- outline the principles of MQ logging and units of work
- review the security mechanisms available to the z/OS implementation of IBM MQ
- explain how IBM MQ interfaces with RACF
- describe how publish/subscribe differs from traditional point-to-point queuing
- test a simple publish/subscribe implementation
- compare the z/OS implementation of IBM MQ with the distributed implementations of IBM MQ

## Training Outline

**Basic Messaging Concepts**

Islands of information and IBM MQ; What's in a name?; Software layers; IBM MQ features; Wide platform coverage; The MQI - a common application programming interface; Time independent or asynchronous processing; Assured message delivery; Support of different application styles; MQ - some comparisons; Queues; Messages; MQPUT; MQGET; Queue Managers and database managers; A

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significant difference between queues and database tables...; Messages and queues; Shared queues; The Queue Manager; Basic message structure; Asynchronous messaging; Synchronous messaging; Multiple requesters, one responder; Parallel messaging; Re-using MQ application processes as business objects; Meshed business objects; Remote messaging (distributed queuing); MQ clients.

**IBM MQ Configuration**

Queue Manager definition & configuration; Installation; System libraries; Sample libraries; Program properties; Sub-systems; Sub system name table entries; Dynamic SETSSI; MQ parameter modules; APF authorised libraries; CSQ6SYSP macro; SET SYSTEM; CSQ6LOGP macro; SET LOG; CSQ6ARVP macro; SET ARCHIVE; CSQBDEFV macro; The BSDS; The LOG datasets; The page datasets; The MASTER JCL; The buffer pools; CSQINP1; Storage classes; Required queues; Queue Manager start-up; Queue Manager 'started task' procedure; CSQ4INP1; CSQ4INYS; CSQ4INSG; CSQ4INSX; Other CSQINP2 members; CSQ4DISP; CSQ4INPX (selection only).

**Administrative Interfaces**

CSQOREXX main panel; Object prompt (first screen); Object prompt (second screen); Object prompt (last screen); MGR display; Queue Manager object; Queue display panel; Queue display; Qlocal display; MQ Explorer; CSQUTIL administration program; Command messages; Practical session 1 - creating a Queue Manager.

**Basic MQ Objects**

The Queue Manager object; The QLOCAL object; The QLOCAL object - priority delivery sequence; The QLOCAL object - DEF QL(A1) SHARE | NOSHARE; The QLOCAL object - DEF QL(A1) DEFPSIST(YES | NO); The QLOCAL object - DISTL(YES | NO); The QLOCAL object - example commands & definitions; The QMODEL object; The QMODEL object - usage; The QMODEL object - example commands & definitions; The QALIAS object; The QALIAS object - usage; The QALIAS object - example commands & definitions; The NAMELIST object; The NAMELIST object - usage; The NAMELIST object - example commands & definitions; The AUTHINFO object; Basic sample programs; Using the samples; Practical session 2 - managing MQ objects.

**Triggering**

Why trigger?; What does the Queue Manager do?; What is required to make it work?; The trigger message QLOCAL object; The trigger monitor process; The Process Object; The application's QLOCAL object; The complete process; Processing the trigger message; Troubleshooting triggering; Triggered sample programs; MQREQ and MQECHO; What the samples do; Practical session 3 - MQ triggering.

**Distributed Queuing - in depth**

Basic distributed queuing; Basic distributed messaging overview; Remote queues; Channel Initiator (CHIN); CSQ6CHIP macro; CHIN procedure; Adapters; Dispatchers; CHIN internals; Message Channel Agents; Configuring MCAs - channels; Channel types & combinations; Sample channel definition; Starting channels; The listener; Triggering channels using the channel initiator; Channel batchsize, batchint & discint; Dead Letter Queue considerations; Multi-hopping; Multi-hopping using a Queue Manager alias; Practical session 4 - configuring distributed messaging; Channel commands; Exercises.

**Introduction to Clustering**

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What is an IBM MQ cluster?; What an MQ cluster is not; Cloned application services; Continuous putting; Scalability; Cluster components; Reduced administration; Joining a Queue Manager to a cluster; Definition through use; Disseminating cluster information; Cluster information message contents; Retention of information in repositories; Dynamically created reply to queues.

**Implementing an MQ Client**

MQClient structure; MQClient installation; MQClient configuration; MQClient - grouping Queue Managers.

**Queue Sharing Groups**

What is a queue sharing group; Rules and size limitations; Advantages; DB2 Utility (CSQ5PQSG).

**MQ Management**

Message persistence; Circular logging; Linear logging; Message recovery; Transaction support; Syncpoint control; Transaction co-ordination; MQ recovery co-ordination of XA compliant resource manager; Non-messaged architecture; Message architecture; Compensating transactions; Practical session 7 - data recovery; Watermark events.

**IBM MQ Security**

Introduction; Security concepts; Authentication and authorisation; SSL (Secure Sockets Layer); SSL handshake: Channel authentication records; Channel access blocking points; Channel authentication examples; Connection authentication; Setting up connection authentication; SSL Queue Manager attributes; SSL channel attributes; Channel exits - security; Channel exits - message, send & receive; Access control; MQSC security commands for access control; Distributed queuing, user Ids, authorisation and MCAUSER; Advanced Message Security (AMS).

**IBM MQ and RACF**

IBM MQ authorisation overview; MQ resources and their associated RACF profiles; Page 10 IBM MQ and RACF SCYCASE and profile high level qualifiers; The MQADMIN class: profiles to control subsystem security; The MQADMIN class: the RESLEVEL profile; The MQADMIN class: resource level checks; The MQCONN class: controlling connections; Access levels for the MQQUEUE class; Using QALIASes for granular access.

**Publish & Subscribe**

A classic example; Types of publications; State publications; Event publications; Adding business processes as subscribers; Topic strings and the topic tree; The topic tree and topic objects; The topic tree and authorisation; Defining topics; Displaying topic status; Types of subscription; MQI Extensions; Testing publish/subscribe; Distributed publish/subscribe; Hierarchies and clusters (1); Proxy subscriptions in clusters.

**Comparing Distributed & z/OS**

Implementations; Installation; Storage (Distributed); Storage (z/OS); Shared Queues (z/OS); Extra Features; Application Programming; Object definition; Object attributes - Queue Manager; Object Attributes - Queues and Channels; Queue Manager operations; Intercommunication and clusters;

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Security; Commands; Monitoring; Problem Determination; Backup; High Availability.