

9.1

IBM MQ Overview

IBM

Note

Before using this information and the product it supports, read the information in [“Notices” on page 237](#).

This edition applies to version 9 release 1 modification 1 of IBM® MQ and to all subsequent releases and modifications until otherwise indicated in new editions.

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Contents

- About IBM MQ..... 5**
- Introduction to IBM MQ..... 6
- IBM MQ license information..... 8
 - IBM MQ Redistributable Components..... 17
 - IBM MQ Client for .NET license information..... 18
 - IBM MQ product identifiers and export information..... 18
- IBM MQ release types and versioning..... 20
- Pricing metric for Virtual Processor Cores (VPCs)..... 21
- What's new and changed in IBM MQ 9.1.0 22
 - What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.0..... 23
 - What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.5 58
 - Deprecated and removed features in IBM MQ 9.1.0..... 67
- What's new and changed in IBM MQ 9.1.x Continuous Delivery..... 70
 - What's new and changed in IBM MQ 9.1.5 71
 - What's new and changed in IBM MQ 9.1.4 87
 - What's new and changed in IBM MQ 9.1.3..... 104
 - What's new and changed in IBM MQ 9.1.2..... 116
 - What's new and changed in IBM MQ 9.1.1..... 129
- What's changed in IBM MQ 9.1.0 Long Term Support..... 140
 - What's changed in IBM MQ 9.1.0 Fix Pack 20..... 144
 - What's changed in IBM MQ 9.1.0 Fix Pack 15..... 144
 - What's changed in IBM MQ 9.1.0 Fix Pack 11..... 144
 - What's changed in IBM MQ 9.1.0 Fix Pack 9..... 145
 - What's changed in IBM MQ 9.1.0 Fix Pack 8..... 146
 - What's changed in IBM MQ 9.1.0 Fix Pack 7..... 146
 - What's changed in IBM MQ 9.1.0 Fix Pack 6..... 147
 - What's changed in IBM MQ 9.1.0 Fix Pack 5..... 147
 - What's changed in IBM MQ 9.1.0 Fix Pack 4..... 149
 - What's changed in IBM MQ 9.1.0 Fix Pack 3..... 150
 - What's changed in IBM MQ 9.1.0 Fix Pack 2..... 150
 - What's changed in IBM MQ 9.1.0 Fix Pack 1..... 152
 - New, changed and removed messages for IBM MQ 9.1 LTS Fix Packs..... 153
- What was new and changed in earlier versions..... 162
- Notices..... 163
 - Trademarks..... 165
 - Terms and conditions for product documentation..... 165
- Accessibility features for IBM MQ..... 166
- Release and platform icons in the product documentation..... 167
- Readme for IBM MQ 9.1 and its maintenance..... 169
- IBM MQ 9.1 Quick Start Guide (Long Term Support)..... 181
- IBM MQ 9.1.x Quick Start Guide (Continuous Delivery)..... 183
- IBM MQ 9.1 information roadmap..... 185
 - Aspera gateway roadmap..... 188
 - IBM MQ Internet Pass-Thru roadmap..... 189
 - Managed File Transfer roadmap..... 189
 - IBM MQ Telemetry roadmap..... 190
- IBM MQ 9.1 in the IBM Documentation Offline app..... 191
- IBM MQ 9.1 PDF files for product documentation and Program Directories..... 192
- Glossary..... 194
 - A..... 194
 - B..... 197
 - C..... 198

D.....	203
E.....	205
F.....	206
G.....	207
H.....	208
I.....	208
J.....	211
K.....	212
L.....	212
M.....	214
N.....	218
O.....	219
P.....	220
Q.....	223
R.....	224
S.....	227
T.....	232
U.....	234
V.....	235
W.....	235
X.....	235
Notices.....	237
Programming interface information.....	238
Trademarks.....	238

About IBM MQ

Introductory information to help you get started with IBM MQ 9.1, including an introduction to the product and an overview of what is new and what is changed for this release.

You can use IBM MQ to enable applications to communicate at different times and in many diverse computing environments.

What is IBM MQ?

IBM MQ supports the exchange of information between applications, systems, services and files by sending and receiving message data via messaging queues. This simplifies the creation and maintenance of business applications. IBM MQ works with a broad range of computing platforms, and can be deployed across a range of different environments including on-premise, in cloud, and hybrid cloud deployments. IBM MQ supports a number of different APIs including Message Queue Interface (MQI), Java Message Service (JMS), REST, .NET, IBM MQ Light and MQTT.

IBM MQ provides:

- Versatile messaging integration from mainframe to mobile that provides a single, robust messaging backbone for dynamic heterogeneous environments.
- Message delivery with security-rich features that produce auditable results.
- Qualities of service that provide once and once only delivery of messages to ensure messages will withstand application and system outages.
- High-performance message transport to deliver data with improved speed and reliability.
- Highly available and scalable architectures to support an application's needs.
- Administrative features that simplify messaging management and reduce time spent using complex tools.
- Open standards development tools that support extensibility and business growth.

An application has a choice of programming interfaces, and programming languages to connect to IBM MQ.

IBM MQ provides these *messaging* and *queuing* capabilities across multiple modes of operation: *point-to-point* ; *publish/subscribe*.

Messaging

Programs communicate by sending each other data in messages rather than by calling each other directly.

Queuing

Messages are placed on queues, so that programs can run independently of each other, at different speeds and times, in different locations, and without having a direct connection between them.

Point-to-point

Applications send messages to a queue and receive messages from a queue. Each message is consumed by a single instance of an application. The sender must know the name of the destination, but not where it is.

Publish/subscribe

Applications subscribe to topics. When an application publishes a message on a topic, IBM MQ sends copies of the message to those subscribing applications. The publisher does not know the names of subscribers, or where they are.

Related information

[System Requirements for IBM MQ](#)

IBM MQ

Welcome to the IBM MQ 9.1 product documentation. This documentation is for the IBM MQ 9.1 Long Term Support release and its maintenance, as well as for the IBM MQ 9.1 Continuous Delivery releases.



IBM MQ is robust, secure and reliable messaging middleware. It uses messages and queues to support exchange of information between applications, systems, services and files. It simplifies and accelerates the integration of different applications and business data across multiple platforms. It supports a wide range of APIs and languages, and can be deployed on-premise, in cloud, and in hybrid cloud.

Related concepts

[About IBM MQ](#)

[Technical overview](#)

[IBM MQ Explorer](#)

[IBM MQ GUI Wizard Help](#)

[IBM MQ in containers](#)

Related tasks

[Planning](#)

[Maintaining and migrating](#)

[Installing and uninstalling](#)

[Securing](#)

[Configuring](#)

[Administering](#)

[Developing applications](#)

[Monitoring and performance](#)

[Troubleshooting and support](#)

Related reference

[Scenarios](#)

[Reference](#)

[IBM MQ Appliance 9.1](#)

[IBM MQ on Cloud](#)

Introduction to IBM MQ

An overview of what IBM MQ can do, how you use it, how it works, and what tools and resources come with it.

What can IBM MQ do for me?

IBM MQ provides a universal messaging backbone with robust connectivity for flexible and reliable messaging for applications and the integration of existing IT assets using a service-oriented architecture (SOA).

- IBM MQ sends and receives data between your applications, and over networks.

- Message delivery is *assured* and *decoupled* from the application. Assured, because IBM MQ exchanges messages transactionally, and decoupled, because applications do not have to check that messages they sent are delivered safely.
- You can secure message delivery between queue managers with TLS.
- With Advanced Message Security (AMS), you can encrypt and sign messages between being put by one application and retrieved by another.
- Application programmers do not need to have communications programming knowledge.

How do I use IBM MQ?

An IBM MQ messaging system is made up of one or more queue managers. Queue managers are where messaging resources, such as queues, are configured and what applications connect to, either running on the same system as the queue manager or over the network.


A network of connected queue managers supports asynchronous routing of messages between systems, where producing and consuming applications are connected to different queue managers.


IBM MQ can be managed using a variety of tools, from the IBM MQ Explorer GUI, through scripted or interactive command line tools or programmatically.

The applications connecting to IBM MQ can be written in any one of many different programming languages and to many different APIs. From C and Cobol, to Java and .Net to NodeJS and Ruby.

How does IBM MQ work?

Here is a brief overview of how IBM MQ works.

- First a messaging application must connect to a queue manager. This may require a channel to be created on the queue manager to accept application connections.
- When your application wants to transfer data to another application, it creates a message and puts the data into it. It puts the message onto a queue, or publishes the message to a topic to be delivered to subscribers to the topic.
- The queue or subscriptions may be on the same queue manager or on other, connected, queue managers. If the latter the connected queue managers work together to reliably transfer the message from the producer's queue manager to the target queue managers. The applications do not communicate with each other, the queue managers do.
- Messages can be handled based on a number of different qualities of service, where reliability and persistence is traded for speed. The highest quality of service given to messages are persistent messages that are sent and received under the control of transactions. This will ensure that messages are delivered once and once only even in the event of system, network or application failures.
- IBM MQ channels are used to connect one queue manager to another over a network. You can create MQ channels yourself, or a queue manager can join a cluster of queue managers where MQ channels are automatically created when they are needed.
-  On z/OS®, you can configure multiple queue managers to share queues on the coupling facility. Applications connected to different queue managers can get and put messages to and from the same queues.
- You can have many queues and topics on one queue manager.
- You can have more than one queue manager on one computer.
- An application can run on the same computer as the queue manager, or on a different one. If it runs on the same computer, it is an IBM MQ server application. If it runs on a different computer, it is an IBM MQ client application. Whether it is IBM MQ client or server makes almost no difference to the application. You can build a client/server application with IBM MQ clients or servers.

 If you are new to using IBM MQ and want to find out more about getting started with IBM MQ, see [LearnMQ](#) on IBM Developer.

What tools and resources come with IBM MQ ?

IBM MQ provides the following tools and resources:

- Control commands, which are run from the command line. You create, start, and stop queue managers with the control commands. You also run IBM MQ administrative and problem determination programs with the control commands.
- IBM MQ script commands (MQSC), which are run by an interpreter. Create queues and topics, configure, and administer IBM MQ with the commands. Edit the commands in a file, and pass the file to the **runmqsc** program to interpret them. You can also run the interpreter on one queue manager, which sends the commands to a different computer to administer a different queue manager.
- The Programmable Command Format (PCF) commands, which you call in your own applications to administer IBM MQ. The PCF commands have the same capability as the script commands, but they are easier to program.
- **V 9.1.0** The IBM MQ Console is a web-based user interface that you can use to administer IBM MQ. The IBM MQ Console runs in a browser and provides control over queue managers and IBM MQ objects.
- **V 9.1.0** The REST API provides an alternative programmable interface to the existing IBM MQ Script Commands (MQSC) and Programmable Command Format (PCF) tools. This RESTful API can help you to embed IBM MQ administration into popular DevOps and automation tooling.
- Sample programs.
- On Windows and Linux® x86 and x86-64 platforms, you can use the IBM MQ Explorer to administer and configure the entire network of queue managers, irrespective of the platform that they are running on. IBM MQ Explorer does the same administrative tasks as the script commands, but is much easier to use interactively.

Related concepts

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's new and changed in IBM MQ 9.1.x Continuous Delivery” on page 70](#)

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[IBM MQ Technical overview](#)

IBM MQ license information

What you can purchase with IBM MQ and what each purchase entitles you to install.

Notice: This License Guide provides supplementary information to assist you in deploying the Programs you licensed from IBM within your purchased entitlement. Your license agreement (such as the IBM International Program License Agreement (IPLA) or equivalent, and its transaction documents, including the License Information for the IBM MQ product offering) is the sole and complete agreement between you and IBM regarding use of the Program.

What you can purchase with IBM MQ

Multi 5724-H72 IBM MQ for Multiplatforms

For IBM MQ for Multiplatforms, the product offering contains the following chargeable components that can be independently purchased:

- IBM MQ
- IBM MQ High Availability Replica (formerly IBM MQ Idle Standby) [“1” on page 9](#)
- IBM MQ Advanced
- IBM MQ Advanced High Availability Replica (formerly IBM MQ Advanced Idle Standby) [“1” on page 9](#)
- IBM MQ Advanced for Developers (Free download but support may optionally be obtained.)



Attention: V 9.1.4

1. Prior to IBM MQ 9.1.4, IBM License Metric Tool (ILMT) reports need to be manually corrected to indicate if a detected installation is IBM MQ High Availability Replica or IBM MQ Advanced Advanced High Availability Replica entitled. From IBM MQ 9.1.4, it is possible to use the **setmqinst** command -l and -e options to correctly set the High Availability Replica entitlement for ILMT to automatically detect. For further information see the **setmqinst** and **dspmqinst** commands.

For the following chargeable components, existing Subscription and Support can be renewed. No new entitlement can be purchased. See the [Withdrawal Announcement Letter](#) for more information.

- IBM MQ Telemetry
- IBM MQ Advanced Message Security
- IBM MQ Advanced Message Security High Availability Replica (formerly IBM MQ Advanced Message Security Idle Standby)
- IBM MQ Managed File Transfer Service
- IBM MQ Managed File Transfer Service High Availability Replica (formerly IBM MQ Managed File Transfer Service Idle Standby)
- IBM MQ Managed File Transfer Agent

z/OS z/OS

On z/OS, IBM MQ offers the following Programs that can be purchased independently:

- **5655-MQ9** IBM MQ for z/OS
- **5655-AV1** IBM MQ Advanced for z/OS Value Unit Edition
- **5655-AV9** IBM MQ Advanced for z/OS
- **5655-VU9** IBM MQ for z/OS Value Unit Edition

For the following chargeable components, existing Subscription and Support can be renewed. No new entitlement can be purchased. See the [Withdrawal Announcement Letter](#) for more information:

- **5655-MF9** IBM MQ Managed File Transfer for z/OS
- **5655-AM9** IBM MQ Advanced Message Security for z/OS

What is my enterprise entitled to install?

Important: For IBM MQ for Multiplatforms, the IBM MQ installation media contains all the components, but you must only install the subset that you have purchased entitlement for.

Any component marked as 'unlimited installs' is a client component and as many copies as required may be installed on client systems. These will not be counted against your purchased IBM MQ entitlement.

IBM MQ and IBM MQ Advanced

In the following table, IBM MQ product features are listed in the first column, and the IBM MQ product offerings are in the remaining columns of the table. For each product feature, a tick in the column for a product offering indicates which product offering entitlement you need to use a product feature.

<i>Table 1. Product offering entitlement for IBM MQ and IBM MQ Advanced</i>							
IBM MQ product feature	IBM MQ	IBM MQ Advanced	IBM MQ for z/OS	IBM MQ for z/OS Value Unit Edition	IBM MQ Advanced for z/OS Value Unit Edition	IBM MQ Advanced for Developers	IBM MQ Appliance
IBM MQ client (unlimited installs)	✓	✓	✓	✓	✓	✓	✓
Telemetry Service (unlimited installs)		✓				✓	
Advanced Message Security		✓			✓	✓	✓
Managed File Transfer Service		✓			✓	✓	
Managed File Transfer Agent (unlimited installs) <u>"1"</u> on page 12		✓			✓	✓	✓
Managed File Transfer Tools (unlimited installs)		✓			✓	✓	✓
Managed File Transfer Database Logger component (unlimited installs) <u>"1"</u> on page 12		✓			✓	✓	✓ <u>"2"</u> on page 12



Table 1. Product offering entitlement for IBM MQ and IBM MQ Advanced (continued)

IBM MQ product feature	IBM MQ	IBM MQ Advanced	IBM MQ for z/OS	IBM MQ for z/OS Value Unit Edition	IBM MQ Advanced for z/OS Value Unit Edition	IBM MQ Advanced for Developers	IBM MQ Appliance
<p>V 9.1.0 Replicated Data Queue Manager (RedHat x86-64 only)</p>		✓ "3" on page 12				✓ "3" on page 12	
<p>V 9.1.0 (Deprecated) Bridge to blockchain (unlimited installs) "1" on page 12 "7" on page 12</p>		✓ "4" on page 12			✓ "4" on page 12	✓ "4" on page 12	
<p>V 9.1.0 (Deprecated) Bridge to Salesforce (unlimited installs) "8" on page 12</p>	✓ "4" on page 12	✓ "4" on page 12				✓ "4" on page 12	
IBM MQ Advanced certified container		✓ "5" on page 12				✓ "5" on page 12	
<p>V 9.1.4 IBM MQ Internet Pass-Thru (unlimited installs) "6" on page 12</p>	✓	✓	✓	✓	✓	✓	✓
<p>V 9.1.4 IBM Aspera fasp.io Gateway</p>		✓			✓		✓
AMQP	✓	✓				✓	✓

Table 1. Product offering entitlement for IBM MQ and IBM MQ Advanced (continued)

IBM MQ product feature	IBM MQ	IBM MQ Advanced	IBM MQ for z/OS	IBM MQ for z/OS Value Unit Edition	IBM MQ Advanced for z/OS Value Unit Edition	IBM MQ Advanced for Developers	IBM MQ Appliance
All other IBM MQ components from the install media not explicitly mentioned above	✓	✓	✓	✓	✓	✓	✓

Notes:

1. May only connect to an IBM MQ Advanced or IBM MQ Appliance entitled queue manager. Managed File Transfer components may also connect to queue managers with IBM MQ Managed File Transfer entitlement.
2. FILE mode only as a client connection.
3. Requires IBM MQ Advanced entitlement on one node and IBM MQ Advanced or IBM MQ Advanced High Availability Replica entitlement on the other two nodes.
4.  Linux x86-64 only.
5. Developer container images are on [Docker Hub](#). The production images are delivered as Continuous Delivery updates only with no Long Term Support.
6.  Cryptographic hardware support is an advanced feature that may only be used if one of the queue managers connected to MQIPT has IBM MQ Advanced, IBM MQ Appliance or IBM MQ Advanced for z/OS Value Unit Edition entitlement.
7. IBM MQ Bridge to blockchain is deprecated across all releases (see [US Announcement letter 222-341](#)).
8. IBM MQ Bridge to Salesforce is deprecated across all releases (see [US Announcement letter 222-341](#)).

Managed File Transfer, Advanced Message Security, and Telemetry

In the following table, IBM MQ product features are listed in the first column, and the IBM MQ product offerings are in the remaining columns of the table. For each product feature, a tick in the column for a product offering indicates which product offering entitlement you need to use a product feature.

Table 2. Product offering entitlement for Managed File Transfer, Advanced Message Security, and Telemetry

IBM MQ product feature	IBM MQ Managed File Transfer Service ^{“1”} on page 14	IBM MQ Managed File Transfer Agent ^{“1”} on page 14	IBM MQ Advanced Message Security ^{“1”} on page 14	IBM MQ Telemetry ^{“1”} on page 14	IBM MQ Advanced for z/OS ^{“2”} on page 14	IBM MQ Managed File Transfer for z/OS ^{“1”} on page 14	IBM MQ Advanced Message Security for z/OS ^{“1”} on page 14
IBM MQ client (unlimited installs)							

Table 2. Product offering entitlement for Managed File Transfer, Advanced Message Security, and Telemetry (continued)

IBM MQ product feature	IBM MQ Managed File Transfer Service ^{“1”} on page 14	IBM MQ Managed File Transfer Agent ^{“1”} on page 14	IBM MQ Advanced Message Security ^{“1”} on page 14	IBM MQ Telemetry ^{“1”} on page 14	IBM MQ Advanced for z/OS ^{“2”} on page 14	IBM MQ Managed File Transfer for z/OS ^{“1”} on page 14	IBM MQ Advanced Message Security for z/OS ^{“1”} on page 14
Telemetry Service				✓			
Advanced Message Security			✓		✓		✓
Managed File Transfer Service	✓				✓	✓	
Managed File Transfer Agent (unlimited installs)	✓	✓			✓ ^{“3”} on page 14	✓	
Managed File Transfer Tools (unlimited installs)	✓	✓			✓	✓	
Managed File Transfer Logger component (unlimited installs)	✓	✓			✓	✓	
▶ V 9.1.0 Replicated Data Queue Manager (RedHat x86-64 only)							
▶ V 9.1.0 (Deprecated) Bridge to blockchain (unlimited installs)							

Table 2. Product offering entitlement for Managed File Transfer, Advanced Message Security, and Telemetry (continued)

IBM MQ product feature	IBM MQ Managed File Transfer Service ^{“1”} on page 14	IBM MQ Managed File Transfer Agent ^{“1”} on page 14	IBM MQ Advanced Message Security ^{“1”} on page 14	IBM MQ Telemetry ^{“1”} on page 14	IBM MQ Advanced for z/OS ^{“2”} on page 14	IBM MQ Managed File Transfer for z/OS ^{“1”} on page 14	IBM MQ Advanced Message Security for z/OS ^{“1”} on page 14
V 9.1.0 (Deprecated) Bridge to Salesforce (unlimited installs)							
IBM MQ Advanced certified container							
V 9.1.4 IBM MQ Internet Pass-Thru							
AMQP							
All other IBM MQ components from the install media not explicitly mentioned above					✓	✓	✓

Notes:

1. New entitlement can no longer be purchased for these Programs.
2. IBM MQ for z/OS entitlement must be separately purchased.
3. May only connect to an IBM MQ Advanced, IBM MQ Appliance, or IBM MQ Managed File Transfer entitled queue manager.

IBM MQ Advanced for Developers (non-warranted)

IBM MQ Advanced for Developers is available as a free download for development purposes, and provides the full set of capability available with IBM MQ Advanced. To get the download, complete the following steps:

1. Go to [Downloading IBM MQ 9.1.](#)
2. Click the tab for the latest Fix Pack.
3. Near the end of the document, find **Other useful links > IBM MQ Advanced for Developers.**
4. Click the link for your preferred platform (Windows / Linux / Ubuntu / Raspberry Pi).

This is a free download but support may optionally be obtained.



Attention: The IBM MQ license defines what is considered as development purposes.

Additionally, your enterprise can mix and match IBM MQ versions as required. Therefore, your 100 PVUs of IBM MQ (Server) entitlement could be split into 50 PVUs of the IBM MQ 9.0 version and 50 PVUs of the IBM MQ 9.1 version of this component.

What are High Availability Replica chargeable components?

High Availability Replica (formerly Idle Standby) parts have been introduced to cater for high availability environments, where multiple systems are configured to provide redundancy. In this case, not all systems will be utilized to full capacity and a lower charge might be applicable to reflect that.

For most scenarios of failover systems where IBM MQ is installed:

- If failover is automatic, and there is no other active use of IBM MQ, then license the failover system as IBM MQ High Availability Replica or IBM MQ Advanced High Availability Replica.
- If failover is manual (for example, for Disaster Recovery), and there is no other active use of IBM MQ, then no IBM MQ or IBM MQ High Availability Replica licenses (or their IBM MQ Advanced equivalents) are required. See [Backup Licensing documents](#).
- The IBM MQ Replicated Data Queue Manager High Availability and Disaster Recovery Features require entitlement as described in the license terms. A copy of the terms are below.

V 9.1.4 You must use the **setmqinst** command to specify that an installation is a High Availability Replica. This action applies tags to the installation such that it can be identified by ILMT (see [setmqinst](#)).

Notes:

1. Use of the IBM MQ multi-instance queue manager and Replicated Data Queue Manager features require High Availability Replica entitlement.
2. There is no High Availability Replica part for the MQ Telemetry component. The same MQ Telemetry part needs to be purchased for the active and passive system, unless you have IBM MQ Advanced High Availability Replica, in which case it is included.

License terms for IBM MQ High Availability Replica components are defined in the Program license terms.



Attention: Always check the Program license agreement for the latest licensing terms.

License terms as of IBM MQ 9.1:

A. Licensee's use of the Program is limited to use of the following features as stated below or as stated in the Other High Availability Solutions section.

1. Multi-Instance Queue Manager Feature

Licensee is permitted to use the multi-instance queue manager feature of the Program for Stand-by Purposes only. Stand-by Purposes are defined as having the Program started, but ensuring that the Program remains idle unless the active and separately entitled IBM MQ copy of the program fails over to the high availability replica Program. If this occurs, the high availability replica Program may be used to carry out productive work during the period of failover. The Program is considered "idle" if, until a failover takes place, it is not used to carry out productive work of any kind and is used exclusively for administrative actions.

2. Replicated Data Queue Manager High Availability Feature

Licensee's use of this replicated data queue manager feature of the Program requires configuration on three servers and requires that all queue managers on the three servers be Replicated Data Queue Managers. Two of the servers may be configured and entitled as IBM MQ Advanced High Availability Replica, but the copy of IBM MQ on the third configured server must be licensed separately by obtaining entitlements to IBM MQ Advanced. When using this high availability feature in conjunction with replication to a disaster recovery site, the three high availability servers at the disaster recovery site must also be entitled as described above.

3. Replicated Data Queue Manager Disaster Recovery Feature

Licensee's use of this replicated data queue manager feature of the Program requires configuration on two servers and requires that all queue managers on the two servers be Replicated Data Queue Managers. One of the servers may be configured and entitled as an IBM MQ Advanced High Availability Replica, but the copy of IBM MQ on the second configured server must be licensed separately by obtaining entitlements to IBM MQ Advanced. This disaster recovery configuration of two servers is a separate configuration to using three servers as a high availability configuration, even when that is used with replication to a disaster recovery site.

B. Other High Availability Solutions

If Licensee chooses to use other high availability solutions along with the Program, Licensee is permitted to use the Program as a high availability replica so long as it resides for backup purposes on a standby server and the Program is not started. The Program may be started automatically by the high availability components in the event of the active server failing, in which event the Program may be used to carry out productive work during the period of failover.

Other questions

In an IBM MQ network using IBM MQ Advanced features, such as Managed File Transfer and Advanced Message Security, which MQ queue managers require IBM MQ Advanced entitlement?

- For Advanced Message Security, only the end-point queue managers where AMS Policies are defined require IBM MQ Advanced entitlement.
- For Managed File Transfer, only the queue managers where MFT components (Agent and Logger) connect require IBM MQ Advanced entitlement.
- Intermediary queue managers that are just routing messages, but perform no IBM MQ Advanced processing, only require IBM MQ entitlement.

V 9.1.2

Questions about High Availability and the Replicated Data Queue Manager capability:

- Q: When configuring the RDQM High Availability feature can I place all the queue managers under RDQM control on the same system?

A: Yes. Queue managers can run on any node in the HA group, including all three queue managers on one node. This is not an optimal configuration for making best use of system resources across the three nodes, but our licensing does not prohibit this.

- Q: Do all nodes in a RDQM HA or DR configuration need to have the same memory, disk and CPU capacity?

A: No, but our recommendation is that all nodes have the same resource allocation. RDQM maximum disk storage capacity is limited to the maximum capacity of the smallest system in the configuration and queue manager creation will fail if RDQM cannot allocate the required disk capacity up front. For CPU and memory, if a well resourced, high performing, system fails over to system with less memory and CPU then there could be undesirable performance consequences because maximum message throughput rates will be reduced.

- Q: Can I place both a RDQM HA queue manager and RDQM DR queue manager on the same system?

A: This would not be in compliance with the IBM MQ Advanced High Availability Replica license terms because a system must be either a dedicated RDQM HA or DR node. It cannot be both. It is technically possible, but this configuration would require IBM MQ Advanced entitlement.

Supporting Programs

The following Supporting Program is licensed with IBM MQ 9.1, IBM MQ for z/OS 9.1, and IBM MQ for z/OS Value Unit Edition 9.1:

- WebSphere® Liberty 19.0

Related concepts

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's new and changed in IBM MQ 9.1.x Continuous Delivery” on page 70](#)

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[IBM MQ Technical overview](#)

Related information

[Downloading IBM MQ 9.1](#)

IBM MQ Redistributable Components

IBM MQ delivers several components that are licensed to be redistributable with third-party applications. The redistributable license terms may be found in the relevant IBM MQ Program license agreement, which may be found at the [IBM Terms website](#).

In the license agreement IBM MQ Client components are also listed as being "Components Not Used for Establishing Required Entitlements". It is the IBM MQ queue manager to which the application is connected that requires correct entitlement.

All IBM MQ redistributable components are supported for use in production environments, and share the same system requirements and support lifecycle as the corresponding installable client images. See the [IBM Software Lifecycle](#) page for more information.

IBM MQ Client components

IBM MQ Client components may be redistributed under the license terms of the following Programs:

- IBM MQ
- IBM MQ Advanced
- IBM MQ Appliance M2000, M2001 and M2002
- IBM MQ for z/OS
- IBM MQ for z/OS Value Unit Edition
- IBM MQ Advanced for z/OS Value Unit Edition

Requirements:

The queue manager to which the application connects must be entitled with one of the above Programs.

Redistributables:

- Redistributable IBM MQ Clients from IBM Fix Central
 - <https://ibm.biz/mq91cdredistclients>
- IBM MQ .NET Client components from nuget.org
 - <https://www.nuget.org/packages/IBMMQDotnetClient/>
 - <https://www.nuget.org/packages/IBMXMSDotnetClient/>
- IBM MQ Java Client components from Maven
 - <https://search.maven.org/search?q=a:com.ibm.mq.allclient>, or
 - <https://mvnrepository.com/artifact/com.ibm.mq/com.ibm.mq.allclient>

IBM MQ Managed File Transfer Agent

IBM MQ Managed File Transfer Agent may be redistributed under the license terms of the following Programs:

- IBM MQ Advanced
- IBM MQ Appliance M2000, M2001 and M2002
- IBM MQ Advanced for z/OS Value Unit Edition
- IBM MQ Managed File Transfer Agent

Requirements:

The queue manager to which the application connects must be entitled with one of the above Programs.

Redistributables:

- IBM MQ Managed File Transfer Agent from IBM Fix Central.
 - <https://ibm.biz/mq91cdredistmftagent>

IBM MQ for z/OS stub routines

IBM MQ for z/OS stub routines may be redistributed under the license terms of the following Programs:

- IBM MQ for z/OS
- IBM MQ for z/OS Value Unit Edition
- IBM MQ Advanced for z/OS Value Unit Edition

Requirements:

The queue manager to which the application connects must be entitled with one of the above Programs.

Redistributables:

The following MQ stub routines that are intended to be bound, link-edited, or otherwise included with code and run on z/OS systems and are contained in the following data set - CSQ.SCSQLOAD:

CSQBSTUB, CSQBRRSI, CSQBRSTB, CSQCSTUB, CSQQSTUB, CSQXSTUB, CSQASTUB

IBM MQ Client for .NET license information

The IBM MQ Client for .NET is a component of IBM MQ that can be downloaded free-of-charge. It can be used to integrate third party .NET applications into an IBM MQ messaging infrastructure. The IBM MQ Clients, including the IBM MQ Client for .NET, are licensed under the IBM MQ Client license terms in the IBM MQ product license.

The IBM MQ Client for .NET is part of the IBM MQ Client package, which contains client libraries supporting many different programming languages. IBM MQ Clients (including IBM MQ .NET client libraries) are made available free-of-charge with certain redistribution rights (see IBM MQ product license for redistributables terms) to enable third parties to easily develop and distribute IBM MQ applications. The IBM MQ Clients are provided as-is. For technical support and defect fixes a support agreement with IBM is required.

IBM MQ product identifiers and export information

An overview of IBM MQ product offerings, their associated product identifiers (PIDs), and export classifications.

<i>Table 3. Table of IBM MQ products, their associated PID values, and export classifications</i>		
IBM MQ product offering	Product identifier (PID)	Export classification (ECCN)
IBM MQ "1" on page 19	5724-H72	5D992

Table 3. Table of IBM MQ products, their associated PID values, and export classifications (continued)

IBM MQ product offering	Product identifier (PID)	Export classification (ECCN)
IBM MQ for z/OS	5655-MQ9	5D992
IBM MQ for z/OS Value Unit Edition	5655-VU9	5D992
IBM MQ Advanced for z/OS Value Unit Edition “2” on page 19	5655-AV1	5D002.c.1
IBM MQ Advanced for z/OS “3” on page 19	5655-AV9	5D992
IBM MQ Advanced Message Security for z/OS “4” on page 19	5655-AM9	EAR99 “5” on page 19
IBM MQ Managed File Transfer for z/OS “4” on page 19	5655-MF9	5D992

Notes:

- 5724-H72 IBM MQ contains the following chargeable components:
 - IBM MQ
 - IBM MQ High Availability Replica
 - IBM MQ Advanced
 - IBM MQ Advanced High Availability Replica
 - IBM MQ Managed File Transfer Service [“4” on page 19](#)
 - IBM MQ Managed File Transfer Service High Availability Replica [“4” on page 19](#)
 - IBM MQ Managed File Transfer Agent [“4” on page 19](#)
 - IBM MQ Advanced Message Security [“4” on page 19](#)
 - IBM MQ Advanced Message Security High Availability Replica [“4” on page 19](#)
 - IBM MQ Telemetry [“4” on page 19](#)
- IBM MQ Advanced for z/OS Value Unit Edition is a zCAP (Collocated Application Pricing) Defining Program.
- IBM MQ Advanced for z/OS is a bundle of IBM MQ Advanced Message Security for z/OS and IBM MQ Managed File Transfer for z/OS. Separate IBM MQ for z/OS or IBM MQ for z/OS Value Unit Edition is also required.
- As per the 9th July, 2019 [Withdrawal Announcement Letter](#), these Programs are withdrawn from sale. Existing customers can continue to use these products and will continue to receive fixes and future functional updates (if a valid subscription and support contract is in place). The capabilities will continue to be available to new and existing customers with IBM MQ Advanced, IBM MQ Advanced for z/OS and IBM MQ Advanced for z/OS VUE.
- This is the IBM MQ Advanced Message Security enablement module.

IBM MQ Appliances



Table 4. IBM MQ Appliance products, their associated PID values, and export classifications

IBM MQ product offering	Product identifier (PID)	Machine-Type Model (MTM)	Firmware Export classification (ECCN)	Hardware Export classification (ECCN)
IBM MQ Appliance M2000	5725-S14	8436-54X	5D992	5A992
IBM MQ Appliance M2001	5725-Z09	8436-55X	5D992	5A992
IBM MQ Appliance M2002	5737-H47	8441-54X	5D992	5A002.a.2

Related tasks

 Product usage recording with IBM MQ for z/OS products

IBM MQ release types and versioning

From IBM MQ 9.0 there are two types of release; a Long Term Support (LTS) release and Continuous Delivery (CD) release.

LTS and CD release types




The aim of the two release types is to meet the requirement for delivery of new and enhanced IBM MQ functions as rapidly as possible in the next CD release, while at the same time maintaining a stable long term support release for systems that need a long term deployment of IBM MQ, and for customers who prefer this traditional option.

The two release types are distinguishable by the modification number, that is the M digit of the VRMF:

- Long Term Support releases have a modification number of zero, for example 9.0.0 and 9.1.0.
- Continuous Delivery releases have a modification number that is non-zero, for example, 9.0.3, 9.1.5, and so on.

Each LTS release is supported for the duration of the release. Each CD release is supported for 12 months or while it is one of the most recent two CD releases, whichever is longer. For more information, see [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](#).

To check the IBM MQ version:

- Type the command `dspmqr`, or `DSPMQVER` on IBM i. The returned messages include the three-digit VRM or, if maintenance has been applied, the four-digit VRMF.
- Use the REST API [GET](#) method.
-   View the [queue manager property panel](#) in IBM MQ Explorer.
-  Look at the CSQY000I message in the queue manager job log. This message is issued when the queue manager starts, and shows the release level and release type.

The command level of a queue manager is the three-digit VRM level. An IBM MQ program can call MQINQ, passing the MQIA_COMMAND_LEVEL selector, to get the command level of the queue manager it is connected to. You can also view the queue manager command level in the [queue manager property panel](#) in IBM MQ Explorer.

Maintenance delivery model

From 1Q 2023, there are two types of maintenance:

LTS Fix packs

Fix packs contain roll-ups of all defects fixed since the previous fix pack delivery or GA. Fix packs are produced exclusively for LTS releases during their normal support lifecycle.

LTS CD Cumulative security updates (CSUs)

CSUs are smaller updates and contain security patches released since the previous maintenance or GA. CSUs are produced for LTS releases (including releases in extended support), and for the latest IBM MQ CD release, as required to deliver relevant security patches.

Both types of maintenance are mutually cumulative (that is, they contain everything included in older CSUs and fix packs) and both are installed using the same mechanisms for applying maintenance. Also, both types of maintenance update the F digit of the VRMF to a higher number than any previous maintenance:

- **LTS** For LTS releases, the F digit of the VRMF is either a fix pack number, which is a value divisible by 5, or a CSU number, which is a value not divisible by 5. For example, 9.1.0.15 is a fix pack and 9.1.0.16 is an LTS CSU.
- **CD** For CD releases, the F digit of the VRMF is either a zero or a CSU number, which is a value not divisible by 5. However this does not affect 9.1 CD releases, because they are no longer supported.

For maintenance releases before 1Q 2023, there were no CSU updates. Therefore the F digit in the VRMF always represents the fix pack level.

Maintenance levels do not affect the command level of the queue manager. No migration is required, and maintenance levels do not affect the service end date of a release.

For more information, see [Changes to IBM MQ's maintenance delivery model](#).

For each supported platform, the release type you choose affects ordering, installation, maintenance and migration. For more information, see [IBM MQ release types: planning considerations](#).

Maintenance delivery model: differences by platform

Multi For Multiplatforms, LTS fix packs and CSUs

- are downloaded as interim fixes
- are downloaded by fix pack or CSU number
- are cumulative

z/OS For z/OS, LTS fix packs and CSUs

- are downloaded as interim fixes
- are downloaded by Program Temporary Fix (PTF) number
- are cumulative

Related concepts

[Applying maintenance to IBM MQ](#)

Related information

[Downloading IBM MQ 9.1](#)

Pricing metric for Virtual Processor Cores (VPCs)

Virtual Processor Core (VPC) is a unit by which IBM MQ can be licensed. A VPC can be either a virtual core assigned to a virtual machine, or a physical processor core, provided that the server is not partitioned for virtual machines. If the number of virtual cores exceeds the number of physical cores, then the number of VPCs that you must license is equal to the number of physical cores.

Usage of each VPC is measured in Virtual Processor Core-Instance-Hours, and captured in whole minute increments. An Instance is a running copy of IBM MQ (the Program), not including copies of the Program

used for backup purposes, specifically those designated as "cold" or "warm", as defined in the IBM Software Licensed under the IPLA - Backup Use Defined Document located here: [Software policies](#).

You must get sufficient entitlements for the total number of Hours that each VPC is made available to each Instance of the Program in a twelve (12) month fixed term. You must use the metering tool provided with the Program to monitor your usage of the Program. If the metering tool is not used, you must get entitlements for 720 Hours per calendar month for each VPC in your environment that can be made available to an Instance of the Program, regardless of whether the VPC is being made available or has been made available to an Instance of the Program.

For more information about how to determine the usage of VPCs, see [Virtual Processor Core \(VPC\)](#). This article explains how to use the IBM License Metric Tool to configure and create a report that you can use to determine the number of VPCs that you need to license. The article includes examples of how to calculate VPC consumption for virtual and physical server environments.

Related tasks

[V 9.1.0](#) [Configuring IBM MQ for use with the metering service in IBM Cloud Private](#)

[V 9.1.0](#) **What's new and changed in IBM MQ 9.1.0**

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

Delivery and support model

IBM MQ 9.1.0 follows the delivery and support model for IBM MQ that was introduced in IBM MQ 9.0. From IBM MQ 9.0, two release types are made available; the Long Term Support (LTS) release and Continuous Delivery (CD) release.

[LTS](#) The Long Term Support release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time. This version is intended for systems which demand a long term deployment and maximum stability.

[CD](#) Continuous Delivery releases deliver new functional enhancements, in addition to fixes and security updates, on a much shorter cadence, so providing much more rapid access to those new functions. This version is intended for systems where applications want to exploit the very latest capabilities of IBM MQ.

For further information see [IBM MQ release types](#) and [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](#).

How to use the what's new and changed information for IBM MQ 9.1.0

If you are moving to IBM MQ 9.1.0 from IBM MQ 9.0 Long Term Support release, review the following sections:

- [“What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.0” on page 23](#)
- [“Deprecated and removed features in IBM MQ 9.1.0” on page 67](#)

If you are moving to IBM MQ 9.1.0 from an IBM MQ 9.0.x Continuous Delivery release, review the following sections:

- [“What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.5 ” on page 58](#)
- [“Deprecated and removed features in IBM MQ 9.1.0” on page 67](#)

Related concepts

[“IBM MQ license information” on page 8](#)

What you can purchase with IBM MQ and what each purchase entitles you to install.

[“What's new and changed in IBM MQ 9.1.x Continuous Delivery” on page 70](#)

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0 What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.0

Features that are new or have changed since IBM MQ 9.0.0 are described in this section. Review this information if you are moving to IBM MQ 9.1.0 from IBM MQ 9.0.0 Long Term Support.

Related concepts

V 9.1.0 [What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.5](#)

Features that are new since IBM MQ 9.0.5 CD release, and changes that have taken place since IBM MQ 9.0.5 to functions and resources that were introduced in IBM MQ 9.0.x CD releases are described in this section. Review this information if you are moving to IBM MQ 9.1.0 from an IBM MQ 9.0.x Continuous Delivery release.

V 9.1.0 [Deprecated and removed features in IBM MQ 9.1.0](#)

A number of features are deprecated or removed from IBM MQ 9.1.0.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0 What's new in IBM MQ 9.1.0


IBM MQ 9.1.0 delivers features and enhancements beyond those that were available in IBM MQ 9.0.0 Long Term Support. Some features are available with both the IBM MQ base and IBM MQ Advanced product entitlement, while other features are available with IBM MQ Advanced product entitlement only.

For more information on what you can purchase with IBM MQ, and what each purchase entitles you to install, see [“IBM MQ license information” on page 8](#).

New IBM MQ for Multiplatforms features - base and Advanced entitlement





On Multiplatforms, that is, all platforms except IBM MQ for z/OS, the following features are available with both base product entitlement, and with Advanced entitlement:

- [“The IBM MQ Console” on page 25](#)
- [“The administrative REST API” on page 25](#)
- [“The messaging REST API” on page 25](#)
- [“Improvements to error logging” on page 26](#)
- [“Improvements to recovery logging” on page 26](#)
-  [“Connectivity to Salesforce with the IBM MQ Bridge to Salesforce” on page 27](#)

New IBM MQ for Multiplatforms features - Advanced entitlement only



The following features are available only with Advanced entitlement:

-  [“High availability and disaster recovery options with replicated data queue managers” on page 28](#)
-  [“Connectivity to Blockchain” on page 29](#)
- [“Managed File Transfer enhancements” on page 28](#)

New IBM MQ for z/OS features - base and Advanced entitlement



The following features are available both with base product entitlement, and with Advanced entitlement:

- [“The IBM MQ Console” on page 25](#)
- [“The administrative REST API” on page 25](#)
- [“IBM MQ for z/OS Unix System Services Web Components feature” on page 30](#)
- [“Additional support for messaging within CICS Liberty JVM server” on page 30](#)
- [“IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition” on page 30](#)
- [“Improved workload balancing options for shared queues” on page 30](#)

New IBM MQ for z/OS features - Advanced entitlement only



The following features are available with Advanced entitlement only.

- [“Java and JMS client connectivity to z/OS queue managers” on page 31](#)
- [“Advanced Message Security on JMS for z/OS queue managers” on page 31](#)
- [“Managed File Transfer enhancements” on page 31](#)
- [“Blockchain connectivity” on page 31](#)

Related reference

[What's new and what's changed in IBM MQ Explorer](#)

Related information


[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New IBM MQ 9.1.0 features for all supported platforms

IBM MQ 9.1.0 delivers a number of new features that are available for all supported platforms. These features include the IBM MQ Console, which provides a customizable, browser-based administration tool, a REST API for administration, and a REST API for messaging.

- [“The IBM MQ Console” on page 25](#)

- [“The administrative REST API” on page 25](#)
-  [“The MFT REST API” on page 25](#)
- [“The messaging REST API” on page 25](#)

The IBM MQ Console

From IBM MQ 9.1.0, you can use a web-based user interface to administer IBM MQ. The IBM MQ Console runs in a browser and provides control over queue managers and IBM MQ objects.

To get started quickly with the IBM MQ Console, see [Getting started with the IBM MQ Console](#).

For more information about the IBM MQ Console, see [Administration using the IBM MQ Console](#).

The administrative REST API

From IBM MQ 9.1.0, you can use the administrative REST API to perform the following actions on MQ objects:

- Query queue managers
- Query installations
- Query subscriptions
- Query queue manager to queue manager channels and channel status
- Query queues and queue status
- Create, update, and delete queues
- Run mqsc commands

This RESTful API can help you to embed IBM MQ administration into popular DevOps and automation tooling.

You can use the administrative REST API to administer queue managers that are not in the same installation as the mqweb server. That is, you can administer remote queue managers and the IBM MQ objects that are associated with the remote queue manager. Therefore, you can use the REST API to administer your entire IBM MQ network with only one installation that runs the mqweb server. For more information, see [Remote administration using the REST API](#).

To get started quickly with the administrative REST API, see [Getting started with the administrative REST API](#).

For more information about the administrative REST API, see [Administration using the REST API](#).

The MFT REST API

 [MQ Adv.](#)

In IBM MQ 9.1.0, you can use the REST API for the Managed File Transfer commands for listing transfers and querying details about file transfer agents. For more information, see [Getting started with the REST API MFT](#).

Important:  [MQ Appliance](#) The MFT portion of the REST API does not apply to the IBM MQ Appliance.

The messaging REST API

From IBM MQ 9.1.0, you can use the messaging REST API to send and receive IBM MQ messages. This feature is intended as a replacement for the IBM MQ bridge for HTTP:

- You can send an IBM MQ text message to a specified queue by using the HTTP POST method with the `/messaging/qmgr/{qmgrName}/queue/{queueName}/message` resource. For more information, see [POST](#).

- You can receive an IBM MQ text message from a specified queue by using the HTTP DELETE method with the `/messaging/qmgr/{qmgrName}/queue/{queueName}/message` resource. For more information, see [DELETE](#).

For more information about the messaging REST API, see [Messaging using the REST API](#).


Related concepts

 [New IBM MQ 9.1.0 features for Multiplatforms](#)


IBM MQ 9.1.0 delivers a number of new features, available with base product entitlement, and with Advanced entitlement, for configuring, monitoring, and administering IBM MQ for [Multiplatforms](#).

 [New IBM MQ 9.1.0 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.0 delivers a number of new features for Multiplatforms that are available only with IBM MQ Advanced entitlement. These features include high availability and disaster recovery options with replicated data queue managers, Managed File Transfer enhancements, and blockchain connectivity.

 [New IBM MQ 9.1.0 features for z/OS](#)


For IBM MQ 9.1.0, IBM MQ for z/OS delivers a number of new features and enhancements that are available with base product entitlement, and with Advanced entitlement. These features include an updated IBM MQ resource adapter, improved workload balancing options for shared queues, and the ability, with the IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition, to process requests arriving through IBM z/OS Connect EE.

 [New IBM MQ 9.1.0 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.0 delivers a number of new features and enhancements on z/OS that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement. These features include Java and JMS client enhancements, Managed File Transfer enhancements, and blockchain connectivity.

 **[New IBM MQ 9.1.0 features for Multiplatforms](#)**

IBM MQ 9.1.0 delivers a number of new features, available with base product entitlement, and with Advanced entitlement, for configuring, monitoring, and administering IBM MQ for [Multiplatforms](#).

- [“Improvements to error logging” on page 26](#)
- [“Improvements to recovery logging” on page 26](#)
- [“LDAP query options” on page 27](#)
-  [“Connectivity to Salesforce with the IBM MQ Bridge to Salesforce” on page 27](#)

Improvements to error logging

IBM MQ 9.1.0 introduces various improvements to the management and output of error logs. The main changes are, that you can:

- Log diagnostic messages, using additional file services and `syslog` on UNIX platforms, as well as `AMQERR01.LOG`.
- Use JSON for the description of the messages, as well as the existing format; see [JSON format diagnostic messages](#).
- Reformat a log into another language or style; see [mqrc](#).

For more information, see [Diagnostic message services](#), and [QMErrorLog service](#).

Improvements to recovery logging

From IBM MQ 9.1.0, the queue manager has been extended to support automatic management of linear log extents that are no longer required for recovery. See [Managing logs](#). To enable this feature for migrated queue managers, you must specify a new attribute (**LogManagement**) either from the Log

queue manager properties page of the IBM MQ Explorer, or the Log stanza in the `qm.ini` file. For more information, see [Log stanza of the `qm.ini` file](#).

See [Logging](#) for more information on types of logging, restart recovery, and calculating the size of the log.

The **migmqlog** command enables you to migrate logs, either in place, or to a new location. For more information, see [migmqlog](#).

LDAP query options

A new authorization method for users and groups in an LDAP repository adds support for LDAP configurations where group membership is indicated by an attribute in the group entry containing the short user names of all the users that belong to the group.

This new authorization method is enabled by setting **AUTHORMD** to `SRCHGRPSN` on an authentication information object with an **AUTHTYPE** of `IDPWLDAP`.

For more information, see the **AUTHORMD** parameter of the [DEFINE AUTHINFO](#) command.

Connectivity to Salesforce with the IBM MQ Bridge to Salesforce

Linux

Events in Salesforce can be published into IBM MQ through the deployment of the IBM MQ Bridge to Salesforce on a Linux system. For more information, see [Configuring IBM MQ for use with Salesforce push topics and platform events](#).

The IBM MQ Bridge to Salesforce can also publish IBM MQ messages into the Salesforce system. For more information, see [Creating event messages for Salesforce platform events](#).

Related concepts

V 9.1.0

[New IBM MQ 9.1.0 features for all supported platforms](#)

IBM MQ 9.1.0 delivers a number of new features that are available for all supported platforms. These features include the IBM MQ Console, which provides a customizable, browser-based administration tool, a REST API for administration, and a REST API for messaging.

Multi

MQ Adv.

V 9.1.0

[New IBM MQ 9.1.0 features for IBM MQ Advanced for](#)

[Multiplatforms](#)

IBM MQ 9.1.0 delivers a number of new features for Multiplatforms that are available only with IBM MQ Advanced entitlement. These features include high availability and disaster recovery options with replicated data queue managers, Managed File Transfer enhancements, and blockchain connectivity.

z/OS

V 9.1.0

[New IBM MQ 9.1.0 features for z/OS](#)

For IBM MQ 9.1.0, IBM MQ for z/OS delivers a number of new features and enhancements that are available with base product entitlement, and with Advanced entitlement. These features include an updated IBM MQ resource adapter, improved workload balancing options for shared queues, and the ability, with the IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition, to process requests arriving through IBM z/OS Connect EE.

z/OS

MQ Adv. VUE

V 9.1.0

[New IBM MQ 9.1.0 features for IBM MQ Advanced for z/OS Value](#)

[Unit Edition](#)

IBM MQ 9.1.0 delivers a number of new features and enhancements on z/OS that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement. These features include Java and JMS client enhancements, Managed File Transfer enhancements, and blockchain connectivity.

Multi **MQ Adv.** **V 9.1.0** **New IBM MQ 9.1.0 features for IBM MQ Advanced for Multiplatforms**

IBM MQ 9.1.0 delivers a number of new features for Multiplatforms that are available only with IBM MQ Advanced entitlement. These features include high availability and disaster recovery options with replicated data queue managers, Managed File Transfer enhancements, and blockchain connectivity.

- **Linux** [“High availability and disaster recovery options with replicated data queue managers” on page 28](#)
- [“Managed File Transfer enhancements” on page 28](#)
- **Linux** [“Connectivity to Blockchain” on page 29](#)

High availability and disaster recovery options with replicated data queue managers

Linux

From IBM MQ 9.1.0, the replicated data queue manager (RDQM) high availability solution is available for Linux platforms only. Queue managers that use RDQM have messages and logs written to the local storage, and this storage is automatically, synchronously replicated by the IBM MQ system to two other systems. This provides the safety of two failover systems without the need for shared disks or external high-availability management solutions. For more information, see [RDQM high availability](#).

There is also an option for a disaster recovery configuration. You can build a disaster recovery solution based on replicated data queue managers (RDQMs). You have a primary instance of a DR queue manager running on one server, and a secondary instance of the queue manager on another server (that acts as the recovery node). Data is replicated between the queue manager instances. If you lose your primary queue manager, you can manually make the secondary instance into the primary instance and start the queue manager, then resume work from the same place. You can configure for synchronous replication of data between primary and secondary queue managers, or asynchronous replication. For more information on DR RDQM, see [RDQM disaster recovery](#).

Managed File Transfer enhancements

For IBM MQ 9.1.0, IBM MQ Advanced for Multiplatforms provides the following functional enhancements to the Managed File Transfer capabilities:

Windows **Linux** **Redistributable Managed File Transfer Agent package**

From IBM MQ 9.1.0, Managed File Transfer Agent is optionally provided as an individual redistributable component, available to be downloaded as a tar package on Linux, or as zip package on Windows. This option enables developers to download, configure and test a Managed File Transfer Agent, to ensure it connects to an existing Managed File Transfer configuration and then make the configured agent bundle available to many users within their organization. Users who are unfamiliar with how Managed File Transfer works, can easily set up the pre-configured agent on their local environment and quickly connect to the relevant IBM MQ network. The users do not have to install IBM MQ to be able to transfer files. For more information, see [Configuring the Redistributable Managed File Transfer Agent](#).

Managed File Transfer resource monitor event logging

From IBM MQ 9.1.0, a new **logMonitor** parameter is added to the **fteSetAgentLogLevel** command for enabling and disabling diagnostic information logging for file transfers between a Managed File Transfer protocol bridge agent and FTP/SFTP/FTPS file servers. Managed File Transfer writes the diagnostic information on what the resource monitors of an agent are doing to a log file that is local to that agent. Having a local log file ensures that information that the resource monitor publishes on what a resource monitor is doing is not lost due to network issues or there being no application running to consume those publications. See [Logging MFT resource monitors](#) for general

information, the [fteSetAgentLogLevel](#) command for a description of the additional **logMonitor** parameter, and [agent.properties](#) file for a description of the additional properties.

Separately installable logger feature

From IBM MQ 9.1.0, the Managed File Transfer Logger, configured to use the FILE mode, can connect to the coordination queue manager in client mode, allowing the logger to be run remotely from the queue manager. To run the Managed File Transfer Logger as a client in FILE mode, you must have an IBM MQ Advanced license. To use the logger as a client, you must use one or more of the additional parameters in the [fteCreateLogger](#) command. There are, also, extra parameters for use in the [logger.properties](#) file.

MFT REST API

The REST API includes options to list all current Managed File Transfer transfers and to query the status of Managed File Transfer agents. For more information, see [Getting started with the REST API MFT](#).

Connectivity to Blockchain

Linux > MQ Adv.

From IBM MQ 9.1.0, the IBM MQ Bridge to blockchain enables IBM MQ applications to connect through IBM MQ into a blockchain to support Hyperledger Composer. Applications that are connected to the blockchain can send query messages and receive responses. They can also query and update the ledger. For more information, see [Configuring IBM MQ for use with blockchain](#).

Related concepts

V 9.1.0

[New IBM MQ 9.1.0 features for all supported platforms](#)

IBM MQ 9.1.0 delivers a number of new features that are available for all supported platforms. These features include the IBM MQ Console, which provides a customizable, browser-based administration tool, a REST API for administration, and a REST API for messaging.

Multi

V 9.1.0

[New IBM MQ 9.1.0 features for Multiplatforms](#)

IBM MQ 9.1.0 delivers a number of new features, available with base product entitlement, and with Advanced entitlement, for configuring, monitoring, and administering IBM MQ for [Multiplatforms](#).

z/OS

V 9.1.0

[New IBM MQ 9.1.0 features for z/OS](#)

For IBM MQ 9.1.0, IBM MQ for z/OS delivers a number of new features and enhancements that are available with base product entitlement, and with Advanced entitlement. These features include an updated IBM MQ resource adapter, improved workload balancing options for shared queues, and the ability, with the IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition, to process requests arriving through IBM z/OS Connect EE.

z/OS

MQ Adv. VUE

V 9.1.0

[New IBM MQ 9.1.0 features for IBM MQ Advanced for z/OS Value](#)

Unit Edition

IBM MQ 9.1.0 delivers a number of new features and enhancements on z/OS that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement. These features include Java and JMS client enhancements, Managed File Transfer enhancements, and blockchain connectivity.

[“IBM MQ license information” on page 8](#)

What you can purchase with IBM MQ and what each purchase entitles you to install.

z/OS

V 9.1.0

[New IBM MQ 9.1.0 features for z/OS](#)

For IBM MQ 9.1.0, IBM MQ for z/OS delivers a number of new features and enhancements that are available with base product entitlement, and with Advanced entitlement. These features include an updated IBM MQ resource adapter, improved workload balancing options for shared queues, and the ability, with the IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition, to process requests arriving through IBM z/OS Connect EE.

- [“Additional support for messaging within CICS Liberty JVM server” on page 30](#)

- [“IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition” on page 30](#)
- [“IBM MQ for z/OS Unix System Services Web Components feature” on page 30](#)
- [“Improved workload balancing options for shared queues” on page 30](#)

Additional support for messaging within CICS Liberty JVM server

IBM MQ 9.1.0 provides an updated IBM MQ resource adapter, which has support to allow connections from the CICS® JVM server Liberty profile to IBM MQ, using either client or bindings mode. This additional support for messaging that the resource adapter now provides has a dependency on the CICS Liberty JVM server profile environment. For more information, see [Using IBM MQ classes for JMS in a CICS Liberty JVM server](#).

IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition

From IBM MQ 9.1.0, IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition (MQ Service Provider) processes requests arriving through IBM z/OS Connect Enterprise Edition (IBM z/OS Connect EE). The MQ Service Provider allows REST aware applications to interact with z/OS assets, that are exposed using IBM MQ for z/OS queues and topics. You can achieve this without having to worry about the coding required to use asynchronous messaging. For more information, see [IBM MQ for z/OS Service Provider for IBM z/OS Connect EE](#).

IBM MQ for z/OS Unix System Services Web Components feature

From IBM MQ 9.1.0, if you want to use the IBM MQ Console, or the administrative REST API to IBM MQ for z/OS you need to install this feature.


Note that to install this feature, you must install the IBM MQ for z/OS Unix System Services Components feature.

See [Create and customize the IBM WebSphere Liberty Profile server definition](#) and [Create a procedure for the IBM WebSphere Liberty Profile server](#) for information on how you set up the feature.

Improved workload balancing options for shared queues

IBM MQ for z/OS queue sharing groups can take advantage of a new configuration option provided by the coupling facility which can, in some configurations, improve the distribution of workload, and minimize the number of empty MQGET calls. For more details see [Tuning coupling facility list monitoring](#).

Related concepts

 [New IBM MQ 9.1.0 features for all supported platforms](#)




IBM MQ 9.1.0 delivers a number of new features that are available for all supported platforms. These features include the IBM MQ Console, which provides a customizable, browser-based administration tool, a REST API for administration, and a REST API for messaging.

  [New IBM MQ 9.1.0 features for Multiplatforms](#)

IBM MQ 9.1.0 delivers a number of new features, available with base product entitlement, and with Advanced entitlement, for configuring, monitoring, and administering IBM MQ for [Multiplatforms](#).

   [New IBM MQ 9.1.0 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.0 delivers a number of new features for Multiplatforms that are available only with IBM MQ Advanced entitlement. These features include high availability and disaster recovery options with replicated data queue managers, Managed File Transfer enhancements, and blockchain connectivity.

   [New IBM MQ 9.1.0 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.0 delivers a number of new features and enhancements on z/OS that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement. These features include Java and JMS client enhancements, Managed File Transfer enhancements, and blockchain connectivity.

[“New, changed and removed z/OS messages in IBM MQ 9.1.0” on page 56](#)

A number of new messages have been added and some existing messages have been changed or removed for IBM MQ for z/OS since IBM MQ 9.0.0.

New IBM MQ 9.1.0 features for IBM MQ Advanced for z/OS Value Unit Edition

IBM MQ 9.1.0 delivers a number of new features and enhancements on z/OS that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement. These features include Java and JMS client enhancements, Managed File Transfer enhancements, and blockchain connectivity.

- [“Java and JMS client connectivity to z/OS queue managers” on page 31](#)
- [“Advanced Message Security on JMS for z/OS queue managers” on page 31](#)
- [“Managed File Transfer enhancements” on page 31](#)
- [“Blockchain connectivity” on page 31](#)

Java and JMS client connectivity to z/OS queue managers

You can connect an IBM MQ classes for JMS, or IBM MQ classes for Java, application to a queue manager on z/OS, that has the **ADVCAP** (ENABLED) attribute, by using a client connection.

For more information, see [Java and JMS client connectivity to z/OS queue managers](#).

Advanced Message Security on JMS for z/OS queue managers

IBM MQ 9.1.0 adds AMS support to an IBM MQ classes for JMS or IBM MQ classes for Java application, running on z/OS, using a client connection to a z/OS queue manager, licensed as IBM MQ Advanced for z/OS Value Unit Edition. For more information, see [Advanced Message Security support](#).

Managed File Transfer enhancements

For IBM MQ 9.1.0, IBM MQ Advanced for z/OS Value Unit Edition provides the following functional enhancements to the Managed File Transfer capabilities:

Managed File Transfer agent remote connections

From IBM MQ 9.1.0, Managed File Transfer agents running on IBM MQ Advanced for z/OS Value Unit Edition can connect to a queue manager using a client connection. This means that agents that send and receive files from the local system can be deployed on a z/OS system that is remote from the queue managers responsible for routing messages that represent the file payloads. For more information, see [Enabling MFT agent connectivity to remote z/OS queue managers](#).

Separately installable logger feature

From IBM MQ 9.1.0, the Managed File Transfer Logger is a separately installable feature that can be run remotely from an IBM MQ queue manager. This reduces the number of queue managers that are required for MFT operations, simplifying the topology for easier administration. To use the logger as a client, you must use one or more of the additional parameters in the [fteCreateLogger](#) command. There are, also, extra parameters for use in the [logger.properties](#) file.

MFT REST API

The REST API includes options to list all current Managed File Transfer transfers and to query the status of Managed File Transfer agents. For more information, see [Getting started with the REST API MFT](#).

Blockchain connectivity

From IBM MQ 9.1.0, IBM MQ Advanced for z/OS VUE includes the IBM MQ Bridge to blockchain, which enables applications and systems to participate in a blockchain network through IBM MQ without the

need to understand ledger-specific APIs, configuration, or controls. Once connection is established, IBM MQ can be used to query information from blockchain and return data via request-reply messages. IBM MQ can also drive create, read, update, and delete operations on blockchain managed assets. For more information, see [Configuring IBM MQ Advanced for VUE for use with blockchain](#).

Related concepts

V 9.1.0 New IBM MQ 9.1.0 features for all supported platforms

IBM MQ 9.1.0 delivers a number of new features that are available for all supported platforms. These features include the IBM MQ Console, which provides a customizable, browser-based administration tool, a REST API for administration, and a REST API for messaging.

Multi **V 9.1.0** New IBM MQ 9.1.0 features for Multiplatforms

IBM MQ 9.1.0 delivers a number of new features, available with base product entitlement, and with Advanced entitlement, for configuring, monitoring, and administering IBM MQ for [Multiplatforms](#).

Multi **MQ Adv.** **V 9.1.0** New IBM MQ 9.1.0 features for IBM MQ Advanced for Multiplatforms

IBM MQ 9.1.0 delivers a number of new features for Multiplatforms that are available only with IBM MQ Advanced entitlement. These features include high availability and disaster recovery options with replicated data queue managers, Managed File Transfer enhancements, and blockchain connectivity.

z/OS **V 9.1.0** New IBM MQ 9.1.0 features for z/OS

For IBM MQ 9.1.0, IBM MQ for z/OS delivers a number of new features and enhancements that are available with base product entitlement, and with Advanced entitlement. These features include an updated IBM MQ resource adapter, improved workload balancing options for shared queues, and the ability, with the IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition, to process requests arriving through IBM z/OS Connect EE.

“IBM MQ license information” on page 8

What you can purchase with IBM MQ and what each purchase entitles you to install.

V 9.1.0 What's changed in IBM MQ 9.1.0 since IBM MQ 9.0.0

Changes to functions and resources since IBM MQ 9.0.0 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems. Review these changes if you are moving to IBM MQ 9.1.0 from IBM MQ 9.0.0 Long Term Support release, or from an earlier version of the product.

Command and configuration file changes

- **ULW** [“crtmqdir command” on page 34](#)
- [“Changes to the strmqm command” on page 34](#)
- [“Changes to qm.ini ChlauthEarlyAdopt attribute for new queue managers” on page 35](#)
- [“IgnoreSeqNumberMismatch attribute in qm.ini” on page 35](#)
- **Multi** [“JSON output format option available with amqsevt” on page 35](#)
- [“IBM MQ Advanced identification” on page 35](#)
- [“Syncpoint performance enhancement” on page 35](#)
- [“Enabling Advanced Message Queuing Protocol \(AMQP\) Service by default” on page 36](#)

Installation changes

- [“Optional installation of the Java Runtime Environment \(JRE\)” on page 36](#)
- **Linux** [“Debian installer for Linux Ubuntu” on page 36](#)

- **Windows** [“Changes to install feature names on Windows” on page 37](#)
- [“Client eImages and DVDs” on page 37](#)

Java and JMS changes

- [“Changes to Java and JMS” on page 37](#)
- [“Changes to user authentication with the IBM MQ Explorer” on page 42](#)
- [“Optional installation of the Java Runtime Environment \(JRE\)” on page 36](#)
- [“Resource adapter updates for targetClientMatching property on an activation specification” on page 38](#)

Logging changes

- **ULW** [“Change to logger checkpointing” on page 38](#)
- **ULW** [“Change to the dmpmqlog command” on page 38](#)
- **ULW** [“Changes to error logging” on page 39](#)
- [“Automatic writing of media images” on page 39](#)

Managed File Transfer changes

MQ Adv.

- [“New parameter for fteListMonitors command for bulk backing up of MFT resource monitors” on page 40](#)
- [“Updates to fteSetAgentTraceLevel and fteSetLoggerTraceLevel commands to allow colon separated lists of trace specifications” on page 40](#)
- [“Managed File Transfer configurable recovery timeout for stalled transfers” on page 40](#)
- [“Change to behavior of Managed File Transfer fteDeleteAgent command” on page 40](#)
- [“New Status Age value displaying age of last reported status for Managed File Transfer agents” on page 41](#)
- [“Change to output of fteDisplayVersion -v command” on page 41](#)
- [“Changes to DISPLAY CHSTATUS command output values for remote Managed File Transfer agents” on page 41](#)
- [“Changes to message to file transfers in Managed File Transfer” on page 41](#)
- [“Change to prefix of subscription names for subscriptions created by the IBM MQ Explorer MFT plug-in” on page 41](#)
- [“Managed File Transfer Logger database schema updates” on page 41](#)

Security changes

- [“Changes to SYSTEM.DEFAULT.AUTHINFO.IDPWOS and SYSTEM.DEFAULT.AUTHINFO.IDPWLDAP connection authentication information objects” on page 42](#)
- **z/OS** [“Changes to client channel authentication for z/OS queue managers” on page 42](#)
- [“Changes to user authentication with the IBM MQ Explorer” on page 42](#)
- **z/OS** [“Two CipherSpecs also available on z/OS” on page 42](#)
- [“Deprecation of the TLS 1.0 Cipherspec protocol” on page 43](#)
- [“Deprecation of the TLS 1.0 Cipherspec protocol” on page 43](#)
- [“Client reason code” on page 43](#)

Windows changes

Windows

- **Windows** [“IBM MQ on Windows is now built using the Microsoft Visual Studio 2017 compiler” on page 43](#)
- **Windows** [“IBM MQ custom channel for WCF enabled for send replying messages in MQSTR format” on page 44](#)
- **Windows** [“.NET Framework updated from v3.5 to v4.5.1” on page 44](#)

z/OS changes

z/OS

- [“Db2 Universal Table Spaces” on page 44](#)
- [“Improvements to z/OSMF” on page 44](#)
- [“Changes in z/OS product identifier \(PID\) recording” on page 44](#)
- [“Display queue manager utility on z/OS” on page 45](#)
- [“Cluster workload exits for z/OS” on page 45](#)
- [“Removal of OPMODE parameter” on page 45](#)
- [“Checking that the mqweb server is correctly configured on z/OS” on page 45](#)

Related reference

[What's new and what's changed in IBM MQ Explorer](#)

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0

Command and configuration file changes for IBM MQ 9.1.0

A number of commands have changed at IBM MQ 9.1.0.

- **ULW** [“crtmqdir command” on page 34](#)
- [“Changes to the strmqm command” on page 34](#)
- [“Changes to qm.ini ChlauthEarlyAdopt attribute for new queue managers” on page 35](#)
- [“IgnoreSeqNumberMismatch attribute in qm.ini” on page 35](#)
- **Multi** [“JSON output format option available with amqsevt” on page 35](#)
- [“IBM MQ Advanced identification” on page 35](#)
- [“Syncpoint performance enhancement” on page 35](#)
- [“Enabling Advanced Message Queuing Protocol \(AMQP\) Service by default” on page 36](#)

crtmqdir command

ULW

From IBM MQ 9.1.0, the **amqicdir** tool to create or configure the IBM MQ data path has been improved and documented as the **crtmqdir** command.

Note, however, that the **amqicdir** tool is still shipped.

Changes to the strmqm command

From IBM MQ 9.1.0, IBM MQ supports the use of back-up queue managers.

UNIX From IBM MQ 9.1.0, the security of *data path/log/qm*, on UNIX, is changed from 2775 to 2770.

For more information, see [strmqm \(start queue manager\)](#).

JSON output format option available with amqsevt

Multi

The sample program **amqsevt** formats the instrumentation events that a queue manager can create. The program reads messages from event queues, and formats them into readable strings.

From IBM MQ 9.1.0, the **-o** parameter includes the **json** option, which provides output in standard JSON format that any application that understands JSON can take and process directly. For more information, see [Sample program to monitor instrumentation events on Multiplatforms](#).

IBM MQ Advanced identification

MQ Adv.

From IBM MQ 9.1.0, new queue manager attribute is added to enable queue managers with IBM MQ Advanced entitlement to identify themselves as advanced queue managers. This allows other components such as IBM MQ clients, Managed File Transfer agents, and IBM MQ Bridge to blockchain to ensure they connect to a correctly entitled queue manager. You can also use this feature help to identify which queue manager entitlements are installed, IBM MQ Advanced or IBM MQ Base. For more information, see the **ADVCAP** attribute of the **DISPLAY QMGR** MQSC command, and the **MQIA_ADVANCED_CAPABILITY** attribute of the [Inquire Queue Manager \(MQCMD_INQUIRE_Q_MGR\)](#) PCF command.

Changes to qm.ini ChlauthEarlyAdopt attribute for new queue managers

In earlier versions of IBM MQ, the **ChlauthEarlyAdopt** attribute could be optionally added to the Channels: stanza of a queue manager's *qm.ini* configuration file. The **ChlauthEarlyAdopt** attribute controls the order in which connection authentication and channel authentication rules are evaluated. From IBM MQ 9.1.0, the **ChlauthEarlyAdopt** attribute is automatically added to the Channels: stanza of the *qm.ini* file for new queue managers with a value of Y that is connection authentication rules are evaluated before channel authentication rules. Queue managers that were created by an earlier version of IBM MQ that are started with IBM MQ 9.1.0 do not have this stanza added and retain any pre-existing **ChlauthEarlyAdopt** attribute values.

For more information, see [Attributes of the channels stanza](#).

IgnoreSeqNumberMismatch attribute in qm.ini

A new Channels: stanza attribute **IgnoreSeqNumberMismatch** can be added to a queue manager's *qm.ini* configuration file. The **IgnoreSeqNumberMismatch** attribute controls how channel sequence number error conditions are handled. Specifying a value of **YES** allows any channels that encounter a sequence number mismatch to report a warning message and continue the channel startup as if an administrator had issued a RESET CHANNEL.

Effectively, this attribute performs a reset channel command on the receiver channel.

For more information, see [Attributes of the channels stanza](#).

Syncpoint performance enhancement

A new tuning parameter in the *qm.ini* file, **ImplSyncOpenOutput** improves performance on put operations of persistent messages outside of syncpoint. Implicit syncpoint support enables persistent message puts outside of syncpoint to perform better when multiple applications are using the same queue. To optimize performance, the default setting is to implicitly put all persistent messages in

syncpoint, if two or more applications have a queue open. For more information, see [Implicit syncpoint and Tuning parameters](#).

Enabling Advanced Message Queuing Protocol (AMQP) Service by default

From IBM MQ 9.1.0, the AMQP service is started by default, which means that:

- AMQP channels can be started and stopped as soon as the queue manager is started.
- The AMQP JVM will be running, and show up in `ps/top/task manager` as soon as a queue manager is started, but if, and only if, the `MQSeriesAMQP` component is installed.

For more information, see [Creating and using AMQP channels](#).

V 9.1.0 *Installation changes for IBM MQ 9.1.0*

A number of changes relating to installation have been made at IBM MQ 9.1.0.

- “Optional installation of the Java Runtime Environment (JRE)” on page 36
- **Linux** “Debian installer for Linux Ubuntu” on page 36
- **Windows** “Changes to install feature names on Windows” on page 37
- “Client eImages and DVDs” on page 37

Optional installation of the Java Runtime Environment (JRE)

From IBM MQ 9.1.0, if you are not using Java in your messaging applications, and you are not using portions of IBM MQ that are written in Java, you have the option to not install the JRE (or to remove the JRE if it was already installed).



Attention: If you choose not to install the JRE, or to remove the JRE if it was already installed:

- You must perform your key management by using the `runmqakm` command line tool rather than the `strmqikm` GUI tool, or the `runmqckm` command line tool.
- The IBM Key Management shortcut is still installed. Clicking the shortcut has no effect. You should use the `runmqakm` command line tool instead.
- Use of the `runmqras` command fails unless a JRE at version 7, or later, is available on the system path.

Linux On Linux, You can install IBM MQ without installing the `MQSeriesJRE` RPM, unless you are installing the portions of the product that require the presence of the JRE, in which case the RPM prerequisites test fails. From IBM MQ 9.1, you can now also install the `MQSeriesGSKit` RPM without the JRE.

Windows On Windows, before IBM MQ 9.1, the JRE was a hidden installation feature that was always installed. From IBM MQ 9.1.0, the JRE becomes an independently installable feature. The feature can be installed or omitted, either silently or through the GUI installer, as long as you are not installing other features that require the presence of the JRE. For more information, see [Install features that require the Server or JRE](#).

Upgrading from an earlier version of IBM MQ to IBM MQ 9.1.0 (or later) adds the separately installed JRE feature to the installed product.

For more information, see [Using `runmqckm`, `runmqakm`, and `strmqikm` to manage digital certificates](#).

Debian installer for Linux Ubuntu

Linux

From IBM MQ 9.1.0, IBM MQ provides packages in Debian installer format (.deb files) for installation by using the `dpkg` command, or a higher-level installation tool, on the Linux Ubuntu distribution on all three supported architectures.

For more information, see [Installing IBM MQ on Linux Ubuntu using Debian](#).

Changes to install feature names on Windows

Windows

From IBM MQ 9.1.0, there are changes to the names of some of the installable features on Windows:

- The Java and .NET Messaging and Web Services feature is now named Extended Messaging APIs.
- The Windows Client is now named MQI Client.

Client eImages and DVDs

From IBM MQ 9.1, separate client eImages are not available for downloading from Passport Advantage®. A separate client DVD is also not available. Instead, you can either obtain the client eImage from inside the main IBM MQ server eImage, or server DVD, which include the server and client. Alternatively, you can download the MQC91 supportpac from [Fix Central](#) (see [MQC91: IBM MQ Clients](#)).

V 9.1.0 Java and JMS changes for IBM MQ 9.1.0

A number of changes relating to Java and JMS have been made at IBM MQ 9.1.0.

- [“Changes to Java and JMS” on page 37](#)
- [“Changes to user authentication with the IBM MQ Explorer” on page 37](#)
- [“Optional installation of the Java Runtime Environment \(JRE\)” on page 37](#)
- [“Resource adapter updates for targetClientMatching property on an activation specification” on page 38](#)

Changes to Java and JMS

- The IBM MQ classes for Java package `com.ibm.mq.pcf` is now deprecated. Any new code you develop for PCF operations under Java should use the `com.ibm.mq.headers.pcf` package instead, and existing code should be migrated to this package when it is convenient to do so.
- The Bouncy Castle Jars that are used to support Advanced Message Security no longer contain a version number as part of their name. If you have configured a Java security policy, you might need to update it to reflect the new file names. For more information, see [Support for non-IBM JREs](#).

Changes to user authentication with the IBM MQ Explorer

In earlier versions of IBM MQ, if IBM MQ Explorer required a user ID and password to connect to a queue manager, it would send that user ID and password using compatibility mode by default.

From IBM MQ 9.1.0, the default setting for IBM MQ Explorer is MQCSP authentication mode. If IBM MQ Explorer needs to connect to a queue manager using compatibility mode, for example for administering queue managers older than IBM MQ 8.0.0, the check box for enabling compatibility mode on panels where a user ID and password are entered must be selected.

For more information, see [Connection authentication with the Java client](#).

Optional installation of the Java Runtime Environment (JRE)

From IBM MQ 9.1.0, if you are not using Java in your messaging applications, and you are not using portions of IBM MQ that are written in Java, you have the option to not install the JRE (or to remove the JRE if it was already installed).



Attention: If you choose not to install the JRE, or to remove the JRE if it was already installed:

- You must perform your key management by using the `runmqakm` command line tool rather than the `strmqikm` GUI tool, or the `runmqckm` command line tool.

- The IBM Key Management shortcut is still installed. Clicking the shortcut has no effect. You should use the **runmqakm** command line tool instead.
- Use of the **runmqras** command fails unless a JRE at version 7, or later, is available on the system path.

Linux On Linux, You can install IBM MQ without installing the MQSeriesJRE RPM, unless you are installing the portions of the product that require the presence of the JRE, in which case the RPM prerequisites test fails. From IBM MQ 9.1.0, you can now also install the MQSeriesGSKit RPM without the JRE.

Windows On Windows, before IBM MQ 9.1.0, the JRE was a hidden installation feature that was always installed. From IBM MQ 9.1.0, the JRE becomes an independently installable feature. The feature can be installed or omitted, either silently or through the GUI installer, as long as you are not installing other features that require the presence of the JRE. For more information, see [Install features that require the Server or JRE](#).

Upgrading from an earlier version of IBM MQ to IBM MQ 9.1.0 (or later) adds the separately installed JRE feature to the installed product.

For more information, see [Using runmqckm, runmqakm, and stirmqikm to manage digital certificates](#).

Resource adapter updates for targetClientMatching property on an activation specification

The IBM MQ JCA resource adapter (MQ-RA) has been updated such that the **targetClientMatching** property can be configured for an activation specification. You can configure the property so that an MQRFH2 header is included on reply messages when request messages do not contain an MQRFH2 header. This means that any message properties that an application defines on a reply message are included when the message is sent. For more information, see [Configuring the targetClientMatching property for an activation specification](#).

V 9.1.0 Logging changes for IBM MQ 9.1.0

A number of changes relating to logging have been made at IBM MQ 9.1.0.

- **ULW** [“Change to logger checkpointing” on page 38](#)
- **ULW** [“Change to the dmpmqlog command” on page 38](#)
- **ULW** [“Changes to error logging” on page 39](#)
- [“Automatic writing of media images” on page 39](#)

Change to logger checkpointing

From IBM MQ 9.1.0, the logger schedules checkpoints more frequently (so the next one is scheduled before the previous one has completed) because the logger is attempting to keep the active log in the primary log extents.

Change to the dmpmqlog command

The **dmpmqlog** command outputs a timestamp with each log record. The following text shows an example of a timestamp:

```
LOG RECORD - LSN <0:0:4615:42406>
*****

HLG Header: lreclsize 212, version 1, rmid 0, eyecatcher HLRH
Creation Time: 2017-01-30 13:50:31.146 GMT Standard Time (UTC +0)
```

Changes to error logging

There are various changes to error logging in IBM MQ 9.1.0:

- The change in log rollover behavior.

See [Using error logs](#) for more information.

- The increased default log size.

From IBM MQ 9.1.0, the default log size before rollover has changed from 2 MB to 32 MB.

You need to ensure that you have enough disk space to allow for the increase in size.

- All diagnostic messages, whether to the error logs or to the screen, now have the severity appended.



Attention: You need to modify any parsing tools appropriately.

The **AMQ_DIAGNOSTIC_MSG_SEVERITY** environment variable with a value of 0 is now used to turn off this feature. For more information, see [Using error logs](#).

- New information in messages, including:

- ArithInsert1
- ArithInsert2
- CommentInsert1
- CommentInsert2
- CommentInsert3

- Message AMQ8077 is split into two, and put out as message AMQ8245 when **+dsp** authority is missing.

Message AMQ8245 is issued when you perform an action requiring only display authority of an IBM MQ object on a queue manager without sufficient permissions. This message is issued for each display violation to the queue manager error logs.

You can suppress message AMQ8245 so that the message is written to the queue manager error log once only in a configurable time interval (default 30 seconds). You do this by adding the message to the **SuppressMessage** attribute of the **QMErrorLog** stanza within the qm.ini file of the queue manager. See [suppressing channel error messages from error logs](#) for more information.

Alternatively, you can exclude message AMQ8245 so that the message is omitted from the list of reported messages in the error log. See [exclude messages](#) for more information.

The revised message AMQ8077 is displayed in the queue manager error logs for object authority manager authority issues which do not exclusively relate to display access on the object.

Note: You cannot exclude or suppress this message.

- When IBM MQ processes write a message to an error log, the message time in ISO 8601 format, in Coordinated Universal Time (UTC), is included as a Time () attribute. For more information, see [Using error logs](#).

Automatic writing of media images

From IBM MQ 9.1.0, the queue manager has been extended to support automatic writing of media images.

For more information, see [Taking media images automatically](#).

MQ Adv.

V 9.1.0

Managed File Transfer changes for IBM MQ 9.1.0

A number of changes have been made for Managed File Transfer at IBM MQ 9.1.0.

- “New parameter for fteListMonitors command for bulk backing up of MFT resource monitors” on page 40
- “Updates to fteSetAgentTraceLevel and fteSetLoggerTraceLevel commands to allow colon separated lists of trace specifications” on page 40

- [“Managed File Transfer configurable recovery timeout for stalled transfers” on page 40](#)
- [“Change to behavior of Managed File Transfer fteDeleteAgent command” on page 40](#)
- [“New Status Age value displaying age of last reported status for Managed File Transfer agents” on page 41](#)
- [“Change to output of fteDisplayVersion -v command” on page 41](#)
- [“Changes to DISPLAY CHSTATUS command output values for remote Managed File Transfer agents” on page 41](#)
- [“Changes to message to file transfers in Managed File Transfer” on page 41](#)
- [“Change to prefix of subscription names for subscriptions created by the IBM MQ Explorer MFT plug-in” on page 41](#)
- [“Managed File Transfer Logger database schema updates” on page 41](#)

New parameter for **fteListMonitors** command for bulk backing up of MFT resource monitors

The **-od** parameter is added to the **fteListMonitors** command. By specifying this parameter, you can back up more than one resource monitor at a time by exporting their definitions in bulk to a specified directory. Each resource monitor definition is saved to a separate XML file with a name in the format *agent name.monitor name.xml*.



The **-od** parameter is particularly useful if you have a large number of resource monitors that you want to back up because you need to run the **fteListMonitors -od** command once only, instead of having to run the **fteListMonitors -ox** command separately for each resource definition, or use a separate script to run the **fteListMonitors -ox** command for each resource monitor.

For more information, see [Backing up and restoring MFT resource monitors](#) and [fteListMonitors: list MFT resource monitors](#).

Updates to **fteSetAgentTraceLevel** and **fteSetLoggerTraceLevel** commands to allow colon separated lists of trace specifications

The **fteSetAgentTraceLevel** and **fteSetLoggerTraceLevel** commands have been updated so that you can specify a colon-separated list of trace specifications with these commands in exactly the same way as you do with the *agent.properties* and *logger.properties* files. This option enables you to set tracing of different classes, and at different levels.

Managed File Transfer configurable recovery timeout for stalled transfers

  From IBM MQ 9.1.0, Managed File Transfer provides a new advanced property for setting a value for the amount of time a source agent continues to try to recover a stalled transfer. You can specify that the agent continues to attempt to recover the stalled transfer until the transfer is successful, or that the agent stops the file transfer as soon as it enters recovery, or that the agent continues to attempt to recover the stalled transfer for the amount of time in seconds as set by the positive integer value specified. For more information, see [Timeout option for transfers in recovery](#).

Change to behavior of Managed File Transfer **fteDeleteAgent** command

From IBM MQ 9.1.0, the **fteDeleteAgent** command has been updated so that any resource monitor and scheduled transfers are removed when the agent is deleted. For more information about the **fteDeleteAgent**, see [fteDeleteAgent \(delete a Managed File Transfer Agent\)](#).

New Status Age value displaying age of last reported status for Managed File Transfer agents

From IBM MQ 9.1.0 a new value, **Status Age**, which shows the age of the status that was last reported by an Managed File Transfer agent, is displayed for agents that are connecting to the coordination manager. The **Status Age** is output when you run **fteListAgents** and **fteShowAgentDetails** commands in the command line. The **Status Age** column can be seen in IBM MQ Explorer for agents that are listed against a coordination manager and in the individual properties for each agent. For more information, see [What to do if an agent is shown as being in an UNKNOWN state.](#)

Change to output of fteDisplayVersion -v command

From IBM MQ 9.1.0, IBM MQ Light Service for Bluemix® JMS Provider is removed from the output of **fteDisplayVersion -v** command. Following this removal, you should review any automation that is based on the output from the **fteDisplayVersion** command.

Changes to DISPLAY CHSTATUS command output values for remote Managed File Transfer agents

From IBM MQ 9.1.0, output from the **DISPLAY CHSTATUS** command includes values that make it clear when the application that is running at the remote end of a channel is a Managed File Transfer Agent:

- The **RAPPLTAG** channel attribute value that displays the remote partner application name is updated to display *MFT Agent and agent name*.
- A new **RPRODUCT** product identifier *MQJF* is added to indicate that the product running at the remote end of the channel is a Managed File Transfer Agent.

For more information, see [Display CHSTATUS](#).

Changes to message to file transfers in Managed File Transfer

In a message to file transfer, the source agent now browses the messages from the source queue, unlike the destructive GET, in IBM MQ versions before IBM MQ 9.1.0. The messages are removed from the source queue after all messages (in a group if message grouping is used) have been browsed and data written to the destination file. This allows messages to remain in the source queue if a transfer fails or is canceled. Due to this change, authority to BROWSE must also be provided along with GET authority to run message to file transfers. For more information about the message-to-file feature, see [Transferring data from messages to files](#).

Change to prefix of subscription names for subscriptions created by the IBM MQ Explorer MFT plug-in

From IBM MQ 9.1.0, the prefix to the name of a subscription created on the coordination queue manager by the IBM MQ Explorer MFT plug-in is changed to show that the subscription was created by the IBM MQ Explorer MFT plug-in and the name of the user. For more information, see [Retaining progress and log messages by using the IBM MQ Explorer plug-in](#).

Managed File Transfer Logger database schema updates

The following data types have been altered, causing a change to various column widths in some database tables:

- LONG VARCHAR has been changed to VARCHAR in the Db2® schema
- NCLOB has been changed to NVARCHAR(Size) in the Oracle Schema

For more information, see [MFT database logger tables](#).

V 9.1.0 *Security changes for IBM MQ 9.1.0*

A number of changes relating to authentication have been made at IBM MQ 9.1.0.

- “Changes to `SYSTEM.DEFAULT.AUTHINFO.IDPWOS` and `SYSTEM.DEFAULT.AUTHINFO.IDPWLDAP` connection authentication information objects” on page 42
- **z/OS** “Changes to client channel authentication for z/OS queue managers” on page 42
- “Changes to user authentication with the IBM MQ Explorer” on page 42
- **z/OS** “Two CipherSpecs also available on z/OS” on page 42
- “Deprecation of the TLS 1.0 Cipherspec protocol” on page 43
- “Client reason code” on page 43

Changes to `SYSTEM.DEFAULT.AUTHINFO.IDPWOS` and `SYSTEM.DEFAULT.AUTHINFO.IDPWLDAP` connection authentication information objects

In earlier versions of IBM MQ, the value for the adopt context parameter of the system default connection authentication information objects was NO. That is, successful user ID and password validation did not change the security context of the connection. From IBM MQ 9.1.0, the adopt context parameters of the `SYSTEM.DEFAULT.AUTHINFO.IDPWOS` and `SYSTEM.DEFAULT.AUTHINFO.IDPWLDAP` objects is set to YES for new queue managers and when re-creating default objects. Queue managers that were created by an earlier version of IBM MQ that are started with IBM MQ 9.1 retain their existing object definitions.

For more information, see [DEFINE AUTHINFO](#).

Changes to client channel authentication for z/OS queue managers

z/OS

In earlier versions of IBM MQ, channel authentication rules are evaluated before connection authentication validation of user ID and password credentials. From IBM MQ 9.1.0, channel authentication rules are evaluated after connection authentication validation of credentials, this change in ordering allows channel authentication blocking and mapping rules to consider any changes in the client security context from a successful user ID and password validation. The previous behavior can be restored by issuing the following MQSC command:

```
RECOVER QMGR(TUNE CHLAUTHEARLYADOPT OFF)
```

For more information, see [Securing remote connectivity to the queue manager](#).

Changes to user authentication with the IBM MQ Explorer

In earlier versions of IBM MQ, if IBM MQ Explorer required a user ID and password to connect to a queue manager, it would send that user ID and password using compatibility mode by default.

From IBM MQ 9.1.0, the default setting for IBM MQ Explorer is MQCSP authentication mode. If IBM MQ Explorer needs to connect to a queue manager using compatibility mode, for example for administering queue managers older than IBM MQ 8.0.0, the check box for enabling compatibility mode on panels where a user ID and password are entered must be selected.

For more information, see [Connection authentication with the Java client](#).

Two CipherSpecs also available on z/OS

z/OS

The following CipherSpecs, previously available only on [Multiplatforms](#), are now also available on z/OS:

- ECDHE_RSA_AES_128_GCM_SHA256

- ECDHE_RSA_AES_256_GCM_SHA384

For more information on platform availability for CipherSpecs, see [Enabling CipherSpecs](#).

Deprecation of the TLS 1.0 Cipherspec protocol

From IBM MQ 9.1.0, the TLS 1.0 Cipherspec protocol is disabled by default.

Multi **z/OS** See [Enabling deprecated Cipherspecs](#) for information on how you enable a deprecated CipherSpec.

Client reason code

From IBM MQ 9.1.0, where multiple client connection attempts are made, for example with a channel with a comma separated connection name and the connection sequence fails, reason codes other than MQRC_HOST_NOT_AVAILABLE and MQRC_STANDBY_Q_MGR are given priority when being returned to an application. In previous versions the last reason code encountered in the connection sequence is always returned, this could lead to configuration errors such as MQRC_NOT_AUTHORIZED encountered earlier in the connection attempt to not be returned to the application.

Windows **V 9.1.0** **Windows changes for IBM MQ 9.1.0**

A number of changes relating to Windows have been made at IBM MQ 9.1.0.

- **Windows** [“IBM MQ on Windows is now built using the Microsoft Visual Studio 2017 compiler” on page 43](#)
- **Windows** [“IBM MQ custom channel for WCF enabled for send replying messages in MQSTR format” on page 44](#)
- **Windows** [“.NET Framework updated from v3.5 to v4.5.1” on page 44](#)

IBM MQ on Windows is now built using the Microsoft Visual Studio 2017 compiler

Windows

Windows From IBM MQ 9.1.0, IBM MQ is built using the Microsoft Visual Studio 2017 compiler.

You must have the universal C runtime installed.

The universal C runtime is a part of Windows 10, and Windows Server 2016. However, on Windows 8.1, and Windows Server 2012 R2 you might need to download this runtime from Microsoft.

Attempting to run an IBM MQ program without the universal c runtime installed results in errors such as the following error:

```
The program can't start because api-ms-win-crt-runtime-|1-1-0.dll
is missing from your computer. Try reinstalling the program to
fix this problem.
```

For more information about installing the universal C runtime, see [Installing the universal C runtime](#).

The Microsoft Visual Studio 2012 C/C++ runtimes are no longer installed by IBM MQ.

If you are using programs that are compiled using Microsoft Visual Studio 2012, you must provide the Microsoft Visual Studio 2012 C/C++ run times, or recompile your programs with Microsoft Visual Studio 2017. For more information, see [Providing the runtimes for Microsoft Visual Studio 2012 programs](#).

C++ libraries built using Microsoft Visual Studio 2015 are available.

In addition to the existing IBM MQ C++ libraries that are built with the Microsoft Visual Studio 2017 compiler, C++ libraries that are built with the Microsoft Visual Studio 2015 are provided. The installed Microsoft Visual Studio 2017 C/C++ runtimes can also run Microsoft Visual Studio 2015 programs, so no further runtimes are required.

For more information, see [Building C++ programs on Windows](#).

IBM MQ custom channel for WCF enabled for send replying messages in MQSTR format

Windows

From IBM MQ 9.1.0, if you put a WCF request message onto a queue by using IBM MQ Custom channel for WCF, in MQMFT_STRING (MQSTR) format, you can select to receive the reply message in the same MQMFT_STRING (MQSTR) format.

For more information, see [Sending MQSTR formatted messages](#).

.NET Framework updated from v3.5 to v4.5.1

Windows

At IBM MQ 9.1.0, the .NET Framework is updated to v4.5.1. To run IBM MQ classes for .NET, you must install the Microsoft.NET Framework v4.5.1, or later.

Any existing applications that use .NET Framework v3.5 can run on IBM MQ 9.1.0 without recompiling the source code by adding the following tag in the app.config file of the application:

```
<configuration>
  <startup>
    <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.5.1"/>
  </startup>
</configuration>
```

z/OS

V 9.1.0

z/OS changes for IBM MQ 9.1.0

A number of commands have changed at IBM MQ 9.1.0.

- [“Db2 Universal Table Spaces” on page 44](#)
- [“Improvements to z/OSMF” on page 44](#)
- [“Changes in z/OS product identifier \(PID\) recording” on page 44](#)
- [“Display queue manager utility on z/OS” on page 45](#)
- [“Cluster workload exits for z/OS” on page 45](#)
- [“Removal of OPMODE parameter” on page 45](#)
- [“Checking that the mqweb server is correctly configured on z/OS” on page 45](#)

Db2 Universal Table Spaces

IBM MQ 9.1.0 provides additional samples, demonstrating how a queue sharing group can be set up to use Universal Table Spaces (UTS) in Db2 12.

For more information, see [Planning your Db2 environment](#).

Improvements to z/OSMF

From IBM MQ 9.1.0, the IBM z/OS Management Facility (z/OSMF) workflows for provisioning IBM MQ resources have been updated to take advantage of newer Cloud Provisioning capabilities that are being made available in z/OSMF V2.2.

Additionally, the workflow to provision local queues has been enhanced to include actions to display selected attributes of a queue, and to browse or destructively get a message from a queue.

For more information on the improvements to z/OSMF, see [Using IBM z/OSMF to automate IBM MQ](#).

Changes in z/OS product identifier (PID) recording

IBM MQ 9.1.0 introduces an improved method of including the correct PID for each of the following components:

- Base IBM MQ

- Advanced Message Security
- Managed File Transfer
- IBM MQ for z/OS Value Unit Edition (VUE)
- IBM MQ Advanced for z/OS Value Unit Edition

For more information, see [Product usage recording with IBM MQ for z/OS products](#).

Display queue manager utility on z/OS

IBM MQ 9.1.0 provides the `CSQUDSPM` utility on z/OS, which displays information about queue managers, and provides the equivalent function to `dspsmq` on [Multiplatforms](#).

Cluster workload exits for z/OS

From IBM MQ 9.1.0, cluster workload exits run in the channel initiator address space, instead of the queue manager address space. If you have a cluster workload exit, you should remove the `CSQXLIB DD` statement from your queue manager started task procedure, and add the dataset containing the cluster workload exit to the `CSQXLIB` concatenation on your channel initiator started task procedure.

Removal of OPMODE parameter

From IBM MQ 9.1.0, the `OPMODE` parameter in the `CSQ6SYSP` macro has been removed, and no longer has any effect. See [OPMODE](#) for details.

Checking that the mqweb server is correctly configured on z/OS

The information *Checking that the mqweb server is correctly configured on z/OS* has been moved to [Troubleshooting the IBM MQ Console and REST API](#).

V 9.1.0 New, changed and removed messages in IBM MQ 9.1.0

A summary of the new messages that have been added for IBM MQ 9.1.0, with links to further information. Any messages that have been changed or removed are also listed.

Related reference

[What's new and what's changed in IBM MQ Explorer](#)

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

Multi **V 9.1.0** New, changed, and removed IBM MQ AMQ messages in IBM MQ 9.1.0

A number of new IBM MQ AMQ messages have been added since IBM MQ 9.0.0. Some existing messages have been changed or removed.

- [“New and changed AMQ messages” on page 45](#)
- [“Changed IBM MQ AMQ messages” on page 48](#)
- [“Removed IBM MQ AMQ messages” on page 52](#)

New and changed AMQ messages

The following AMQ messages are new for IBM MQ 9.1.0:

AMQ3xxx: Utilities and tools

AMQ3723

AMQ3724

AMQ3725

AMQ3726 to AMQ3773

AMQ3774 to AMQ3899

AMQ3920

AMQ3921

AMQ3922

AMQ3923

AMQ3924

AMQ3925

AMQ3926

AMQ3927

AMQ3928

AMQ3929

AMQ3930

AMQ3931

AMQ3932

AMQ3933

AMQ3934

AMQ3935 to AMQ3943

AMQ3944 to AMQ3960

AMQ3961

AMQ3962

AMQ3963

AMQ3964

AMQ3965

AMQ3966

AMQ3967

AMQ3968

AMQ3969

AMQ3970

AMQ3971

AMQ3972

AMQ3973

AMQ3974

AMQ3975

AMQ3976-99

Windows

Linux

AMQ4xxx: User interface messages (Windows and Linux systems)

AMQ4638

AMQ4639

AMQ5xxx: Installable services

AMQ5058

AMQ5059

AMQ5060

AMQ5061_unix

AMQ5062

AMQ5063

AMQ5064

AMQ5766

AMQ6xxx: Common Services

AMQ6321

AMQ6322

AMQ6323 (UNIX and Linux)

AMQ6323 (Windows)

AMQ6324

AMQ6325

AMQ6326

AMQ6610 (IBM MQ Appliance)

AMQ6685

AMQ6721

AMQ6723

AMQ6723_ibm

AMQ6762

AMQ6783

AMQ6784

AMQ6917 (IBM i)

AMQ7xxx: IBM MQ product

AMQ7827

AMQ7828

AMQ7354 to AMQ7361

AMQ7489

AMQ7490

AMQ7491

AMQ7734 to AMQ7737

AMQ7824 to AMQ7826

AMQ8xxx: Administration

AMQ8124

AMQ8125

AMQ8245

AMQ870B

AMQ8928

AMQ8929

AMQ8599

AMQ8922

AMQ8923

AMQ8923_ibm

AMQ8924

AMQ8924_ibm

AMQ8925

AMQ8926
AMQ8927
AMQ8930
AMQ8D3B to AMQ8D3F

AMQ9xxx: Remote

AMQ9097
AMQ9098
AMQ9183
AMQ9278
AMQ9279
AMQ9703
AMQ9708
AMQ9709
AMQ9849

Changed IBM MQ AMQ messages

The following AMQ messages are changed for IBM MQ 9.1.0:

AMQ3xxx: Utilities and tools

AMQ3824
AMQ3825
AMQ3844
AMQ3894
AMQ3982
AMQ3985
AMQ3988
AMQ3993

AMQ4xxx: User interface messages (Windows and Linux systems)

AMQ4501
AMQ4635

AMQ5xxx: Installable services

AMQ5019 to AMQ5021
AMQ5032
AMQ5036
AMQ5042
AMQ5054
AMQ5055
AMQ5061
AMQ5600
AMQ5600_unix
AMQ5600_windows
AMQ5600 (IBM MQ Appliance)
AMQ5610 (AIX)
AMQ5613 (IBM MQ Appliance)
AMQ5657

AMQ5659

AMQ5703

AMQ5975

AMQ6xxx: Common Services

AMQ6004

AMQ6052

AMQ6064

AMQ6107

AMQ6109

AMQ6110

AMQ6120 to AMQ6122 (Severity changed)

AMQ6125

AMQ6177

AMQ6187

AMQ6231

AMQ6257

AMQ6231 (HP NSS)

AMQ6241

AMQ6258

AMQ6266

AMQ6271

AMQ6276

AMQ6354

AMQ6509

AMQ6529

AMQ6530

AMQ6532

AMQ6533

AMQ6537

AMQ6538

AMQ6544

AMQ6572

AMQ6584

AMQ6610

AMQ6620

AMQ6623

AMQ6641

AMQ6642

AMQ6648

AMQ6657 to AMQ665760

AMQ6662

AMQ6663

AMQ6666

AMQ6668

AMQ6671
AMQ6672
AMQ6674
AMQ6675
AMQ6680
AMQ6686
AMQ6693
AMQ6994
AMQ6999
AMQ6623
AMQ6693

AMQ7xxx: IBM MQ product

AMQ7005
AMQ7008
AMQ7010 to AMQ7016
AMQ7021
AMQ7025
AMQ7026
AMQ7041
AMQ7068
AMQ7072 (QM.INI changed to qm.ini)
AMQ7073
AMQ7077
AMQ7078
AMQ7091 to AMQ7098
AMQ7206
AMQ7207
AMQ7214
AMQ7215
AMQ7264
AMQ7285
AMQ7291
AMQ7299
AMQ7342
AMQ7701 to AMQ7704
AMQ7706 to AMQ7709
AMQ7711
AMQ7712
AMQ7714
AMQ7716 to AMQ7718 (IBM i)
AMQ7770 to AMQ7781
AMQ7783 to AMQ7799
AMQ7819

AMQ8xxx: Administration

AMQ8104

AMQ8110

AMQ8117

AMQ8118

AMQ8121

AMQ8135

AMQ8138

AMQ8140

AMQ8143

AMQ8145 to AMQ8148

AMQ8150

AMQ8151

AMQ8154 to AMQ8157

AMQ8178 to AMQ8180

AMQ8190 to AMQ8196

AMQ8202

AMQ8204 to AMQ8211

AMQ8214

AMQ8226

AMQ8242

AMQ8243

AMQ8249

AMQ8250

AMQ8298

AMQ8304

AMQ8350

AMQ8351

AMQ8449

AMQ8477

AMQ8478

AMQ8481

AMQ8501 to AMQ8504

AMQ8506

AMQ8576_windows

AMQ8602

AMQ8617

AMQ8712

AMQ8737

AMQ8760 to AMQ8769

AMQ8882

AMQ8885

AMQ8886

AMQ8923

AMQ8927

AMQ9xxx: Remote

AMQ9202

AMQ9467

AMQ9060

AMQ9061

AMQ9063

AMQ9239

AMQ9269

AMQ9297

AMQ9557

AMQ9616

AMQ9635

AMQ9641

AMQ9674

AMQ9785

Removed IBM MQ AMQ messages

The following AMQ messages are removed for IBM MQ 9.1.0:

AMQ6xxx: Common Services

AMQ6599

Related reference

[IBM MQ AMQ messages](#)

 *New, changed, and removed Managed File Transfer messages in IBM MQ*

9.1.0

A number of new messages have been added and some existing messages have been changed for Managed File Transfer since IBM MQ 9.0.0.

- [“New Managed File Transfer messages” on page 52](#)
- [“Changed Managed File Transfer messages” on page 54](#)

New Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.1.0:

BFGAG0001 - BFGAG9999

BFGAG0183I

BFGAG0184W

BFGAG0185W

BFGAG0186W

BFGAG0187E

BFGAG0188I

BFGAG0189W

BFGAI0001 - BFGAI9999

BFGAI0041E

BFGAP0001 - BFGAP9999

BFGAP0064E

BFGAP0065E

BFGBR0001 - BFGBR9999

BFGBR0208E

BFGCH0001 - BFGCH9999

BFGCH0122E

BFGCH0123E

BFGCH0124E

BFGCH0125E

BFGCH0126E

BFGAP0001 - BFGAP9999

BFGAP0064E

BFGAP0065E

BFGCI0001 - BFGCI9999

BFGCI0012E

BFGCI0013E

BFGCI0014E

BFGCI0015E

BFGCI0016E

BFGCH0001 - BFGCH9999

BFGCH0127I

BFGCL0001 - BFGCL9999

BFGCL0750E

BFGCL0751E

BFGCL0752E

BFGCL0753E

BFGCL0754I

BFGCL0755I

BFGCL0756E

BFGCL0757E

BFGCL0761E

BFGCL0762E

BFGCL0763E

BFGCL0764I

BFGCL0765I

BFGCL0766I

BFGCL0767I

BFGCL0768

IBFGCL0769I

BFGCL0770W

BFGCL0771W

BFGCL0772I

BFGCL0773I

BFGCL0774E

BFGCL0775E

BFGCL0776E

BFGCL0777E

BFGCL0778E

BFGCL0779E

BFGCU0001 - BFGCU9999

BFGCU0056E

BFGDB0001 - BFGDB9999

BFGDB0079E

BFGDB0080E

BFGDB0081E

BFGIO0001 - BFGIO9999

BFGIO0410E

BFGJE0001 - BFGJE9999

BFGJE0006W

BFGMQ0001 - BFGMQ9999

BFGMQ1044E

BFGMQ1045I

BFGNV0001 - BFGNV9999

BFGNV0175W

BFGNV0176I

BFGPC0001 - BFGPC9999

BFGPC0053E

BFGPR0001 - BFGPR9999

BFGPR0136E

BFGPR0137I

BFGPR0138W

BFGPR0139E

BFGPR0140I

BFGSS0001 - BFGSS9999

BFGSS0077E

BFGSS0078E

BFGSS0079E

BFGSS0080E

BFGSS0081E

BFGTR0001 - BFGTR9999

BFGTR0081I

BFGTR0082I

BFGUT0001 - BFGUT9999

BFGUT0032I

BFGUT0033E

BFGUT0034E

BFGUT0035E

BFGUT0036I

Changed Managed File Transfer messages

The following Managed File Transfer messages are changed for IBM MQ 9.1.0:

BFGAG0001 - BFGAG9999

BFGAG0114I

BFGAG0141E

BFGCL0001 - BFGCL9999

BFGCL0561E

BFGII0001 - BFGII9999

BFGII0024E (typo fixed)

BFGJE0001 - BFGJE9999

BFGJE0001W

BFGSS0001 - BFGSS9999

BFGSS0071E

BFGTR0001 - BFGTR9999

BFGTR0062I

BFGTR0063I

BFGTR0068I

BFGTR0077I

Related reference[Managed File Transfer diagnostic messages](#)** *New REST API messages in IBM MQ 9.1.0***

A number of new REST API messages have been added since IBM MQ 9.0.0.

The following REST API messages are new for IBM MQ 9.1.0:

- [MQWB00xx: REST API messages](#)
- [MQWB01xx: REST API messages](#)
- [MQWB02xx: REST API messages](#)
- [MQWB03xx: REST API messages](#)
- [MQWB04xx: REST API messages](#)
- [MQWB09xx: REST API messages](#)
- [MQWB20xx: REST API messages](#)

Related reference[REST API messages](#)** *New IBM MQ Console messages in IBM MQ 9.1.0***

A number of new IBM MQ Console messages have been added since IBM MQ 9.0.0.

The following IBM MQ Console messages are new for IBM MQ 9.1.0:

IBM MQ MQWB20xx: IBM MQ Console messages

MQWB2001 to MQWB2019

Related reference[IBM MQ Console messages](#)**   *New IBM MQ Bridge to blockchain messages in IBM MQ 9.1.0***

A number of new IBM MQ Bridge to blockchain messages have been added since IBM MQ 9.0.0.

The following IBM MQ Bridge to blockchain messages are new for IBM MQ 9.1.0: [AMQBCxxx: IBM MQ Bridge to blockchain messages](#)

Related reference

[IBM MQ Bridge to blockchain diagnostic messages](#)

New IBM MQ Bridge to Salesforce messages in IBM MQ 9.1.0

A number of new IBM MQ Bridge to Salesforce messages have been added since IBM MQ 9.0.0.

The following IBM MQ Bridge to Salesforce messages are new for IBM MQ 9.1.0:

AMQSFxxx: IBM MQ Bridge to Salesforce messages

AMQSF000 to AMQSF039

Related reference

[IBM MQ Bridge to Salesforce diagnostic messages](#)

New, changed and removed z/OS messages in IBM MQ 9.1.0

A number of new messages have been added and some existing messages have been changed or removed for IBM MQ for z/OS since IBM MQ 9.0.0.

- [“New IBM MQ for z/OS CSQ messages” on page 56](#)
- [“Changed IBM MQ for z/OS CSQ messages” on page 57](#)
- [“Removed IBM MQ for z/OS CSQ messages” on page 58](#)

New IBM MQ for z/OS CSQ messages

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.1.0:

Message manager messages (CSQM...)

CSQM102E
CSQM572E
CSQM573E
CSQM574E
CSQM575E
CSQM576E
CSQM577E
CSQM578I
CSQM062I

Agent services messages (CSQV...)

CSQV460I
CSQV461D

Distributed queuing messages (CSQX...)

CSQX193I
CSQX194E
CSQX198E
CSQX674E
CSQX690I
CSQX691I
CSQX692I
CSQX693I
CSQX694I
CSQX695I
CSQX967I

[CSQX968I](#)

Initialization procedure and general services messages (CSQY...)

[CSQY036I](#)

[CSQY037I](#)

[CSQY038E](#)

[CSQY039I](#)

[CSQY040I](#)

[CSQY140I](#)

[CSQY141I](#)

[CSQY142I](#)

Advanced Message Security (CSQ0...)

[CSQ0619I](#)

- [CSQZ - IBM MQ for z/OS service provider for z/OS Connect](#)

Changed IBM MQ for z/OS CSQ messages

The following CSQ messages are changed for IBM MQ 9.1.0:

CICS adapter and Bridge messages (CSQC...)

All CSQC messages ([CSQC100D](#) to [CSQC792I](#)) replaced by a link into the [DFHMQnnnn messages](#) section of the CICS documentation.

Data manager messages (CSQI...)

[CSQI065I](#) (OPMODE sentence removed)

Recovery log manager messages (CSQJ...)

[CSQJ414I](#)

Message manager messages (CSQM...)

[CSQM118I](#) (updated title of a linked topic)

[CSQM119I](#) (updated title of a linked topic)

[CSQM563E](#) (variable formatting correction)

Buffer manager messages (CSQP...)

[CSQP002I](#) (OPMODE sentence removed)

Utilities messages (CSQU...)

[CSQU555E](#) (updated title of a linked topic)

[CSQU586I](#)

[CSQU581E](#) (updated title of a linked topic)

[CSQU582E](#) (updated title of a linked topic)

[CSQU584E](#) (updated title of a linked topic)

Agent services messages (CSQV...)

[CSQV450I](#) (sentence removed)

[CSQV451I](#) (further information link updated)

[CSQV453I](#) (further information link updated)

[CSQV457E](#) (further information link updated)

[CSQV459I](#) (further information link updated)

Distributed queuing messages (CSQX...)

[CSQX199E](#) (renaming of Bluemix)

[CSQX208E](#) (reworking of links to further information)

[CSQX571I](#) (further information links updated)

[CSQX630E](#) (typo fixed)

[CSQX633E](#) (updated title of a linked topic)
[CSQX634E](#) (updated title of a linked topic)
[CSQX637E](#) (updated title of a linked topic)
[CSQX642E](#) (updated title of a linked topic)
[CSQX644E](#) (updated title of a linked topic)
[CSQX645E](#) (OPMODE sentence removed)
[CSQX674E](#) (property name changed from CSQWEAK to CSQXWEAK)
[CSQX967I](#) (variable formatting correction)

Initialization procedure and general services messages (CSQY...)

[CSQY000I](#)
[CSQY019E](#) (OPMODE sentences removed)
[CSQY333E](#) (OPMODE sentence removed)
[CSQY334E](#) (OPMODE sentence removed)
[CSQY336E](#) (OPMODE sentence removed)
[CSQY337E](#) (OPMODE sentence removed)

Advanced Message Security (CSQ0...)

[CSQ0608E](#)
[CSQ0629E](#)
[CSQ0214E](#) (grammar improved)
[CSQ0215E](#) (grammar improved)
[CSQ0216E](#) (grammar improved)

Db2 manager messages (CSQ5...)

[CSQ5004E](#) (updated title of a linked topic)
[CSQ5037I](#) (updated title of a linked topic)

Removed IBM MQ for z/OS CSQ messages

The following IBM MQ for z/OS CSQ messages are removed for IBM MQ 9.1.0:

Buffer manager messages (CSQP...)

[CSQP057E](#)
[CSQP058E](#)
[CSQP059E](#)

Distributed queuing messages (CSQX...)

[CSQX295E](#)

Initialization procedure and general services messages (CSQY...)

[CSQY344E](#)

Related reference

[Messages for IBM MQ for z/OS](#)

9.1.0 What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.5

Features that are new since IBM MQ 9.0.5 CD release, and changes that have take place since IBM MQ 9.0.5 to functions and resources that were introduced in IBM MQ 9.0.x CD releases are described in this section. Review this information if you are moving to IBM MQ 9.1.0 from an IBM MQ 9.0.x Continuous Delivery release.

- [“Changes to the REST API” on page 59](#)

- **MQ Appliance** [“Support for the messaging REST API on the IBM MQ Appliance” on page 59](#)
- [Changes to Java and JMS](#)
- [“Resource adapter updates for targetClientMatching property on an activation specification” on page 60](#)
- **Multi** [“JSON output format option available with amqsevt” on page 60](#)
- [“Deprecation of the TLS 1.0 Cipherspec protocol” on page 60](#)
- **Windows** [“IBM MQ on Windows is now built using the Microsoft Visual Studio 2017 compiler” on page 60](#)
- **Windows** [“.NET Framework updated from v3.5 to v4.5.1” on page 61](#)
- [“Enhancements to the fteListmonitors command” on page 61](#)
- **z/OS** [“Change to the mqmdFormat property for the MQ Service Provider for IBM z/OS Connect EE” on page 61](#)
- **z/OS** [“Cluster workload exits for z/OS” on page 61](#)
- **z/OS** [“Removal of OPMODE parameter” on page 61](#)
- **Linux** **z/OS** [“Changes to the IBM MQ Bridge to blockchain” on page 61](#)

Changes to the REST API

- When you issue a GET request on the `/login` resource, the response body no longer contains the authentication mechanism attribute. For more information about the `/login` resource, see [/login](#).
- When you issue a GET request on the `/installation` resource, the response body no longer contains the **hostname** attribute. For more information about the `/installation` resource, see [/installation](#).

- **ULW** **z/OS**

When you use token-based authentication with the REST API, the name of the cookie that is used to store the LTPA token to authenticate requests is no longer called `LtpaToken2`. By default, the token cookie starts with the prefix `LtpaToken2`, and can contain further randomized characters that can change each time the `mqweb` server is started. Therefore, to ensure that your applications can authenticate with the REST API, you must code your applications to use the LTPA token without knowing the full name of the token cookie. Alternatively, you can configure the LTPA cookie name to be a specified string by using the **setmqweb** command. For more information, see [Configuring the LTPA token](#).

MQ Appliance You cannot configure the LTPA token cookie name on the IBM MQ Appliance.

- **ULW** **z/OS**

When you use token-based authentication with the REST API, the LTPA token that is used to authenticate requests can no longer be used with insecure connections, by default. That is, LTPA token authentication cannot be used with an HTTP connection. You can enable use of the LTPA token with an HTTP connection by setting the **secureLtpa** parameter with the **setmqweb** command. For more information, see [Configuring the LTPA token](#).

MQ Appliance You cannot set **secureLtpa** on the IBM MQ Appliance.

Support for the messaging REST API on the IBM MQ Appliance

The messaging REST API can be used to send and receive IBM MQ messages. This functionality was available for AIX®, Linux, Windows and z/OS at IBM MQ 9.0.4. From IBM MQ 9.1.0, it is also available on the IBM MQ Appliance.

For more information about the messaging REST API, see [Messaging using the REST API](#).


Changes to Java and JMS

- The IBM MQ classes for Java package `com.ibm.mq.pcf` is now deprecated. Any new code you develop for PCF operations under Java should use the `com.ibm.mq.headers.pcf` package instead, and existing code should be migrated to this package when it is convenient to do so.
- The Bouncy Castle Jars that are used to support Advanced Message Security no longer contain a version number as part of their name. If you have configured a Java security policy, you might need to update it to reflect the new file names. For more information, see [Support for non-IBM JREs](#).

Resource adapter updates for `targetClientMatching` property on an activation specification

The IBM MQ JCA resource adapter (MQ-RA) has been updated such that the **`targetClientMatching`** property can be configured for an activation specification. You can configure the property so that an `MQRFH2` header is included on reply messages when request messages do not contain an `MQRFH2` header. This means that any message properties that an application defines on a reply message are included when the message is sent. For more information, see [Configuring the `targetClientMatching` property for an activation specification](#).

Deprecation of the TLS 1.0 Cipherspec protocol

  From IBM MQ 9.1.0, the TLS 1.0 Cipherspec protocol is disabled by default.

For more information on how to enable a deprecated CipherSpec, see [Enabling CipherSpecs](#).

JSON output format option available with `amqsevt`




The sample program **`amqsevt`** formats the instrumentation events that a queue manager can create. The program reads messages from event queues, and formats them into readable strings.

From IBM MQ 9.1.0, the `-o` parameter includes the `json` option, which provides output in standard JSON format that any application that understands JSON can take and process directly. For more information, see [Sample program to monitor instrumentation events on Multiplatforms](#).

IBM MQ on Windows is now built using the Microsoft Visual Studio 2017 compiler



 From IBM MQ 9.1.0, IBM MQ is built using the Microsoft Visual Studio 2017 compiler.

You must have the universal C runtime installed.

The universal C runtime is a part of Windows 10, and Windows Server 2016. However, on Windows 8.1, and Windows Server 2012 R2 you might need to download this runtime from Microsoft.

Attempting to run an IBM MQ program without the universal c runtime installed results in errors such as the following error:

```
The program can't start because api-ms-win-crt-runtime-|1-1-0.dll
is missing from your computer. Try reinstalling the program to
fix this problem.
```

For more information about installing the universal C runtime, see [Installing the universal C runtime](#).

The Microsoft Visual Studio 2012 C/C++ runtimes are no longer installed by IBM MQ.

If you are using programs that are compiled using Microsoft Visual Studio 2012, you must provide the Microsoft Visual Studio 2012 C/C++ run times, or recompile your programs with Microsoft Visual

Studio 2017. For more information, see [Providing the runtimes for Microsoft Visual Studio 2012 programs](#).

C++ libraries built using Microsoft Visual Studio 2015 are available.

In addition to the existing IBM MQ C++ libraries that are built with the Microsoft Visual Studio 2017 compiler, C++ libraries that are built with the Microsoft Visual Studio 2015 are provided. The installed Microsoft Visual Studio 2017 C/C++ runtimes can also run Microsoft Visual Studio 2015 programs, so no further runtimes are required.

For more information, see [Building C++ programs on Windows](#).

.NET Framework updated from v3.5 to v4.5.1

Windows At IBM MQ 9.1.0, the .NET Framework is updated to v4.5.1. To run IBM MQ classes for .NET, you must install the Microsoft.NET Framework v4.5.1, or later.

Any existing applications that use .NET Framework v3.5 can run on IBM MQ 9.1.0 without recompiling the source code by adding the following tag in the `app.config` file of the application:

```
<configuration>
  <startup>
    <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.5.1"/>
  </startup>
</configuration>
```

Enhancements to the `ftelListmonitors` command

From IBM MQ 9.1.0, any special characters in the name of a resource monitor, that might not valid be valid in the name of a file, are converted to their ASCII equivalent. See the [ftelListmonitors](#) command for further information.

Change to the `mqmdFormat` property for the MQ Service Provider for IBM z/OS Connect EE

z/OS

The default value of the `mqmdFormat` configuration property for the MQ Service Provider for IBM z/OS Connect EE has changed from a blank string to "MQSTR".

In most cases, this change is not apparent to applications; if not, you can provide a user specified value. For more information on the `mqmdFormat` property, see [mqzOSConnectService](#) element.

Cluster workload exits for z/OS

z/OS

From IBM MQ 9.1.0, cluster workload exits run in the channel initiator address space, instead of the queue manager address space. If you have a cluster workload exit, you should remove the CSQXLIB DD statement from your queue manager started task procedure, and add the dataset containing the cluster workload exit to the CSQXLIB concatenation on your channel initiator started task procedure.

Removal of `OPMODE` parameter

z/OS

From IBM MQ 9.1.0, the `OPMODE` parameter in the CSQ6SYSP macro has been removed, and no longer has any effect. See [OPMODE](#) for details.

Changes to the IBM MQ Bridge to blockchain

Linux **z/OS**

From IBM MQ 9.1.0, the IBM MQ Bridge to blockchain has been realigned to integrate with Hyperledger Composer, which leads to a number of changes:

- New IBM MQ Advanced for z/OS Value Unit Edition installer and z/OS runtime. See [Running the IBM MQ Bridge to blockchain](#) for more information.
- Support for connecting to Hyperledger Fabric has been removed.
- Support for connecting to the REST interface of Hyperledger Composer has been added.
- JSON Message formats have been changed to align with accessing the Hyperledger Composer REST interface. See [Message formats for the IBM MQ Bridge to blockchain](#) for more information.

Related concepts

V 9.1.0 What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.0
Features that are new or have changed since IBM MQ 9.0.0 are described in this section. Review this information if you are moving to IBM MQ 9.1.0 from IBM MQ 9.0.0 Long Term Support.

V 9.1.0 Deprecated and removed features in IBM MQ 9.1.0
A number of features are deprecated or removed from IBM MQ 9.1.0.

[“What's changed in IBM MQ 9.1.0 since IBM MQ 9.0.0” on page 32](#)
Changes to functions and resources since IBM MQ 9.0.0 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems. Review these changes if you are moving to IBM MQ 9.1.0 from IBM MQ 9.0.0 Long Term Support release, or from an earlier version of the product.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0 New, changed and removed messages since IBM MQ 9.0.5

A number of new messages have been added and some existing messages have been changed or removed since IBM MQ 9.0.5.

- **Multi** [“New, changed and removed IBM MQ AMQ messages” on page 62](#)
- [“New, changed and removed Managed File Transfer messages” on page 64](#)
- [“New, changed and removed REST API messages” on page 64](#)
- [“New, changed and removed IBM MQ Console messages” on page 65](#)
- **Linux** **MQ Adv.** [“New, changed and removed IBM MQ Bridge to blockchain messages” on page 65](#)
- **Linux** [“New, changed and removed IBM MQ Bridge to Salesforce messages” on page 66](#)
- **z/OS** [“New, changed and removed z/OS messages” on page 66](#)

New, changed and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new since IBM MQ 9.0.5:

AMQ3xxx: Utilities and tools

AMQ3723

AMQ3724

AMQ3725

AMQ3920

AMQ3921

AMQ3922
AMQ3923
AMQ3924
AMQ3925
AMQ3926
AMQ3927
AMQ3928
AMQ3929
AMQ3930
AMQ3931
AMQ3933
AMQ3934

AMQ5xxx: Installable services

AMQ5063
AMQ5064

AMQ6xxx: Common Services

AMQ6917 (IBM i)

AMQ7xxx: IBM MQ product

AMQ7827
AMQ7828

AMQ8xxx: Administration

AMQ8930

AMQ9xxx: Remote

AMQ9098
AMQ9278
AMQ9279
AMQ9708
AMQ9709

The following AMQ messages are changed since IBM MQ 9.0.5:

AMQ6xxx: Common Services

AMQ6544 (two extra DR commands added to the list)
AMQ6668 (extra options added to the sethagrp command)
AMQ6671 (explanation text improved)
AMQ6693 (two extra HA commands added to the list)

AMQ8xxx: Administration

AMQ8242 (response text extended)
AMQ8250 (severity altered from "severe error" to "information")
AMQ8350 (an MFT line added to the command usage example)

AMQ9xxx: Remote

AMQ9202 (minor text change)
AMQ9467 (updated reference to the product documentation)
AMQ9616 (two lines of explanation removed)
AMQ9635 (response text updated and extended)
AMQ9641 (explanation and response texts improved)
AMQ9674 (CipherSpec information updated)

There are no removed AMQ messages since IBM MQ 9.0.5.

New, changed and removed Managed File Transfer messages

The following Managed File Transfer messages are new since IBM MQ 9.0.5:

BFGAG0001 - BFGAG9999

BFGAG0188I

BFGAG0189W

The following Managed File Transfer messages are changed since IBM MQ 9.0.5:

BFGCL0001 - BFGCL9999

BFGCL0777E (wording improved)

BFGCL0779E (wording improved)

There are no removed Managed File Transfer messages since IBM MQ 9.0.5.

New, changed and removed REST API messages

The following REST API messages are new since IBM MQ 9.0.5:

MQWB00xx: REST API messages

MQWB0087E

MQWB04xx: REST API messages

MQWB0406E

MQWB09xx: REST API messages

MQWB0901E

The following REST API messages are changed since IBM MQ 9.0.5:

MQWB00xx: REST API messages

MQWB00xx (almost every message in this set has been edited, and the text tidied up)

MQWB0010E (rewritten)

MQWB01xx: REST API messages

MQWB0104E (extended to also describe the z/OS case)

MQWB0108E (extended to also describe the z/OS case)

MQWB0110E (tidied up)

MQWB0113E (tidied up)

MQWB0115E (tidied up)

MQWB02xx: REST API messages

MQWB0201E (tidied up)

MQWB0202E (tidied up)

MQWB0205E (tidied up)

MQWB0207E (tidied up)

MQWB0208E (tidied up)

MQWB03xx: REST API messages

MQWB03xx (almost every message in this set has been edited, and the text tidied up)

MQWB04xx: REST API messages

MQWB0400E (tidied up)

MQWB0401E (tidied up and "Explanation" extended)

MQWB0402E (tidied up)

MQWB0403E (tidied up)

MQWB0404E (rewritten)

MQWB0407E (tidied up)

MQWB0408E (tidied up)

MQWB09xx: REST API messages

MQWB0900E (tidied up)

The following REST API messages are removed since IBM MQ 9.0.5:

MQWB00xx: REST API messages

MQWB0101E

MQWB04xx: REST API messages

MQWB0405E

New, changed and removed IBM MQ Console messages

There are no new, changed or removed IBM MQ Console messages since IBM MQ 9.0.5.

New, changed and removed IBM MQ Bridge to blockchain messages



The following IBM MQ Bridge to blockchain messages are new since IBM MQ 9.0.5:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC000I

AMQBC052E

AMQBC053E

AMQBC054E

AMQBC055E

Since IBM MQ 9.0.5, a severity identifier (E/W/I) is added to the end of each IBM MQ Bridge to blockchain message number. The following IBM MQ Bridge to blockchain messages are changed since IBM MQ 9.0.5:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC006E (rewritten)

AMQBC011E (rewritten)

AMQBC020E (sentence removed)

AMQBC024E (syntax example updated)

The following IBM MQ Bridge to blockchain messages are removed since IBM MQ 9.0.5:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC002

AMQBC003

AMQBC007

AMQBC009

AMQBC019

AMQBC023

AMQBC025

AMQBC026

AMQBC027

AMQBC031

AMQBC037

AMQBC039

AMQBC040

AMQBC041
AMQBC042
AMQBC046
AMQBC047
AMQBC048
AMQBC049
AMQBC050
AMQBC051

New, changed and removed IBM MQ Bridge to Salesforce messages

Linux

The following IBM MQ Bridge to Salesforce messages are new since IBM MQ 9.0.5:

AMQSFxxx: IBM MQ Bridge to Salesforce messages

AMQSF000I
AMQSF038W
AMQSF039E

Since IBM MQ 9.0.5, a severity identifier (E/W/I) is added to the end of each IBM MQ Bridge to Salesforce message number.

There are no removed IBM MQ Bridge to Salesforce messages since IBM MQ 9.0.5.

New, changed and removed z/OS messages

z/OS

The following IBM MQ for z/OS CSQ messages are new since IBM MQ 9.0.5:

Distributed queuing messages (CSQX...)

CSQX694I
CSQX695I

Initialization procedure and general services messages (CSQY...)

CSQY039I
CSQY040I

The following IBM MQ for z/OS CSQ messages are changed since IBM MQ 9.0.5:

Data manager messages (CSQI...)

CSQI065I (OPMODE sentence removed)

Buffer manager messages (CSQP...)

CSQP002I (OPMODE sentence removed)

Agent services messages (CSQV...)

CSQV450I (sentence removed)
CSQV451I (further information link updated)
CSQV453I (further information link updated)
CSQV457E (further information link updated)
CSQV459I (further information link updated)

Distributed queuing messages (CSQX...)

CSQX571I (further information links updated)
CSQX645E (OPMODE sentence removed)
CSQX674E (data definition statement names changed)

Initialization procedure and general services messages (CSQY...)

CSQY019E (OPMODE sentences removed)
CSQY333E (OPMODE sentence removed)
CSQY334E (OPMODE sentence removed)
CSQY336E (OPMODE sentence removed)
CSQY337E (OPMODE sentence removed)

The following IBM MQ for z/OS CSQ messages are removed since IBM MQ 9.0.5:

Buffer manager messages (CSQP...)

CSQP057E
CSQP058E
CSQP059E

Distributed queuing messages (CSQX...)

CSQX295E

Initialization procedure and general services messages (CSQY...)

CSQY344E

Related reference

[IBM MQ AMQ messages](#)
[Managed File Transfer diagnostic messages](#)
[REST API messages](#)
[IBM MQ Console messages](#)
[IBM MQ Bridge to blockchain messages](#)
[IBM MQ Bridge to Salesforce messages](#)
[Messages for IBM MQ for z/OS](#)

V 9.1.0 **Deprecated and removed features in IBM MQ 9.1.0**

A number of features are deprecated or removed from IBM MQ 9.1.0.

Deprecations on all platforms



- [IBM MQ classes for Java package com.ibm.mq.pcf](#)
- [IBM Cloud® Product Insights](#)

Deprecations on UNIX, Linux, and Windows



The use of the Postcard application and its supporting Default Configuration wizard for installation verification is deprecated from IBM MQ 9.1.0.

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](#)

Removed features

- [“Support for HP-UX” on page 69](#)
- [Support for installing IBM MQ on Linux Ubuntu systems using rpm](#)
- **Windows** [Support for Microsoft Internet Explorer 11 browser](#)
- [IBM MQ transport for SOAP and HTTP bridge](#)
- [Support for the MQ Service Provider in z/OS Connect V1](#)

Related concepts

V 9.1.0 [What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.0](#)
Features that are new or have changed since IBM MQ 9.0.0 are described in this section. Review this information if you are moving to IBM MQ 9.1.0 from IBM MQ 9.0.0 Long Term Support.

V 9.1.0 [What's new and changed in IBM MQ 9.1.0 compared to IBM MQ 9.0.5](#)
Features that are new since IBM MQ 9.0.5 CD release, and changes that have take place since IBM MQ 9.0.5 to functions and resources that were introduced in IBM MQ 9.0.x CD releases are described in this section. Review this information if you are moving to IBM MQ 9.1.0 from an IBM MQ 9.0.x Continuous Delivery release.

Related reference

[Deprecated Cipherspecs](#)

V 9.1.0 Deprecations on all platforms in IBM MQ 9.1.0

Some features for all supported platforms are deprecated at IBM MQ 9.1.0.

Deprecation of IBM MQ classes for Java package `com.ibm.mq.pcf`

The IBM MQ classes for Java package `com.ibm.mq.pcf` is now deprecated. Any new code you develop for PCF operations under Java should use the `com.ibm.mq.headers.pcf` package instead, and existing code should be migrated to this package when it is convenient to do so.

Deprecation of IBM Cloud Product Insights service

The IBM Cloud Product Insights service is deprecated on all platforms at IBM MQ 9.1.0.

The IBM Cloud Product Insights service has been replaced by the *ICP metering service*, referred to within this documentation as the `metering` service.

Multi The IBM MQ 9.0 topic, [Configuring IBM MQ for use with IBM Cloud Product Insights service in IBM Cloud](#) has been renamed to [Configuring IBM MQ for use with the metering service in IBM Cloud](#).



Attention: The **APIKeyFile**, **ServiceURL**, and **ServiceProxy** attributes that are no longer used to connect to IBM Cloud Product Insights, have been reinstated for the metering service.

Related concepts

V 9.1.0 [Deprecations on z/OS in IBM MQ 9.1.0](#)

A number of IBM MQ for z/OS features are deprecated at IBM MQ 9.1.0, and will be removed in a future release.

V 9.1.0 [Removed features in IBM MQ 9.1.0](#)

A number of features are removed from IBM MQ 9.1.0.

V 9.1.0 Deprecations on z/OS in IBM MQ 9.1.0

A number of IBM MQ for z/OS features are deprecated at IBM MQ 9.1.0, and will be removed in a future release.

Buffer pools located below the bar

This deprecation applies to buffer pools which were not defined with the **LOCATION/LOC** attribute, or were defined with **LOCATION(BELOW)**.

You should define new buffer pools with **LOCATION(ABOVE)**, and alter existing buffer pools so that they use **LOCATION(ABOVE)**.

See [DEFINE BUFFPOOL](#) for more information on defining a buffer pool, and [ALTER BUFFPOOL](#) for more information on altering a buffer pool.

Note that a future release will ignore the value of the **LOCATION** attribute, and all buffer pools will be located above the bar.

MAKECLNT CSQUTIL tool

The MAKECLNT CSQUTIL tool was stabilized at the IBM WebSphere MQ 7.1 level and is now deprecated. You should use **runmqsc -n** instead. For further information, see [runmqsc](#).

Use of queue sharing groups with Db2 table spaces of any type other than universal table spaces

Db2 11 deprecated support for any table space type that was not a universal table space. Support for queue sharing groups using non-universal table spaces is now deprecated; you should consider migrating existing table spaces to universal table spaces if possible. If you are creating a new queue sharing group, ensure that you use the samples that define universal table spaces.

See [Planning your Db2 environment](#) for more information.

Using hexadecimal strings in the SSLCIPH attribute

In a future release, the **SSLCIPH** attribute on a channel definition will not accept hexadecimal string values. Only IBM MQ cipher strings will be accepted.

Related concepts

V 9.1.0 [Deprecations on all platforms in IBM MQ 9.1.0](#)

Some features for all supported platforms are deprecated at IBM MQ 9.1.0.

V 9.1.0 [Removed features in IBM MQ 9.1.0](#)

A number of features are removed from IBM MQ 9.1.0.

V 9.1.0 Removed features in IBM MQ 9.1.0

A number of features are removed from IBM MQ 9.1.0.

Support for HP-UX

Support for the HP-UX operating system for all IBM MQ components, including server and clients, is removed from IBM MQ 9.1.0.

Support for installing IBM MQ on Linux Ubuntu systems using rpm

The ability to install IBM MQ on Linux Ubuntu systems using rpm has been removed. The product must be installed using the supplied Debian-style packages. For more information about installing with Debian-style packages, see [Installing IBM MQ on Linux Ubuntu using Debian](#).

Support for Microsoft Internet Explorer 11 browser

Windows

Microsoft Internet Explorer 11 browser support has been removed. The Microsoft Edge browser is now supported by the IBM MQ Console.

IBM MQ transport for SOAP and HTTP bridge

The IBM MQ transport for SOAP, and IBM MQ HTTP bridge components were deprecated in earlier releases of the product. These components have been removed at IBM MQ 9.1.0.

Support for the MQ Service Provider in z/OS Connect V1

The zosConnectMQ-1.0 feature has been removed. You can, instead, use the MQ Service Provider for IBM z/OS Connect EE.

Note: Any reference to z/OS Connect in this documentation, refers only to [IBM MQ for z/OS Connect Enterprise Edition](#) (IBM z/OS Connect EE).

Related concepts

V 9.1.0 Deprecations on all platforms in IBM MQ 9.1.0
Some features for all supported platforms are deprecated at IBM MQ 9.1.0.

V 9.1.0 Deprecations on z/OS in IBM MQ 9.1.0
A number of IBM MQ for z/OS features are deprecated at IBM MQ 9.1.0, and will be removed in a future release.

CD

What's new and changed in IBM MQ 9.1.x Continuous Delivery

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

Continuous Delivery releases (CD releases) deliver new functional enhancements, in addition to fixes and security updates, on a much shorter cadence, so providing much more rapid access to those new functions. This delivery model is intended for systems where applications want to exploit the very latest capabilities of IBM MQ.

The individual features provided by a CD release are stand-alone functions but may increase in capability in subsequent CD releases, enhancing earlier CD features and forming a suite of related capabilities.

It is also possible for newly created features in one CD release to be modified in later CD releases to improve the user experience. Where migration to the improved capability is required it will be documented.

For further information see [IBM MQ release types](#) and [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](#).

Related concepts

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the

features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.5 What's new and changed in IBM MQ 9.1.5

IBM MQ 9.1.5, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related concepts

[V 9.1.4](#) What's new and changed in IBM MQ 9.1.4

IBM MQ 9.1.4, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.1.3](#) What's new and changed in IBM MQ 9.1.3

IBM MQ 9.1.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.1.2](#) What's new and changed in IBM MQ 9.1.2

IBM MQ 9.1.2 is the follow-on Continuous Delivery (CD) release to IBM MQ 9.1.1. IBM MQ 9.1.2 delivers a number of new enhancements on AIX, Linux, Windows, and z/OS.

[V 9.1.1](#) What's new and changed in IBM MQ 9.1.1

IBM MQ 9.1.1, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.5 What's new in IBM MQ 9.1.5

IBM MQ 9.1.5 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

The individual features provided by a CD release are stand-alone functions but may increase in capability in subsequent CD releases, enhancing earlier CD features and forming a suite of related capabilities.

New IBM MQ for Multiplatforms features



The following new features are available with both IBM MQ base product entitlement, and with IBM MQ Advanced entitlement:

- [“Application resource monitoring” on page 73](#)

- [“Updated IBM MQ Console look and feel” on page 73](#)
- [“Controlling the size of queue files” on page 73](#)
- **Linux** [“License acceptance after installation on Linux” on page 74](#)
- [“Enhanced protection of stored passwords in MQIPT” on page 74](#)
- [“Alias Cipher and TLS 1.3 support in Java and JMS client applications” on page 74](#)
- **Windows** [“.NET project templates” on page 74](#)
- [“Publish messages to topics with the messaging REST API” on page 74](#)
- [“Userdata directory” on page 74](#)
- [“Version 2 of the REST API” on page 74](#)
- [“New environment variable AMQ_NO_BAD_COMMS_DATA_FDCS” on page 75](#)

MQ Adv. The following new features are available only with IBM MQ Advanced entitlement:

- **Linux** [“Disaster recovery now available for high availability replicated data queue managers” on page 75](#)
- **Linux** [“Use of an IBM Aspera fasp.io Gateway running on Linux on POWER Systems or Linux for IBM Z” on page 76](#)

New IBM MQ for z/OS features

z/OS

The following new features are available both with IBM MQ for z/OS base product entitlement, and with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [“Support for data set encryption” on page 77](#)
- [“Enhanced protection of stored passwords in MQIPT” on page 77](#)
- [“Publish messages to topics with the messaging REST API” on page 77](#)
- [“Version 2 of the REST API” on page 77](#)

z/OS **MQ Adv. VUE** The following new feature is available only with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [“Use of IBM Aspera fasp.io Gateway streaming for IBM MQ messages” on page 78](#)

Related concepts

V 9.1.5 [What's changed in IBM MQ 9.1.5](#)

Changes to functions and resources in IBM MQ 9.1.5 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.5 [New, changed and removed messages in IBM MQ 9.1.5](#)

A summary of the new messages that have been added for IBM MQ 9.1.5, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.





Related information

[System Requirements for IBM MQ](#)



[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New IBM MQ 9.1.5 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

-   [“Application resource monitoring” on page 73](#)
- [“Updated IBM MQ Console look and feel” on page 73](#)
- [“Controlling the size of queue files” on page 73](#)
-  [“License acceptance after installation on Linux” on page 74](#)
- [“Enhanced protection of stored passwords in MQIPT” on page 74](#)
- [“Alias Cipher and TLS 1.3 support in Java and JMS client applications” on page 74](#)
-  [“.NET project templates” on page 74](#)
- [“Publish messages to topics with the messaging REST API” on page 74](#)
- [“Userdata directory” on page 74](#)
- [“Version 2 of the REST API” on page 74](#)
- [“New environment variable AMQ_NO_BAD_COMMS_DATA_FDCS” on page 75](#)

Application resource monitoring

IBM MQ 9.1.5 adds the ability to allow you to monitor usage statistics for each application that you specify by adding the STATAPP class to the **amqsrua** command. You can use this information to help you understand how your applications are being moved between queue managers and identify any anomalies.

For more information, see [Monitoring system resource usage by using the **amqsrua** command](#).

Updated IBM MQ Console look and feel

From IBM MQ 9.1.5 a new console, with a new look and feel, is available on Multiplatforms.

For more information, see [Quick tour of the New Web Console](#).

Controlling the size of queue files

From IBM MQ 9.1.5, you have the option of configuring and monitoring queues that will support substantially more than the two terabyte default limit used in releases of IBM MQ prior to IBM MQ 9.1.5. You also have the option of reducing the size a queue file can grow to.

To enable you to configure queues, there is an additional attribute on local and model queues, MAXFSIZE and to monitor queues there are two additional queue status attribute, CURFSIZE and CURMAXFS.

For more information, see [Modifying IBM MQ queue files](#).

License acceptance after installation on Linux

Linux

From IBM MQ 9.1.5, on Linux, you have the option of accepting the correct license for your enterprise after you install the product.

For more information, see [License acceptance on IBM MQ for Linux](#).

Enhanced protection of stored passwords in MQIPT

From IBM MQ 9.1.5, all passwords that are stored in the IBM MQ Internet Pass-Thru (MQIPT) configuration can be protected by encrypting the passwords using the **mqiptPW** command. IBM MQ 9.1.5 also introduces a new, more secure, protection method for passwords that are stored for use by MQIPT, and the ability for you to specify an encryption key that is used to encrypt and decrypt stored passwords.

For more information, see [Encrypting stored passwords](#).

Alias Cipher and TLS 1.3 support in Java and JMS client applications

From IBM MQ 9.1.5, support of TLS 1.3 has been enabled in Java and JMS applications. This allows users of Java and JMS applications to supply TLS 1.3 Ciphersuites to be used for TLS communication. Additionally, support for a selection of alias CipherSpecs has been added that allow a user to configure multi-cipher communication based on protocol versions. For a list of supported new Ciphersuites, see Table 1 in [TLS CipherSpecs and CipherSuites in IBM MQ classes for Java](#) and [TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS](#).

Note: To use TLS 1.3 or TLS 1.3 alias CipherSpecs, the JRE running your JMS or Java application must support TLS 1.3.

.NET project templates

Windows

IBM MQ 9.1.5 adds .NET project templates to Microsoft Visual Studio, enabling you to write your applications more quickly.

For more information, see [Using the IBM MQ .NET project template](#) and [Using the IBM MQ XMS .NET project template](#).

Publish messages to topics with the messaging REST API

From IBM MQ 9.1.5, you can publish messages to a specified topic by using the messaging REST API. You can use the `/messaging/qmgr/{qmgrName}/topic/{topicString}/message` resource with an HTTP POST to publish a message to the topic.

For more information, see [POST /messaging/qmgr/{qmgrName}/topic/{topicString}/message](#).

Userdata directory

From IBM MQ 9.1.5, the queue manager filestore includes a userdata directory that you can use for storing the persistent state of an application. For more information, see [Userdata directory](#) and [Storing persistent application status](#).

Version 2 of the REST API

IBM MQ 9.1.5 introduces version 2 of the REST API. This version increase applies to the administrative REST API, messaging REST API, and MFT REST API.

This version increase changes the resource URL that is used for the REST API. The URL prefix for the resource URLs at version 2 is the following URL:

```
https://host:port/ibmmq/rest/v2/
```

You can continue to use the version 1 URL for existing applications. Most REST API resources are available in both versions. However, new REST API resources are available only with the version 2 URL. For example, the new publish URL in the messaging REST API is available only with the version 2 URL.

The following REST API resources are not available in version 2:

- GET subscription
- GET channel
- POST queue
- PATCH queue
- GET queue
- DELETE queue

You can use the [MQSC](#) resource URL as an alternative to using these version 1 REST API resources.



New environment variable **AMQ_NO_BAD_COMMS_DATA_FDCS**

From IBM MQ 9.1.5, you can use the **AMQ_NO_BAD_COMMS_DATA_FDCS** environment variable to suppress the capture of FFSTs when reporting [AMQ9207E](#) error messages on initial communications flows. For more information, see [Environment variables descriptions](#).




Related concepts

   [New IBM MQ 9.1.5 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.5 delivers new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

  [New IBM MQ 9.1.5 features for z/OS](#)




On the z/OS platform, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

   [New IBM MQ 9.1.5 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.5 delivers a new feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

   [***New IBM MQ 9.1.5 features for IBM MQ Advanced for Multiplatforms***](#)

IBM MQ 9.1.5 delivers new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

-  [“Disaster recovery now available for high availability replicated data queue managers” on page 75](#)
-  [“Use of an IBM Aspera fasp.io Gateway running on Linux on POWER Systems or Linux for IBM Z” on page 76](#)
-  [“Use of MQ Operators to deploy an IBM MQ Advanced certified container” on page 76](#)

Disaster recovery now available for high availability replicated data queue managers



You can now configure a replicated data queue manager (RDQM) that runs on a high availability group on one site, but can fail over to another high availability group at another site if some disaster occurs that makes the first group unavailable. This is known as a DR/HA RDQM. See [RDQM disaster recovery and high availability](#).

Use of an IBM Aspera fasp.io Gateway running on Linux on POWER Systems or Linux for IBM Z

Linux

Queue managers can be configured so that IBM MQ system, application, and Managed File Transfer messages pass through an Aspera gateway to reach a destination using the Aspera FASP protocol in place of TCP/IP. For some use cases, this allows messages to move between destinations more rapidly than otherwise would be the case.

From IBM MQ 9.1.4, IBM MQ Advanced for Multiplatforms provided entitlement for using an IBM Aspera fasp.io Gateway running on Linux for x86-64 systems. From IBM MQ 9.1.5, an IBM MQ Advanced for Multiplatforms queue manager can also use an Aspera gateway running on Linux on POWER® Systems or Linux for IBM Z.

An Aspera gateway is set up, under Linux, for use by sending and receiving queue managers. Each of these queue managers must be one of IBM MQ Advanced for z/OS VUE, IBM MQ Advanced for Multiplatforms, or IBM MQ Appliance queue managers. The gateway does not need to run on the same server as the queue manager, or on the IBM MQ Appliance.

For more information, see [Defining an Aspera gateway connection on Linux](#).

Note that use of the Aspera gateway is limited to IBM MQ messages unless the gateway is separately entitled.

Use of MQ Operators to deploy an IBM MQ Advanced certified container

Linux

As an alternative to Helm, you can now use MQ Operator 1.0.0 to deploy your IBM MQ certified containers. The MQ Operator is a Kubernetes Operator that provides native integration with Red Hat® OpenShift® Container Platform. This first version of the MQ Operator is only compatible with IBM MQ 9.1.5.

Related concepts

Multi

V 9.1.5

New IBM MQ 9.1.5 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

z/OS

V 9.1.4

New IBM MQ 9.1.5 features for z/OS

On the z/OS platform, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.5

z/OS

MQ Adv. VUE

New IBM MQ 9.1.5 features for IBM MQ Advanced for z/OS Value

Unit Edition

IBM MQ 9.1.5 delivers a new feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.1.5

z/OS

New IBM MQ 9.1.5 features for z/OS

On the z/OS platform, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

- [“Support for data set encryption” on page 77](#)
- [“Enhanced protection of stored passwords in MQIPT” on page 77](#)
- [“Publish messages to topics with the messaging REST API” on page 77](#)

- [“Version 2 of the REST API” on page 77](#)

Support for data set encryption

From IBM MQ 9.1.5, IBM MQ for z/OS introduces support for the use of z/OS data set encryption, for shared message data sets .

This, together with the support for encrypting page sets and logs that was added in IBM MQ 9.1.4, means that all data stored in IBM MQ for z/OS data sets can now be protected on disk.

For more information, see [Confidentiality for data at rest on IBM MQ for z/OS with data set encryption](#)

Enhanced protection of stored passwords in MQIPT

From IBM MQ 9.1.5, all passwords that are stored in the IBM MQ Internet Pass-Thru (MQIPT) configuration can be protected by encrypting the passwords using the **mqiptPW** command. IBM MQ 9.1.5 also introduces a new, more secure, protection method for passwords that are stored for use by MQIPT, and the ability for you to specify an encryption key that is used to encrypt and decrypt stored passwords.

For more information, see [Encrypting stored passwords](#).

Publish messages to topics with the messaging REST API

From IBM MQ 9.1.5, you can publish messages to a specified topic by using the messaging REST API. You can use the `/messaging/qmgr/{qmgrName}/topic/{topicString}/message` resource with an HTTP POST to publish a message to the topic.

For more information, see [POST /messaging/qmgr/{qmgrName}/topic/{topicString}/message](#).

Version 2 of the REST API

IBM MQ 9.1.5 introduces version 2 of the REST API. This version increase applies to the administrative REST API, messaging REST API, and MFT REST API.

This version increase changes the resource URL that is used for the REST API. The URL prefix for the resource URLs at version 2 is the following URL:

```
https://host:port/ibmmq/rest/v2/
```

You can continue to use the version 1 URL for existing applications. Most REST API resources are available in both versions. However, new REST API resources are available only with the version 2 URL. For example, the new publish URL in the messaging REST API is available only with the version 2 URL.

The following REST API resources are not available in version 2:

- GET subscription
- GET channel
- POST queue
- PATCH queue
- GET queue
- DELETE queue

You can use the [MQSC](#) resource URL as an alternative to using these version 1 REST API resources.


Related concepts

  [New IBM MQ 9.1.5 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.5 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.5 delivers new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [New IBM MQ 9.1.5 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.5 delivers a new feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 **[New IBM MQ 9.1.5 features for IBM MQ Advanced for z/OS Value Unit Edition](#)**

IBM MQ 9.1.5 delivers a new feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

- [“Use of IBM Aspera fasp.io Gateway streaming for IBM MQ messages” on page 78](#)

Use of IBM Aspera fasp.io Gateway streaming for IBM MQ messages

Queue managers can be configured so that IBM MQ system, application, and Managed File Transfer messages pass through an Aspera gateway to reach a destination using the Aspera FASP protocol in place of TCP/IP. For some use cases, this allows messages to move between destinations more rapidly than otherwise would be the case.

From IBM MQ 9.1.5, IBM MQ Advanced for z/OS VUE provides entitlement for using the IBM Aspera fasp.io Gateway.

An Aspera gateway is set up, under Linux, for use by sending and receiving queue managers. Each of these queue managers must be one of IBM MQ Advanced for z/OS VUE, IBM MQ Advanced for Multiplatforms, or IBM MQ Appliance queue managers. The gateway does not need to run on the same server as the queue manager, or on the IBM MQ Appliance.

For more information, see [Defining an Aspera gateway connection on Linux](#).

Note that use of the Aspera gateway is limited to IBM MQ messages unless the gateway is separately entitled.

Related concepts

 [New IBM MQ 9.1.5 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.5 features for IBM MQ Advanced for Multiplatforms](#)





IBM MQ 9.1.5 delivers new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [New IBM MQ 9.1.5 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.5 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.5 What's changed in IBM MQ 9.1.5

Changes to functions and resources in IBM MQ 9.1.5 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

- [“Change to authorities needed for XMS .NET to query the BackoutThreshold and BackoutRequeueQName of a cluster queue” on page 79](#)
- [“Change to default trace name for IBM MQ classes for Java and IBM MQ classes for JMS” on page 79](#)
- [“Changes to the tracing of the AMQR and MQXR services” on page 79](#)
-  [“Update to IBM MQ AMQP service” on page 80](#)
-  [“Change to inquiries used by dmpmqcfg command” on page 80](#)
-  [“New RecoveryTimedOut transfer state for MFT agents” on page 80](#)
-  [“Change to how MFT resource monitors initiate polling” on page 80](#)
- [“Change to exception messages for failed managed transfer requests that require a new directory to be created on an SFTP file server” on page 80](#)
- [“Removal of the ibm-mq-total-browse-size response header from the messaging REST API” on page 81](#)
- [“Migrating uniform clusters to IBM MQ 9.1.5” on page 81](#)
- [“Change to version of Eclipse that IBM MQ Explorer is built on” on page 81](#)
- [“Case-insensitive matching of usernames in the CLNTUSER and USERLIST attributes” on page 81](#)

Change to authorities needed for XMS .NET to query the BackoutThreshold and BackoutRequeueQName of a cluster queue

From IBM MQ 9.1.5, the XMS .NET client has been updated so that only inquire access is required to query the **BackoutThreshold** and **BackoutRequeueQName** of a cluster queue. For more information, see [Open options for cluster queues in Poison messages in XMS](#).

Change to default trace name for IBM MQ classes for Java and IBM MQ classes for JMS

From IBM MQ 9.1.5, the IBM MQ classes for Java, IBM MQ classes for JMS and IBM MQ resource adapter have been updated such that when threads are running using separate Java ClassLoaders, by default, each thread generates trace to its own ClassLoader specific trace file:

- The default trace name for the IBM MQ classes for Java and IBM MQ classes for JMS is of the form: `mqjava_%PID%.cl%u.trc`.
- If you are using the relocatable JAR file `com.ibm.mq.mqallclient.jar`, the default trace name is of the form: `mqjavaclient_%PID%.cl%u.trc`.

where `%PID%` is the process identifier of the application that is being traced, and `%u` is a unique number to differentiate files between threads running trace under different Java classloaders.

For more information, see the subtopics of [Tracing IBM MQ classes for Java applications](#) and [Tracing IBM MQ classes for JMS applications](#).

Changes to the tracing of the AMQR and MQXR services

From IBM MQ 9.1.5 you can trace selected areas of interest, as well as the entire service, for both the AMQR and MQXR services.

For more information, see [Tracing the Advanced Message Queuing Protocol \(AMQP\) Service](#) and [Tracing the telemetry \(MQXR\) service](#).

Update to IBM MQ AMQP service



From IBM MQ 9.1.5, the IBM MQ AMQP service has been updated such that when the **SSLPEER** attribute is set and the **SSLCAUTH** attribute is set to REQUIRED, the "distinguished name" of the client certificate is checked with the **SSLPEER** attribute.

For more information, see [Creating and using AMQP channels](#).

Change to inquiries used by dmpmqcfc command



From IBM MQ 9.1.5, the inquiries used by the **dmpmqcfc** command inquire only QSGDISP(QMGR) definitions by default. You can inquire additional definitions by using the environment variable **AMQ_DMPMQCFG_QSGDISP_DEFAULT**. For more information, see [dmpmqcfc](#).

New RecoveryTimedOut transfer state for MFT agents



From IBM MQ 9.1.5, if a transfer recovery timeout is set for a transfer, the source agent moves the transfer into the RecoveryTimedOut state if transfer recovery times out. After the transfer has been resynchronized, the destination agent removes any part files that were created during the transfer and sends a completion message to the source agent.

For more information, see [Transfer recovery timeout concepts](#) and [MFT agent transfer states](#).

Change to how MFT resource monitors initiate polling



Before IBM MQ 9.1.5, if a resource monitor performs a poll that takes longer than the polling interval, the next poll starts as soon as the current one finishes with no gap in between. If the items that are found during the first poll are still there when the second poll takes place, this could cause performance issues as it could have an effect on how quickly resource monitors submit work to an agent.

From IBM MQ 9.1.5, the way in which resource monitors initiate polling has been changed so that the resource monitor now uses the ScheduledExecutorService and initiates the next poll only after the completion of the previous poll plus the configured poll interval time. This means that there will now always be a gap in between the poll intervals, rather than having another poll starting straight away after the previous poll if the poll time was longer than the poll interval.

For more information, see [MFT resource monitoring concepts](#).

Change to exception messages for failed managed transfer requests that require a new directory to be created on an SFTP file server

Managed File Transfer protocol bridge agents use the third-party JSch library to communicate with file servers using the SFTP protocol. If the protocol bridge agent attempts to transfer a file into a directory that does not exist on a file server and JSch is unable to perform the requested SFTP operation to create that directory, because the user that the protocol bridge agent logs into the file server with does not have permission to do so, JSch throws an exception back to the protocol bridge agent. The protocol bridge agent then marks the managed transfer as "Failed" and generates a supplementary message.

From IBM MQ 9.1.5, if the JSch exception does not contain any more information about the failure, the protocol bridge agent generates the following supplementary message:

```
BFGTR0072E: The transfer failed to complete due to the exception:  
BFGBR0209E: Bridge agent was unable to create directory directory name
```


For more information, see [Transferring files to or from protocol bridge agents](#).

Removal of the `ibm-mq-total-browse-size` response header from the messaging REST API

From IBM MQ 9.1.5, the response header `ibm-mq-total-browse-size` is no longer returned when you browse a list of messages on a queue using the messaging REST API. That is, when you send a GET request to the `/messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist` URL, the response no longer contains the `ibm-mq-total-browse-size` header.

For more information about GET `/messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist`, see [GET `/messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist`](#).

Migrating uniform clusters to IBM MQ 9.1.5

You need to be aware of certain restrictions when you migrate a uniform cluster from IBM MQ 9.1.4 to IBM MQ 9.1.5.

See [Limitations and considerations for uniform clusters](#) for details.

Change to version of Eclipse that IBM MQ Explorer is built on

From IBM MQ 9.1.5, IBM MQ Explorer is built on Eclipse 4.11 instead of Eclipse 4.8. This change to the Eclipse level applies to Continuous Delivery only. For Long Term Support, the Eclipse level remains at Eclipse 4.7.3.

Case-insensitive matching of usernames in the `CLNTUSER` and `USERLIST` attributes

Some LDAP schemas are implemented such that the "short username" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema). Before IBM MQ 9.1.4, the behavior of the queue manager on Linux and Unix platforms was to fold short usernames from their original case returned by LDAP, to be all lowercase. In V9.1.4, in situations where LDAP is the definitive source of user information, APAR IT29065 changed this behavior and kept short usernames in their original case as returned by LDAP. However, this change affected the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). This is described in more detail in ["What's changed in IBM MQ 9.1.4"](#) on page 96.

In V9.1.5, APAR IT31578 allows usernames in CHLAUTH rules to be matched case-insensitively.

To enable the new behavior, add `ChlauthIgnoreUserCase=Y` in the **Channels** stanza of the `qm.ini` file. See usage details for `ChlauthIgnoreUserCase` in [Channels stanza of the `qm.ini` file](#). If there is no **Channels** stanza, you will have to create one.

To enable the new behavior on the MQ Appliance, issue the following command, with your real queue manager name in the place of *YOUR-QMNAME*:

```
setmqini -m YOUR-QMNAME -s Channels -k ChlauthIgnoreUserCase -v Y
```

Related concepts

V 9.1.5 [What's new in IBM MQ 9.1.5](#)

IBM MQ 9.1.5 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.5 [New, changed and removed messages in IBM MQ 9.1.5](#)

A summary of the new messages that have been added for IBM MQ 9.1.5, with links to further information. Any messages that have been changed or removed are also listed.

["What's new and changed in IBM MQ 9.1.0"](#) on page 22

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the

features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.


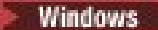









Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New, changed and removed messages in IBM MQ 9.1.5

A summary of the new messages that have been added for IBM MQ 9.1.5, with links to further information. Any messages that have been changed or removed are also listed.

-  [“New, changed and removed AMQ messages” on page 82](#)
- [“New, changed and removed Managed File Transfer messages” on page 84](#)
-    [“New, changed and removed MQ Telemetry messages” on page 85](#)
- [“New, changed and removed REST API messages” on page 85](#)
- [“New, changed and removed IBM MQ Console messages” on page 85](#)
-   [“New, changed and removed IBM MQ Bridge to blockchain messages” on page 85](#)
-  [“New, changed and removed IBM MQ Bridge to Salesforce messages” on page 86](#)
-    [“New, changed and removed IBM MQ Internet Pass-Thru messages” on page 86](#)
- [“New, changed and removed MQJMS messages” on page 86](#)
- [“New, changed and removed JSON messages” on page 86](#)
-  [“New, changed and removed z/OS messages” on page 86](#)

New, changed and removed AMQ messages



The following AMQ messages are new for IBM MQ 9.1.5:

AMQ3xxx: Utilities and tools

AMQ3679I to AMQ3685E

AMQ3689E

AMQ3692I

AMQ3697I

AMQ3701I to AMQ3703E

AMQ3708I to AMQ3709E

AMQ5xxx: Installable services

AMQ5102W

AMQ5612I IBM MQ Appliance

AMQ5660I IBM MQ Appliance

AMQ5779I

AMQ6xxx: Common services

AMQ6007S

AMQ6322I UNIX and Linux

AMQ6323E IBM i

AMQ6327E

AMQ8xxx: Administration

AMQ8042I (HP NSS)

AMQ8932

AMQ8933

AMQ9xxx: Remote

AMQ9226W (HP NSS)

AMQ9885W

The following AMQ messages are changed for IBM MQ 9.1.5:

AMQ3xxx: Utilities and tools

AMQ3706E (Message reworded)

AMQ3711E (Explanation and Response added)

AMQ3717E (Message reworded)

AMQ3719E (Explanation and Response added)

AMQ3727E (Explanation and Response added)

AMQ3741I (typo fixed)

AMQ3750E (Explanation and Response added)

AMQ3752E (Explanation and Response added)

AMQ3758I ("estimated time to completion" changed to "estimated time of completion")

AMQ3760W (Explanation and Response added)

AMQ3766E (Explanation and Response added)

AMQ3767I (description of each available command switch added)

AMQ3774E (Explanation and Response added)

AMQ3775E (Explanation and Response added)

AMQ3780E (Explanation and Response added)

AMQ3781E (Explanation and Response added)

AMQ3782E (Explanation and Response added)

AMQ3791E (Explanation and Response added)

AMQ3795E (Explanation and Response added)

AMQ3812E (Explanation and Response added)

AMQ3828E (Explanation and Response added)

AMQ3830E (Explanation and Response added)

AMQ3841I ("estimated time to completion" changed to "estimated time of completion")

AMQ3865E (Explanation and Response added)

AMQ3866E (Explanation and Response added)

AMQ3867E (Explanation and Response added)
AMQ3877E (Explanation and Response added)
AMQ3878E (Explanation and Response added)
AMQ3879E (Explanation and Response added)
AMQ3880E (Explanation and Response added)
AMQ3891E (Explanation and Response added)
AMQ3892E (Explanation and Response added)
AMQ3893E (Explanation and Response added)
AMQ3894I (Usage rewritten)

AMQ5xxx: Installable services

AMQ5610I AIX and Windows (Usage updated)

AMQ6xxx: Common Services

AMQ6621I (dspmqtrc command added)

AMQ7xxx: IBM MQ Product

AMQ7196I (Explanation added. Message and Response updated)

AMQ8xxx: Administration

AMQ8599E (command name is no longer hard coded in the Message and Explanation)

AMQ9xxx: Remote

AMQ9017E (Explanation extended)
AMQ9637E (Message, Explanation and Response rewritten)
AMQ9645E (Message, Explanation and Response rewritten)
AMQ9849E (Message, Explanation and Response rewritten)
AMQ9887W (typo fixed)

The following AMQ messages are removed for IBM MQ 9.1.5:

AMQ3xxx: Utilities and tools

AMQ3944E

AMQ7xxx: IBM MQ Product

AMQ7153E

New, changed and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.1.5:

BFGBR0001 - BFGBR9999

BFGBR0209E

BFGIO0001 - BFGIO9999

BFGIO0411E

The following Managed File Transfer messages are changed to have "Information Center" references repointed to "IBM Documentation" for IBM MQ 9.1.5:

BFGCL0001 - BFGCL9999

BFGCL0126I

BFGCL0128I

BFGCL0424I

BFGCL0425I

BFGCM0001 - BFGCM9999

BFGCM0239I

BFGCM0241I

BFGCM0242I

BFGCM0243I

BFGCR0001 - BFGCR9999

BFGCR0003E

BFGCR0005E

BFGCR0012E

BFGCR0013E

BFGCR0014E

BFGDM0001 - BFGDM9999

BFGDM0107W

BFGSS0001 - BFGSS9999

BFGSS0027E

BFGSS0028E

BFGSS0029E

BFGSS0001 - BFGSS9999

BFGUB0054E

BFGUB0055E

BFGUB0056E

BFGUB0057E

There are no removed Managed File Transfer messages for IBM MQ 9.1.5.

New, changed and removed MQ Telemetry messages



There are no new, changed or removed [MQ Telemetry messages](#) for IBM MQ 9.1.5.

New, changed and removed REST API messages

The following REST API messages are new for IBM MQ 9.1.5:

MQWB03xx: REST API messages MQWB0300 to 3999

MQWB0316E

The following REST API messages are changed for IBM MQ 9.1.5:

MQWB00xx: REST API messages MQWB0000 to 0999

MQWB0009E (Response shortened)

MQWB01xx: REST API messages MQWB0100 to 1999

MQWB0103E (extra item added to the "not authorized" list)

MQWB03xx: REST API messages MQWB0300 to 3999

MQWB0300E (Explanation updated)

MQWB0303E ("publishing" added to Message and Explanation)

MQWB11xx: REST API messages MQWB1100 to 1199

MQWB1105E (typo fixed)

There are no removed REST API messages for IBM MQ 9.1.5.

New, changed and removed IBM MQ Console messages

There are no new, changed or removed IBM MQ Console messages for IBM MQ 9.1.5.

New, changed and removed IBM MQ Bridge to blockchain messages



There are no new, changed or removed IBM MQ Bridge to blockchain messages for IBM MQ 9.1.5.

New, changed and removed IBM MQ Bridge to Salesforce messages

Linux

There are no new, changed or removed IBM MQ Bridge to Salesforce messages for IBM MQ 9.1.5.

New, changed and removed IBM MQ Internet Pass-Thru messages

The following IBM MQ Internet Pass-Thru messages are new for IBM MQ 9.1.5:

MQCxxxxx: MQIPT messages

MQCPE101 to MQCPE109

MQCPI145 to MQCPI151

MQCPW010 to MQCPW012

The following IBM MQ Internet Pass-Thru messages are changed for IBM MQ 9.1.5:

MQCxxxxx: MQIPT messages

MQCPI102 (new parameter added)

MQCPI121 to MQCPI125 (updated description of `mqiptPW` usage)

New, changed and removed MQJMS messages

There are no new, changed or removed MQJMS messages for IBM MQ 9.1.5.

New, changed and removed JSON messages

There are no new, changed or removed JSON format diagnostic messages for IBM MQ 9.1.5.

New, changed and removed z/OS messages

z/OS

There are no new IBM MQ for z/OS CSQ messages for IBM MQ 9.1.5.

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.1.5:

Data manager messages (CSQI...)

CSQI065I (table format fixed, and "Page class" information improved)

Recovery manager messages (CSQR...)

CSQR031I (Explanation extended)

Distributed queuing messages (CSQX...)

CSQX058E (Action and Response extended)

CSQX635E (Message and Explanation updated)

The following IBM MQ for z/OS CSQ messages are removed for IBM MQ 9.1.5:

Distributed queuing messages (CSQX...)

CSQX967I

CSQX968I

Related concepts

V 9.1.5

[What's new in IBM MQ 9.1.5](#)

IBM MQ 9.1.5 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.5

[What's changed in IBM MQ 9.1.5](#)

Changes to functions and resources in IBM MQ 9.1.5 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.4 What's new and changed in IBM MQ 9.1.4

IBM MQ 9.1.4, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related concepts

V 9.1.5 What's new and changed in IBM MQ 9.1.5

IBM MQ 9.1.5, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.3 What's new and changed in IBM MQ 9.1.3

IBM MQ 9.1.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.2 What's new and changed in IBM MQ 9.1.2

IBM MQ 9.1.2 is the follow-on Continuous Delivery (CD) release to IBM MQ 9.1.1. IBM MQ 9.1.2 delivers a number of new enhancements on AIX, Linux, Windows, and z/OS.

V 9.1.1 What's new and changed in IBM MQ 9.1.1

IBM MQ 9.1.1, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.4 What's new in IBM MQ 9.1.4

IBM MQ 9.1.4 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

The individual features provided by a CD release are stand-alone functions but may increase in capability in subsequent CD releases, enhancing earlier CD features and forming a suite of related capabilities.

New IBM MQ for Multiplatforms features



Windows Linux AIX

The following new features are available with both IBM MQ base product entitlement, and with IBM MQ Advanced entitlement:

- [“Support for Transport Layer Security \(TLS\) 1.3” on page 89](#)
- [“TLS Handshake Transcript” on page 90](#)
- [“IBM MQ Internet Pass-Thru” on page 90](#)
- [“Enhancements to the administrative REST API” on page 90](#)
- [“Host header validation for the IBM MQ Console and REST API” on page 91](#)
- [“Automatic configuration of uniform clusters” on page 91](#)
- [“Simplified setup for uniform clusters” on page 91](#)
- [“Ability to balance .NET and XMS .NET applications across queue managers” on page 91](#)
- [“IBM MQ classes for .NET Standard and IBM MQ classes for XMS .NET Standard available from the NuGet repository” on page 91](#)

MQ Adv.

The following new features are available only with IBM MQ Advanced entitlement:

- [“New administrative REST API for submitting a request to create and delete MFT resource monitors” on page 92](#)
- [“New property for specifying the permission of the MFT log file” on page 92](#)
- [“Support for the MQWebUser role in the MFT REST API” on page 92](#)
- [Highly available MFT agents](#)
- [“Identification of installs of High Availability Replica” on page 93](#)
-  [“New support for the IBM MQ Bridge to blockchain” on page 93](#)
-  [“Use of Aspera gateway streaming for IBM MQ messages” on page 93](#)
- [“OpenShift support for the IBM MQ Advanced certified container image” on page 93](#)

New IBM MQ for z/OS features



The following new features are available both with IBM MQ for z/OS base product entitlement, and with IBM MQ Advanced for z/OS Value Unit Edition entitlement:


- [“Support for data set encryption” on page 94](#)
- [Enhancements to the administrative REST API](#)
- [Host header validation for the IBM MQ Console and REST API](#)




The following new features are available only with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [Enhancements to the administrative REST API for creating and deleting MFT resource monitors](#)
- [Support for the MQWebUser role in the MFT REST API](#)
- [Highly available MFT agents](#)

Related concepts

 [What's changed in IBM MQ 9.1.4](#)

Changes to functions and resources in IBM MQ 9.1.4 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

 [New, changed and removed messages in IBM MQ 9.1.4](#)

A summary of the new messages that have been added for IBM MQ 9.1.4, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

Related information

System Requirements for IBM MQ

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New IBM MQ 9.1.4 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

- [“Support for Transport Layer Security \(TLS\) 1.3” on page 89](#)
- [“TLS Handshake Transcript” on page 90](#)
- [“IBM MQ Internet Pass-Thru” on page 90](#)
- [“Enhancements to the administrative REST API” on page 90](#)
- [“Host header validation for the IBM MQ Console and REST API” on page 91](#)
- [“Automatic configuration of uniform clusters” on page 91](#)
- [“Simplified setup for uniform clusters” on page 91](#)
- [“Ability to balance .NET and XMS .NET applications across queue managers” on page 91](#)
- [“IBM MQ classes for .NET Standard and IBM MQ classes for XMS .NET Standard available from the NuGet repository” on page 91](#)

Support for Transport Layer Security (TLS) 1.3

IBM MQ 9.1.4 supports the new TLS 1.3 security protocol on AIX, Linux and Windows. This functionality is provided in:

- The server 'C' bindings
- The MQI client

The new CipherSpecs for TLS 1.3 that IBM MQ 9.1.4 provides are described in [Enabling CipherSpecs](#). (For a list of these CipherSpecs, see the TLS 1.3 CipherSpecs section in [Table 1.](#)) All the new CipherSpecs work both with RSA and Elliptic Curve certificates.

IBM MQ 9.1.4 also provides an expanded set of alias CipherSpecs, adding to the existing ANY_TLS12 (available since IBM MQ 9.1.1). These alias CipherSpecs include ANY_TLS12_OR_HIGHER, and ANY_TLS13_OR_HIGHER among others, and are provided for ease of configuration and future migration. They are also described in [Enabling CipherSpecs](#). (For a list of these CipherSpecs, see the Alias CipherSpecs section in [Table 1.](#))

Note: When using earlier CipherSpecs on a queue manager that has TLS 1.3 enabled through a server `qm.ini` property or a client `mqclient.ini` property, which is the default setting on a new queue manager, there are some changes that you should be aware of.

In accordance with the TLS 1.3 specification, many earlier CipherSpecs are disabled and *cannot be enabled* by use of the existing configuration options. These include:

- All SSLv3 CipherSpecs
- All RC2 or RC4 CipherSpecs
- All CipherSpecs with an encryption key size of less than 112 bits

In IBM MQ 9.1.4, which is a Continuous Delivery release, TLS 1.3 is not yet available when using:

- IBM MQ classes for Java
- IBM MQ classes for JMS
- .NET
- It is also not yet available on IBM i or IBM Z.

To restore previous behavior, TLS 1.3 can be disabled as described in [Using TLS 1.3 in IBM MQ](#).

TLS Handshake Transcript

IBM MQ 9.1.4 adds support for the TLS handshake transcript available from the GSKit cryptographic provider. This functionality is available on Distributed platforms that utilize GSKit both in the queue manager and client. To view the TLS handshake transcript, IBM MQ and GSKit trace must be enabled and a TLS handshake must fail. The transcript will then be collected and written out as part of the amqrmppa or client application trace file.

IBM MQ Internet Pass-Thru

IBM MQ Internet Pass-Thru (MQIPT) is a utility that can be used to implement messaging solutions between remote sites across the internet. In IBM MQ 9.1.4, MQIPT is a fully-supported optional component of IBM MQ that you can download from [IBM Fix Central for IBM MQ](#). MQIPT has previously been available as support pack MS81.

The following changes have been made to MQIPT since version 2.1 of the support pack:

- The supplied Java runtime environment (JRE) has been upgraded from Java 7 to Java 8, to match the JRE version supplied with IBM MQ.
- The SSL 3.0, TLS 1.0, and TLS 1.1 protocols are disabled by default. The only cryptographic protocol that is enabled by default is TLS 1.2. To enable protocols that are disabled, follow the procedure in [Enabling deprecated protocols and CipherSuites](#).
- Support for IBM Network Dispatcher has been removed.
- The IPT Administration Client is deprecated. Current versions of the IPT Administration Client might not work with future versions of MQIPT. To configure and administer MQIPT, edit the `mqipt.conf` configuration file and use the `mqiptAdmin` script, as described in [Administering MQIPT by using the command line](#).
- All sample files supplied with MQIPT are now located under a new directory called `samples` in the MQIPT installation directory.
- The **CommandPort** and **RemoteShutdown** properties have been removed from the sample configuration file `mqiptSample.conf` to improve security. This means that when using the sample configuration, MQIPT will not listen for commands issued by the `mqiptAdmin` script or the IPT Administration Client. To allow MQIPT to be administered using the `mqiptAdmin` script or the IPT Administration Client, change the configuration file to specify a value for the **CommandPort** property. Review the security considerations in [Other security considerations](#) before enabling the MQIPT command port or allowing remote shutdown.

See [IBM MQ Internet Pass-Thru](#) for more information.

Enhancements to the administrative REST API

From IBM MQ 9.1.4, the following enhancements are available with the JSON format MQSC REST API:

- The following commands are now supported:
 - `DISPLAY CONN(connectionID) TYPE (HANDLE)`
 - `DISPLAY CONN(connectionID) TYPE (*)`
 - `DISPLAY CONN(connectionID) TYPE (ALL)`
- Single quotation marks are automatically escaped. You no longer need to use an additional single quotation mark to specify a single quotation mark in an attribute value.
- In the **SET POLICY** command, the **SIGNER** and **RECIP** attributes are now list attributes. Instead of specifying a string value for these attributes, you now use a JSON array. This change enables you to specify multiple values for the **SIGNER** and **RECIP** within a single command.
- Enhanced MQSC syntax error checking is now available. When an MQSC syntax error is detected in the JSON input, instead of returning a 200 response and the MQSC error in the response body, a 400 response is returned with a new error message indicating where the syntax error occurred.

For more information, see [POST /admin/action/qmgr/{qmgrName}/mqsc](#) (JSON formatted command)

Host header validation for the IBM MQ Console and REST API

You can configure the mqweb server to restrict access to the IBM MQ Console and REST API such that only requests that are sent with a host header that matches a specified allowlist are processed. An error is returned if a host header value that is not on the allowlist is used.

For more information, see [Configuring host header validation for the IBM MQ Console and REST API](#).

Automatic configuration of uniform clusters

From IBM MQ 9.1.4, you have various options to help you configure uniform clusters. You can:

- Apply [automatic configuration from an MQSC script at startup](#).
- Apply [automatic configuration from an INI script at startup](#).
- Use additional `qm.ini` file stanzas to assist [automatic cluster configuration](#).
- Provide an input file to `runmqsc`; see [running MQSC commands from text files](#) for more details.

Simplified setup for uniform clusters

From IBM MQ 9.1.4 you can use a simplified form of cluster setup and configuration.

See [Creating a uniform cluster from IBM MQ 9.1.4](#) for further details.

Ability to balance .NET and XMS .NET applications across queue managers

IBM MQ 9.1.2 introduced a feature to improve the product's ability to balance C language application connections across multiple, different queue managers. IBM MQ 9.1.3 then extended this feature to include JMS applications.

From IBM MQ 9.1.4, IBM MQ .NET and XMS .NET managed applications are also able to automatically balance connections across clustered queue managers. Both the .NET Framework and .NET Standard libraries are supported.

For more information, see [Uniform clusters](#) and [Automatic application balancing](#).

IBM MQ classes for .NET Standard and IBM MQ classes for XMS .NET Standard available from the NuGet repository

From IBM MQ 9.1.4, the IBM MQ classes for .NET Standard and IBM MQ classes for XMS .NET Standard libraries are available for downloading from the NuGet repository, so that they can be easily consumed by .NET Developers.

The following two NuGet packages are available:

IBMMQDotnetClient: IBM MQ classes for .NET Standard

This package includes `amqmdnetstd.dll` only.

IBMXMSDotnetClient: IBM MQ classes for XMS .NET Standard

This package includes both `amqmdnetstd.dll` and `amqmxmstd.dll`.

For more information, see [Downloading IBM MQ classes for .NET Standard from the NuGet repository](#) and [Downloading IBM MQ classes for XMS .NET Standard from the NuGet repository](#).


Related concepts

 [New IBM MQ 9.1.4 features for IBM MQ Advanced for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 New IBM MQ 9.1.4 features for z/OS



On the z/OS platform, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

 New IBM MQ 9.1.4 features for IBM MQ Advanced for z/OS Value Unit Edition

IBM MQ 9.1.4 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 ***New IBM MQ 9.1.4 features for IBM MQ Advanced for Multiplatforms***

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

- [“New administrative REST API for submitting a request to create and delete MFT resource monitors” on page 92](#)
- [“New property for specifying the permission of the MFT log file” on page 92](#)
- [“Support for the MQWebUser role in the MFT REST API” on page 92](#)
- [“Highly available MFT agents” on page 93](#)
- [“Identification of installs of High Availability Replica” on page 93](#)
-  [“New support for the IBM MQ Bridge to blockchain” on page 93](#)
-  [“Use of Aspera gateway streaming for IBM MQ messages” on page 93](#)
- [“OpenShift support for the IBM MQ Advanced certified container image” on page 93](#)
- [“Support for PKCS #11 cryptographic hardware in MQIPT” on page 94](#)

New administrative REST API for submitting a request to create and delete MFT resource monitors

From IBM MQ 9.1.4, the following new REST services are added for invoking administrative functions for Managed File Transfer:

- A [POST](#) call to create a new resource monitor.
- A [DELETE](#) call to delete an existing resource monitor, or delete the history of an existing resource monitor.

New property for specifying the permission of the MFT log file

The MFT Logger enables you to log data about the use of Managed File Transfer in an offline store for additional review or auditing.

IBM MQ 9.1.4 introduces a new property of `wmqfte.file.logger.filePermissions` in the `logger.properties` file which allows you to enable read permissions on the logger file, making it easier for additional sources to read these logs and consume the data for analysis.

For more information, see [the MFT logger.properties file](#).

Support for the MQWebUser role in the MFT REST API

From IBM MQ 9.1.4 you can use the MQWebUser role to authenticate:

POST operations

For more information, see [POST](#) for monitors and [POST](#) for transfers.

GET operations

For more information, see [GET](#) for agents, [GET](#) for transfers, and [GET](#) for monitor status.

Highly available MFT agents

From IBM MQ 9.1.4, you can set up Managed File Transfer standard and bridge agents to be highly available.

You can configure multiple instances of the same MFT agent on two or more servers in active and standby mode. If the active instance of the agent fails at any time, even when transfers are not in progress, another instance of the agent automatically starts up and enables file transfer to continue. This occurs, even in cases where one of the agents fails due to network issues, hardware issues, or any other reason that causes the agent to stop.

For more information, see [Highly available agents in IBM MQ Managed File Transfer](#).

Identification of installs of High Availability Replica

From IBM MQ 9.1.4, it is now possible, when installing and configuring IBM MQ Advanced for RDQM, to nominate individual installs as either IBM MQ Advanced or IBM MQ Advanced High Availability Replica. This is then reported with IBM License Management Tool (ILMT) to allow for correct license identification. For more information, see [setmqinst \(set IBM MQ installation\)](#).

New support for the IBM MQ Bridge to blockchain

Linux

From IBM MQ 9.1.4, the IBM MQ Bridge to blockchain is updated to add support for Hyperledger Fabric for interaction between IBM MQ and the blockchain. This support replaces previous APIs that were used for connectivity.

For more information, see [Configuring IBM MQ for use with blockchain](#)

Use of Aspera gateway streaming for IBM MQ messages

Linux

CD

From IBM MQ 9.1.4, you can deploy an IBM Aspera fasp.io Gateway on Linux for x86-64, then configure queue managers so that IBM MQ system, application, and Managed File Transfer messages pass through the Aspera gateway to reach a destination using the Aspera FASP protocol in place of TCP/IP. For some use cases, this allows messages to move between destinations more rapidly than otherwise would be the case.

An Aspera gateway needs to be set up, under Linux for x86-64, for use by sending and receiving queue managers. Both these queue managers must be IBM MQ Advanced or IBM MQ Appliance queue managers. The gateway does not need to run on the same server as the queue manager, or on the IBM MQ Appliance. For more information, see [Defining an Aspera gateway connection on Linux](#).

Note that use of the Aspera gateway is limited to IBM MQ messages unless the gateway is separately entitled.

OpenShift support for the IBM MQ Advanced certified container image

From IBM MQ 9.1.4, IBM MQ Advanced containers support OpenShift directly without requiring IBM Cloud Private as a prerequisite. For more information, see [Deploying an IBM MQ Advanced certified container on OpenShift](#).


Support for PKCS #11 cryptographic hardware in MQIPT

From IBM MQ 9.1.4, IBM MQ Internet Pass-Thru (MQIPT) can access digital certificates that are stored in cryptographic hardware that supports the PKCS #11 interface. See [Using PKCS #11 cryptographic hardware](#) for more information.


Related concepts

 [New IBM MQ 9.1.4 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.4 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.4 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.4 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 [New IBM MQ 9.1.4 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

- [“Support for data set encryption” on page 94](#)
- [“Enhancements to the administrative REST API” on page 94](#)
- [“Host header validation for the IBM MQ Console and REST API” on page 95](#)

Support for data set encryption

From IBM MQ 9.1.4, IBM MQ for z/OS introduces support for the use of z/OS data set encryption, for active log data sets, and page sets.

For more information, see [Confidentiality for data at rest on IBM MQ for z/OS with data set encryption](#).

Enhancements to the administrative REST API

From IBM MQ 9.1.4, the following enhancements are available with the JSON format MQSC REST API:

- The following commands are now supported:
 - DISPLAY CONN(*connectionID*) TYPE (HANDLE)
 - DISPLAY CONN(*connectionID*) TYPE (*)
 - DISPLAY CONN(*connectionID*) TYPE (ALL)
- Single quotation marks are automatically escaped. You no longer need to use an additional single quotation mark to specify a single quotation mark in an attribute value.
- In the **SET POLICY** command, the **SIGNER** and **RECIP** attributes are now list attributes. Instead of specifying a string value for these attributes, you now use a JSON array. This change enables you to specify multiple values for the **SIGNER** and **RECIP** within a single command.
- Enhanced MQSC syntax error checking is now available. When an MQSC syntax error is detected in the JSON input, instead of returning a 200 response and the MQSC error in the response body, a 400 response is returned with a new error message indicating where the syntax error occurred.

For more information, see [POST /admin/action/qmgr/{qmgrName}/mqsc \(JSON formatted command\)](#)

Host header validation for the IBM MQ Console and REST API

You can configure the mqweb server to restrict access to the IBM MQ Console and REST API such that only requests that are sent with a host header that matches a specified allowlist are processed. An error is returned if a host header value that is not on the allowlist is used.

For more information, see [Configuring host header validation for the IBM MQ Console and REST API](#).


Related concepts

 [New IBM MQ 9.1.4 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.4 features for IBM MQ Advanced for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [New IBM MQ 9.1.4 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.4 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 [***New IBM MQ 9.1.4 features for IBM MQ Advanced for z/OS Value Unit Edition***](#)

IBM MQ 9.1.4 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

- [New administrative REST API for submitting a request to create and delete MFT resource monitors](#)
- [Support for the MQWebUser1 role in the MFT REST API](#)
- [Highly available MFT agents](#)

New administrative REST API for submitting a request to create and delete MFT resource monitors

From IBM MQ 9.1.4, the following new REST services are added for invoking administrative functions for Managed File Transfer:

- A [POST](#) call to create a new resource monitor.
- A [DELETE](#) call to delete an existing resource monitor, or delete the history of an existing resource monitor.

Support for the MQWebUser1 role in the MFT REST API

From IBM MQ 9.1.4 you can use the MQWebUser1 role to authenticate:

POST operations

For more information, see [POST](#) for monitors and [POST](#) for transfers.

GET operations

For more information, see [GET](#) for agents, [GET](#) for transfers, and [GET](#) for monitor status.

Highly available MFT agents

From IBM MQ 9.1.4, you can set up Managed File Transfer standard and bridge agents to be highly available.

You can configure multiple instances of the same MFT agent on two or more servers in active and standby mode. If the active instance of the agent fails at any time, even when transfers are not in progress, another instance of the agent automatically starts up and enables file transfer to continue. This occurs,

even in cases where one of the agents fails due to network issues, hardware issues, or any other reason that causes the agent to stop.

For more information, see [Highly available agents in IBM MQ Managed File Transfer](#).

Related concepts

  [New IBM MQ 9.1.4 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

   [New IBM MQ 9.1.4 features for IBM MQ Advanced for Multiplatforms](#)






On AIX, Linux and Windows, IBM MQ 9.1.4 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

  [New IBM MQ 9.1.4 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.4 delivers a number of new features that are available with base and advanced entitlement.

What's changed in IBM MQ 9.1.4

Changes to functions and resources in IBM MQ 9.1.4 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

-   [“Changes to delivery mechanism for updates to stand-alone IBM MQ Explorer” on page 96](#)
- [“Change to version of Eclipse that IBM MQ Explorer is built on” on page 96](#)
- [Enhancements to the administrative REST API](#)
- [“Change to trigger monitor shutdown code” on page 97](#)
- [“Target shutdown time option for endmqm command” on page 97](#)
- [“TYPE response added to DISPLAY APSTATUS command” on page 97](#)
-  [“Name change for APPLNAMECHG value in DISPLAY APSTATUS command” on page 97](#)
-  [“Allow Advanced Message Security applications to use GSKit in non-FIPS mode” on page 97](#)
-  [“Changes to the sample security exit CSQ4BCX3” on page 98](#)
- [“Enabling dynamic tracing of LDAP client library code shipped with IBM MQ” on page 98](#)
- [“Make usernames case-sensitive in the CLNTUSER and USERLIST attributes” on page 98](#)

Changes to delivery mechanism for updates to stand-alone IBM MQ Explorer

From IBM MQ 9.1.4, the stand-alone IBM MQ Explorer, previously known as SupportPac MS0T, is available as a stand-alone application from [Fix Central](#). SupportPac MS0T is no longer available from the IBM download site. For information on how to install the stand-alone IBM MQ Explorer, see [Installing and uninstalling IBM MQ Explorer as a stand-alone application on Linux and Windows](#).

Change to version of Eclipse that IBM MQ Explorer is built on

From IBM MQ 9.1.4, IBM MQ Explorer is built on Eclipse 4.8 instead of Eclipse 4.7.3. This change to the Eclipse level applies to Continuous Delivery only. For Long Term Support, the Eclipse level remains at Eclipse 4.7.3.

Enhancements to the administrative REST API

From IBM MQ 9.1.4, the following enhancements are available with the JSON format MQSC REST API:

- The following commands are now supported:
 - DISPLAY CONN(*connectionID*) TYPE (HANDLE)
 - DISPLAY CONN(*connectionID*) TYPE (*)
 - DISPLAY CONN(*connectionID*) TYPE (ALL)
- Single quotation marks are automatically escaped. You no longer need to use an additional single quotation mark to specify a single quotation mark in an attribute value.
- In the **SET POLICY** command, the **SIGNER** and **RECIP** attributes are now list attributes. Instead of specifying a string value for these attributes, you now use a JSON array. This change enables you to specify multiple values for the **SIGNER** and **RECIP** within a single command.
- Enhanced MQSC syntax error checking is now available. When an MQSC syntax error is detected in the JSON input, instead of returning a 200 response and the MQSC error in the response body, a 400 response is returned with a new error message indicating where the syntax error occurred.

For more information, see [POST /admin/action/qmgr/{qmgrName}/mqsc \(JSON formatted command\)](#)

Change to trigger monitor shutdown code

From IBM MQ 9.1.4, a normal shutdown when the queue manager is ending, of either a trigger monitor or client trigger monitor, returns a code of 0 rather than 10.

For more information, see [runmqtm](#) and [runmqtrm](#).

Target shutdown time option for endmqm command

From IBM MQ 9.1.4, you have the option to end the queue manager within a target time of a number of seconds that you specify.

For more information, see [Stopping a queue manager](#) and [endmqm](#).

TYPE response added to DISPLAY APSTATUS command

From IBM MQ 9.1.4, the MQSC command **DISPLAY APSTATUS** displays the **TYPE** of response, which is one of application (APPL), local (LOCAL), or queue manager (QMGR). For more information, see [Monitoring application balancing](#).

The equivalent PCF command Inquire Application Status (**MQCMD_INQUIRE_APPL_STATUS**) also displays the type of response. For more information, see [Inquire Application Status \(Response\)](#).

Name change for APPLNAMECHG value in DISPLAY APSTATUS command



From IBM MQ 9.1.4, the **APPLNAMECHG** value of the **IMMREASN** parameter of the **DISPLAY APSTATUS** command has been renamed **APPNAMECHG**.

Allow Advanced Message Security applications to use GSKit in non-FIPS mode



From IBM MQ 9.1.4, a check has been added to the IBM MQ library code that runs within the customer's application program. The check runs early in its initialization to read the value of the environment variable **AMQ_AMS_FIPS_OFF** and, if it is set to any value, then the GSKit code will be run in non-FIPS mode in that application.

Changes to the sample security exit CSQ4BCX3

z/OS

From IBM MQ 9.1.4, the sample security exit [CSQ4BCX3](#) has been updated to support both the following methods of checking a user ID and password:

- Using the **RemoteUserIdentifier** and **RemotePassword** pair from the MQCD structure
- Using the **CSPUserIdPtr** and **CSPPasswordPtr** pair from the MQCSP structure.

For more information, see [IBM MQ for z/OS server connection channel](#).

Enabling dynamic tracing of LDAP client library code shipped with IBM MQ

Before IBM MQ 9.1.4, it was not possible to switch the LDAP client trace on and off without also stopping or starting the queue manager.

From IBM MQ 9.1.4, you can switch LDAP client trace on with the **strmqtrc** command and off with the **endmqtrc** command without needing to stop or start the queue manager. To enable this behavior, it is also necessary to set an environment variable **AMQ_LDAP_TRACE** to a non-null value. For more information, see [Enabling dynamic tracing of LDAP client library code](#).

Make usernames case-sensitive in the CLNTUSER and USERLIST attributes

Some LDAP schemas are implemented such that the "short username" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema).

Before this release, the behavior of the queue manager on Linux and UNIX platforms was to fold short usernames from their original case returned by LDAP, to be all lowercase. However, if the LDAP field is case-sensitive, this behavior causes later interactions with the LDAP server to fail.

In this release, in situations where LDAP is the definitive source of user information, APAR IT29065 changes this behavior and keeps short usernames in their original case as returned by LDAP. However, this change affects the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). These will have been specified in all lowercase, which was required before the APAR fix. If the true short usernames coming from the LDAP repository are mixed case, or all uppercase, then the **CHLAUTH** rules will no longer match correctly.

Note: If your configuration is as follows, you need to alter some of your **CHLAUTH** rules, to correct the case of the usernames in the **CLNTUSER** and **USERLIST** attributes:

- The queue manager is running on a Linux or UNIX platform.
- The queue manager is using LDAP as the source of usernames. That is, you have configured the queue manager's **CONNAUTH** to use an **AUTHINFO** object with TYPE (IDPWLDP) and one of: AUTHORMD (SEARCHGRP) or AUTHORMD (SEARCHUSR)
- These usernames provided by LDAP are uppercase, or mixed case.
- The queue manager has **CHLAUTH** rules of TYPE (USERMAP), and you have provided usernames in lowercase in the **CLNTUSER** attribute (as was mandatory before V9.1.4).
- The queue manager has **CHLAUTH** rules of TYPE (BLOCKUSER), and you have provided usernames in lowercase in the **USERLIST** attribute (as was mandatory before V9.1.4).

In IBM MQ 9.1.5, APAR IT31578 allows usernames in **CHLAUTH** rules to be matched case-insensitively. See ["What's changed in IBM MQ 9.1.5"](#) on page 79.

Related concepts

V 9.1.4

[What's new in IBM MQ 9.1.4](#)

IBM MQ 9.1.4 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.4

[New, changed and removed messages in IBM MQ 9.1.4](#)

A summary of the new messages that have been added for IBM MQ 9.1.4, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.









Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New, changed and removed messages in IBM MQ 9.1.4

A summary of the new messages that have been added for IBM MQ 9.1.4, with links to further information. Any messages that have been changed or removed are also listed.

-  [“New, changed and removed AMQ messages” on page 99](#)
- [“New, changed and removed Managed File Transfer messages” on page 101](#)
-    [“New, changed and removed MQ Telemetry messages” on page 102](#)
- [“New, changed and removed REST API messages” on page 102](#)
- [“New, changed and removed IBM MQ Console messages” on page 102](#)
-   [“New, changed and removed IBM MQ Bridge to blockchain messages” on page 102](#)
-  [“New, changed and removed IBM MQ Bridge to Salesforce messages” on page 103](#)
- [“New, changed and removed MQJMS messages” on page 103](#)
- [“New, changed and removed JSON messages” on page 103](#)
-  [“New, changed and removed z/OS messages” on page 103](#)

New, changed and removed AMQ messages



The following AMQ messages are new for IBM MQ 9.1.4:

AMQ3xxx: Utilities and tools

AMQ3569I

AMQ3686E to AMQ3688I

AMQ3690I

AMQ3691I

AMQ3693E to AMQ3695E

AMQ3704E to AMQ3707E

AMQ5xxx: Installable services

AMQ5047I

AMQ5048I

AMQ5767I to AMQ5771E

AMQ5773W to AMQ5778E

AMQ6xxx: Common services

AMQ6328W

AMQ6599W

AMQ7xxx: IBM MQ product

AMQ7830E

AMQ8xxx: Administration

AMQ8277E

AMQ8399E

AMQ8939I to AMQ8942I

AMQ8953I

AMQ9xxx: Remote

AMQ9720W

AMQ9721S

AMQ9886E

AMQ9887W

The following AMQ messages are changed for IBM MQ 9.1.4:


AMQ3xxx: Utilities and tools

AMQ3764I (severity changed from "Error" to "Information")

AMQ3765I (severity changed from "Error" to "Information")

AMQ3814I (minor rewording)

AMQ3894I (three extra options added to the code blocks in Usage)

 **User interface messages (Windows and Linux systems)**

AMQ4547E (minor edit in Response)

AMQ5xxx: Installable services

AMQ5600I (three extra options added to the code block in Usage)

AMQ6xxx: Common Services

AMQ6174I (minor change in Description, Explanation and Response)

AMQ6637I (extra option added in Usage)

AMQ7xxx: IBM MQ product

AMQ7367I (minor changes in Description and Explanation)

AMQ8xxx: Administration

AMQ8084S (severity changed from "Information" to "Severe error")

AMQ8242S (explanation extended to cover TLS 1.3)

AMQ8326S (severity changed from "Information" to "Severe error")

AMQ8404E (severity changed from "Information" to "Error")

AMQ8413E (severity changed from "Information" to "Error")

AMQ8419S (severity changed from "Information" to "Severe error")

AMQ8421E (severity changed from "Information" to "Error")

AMQ8423S (severity changed from "Information" to "Severe error")
AMQ8424E (severity changed from "Information" to "Error")
AMQ8425E (severity changed from "Information" to "Error")
AMQ8429E (severity changed from "Information" to "Error")
AMQ8430E (severity changed from "Information" to "Error")
AMQ8432S (severity changed from "Information" to "Severe error")
AMQ8433S (severity changed from "Information" to "Severe error")
AMQ8434S (severity changed from "Information" to "Severe error")
AMQ8442S (severity changed from "Information" to "Severe error")
AMQ8449E (severity changed from "Information" to "Error")
AMQ8458S (severity changed from "Information" to "Severe error")
AMQ8486S (severity changed from "Information" to "Severe error")
AMQ8494S (severity changed from "Information" to "Severe error")
AMQ8499I (extra option added in Usage)
AMQ8549E (severity changed from "Information" to "Error")
AMQ8554E (severity changed from "Information" to "Error")
AMQ8555E (severity changed from "Information" to "Error")
AMQ8569E (severity changed from "Information" to "Error")
AMQ8586I (2 extra options added in Usage)
AMQ8698E (severity changed from "Information" to "Error")

AMQ9xxx: Remote

AMQ9441I (change in Explanation)
AMQ9616S (TLS 1.3 updates in Explanation)
AMQ9631S (update for the 'ANY' type CipherSpecs in response)
AMQ9635S (TLS 1.3 update in Response)
AMQ9641S (update for the 'ANY' type CipherSpecs in response)
AMQ9674S (TLS 1.3 update in Response)
AMQ9796W (typo fixed)

The following AMQ messages are removed for IBM MQ 9.1.4:

AMQ9xxx: Remote

AMQ9087E
AMQ9619S

New, changed and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.1.4:

BFGAG0001 - BFGAG9999

BFGAG0192I to BFGAG0201I

BFGCH0001 - BFGCH9999

BFGCH0128E

BFGCL0001 - BFGCL9999

BFGCL0787I to BFGCL0793I

BFGPR0001 - BFGPR9999

BFGPR0141I to BFGPR0143I

The following Managed File Transfer messages are changed for IBM MQ 9.1.4:

BFGAG0001 - BFGAG9999

BFGAG0124E (Response extended)

BFGAG0125W (link to product documentation updated in Response)

BFGBR0001 - BFGBR9999

BFGBR0023E (extended Description and Response)

BFGCH0001 - BFGCH9999

BFGCH0025E (typo fixed)

BFGCL0001 - BFGCL9999

BFGCL0181E (severity changed from "Information" to "Error")

There are no removed Managed File Transfer messages for IBM MQ 9.1.4.

New, changed and removed MQ Telemetry messages



There are no new, changed or removed [MQ Telemetry messages](#) for IBM MQ 9.1.4.

New, changed and removed REST API messages

The following REST API messages are new for IBM MQ 9.1.4:

MQWB01xx: REST API messages MQWB0100 to 0199

MQWB0119E to MQWB0121E

MQWB04xx: REST API messages MQWB0400 to 0499

MQWB0422E to MQWB0445E

MQWB09xx: REST API messages MQWB0900 to 0999

MQWB0902E

The following REST API messages are changed for IBM MQ 9.1.4:

MQWB00xx: REST API messages MQWB0000 to 0099

MQWB0013E (simplified Explanation)

MQWB01xx: REST API messages MQWB0100 to 0199

MQWB0103E (extra line "Not authorized to browse" added to the Description)

MQWB03xx: REST API messages MQWB0300 to 0399

MQWB0303E (Description extended to include browsing)

MQWB0309E (Description extended to include browsing)

MQWB09xx: REST API messages MQWB0900 to 0499

MQWB0901E (Description extended to mention UTF-8)

There are no removed REST API messages for IBM MQ 9.1.4.

New, changed and removed IBM MQ Console messages

The following IBM MQ Console messages are new for IBM MQ 9.1.4:

MQWB20xx IBM MQ Console messages

MQWB2023E

There are no changed or removed IBM MQ Console messages for IBM MQ 9.1.4.

New, changed and removed IBM MQ Bridge to blockchain messages



The following IBM MQ Bridge to blockchain messages are new for IBM MQ 9.1.4:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC031E

AMQBC059E to AMQBC064E

The following IBM MQ Bridge to blockchain messages are changed for IBM MQ 9.1.4:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC055E (rewritten Description)

AMQBC058E (rewritten Description)

The following IBM MQ Bridge to blockchain messages are removed for IBM MQ 9.1.4:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC053E

New, changed and removed IBM MQ Bridge to Salesforce messages

Linux

The following IBM MQ Bridge to Salesforce messages are new for IBM MQ 9.1.4:

IBM MQ Bridge to Salesforce messages AMQSF000 to 999

AMQSF048E

There following IBM MQ Bridge to Salesforce messages are changed for IBM MQ 9.1.4.

IBM MQ Bridge to Salesforce messages AMQSF000 to 999

AMQSF021E (minor edit in Description)

There are no removed IBM MQ Bridge to Salesforce messages for IBM MQ 9.1.4.

New, changed and removed MQJMS messages

There are no new, changed or removed MQJMS messages for IBM MQ 9.1.4.

New, changed and removed JSON messages

There are no new, changed or removed [JSON format diagnostic messages](#) for IBM MQ 9.1.4.

New, changed and removed z/OS messages

z/OS

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.1.4:

Recovery log manager messages (CSQJ...)

CSQJ165I

Db2 manager messages (CSQ5...)

CSQ5040E

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.1.4:

Coupling Facility manager messages (CSQE...)

CSQE280I (Encrypt (y/n) option added to the Explanation)

Data manager messages (CSQI...)

CSQI010I (Encrypt (y/n) option added to the Explanation)

Recovery log manager messages (CSQJ...)

CSQJ103E (updated link to documentation in System programmer response)

CSQJ104E (added a link to the "DFSMS/MVS Macro Instructions for Data Sets" manual)

CSQJ213E (updated link to documentation in System programmer response)

CSQJ228E (updated link to documentation in System programmer response)

CSQJ302E (updated link to documentation in System programmer response)

CSQJ370I (log status report extended)

Buffer manager messages (CSQP...)

[CSQP030E](#) (updated link to documentation in System programmer response)

[CSQP035E](#) (updated link to documentation in System programmer response)

Distributed queuing messages (CSQX...)

[CSQX042E - CSQX045E](#) (updated link to documentation in System programmer response)

[CSQX049E to CSQX051E](#) (updated link to documentation in System programmer response)

Initialization procedure and general services messages (CSQY...)

[CSQY291E](#) (updated link to documentation in System programmer response)

There are no removed IBM MQ for z/OS CSQ messages for IBM MQ 9.1.4.

Related concepts

[V 9.1.4](#) [What's new in IBM MQ 9.1.4](#)

IBM MQ 9.1.4 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.1.4](#) [What's changed in IBM MQ 9.1.4](#)

Changes to functions and resources in IBM MQ 9.1.4 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.3 What's new and changed in IBM MQ 9.1.3

IBM MQ 9.1.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related concepts

[V 9.1.5](#) [What's new and changed in IBM MQ 9.1.5](#)

IBM MQ 9.1.5, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.1.4](#) [What's new and changed in IBM MQ 9.1.4](#)

IBM MQ 9.1.4, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.1.2](#) [What's new and changed in IBM MQ 9.1.2](#)

IBM MQ 9.1.2 is the follow-on Continuous Delivery (CD) release to IBM MQ 9.1.1. IBM MQ 9.1.2 delivers a number of new enhancements on AIX, Linux, Windows, and z/OS.

[V 9.1.1](#) [What's new and changed in IBM MQ 9.1.1](#)

IBM MQ 9.1.1, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.3 What's new in IBM MQ 9.1.3

IBM MQ 9.1.3 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

The individual features provided by a CD release are stand-alone functions but may increase in capability in subsequent CD releases, enhancing earlier CD features and forming a suite of related capabilities.

New IBM MQ for Multiplatforms features

[Windows](#) [Linux](#) [AIX](#)

The following new features are available with both IBM MQ base product entitlement, and with IBM MQ Advanced entitlement:

- [“Enhancements to automatic application balancing” on page 106](#)
- [“Enhancements to the messaging REST API” on page 106](#)
- [“Enhancements to the administrative REST API” on page 106](#)
- [“Configurable ephemeral directory” on page 107](#)
- [“.NET Core application development on MacOS” on page 107](#)
- [“Support for converting between CCSIDs 37 and 500” on page 107](#)
- [“Embedding the IBM MQ Console in an IFrame” on page 107](#)

MQ Adv.

The following new features are available only with IBM MQ Advanced entitlement:

- [“New fteClearMonitorHistory command for clearing resource monitor history” on page 108](#)
- [“Managed File Transfer support for FTP server on existing IBM i systems” on page 108](#)
- [“Option to specify wait time for Managed File Transfer database logger shut down” on page 108](#)

New IBM MQ for z/OS features

z/OS

The following new features are available both with IBM MQ for z/OS base product entitlement, and with IBM MQ Advanced for z/OS and IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [“Runnable Service Archive support for IBM MQ” on page 109](#)
- [“Enhancements to the messaging REST API” on page 109](#)
- [“Enhancements to the administrative REST API” on page 109](#)
- [“Embedding the IBM MQ Console in an IFrame” on page 110](#)

z/OS

MQ Adv. VUE

The following new features are available only with IBM MQ Advanced for z/OS and IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- New **fteClearMonitorHistory** command for clearing resource monitor history
- Option to specify wait time for Managed File Transfer database logger shut down
- [“Advanced Message Security interception on server-to-server message channels” on page 110](#)

Related concepts

V 9.1.3

What's changed in IBM MQ 9.1.3

Changes to functions and resources in IBM MQ 9.1.3 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.3

New, changed and removed messages in IBM MQ 9.1.3

A summary of the new messages that have been added for IBM MQ 9.1.3, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

Related information

System Requirements for IBM MQ

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New IBM MQ 9.1.3 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

- [“Enhancements to automatic application balancing” on page 106](#)
- [“Enhancements to the messaging REST API” on page 106](#)
- [“Enhancements to the administrative REST API” on page 106](#)
- [“Configurable ephemeral directory” on page 107](#)
- [“.NET Core application development on MacOS” on page 107](#)
- [“Support for converting between CCSIDs 37 and 500” on page 107](#)
- [“Embedding the IBM MQ Console in an IFrame” on page 107](#)

Enhancements to automatic application balancing

IBM MQ 9.1.3 enhances the features of automatic application balancing introduced in IBM MQ 9.1.2 by:

- Introducing the concept of `application instances`, which is a group of related connections identified within the queue manager by a shared connection tag. See [connection tag](#) for more information.
- Enabling application balancing at this `application instance` level, now including JMS application instances.
- Adding the `DISPLAY APSTATUS MQSC` command, which allows you to display the status of one or more applications, and `application instances`, connected to a queue manager, cluster, or a uniform cluster.
- Adding the `Inquire Application Status` and `Inquire Application Status (Response) PCF` commands.
- Allowing you to [monitor](#) and [troubleshoot](#) application balancing.
- Allowing you to automatically balance applications which use [IBM MQ Classes for JMS](#).

Enhancements to the messaging REST API

IBM MQ 9.1.3 introduces the ability to browse messages on a queue by using the messaging REST API:

- You can use the `/messaging/qmgr/{qmgrName}/queue/{queueName}/message` resource with an HTTP GET to browse the next message on the queue. For more information, see [GET /messaging/qmgr/{qmgrName}/queue/{queueName}/message](#).
- You can use the `/messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist` resource with an HTTP GET to view a list of messages on the queue. For more information, see [GET /messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist](#).

Enhancements to the administrative REST API

IBM MQ 9.1.3 introduces new administrative REST API enhancements with the `/admin/action/qmgr/{qmgrName}/mqsc` resource. Before IBM MQ 9.1.3, this resource could be used to send MQSC commands to a queue manager for processing. Now, you can choose to send the MQSC command to the queue manager, and receive responses, in JSON format instead of the MQSC command format.

For example, before IBM MQ 9.1.3 the MQSC command could be sent to the `/admin/action/qmgr/{qmgrName}/mqsc` resource in the following format:

```
{
  "type": "runCommand",
  "parameters": {
    "command": "DEFINE CHANNEL(NEWSVRCONN) CHLTYPE(SVRCONN)"
  }
}
```

From IBM MQ 9.1.3, you can send the command in the following JSON format:

```
{
  "type": "runCommandJSON",
  "command": "define",
  "qualifier": "channel",
  "name": "NEWSVRCONN",
  "parameters": {
    "chltype": "svrconn"
  }
}
```

For more information about the `/admin/action/qmgr/{qmgrName}/mqsc` resource and the format of the JSON you can specify in the request body, see [POST /admin/action/qmgr/{qmgrName}/mqsc](#).

Configurable ephemeral directory



IBM MQ 9.1.3 introduces the **EphemeralPrefix**, which defines the location that data ephemeral to the queue manager should go, such as queue manager operating system sockets, allowing the UNIX domain sockets to be placed on a non-mounted file system in a Red Hat OpenShift environment.

Note: You do not have to run in Red Hat OpenShift to run in this environment. You have the option to use an alternative ephemeral data directory on all platforms except z/OS, and on the IBM MQ Appliance.

For more information, see [Configurable ephemeral directory](#).

.NET Core application development on MacOS

IBM MQ 9.1.3 enables the development of .NET Core applications on MacOS. Once developed, these applications can be run supported on either Windows or Linux environments. For more information, see [Developing IBM MQ .NET Core applications on MacOS](#).

Support for converting between CCSIDs 37 and 500

From IBM MQ 9.1.3, support has been added for converting between CCSIDs 37 and 500 on the IBM MQ Appliance, Windows, Linux, and MacOS.

Embedding the IBM MQ Console in an IFrame

IBM MQ 9.1.3 introduces a new configuration property which allows the IBM MQ Console to be embedded in an IFrame.

For more information, see [embedding the IBM MQ Console in an IFrame](#).


Related concepts

A horizontal navigation bar with three buttons: 'Multi' (dark green), 'V 9.1.3' (blue), and 'MQ Adv.' (dark green). The 'V 9.1.3' button is highlighted with a blue background and white text. To the right of the buttons is the text 'New IBM MQ 9.1.3 features for IBM MQ Advanced for Multiplatforms'.

On Multiplatforms, IBM MQ 9.1.3 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

A horizontal navigation bar with two buttons: 'z/OS' (red) and 'V 9.1.3' (blue). The 'V 9.1.3' button is highlighted with a blue background and white text. To the right of the buttons is the text 'New IBM MQ 9.1.3 features for z/OS'.

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.3 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 ***New IBM MQ 9.1.3 features for IBM MQ Advanced for Multiplatforms***

On Multiplatforms, IBM MQ 9.1.3 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

- [“New fteClearMonitorHistory command for clearing resource monitor history” on page 108](#)
- [“Managed File Transfer support for FTP server on existing IBM i systems” on page 108](#)
- [“Option to specify wait time for Managed File Transfer database logger shut down” on page 108](#)

New fteClearMonitorHistory command for clearing resource monitor history

From IBM MQ 9.1.3, the **fteClearMonitorHistory** command provides a mechanism for clearing the history of a Managed File Transfer resource monitor to simplify the process of re-initiating failed transfers. For more information, see [Clearing resource monitor history](#) and [fteClearMonitorHistory](#).

Managed File Transfer support for FTP server on existing IBM i systems

From IBM MQ 9.1.3 you can use an FTP server, running on IBM i, to upload and download files, from or to, the root file system ("/") of the Integrated File System (IFS)



Attention:

1. You do not require IBM MQ for IBM i to be installed on your IBM i machine.
2. You can use the root (/) file system only. Other file systems are not supported.

For more information, see the [fteCreateBridgeAgent](#) command.


Option to specify wait time for Managed File Transfer database logger shut down

From IBM MQ 9.1.3, a new property, **immediateShutdownTimeout**, is added to the `logger.properties` file. When this property is called, the logger waits for the specified amount of time for any outstanding operations to complete and shut down gracefully. For more information, see [The MFT logger.properties file](#).

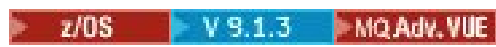
Related concepts

 [New IBM MQ 9.1.3 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.3 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.3 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

New IBM MQ 9.1.3 features for z/OS

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

- [“Runnable Service Archive support for IBM MQ” on page 109](#)
- [“Enhancements to the messaging REST API” on page 109](#)
- [“Enhancements to the administrative REST API” on page 109](#)
- [“Embedding the IBM MQ Console in an IFrame” on page 110](#)

Runnable Service Archive support for IBM MQ

z/OS Connect EE 3.0.21.0 and later, ships an enhanced version of the MQ Service Provider which supports service archive files. You should migrate to that version of z/OS Connect EE and use the built-in MQ Service Provider, instead of using the service provider shipped with the IBM MQ for z/OS product.

See [Quick start scenarios](#) for the MQ Service Provider in the z/OS Connect EE information in IBM Documentation.

Detailed reference information is provided under [Using the IBM MQ service provider](#).

Enhancements to the messaging REST API

IBM MQ 9.1.3 introduces the ability to browse messages on a queue by using the messaging REST API:

- You can use the `/messaging/qmgr/{qmgrName}/queue/{queueName}/message` resource with an HTTP GET to browse the next message on the queue. For more information, see [GET /messaging/qmgr/{qmgrName}/queue/{queueName}/message](#).
- You can use the `/messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist` resource with an HTTP GET to view a list of messages on the queue. For more information, see [GET /messaging/qmgr/{qmgrName}/queue/{queueName}/messagelist](#).

Enhancements to the administrative REST API

IBM MQ 9.1.3 introduces new administrative REST API enhancements with the `/admin/action/qmgr/{qmgrName}/mqsc` resource. Before IBM MQ 9.1.3, this resource could be used to send MQSC commands to a queue manager for processing. Now, you can choose to send the MQSC command to the queue manager, and receive responses, in JSON format instead of the MQSC command format.

For example, before IBM MQ 9.1.3 the MQSC command could be sent to the `/admin/action/qmgr/{qmgrName}/mqsc` resource in the following format:

```
{
  "type": "runCommand",
  "parameters": {
    "command": "DEFINE CHANNEL(NEWSVRCONN) CHLTYPE(SVRCONN)"
  }
}
```

From IBM MQ 9.1.3, you can send the command in the following JSON format:

```
{
  "type": "runCommandJSON",
  "command": "define",
  "qualifier": "channel",
  "name": "NEWSVRCONN",
  "parameters": {
    "chltype": "svrconn"
  }
}
```

For more information about the `/admin/action/qmgr/{qmgrName}/mqsc` resource and the format of the JSON you can specify in the request body, see [POST /admin/action/qmgr/{qmgrName}/mqsc](#).

Embedding the IBM MQ Console in an IFrame

IBM MQ 9.1.3 introduces a new configuration property which allows the IBM MQ Console to be embedded in an IFrame.

For more information see [embedding the IBM MQ Console in an IFrame](#).


Related concepts

 New IBM MQ 9.1.3 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

 New IBM MQ 9.1.3 features for IBM MQ Advanced for Multiplatforms

On Multiplatforms, IBM MQ 9.1.3 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 New IBM MQ 9.1.3 features for IBM MQ Advanced for z/OS Value Unit Edition

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 ***New IBM MQ 9.1.3 features for IBM MQ Advanced for z/OS Value Unit Edition***

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

- New **`fteClearMonitorHistory`** command for clearing resource monitor history
- Option to specify wait time for Managed File Transfer database logger shut down
- [“Advanced Message Security interception on server-to-server message channels” on page 110](#)

New `fteClearMonitorHistory` command for clearing resource monitor history

From IBM MQ 9.1.3, the **`fteClearMonitorHistory`** command provides a mechanism for clearing the history of a Managed File Transfer resource monitor to simplify the process of re-initiating failed transfers. For more information, see [Clearing resource monitor history](#) and [fteClearMonitorHistory](#).

Option to specify wait time for Managed File Transfer database logger shut down

From IBM MQ 9.1.3, a new property, **`immediateShutdownTimeout`**, is added to the `logger.properties` file. When this property is called, the logger waits for the specified amount of time for any outstanding operations to complete and shut down gracefully. For more information, see [The MFT logger.properties file](#).

Advanced Message Security interception on server-to-server message channels

IBM MQ for z/OS 9.1.3 introduces AMS interception on server-to-server message channels.

This feature enables you, for example, to decrypt outbound messages to a business partner who does not use AMS and to encrypt inbound messages from a business partner who does not use AMS. Therefore, allowing you to support AMS and to communicate with business partners who do not support AMS.

For more information, see [overview of AMS interception](#) and [example configurations](#).

Related concepts

 New IBM MQ 9.1.3 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

Multi **V 9.1.3** **MQ Adv.** [New IBM MQ 9.1.3 features for IBM MQ Advanced for Multiplatforms](#)

On Multiplatforms, IBM MQ 9.1.3 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

z/OS **V 9.1.3** [New IBM MQ 9.1.3 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.3 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.3 **What's changed in IBM MQ 9.1.3**

Changes to functions and resources in IBM MQ 9.1.3 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

- [“File encoding variable added to the jvm.options file for the mqweb server” on page 111](#)
- **z/OS** [“Removal of IBM MQ for z/OS enablement modules” on page 111](#)
- **ULW** [“Changes to the DISPLAY CONN command” on page 112](#)
- **Linux** [“Changes to the replicated data queue manager \(RDQM\) install packages” on page 112](#)
- [“New return codes returned by fteStartAgent command” on page 112](#)
- [“Changes to connection sharing by JMS applications” on page 112](#)

File encoding variable added to the jvm.options file for the mqweb server

From IBM MQ 9.1.3, the file encoding that is used to store user dashboard information for the IBM MQ Console is set to UTF-8. This setting ensures that user dashboard information in double-byte character sets is displayed correctly.

This update is made automatically only for new installations of IBM MQ where the IBM MQ data directory does not exist. If you upgrade your version of IBM MQ, or reinstall IBM MQ with an existing IBM MQ data directory, you must manually set the file encoding if you experience issues with the display of the user dashboard information.

The file encoding is set in the `jvm.options` file. For more information, see [Tuning the mqweb server JVM](#).

Removal of IBM MQ for z/OS enablement modules

z/OS

From IBM MQ for z/OS 9.1.3 onwards, the enablement modules for Advanced Message Security for z/OS, IBM MQ Advanced for z/OS Value Unit Edition, and IBM MQ for z/OS Value Unit Edition are no longer shipped.



Attention:

- If your enterprise is using the enablement modules for either IBM MQ Advanced for z/OS Value Unit Edition, or IBM MQ for z/OS Value Unit Edition, you should start setting the QMGRPROD attribute as part of migrating to IBM MQ 9.1.3 or later. Failure to do this results in the wrong Product ID being associated with usage of the IBM MQ product, which will affect accurate SCRT reporting.
- If your enterprise is using the enablement module for Advanced Message Security, you should start setting the AMSPROD attribute as part of migrating to IBM MQ 9.1.3 or later. Failure to do this prevents the queue manager starting up, and message [CSQY024I](#) will be issued.

See [z/OS installation overview from IBM MQ for z/OS 9.1.3 onwards](#) and [product usage recording with IBM MQ for z/OS products](#) for more information.

Changes to the DISPLAY CONN command



From IBM MQ 9.1.3, there is a change in behavior for the DISPLAY CONN command, and the equivalent PCF, REST API, and IBM MQ Explorer output.

Connections coming from either the REST API or IBM MQ Explorer, which previously appeared with an **APPLTYPE** of *USER* and a blank **APPLDESC**, now appear with an **APPLTYPE** of *SYSTEM* and an **APPLDESC** of:

IBM MQ REST API

For connections coming from the IBM MQ REST API.

IBM MQ Explorer

For connections coming from an IBM MQ Explorer.

Changes to the replicated data queue manager (RDQM) install packages



IBM MQ 9.1.3 introduces an upgraded version of Pacemaker, and this version requires additional installation packages for RDQM.

See [hardware and software requirements on Linux systems](#) for more information.

New return codes returned by fteStartAgent command

Before IBM MQ 9.1.3, the **fteStartAgent** command returned either 0 for success or 1 for any type of failure. From IBM MQ 9.1.3, the **fteStartAgent** command can return four additional codes that indicate the nature of a failure. For more information, see [fteStartAgent: start an MFT agent](#).

Changes to connection sharing by JMS applications

If applications are configured as `reconnectable`, channel instances can only be shared between related JMS objects, that is a JMS Connection and its related JMS Sessions. This might require additional channel instances to be configured to support such applications.

For example, if an application uses a single JMS Connection and a single JMS Session, and the channel used has **SHARECNV** equal to 10, previously up to five instances of the application could share a single channel instance. This is still the case if the application is not configured to be `reconnectable`, but if the application is configured as `reconnectable`, each application instance will require its own channel instance, so five channel instances in total would be needed.

For more information, see [Sharing a TCP/IP connection in IBM MQ classes for JMS](#).

Related concepts



[What's new in IBM MQ 9.1.3](#)

IBM MQ 9.1.3 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.



[New, changed and removed messages in IBM MQ 9.1.3](#)

A summary of the new messages that have been added for IBM MQ 9.1.3, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the

features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.









Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New, changed and removed messages in IBM MQ 9.1.3

A summary of the new messages that have been added for IBM MQ 9.1.3, with links to further information. Any messages that have been changed or removed are also listed.

-  [“New, changed and removed AMQ messages” on page 113](#)
- [“New, changed and removed Managed File Transfer messages” on page 114](#)
-    [“New, changed and removed MQ Telemetry messages” on page 115](#)
- [“New, changed and removed REST API messages” on page 115](#)
- [“New, changed and removed IBM MQ Console messages” on page 115](#)
-   [“New, changed and removed IBM MQ Bridge to blockchain messages” on page 115](#)
-  [“New, changed and removed IBM MQ Bridge to Salesforce messages” on page 115](#)
- [“New, changed and removed MQJMS messages” on page 115](#)
- [“New, changed and removed JSON messages” on page 115](#)
-  [“New, changed and removed z/OS messages” on page 116](#)

New, changed and removed AMQ messages



The following AMQ messages are new for IBM MQ 9.1.3:

AMQ3xxx: Utilities and tools

AMQ3570E to AMQ3700I

AMQ3900I to AMQ3915I

AMQ5xxx: Installable services

AMQ5022I (HP NSS) to AMQ5029I (HP NSS)

AMQ5401S (HP NSS) to AMQ5414W (HP NSS)

AMQ5600I (HP NSS)

AMQ5603I (HP NSS)

AMQ5605I (HP NSS)

AMQ5607I (HP NSS)
AMQ5640I (HP NSS) to AMQ5645I (HP NSS)
AMQ5772I

AMQ6xxx: Common services

AMQ6183W (HP NSS)
AMQ6184W (HP NSS)
AMQ6526E IBM MQ Appliance

AMQ8xxx: Administration

AMQ8042I (HP NSS)
AMQ8932
AMQ8933

AMQ9xxx: Remote

AMQ9226W (HP NSS)
AMQ9885W

The following AMQ messages are changed for IBM MQ 9.1.3:

AMQ3xxx: Utilities and tools

AMQ3814I (changed message text)
AMQ3815I (changed message text)
AMQ3821E (changed message text)
AMQ3822E (changed message text)

AMQ5xxx: Installable services

AMQ5610I (AIX) (changed usage text)
AMQ5610I (all platforms) (changed usage text)

AMQ6xxx: Common Services

AMQ6558E (changed message text)

AMQ8xxx: Administration

AMQ8938E (typos fixed)

AMQ9xxx: Remote

AMQ9513S (Explanation expanded)
AMQ9557S (Explanation expanded)

Capitalization of "uniform cluster" has been fixed throughout.

There are no removed AMQ messages for IBM MQ 9.1.3.

New, changed and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.1.3:

BFGAG0001 - BFGAG9999

BFGAG0190W (replaces BFGAG0189W)
BFGAG0191I (replaces BFGAG0188I)

BFGCL0001 - BFGCL9999

BFGCL0784E
BFGCL0785E
BFGCL0786W

BFGDB0001 - BFGDB9999

BFGDB0082I
BFGDB0083W

BFGPC0001 - BFGPC9999

BFGPC0054E to BFGPC0061E

The following Managed File Transfer messages are changed for IBM MQ 9.1.3:

BFGPR0001 - BFGPR9999

BFGPR0037E (Message extended)

The following Managed File Transfer messages are removed for IBM MQ 9.1.3:

BFGAG0001 - BFGAG9999

BFGAG0188I (replaced by BFGAG0191I)

BFGAG0189W (replaced by BFGAG0190W)

New, changed and removed MQ Telemetry messages



There are no new, changed or removed [MQ Telemetry messages](#) for IBM MQ 9.1.3.

New, changed and removed REST API messages

There are no new, changed or removed REST API messages for IBM MQ 9.1.3.

New, changed and removed IBM MQ Console messages

There are no new or changed IBM MQ Console messages for IBM MQ 9.1.3.

The following IBM MQ Console messages are removed for IBM MQ 9.1.3:

MQWB20xx IBM MQ Console messages

MQWB2021

MQWB2022

New, changed and removed IBM MQ Bridge to blockchain messages



The following IBM MQ Bridge to blockchain messages are new for IBM MQ 9.1.3:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC058E

There are no changed or removed IBM MQ Bridge to blockchain messages for IBM MQ 9.1.3.

New, changed and removed IBM MQ Bridge to Salesforce messages



The following IBM MQ Bridge to Salesforce messages are new for IBM MQ 9.1.3:

IBM MQ Bridge to Salesforce messages AMQSF000 to 999

AMQSF047E

There are no changed or removed IBM MQ Bridge to Salesforce messages for IBM MQ 9.1.3.

New, changed and removed MQJMS messages

There are no new, changed or removed MQJMS messages for IBM MQ 9.1.3.

New, changed and removed JSON messages

There are no new, changed or removed [JSON format diagnostic messages](#) for IBM MQ 9.1.3.

New, changed and removed z/OS messages

z/OS

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.1.3:

Message manager messages (CSQM...)

CSQM527E

Distributed queuing messages (CSQX...)

CSQX298E

Advanced Message Security (CSQO...)

CSQO234I

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.1.3:

Data manager messages (CSQI...)

CSQI005I (Explanation is shortened)

CSQI010I (Explanation is shortened)

Initialization procedure and general services messages (CSQY...)

CSQY024I (Explanation and Response expanded)

CSQY025I (Message text amended)

"pagesets" is changed to "page sets" throughout.

There are no removed IBM MQ for z/OS CSQ messages for IBM MQ 9.1.3.

Related concepts

V 9.1.3 [What's new in IBM MQ 9.1.3](#)

IBM MQ 9.1.3 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.3 [What's changed in IBM MQ 9.1.3](#)

Changes to functions and resources in IBM MQ 9.1.3 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.2 What's new and changed in IBM MQ 9.1.2

IBM MQ 9.1.2 is the follow-on Continuous Delivery (CD) release to IBM MQ 9.1.1. IBM MQ 9.1.2 delivers a number of new enhancements on AIX, Linux, Windows, and z/OS.

Related concepts

V 9.1.5 [What's new and changed in IBM MQ 9.1.5](#)

IBM MQ 9.1.5, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.4 [What's new and changed in IBM MQ 9.1.4](#)

IBM MQ 9.1.4, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.3 [What's new and changed in IBM MQ 9.1.3](#)

IBM MQ 9.1.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.1 [What's new and changed in IBM MQ 9.1.1](#)

IBM MQ 9.1.1, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.2 What's new in IBM MQ 9.1.2

IBM MQ 9.1.2 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

The individual features provided by a CD release are stand-alone functions but may increase in capability in subsequent CD releases, enhancing earlier CD features and forming a suite of related capabilities.

New IBM MQ for Multiplatforms features

Windows **Linux** **AIX**

The following new features are available with both IBM MQ base product entitlement, and with IBM MQ Advanced entitlement:

- [“Uniform clusters” on page 118](#)
- [“JSON format client channel definition table” on page 118](#)
- [“Custom application identification” on page 118](#)
- [“Enhanced REST messaging performance with connection pools” on page 119](#)
- **Linux** [“Support for Microsoft .NET Core on Linux” on page 119](#)
- **Linux** [“Enhancements to the IBM MQ Bridge to Salesforce” on page 119](#)
- [“Full WebSphere Liberty XA support with client channel definition tables” on page 119](#)

MQ Adv.

The following new features are available only with IBM MQ Advanced entitlement:

- [“New REST API calls for Managed File Transfer administration” on page 120](#)
- [“Option to specify an installation name with the fteCreateEnvironment command” on page 120](#)
- **Linux** [“Enhancements to the IBM MQ Bridge to blockchain” on page 120](#)

New IBM MQ for z/OS features

z/OS

The following new features are available both with IBM MQ for z/OS base product entitlement, and with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [“Improved log throughput using zHyperWrite” on page 121](#)
- [Enhanced REST messaging performance with connection pools](#)

z/OS

MQ Adv. VUE

The following new feature is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [New REST API calls for Managed File Transfer administration](#)

Related concepts

V 9.1.2 What's changed in IBM MQ 9.1.2

Changes to functions and resources in IBM MQ 9.1.2 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.2

New, changed and removed messages in IBM MQ 9.1.2

A summary of the new messages that have been added for IBM MQ 9.1.2, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the

features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.



Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New IBM MQ 9.1.2 features for Multiplatforms

On AIX, Linux and Windows, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

- [“Uniform clusters” on page 118](#)
- [“JSON format client channel definition table” on page 118](#)
- [“Custom application identification” on page 118](#)
- [“Enhanced REST messaging performance with connection pools” on page 119](#)
-  [“Support for Microsoft .NET Core on Linux” on page 119](#)
-  [“Enhancements to the IBM MQ Bridge to Salesforce” on page 119](#)
- [“Full WebSphere Liberty XA support with client channel definition tables” on page 119](#)

Uniform clusters

IBM MQ 9.1.2 introduces uniform clusters, which are a specific pattern of an IBM MQ cluster that provides applications with a highly available and horizontally scaled collection of queue managers. When an application interacts with a uniform cluster as a single group, the queue managers work together to maintain an even balance of application instances across the cluster, even across queue manager maintenance and restarts.

For more information, see [Uniform clusters](#).

JSON format client channel definition table

IBM MQ 9.1.2 introduces a JSON format for the client channel definition table (CCDT). This gives various improvements over the existing binary format CCDT, including the ability to define duplicate channel definitions of the same name.

This is a client-side feature (that is, you need an IBM MQ 9.1.2 client, not an IBM MQ 9.1.2 queue manager).

For more information, see [Configuring a JSON format CCDT](#).

Custom application identification

In addition to the existing ability to choose an application name on Java or JMS client applications, IBM MQ 9.1.2 extends this to other programming languages.

See [Specifying the application name in supported programming languages](#) for more information.

Enhanced REST messaging performance with connection pools

To optimize the performance of the messaging REST API, connections to IBM MQ queue managers are pooled. That is, instead of each REST request creating, using, and destroying its own connection, each REST request uses a connection from a connection pool.

By default, 20 connections are available for each queue manager pool. You can change the maximum number of pooled connections and the default behavior of the messaging REST API when all connections are in use by using the **setmqweb properties** command. For more information, see [Configuring the messaging REST API](#).

Support for Microsoft .NET Core on Linux

Linux

IBM MQ 9.1.1 added support for .NET Core for applications in Windows environments.

From IBM MQ 9.1.2, IBM MQ supports .NET Core on IBM MQ .NET and XMS.NET on Linux platforms in addition to Windows platforms.

For more information, see [Installing IBM MQ classes for .NET Standard](#) and [Using IBM MQ classes for XMS .NET Standard](#).

Enhancements to the IBM MQ Bridge to Salesforce

Linux

IBM MQ 9.1.2 introduces additional configuration options that permit two major classes of additional topology, and changes to the way in which tracing and logging work.

For more information, see [Additional configuration options for IBM MQ Bridge to Salesforce](#) and [runmqsfb](#) for details of the changes to this command.

Full WebSphere Liberty XA support with client channel definition tables

When using WebSphere Liberty 18.0.0.2 onwards, with IBM MQ 9.1.2, you can make use of queue manager groups within the client channel definition table (CCDT) in conjunction with XA transactions. This means that it is now possible to make use of workload distribution and availability, provided by queue manager groups, whilst maintaining transaction integrity. For more information, see [Full Liberty XA support with client channel definition tables](#).

This is a client-side feature, that is, you need an IBM MQ 9.1.2 resource adapter, not an IBM MQ 9.1.2 queue manager.

Related concepts

Multi

MQ Adv.

V 9.1.2

[New IBM MQ 9.1.2 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.2 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

z/OS

V 9.1.2

[New IBM MQ 9.1.2 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

z/OS

V 9.1.2


MQ Adv. VUE

[New IBM MQ 9.1.2 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.2 delivers a new REST API for Managed File Transfer feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

New IBM MQ 9.1.2 features for IBM MQ Advanced for Multiplatforms

IBM MQ 9.1.2 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

- [“New REST API calls for Managed File Transfer administration” on page 120](#)
- [“Option to specify an installation name with the `fteCreateEnvironment` command” on page 120](#)
-  [“Enhancements to the IBM MQ Bridge to blockchain” on page 120](#)

New REST API calls for Managed File Transfer administration

IBM MQ 9.1.2 expands the existing REST API for Managed File Transfer, by adding a REST API to create transfers.

For more information, see [admin/mft/transfer](#).

Option to specify an installation name with the `fteCreateEnvironment` command

IBM MQ 9.1.2 introduces an additional parameter to the `fteCreateEnvironment` command, which sets the environment variable for the configuration and transfer of files for the Redistributable Managed File Transfer Agent. You can use the new `-n` parameter to specify an installation name.

For more information, see [Creating the initial configuration for the Redistributable Managed File Transfer Agent and `fteCreateEnvironment`](#).

Enhancements to the IBM MQ Bridge to blockchain



IBM MQ 9.1.2 introduces changes to the way in which tracing and logging work.

For more information, see [Additional configuration options for IBM MQ Bridge to blockchain](#).




Related concepts

  **New IBM MQ 9.1.2 features for Multiplatforms**

On AIX, Linux and Windows, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

  **New IBM MQ 9.1.2 features for z/OS**

On the z/OS platform, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

   **New IBM MQ 9.1.2 features for IBM MQ Advanced for z/OS Value Unit Edition**

IBM MQ 9.1.2 delivers a new REST API for Managed File Transfer feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

  **New IBM MQ 9.1.2 features for z/OS**

On the z/OS platform, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

- [“Improved log throughput using zHyperWrite” on page 121](#)
- [Enhanced REST messaging performance with connection pools](#)

Improved log throughput using zHyperWrite

IBM MQ 9.1.2 adds the ability to use zHyperWrite, when writing to active log data sets that have been configured for synchronous replication, using IBM MQ Metro Mirror. zHyperWrite can speed up IBM MQ log writes by removing some of the time required for the synchronous replication of data.

For more information, see [Using MetroMirror with IBM MQ](#).

Enhanced REST messaging performance with connection pools

To optimize the performance of the messaging REST API, connections to IBM MQ queue managers are pooled. That is, instead of each REST request creating, using, and destroying its own connection, each REST request uses a connection from a connection pool.

By default, 20 connections are available for each queue manager pool. You can change the maximum number of pooled connections and the default behavior of the messaging REST API when all connections are in use by using the **setmqweb properties** command. For more information, see [Configuring the messaging REST API](#).


Related concepts

 [New IBM MQ 9.1.2 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.2 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.2 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [New IBM MQ 9.1.2 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

IBM MQ 9.1.2 delivers a new REST API for Managed File Transfer feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

 **[New IBM MQ 9.1.2 features for IBM MQ Advanced for z/OS Value Unit Edition](#)**

IBM MQ 9.1.2 delivers a new REST API for Managed File Transfer feature that is available with IBM MQ Advanced for z/OS Value Unit Edition entitlement.

- [New REST API calls for Managed File Transfer administration](#)

New REST API calls for Managed File Transfer administration

IBM MQ 9.1.2 expands the existing REST API for Managed File Transfer, by adding a REST API to create transfers.

For more information, see [admin/mft/transfer](#).

Related concepts

 [New IBM MQ 9.1.2 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

 [New IBM MQ 9.1.2 features for IBM MQ Advanced for Multiplatforms](#)

IBM MQ 9.1.2 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [New IBM MQ 9.1.2 features for z/OS](#)

On the z/OS platform, IBM MQ 9.1.2 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.2 What's changed in IBM MQ 9.1.2

Changes to functions and resources in IBM MQ 9.1.2 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

- **ULW** “Removal of Postcard and Default Configuration wizard” on page 122
- **ULW** “The MQCNO_RECONNECT and MQCNO_RECONNECT_Q_MGR parameters” on page 122
- **z/OS** “The CONNSWAP parameter” on page 122
- **Multi** “New environment variable AMQ_CONVEBCDICNEWLINE” on page 123
- **Windows** “New error response MQRC_INCOMPLETE_TRANSACTION” on page 123
- **AIX** “Change to linking mechanism used in IBM MQ sample code to build Sybase XA switch files” on page 123
- “Updates for messages produced during backout queue and dead letter queue processing for IBM MQ classes for JMS” on page 123
- “Change to authorities needed for IBM MQ classes for JMS to query the BackoutThreshold and BackoutRequeueQName of a cluster queue” on page 123
- “Java exceptions no longer returned in REST JSON error responses” on page 124
- **Multi** “Improvements in performance to queue manager shutdown times” on page 124
- **Windows** “Changes to Windows program directory security permissions” on page 124

Removal of Postcard and Default Configuration wizard

ULW

The Postcard application and its supporting Default Configuration wizard, which were used in earlier versions of IBM MQ for installation verification and were deprecated from IBM MQ 9.1.0, are removed from the product at IBM MQ 9.1.2.

The MQCNO_RECONNECT and MQCNO_RECONNECT_Q_MGR parameters

ULW

The DISPLAY CONN command displays connection information for applications connected to a queue manager. Two displayed CONNOPS parameters are MQCNO_RECONNECT and MQCNO_RECONNECT_Q_MGR.

If you are using an IBM MQ V9.1.2 or later client, the values displayed for MQCNO_RECONNECT and MQCNO_RECONNECT_Q_MGR are the effective reconnect options. If you are using an earlier client version, the values displayed are whatever the application specifies, whether they are currently taking effect or not.

For more information, see [DISPLAY CONN](#).

The CONNSWAP parameter

z/OS

The value of the **CONNSWAP** parameter is ignored by the CSQ6SYSP macro.

For more information, see [Using CSQ6SYP](#).

In addition, the `DISPLAY SYSTEM MQSC` command and `Inquire System PCF` command no longer return CONNSWAP information.

New environment variable `AMQ_CONVEBCDICNEWLINE`

Multi

Before IBM MQ 9.1.2, the `ConvEBCDICNewLine` attribute, which you can use to specify how IBM MQ is to convert an EBCDIC NL character into ASCII format, is available only by using the `mqs.ini` file. From IBM MQ 9.1.2, you can use the `AMQ_CONVEBCDICNEWLINE` environment variable instead of the `ConvEBCDICNewLine` stanza attribute, for example to provide `ConvEBCDICNewline` functionality on the client side in situations where the `mqs.ini` file cannot be used. For more information, see [All queue managers and Environment variables descriptions](#).

New error response `MQRC_INCOMPLETE_TRANSACTION`

Windows

From IBM MQ 9.1.2, the error that is returned if a transactional .NET application attempts to disconnect from a queue manager when there is an active incomplete transaction has changed. A new error response `MQRC_INCOMPLETE_TRANSACTION` replaces `MQRC_UNEXPECTED_ERROR`. For more information, see [2147 \(0863\) \(RC2147\): MQRC_INCOMPLETE_TRANSACTION](#).

Change to linking mechanism used in IBM MQ sample code to build Sybase XA switch files

AIX

From IBM MQ 9.1.2, the supplied makefile has been modified so that you can use different linking options (`-bstatic -bdynamic`), which accommodates the change in the format of the XA library files shipped at Sybase 15 ESD#5 and later. For more information, see [Sybase configuration](#).

Updates for messages produced during backout queue and dead letter queue processing for IBM MQ classes for JMS

From IBM MQ 9.1.2, when an attempt by the IBM MQ classes for JMS to re-queue a message either to a specified backout queue, or to the queue manager's dead-letter queue fails, a message is written to the log indicating the message ID of the message, the name of the backout or dead-letter queue the message could not be moved to, and the exception or error that prevented the move.

- A failure to move a message to the backout queue results in the following log message:

```
JMSWMQ1120 = Message "message ID", could not be moved to backout queue
"backout queue name" for reason "exception or error", it will be
moved to the dead letter queue or discarded.
```

- A failure to move a message to the dead-letter queue results in the following log message:

```
JMSWMQ0035 = Message "message ID", could not be moved to dead letter queue
"dead-letter queue name" because of exception "exception or error",
it will be returned to the source queue.
```

- If there is an exception listener registered on a consumer which tries and fails to re-queue a message to the dead-letter queue, as well as the log message being written, an exception containing the exception message text is sent to this exception listener:

```
JMSWMQ1079: Unable to write a message to dead letter queue.
```

For more information, see [JMS Exception Messages](#).

Change to authorities needed for IBM MQ classes for JMS to query the `BackoutThreshold` and `BackoutRequeueQName` of a cluster queue

From IBM MQ 9.1.2, the IBM MQ classes for JMS have been updated so that only inquire access is required to query the `BackoutThreshold` and `BackoutRequeueQName` of a cluster queue. Before IBM

MQ 9.1.2, browse and get access are also required. For more information, see [Handling poison messages in IBM MQ classes for JMS](#).

Java exceptions no longer returned in REST JSON error responses

Previously, when an error response was returned by the REST API and the error was a Java error, the JSON response included details of the Java exception. From IBM MQ 9.1.2, this information is no longer returned. For more information about REST API error responses, see [REST API error handling](#).

Improvements in performance to queue manager shutdown times

From IBM MQ 9.1.2, in certain situations which previously could have caused an extended period between issuing the **endmqm** command, and the queue manager stopping, the shutdown period has been very significantly reduced.



Attention: This is a significant change in performance, therefore, IBM MQ applications and queue manager topologies that make assumptions about extended shutdown periods, might effectively see changes in behavior in some cases.

As an extreme example, in circumstances where remote SENDER channels would have been notified that the receiver was ending during a slower shutdown, this might now only be detected when the next message is sent (which could, as expected, result in loss of non-persistent messages if using the setting NPMSPEED HIGH).

Changes to Windows program directory security permissions

Windows

The IBM MQ installer on Windows now sets additional permission restrictions as part of the security configuration of the MQ installation directories. The logic that does this is run at installation, upgrade, modification, and fix pack installation time.

You might find that, due to the increased security, you are unable to do certain things exactly the same way you used to do them. For example:

- An MQ Administrator (who is not also a member of the Administrators group) can no longer edit or recompile the sample programs in the Tools subdirectory. If you wish to do this, take a copy of the directory (or the portions you are interested in) and change your copies of the build scripts to reflect the new location.

In normal use, however, you should be unaware of the change, except for the little extra time required by the installer to make the changes. During this period the message `Initializing security...` will be displayed. A similar short pause will occur when installing the fix pack files or applying a patch.

The update of the security writes a log (`amqidsec-<Installationname>.txt`) to the TEMP directory on the machine. If you see the main install failing in custom action 'iwiLaunchAmqidsec', you should consult this file.

Related concepts

[V 9.1.2](#) [What's new in IBM MQ 9.1.2](#)

IBM MQ 9.1.2 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.1.2](#) [New, changed and removed messages in IBM MQ 9.1.2](#)

A summary of the new messages that have been added for IBM MQ 9.1.2, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the

features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.









Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New, changed and removed messages in IBM MQ 9.1.2

A summary of the new messages that have been added for IBM MQ 9.1.2, with links to further information. Any messages that have been changed or removed are also listed.

-  [“New, changed and removed AMQ messages” on page 125](#)
- [“New, changed and removed Managed File Transfer messages” on page 126](#)
-    [“New, changed and removed MQ Telemetry messages” on page 127](#)
- [“New, changed and removed REST API messages” on page 127](#)
- [“New, changed and removed IBM MQ Console messages” on page 127](#)
-   [“New, changed and removed IBM MQ Bridge to blockchain messages” on page 127](#)
-  [“New, changed and removed IBM MQ Bridge to Salesforce messages” on page 127](#)
- [“New, changed and removed MQJMS messages” on page 128](#)
-  [“New, changed and removed z/OS messages” on page 128](#)

New, changed and removed AMQ messages



The following AMQ messages are new for IBM MQ 9.1.2:

AMQ3xxx: Utilities and tools

AMQ3710 to AMQ3716

AMQ3916 to AMQ3919

AMQ7xxx: IBM MQ product

AMQ7363 to AMQ7367

AMQ7438 to AMQ7439

AMQ7495 to AMQ7496

AMQ8xxx: Administration

AMQ8938

AMQ9xxx: Remote

AMQ9568

AMQ9695 to AMQ9696

AMQ9699

AMQ9798

AMQ9881 to AMQ9884

The following AMQ messages are changed for IBM MQ 9.1.2:

AMQ6xxx: Common Services

AMQ6245 Windows (minor rewording)

AMQ6626 (Typo in Explanation; command name changed from "setmqini" to "dspmqini" in Response)

AMQ6636 (Usage example and parameters updated)

AMQ6637 (Usage example and parameters updated)

AMQ7xxx: IBM MQ product

AMQ7540 (Typo in Explanation)

AMQ7541 (Typo in Explanation)

AMQ8xxx: Administration

AMQ8242 (Two attribute names updated)

AMQ8416 (Message extended; Response rewritten)

AMQ9xxx: Remote

AMQ9509 (Object type parameterised)

AMQ9512 (Explanation shortened)

AMQ9527 (Explanation and Response rewritten)

AMQ9544 (Explanation and Response rewritten)

AMQ9548 (Message and Explanation improved)

The following AMQ messages are removed for IBM MQ 9.1.2:

AMQ7xxx: IBM MQ product

AMQ7821

AMQ9xxx: Remote

AMQ9924

AMQ9955

New, changed and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.1.2:

BFGCL0001 - BFGCL9999

BFGCL0780I

BFGCL0781E

BFGCL0782E

BFGCL0783E

BFGDM0001 - BFGDM9999

BFGDM0123I

BFGDM0124E

BFGDM0125E

BFGDM0126I

There are no changed or removed Managed File Transfer messages for IBM MQ 9.1.2.

New, changed and removed MQ Telemetry messages



There are no new, changed or removed [MQ Telemetry messages](#) for IBM MQ 9.1.2.

New, changed and removed REST API messages

The following REST API messages are new for IBM MQ 9.1.2:

MQWB03xx: REST API messages MQWB0300 to 0399

MQWB0315E

MQWB04xx: REST API messages MQWB0400 to 0499

MQWB0441E

There are no changed or removed REST API messages for IBM MQ 9.1.2.

New, changed and removed IBM MQ Console messages

There are no new, changed or removed IBM MQ Console messages for IBM MQ 9.1.2.

New, changed and removed IBM MQ Bridge to blockchain messages



The following [IBM MQ Bridge to blockchain messages](#) are new for IBM MQ 9.1.2:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC056E

AMQBC057I

The following [IBM MQ Bridge to blockchain messages](#) are changed for IBM MQ 9.1.2:

AMQBCxxx: IBM MQ Bridge to blockchain messages

AMQBC000I (Usage updated)

AMQBC004I (Typo fixed)

AMQBC035E (Message extended)

There are no removed IBM MQ Bridge to blockchain messages for IBM MQ 9.1.2.

New, changed and removed IBM MQ Bridge to Salesforce messages



The following IBM MQ Bridge to Salesforce messages are new for IBM MQ 9.1.2:

IBM MQ Bridge to Salesforce messages AMQSF000 to 999

AMQSF040E to AMQSF046E

The following IBM MQ Bridge to Salesforce messages are changed for IBM MQ 9.1.2:

IBM MQ Bridge to Salesforce messages AMQSF000 to 999

AMQSF000I (Usage extended)

AMQSF004I (Typo fixed)

AMQSF005E (Typo fixed)

AMQSF012E (Message extended)

AMQSF022I (Reclassified as an "Information" message)

AMQSF034E (Typo fixed)

There are no removed IBM MQ Bridge to Salesforce messages for IBM MQ 9.1.2.

New, changed and removed MQJMS messages

There are no new, changed or removed MQJMS messages for IBM MQ 9.1.2.

New, changed and removed z/OS messages



The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.1.2:

Data manager messages (CSQI...)

CSQI052E

CSQI053E

Distributed queuing messages (CSQX...)

CSQX697I

CSQX698I

CSQX797E

Subsystem support messages (CSQ3...)

CSQ3018I

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.1.2:

Data manager messages (CSQI...)

CSQI045I (Extra link added to Response)

CSQI046E (Extra link added to Response)

CSQI047E (Extra link added to Response)

Recovery log manager messages (CSQJ...)

CSQJ031D (Extra link added to Response)

CSQJ032E (Extra link added to Response)

Distributed queuing messages (CSQX...)

CSQX641E (Explanation rewritten)

Initialization procedure and general services messages (CSQY...)

CSQY291E (Explanation and Response expanded)

Advanced Message Security (CSQ0...)

CSQ0210E (Explanation rewritten; Response extended)

CSQ0216E (System action extended)

CSQ0608E (Response extended)

Generalized command preprocessor messages (CSQ9...)

CSQ9000E (Link updated)

CSQ9002E (Link updated)

CSQ9003E (Link updated)

CSQ9007E (Two links updated)

CSQ9008E (Link updated)

CSQ9011E (Link updated)

CSQ9014E (Two links updated)

CSQ9015E (Two links updated)

CSQ9019E (Two links updated)

CSQ9020E (Two links updated)

CSQ9025E (Link updated)

CSQ9026E (Two links updated)

CSQ9028E (Two links updated)

CSQ9030E (Two links updated)

CSQ9031E (Link updated)

CSQ9035E (Two links updated)

CSQ9045E (Link updated)

There are no removed IBM MQ for z/OS CSQ messages for IBM MQ 9.1.2.

Related concepts

V 9.1.2 [What's new in IBM MQ 9.1.2](#)

IBM MQ 9.1.2 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.2 [What's changed in IBM MQ 9.1.2](#)

Changes to functions and resources in IBM MQ 9.1.2 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

Related reference

[Messages and reason codes](#)

V 9.1.1 What's new and changed in IBM MQ 9.1.1

IBM MQ 9.1.1, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

Related concepts

V 9.1.5 [What's new and changed in IBM MQ 9.1.5](#)

IBM MQ 9.1.5, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.4 [What's new and changed in IBM MQ 9.1.4](#)

IBM MQ 9.1.4, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.3 [What's new and changed in IBM MQ 9.1.3](#)

IBM MQ 9.1.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.2 [What's new and changed in IBM MQ 9.1.2](#)

IBM MQ 9.1.2 is the follow-on Continuous Delivery (CD) release to IBM MQ 9.1.1. IBM MQ 9.1.2 delivers a number of new enhancements on AIX, Linux, Windows, and z/OS.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.1 What's new in IBM MQ 9.1.1

IBM MQ 9.1.1 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

The individual features provided by a CD release are stand-alone functions but may increase in capability in subsequent CD releases, enhancing earlier CD features and forming a suite of related capabilities.

New IBM MQ for Multiplatforms features

Multi

The following new features are available with both IBM MQ base product entitlement, and with IBM MQ Advanced entitlement:

- [“Controlling permitted CipherSpecs” on page 131](#)

- [“Addition of ANY_TLS12 CipherSpec” on page 131](#)
- **Windows** [“Support for running applications on Microsoft .NET Core on Windows” on page 131](#)
- [“IBM MQ message-driven bean pause in WebSphere Liberty” on page 131](#)

MQ Adv.

The following new features are available only with IBM MQ Advanced entitlement:

- [“New REST API calls for Managed File Transfer administration” on page 132](#)

New IBM MQ for z/OS features

z/OS

The following new features are available both with IBM MQ for z/OS base product entitlement, and with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [“Support for using client connections with IBM z/OS Connect Enterprise Edition” on page 133](#)
- [Addition of ANY_TLS12 CipherSpec](#)
- [“SECPROT attribute available on z/OS” on page 133](#)
- [IBM MQ message-driven bean pause in WebSphere Liberty](#)

z/OS

MQ Adv. VUE

The following new features are available with IBM MQ Advanced for z/OS Value Unit Edition entitlement:

- [New REST API calls for Managed File Transfer administration](#)

Related concepts

V 9.1.1

What's changed in IBM MQ 9.1.1

Changes to functions and resources in IBM MQ 9.1.1 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.1.1

New, changed and removed messages in IBM MQ 9.1.1

A summary of the new messages that have been added for IBM MQ 9.1.1, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

On AIX, Linux and Windows, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

- [“Controlling permitted CipherSpecs” on page 131](#)
- [“Addition of ANY_TLS12 CipherSpec” on page 131](#)
- **Windows** [“Support for running applications on Microsoft .NET Core on Windows” on page 131](#)
- [“IBM MQ message-driven bean pause in WebSphere Liberty” on page 131](#)

Controlling permitted CipherSpecs

From IBM MQ 9.1.1, you can provide a custom list of enabled CipherSpecs that IBM MQ is permitted to use.

See [Providing a custom list of enabled CipherSpecs](#) for details on how to configure a custom list.

Addition of ANY_TLS12 CipherSpec

From IBM MQ 9.1.1, you can add a new CipherSpec, ANY_TLS12, to message channel agent channels, MQI, Java and .NET clients, and cluster channels to allow the use of any supported TLS 1.2 cipher. This means that you can:

- Configure TLS channel security without needing to know a long complicated IBM MQ specific CipherSpec string.
- Adapt without any configuration change to use new ciphers, and handle deprecation of weak ciphers. This feature is particularly useful within clusters.

For more information, see [SSLCIPH](#), and [Migrating existing security configurations to use the ANY_TLS12 CipherSpec](#).



Attention: ANY_TLS12 does not guarantee that a specific CipherSpec will be used on a running channel, only that the negotiated CipherSpec is enabled and acceptable to IBM MQ on both ends of the channel. To request that a specific CipherSpec is used by a channel, you must specify that specific value on both ends of the channel.

From IBM MQ 9.1.4, IBM MQ provides an expanded set of alias CipherSpecs, adding to the existing ANY_TLS12 (available since IBM MQ 9.1.1). These alias CipherSpecs include ANY_TLS12_OR_HIGHER, and ANY_TLS13_OR_HIGHER among others, and are provided for ease of configuration and future migration. They are described in [Enabling CipherSpecs](#). (For a list of these CipherSpecs, see the Alias CipherSpecs section in [Table 1](#).)

Support for running applications on Microsoft .NET Core on Windows

From IBM MQ 9.1.1, IBM MQ supports .NET Core on MQ .NET and XMS .NET.

For more information, see [Installing IBM MQ classes for .NET Standard](#) and [Using IBM MQ classes for XMS .NET Standard](#).

IBM MQ message-driven bean pause in WebSphere Liberty

From IBM MQ 9.1.1, the **maxSequentialDeliveryFailures** activation specification property defines the maximum number of sequential message delivery failures to a message-driven bean (MDB) instance that the resource adapter tolerates, before pausing the MDB.

For more information, see [IBM MQ message-driven bean pause in WebSphere Liberty](#).

Related concepts

V 9.1.1 **MQ Adv.** [New IBM MQ 9.1.1 features for IBM MQ Advanced for Multiplatforms](#)
For IBM MQ 9.1.1, IBM MQ Advanced for Multiplatforms includes the capabilities provided with IBM MQ 9.1.1 base entitlement and also delivers enhancements to the REST API for Managed File Transfer administration.

V 9.1.1 **z/OS** [New IBM MQ 9.1.1 features for z/OS](#)
On the z/OS platform, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.1 **z/OS** **MQ Adv. VUE** [New IBM MQ 9.1.1 features for IBM MQ Advanced for z/OS Value Unit Edition](#)
For IBM MQ 9.1.1, IBM MQ Advanced for z/OS Value Unit Edition includes the capabilities provided with IBM MQ for z/OS 9.1.1 base entitlement, and also delivers enhancements to the REST API for Managed File Transfer administration.

V 9.1.1 **Multi** **MQ Adv.** ***New IBM MQ 9.1.1 features for IBM MQ Advanced for Multiplatforms***

For IBM MQ 9.1.1, IBM MQ Advanced for Multiplatforms includes the capabilities provided with IBM MQ 9.1.1 base entitlement and also delivers enhancements to the REST API for Managed File Transfer administration.

New REST API calls for Managed File Transfer administration

IBM MQ 9.1.1 expands the existing REST API for Managed File Transfer, by adding a REST API to list MFT resource monitor status along with other configuration information.

For more information, see [admin/mft/monitor](#).

Related concepts

V 9.1.1 **Multi** [New IBM MQ 9.1.1 features for Multiplatforms](#)
On AIX, Linux and Windows, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.1 **z/OS** [New IBM MQ 9.1.1 features for z/OS](#)
On the z/OS platform, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.1 **z/OS** **MQ Adv. VUE** [New IBM MQ 9.1.1 features for IBM MQ Advanced for z/OS Value Unit Edition](#)
For IBM MQ 9.1.1, IBM MQ Advanced for z/OS Value Unit Edition includes the capabilities provided with IBM MQ for z/OS 9.1.1 base entitlement, and also delivers enhancements to the REST API for Managed File Transfer administration.

V 9.1.1 **z/OS** ***New IBM MQ 9.1.1 features for z/OS***

On the z/OS platform, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

- [“Support for using client connections with IBM z/OS Connect Enterprise Edition” on page 133](#)
- [Addition of ANY_TLS12 CipherSpec](#)
- [“SECPROT attribute available on z/OS” on page 133](#)
- [IBM MQ message-driven bean pause in WebSphere Application Server Liberty](#)

Support for using client connections with IBM z/OS Connect Enterprise Edition

The MQ Service Provider for IBM z/OS Connect EE now supports client connections to both remote and local z/OS queue managers. This allows more flexible deployments as the queue manager and IBM z/OS Connect EE server do not need to be running on the same LPAR.

For more information, see [Connection modes](#).

Addition of ANY_TLS12 CipherSpec

From IBM MQ 9.1.1, you can add a new CipherSpec, ANY_TLS12, to message channel agent channels, MQI, Java and .NET clients, and cluster channels to allow the use of any supported TLS 1.2 cipher. This means that you can:

- Configure TLS channel security without needing to know a long complicated IBM MQ specific CipherSpec string.
- Adapt without any configuration change to use new ciphers, and handle deprecation of weak ciphers. This feature is particularly useful within clusters.

For more information, see [SSLCIPH](#), and [Migrating existing security configurations to use the ANY_TLS12 CipherSpec](#).



Attention: ANY_TLS12 does not guarantee that a specific CipherSpec will be used on a running channel, only that the negotiated CipherSpec is enabled and acceptable to IBM MQ on both ends of the channel. To request that a specific CipherSpec is used by a channel, you must specify that specific value on both ends of the channel.

V 9.1.4 From IBM MQ 9.1.4, IBM MQ provides an expanded set of alias CipherSpecs, adding to the existing ANY_TLS12 (available since IBM MQ 9.1.1). These alias CipherSpecs include ANY_TLS12_OR_HIGHER, and ANY_TLS13_OR_HIGHER among others, and are provided for ease of configuration and future migration. They are described in [Enabling CipherSpecs](#). (For a list of these CipherSpecs, see the Alias CipherSpecs section in [Table 1](#).)

SECPROT attribute available on z/OS

From IBM MQ 9.1.1, the **SECPROT** (MQIACH_SECURITY_PROTOCOL) attribute, which displays the security protocol currently in use, is available on z/OS.

For more information, see [DISPLAY CHSTATUS](#).

IBM MQ message-driven bean pause in WebSphere Liberty

From IBM MQ 9.1.1, the **maxSequentialDeliveryFailures** activation specification property defines the maximum number of sequential message delivery failures to a message-driven bean (MDB) instance that the resource adapter tolerates, before pausing the MDB.

For more information, see [IBM MQ message-driven bean pause in WebSphere Liberty](#).

Related concepts

V 9.1.1 **Multi** [New IBM MQ 9.1.1 features for Multiplatforms](#)

On AIX, Linux and Windows, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.1 **MQ Adv.** [New IBM MQ 9.1.1 features for IBM MQ Advanced for Multiplatforms](#)

For IBM MQ 9.1.1, IBM MQ Advanced for Multiplatforms includes the capabilities provided with IBM MQ 9.1.1 base entitlement and also delivers enhancements to the REST API for Managed File Transfer administration.

V 9.1.1 **z/OS** **MQ Adv. VUE** [New IBM MQ 9.1.1 features for IBM MQ Advanced for z/OS Value Unit Edition](#)

For IBM MQ 9.1.1, IBM MQ Advanced for z/OS Value Unit Edition includes the capabilities provided with IBM MQ for z/OS 9.1.1 base entitlement, and also delivers enhancements to the REST API for Managed File Transfer administration.

V 9.1.1 **z/OS** **MQ Adv. VUE** **New IBM MQ 9.1.1 features for IBM MQ Advanced for z/OS Value Unit Edition**

For IBM MQ 9.1.1, IBM MQ Advanced for z/OS Value Unit Edition includes the capabilities provided with IBM MQ for z/OS 9.1.1 base entitlement, and also delivers enhancements to the REST API for Managed File Transfer administration.

New REST API calls for Managed File Transfer administration

IBM MQ 9.1.1 expands the existing REST API for Managed File Transfer, by adding a REST API to list MFT resource monitor status along with other configuration information.

For more information, see [admin/mft/monitor](#).

Related concepts

V 9.1.1 **Multi** **New IBM MQ 9.1.1 features for Multiplatforms**

On AIX, Linux and Windows, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.1 **MQ Adv.** **New IBM MQ 9.1.1 features for IBM MQ Advanced for Multiplatforms**

For IBM MQ 9.1.1, IBM MQ Advanced for Multiplatforms includes the capabilities provided with IBM MQ 9.1.1 base entitlement and also delivers enhancements to the REST API for Managed File Transfer administration.

V 9.1.1 **z/OS** **New IBM MQ 9.1.1 features for z/OS**

On the z/OS platform, IBM MQ 9.1.1 delivers a number of new features that are available with base and advanced entitlement.

V 9.1.1 **What's changed in IBM MQ 9.1.1**

Changes to functions and resources in IBM MQ 9.1.1 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

- **Windows** [“Change to format of trace timestamps” on page 135](#)
- [“New -caseno parameter for the runmqras command” on page 135](#)
- [“New IGNSTATE parameter for runmqsc START and STOP commands” on page 135](#)
- [“Behavioral changes to IBM MQ client connections” on page 135](#)
- **Windows** [“Removal of 12 character limit on MCAUSER user ID for AMQP channels on Windows” on page 135](#)
- **Windows** **Linux** [“IBM MQ C redistributable client packages extended to include elements required to build applications” on page 135](#)
- [“Reduction in the number of default objects” on page 136](#)
- [“Replacement for Product Insights” on page 136](#)
- **z/OS** [“Preventing accidental migration from an LTS release to a CD release” on page 136](#)
- **Multi** [“Reduction in the number of XMS.NET dynamic link libraries” on page 136](#)
- [“Changes to connection authentication for Managed File Transfer agents and logger” on page 136](#)

Change to format of trace timestamps

Windows

From IBM MQ 9.1.1, the format of Windows trace timestamps has changed. See [Example trace data for Windows](#) for an example of the revised format.

New -caseno parameter for the runmqras command

The **-caseno** parameter is equivalent to **-pmrno**, except it allows a valid Salesforce case number to be specified. **-caseno** or **-pmrno** are both optional parameters, but it is not permitted to supply both together. For more information, see [runmqras \(collect IBM MQ diagnostic information\)](#).

New IGNSTATE parameter for runmqsc START and STOP commands

From IBM MQ 9.1.1, it is possible to specify what the return code from **runmqsc START** and **STOP** commands should be in the case where the object being started or stopped is already in the desired state. This makes it easier to write **runmqsc** scripts that give the same result when they are executed multiple times. The object types that **IGNSTATE** applies to are: CHANNEL, LISTENER, and SERVICE.

For more information about how you use this attribute, see [START CHANNEL](#) and [STOP CHANNEL](#).

Behavioral changes to IBM MQ client connections

From IBM MQ 9.1.1, there are a number of minor changes to the way in which a client channel connects to a queue manager. The changes are most specifically in the interactions between security exits and the application of CHLAUTH mapping rules. For more information, see the technote [Behavioral changes to MQ client connections introduced by APAR IT25839](#).

For more information, see [Interaction of CHLAUTH and CONNAUTH](#) and [Resolving CHLAUTH access issues](#).

Removal of 12 character limit on MCAUSER user ID for AMQP channels on Windows

Windows

AMQP channels have an MCAUSER attribute, which you can use to set the IBM MQ user ID that all connections to that channel are authorized under (see [MCAUSER setting on a channel](#)). On Windows, before IBM MQ 9.1.1, the MCAUSER user ID setting is only supported for user IDs up to 12 characters in length. From IBM MQ 9.1.1, the 12 character limit is removed.

IBM MQ C redistributable client packages extended to include elements required to build applications

Windows

Linux

From IBM MQ 9.1.1, the IBM MQ C redistributable client packages include the elements required to build the application, that is the header files and copybooks. This simplifies application development process as it means that you no longer need to do a full installation of IBM MQ components in order to get started with developing your application. However, the sample source code is still not included in these packages.

The **genmqpkg** command that you can use to build a tailor made package with the subset of files needed for your application is extended so that the repackaging can now be done programmatically as well as interactively. This means that you can embed the rebuilding of the redistributable client into an automated development pipeline for onwards processing.

For more information, see [Redistributable clients](#) and [Installation considerations for redistributable clients](#).

Reduction in the number of default objects

CD From IBM MQ 9.1.1 the number of default objects in Continuous Delivery releases has been reduced by one, from 84 to 83. This is because of the removal of the `SYSTEM.MESSAGE.ASSOCIATION.QUEUE`, previously used by the MQ Light web console. The console is no longer available in IBM MQ Continuous Delivery.

Replacement for Product Insights

Product Insights has been replaced by a metering service in IBM Cloud Private.

For more information, see [Configuring IBM MQ for use with the metering service in IBM Cloud Private](#).

Preventing accidental migration from an LTS release to a CD release

z/OS

If the queue manager detects that you are migrating from an LTS release, such as IBM MQ 9.1.0, to a CD release, such as IBM MQ 9.1.1, a `write to operator reply` message is output to confirm that you want to migrate. If you do not respond to this message the queue manager does not start up.

See message [CSQY041D](#) for more information.

Reduction in the number of XMS.NET dynamic link libraries

Multi

From IBM MQ 9.1.1, the number of XMS.NET dynamic link libraries has been significantly reduced, to a total of five.

The five dynamic link libraries are:

- `IBM.XMS.dll` - includes all the national language messages
- `IBM.XMS.Comms.RMM.dll`
- Three policy dynamic link libraries:
 - `policy.8.0.IBM.XMS.dll`
 - `policy.9.0.IBM.XMS.dll`
 - `policy.9.1.IBM.XMS.dll`

Changes to connection authentication for Managed File Transfer agents and logger

From IBM MQ 9.1.1, MQCSP authentication mode is enabled by default for connection authentication for the MFT agents and logger. This applies to connection authentication of the IBM MQ Explorer MFT Plugin connecting with a coordination queue manager or command queue manager, and connection authentication for a Managed File Transfer agent connecting with a coordination queue manager or command queue manager. For more information, see [Enabling connection authentication for MFT and MFT credentials file format](#).

Related concepts

V 9.1.1 [What's new in IBM MQ 9.1.1](#)

IBM MQ 9.1.1 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.1 [New, changed and removed messages in IBM MQ 9.1.1](#)

A summary of the new messages that have been added for IBM MQ 9.1.1, with links to further information. Any messages that have been changed or removed are also listed.

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the

features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.









Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

New, changed and removed messages in IBM MQ 9.1.1

A summary of the new messages that have been added for IBM MQ 9.1.1, with links to further information. Any messages that have been changed or removed are also listed.

-  [“New, changed and removed AMQ messages” on page 137](#)
- [“New, changed and removed Managed File Transfer messages” on page 138](#)
-    [“New, changed and removed MQ Telemetry messages” on page 138](#)
- [“New, changed and removed REST API messages” on page 138](#)
- [“New, changed and removed IBM MQ Console messages” on page 138](#)
-   [“New, changed and removed IBM MQ Bridge to blockchain messages” on page 139](#)
-  [“New, changed and removed IBM MQ Bridge to Salesforce messages” on page 139](#)
- [“New, changed and removed MQJMS messages” on page 139](#)
-  [“New, changed and removed z/OS messages” on page 139](#)

New, changed and removed AMQ messages



The following AMQ messages are new for IBM MQ 9.1.1:

AMQ3xxx: Utilities and tools

AMQ3717 to AMQ3722

AMQ5xxx: Installable services

AMQ5065

AMQ7xxx: IBM MQ product

AMQ7362

AMQ9xxx: Remote

AMQ9567

AMQ9697

AMQ9698

The following AMQ messages are changed for IBM MQ 9.1.1:

AMQ5xxx: Installable services

AMQ5058 to AMQ5060 (references to IBM Cloud Product Insights changed to "the metering service")

AMQ5062 (references to IBM Cloud Product Insights changed to "the metering service")

AMQ5540 (Response section changed)

AMQ5610 to AMQ5611 (parameter **-w** removed)

AMQ6xxx: Common Services

AMQ6257 to AMQ6258 (Explanation section expanded)

AMQ6538 (usage of **-s** parameter rewritten)

AMQ6598 (Explanation section changed)

AMQ7xxx: IBM MQ product

AMQ7824 (Explanation section changed)

AMQ8xxx: Administration

AMQ8045 (MQLight channel changed to AMQP channel)

AMQ8242 (Explanation section changed)

AMQ8492 (MQLight service changed to AMQP service)

AMQ8496 (MQLight service changed to AMQP service)

AMQ9xxx: Remote

AMQ9616 (Explanation and Response sections changed)

AMQ9635 (Response section changed)

AMQ9674 (Response section changed)

The following AMQ messages are removed for IBM MQ 9.1.1:

AMQ7xxx: IBM MQ product

AMQ7167

AMQ7816

AMQ7820

AMQ8xxx: Administration

AMQ8343

New, changed and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.1.1:

BFGSS0001 - BFGSS9999

BFGSS0082I

There are no changed or removed Managed File Transfer messages for IBM MQ 9.1.1.

New, changed and removed MQ Telemetry messages



There are no new, changed or removed [MQ Telemetry messages](#) for IBM MQ 9.1.1.

New, changed and removed REST API messages

There are no new, changed or removed REST API messages for IBM MQ 9.1.1.

New, changed and removed IBM MQ Console messages

The following IBM MQ Console messages are new for IBM MQ 9.1.1:

MQWB20xx IBM MQ Console messages

MQWB2021

MQWB2022

There are no changed or removed IBM MQ Console messages for IBM MQ 9.1.1.

New, changed and removed IBM MQ Bridge to blockchain messages

Linux MQ Adv.

There are no new, changed or removed [IBM MQ Bridge to blockchain messages](#) for IBM MQ 9.1.1.

New, changed and removed IBM MQ Bridge to Salesforce messages

Linux

The following IBM MQ Bridge to Salesforce messages are changed for IBM MQ 9.1.1:

IBM MQ Bridge to Salesforce messages AMQSF000 to 999

AMQSF034E (message ID changed from AMQSF034 to AMQSF034E)

There are no new or removed IBM MQ Bridge to Salesforce messages for IBM MQ 9.1.1.

New, changed and removed MQJMS messages

There are no new, changed or removed MQJMS messages for IBM MQ 9.1.1.

New, changed and removed z/OS messages

z/OS

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.1.1:

Initialization procedure and general services messages (CSQY...)

CSQY041D

Distributed queuing messages (CSQX...)

CSQX179I

CSQX180I

CSQX616E

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.1.1:

Coupling Facility manager messages (CSQE...)

CSQE232E (table summary added)

Recovery log manager messages (CSQJ...)

CSQJ111A (MQ becomes IBM MQ)

CSQJ115E (hyperlinks added)

CSQJ160I (extra information added to the system programmer response section.)

CSQJ161I (extra information added to the system programmer response section)

CSQJ166E (typo fixed)

Message manager messages (CSQM...)

CSQM108I (table summary added)

CSQM4nnI (table summary added)

Initialization procedure and general services messages (CSQV...)

CSQV451I (IBM Documentation link text reworked, and example queue manager name changed)

CSQV453I (IBM Documentation link text reworked)

CSQV457E (IBM Documentation link text reworked)

CSQV459I (IBM Documentation link text reworked)

Distributed queuing messages (CSQX...)

CSQX502E (table summary added)

CSQX629E (table added to explanation section)

CSQX631E (parameter names tweaked, table summary added.)

CSQX635E (number of linked message changed)

CSQX641E (parameter names tweaked, table summary added, extra text added to the Explanation section)

CSQX719E (parameter names tweaked)

IBM MQ-IMS bridge Messages (CSQ2...)

CSQ2002E (capitalization error fixed)

CSQ2003E (capitalization error fixed)

CSQ2005I (capitalization error fixed)

CSQ2023E (capitalization error fixed)

Db2 manager messages (CSQ5...)

CSQ5005E (more information link updated)

The following IBM MQ for z/OS CSQ messages are removed for IBM MQ 9.1.1:

Distributed queuing messages (CSQX...)

CSQX166E

Related concepts

V 9.1.1 [What's new in IBM MQ 9.1.1](#)

IBM MQ 9.1.1 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

V 9.1.1 [What's changed in IBM MQ 9.1.1](#)

Changes to functions and resources in IBM MQ 9.1.1 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

Related reference

[Messages and reason codes](#)

LTS

What's changed in IBM MQ 9.1.0 Long Term Support

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

LTS releases do not deliver new functional enhancements. They contain only defect fixes and security updates, and are made available at regular intervals. They are intended for systems that demand maximum stability over a long term deployment period.

For more information see [IBM MQ release types](#) and [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](#).

For Long Term Support for IBM MQ 9.1.0 for [Multiplatforms](#) and IBM MQ Appliance, maintenance updates are provided as fix packs or cumulative security updates (CSUs).

Note: From 1Q 2023, for Multiplatforms, there are two types of maintenance:

- Fix packs, which contain roll-ups of all defects fixed since the previous fix pack delivery (or GA). Fix packs are produced exclusively for Long Term Support (LTS) releases during their normal support lifecycle.
- Cumulative security updates (CSUs), which are smaller updates and contain security patches released since the previous maintenance (GA). CSUs are produced for LTS releases (including releases in extended support), and also for the latest IBM MQ Continuous Delivery (CD) release, as required to deliver relevant security patches.

For maintenance releases in or after 1Q 2023, the fourth digit in the VRMF represents either a fix pack number or a CSU number. Both types of maintenance are mutually cumulative (that is, they contain everything included in older CSUs and fix packs), and both are installed using the same mechanisms for applying maintenance. Both types of maintenance update the F-digit of the VRMF to a higher number than any previous maintenance: fix packs use "F" values divisible by 5, CSUs use "F" values not divisible by 5.

For maintenance releases before 1Q 2023, the fourth digit in the VRMF always represents the fix pack level. For example, the first fix pack of the IBM MQ 9.1.0 LTS release is numbered 9.1.0.1.

For more information, see [Changes to IBM MQ's maintenance delivery model](#).

z/OS For z/OS, maintenance updates are provided as PTFs or cumulative security updates (CSUs). For Unix System Services features (that is, JMS and WEB UI, Connector Pack, and Managed File Transfer) the z/OS PTFs are aligned directly with the [Multiplatforms](#) fix packs. Other PTFs are made available as and when they are produced.

IBM MQ 9.1.0 CSU 21

V 9.1.0.21

Removal of support for RSA key exchange when operating in FIPS mode

From IBM MQ 9.1.0 CSU 21, the IBM Java 8 JRE removes support for RSA key exchange when operating in FIPS mode. This removal applies to the following CipherSuites:

- TLS_RSA_WITH_AES_256_GCM_SHA384
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_3DES_EDE_CBC_SHA

To continue using FIPS mode, the following IBM MQ components should be changed to use a CipherSuite that is still supported:

- AMQP server
- Managed File Transfer (MFT)
- IBM MQ Console
- IBM MQ Explorer
- IBM MQ REST API
- IBM MQ Telemetry service

For more information, see [TLS CipherSpecs and CipherSuites in IBM MQ classes for Java](#).

IBM MQ 9.1.0 Fix Pack 20

V 9.1.0.20

- **z/OS** [“Update to zos_saf_registry.xml” on page 144](#)

IBM MQ 9.1.0 Fix Pack 15

V 9.1.0.15

- [“New OAMLdapResponseWarningTime parameter in TuningParameters stanza of qm.ini” on page 144](#)

IBM MQ 9.1.0 Fix Pack 12

V 9.1.0.12

There are no documentation updates relating to changes to functions and resources in IBM MQ 9.1.0 Fix Pack 12.

IBM MQ 9.1.0 Fix Pack 11

V 9.1.0.11

- [“Change to Managed File Transfer Monitor.xsd XML schema” on page 145](#)

IBM MQ 9.1.0 Fix Pack 10

V 9.1.0.10

There are no documentation updates relating to changes to functions and resources in IBM MQ 9.1.0 Fix Pack 10.

IBM MQ 9.1.0 Fix Pack 9

V 9.1.0.9

- [“Changes to channel status attributes” on page 145](#)
- [“Changes to runmqras command” on page 145](#)
- [“New Bouncy Castle jar file” on page 145](#)
- [“Additional queue manager configuration attributes to control the connection and operation timeout for LDAP calls” on page 145](#)

IBM MQ 9.1.0 Fix Pack 8

V 9.1.0.8

- [“Java clients installed with the self-extracting JAR file can use the JMSAdmin tool” on page 146](#)
- [“JMQUI updates for local address field set on an MQCD object” on page 146](#)
- [“Change to Managed File Transfer delimiter transfer error messages” on page 146](#)
- [“Improved error reporting when HOME is set to a directory that cannot be accessed” on page 146](#)

IBM MQ 9.1.0 Fix Pack 7

V 9.1.0.7

- [“Schedule ID included in error messages for semantically incorrect scheduled transfers” on page 146](#)

IBM MQ 9.1.0 Fix Pack 6

V 9.1.0.6

- [“Update to IBM MQ and Microsoft .NET mapping table for IBM MQ managed .NET client” on page 147](#)

IBM MQ 9.1.0 Fix Pack 5

V 9.1.0.5

- [“Change to authorities needed for XMS .NET to query the BackoutThreshold and BackoutRequeueQName of a cluster queue” on page 147](#)
- [“Queue file size limit” on page 147](#)
- **ULW** [“Update to IBM MQ AMQP service” on page 147](#)
- [“Change to exception messages for failed managed transfer requests that require a new directory to be created on an SFTP file server” on page 148](#)
- [“Change to default trace name for IBM MQ classes for Java and IBM MQ classes for JMS” on page 148](#)

- **z/OS** [“Change to inquiries used by dmpmqcfg command” on page 148](#)
- [“Case-insensitive matching of usernames in the CLNTUSER and USERLIST attributes” on page 148](#)
- [“New environment variable AMQ_NO_BAD_COMMS_DATA_FDCS” on page 149](#)

IBM MQ 9.1.0 Fix Pack 4

V 9.1.0.4

- **AIX** [“Allow Advanced Message Security applications to use GSKit in non-FIPS mode” on page 149](#)
- [“Enable dynamic tracing of LDAP client library code shipped with IBM MQ” on page 149](#)

IBM MQ 9.1.0 Fix Pack 3

V 9.1.0.3

- [“Update to Managed File Transfer agent startup messages” on page 150](#)

IBM MQ 9.1.0 Fix Pack 2

V 9.1.0.2

- [“Updates for messages produced during backout queue and dead letter queue processing for IBM MQ classes for JMS” on page 150](#)
- [“Change to authorities needed for IBM MQ classes for JMS to query the BackoutThreshold and BackoutRequeueQName of a cluster queue” on page 151](#)
- **Multi** [“New environment variable AMQ_CONVEBCDICNEWLINE” on page 151](#)
- **Windows** [“New error response MQRC_INCOMPLETE_TRANSACTION” on page 151](#)
- **AIX** [“Change to linking mechanism used in IBM MQ sample code to build Sybase XA switch files” on page 151](#)
- **Windows** [“Changes to Windows program directory security permissions” on page 151](#)
- [“Dependency on IBM MQ JRE packages removed for IBM MQ Fix Pack RPM and Debian packages for IBM Global Security Kit component” on page 152](#)

IBM MQ 9.1.0 Fix Pack 1

V 9.1.0.1

- [“New -caseno parameter for the runmqras command” on page 152](#)
- [“Behavioral changes to IBM MQ client connections” on page 152](#)

Related concepts

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's new and changed in IBM MQ 9.1.x Continuous Delivery” on page 70](#)

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

[“Release and platform icons in the product documentation” on page 167](#)

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

[Recommended Fixes for IBM MQ](#)

[IBM MQ planned maintenance release dates](#)

V 9.1.0.20 What's changed in IBM MQ 9.1.0 Fix Pack 20

IBM MQ 9.1.0 Fix Pack 20 includes a resource change.

Update to zos_saf_registry.xml



From IBM MQ 9.1.0 Fix Pack 20, the sample configuration file `zos_saf_registry.xml` has been updated to remove a duplicate `safAuthorization` entry.

This update fixes an issue where an ICH408I error might occur when the MQ Console on z/OS is upgraded to a level that ships WebSphere Liberty Profile 22.0.0.12 or later: that is, from IBM MQ 9.1.0 Fix Pack 15.

For more information, see [Configuring a SAF registry for the IBM MQ Console and REST API](#).

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.15 What's changed in IBM MQ 9.1.0 Fix Pack 15

IBM MQ 9.1.0 Fix Pack 15 includes a resource change.

- [“New OAMLdapResponseWarningTime parameter in TuningParameters stanza of qm.ini” on page 144](#)

New OAMLdapResponseWarningTime parameter in TuningParameters stanza of qm.ini

If a connection to an LDAP server took longer than the threshold number of seconds specified by the **OAMLdapResponseWarningTime** parameter, then an `AMQ5544W` message will be written to the error log. For more information, see [TuningParameters stanza of the qm.ini file](#).

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.11 What's changed in IBM MQ 9.1.0 Fix Pack 11

IBM MQ 9.1.0 Fix Pack 11 includes a resource change.

- [“Change to Managed File Transfer Monitor.xsd XML schema” on page 145](#)

Change to Managed File Transfer Monitor.xsd XML schema

The Managed File Transfer Monitor.xsd XML schema is used to manually build XML messages to create resource monitors that monitor a directory resource. From IBM MQ 9.1.0 Fix Pack 11, there is a change to the maxOccurs attribute of the directory element, which is now set to 1. This attribute was previously set to unbounded, which indicated that there could be multiple directory entries. However, this was incorrect because you can only specify one directory when creating a resource monitor that monitors a directory. For more information, see [MFT monitor request message formats](#).

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.9 What's changed in IBM MQ 9.1.0 Fix Pack 9

IBM MQ 9.1.0 Fix Pack 9 includes a number of resource changes.

- [“Changes to channel status attributes” on page 145](#)
- [“Changes to runmqras command” on page 145](#)
- [“New Bouncy Castle jar file” on page 145](#)
- [“Additional queue manager configuration attributes to control the connection and operation timeout for LDAP calls” on page 145](#)

Changes to channel status attributes

From IBM MQ 9.1.0 Fix Pack 9, the following changes have been made to channel status attributes:

DISPLAY CHSTATUS command

If the value for BYTSENT or BYTSCVD exceeds 4294967295, it is returned as 4294967295.

Inquire Channel Status (response)

If the value for BytesSent or BytesReceived exceeds 4294967295, it is returned as 4294967295.

Changes to runmqras command

From IBM MQ 9.1.0 Fix Pack 9, the **runmqras** command includes a new parameter, **-noqmdata**, to capture installation-level diagnostics only, skipping any queue manager-specific diagnostics.

Also from IBM MQ 9.1.0 Fix Pack 9, the **-ftp** IBM option is no longer available.

For more information, see [runmqras \(collect IBM MQ diagnostic information\)](#).

New Bouncy Castle jar file

The Bouncy Castle jar files used to support Advanced Message Security have been updated and from IBM MQ 9.1.0 Fix Pack 9 include `bcutil-jdk15on.jar`. For more information, see [Support for non-IBM JREs with AMS](#).

Additional queue manager configuration attributes to control the connection and operation timeout for LDAP calls

From IBM MQ 9.1.0 Fix Pack 9, two new optional tuning parameters, **OAMLdapConnectTimeout** and **OAMLdapQueryTimeLimit**, have been added. You can use these two parameters within the TuningParameters stanza in the queue manager configuration file, `qm.ini`. For more information, see [TuningParameters stanza of the qm.ini file](#).

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.8 What's changed in IBM MQ 9.1.0 Fix Pack 8

IBM MQ 9.1.0 Fix Pack 8 includes a number of resource changes.

- [“Java clients installed with the self-extracting JAR file can use the JMSAdmin tool” on page 146](#)
- [“JMQUI updates for local address field set on an MQCD object” on page 146](#)
- [“Change to Managed File Transfer delimiter transfer error messages” on page 146](#)
- [“Improved error reporting when HOME is set to a directory that cannot be accessed” on page 146](#)

Java clients installed with the self-extracting JAR file can use the JMSAdmin tool

From IBM MQ 9.1.0 Fix Pack 8, the self-extracting JAR file *version-IBM-MQ-Install-Java-All.jar* has been updated to include all of the files related to the JMSAdmin tool, in addition to all of the files that it did before. As a result of these changes, a client that is installed using the self-extracting JAR file can use the JMSAdmin tool installed as part of the JAR file to create JMS administered objects within a file system context (*.bindings* file). The client can also look up and use these administered objects. For more information, see [Obtaining the IBM MQ classes for JMS separately](#).

Note: A client installed by unpacking the redistributable Java client does not contain the JMSAdmin tool, or its prerequisite JAR files *fscontext.jar* and *providerutil.jar*. For more information, see [Limitations and other considerations for redistributable clients](#).

JMQUI updates for local address field set on an MQCD object

From IBM MQ 9.1.0 Fix Pack 8, the Java Message Queuing Interface (JMQUI) has been updated to ensure that the [local address field](#) is set on an MQCD object after a channel instance has been created and is connected to a queue manager. This means that when a channel exit written in Java calls the method `MQCD.getLocalAddress()`, the method returns the local address that the channel instance is using.

Change to Managed File Transfer delimiter transfer error messages

From IBM MQ 9.1.0 Fix Pack 8 only one empty message is sent when a transfer from a file fails due to a delimiter size check failure. See [Failure of a file-to-message transfer](#) for more details.

Improved error reporting when HOME is set to a directory that cannot be accessed

The `${HOME}/.mqm` directory is created by the queue manager when using an unregistered or non-installed version of IBM MQ such as the redistributable client. For more information, see [Limitations and other considerations for redistributable clients](#) and [IBM MQ file system permissions applied to /var/mqm](#).

From IBM MQ 9.1.0 Fix Pack 8, the IBM MQ code has been modified so that a more appropriate error message is displayed if there is a problem writing to the HOME directory. The code path that previously led to a SEGV failure has also been corrected.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.7 What's changed in IBM MQ 9.1.0 Fix Pack 7

IBM MQ 9.1.0 Fix Pack 7 includes a resource change.

- [“Schedule ID included in error messages for semantically incorrect scheduled transfers” on page 146](#)

Schedule ID included in error messages for semantically incorrect scheduled transfers

If a transfer with a semantically incorrect date and time combination is scheduled, this causes error messages to be displayed when you run the `ftelistscheduledtransfers` command. From IBM MQ

9.1.0 Fix Pack 7, the error messages include the schedule ID of the invalid scheduled transfer. You can then run the **fteDeleteScheduledTransfer** command with the **schedule_ID** parameter to delete the invalid scheduled transfer.

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.6 What's changed in IBM MQ 9.1.0 Fix Pack 6

IBM MQ 9.1.0 Fix Pack 6 includes a resource change.

Update to IBM MQ and Microsoft .NET mapping table for IBM MQ managed .NET client

From IBM MQ 9.1.0 Fix Pack 6, the IBM MQ and Microsoft .NET mapping table for the IBM MQ managed .NET client has been updated to include the TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 and TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 CipherSpecs. This update means that the correct SSL/TLS protocol version is proposed to the server by the client so that the client can connect to a queue manager via a TLS enabled channel using these CipherSpecs. For more information, see [CipherSpec mappings for the managed .NET client](#).



Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.5 What's changed in IBM MQ 9.1.0 Fix Pack 5

IBM MQ 9.1.0 Fix Pack 5 includes a number of resource changes.

- “Change to authorities needed for XMS .NET to query the BackoutThreshold and BackoutRequeueQName of a cluster queue” on page 147
- “Queue file size limit” on page 147
-  “Update to IBM MQ AMQP service” on page 147
- “Change to exception messages for failed managed transfer requests that require a new directory to be created on an SFTP file server” on page 148
- “Change to default trace name for IBM MQ classes for Java and IBM MQ classes for JMS” on page 148
-  “Change to inquiries used by dmpmqcfg command” on page 148
- “Case-insensitive matching of usernames in the CLNTUSER and USERLIST attributes” on page 148
- “New environment variable AMQ_NO_BAD_COMMS_DATA_FDCS” on page 149

Change to authorities needed for XMS .NET to query the BackoutThreshold and BackoutRequeueQName of a cluster queue

From IBM MQ 9.1.0 Fix Pack 5, the XMS .NET client has been updated so that only inquire access is required to query the **BackoutThreshold** and **BackoutRequeueQName** of a cluster queue. For more information, see [Open options for cluster queues in Poison messages in XMS](#).

Queue file size limit

From IBM MQ 9.1.0 Fix Pack 5, the queue manager limits the maximum queue file size to 2 TB by default.

Update to IBM MQ AMQP service



From IBM MQ 9.1.0 Fix Pack 5, the IBM MQ AMQP service has been updated such that when the **SSLPEER** attribute is set and the **SSLCAUTH** attribute is set to REQUIRED, the "distinguished name" of the client certificate is checked with the **SSLPEER** attribute.

For more information, see [Creating and using AMQP channels](#).

Change to exception messages for failed managed transfer requests that require a new directory to be created on an SFTP file server

Managed File Transfer protocol bridge agents use the third-party JSch library to communicate with file servers using the SFTP protocol. If the protocol bridge agent attempts to transfer a file into a directory that does not exist on a file server and JSch is unable to perform the requested SFTP operation to create that directory, because the user that the protocol bridge agent logs into the file server with does not have permission to do so, JSch throws an exception back to the protocol bridge agent. The protocol bridge agent then marks the managed transfer as "Failed" and generates a supplementary message.

From IBM MQ 9.1.0 Fix Pack 5, if the JSch exception does not contain any more information about the failure, the protocol bridge agent generates the following supplementary message:

```
BFGTR0072E: The transfer failed to complete due to the exception:  
BFGBR0209E: Bridge agent was unable to create directory directory name
```

For more information, see [Transferring files to or from protocol bridge agents](#).

Change to default trace name for IBM MQ classes for Java and IBM MQ classes for JMS

From IBM MQ 9.1.0 Fix Pack 5, the IBM MQ classes for Java, IBM MQ classes for JMS and IBM MQ resource adapter have been updated such that when threads are running using separate Java ClassLoaders, by default, each thread generates trace to its own ClassLoader specific trace file:

- The default trace name for the IBM MQ classes for Java and IBM MQ classes for JMS is of the form: `mqjava_%PID%.cl%u.trc`.
- If you are using the relocatable JAR file `com.ibm.mq.mqallclient.jar`, the default trace name is of the form: `mqjavaclient_%PID%.cl%u.trc`.

where `%PID%` is the process identifier of the application that is being traced, and `%u` is a unique number to differentiate files between threads running trace under different Java classloaders.

For more information, see the subtopics of [Tracing IBM MQ classes for Java applications](#) and [Tracing IBM MQ classes for JMS applications](#).

Change to inquiries used by `dmpmqcfg` command



From IBM MQ 9.1.0 Fix Pack 5, the inquiries used by the `dmpmqcfg` command inquire only QSGDISP(QMGR) definitions by default. You can inquire additional definitions by using the environment variable `AMQ_DMPMQCFG_QSGDISP_DEFAULT`. For more information, see [dmpmqcfg](#).

Case-insensitive matching of usernames in the **CLNTUSER** and **USERLIST** attributes

Some LDAP schemas are implemented such that the "short username" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema). Before IBM MQ 9.1.0 Fix Pack 4, the behavior of the queue manager on Linux and Unix platforms was to fold short usernames from their original case returned by LDAP, to be all lowercase. In V9.1.0.4, in situations where LDAP is the definitive source of user information, APAR IT29065 changed this behavior and kept short usernames in their original case as returned by LDAP. However, this change affected the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). This is described in more detail in ["What's changed in IBM MQ 9.1.0 Fix Pack 4"](#) on page 149.

In V9.1.0.5, APAR IT31578 allows usernames in CHLAUTH rules to be matched case-insensitively.

To enable the new behavior, add `ChlauthIgnoreUserCase=Y` in the **Channels** stanza of the `qm.ini` file. See usage details for `ChlauthIgnoreUserCase` in [Channels stanza of the qm.ini file](#). If there is no **Channels** stanza, you will have to create one.

To enable the new behavior on the MQ Appliance, issue the following command, with your real queue manager name in the place of *YOUR-QMNAME*:

```
setmqini -m YOUR-QMNAME -s Channels -k ChlauthIgnoreUserCase -v Y
```

New environment variable `AMQ_NO_BAD_COMMS_DATA_FDCS`

From IBM MQ 9.1.0 Fix Pack 5, you can use the `AMQ_NO_BAD_COMMS_DATA_FDCS` environment variable to suppress the capture of FFSTs when reporting AMQ9207E error messages on initial communications flows. For more information, see [Environment variables descriptions](#).

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

V 9.1.0.4 What's changed in IBM MQ 9.1.0 Fix Pack 4

IBM MQ 9.1.0 Fix Pack 4 includes some changes to functions and resources.

- ▶ **ULW** [“Allow Advanced Message Security applications to use GSKit in non-FIPS mode” on page 149](#)
- ▶ [“Enable dynamic tracing of LDAP client library code shipped with IBM MQ” on page 149](#)
- ▶ [“Make usernames case-sensitive in the CLNTUSER and USERLIST attributes” on page 149](#)

Allow Advanced Message Security applications to use GSKit in non-FIPS mode

▶ **ULW**

From IBM MQ 9.1.0 Fix Pack 4, a check has been added to the IBM MQ library code that runs within the customer's application program. The check runs early in its initialization to read the value of the environment variable `AMQ_AMS_FIPS_OFF` and, if it is set to any value, then the GSKit code will be run in non-FIPS mode in that application.

Enable dynamic tracing of LDAP client library code shipped with IBM MQ

Before IBM MQ 9.1.0 Fix Pack 4, it was not possible to switch the LDAP client trace on and off without also stopping or starting the queue manager.

From IBM MQ 9.1.0 Fix Pack 4, you can switch LDAP client trace on with the `strmqtrc` command and off with the `endmqtrc` command without needing to stop or start the queue manager. To enable this behavior, it is also necessary to set an environment variable `AMQ_LDAP_TRACE` to a non-null value. For more information, see [Enabling dynamic tracing of LDAP client library code](#).

Make usernames case-sensitive in the CLNTUSER and USERLIST attributes

Some LDAP schemas are implemented such that the "short username" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema).

Before this fix pack, the behavior of the queue manager on Linux and UNIX platforms was to fold short usernames from their original case returned by LDAP, to be all lowercase. However, if the LDAP field is case-sensitive, this behavior causes later interactions with the LDAP server to fail.

In this fix pack, in situations where LDAP is the definitive source of user information, APAR IT29065 changes this behavior and keeps short usernames in their original case as returned by LDAP. However, this change affects the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). These will have been specified in all lowercase, which was required before the APAR fix. If the true short

usernames coming from the LDAP repository are mixed case, or all uppercase, then the **CHLAUTH** rules will no longer match correctly.

Note: If your configuration is as follows, you need to alter some of your **CHLAUTH** rules, to correct the case of the usernames in the **CLNTUSER** and **USERLIST** attributes:

- The queue manager is running on a Linux or UNIX platform.
- The queue manager is using LDAP as the source of usernames. That is, you have configured the queue manager's **CONNAUTH** to use an **AUTHINFO** object with TYPE (IDPWLDAP) and one of: AUTHORMD (SEARCHGRP) or AUTHORMD (SEARCHUSR)
- These usernames provided by LDAP are uppercase, or mixed case.
- The queue manager has **CHLAUTH** rules of TYPE (USERMAP), and you have provided usernames in lowercase in the **CLNTUSER** attribute (as was mandatory before V9.1.0.4).
- The queue manager has **CHLAUTH** rules of TYPE (BLOCKUSER), and you have provided usernames in lowercase in the **USERLIST** attribute (as was mandatory before V9.1.0.4).

In IBM MQ 9.1.0 Fix Pack 5, APAR IT31578 allows usernames in **CHLAUTH** rules to be matched case-insensitively. See [“What's changed in IBM MQ 9.1.0 Fix Pack 5”](#) on page 147.

V 9.1.0.3 What's changed in IBM MQ 9.1.0 Fix Pack 3

IBM MQ 9.1.0 Fix Pack 3 includes some changes to functions and resources.

Update to Managed File Transfer agent startup messages

From IBM MQ 9.1, when a Managed File Transfer agent connects to a queue manager, a check is made to determine whether the queue manager is suitably licensed for usage with IBM MQ. From IBM MQ 9.1.0 Fix Pack 3, the agent startup messages relating to these checks have been updated:

- BFGAG0188I is replaced by BFGAG0191I
- BFGAG0189W is replaced by BFGAG0190W

For more information, see [BFGAG0001 - BFGAG9999](#).

V 9.1.0.2 What's changed in IBM MQ 9.1.0 Fix Pack 2

IBM MQ 9.1.0 Fix Pack 2 includes a number of changes to functions and resources.

- [“Updates for messages produced during backout queue and dead letter queue processing for IBM MQ classes for JMS”](#) on page 150
- [“Change to authorities needed for IBM MQ classes for JMS to query the BackoutThreshold and BackoutRequeueQName of a cluster queue”](#) on page 151
- **Multi** [“New environment variable AMQ_CONVEBCDICNEWLINE”](#) on page 151
- **Windows** [“New error response MQRC_INCOMPLETE_TRANSACTION”](#) on page 151
- **AIX** [“Change to linking mechanism used in IBM MQ sample code to build Sybase XA switch files”](#) on page 151
- **Windows** [“Changes to Windows program directory security permissions”](#) on page 151
- [“Dependency on IBM MQ JRE packages removed for IBM MQ Fix Pack RPM and Debian packages for IBM Global Security Kit component”](#) on page 152

Updates for messages produced during backout queue and dead letter queue processing for IBM MQ classes for JMS

From IBM MQ 9.1.0 Fix Pack 2, when an attempt by the IBM MQ classes for JMS to re-queue a message either to a specified backout queue, or to the queue manager's dead-letter queue fails, a message is

written to the log indicating the message ID of the message, the name of the backout or dead-letter queue the message could not be moved to, and the exception or error that prevented the move.

- A failure to move a message to the backout queue results in the following log message:

```
JMSWMQ1120 = Message "message ID", could not be moved to backout queue
"backout queue name" for reason "exception or error", it will be
moved to the dead letter queue or discarded.
```

- A failure to move a message to the dead-letter queue results in the following log message:

```
JMSWMQ0035 = Message "message ID", could not be moved to dead letter queue
"dead-letter queue name" because of exception "exception or error",
it will be returned to the source queue.
```

- If there is an exception listener registered on a consumer which tries and fails to re-queue a message to the dead-letter queue, as well as the log message being written, an exception containing the exception message text is sent to this exception listener:

```
JMSWMQ1079: Unable to write a message to dead letter queue.
```

For more information, see [JMS Exception Messages](#).

Change to authorities needed for IBM MQ classes for JMS to query the `BackoutThreshold` and `BackoutRequeueQName` of a cluster queue

From IBM MQ 9.1.0 Fix Pack 2, the IBM MQ classes for JMS have been updated so that only inquire access is required to query the `BackoutThreshold` and `BackoutRequeueQName` of a cluster queue. Before IBM MQ 9.1.0 Fix Pack 2, browse and get access are also required. For more information, see [Handling poison messages in IBM MQ classes for JMS](#).

New environment variable `AMQ_CONVEBCDICNEWLINE`

Multi

Before IBM MQ 9.1.0 Fix Pack 2, the `ConvEBCDICNewLine` attribute, which you can use to specify how IBM MQ is to convert an EBCDIC NL character into ASCII format, is available only by using the `mqs.ini` file. From IBM MQ 9.1.0 Fix Pack 2, you can use the `AMQ_CONVEBCDICNEWLINE` environment variable instead of the `ConvEBCDICNewLine` stanza attribute, for example to provide `ConvEBCDICNewline` functionality on the client side in situations where the `mqs.ini` file cannot be used. For more information, see [All queue managers](#) and [Environment variables descriptions](#).

New error response `MQRC_INCOMPLETE_TRANSACTION`

Windows yes

From IBM MQ 9.1.0 Fix Pack 2, the error that is returned if a transactional .NET application attempts to disconnect from a queue manager when there is an active incomplete transaction has changed. A new error response `MQRC_INCOMPLETE_TRANSACTION` replaces `MQRC_UNEXPECTED_ERROR`. For more information, see [2147 \(0863\) \(RC2147\): `MQRC_INCOMPLETE_TRANSACTION`](#).

Change to linking mechanism used in IBM MQ sample code to build Sybase XA switch files

AIX

From IBM MQ 9.1.0 Fix Pack 2, the supplied makefile has been modified so that you can use different linking options (`-bstatic -bdynamic`), which accommodates the change in the format of the XA library files shipped at Sybase 15 ESD#5 and later. For more information, see [Sybase configuration](#).

Changes to Windows program directory security permissions

Windows

The IBM MQ installer on Windows now sets additional permission restrictions as part of the security configuration of the MQ installation directories. The logic that does this is run at installation, upgrade, modification, and fix pack installation time.

You might find that, due to the increased security, you are unable to do certain things exactly the same way you used to do them. For example:

- An MQ Administrator (who is not also a member of the Administrators group) can no longer edit or recompile the sample programs in the Tools subdirectory. If you wish to do this, take a copy of the directory (or the portions you are interested in) and change your copies of the build scripts to reflect the new location.

In normal use, however, you should be unaware of the change, except for the little extra time required by the installer to make the changes. During this period the message `Initializing security...` will be displayed. A similar short pause will occur when installing the fix pack files or applying a patch.

The update of the security writes a log (`amqidsec-<Installationname>.txt`) to the TEMP directory on the machine. If you see the main install failing in custom action 'iwiLaunchAmqidsec', you should consult this file.

Note: When installing the fix pack files, you must have a security group called “mqm” on the machine. This will be the case already if you have installed IBM MQ on the machine. If, however, you have a machine that only has IBM MQ fix packs on it (or you wish to install the fix pack files first, before you install IBM MQ) then you will need to create this local group.

Dependency on IBM MQ JRE packages removed for IBM MQ Fix Pack RPM and Debian packages for IBM Global Security Kit component

Before IBM MQ 9.1.0 Fix Pack 2, the IBM MQ Fix Pack RPM and Debian packages for the IBM Global Security Kit component (MQSeriesGSKit) contained a dependency on the Java JRE RPM package (MQSeriesJRE). This prevented the IBM Global Security Kit component from being updated to the IBM MQ 9.1.0 Fix Pack 1 without also installing and updating the Java JRE component to the same version. From IBM MQ 9.1.0 Fix Pack 2, the IBM MQ Fix Pack Linux RPM and Debian packages for the IBM Global Security Kit component (MQSeriesGSKit) has been corrected to remove the dependency on the IBM MQ JRE packages.

V9.1.0.1 What's changed in IBM MQ 9.1.0 Fix Pack 1

IBM MQ 9.1.0 Fix Pack 1 includes a number of changes to functions and resources.

- [“New -caseno parameter for the runmqras command” on page 152](#)
- [“Behavioral changes to IBM MQ client connections” on page 152](#)

New -caseno parameter for the runmqras command

The **-caseno** parameter is equivalent to **-pmrno**, except it allows a valid Salesforce case number to be specified. **-caseno** or **-pmrno** are both optional parameters, but it is not permitted to supply both together. For more information, see [runmqras \(collect IBM MQ diagnostic information\)](#).

Behavioral changes to IBM MQ client connections

From IBM MQ 9.1.0 Fix Pack 1, there are a number of minor changes to the way in which a client channel connects to a queue manager. The changes are most specifically in the interactions between security exits and the application of CHLAUTH mapping rules. For more information, see the technote [Behavioral changes to MQ client connections introduced by APAR IT25839](#).

For more information, see [Interaction of CHLAUTH and CONNAUTH](#) and [Resolving CHLAUTH access issues](#).

New, changed and removed messages for IBM MQ 9.1 LTS Fix Packs

A summary of the messages that have been added, changed or removed for IBM MQ 9.1 Fix Packs from IBM MQ 9.1.0 Fix Pack 6, with links to further information. New, changed and removed IBM MQ for z/OS messages since IBM MQ 9.1.5 are also summarized.

IBM MQ AMQ, Managed File Transfer, and z/OS messages have been updated for IBM MQ 9.1 Fix Packs since IBM MQ 9.1.5:

- ▶ **Multi** “New, changed and removed IBM MQ AMQ messages” on [page 153](#)
- “New, changed and removed Managed File Transfer messages” on [page 155](#)
- ▶ **z/OS** “New, changed and removed z/OS (CSQ) messages since IBM MQ 9.1.5” on [page 156](#)

There have been no updates to the following messages for IBM MQ 9.1 Fix Packs since IBM MQ 9.1.5:

- REST API
- IBM MQ Console
- MQ Telemetry
- IBM MQ Bridge to blockchain
- IBM MQ Bridge to Salesforce
- IBM MQ Internet Pass-Thru
- MQJMS
- JSON

New, changed and removed IBM MQ AMQ messages

Multi

V 9.1.0.20 IBM MQ 9.1.0 Fix Pack 20

The following AMQ messages are new for IBM MQ 9.1.0 Fix Pack 20:

AMQ9xxx: Remote AMQ9917W

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 20:

AMQ3xxx: Utilities and tools

In several AMQ3 messages, "MQ L3 Support" becomes "IBM Support".

AMQ7xxx: IBM MQ product

AMQ7486I (Explanation is updated)

There are no removed AMQ messages for IBM MQ 9.1.0 Fix Pack 20.

V 9.1.0.15 IBM MQ 9.1.0 Fix Pack 15

The following AMQ messages are new for IBM MQ 9.1.0 Fix Pack 15:

AMQ5xxx: Installable services AMQ5544W

There are no changed or removed AMQ messages for IBM MQ 9.1.0 Fix Pack 15.

V 9.1.0.12 IBM MQ 9.1.0 Fix Pack 12

The following AMQ messages are new for IBM MQ 9.1.0 Fix Pack 12:

AMQ3xxx: Utilities and tools AMQ3635I AMQ3694E

AMQ9xxx: Remote

AMQ9108E

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 12:

AMQ8xxx: Administration

AMQ8914E (Explanation extended)

AMQ8916E (Explanation extended)

AMQ9xxx: Remote

AMQ9654E (Explanation extended and typo fixed)

The following AMQ messages are removed for IBM MQ 9.1.0 Fix Pack 12:

AMQ6xxx: Common Services

AMQ6176W

V 9.1.0.11 IBM MQ 9.1.0 Fix Pack 11

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 11:

AMQ7xxx: IBM MQ product

AMQ7301I (Message rewritten)

There are no new or removed AMQ messages for IBM MQ 9.1.0 Fix Pack 11.

V 9.1.0.10 IBM MQ 9.1.0 Fix Pack 10

The following AMQ messages are new for IBM MQ 9.1.0 Fix Pack 10:

AMQ6xxx: Common Services

AMQ6176W

AMQ7xxx: IBM MQ product

AMQ7497W

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 10:

AMQ6xxx: Common Services

AMQ6560I (Usage is extended to describe all available switches)

AMQ8xxx: Administration

AMQ8079W (Windows) (Response is expanded)

There are no removed AMQ messages for IBM MQ 9.1.0 Fix Pack 10.

V 9.1.0.9 IBM MQ 9.1.0 Fix Pack 9

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 9:

AMQ6xxx: Common Services

AMQ6150E (IBM i) (Variables removed from Message and Explanation)

AMQ6165W (Reference to QMSTATUS.INI removed from the Explanation)

There are no new or removed AMQ messages for IBM MQ 9.1.0 Fix Pack 9.

V 9.1.0.8 IBM MQ 9.1.0 Fix Pack 8

The following AMQ messages are new for IBM MQ 9.1.0 Fix Pack 8:

AMQ9xxx: Remote

AMQ9797E (IBM i)

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 8:

AMQ6xxx: Common Services

AMQ6150W (Windows) (Explanation shortened)

AMQ6165W (Explanation shortened)

AMQ7xxx: IBM MQ product

AMQ7301I (Message rewritten)

AMQ9xxx: Remote

AMQ9456I ("object" replaced with "queue" in Message and Explanation)

AMQ9633E (An extra reason added to the list in Explanation)

AMQ9797E (An extra reason added to the list in Explanation)

There are no removed AMQ messages for IBM MQ 9.1.0 Fix Pack 8.

V 9.1.0.7 IBM MQ 9.1.0 Fix Pack 7

The following AMQ messages are new for IBM MQ 9.1.0 Fix Pack 7:

AMQ3xxx: Utilities and tools

AMQ3557E

AMQ9xxx: Remote

AMQ9797E

The following AMQ messages are changed for IBM MQ 9.1.0 Fix Pack 7:

AMQ6xxx: Common Services

AMQ6543E (Extended Message and Explanation)

AMQ6598E (Typo fixed in Explanation)

AMQ8xxx: Administration

AMQ8496I (Capitalization fixed)

There are no removed AMQ messages for IBM MQ 9.1.0 Fix Pack 7.

V 9.1.0.6 IBM MQ 9.1.0 Fix Pack 6

There are no new, changed or removed AMQ messages for IBM MQ 9.1.0 Fix Pack 6.

New, changed and removed Managed File Transfer messages

V 9.1.0.20 IBM MQ 9.1.0 Fix Pack 20

There are no new, changed, or removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 20.

V 9.1.0.15 IBM MQ 9.1.0 Fix Pack 15

There are no new, changed, or removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 15.

V 9.1.0.12 IBM MQ 9.1.0 Fix Pack 12

The following Managed File Transfer messages are new for IBM MQ 9.1.0 Fix Pack 12:

BFGCL0001 - BFGCL9999

BFGCL0831I - BFGCL0834E

BFGMQ0001 - BFGMQ9999

BFGMQ1046I

BFGUB0001 - BFGUB9999

BFGUB0088E

There are no changed or removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 12.

V 9.1.0.11 IBM MQ 9.1.0 Fix Pack 11

There are no new, changed or removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 11.

V 9.1.0.10 IBM MQ 9.1.0 Fix Pack 10

The following Managed File Transfer messages are removed for IBM MQ 9.1.0 Fix Pack 10:

BFGBR0001 - BFGBR9999

BFGBR0210E to BFGBR0216E

There are no new or changed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 10.

V 9.1.0.9 IBM MQ 9.1.0 Fix Pack 9

The following Managed File Transfer messages are new for IBM MQ 9.1.0 Fix Pack 9:

BFGSS0001 - BFGSS9999

BFGSS0091E

The following Managed File Transfer messages are changed for IBM MQ 9.1.0 Fix Pack 9:

BFGSS0001 - BFGSS9999

BFGSS0024E (Message extended)

There are no removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 9.

V 9.1.0.8 IBM MQ 9.1.0 Fix Pack 8

The following Managed File Transfer messages are new for IBM MQ 9.1.0 Fix Pack 8:

BFGBR0001 - BFGBR9999

BFGBR0210E to BFGBR0216E

BFGCL0001 - BFGCL9999

BFGCL0810E

BFGRP0001 - BFGRP9999

BFGRP0038I

The following Managed File Transfer messages are changed for IBM MQ 9.1.0 Fix Pack 8:

BFGCH0001 - BFGCH9999

BFGCH0025E (Typo fixed in Message)

BFGSS0001 - BFGSS9999

BFGSS0024E (Message shortened)

References to "Information Center" have been updated in a number of messages.

There are no removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 8.

V 9.1.0.7 IBM MQ 9.1.0 Fix Pack 7

The following Managed File Transfer messages are changed for IBM MQ 9.1.0 Fix Pack 7:

BFGBR0001 - BFGBR9999

BFGBR0023E (Updated message and Response)

BFGCH0001 - BFGCH9999

BFGCH0025E (Typo fixed in Message)

BFGPR0001 - BFGPR9999

BFGPR0037E (Shortened Message)

There are no new or removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 7.

V 9.1.0.6 IBM MQ 9.1.0 Fix Pack 6

The following Managed File Transfer messages are new for IBM MQ 9.1.0 Fix Pack 6:

BFGTR0001 - BFGTR9999

BFGTR0083E

There are no changed or removed Managed File Transfer messages for IBM MQ 9.1.0 Fix Pack 6.

New, changed and removed z/OS (CSQ) messages since IBM MQ 9.1.5

z/OS

The following CSQ messages are new since IBM MQ 9.1.5:

Data manager messages (CSQI...)

CSQI051E

Message manager messages (CSQM...)

CSQM068I

Distributed queuing messages (CSQX...)

CSQX166E

CSQX705E

IBM MQ-IMS bridge Messages (CSQ2...)

CSQ2007I

Db2 manager messages (CSQ5...)

CSQ5041E

The following CSQ messages changed since IBM MQ 9.1.5:

Coupling Facility manager messages (CSQE...)

CSQE007I (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE016I (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE020E (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE021I (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE033E (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE034E (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE035E (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE106E (reference to MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

CSQE137E ("/cpf" removed from the Message)

CSQE146E (reference to MVS Programming Sysplex Services" in System programmer response now links to to IBM Documentation)

CSQE162E (reference to MVS Programming Sysplex Services" in System programmer response now links to to IBM Documentation)

CSQE222E (System programmer response extended)

Data manager messages (CSQI...)

CSQI042E (reference to "Programming: Workload Management Services" in System programmer response now links to IBM Documentation)

CSQI048I (reference to "Programming: Workload Management Services" in System programmer response now links to IBM Documentation)

Recovery log manager messages (CSQJ...)

CSQJ105E (reference to "Media manager return codes" in System programmer response now links to IBM Documentation)

CSQJ106E (reference to "Media manager return codes" in Explanation now links to IBM Documentation)

CSQJ107E (reference to "Macro Instructions for Data Sets" in Explanation now links to IBM Documentation)

CSQJ108E (reference to "Macro Instructions for Data Sets" in Explanation now links to IBM Documentation)

CSQJ117E (reference to "Macro Instructions for Data Sets" in Explanation now links to IBM Documentation)

CSQJ228E (link to "Interpreting DYNALLOC return codes" updated in System programmer response)

CSQJ302E (link to "Interpreting DYNALLOC return codes" updated in System programmer response)

CSQJ494E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQJ495E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQJ499I (System action extended)

Message manager messages (CSQM...)

CSQM056E (System programmer response rewritten)

CSQM057E (System programmer response rewritten)

CSQM112E (System programmer response rewritten)

CSQM577E ("API reason codes" changed to "API completion and reason codes" in System programmer response)

Command server messages (CSQN...)

CSQN203I (System programmer response rewritten)

CSQN207I (System action is extended and System programmer response extended)

CSQN208E to CSQN212E (System programmer response extended)

Buffer manager messages (CSQP...)

CSQP004E (Typo ("an IBM MQ") fixed in System action and reference to "Media manager return codes" in System programmer response now links to IBM Documentation)

CSQP011E (reference to "Media manager return codes" in System programmer response now links to IBM Documentation)

CSQP014E (Parameter name changed ("UNCOM CURDEPTH") and return code 220 added in System programmer response)

CSQP012I (reference to "Media manager return codes" in System programmer response now links to IBM Documentation)

CSQP014E (value 104 is rewritten in System programmer response)

CSQP037E to CSQP039E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQP048E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

Recovery manager messages (CSQR...)

CSQR027I (typo fixed in Explanation)

Utilities messages (CSQU...)

CSQU002E ("STORAGE" and "GETMAIN" in System programmer response now link to IBM Documentation)

CSQU003E ("STORAGE" and "FREEMAIN" in System programmer response now link to IBM Documentation)

CSQU090E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQU020E (Extended System programmer response)

CSQU093E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQU094E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQU156E (reference to "Macro Instructions for Data Sets" in System programmer response now links to IBM Documentation)

CSQU504E (System programmer response rewritten, and "LOAD" now links to IBM Documentation)

CSQU514E (System programmer response rewritten, and "Db2 for z/OS" now links to IBM Documentation)

CSQU518E ("IXCQUERY" in System programmer response now links to IBM Documentation)

CSQU525E (System programmer response extended)

CSQU533E ("Db2 for z/OS" in System programmer response now links to IBM Documentation)
CSQU544E ("IXCDELET" in System programmer response now links to IBM Documentation)
CSQU545E ("IXCCREAT" in System programmer response now links to IBM Documentation)
CSQU561E (System programmer response extended, and "IXLMG" in now links to IBM Documentation)

Agent services messages (CSQV...)

CSQV451I (Updates to System programmer response)
CSQV453I (Updates to System programmer response)
CSQV457E (System programmer response rewritten, and "ESTAE" now links to IBM Documentation)
CSQV459I (System programmer response rewritten, and "STORAGE" now links to IBM Documentation)

Instrumentation facilities messages (CSQW...)

CSQW133E ("MVS System Management Facilities" in Explanation and in System programmer response now links to IBM Documentation)
CSQW200E (System programmer response rewritten, and "STORAGE" now links to IBM Documentation)
CSQW701E (System programmer response rewritten)

Distributed queuing messages (CSQX...)

CSQX004I (Explanation extended)
CSQX027E (Updates to System programmer response)
CSQX028E (Updates to System programmer response)
CSQX042E to CSQX045E (System programmer response extended)
CSQX049E (System programmer response extended)
CSQX050E (System programmer response extended)
CSQX052E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)
CSQX054E (System programmer response rewritten, and "Language Environment for Runtime Messages" now links to IBM Documentation)
CSQX055E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)
CSQX056E (System programmer response rewritten, and "CEEPIPI" now links to IBM Documentation)
CSQX057E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)
CSQX058E (System programmer response rewritten, and "IEAVPSE pause service" now links to IBM Documentation)
CSQX060E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)
CSQX059E (System action updated)
CSQX061E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)
CSQX069E (System programmer response rewritten, and "z/OS Language Environment Programming Guide" now links to IBM Documentation)
CSQX104E (System programmer response rewritten, and "ESTAE" now links to IBM Documentation)
CSQX106E (reference to "UNIX System Services Messages and Codes" in System programmer response now links to IBM Documentation)
CSQX110E (System programmer response rewritten, and "Language Environment for Runtime Messages" now links to IBM Documentation)
CSQX111E (System programmer response rewritten, and "Language Environment for Runtime Messages" and "MVS System Codes" now link to IBM Documentation)
CSQX112E (System programmer response rewritten, and "Language Environment for Runtime Messages" now links to IBM Documentation)
CSQX113E (System action amended, System programmer response rewritten, and "Language Environment for Runtime Messages" now links to IBM Documentation)

CSQX143E (System programmer response rewritten, and "Language Environment for Runtime Messages" now links to IBM Documentation)

CSQX144E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)CSQX153E (System programmer response rewritten, and "Language Environment for Runtime Messages" now links to IBM Documentation)

CSQX145E (System programmer response rewritten, and "ATTACH" now links to IBM Documentation)

CSQX164E (Typo fixed in Explanation and System programmer response rewritten)

CSQX201E (System programmer response updated and reference to "UNIX System Services Messages and Codes" in System programmer response now links to IBM Documentation)

CSQX202E - CSQX206E (System programmer response updated)

CSQX203E to CSQX206E (reference to "UNIX System Services Messages and Codes" in System programmer response now links to IBM Documentation)

CSQX208E - CSQX209E (System programmer response updated)

CSQX209E (reference to "UNIX System Services Messages and Codes" in System programmer response now links to IBM Documentation)

CSQX212E - CSQX213E (System programmer response updated)

CSQX210E (reference to "Writing Servers for APPC/MVS" in System programmer response now links to IBM Documentation)

CSQX212E (reference to "UNIX System Services Messages and Codes" in System programmer response now links to IBM Documentation)

CSQX218E (System programmer response updated)

CSQX235E (System programmer response updated)

CSQX239E (System programmer response updated)

CSQX250E (in System programmer response, "z/OS Language Environment Programming Guide" now links to IBM Documentation)

CSQX456I ("queue" replaced with "object" throughout. System programmer response is extended.)

CSQX469E (System programmer response extended)

CSQX477E (Explanation rewritten. System programmer response extended)

CSQX502E (System programmer response is extended)

CSQX503E (Updated Message and extended Explanation)

CSQX547E (System programmer response is extended)

CSQX567E (System programmer response updated and in System programmer response, " Writing Servers for APPC/MVS" now links to IBM Documentation)

CSQX568E (System programmer response updated and in System programmer response, " Writing Servers for APPC/MVS" now links to IBM Documentation)

CSQX599E (Extended Explanation)

CSQX616E (System programmer response is extended)

CSQX617I (Typo fixed in Explanation; note added to System programmer response)

CSQX625E (System programmer response rewritten, and "SSL Function Return Codes" now links to IBM Documentation)

CSQX629E (Two tables moved from Explanation into IBM Documentation topics and System programmer response extended)

CSQX632I (Typo (missing "not") is fixed in Explanation)

CSQX633E (System programmer response extended)

CSQX634E (System programmer response rewritten)CSQX635E (System programmer response extended)

CSQX637E (System programmer response extended)

CSQX638E (System programmer response extended)
CSQX641E (Message and Explanation updated)CSQX643E (System programmer response updated)
CSQX642E (System programmer response is extended)
CSQX644E (System programmer response updated)
CSQX645E (System programmer response updated and extended)
CSQX646E (System programmer response extended)
CSQX658E (Typo fixed and System programmer response extended)
CSQX663E (System programmer response extended)
CSQX665E (System programmer response extended)
CSQX666E (System programmer response extended)
CSQX683E to CSQX685E (System programmer response extended)
CSQX686E (Explanation updated, System programmer response extended)
CSQX687E to CSQX689E (System programmer response extended)
CSQX697I (Typo fixed)
CSQX878I (System programmer response extended)

Initialization procedure and general services messages (CSQY...)

CSQY220I (Explanation extended)

IBM MQ-IMS bridge Messages (CSQ2...)

CSQ2001I (The word "Version" added in System programmer response)
CSQ2002E ("Codes" changed to "codes" in a link name in System programmer response)
CSQ2003E ("Codes" changed to "codes" in a link name in System programmer response)
CSQ2004E (Extended Explanation and System programmer response)
CSQ2005I ("Codes" changed to "codes" in a link name in System programmer response. Extra feedback code added in System programmer response)
CSQ2023E ("Codes" changed to "codes" in a link name in System programmer response)

Subsystem support messages (CSQ3...)

CSQ3119E (Updates to System programmer response)
CSQ3120E ("IXCQUERY" in System programmer response now links to IBM Documentation)

Db2 manager messages (CSQ5...)

CSQ5002E (reference to the "Messages and Codes manual" in System programmer response now links to IBM Documentation)
CSQ5007E (System action updated and reference to the "Messages and Codes manual" in System programmer response now links to IBM Documentation)
CSQ5009E (reference to the "Messages and Codes manual" in System programmer response now links to IBM Documentation)
CSQ5010E ("IXCQUERY" in System programmer response now links to IBM Documentation)CSQ5011E ("IXCJOIN" in System programmer response now links to IBM Documentation)
CSQ5012E ("IXCQUIES" in System programmer response now links to IBM Documentation)CSQ5013E ("IXCSETUS" in System programmer response now links to IBM Documentation)
CSQ5025E (reference to the "Messages and Codes manual" in System programmer response now links to IBM Documentation)
CSQ5027E (reference to the "Messages and Codes manual" in System programmer response now links to IBM Documentation)
CSQ5040E (Product version corrected (9.1.4 to 9.1.3) in Explanation)

CSQ5116E (reference to "MVS Programming Sysplex Services" in System programmer response now links to IBM Documentation)

Instances of the word "Version" have been removed from many messages.

V 9.1.0.10 All links to the z/OS collection in IBM Documentation are updated.

The following CSQ messages are removed since IBM MQ 9.1.5:

Data manager messages (CSQI...)

CSQI966I (was only relevant for backward migration from IBM WebSphere MQ 7.0 to IBM WebSphere MQ 6.0)

CSQI967I (was only relevant for backward migration from IBM WebSphere MQ 7.0 to IBM WebSphere MQ 6.0)

Recovery log manager messages (CSQJ...)

CSQJ165I

What was new and changed in earlier versions

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

For information about what was new and what changed in an earlier version of the product, see the appropriate section in the product documentation for that version.

IBM MQ 9.0

- [What's new and changed in IBM MQ 9.0.0](#)
- [What's new and changed in IBM MQ 9.0.x Continuous Delivery](#)
- [What's changed in IBM MQ 9.0.0.x Long Term Support](#)

IBM MQ 8.0

- [What's new in IBM MQ 8.0](#)
- [What's changed in IBM MQ 8.0](#)
- [What's new and changed in IBM MQ 8.0 Fix Packs](#)

IBM WebSphere MQ 7.5

- [What's new in IBM WebSphere MQ 7.5](#)
- [What's changed in IBM WebSphere MQ 7.5](#)
- [What's changed in IBM WebSphere MQ 7.5 Fix Packs](#)
- [Behavior that has changed between IBM WebSphere MQ Advanced Message Security 7.0.1 and IBM WebSphere MQ 7.5](#)
- [What's new in previous versions of IBM WebSphere MQ File Transfer Edition](#)
- [Changes between IBM WebSphere MQ File Transfer Edition 7.0.4 or earlier and IBM WebSphere MQ 7.5](#)

IBM WebSphere MQ 7.1

- [What's new in IBM WebSphere MQ 7.1](#)
- [What's changed in IBM WebSphere MQ 7.1](#)
- [What's changed in IBM WebSphere MQ 7.1 Fix Packs](#)

IBM WebSphere MQ 7.0.1 and earlier

For older versions of products, where information is provided outside of IBM Documentation, see [Documentation for older versions of IBM MQ](#).



Attention:

Multi On IBM MQ for Multiplatforms, you cannot reverse queue manager migration to remove the effect of changes. This restriction applies whether your enterprise uses the Long Term Support (LTS) release or Continuous Delivery (CD) release model.

z/OS **LTS** On IBM MQ for z/OS, you can reverse queue manager migration as long as you have migrated from an earlier LTS release to a more recent LTS release, and the earlier LTS release had the backwards migration PTFs for the more recent LTS release installed before the migration started.

See [IBM MQ release types](#) for further information.

Related concepts

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's new and changed in IBM MQ 9.1.x Continuous Delivery” on page 70](#)

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[Migration methods and concepts](#)

Related information

[System Requirements for IBM MQ](#)

[IBM MQ, WebSphere MQ, and MQSeries product readmes web page](#)

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Accessibility features for IBM MQ

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

Accessibility features

IBM MQ includes the following major accessibility features:

- Keyboard-only operation
- Operations that use a screen reader

IBM MQ uses the latest W3C Standard, [WAI-ARIA 1.0 \(https://www.w3.org/TR/wai-aria/\)](https://www.w3.org/TR/wai-aria/), to ensure compliance to [US Section 508 \(https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards\)](https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards), and [Web Content Accessibility Guidelines \(WCAG\) 2.0 \(https://www.w3.org/TR/WCAG20/\)](https://www.w3.org/TR/WCAG20/). To take advantage of accessibility features, use the latest release of your screen reader in combination with the latest web browser that is supported by this product.

The IBM MQ online product information in IBM Documentation is enabled for accessibility. The accessibility features of IBM Documentation are described at [../..../about/releasenotes.html](https://www.ibm.com/docs/en/mq/9.1.0/..../about/releasenotes.html).

Keyboard navigation

This product uses standard navigation keys.

Interface information

The fully accessible way of using IBM MQ is to use the command line interface. For more information about using commands, see [How to use IBM MQ control commands and Administration using MQSC commands](#).

For Windows, the accessible way to install IBM MQ is by using a non interactive installation. For further information, see [Advanced installation using msixexec](#).

The IBM MQ user interfaces do not have content that flashes 2 - 55 times per second.

The IBM MQ web user interface does not rely on cascading style sheets to render content properly and to provide a usable experience. However, the product documentation does rely on cascading style sheets. IBM MQ provides an equivalent way for low-vision users to use a user's system display settings, including high-contrast mode. You can control font size by using the device or browser settings.

Related accessibility information

In addition to standard IBM help desk and support websites, IBM has established a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:


TTY service
800-IBM-3383 (800-426-3383)
(within North America)

IBM and accessibility

For more information about the commitment that IBM has to accessibility, see [IBM Accessibility \(www.ibm.com/able\)](https://www.ibm.com/able).








Release and platform icons in the product documentation

The product documentation for all IBM MQ 9.1 release types (LTS, CD), release versions, and platforms is provided in a single information set in IBM Documentation. If information is specific to a given release type, version, or platform, this is indicated by a rectangular icon. Information that applies to all release types, versions, and platforms is left unmarked.

 The product documentation for IBM MQ 9.1.0, which is the initial release of IBM MQ 9.1, and for the IBM MQ 9.1.x Continuous Delivery (CD) releases, is in the same IBM MQ 9.1 section in IBM Documentation.










Long Term Support release, Continuous Delivery release, and release number icons

In the IBM MQ 9.1 documentation, rectangular icons are used as follows to identify the following information relating to releases:


- Information about features that are first made available at the initial release of IBM MQ 9.1 is indicated by a dark blue icon that contains the initial release number: .
- Information that applies to the Long Term Support release in general is indicated by a dark blue icon with the text LTS: .
-  For Long Term Support (LTS) release content, the icon is dark blue and contains the LTS release and Fix Pack number. For example .
- Information that applies to the Continuous Delivery release in general is indicated by a light blue icon with the text CD: .
-  Information about features that are first made available at an IBM MQ 9.1.x Continuous Delivery (CD) release is indicated by a light blue icon that contains the CD release number. For example, .

Platform icons

Platform icons are used to identify information that applies only to a specific platform, or group of platforms.

Icon	Platform
	AIX
	Solaris. Not supported for CD releases.
	All supported UNIX platforms. That is, all platforms listed previously in this table.
	Linux
	Windows
	All supported UNIX, Linux, and Windows platforms. That is, all platforms listed previously in this table.
	IBM i. Not supported for CD releases.
	Multiplatforms. That is, all supported platforms except z/OS. <ul style="list-style-type: none"> • For CD releases, this means AIX, Linux, and Windows. • For LTS releases, this means AIX, Solaris, Linux, Windows, and IBM i.
	z/OS

Note:

- The supported platforms for CD releases are AIX, Linux, Windows, and z/OS.
- The supported platforms for LTS releases are AIX, Solaris, Linux, Windows, IBM i, and z/OS.
- Any information not explicitly flagged as IBM i or z/OS also applies to the IBM MQ Appliance.
-  Support for HP-UX for all IBM MQ components, including server and clients, is removed from IBM MQ 9.1.

Related concepts

[IBM MQ release types](#)

[“What's new and changed in IBM MQ 9.1.0 ” on page 22](#)

IBM MQ 9.1.0 is the follow-on release to IBM MQ 9.0 Long Term Support (LTS) release. It is also the next release for Continuous Delivery (CD) users, following on from IBM MQ 9.0.5. IBM MQ 9.1.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.0.1 through IBM MQ 9.0.5 along with some minor enhancements.

[“What's new and changed in IBM MQ 9.1.x Continuous Delivery” on page 70](#)

Following the initial release of IBM MQ 9.1.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.1.1.

[“What's changed in IBM MQ 9.1.0 Long Term Support” on page 140](#)

The Long Term Support (LTS) release is a recommended product level for which support, including defect and security updates, is provided over a specified period of time.

[“What was new and changed in earlier versions” on page 162](#)

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.1.

Readme for IBM MQ 9.1 and its maintenance

This document contains the readme information for IBM MQ 9.1.0 Long Term Support release and its maintenance, and also for IBM MQ 9.1.x Continuous Delivery releases.

A PDF copy of this document, in English and in translation, is available for download here: <https://public.dhe.ibm.com/software/integration/wmq/docs/V9.1/Readme/>.

The English version of this document is the most up-to-date version.

Content

The main sections of this document describe product limitations and known problems.

In addition to this document, you can find more information on the IBM MQ website: <https://www.ibm.com/products/mq>.

The SupportPac web page is here: <https://ibm.biz/mqsupportpacs>.

For current information about known problems and available fixes, see the IBM MQ Support page: https://www.ibm.com/mysupport/s/topic/OTO500000024cJGAQ/mq?language=en_US&productId=01t0z000006zdYXAAAY.

Product documentation for all supported versions of IBM MQ is available through IBM Documentation: <https://www.ibm.com/docs/ibm-mq>. Specifically, the IBM MQ 9.1 product information is available in IBM Documentation: <https://www.ibm.com/docs/ibm-mq/9.1>.

Announcement letters

The announcement letters for IBM MQ 9.1 (US English) are available at the following locations. The announcement letters provide these types of information:

- Detailed product description, including description of new function.
- Product-positioning statement.
- Ordering details.
- Hardware and software requirements.
- Hourly pricing.

Announcement letters for Continuous Delivery Releases

IBM MQ for Multiplatforms V9.1.5 and IBM MQ on Cloud
<https://www.ibm.com/docs/en/announcements/ZP20-0119/index.html>

IBM MQ for z/OS, V9.1.5

<https://www.ibm.com/docs/en/announcements/ZP20-0121/index.html>

IBM MQ for z/OS Value Unit Edition V9.1.5, IBM MQ Advanced for z/OS, V9.1.5, and IBM MQ Advanced for z/OS Value Unit Edition V9.1.5
<https://www.ibm.com/docs/en/announcements/ZP20-0120/index.html>
 IBM MQ V9.1.4 for Multiplatforms
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-487>
 IBM MQ for z/OS, 9.1.4
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-444>
 IBM MQ for z/OS VUE, IBM MQ Advanced for z/OS, and IBM MQ Advanced for z/OS VUE V9.1.4
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-488>
 Software withdrawal: IBM MQ for Multiplatforms selected part numbers
<https://www.ibm.com/docs/en/announcements/archive/ENUS919-192>
 IBM MQ V9.1.3 for Multiplatforms
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-254>
 IBM MQ for z/OS, V9.1.3
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-257>
 IBM MQ for z/OS VUE, IBM MQ Advanced for z/OS, and IBM MQ Advanced for z/OS VUE V9.1.3
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-255>
 Software withdrawal: IBM MQ Managed File Transfer for z/OS and IBM MQ Advanced Message Security for z/OS
<https://www.ibm.com/docs/en/announcements/archive/ENUS919-089>
 IBM MQ V9.1.2 for Multiplatforms
<https://www.ibm.com/docs/en/announcements/archive/ENUS219-015>
 IBM MQ V9.1.1 for Multiplatforms
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-511>
 IBM MQ for z/OS, V9.1.1
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-508>
 IBM MQ for z/OS, V9.1.1
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-510>

Announcement letters for IBM MQ 9.1.0

IBM MQ V9.1 for Multiplatforms
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-246>
 IBM MQ for z/OS, V9.1
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-252>
 IBM MQ Advanced for z/OS VUE, V9.1
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-213>
 IBM MQ 9.1 hourly pricing for on-premises and public cloud containers
<https://www.ibm.com/docs/en/announcements/archive/ENUS218-141>

Update history

26 Apr 2024	Updates for IBM MQ 9.1.0.21 CSU
22 Feb 2024	Updates for IBM MQ 9.1.0.20
10 May 2023	Updates for IBM MQ 9.1.0.15
18 Oct 2022	Updates for IBM MQ 9.1.0.12
29 Mar 2022	Updates for IBM MQ 9.1.0.11
15 Dec 2021	Updates for IBM MQ 9.1.0.10
24 Aug 2021	Updates for IBM MQ 9.1.0.9
02 Jun 2021	Updates for IBM MQ 9.1.0.8
25 Feb 2021	Updates for IBM MQ 9.1.5

04 Dec 2020	Updates for IBM MQ 9.1.0.7
16 Sep 2020	Extra information for IBM MQ 9.1.4 and 9.1.5
21 Jul 2020	Updates for IBM MQ 9.1.0.6
06 Apr 2020	Updates for IBM MQ 9.1.0.5
02 Apr 2020	Updates for IBM MQ 9.1.5
05 Dec 2019	Updates for IBM MQ 9.1.4
03 Dec 2019	Updates for IBM MQ 9.1.0.4
31 Jul 2019	Updates for IBM MQ 9.1.0.3
11 Jul 2019	Updates for IBM MQ 9.1.3
09 Apr 2019	Updates for IBM MQ 9.1.0.2
14 Mar 2019	Updates for IBM MQ 9.1.2
30 Nov 2018	Updates for IBM MQ 9.1.1
14 Nov 2018	Updates for IBM MQ 9.1.0.1
25 Sep 2018	Added link to IBM MQ 9.1 hourly pricing announcement letter
16 Jul 2018	Created for IBM MQ 9.1.0

Installation instructions

Installation instructions are available as part of the IBM MQ 9.1 product information published in IBM Documentation: https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.ins.doc/q008250_.html

Limitations and known problems for Long Term Support releases

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0.21 CSU

Support is removed for RSA key exchange in FIPS mode

The IBM Java 8 JRE removes support for RSA key exchange when operating in FIPS mode. This removal applies to the following CipherSuites:

- TLS_RSA_WITH_AES_256_GCM_SHA384
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_3DES_EDE_CBC_SHA

To continue using FIPS mode, the following IBM MQ components should be changed to use a CipherSuite that is still supported:

- AMQP server
- Managed File Transfer (MFT)
- IBM MQ Console
- IBM MQ Explorer
- IBM MQ REST API
- IBM MQ Telemetry service

For details of supported CipherSuites, see [TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS](#) in the IBM MQ product documentation.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 20

On Linux, after installing IBM MQ Explorer, a java.security.SignatureException error is displayed when viewing the error log

To recreate this error on the Linux 64-bit platform, complete the following steps:

1. Install the IBM MQ 91 initial release, then apply Fix Pack 9.1.0.20.
2. Launch the IBM MQ Explorer using the VNC viewer.
3. Go to **Help tab > About Explorer**, then click "Installation details".
4. Go to **Configuration tab > View error log**.

A message similar to the following is displayed:

```
!ENTRY org.eclipse.osgi 4 0 2024-02-10 07:19:44.214
!MESSAGE Either the manifest file or the signature file has been tampered in this
jar: /opt/mqm/mqexplorer/eclipse/plugins/org.apache.ant_1.10.12.v20211102-1452
```

The error message can be ignored.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 10/11/12/15

There are no new limitations or known problems.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 9

Error message in the IBM MQ Explorer log after IBM MQ 9.1.0.9 is installed on Windows

After IBM MQ 9.1.0, Fix Pack 9 is installed on Windows, you might see the following error message in the IBM MQ Explorer log file the first time the IBM MQ Explorer is started.

The error message can be ignored.

The log file is here:

```
USER_Home\IBM\WebSphereMQ\workspace-installation_name\metadata\.log
```

```
!MESSAGE FrameworkEvent ERROR
!STACK 0
org.osgi.framework.BundleException: Could not resolve module:
org.eclipse.equinox.http.jetty [297]
Unresolved requirement: Import-Package: org.eclipse.jetty.servlet; version="[9.4.0,10.0.0)"
```

This issue was first identified in IBM MQ 9.1.0, Fix Pack 7, and a full listing of the error message is included in the 9.1.0.7 section of this readme file.

For IBM MQ 9.1.0.9, this issue is addressed by APAR IT37465.

IBM MQ Explorer installation details are not updated after IBM MQ 9.1.0.9 is uninstalled on Windows

After IBM MQ 9.1.0, Fix Pack 9 is uninstalled on Windows, the information displayed on the "Installed Software" tab of the "IBM MQ Explorer Installation Details" panel still includes the following entry:

```
- HELP Patch (bugzillas 538020,547101,509819,568292,569227,569855,453379,573066)
```

This information is not correct. The HELP patch is no longer installed.

This issue was first identified in IBM MQ 9.1.0, Fix Pack 7.

For IBM MQ 9.1.0.9, this issue is addressed by APAR IT37465.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 8

Error message in the IBM MQ Explorer log after IBM MQ 9.1.0.8 is installed on Windows

After IBM MQ 9.1.0, Fix Pack 8 is installed on Windows, you might see the following error message in the IBM MQ Explorer log file the first time the IBM MQ Explorer is started.

The error message can be ignored.

The log file is here:

```
USER_Home\IBM\WebSphereMQ\workspace-installation_name\.metadata\.log
```

```
!MESSAGE FrameworkEvent ERROR
!STACK 0
org.osgi.framework.BundleException: Could not resolve module:
org.eclipse.equinox.http.jetty [297]
Unresolved requirement: Import-Package: org.eclipse.jetty.servlet; version="[9.4.0,10.0.0)"
```

This issue was first identified in IBM MQ 9.1.0, Fix Pack 7, and a full listing of the error message is included in the 9.1.0.7 section of this readme file.

For IBM MQ 9.1.0.8, this issue is addressed by APAR IT36383.

Explorer Help browser might not open after IBM MQ 9.1.0.8 is installed on Windows

After installing IBM MQ 9.1.0, Fix Pack 8 on Windows, navigate to **Explorer Help > Help Content**. The Help browser might not open, and you might see the following error message in the IBM MQ Explorer log file.

The log file is here:

```
USER_Home\IBM\WebSphereMQ\workspace-installation_name\.metadata\.log
```

```
java.lang.NoClassDefFoundError: org.eclipse.equinox.http.jetty.JettyConfigurator
    at
    org.eclipse.help.internal.server.JettyHelpServer$StartServerThread.run(JettyHelpServer.java:
    79)
    Caused by: java.lang.ClassNotFoundException:
    org.eclipse.equinox.http.jetty.JettyConfigurator cannot be found by
    org.eclipse.help.base_4.2.155.v20210319-0601
    at
    org.eclipse.osgi.internal.loader.BundleLoader.findClassInternal(BundleLoader.java:484)
    at
    org.eclipse.osgi.internal.loader.BundleLoader.findClass(BundleLoader.java:395)
    at
    org.eclipse.osgi.internal.loader.BundleLoader.findClass(BundleLoader.java:387)
    at
    org.eclipse.osgi.internal.loader.ModuleClassLoader.loadClass(ModuleClassLoader.java:150)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:870)
```

To fix this issue, add the following line to the bundles.info file, which is located in *MQ_INSTALL_LOCATION*\MQExplorer\eclipse\configuration\org.eclipse.equinox.simpleconfigurator.

```
org.eclipse.jetty.util.ajax,9.4.35.v20201120,plugins/
org.eclipse.jetty.util.ajax_9.4.35.v20201120.jar,4,false
```

This issue is addressed by APAR IT36383.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 7

Error message in the IBM MQ Explorer log after IBM MQ 9.1.0.7 is installed on Windows

After IBM MQ 9.1.0, Fix Pack 7 is installed on Windows, you might see the following error message in the IBM MQ Explorer log file the first time the IBM MQ Explorer is started.

The error message can be ignored.

The log file is here:

```
USER_Home\IBM\WebSphereMQ\workspace-installation_name\metadata\log
```

```
!MESSAGE FrameworkEvent ERROR
!STACK 0
org.osgi.framework.BundleException: Could not resolve module:
org.eclipse.equinox.http.jetty [298]
Unresolved requirement: Import-Package: org.eclipse.jetty.servlet; version="[9.4.0,10.0.0)"
-> Export-Package: org.eclipse.jetty.servlet; bundle-symbolic-
name="org.eclipse.jetty.servlet"; bundle-version="9.4.33.v20201020"; version="9.4.33";
uses="javax.servlet, javax.servlet.descriptor, javax.servlet.http, org.eclipse.jetty.http.path
map, org.eclipse.jetty.security, org.eclipse.jetty.server, org.eclipse.jetty.server.handler, org
.eclipse.jetty.server.handler.gzip, org.eclipse.jetty.server.session, org.eclipse.jetty.util, o
rg.eclipse.jetty.util.annotation, org.eclipse.jetty.util.component, org.eclipse.jetty.util.res
ource"
    org.eclipse.jetty.servlet [615]
        Unresolved requirement: Import-Package: org.eclipse.jetty.jmx;
version="[9.4.33,10.0.0)"; resolution="optional"
        Unresolved requirement: Import-Package: org.eclipse.jetty.security;
version="[9.4.33,10.0.0)"
            at org.eclipse.osgi.container.Module.start(Module.java:444)
            at
org.eclipse.osgi.container.ModuleContainer$ContainerStartLevel.incStartLevel(ModuleContainer
.java:1634)
            at
org.eclipse.osgi.container.ModuleContainer$ContainerStartLevel.incStartLevel(ModuleContainer
.java:1613)
            at
org.eclipse.osgi.container.ModuleContainer$ContainerStartLevel.doContainerStartLevel(ModuleC
ontainer.java:1585)
            at
org.eclipse.osgi.container.ModuleContainer$ContainerStartLevel.dispatchEvent(ModuleContainer
.java:1528)
            at
org.eclipse.osgi.container.ModuleContainer$ContainerStartLevel.dispatchEvent(ModuleContainer
.java:1)
                at org.eclipse.osgi.framework.eventmgr.EventManager.dispatchEvent(EventManager.java:230)
                at
org.eclipse.osgi.framework.eventmgr.EventManager$EventThread.run(EventManager.java:340)
```

For IBM MQ 9.1.0.7, this issue is addressed by APAR IT34927.

IBM MQ Explorer installation details are not updated after IBM MQ 9.1.0.7 is uninstalled on Windows

After IBM MQ 9.1.0, Fix Pack 7 is uninstalled on Windows, the information displayed on the "Installed Software" tab of the "IBM MQ Explorer Installation Details" panel still includes the following entry:

```
- HELP Patch (bugzillas 538020,547101,509819,568292)
```

This information is not correct. The HELP patch is no longer installed.

For IBM MQ 9.1.0.7, this issue is addressed by APAR IT35052.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 6

There are no new limitations or known problems.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 5

Case-insensitive matching of user names in the CLNTUSER and USERLIST attributes

Some LDAP schemas are implemented such that the "short username" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema). Before IBM MQ 9.1.0, Fix Pack 4, the behavior of the queue manager on Linux and UNIX platforms was to fold short user names from their original case returned by LDAP to be all lowercase. In IBM MQ 9.1.0.4, in situations where LDAP is the definitive source of user information, APAR IT29065 changed this behavior and kept short user names in their original case as returned by LDAP. However, this change affected the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). This is described in more detail in a readme file entry for IBM MQ 9.1.0.4.

In IBM MQ 9.1.0, Fix Pack 5, APAR IT31578 allows user names in **CHLAUTH** rules to be matched case-insensitively.

To enable the new behavior, add `ChlauthIgnoreUserCase=Y` in the `Channels` stanza of the `qm.ini` file. If there is no `Channels` stanza, you have to create one. Refer to IBM Documentation for details of adding stanzas to the `qm.ini` file.

To enable the new behavior on the IBM MQ Appliance, issue the following command, with your real queue manager name in the place of *YOUR-QMNAME*:

```
setmqini -m YOUR-QMNAME -s Channels -k ChlauthIgnoreUserCase -v Y
```

Issues when using RPM to verify the MQSeriesWeb package

When you run the verification with `rpm -V` after you install the product, verification failures are reported. They do not affect the integrity of the installed component.

This issue was discovered in the IBM MQ 9.1.0.5 timeframe, and affects all IBM MQ 9.1 versions. The issue is described in detail in the readme file section "LIMITATIONS AND KNOWN PROBLEMS FOR THE INITIAL IBM MQ 9.1.0 RELEASE".

Minor modification made to system message AMQ7056

In this fix pack only, the following message is modified from this:

```
AMQ7056: Transaction number n,m is in-doubt.
```

to this:

```
AMQ7056: Transaction number n,m. The external identifier follows this message.
```

This modification is reversed in IBM MQ 9.1.0, Fix Pack 6.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 4

User names in the CLNTUSER and USERLIST attributes are now case-sensitive

If your configuration is as follows, you need to alter some of your **CHLAUTH** rules, to correct the case of the user names in the **CLNTUSER** and **USERLIST** attributes:

- The queue manager is running on a Linux or UNIX platform.
- The queue manager is using LDAP as the source of user names. That is, you configured the queue manager's **CONNAUTH** to use an **AUTHINFO** object with TYPE (IDPWLDAP) and one of: **AUTHORMD (SEARCHGRP)** or **AUTHORMD (SEARCHUSR)**
- These user names provided by LDAP are uppercase, or mixed case.
- The queue manager has **CHLAUTH** rules of TYPE (USERMAP), and you provided user names in lowercase in the **CLNTUSER** attribute (as was mandatory before IBM MQ 9.1.0.4).
- The queue manager has **CHLAUTH** rules of TYPE (BLOCKUSER), and you provided user names in lowercase in the **USERLIST** attribute (as was mandatory before IBM MQ 9.1.0.4).

Some LDAP schemas are implemented such that the "short user name" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema).

Before this fix pack, the behavior of the queue manager on Linux and UNIX platforms was to fold short user names from their original case returned by LDAP to be all lowercase. However, if the LDAP field is case-sensitive, this behavior causes later interactions with the LDAP server to fail.

In this fix pack, in situations where LDAP is the definitive source of user information, APAR IT29065 changes this behavior and keeps short user names in their original case as returned by LDAP. However, this change affects the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). These will have been specified in all lowercase, which was required before the

APAR fix. If the true short user names coming from the LDAP repository are mixed case, or all uppercase, then the **CHLAUTH** rules no longer match correctly.

In IBM MQ 9.1.0, Fix Pack 5, APAR IT31578 allows user names in **CHLAUTH** rules to be matched case-insensitively. How to configure this option is described in a readme file entry for IBM MQ 9.1.0.5.

Limits of support for IBM MQ Explorer and RDQM on Red Hat and Ubuntu systems

IBM MQ Explorer and replicated data queue managers (RDQM) are not supported on version 8 of Red Hat Enterprise Linux for System x (64 bit) or Red Hat Enterprise Linux Server for IBM Z. IBM MQ Explorer is not supported on version 18.04 of Ubuntu Linux for System x (64 bit) or Ubuntu Linux for IBM Z.

Incompatibility between GSKit 8.0.55.3 and later, and the version 8 IBM JRE on AIX

This issue affects only AIX systems that are running an IBM MQ Java or JMS application that meets all of the following criteria:

- Not using the JRE supplied with IBM MQ
- Using a version 8 IBM JRE earlier than version 8.0 Service Refresh 5 Fix Pack 40
- Using a bindings mode connection to the queue manager
- Using AMS

The incompatibility is caused by an **IBMJCEP1us** name space change for GSKit, as described in JRE APAR IJ17282 (<https://www.ibm.com/support/docview.wss?uid=swg1IJ17282>).

If your system meets all these criteria, update your JRE to version 8.0 Service Refresh 5 Fix Pack 40 or later, or use the JRE supplied with the IBM MQ fix pack.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.0, FIX PACK 3 and earlier

There are no new limitations or known problems.

Limitations and known problems for Continuous Delivery releases

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.5

Channel names are blank in MQSC and IBM MQ Explorer after direct migration from IBM MQ 8.0.0.1, 8.0.0.2, or 8.0.0.3

When you migrate from IBM MQ 8.0.0 Fix Pack 1, 2 or 3 directly to IBM MQ 9.1.5 or later, channel objects are not migrated correctly when the queue manager is started at the new code level. Channels continue to work normally, but channel names are not displayed by **runmqsc** or IBM MQ Explorer.

Case-insensitive matching of user names in the CLNTUSER and USERLIST attributes

Some LDAP schemas are implemented such that the "short user name" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema). Before IBM MQ 9.1.4, the behavior of the queue manager on Linux and UNIX platforms was to fold short user names from their original case returned by LDAP to be all lowercase. In IBM MQ 9.1.4, in situations where LDAP is the definitive source of user information, APAR IT29065 changed this behavior and kept short user names in their original case as returned by LDAP. However, this change affected the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). This is described in more detail in a readme file entry for IBM MQ 9.1.4.

In IBM MQ 9.1.5, APAR IT31578 allows user names in **CHLAUTH** rules to be matched case-insensitively.

To enable the new behavior, add `ChlauthIgnoreUserCode=Y` in the Channels stanza of the `qm.ini` file. If there is no Channels stanza, you have to create one. Refer to IBM Documentation for details of adding stanzas to the `qm.ini` file.

To enable the new behavior on the IBM MQ Appliance, issue the following command, with your real queue manager name in the place of *YOUR-QMNAME*:

```
setmqini -m YOUR-QMNAME -s Channels -k ChlauthIgnoreUserCode -v Y
```

"failed to link" error message is issued when the updateRDQMSupport script is running

When the **updateRDQMSupport** script runs under IBM MQ 9.1.0.5, the following error message is issued:

```
failed to link /usr/bin/parallax-askpass -> /etc/alternatives/parallax-askpass:  
/usr/bin/parallax-askpass exists and it is not a symlink
```

The install scripts are trying to create a **symlink** in `/usr/bin/` to `/etc/alternatives/parallax-askpass`. The link fails because there is already a file called `/usr/bin/parallax-askpass` from the previous install, and this earlier version of the file is left in place. The contents of this file is not changed in the new version of the package, so this does not cause any problems and the error message can be ignored.

Issues when using RPM to verify the MQSeriesWeb package

When you run the verification with `rpm -V` after you install the product, verification failures are reported. They do not affect the integrity of the installed component.

This issue was discovered in the IBM MQ 9.1.5 timeframe, and affects all IBM MQ 9.1 versions. The issue is described in detail in the readme file section "LIMITATIONS AND KNOWN PROBLEMS FOR THE INITIAL IBM MQ 9.1.0 RELEASE"

GTK+ Messages issued by IBM MQ Explorer

In some Linux environments, messages from the GTK+ graphical user interface library might be seen in the UNIX console window from which IBM MQ Explorer was started. For example:

```
(:16073): Gtk-CRITICAL **: 17:09:00.159: gtk_box_gadget_distribute: assertion  
'size >= 0' failed in GtkScrollbar
```

These messages are caused by errors in the gtk3 libraries, and do not cause any functional failures in IBM MQ Explorer itself.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.4

User names in the CLNTUSER and USERLIST attributes are now case-sensitive

If your configuration is as follows, you need to alter some of your **CHLAUTH** rules, to correct the case of the user names in the **CLNTUSER** and **USERLIST** attributes:

- The queue manager is running on a Linux or UNIX platform.
- The queue manager is using LDAP as the source of user names. That is, you configured the queue manager's **CONNAUTH** to use an **AUTHINFO** object with TYPE (IDPWLDP) and one of: AUTHORMD (SEARCHGRP) or AUTHORMD (SEARCHUSR).
- These user names provided by LDAP are uppercase, or mixed case.
- The queue manager has **CHLAUTH** rules of TYPE (USERMAP), and you provided user names in lowercase in the **CLNTUSER** attribute (as was mandatory before IBM MQ 9.1.4).
- The queue manager has **CHLAUTH** rules of TYPE (BLOCKUSER), and you provided user names in lowercase in the **USERLIST** attribute (as was mandatory before IBM MQ 9.1.4).

Some LDAP schemas are implemented such that the "short user name" for the connection comes from a field that is case-sensitive for lookups (configured this way in the LDAP schema).

Before this release, the behavior of the queue manager on Linux and UNIX platforms was to fold short user names from their original case returned by LDAP to be all lowercase. However, if the LDAP field is case-sensitive, this behavior causes later interactions with the LDAP server to fail.

In this release, in situations where LDAP is the definitive source of user information, APAR IT29065 changes this behavior and keeps short user names in their original case as returned by LDAP. However, this change affects the operation of the **CHLAUTH** rules of TYPE (USERMAP) and TYPE (BLOCKUSER). These will have been specified in all lowercase, which was required before the APAR fix. If the true short user names coming from the LDAP repository are mixed case, or all uppercase, then the **CHLAUTH** rules no longer match correctly.

In IBM MQ 9.1.5, APAR IT31578 allows user names in **CHLAUTH** rules to be matched case-insensitively. How to configure this option is described in a readme file entry for IBM MQ 9.1.5.

Limits of support for IBM MQ Explorer and RDQM on Red Hat and Ubuntu systems

IBM MQ Explorer and replicated data queue managers (RDQM) are not supported on version 8 of Red Hat Enterprise Linux for System x (64 bit) or Red Hat Enterprise Linux Server for IBM Z. IBM MQ Explorer is not supported on version 18.04 of Ubuntu Linux for System x (64 bit) or Ubuntu Linux for IBM Z.

Incompatibility between GSKit 8.0.55.3 and later, and the version 8 IBM JRE on AIX

This issue affects only AIX systems that are running an IBM MQ Java or JMS application that meets all of the following criteria:

- Not using the JRE supplied with IBM MQ
- Using a version 8 IBM JRE earlier than version 8.0 Service Refresh 5 Fix Pack 40
- Using a bindings mode connection to the queue manager
- Using AMS

The incompatibility is caused by an **IBMJCEP1us** name space change for GSKit, as described in JRE APAR IJ17282 (<https://www.ibm.com/support/docview.wss?uid=swg1IJ17282>).

If your system meets all these criteria, update your JRE to version 8.0 Service Refresh 5 Fix Pack 40 or later, or use the JRE supplied with IBM MQ 9.1.4.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.1.3 and earlier

There are no new limitations or known problems.

Limitations and known problems for the initial IBM MQ 9.1.0 release

Issues when using RPM to verify the MQSeriesWeb package

This applies to the full product media, rather than the fix pack installer.

When you run the verification with `rpm -V` after you install the product, you get the following messages:

```
# rpm -Vp MQSeriesWeb-9.1.0-0.x86_64.rpm
S.5...T. /opt/mqm/bin/dspmweb
S.5...T. /opt/mqm/bin/endmqweb
S.5...T. /opt/mqm/bin/setmqweb
S.5...T. /opt/mqm/bin/stmqweb
S.5...T. /opt/mqm/web/etc/server.env
```

These specific verification failures are caused by the need to modify these files during installation, based on the detected environment. They do not affect the integrity of the installed component.

For traditional Chinese, the IBM MQ Explorer MFT plug-in displays an "assertion failed" error message

For the traditional Chinese locale `zh_TW`, when using the Managed File Transfer (MFT) plug-in to monitor file transfers using the Transfer Progress view, the IBM MQ Explorer continually displays an error message with the following text:

```
assertion failed: Column 7 has no label provider.
```

This error was introduced when an update to the traditional Chinese translation for the title of Column 7 ("Started", in English) was not also applied to a control file used by the MFT plug-in.

This issue is fixed in IBM MQ 9.1.3, and in IBM MQ 9.1.0, Fix Pack 3, by APAR IT28289.

This issue can also be resolved by applying either of the following local fixes.

Local Fix Method One:

1. Temporarily open the IBM MQ Explorer in a different language and locale.

One way to do this is to configure the Java system properties **user.language** and **user.region**. You do this for the IBM MQ Explorer by opening the `MQExplorer.ini` file located in the `/bin` directory of the IBM MQ installation, and adding these entries to the end of the file after the following line:

```
-vmargs
```

For example, to open the IBM MQ Explorer in US English, add the following lines to the `MQExplorer.ini` file:

```
-Duser.language=en  
-Duser.region=US
```

The end of the file now looks similar to the following example:

```
-vmargs  
-Xmx512M  
-Duser.language=en  
-Duser.region=US
```

Save and close the file.

2. In the new locale:
 - a. Open IBM MQ Explorer.
 - b. Connect to the MFT configuration.
 - c. Open the Transfer Log page listed under the MFT configuration.
 - d. Ensure the "Current Transfer Progress" view is also displayed. It is, by default, located directly beneath the Transfer Log content view.
3. Close IBM MQ Explorer then reopen it in the `zh_TW` locale. If `zh_TW` is your system locale, remove the specific **user.language** and **user.region** system properties from the `MQExplorer.ini` file.

Local Fix Method Two:

1. Close IBM MQ Explorer.
2. Open the `dialog_settings.xml` file from the IBM MQ Explorer workspace. This is located in a directory similar to the following:

[on Linux]

```
/home/user1/IBM/WebSphereMQ/workspace-Installation1/.metadata/.plugins/  
com.ibm.wmqfte.explorer
```

[on Windows]

```
C:\Users\Administrator\IBM\WebSphereMQ\workspace-  
Installation1\.metadata\.plugins\com.ibm.wmqfte.explorer\
```

3. Delete any one of the items listed under the following XML entry for "COLUMNS", so that the list contains seven items, rather than the original eight.

```
<section name="TRANSFER_PROGRESS_VIEW_SETTINGS">  
  <item value="zh" key="LOCALE"/>  
  <list key="COLUMNS">  
    <!-- Delete any one of the items here -->  
  </list>
```

For example, delete the first item in the list for "COLUMNS":

```
<item value="" />
```

4. Save and close the file.
5. Restart IBM MQ Explorer.

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IBM MQ 9.1 Quick Start Guide (Long Term Support)

Use this guide to get started with IBM MQ 9.1.

National Language Version:

To obtain the Quick Start Guide in other languages, print the language-specific PDF from the Quick Start DVD.

Product overview

IBM MQ is robust messaging middleware that simplifies and accelerates the integration of diverse applications and business data across multiple platforms. IBM MQ facilitates the assured, secure and reliable exchange of information between applications, systems, services and files by sending and receiving message data via messaging queues, thereby simplifying the creation and maintenance of business applications. It delivers Universal Messaging with a broad set of offerings to meet enterprise-wide messaging needs, and can be deployed across a range of different environments including on-premise, in cloud environments and supporting hybrid cloud deployments.

IBM MQ supports a number of different application programming interfaces (APIs) including Message Queue Interface (MQI), Java Message Service (JMS), .NET, IBM MQ Light and MQTT, and the messaging REST API.

Access the software and documentation

This product offering includes the following items:

- A Quick Start DVD that contains this Quick Start Guide in US English and other national languages.
- For each supported platform, a DVD that contains the code for runtime components and other required products.

If you download your product from IBM Passport Advantage, see [Downloading IBM MQ 9.1](https://www.ibm.com/support/pages/downloading-ibm-mq-91). (<https://www.ibm.com/support/pages/downloading-ibm-mq-91>) and the [Passport Advantage and Passport Advantage Express](https://www.ibm.com/software/passportadvantage/) (<https://www.ibm.com/software/passportadvantage/>) website for more information.

Product documentation for all supported versions of IBM MQ is available through [IBM Knowledge Center](https://www.ibm.com/docs/SSFKSJ) (<https://www.ibm.com/docs/SSFKSJ>). Specifically, the IBM MQ 9.1 product documentation is also available in [IBM Knowledge Center](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/WelcomePagev9r1.html) (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/WelcomePagev9r1.html).

Service and support information is provided in the documentation.

Information about how to use MQ Explorer can be accessed either from within MQ Explorer or in the product documentation.

Evaluate the hardware and system requirements

For details of hardware and software requirements on all supported platforms, see the [System Requirements](https://www.ibm.com/support/pages/node/318077) web page (<https://www.ibm.com/support/pages/node/318077>).

Review the installation architecture

IBM MQ architectures range from simple architectures that use a single queue manager, to more complex networks of interconnected queue managers. For more information about planning your IBM MQ architecture, see the [Planning section](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pla.doc/q004690_.html) of the product documentation in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pla.doc/q004690_.html).

For links to additional information, see the [IBM MQ information roadmap](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pro.doc/q123810_.html) in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pro.doc/q123810_.html).

Install the product

For installation instructions for IBM MQ on all supported platforms, and for details of the hardware and software configurations that are required, see the [Installing section](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.ins.doc/q008250_.html) of the product documentation in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.ins.doc/q008250_.html).

Get started

The *Getting Started* scenario in the [Scenarios section](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.sce.doc/q004360_.html) of the product documentation in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.sce.doc/q004360_.html) explains how to

get started with IBM MQ on Windows. Use this scenario if you have not used IBM MQ before and want to get started quickly.

Further scenarios help you to configure or use product features by taking you through the appropriate task steps. The scenarios include links to other content that helps you to gain a better understanding of the area in which you are interested.

More information

For more information about IBM MQ, see the following resources:

IBM FAQ for Long Term Support and Continuous Delivery releases

From IBM MQ 9.0, IBM MQ introduced a Continuous Delivery (CD) support model. Following the initial release of a new version, new function and enhancements are made available by incremental updates within the same version and release. There is also a Long Term Support release available for deployments that require security and defect fixes only. For more information, see [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](https://www.ibm.com/support/pages/node/713169) (<https://www.ibm.com/support/pages/node/713169>).

Online product readme file

The latest version of the online product readme file is available on the [IBM MQ product readmes web page](https://www.ibm.com/support/pages/node/317955) (<https://www.ibm.com/support/pages/node/317955>).

IBM Support information

Support information includes the following resources:

- [IBM Support web page](https://www.ibm.com/support/home/) (<https://www.ibm.com/support/home/>)
- [IBM Support Assistant](https://www.ibm.com/support/home/product/C100515X13178X21/other_software/ibm_support_assistant) (https://www.ibm.com/support/home/product/C100515X13178X21/other_software/ibm_support_assistant)
- [Social Media Channels within Cloud Technical Support](https://www.ibm.com/support/pages/node/131651) (<https://www.ibm.com/support/pages/node/131651>)

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IBM MQ 9.1.x Quick Start Guide (Continuous Delivery)

Use this guide to get started with IBM MQ 9.1.x Continuous Delivery.

National Language Version

The Quick Start Guide is available in other languages from the Quick Start Guide eImage.

Product overview

IBM MQ is robust messaging middleware that simplifies and accelerates the integration of diverse applications and business data across multiple platforms. IBM MQ facilitates the assured, secure and reliable exchange of information between applications, systems, services and files by sending and

receiving message data via messaging queues, thereby simplifying the creation and maintenance of business applications. It delivers Universal Messaging with a broad set of offerings to meet enterprise-wide messaging needs, and can be deployed across a range of different environments including on-premise, in cloud environments and supporting hybrid cloud deployments.

IBM MQ supports a number of different application programming interfaces (APIs) including Message Queue Interface (MQI), Java Message Service (JMS), .NET, IBM MQ Light, MQTT, and the messaging REST API.

Access the software and documentation

For distributed platforms, this product offering provides the following items, which are available from IBM Passport Advantage:

- Server and Trial eAssemblies for the full release on all supported platforms. The eImages that make up the full release can be downloaded individually if you do not need the full release. For more information, see [Downloading IBM MQ 9.1](https://www.ibm.com/support/pages/downloading-ibm-mq-91). (<https://www.ibm.com/support/pages/downloading-ibm-mq-91>).
- A Quick Start Guide eImage. A Quick Start Guide PDF file can also be downloaded from https://public.dhe.ibm.com/software/integration/wmq/docs/V9.1/QuickStartGuide/mq91cdr_qsg_en.pdf). Alternatively, the Quick Start Guide is available in HTML format from [IBM Knowledge Center](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/mq91cdr_qsg_en.html) (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/mq91cdr_qsg_en.html).

For more information about downloading the product IBM Passport Advantage, see [Downloading IBM MQ 9.1](https://www.ibm.com/support/pages/node/317001). (<https://www.ibm.com/support/pages/node/317001>) and the [Passport Advantage and Passport Advantage Express](https://www.ibm.com/software/passportadvantage/) (<https://www.ibm.com/software/passportadvantage/>) website for more information.

Product documentation for all supported versions of IBM MQ is available through [IBM Knowledge Center](https://www.ibm.com/docs/SSFKSJ) (<https://www.ibm.com/docs/SSFKSJ>). Specifically, the documentation for IBM MQ 9.1.x Continuous Delivery releases is published as part of the [IBM MQ 9.1.x product documentation](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/WelcomePagev9r1.html) (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/WelcomePagev9r1.html) in IBM Knowledge Center.

Service and support information is provided in the documentation.

Information about how to use MQ Explorer can be accessed either from within MQ Explorer or in the product documentation.

Evaluate the hardware and system requirements

For details of hardware and software requirements on all supported platforms, see the [System Requirements](https://www.ibm.com/support/pages/node/318077) web page (<https://www.ibm.com/support/pages/node/318077>).

Review the installation architecture

IBM MQ architectures range from simple architectures that use a single queue manager, to more complex networks of interconnected queue managers. For more information about planning your IBM MQ architecture, see the [Planning](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pla.doc/q004690_.html) section of the product documentation in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pla.doc/q004690_.html).

For links to additional information, see the [IBM MQ information roadmap](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pro.doc/q123810_.html) in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.pro.doc/q123810_.html).

Install the product

For installation instructions for IBM MQ on all supported platforms, and for details of the hardware and software configurations that are required, see the [Installing](https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.ins.doc/q008250_.html) section of the product documentation in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.ins.doc/q008250_.html).

Get started

The *Getting Started* scenario in the Scenarios section of the product documentation in IBM Knowledge Center (https://www.ibm.com/docs/SSFKSJ_9.1.0/com.ibm.mq.sce.doc/q004360_.html) explains how to get started with IBM MQ on Microsoft Windows. Use this scenario if you have not used IBM MQ before and want to get started quickly.

For more tutorials to help you get started with IBM MQ, see [Learning IBM MQ](#) on the IBM Developer website.

More information

For more information about IBM MQ, see the following resources:

IBM FAQ for Long Term Support and Continuous Delivery releases

From IBM MQ 9.0, IBM MQ introduced a Continuous Delivery (CD) support model. Following the initial release of a new version, new function and enhancements are made available by incremental updates within the same version and release. There is also a Long Term Support release available for deployments that require security and defect fixes only. For more information, see [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](https://www.ibm.com/support/pages/node/713169) (<https://www.ibm.com/support/pages/node/713169>).

Online product readme file

The latest version of the online product readme file is available on the [IBM MQ product readmes web page](https://www.ibm.com/support/pages/node/317955) (<https://www.ibm.com/support/pages/node/317955>).

IBM Support information

Support information includes the following resources:

- [IBM Support web page](https://www.ibm.com/support/home/) (<https://www.ibm.com/support/home/>)
- [IBM Support Assistant](https://www.ibm.com/support/home/product/C100515X13178X21/other_software/ibm_support_assistant) (https://www.ibm.com/support/home/product/C100515X13178X21/other_software/ibm_support_assistant)
- [Social Media Channels within Hybrid Cloud Technical Support](https://www.ibm.com/support/pages/node/131651) (<https://www.ibm.com/support/pages/node/131651>)

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IBM MQ 9.1 information roadmap

This roadmap provides two sets of maps that help you navigate particular aspects of IBM MQ 9.1. There is a map for each product-level task (for example Installing; Securing; Configuring; Troubleshooting), and a map for each product feature (for example Managed File Transfer; Internet Pass-Thru; Aspera gateway).

For product-level tasks, click the following links to see what resources are available. For product features, click the subtopic links at the end of this roadmap.

- [Product overview](#)
- [Technical overview](#)

- [Scenarios](#)
- [Planning](#)
- [Migrating and upgrading](#)
- [Installing](#)
- [Security](#)
- [Configuring](#)
- [Administering](#)
- [Developing applications](#)
- [Monitoring and performance](#)
- [Troubleshooting and support](#)
- [Reference](#)

Table 6. IBM MQ information roadmap for product-level categories






Category	Information resources
About IBM MQ	<p>Overview of the overall purpose, capabilities, and new features of IBM MQ.</p> <p> “About IBM MQ” on page 5 Introductory information to help you get started with IBM MQ 9.1, including an introduction to the product and an overview of what is new and what is changed for this version of the product.</p> <p>LearnMQ on the IBM Developer website Tutorials to help you get started with IBM MQ.</p> <p>IBM MQ product web page Product web page with links to resources and additional information.</p> <p>IBM MQ system requirements Web page with links to the system requirements for the different releases of IBM MQ.</p> <p>“IBM MQ 9.1 in the IBM Documentation Offline app” on page 191 You can download IBM MQ 9.1 messaging documentation into an offline version of IBM Documentation that you install locally.</p> <p>IBM MQ 9.1 PDF documentation You can download IBM MQ 9.1 product documentation as a series of PDF files.</p>
Technical overview	<p> IBM MQ Technical overview</p> <p>Information to help you to find out about message queuing and other features that IBM MQ provides.</p>
Scenarios	<p>Each scenario takes you through a significant set of tasks, and helps you to configure a major product feature. The scenarios include useful links to other content to help you to gain a better understanding of the area in which you are interested. The <i>Getting started</i> scenario explains how to get started with IBM MQ. Use this scenario if you have not used IBM MQ before and want to get started quickly. Further scenarios help you to configure or use product features by taking you through the appropriate task steps.</p>
Planning	<p> Planning</p> <p>When planning your IBM MQ environment, consider the support that IBM MQ provides for single and multiple queue manager architectures, and for point-to-point and publish/subscribe messaging styles. Also plan your resource requirements, and your use of logging and backup facilities.</p>

Table 6. IBM MQ information roadmap for product-level categories (continued)

Category	Information resources
Migrating and upgrading	<p>❄ <u>Maintaining and migrating</u> Migration is the process of updating queue managers, and other objects, such as applications or administrative procedures. To migrate a queue manager to run on a new level of code, you must first upgrade IBM MQ to install the new code level. When you have verified that the upgrade is successful, migrate the queue manager and all the applications and resources that are associated with it. Before you start this process, create a migration plan, based on the information in this documentation.</p> <p>► Multi</p> <p><u>IBM WebSphere MQ / IBM MQ Migration Guide</u> This guide provides information to help you plan the process of migrating from an older version to a new version of IBM MQ for Multiplatforms. You can either view the guide in your web browser or download it as a PDF file.</p> <p>► z/OS</p> <p><u>IBM WebSphere MQ / IBM MQ for z/OS Migration Guide</u> This guide provides information to help you plan the process of migrating from an older version to a new version on z/OS. You can either view the guide in your web browser or download it as a PDF file.</p>
Installing	<p>❄ <u>Installing and uninstalling</u> Information to help you to prepare for installation, install the product, and verify the installation. There is also information to help you to uninstall the product.</p>
Security	<p>❄ <u>Securing</u> Aspects of security to consider in your IBM MQ installation including identification and authentication, authorization, auditing, confidentiality, and data integrity.</p>
Configuring	<p>❄ <u>Configuring</u> Create one or more queue managers on one or more computers, and configure them and their related resources on your development, test, and production systems to process messages that contain your business data.</p>
Administering	<p>❄ <u>Administering IBM MQ</u> Administer your queue managers and associated resources.</p>
Developing applications	<p>❄ <u>Developing applications</u> Develop applications to send and receive messages, and to manage your queue managers and related resources. IBM MQ support applications written in procedural languages, and object oriented languages and frameworks.</p>
Monitoring and performance	<p>❄ <u>Monitoring and performance</u> Monitoring information and guidance to help improve the performance of your queue manager network and tuning tips to help improve the performance of your queue manager network.</p>

Table 6. IBM MQ information roadmap for product-level categories (continued)

Category	Information resources
Troubleshooting and support	<p> <u>Troubleshooting and support</u> Techniques to help you diagnose and solve problems with your queue manager network or IBM MQ applications.</p> <p><u>IBM Support Assistant web page</u> The IBM Support Assistant (ISA) helps you to resolve questions and problems with IBM software products by providing access to support-related information and troubleshooting tools.</p> <p><u>IBM Support Portal web page</u> IBM Support Portal for IBM MQ.</p> <p><u>IBM Support Forums</u> Search for "MQ".</p>
Reference	<p> <u>Reference</u> Reference information for configuration, administration, developing applications, telemetry, security, monitoring, troubleshooting and support, and diagnostic messages.</p>

Linux

MQ Adv.

MQ Adv. VUE

Aspera gateway roadmap

This roadmap provides a clickable index to the Aspera gateway topics in this documentation set. The aim is to help you find all topics that describe this feature, no matter how scattered those topics are across the product-level tasks in the IBM Documentation main navigation tree.

Aspera gateway-specific topics in the IBM MQ documentation:

- [Defining an Aspera gateway connection on Linux](#)
- [Aspera gateway can improve performance over high latency networks](#)

Full Aspera gateway information is in a separate collection in IBM Documentation:

- [IBM Aspera fasp.io Gateway V1.0.0 documentation](#)

All the following IBM MQ topics refer to the Aspera gateway, and link to [Defining an Aspera gateway connection on Linux](#):

- [Which communication type to use](#)
- [Message channel planning example for UNIX, Linux, and Windows](#)
- [Message channel planning example for IBM i](#)
- [Message channel planning example for z/OS](#)
- [Setting up communication on UNIX and Linux](#)
- [Setting up communication on Windows](#)
- [Setting up communication for IBM i](#)
- [Setting up communication for z/OS](#)
- [Defining a TCP connection on Windows](#)
- [Defining a TCP connection on UNIX and Linux](#)
- [Defining a TCP connection on IBM i](#)
- [Defining a TCP connection on z/OS](#)

IBM MQ Internet Pass-Thru roadmap

This roadmap provides a clickable index to the IBM MQ Internet Pass-Thru topics in this documentation set. The aim is to help you find all topics that describe this feature, no matter how scattered those topics are across the product-level tasks in the IBM Documentation main navigation tree.

- About IBM MQ
 - [“IBM MQ license information” on page 8](#) (entitlement for installing IBM MQ Internet Pass-Thru)
- Technical overview
 - [IBM MQ Internet Pass-Thru](#) (and subtopics)
- Scenarios
 - [Getting started with IBM MQ Internet Pass-Thru](#) (and subtopics)
- Maintaining and migrating
 - [Migrating IBM MQ Internet Pass-Thru](#)
- Installing and uninstalling
 - [Installing and uninstalling IBM MQ Internet Pass-Thru](#) (and subtopics)
- Securing
 - Planning for your security requirements
 - [Firewalls and Internet pass-thru](#) (and subtopics)
- Configuring
 - [Configuring IBM MQ Internet Pass-Thru](#) (and subtopics)
- Administering
 - [Administering and configuring IBM MQ Internet Pass-Thru](#) (and subtopics)
- Troubleshooting and support
 - [Troubleshooting IBM MQ Internet Pass-Thru](#) (and subtopics)
- Reference
 - Configuration reference
 - [IBM MQ Internet Pass-Thru configuration reference](#) (and subtopics)
 - Administration reference
 - [IBM MQ Internet Pass-Thru commands reference](#) (and subtopics)
 - Messages
 - [IBM MQ Internet Pass-Thru messages](#) (and subtopics)

Managed File Transfer roadmap

This roadmap provides a clickable index to the Managed File Transfer topics in this documentation set. The aim is to help you find all topics that describe this feature, no matter how scattered those topics are across the product-level tasks in the IBM Documentation main navigation tree.

- About IBM MQ
 - [“IBM MQ license information” on page 8](#) (entitlement for installing Managed File Transfer)
- Technical overview
 - [Managed File Transfer for z/OS](#) (and subtopics)
- Scenarios
 - [Managed File Transfer scenario](#) (and subtopics)
- Maintaining and migrating

- Migrating IBM MQ
 - Changes that affect migration
 - [Considerations when migrating from FTE to MFT](#)
 - [Migrating an FTE V7.0 database logger to MQ V7.5 or later](#)
 - [Migrating MFT: Increasing the log db page size for Db2 on UNIX, Linux, and Windows](#)
 - [Migrating Managed File Transfer agents from an earlier version](#)
 - [Migrating MFT to a new machine with a different operating system](#)
- Installing and uninstalling
 - Installing IBM MQ Advanced for Multiplatforms
 - [Installing Managed File Transfer \(and subtopics\)](#)
 - Installing IBM MQ Advanced for z/OS
 - [Installing Managed File Transfer for z/OS](#)
- Securing
 - [Securing Managed File Transfer \(and subtopics\)](#)
- Configuring
 - [Configuring Managed File Transfer \(and subtopics\)](#)
- Administering
 - [Administering Managed File Transfer \(and subtopics\)](#)
- Developing applications
 - [Developing applications for Managed File Transfer \(and subtopics\)](#)
- Troubleshooting and support
 - [Troubleshooting Managed File Transfer \(and subtopics\)](#)
- Reference
 - Configuration reference
 - [Managed File Transfer configuration reference \(and subtopics\)](#)
 - Administration reference
 - [Managed File Transfer administration reference \(and subtopics\)](#)
 - The topic [Tracing MFT commands](#) has been moved from the Troubleshooting and Support section of the documentation.
 - Developing applications reference
 - [Managed File Transfer developing applications reference \(and subtopics\)](#)
 - Security reference
 - [Managed File Transfer security reference \(and subtopics\)](#)
 - Messages
 - [MFT messages \(and subtopics\)](#)

IBM MQ Telemetry roadmap

This roadmap provides a clickable index to the MQ Telemetry topics in this documentation set. The aim is to help you find all topics that describe this feature, no matter how scattered those topics are across the product-level tasks in the IBM Documentation main navigation tree.

- About IBM MQ
 - [“IBM MQ license information” on page 8 \(entitlement for installing MQ Telemetry\)](#)

- Technical overview
 - [MQ Telemetry overview](#) (and subtopics)
- Installing and uninstalling
 - Installing IBM MQ Advanced for Multiplatforms
 - [Installing MQ Telemetry](#) (and subtopics)
- Administering
 - [Administering MQ Telemetry](#) (and subtopics)
- Developing applications
 - [Developing applications for MQ Telemetry](#) (and subtopics)
- Troubleshooting and support
 - [MQ Telemetry troubleshooting](#) (and subtopics)
- Reference
 - Administration reference
 - MQSC commands
 - [ALTER CHANNEL \(MQTT\)](#)
 - [DEFINE CHANNEL \(MQTT\)](#)
 - [DELETE CHANNEL \(MQTT\)](#)
 - [DISPLAY CHANNEL \(MQTT\)](#)
 - [DISPLAY CHSTATUS \(MQTT\)](#)
 - [START CHANNEL \(MQTT\)](#)
 - [STOP CHANNEL \(MQTT\)](#)
 - Programmable command formats reference
 - Definitions of the Programmable Command Formats
 - [Change, Copy, and Create Channel \(MQTT\)](#)
 - [Delete Channel \(MQTT\)](#)
 - [Inquire Channel \(MQTT\)](#)
 - [Inquire Channel Status \(MQTT\)](#)
 - [Inquire Channel Status \(Response\) \(MQTT\)](#)
 - [Start Channel \(MQTT\)](#)
 - [Stop Channel \(MQTT\)](#)
 - [MQ Telemetry Reference](#) (and subtopics)
 - Messages
 - [Telemetry messages](#)

IBM MQ 9.1 in the IBM Documentation Offline app

If you are in an airgap environment without access to the internet, use our Dark Shop app "IBM Documentation Offline" to view downloads of the IBM MQ 9.1 product documentation.

IBM Documentation Offline has two components:

- **The IBM Documentation Offline app.** This is a locally-installable offline version of IBM Documentation.
- **The documentation packages that you install into the IBM Documentation Offline app.** These packages contain the same documentation as is published online in IBM Documentation.

To download the app, and the IBM MQ 9.1 documentation package, you need to log in to IBM Documentation. For more information, see [IBM Documentation Offline](#).

IBM MQ 9.1 PDF files for product documentation and Program Directories

You can download the IBM MQ 9.1 product documentation, and the IBM MQ for z/OS Program Directories, in PDF format.

IBM MQ 9.1 product documentation PDF files

The IBM MQ 9.1 PDF files contain the same information as the HTML version published in IBM Documentation. You can download them by clicking the links in the following table.

Note: You can also download the IBM MQ 9.1 product documentation in HTML format into an offline version of IBM Documentation that you install locally. For more information, see [“IBM MQ 9.1 in the IBM Documentation Offline app”](#) on page 191.





PDF file name and download link	Equivalent section in IBM Documentation
mq91_readme_en.pdf Translations of this readme file are available to download here .	Readme for IBM MQ 9.1 and its maintenance
 mq91_qsg_en.pdf Translations of this Quick Start Guide are available to download here .	IBM MQ 9.1.0 Quick Start Guide (Long Term Support)
 mq91cdr_qsg_en.pdf Translations of this Quick Start Guide are available to download here .	IBM MQ 9.1.0 Quick Start Guide (Continuous Delivery)
mq91.overview.pdf	About IBM MQ Technical overview Scenarios
mq91.plan.pdf	Planning for IBM MQ
mq91.migrate.pdf	Maintaining and migrating IBM MQ
mq91.install.pdf	Installing and uninstalling IBM MQ
mq91.secure.pdf	Securing IBM MQ
mq91.configure.pdf	Configuring IBM MQ
mq91.administer.pdf	Administering IBM MQ
mq91.develop.pdf	Developing applications for IBM MQ
mq91.monitor.pdf	Monitoring and performance for IBM MQ
mq91.troubleshoot.pdf	Troubleshooting and support for IBM MQ
mq91.reference.pdf	IBM MQ Reference
mq91.refcon.pdf	IBM MQ Configuration reference

Table 7. PDF files for the product documentation and how they correspond to the product documentation sections in IBM Documentation (continued)

PDF file name and download link	Equivalent section in IBM Documentation
mq91.refadmin.pdf	IBM MQ Administration reference
mq91.refdev.pdf	IBM MQ Developing applications reference
mq91.explorer.pdf	IBM MQ Explorer
mq91.guiwizard.pdf	IBM MQ GUI Wizard help
mq91.container.pdf	IBM MQ in containers
 MQ_Migration_Guide.pdf	IBM WebSphere MQ / IBM MQ Migration Guide
 WMQ_zOS_Migration.pdf	IBM WebSphere MQ / IBM MQ for z/OS Migration Guide

Note: The PDF files must be in the same folder for links between PDF files to function correctly.

IBM MQ for z/OS Program Directory PDF files



The following IBM MQ for z/OS 9.1.0 Program Directory documents for Long Term Support are available for download as PDF files:

- [Program directory for IBM MQ for z/OS Long Term Support V9.1.0 \(GI13-4418-00\)](#)
- [Program directory for IBM MQ for z/OS Value Unit Edition Long Term Support V9.1.0 \(GI13-4419-00\)](#)
- [Program directory for IBM MQ for z/OS Advanced Message Security Long Term Support V9.1.0 \(GI13-4420-00\)](#)
- [Program directory for IBM MQ for z/OS Managed File Transfer Long Term Support V9.1.0 \(GI13-4421-00\)](#)
- [Program directory for IBM MQ Advanced for z/OS Long Term Support V9.1.0 \(GI13-4422-00\)](#)
- [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Long Term Support V9.1.0 \(GI13-4423-00\)](#)



The following IBM MQ for z/OS 9.1.x Program Directory documents for Continuous Delivery are available for download as PDF files:

- Program directory for IBM MQ for z/OS Continuous Delivery V9.1.x
 - [Program directory for IBM MQ for z/OS Continuous Delivery V9.1.1 \(GI13-4424-00\)](#)
 - [Program directory for IBM MQ for z/OS Continuous Delivery V9.1.2 \(GI13-4424-01\)](#)
 - [Program directory for IBM MQ for z/OS Continuous Delivery V9.1.3 \(GI13-4424-02\)](#)
 - [Program directory for IBM MQ for z/OS Continuous Delivery V9.1.4 \(GI13-4424-03\)](#)
 - [Program directory for IBM MQ for z/OS Continuous Delivery V9.1.5 \(GI13-4424-04\)](#)
- Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery V9.1.x
 - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery V9.1.1 \(GI13-4425-00\)](#)
 - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery V9.1.2 \(GI13-4425-01\)](#)
 - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery V9.1.3 \(GI13-4425-02\)](#)

- [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery V9.1.4 \(GI13-4425-03\)](#)
- [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery V9.1.5 \(GI13-4425-04\)](#)
- Program directory for IBM MQ Advanced for z/OS Continuous Delivery V9.1.x
 - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery V9.1.1 \(GI13-4428-00\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery V9.1.2 \(GI13-4428-01\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery V9.1.3 \(GI13-4428-02\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery V9.1.4 \(GI13-4428-03\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery V9.1.5 \(GI13-4428-05\)](#)
- Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery V9.1.x
 - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery V9.1.1 \(GI13-4429-00\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery V9.1.2 \(GI13-4429-01\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery V9.1.3 \(GI13-4429-02\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery V9.1.4 \(GI13-4429-03\)](#)
 - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery V9.1.5 \(GI13-4429-04\)](#)

Glossary

This glossary provides terms and definitions for the IBM MQ software and products.

The following cross-references are used in this glossary:

- *See* refers you from a nonpreferred term to the preferred term or from an abbreviation to the spelled-out form.
- *See also* refers you to a related or contrasting term.

[“A” on page 194](#) [“B” on page 197](#) [“C” on page 198](#) [“D” on page 203](#) [“E” on page 205](#) [“F” on page 206](#) [“G” on page 207](#) [“H” on page 208](#) [“I” on page 208](#) [“J” on page 211](#) [“K” on page 212](#) [“L” on page 212](#) [“M” on page 214](#) [“N” on page 218](#) [“O” on page 219](#) [“P” on page 220](#) [“Q” on page 223](#) [“R” on page 224](#) [“S” on page 227](#) [“T” on page 232](#) [“U” on page 234](#) [“V” on page 235](#) [“W” on page 235](#) [“X” on page 235](#)

A

abend reason code

A 4-byte hexadecimal code that uniquely identifies a problem with a program that runs on the z/OS operating system.

abstract class

In object-oriented programming, a class that represents a concept; classes derived from it represent implementations of the concept. An object cannot be constructed from an abstract class; that is, it cannot be instantiated. See also [parent class](#).

Abstract Syntax Notation One (ASN.1)

The international standard for defining the syntax of information data. It defines a number of simple data types and specifies a notation for referencing these types and for specifying values of these types. The ASN.1 notations can be applied whenever it is necessary to define the abstract syntax of information without constraining in any way how the information is encoded for transmission.

access control

In computer security, the process of ensuring that users can access only those resources of a computer system for which they are authorized.

access control list (ACL)

In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights.

ACL

See [access control list](#).

active log

A data set with a fixed size where recovery events are recorded as they occur. When the active log is full, the contents of the active log are copied to the archive log.

active queue manager instance

The instance of a running multi-instance queue manager that is processing requests. There is only one active instance of a multi-instance queue manager.

adapter

An intermediary software component that allows two other software components to communicate with one another.

address space

The range of addresses available to a computer program or process. Address space can refer to physical storage, virtual storage, or both. See also [allied address space](#), [buffer pool](#).

administration bag

In the IBM MQ Administration Interface (MQAI), a type of data bag that is created for administering IBM MQ by implying that it can change the order of data items, create lists, and check selectors within a message.

administrative topic object

An object that allows you to assign specific, non-default attributes to topics.

administrator command

A command used to manage IBM MQ objects, such as queues, processes, and namelists.

Advanced Message Queuing Protocol (AMQP)

An open-source wire protocol that is used to receive, queue, route, and deliver messages.

Advanced Program-to-Program Communication (APPC)

An implementation of the SNA LU 6.2 protocol that allows interconnected systems to communicate and share the processing of programs.

affinity

An association between objects that have some relationship or dependency upon each other.

alert

A message or other indication that signals an event or an impending event that meets a set of specified criteria.

alert monitor

In IBM MQ for z/OS, a component of the CICS adapter that handles unscheduled events occurring as a result of connection requests to IBM MQ for z/OS.

alias queue

An IBM MQ object, the name of which is an alias for a base queue or topic that is defined to the local queue manager. When an application or a queue manager uses an alias queue, the alias name is resolved and the requested operation is performed on the associated base object. For further information, see the topic [Alias queues](#).

alias queue object

An IBM MQ object, the name of which is an alias for a base queue defined to the local queue manager. When an application or a queue manager uses an alias queue, the alias name is resolved and the requested operation is performed on the associated base queue.

allied address space

A z/OS address space that is connected to IBM MQ for z/OS.

ally

See [allied address space](#).

alternate user authority

The ability of a user ID to supply a different user ID for security checks. When an application opens an IBM MQ object, it can supply a user ID on the MQOPEN, MQPUT1, or MQSUB call that the queue manager uses for authority checks instead of the one associated with the application. For further information, see the topic [Alternate user authority](#).

alternate user security

On z/OS, the authority checks that are performed when an application requests alternate user authority when opening an IBM MQ object.

AMQP

See [Advanced Message Queuing Protocol](#).

AMQP channel

A type of channel that provides a level of support for AMQP 1.0-compliant applications. MQ Light clients or other AMQP 1.0 compatible clients can be connected to an IBM MQ AMQP channel.

APAR

See [authorized program analysis report](#).

APF

See [authorized program facility](#).

API-crossing exit

A user written program that is similar in concept to an API exit. It is supported only for CICS applications on IBM MQ for z/OS.

API exit

A user-written program that monitors or modifies the function of an MQI call. For each MQI call issued by an application, the API exit is called before the queue manager starts to process the call and again after the queue manager has completed processing the call. The API exit can inspect and modify any of the parameters on the MQI call.

APPC

See [Advanced Program-to-Program Communication](#).

application-defined format

Application data in a message for which the user application defines the meaning. See also [built-in format](#).

application environment

The environment that includes the software and the server or network infrastructure that supports it.

application level security

The security services that are started when an application issues an MQI call.

application log

In Windows systems, a log that records significant application events.

application queue

A local queue that is used by applications for messaging, through the Message Queue Interface (MQI). Application queues are often set up as triggered queues.

archive log

A data set on a storage device to which IBM MQ copies the contents of each active log data set when the active log reaches its size limit. See also [recovery log](#).

ARM

See [automatic restart manager](#).

ASN.1

See [Abstract Syntax Notation One](#).

asymmetric key cryptography

A system of cryptography that uses two keys: a public key known to everyone and a private key known only to the receiver or sender of the message. See also [symmetric key cryptography](#). For further information, see the topic [Cryptography](#).

asynchronous consumption

A process that uses a set of MQI calls that allow an application to consume messages from a set of queues. Messages are delivered to the application by using a unit of code identified by the application, passing either the message or a token representing the message.

asynchronous messaging

A method of communication between programs in which a program places a message on a message queue, then proceeds with its own processing without waiting for a reply to its message. See also [synchronous messaging](#).

asynchronous put

A put of a message by an application, without waiting for a response from the queue manager.

attribute

1. A characteristic or trait of an entity that describes the entity; for example, the telephone number of an employee is one of the employee attributes. See also [entity](#).
2. In object-oriented programming, a property of an object or class that can be distinguished distinctly from any other properties. Attributes often describe state information.

authentication

A security service that provides proof that a user of a computer system is genuinely who that person claims to be. Common mechanisms for implementing this service are passwords and digital signatures.

authentication information object

An object that provides the definitions needed to check certificate revocation lists (CRLs) using LDAP servers, in support for Secure Sockets Layer (SSL) security.

authority check

See [authorization check](#).

authorization

The process of granting a user, system, or process either complete or restricted access to an object, resource, or function.

authorization check

A security check that is performed when a user or application attempts to access a system resource; for example, when an administrator attempts to issue a command to administer IBM MQ or when an application attempts to connect to a queue manager.

authorization file

A file that provides security definitions for an object, a class of objects, or all classes of objects.

authorization service

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, a service that provides authority checking of commands and MQI calls for the user identifier associated with the command or call.

authorized program analysis report (APAR)

A request for correction of a defect in a supported release of a program supplied by IBM.

authorized program facility (APF)

In a z/OS environment, a facility that permits the identification of programs that are authorized to use restricted functions.

automatic restart manager (ARM)

A z/OS recovery function that can automatically restart batch jobs and started tasks after they or the system on which they are running end unexpectedly.

B**backout**

An operation that reverses all changes to resources made during the current unit of work. See also [commit](#).

bag

See [data bag](#).

bar

A z/OS memory limit, which in 64-bit systems is set at 2 GB. The bar separates storage below the 2-gigabyte address from storage above the 2 GB address. The area above the bar is intended for data; no programs run above the bar.

basic mapping support (BMS)

An interface between CICS and application programs that formats input and output display data and routes multiple-page output messages without regard for control characters used by various terminals.

behavior

In object-oriented programming, the functionality embodied within a method.

BMS

See [basic mapping support](#).

Booch methodology

An object-oriented methodology that helps users design systems using the object-oriented paradigm.

bootstrap data set (BSDS)

A VSAM data set that contains an inventory of all active and archived log data sets known to IBM MQ for z/OS, and a wrap-around inventory of all recent IBM MQ for z/OS activity. The BSDS is required to restart the IBM MQ for z/OS subsystem.

browse

In message queuing, to copy a message without removing it from the queue. See also [get](#), [put](#).

browse cursor

In message queuing, an indicator used when browsing a queue to identify the message that is next in sequence.

BSDS

See [bootstrap data set](#).

buffer pool

An area of memory into which data pages are read and in which they are modified and held during processing. See also [address space](#).

built-in format

Application data in a message for which the queue manager defines the meaning. See also [application-defined format](#).

C**CA**

See [certificate authority](#).

CAF

See [client attachment feature](#).

callback

A message consumer or an event handler routine.

CCDT

See [client channel definition table](#).

CCF

See [channel control function](#).

CCSID

See [coded character set identifier](#).

CDF

See [channel definition file](#).

certificate authority (CA)

A trusted third-party organization or company that issues the digital certificates. The certificate authority typically verifies the identity of the individuals who are granted the unique certificate. See also [Secure Sockets Layer](#). For further information, see the topic [Certificate Authorities](#).

certificate chain

A hierarchy of certificates that are cryptographically related to one another, starting with the personal certificate and ending with root at the top of the chain.

certificate expiration

A digital certificate contains a date range when the certificate is valid. Outside the valid date range, the certificate is said to be "expired".

certificate request (CR)

Synonym for [certificate signing request](#).

certificate revocation list (CRL)

A list of certificates that have been revoked before their scheduled expiration date. Certificate revocation lists are maintained by the certificate authority and used, during a Secure Sockets Layer (SSL) handshake to ensure that the certificates involved have not been revoked. For further information, see the topic [Certificate management](#).

certificate signing request (CSR)

An electronic message that an organization sends to a certificate authority (CA) to obtain a certificate. The request includes a public key and is signed with a private key; the CA returns the certificate after signing with its own private key.

certificate store

The Windows name for a key repository. For further information, see the topic [Personal certificate store](#).

CF

See [coupling facility](#).

CFSTRUCT

An IBM MQ object used to describe the queue manager's use of a Coupling Facility list structure

channel

An IBM MQ object that defines a communication link between two queue managers (message channel) or between a client and a queue manager (MQI channel). See also [message channel](#), [MQI channel](#), [queue manager](#).

channel callback

A mechanism that ensures that the channel connection is established to the correct machine. In a channel callback, a sender channel calls back the original requester channel using the sender's definition.

channel control function (CCF)

A program to move messages from a transmission queue to a communication link, and from a communication link to a local queue, together with an operator panel interface to allow the setup and control of channels.

channel definition file (CDF)

A file containing communication channel definitions that associate transmission queues with communication links.

channel event

An event reporting conditions detected during channel operations, such as when a channel instance is started or stopped. Channel events are generated on the queue managers at both ends of the channel.

channel exit program

A user-written program that is called from one of a defined number of places in the processing sequence of a message channel agent (MCA).

channel initiator

A component of IBM MQ distributed queuing that monitors the initiation queue and starts the sender channel when triggering criteria are met.

channel listener

A component of IBM MQ distributed queuing that monitors the network for a startup request and then starts the receiving channel.

checkpoint

A place in a program at which a check is made, or at which a recording of data is made to allow the program to be restarted in case of interruption.

CI

See [control interval](#).

CipherSpec

The combination of encryption algorithm and hash function applied to an SSL message after authentication completes.

cipher suite

The combination of authentication, key exchange algorithm, and the Secure Sockets Layer (SSL) cipher specification used for the secure exchange of data.

ciphertext

Data that is encrypted. Ciphertext is unreadable until it is converted into plaintext (decrypted) with a key. See also [cleartext](#).

circular logging

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, the process of keeping all restart data in a ring of log files. See also [linear logging](#). For further information, see the topic [Types of logging](#).

CL

See [Command Language](#).

class

In object-oriented design or programming, a model or template that can be used to create objects with a common definition and common properties, operations, and behavior. An object is an instance of a class.

class hierarchy

The relationships between classes that share a single inheritance.

class library

In object-oriented programming, a collection of prewritten classes or coded templates, any of which can be specified and used by a programmer when developing an application.

cleartext

A string of characters sent over a network in readable form. It might be encoded for the purposes of compression, but it can easily be decoded. See also [ciphertext](#).

client

A runtime component that provides access to queuing services on a server for local user applications. The queues used by the applications reside on the server. See also [IBM MQ fully managed .NET client](#), [IBM MQ Java client](#), [IBM MQ MQI client](#).

client application

An application, running on a workstation and linked to a client, that gives the application access to queuing services on a server.

client attachment feature (CAF)

An option that supports the attachment of clients to z/OS.

client channel definition table (CCDT)

A file that contains one or more client-connection channel definitions. For further information, see the topic [Client channel definition table](#).

client-connection channel type

The type of MQI channel definition associated with an IBM MQ client. See also [server-connection channel type](#).

CLUSRCVR

See [cluster-receiver channel](#).

CLUSSDR

See [cluster-sender channel](#).

cluster

In IBM MQ, a group of two or more queue managers on one or more computers, providing automatic interconnection, and allowing queues and topics to be advertised among them for load balancing and redundancy.

cluster queue

A local queue that is hosted by a cluster queue manager, and defined as a target for messages being put from an application connected to any queue manager within the cluster. All applications retrieving messages must be locally connected.

cluster queue manager

A queue manager that is a member of a cluster. A queue manager can be a member of more than one cluster.

cluster-receiver channel (CLUSRCVR)

A channel on which a cluster queue manager can receive messages from other queue managers in the cluster, and cluster information from the repository queue managers.

cluster-sender channel (CLUSSDR)

A channel on which a cluster queue manager can send messages to other queue managers in the cluster, and cluster information to the repository queue managers.

cluster topic

An administrative topic that is defined on a cluster queue manager and made available to other queue managers in the cluster.

cluster transmission queue

A transmission queue that holds all messages from a queue manager destined for another queue manager that is in the same cluster. The queue is called `SYSTEM.CLUSTER.TRANSMIT.QUEUE`.

CMS key database

A CMS key database is the format of the Database supported by Windows systems, UNIX systems, Linux, and the clients of those platforms. Files ending with ".kdb" are CMS format. The ".kdb" files contain the certificates and the keys.

coded character set identifier (CCSID)

A 16-bit number that includes a specific set of encoding scheme identifiers, character set identifiers, code page identifiers, and other information that uniquely identifies the coded graphic-character representation.

coexistence

The ability of two or more different versions of IBM MQ to function on the same computer.

command

A statement used to initiate an action or start a service. A command consists of the command name abbreviation, and its parameters and flags if applicable.

command bag

In the MQAI, a type of bag that is created for administering IBM MQ objects, but cannot change the order of data items or create lists within a message.

command event

A notification that an MQSC or PCF command has run successfully.

Command Language (CL)

In IBM MQ for IBM i, a language that can be used to issue commands, either at the command line or by writing a CL program.

command prefix (CPF)

1. In IBM MQ for z/OS, a character string that identifies the queue manager to which IBM MQ for z/OS commands are directed, and from which IBM MQ for z/OS operator messages are received.
2. A 1-character to 8-character command identifier. The command prefix distinguishes the command as belonging to an application or subsystem rather than to z/OS.

command server

The IBM MQ component that reads commands from the system-command input queue, verifies them, and passes valid commands to the command processor.

commit

To apply all the changes made during the current unit of recovery (UR) or unit of work (UOW). After the operation is complete, a new UR or UOW can begin.

common name (CN)

The component in a Distinguished Name (DN) attribute of an X.509 certificate that represents the name normally associated with the owner of the certificate. For people, the CN is usually their actual name. For web servers, the CN is the fully qualified host and domain name of the server. For IBM MQ there are no specific requirements on this field, however many administrators use the name of the queue manager. See also "Distinguished Name"

completion code

A return code indicating how a message queue interface (MQI) call has ended.

confidentiality

The security service that protects sensitive information from unauthorized disclosure. Encryption is a common mechanism for implementing this service.

configuration event

Notifications about the attributes of an object. The notifications are generated when the object is created, changed, or deleted and also by explicit requests.

connection affinity

A channel attribute that specifies the client channel definition that client applications use to connect to the queue manager, if multiple connections are available.

connection factory

A set of configuration values that produces connections that enable a Java EE component to access a resource. Connection factories provide on-demand connections from an application to an enterprise information system (EIS) and allow an application server to enroll the EIS in a distributed transaction.

connection handle

The identifier or token by which a program accesses the queue manager to which it is connected.

constructor

In object-oriented programming, a special method used to initialize an object.

consume

To remove a message from a queue and return its contents to the calling application.

consumer

An application that receives and processes messages. See also [message consumer](#).

context security

On z/OS, the authority checks that are performed when an application opens a queue and specifies that it will set the context in messages that it puts on the queue, or pass the context from messages that it has received to messages that it puts on the queue.

control command

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, a command that can be entered interactively from the operating system command line. Such a command requires only that the IBM MQ product be installed; it does not require a special utility or program to run it.

control interval (CI)

A fixed-length area of direct access storage in which VSAM stores records and creates distributed free space. The control interval is the unit of information that VSAM transmits to or from direct-access storage. A control interval always includes an integral number of physical records.

controlled shutdown

See [quiesced shutdown](#).

correlation identifier

A field in a message that provides a means of identifying related messages. Correlation identifiers are used, for example, to match request messages with their corresponding reply message.

coupling facility (CF)

A special logical partition that provides high-speed caching, list processing, and locking functions in a sysplex.

CPF

See [command prefix](#).

CRL

See [certificate revocation list](#).

cross-system coupling facility (XCF)

A component of z/OS that provides functions to support cooperation between authorized programs running within a sysplex.

cryptography

A method for protecting information by transforming it (encrypting it) into an unreadable format, called ciphertext. Only users who possess a secret key can decipher (or decrypt) the message into plaintext.

D**DAE**

See [dump analysis and elimination](#).

daemon

A program that runs unattended to perform continuous or periodic functions, such as network control.

data bag

A container of object properties that the MQAI uses in administering queue managers. There are three types of data bag: user (for user data), administration (for administration with assumed options), and command (for administration with no options assumed).

data-conversion interface (DCI)

The IBM MQ interface to which customer-written or vendor-written programs that convert application data between different machine encodings and CCSIDs must conform.

data-conversion service

A service that converts application data to the character set and encoding that are required by applications on other platforms.

datagram

A form of asynchronous messaging in which an application sends a message, but does not require a response. See also [request/reply](#).

data integrity

The security service that detects whether there has been unauthorized modification of data, or tampering. The service detects only whether data has been modified; it does not restore data to its original state if it has been modified.

data item

In the MQAI, an integer or character-string item that is contained within a data bag. A data item can be either a user item or a system item.

DCE

See [Distributed Computing Environment](#).

DCE principal

A user ID that uses the distributed computing environment.

DCI

See [data-conversion interface](#).

DCM

See [Digital Certificate Manager](#).

dead-letter queue (DLQ)

A queue to which a queue manager or application sends messages that cannot be delivered to their correct destination.

dead-letter queue handler

A utility that monitors a dead-letter queue (DLQ) and processes messages on the queue in accordance with a user-written rules table. A sample dead letter queue handler is provided by IBM MQ.

decryption

The process of decoding data that has been encrypted into a secret format. Decryption requires a secret key or password.

default object

A definition of an object (for example, a queue) with all attributes defined. If a user defines an object but does not specify all possible attributes for that object, the queue manager uses default attributes in place of any that were not specified.

deferred connection

A pending event that is activated when a CICS subsystem tries to connect to IBM MQ for z/OS before it has started.

derivation

In object-oriented programming, the refinement or extension of one class from another.

destination

1. An end point to which messages are sent, such as a queue or topic.
2. In JMS, an object that specifies where and how messages should be sent and received.

Diffie-Hellman key exchange

A public, key-exchange algorithm that is used for securely establishing a shared secret over an insecure channel.

digital certificate

An electronic document used to identify an individual, a system, a server, a company, or some other entity, and to associate a public key with the entity. A digital certificate is issued by a certification authority and is digitally signed by that authority.

Digital Certificate Manager (DCM)

On IBM i systems, the method of managing digital certificates and using them in secure applications on the IBM i server. Digital Certificate Manager requests and processes digital certificates from certification authorities (CAs) or other third-parties.

digital signature

Information that is encrypted with a private key and is appended to a message or object to assure the recipient of the authenticity and integrity of the message or object. The digital signature proves that the message or object was signed by the entity that owns, or has access to, the private key or shared-secret symmetric key.

direct routing

An option for routing publications in a publish/subscribe cluster. With direct routing, every queue manager in the cluster sends publications from any publishing queue manager direct to any other queue manager in the cluster with a matching subscription.

disconnect

To break the connection between an application and a queue manager.

distinguished name (DN)

A set of name-value pairs (such as CN=person name and C=country or region) that uniquely identifies an entity in a digital certificate.

distributed application

In message queuing, a set of application programs that can each be connected to a different queue manager, but that collectively comprise a single application.

Distributed Computing Environment (DCE)

In network computing, a set of services and tools that supports the creation, use, and maintenance of distributed applications across heterogeneous operating systems and networks.

distributed publish/subscribe

Publish/subscribe messaging performed in a multiple queue manager environment.

distributed queue management

In message queuing, the setup and control of message channels between distributed queue managers.

distributed queuing

Sending messages from one queue manager to another. The receiving queue manager could be on the same machine or on a remote one.

distribution list

A list of queues to which a message can be put with a single statement.

DLQ

See [dead-letter queue](#).

DN

See [distinguished name](#).

dual logging

A method of recording IBM MQ for z/OS activity, where each change is recorded on two data sets, so that if a restart is necessary and one data set is unreadable, the other can be used. See also [single logging](#).

dual mode

See [dual logging](#).

dump analysis and elimination (DAE)

A z/OS service that enables an installation to suppress SVC dumps and ABEND SYSUDUMP dumps that are not needed because they duplicate previously written dumps.

durable subscription

A subscription that is retained when the connection from a subscribing application to the queue manager is closed. When the subscribing application disconnects, the durable subscription remains in place and publications continue to be delivered. When the application reconnects, it can use the same subscription by specifying the unique subscription name. See also [nondurable subscription](#).

dynamic queue

A local queue created when a program opens a model queue object.

E**eavesdropping**

A breach of communication security in which the information remains intact, but its privacy is compromised. See also [impersonation](#), [tampering](#).

Eclipse

An open-source initiative that provides independent software vendors (ISVs) and other tool developers with a standard platform for developing plug-compatible application development tools.

encapsulation

In object-oriented programming, the technique that is used to hide the inherent details of an object, function, or class from client programs.

encryption

In computer security, the process of transforming data into an unintelligible form in such a way that the original data either cannot be obtained or can be obtained only by using a decryption process.

enqueue

To put a message or item in a queue.

entity

A user, group, or resource that is defined to a security service, such as RACF®.

environment variable

A variable that specifies how an operating system or another program runs, or the devices that the operating system recognizes.

ESM

See [external security manager](#).

ESTAE

See [extended specify task abnormal exit](#).

event data

In an event message, the part of the message data that contains information about the event (such as the queue manager name, and the application that gave rise to the event). See also [event header](#).

event header

In an event message, the part of the message data that identifies the event type of the reason code for the event. See also [event data](#).

event message

A message that contains information (such as the category of event, the name of the application that caused the event, and queue manager statistics) relating to the origin of an instrumentation event in a network of IBM MQ systems.

event queue

The queue onto which the queue manager puts an event message after it detects an event. Each category of event (queue manager, performance, configuration, instrumentation, or channel event) has its own event queue.

Event Viewer

A tool provided by Windows systems to examine and manage log files.

exception listener

An instance of a class that can be registered by an application and for which the `onException()` method is called to pass a JMS exception to the application asynchronously.

exclusive method

In object-oriented programming, a method that is not intended to exhibit polymorphism; one with specific effect.

extended specify task abnormal exit (ESTAE)

A z/OS macro that provides recovery capability and gives control to the user-specified exit routine for processing, diagnosing an abend, or specifying a retry address.

external security manager (ESM)

A security product that performs security checking on users and resources. RACF is an example of an ESM.

F**failover**

An automatic operation that switches to a redundant or standby system or node in the event of a software, hardware, or network interruption.

FAP

See [Formats and Protocols](#).

Federal Information Processing Standard

A standard produced by the National Institute of Standards and Technology when national and international standards are nonexistent or inadequate to satisfy the U.S. government requirements.

FFDC

See [first-failure data capture](#).

FFST

See [First Failure Support Technology](#).

FFST file

See [First Failure Support Technology file](#).

FIFO

See [first-in first-out](#).

FIPS

See [Federal Information Processing Standard](#).

first-failure data capture (FFDC)

1. The i5/OS implementation of the FFST architecture providing problem recognition, selective dump of diagnostic data, symptom string generation, and problem log entry.

2. A problem diagnosis aid that identifies errors, gathers and logs information about these errors, and returns control to the affected runtime software.

First Failure Support Technology (FFST)

An IBM architecture that defines a single approach to error detection through defensive programming techniques. These techniques provide proactive (passive until required) problem recognition and a description of diagnostic output required to debug a software problem.

First Failure Support Technology file (FFST file)

A file containing information for use in detecting and diagnosing software problems. In IBM MQ, FFST files have a file type of FDC.

first-in first-out (FIFO)

A queuing technique in which the next item to be retrieved is the item that has been in the queue for the longest time.

forced shutdown

A type of shutdown of the CICS adapter where the adapter immediately disconnects from IBM MQ for z/OS, regardless of the state of any currently active tasks. See also [quiesced shutdown](#).

format

In message queuing, a term used to identify the nature of application data in a message.

Formats and Protocols (FAP)

In message queuing, a definition of how queue managers communicate with each other, and of how clients communicate with server queue managers.

Framework

In IBM MQ, a collection of programming interfaces that allow customers or vendors to write programs that extend or replace certain functions provided in IBM MQ products. The interfaces are the following: data conversion interface (DCI), message channel interface (MCI), name service interface (NSI), security enabling interface (SEI), trigger monitor interface (TMI).

friend class

A class in which all member functions are granted access to the private and protected members of another class. It is named in the declaration of another class and uses the keyword friend as a prefix to the class.

FRR

See [functional recovery routine](#).

full repository

A complete set of information about every queue manager in a cluster. This set of information is called the repository or sometimes the full repository and is usually held by two of the queue managers in the cluster. See also [partial repository](#).

function

A named group of statements that can be called and evaluated and can return a value to the calling statement.

functional recovery routine (FRR)

A z/OS recovery and termination manager that enables a recovery routine to gain control in the event of a program interrupt.

G**gateway queue manager**

A cluster queue manager that is used to route messages from an application to other queue managers in the cluster.

generalized trace facility (GTF)

A z/OS service program that records significant system events such as I/O interrupts, SVC interrupts, program interrupts, and external interrupts.

Generic Security Services API

See [Generic Security Services application programming interface](#).

Generic Security Services application programming interface (Generic Security Services API, GSS API)

A common application programming interface (API) for accessing security services.

get

In message queuing, to use the MQGET call to remove a message from a queue and return its contents to the calling application. See also [browse](#), [put](#).

globally defined object

On z/OS, an object whose definition is stored in the shared repository. The object is available to all queue managers in the queue sharing group. See also [locally defined object](#).

global trace

An IBM MQ for z/OS trace option where the trace data comes from the entire IBM MQ for z/OS subsystem.

global transaction

A recoverable unit of work performed by one or more resource managers in a distributed transaction environment and coordinated by an external transaction manager.

GSS API

See [Generic Security Services application programming interface](#).

GTF

See [generalized trace facility](#).

H

handshake

The exchange of messages at the start of a Secure Sockets Layer session that allows the client to authenticate the server using public key techniques (and, optionally, for the server to authenticate the client) and then allows the client and server to cooperate in creating symmetric keys for encryption, decryption, and detection of tampering.

hardened message

A message that is written to auxiliary (disk) storage so that the message is not lost in the event of a system failure.

header

See [message header](#).

heartbeat

A signal that one entity sends to another to convey that it is still active.

heartbeat flow

A pulse that is passed from a sending message channel agent (MCA) to a receiving MCA when there are no messages to send. The pulse unblocks the receiving MCA, which would otherwise remain in a wait state until a message arrived or the disconnect interval expired.

heartbeat interval

The time, in seconds, that is to elapse between heartbeat flows.

hierarchy

In publish/subscribe messaging topology, a local queue manager connected to a parent queue manager.

HTTP

See [Hypertext Transfer Protocol](#).

Hypertext Transfer Protocol (HTTP)

An Internet protocol that is used to transfer and display hypertext and XML documents on the web.

I

IBM MQ

A family of IBM licensed programs that provides message queuing services.

IBM MQ Administration Interface (MQAI)

A programming interface that performs administration tasks on an IBM MQ queue manager through the use of data bags. Data bags allow the user to handle properties (or parameters) of IBM MQ objects.

IBM MQ classes for .NET

A set of classes that allow a program written in the .NET programming framework to connect to IBM MQ as an IBM MQ client or to connect directly to an IBM MQ server.

IBM MQ classes for C++

A set of classes that encapsulate the IBM MQ Message Queue Interface (MQI) in the C++ programming language.

IBM MQ classes for Java

A set of classes that encapsulate the IBM MQ Message Queue Interface (MQI) in the Java programming language.

IBM MQ fully managed .NET client

Part of an IBM MQ product that can be installed on a system without installing the full queue manager. The IBM MQ .NET client is used by fully-managed .NET applications and communicates with a queue manager on a server system. A .NET application that is not fully managed uses the IBM MQ MQI client. See also [client](#), [IBM MQ Java client](#), [IBM MQ MQI client](#).

IBM MQ Java client

Part of an IBM MQ product that can be installed on a system without installing the full queue manager. The IBM MQ Java client is used by Java applications (both IBM MQ classes for Java and IBM MQ classes for JMS) and communicates with a queue manager on a server system. See also [client](#), [IBM MQ fully managed .NET client](#), [IBM MQ MQI client](#).

IBM MQ MQI client

Part of an IBM MQ product that can be installed on a system without installing the full queue manager. The IBM MQ MQI client accepts MQI calls from applications and communicates with a queue manager on a server system. See also [client](#), [IBM MQ fully managed .NET client](#), [IBM MQ Java client](#).

IBM MQ script commands (MQSC)

Human readable commands, uniform across all platforms, that are used to manipulate IBM MQ objects. See also [programmable command format](#).

IBM MQ server

A queue manager that provides queuing services to one or more clients. All the IBM MQ objects, for example queues, exist only on the queue manager system, that is, on the MQI server machine. A server can support normal local MQI applications as well.

IBM MQ Telemetry

Supports small client libraries that can be embedded into smart devices running on a number of different device platforms. Applications built with the clients use the MQ Telemetry Transport (MQTT) protocol and the IBM MQ telemetry service to publish and subscribe messages reliably with IBM MQ.

IBM MQ Telemetry daemon for devices

See [MQTT daemon for devices](#).

identification

The security service that enables each user of a computer system to be identified uniquely. A common mechanism for implementing this service is to associate a user ID with each user.

identity context

Information that identifies the user of the application that first puts the message on a queue

IFCID

See [instrumentation facility component identifier](#).

ILE

See [Integrated Language Environment](#)[®].

immediate shutdown

In IBM MQ, a shutdown of a queue manager that does not wait for applications to disconnect. Current message queue interface (MQI) calls are allowed to complete, but new MQI calls fail after an immediate shutdown has been requested. See also [preemptive shutdown](#), [quiesced shutdown](#).

impersonation

A breach of communication security in which the information is passed to a person posing as the intended receiver or information is sent by a person posing as someone else. See also [eavesdropping](#), [tampering](#).

inbound channel

A channel that receives messages from another queue manager.

in-built format

See [built-in format](#).

index

In the IBM MQ Administration Interface (MQAI), a means of referencing data items.

indoubt unit of recovery

The status of a unit of recovery for which a sync point has been requested but not yet confirmed.

inflight

The state of a resource or unit of recovery that has not yet completed the prepare phase of the commit process.

inheritance

An object-oriented programming technique in which existing classes are used as a basis for creating other classes. Through inheritance, more specific elements incorporate the structure and behavior of more general elements.

initialization input data set

A data set that is used by IBM MQ for z/OS when it starts.

initiation queue

A local queue on which the queue manager puts trigger messages.

initiator

In distributed queuing, a program that requests network connections on another system. See also [responder](#).

input parameter

A parameter of an MQI call in which information is supplied.

insertion order

In the IBM MQ Administration Interface (MQAI), the order that data items are placed into a data bag.

installable service

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, additional functionality provided as independent component. The installation of each component is optional: in-house or third-party components can be used instead.

instance

A specific occurrence of an object that belongs to a class. See also [object](#).

instance data

In object-oriented programming, state information associated with an object.

intermediate certificate

A signer certificate that is not the root certificate. It is issued by the trusted root specifically to issue end-entity server certificates. The result is a certificate chain that begins at the trusted root CA, through a number of intermediates, and ends with the SSL certificate issued to the organization.

instrumentation event

A way of monitoring queue manager resource definitions, performance conditions, and channel conditions in a network of IBM MQ systems.

instrumentation facility component identifier (IFCID)

In Db2 for z/OS, a value that names and identifies a trace record of an event. As a parameter on the START TRACE and MODIFY TRACE commands, it specifies that the corresponding event is to be traced.

Integrated Language Environment (ILE)

A set of constructs and interfaces that provides a common runtime environment and runtime bindable application programming interfaces (APIs) for all ILE-conforming high-level languages.

Interactive Problem Control System (IPCS)

A component of MVS™ and z/OS that permits online problem management, interactive problem diagnosis, online debugging for disk-resident abend dumps, problem tracking, and problem reporting.

Interactive System Productivity Facility (ISPF)

An IBM licensed program that serves as a full-screen editor and dialog manager. Used for writing application programs, it provides a means of generating standard screen panels and interactive dialogs between the application programmer and the terminal user.

interface

In object-oriented programming, an abstract model of behavior; a collection of functions or methods.

Internet Protocol (IP)

A protocol that routes data through a network or interconnected networks. This protocol acts as an intermediary between the higher protocol layers and the physical network. See also [Transmission Control Protocol](#).

interprocess communication (IPC)

The process by which programs send messages to each other. Sockets, semaphores, signals, and internal message queues are common methods of interprocess communication. See also [client](#).

intersystem communication (ISC)

A CICS facility that provides inbound and outbound support for communication from other computer systems.

IP

See [Internet Protocol](#).

IPC

See [interprocess communication](#).

IPCS

See [Interactive Problem Control System](#).

ISC

See [intersystem communication](#).

ISPF

See [Interactive System Productivity Facility](#).

J**JAAS**

See [Java Authentication and Authorization Service](#).

Java Authentication and Authorization Service (JAAS)

In Java EE technology, a standard API for performing security-based operations. Through JAAS, services can authenticate and authorize users while enabling the applications to remain independent from underlying technologies.

Java Message Service (JMS)

An application programming interface that provides Java language functions for handling messages. See also [Message Queue Interface](#).

Java runtime environment (JRE)

A subset of a Java developer kit that contains the core executable programs and files that constitute the standard Java platform. The JRE includes the Java virtual machine (JVM), core classes, and supporting files.

JMS

See [Java Message Service](#).

JMSAdmin

An administration tool that enables administrators to define the properties of JMS objects and to store them within a JNDI namespace

journal

A feature of OS/400® that IBM MQ for IBM i uses to control updates to local objects. Each queue manager library contains a journal for that queue manager.

JRE

See [Java runtime environment](#).

K**keepalive**

A TCP/IP mechanism where a small packet is sent across the network at predefined intervals to determine whether the socket is still working correctly.

Kerberos

A network authentication protocol that is based on symmetric key cryptography. Kerberos assigns a unique key, called a ticket, to each user who logs on to the network. The ticket is embedded in messages that are sent over the network. The receiver of a message uses the ticket to authenticate the sender.

key authentication

See [authentication](#).

key repository

A store for digital certificates and their associated private keys.

key ring

In computer security, a file that contains public keys, private keys, trusted roots, and certificates.

keystore

In security, a file or a hardware cryptographic card where identities and private keys are stored, for authentication and encryption purposes. Some keystores also contain trusted or public keys. See also [truststore](#).

L**last will and testament**

An object that is registered with a monitor by a client, and used by the monitor if the client ends unexpectedly.

LDAP

See [Lightweight Directory Access Protocol](#).

Lightweight Directory Access Protocol (LDAP)

An open protocol that uses TCP/IP to provide access to directories that support an X.500 model and that does not incur the resource requirements of the more complex X.500 Directory Access Protocol (DAP). For example, LDAP can be used to locate people, organizations, and other resources in an Internet or intranet directory.

linear logging

In IBM MQ on UNIX and Linux systems, and IBM MQ for Windows, the process of keeping restart data in a sequence of files. New files are added to the sequence as necessary. The space in which the data is written is not reused. See also [circular logging](#). For further information, see the topic [Types of logging](#).

link level security

The security services that are started, directly or indirectly, by a message channel agent (MCA), the communications subsystem, or a combination of the two working together.

listener

A program that detects incoming requests and starts the associated channel.

local definition of a remote queue

An IBM MQ object belonging to a local queue manager that defines the attributes of a queue that is owned by another queue manager. In addition, it is used for queue manager aliasing and reply-to-queue aliasing.

locale

A setting that identifies language or geography and determines formatting conventions such as collation, case conversion, character classification, the language of messages, date and time representation, and numeric representation.

locally defined object

On z/OS, an object whose definition is stored on page set zero. The definition can be accessed only by the queue manager that defined it. See also [globally defined object](#).

local queue

A queue that belongs to the local queue manager. A local queue can contain a list of messages waiting to be processed. See also [remote queue](#).

local queue manager

The queue manager to which the program is connected and that provides message queuing services to the program. See also [remote queue manager](#).

log

In IBM MQ, a file recording the work done by queue managers while they receive, transmit, and deliver messages, to enable them to recover in the event of failure.

log control file

In IBM MQ on UNIX and Linux systems, and IBM MQ for Windows, the file containing information needed to monitor the use of log files (for example, their size and location, and the name of the next available file).

log file

In IBM MQ on UNIX and Linux systems, and IBM MQ for Windows, a file in which all significant changes to the data controlled by a queue manager are recorded. If the primary log files become full, IBM MQ allocates secondary log files.

logical unit (LU)

An access point through which a user or application program accesses the SNA network to communicate with another user or application program.

logical unit 6.2 (LU 6.2)

An SNA logical unit that supports general communication between programs in a distributed processing environment.

logical unit of work identifier (LUWID)

A name that uniquely identifies a thread within a network. This name consists of a fully qualified logical unit network name, a logical unit of work instance number, and a logical unit of work sequence number.

log record

A set of data that is treated as a single unit in a log file.

log record sequence number (LRSN)

A unique identifier for a log record that is associated with a data sharing member. Db2 for z/OS uses the LRSN for recovery in the data sharing environment.

LRSN

See [log record sequence number](#).

LU

See [logical unit](#).

LU 6.2

See [logical unit 6.2](#).

LU 6.2 conversation

In SNA, a logical connection between two transaction programs over an LU 6.2 session that enables them to communicate with each other.

LU 6.2 conversation level security

In SNA, a conversation level security protocol that enables a partner transaction program to authenticate the transaction program that initiated the conversation.

LU 6.2 session

In SNA, a session between two logical units (LUs) of type 6.2.

LU name

The name by which VTAM® refers to a node in a network.

LUID

See [logical unit of work identifier](#).

M**managed destination**

A queue that is provided by the queue manager, as the destination to which published messages are to be sent, for an application that elects to use a managed subscription. See also [managed subscription](#).

managed handle

An identifier that is returned by the MQSUB call when a queue manager is specified to manage the storage of messages that are sent to the subscription.

managed subscription

A subscription for which the queue manager creates a subscriber queue to receive publications because the application does not require a specific queue to be used. See also [managed destination](#).

marshalling

See [serialization](#).

MCA

See [message channel agent](#).

MCI

See [message channel interface](#).

media image

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, the sequence of log records that contain an image of an object. The object can be re-created from this image.

message

1. In system programming, information intended for the terminal operator or system administrator.
2. A string of bytes that is passed from one application to another. Messages typically comprise a message header (used for message routing and identification) and a payload (containing the application data being sent). The data has a format that is compatible with both the sending and receiving application.

message affinity

The relationship between conversational messages that are exchanged between two applications, where the messages must be processed by a particular queue manager or in a particular sequence.

message channel

In distributed message queuing, a mechanism for moving messages from one queue manager to another. A message channel comprises two message channel agents (a sender at one end and a receiver at the other end) and a communication link. See also [channel](#).

message channel agent (MCA)

A program that transmits prepared messages from a transmission queue to a communication link, or from a communication link to a destination queue. See also [Message Queue Interface](#).

message channel interface (MCI)

The IBM MQ interface to which customer-written or vendor-written programs that transmit messages between an IBM MQ queue manager and another messaging system must conform. See also [Message Queue Interface](#).

message consumer

1. In JMS, an object that is created within a session to receive messages from a destination.
2. A program, function, or organization that gets and processes messages. See also [consumer](#).

message context

Information about the originator of a message that is held in fields in the message descriptor. There are two categories of context information: identity context and origin context.

message descriptor

Control information describing the message format and presentation that is carried as part of an IBM MQ message. The format of the message descriptor is defined by the MQMD structure.

message exit

A type of channel exit program that is used to modify the contents of a message. Message exits usually work in pairs, one at each end of a channel. At the sending end of a channel, a message exit is called after the message channel agent (MCA) has got a message from the transmission queue. At the receiving end of a channel, a message exit is called before the message channel agent (MCA) puts a message on its destination queue.

message flow control

A distributed queue management task that involves setting up and maintaining message routes between queue managers.

Message Format Service (MFS)

An IMS editing facility that allows application programs to deal with simple logical messages instead of device-dependent data, thus simplifying the application development process.

message group

A logical group of related messages. The relationship is defined by the application putting the messages, and ensures that the messages are retrieved in the sequence put if both the producer and consumer honor the grouping.

message handle

A reference to a message. The handle can be used to obtain access to the message properties of the message.

message header

The part of a message that contains control information such as a unique message ID, the sender and receiver of the message, the message priority, and the type of message.

message input descriptor (MID)

The Message Format Service (MFS) control block that describes the format of the data presented to the application program. See also [message output descriptor](#).

message listener

An object that acts as an asynchronous message consumer.

message output descriptor (MOD)

The Message Format Service (MFS) control block that describes the format of the output data produced by the application program. See also [message input descriptor](#).

message priority

In IBM MQ, an attribute of a message that can affect the order in which messages on a queue are retrieved, and whether a trigger event is generated.

message producer

In JMS, an object that is created by a session and that is used to send messages to a destination. See also [producer](#).

message property

Data associated with a message, in name-value pair format. Message properties can be used as message selectors to filter publications or to selectively get messages from queues. Message

properties can be used to include business data or state information about processing without having to alter the message body.

Message Queue Interface (MQI)

The programming interface provided by IBM MQ queue managers. The programming interface allows application programs to access message queuing services. See also [Java Message Service](#), [message channel agent](#), [message channel interface](#).

message queue management (MQM)

In IBM MQ for HP NonStop Server, a facility that provides access to PCF command formats and control commands to manage queue managers, queues, and channels.

message queuing

A programming technique in which each program within an application communicates with the other programs by putting messages on queues.

message-retry

An option available to an MCA that is unable to put a message. The MCA can wait for a predefined amount of time and then try to put the message again.

message segment

One of a number of segments of a message that is too large either for the application or for the queue manager to handle.

message selector

In application programming, a variable-length string that is used by an application to register its interest in only those messages whose properties satisfy the Structured Query Language (SQL) query that the selection string represents. The syntax of a message selector is based on a subset of the SQL92 conditional expression syntax.

message sequence numbering

A programming technique in which messages are given unique numbers during transmission over a communication link. This number enables the receiving process to check whether all messages are received, to place them in a queue in the original order, and to discard duplicate messages.

message token

A unique identifier of a message within an active queue manager.

method

In object-oriented design or programming, the software that implements the behavior specified by an operation.

MFS

See [Message Format Service](#).

MGAS

See [mostly global address space](#).

Microsoft Cluster Server (MSCS)

A technology that provides high availability by grouping computers running Windows into MSCS clusters. If one of the computers in the cluster hits any one of a range of problems, MSCS shuts down the disrupted application in an orderly manner, transfers its state data to another computer in the cluster, and re-initiates the application there. For further information, see the topic [Supporting the Microsoft Cluster Service \(MSCS\)](#).

Microsoft Transaction Server (MTS)

A facility that helps Windows users run business logic applications in a middle tier server. MTS divides work up into activities, which are short independent chunks of business logic.

MID

See [message input descriptor](#).

MOD

See [message output descriptor](#).

model queue object

A set of queue attributes that act as a template when a program creates a dynamic queue.

mostly global address space (MGAS)

A flexible virtual address space model that preserves most of the address space for shared applications. This model can enhance performance for processes that share a lot of data. See also [mostly private address space](#).

mostly private address space (MPAS)

A flexible virtual address space model that can allocate larger address space blocks to processes. This model can enhance performance for processes that require a lot of data space. See also [mostly global address space](#).

MPAS

See [mostly private address space](#).

MQAI

See [IBM MQ Administration Interface](#).

MQI

See [Message Queue Interface](#).

MQI channel

A connection between an IBM MQ client and a queue manager on a server system. An MQI channel transfers only MQI calls and responses in a bidirectional manner. See also [channel](#).

MQM

See [message queue management](#).

MQSC

See [IBM MQ script commands](#).

MQSeries

A previous name for IBM MQ and IBM WebSphere MQ.

MQ Telemetry Transport (MQTT)

An open, lightweight publish/subscribe messaging protocol flowing over TCP/IP to connect large numbers of devices such as servos, actuators, smart phones, vehicles, homes, health, remote sensors, and control devices. MQTT is designed for constrained devices and low-bandwidth, high-latency or unreliable networks. The protocol minimises network bandwidth and device resource requirements, while ensuring some degree of reliability and assured delivery. It is used increasingly in the *machine-to-machine* (M2M) or *Internet of Things* world of connected devices, and for mobile applications where bandwidth and battery power are at a premium.

MQTT

See [MQ Telemetry Transport](#).

MQTT client

An MQTT client application connects to MQTT capable servers such as IBM MQ Telemetry channels. You can write your own clients to use the published protocol, or download the free Paho clients. A typical client is responsible for collecting information from a telemetry device and publishing the information to the server. It can also subscribe to topics, receive messages, and use this information to control the telemetry device.

MQTT daemon for devices

The MQTT daemon for devices was an advanced MQTT V3 client. It was a very small footprint MQTT server designed for embedded systems. Its primary use was to store and forward messages from telemetry devices and other MQTT clients, including other MQTT daemons for devices.

MQTT server

A messaging server that supports the MQ Telemetry Transport protocol. It enables mobile apps and devices, supported by MQTT clients, to exchange messages. It typically allows many MQTT clients to connect to it at the same time, and provides a hub for messages distribution to the MQTT clients. MQTT servers are available from IBM and others. IBM MessageSight and IBM MQ Telemetry are MQTT servers from IBM.

MQXR service

See [telemetry service](#).

MSCS

See [Microsoft Cluster Server](#). For further information, see the topic [Supporting the Microsoft Cluster Service \(MSCS\)](#).

MTS

See [Microsoft Transaction Server](#).

multi-hop

To pass through one or more intermediate queue managers when there is no direct communication link between a source queue manager and the target queue manager.

multi-instance queue manager

A queue manager that is configured to share the use of queue manager data with other queue manager instances. One instance of a running multi-instance queue manager is active, other instances are on standby ready to take over from the active instance. See also [queue manager, single instance queue manager](#).

N

namelist

An IBM MQ object that contains a list of object names, for example, queue names.

name service

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, the facility that determines which queue manager owns a specified queue.

name service interface (NSI)

The IBM MQ interface to which customer-written or vendor-written programs that resolve queue-name ownership must conform.

name transformation

In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, an internal process that changes a queue manager name so that it is unique and valid for the system being used. Externally, the queue manager name remains unchanged.

nested bag

In the IBM MQ Administration Interface (MQAI), a system bag that is inserted into another data bag

nesting

In the IBM MQ Administration Interface (MQAI), a means of grouping information returned from IBM MQ.

NetBIOS (Network Basic Input/Output System)

A standard interface to networks and personal computers that is used on local area networks to provide message, print-server, and file-server functions. Application programs that use NetBIOS do not have to handle the details of LAN data link control (DLC) protocols.

Network Basic Input/Output System

See [NetBIOS](#).

New Technology File System (NTFS)

One of the native file systems in Windows operating environments.

node

In Microsoft Cluster Server (MSCS), each computer in the cluster.

nondurable subscription

A subscription that exists only while the connection from the subscribing application to the queue manager remains open. The subscription is removed when the subscribing application disconnects from the queue manager either deliberately or by loss of connection. See also [durable subscription](#).

nonpersistent message

A message that does not survive a restart of the queue manager. See also [persistent message](#).

NSI

See [name service interface](#).

NTFS

See [New Technology File System](#).

NUL

See [null character](#).

null character (NUL)

A control character with the value of X'00' that represents the absence of a displayed or printed character.

O**OAM**

See [object authority manager](#).

object

1. In IBM MQ, a queue manager, queue, process definition, channel, namelist, authentication information object, administrative topic object, listener, service object, or (on z/OS only) a CF structure object or storage class.
2. In object-oriented design or programming, a concrete realization (instance) of a class that consists of data and the operations associated with that data. An object contains the instance data that is defined by the class, but the class owns the operations that are associated with the data.

object authority manager (OAM)

In IBM MQ on UNIX and Linux systems, IBM MQ for IBM i, and IBM MQ for Windows, the default authorization service for command and object management. The OAM can be replaced by, or run in combination with, a customer-supplied security service.

object descriptor

A data structure that identifies a particular IBM MQ object. Included in the descriptor are the name of the object and the object type.

object handle

The identifier or token by which a program accesses the IBM MQ object with which it is working.

object-oriented programming

A programming approach based on the concepts of data abstraction and inheritance. Unlike procedural programming techniques, object-oriented programming concentrates not on how something is accomplished but instead on what data objects compose the problem and how they are manipulated.

OCSP

See [Online Certificate Status Protocol](#).

offloading

In IBM MQ for z/OS, an automatic process whereby a queue manager's active log is transferred to its archive log.

Online Certificate Status Protocol

A method of checking if a certificate is revoked.

one way authentication

In this method of authentication, the queue manager presents the certificate to the client, but the authentication is not checked from the client to the queue manager.

open

To establish access to an object, such as a queue, topic, or hyperlink.

open systems interconnection (OSI)

The interconnection of open systems in accordance with standards of the International Organization for Standardization (ISO) for the exchange of information.

Open Transaction Manager Access (OTMA)

A component of IMS that implements a transaction-based, connectionless client/server protocol in an MVS sysplex environment. The domain of the protocol is restricted to the domain of the z/OS

Cross-System Coupling Facility (XCF). OTMA connects clients to servers so that the client can support a large network (or a large number of sessions) while maintaining high performance.

OPM

See [original program model](#).

original program model (OPM)

The set of functions for compiling source code and creating high-level language programs before the Integrated Language Environment (ILE) model was introduced.

OSGi Alliance

A consortium of more than 20 companies, including IBM, that creates specifications to outline open standards for the management of voice, data and multimedia wireless and wired networks.

OSI

See [open systems interconnection](#).

OSI directory standard

The standard, known as X.500, that defines a comprehensive directory service, including an information model, a namespace, a functional model, and an authentication framework. X.500 also defines the Directory Access Protocol (DAP) used by clients to access the directory. The Lightweight Directory Access Protocol (LDAP) removes some of the burden of X.500 access from directory clients, making the directory available to a wider variety of machines and applications.

OTMA

See [Open Transaction Manager Access](#).

outbound channel

A channel that takes messages from a transmission queue and sends them to another queue manager.

output log-buffer

In IBM MQ for z/OS, a buffer that holds recovery log records before they are written to the archive log.

output parameter

A parameter of an MQI call in which the queue manager returns information when the call completes or fails.

overloading

In object-oriented programming, the capability of an operator or method to have different meanings depending on the context. For example, in C++, a user can redefine functions and most standard operators when the functions and operators are used with class types. The method name or operator remains the same, but the method parameters differ in type, number, or both. This difference is collectively called the function's or the operator's signature and each signature requires a separate implementation.

P

page set

A VSAM data set used when IBM MQ for z/OS moves data (for example, queues and messages) from buffers in main storage to permanent backing storage (DASD).

parent class

A class from which another class inherits instance methods, attributes, and instance variables. See also [abstract class](#).

partial repository

A partial set of information about queue managers in a cluster. A partial repository is maintained by all cluster queue managers that do not host a full repository. See also [full repository](#).

partner queue manager

See [remote queue manager](#).

PassTicket

In RACF secured sign-on, a dynamically generated, random, one-time-use, password substitute that a workstation or other client can use to sign on to the host rather than sending a RACF password across the network.

PCF

See [programmable command format](#).

pending event

An unscheduled event that occurs as a result of a connect request from a CICS adapter.

percolation

In error recovery, the passing along a preestablished path of control from a recovery routine to a higher-level recovery routine.

performance event

A category of event indicating that a limit condition has occurred.

performance trace

An IBM MQ trace option where the trace data is to be used for performance analysis and tuning.

permanent dynamic queue

A dynamic queue that is deleted when it is closed only if deletion is explicitly requested. Permanent dynamic queues are recovered if the queue manager fails, so they can contain persistent messages. See also [temporary dynamic queue](#).

persistent message

A message that survives a restart of the queue manager. See also [nonpersistent message](#).

personal certificate

Certificate for which you own the corresponding private key. Associated with queue managers or applications.

PGM

See [Pragmatic General Multicast](#).

PID

See [process ID](#).

ping

The command that sends an Internet Control Message Protocol (ICMP) echo-request packet to a gateway, router, or host with the expectation of receiving a reply.

PKCS

Public Key Cryptography Standards. A set of standards for cryptography, of which:

- 7 is for messages
- 11 is for hardware security modules
- 12 is for the file format used in the key repository

PKI

See [public key infrastructure](#).

plain text

See [cleartext](#).

point of recovery

In IBM MQ for z/OS, a set of backup copies of IBM MQ for z/OS page sets and the corresponding log data sets required to recover these page sets. These backup copies provide a potential restart point in the event of page set loss (for example, page set I/O error).

poison message

In a queue, an incorrectly formatted message that the receiving application cannot process. The message can be repeatedly delivered to the input queue and repeatedly backed out by the application.

polymorphism

An object-oriented programming characteristic that allows a method to perform differently, depending on the class that implements it. Polymorphism allows a subclass to override an inherited method without affecting the method of the parent class. Polymorphism also enables a client to access two or more implementations of an object from a single interface.

Pragmatic General Multicast (PGM)

A reliable multicast transport protocol that provides a reliable sequence of packets to multiple recipients simultaneously.

preemptive shutdown

In IBM MQ, a shutdown of a queue manager that does not wait for connected applications to disconnect, or for current MQI calls to complete. See also [immediate shutdown](#), [quiesced shutdown](#).

preferred computer

The primary computer used by an application running under Microsoft Cluster Server control. After a failover to another computer, MSCS monitors the preferred computer until it is repaired, and as soon as it is running correctly again, moves the application back to it.

principal

An entity that can communicate securely with another entity. A principal is identified by its associated security context, which defines its access rights.

privately defined object

See [locally defined object](#).

private methods and instance data

In object-oriented programming, methods and instance data that are only accessible to the implementation of the same class.

process definition object

An IBM MQ object that contains the definition of an IBM MQ application. For example, a queue manager uses the definition when it works with trigger messages.

process ID (PID)

The unique identifier that represents a process. A process ID is a positive integer and is not reused until the process lifetime ends.

producer

An application that creates and sends messages. See also [message producer](#), [publisher](#).

programmable command format (PCF)

A type of IBM MQ message used by the following applications: user administration applications, to put PCF commands onto the system command input queue of a specified queue manager, user administration applications, to get the results of a PCF command from a specified queue manager, and a queue manager, as a notification that an event has occurred. See also [IBM MQ script commands](#).

program temporary fix (PTF)

For System i®, System p, and IBM Z products, a package containing individual or multiple fixes that is made available to all licensed customers. A PTF resolves defects and might provide enhancements.

property

A characteristic of an object that describes the object. A property can be changed or modified. Properties can describe an object name, type, value, or behavior, among other things.

protected methods and instance data

In object-oriented programming, methods and instance data that are only accessible to the implementations of the same or derived classes, or from friend classes.

proxy subscription

A proxy subscription is a subscription made by one queue manager for topics published on another queue manager. A proxy subscription flows between queue managers for each individual topic string that is subscribed to by a subscription. You do not create proxy subscriptions explicitly, the queue manager does so on your behalf.

PTF

See [program temporary fix](#).

public key cryptography

A cryptography system that uses two keys: a public key known to everyone and a private or secret key known only to the recipient of the message. The public and private keys are related in such a way that only the public key can be used to encrypt messages and only the corresponding private key can be used to decrypt them.

public key infrastructure (PKI)

A system of digital certificates, certification authorities, and other registration authorities that verify and authenticate the validity of each party involved in a network transaction.

public methods and instance data

In object oriented programming, methods and instance data that are accessible to all classes.

public-private key cryptography

See [public key cryptography](#).

publish

To make information about a specified topic available to a queue manager in a publish/subscribe system.

publisher

An application that makes information about a specified topic available to a broker in a publish/subscribe system. See also [producer](#).

publish/subscribe

A type of messaging interaction in which information, provided by publishing applications, is delivered by an infrastructure to all subscribing applications that registered to receive that type of information.

publish/subscribe cluster

A set of queue managers that are fully interconnected and that form part of a multi queue manager network for publish/subscribe applications.

put

In message queuing, to use the MQPUT or MQPUT1 calls to place messages on a queue. See also [browse](#), [get](#).

Q**queue**

An object that holds messages for message-queuing applications. A queue is owned and maintained by a queue manager.

queue index

In IBM MQ for z/OS, a list of message identifiers or a list of correlation identifiers that can be used to increase the speed of MQGET operations on the queue.

queue-manager

A component of a message queuing system that provides queuing services to applications. See also [channel](#), [multi-instance queue manager](#).

queue-manager-event

An event that indicates that an error condition has occurred in relation to the resources used by a queue manager (for example, a queue is unavailable), or a significant change has occurred in the queue manager (for example, a queue manager has stopped or started).

queue-manager-group

In a client channel definition table (CCDT), the group of queue managers a client tries to connect to when a connection is established to a server.

queue-manager-level-security

In IBM MQ for z/OS, the authorization checks that are performed using RACF profiles specific to a queue manager.

queue-manager-set

A grouping of queue managers in IBM MQ Explorer that allows a user to perform actions on all of the queue managers in the group.

queue sharing group

In IBM MQ for z/OS, a group of queue managers in the same sysplex that can access a single set of object definitions stored in the shared repository, and a single set of shared queues stored in the coupling facility. See also [shared queue](#).

queue sharing group level security

In IBM MQ for z/OS, the authorization checks that are performed using RACF profiles that are shared by all queue managers in a queue sharing group.

quiesce

To end a process or shut down a system after allowing normal completion of active operations.

quiesced shutdown

1. In IBM MQ, a shutdown of a queue manager that allows all connected applications to disconnect. See also [immediate shutdown](#), [preemptive shutdown](#).
2. A type of shutdown of the CICS adapter where the adapter disconnects from IBM MQ, but only after all the currently active tasks have been completed. See also [forced shutdown](#).

quiescing

In IBM MQ, the state of a queue manager before it stops. In this state, programs are allowed to finish processing, but no new programs are allowed to start.

quorum disk

The disk accessed exclusively by Microsoft Cluster Server to store the cluster recovery log, and to determine whether a server is up or down. Only one server can own the quorum disk at a time. Servers in the cluster can negotiate for the ownership.

R**RACF**

See [Resource Access Control Facility](#).

RAID

See [Redundant Array of Independent Disks](#).

RAS

Reliability, Availability, and Serviceability.

RBA

See [relative byte address](#).

RC

See [return code](#).

read ahead

An option that allows messages to be sent to a client before an application requests them.

reason code

A return code that describes the reason for the failure or partial success of a Message Queue Interface (MQI) call.

receive exit

A type of channel exit program that is called just after the message channel agent (MCA) has regained control following a communications receive and has received a unit of data from a communications connection. See also [send exit](#).

receiver channel

In message queuing, a channel that responds to a sender channel, takes messages from a communication link, and puts them on a local queue.

recovery log

In IBM MQ for z/OS, data sets containing information needed to recover messages, queues, and the IBM MQ subsystem. See also [archive log](#).

recovery termination manager (RTM)

A program that handles all normal and abnormal termination of tasks by passing control to a recovery routine associated with the terminating function.

Redundant Array of Independent Disks (RAID)

A collection of two or more physical disk drives that present to the host an image of one or more logical disk drives. In the event of a physical device failure, the data can be read or regenerated from the other disk drives in the array due to data redundancy.

reference message

A message that refers to a piece of data that is to be transmitted. The reference message is handled by message exit programs, which attach and detach the data from the message so allowing the data to be transmitted without having to be stored on any queues.

registry

A repository that contains access and configuration information for users, systems, and software.

Registry Editor

In Windows systems, the program that allows the user to edit the registry.

registry hive

In Windows systems, the structure of the data stored in the registry.

relative byte address (RBA)

The offset of a data record or control interval from the beginning of the storage space that is allocated to the data set or file to which it belongs.

reliable multicast messaging (RMM)

A high-throughput low-latency transport fabric designed for one-to-many data delivery or many-to-many data exchange, in a message-oriented middleware publish/subscribe fashion. RMM uses the IP multicast infrastructure to ensure scalable resource conservation and timely information distribution.

remote queue

A queue that belongs to a remote queue manager. Programs can put messages on remote queues, but they cannot get messages from remote queues. See also [local queue](#).

remote queue manager

A queue manager to which a program is not connected, even if it is running on the same system as the program. See also [local queue manager](#).

remote queue object

An IBM MQ object belonging to a local queue manager. This object defines the attributes of a queue that is owned by another queue manager. In addition, it is used for queue manager aliasing and reply-to-queue aliasing.

remote queuing

In message queuing, the provision of services to enable applications to put messages on queues belonging to other queue managers.

reply message

A type of message used for replies to request messages. See also [report message](#), [request message](#).

reply-to queue

The name of a queue to which the program that issued an MQPUT call wants a reply message or report message sent.

report message

A type of message that gives information about another message. A report message can indicate that a message has been delivered, has arrived at its destination, has expired, or could not be processed for some reason. See also [reply message](#), [request message](#).

repository

A collection of information about the queue managers that are members of a cluster. This information includes queue manager names, their locations, their channels, and what queues they host.

repository queue manager

A queue manager that hosts the full repository of information about a cluster.

requester channel

In message queuing, a channel that can be started locally to initiate operation of a server channel. See also [server channel](#).

request message

A type of message used to request a reply from another program. See also [reply message](#), [report message](#).

request/reply

A type of messaging application in which a request message is used to request a reply from another application. See also [datagram](#).

RESLEVEL

In IBM MQ for z/OS, an option that controls the number of user IDs checked for API-resource security.

resolution path

The set of queues that are opened when an application specifies an alias or a remote queue on input to an MQOPEN call.

resource

A facility of a computing system or operating system required by a job, task, or running program. Resources include main storage, input/output devices, the processing unit, data sets, files, libraries, folders, application servers, and control or processing programs.

Resource Access Control Facility (RACF)

An IBM licensed program that provides access control by identifying users to the system; verifying users of the system; authorizing access to protected resources; logging unauthorized attempts to enter the system; and logging accesses to protected resources.

resource adapter

An implementation of the Java Enterprise Edition Connector Architecture that allows JMS applications and message driven beans, running in an application server, to access the resources of an IBM MQ queue manager.

resource manager

An application, program, or transaction that manages and controls access to shared resources such as memory buffers and data sets. IBM MQ, CICS, and IMS are resource managers.

Resource Recovery Services (RRS)

A component of z/OS that uses a sync point manager to coordinate changes among participating resource managers.

responder

In distributed queuing, a program that replies to network connection requests from another system. See also [initiator](#).

resynch

In IBM MQ, an option to direct a channel to start and resolve any in-doubt status messages, but without restarting message transfer.

return code (RC)

A value returned by a program to indicate the result of its processing. Completion codes and reason codes are examples of return codes.

return-to-sender

An option available to an MCA that is unable to deliver a message. The MCA can send the message back to the originator.

Rivest-Shamir-Adleman algorithm (RSA)

A public-key encryption technology developed by RSA Data Security, Inc, and used in the IBM implementation of SSL.

RMM

See [reliable multicast messaging](#).

rollback

See [backout](#).

root certificate

The top certificate in the chain. If this is a self-signed certificate, it is used only for signing other certificates. See also [self-signed certificate](#).

RRS

See [Resource Recovery Services](#).

RSA

See [Rivest-Shamir-Adleman algorithm](#).

RTM

See [recovery termination manager](#).

rules table

A control file containing one or more rules that the dead-letter queue handler applies to messages on the dead letter queue (DLQ).

S**SAF**

See [store and forward](#).

Scalable Parallel 2 (SP2)

IBM's parallel UNIX system: effectively parallel AIX systems on a high-speed network.

SDK

See [software development kit](#).

SDWA

See [system diagnostic work area](#).

SECMEC

See [security mechanism](#).

Secure Sockets Layer (SSL)

A security protocol that provides communication privacy. With SSL, client/server applications can communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery. See also [certificate authority](#).

security enabling interface (SEI)

The IBM MQ interface to which customer-written or vendor-written programs that check authorization, supply a user identifier, or perform authentication must conform.

security exit

A channel exit program that is called immediately after the initial data negotiation has completed on channel startup. Security exits normally work in pairs and can be called on both message channels and MQI channels. The primary purpose of the security exit is to enable the message channel agent (MCA) at each end of a channel to authenticate its partner.

security identifier (SID)

On Windows systems, a supplement to the user ID that identifies the full user account details on the Windows security account manager database where the user is defined.

security mechanism (SECMEC)

A technical tool or technique that is used to implement a security service. A mechanism might operate by itself, or in conjunction with others, to provide a particular service. Examples of security mechanisms include access control lists, cryptography, and digital signatures.

security message

One of the messages, sent by security exits that are called at both ends of a channel, to communicate with each other. The format of a security message is not defined and is determined by the user.

security service

A service within a computer system that protect its resources. Access control is an example of a security service.

Security Support Provider Interface (SSI)

The means for networked applications to call one of several security support providers (SSPs) to establish authenticated connections and to exchange data securely over those connections. It is available for use on Windows systems.

segmentation

The division of a message that is too large for a queue manager, queue, or application, into a number of smaller physical messages, which are then reassembled by the receiving queue manager or application.

SEI

See [security enabling interface](#).

selector

An identifier for a data item. In the IBM MQ Administration Interface (MQAI), there are two types of selector: a user selector and a system selector.

self-signed certificate

A certificate that is constructed like a digital certificate, but is signed by its subject. Unlike a digital certificate, a self-signed certificate cannot be used in a trustworthy manner to authenticate a public key to other parties.

semaphore

In UNIX and Linux systems, a general method of communication between two processes that extends the features of signals.

sender channel

In message queuing, a channel that initiates transfers, removes messages from a transmission queue, and moves them over a communication link to a receiver or requester channel.

send exit

A type of channel exit program that is called just before a message channel agent (MCA) issues a communications send to send a unit of data over a communications connection. See also [receive exit](#).

Sequenced Packet Exchange protocol (SPX)

A session-oriented network protocol that provides connection-oriented services between two nodes on the network, and is used primarily by client/server applications. It relies on the Internet Packet Exchange (IPX) protocol, provides flow control and error recovery, and guarantees reliability of the physical network.

sequence number wrap value

In IBM MQ, a method of ensuring that both ends of a communication link reset their current message sequence numbers at the same time. Transmitting messages with a sequence number ensures that the receiving channel can reestablish the message sequence when storing the messages.

serialization

In object-oriented programming, the writing of data in sequential fashion to a communications medium from program memory.

server

1. A software program or a computer that provides services to other software programs or other computers. See also [client](#).
2. A queue manager that provides queue services to client applications running on a remote workstation.

server channel

In message queuing, a channel that responds to a requester channel, removes messages from a transmission queue, and moves them over a communication link to the requester channel. See also [requester channel](#).

server-connection channel type

The type of MQI channel definition associated with the server that runs a queue manager. See also [client-connection channel type](#).

service interval

A time interval, against which the elapsed time between a put or a get and a subsequent get is compared by the queue manager in deciding whether the conditions for a service interval event have been met. The service interval for a queue is specified by a queue attribute.

service interval event

An event related to the service interval.

service object

An object that can start additional processes when the queue manager starts and can stop the processes when the queue manager stops.

session

A logical or virtual connection between two stations, software programs, or devices on a network that allows the two elements to communicate and exchange data for the duration of the session.

session ID

See [session identifier](#).

session identifier (session ID)

In IBM MQ for z/OS, the identifier, unique to CICS, that defines the communication link to be used by a message channel agent when moving messages from a transmission queue to a link.

session-level authentication

In Systems Network Architecture (SNA), a session level security protocol that enables two logical units (LUs) to authenticate each other while they are activating a session. Session level authentication is also known as LU-LU verification.

session-level cryptography

In Systems Network Architecture (SNA), a method of encrypting and decrypting data that flows on a session between two logical units (LUs).

shared inbound channel

In IBM MQ for z/OS, a channel that was started by a listener using the group port. The channel definition of a shared channel can be stored either on page set zero (private) or in the shared repository (global).

shared outbound channel

In IBM MQ for z/OS, a channel that moves messages from a shared transmission queue. The channel definition of a shared channel can be stored either on page set zero (private) or in the shared repository (global).

shared queue

In IBM MQ for z/OS, a type of local queue. The messages on the queue are stored in the coupling facility and can be accessed by one or more queue managers in a queue sharing group. The definition of the queue is stored in the shared repository. See also [queue sharing group](#).

shared repository

In IBM MQ for z/OS, a shared Db2 database that is used to hold object definitions that have been defined globally.

sharing conversations

The facility for more than one conversation to share a channel instance, or the conversations that share a channel instance.

shell

A software interface between users and an operating system. Shells generally fall into one of two categories: a command line shell, which provides a command line interface to the operating system; and a graphical shell, which provides a graphical user interface (GUI).

SID

See [security identifier](#).

signal

A mechanism by which a process can be notified of, or affected by, an event occurring in the system. Examples of such events include hardware exceptions and specific actions by processes.

signaling

In IBM MQ for z/OS and IBM MQ, a feature that allows the operating system to notify a program when an expected message arrives on a queue.

signature

The collection of types associated with a method. The signature includes the type of the return value, if any, as well as the number, order, and type of each of the method's arguments.

signer certificate

The digital certificate that validates the issuer of a certificate. For a CA, the signer certificate is the root CA certificate. For a user who creates a self-signed certificate for testing purposes, the signer certificate is the user's personal certificate.

single instance queue manager

A queue manager that does not have multiple instances. See also [multi-instance queue manager](#).

single logging

A method of recording IBM MQ for z/OS activity where each change is recorded on one data set only. See also [dual logging](#).

single-phase backout

A method in which an action in progress must not be allowed to finish, and all changes that are part of that action must be undone.

single-phase commit

A method in which a program can commit updates to a commitment resource without coordinating those updates with updates the program has made to resources controlled by another resource manager.

SIT

See [system initialization table](#).

SMF

See [System Management Facilities](#).

SNA

See [Systems Network Architecture](#).

software development kit (SDK)

A set of tools, APIs, and documentation to assist with the development of software in a specific computer language or for a particular operating environment.

source queue manager

See [local queue manager](#).

SP2

See [Scalable Parallel 2](#).

SPX

See [Sequenced Packet Exchange protocol](#).

SSI

See [Security Support Provider Interface](#).

SSL

See [Secure Sockets Layer](#).

SSLPeer

The value in the issuer represents the distinguished name of the remote personal certificate.

SSL or TLS client

The initiating end of the connection. One outbound channel from a queue manager is also an SSL or TLS client.

standby queue manager instance

An instance of a running multi-instance queue manager ready to take over from the active instance. There are one or more standby instances of a multi-instance queue manager.

stanza

A group of lines in a file that together have a common function or define a part of the system. Stanzas are usually separated by blank lines or colons, and each stanza has a name.

star-connected communications network

A network in which all nodes are connected to a central node.

storage class

In IBM MQ for z/OS, the page set that is to hold the messages for a particular queue. The storage class is specified when the queue is defined.

store and forward (SAF)

The temporary storing of packets, messages, or frames in a data network before they are retransmitted toward their destination.

streaming

In object-oriented programming, the serialization of class information and object instance data.

subscribe

To request information about a topic.

subsystem

In z/OS, a service provider that performs one or many functions but does nothing until a request is made. For example, each IBM MQ for z/OS queue manager or instance of a Db2 for z/OS database management system is a z/OS subsystem.

supervisor call (SVC)

An instruction that interrupts the program being run and passes control to the supervisor so that it can perform the specific service indicated by the instruction.

SVC

See [supervisor call](#).

switchover

The change from the active multi-instance queue manager instance to a standby instance. A switchover results from an operator intentionally stopping the active multi-instance queue manager instance.

switch profile

In IBM MQ for z/OS, a RACF profile used when IBM MQ starts up or when a refresh security command is issued. Each switch profile that IBM MQ detects turns off checking for the specified resource.

symmetric key cryptography

A system of cryptography in which the sender and receiver of a message share a single, common, secret key that is used to encrypt and decrypt the message. See also [asymmetric key cryptography](#).

symptom string

Diagnostic information displayed in a structured format designed for searching the IBM software support database.

synchronous messaging

A method of communication between programs in which a program places a message on a message queue and then waits for a reply to its message before resuming its own processing. See also [asynchronous messaging](#).

sync point

A point during the processing of a transaction at which protected resources are consistent.

sysplex

A set of z/OS systems that communicate with each other through certain multisystem hardware components and software services.

system bag

A type of data bag that is created by the MQAI.

system control commands

Commands used to manipulate platform-specific entities such as buffer pools, storage classes, and page sets.

system diagnostic work area (SDWA)

In a z/OS environment, the data that is recorded in a SYS1.LOGREC entry that describes a program or hardware error.

system initialization table (SIT)

A table containing parameters used by CICS at startup.

system item

A type of data item that is created by the MQAI.

System Management Facilities (SMF)

A component of z/OS that collects and records a variety of system and job-related information.

system selector

In the IBM MQ Administration Interface (MQAI), a system item identifier that is included in the data bag when it is created.

Systems Network Architecture (SNA)

The description of the logical structure, formats, protocols, and operational sequences for transmitting information through and controlling the configuration and operation of networks.

T

tampering

A breach of communication security in which information in transit is changed or replaced and then sent on to the recipient. See also [eavesdropping](#), [impersonation](#).

target library high-level qualifier (thlqual)

A high-level qualifier for z/OS target data set names.

target queue manager

See [remote queue manager](#).

task control block (TCB)

A z/OS control block that is used to communicate information about tasks within an address space that is connected to a subsystem.

task switching

The overlapping of I/O operations and processing between several tasks.

TCB

See [task control block](#).

TCP

See [Transmission Control Protocol](#).

TCP/IP

See [Transmission Control Protocol/Internet Protocol](#).

technote

A short document about a single topic.

telemetry channel

A communication link between a queue manager on IBM MQ, and MQTT clients. Each channel might have one or more telemetry devices connected to it.

telemetry service

The telemetry service is an IBM MQ service that handles the server side of the MQTT protocol (see *MQTT Server*). The telemetry service hosts telemetry channels. It is sometimes referred to as the MQXR (MQ extended reach) service.

temporary dynamic queue

A dynamic queue that is deleted when it is closed. Temporary dynamic queues are not recovered if the queue manager fails, so they can contain nonpersistent messages only. See also [permanent dynamic queue](#).

teraspace

A one terabyte temporary storage area that provides storage that is private to a process.

termination notification

A pending event that is activated when a CICS subsystem successfully connects to IBM MQ for z/OS.

thlqual

See [target library high-level qualifier](#).

thread

A stream of computer instructions that is in control of a process. In some operating systems, a thread is the smallest unit of operation in a process. Several threads can run concurrently, performing different jobs.

TID

See [transaction identifier](#).

time-independent messaging

See [asynchronous messaging](#).

TLS

See [Transport Layer Security](#).

TMF

See [Transaction Manager Facility](#).

TMI

See [trigger monitor interface](#).

topic host routing

An option for routing publications in a publish/subscribe cluster. With topic host routing, only selected cluster queue managers host the topic definitions. Publications from non-hosting queue managers are routed through the hosting queue managers to any queue manager in the cluster with a matching subscription.

TP

See [transaction program](#).

trace

A record of the processing of a computer program or transaction. The information collected from a trace can be used to assess problems and performance.

transaction ID

See [transaction identifier](#).

transaction identifier (TID, transaction ID, XID)

A unique name that is assigned to a transaction and is used to identify the actions associated with that transaction.

transaction manager

A software unit that coordinates the activities of resource managers by managing global transactions and coordinating the decision to commit them or roll them back.

Transaction Manager Facility (TMF)

In IBM MQ for HP NonStop Server, a subsystem to protect business transactions and the integrity of databases.

transaction program (TP)

A program that processes transactions in an SNA network.

Transmission Control Protocol (TCP)

A communication protocol used in the Internet and in any network that follows the Internet Engineering Task Force (IETF) standards for internetwork protocol. TCP provides a reliable host-to-host protocol in packet-switched communication networks and in interconnected systems of such networks. See also [Internet Protocol](#).

Transmission Control Protocol/Internet Protocol (TCP/IP)

An industry-standard, nonproprietary set of communication protocols that provides reliable end-to-end connections between applications over interconnected networks of different types.

transmission program

See [message channel agent](#).

transmission queue

A local queue on which prepared messages destined for a remote queue manager are temporarily stored.

transmission segment

The data sent in each single flow between a pair of message channel agents or a pair of client-server connection MQI agents.

Transport Layer Security

A set of encryption rules that uses verified certificates and encryption keys to secure communications over the Internet. TLS is an update to the SSL protocol.

triggered queue

A local queue, usually an application queue, that has triggering enabled so that a message is written when a trigger event occurs. The trigger message is often written to an initiation queue.

trigger event

An event, such as a message arriving on a queue, that causes a queue manager to create a trigger message on an initiation queue.

triggering

In IBM MQ, a facility that allows a queue manager to start an application automatically when predetermined conditions on a queue are satisfied.

trigger message

A message that contains information about the program that a trigger monitor is to start.

trigger monitor

A continuously running application that serves one or more initiation queues. When a trigger message arrives on an initiation queue, the trigger monitor retrieves the message. It uses the information in the trigger message to start a process that serves the queue on which a trigger event occurred.

trigger monitor interface (TMI)

The IBM MQ interface to which customer-written or vendor-written trigger monitor programs must conform.

truststore

In security, a storage object, either a file or a hardware cryptographic card, where public keys are stored in the form of trusted certificates, for authentication purposes. In some applications, these trusted certificates are moved into the application keystore to be stored with the private keys.

two-phase commit

A two-step process by which recoverable resources and an external subsystem are committed. During the first step, the database manager subsystems are polled to ensure that they are ready to commit. If all subsystems respond positively, the database manager instructs them to commit.

two way authentication

In this method of authentication, the queue manager and the client, present the certificate to each other. Also known as mutual authentication.

type

A characteristic that specifies the internal format of data and determines how the data can be used.

U

UDP

See [User Datagram Protocol](#).

unauthorized access

Gaining access to resources within a computer system without permission.

undelivered message queue

See [dead-letter queue](#).

undo/redo record

A log record used in recovery. The redo part of the record describes a change to be made to an IBM MQ object. The undo part describes how to back out the change if the work is not committed.

unit of recovery

A recoverable sequence of operations within a single resource manager, such as an instance of Db2 for z/OS. See also [unit of work](#).

unit of work (UOW)

A recoverable sequence of operations performed by an application between two points of consistency. A unit of work begins when a transaction starts or at a user-requested sync point. It ends either at a user-requested sync point or at the end of a transaction.

UOW

See [unit of work](#).

user bag

In the MQAI, a type of data bag that is created by the user.

User Datagram Protocol (UDP)

An Internet protocol that provides unreliable, connectionless datagram service. It enables an application program on one machine or process to send a datagram to an application program on another machine or process.

user item

In the MQAI, a type of data item that is created by the user.

user selector

In the IBM MQ Administration Interface (MQAI), the identifier that is placed with a data item into a data bag to identify the data item. IBM MQ provides predefined user selectors for IBM MQ objects.

user token (UTOKEN)

The RACF security token that encapsulates or represents the security characteristics of a user. RACF assigns a UTOKEN to each user in the system.

utility

In IBM MQ, a supplied set of programs that provide the system operator or system administrator with facilities in addition to those provided by the IBM MQ commands.

UTOKEN

See [user token](#).

V**value**

The content of a data item. The value can be an integer, a string, or the handle of another data bag.

virtual method

In object-oriented programming, a method that exhibits polymorphism.

W**WCF custom channel**

Microsoft Windows Communication Foundation (WCF) custom channel for IBM MQ.

IBM WebSphere MQ

A previous name for IBM MQ.

wiretapping

The act of gaining access to information that is flowing along a wire or any other type of conductor used in communications. The objective of wiretapping is to gain unauthorized access to information without being detected.

X**X509**

International Telecommunications Union standard for PKI. Specifies the format of the public key certificate and the public key cryptography.

XCF

See [cross-system coupling facility](#).

XID

See [transaction identifier](#).

X/Open XA

The X/Open Distributed Transaction Processing XA interface. A proposed standard for distributed transaction communication. The standard specifies a bidirectional interface between resource managers that provide access to shared resources within transactions, and between a transaction service that monitors and resolves transactions.

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