

9.3

*IBM MQ Overview*

**IBM**

**Note**

Before using this information and the product it supports, read the information in [“Notices” on page 243.](#)

This edition applies to version 9 release 3 of IBM® MQ and to all subsequent releases and modifications until otherwise indicated in new editions.

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# About IBM MQ

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Introductory information to help you get started with IBM MQ 9.3, 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), JMS, REST, .NET, AMQP 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

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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.



Documentation sets are available for each of the following IBM MQ products:

- [“IBM MQ for Multiplatforms and IBM MQ for z/OS” on page 6](#)
- [“IBM MQ Explorer” on page 6](#)
- [“IBM MQ in containers and IBM Cloud Pak for Integration” on page 7](#)
- [“IBM MQ on Cloud” on page 7](#)
- [“IBM MQ Appliance” on page 7](#)

## IBM MQ for Multiplatforms and IBM MQ for z/OS

The documentation for both these products is presented in a single documentation set, subdivided into the following categories. Each category contains topics that apply to the IBM MQ for Multiplatforms product, or to the IBM MQ for z/OS<sup>®</sup> product, or to both products. This documentation is for the IBM MQ 9.3 Long Term Support release and its maintenance, as well as for the IBM MQ 9.3 Continuous Delivery releases.

- [About IBM MQ](#)
- [Technical overview](#)
- [Scenarios](#)
- [Planning](#)
- [Maintaining and migrating](#)
- [Installing and uninstalling](#)
- [Securing](#)
- [Configuring](#)
- [Administering](#)
- [Developing applications](#)
- [Monitoring and performance](#)
- [Troubleshooting and support](#)
- [Reference](#)

## IBM MQ Explorer

IBM MQ Explorer is an optional graphical user interface that runs on Windows and Linux<sup>®</sup> x86-64. It can remotely connect to queue managers that are running on any supported platform including z/OS, enabling your entire messaging backbone to be viewed, explored, and altered from the console.

See [Introduction to IBM MQ Explorer](#).

## IBM MQ in containers and IBM Cloud Pak for Integration

You can run IBM MQ in the pre-packaged container provided in IBM Cloud Pak® for Integration, IBM MQ Advanced and IBM MQ Advanced for Developers. This IBM MQ Advanced container offers a supported image and Operator, and can be used to deploy a production-ready IBM MQ image into Red Hat® OpenShift®.

You can also run IBM MQ in a container you build yourself.

See [IBM MQ in containers and IBM Cloud Pak for Integration](#).

## IBM MQ on Cloud

This managed service is available in both IBM Cloud® and Amazon Web Services (AWS). The IBM MQ on Cloud service lets you use IBM MQ as a managed offering, leaving IBM to handle upgrades, patches and also many of the operational management tasks, and allowing you to focus on the integration of IBM MQ with your applications.

See [IBM MQ on Cloud](#).

## IBM MQ Appliance

The IBM MQ Appliance is a hardware product that provides IBM MQ ready installed and ready to use. There is no general-purpose operating system that is exposed to the administrator or messaging user, and everything that runs on the appliance is factory-installed in the appliance firmware.

See [IBM MQ Appliance](#).

# Introduction to IBM MQ

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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 Queuing Protocol (AMQP), 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 IBM MQ channels yourself, or a queue manager can join a cluster of queue managers where IBM MQ channels are automatically created when they are needed.
- **z/OS** 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.



**Windows** 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.
- 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.



- 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 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's new and changed in IBM MQ 9.3.x Continuous Delivery” on page 81](#)

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icons are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

[Technical overview](#)

## IBM MQ license information

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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

#### 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 10](#)
- IBM MQ Advanced
- IBM MQ Advanced High Availability Replica (formerly IBM MQ Advanced Idle Standby) [“1” on page 10](#)
- IBM MQ Advanced for Developers (Non-warranted, free download)
- IBM MQ for Non-Production Environment
- IBM MQ Advanced for Non-Production Environment

**Attention:**

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, IBM MQ Advanced, and IBM Cloud Pak for Integration

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.


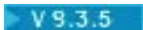
Table 1. Product offering entitlement for IBM MQ, IBM MQ Advanced, and IBM Cloud Pak for Integration

IBM MQ product feature	IBM MQ and IBM MQ for Non-Production Environment	IBM MQ Advanced and IBM MQ Advanced for Non-Production Environment	IBM MQ for z/OS	IBM MQ for z/OS Value Unit Edition	IBM MQ Advanced for z/OS Value Unit Edition	IBM MQ Appliance	IBM Cloud Pak for Integration
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 13		✓			✓	✓	✓
Managed File Transfer Tools (unlimited installs)		✓			✓	✓	✓
Managed File Transfer Database Logger component (unlimited installs) <u>"1"</u> on page 13		✓			✓	✓ <u>"2"</u> on page 13	✓


Table 1. Product offering entitlement for IBM MQ, IBM MQ Advanced, and IBM Cloud Pak for Integration (continued)

IBM MQ product feature	IBM MQ and IBM MQ for Non-Production Environment	IBM MQ Advanced and IBM MQ Advanced for Non-Production Environment	IBM MQ for z/OS	IBM MQ for z/OS Value Unit Edition	IBM MQ Advanced for z/OS Value Unit Edition	IBM MQ Appliance	IBM Cloud Pak for Integration
Replicated Data Queue Manager (Red Hat Enterprise Linux for x86-64 only)		✓ "3" on page 13					✓
<b>V 9.3.3</b> Kafka Connect connectors (unlimited installs) "1" on page 13		✓			✓	✓	✓
<b>&gt; Deprecated</b> Bridge to blockchain (unlimited installs) "1" on page 13 "8" on page 14		✓ "4" on page 13			✓ "4" on page 13		✓ "4" on page 13
<b>&gt; Deprecated</b> Bridge to Salesforce (unlimited installs) "9" on page 14	✓ "4" on page 13	✓ "4" on page 13					✓ "4" on page 13
IBM MQ Advanced container		✓ "5" on page 13					✓
IBM MQ Internet Pass-Thru (unlimited installs) "6" on page 14	✓	✓	✓	✓	✓	✓	✓

Table 1. Product offering entitlement for IBM MQ, IBM MQ Advanced, and IBM Cloud Pak for Integration (continued)

IBM MQ product feature	IBM MQ and IBM MQ for Non-Production Environment	IBM MQ Advanced and IBM MQ Advanced for Non-Production Environment	IBM MQ for z/OS	IBM MQ for z/OS Value Unit Edition	IBM MQ Advanced for z/OS Value Unit Edition	IBM MQ Appliance	IBM Cloud Pak for Integration
IBM Aspera® faspio Gateway		✓			✓	✓	✓
AMQP	✓	✓				✓	✓
Native HA		✓ “7” on page 14					✓ “7” on page 14
 IBM MQ Web Server (unlimited installs)	✓ “10” on page 14	✓ “10” on page 14	✓ “10” on page 14	✓ “10” on page 14	✓ “10” on page 14	✓ “10” on page 14	✓ “10” on page 14
 IBM Instana Tracing Exit	✓	✓					✓
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 [IBM Container Registry](#). 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. For more information, see [EnableAdvancedCapabilities](#).
7. **V 9.3.0** Native HA is available for production use for customers with entitlement to IBM MQ Advanced or IBM Cloud Pak for Integration deploying IBM MQ Advanced conversion entitlement ratios. For development purposes, Native HA capability is also available in the free IBM MQ Advanced for Developers. Native HA is only supported with IBM MQ in container deployments. Customers can obtain production and development licensed pre-built container images from the [IBM Container Registry](#) or build a custom container image.  
  
Minimum supported levels of OpenShift Container Platform and Kubernetes, across public and private cloud environments, are documented for each release on the [IBM MQ system requirements pages](#). IBM provides as-is reference implementations on GitHub for [building the custom container image](#), and a [helm chart](#) for deploying it. These together show how Native HA can be deployed in a common Kubernetes environment. Customers are recommended to verify that this functions correctly within their intended environment.
8.
  - ▶ **Deprecated** IBM MQ Bridge to blockchain is deprecated across all releases (see [US Announcement letter 222-341](#)).
  - ▶ **CD** IBM MQ 9.3.1 is the last Continuous Delivery release it is delivered with.
  - ▶ **Removed** ▶ **V 9.3.2** For Continuous Delivery, IBM MQ Bridge to blockchain is removed at IBM MQ 9.3.2.
9. ▶ **Deprecated** IBM MQ Bridge to Salesforce is deprecated across all releases (see [US Announcement letter 222-341](#)).
10. ▶ **Linux** Linux for x86-64, Linux on Power® Systems - Little Endian, and Linux for IBM Z® only.

### 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.

IBM MQ product feature	IBM MQ Managed File Transfer Service “1” on page 16	IBM MQ Managed File Transfer Agent “1” on page 16	IBM MQ Advanced Message Security “1” on page 16	IBM MQ Telemetry “1” on page 16	IBM MQ Advanced for z/OS “2” on page 17	IBM MQ Managed File Transfer for z/OS “1” on page 16	IBM MQ Advanced Message Security for z/OS “1” on page 16
IBM MQ client (unlimited installs)							
Telemetry Service				✓			
Advanced Message Security			✓		✓		✓

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 <sup>“1”</sup> on page 16	IBM MQ Managed File Transfer Agent <sup>“1”</sup> on page 16	IBM MQ Advanced Message Security <sup>“1”</sup> on page 16	IBM MQ Telemetry <sup>“1”</sup> on page 16	IBM MQ Advanced for z/OS <sup>“2”</sup> on page 17	IBM MQ Managed File Transfer for z/OS <sup>“1”</sup> on page 16	IBM MQ Advanced Message Security for z/OS <sup>“1”</sup> on page 16
Managed File Transfer Service	✓				✓	✓	
Managed File Transfer Agent (unlimited installs)	✓	✓			✓ <sup>“3”</sup> on page 17	✓	
Managed File Transfer Tools (unlimited installs)	✓	✓			✓	✓	
Managed File Transfer Logger component (unlimited installs)	✓	✓			✓	✓	
Replicated Data Queue Manager (Red Hat Enterprise Linux for x86-64 only)							
<b>V 9.3.3</b> Kafka Connect connectors (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 <sup>“1”</sup> on page 16	IBM MQ Managed File Transfer Agent <sup>“1”</sup> on page 16	IBM MQ Advanced Message Security <sup>“1”</sup> on page 16	IBM MQ Telemetry <sup>“1”</sup> on page 16	IBM MQ Advanced for z/OS <sup>“2”</sup> on page 17	IBM MQ Managed File Transfer for z/OS <sup>“1”</sup> on page 16	IBM MQ Advanced Message Security for z/OS <sup>“1”</sup> on page 16
<p>➤ <b>Deprecated</b></p> <p>Bridge to blockchain (unlimited installs) <sup>“8”</sup> on page 14</p>							
<p>➤ <b>Deprecated</b></p> <p>Bridge to Salesforce (unlimited installs) <sup>“9”</sup> on page 14</p>							
IBM MQ Advanced container							
IBM MQ Internet Pass-Thru							
AMQP							
<p>➤ <b>V 9.3.5</b></p> <p>IBM MQ Web Server (unlimited installs)</p>							
<p>➤ <b>V 9.3.5</b></p> <p>IBM Instana Tracing Exit</p>							
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. Components include:

- IBM MQ Advanced for Developers server install
- IBM MQ Advanced for Developers non-install package for building container images
- IBM MQ MacOS Toolkit

To get the download, complete the following steps:

1. Go to [Downloading IBM MQ 9.3](#).
2. Click the tab for the latest Continuous Delivery or Long Term Support release.
3. Near the end of the document, find **Other useful links > Development > IBM MQ Advanced for Developers**.
4. Click the link for your preferred platform (Windows / Linux / Ubuntu / Raspberry Pi).

This is a free download. Support for development, test and staging environments may be obtained through purchasing IBM MQ for Non-Production Environment or IBM MQ Advanced for Non-Production Environment entitlement.



**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 9.1 version and 50 PVUs of the IBM MQ 9.2 version of this component.

### **What are Subscription License parts?**

V 9.3.5

- Subscription License parts are available for IBM MQ on Multiplatforms (PID 5724-H72) and include:
  - VPC-based parts for IBM MQ and IBM MQ Advanced
  - Subscription License Upgrade parts
  - Extended Support parts
  - Advanced Support parts
- They are for customers to purchase IBM MQ via Private offer on AWS Marketplace and these parts reside along with the existing Monthly VPC and Perpetual PVC parts. For more information, read the [Subscription License guidance](#).

### **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.

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 the IBM License Metric Tool (ILMT). For more information, 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.

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.

2a. Replicated Data Queue Manager Disaster Recovery: 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.

## How do I configure IBM MQ for non-production environments?

IBM MQ Advanced for Non-Production Environment is an entitlement option for internal development and test systems for non-production activities.



You must use the **setmqinst** command to specify that an installation is a Non-Production Environment. This action applies tags to the installation such that it can be identified by the IBM License Metric Tool (ILMT). For more information, see [setmqinst](#).

IBM MQ for Non-Production Environment cannot currently be configured to be automatically identified by the IBM License Metric Tool (ILMT).





## Which components of IBM MQ can I install separately from the queue manager?

Some components of IBM MQ are designed to be for client or administrator usage and are intended to be installed on systems that are remote from an IBM MQ queue manager, but connected over a network to an IBM MQ queue manager. The following list shows the IBM MQ components that are in this category and can be installed on remote systems in accordance with the license terms:

### IBM MQ/IBM MQ Appliance

- IBM MQ C, C++ and .NET clients
- IBM MQ Java/JMS client
- IBM MQ Resource Adapter
- IBM MQ Internet Pass-Thru (MQIPT)
- IBM MQ Explorer
-  IBM MQ Bridge to Salesforce
-  IBM MQ Web Server

### IBM MQ Advanced/IBM MQ Appliance

- IBM MQ Managed File Transfer Agent
- IBM MQ Managed File Transfer Database Logger
- IBM MQ Managed File Transfer Tools
-  Kafka Connect source and sink connectors for IBM MQ
- IBM Aspera faspio Gateway
-  IBM MQ Bridge to blockchain
  - Shipped in IBM MQ 9.3 LTS and earlier.
  -   For Continuous Delivery, IBM MQ Bridge to blockchain is removed in IBM MQ 9.3.2 CD and later.

Further to this, a subset of these components are licensed to be redistributable with 3rd party applications. For more information, see [“IBM MQ Redistributable Components” on page 20](#).

## Other questions

In an IBM MQ network using IBM MQ Advanced features, such as Managed File Transfer and Advanced Message Security, which IBM 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.

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 Advanced 9.3, IBM MQ Advanced for Non-Production Environment 9.3, IBM MQ Advanced for z/OS Value Unit Edition 9.3,

 and IBM MQ Advanced for z/OS 9.3:

- IBM Aspera faspio Gateway 1.3

### Related concepts

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's new and changed in IBM MQ 9.3.x Continuous Delivery” on page 81](#)

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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.

[Technical overview](#)

[IBM MQ non-install images](#)

### Related information

[Downloading IBM MQ 9.3](#)

## 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.

The license agreement can 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 M2001, M2002 and M2003
- 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:**

- IBM MQ Clients from IBM Fix Central
  - <https://ibm.biz/mq93redistclients>
- IBM MQ Message Service Client (XMS) for C/C++ (IA94 SupportPac)
  - <https://ibm.biz/mqxms3supportpac>
- 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 (including, from IBM MQ 9.3.0, the Managed File Transfer Logger component) 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/mq93redistmftagent>

## **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, CSQBRSI, CSQBRSTB, CSQCSTUB, CSQQSTUB, CSQXSTUB, CSQASTUB

Members of the following data sets are required for application development and compilation and may also be redistributed:

- CSQ.SCSQPLIC - PL/I include files
- CSQ.SCSQMACS – assembler macros
- CSQ.SCSQHPPS – C++ header files
- CSQ.SCSQC370 – C header files
- CSQ.SCSQCOBC – COBOL copy books
- CSQ.SCSQDEFS – C++ side decks subset:

CSQA, CSQBAS1X, CSQBAS2X, CSQBMB1X, CSQBMB2X, CSQBMQ1, CSQBMQ1X, CSQBMQ2X, CSQBRI1, CSQBRI1X, CSQBRI2X, CSQBRR1, CSQBRR1X, CSQBRR2X, CSQBXB1X, CSQBXB2X, CSQBXI1, CSQBXI1X, CSQBXI2X, CSQBXQ1, CSQBXQ1X, CSQBXQ2X, CSQBXR1, CSQBXR1X, CSQBXR2X, CSQBXS1X, CSQBXS2X, CSQC, CSQCMQ2X, CSQCXQ2X, CSQMDA, CSQMDL, CSQMDV, CSQMD1A, CSQMD1L, CSQMD1V, CSQMD2A, CSQMD2L, CSQMD2V, CSQP, CSQQMQ1X, CSQQMQ2X, CSQQXQ1X, CSQQXQ2X, CSQV

## 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>		
<b>IBM MQ product offering</b>	<b>Product identifier (PID)</b>	<b>Export classification (ECCN)</b>
IBM MQ <a href="#">"1" on page 23</a>	5724-H72	5D992
IBM MQ for z/OS	5655-MQ9	  5D002.c.1
IBM MQ for z/OS Value Unit Edition	5655-VU9	  5D002.c.1

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 Advanced for z/OS Value Unit Edition “2” on page 23	5655-AV1	5D002.c.1
IBM MQ Advanced for z/OS “3” on page 23	5655-AV9	<b>V 9.3.0</b> <b>V 9.3.0</b> 5D002.c.1
IBM MQ Advanced Message Security for z/OS “4” on page 23	5655-AM9	EAR99
IBM MQ Managed File Transfer for z/OS “4” on page 23	5655-MF9	5D992

**Notes:**

1. 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 23
- IBM MQ Managed File Transfer Service High Availability Replica “4” on page 23
- IBM MQ Managed File Transfer Agent “4” on page 23
- IBM MQ Advanced Message Security “4” on page 23
- IBM MQ Advanced Message Security High Availability Replica “4” on page 23
- IBM MQ Telemetry “4” on page 23

2. IBM MQ Advanced for z/OS Value Unit Edition is a zCAP (Collocated Application Pricing) Defining Program.

3. **V 9.3.0** At IBM MQ 9.3.0 Long Term Support, IBM MQ Advanced for z/OS is a bundle of IBM MQ Advanced Message Security for z/OS, IBM MQ Managed File Transfer for z/OS, and the Connector Pack.

**CD** From IBM MQ 9.3.0 to IBM MQ 9.3.3 Continuous Delivery, 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.

**V 9.3.4** From IBM MQ 9.3.4, IBM MQ Advanced for z/OS is a bundle of IBM MQ Advanced Message Security for z/OS, IBM MQ Managed File Transfer for z/OS, and the Connector Pack.

Separate entitlement to IBM MQ for z/OS or IBM MQ for z/OS Value Unit Edition is required to run the queue manager.

4. 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.

**IBM MQ Appliances**

**MQ Appliance**



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 concepts

 Product usage recording with IBM MQ for z/OS products

## IBM MQ release types and versioning

There are two main types of release for IBM MQ; Long Term Support (LTS) and Continuous Delivery (CD). Some versions of the IBM MQ Advanced container are IBM Cloud Pak for Integration - Long Term Support (CP4I-LTS) releases.

### LTS and CD release types

The aim of the two main 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 LTS 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 always have a modification number of zero. For example IBM MQ 9.2.0 and 9.3.0.
- Continuous Delivery releases usually have a modification number that is non-zero. For example 9.3.1, 9.3.2, and so on.




For each new version of IBM MQ there is an initial CD release available at the same time as the initial LTS release. Both releases have the same Modification level of zero, and both are functionally identical. For example, IBM MQ 9.3.0 is the follow-on LTS release to IBM MQ 9.2.0. It is also the follow-on CD release to IBM MQ 9.2.5.

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.

**Note:** IBM MQ Explorer, IBM MQ Operator and IBM MQ Container releases are CD only. See [Version support for the IBM MQ Operator](#).

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 `DSPMQMVER` 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:



### **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.

### **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:

-  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, 9.3.0.5 is a fix pack and 9.3.0.1 is an LTS CSU.
-  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. For example, 9.3.2.1 is a CD CSU.

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

 For Multiplatforms, LTS fix packs and CSUs, and CD CSUs,

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

 For z/OS, LTS fix packs and CSUs

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

z/OS CD CSUs are not usually made available as separate downloads. They are bundled into the next CD release. If you cannot wait for the next CD release, you can request a CD CSU as a USERMOD.

## IBM MQ Advanced container and the CP4I-LTS release model

The IBM MQ Advanced container is only supported when deployed using the IBM MQ Operator on the Red Hat OpenShift Container Platform. IBM MQ Advanced container Operators are supported for use as part of the IBM Cloud Pak for Integration, or independently. The IBM Cloud Pak for Integration uses the IBM Cloud Pak for Integration - Long Term Support (CP4I-LTS) release model. This provides support for up to 2 years, with an optional extension for another year, for each CP4I-LTS release.

The IBM MQ Advanced container image is based on IBM MQ Continuous Delivery, and is typically supported as a CD release. **V 9.3.0** However, if a container image is based on a version of IBM MQ 9.3, and the container is used as part of the IBM Cloud Pak for Integration, the container is instead supported as a CP4I-LTS release.

For detailed mappings between IBM MQ Operators, IBM Cloud Pak for Integration versions, and container images, see [Release history for IBM MQ Operator](#).

### **Related concepts**

[Applying maintenance to IBM MQ](#)

### **Related information**

[Downloading IBM MQ 9.3](#)

## **Pricing metric for Virtual Processor Cores (VPCs)**

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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**

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

## **V 9.3.0 V 9.3.0 What's new and changed in IBM MQ 9.3.0**

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IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.


### **Statement of direction**


**LTS** Effective with the next IBM MQ Long Term Support release, clients should use a separately downloadable IBM Semeru Java runtime for IBM MQ client applications instead of using the Java runtime packaged with IBM MQ. IBM MQ intends to provide support for the IBM Semeru runtime via IBM MQ

product entitlement when used for the purpose of running IBM MQ Java/JMS applications. The Java runtime packaged with the IBM MQ product is expected to be updated more often which might result in breaking changes for applications depending on it.

## Delivery and support model

IBM MQ 9.3.0 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; a Long Term Support (LTS) release and a Continuous Delivery (CD) release.



 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 release is intended for systems which demand a long term deployment and maximum stability.

 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. These releases are intended for systems where applications want to exploit the very latest capabilities of IBM MQ.

For further information see [IBM MQ release types and versioning](#) 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 9.3.0

IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.0 through IBM MQ 9.2.5, along with some features and enhancements that are new at IBM MQ 9.3.0:

- Features that are new to Long Term Support (LTS) users at IBM MQ 9.3.0 are indicated by a dark blue icon 
- Features that are new to Continuous Delivery (CD) users at IBM MQ 9.3.0 are indicated by a light blue icon 

### Related concepts

[“IBM MQ license information” on page 9](#)

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

[“What's new and changed in IBM MQ 9.3.x Continuous Delivery” on page 81](#)

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icons are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)



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

## What's new in IBM MQ 9.3.0

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

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 9.

IBM MQ 9.3.0 includes the features that were previously delivered in the CD releases of IBM MQ 9.2.0 through IBM MQ 9.2.5, along with some features that are new at IBM MQ 9.3.0:






- Features and enhancements that are new to Long Term Support (LTS) users at IBM MQ 9.3.0 are indicated by a dark blue icon 
- Features and enhancements that are new to Continuous Delivery (CD) users at IBM MQ 9.3.0 are indicated by a light blue icon 

## New for IBM MQ for Multiplatforms - base and Advanced entitlement



On [Multiplatforms](#), that is, all platforms except IBM MQ for z/OS, the following features and enhancements are available with both base product entitlement, and with Advanced entitlement.

### License entitlement, installation and upgrade

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:


-   [“\[Windows\]\[MQ 9.3.0 Jun 2022\]New Confirm License Entitlement panel”](#) on page 35
-   [“\[MQ 9.3.0 Jun 2022\]\[Linux\]Support for upgrading IBM MQ for Linux without uninstalling the earlier version”](#) on page 35
-  [“\[MQ 9.3.0 Jun 2022\]IBM MQ code signing support”](#) on page 35

The following capabilities are new for Long Term Support at IBM MQ 9.3.0:

-   [“\[MQ 9.3.0 Jun 2022\]\[IBM i\]Support for dspmqinst and setmqinst on IBM MQ for IBM i”](#) on page 36







### Streaming queues

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

-  [“\[MQ 9.3.0 Jun 2022\]Streaming queues to realize additional value from data already flowing through IBM MQ”](#) on page 36

### Administration

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

-  [“\[MQ 9.3.0 Jun 2022\]IBM MQ Console Application quick start”](#) on page 36
-  [“\[MQ 9.3.0 Jun 2022\]Remote queue manager support for the IBM MQ Console”](#) on page 36
-  [“\[MQ 9.3.0 Jun 2022\]Configurable IBM MQ Console message browsing controls”](#) on page 36
-  [“\[MQ 9.3.0 Jun 2022\]Dead-letter queue handler included in client package”](#) on page 36
-   [“\[MQ 9.3.0 Jun 2022\]\[AIX, Linux, Windows\]New IGNSTATE parameter for using MQSC DELETE commands idempotently”](#) on page 37

- [V 9.3.0](#) [AIX](#) “[MQ 9.3.0 Jun 2022][AIX]Support for zlibNX compression library” on [page 37](#)

## Security

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [Linux](#) [AIX](#) “[MQ 9.3.0 Jun 2022][Linux][AIX]Permitting non-operating system users in the Object Authority Manager” on [page 37](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]TLS 1.3 support from IBM MQ Java applications” on [page 37](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Support for Transport Layer Security (TLS) 1.3 in MQIPT” on [page 37](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Encryption of passphrases for MQTT channels” on [page 38](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]SecureCommsOnly setting available on the queue manager” on [page 38](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]More flexible configuration for SNI support” on [page 38](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]OutboundSNI property for NMQI and XMS .NET clients ” on [page 38](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Support for multiple queue manager certificates in MQIPT” on [page 38](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]TLS support for the IBM MQ .NET XA Monitor application” on [page 38](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Additional configuration option to control TLS environment in C clients” on [page 39](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Improved password protection for IBM MQ clients using cryptographic hardware” on [page 39](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [V 9.3.0](#) [V 9.3.0](#) “User data traced by MQIPT can be configured” on [page 39](#)
- [V 9.3.0](#) [V 9.3.0](#) “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows][MQ 9.3.0 Jun 2022]Support for PKCS#12 key repositories” on [page 39](#)
- [V 9.3.0](#) [V 9.3.0](#) “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows][MQ 9.3.0 Jun 2022]Support for key repository passwords” on [page 39](#)

## Scalability

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Application re-balancing support” on [page 39](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Support for dynamic balancing of Java Platform, Enterprise Edition inbound connections in a uniform cluster” on [page 40](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]IBM MQ scaler for KEDA” on [page 40](#)

## Application development

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) “[MQ 9.3.0 Jul 2022]Support for the Apache Qpid JMS client library” on [page 40](#)

- **V 9.3.0** “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows]Point-to-point messaging on AMQP channels” on page 40
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Java 17 support for IBM MQ clients” on page 40
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]REST Messaging API: greater access to message properties when sending and receiving messages using the REST API” on page 40

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **JM 3.0** **V 9.3.0** **V 9.3.0** “[Jakarta Messaging 3.0][MQ 9.3.0 Jun 2022][MQ 9.3.0 Jun 2022]Support for Jakarta Messaging 3.0” on page 41

## **Multi** **MQ Adv.** **New for IBM MQ for Multiplatforms - Advanced entitlement only**

The following features and enhancements are available only with Advanced entitlement.

### **Linux** **Using the IBM MQ Advanced container with the IBM Cloud Pak for Integration**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[IBM Cloud Pak for Integration][MQ 9.3.0 Jun 2022]Native HA for IBM MQ containers in Red Hat OpenShift” on page 43
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]Deploying the IBM MQ Advanced container to IBM Cloud Pak for Integration” on page 43
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux][CP4I Long Term Support][MQ 9.3.0 Jun 2022]The IBM MQ Advanced container and the CP4I-LTS release model” on page 43

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **CP4I-LTS** **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux][CP4I Long Term Support][MQ 9.3.0 Jun 2022]IBM MQ Advanced container support for Power Systems” on page 43
- **V 9.3.0** **CP4I-LTS** **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux][CP4I Long Term Support][MQ 9.3.0 Jun 2022]IBM MQ Advanced container support for Power Systems” on page 43

### **Replicated Data Queue Manager (RDQM)**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]Replicated Data Queue Manager (RDQM) kernel module serviceability enhancements” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]RDQM now reports when an HA or DR node's replication was last in sync” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]RDQM summary status now includes the preferred location for HA queue managers” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]You can now see and clear RDQM HA failed resource actions” on page 44

### **Security**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Improved password protection for MQI Advanced Message Security clients” on page 44



## Managed File Transfer

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Redistributable Managed File Transfer Logger” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Limiting the number of file transfers for each FTP endpoint” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]New Managed File Transfer commands for starting and stopping resource monitors” on page 45
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Enhanced credentials protection for Managed File Transfer” on page 45
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Improvements to the fteRAS command” on page 45
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Transfer logging on Managed File Transfer” on page 45

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **> V 9.3.0** “[MQ 9.3.0 Jun 2022][MQ 9.3.0 Jun 2022]Enable MQCSP support by default for Managed File Transfer commands” on page 45
- **V 9.3.0** **> V 9.3.0** “[MQ 9.3.0 Jun 2022][MQ 9.3.0 Jun 2022]The REST API and managed calls for Managed File Transfer” on page 46

## **z/OS** New for IBM MQ for z/OS - base and Advanced VUE entitlement

The following features and enhancements are available both with base product entitlement, and with IBM MQ Advanced for z/OS Value Unit Edition (Advanced VUE) entitlement.

### Streaming queues

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **> V 9.3.0** “[MQ 9.3.0 Jul 2022][MQ 9.3.0 Jul 2022]Streaming queues to realize additional value from data already flowing through IBM MQ” on page 47

### Administration

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jul 2022]New queue managers 64-bit RBA capable by default” on page 47
- **V 9.3.0** “[MQ 9.3.0 Jul 2021]Changes to statistics collection intervals” on page 47
- **V 9.3.0** “[MQ 9.3.0 Jul 2022]CSQUDSPM utility supports upper case and lower case parameters” on page 48
- **V 9.3.0** IBM MQ Console Application quick start
- **V 9.3.0** Remote queue manager support for the IBM MQ Console
- **V 9.3.0** Configurable IBM MQ Console message browsing controls

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **> V 9.3.0** “[MQ 9.3.0 Jul 2022][MQ 9.3.0 Jul 2022]Enhancements to SMF statistics ” on page 48

## Security

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [“AT-TLS best practices for IBM MQ for z/OS” on page 48](#)
- [V 9.3.0](#) “[MQ 9.3.0 Jul 2022]More flexible configuration for SNI support” on page 48
- [V 9.3.0](#) [Support for multiple queue manager certificates in MQIPT](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [V 9.3.0](#) [V 9.3.0](#) [User data traced by MQIPT can be configured](#)

## Application development

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [REST Messaging API: greater access to message properties when sending and receiving messages using the REST API](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [JM 3.0](#) [V 9.3.0](#) [V 9.3.0](#) [Support for Jakarta Messaging 3.0](#)

## [z/OS](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) **New for IBM MQ for z/OS - Advanced and Advanced VUE entitlement only**

The following features and enhancements are available with Advanced or Advanced VUE entitlement only.

### IBM MQ Advanced for z/OS entitlement

The following capabilities are new for Long Term Support at IBM MQ 9.3.0. However, they are not currently available in the IBM MQ 9.3.x Continuous Delivery releases:

- [V 9.3.0](#) [“IBM MQ Advanced for z/OS Value Unit Edition features now available with IBM MQ Advanced for z/OS entitlement” on page 51](#)

## Managed File Transfer

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [“Guidance for use of Managed File Transfer on z/OS” on page 51](#)
- [V 9.3.0](#) [Redistributable Managed File Transfer Logger](#)
- [V 9.3.0](#) [Limiting the number of file transfers for each FTP endpoint](#)
- [V 9.3.0](#) [New Managed File Transfer commands for starting and stopping resource monitors](#)
- [V 9.3.0](#) [Enhanced credentials protection for Managed File Transfer](#)
- [V 9.3.0](#) [Improvements to the \*\*fteRAS\*\* command](#)
- [V 9.3.0](#) [Transfer logging on Managed File Transfer](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [V 9.3.0](#) [V 9.3.0](#) [Enable MQCSP support by default for Managed File Transfer commands](#)
- [V 9.3.0](#) [V 9.3.0](#) [The REST API and managed calls for Managed File Transfer](#)



## Related concepts

[V 9.3.0](#) [V 9.3.0](#) [What's changed in IBM MQ 9.3.0](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.2.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

[V 9.3.0](#) [New, changed, and removed messages in IBM MQ 9.3.0](#)

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.2.0.

[V 9.3.0](#) [New, changed, and removed messages since IBM MQ 9.2.5](#)

For Continuous Delivery users, a summary of the new messages that have been added and the existing messages that have been changed or removed since IBM MQ 9.2.5.

[V 9.3.0](#) [V 9.3.0](#) [Deprecated, stabilized, and removed features in IBM MQ 9.3.0](#)

A number of features are deprecated, stabilized or removed from IBM MQ 9.3.0.

[“IBM MQ license information” on page 9](#)

[What you can purchase with IBM MQ and what each purchase entitles you to install.](#)

[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 9.3.0](#) [V 9.3.0](#) **What's new in IBM MQ 9.3.0 for Multiplatforms - base and Advanced entitlement**

For Multiplatforms, IBM MQ 9.3.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

### License entitlement, installation, and upgrade

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [Windows](#) [V 9.3.0](#) [“\[Windows\]\[MQ 9.3.0 Jun 2022\]New Confirm License Entitlement panel” on page 35](#)
- [V 9.3.0](#) [Linux](#) [“\[MQ 9.3.0 Jun 2022\]\[Linux\]Support for upgrading IBM MQ for Linux without uninstalling the earlier version” on page 35](#)
- [V 9.3.0](#) [“\[MQ 9.3.0 Jun 2022\]IBM MQ code signing support” on page 35](#)

The following capabilities are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [IBM i](#) [“\[MQ 9.3.0 Jun 2022\]\[IBM i\]Support for dspmqinst and setmqinst on IBM MQ for IBM i” on page 36](#)

### Streaming queues

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [“\[MQ 9.3.0 Jun 2022\]Streaming queues to realize additional value from data already flowing through IBM MQ” on page 36](#)

### Administration

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [“\[MQ 9.3.0 Jun 2022\]IBM MQ Console Application quick start” on page 36](#)

- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Remote queue manager support for the IBM MQ Console” on page 36
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Configurable IBM MQ Console message browsing controls” on page 36
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Dead-letter queue handler included in client package” on page 36
- [V 9.3.0](#) [ALW](#) “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows]New IGNSTATE parameter for using MQSC DELETE commands idempotently” on page 37
- [V 9.3.0](#) [AIX](#) “[MQ 9.3.0 Jun 2022][AIX]Support for zlibNX compression library” on page 37

## Security

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [Linux](#) [AIX](#) “[MQ 9.3.0 Jun 2022][Linux][AIX]Permitting non-operating system users in the Object Authority Manager” on page 37
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]TLS 1.3 support from IBM MQ Java applications” on page 37
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Support for Transport Layer Security (TLS) 1.3 in MQIPT” on page 37
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Encryption of passphrases for MQTT channels” on page 38
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]SecureCommsOnly setting available on the queue manager” on page 38
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]More flexible configuration for SNI support” on page 38
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]OutboundSNI property for NMQI and XMS .NET clients ” on page 38
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Support for multiple queue manager certificates in MQIPT” on page 38
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]TLS support for the IBM MQ .NET XA Monitor application” on page 38
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Additional configuration option to control TLS environment in C clients” on page 39
- [V 9.3.0](#) “[MQ 9.3.0 Jun 2022]Improved password protection for IBM MQ clients using cryptographic hardware” on page 39

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [V 9.3.0](#) [V 9.3.0](#) “User data traced by MQIPT can be configured” on page 39
- [V 9.3.0](#) [V 9.3.0](#) “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows][MQ 9.3.0 Jun 2022]Support for PKCS#12 key repositories” on page 39
- [V 9.3.0](#) [V 9.3.0](#) “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows][MQ 9.3.0 Jun 2022]Support for key repository passwords” on page 39

## Scalability

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Application re-balancing support” on page 39
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Support for dynamic balancing of Java Platform, Enterprise Edition inbound connections in a uniform cluster” on page 40
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]IBM MQ scaler for KEDA” on page 40

### Application development

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jul 2022]Support for the Apache Qpid JMS client library” on page 40
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][AIX, Linux, Windows]Point-to-point messaging on AMQP channels” on page 40
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Java 17 support for IBM MQ clients” on page 40
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]REST Messaging API: greater access to message properties when sending and receiving messages using the REST API” on page 40

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **JM 3.0** **V 9.3.0** **V 9.3.0** “[Jakarta Messaging 3.0][MQ 9.3.0 Jun 2022][MQ 9.3.0 Jun 2022]Support for Jakarta Messaging 3.0” on page 41

### License entitlement, installation, and upgrade

#### **Windows** **V 9.3.0** **New Confirm License Entitlement panel**

From IBM MQ 9.3.0, the new **Confirm License Entitlement** panel in the Windows interactive installer is presented after feature selection if you have chosen to install any IBM MQ Advanced features (MQ Telemetry Service, Advanced Message Security, or Managed File Transfer Service), or if you are upgrading from an installation that already has these features.

This panel simply warns you that these features are considered IBM MQ Advanced functionality and should only be installed if you have entitlement to IBM MQ Advanced. This warning reduces the risk of users installing IBM MQ Advanced features in error. For more information, see [Installing the server using the Launchpad](#).

#### **V 9.3.0** **Linux** **Support for upgrading IBM MQ for Linux without uninstalling the earlier version**

From IBM MQ 9.3.0, you can choose to upgrade IBM MQ on Linux platforms without uninstalling the earlier version of IBM MQ. The version that you are upgrading from must be at IBM MQ 9.2.0, or later, and no fix packs can be installed for the earlier version. That is, the fix pack number in the version.release.modification.fixpack (V . R . M . F) release identifier must be 0.

Previously, when you moved from an earlier version of IBM MQ to a later version in a single stage migration scenario, you had to uninstall the earlier version of IBM MQ before you installed the later version. Now, you can choose to install the later version without uninstalling the earlier version, which can make the upgrade process quicker and easier.

For more information, see [Upgrading an IBM MQ installation on Linux](#).

#### **V 9.3.0** **IBM MQ code signing support**

IBM MQ deliverables that you can download from IBM are signed with a digital signature. From IBM MQ 9.3.0, to aid with verifying the deliverables, IBM MQ provides an additional package that you can download from Fix Central. This package contains signatures and the public keys to verify them. For more information, see [IBM MQ code signatures](#).

> V 9.3.0

IBM i

### Support for `dspmqinst` and `setmqinst` on IBM MQ for IBM i

From IBM MQ 9.3.0, support has been added to display the IBM MQ entitlement and set or unset the High Availability Replica and non-production IBM License Metric Tool. For more information, see [dspmqinst](#) and [setmqinst](#).

## Streaming queues

> V 9.3.0

### Streaming queues to realize additional value from data already flowing through IBM MQ

IBM MQ 9.3.0 adds the streaming queues feature, which allows you to configure a queue to put a near-identical copy of every message to a second queue. Streaming queues can be useful in certain scenarios, where you need to create a copy of your messages. For example:

- Streaming messages to Apache Kafka using the Kafka Connect source connector for IBM MQ. For more information, see [kafka\\_connect\\_mq\\_source](#).
- Performing analysis on the data going through the system.
- Storing messages for recovery at a later time.
- Capturing a set of messages to use in development and test systems.
- Consuming IBM MQ event messages from the system event queues, and sending additional copies to other queues or topics.

For more information, see [Streaming queues](#).

## Administration

> V 9.3.0

### IBM MQ Console Application quick start

Enhancements to the IBM MQ Console can help new users to get started more easily than ever before, following simple steps to create a messaging configuration with an application. For more information, see [Quick tour of the IBM MQ Console](#).

> V 9.3.0

### Remote queue manager support for the IBM MQ Console

IBM MQ 9.3.0 adds support for managing remote queue managers in the IBM MQ Console. Adding remote queue managers to the IBM MQ Console enables you to administer all your queue managers in a single IBM MQ Console instance. The remote queue managers can be queue managers that are running in a different installation on the same system as the IBM MQ Console, or queue managers that are running on a different system. For more information, see [Adding a remote queue manager to the IBM MQ Console](#).

> V 9.3.0

### Configurable IBM MQ Console message browsing controls

At IBM MQ 9.3.0, general updates have been made to improve the usability of the IBM MQ Console for a better user experience. These include the capability to download and view complete message contents from the IBM MQ Console, enhancing the prior previewing capability. You can configure these capabilities with three new parameters, `mqConsoleMaxMsgCharsToDisplay`, `mqConsoleMaxMsgRequestSize` and `mqConsoleMaxMsgsPerRequest`, that have been added to the `setmqweb` command. For more information, see [setmqweb \(set mqweb server configuration\)](#).

> V 9.3.0

### Dead-letter queue handler included in client package

The dead-letter queue (DLQ) handler can connect to a remote queue manager and is included in the client package, in addition to the server package in which it is already available. This means that the DLQ handler can now connect to either a local or remote queue manager, including an IBM MQ Appliance or cloud environment.

You can use the `runmqdlq` command with the `-c` parameter to specify that it should establish a client connection to a remote queue manager. For more information, see [runmqdlq \(run dead-letter queue handler\)](#).

A built version of the sample program, named `amqsd1qc`, is included. You can use this to connect to a remote queue manager in client mode. For more information, see [The sample DLQ handler amqsd1qc](#).

**idempotently**

IBM MQ 9.3.0 introduces the **IGNSTATE** parameter for **DELETE** commands. This parameter allows you to specify whether you want the command to return an error return code if the object is already in the state the command would move it to. For more information about the **IGNSTATE** parameter and its options, see, for example, [DELETE queues](#).

Specifying this parameter allows you to use the command **DELETE** in an iterative manner, for example in scripts, without the command or script failing after the first run because an object has already been deleted and no longer exists. Since the **IGNSTATE** parameter is an addition to the existing **DELETE** command functionality, the default behavior for existing scripts is to continue to operate as they have done previously.

Note that, when running in **runmqsc -n** mode, that is, not connected to a queue manager, the two available **DELETE** commands, **DELETE AUTHINFO** and **DELETE CHANNEL**, accept the **IGNSTATE** parameter, but there is no difference in behavior between YES and NO options. If **runmqsc** is run normally, **DELETE AUTHINFO** and **DELETE CHANNEL** act like other objects.

From IBM MQ 9.3.0, channel compression of message data that uses ZLIBFAST or ZLIBHIGH compression techniques can opt to use hardware-acceleration in IBM MQ for AIX®.

Opting to use the **zlibNX** library for channel compression will typically result in lower CPU usage and consequently improve message throughput rates. The impact of the **zlibNX** hardware-acceleration on channel compression will vary according to how large and how compressible the message data is. Highly compressible messages that are over 2KB in size are most likely to benefit from opting to use the **zlibNX** library.

For more information on data compression, see [Data compression \(COMPMSG\)](#). For information on the **AMQ\_USE\_ZLIBNX** environment variable, which enables the support in IBM MQ for AIX, see [Environment variables descriptions](#).

**Security****Authority Manager**

From IBM MQ 9.3.0, the authority model has been simplified for IBM MQ running in a container environment, where usernames cannot be managed in the traditional way. The additional **UserExternal** option enables you to define permissions for users without the users having to exist in a Lightweight Directory Access Protocol (LDAP) server by allowing you to specify a non-operating system user name with a maximum of 12 characters to be used both for checking and setting authorizations.

For more information on the **UserExternal** option, see the **-oa** parameter of the **crtmqm** command and the **SecurityPolicy** parameter of the [Service stanza](#) of the **qm.ini** file.

From IBM MQ 9.3.0, using the Java runtime environment (JRE) provided by IBM MQ permits the use of the TLS 1.3 CipherSpecs as described in [TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS](#).

**Note:** In the Java runtime environment shipped as part of IBM MQ, the Java Security Provider for FIPS has been updated from **IBMJCEFIPS** to **IBMJCEPlusFIPS**.

From IBM MQ 9.3.0, IBM MQ Internet Pass-Thru (MQIPT) supports Transport Layer Security (TLS) 1.3. Three new CipherSuites are provided for use with TLS 1.3.

TLS 1.3 can be used on routes where MQIPT is configured as a TLS server, TLS client, or TLS proxy. Connections between the **mqiptAdmin** command and MQIPT can also be secured with TLS 1.3.

TLS 1.3 is enabled by default on routes that use TLS, and the TLS command port, from IBM MQ 9.3.0. To disable TLS 1.3, specify the protocols to be enabled using the **SSLClientProtocols**, **SSLServerProtocols**, or **SSLCommandPortProtocols** properties.

For more information about TLS support in MQIPT, see [SSL/TLS support](#). The new CipherSuites are listed in the TLS 1.3 section of [Table 1](#).

#### **V 9.3.0 Encryption of passphrases for MQTT channels**

IBM MQ 9.3.0 adds support for encryption of passphrases for MQTT channels. For more information, see [Encrypting passphrases for MQTT TLS channels](#) and [Migration of plain text passphrases to encrypted passphrases](#).

#### **V 9.3.0 SecureCommsOnly setting available on the queue manager**

From IBM MQ 9.3.0, a security enhancement has been deployed to allow queue managers to be configured to only allow secure communications. A warning message is issued on startup if plain text communications are enabled. For more information, see [SecureCommsOnly](#).

#### **V 9.3.0 More flexible configuration for SNI support**

The Server Name Indication (SNI) extension of TLS enables a client to indicate the hostname to which it is attempting to connect at the start of the handshaking process. From IBM MQ 9.3.0, an improvement has been made to allow the SNI to store either the IBM MQ channel name or the hostname.

The **OutboundSNI** property of the SSL stanza allows you to select whether the SNI should be set to the target IBM MQ channel name to the remote system when initiating a TLS connection, or to the hostname. For more information about the **OutboundSNI** property, see [SSL stanza of the qm.ini file](#) and [SSL stanza of the client configuration file](#).

For more information on how this property is used, see [Connecting to a queue manager deployed in a Red Hat OpenShift cluster](#).

#### **V 9.3.0 OutboundSNI property for NMQI and XMS .NET clients**

From IBM MQ 9.3.0, NMQI and XMS .NET client applications can use either a property or an environment variable to set the **OutboundSNI** property. In addition, the default value for this property has been changed to **channel**. Before IBM MQ 9.3.0 the **OutboundSNI** property was always set to **\*** for the .NET clients.

For more information, see [XMS .NET property mapping for administered objects](#) and [OutboundSNI property](#).

#### **V 9.3.0 Support for multiple queue manager certificates in MQIPT**

From IBM MQ 9.3.0, per-channel certificates can be used on a queue manager for TLS connections received from IBM MQ Internet Pass-Thru (MQIPT), where the MQIPT route is configured as a TLS client.

IBM MQ supports the use of multiple certificates on the same queue manager, using a per-channel certificate label, specified using the **CERTLABL** attribute on the channel definition. Inbound channels to the queue manager rely on detecting the channel name using TLS Server Name Indication (SNI), in order for the queue manager to present the correct certificate. From IBM MQ 9.3.0, MQIPT can be configured to allow multiple certificates to be used by the destination queue manager by either setting the SNI to the channel name, or passing through the SNI received on the inbound connection to the route.

For more information about multiple certificate support and MQIPT, see [IBM MQ multiple certificate support with MQIPT](#).

#### **V 9.3.0 TLS support for the IBM MQ .NET XA Monitor application**

The IBM MQ .NET client provides an XA Monitor application, WmqDotnetXAMonitor, that you can use to recover any incomplete distributed transactions. From IBM MQ 9.3.0, the WmqdotnetXAMonitor application includes the option to establish a secure connection to the queue manager. For more information, see [Using the WMQDotnetXAMonitor application](#) and [WmqDotNETXAMonitor application configuration file settings](#).



### **V 9.3.0** Additional configuration option to control TLS environment in C clients

A new configuration option has been added to C clients to allow a different mode of operating when creating TLS connections. For more information, see the [EnvironmentScope](#) attribute of the SSL stanza of the client configuration file.

### **V 9.3.0** Improved password protection for IBM MQ clients using cryptographic hardware

IBM MQ 9.3.0 deploys an improvement to IBM MQ clients that allows them to parse cryptographic hardware configuration strings that contain encrypted passwords. This allows for the protection of PKCS #11 token pins inside the **SSLCryptoHardware** attribute in the SSL stanza of the mqclient.ini file, and the **MQSSLCRYP** environment variable.

**Important:** This is not applicable for cryptographic hardware settings provided to the queue manager using the queue manager SSLCRYP setting, or provided to client applications using the **MQSCO.CryptoHardware** structure field.

A command has been provided that can encrypt plain text passwords into the encrypted format usable with cryptographic hardware configuration strings for IBM MQ clients. For more information, see [IBM MQ clients using cryptographic hardware](#).

### User data traced by MQIPT can be configured

**V 9.3.0** **V 9.3.0** From IBM MQ 9.3.0, the amount of user data in network transmissions received and sent by MQIPT routes that is traced can be configured using the **TraceUserData** property. If this property is not specified, only the first 64 bytes of data in network transmissions is traced.

### **V 9.3.0** **ALW** **V 9.3.0** Support for PKCS#12 key repositories

From IBM MQ 9.3.0 you can configure queue managers and client applications to use PKCS#12 key repositories for TLS communications. To facilitate key repositories with different extensions, the mechanism to provide key repositories to queue managers or client applications has been updated to support a full file path.

For more information, see [Changing the key repository location for a queue manager on AIX, Linux, and Windows](#) and [Specifying the key repository location for an IBM MQ MQI client on AIX, Linux, and Windows](#).

### **V 9.3.0** **ALW** **V 9.3.0** Support for key repository passwords

From IBM MQ 9.3.0 you can provide key repository passwords directly to queue managers and clients, instead of requiring a stash file. To ensure the secure storage of key repository passwords, the queue manager and client applications have been extended to support the storage of key repository passwords encrypted using the IBM MQ Password Protection system.

For more information, see [Supplying the key repository password for a queue manager on AIX, Linux, and Windows](#) and [Supplying the key repository password for an IBM MQ MQI client on AIX, Linux, and Windows](#).

## Scalability

### **V 9.3.0** Application re-balancing support

IBM MQ 9.3.0 adds support for controlling or influencing the re-balancing behavior between uniform clusters to suit the needs of specific types of application; for example, minimizing interruptions to in flight transactions, or ensuring requester applications receive their responses before being moved.

One of the goals of uniform clustering is to allow workload to be distributed across a group of queue managers. In IBM MQ 9.2.4 (and later implementations) behavior was modified so that applications are only balanced when they are actively performing IBM MQ operations. Applications check to see whether they should move when they are performing an IBM MQ operation like MQPUT, MQGET, or MQCMIT.

**Important:** An application which has only performed an MQCONN operation is not rebalanced until it subsequently performs one of these MQI operations.

You can use the default behaviors described in [Influencing application re-balancing in uniform clusters](#) or make changes, either at configuration or deployment time through the `client.ini` file. Alternatively, you can make the balancing behavior and requirements part of the application logic using the `MQBNO` structure.

IBM MQ 9.3.0 also adds support for re-balancing the following types of application:

- XMS .NET: for more information, see [Properties of ConnectionFactory](#).
- IBM MQ .NET: for more information, see [Influencing application re-balancing in .NET](#).

### **V 9.3.0** Support for dynamic balancing of Java Platform, Enterprise Edition inbound connections in a uniform cluster

From IBM MQ 9.3.0, a new property **dynamicallyBalanced** is available when configuring `ActivationSpecs`. For more information, see [Configuring the resource adapter for inbound communication](#).

### **V 9.3.0** IBM MQ scaler for KEDA

From IBM MQ 9.3.0, auto-scaling of client applications is possible based on queue depth. This feature uses the Kubernetes-based Event Driven Autoscaler (KEDA), which is a lightweight, open source solution designed to provide better scaling options for event-driven client applications on Kubernetes. You can use KEDA to scale client applications running on IBM MQ queue managers, including queue managers in containers.

For more information, see [Introduction to KEDA](#). The IBM MQ scaler for KEDA was contributed by the IBM MQ development team and is maintained by the KEDA community. If you have a question or would like to raise a issue, use the `kedacore` GitHub repo: <https://github.com/kedacore/keda/issues>.

## Application development

### **V 9.3.0** Support for the Apache Qpid JMS client library

IBM MQ 9.3.0 adds two additional channel attributes for AMQP channels, **TMPMODEL** and **TMPQPRFX**, enabling you to set the model queue and queue prefix that you use, while creating a temporary queue using Qpid JMS. For more information, see [Developing AMQP client applications](#) and [DEFINE CHANNEL](#).

### **V 9.3.0** **ALW** Point-to-point messaging on AMQP channels

IBM MQ 9.3.0 adds point-to-point messaging support to IBM MQ AMQP channels, so that AMQP clients such as Apache Qpid™ JMS applications can connect to IBM MQ and send messages to queues or temporary queues, or receive messages from queues and temporary queues. For more information, see [Developing AMQP client applications](#).

IBM MQ 9.3.0 also adds browse support for point-to-point messaging to IBM MQ AMQP channels, so that AMQP clients, like Apache Qpid JMS applications, can connect to IBM MQ and browse messages. For more information, see [Developing AMQP client applications](#).

### **V 9.3.0** Java 17 support for IBM MQ clients

IBM MQ 9.3.0 adds Java 17 support for IBM MQ classes for Java and IBM MQ classes for JMS for Oracle and Adoptium.

### **V 9.3.0** REST Messaging API: greater access to message properties when sending and receiving messages using the REST API

The following new features provide increased access to message properties when sending or receiving messages by using the REST API:

- A new REST API V3 has been introduced. New features are available by using the v3 version of the resource URL.
- Support for a message priority request header has been added.
- Application-specific correlation IDs can now be used (bringing the use of Correlation and Message IDs more in line with JMS).
- Support for setting and reading multiple user-defined message properties has been added.



Details of the new features are available in the following topics:

- [Message post](#)
- [Message get](#)
- [Message delete](#)
- [Message list get](#)
- [Topic post](#)

### [JM 3.0](#) [V 9.3.0](#) [V 9.3.0](#) **Support for Jakarta Messaging 3.0**

The JMS specification defines a set of named Java interfaces that software conforming to the specification must implement. From IBM MQ 9.3.0, [Jakarta Messaging 3.0](#) is supported. This extends the set of environments in which IBM MQ can be used.

IBM MQ 9.2 and earlier support JMS 2.0, which also supports the functionality defined in JMS 1.0 and JMS 1.1. IBM MQ 9.3.0 continues to support JMS 2.0 for existing applications, and adds support for Jakarta Messaging 3.0 for new development:

- A new **-j** option is added to the **setmqenv** and **crtmqenv** commands. You can use this option to specify whether you require an environment suitable to run JMS 2.0 or Jakarta Messaging 3.0 applications.
- Two new sample scripts, `setjms30env` and `setjms30env_64`, are provided. You can use them to set the environment for Jakarta Messaging 3.0 applications. For more information, see [Setting environment variables for IBM MQ classes for JMS/Jakarta Messaging](#).
- An additional set of Java classes are provided. They implement the interfaces specified in Jakarta Messaging 3.0. These classes have different names from the existing implementation classes and are packaged into new JAR and RAR files. For the Javadoc information for these classes, see [IBM MQ classes for JMS 3.0](#).

**Note:** For Jakarta Messaging 3.0, control of the JMS specification moves from Oracle to the Java Community Process. However, Oracle retains control of the "javax" name, which is used in other Java technologies that have not moved to the Java Community Process. So, while Jakarta Messaging 3.0 is functionally equivalent to JMS 2.0 there are some differences in naming:

- The official name for Jakarta Messaging 3.0 is Jakarta Messaging rather than Java Message Service.
- The package and constant names are prefixed with `jakarta` rather than `javax`. For example, in JMS 2.0 the initial connection to a messaging provider is a `javax.jms.Connection` object, and in Jakarta Messaging 3.0 it is a `jakarta.jms.Connection` object.

For more information, see [Using IBM MQ classes for JMS/Jakarta Messaging](#).

### Related concepts

[Multi](#) [V 9.3.0](#) [MQ Adv.](#) [V 9.3.0](#) [What's new in IBM MQ 9.3.0 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

[z/OS](#) [V 9.3.0](#) [V 9.3.0](#) [What's new in IBM MQ for z/OS 9.3.0 - base and Advanced VUE entitlement](#)

IBM MQ 9.3.0 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[V 9.3.0](#) [MQ Adv. VUE](#) [V 9.3.0](#) [MQ Adv. z/OS](#) [What's new in IBM MQ for z/OS 9.3.0 - Advanced and Advanced VUE entitlement](#)

IBM MQ for z/OS 9.3.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

["IBM MQ license information" on page 9](#)

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

## Multi V 9.3.0 MQ Adv. V 9.3.0 **What's new in IBM MQ 9.3.0 for Multiplatforms - Advanced entitlement only**

IBM MQ 9.3.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

### Linux **Using the IBM MQ Advanced container with the IBM Cloud Pak for Integration**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[IBM Cloud Pak for Integration][MQ 9.3.0 Jun 2022]Native HA for IBM MQ containers in Red Hat OpenShift” on page 43
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]Deploying the IBM MQ Advanced container to IBM Cloud Pak for Integration” on page 43

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **Linux** **CP4I-LTS** **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux][CP4I Long Term Support][MQ 9.3.0 Jun 2022]The IBM MQ Advanced container and the CP4I-LTS release model” on page 43
- **V 9.3.0** **Linux** **CP4I-LTS** **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux][CP4I Long Term Support][MQ 9.3.0 Jun 2022]IBM MQ Advanced container support for Power Systems” on page 43

### **Replicated Data Queue Manager (RDQM)**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]Replicated Data Queue Manager (RDQM) kernel module serviceability enhancements” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]RDQM now reports when an HA or DR node's replication was last in sync” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]RDQM summary status now includes the preferred location for HA queue managers” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022][Linux]You can now see and clear RDQM HA failed resource actions” on page 44

### **Security**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Improved password protection for MQI Advanced Message Security clients” on page 44

### **Managed File Transfer**

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Redistributable Managed File Transfer Logger” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Limiting the number of file transfers for each FTP endpoint” on page 44
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]New Managed File Transfer commands for starting and stopping resource monitors” on page 45

- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Enhanced credentials protection for Managed File Transfer” on page 45
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Improvements to the fteRAS command” on page 45
- **V 9.3.0** “[MQ 9.3.0 Jun 2022]Transfer logging on Managed File Transfer” on page 45

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **V 9.3.0** “[MQ 9.3.0 Jun 2022][MQ 9.3.0 Jun 2022]Enable MQCSP support by default for Managed File Transfer commands” on page 45
- **V 9.3.0** **V 9.3.0** “[MQ 9.3.0 Jun 2022][MQ 9.3.0 Jun 2022]The REST API and managed calls for Managed File Transfer” on page 46

## Using the IBM MQ Advanced container with the IBM Cloud Pak for Integration

### **CP4I** **V 9.3.0** **Native HA for IBM MQ containers in Red Hat OpenShift**

The native high availability (Native HA) capability is available for clients deploying container-based queue managers to IBM Cloud Pak for Integration in Red Hat OpenShift using the IBM MQ container. This capability provides a highly available queue manager, automatically recovering from failures in seconds. All recoverable IBM MQ data are consistently replicated across multiple sets of independent storage, preventing loss from storage failures and enabling failover across availability zones. For more information, see [Native HA](#).

### **V 9.3.0** **Linux** **Deploying the IBM MQ Advanced container to IBM Cloud Pak for**

#### **Integration**

The IBM MQ Advanced container is supported for use as part of the [IBM Cloud Pak for Integration](#), or independently.

For detailed mappings between IBM MQ Operators, IBM Cloud Pak for Integration versions, and container images, see [Release history for IBM MQ Operator and containers](#).

### **V 9.3.0** **Linux** **CP4I-LTS** **V 9.3.0** **The IBM MQ Advanced container and the CP4I-**

#### **LTS release model**

The IBM Cloud Pak for Integration uses the IBM Cloud Pak for Integration - Long Term Support (CP4I-LTS) release model (formerly the Extended Update Support release model). Each CP4I-LTS release is supported for up to 2 years, with an optional extension for another year.

The IBM MQ Advanced container image is typically supported for 12 months, which is the usual support period for a CD release. **V 9.3.0** However, if a container image is based on a version of IBM MQ 9.3, and the container is used as part of the IBM Cloud Pak for Integration, the container is instead supported as a CP4I-LTS release. For more information, see [Support for IBM MQ Operator and containers](#).

The exception to this model is Native HA, which is supported outside of the IBM MQ Operator. Native HA is shipped as a core component of IBM MQ, and is therefore supported under the terms of an IBM MQ LTS release.

### **V 9.3.0** **Linux** **CP4I-LTS** **V 9.3.0** **IBM MQ Advanced container support for Power**

#### **Systems**

IBM MQ Operator 2.0.0, running on Red Hat OpenShift Container Platform 4.10 and above, supports the IBM MQ Advanced container running on ppc64le Power Systems.

For more information, see [Support for IBM MQ Operator and containers](#).

## Replicated Data Queue Manager (RDQM)

### **V 9.3.0** **Linux** **Replicated Data Queue Manager (RDQM) kernel module serviceability enhancements**

RDQM relies on DRBD to provide data replication. IBM MQ 9.3.0 delivers enhancements to help you ensure that you have loaded the correct DRBD kernel module to match the OS kernel version and to improve diagnostics. For more information, see [Viewing RDQM and HA group status](#), [Viewing DR RDQM status](#), and [Viewing DR/HA RDQM and HA group status](#).

### **V 9.3.0** **Linux** **RDQM now reports when an HA or DR node's replication was last in sync**

From IBM MQ 9.3.0, the status that is returned by the **rdqmstatus** command reports the last time that a DR or HA RDQM node's replication was in sync, if synchronization has been lost. This information helps problem determination and recovery. For more information, see [Viewing RDQM and HA group status](#), [Viewing DR RDQM status](#), and [Viewing DR/HA RDQM and HA group status](#).

### **V 9.3.0** **Linux** **RDQM summary status now includes the preferred location for HA queue managers**

From IBM MQ 9.3.0, the summary status returned by the **rdqmstatus** command now reports the preferred location for each HA queue manager. For more information, see [Viewing RDQM and HA group status](#) and [Viewing DR/HA RDQM and HA group status](#).

### **V 9.3.0** **Linux** **You can now see and clear RDQM HA failed resource actions**

From IBM MQ 9.3.0, failed resource actions, which can prevent queue manager failover or result in a queue manager running in a non-preferred location, can be displayed and resolved using dedicated commands. You can now view details of failed resource actions by using the **rdqmstatus** command, and clear them by using the **rdqmclean** command. For more information, see [Failed resource actions](#).

## Security

### **V 9.3.0** **Improved password protection for MQI Advanced Message Security clients**

IBM MQ 9.3.0 deploys an improvement to MQI Advanced Message Security (AMS) clients, allowing you to protect sensitive credentials inside AMS configuration files.

In addition to the JKS keystore passwords, you can now protect PEM file passwords and pkcs#11 token pins.

For more information, see [Protecting passwords in AMS configuration files](#).

## Managed File Transfer

### **V 9.3.0** **Redistributable Managed File Transfer Logger**

From IBM MQ 9.3.0, the Redistributable Managed File Transfer package includes the Managed File Transfer Logger component, enabling you to optionally copy published information about actions for analysis and auditing purposes. The logger supports FILE type loggers connecting in client mode to the coordination queue manager. For more information, see [Downloading and configuring Redistributable Managed File Transfer components](#).

### **V 9.3.0** **Limiting the number of file transfers for each FTP endpoint**

From IBM MQ 9.3.0, enhancements to the Managed File Transfer protocol bridge agent enable you to choose to limit file transfers per File Transfer Protocol (FTP) and Secure FTP (SFTP) endpoint to reduce the risk of bottlenecks and effectively prioritize file transfers. You can limit the number of file transfers for each FTP endpoint by using the additional attributes of **maxActiveDestinationTransfers** (at both the global and individual server level) and **failTransferWhenCapacityReached**. For more information, see [Scenarios and examples for limiting the number of file transfers to individual file servers](#) and [Protocol bridge properties file format](#) for details of the additional attributes.

### V 9.3.0 New Managed File Transfer commands for starting and stopping resource monitors

From IBM MQ 9.3.0, two new commands, **fteStartMonitor** and **fteStopMonitor**, allow you to start and stop resource monitors without needing to stop or restart an agent. This is useful, for example, in the following situations:

- If an agent has multiple resource monitors, and only some of them have encountered errors but the remaining resource monitors are still working fine so you just want to restart the failed resource monitors.
- If you want to stop a resource monitor to carry out some maintenance work, or if the resource monitor is not required for certain time and you do not want it to run unnecessarily, thus consuming precious system resources.

For more information, see [Starting an MFT resource monitor](#) and [Stopping an MFT resource monitor](#).

### V 9.3.0 Enhanced credentials protection for Managed File Transfer

At IBM MQ 9.2.0, the **fteObfuscate** command was enhanced to encrypt and decrypt credentials with a stronger algorithm and a user supplied key. From IBM MQ 9.3.0, the command has an additional protection mode that provides MD5 hashing and encryption of credentials using the latest algorithm and a user specified key to encrypt. For more information, see [fteObfuscate](#) and [Improvements to Managed File Transfer security from IBM MQ 9.2](#)



**Attention:** Managed File Transfer will still be able to use any existing stored credentials from a previous release. Migration of credentials to use the new encryption algorithm is not automatic. To enhance the security in your enterprise, you need to re-encrypt the credentials using the **fteObfuscate** command with the additional option on the **protection mode** parameter.

### V 9.3.0 Improvements to the fteRAS command

IBM MQ 9.3.0 improves the output of information to the console so that you can see the progress of the command while it runs. For more information, see [fteRAS](#).

The enhancements to the output of the **fteRAS** command include subscription logging. For an example of the enhanced output, see [fteRAS](#).

### V 9.3.0 Transfer logging on Managed File Transfer

From IBM MQ 9.3.0, transfer logging is available on MFT for enhanced visibility of file transfer status. More information is provided about the activities of MFT agents, including details of both successful transfers and any failure cases. Transfer logs can assist users in resolving common problems and can also be used to supply more detailed diagnostics if required by IBM support.

A **LogTransfer** option has been added to the **fteSetAgentLogLevel** command and the MFT agent.properties file. For more information, see the [fteSetAgentLogLevel](#) command and [The MFT agent.properties file](#).

**Note:** The **LogTransfer** option cannot be used with either the **LogAgent** or **LogMonitor** options.

From IBM MQ 9.3.0, a new log file `transferlog0.json` is also available. For more information, see [Output produced by the LogTransfer function](#).

### V 9.3.0 V 9.3.0 Enable MQCSP support by default for Managed File Transfer commands

From IBM MQ 9.3 onwards Managed File Transfer commands that connect to an agent, command, or coordination queue manager use the MQCSP structure by default so that you can use passwords longer than 12 characters. Also, an additional option has been added to these commands for backward compatibility, for example, when connecting to a version of IBM MQ prior to version 8.

See [Which MFT commands and processes connect to which queue manager](#) for a list of the commands affected by the change.

As the changes are the same for each command, select the link to any one of these commands to see the additions.

## [V 9.3.0](#) [V 9.3.0](#) **The REST API and managed calls for Managed File Transfer**

IBM MQ 9.3 introduces Version 3 of the REST API which includes the HTTP GET and HTTP POST verbs for use with managed calls.

See [Using the REST API with managed calls](#) for more information and links to the new verbs.

### Related concepts

[Multi](#) [V 9.3.0](#) [V 9.3.0](#) **[What's new in IBM MQ 9.3.0 for Multiplatforms - base and Advanced entitlement](#)**

For Multiplatforms, IBM MQ 9.3.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

[z/OS](#) [V 9.3.0](#) [V 9.3.0](#) **[What's new in IBM MQ for z/OS 9.3.0 - base and Advanced VUE entitlement](#)**

IBM MQ 9.3.0 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[V 9.3.0](#) [MQ Adv. VUE](#) [V 9.3.0](#) [MQ Adv. z/OS](#) **[What's new in IBM MQ for z/OS 9.3.0 - Advanced and Advanced VUE entitlement](#)**

IBM MQ for z/OS 9.3.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

[What you can purchase with IBM MQ and what each purchase entitles you to install.](#)

## [z/OS](#) [V 9.3.0](#) [V 9.3.0](#) **What's new in IBM MQ for z/OS 9.3.0 - base and Advanced VUE entitlement**

IBM MQ 9.3.0 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

### Streaming queues

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [V 9.3.0](#) [V 9.3.0](#) [“\[MQ 9.3.0 Jul 2022\]\[MQ 9.3.0 Jul 2022\]Streaming queues to realize additional value from data already flowing through IBM MQ” on page 47](#)

### Administration

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [V 9.3.0](#) [“\[MQ 9.3.0 Jul 2022\]New queue managers 64-bit RBA capable by default” on page 47](#)
- [V 9.3.0](#) [“\[MQ 9.3.0 Jul 2021\]Changes to statistics collection intervals” on page 47](#)
- [V 9.3.0](#) [“\[MQ 9.3.0 Jul 2022\]CSQUDSPM utility supports upper case and lower case parameters” on page 48](#)
- [V 9.3.0](#) [IBM MQ Console Application quick start](#)
- [V 9.3.0](#) [Remote queue manager support for the IBM MQ Console](#)
- [V 9.3.0](#) [Configurable IBM MQ Console message browsing controls](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- [V 9.3.0](#) [V 9.3.0](#) [“\[MQ 9.3.0 Jul 2022\]\[MQ 9.3.0 Jul 2022\]Enhancements to SMF statistics ” on page 48](#)



## Security

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [“AT-TLS best practices for IBM MQ for z/OS” on page 48](#)
- **V 9.3.0** [“\[MQ 9.3.0 Jul 2022\]More flexible configuration for SNI support” on page 48](#)
- **V 9.3.0** [Support for multiple queue manager certificates in MQIPT](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **V 9.3.0** [User data traced by MQIPT can be configured](#)

## Application development

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- **V 9.3.0** [REST Messaging API: greater access to message properties when sending and receiving messages using the REST API](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **JM 3.0** **V 9.3.0** **V 9.3.0** [Support for Jakarta Messaging 3.0](#)

The following capabilities are new for Long Term Support at IBM MQ 9.3.0:

- **LTS** [“\[Long Term Support\]Simplified Java application technologies” on page 50](#)

## Streaming queues

### **V 9.3.0** **V 9.3.0** **Streaming queues to realize additional value from data already flowing through IBM MQ**

IBM MQ 9.3.0 adds the streaming queues feature, which allows you to configure a queue to put a near-identical copy of every message to a second queue. Streaming queues can be useful in certain scenarios, where you need to create a copy of your messages. For example:

- Performing analysis on the data going through the system.
- Storing messages for recovery at a later time.
- Capturing a set of messages to use in development and test systems.
- Consuming IBM MQ event messages from the system event queues, and sending additional copies to other queues or topics.

For more information, see [Streaming queues](#).

## Administration

### **V 9.3.0** **New queue managers 64-bit RBA capable by default**

IBM MQ for z/OS 9.3.0 simplifies the creation of new queue managers by making them use a 64 bit log RBA, and being capable of having up to 310 active logs, by default. This means that you no longer have to run the CSQJUCNV utility on new queue managers to use these capabilities. For more information, see [CSQJUCNV](#) and [Larger log Relative Byte Address](#).

### **V 9.3.0** **Changes to statistics collection intervals**

IBM MQ for z/OS can capture statistics and accounting data in SMF records at regular intervals. Statistics data is cheap to capture and small in volume. Accounting data is more expensive to capture, and can be large in volume. From IBM MQ for z/OS 9.3.0 you have the ability to define separate intervals for the collection of statistics and accounting data allowing more frequent capturing of statistics data without also having to capture large volumes of accounting data.

IBM MQ for z/OS 9.3.0 also adds the ability to collect SMF records at more precise intervals. You can define the statistics and accounting intervals so that they use a value for both minutes and seconds. This not only allows for more precise data collection, but also more frequent collection, as you can select an interval of less than one minute. This can be particularly important when analyzing performance problems.

For more information, see [Using System Management Facility](#) and [Using CSQ6SYSP](#).

#### **V 9.3.0 CSQUDSPM utility supports upper case and lower case parameters**

From IBM MQ for z/OS 9.3.0, the CSQUDSPM utility now supports upper case and lower case parameters. This means batch jobs using this utility can be written with CAPS ON, which is a common configuration. This change also means those using the utility in Unix System Services have the choice to use upper or lower case flags, to match their preference. For more information, see [Display queue manager information utility \(CSQUDSPM\)](#).

#### **V 9.3.0 IBM MQ Console Application quick start**

Enhancements to the IBM MQ Console can help new users to get started more easily than ever before, following simple steps to create a messaging configuration with an application. For more information, see [Quick tour of the IBM MQ Console](#).

#### **V 9.3.0 Remote queue manager support for the IBM MQ Console**

IBM MQ 9.3.0 adds support for managing remote queue managers in the IBM MQ Console. Adding remote queue managers to the IBM MQ Console enables you to administer all your queue managers in a single IBM MQ Console instance. The remote queue managers can be queue managers that are running in a different installation on the same system as the IBM MQ Console, or queue managers that are running on a different system. For more information, see [Adding a remote queue manager to the IBM MQ Console](#).

#### **V 9.3.0 Configurable IBM MQ Console message browsing controls**

At IBM MQ 9.3.0, general updates have been made to improve the usability of the IBM MQ Console for a better user experience. These include the capability to download and view complete message contents from the IBM MQ Console, enhancing the prior previewing capability. You can configure these capabilities with three new parameters, **mqConsoleMaxMsgCharsToDisplay**, **mqConsoleMaxMsgRequestSize** and **mqConsoleMaxMsgsPerRequest**, that have been added to the **setmqweb** command. For more information, see [setmqweb \(set mqweb server configuration\)](#).

#### **V 9.3.0 V 9.3.0 Enhancements to SMF statistics**

IBM MQ 9.3.0 adds the collection of queue statistics to the existing SMF information available to your enterprise. The new queue statistics data provides relevant data for each queue without the burden of collecting accounting information, or having to write an application to issue the DISPLAY QSTATUS command. This allows you to better monitor the performance of your queues over time, using your existing SMF tools.

For more information, see [Queue data records](#).

## **Security**

### **AT-TLS best practices for IBM MQ for z/OS**

Application Transparent Transport Layer Security (AT-TLS) can make it simpler to enable TLS on channels. It is designed to create a secure session on behalf of an application and provide encryption and decryption of data based on policy statements rather than requiring TLS to be implemented by every application that requires a secure connection. For more information, see [Use of AT-TLS with IBM MQ for z/OS](#).

#### **V 9.3.0 More flexible configuration for SNI support**

The Server Name Indication (SNI) extension of TLS enables a client to indicate the hostname to which it is attempting to connect at the start of the handshaking process. From IBM MQ 9.3.0, an improvement has been made to allow the SNI to store either the IBM MQ channel name or the hostname.



The **OutboundSNI** property of the TransportSecurity stanza allows you to select whether the SNI should be set to the target IBM MQ channel name to the remote system when initiating a TLS connection, or to the hostname. For more information about the **OutboundSNI** property, see [The QMINI data set](#).

### **V 9.3.0** Support for multiple queue manager certificates in MQIPT

From IBM MQ 9.3.0, per-channel certificates can be used on a queue manager for TLS connections received from IBM MQ Internet Pass-Thru (MQIPT), where the MQIPT route is configured as a TLS client.

IBM MQ supports the use of multiple certificates on the same queue manager, using a per-channel certificate label, specified using the **CERTLABL** attribute on the channel definition. Inbound channels to the queue manager rely on detecting the channel name using TLS Server Name Indication (SNI), in order for the queue manager to present the correct certificate. From IBM MQ 9.3.0, MQIPT can be configured to allow multiple certificates to be used by the destination queue manager by either setting the SNI to the channel name, or passing through the SNI received on the inbound connection to the route.

For more information about multiple certificate support and MQIPT, see [IBM MQ multiple certificate support with MQIPT](#).

### User data traced by MQIPT can be configured

**V 9.3.0** **V 9.3.0** From IBM MQ 9.3.0, the amount of user data in network transmissions received and sent by MQIPT routes that is traced can be configured using the **TraceUserData** property. If this property is not specified, only the first 64 bytes of data in network transmissions is traced.

## Application development

### **V 9.3.0** REST Messaging API: greater access to message properties when sending and receiving messages using the REST API

The following new features provide increased access to message properties when sending or receiving messages by using the REST API:

- A new REST API V3 has been introduced. New features are available by using the v3 version of the resource URL.
- Support for a message priority request header has been added.
- Application-specific correlation IDs can now be used (bringing the use of Correlation and Message IDs more in line with JMS).
- Support for setting and reading multiple user-defined message properties has been added.

Details of the new features are available in the following topics:

- [Message post](#)
- [Message get](#)
- [Message delete](#)
- [Message list get](#)
- [Topic post](#)

### **JM 3.0** **V 9.3.0** **V 9.3.0** Support for Jakarta Messaging 3.0

The JMS specification defines a set of named Java interfaces that software conforming to the specification must implement. From IBM MQ 9.3.0, [Jakarta Messaging 3.0](#) is supported. This extends the set of environments in which IBM MQ can be used.

IBM MQ 9.2 and earlier support JMS 2.0, which also supports the functionality defined in JMS 1.0 and JMS 1.1. IBM MQ 9.3.0 continues to support JMS 2.0 for existing applications, and adds support for Jakarta Messaging 3.0 for new development:

- A new **-j** option is added to the **setmqenv** and **crtmqenv** commands. You can use this option to specify whether you require an environment suitable to run JMS 2.0 or Jakarta Messaging 3.0 applications.
- Two new sample scripts, **setjms30env** and **setjms30env\_64**, are provided. You can use them to set the environment for Jakarta Messaging 3.0 applications. For more information, see [Setting environment variables for IBM MQ classes for JMS/Jakarta Messaging](#).
- An additional set of Java classes are provided. They implement the interfaces specified in Jakarta Messaging 3.0. These classes have different names from the existing implementation classes and are packaged into new JAR and RAR files. For the Javadoc information for these classes, see [IBM MQ classes for JMS 3.0](#).

**Note:** For Jakarta Messaging 3.0, control of the JMS specification moves from Oracle to the Java Community Process. However, Oracle retains control of the "javax" name, which is used in other Java technologies that have not moved to the Java Community Process. So, while Jakarta Messaging 3.0 is functionally equivalent to JMS 2.0 there are some differences in naming:

- The official name for Jakarta Messaging 3.0 is Jakarta Messaging rather than Java Message Service.
- The package and constant names are prefixed with **jakarta** rather than **javax**. For example, in JMS 2.0 the initial connection to a messaging provider is a **javax.jms.Connection** object, and in Jakarta Messaging 3.0 it is a **jakarta.jms.Connection** object.


For more information, see [Using IBM MQ classes for JMS/Jakarta Messaging](#).

### **LTS** Simplified Java application technologies

With APAR PH56722, IBM MQ classes for JMS and IBM MQ classes for Java applications running in a batch environment are allowed to use client connectivity to any z/OS queue manager, regardless of the PID that the queue manager is running under.

See [Java client connectivity to batch applications running on z/OS and JMS/Jakarta Messaging client connectivity to batch applications running on z/OS](#) for more information.

### Related concepts

 [What's new in IBM MQ 9.3.0 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

 [What's new in IBM MQ 9.3.0 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [What's new in IBM MQ for z/OS 9.3.0 - Advanced and Advanced VUE entitlement](#)

IBM MQ for z/OS 9.3.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

### **What's new in IBM MQ for z/OS 9.3.0 - Advanced and Advanced VUE entitlement**

IBM MQ for z/OS 9.3.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

#### **IBM MQ Advanced for z/OS entitlement**

The following capabilities are new for Long Term Support at IBM MQ 9.3.0.

- **V 9.3.0** [“IBM MQ Advanced for z/OS Value Unit Edition features now available with IBM MQ Advanced for z/OS entitlement” on page 51](#)
- **V 9.3.4** These capabilities are also available for Continuous Delivery from IBM MQ 9.3.4. For more information, see [“What's new in IBM MQ 9.3.4 for z/OS - Advanced and Advanced VUE entitlement” on page 97.](#)

### Managed File Transfer

The following capabilities first appeared in IBM MQ 9.2.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.3.0:

- [“Guidance for use of Managed File Transfer on z/OS” on page 51](#)
- **V 9.3.0** [Redistributable Managed File Transfer Logger](#)
- **V 9.3.0** [Limiting the number of file transfers for each FTP endpoint](#)
- **V 9.3.0** [New Managed File Transfer commands for starting and stopping resource monitors](#)
- **V 9.3.0** [Enhanced credentials protection for Managed File Transfer](#)
- **V 9.3.0** [Improvements to the \*\*fteRAS\*\* command](#)
- **V 9.3.0** [Transfer logging on Managed File Transfer](#)

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.3.0:

- **V 9.3.0** **V 9.3.0** [Enable MQCSP support by default for Managed File Transfer commands](#)
- **V 9.3.0** **V 9.3.0** [The REST API and managed calls for Managed File Transfer](#)

## IBM MQ Advanced for z/OS Value Unit Edition features now available with IBM MQ Advanced for z/OS entitlement

Customers with IBM MQ Advanced for z/OS entitlement gain access to features that were previously only available with IBM MQ Advanced for z/OS Value Unit Edition entitlement. Including:

- **V 9.3.0** The Connector Pack component, which provides the [IBM Aspera faspio Gateway](#), which can improve the speed of transfer of IBM MQ data in lossy, high latency, networks.

### Managed File Transfer enhancements

#### Guidance for use of Managed File Transfer on z/OS

This is a documentation only enhancement.

**V 9.3.0** On z/OS, Managed File Transfer supports transfer of data to and from files and data sets. A wide range of data set types and characteristics are supported, but [Transferring between data sets on z/OS](#) describes some restrictions that apply. See the section on [Partitioned data sets \(PDS\) and partitioned data set extended \(PDSE\) data sets](#) for more detailed information. [Using Managed File Transfer in combination with z/OS utilities to transfer files](#) gives additional guidance by describing methods that can be used to transfer data sets for which Managed File Transfer has restrictions.

**V 9.3.0** To ensure that Managed File Transfer makes full use of the resilience capabilities of IBM MQ on z/OS, additional guidance has been provided within IBM Documentation to help you configure Managed File Transfer to use queue-sharing groups. For more information, see [Planning your MFT infrastructure with IBM MQ for z/OS queue sharing groups.](#)

#### **V 9.3.0** Redistributable Managed File Transfer Logger

From IBM MQ 9.3.0, the Redistributable Managed File Transfer package includes the Managed File Transfer Logger component, enabling you to optionally copy published information about actions for analysis and auditing purposes. The logger supports FILE type loggers connecting in client

mode to the coordination queue manager. For more information, see [Downloading and configuring Redistributable Managed File Transfer components](#).

### V 9.3.0 Limiting the number of file transfers for each FTP endpoint

From IBM MQ 9.3.0, enhancements to the Managed File Transfer protocol bridge agent enable you to choose to limit file transfers per File Transfer Protocol (FTP) and Secure FTP (SFTP) endpoint to reduce the risk of bottlenecks and effectively prioritize file transfers. You can limit the number of file transfers for each FTP endpoint by using the additional attributes of **maxActiveDestinationTransfers** (at both the global and individual server level) and **failTransferWhenCapacityReached**. For more information, see [Scenarios and examples for limiting the number of file transfers to individual file servers](#) and [Protocol bridge properties file format](#) for details of the additional attributes.

### V 9.3.0 New Managed File Transfer commands for starting and stopping resource monitors

From IBM MQ 9.3.0, two new commands, **fteStartMonitor** and **fteStopMonitor**, allow you to start and stop resource monitors without needing to stop or restart an agent. This is useful, for example, in the following situations:

- If an agent has multiple resource monitors, and only some of them have encountered errors but the remaining resource monitors are still working fine so you just want to restart the failed resource monitors.
- If you want to stop a resource monitor to carry out some maintenance work, or if the resource monitor is not required for certain time and you do not want it to run unnecessarily, thus consuming precious system resources.

For more information, see [Starting an MFT resource monitor](#) and [Stopping an MFT resource monitor](#).

### V 9.3.0 Enhanced credentials protection for Managed File Transfer

At IBM MQ 9.2.0, the **fteObfuscate** command was enhanced to encrypt and decrypt credentials with a stronger algorithm and a user supplied key. From IBM MQ 9.3.0, the command has an additional protection mode that provides MD5 hashing and encryption of credentials using the latest algorithm and a user specified key to encrypt. For more information, see [fteObfuscate](#) and [Improvements to Managed File Transfer security from IBM MQ 9.2](#)



**Attention:** Managed File Transfer will still be able to use any existing stored credentials from a previous release. Migration of credentials to use the new encryption algorithm is not automatic. To enhance the security in your enterprise, you need to re-encrypt the credentials using the **fteObfuscate** command with the additional option on the **protection mode** parameter.

### V 9.3.0 Improvements to the fteRAS command

IBM MQ 9.3.0 improves the output of information to the console so that you can see the progress of the command while it runs. For more information, see [fteRAS](#).

The enhancements to the output of the **fteRAS** command include subscription logging. For an example of the enhanced output, see [fteRAS](#).

### V 9.3.0 Transfer logging on Managed File Transfer

From IBM MQ 9.3.0, transfer logging is available on MFT for enhanced visibility of file transfer status. More information is provided about the activities of MFT agents, including details of both successful transfers and any failure cases. Transfer logs can assist users in resolving common problems and can also be used to supply more detailed diagnostics if required by IBM support.

A **LogTransfer** option has been added to the **fteSetAgentLogLevel** command and the MFT agent.properties file. For more information, see the [fteSetAgentLogLevel](#) command and [The MFT agent.properties file](#).

**Note:** The **LogTransfer** option cannot be used with either the **LogAgent** or **LogMonitor** options.

From IBM MQ 9.3.0, a new log file `transferlog0.json` is also available. For more information, see [Output produced by the LogTransfer function](#).

## **Enable MQCSP support by default for Managed File Transfer commands**

From IBM MQ 9.3 onwards Managed File Transfer commands that connect to an agent, command, or coordination queue manager use the MQCSP structure by default so that you can use passwords longer than 12 characters. Also, an additional option has been added to these commands for backward compatibility, for example, when connecting to a version of IBM MQ prior to version 8.

See [Which MFT commands and processes connect to which queue manager](#) for a list of the commands affected by the change.

As the changes are the same for each command, select the link to any one of these commands to see the additions.

## **The REST API and managed calls for Managed File Transfer**

IBM MQ 9.3 introduces Version 3 of the REST API which includes the HTTP GET and HTTP POST verbs for use with managed calls.

See [Using the REST API with managed calls](#) for more information and links to the new verbs.

### Related concepts

#### [What's new in IBM MQ 9.3.0 for Multiplatforms - base and](#)

[Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

#### [What's new in IBM MQ 9.3.0 for Multiplatforms -](#)

[Advanced entitlement only](#)

IBM MQ 9.3.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

#### [What's new in IBM MQ for z/OS 9.3.0 - base and Advanced VUE](#)

[entitlement](#)

IBM MQ 9.3.0 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.



[“IBM MQ license information” on page 9](#)

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











## **What's changed in IBM MQ 9.3.0**

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.2.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

IBM MQ 9.3.0 includes enhancements that were previously delivered in the CD releases of IBM MQ 9.2.0 through IBM MQ 9.2.5, along with some enhancements that are new at IBM MQ 9.3.0:

- Changes that are new to Long Term Support (LTS) users at IBM MQ 9.3.0 are indicated by a dark blue icon 
- Changes that are new to Continuous Delivery (CD) users at IBM MQ 9.3.0 are indicated by a light blue icon 

### Client application changes

-   [“Change to location of JAAS login files” on page 55](#)
-    [“Support for .NET 6” on page 55](#)
-    [“Change to minimum required version of .NET Framework” on page 55](#)
-   [“Changes to Bouncy Castle JAR file names” on page 55](#)

- [V 9.3.0](#) [“Improved toString\(\) methods for some objects in IBM MQ classes for JMS” on page 55](#)
- [V 9.3.0](#) [“Improved toString\(\) methods for some objects in the IBM MQ resource adapter” on page 56](#)
- [V 9.3.0](#) [“Improved toString\(\) methods for some objects in IBM MQ classes for Java” on page 56](#)
- [V 9.3.0](#) [“Default authentication mode for IBM MQ classes for Java and IBM MQ classes for JMS client applications” on page 56](#)
- [V 9.3.0](#) [“Changes to JMS/Java applications affecting applications connecting via TLS” on page 57](#)
- [V 9.3.0](#) [V 9.3.0](#) [“Change of behavior for the managed .NET client when using a CCDT with queue manager grouping” on page 57](#)

### Command and configuration changes

- [V 9.3.0](#) [V 9.3.0](#) [“Change to error returned if MQCSP user ID and password length is exceeded” on page 57](#)
- [V 9.3.0](#) [MQ Adv.](#) [MQ Adv. VUE](#) [V 9.3.0](#) [“IBM Aspera faspio Gateway version upgraded” on page 58](#)
- [V 9.3.0](#) [“Change to automatic configuration from MQSC at startup” on page 58](#)
- [V 9.3.0](#) [“Value of the SYSTEM.MQSC.REPLY.QUEUE MAXDEPTH attribute increased” on page 58](#)
- [V 9.3.0](#) [“ConnName of application connection included in queue accounting records” on page 58](#)
- [V 9.3.0](#) [“IBM MQ Operator 1.7.0 works with CP4I 2021.4” on page 58](#)

### Installation and migration changes

- [V 9.3.0](#) [V 9.3.0](#) [“Change to how IBM MQ Explorer is delivered” on page 58](#)

### [MQ Adv.](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) Managed File Transfer changes


- [V 9.3.0](#) [“Changes to Managed File Transfer log files” on page 59](#)
- [V 9.3.0](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [“Change to MFT agent ioIdleThreadTimeout property on z/OS” on page 59](#)
- [V 9.3.0](#) [V 9.3.0](#) [“New STOPPING state for MFT agents” on page 59](#)

### REST API changes



- [V 9.3.0](#) [“Newline limitation removed from the messaging REST API” on page 60](#)
- [V 9.3.0](#) [“REST API now uses the WebSphere Liberty Profile jaxrs-2.1 feature” on page 60](#)

### Security changes

- [V 9.3.0](#) [“New and removed Cipher Suites in MQIPT” on page 60](#)
- [V 9.3.0](#) [V 9.3.0](#) [“Changes to supplying a key repository location” on page 60](#)
- [V 9.3.0](#) [V 9.3.0](#) [“Changes to the SSLKEYRPWD parameter of the CHGMQM command” on page 60](#)

-  [“Changes to how FIPS mode is enabled in MQIPT” on page 61](#)

## IBM MQ for z/OS changes

-   [“Changes to queue sharing group \(QSG\) support” on page 61](#)

## Documentation platform changes

- [“Replacement tool for hosting an offline version of IBM Documentation” on page 61](#)

## Change to location of JAAS login files

From IBM MQ 9.3.0, the location of the JAAS login files has changed to `&MQ_INSTALL_DIRECTORY&/amqp/samples/jaas`.

For earlier versions of IBM MQ, the location is `&MQ_INSTALL_DIRECTORY&/ amqp/samples/samples`

For more information, see [Creating and using AMQP channels, Location of telemetry logs, error logs, and configuration files, and JAAS login module not called by the telemetry service.](#)

## Support for .NET 6

IBM MQ 9.3.0 adds support for .NET 6.

For more information, see [Installing IBM MQ classes for .NET Standard](#) and [Using IBM MQ classes for XMS .NET Standard](#).

## Change to minimum required version of .NET Framework

From IBM MQ 9.3.0, to run IBM MQ classes for .NET Framework or IBM MQ classes for XMS .NET Framework, you must install Microsoft.NET Framework V4.7.2. This is a change from IBM MQ 9.2 where the minimum required version was V4.6.2.

For more information, see [Installing IBM MQ classes for .NET Framework](#) and [IBM MQ classes for XMS .NET Framework and IBM MQ classes for XMS .NET Standard features.](#)

## Changes to Bouncy Castle JAR file names

From IBM MQ 9.3.0, the names of the Bouncy Castle JAR files bundled with the product have changed. For example, `bcprov-jdk15on.jar` has changed to `bcprov-jdk15to18.jar`. For more information, see [IBM MQ classes for JMS relocatable JAR files](#) and [IBM MQ classes for Java relocatable JAR files](#).

## Improved toString() methods for some objects in IBM MQ classes for JMS



The `com.ibm.mq.jms.MQConnection` and `com.ibm.mq.jms.MQSession` objects implement `javax.jms.Connection` and `javax.jms.Session` respectively. They now have `toString()` methods which return key information about the underlying connection to IBM MQ.

The resulting string is in JSON format and contains fields as follows:

### ObjectId

As a `className` and hexadecimal identifier

### ConnectionId

In hexadecimal form



**ConnectionMode**

As specified at connection time

**Host**

Only applicable for client connections, but might be shown for bindings

**Port**

Only applicable for client connections, but might be shown for bindings

**QueueManager**

As specified at connection time

**ResolvedQueueManager**

Possibly different to **QueueManager** if a CCDT was used

The undocumented object produced by `ConnectionFactory.createContext()` essentially wraps a `Connection` and a `Session` object. Its `toString()` method produces a `String` representing a JSON object containing:

**ObjectId**

As a `className` and hexadecimal identifier

**Connection**

The `toString()` representation of the `Connection`

**Session**

The `toString()` representation of the `Session`

**Improved toString() methods for some objects in the IBM MQ resource adapter**

**V 9.3.0**

`Connections`, `Sessions` and `Contexts` generated in the IBM MQ resource adapter wrap their IBM MQ classes for JMS equivalents, and the `toString()` methods on them will produce information including the `toString()` representations of the wrapped IBM MQ classes for JMS objects.

**Improved toString() methods for some objects in IBM MQ classes for Java**

**V 9.3.0**

The `toString()` method for `com.ibm.mq.MQQueueManager` in IBM MQ classes for Java also produces a string in JSON format and containing fields as follows:

**ObjectId**

As a `className` and hexadecimal identifier

**ConnectionId**

In hexadecimal form

**ConnectionMode**

As specified at connection time

**Host**

Only applicable for client connections, but might be shown for bindings

**Port**

Only applicable for client connections, but might be shown for bindings

**QueueManager**

As specified at connection time

**ResolvedQueueManager**

Possibly different to **QueueManager** if a CCDT was used

**Default authentication mode for IBM MQ classes for Java and IBM MQ classes for JMS client applications**

**V 9.3.0**



IBM MQ classes for Java and IBM MQ classes for JMS applications that use client transport can be configured to use either MQCSP or compatibility mode to supply authentication information when connecting to an IBM MQ queue manager.

Before IBM MQ 9.3.0, the default authentication mode is MQCSP in applications that use IBM MQ classes for Java, and compatibility mode in applications that use IBM MQ classes for JMS.

From IBM MQ 9.3.0, the default authentication mode is MQCSP for both applications that use IBM MQ classes for Java, and applications that use IBM MQ classes for JMS. The methods that can be used to select a specific authentication mode, and which methods take precedence, has also been clarified.

For more information about connection authentication in IBM MQ Java clients, and how to select a specific authentication mode, see [Connection authentication with the Java client](#).

These changes might cause the authentication method that is used by some Java client applications to change when the IBM MQ classes for Java or IBM MQ classes for JMS are upgraded to IBM MQ 9.3.0. This might cause applications that previously connected successfully to a queue manager to fail to connect with reason code 2035 (MQRC\_NOT\_AUTHORIZED). Review the information in [Connection authentication with the Java client](#) before migrating the IBM MQ classes for Java or IBM MQ classes for JMS to IBM MQ 9.3.0.

## Changes to JMS/Java applications affecting applications connecting via TLS

► V 9.3.0

A defect was found within JMS and Java applications when generating a server name indication (SNI) header for TLS connections. The defect meant that JMS and Java applications were not converting IBM MQ channel names to a SNI address in accordance with the rules defined in [How IBM MQ provides multiple certificates capability](#).

The fix now resolves this issue and allows JMS and Java applications to correctly convert an IBM MQ channel name to an SNI address. However, Java performs validation on the SNI address set during TLS initialization to ensure that it conforms to RFC 1123 restrictions. If the last character of an IBM MQ channel name is a lowercase letter or symbol, then an invalid SNI address will be generated and the JMS/Java application will fail to start a TLS connection. This failure can be recognized by the presence of `BadChannelNameException` in the stack trace. If you encounter this failure, you can resolve it by doing either of the following:

- Modifying IBM MQ channel names to end with an uppercase letter or digit.
- Configuring JMS/Java applications to use the hostname SNI address instead of the IBM MQ channel name SNI address by using the **OutboundSNI** setting of the SSL stanza of the client configuration file.

## Change of behavior for the managed .NET client when using a CCDT with queue manager grouping

► V 9.3.0   ► V 9.3.0

Before IBM MQ 9.3.0, there is a difference in behavior between the managed .NET client and the IBM MQ Java and C clients when using a CCDT with queue manager grouping. When a CCDT file contains a queue manager group of three queue managers and three explicit CLNTCONN to the same three queue managers and the application provides "\*" as the queue manager, C and Java clients return `MQRC_Q_MGR_NAME_ERROR`. However, the managed .NET client uses the first available CLNTCONN and, if none are available, it then uses the queue manager grouped CLNTCONN.

From IBM MQ 9.3.0, the .NET client behaves in the same way as the C and Java clients and returns the `MQRC_Q_MGR_NAME_ERROR`. For more information, see [Using a client channel definition table with .NET](#).

## Change to error returned if MQCSP user ID and password length is exceeded

► V 9.3.0   ► V 9.3.0

From IBM MQ 9.3.0, if a user ID or password exceeds the length permitted, the error returned to indicate the authentication request failed is MQRC\_CSP\_ERROR. In earlier versions, the error returned is MQRC\_NOT\_AUTHORIZED. For more information, see [CSPUserIdLength \(MQLONG\) for MQCSP](#) and [CSPPasswordLength \(MQLONG\) for MQCSP](#).

## IBM Aspera faspio Gateway version upgraded

V 9.3.0 MQ Adv. MQ Adv. VUE V 9.3.0

MQ Adv. MQ Adv. VUE IBM MQ Advanced for z/OS Value Unit Edition 9.3.0 and IBM MQ Advanced for Multiplatforms 9.3.0 upgrade the version of the IBM Aspera faspio Gateway to 1.3.0.

IBM Aspera faspio Gateway 1.3 makes a number of breaking changes from earlier versions:

- If you are migrating from IBM Aspera faspio Gateway 1.2, a license file is now required to run the gateway in server mode. See [Release Notes: IBM Aspera faspio Gateway 1.3](#) for details. This license file is provided with IBM MQ, see [Defining an Aspera gateway connection on Linux, Windows, or macOS](#).
- If you are migrating from IBM Aspera fasp.io Gateway 1.1 then, in addition to the license file change already described, there is also a changed directory structure and TLS is enabled by default. See [Release Notes: IBM Aspera faspio Gateway 1.2](#) for details. For more information, see [Defining an Aspera gateway connection on , Linux, Windows or macOS](#).

## Change to automatic configuration from MQSC at startup

V 9.3.0

From IBM MQ 9.3.0, the way that the auto-configuration feature behaves has changed. All MQSC commands are completed before applications can connect to the queue manager. This ensures that a queue manager's configuration is up to date prior to applications connecting but may increase the time it takes applications to connect to a restarted queue manager. For more information, see [Automatic configuration from an MQSC script at startup](#).

## Value of the SYSTEM.MQSC.REPLY.QUEUE MAXDEPTH attribute increased

V 9.3.0

To ensure that a remotely connected **runmqsc** command can process the full results for each command, IBM MQ 9.3.0 increases the value of the MAXDEPTH attribute from 3000 to 999999999. IBM MQ 9.3.0 also changes the way in which the **WaitTime** parameter of the **runmqsc** command behaves, by setting the value of **WaitTime** as an expiry time for PCF request messages. For more information, see [runmqsc](#).

## ConnName of application connection included in queue accounting records

V 9.3.0

From IBM MQ 9.3.0, ConnName is included in queue accounting records as well as in MQI accounting records. Both Channel Name and ConnName are needed in queue accounting records in order to fully identify a client-connected application. For more information, see [Queue accounting message data](#).

## IBM MQ Operator 1.7.0 works with CP4I 2021.4

V 9.3.0

For IBM MQ 9.3.0 in containers, you can use IBM MQ Operator 1.7.0. This Operator works with IBM Cloud Pak for Integration 2021.4.

## Change to how IBM MQ Explorer is delivered

V 9.3.0 V 9.3.0

From IBM MQ 9.3.0, the IBM MQ Explorer feature is no longer included in the Server product on Windows or Linux x86\_64. It is still available as a separate download for those platforms. For more information, see [Installing and uninstalling IBM MQ Explorer as a stand-alone application on Linux and Windows](#). One external change is that the **strmqcfig** command has been removed.

## Changes to Managed File Transfer log files

> V 9.3.0

IBM MQ 9.3.0 introduces changes to resource monitor log files and protocol bridge agent log files:

### Resource monitor log files

These event log files record several actions that take place when a monitor polls a resource, for example, a directory or a queue:

- The default value of the **resourceMonitorLogFiles** agent property has changed from 10 to 5. This means that, from IBM MQ 9.3.0 onwards, if the default is set, there can be a maximum of five resource monitor event log files, starting from `resmonevent0.log` to `resmonevent4.log`. However, you can change this value if required.
- If the agent is migrated from a version prior to IBM MQ 9.3.0, you should manually delete the `resmonevent5.log` to `resmonevent9.log` files if any exist.
- However, the size of each log file remains at 20 MB.

### Protocol bridge agent log files

These event log files record the flow of commands and responses that flow between a protocol bridge agent and a file server, such as an SFTP server:

- The default value of **agentLogFiles** agent property has changed from 10 to 5. This means that from IBM MQ 9.3.0 onwards, if the default is set, there can be a maximum of five protocol bridge agent event log files, starting from `agentevent0.log` to `agentevent4.log`. However, you can change this value if required.
- If the agent is migrated from a version prior to IBM MQ 9.3.0, you should manually delete the `agentevent5.log` to `agentevent9.log` files if any exist.
- However, the size of each log file remains at 20 MB.

## Change to MFT agent `ioIdleThreadTimeout` property on z/OS

> z/OS > V 9.3.0 > MQ.Adv.VUE > MQ.Adv.z/OS

From IBM MQ 9.3.0, this property does not apply to Managed File Transfer agents running on IBM MQ for z/OS.

In addition, **FileIOWorker** threads for MFT agents running on IBM MQ for z/OS no longer time out.

For more information, see [The MFT agent.properties file](#).

## New STOPPING state for MFT agents

> V 9.3.0 > V 9.3.0

If an agent is stopped in a controlled manner using the `fteStopAgent` command, then the agent does not accept any new managed transfer requests and waits for any in-progress transfers to complete before it actually shuts itself down. Before IBM MQ 9.3.0, the status of agent was shown as STOPPED as soon as the command was issued. IBM MQ 9.3.0 adds a new STOPPING state for Managed File Transfer agents that are stopped in a controlled manner with the **fteStopAgent** command. The addition of this new state helps to make it clear that an agent is still in a transient state, and therefore has not yet shut down and cannot yet be restarted. For more information, see [MFT agent status values](#) and [Stopping an MFT agent](#).

## Newline limitation removed from the messaging REST API

V 9.3.0

The messaging REST API no longer removes new-lines from the HTTP request body.

## REST API now uses the WebSphere Liberty Profile jaxrs-2.1 feature

V 9.3.0

The REST API previously used the WebSphere® Liberty Profile `jaxrs-1.1` feature to map URLs to Java code, and to parse incoming requests. The REST API has now migrated to the `jaxrs-2.1` feature to maintain currency and remove some restrictions.

In normal operation, there should be no difference in behavior. However, there might be some changes for error conditions:

- The `jaxrs-1.1` feature accepted URLs containing multiple consecutive '/' characters. `jaxrs-2.1` does not, so some connections might be rejected, reporting no suitable URL is available. Applications that encounter this problem will need to be amended to correct the URL presented.
- The HTTP response code returned in error conditions might change. It will still be an error code but the exact value might be different. This will not affect successful operations.

## New and removed Cipher Suites in MQIPT

V 9.3.0

From IBM MQ 9.3.0, the following TLS 1.2 CipherSuites are available in IBM MQ Internet Pass-Thru (MQIPT) :

- TLS\_ECDHE\_RSA\_WITH\_CHACHA20\_POLY1305\_SHA256
- TLS\_ECDHE\_ECDSA\_WITH\_CHACHA20\_POLY1305\_SHA256
- TLS\_DHE\_RSA\_WITH\_CHACHA20\_POLY1305\_SHA256

These CipherSuites can be used only for routes between instances of MQIPT as they are not supported by IBM MQ.

From IBM MQ 9.3.0, the following CipherSuites have been removed from MQIPT :

- SSL\_RSA\_FIPS\_WITH\_3DES\_EDE\_CBC\_SHA
- SSL\_RSA\_FIPS\_WITH\_DES\_CBC\_SHA

For more information about TLS support in MQIPT, see [SSL/TLS support](#).

## Changes to supplying a key repository location

Multi V 9.3.0 V 9.3.0

From IBM MQ 9.3.0, the queue manager and client applications have been updated to allow you to use a full file path, including extension, when providing the location of a key repository. Prior to this IBM MQ expected you to supply a file path without the extension.

To facilitate migration, IBM MQ continues to support a file path without an extension. In this case IBM MQ verifies that the full file path has not been provided and, on detecting that no file exists, automatically appends `.kdb` to the supplied value.

For more information, see [Changing the key repository location for a queue manager on IBM i](#).

## Changes to the SSLKEYRPWD parameter of the CHGMQM command

V 9.3.0 IBM i V 9.3.0

From IBM MQ 9.3.0, the CHGMQM command has been updated so that when you provide key repository passwords through the SSLKEYRPWD parameter, the password is encrypted using the IBM MQ Password Protection system.

This uses the initial key set on the queue manager. You should run the CHGMQM command after upgrading to IBM MQ 9.3.0, or higher, and setting a unique initial key in the queue manager to ensure your key repository passwords are protected with the latest algorithm.

See [CHGMQM](#) for more information.

## Changes to how FIPS mode is enabled in MQIPT

> V 9.3.0

From IBM MQ 9.3.0, the IBMJCEP1usFIPS cryptographic provider should be used to provide FIPS-certified cryptography in MQIPT. To use the IBMJCEP1usFIPS cryptographic provider, specify the `com.ibm.jsse2.usefipsProviderName=IBMJCEP1usFIPS` Java system property. For more information about enabling FIPS mode in MQIPT, see [Enabling FIPS mode in MQIPT](#).

## Changes to queue sharing group (QSG) support

> z/OS > V 9.3.0 > V 9.3.0

From IBM MQ for z/OS 9.3, a queue manager is supported only in queue sharing groups containing queue managers at version 9.1 (CD or LTS) or above. This means that if you try to start an IBM MQ for z/OS 9.3 queue manager in a QSG containing queue managers below this level, the queue manager will terminate with completion code X'6C6' and reason code X'00F50029'.

Supporting the changes in QSG support, the VERIFY QSG function of the CSQ5PQSG utility now issues the CSQU599I message if a QSG contains queue managers of a version unsupported by the version of IBM MQ for z/OS that the utility is run from.

## Replacement tool for hosting an offline version of IBM Documentation

Previously, documentation hosted in IBM Knowledge Center could also be downloaded and installed offline in a customer-installable version of Knowledge Center called KC-CI. This tool was designed for use in a Dark Shop environment, or in any situation where you cannot access documentation on the Internet. For documentation hosted in IBM Documentation, an equivalent offline tool is now available. The new tool is called "IBM Documentation Offline". For more information, see ["IBM MQ 9.3 in the IBM Documentation Offline app"](#) on page 198.

### Related concepts

> V 9.3.0 > V 9.3.0 [What's new in IBM MQ 9.3.0](#)

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

> V 9.3.0 [New, changed, and removed messages in IBM MQ 9.3.0](#)

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.2.0.

> V 9.3.0 [New, changed, and removed messages since IBM MQ 9.2.5](#)

For Continuous Delivery users, a summary of the new messages that have been added and the existing messages that have been changed or removed since IBM MQ 9.2.5.

> V 9.3.0 > V 9.3.0 [Deprecated, stabilized, and removed features in IBM MQ 9.3.0](#)

A number of features are deprecated, stabilized or removed from IBM MQ 9.3.0.

### Related reference

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

### Related information

[System Requirements for IBM MQ](#)

## V 9.3.0 New, changed, and removed messages in IBM MQ 9.3.0

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.2.0.

V 9.3.0 For a list of just the messages that are new, changed or removed since IBM MQ 9.2.5, see “New, changed, and removed messages since IBM MQ 9.2.5” on page 74.

- Multi “[UNIX, Linux, Windows, IBM i]New, changed, and removed IBM MQ AMQ messages” on page 62
- MQ Adv. MQ Adv. VUE MQ Adv. z/OS “[IBM MQ Advanced][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]New, changed, and removed Managed File Transfer messages” on page 67
- MQ Adv. ALW “[IBM MQ Advanced][AIX, Linux, Windows]New, changed and removed MQ Telemetry messages” on page 69
- “New, changed, and removed REST API messages” on page 69
- “New, changed, and removed IBM MQ Console messages” on page 69
- Removed Deprecated MQ Adv. Linux “[IBM MQ Advanced][Linux]New, changed, and removed IBM MQ Bridge to blockchain messages” on page 70
- Deprecated Linux “[Linux]New, changed, and removed IBM MQ Bridge to Salesforce messages” on page 70
- ALW “[AIX, Linux, Windows]New, changed and removed IBM MQ Internet Pass-Thru messages” on page 70
- “New, changed and removed MQJMS messages” on page 70
- “New, changed and removed JSON messages” on page 70
- z/OS “[z/OS]New, changed, and removed z/OS messages” on page 71

## Multi New, changed, and removed IBM MQ AMQ messages

The following AMQ messages are new for IBM MQ 9.3.0:

### **AMQ3xxx: Utilities and tools**

AMQ3055I  
AMQ3056I  
AMQ3201E - AMQ3206E  
AMQ3208E - AMQ3219E  
AMQ3221E - AMQ3225E  
AMQ3227I - AMQ3239E  
AMQ3240I  
AMQ3241E  
AMQ3242E  
AMQ3243E to AMQ3246E  
AMQ3247W  
AMQ3496E  
AMQ3497I  
AMQ3498E

AMQ3499E  
AMQ3500E  
AMQ3501I to AMQ3534E  
AMQ3535E  
AMQ3536I to AMQ3550I  
AMQ3551I  
AMQ3552I  
AMQ3553E  
AMQ3554I  
AMQ3555E  
AMQ3556E  
AMQ3636I to AMQ3643I  
AMQ3635I  
AMQ3644I - AMQ3676I  
AMQ3677I

**AMQ5xxx: Installable services**

AMQ5066W  
AMQ5067W  
AMQ5068W  
AMQ5707E - AMQ5708E  
AMQ5781I

**AMQ6xxx: Common services**

AMQ6206I  
AMQ6330E  
AMQ6331E  
AMQ6333E  
AMQ6335E  
AMQ6337E  
AMQ6339E  
AMQ6340I  
AMQ6341E  
AMQ6861W

**AMQ7xxx: IBM MQ product**

AMQ7153W  
AMQ7275E  
AMQ7277E  
AMQ7369W to AMQ7371W  
AMQ7372W  
AMQ7442W  
AMQ7497W  
AMQ7814I - AMQ7816I

**AMQ8xxx: Administration**

AMQ8270I - AMQ8273I  
AMQ8343I

AMQ8634E  
AMQ870DI (IBM i)  
AMQ870EI (IBM i)  
AMQ8797E  
AMQ8954W  
AMQ8955E to AMQ8958E  
AMQ8A26S (IBM i)  
AMQ8D41 (IBM i)

#### **AMQ9xxx: Remote**

AMQ9099I  
AMQ9101E - AMQ9107E  
AMQ9108E  
AMQ9263E  
AMQ9722W  
AMQ9723I  
AMQ9797E  
AMQ9852I to AMQ9854I

The following AMQ messages are changed for IBM MQ 9.3.0:

#### **AMQ3xxx: Utilities and tools**

AMQ3055I (Usage updated)  
AMQ3201E (Typographical error fixed in Explanation; Response is rewritten)  
AMQ3205E (Message and Explanation extended)  
AMQ3221E (Response is rewritten)  
AMQ3230E (Response is rewritten)  
AMQ3232E (Explanation extended)  
AMQ3235I (Explanation is extended)  
AMQ3237I (Explanation is extended)  
AMQ3240I (Message reworded and Explanation extended)  
AMQ3242E (Explanation updated. Response extended.)  
AMQ3635E (Severity changed from Informational to Error)  
AMQ3699I ("DR" removed from Message)  
AMQ3700I ("DR" removed from Message)  
AMQ3980E (Minor edits in Message, Explanation, and Response)  
AMQ3985I (backup file name added to Message, and mentioned in Explanation)  
AMQ3992I (Usage parameter list extended)  
AMQ3994I (Usage updated)  
AMQ3995E (Message and Response updated)

#### **AMQ5xxx: Installable services**

AMQ5542I (Response extended)  
AMQ5600I IBM MQ Appliance (Usage updated)  
AMQ5600I (UNIX and Linux) (Usage example extended and Usage updated to include Native HA parameter)  
AMQ5613I (Usage updated to include Native HA parameter)  
AMQ5697I (Usage extended to specify JMS version)



AMQ5698I (Usage extended to specify JMS version)

AMQ5774E (Message extended, Response reduced)

AMQ5776E (Explanation and Response extended)

#### **AMQ6xxx: Common Services**

AMQ6109S (Explanation extended)

AMQ6110S (Explanation extended)

AMQ6119S (Explanation extended)

AMQ6125E (Explanation extended)

AMQ6150E (Variable removed from Message and Explanation)

AMQ6165W (Explanation extended)

AMQ6183W (Message extended)

AMQ6184W (Message extended)

AMQ6333E (Explanation and Response extended)

AMQ6537I (Usage example extended - ReplicationType added)

AMQ6538I (Usage example extended - ReplicationType added)

AMQ6544I (Message extended - dspdrsecondary added)

AMQ6560I (Extra parameters added to the Usage list)

AMQ6570I (Usage information expanded)

AMQ6571I (Usage information expanded)

AMQ6620I (list of available commands extended)

AMQ6622I (List of commands tidied up)

AMQ6623I (List of available commands extended)

AMQ6624I (Usage extended)

AMQ6637I (Usage extended)

AMQ6645I (Message and Explanation updated)

AMQ6651E (Message and Explanation updated)

AMQ6680E (Message and Explanation updated)

AMQ6668I (Code is amended in Usage)

AMQ6693I (List of commands tidied up)

AMQ6697E (Message and Explanation updated)

#### **AMQ7xxx: IBM MQ product**

AMQ7017S (Explanation and Response updated)

AMQ7148E (Message and Explanation updated)

AMQ7204E (Message extended)

AMQ7301I (Message rewritten)

AMQ7367I Minor edit in Explanation.

AMQ7369W (Message reworded)

AMQ7371W (Explanation extended)

AMQ7472W (Response reworded)

AMQ7493W (Typo fixed)

AMQ7734I (Usage updated to include new parameter)

#### **AMQ8xxx: Administration**

AMQ8001I (Variable is removed from Message)

AMQ8007I (Message is shortened)

AMQ8011I (Message is shortened)  
AMQ8015I (Message is shortened)  
AMQ8079W Windows (Response extended)  
AMQ8095I (Message is shortened)  
AMQ8109I (Variable is added to Message)  
AMQ8119S IBM i (Message, Explanation and Response rewritten)  
AMQ8120I (Message reworded)  
AMQ8351E (Response extended to cover JMS 3.0)  
AMQ8384I Windows (Usage extended)  
AMQ8455E (Explanation and Response rewritten)  
AMQ8553I (Message is shortened)  
AMQ8564I (Message is shortened)  
AMQ8588W (Response clarified)  
AMQ8627I (Message is shortened)  
AMQ8628I (Message is shortened)  
AMQ8860I (Message is shortened)  
AMQ8670E (Message and Response extended)  
AMQ8689E (Message and Response extended)  
AMQ8692I (Message is shortened)  
AMQ8702I IBM MQ Appliance (Usage amended)  
AMQ8710I (Code is amended in Usage)  
AMQ8860I (Message and Explanation extended)  
AMQ8863I (Message is shortened)  
AMQ8894E (Message, Explanation and Response rewritten)  
AMQ8914E (Explanation extended)  
AMQ8916E (Explanation extended)  
AMQ8955E (Explanation extended)

**AMQ9xxx: Remote**

AMQ9085I (Message is shortened)  
AMQ9108E (Explanation and Response extended)  
AMQ9456W (Severity changed from "I" to "W")  
AMQ9456I (Formerly AMQ9456W; references to "queue" are changed to "object")  
AMQ9514E (Explanation extended)  
AMQ9617E (Explanation and Response extended)  
AMQ9631E (Response rewritten)  
AMQ9633E (Explanation extended)  
AMQ9641E (Response rewritten)  
AMQ9654E (Explanation extended)  
AMQ9660E (Message, Explanation and Response rewritten)  
AMQ9720W (Typo fixed in Explanation)  
AMQ9825I (Usage extended)

"Knowledge Center" replaced with "IBM Documentation" throughout.

The following AMQ messages are removed for IBM MQ 9.3.0:

### **AMQ3xxx: Utilities and tools**

AMQ3589E

AMQ3932E

### **AMQ6xxx: Common Services**

AMQ6183W (HP NSS)

AMQ6184W (HP NSS)

### **AMQ8xxx: Administration**

AMQ8771I DEC to AMQ8796E DEC (26 messages)

### **AMQ9xxx: Remote**

AMQ9099I (replaced with AMQ3056I)

AMQ9102W (replaced with AMQ6339W)

AMQ9103E (replaced with AMQ6335E)

AMQ9104E (replaced with AMQ6337E)

AMQ9107E (replaced with AMQ6333E)

## **MQ Adv. MQ Adv. VUE MQ Adv. z/OS New, changed, and removed Managed File Transfer messages**

The following Managed File Transfer messages are new for IBM MQ 9.3.0:

### **BFGAG0001 - BFGAG9999: MFT agents messages**

BFGAG0202I

BFGAG0203I

BFGAG0204I

BFGAG0205E to BFGAG0210W

BFGAG0211W

BFGAG0212I

### **BFGBR0001 - BFGBR9999: MFT protocol bridge messages**

BFGBR0220E

BFGBR0221E to BFGBR0223E

### **BFGCH0001 - BFGCH9999: MFT command handler messages**

BFGCH0129W

BFGCH0130I

### **BFGCL0001 - BFGCL9999: MFT commands messages**

BFGCL0810E

BFGCL0811E

BFGCL0812E - BFGCL0816I

BFGCL0817E

BFGCL0818E

BFGCL0819I to BFGCL0826E

BFGCL0827I

BFGCL0828E

BFGCL0829E

### **BFGDM0001 - BFGDM9999: MFT resource monitor messages**

BFGDM0127E

BFGDM0128E - BFGDM0132E

### **BFGIO0001 - BFGIO9999: MFT filesystem I/O on IBM i messages**

BFGIO0414E

**BFGNV0001 - BFGNV9999: MFT native code messages**

BFGNV0177E

**BFGPR0001 - BFGPR9999: MFT miscellaneous messages**

BFGPR0153I

BFGPR0154I

**BFGRP0001 - BFGRP9999: MFT audit information messages**

BFGRP0038I

**BFGMQ0001 - BFGMQ9999: MFT WMQ interface messages**

BFGMQ1046I

**BFGSS0001 - BFGSS9999: MFT state store messages**

BFGSS0083W

BFGSS0084E

BFGSS0085I

BFGSS0086I

BFGSS0087E

BFGSS0088W

BFGSS0089I

BFGSS0090E

**BFGTL0001 - BFGTL9999: MFT transfer agent messages**

BFGTL0001I to BFGTL0076E

BFGTL9999E

**BFGTR0001 - BFGTR9999**

BFGTR0084E

**BFGUT0001 - BFGUT9999: MFT tracing and logging messages**

BFGUT0037E to BFGUT0039I

The following Managed File Transfer messages are changed for IBM MQ 9.3.0:

**BFGAG0001 - BFGAG9999: MFT agents messages**

BFGAG0141E (MQI reason code added to the Message)

BFGAG0201I (Typo fixed in Response)

**BFGCL0001 - BFGCL9999: MFT commands messages**

BFGCL0261E (Message shortened)

BFGCL0262E (Message shortened)

BFGCL0756E (Extra option (LogTransfer) added to the Message and Explanation. Response rewritten.)

**BFGIO0001 - BFGIO9999: MFT filesystem I/O on IBM i messages**

BFGIO0059E (Exception details added to the Message)

BFGIO0121E (Message rewritten)

**BFGMQ0001 - BFGMQ9999: MFT WMQ interface messages**

BFGMQ1045I (Typo fixed in Explanation: DEFSOPT(EXCL) becomes DEFSOPT(SHARED))

**BFGNV0001 - BFGNV9999: MFT native code messages**

BFGNV0066E (Typo fixed (missing period) in the Message)

**BFGUE0001 - BFGUE9999: MFT user exits messages**

BFGUE0029E (Explanation and Response clarified)

Additionally, many of the MFT messages have small corrections for typos and style.

The following Managed File Transfer messages are removed for IBM MQ 9.3.0:

**BFGPR0001 - BFGPR9999: MFT miscellaneous messages**

BFGPR0153I

The following MQ Telemetry messages are new for IBM MQ 9.3.0:

**Telemetry (AMQXR) messages**

AMQXR2105E

AMQXR2106E

The following MQ Telemetry message is changed for IBM MQ 9.3.0:

**Telemetry (AMQXR) messages**

AMQXR10006E (re-numbered to AMQXR1006E)

The following MQ Telemetry messages are removed for IBM MQ 9.3.0:

**Telemetry (AMQXR) messages**

AMQXR0014E

AMQXR1001E

## **New, changed, and removed REST API messages**

The following REST API messages are new for IBM MQ 9.3.0:

**MQWB03xx: REST API messages MQWB0300 to 0399**

MQWB0317E

**MQWB04xx: REST API messages MQWB0400 to 0499**

MQWB0446E

MQWB0447E

MQWB0448E

**MQWB10xx: REST API messages MQWB1000 to 1099**

MQWB1004I

MQWB1012I

**MQWB11xx: REST API messages MQWB1100 to 1199**

MQWB1144E to MQWB1158E

The following REST API messages are changed for IBM MQ 9.3.0:

**MQWB01xx: REST API messages MQWB0100 to 0199**

MQWB0115E (typo fixed in Message)

**MQWB10xx: REST API messages MQWB1000 to 1099**

MQWB1000I (Code updated and typo removed from Usage)

MQWB1003I (Code updated in Usage and dspmqweb properties information removed from Usage)

MQWB1010I (Code shortened in Usage)

**MQWB11xx: REST API messages MQWB1100 to 1199**

MQWB1126E (Explanation is extended and Response is rewritten)

MQWB1137E (Variable in the Message is edited)

"Knowledge Center" replaced with "IBM Documentation" throughout.

There are no removed REST API messages for IBM MQ 9.3.0.

## **New, changed, and removed IBM MQ Console messages**

The following IBM MQ Console messages are new for IBM MQ 9.3.0:

**MQWB20xx IBM MQ Console messages**

MQWB2024I

MQWB2025E to MQWB2027E

The following IBM MQ Console messages are changed for IBM MQ 9.3.0:

## **MQWB20xx IBM MQ Console messages**

MQWB2010E (Typo fixed in the Response)

MQWB2020E ("Knowledge Center" replaced with "IBM Documentation")

There are no removed IBM MQ Console messages for IBM MQ 9.3.0.

MQ Adv.

Linux

## **New, changed, and removed IBM MQ Bridge to blockchain messages**

Deprecated

The following IBM MQ Bridge to blockchain messages are changed for IBM MQ 9.3.0:

### **AMQBCxxx: IBM MQ Bridge to blockchain messages**

AMQBC036E ("Knowledge Center" replaced with "IBM Documentation")

There are no new or removed IBM MQ Bridge to blockchain messages for IBM MQ 9.3.0.

### **Important:**

- **Deprecated** The IBM MQ Bridge to blockchain is deprecated across all releases from November 22 2022 (see [US Announcement letter 222-341](#)). Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.
- For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2.

Linux

## **New, changed, and removed IBM MQ Bridge to Salesforce messages**

Deprecated

There are no new, changed or removed [IBM MQ Bridge to Salesforce](#) messages for IBM MQ 9.3.0.

**Important:** The IBM MQ Bridge to Salesforce is deprecated across all releases from November 22 2022 (see [US Announcement letter 222-341](#)).

ALW

## **New, changed and removed IBM MQ Internet Pass-Thru messages**

The following IBM MQ Internet Pass-Thru messages are new for IBM MQ 9.3.0:

### **MQCPxxxx: MQIPT messages**

MQCPE117

MQCPE118

MQCPE119

The following IBM MQ Internet Pass-Thru messages are changed for IBM MQ 9.3.0:

### **MQCPxxxx: MQIPT messages**

MQCPE050 (Expanded message text, Explanation and User response)

The following IBM MQ Internet Pass-Thru messages are removed for IBM MQ 9.3.0:

### **MQCPxxxx: MQIPT messages**

### **MQCAxxxx: administration client messages**

## **New, changed and removed MQJMS messages**

Jakarta Messaging 3.0 exception messages are added to the Javadoc information for IBM MQ 9.3.0.

## **New, changed and removed JSON messages**

There are no new, changed or removed [JSON format diagnostic messages](#) for IBM MQ 9.3.0.

## **New, changed, and removed z/OS messages**

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.3.0:

### **Data manager messages (CSQI...)**

CSQI051E

### **Message manager messages (CSQM...)**

CSQM068I

### **Distributed queuing messages (CSQX...)**

CSQX166E

### **IBM MQ-IMS bridge Messages (CSQ2...)**

CSQ2007I

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.3.0:

### **Batch adapter messages (CSQB...)**

CSQB001E (Expands "USS" to "z/OS UNIX System Services")

### **Coupling Facility manager messages (CSQE...)**

CSQE161E (Punctuation is improved in the Message)

CSQE280I (LTS version of the data set table is added)

### **Recovery log manager messages (CSQJ...)**

CSQJ073E (System programmer response is rewritten)

CSQJ077E (Extra paragraph in the System programmer response)

CSQJ100E (Typo fixed in the message text)

CSQJ103E (System programmer response is rewritten)

CSQJ107E (Extra sentence added to System action)

CSQJ108E (Extra sentence added to System action)

CSQJ166E (LTS-specific version of the message is removed)

CSQJ302E (System programmer response is rewritten)

### **Message manager messages (CSQM...)**

CSQM001E (References to "USS" or "UNIX System Services" are expanded or corrected)

CSQM102E (Set of examples of weak CipherSpecs replaced by a link to another topic)

CSQM529E (Explanation rewritten)

CSQM582E (Explanation rewritten)

CSQM583E (Explanation rewritten)

### **Command server messages (CSQN...)**

CSQN207I (System action is extended)

### **Buffer manager messages (CSQP...)**

CSQP014E (Extra section added to System Programmer Response)

CSQP004E (Typo fixed in System action)

CSQP030E (System programmer response is rewritten)

CSQP035E (System programmer response is rewritten)

### **Utilities messages (CSQU...)**

CSQU020E (Extended System programmer response)

### **Agent services messages (CSQV...)**

CSQV451I (System programmer response is rewritten)

CSQV453I (System programmer response is rewritten)

### **Agent services messages (CSQW...)**

CSQW701E (System programmer response is rewritten)

### **Distributed queuing messages (CSQX...)**

CSQX004I (Explanation extended)

CSQX027E and CSQX028E (System programmer response is rewritten)

CSQX042E and CSQX043E (System programmer response is rewritten)

CSQX044E (System programmer response is rewritten)

CSQX045E (System programmer response is rewritten)

CSQX049E (System programmer response is rewritten)

CSQX050E (System programmer response is rewritten)

CSQX051E (System programmer response is rewritten)

CSQX059E (System action extended)

CSQX106E (References to "USS" or "UNIX System Services" are expanded or corrected)

CSQX164E (Typo fixed in Explanation)

CSQX456E (Renamed from CSQX456I; Field "qmgr\_name" is replaced with "qmgr\_uuid"; Severity is changed to "4" hyphens removed from some variable names, and all sections revised)

CSQX458E (Severity level added)

CSQX459E (Severity level added)

CSQX502E (System programmer response extended)

CSQX547E (System programmer response amended)

CSQX616E (System programmer response rewritten and details of how to re-enable weak CipherSpecs replaced by a link to another topic)

CSQX617I (Typo fixed in Explanation. System programmer response extended)

CSQX620E (System programmer response is rewritten)

CSQX629E (Explanation extended)

CSQX632I (Explanation amended)

CSQX635E (Explanation is extended, System programmer response is rewritten)

CSQX637E (Expands System programmer response)

CSQX642E (Expands System programmer response)

CSQX658E (Typo fixed)

CSQX670I (System programmer response updated)

CSQX671I (Updated a note number in System programmer response)

CSQX674E (Details of how to re-enable weak CipherSpecs replaced by a link to another topic)

CSQX690I (Typos fixed in System programmer response and details of how to re-enable weak CipherSpecs replaced by a link to another topic)

CSQX692I (System programmer response extended and details of how to re-enable weak CipherSpecs replaced by a link to another topic)

CSQX696I (Details of how to disable weak or broken CipherSpecs replaced by a link to another topic)

CSQX697I (Typo fixed, and details of how to disable weak or broken CipherSpecs replaced by a link to another topic)

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

CSQY200E (System programmer response is rewritten, and link is added)

CSQY210E (System programmer response is rewritten)

CSQY220I (Explanation is extended)

CSQY291E (System programmer response is rewritten)

### **Service facilities messages (CSQ1...)**

CSQ1217E (for the RBA RANGE WARNING, the RETCODE parameter is excluded for IBM MQ 9.3.0)



### **IBM MQ-IMS bridge Messages (CSQ2...)**

CSQ2004E (Extra paragraph in the Explanation)

CSQ2004E (Extra paragraph in the System programmer response)

### **Subsystem support messages (CSQ3...)**

CSQ3119E (System programmer response is rewritten)

The word "Version" has been removed from IBM MQ product name across all messages. Many links are updated to point to the latest version of the z/OS documentation.

The following IBM MQ for z/OS CSQ messages are removed for IBM MQ 9.3.0:

### **Recovery log manager messages (CSQJ...)**

CSQJ450E

### **Distributed queuing messages (CSQX...)**

CSQX456I

### **Db2® manager messages (CSQ5...)**

CSQ5037I

### **Related concepts**

[V 9.3.0](#) [V 9.3.0](#) [What's new in IBM MQ 9.3.0](#)

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

[V 9.3.0](#) [V 9.3.0](#) [What's changed in IBM MQ 9.3.0](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.2.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

[V 9.3.0](#) [New, changed, and removed messages since IBM MQ 9.2.5](#)

For Continuous Delivery users, a summary of the new messages that have been added and the existing messages that have been changed or removed since IBM MQ 9.2.5.

[V 9.3.0](#) [V 9.3.0](#) [Deprecated, stabilized, and removed features in IBM MQ 9.3.0](#)

A number of features are deprecated, stabilized or removed from IBM MQ 9.3.0.

[“New, changed, and removed messages since IBM MQ 9.2.5” on page 74](#)

For Continuous Delivery users, a summary of the new messages that have been added and the existing messages that have been changed or removed since IBM MQ 9.2.5.

### **Related reference**

[IBM MQ AMQ messages](#)

[Managed File Transfer diagnostic messages](#)

[Telemetry messages](#)

[REST API messages](#)

[IBM MQ Console messages](#)

[IBM MQ Bridge to blockchain messages](#)

[IBM MQ Bridge to Salesforce messages](#)

[IBM MQ Internet Pass-Thru messages](#)

[MQJMS messages](#)

[JSON format diagnostic messages](#)

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

## V 9.3.0 New, changed, and removed messages since IBM MQ 9.2.5

For Continuous Delivery users, a summary of the new messages that have been added and the existing messages that have been changed or removed since IBM MQ 9.2.5.

V 9.3.0 For a list of all the messages that are new, changed or removed since IBM MQ 9.2.0, see “New, changed, and removed messages in IBM MQ 9.3.0” on page 62.

- Multi “[UNIX, Linux, Windows, IBM i]New, changed, and removed IBM MQ AMQ messages” on page 74
- MQ Adv. MQ Adv. VUE MQ Adv. z/OS “[IBM MQ Advanced][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]New, changed, and removed Managed File Transfer messages” on page 75
- MQ Adv. ALW “[IBM MQ Advanced][AIX, Linux, Windows]New, changed and removed MQ Telemetry messages” on page 76
- “New, changed, and removed REST API messages” on page 76
- “New, changed, and removed IBM MQ Console messages” on page 76
- Deprecated MQ Adv. Linux “[IBM MQ Advanced][Linux]New, changed, and removed IBM MQ Bridge to blockchain messages” on page 76
- Deprecated Linux “[Linux]New, changed, and removed IBM MQ Bridge to Salesforce messages” on page 76
- ALW “[AIX, Linux, Windows]New, changed and removed IBM MQ Internet Pass-Thru messages” on page 76
- “New, changed and removed MQJMS messages” on page 76
- “New, changed and removed JSON messages” on page 76
- z/OS “[z/OS]New, changed, and removed z/OS messages” on page 76

### Multi New, changed, and removed IBM MQ AMQ messages

The following AMQ messages are new since IBM MQ 9.2.5:

#### **AMQ3xxx: Utilities and tools**

AMQ3247W

AMQ3496E

#### **AMQ5xxx: Installable services**

AMQ5066W

AMQ5067W

AMQ5068W

#### **AMQ6xxx: Common services**

AMQ6330E

AMQ6331E

AMQ6340I

AMQ6341E

#### **AMQ7xxx: IBM MQ product**

AMQ7372W

#### **AMQ8xxx: Administration**

AMQ8A26S (IBM i)

The following AMQ messages are changed since IBM MQ 9.2.5:

### **AMQ3xxx: Utilities and tools**

AMQ3055I (Usage updated)

AMQ3242E (Explanation updated. Response extended.)

AMQ3635E (Severity changed from Informational to Error)

AMQ3699I ("DR" removed from Message)

AMQ3700I ("DR" removed from Message)

### **AMQ5xxx: Installable services**

AMQ5697I (Usage extended to specify JMS version)

AMQ5698I (Usage extended to specify JMS version)

### **AMQ6xxx: Common services**

AMQ6183W (Message extended)

AMQ6184W (Message extended)

AMQ6333E (Explanation and Response extended)

### **AMQ7xxx: IBM MQ product**

AMQ7301I (Message rewritten)

### **AMQ8xxx: Administration**

AMQ8119S IBM i (Message, Explanation and Response rewritten)

AMQ8351E (Response extended to cover JMS 3.0)

AMQ8455E (Explanation and Response rewritten)

AMQ8914E (Explanation extended)

AMQ8916E (Explanation extended)

### **AMQ9xxx: Remote**

AMQ9108E (Explanation and Response extended)

AMQ9654E (Explanation extended)

AMQ9660E (Message, Explanation and Response rewritten)

The following AMQ messages are removed since IBM MQ 9.2.5:

### **AMQ8xxx: Administration**

AMQ8771I DEC to AMQ8796E DEC (26 messages)

## **MQ Adv. MQ Adv. VUE MQ Adv.z/OS **New, changed, and removed Managed File Transfer messages****

The following Managed File Transfer messages are new since IBM MQ 9.2.5:

### **BFGAG0001 - BFGAG9999: MFT agents messages**

BFGAG0212I

### **BFGCL0001 - BFGCL9999: MFT commands messages**

BFGCL0828E

BFGCL0829E

The following Managed File Transfer messages are changed since IBM MQ 9.2.5:

### **BFGUE0001 - BFGUE9999: MFT user exits messages**

BFGUE0029E (Explanation and Response clarified)

Additionally, many of the MFT messages have small corrections for typos and style.

The following Managed File Transfer messages are removed since IBM MQ 9.2.5:

### **BFGPR0001 - BFGPR9999: MFT miscellaneous messages**

BFGPR0153I

MQ Adv.

ALW

## New, changed and removed MQ Telemetry messages

There are no new, changed or removed [MQ Telemetry messages](#) since IBM MQ 9.2.5.

## New, changed, and removed REST API messages

The following REST API messages are new since IBM MQ 9.2.5:

### **MQWB04xx: REST API messages MQWB0400 to 0499**

MQWB0446E

MQWB0447E

MQWB0448E

There are no changed or removed REST API messages since IBM MQ 9.2.5.

## New, changed, and removed IBM MQ Console messages

There are no new, changed or removed [IBM MQ Console messages](#) since IBM MQ 9.2.5.

MQ Adv.

Linux

## New, changed, and removed IBM MQ Bridge to blockchain messages

Deprecated

There are no new, changed or removed [IBM MQ Bridge to blockchain messages](#) since IBM MQ 9.2.5.

Linux

## New, changed, and removed IBM MQ Bridge to Salesforce messages

Deprecated

There are no new, changed or removed [IBM MQ Bridge to Salesforce messages](#) since IBM MQ 9.2.5.

ALW

## New, changed and removed IBM MQ Internet Pass-Thru messages

The following IBM MQ Internet Pass-Thru messages are new since IBM MQ 9.2.5:

### **MQCPxxxx: MQIPT messages**

MQCPE119

There are no changed or removed IBM MQ Internet Pass-Thru messages since IBM MQ 9.2.5.

## New, changed and removed MQJMS messages

Jakarta Messaging 3.0 exception messages are added to the Javadoc information since IBM MQ 9.2.5.

## New, changed and removed JSON messages

There are no new, changed or removed [JSON format diagnostic messages](#) for IBM MQ 9.2.5.

z/OS

## New, changed, and removed z/OS messages

The following IBM MQ for z/OS CSQ messages are new since IBM MQ 9.2.5:

### **Data manager messages (CSQI...)**

CSQI051E

### **Distributed queuing messages (CSQX...)**

CSQX166E

### **IBM MQ-IMS bridge Messages (CSQ2...)**

CSQ2007I

The following IBM MQ for z/OS CSQ messages are changed since IBM MQ 9.2.5:

**Distributed queuing messages (CSQX...)**

CSQX059E (System action extended)

CSQX456E (hyphens removed from some variable names, and all sections revised)

CSQX617I (typo fixed in Explanation. System programmer response extended)

CSQX629E (Explanation extended)

CSQX670I (System programmer response updated)

The following IBM MQ for z/OS CSQ messages are removed since IBM MQ 9.2.5:

**Recovery log manager messages (CSQJ...)**

CSQJ450E

**Distributed queuing messages (CSQX...)**

CSQX456I

**Db2 manager messages (CSQ5...)**

CSQ5037I

**Related concepts**

[V 9.3.0](#) [V 9.3.0](#) [What's new in IBM MQ 9.3.0](#)

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

[V 9.3.0](#) [V 9.3.0](#) [What's changed in IBM MQ 9.3.0](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.2.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

[V 9.3.0](#) [New, changed, and removed messages in IBM MQ 9.3.0](#)

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.2.0.

[V 9.3.0](#) [V 9.3.0](#) [Deprecated, stabilized, and removed features in IBM MQ 9.3.0](#)

A number of features are deprecated, stabilized or removed from IBM MQ 9.3.0.

[“New, changed, and removed messages in IBM MQ 9.3.0” on page 62](#)

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.2.0.

**Related reference**

[IBM MQ AMQ messages](#)

[Managed File Transfer diagnostic messages](#)

[Telemetry messages](#)

[REST API messages](#)

[IBM MQ Console messages](#)

[IBM MQ Bridge to blockchain messages](#)

[IBM MQ Bridge to Salesforce messages](#)

[IBM MQ Internet Pass-Thru messages](#)

[MQJMS messages](#)

[JSON format diagnostic messages](#)

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

## 9.3.0

A number of features are deprecated, stabilized or removed from IBM MQ 9.3.0.

- “Deprecated features” on page 78
- “Stabilized features” on page 79
- “Removed features” on page 80

### Deprecated features

Deprecated

Table 5. Deprecations at IBM MQ 9.3.0	
Feature	Description
<p>V 9.3.0 V 9.3.0 Deprecation: Ciphers used by AMS</p>	<p>The following signing and encryption algorithms from the Advanced Message Security (AMS) component are deprecated from IBM MQ 9.3.0: MD5, SHA1, RC2, DES and 3DES. IBM intends to remove support for these algorithms in a future IBM MQ release.</p> <p>Customers using these algorithms should migrate to stronger algorithms such as: SHA256, SHA384, SHA512, AES128 or AES256.</p>
<p>V 9.3.0 V 9.3.0 Deprecation: 32-bit IBM MQ application libraries</p>	<p>The 32-bit IBM MQ application libraries have been deprecated from IBM MQ 9.3.0 for all platforms, both for network and local binding connections. 32-bit applications will be supported for the duration of the IBM MQ 9.3.0 LTS lifecycle, but might be removed in a future CD or LTS release. 32-bit applications should be recompiled as 64-bit to ensure that IBM MQ applications can be migrated to future IBM MQ application libraries.</p>
<p>V 9.3.3 V 9.3.0 Deprecation: Operations Dashboard (IBM MQ in Containers)</p>	<p>From IBM MQ Operator 2.0.0 the Operations Dashboard is deprecated, and receives no further updates. No new uses of the Operations Dashboard should be created.</p>
<p>Deprecation: Secure Sockets Layer v3 (SSLv3) and TLS 1.0 <a href="#">“1” on page 79</a></p>	<p>For Long Term Support, Secure Sockets Layer v3 (SSLv3) and TLS 1.0 have been deprecated from IBM MQ 9.2.0. This means that IBM MQ 9.2.0 was the release last to provide SSLv3 and TLS 1.0 support for Long Term Support. The plan is to remove support in a future Continuous Delivery release after that.</p>
<p>Deprecation: Support for <b>-credentialsFile</b> parameter <a href="#">“1” on page 79</a></p>	<p>The <b>-credentialsFile</b> parameter of the <b>fteObfuscate</b> command, used in IBM MQ prior to IBM MQ 9.2, has been deprecated from IBM MQ 9.2.0. You can use the <b>-f</b> parameter instead. For more information, see <b>fteObfuscate: encrypt sensitive data</b>.</p>

Table 5. Deprecations at IBM MQ 9.3.0 (continued)

Feature	Description
Deprecation: Support for all Managed File Transfer environment variables beginning with <b>FTE</b> <sup>“1”</sup> on <a href="#">page 79</a>	Support for all Managed File Transfer environment variables that begin with <b>FTE</b> has been deprecated from IBM MQ 9.2.0. You can substitute <b>FTE</b> environment variables with those that begin with <b>BFG</b> as shown in the following examples: <ul style="list-style-type: none"> <li>• For <b>FTE_ANT_HOME</b>, substitute <b>BFG_ANT_HOME</b></li> <li>• For <b>FTE_CLASSPATH</b>, substitute <b>BFG_CLASSPATH</b></li> <li>• <b>FTE_JVM_PROPERTIES</b>, substitute <b>BFG_JVM_PROPERTIES</b></li> <li>• For <b>FTE_JAVA_HOME</b>, substitute <b>BFG_JAVA_HOME</b></li> </ul>
Deprecation: IBM MQ Bridge to blockchain	The IBM MQ Bridge to blockchain component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see <a href="#">US Announcement letter 222-341</a> ) and IBM intends to remove the capability from Long Term Support releases in upcoming fix packs. Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration. If you have applications that will be impacted by this change, please contact IBM Support.

**Note:**

1. These deprecations are carried forward to IBM MQ 9.3 from IBM MQ 9.2.

**Stabilized features**



Table 6. Stabilizations at IBM MQ 9.3.0

Feature	Description
Stabilization: amqmdnet.dll library <sup>“1”</sup> on <a href="#">page 80</a>	From IBM MQ 9.2.0, the amqmdnet .dll library for .NET Framework is still supplied, but this library is stabilized; that is, no new features will be introduced into it. <p>For any of the latest features you must migrate to the amqmdnetstd .dll library. However, you can continue to use the amqmdnet .dll library on IBM MQ 9.1 or later Long Term Support or Continuous Delivery releases.</p> <p>For more information, see <a href="#">Installing IBM MQ classes for .NET</a>.</p>



Table 6. Stabilizations at IBM MQ 9.3.0 (continued)

Feature	Description
Stabilization: IBM.XMS.* libraries <a href="#">“1” on page 80</a>	<p>From IBM MQ 9.2.0, all the IBM.XMS.* libraries are still supplied, but these libraries are stabilized; that is, no new features will be introduced into them.</p> <p>For any of the latest features, you must migrate to the amqmxsstd.dll library. However, you can continue to use the existing libraries on IBM MQ 9.1 Long Term Support or Continuous Delivery releases.</p> <p>For more information, see <a href="#">Using IBM MQ classes for XMS .NET Standard</a>.</p>

**Note:**

1. These stabilizations are carried forward to IBM MQ 9.3 from IBM MQ 9.2.

**Removed features**

Removed

Table 7. Removals at IBM MQ 9.3.0

Feature	Description
<b>IBM MQ 9.3.0 initial release</b>	
<p><a href="#">V 9.3.0</a> <a href="#">V 9.3.0</a> Removal: Dashboard Web Console</p>	<p>The widget-based Dashboard Web Console is removed from IBM MQ 9.3.0. For information about using the Dashboard Web Console, see <a href="#">The Dashboard Web Console</a> in the IBM MQ 9.1 documentation.</p>
<p><a href="#">V 9.3.0</a> <a href="#">V 9.3.0</a> Removal: XMS .NET Multicast messaging</p>	<p>XMS .NET Multicast messaging (using RMM) is removed from IBM MQ 9.3.0.</p>
<p><a href="#">V 9.3.0</a> Removal: <b>fteMigrateAgent</b>, <b>fteMigrateConfigurationOptions</b>, and <b>fteMigrateLogger</b> commands</p>	<p>For Long Term Support, the <b>fteMigrateAgent</b>, <b>fteMigrateConfigurationOptions</b>, and <b>fteMigrateLogger</b> commands are removed at IBM MQ 9.3.0.</p> <p><a href="#">CD</a> For Continuous Delivery, these commands were removed at IBM MQ 9.2.1.</p>

**Related concepts**

[V 9.3.0](#) [V 9.3.0](#) [What's new in IBM MQ 9.3.0](#)

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

[V 9.3.0](#) [V 9.3.0](#) [What's changed in IBM MQ 9.3.0](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.2.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

[V 9.3.0](#) [New, changed, and removed messages in IBM MQ 9.3.0](#)

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.2.0.

### V 9.3.0

[New, changed, and removed messages since IBM MQ 9.2.5](#)

For Continuous Delivery users, a summary of the new messages that have been added and the existing messages that have been changed or removed since IBM MQ 9.2.5.

[Deprecated Cipherspecs](#)

## CD

## What's new and changed in IBM MQ 9.3.x Continuous Delivery

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

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

From 1Q 2023, changes to the IBM MQ maintenance delivery model include the introduction of cumulative security updates (CSUs), which contain security patches released since the previous maintenance. CSUs are produced for the latest CD release and use the VRMF version identifier format, where the VRM digits correspond to the CD release number and the F-digit shows the fix number for the CSU. CSUs use F-digit values that are not divisible by 5. For more information, see [Changes to IBM MQ's maintenance delivery model](#).

### Related concepts

[“What's new in IBM MQ 9.3.0” on page 28](#)

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icon are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)

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

## What's changed in IBM MQ 9.3.x CD CSUs

Cumulative security updates (CSUs) typically contain small numbers of security updates, but IBM might on occasion ship additional APARs in these deliveries if a technical need should arise, for example if intrinsically linked to a security update.

### IBM MQ 9.3.5 CSU 1

#### V 9.3.5.1

#### Removal of support for RSA key exchange when operating in FIPS mode

From IBM MQ 9.3.5 CSU 1, 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](#).

## V 9.3.5 What's new and changed in IBM MQ 9.3.5

IBM MQ 9.3.5, 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 9.3.5 What's new in IBM MQ 9.3.5

IBM MQ 9.3.5 delivers 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 for IBM MQ for Multiplatforms - base and Advanced entitlement

#### Multi

On Multiplatforms, the following features and enhancements are available with both base product entitlement, and with Advanced entitlement.

## Administration

- ▶ **AIX** [“Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0 \(XLC 17\)” on page 84](#)
- [“Enhancements to the IBM MQ Console” on page 84](#)
- [“Stand-alone IBM MQ Web Server” on page 84](#)
- [“OpenTelemetry tracing” on page 84](#)

## Application development

- [“Additional JSON Web Token \(JWT\) support” on page 85](#)

## New for IBM MQ for z/OS - base, Advanced, and Advanced VUE entitlement



The following features and enhancements are available both with base product entitlement, and with IBM MQ Advanced for z/OS (Advanced) and IBM MQ Advanced for z/OS Value Unit Edition (Advanced VUE) entitlement.

### Administration

- [“Enhancements to the IBM MQ Console” on page 85](#)
- [“Stand-alone IBM MQ Web Server” on page 85](#)

### Related concepts

#### ▶ **V 9.3.5** [What's changed in IBM MQ 9.3.5](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.4 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

#### ▶ **V 9.3.5** [New, changed, and removed messages in IBM MQ 9.3.5](#)

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.5.

#### ▶ **V 9.3.5** [Deprecated, stabilized, and removed features in IBM MQ 9.3.5](#)

There is a deprecation from IBM MQ 9.3.5.

#### [“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

#### [“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

#### [“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icon are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)

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

**Advanced entitlement**

For Multiplatforms, IBM MQ 9.3.5 delivers new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

**Administration**

- **AIX** [“Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0 \(XLC 17\)” on page 84](#)
- [“Enhancements to the IBM MQ Console” on page 84](#)
- [“Stand-alone IBM MQ Web Server” on page 84](#)
- [“OpenTelemetry tracing” on page 84](#)

**Application development**

- [“Additional JSON Web Token \(JWT\) support” on page 85](#)

**Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0 (XLC 17)****AIX**

From IBM MQ 9.3.5, you can compile AIX programs using the XLC 17 compiler alongside the existing XLC 16 compiler.

For more information, see [External library and control command links to primary installation on AIX and Linux](#) for details of the additional library names, and [Building C++ programs on AIX](#) and [Preparing C programs in AIX](#) for examples of the additional commands.

**Enhancements to the IBM MQ Console**

- There are two new overview tabs in the IBM MQ Console. The Applications Overview tab displays a number of tiles giving a quick view of applications connected to the queue manager being viewed. The MQ Network Overview tab displays a number of tiles giving a quick view of the queue manager to queue manager communication for the queue manager being viewed. See [Quick tour of the IBM MQ console - CD only](#).
- The timestamps associated with queue managers are now displayed in the timezone where the queue manager is running, rather than the timezone of the IBM MQ Console.

**Stand-alone IBM MQ Web Server**

From IBM MQ 9.3.5, you can run the IBM MQ Console and messaging REST API in a stand-alone IBM MQ Web Server installation. The stand-alone IBM MQ Web Server is supported only on Linux, and can run on systems that are separate to your IBM MQ installations.

Installing a stand-alone IBM MQ Web Server gives greater flexibility as to which systems, and the number of systems, that you choose to run the IBM MQ Console and messaging REST API on. Several instances of the stand-alone IBM MQ Web Server can be installed on different machines to provide the scalability and availability that you need.

For more information about the installation options for the IBM MQ component that runs the IBM MQ Console and REST API, see [The IBM MQ Console and REST API](#).



**OpenTelemetry tracing**

From IBM MQ 9.3.5, IBM MQ provides a tracing service that allows you to integrate with an OpenTelemetry tracing system. For more information, see [OpenTelemetry integration](#).

## Additional JSON Web Token (JWT) support

From IBM MQ 9.3.5, applications can use the JMS client API to directly provide JWT credentials. For more information, see [Using authentication tokens in an application](#).

### Related concepts

  [What's new in IBM MQ 9.3.5 for z/OS - base and Advanced VUE entitlement](#)  
On z/OS, IBM MQ 9.3.5 delivers new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[“IBM MQ license information” on page 9](#)

[What you can purchase with IBM MQ and what each purchase entitles you to install.](#)

  **[What's new in IBM MQ 9.3.5 for z/OS - base and Advanced VUE entitlement](#)**

On z/OS, IBM MQ 9.3.5 delivers new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

### Administration

- [“Enhancements to the IBM MQ Console” on page 85](#)
- [“Stand-alone IBM MQ Web Server” on page 85](#)

## Enhancements to the IBM MQ Console

- From IBM MQ 9.3.5, you can use the IBM MQ Console to add, view, delete and update storage classes on z/OS queue managers. For more information, see [IBM MQ Console: Working with storage classes](#).
- There are two new overview tabs in the IBM MQ Console. The Applications Overview tab displays a number of tiles giving a quick view of applications connected to the queue manager being viewed. The MQ Network Overview tab displays a number of tiles giving a quick view of the queue manager to queue manager communication for the queue manager being viewed. For more information, see [Quick tour of the IBM MQ console - CD only](#).
- The timestamps associated with queue managers are now displayed in the timezone where the queue manager is running, rather than the timezone of the IBM MQ Console.



## Stand-alone IBM MQ Web Server

From IBM MQ 9.3.5, you can run the IBM MQ Console and messaging REST API in a stand-alone IBM MQ Web Server installation. The stand-alone IBM MQ Web Server is supported only on Linux, and can run on systems that are separate to your IBM MQ installations.

Installing a stand-alone IBM MQ Web Server gives greater flexibility as to which systems, and the number of systems, that you choose to run the IBM MQ Console and messaging REST API on. Several instances of the stand-alone IBM MQ Web Server can be installed on different machines to provide the scalability and availability that you need.

For more information about the installation options for the IBM MQ component that runs the IBM MQ Console and REST API, see [The IBM MQ Console and REST API](#).

### Related concepts

  [What's new in IBM MQ 9.3.5 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.5 delivers new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.



[“IBM MQ license information” on page 9](#)

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






## What's changed in IBM MQ 9.3.5

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.4 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

### Client application changes

- [“Changes to Bouncy Castle JAR file names” on page 86](#)
-   [“Error message improvements for security exit failures when a .NET client is connecting to IBM MQ” on page 86](#)

### Administration

-    [“runmqdlq tool default permissions change” on page 86](#)
-  [“Changes to zHyperWrite” on page 86](#)
-  [“Update to zos\\_saf\\_registry.xml” on page 87](#)

## Changes to Bouncy Castle JAR file names

From IBM MQ 9.3.5, the names of the Bouncy Castle JAR files bundled with the product have changed. For example, `bcprov-jdk15to18.jar` has changed to `bcprov-jdk18on.jar`. For more information, see [IBM MQ classes for JMS/Jakarta Messaging relocatable JAR files](#) and [IBM MQ classes for Java relocatable JAR files](#).

## Error message improvements for security exit failures when a .NET client is connecting to IBM MQ

A security exit program is used to verify that the partner at the other end of a channel is genuine. This is also known as authentication. To specify that a channel must use a security exit, you can specify the exit name in the `SCYEXIT` field of the channel definition.

From IBM MQ 9.3.5, a new and improved diagnostic message is thrown by the managed IBM MQ classes for .NET or IBM MQ classes for XMS .NET client application if the security exit used by the application results in an unsuccessful connection to the IBM MQ server. The old error message 2195 MQRC\_UNEXPECTED\_ERROR is replaced by the new error message 2406 MQRC\_CLIENT\_EXIT\_LOAD\_ERROR.

For more information about security exits, see [Channel security exit programs](#).

## runmqdlq tool default permissions change

From IBM MQ 9.3.5, the default permissions of `runmqdlq` have been changed to remove the setuid bit. When running `runmqdlq`, the tool now runs under the context of the user that invokes the command. This change brings `runmqdlq` in line with other tools that support client connection functionality.

For more information about `runmqdlq`, see [runmqdlq \(run dead-letter queue handler\)](#).

## Changes to zHyperWrite



From IBM MQ 9.3.5, the zHyperWrite behavior has changed, so that when ZHYWRITE(YES) is set, active log writes attempt to use zHyperWrite regardless of whether the log data sets are enabled for



zHyperWrite. Previously active log writes would attempt to use zHyperWrite only if the log data sets were enabled for zHyperWrite.

For more information, see [Using zHyperWrite with IBM MQ active logs](#).

## Update to zos\_saf\_registry.xml



From IBM MQ 9.3.5, 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 IBM 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 9.3.0 Fix Pack 2 for Long Term Support and from IBM MQ 9.3.1 CSU 1 and IBM MQ 9.3.2 for Continuous Delivery.

For more information, see [Configuring a SAF registry for the IBM MQ Console and REST API](#).

### Related concepts

[What's new in IBM MQ 9.3.5](#)

IBM MQ 9.3.5 delivers new and enhanced features on AIX, Linux, Windows, and z/OS.

[New, changed, and removed messages in IBM MQ 9.3.5](#)

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.5.

[Deprecated, stabilized, and removed features in IBM MQ 9.3.5](#)

There is a deprecation from IBM MQ 9.3.5.

[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, changed, and removed messages in IBM MQ 9.3.5

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.5.

- [“New, changed, and removed IBM MQ AMQ messages” on page 88](#)
- [“New, changed, and removed IBM MQ Bridge to blockchain messages” on page 88](#)
- [“New, changed, and removed IBM MQ Bridge to Salesforce messages” on page 88](#)
- [“New, changed, and removed IBM MQ Console messages” on page 88](#)
- [“New, changed and removed IBM MQ Internet Pass-Thru messages” on page 88](#)
- [“New, changed and removed JSON messages” on page 89](#)
- [“New, changed, and removed Managed File Transfer messages” on page 89](#)
- [“New, changed and removed MQJMS messages” on page 89](#)
- [“New, changed, and removed REST API messages” on page 89](#)
- [“New, changed and removed MQ Telemetry messages” on page 89](#)
- [“New, changed, and removed z/OS messages” on page 90](#)

## New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new for IBM MQ 9.3.5:

### **AMQ4xxx: User interface messages (Windows and Linux systems)**

AMQ4641W

AMQ4642W

### **AMQ6xxx: Common Services**

AMQ6345E

AMQ6346E

AMQ6863I

AMQ6864I

AMQ6865I

AMQ6866E

### **AMQ7xxx: IBM MQ product**

AMQ7730E

### **AMQ9xxx: Remote**

AMQ9855E

AMQ9917W

The following AMQ messages are changed for IBM MQ 9.3.5:

### **AMQ3xxx: Utilities and tools**

AMQ3031S ("MQ L3 Support" changed to "IBM Support" in Response)

AMQ3043E ("MQ L3 Support" changed to "IBM Support" in Response)

### **AMQ5xxx: Installable services**

AMQ5657W UNIX and Linux (Explanation extended)

AMQ5779I (-check\_only switch added to Usage)

### **AMQ8xxx: Administration**

AMQ8960E ("MQCONN" replaced with a variable in Response)

### **AMQ9xxx: Remote**

AMQ9504E ("or client" added in Explanation)

There are no removed AMQ messages for IBM MQ 9.3.5.

## New, changed, and removed IBM MQ Bridge to blockchain messages

Removed

MQ Adv.

Linux

**Note:** For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2.

## New, changed, and removed IBM MQ Bridge to Salesforce messages

Deprecated

Linux

There are no new, changed, or removed IBM MQ Bridge to Salesforce messages for IBM MQ 9.3.5.

## New, changed, and removed IBM MQ Console messages

There are no new, changed, or removed IBM MQ Console messages for IBM MQ 9.3.5.

## New, changed and removed IBM MQ Internet Pass-Thru messages

Windows

Linux

AIX

"Java Security Manager" becomes "Java security manager" in all IBM MQ Internet Pass-Thru messages for IBM MQ 9.3.5:

There are no new or removed IBM MQ Internet Pass-Thru messages for IBM MQ 9.3.5.

## **New, changed and removed JSON messages**

There are no new, changed, or removed JSON format diagnostic messages for IBM MQ 9.3.5.

## **New, changed, and removed Managed File Transfer messages**

The following Managed File Transfer messages are new for IBM MQ 9.3.5:

### **BFGIO0001 - BFGIO999: MFT filesystem I/O messages**

BFGIO0418E

BFGIO0419E

BFGIO0420E

### **BFGPR0001 - BFGPR9999: MFT miscellaneous messages**

BFGPR0156E

### **BFGUB0001 - BFGUB9999: MFT configuration and properties messages**

BFGUB0089W

The following Managed File Transfer messages are changed for IBM MQ 9.3.5:

### **BFGBR0001 - BFGBR9999: MFT protocol bridge messages**

BFGBR0046E (In Message, quotation marks added around the variable and a period added at the end)

### **BFGPR0001 - BFGPR9999: MFT miscellaneous messages**

BFGPR0051E (In Message, quotation marks added around the variable)

There are no removed Managed File Transfer messages for IBM MQ 9.3.5.

## **New, changed and removed MQJMS messages**

There are no new, changed, or removed MQJMS messages for IBM MQ 9.3.5.

## **New, changed, and removed REST API messages**

The following REST API messages are new for IBM MQ 9.3.3:

### **MQWB00xx: REST API messages MQWB0000 to 0099**

MQWB0088E

There are no changed or removed REST API messages for IBM MQ 9.3.5.

## **New, changed and removed MQ Telemetry messages**



The following AMQXR MQ Telemetry messages are new for IBM MQ 9.3.5:

### **Telemetry (AMQXR) messages**

AMQXR2121W

AMQXR2122E

AMQXR2123E

The following AMQXR MQ Telemetry messages are changed for IBM MQ 9.3.5:

### **Telemetry (AMQXR) messages**

AMQXR0004E ("An IBM MQ verb" becomes "The IBM MQ verb" in Explanation)

AMQXR0008E ("and/or" becomes "or" in Response)

AMQXR0009E ("and/or" becomes "or" in Response)

AMQXR10006E (message ID corrected to "AMQXR10006E")  
AMQXR2014E ("and/or" becomes "or" in Response)  
AMQXR2015E ("and/or" becomes "or" in Response)  
AMQXR2071W ("None." removed from Response)  
AMQXR2091E (Missing period added at end of Explanation)  
AMQXR2094E (Missing period added at end of Explanation)  
AMQXR2120I ("No action is required." becomes "None." in Response)

There are no removed AMQXR MQ Telemetry messages for IBM MQ 9.3.5.

There are also no new, changed, or removed AMQAM, AMQCO or AMQHT MQ Telemetry messages for IBM MQ 9.3.5.

## New, changed, and removed z/OS messages



The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.3.5:

### **Recovery log manager messages (CSQJ...)**

CSQJ169E

### **Utilities messages (CSQU...)**

CSQU180E

CSQU181E

CSQU559I

### **Distributed queuing messages (CSQX...)**

CSQX705E

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.3.5:

### **Recovery log manager messages (CSQJ...)**

CSQJ166E (System programmer response extended)

CSQJ167E (Explanation and System action extended)

CSQJ370I (Explanation extended)

### **Utilities messages (CSQU...)**

CSQU525E (System programmer response extended)

CSQU568E (System programmer response extended)

### **Distributed queuing messages (CSQX...)**

CSQX004I (Explanation extended)

CSQX031E (minor change in System programmer response)

CSQX477E (Explanation rewritten. System programmer response extended)

CSQX878I (System programmer response extended)

### **Generalized command preprocessor messages (CSQ9...)**

CSQ9014E ("parameter(s)" becomes "parameters" in Message)

In many messages, the version of z/OS is updated in the hyperlinks.

There are no removed IBM MQ for z/OS CSQ messages for IBM MQ 9.3.5.

## Related concepts

[What's new in IBM MQ 9.3.5](#)

IBM MQ 9.3.5 delivers new and enhanced features on AIX, Linux, Windows, and z/OS.

[What's changed in IBM MQ 9.3.5](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.4 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.5** [Deprecated, stabilized, and removed features in IBM MQ 9.3.5](#)

There is a deprecation from IBM MQ 9.3.5.

**Related reference**

- [IBM MQ AMQ messages](#)
- [IBM MQ Bridge to blockchain messages](#)
- [JSON format diagnostic messages](#)
- [IBM MQ Bridge to Salesforce messages](#)
- [IBM MQ Console messages](#)
- [IBM MQ Internet Pass-Thru messages](#)
- [Managed File Transfer diagnostic messages](#)
- [MQJMS messages](#)
- [REST API messages](#)
- [Telemetry messages](#)
- [Messages for IBM MQ for z/OS](#)

**V 9.3.5** **Deprecated, stabilized, and removed features in IBM MQ 9.3.5**

There is a deprecation from IBM MQ 9.3.5.

**Deprecated features**



*Table 8. Deprecations at IBM MQ 9.3.5*

Feature	Description
<p><b>AIX</b> Deprecation: XL C/C++ for AIX 16 compiler support on AIX</p>	<p>Support for the XL C/C++ for AIX 16 compiler on AIX is deprecated from IBM MQ 9.3.5.</p> <p>From IBM MQ 9.3.5, you can compile AIX programs using the XLC 17 compiler alongside the XLC 16 compiler. For more information, see <a href="#">External library and control command links to primary installation on AIX and Linux</a> for details of the additional library names, and <a href="#">Building C++ programs on AIX</a> and <a href="#">Preparing C programs in AIX</a> for examples of the additional commands.</p>

**Related concepts**

**V 9.3.5** [What's new in IBM MQ 9.3.5](#)

IBM MQ 9.3.5 delivers new and enhanced features on AIX, Linux, Windows, and z/OS.

**V 9.3.5** [What's changed in IBM MQ 9.3.5](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.4 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.5** [New, changed, and removed messages in IBM MQ 9.3.5](#)

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.5.

## **What's new and changed in IBM MQ 9.3.4**

IBM MQ 9.3.4, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

**Important:** For IBM MQ in containers, the IBM MQ 9.3.4 release is planned for December 2023. This is to align with the next major version of the IBM Cloud Pak for Integration. Until that time, IBM MQ 9.3.4 new features will not run using the IBM MQ Operator on the OpenShift Container Platform.

### **Related information**

[System Requirements for IBM MQ](#)

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

## **What's new in IBM MQ 9.3.4**

IBM MQ 9.3.4 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 for IBM MQ for Multiplatforms - base and Advanced entitlement**


 Multi

On Multiplatforms, the following features and enhancements are available with both base product entitlement, and with Advanced entitlement.

### **Administration**

- [“New Overview tab for queue managers in IBM MQ Console” on page 94](#)
- [“Media image scheduling - linear logging” on page 94](#)
- [“Environment variables for tuning I/O operations that take too long” on page 94](#)

### **Security**

- [“JSON Web Tokens - authentication and authorization” on page 94](#)
-  Linux [“Read-only root filesystem for the IBM MQ container” on page 95](#)

### **Scalability**

- [“Application re-balancing support for IBM MQ classes for JMS” on page 95](#)

## **New IBM MQ for Multiplatforms features - Advanced entitlement only**

 Multi

 MQ Adv.

The following features and enhancements are available on Multiplatforms only with Advanced entitlement.

### **Administration**

- [“Media image scheduling - replicated logging” on page 95](#)
- [“Updated IBM MQ Kafka Connectors with exactly-once support” on page 96](#)
- [“Option to run fteRAS for specific MFT agents” on page 96](#)

## **New for IBM MQ for z/OS - base, Advanced, and Advanced VUE entitlement**

 z/OS

The following features and enhancements are available both with base product entitlement, and with IBM MQ Advanced for z/OS (Advanced) and IBM MQ Advanced for z/OS Value Unit Edition (Advanced VUE) entitlement.

### Administration

- [“New Overview tab for queue managers in IBM MQ Console” on page 97](#)

### Application development

- [“Simplified Java application topologies” on page 97](#)

## New for IBM MQ for z/OS - Advanced and Advanced VUE entitlement only

z/OS MQ,Adv,VUE MQ,Adv,z/OS

The following features and enhancements are available with Advanced or Advanced VUE entitlement only.

### Administration

- [“Additional capabilities for users with IBM MQ Advanced for z/OS entitlement” on page 97](#)
- [“Updated IBM MQ Kafka Connectors with exactly-once support” on page 98](#)
- [“Option to run fteRAS for specific MFT agents” on page 98](#)

### Related concepts

**V 9.3.4** [What's changed in IBM MQ 9.3.4](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.3 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.4** [New, changed, and removed messages in IBM MQ 9.3.4](#)

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.4.

**V 9.3.4** [Deprecated, stabilized, and removed features in IBM MQ 9.3.4](#)

There are some deprecations for Continuous Delivery at IBM MQ 9.3.4.

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icon are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)

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





**Advanced entitlement**

For Multiplatforms, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

**Administration**

- [“New Overview tab for queue managers in IBM MQ Console” on page 94](#)
- [“Media image scheduling - linear logging” on page 94](#)
- [“Environment variables for tuning I/O operations that take too long” on page 94](#)

**Security**

-  [“JSON Web Tokens - authentication and authorization” on page 94](#)
-  [“Read-only root filesystem for the IBM MQ container” on page 95](#)

**Scalability**

- [“Application re-balancing support for IBM MQ classes for JMS” on page 95](#)

**New Overview tab for queue managers in IBM MQ Console**

The Overview tab of the queue manager page displays various information about a queue manager and the resources it is consuming, see [Quick tour of the IBM MQ Console](#). This tab makes it easier to see at a glance what the overall state of the queue manager is, and any problems that might need to be investigated. Some of the information is derived from monitoring system topics. This monitoring can be disabled, if required, see [setmqweb properties](#).

**Media image scheduling - linear logging**

Changes have been made to the way in which the scheduling of media images is calculated. Where automatic media imaging is enabled, the frequency with which media images are taken is controlled by the **IMGLOGLN** and **IMGINTVL** queue manager parameters. Now, even when **IMGINTVL** specifies that it is time for an image to be taken, if no significant amount of work has been performed since the last image was taken, then no new image is taken. This prevents the unnecessary use of computing time on writing to logs when little or no information has changed.

See [Managing log files](#) and [ALTER QMGR \(alter queue manager settings\)](#).

**Environment variables for tuning I/O operations that take too long**

Three new environment variables are added to increase or decrease the threshold at which a warning message is written to the queue manager log if a slow read/write time is detected. Fine tuning with these environment variables can help with diagnosing operating system or storage system issues and reduce the number of errors written to the log. For more information, see [AMQ\\_IODELAY](#), [AMQ\\_IODELAY\\_INMS](#) and [AMQ\\_IODELAY\\_FFST](#).

**JSON Web Tokens - authentication and authorization** Linux AIX

A new method for authentication and authorization with tokens is added, improving security and centralizing identity management. Queue managers that run on AIX or Linux are configured to accept tokens, IBM MQ MQI clients present tokens on connection and can be authenticated.

If the token contains a user claim, applications can also be authorized for access to IBM MQ objects. For more information, see [Working with authentication tokens](#), [Configuring a queue manager to accept authentication tokens](#) and [Using authentication tokens in an application](#).

Both IBM MQ MQI clients and Java clients can remain unchanged and use security exits to send authentication tokens to the queue manager.

## Read-only root filesystem for the IBM MQ container

Linux

From IBM MQ Operator 3.0.0 and IBM MQ container 9.3.4.0, you can enable the IBM MQ container to run with a read-only root file system. This prevents attackers from copying and running malicious code in the container. For more information, see [Running the IBM MQ container with a read-only root file system](#).

**Important:** For IBM MQ in containers, the IBM MQ 9.3.4 release is planned for December 2023. This is to align with the next major version of the IBM Cloud Pak for Integration. Until that time, IBM MQ 9.3.4 new features will not run using the IBM MQ Operator on the OpenShift Container Platform.

## Application re-balancing support for IBM MQ classes for JMS

[Application re-balancing support](#) is extended to include support for JMS applications. For more information, see [Influencing application re-balancing in IBM MQ classes for JMS](#).

### Related concepts

Multi

MQ Adv.

V 9.3.4

[What's new in IBM MQ 9.3.4 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.4 delivers enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

z/OS

V 9.3.4

[What's new in IBM MQ 9.3.4 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

V 9.3.4

MQ Adv. VUE

MQ Adv. z/OS

[What's new in IBM MQ 9.3.4 for z/OS - Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.4 delivers enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

Multi

MQ Adv.

V 9.3.4

[What's new in IBM MQ 9.3.4 for Multiplatforms -](#)

### **Advanced entitlement only**

IBM MQ 9.3.4 delivers enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

### Administration

- [“Media image scheduling - replicated logging” on page 95](#)
- [“Updated IBM MQ Kafka Connectors with exactly-once support” on page 96](#)
- [“Option to run fteRAS for specific MFT agents” on page 96](#)

## Media image scheduling - replicated logging

Changes have been made to the way in which the scheduling of media images is calculated. Where automatic media imaging is enabled, the frequency with which media images are taken is controlled by the **IMGLOGLN** and **IMGINTVL** queue manager parameters. Now, even when **IMGINTVL** specifies that it is time for an image to be taken, if no significant amount of work has been performed since the last image was taken, no new image is taken. This prevents the unnecessary use of computing and network time on writing to logs when little or no information has changed.

When Native HA queue managers are created, the value of **IMGLOGLN** is now set to a value calculated to be 25% of the available log space. This lessens the likelihood of the attempt to take a media image occurring when log space has been exhausted.

See [Managing log files](#) and [ALTER QMGR \(alter queue manager settings\)](#).

## Updated IBM MQ Kafka Connectors with exactly-once support

The IBM MQ Kafka Connectors have been upgraded to version 2 which provides exactly-once message delivery. This significant enhancement means that failures in either IBM MQ, the IBM MQ Kafka Connectors or Kafka do not result in duplicate messages in either IBM MQ or Kafka.


For more information, see [Exactly once support](#).

## Option to run fteRAS for specific MFT agents


From IBM MQ 9.3.4, you can collect troubleshooting information (MustGather data) for a specific Managed File Transfer (MFT) agent or agents instead of for all agents on the system. You do this by running the **fteRAS** command with the **-agents** parameter. For more information, see [fteRAS \(collect MFT troubleshooting information\)](#).

The introduction of the **-agents** parameter reduces the amount of time that it takes to gather troubleshooting information if the data that you need to investigate a problem is for a specific agent or agents. Before IBM MQ 9.3.4, **fteRAS** collects the entire data for the Managed File Transfer installation on the system, even if the data needed for investigation is for a specific agent. If there are a large number of Managed File Transfer agents configured on a system, the **fteRAS** command can take a long time to complete and the large zip files that it outputs take additional time to upload.


### Related concepts

 [What's new in IBM MQ 9.3.4 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

 [What's new in IBM MQ 9.3.4 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

 [What's new in IBM MQ 9.3.4 for z/OS - Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.4 delivers enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

“IBM MQ license information” on page 9

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

 [\*\*What's new in IBM MQ 9.3.4 for z/OS - base and Advanced VUE entitlement\*\*](#)

On z/OS, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

### Administration

- [“New Overview tab for queue managers in IBM MQ Console” on page 97](#)

### Application Development

- [“Simplified Java application topologies” on page 97](#)

## New Overview tab for queue managers in IBM MQ Console

The Overview tab of the queue manager dashboard displays various information about a queue manager and the resources it is consuming, see [Quick tour of the IBM MQ Console](#).

## Simplified Java application topologies

IBM MQ classes for JMS/Jakarta Messaging and IBM MQ classes for Java applications running in a batch environment will be allowed to use client connectivity to any z/OS queue manager, regardless of the PID that the queue manager is running under. For more information, see [JMS/Jakarta Messaging client connectivity to batch applications running on z/OS](#) and [Java client connectivity to batch applications running on z/OS](#).

### Related concepts

[Multi](#) [V 9.3.4](#) [What's new in IBM MQ 9.3.4 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

[Multi](#) [MQ Adv.](#) [V 9.3.4](#) [What's new in IBM MQ 9.3.4 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.4 delivers enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

[V 9.3.4](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [What's new in IBM MQ 9.3.4 for z/OS - Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.4 delivers enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

[V 9.3.4](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [\*\*What's new in IBM MQ 9.3.4 for z/OS - Advanced and Advanced VUE entitlement\*\*](#)

On z/OS, IBM MQ 9.3.4 delivers enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

### Administration

- [“Additional capabilities for users with IBM MQ Advanced for z/OS entitlement” on page 97](#)
- [“Updated IBM MQ Kafka Connectors with exactly-once support” on page 98](#)
- [“Option to run fteRAS for specific MFT agents” on page 98](#)

## Additional capabilities for users with IBM MQ Advanced for z/OS entitlement

From IBM MQ 9.3.4, users with IBM MQ Advanced for z/OS entitlement gain access to features that were previously only available with IBM MQ Advanced for z/OS Value Unit Edition. These include:

- The Connector Pack component, which:
  - Provides the IBM MQ Kafka Connector, which allows data to flow between IBM MQ and Kafka topologies. See [Kafka Connect scenarios](#) for more information.
  - Allows [Defining an IBM Aspera faspio Gateway connection on Linux or Windows platforms](#), which can improve the speed of transfer of IBM MQ data in lossy, high latency, networks.
- Simpler Managed File Transfer topologies by allowing [MFT agent connectivity to remote z/OS queue managers](#) using a client connection.
- Support for [Using PKCS #11 cryptographic hardware in MQIPT](#).

## Updated IBM MQ Kafka Connectors with exactly-once support

The IBM MQ Kafka Connectors have been upgraded to version 2 which provides exactly-once message delivery. This significant enhancement means that failures in either IBM MQ, the IBM MQ Kafka Connectors or Kafka do not result in duplicate messages in either IBM MQ or Kafka.


For more information, see [Exactly once support](#).

## Option to run fteRAS for specific MFT agents

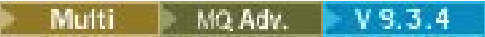
From IBM MQ 9.3.4, you can collect troubleshooting information (MustGather data) for a specific Managed File Transfer (MFT) agent or agents instead of for all agents on the system. You do this by running the **fteRAS** command with the **-agents** parameter. For more information, see [fteRAS \(collect MFT troubleshooting information\)](#).

The introduction of the **-agents** parameter reduces the amount of time that it takes to gather troubleshooting information if the data that you need to investigate a problem is for a specific agent or agents. Before IBM MQ 9.3.4, **fteRAS** collects the entire data for the Managed File Transfer installation on the system, even if the data needed for investigation is for a specific agent. If there are a large number of Managed File Transfer agents configured on a system, the **fteRAS** command can take a long time to complete and the large zip files that it outputs take additional time to upload.


### Related concepts

 [What's new in IBM MQ 9.3.4 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

 [What's new in IBM MQ 9.3.4 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.4 delivers enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [What's new in IBM MQ 9.3.4 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.4 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[“IBM MQ license information” on page 9](#)

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




## What's changed in IBM MQ 9.3.4

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.3 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

### License entitlement

-  [“Change to nonprod entitlement option of setmqinst command” on page 99](#)

### Administration

-  [“Changes to Security Policy attribute of the Service stanza of the qm.ini file” on page 99](#)
-  [“Changes to the way the CSQ1LOGP EXTRACT function handles messages with message properties” on page 99](#)
-  [“IBM Kafka Source and Sink Connector version upgraded” on page 99](#)

- [MQ Adv.](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [“IBM Aspera faspio Gateway version upgraded” on page 99](#)
- [Windows](#) [Linux](#) [AIX](#) [“Changes to entries in the connection log for connections to MQIPT TLS server routes that close without sending any data” on page 100](#)

## Change to nonprod entitlement option of setmqinst command

[Multi](#)

From IBM MQ 9.3.4, the nonprod option of the **-l** parameter of the **setmqinst** command sets the entitlement to IBM MQ (Non-Production) or IBM MQ Advanced (Non-Production), depending on whether the installation is IBM MQ Advanced or not. For more information about the **setmqinst** command, see [setmqinst \(set IBM MQ installation\)](#).

## Changes to Security Policy attribute of the Service stanza of the qm.ini file

[Linux](#) [AIX](#)

From IBM MQ 9.3.4, changes are made to the **SecurityPolicy** attribute of the Service stanza of the `qm.ini` file when the queue manager is configured to accept authentication tokens. To allow users that are not known to the queue manager to be used for authentication and authorization, the queue manager is put in `UserExternal` mode when the `AuthToken` stanza is added to the `qm.ini` file. This does not automatically happen if the **SecurityPolicy** attribute of the Service stanza of the `qm.ini` file is already set to `group`. If you want to use authentication tokens, change the setting from `group` to `UserExternal` and restart your queue manager. For more information, see [SecurityPolicy](#) and [AuthToken stanza of the qm.ini file](#).

## Changes to the way the CSQ1LOGP EXTRACT function handles messages with message properties

[z/OS](#)

From IBM MQ 9.3.4, the CSQ1LOGP EXTRACT function is changed so that a message with message properties has the properties converted into MQRFH2 in the output record.



### Attention:

- The utility no longer produces MQPUTPRP records.
- The CSQ1LOGP EXTRACT function requires `thlqual.SCSQAUTH` to be included in STEPLIB.

See [The log print utility \(CSQ1LOGP\)](#) for more information, and [Service facilities codes \(X'F1'\)](#) for changes to the codes produced.

## IBM Kafka Source and Sink Connector version upgraded

[MQ Adv.](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#)

IBM MQ Advanced for z/OS, IBM MQ Advanced for z/OS Value Unit Edition 9.3.4, IBM MQ Advanced for Multiplatforms 9.3.4, and IBM MQ Appliance 9.3.4 upgrade the version of the IBM provided Kafka Source and Sink Connectors from 1.3.2 to 2.0.

## IBM Aspera faspio Gateway version upgraded

[MQ Adv.](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#)

IBM MQ Advanced for z/OS Value Unit Edition 9.3.4 and IBM MQ Advanced for Multiplatforms 9.3.4 upgrade the version of the IBM Aspera faspio Gateway to 1.3.3.

IBM Aspera faspio Gateway 1.3.3 implements a number of new features that might require you to adjust your workflow, configuration or usage. See [Release Notes: IBM Aspera faspio Gateway 1.3.3](#) for details.

Also note the following breaking changes from earlier versions:

- If you are migrating from IBM Aspera faspio Gateway 1.2, a license file is now required to run the gateway in server mode. See [Release Notes: IBM Aspera faspio Gateway 1.3](#) for details. This license file is provided with IBM MQ. See [Defining an Aspera gateway connection on Linux, or Windows](#).
- If you are migrating from IBM Aspera fasp.io Gateway 1.1 then, in addition to the license file change already described, there is also a changed directory structure and TLS is enabled by default. See [Release Notes: IBM Aspera faspio Gateway 1.2](#) for details. For more information, see [Defining an Aspera gateway connection on Linux, or Windows](#).

## Changes to entries in the connection log for connections to MQIPT TLS server routes that close without sending any data



From IBM MQ 9.3.4, connections to IBM MQ Internet Pass-Thru (MQIPT) routes that close before any data is sent are not logged as errors. This change affects routes that are defined with `SSLServer=true` and `SSLPlainConnections=false`. In previous versions of MQIPT, connections to these routes that closed without sending any data caused an entry to be written to the connection log with an `ERROR` completion code and a `SSLHandshakeException` error message. From IBM MQ 9.3.4, the same connections cause a `nodata` entry to be written to the connection log, with an `OK` completion code. This change makes the connection log entries for connections that close before any data is sent consistent for all types of MQIPT routes.

### Related concepts

[V 9.3.4](#) [What's new in IBM MQ 9.3.4](#)

IBM MQ 9.3.4 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.3.4](#) [New, changed, and removed messages in IBM MQ 9.3.4](#)

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.4.

[V 9.3.4](#) [Deprecated, stabilized, and removed features in IBM MQ 9.3.4](#)

There are some deprecations for Continuous Delivery at IBM MQ 9.3.4.

[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 9.3.4](#) **New, changed, and removed messages in IBM MQ 9.3.4**

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.4.

- [Multi](#) [“New, changed, and removed IBM MQ AMQ messages” on page 101](#)
- [ALW](#) [“New, changed, and removed AMQP channel messages” on page 102](#)
- [MQ Adv.](#) [Linux](#) [“New, changed, and removed IBM MQ Bridge to blockchain messages” on page 102](#)
- [Linux](#) [“New, changed, and removed IBM MQ Bridge to Salesforce messages” on page 102](#)
- [“New, changed, and removed IBM MQ Console messages” on page 102](#)
- [Windows](#) [Linux](#) [AIX](#) [“New, changed and removed IBM MQ Internet Pass-Thru messages” on page 102](#)
- [“New, changed and removed JSON messages” on page 102](#)



- [“New, changed, and removed Managed File Transfer messages” on page 102](#)
- [“New, changed and removed MQJMS messages” on page 102](#)
- [“New, changed, and removed REST API messages” on page 102](#)
-    [“New, changed and removed MQ Telemetry messages” on page 103](#)
-  [“New, changed, and removed z/OS messages” on page 103](#)

## New, changed, and removed IBM MQ AMQ messages

### Multi

The following AMQ messages are new for IBM MQ 9.3.4:

#### **AMQ3xxx: Utilities and tools**

AMQ3057I

#### **AMQ5xxx: Installable services**

AMQ5783E

AMQ5784E

AMQ5785I

AMQ5786E

AMQ5787W

#### **AMQ6xxx: Common Services**

AMQ6344I

AMQ6729W

#### **AMQ8xxx: Administration**

AMQ8960E

The following AMQ messages are changed for IBM MQ 9.3.4:

#### **AMQ5xxx: Installable services**

AMQ5068W (Reworded Explanation and Response)

AMQ5534E (Extended Response)

AMQ5540E (Reworded Message, Explanation and Response)

#### **AMQ7xxx: IBM MQ product**

AMQ7006E (Reworded Message)

AMQ7081I (Extended Explanation)

AMQ7443E (Extended Explanation)

AMQ7486I (Extended Explanation)

#### **AMQ8xxx: Administration**

AMQ8871E (Extended Message and Explanation)

#### **AMQ9xxx: Remote**

AMQ9296E (Reworded Response)

AMQ9297E (Reworded Explanation)

AMQ9528W (Extended Message)

AMQ9546E (Extended Explanation)

AMQ9557E (Updated Message, Explanation and Response)

AMQ9673E (Extended Explanation)

There are no removed AMQ messages for IBM MQ 9.3.4.



## New, changed, and removed AMQP channel messages



There are no new, changed or removed [AMQP channel messages](#) for IBM MQ 9.3.4.

## New, changed, and removed IBM MQ Bridge to blockchain messages



**Note:** For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2.

## New, changed, and removed IBM MQ Bridge to Salesforce messages



There are no new, changed, or removed [IBM MQ Bridge to Salesforce messages](#) for IBM MQ 9.3.4.

## New, changed, and removed IBM MQ Console messages

The following IBM MQ Console messages are changed for IBM MQ 9.3.4:

### **MQWB20xx: IBM MQ Console messages**

MQWB2027E (Typo fixed in Response)

There are no new or removed [IBM MQ Console messages](#) for IBM MQ 9.3.4.

## New, changed and removed IBM MQ Internet Pass-Thru messages



The following IBM MQ Internet Pass-Thru messages are new for IBM MQ 9.3.4:

### **MQCPxxxx: MQIPT messages**

MQCPE120

MQCPE121

There are no changed or removed IBM MQ Internet Pass-Thru messages for IBM MQ 9.3.4.

## New, changed and removed JSON messages

There are no new, changed, or removed [JSON format diagnostic messages](#) for IBM MQ 9.3.4.

## New, changed, and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.3.4:

### **BFGCL0001 - BFGCL9999: MFT commands messages**

BFGCL0835E

### **BFGIO0001 - BFGIO999: MFT filesystem I/O messages**

BFGIO0417E

There are no changed or removed Managed File Transfer messages for IBM MQ 9.3.4.

## New, changed and removed MQJMS messages

There are no new, changed, or removed [MQJMS messages](#) for IBM MQ 9.3.4.

## New, changed, and removed REST API messages

There are no new, changed, or removed REST API messages for IBM MQ 9.3.4.

## New, changed and removed MQ Telemetry messages



There are no new, changed, or removed [MQ Telemetry](#) messages for IBM MQ 9.3.4.

## New, changed, and removed z/OS messages



The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.3.4:

### **Recovery log manager messages (CSQJ...)**

CSQJ105E (Hyphen added in Explanation)

### **Distributed queuing messages (CSQX...)**

CSQX469E (Rewritten System programmer response)

CSQX686E (Extended System programmer response)

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


CSQY038E (Redundant quotation marks removed; link text updated in System programmer response)

### **IBM MQ-IMS bridge Messages (CSQ2...)**


CSQ2005I (MQFB\_DATA\_LENGTH\_TOO\_SHORT added to System programmer response)

There are no new or removed IBM MQ for z/OS CSQ messages for IBM MQ 9.3.4.


## Related concepts

 [What's new in IBM MQ 9.3.4](#)

IBM MQ 9.3.4 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

 [What's changed in IBM MQ 9.3.4](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.3 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

 [Deprecated, stabilized, and removed features in IBM MQ 9.3.4](#)

There are some deprecations for Continuous Delivery at IBM MQ 9.3.4.

## Related reference

[IBM MQ AMQ messages](#)

[Managed File Transfer diagnostic messages](#)

[Telemetry messages](#)

[REST API messages](#)

[IBM MQ Console messages](#)

[IBM MQ Bridge to blockchain messages](#)

[IBM MQ Bridge to Salesforce messages](#)

[IBM MQ Internet Pass-Thru messages](#)

[MQJMS messages](#)

[JSON format diagnostic messages](#)

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

 **Deprecated, stabilized, and removed features in IBM MQ 9.3.4**

There are some deprecations for Continuous Delivery at IBM MQ 9.3.4.



Table 9. Deprecations at IBM MQ 9.3.4

Feature	Description
Deprecation: CMS keystore support for IBM MQ Java applications, AMQP and MQTT and associated tools	<p>CMS keystore support for IBM MQ Java applications, AMQP and MQTT is deprecated from IBM MQ 9.3.4. If you are using a CMS keystore with IBM MQ Java applications, AMQP and MQTT, you should migrate to the PKCS#12 key repository support released in IBM MQ 9.3.0.</p> <p>The <b>runmqckm</b>, <b>strmqikm</b>, <b>mqiptKeycmd</b> and <b>mqiptKeyman</b> tools are also deprecated. The <b>runmqakm</b> command from IBM MQ and the <b>keytool</b> command from the JRE are available as alternatives.</p> <p>See <a href="#">Using runmqckm, runmqakm, and strmqikm to manage digital certificates</a> and <a href="#">Setting up a key repository on AIX, Linux, and Windows</a>.</p>
Deprecation: XPARM utility	The XPARM utility for the channel initiator parameter module, used to migrate to IBM WebSphere MQ for z/OS 7.0, is deprecated from IBM MQ 9.3.4.

### Related concepts

#### What's new in IBM MQ 9.3.4

IBM MQ 9.3.4 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

#### What's changed in IBM MQ 9.3.4

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.3 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 9.3.4

A number of new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.4.

## What's new and changed in IBM MQ 9.3.3

IBM MQ 9.3.3, 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](#)

#### What's new in IBM MQ 9.3.3

IBM MQ 9.3.3 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 for IBM MQ for Multiplatforms: base and Advanced entitlement



On [Multiplatforms](#), the following features and enhancements are available with both base product entitlement, and with Advanced entitlement.

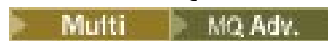
## Administration

- [“Additions to IBM MQ Console” on page 106](#)

## Application Development

- [“Performance improvements for processing of AMQP message acknowledgments” on page 106](#)
- [“Tracing enhancements for IBM MQ .NET and XMS .NET client libraries” on page 107](#)
- [“Error message improvements for IBM MQ .NET and XMS .NET clients SSL connectivity issues” on page 107](#)
- [“Remote messaging with the messaging REST API” on page 107](#)
- [“Containers non-install image added for Linux ARM64 / Apple Silicon” on page 107](#)

## New IBM MQ for Multiplatforms features: Advanced entitlement only



The following features and enhancements are available on Multiplatforms only with Advanced entitlement.

### Administration

- [Unlocking events from mission-critical data using Kafka Connect](#)
- [“Autorecovery of damaged objects for Native HA queue managers” on page 108](#)

## New for IBM MQ for z/OS: base, Advanced, and Advanced VUE entitlement



The following features and enhancements are available both with base product entitlement, and with IBM MQ Advanced for z/OS (Advanced) and IBM MQ Advanced for z/OS Value Unit Edition (Advanced VUE) entitlement.

### Administration

- [“Enhancements to SMF queue statistics records” on page 109](#)
- [“Additions to IBM MQ Console” on page 109](#)

### Application Development

- [“Remote messaging with the messaging REST API” on page 109](#)

## New for IBM MQ for z/OS: Advanced and Advanced VUE entitlement only



The following features and enhancements are available with Advanced or Advanced VUE entitlement only.

### Administration

- [“Unlocking events from mission-critical data using Kafka Connect” on page 110](#)

### Related concepts

#### What's changed in IBM MQ 9.3.3

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.2 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 9.3.3

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.3.

#### Deprecated, stabilized, and removed features in IBM MQ 9.3.3

There are removals from IBM MQ 9.3.3.

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icons are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)

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

## **What's new in IBM MQ 9.3.3 for Multiplatforms: base and Advanced entitlement**

For Multiplatforms, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

### Administration

- [“Additions to IBM MQ Console” on page 106](#)
- [“dspmqver command now reports release type” on page 107](#)

### Application Development

- [“Performance improvements for processing of AMQP message acknowledgments” on page 106](#)
- [“Tracing enhancements for IBM MQ .NET and XMS .NET client libraries” on page 107](#)
- [“Error message improvements for IBM MQ .NET and XMS .NET clients SSL connectivity issues” on page 107](#)
- [“Remote messaging with the messaging REST API” on page 107](#)
- [“Containers non-install image added for Linux ARM64 / Apple Silicon” on page 107](#)

### Additions to IBM MQ Console

Simplified administration through web console updates can provide easier navigation between the configuration and runtime relationships of IBM MQ resources. For example, administrators can view which applications are putting messages on queues and see the relationships between different queues. A new feature enables you to view the IBM MQ objects associated with a queue. For more information, see [IBM MQ Console: Working with queues - CD only](#).

### Performance improvements for processing of AMQP message acknowledgments



If an AMQP application is using QOS\_AT\_LEAST\_ONCE(1) message delivery, the AMQP service waits for an acknowledgment from the application before it discards the copy of a message that it keeps after sending that message to the application.

Before IBM MQ 9.3.3, each message that has been acknowledged is removed from the queue individually. From IBM MQ 9.3.3 messages are removed in batches, which improves performance. For more information, see [Removing acknowledged AMQP messages from the queue in batches](#).

## **dspmqr command now reports release type**

The **dspmqr** command has been extended to include the release type, which makes it easy to see if the release is Continuous Delivery or Long Term Support.

The release type reported can be one of Long Term Support (LTS), Continuous Delivery(CD), or Long Term Support(LTS)and Continuous Delivery(CD). For more information, see [dspmqr \(display version information\)](#).

## **Tracing enhancements for IBM MQ .NET and XMS .NET client libraries**

From IBM MQ 9.3.3, you can enable and disable tracing for the IBM MQ .NET and XMS .NET client libraries without needing to restart the application.

You can use the `mqclient.ini` file to enable traces for the IBM MQ .NET and XMS .NET client libraries (.NET Standard, .NET Framework, and .NET 6). You can also enable and disable tracing dynamically. When the application is running, if the `mqclient.ini` file is modified, created, or deleted, the IBM MQ .NET and XMS .NET client reads the properties of the trace section again and then enables or disables the trace, so that restart of the application is not needed.

For more information, see [Trace stanza of the client configuration file](#), [Tracing IBM MQ .NET applications with mqclient.ini](#), and [Tracing XMS .NET applications with mqclient.ini](#).

## **Error message improvements for IBM MQ .NET and XMS .NET clients SSL connectivity issues**

From IBM MQ 9.3.3, the IBM MQ .NET client and XMS .NET client provide improved and more meaningful information about SSL enabled connection failures, helping you understand an issue and resolve this type of issue more quickly.

Improvements made to the IBM MQ .NET and XMS .NET client libraries (`amqmdnetstd.dll`) and (`amqmxmsstd.dll`) provide a more specific exception mechanism for SSL-related issues. The MQRC reason codes are in line with the other .NET client libraries, such as C. For more information, see [Common SSL error codes thrown by IBM MQ .NET client libraries](#) and [Common SSL error codes thrown by XMS .NET client libraries](#).

## **Remote messaging with the messaging REST API**

From IBM MQ 9.3.3, you can use the messaging REST API to connect to remote queue managers for messaging. Remote queue managers can be queue managers within another installation, or on another system. Therefore, you can now use a single installation to run the mqweb server and connect to any queue manager with the messaging REST API.

For more information about remote messaging with the messaging REST API, see [Setting up a remote queue manager to use with the messaging REST API](#).

## **Containers non-install image added for Linux ARM64 / Apple Silicon**

If you have strong container development skills, you can use the make files supplied in the `mq-container` GitHub repository to build your own production container image. This image works in conjunction with a set of non-install (unzippable) IBM MQ images that help you build a container image that can run under the OpenShift anyuid Security Context Constraint. From IBM MQ 9.3.3, the set of non-install images includes an image that works with the Linux ARM64 and Apple Silicon platforms.

For more information, see [Building a sample base IBM MQ queue manager image](#).

### Related concepts

[V 9.3.3](#) [Multi](#) [MQ Adv.](#) [What's new in IBM MQ 9.3.3 for Multiplatforms: Advanced entitlement only](#)

IBM MQ 9.3.3 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

[V 9.3.3](#) [z/OS](#) [What's new in IBM MQ 9.3.3 for z/OS: base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[V 9.3.3](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [What's new in IBM MQ 9.3.3 for z/OS: Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.3 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

[V 9.3.3](#) [Multi](#) [MQ Adv.](#) ***What's new in IBM MQ 9.3.3 for Multiplatforms:***

### ***Advanced entitlement only***

IBM MQ 9.3.3 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

### Administration

- [Unlocking events from mission-critical data using Kafka Connect](#)
- [“Autorecovery of damaged objects for Native HA queue managers” on page 108](#)

## Unlocking events from mission-critical data using Kafka Connect

The wide-spread use of IBM MQ means that it is a great route for getting data into Kafka for example, by taking a copy of existing data with streaming queues.

From IBM MQ 9.3.3, if your enterprise has IBM MQ Advanced for z/OS Value Unit Edition entitlement, IBM MQ Advanced for Multiplatforms entitlement, or IBM MQ Appliance entitlement, you get access to IBM provided, and supported connectors that can copy data from IBM MQ to Kafka, or Kafka to IBM MQ.

Previously, you could get the connectors for free without support, or obtain support with IBM Event Streams entitlement.

For more information, see [Kafka Connect scenarios](#).

## Autorecovery of damaged objects for Native HA queue managers

From IBM MQ 9.3.3, if a Native HA queue manager detects any damaged objects when it starts, it automatically attempts to recover those objects. For more information, see [Recovering damaged objects](#).

### Related concepts

[V 9.3.3](#) [Multi](#) [What's new in IBM MQ 9.3.3 for Multiplatforms: base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

[V 9.3.3](#) [z/OS](#) [What's new in IBM MQ 9.3.3 for z/OS: base and Advanced VUE entitlement](#)



On z/OS, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

**V 9.3.3** **MQ Adv. VUE** **MQ Adv. z/OS** [What's new in IBM MQ 9.3.3 for z/OS: Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.3 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

**V 9.3.3** **z/OS** **What's new in IBM MQ 9.3.3 for z/OS: base and Advanced VUE entitlement**

On z/OS, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

### Administration

- [“Enhancements to SMF queue statistics records” on page 109](#)
- [“Additions to IBM MQ Console” on page 109](#)

### Application Development

- [“Remote messaging with the messaging REST API” on page 109](#)

## Enhancements to SMF queue statistics records

IBM MQ 9.3.3 further enhances the SMF queue statistics records from IBM MQ 9.3.1. The latest improvements to the queue statistics give insight into what happened with your queue during the last SMF interval. This includes information on message flow, expiry, high and low watermarks and more. For more information, see [Queue data records IBM MQ 9.3.3 release](#).

## Additions to IBM MQ Console

Simplified administration through web console updates can provide easier navigation between the configuration and runtime relationships of IBM MQ resources. For example, administrators can view which applications are putting messages on queues and see the relationships between different queues. A new feature enables you to view the IBM MQ objects associated with a queue. For more information, see [IBM MQ Console: Working with queues - CD only](#).

## Remote messaging with the messaging REST API

From IBM MQ 9.3.3, you can use the messaging REST API to connect to remote queue managers for messaging. Remote queue managers can be queue managers within another installation, or on another system. Therefore, you can now use a single installation to run the mqweb server and connect to any queue manager with the messaging REST API.

For more information about remote messaging with the messaging REST API, see [Setting up a remote queue manager to use with the messaging REST API](#).

### Related concepts

**V 9.3.3** **Multi** [What's new in IBM MQ 9.3.3 for Multiplatforms: base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

**V 9.3.3** **Multi** **MQ Adv.** [What's new in IBM MQ 9.3.3 for Multiplatforms: Advanced entitlement only](#)



IBM MQ 9.3.3 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

[V 9.3.3](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [What's new in IBM MQ 9.3.3 for z/OS: Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.3 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

[V 9.3.3](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [\*\*What's new in IBM MQ 9.3.3 for z/OS: Advanced and Advanced VUE entitlement\*\*](#)

On z/OS, IBM MQ 9.3.3 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

### Administration

- [“Unlocking events from mission-critical data using Kafka Connect” on page 110](#)

## Unlocking events from mission-critical data using Kafka Connect

The wide-spread use of IBM MQ means that it is a great route for getting data into Kafka for example, by taking a copy of existing data with streaming queues.

From IBM MQ 9.3.3, if your enterprise has IBM MQ Advanced for z/OS Value Unit Edition entitlement, IBM MQ Advanced for Multiplatforms entitlement, or IBM MQ Appliance entitlement, you get access to IBM provided, and supported connectors that can copy data from IBM MQ to Kafka, or Kafka to IBM MQ.

Previously, you could get the connectors for free without support, or obtain support with IBM Event Streams entitlement.

For more information, see [Kafka Connect scenarios](#).

### Related concepts

[V 9.3.3](#) [Multi](#) [What's new in IBM MQ 9.3.3 for Multiplatforms: base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

[V 9.3.3](#) [Multi](#) [MQ Adv.](#) [What's new in IBM MQ 9.3.3 for Multiplatforms: Advanced entitlement only](#)

IBM MQ 9.3.3 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

[V 9.3.3](#) [z/OS](#) [What's new in IBM MQ 9.3.3 for z/OS: base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.3 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[“IBM MQ license information” on page 9](#)

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

## [V 9.3.3](#) **What's changed in IBM MQ 9.3.3**

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.2 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

### Command and Configuration

- [“IBM Aspera faspio Gateway version upgraded” on page 111](#)
- [“Change to RPM signature version” on page 111](#)

## Application development

- [“Removal of useIBMCipherMappings” on page 111](#)

## IBM Aspera faspio Gateway version upgraded

MQ Adv. > MQ Adv. VUE > MQ Adv. z/OS

IBM MQ Advanced for z/OS Value Unit Edition 9.3.3 and IBM MQ Advanced for Multiplatforms 9.3.3 upgrade the version of the IBM Aspera faspio Gateway to 1.3.2.

IBM Aspera faspio Gateway 1.3.2 implements a number of new features that might require you to adjust your workflow, configuration or usage. See [Release Notes: IBM Aspera faspio Gateway 1.3.2](#) for details.

Also note the following breaking changes from earlier versions:

- If you are migrating from IBM Aspera faspio Gateway 1.2, a license file is now required to run the gateway in server mode. See [Release Notes: IBM Aspera faspio Gateway 1.3](#) for details. This license file is provided with IBM MQ. See [Defining an Aspera gateway connection on Linux, or Windows](#).
- If you are migrating from IBM Aspera fasp.io Gateway 1.1 then, in addition to the license file change already described, there is also a changed directory structure and TLS is enabled by default. See [Release Notes: IBM Aspera faspio Gateway 1.2](#) for details. For more information, see [Defining an Aspera gateway connection on Linux, or Windows](#).

## Change to RPM signature version

The RPM signature version was changed to v4 at IBM MQ 9.3.3 for Continuous Delivery. As part of this, the private key used by IBM to sign the packages was changed, and so if you want to validate RPM packages at or above these levels, you need to import the newer IBM MQ public signing gpg key. You will also need the old key if you want to retain the ability to verify the signatures on older IBM MQ 9.3.x packages. For more information, see [IBM MQ code signatures](#).

## Removal of useIBMCipherMappings

The Java System Property `com.ibm.mq.cfg.useIBMCipherMappings`, which controls which mappings are used is removed from the product for Continuous Delivery from IBM MQ 9.3.3.

From IBM MQ 9.3.3, a Cipher can be defined as either the CipherSpec or CipherSuite name and is handled correctly by IBM MQ. As part of this change, three new JAR files have been added to the IBM MQ classes for Java, IBM MQ classes for JMS, and IBM MQ classes for Jakarta Messaging:

- `jackson-annotations.jar`
- `jackson-core.jar`
- `jackson-databind.jar`

From IBM MQ 9.3.3, the information about configuring your application to use IBM Java or Oracle Java CipherSuite mappings in [TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS](#) and [TLS CipherSpecs and CipherSuites in IBM MQ classes for Java](#) applies to Long Term Support and Continuous Delivery before IBM MQ 9.3.3 only.

## Related concepts

[V 9.3.3](#) [What's new in IBM MQ 9.3.3](#)

IBM MQ 9.3.3 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.3.3](#) [New, changed, and removed messages in IBM MQ 9.3.3](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.3.

[V 9.3.3](#) [Deprecated, stabilized, and removed features in IBM MQ 9.3.3](#)

There are removals from IBM MQ 9.3.3.

[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 9.3.3 New, changed, and removed messages in IBM MQ 9.3.3**

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.3.

- **Multi** [“New, changed, and removed IBM MQ AMQ messages” on page 112](#)
- **MQ Adv.** **Linux** [“New, changed, and removed IBM MQ Bridge to blockchain messages” on page 113](#)
- **Linux** [“New, changed, and removed IBM MQ Bridge to Salesforce messages” on page 113](#)
- [“New, changed, and removed IBM MQ Console messages” on page 113](#)
- **Windows** **Linux** **AIX** [“New, changed and removed IBM MQ Internet Pass-Thru messages” on page 113](#)
- [“New, changed and removed JSON messages” on page 113](#)
- [“New, changed, and removed Managed File Transfer messages” on page 113](#)
- [“New, changed and removed MQJMS messages” on page 114](#)
- [“New, changed, and removed REST API messages” on page 114](#)
- **ALW** [“New, changed and removed Telemetry messages” on page 114](#)
- **Windows** **Linux** **AIX** [“New, changed and removed Telemetry messages” on page 114](#)
- **z/OS** [“New, changed, and removed z/OS messages” on page 114](#)

### **New, changed, and removed IBM MQ AMQ messages**

**Multi**

The following AMQ messages are new for IBM MQ 9.3.3:

#### **AMQ3xxx: Utilities and tools**

AMQ3248I

AMQ3249I

AMQ3250I

AMQ3487I

AMQ3488E

#### **AMQ6xxx: Common Services**

AMQ6862W

#### **AMQ7xxx: IBM MQ product**

AMQ7443E

#### **AMQ9xxx: Remote**

AMQ9888W

AMQ9889W

AMQ9916E

The following AMQ messages are changed for IBM MQ 9.3.3:

### **AMQ3xxx: Utilities and tools**

AMQ3231E (typographical error fixed in Response)

### **AMQ7xxx: IBM MQ product**

AMQ7081I (Explanation extended)

AMQ7205E (Message and Explanation rewritten)

AMQ7472W (Response extended)

AMQ7493W (Message and Explanation rewritten)

### **AMQ8xxx: Administration**

AMQ8043I (Explanation extended)

AMQ8350I (Extra fields added to Usage)

AMQ8373S (Message and Explanation extended)

### **AMQ9xxx: Remote**

AMQ9209E (Explanation and Response extended)

The following AMQ messages are removed for IBM MQ 9.3.3:

### **AMQ3xxx: Utilities and tools**

AMQ3532E

AMQ3923E

AMQ3949E - AMQ3960E

### **AMQ6xxx: Common Services**

AMQ6555E

## **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 9.3.3.

**Note:** For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2.

## **New, changed, and removed IBM MQ Bridge to Salesforce messages**



There are no new, changed, or removed [IBM MQ Bridge to Salesforce](#) messages for IBM MQ 9.3.3.

## **New, changed, and removed IBM MQ Console messages**

There are no new, changed, or removed [IBM MQ Console](#) messages for IBM MQ 9.3.3.

## **New, changed and removed IBM MQ Internet Pass-Thru messages**



There are no new, changed, or removed [IBM MQ Internet Pass-Thru](#) messages for IBM MQ 9.3.3.

## **New, changed and removed JSON messages**

There are no new, changed, or removed [JSON format diagnostic messages](#) for IBM MQ 9.3.3.

## **New, changed, and removed Managed File Transfer messages**

There are no new, changed, or removed Managed File Transfer messages for IBM MQ 9.3.3.

## New, changed and removed MQJMS messages

There are no new, changed, or removed [MQJMS messages](#) for IBM MQ 9.3.3.

## New, changed, and removed REST API messages

The following REST API messages are new for IBM MQ 9.3.3:

### **MQWB03xx: REST API messages MQWB0300 to 0399**

MQWB0318I - MQWB0328I

### **MQWB11xx: REST API messages MQWB1100 to 1199**

MQWB1159E - MQWB1160E

The following REST API messages are changed for IBM MQ 9.3.3:

### **MQWB00xx: REST API messages MQWB0000 to 0099**

MQWB0055E (Explanation and Response extended)

MQWB0063E (Response extended)

### **MQWB10xx: REST API messages MQWB1000 to 1099**

MQWB1012I (Usage extended)

There are no removed REST API messages for IBM MQ 9.3.3.

## New, changed and removed Telemetry messages



The following Telemetry messages are new for IBM MQ 9.3.3:

### **Telemetry (AMQXR) messages**

AMQXR2119W

AMQXR2120I

There are no changed, or removed MQ Telemetry messages for IBM MQ 9.3.3.

## New, changed, and removed z/OS messages



The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.3.3:

### **Data manager messages (CSQI...)**

CSQI050E

### **Distributed queuing messages (CSQX...)**

CSQX888E

CSQX889E

### **Db2 manager messages (CSQ5...)**

CSQ5041E

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.3.3:

### **Coupling Facility manager messages (CSQE...)**

CSQE007I (Link added to System programmer response)

CSQE016E (Link added to System programmer response)

CSQE020E - CSQE021E (Link added to System programmer response)

CSQE033E - CSQE035E (Link added to System programmer response)

CSQE106E (Link added to System programmer response)

CSQE146E (Link added to System programmer response)

CSQE162E (Link added to System programmer response)

**Data manager messages (CSQI...)**

CSQI042E - CSQI043E (Link added to System programmer response)

CSQI048E (Link added to System programmer response)

**Recovery log manager messages (CSQJ...)**

CSQJ073E (Link updated in System programmer response)

CSQJ103E (Link updated in System programmer response)

CSQJ104E (Typographical errors fixed and Link updated in Explanation)

CSQJ105E (System programmer response rewritten)

CSQJ106E - CSQJ108E (Link updated in Explanation)

CSQJ117E (Link added to Explanation)

CSQJ228E (Link updated in System programmer response)

CSQJ302E (Link updated in System programmer response)

CSQJ494E - CSQJ495E (Link updated in System programmer response)

**Message manager messages (CSQM...)**

CSQM056E - CSQM057E (Link updated in System programmer response)

CSQM111E (Link updated in System programmer response)

CSQM586E - CSQM587E (Explanation and System programmer response rewritten)

**Buffer manager messages (CSQP...)**

CSQP004E (Link added to System programmer response)

CSQP011E - CSQP012E (Link added to System programmer response)

CSQP014E (Link changed in System programmer response)

CSQP030E (Link updated in System programmer response)

CSQP037E - CSQP039E (Link added to System programmer response)

CSQP048E (Link added to System programmer response)

**Recovery manager messages (CSQR...)**

CSQR027I (Typographical error fixed in Explanation)

**Utilities messages (CSQU...)**

CSQU002E - CSQU003E (Link updated in System programmer response)

CSQU090E (Link added to System programmer response)

CSQU093E - CSQU094E (Link added to System programmer response)

CSQU156E (Link added to System programmer response)

CSQU504E (Link added to System programmer response)

CSQU514E (Link added to System programmer response)

CSQU518E (Link added to System programmer response)

CSQU533E (Link added to System programmer response)

CSQU544E - CSQU545E (Link added to System programmer response)

CSQU561E (Link added to System programmer response)

**Agent services messages (CSQV...)**

CSQV453I (Link updated in System programmer response)

CSQV457E (Rewritten System programmer response)

CSQV459I (Rewritten System programmer response)

**Instrumentation facilities messages (CSQW...)**

CSQW133E (Links added to Explanation and System programmer response)

CSQW200E (Link added to System programmer response)

CSQW701E (Link updated in System programmer response)

### **Distributed queuing messages (CSQX...)**

CSQX027E - CSQX028E (Link updated in System programmer response)  
CSQX042E - CSQX045E (Links updated in System programmer response)  
CSQX049E - CSQX052E (Links updated in System programmer response)  
CSQX054E - CSQX058E (Links added to System programmer response)  
CSQX060E - CSQX061E (Link added to System programmer response)  
CSQX069E (Link added to System programmer response)  
CSQX104E (Link added to System programmer response)  
CSQX106E (Link added to System programmer response)  
CSQX110E - CSQX113E (Link added to System programmer response)  
CSQX143E - CSQX144E (Link added to System programmer response)  
CSQX153E - CSQX154E (Link added to System programmer response)  
CSQX164E (Link updated in System programmer response)  
CSQX201E - CSQX206E (Links added to System programmer response)  
CSQX209E - CSQX212E (Link added to System programmer response)  
CSQX250E (Rewritten System programmer response)  
CSQX567E - CSQX568E (Link added to System programmer response)  
CSQX571E (Link updated in System programmer response)  
CSQX620E (Link updated in System programmer response)  
CSQX625E (Link added to System programmer response)  
CSQX629E (Link updated in System programmer response)  
CSQX633E - CSQX634E (Link updated in System programmer response)  
CSQX635E (Updated System programmer response)  
CSQX637E - CSQX638E (Link updated in System programmer response)  
CSQX641E (updated Message and Explanation)  
CSQX642E (System programmer response: default certificate is now named "ibmMQ ...", not "ibmWebSphereMQ ...")  
CSQX644E (System programmer response: default certificate is now named "ibmMQ ...", not "ibmWebSphereMQ ...")  
CSQX645E (System programmer response: Link updated and default certificate is now named "ibmMQ ...", not "ibmWebSphereMQ ...")  
CSQX646E (Link updated in System programmer response)  
CSQX658E (Link updated in System programmer response)  
CSQX663E (Link updated in System programmer response)  
CSQX665E - CSQX666E (Link updated in System programmer response)  
CSQX683E - CSQX685E (Link updated in System programmer response)  
CSQX686E (System programmer response: Link updated and default certificate is now named "ibmMQ ...", not "ibmWebSphereMQ ...")  
CSQX687E - CSQX689E (Link updated in System programmer response)

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

CSQY024I (Reference to MQ 9.1.3 behavior removed from Explanation and System programmer response)  
CSQY037I (Link updated in Explanation)  
CSQY200E (Link updated in System programmer response)  
CSQY210E (Links updated in System programmer response)



CSQY291E (Links updated in Explanation and System programmer response)

### **Subsystem support messages (CSQ3...)**

CSQ3111I (Explanation extended)

### **Db2 manager messages (CSQ5...)**

CSQ5002E (Link added to System programmer response)

CSQ5007E (Link added to System programmer response)

CSQ5009E - CSQ5013E (Link added to System programmer response)

CSQ5025E (System programmer response rewritten)

CSQ5027E (System programmer response rewritten)

CSQ5116E (Link added to System programmer response)

The following IBM MQ for z/OS CSQ messages are removed for IBM MQ 9.3.3:

### **Data manager messages (CSQI...)**


CSQI966I

CSQI967I

### **Recovery log manager messages (CSQJ...)**

CSQJ165I


### **Related concepts**

 [What's new in IBM MQ 9.3.3](#)

IBM MQ 9.3.3 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

 [What's changed in IBM MQ 9.3.3](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.2 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

 [Deprecated, stabilized, and removed features in IBM MQ 9.3.3](#)

There are removals from IBM MQ 9.3.3.

### **Related reference**

[IBM MQ AMQ messages](#)

[Telemetry \(AMQXR\) messages](#)

[IBM MQ Bridge to blockchain messages](#)

[IBM MQ Bridge to Salesforce messages](#)

[IBM MQ Internet Pass-Thru messages](#)

[IBM MQ Console messages](#)

[JSON format diagnostic messages](#)

[Managed File Transfer diagnostic messages](#)

[MQJMS messages](#)

[REST API messages](#)

[Telemetry messages](#)

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

### **Deprecated, stabilized, and removed features in IBM MQ 9.3.3**

There are removals from IBM MQ 9.3.3.

### **Removed features**





Table 10. Removals at IBM MQ 9.3.3

Feature	Description
Removal: traceControl.jar dynamic tracing utility	For Continuous Delivery, the trace control utility is removed from the product at IBM MQ 9.3.3. IBM MQ 9.3.2 is the last Continuous Delivery release that it is delivered with. If dynamic trace is needed to diagnose an issue, IBM Support can guide you through the steps to gather trace as required.
Removal: Operations Dashboard (IBM MQ in Containers)	From IBM MQ Operator 2.4.0 the Operations Dashboard is removed. Note that the Operations Dashboard may still be used for existing queue managers that are older than 9.3.3.0-r1 if on an IBM MQ Operator that supports that queue manager container image. For version support for the IBM MQ Operator, see <a href="#">Available IBM MQ versions</a> .
Removal: com.ibm.mq.cfg.useIBMCipherMappings Java System Property	For Continuous Delivery, the Java System Property <code>com.ibm.mq.cfg.useIBMCipherMappings</code> , which was previously used for configuring IBM Java or Oracle Java Cipher mappings, is removed from the product at IBM MQ 9.3.3.  From IBM MQ 9.3.3, a Cipher can be defined as either the <code>CipherSpec</code> or <code>CipherSuite</code> name and is handled correctly by IBM MQ. For more information, see <a href="#">TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS and TLS CipherSpecs and CipherSuites in IBM MQ classes for Java</a> .

### Related concepts

[V 9.3.3](#) What's new in IBM MQ 9.3.3

IBM MQ 9.3.3 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.3.3](#) What's changed in IBM MQ 9.3.3

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.2 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

[V 9.3.3](#) [New, changed, and removed messages in IBM MQ 9.3.3](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.3.

## [V 9.3.2](#) What's new and changed in IBM MQ 9.3.2

IBM MQ 9.3.2, 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](#)

## What's new in IBM MQ 9.3.2

IBM MQ 9.3.2 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 for IBM MQ for Multiplatforms - base and Advanced entitlement

 Multi

On Multiplatforms, the following features and enhancements are available with both base product entitlement, and with Advanced entitlement.

#### Administration

- [“New application view in IBM MQ Console” on page 121](#)
- [“Extension of queue manager status attributes” on page 121](#)
- [“Addition of Native HA status attributes” on page 121](#)
- [“MQIPT trace file configuration enhancements” on page 121](#)

#### Security

-   [“Support for TLS1.3 on managed .NET clients” on page 121](#)

#### Application Development

- [“New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging” on page 122](#)
- [“Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging” on page 122](#)
- [“New property to set the user context that is used for authorization in the messaging REST API” on page 122](#)

### New IBM MQ for Multiplatforms features - Advanced entitlement only

 Multi  MQ Adv.

The following features and enhancements are available on Multiplatforms only with Advanced entitlement.

#### Administration

- [“Additional MFT resource monitor events” on page 123](#)

#### Configuration

- [“Native HA entitlement” on page 123](#)

### New for IBM MQ for z/OS - base, Advanced, and Advanced VUE entitlement

 z/OS

The following features and enhancements are available both with base product entitlement, and with IBM MQ Advanced for z/OS (Advanced) and IBM MQ Advanced for z/OS Value Unit Edition (Advanced VUE) entitlement.

#### Administration

- [“Enhancements to SMF accounting data” on page 124](#)
- [New application view in console](#)

#### Developing applications

- [New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS](#)

- [Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging](#)
- [New property to set the user context that is used for authorization in the messaging REST API](#)

## New for IBM MQ for z/OS - Advanced and Advanced VUE entitlement only

z/OS MQ Adv. VUE MQ Adv. z/OS

The following features and enhancements are available with Advanced or Advanced VUE entitlement only.

### Administration

- [“Additional MFT resource monitor events” on page 125](#)

### Related concepts

**V 9.3.2** [What's changed in IBM MQ 9.3.2](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.2** [New, changed, and removed messages in IBM MQ 9.3.2](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.2.

**V 9.3.2** [Deprecated, stabilized, and removed features in IBM MQ 9.3.2](#)

There are deprecations and removals from IBM MQ 9.3.2.

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icon are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)

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

## **Multi** **V 9.3.2** **What's new in IBM MQ 9.3.2 for Multiplatforms - base and Advanced entitlement**

For Multiplatforms, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

### Administration

- [“New application view in IBM MQ Console” on page 121](#)
- [“Extension of queue manager status attributes” on page 121](#)

- [“Addition of Native HA status attributes” on page 121](#)
- [“MQIPT trace file configuration enhancements” on page 121](#)

## Security

-   [“Support for TLS1.3 on managed .NET clients” on page 121](#)

## Application Development

- [“New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging” on page 122](#)
- [“Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging” on page 122](#)
- [“New property to set the user context that is used for authorization in the messaging REST API” on page 122](#)

## New application view in IBM MQ Console

From IBM MQ 9.3.2, the console has a view that shows details of applications that are connected to queue managers. The view includes a panel that shows a quick view of how many applications are connected to a queue manager and enables you to drill down to see more details. For more information, see [IBM MQ Console: Working with applications](#).

## Extension of queue manager status attributes

From IBM MQ 9.3.2, new attributes have been added to the **DISPLAY QMSTATUS** command and the response from the **MQCMD\_INQUIRE\_Q\_MGR\_STATUS** PCF command. The new attributes report a range of additional information about queue managers and help with administration and troubleshooting. For more information, see [DISPLAY QMSTATUS, MQCMD\\_INQUIRE\\_Q\\_MGR\\_STATUS \(Inquire Queue Manager Status\) on Multiplatforms](#), and [MQCMD\\_INQUIRE\\_Q\\_MGR\\_STATUS \(Inquire Queue Manager Status\) Response on Multiplatforms](#).

## Addition of Native HA status attributes

From IBM MQ 9.3.2, new attributes have been added to the **DISPLAY QMSTATUS** command and the response from the **MQCMD\_INQUIRE\_Q\_MGR\_STATUS** PCF command that are specific to Native HA. These attributes report additional information about Native HA configurations and help with administration and troubleshooting. For more information, see [DISPLAY QMSTATUS, MQCMD\\_INQUIRE\\_Q\\_MGR\\_STATUS \(Inquire Queue Manager Status\) on Multiplatforms](#), and [MQCMD\\_INQUIRE\\_Q\\_MGR\\_STATUS \(Inquire Queue Manager Status\) Response on Multiplatforms](#).

## MQIPT trace file configuration enhancements

From IBM MQ 9.3.2, the maximum size of the trace files produced by IBM MQ Internet Pass-Thru (MQIPT), and the number of trace files that are kept, can be configured using the new **TraceFileSize** and **TraceFileCount** properties in the MQIPT configuration file. For more information about enabling trace in MQIPT, see [Tracing errors in IBM MQ Internet Pass-Thru](#).

## Support for TLS1.3 on managed .NET clients



From IBM MQ 9.3.2, support has been added for TLS1.3 on managed .NET clients, provided that the operating system supports TLS1.3.

For more information, see [Support for TLS1.3 on managed IBM MQ .NET and XMS .NET clients](#).

## New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging

From IBM MQ 9.3.2, for applications that use IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging, you can now choose a strategy for sharing TCP/IP connections between JMS objects.

You can choose one of the following strategies:

- The GLOBAL strategy. The GLOBAL strategy minimizes the number of open sockets at the expense of a longer connect time. This is the default strategy for non-reconnectable applications.
- The CONNECTION strategy. The CONNECTION strategy minimizes the connect time at the expense of higher socket usage. This strategy is always used for reconnectable applications. You can enable this strategy for non-reconnectable applications on an application-wide basis by setting the system property `com.ibm.mq.jms.channel.sharing` to the value CONNECTION

For more information, see [Sharing a TCP/IP connection in IBM MQ classes for JMS](#).

## Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging

From IBM MQ 9.3.2, when you develop modular applications you can configure your applications to use IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging. Each of the JAR files now includes modular names, and the JAR files are provided in directories that contain only the JAR files that are needed, with no duplication of packages between the JARs. Therefore, you can include the IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging in your application in a modular manner by requiring the appropriate module within your application, and including the appropriate directory in the module-path. This support is available within the JAR files that are provided with your IBM MQ installation and is also available in the redistributable client images.

For more information, see [Configuring your modular application to use IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging](#).

## New property to set the user context that is used for authorization in the messaging REST API


From IBM MQ 9.3.2, you can simplify your security configuration for the messaging REST API by configuring what user context is used for authorization when you are using the messaging REST API to send, receive, browse, or publish a message.

By default, all requests are authorized to use IBM MQ objects based on the user ID that is logged in to the messaging REST API. Therefore, each user that exists as a messaging REST API user must also exist as an IBM MQ user and be authorized to access the appropriate IBM MQ objects.


From IBM MQ 9.3.2, you can configure what user context is used for authorization when you are using the messaging REST API. That is, you can configure the messaging REST API such that each request is authorized to access IBM MQ objects based on the user that started the mqweb server instead of the user that is logged in to the messaging REST API. Therefore, each user that exists as a messaging REST API user does not need exist as an IBM MQ user. Only the user that starts the mqweb server needs authorization to access the IBM MQ objects.

For more information, see [Configuring the user context that is used for authorization in the messaging REST API](#).

### Related concepts

 [What's new in IBM MQ 9.3.2 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.2 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [What's new in IBM MQ 9.3.2 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[V 9.3.2](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [What's new in IBM MQ 9.3.2 for z/OS - Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.2 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

[“IBM MQ license information” on page 9](#)

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

[Multi](#) [MQ Adv.](#) [V 9.3.2](#) [What's new in IBM MQ 9.3.2 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.2 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

#### Administration

- [“Additional MFT resource monitor events” on page 123](#)
- [“Native HA entitlement” on page 123](#)

### Additional MFT resource monitor events

IBM MQ 9.3.2 adds three additional resource monitor verbose level logging events related to connecting and disconnecting from a queue manager.

For more information, see [Logging MFT resource monitors](#).

### Native HA entitlement

From IBM MQ 9.3.2, the Native HA high availability solution can be deployed in container-based queue managers in Red Hat OpenShift and Kubernetes v1.18 onward under the Advanced entitlement (in addition to IBM Cloud Pak for Integration entitlement). See [Native HA](#).

#### Related concepts

[Multi](#) [V 9.3.2](#) [What's new in IBM MQ 9.3.2 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

[z/OS](#) [V 9.3.2](#) [What's new in IBM MQ 9.3.2 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[V 9.3.2](#) [MQ Adv. VUE](#) [MQ Adv. z/OS](#) [What's new in IBM MQ 9.3.2 for z/OS - Advanced and Advanced VUE entitlement](#)

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[“IBM MQ license information” on page 9](#)

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

[z/OS](#) [V 9.3.2](#) [What's new in IBM MQ 9.3.2 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

#### Administration

- [“Enhancements to SMF accounting data” on page 124](#)

- [New application view in IBM MQ Console](#)

## Application Development

- [New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS](#)
- [Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging](#)
- [New property to set the user context that is used for authorization in the messaging REST API](#)

## Enhancements to SMF accounting data

From IBM MQ 9.3.2, SMF accounting data tracks a new datapoint, **StreamedN**, in the CSQDWQ macro, which allows you to track the number of messages being streamed using the *Streaming queues* feature added in IBM MQ 9.3.0. The header file CSQDSMFC.H has also been updated to accommodate this new datapoint.

For more information, see [Interpreting IBM MQ for z/OS accounting data](#) and [Streaming queues](#).

## New application view in IBM MQ Console

From IBM MQ 9.3.2, the console has a view that shows details of applications that are connected to queue managers. The view includes a panel that shows a quick view of how many applications are connected to a queue manager and enables you to drill down to see more details. For more information, see [IBM MQ Console: Working with applications](#).

## New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging

From IBM MQ 9.3.2, for applications that use IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging, you can now choose a strategy for sharing TCP/IP connections between JMS objects.

You can choose one of the following strategies:

- The GLOBAL strategy. The GLOBAL strategy minimizes the number of open sockets at the expense of a longer connect time. This is the default strategy for non-reconnectable applications.
- The CONNECTION strategy. The CONNECTION strategy minimizes the connect time at the expense of higher socket usage. This strategy is always used for reconnectable applications. You can enable this strategy for non-reconnectable applications on an application-wide basis by setting the system property `com.ibm.mq.jms.channel.sharing` to the value CONNECTION

For more information, see [Sharing a TCP/IP connection in IBM MQ classes for JMS](#).

## Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging

From IBM MQ 9.3.2, when you develop modular applications you can configure your applications to use IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging. Each of the JAR files now includes modular names, and the JAR files are provided in directories that contain only the JAR files that are needed, with no duplication of packages between the JARs. Therefore, you can include the IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging in your application in a modular manner by requiring the appropriate module within your application, and including the appropriate directory in the module-path. This support is available within the JAR files that are provided with your IBM MQ installation and is also available in the redistributable client images.

For more information, see [Configuring your modular application to use IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging](#).



## New property to set the user context that is used for authorization in the messaging REST API


From IBM MQ 9.3.2, you can simplify your security configuration for the messaging REST API by configuring what user context is used for authorization when you are using the messaging REST API to send, receive, browse, or publish a message.

By default, all requests are authorized to use IBM MQ objects based on the user ID that is logged in to the messaging REST API. Therefore, each user that exists as a messaging REST API user must also exist as an IBM MQ user and be authorized to access the appropriate IBM MQ objects.

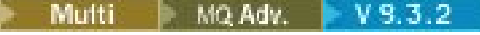
From IBM MQ 9.3.2, you can configure what user context is used for authorization when you are using the messaging REST API. That is, you can configure the messaging REST API such that each request is authorized to access IBM MQ objects based on the user that started the mqweb server instead of the user that is logged in to the messaging REST API. Therefore, each user that exists as a messaging REST API user does not need exist as an IBM MQ user. Only the user that starts the mqweb server needs authorization to access the IBM MQ objects.

For more information, see [Configuring the user context that is used for authorization in the messaging REST API](#).


### Related concepts

 [What's new in IBM MQ 9.3.2 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

 [What's new in IBM MQ 9.3.2 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.2 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

 [What's new in IBM MQ 9.3.2 for z/OS - Advanced and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.2 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

“IBM MQ license information” on page 9

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

 [\*\*What's new in IBM MQ 9.3.2 for z/OS - Advanced and Advanced VUE entitlement\*\*](#)

On z/OS, IBM MQ 9.3.2 delivers an enhancement that is available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

### Administration


- [“Additional MFT resource monitor events” on page 125](#)

### Additional MFT resource monitor events

IBM MQ 9.3.2 adds three additional resource monitor verbose level logging events related to connecting and disconnecting from a queue manager.

For more information, see [Logging MFT resource monitors](#).

### Related concepts

 [What's new in IBM MQ 9.3.2 for Multiplatforms - base and Advanced entitlement](#)



For Multiplatforms, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

**Multi** **MQ Adv.** **V 9.3.2** [What's new in IBM MQ 9.3.2 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.2 delivers two enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

**z/OS** **V 9.3.2** [What's new in IBM MQ 9.3.2 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.2 delivers a number of new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[“IBM MQ license information” on page 9](#)

[What you can purchase with IBM MQ and what each purchase entitles you to install.](#)

## **V 9.3.2** What's changed in IBM MQ 9.3.2

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

### Installation and migration

- **Removed** **Linux** [“Migration considerations relating to IBM MQ Bridge to blockchain removal” on page 126](#)

### Administration

- [“New OAMLdapResponseWarningTime parameter in TuningParameters stanza of qm.ini” on page 126](#)
- [“Changed return code for endmqm” on page 126](#)

### Containers

- [“Changed environment variables for the IBM MQ Advanced for Developers container image” on page 127](#)
- [“For use in containers, a certificate must have a unique Subject Distinguished Name” on page 127](#)

## Migration considerations relating to IBM MQ Bridge to blockchain removal

**Removed** **Linux**

For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2.

On Linux for x86-64 only, if you are migrating on an installation where the IBM MQ Bridge to blockchain is present, you must remove it before you upgrade to IBM MQ 9.3.2 or later.

## 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](#).

## Changed return code for endmqm

If an **endmqm** command was issued to a queue manager that was in the process of starting up, the generic code 71 'unexpected error' was returned. An attempt to end a queue manager that is starting up now returns the code 4 'Queue manager is being started'. See [endmqm](#).

## Changed environment variables for the IBM MQ Advanced for Developers container image

Three new environment variables are added:

- **MQ\_LOGGING\_CONSOLE\_SOURCE**
- **MQ\_LOGGING\_CONSOLE\_FORMAT** (which supersedes **LOG\_FORMAT**)
- **MQ\_LOGGING\_CONSOLE\_EXCLUDE\_ID**

See [IBM MQ Advanced for Developers container image](#).

## For use in containers, a certificate must have a unique Subject Distinguished Name

Queue manager certificates with the same Subject Distinguished Name (DN) as the issuer (CA) certificate are not supported for use with IBM MQ containers. The product now checks for this condition, and stops it from occurring.

### Related concepts

**V 9.3.2** [What's new in IBM MQ 9.3.2](#)

IBM MQ 9.3.2 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

**V 9.3.2** [New, changed, and removed messages in IBM MQ 9.3.2](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.2.

**V 9.3.2** [Deprecated, stabilized, and removed features in IBM MQ 9.3.2](#)

There are deprecations and removals from IBM MQ 9.3.2.

[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 9.3.2** New, changed, and removed messages in IBM MQ 9.3.2

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.2.

- **Multi** [“New, changed, and removed IBM MQ AMQ messages” on page 128](#)
- [“New, changed, and removed Managed File Transfer messages” on page 128](#)
- **Windows** **Linux** **AIX** [“New, changed and removed MQ Telemetry messages” on page 128](#)
- [“New, changed, and removed REST API messages” on page 128](#)
- [“New, changed, and removed IBM MQ Console messages” on page 129](#)
- **MQ Adv.** **Linux** [“New, changed, and removed IBM MQ Bridge to blockchain messages” on page 129](#)
- **Linux** [“New, changed, and removed IBM MQ Bridge to Salesforce messages” on page 129](#)
- **Windows** **Linux** **AIX** [“New, changed and removed IBM MQ Internet Pass-Thru messages” on page 129](#)
- [“New, changed and removed MQJMS messages” on page 129](#)
- [“New, changed and removed JSON messages” on page 129](#)
- **z/OS** [“New, changed, and removed z/OS messages” on page 129](#)

## New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new for IBM MQ 9.3.2:

### **AMQ3xxx: Utilities and tools**

AMQ3489W - AMQ3495I

AMQ3633E - AMQ3634E

### **AMQ4xxx: User interface messages (Windows and Linux systems)**

AMQ4640E

### **AMQ5xxx: Installable services**

AMQ5544W

### **AMQ8xxx: Administration**

AMQ8959I

The following AMQ messages are changed for IBM MQ 9.3.2:

### **AMQ3xxx: Utilities and tools**

AMQ3554I (Added a colon to the Message)

AMQ3583W (Response added)

AMQ3595W (Explanation extended)

### **AMQ5xxx: Installable services**

AMQ5708E (Message, Explanation, and Response re-written)

### **AMQ6xxx: Common Services**

AMQ6537I (Usage rewritten)

AMQ6538I (Usage rewritten)

AMQ6648I (Usage syntax updated)

### **AMQ7xxx: IBM MQ product**

AMQ7493W (QSTATUS attribute name changed in Response)

### **AMQ9xxx: Remote**

AMQ9616E (Explanation and Response updated)

AMQ9722W (Explanation added)

AMQ9723I (Explanation and Response added)

All HP Integrity NonStop Server versions of messages are removed for IBM MQ 9.3.2.

## New, changed, and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.3.2:

### **BFGAG0001 - BFGAG9999: MFT agents messages**

BFGAG0215W - BFGAG0216W

### **BFGDB0001 - BFGDB9999: MFT database logger messages**

BFGDB0084I - BFGDB0085I

There are no changed or removed Managed File Transfer for IBM MQ 9.3.2.

## New, changed and removed MQ Telemetry messages

Windows

Linux

AIX

There are no new, changed, or removed MQ Telemetry messages for IBM MQ 9.3.2.

## New, changed, and removed REST API messages

The following REST API messages are changed for IBM MQ 9.3.2:

### **MQWB10xx: REST API messages MQWB1000 to 1099**

MQWB1012I (Usage extended)

### **MQWB11xx: REST API messages MQWB1100 to 1199**

MQWB1148E (Response extended)

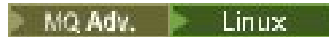
MQWB1156E (Explanation and Response rewritten)

There are no new or removed REST API messages for IBM MQ 9.3.2.

### **New, changed, and removed IBM MQ Console messages**

There are no new, changed, or removed [IBM MQ Console messages](#) for IBM MQ 9.3.2.

### **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 9.3.2.

**Note:** For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2.

### **New, changed, and removed IBM MQ Bridge to Salesforce messages**



There are no new, changed, or removed [IBM MQ Bridge to Salesforce messages](#) for IBM MQ 9.3.2.

### **New, changed and removed IBM MQ Internet Pass-Thru messages**



There are no new, changed, or removed [IBM MQ Internet Pass-Thru messages](#) for IBM MQ 9.3.2.

### **New, changed and removed MQJMS messages**

There are no new, changed, or removed [MQJMS messages](#) for IBM MQ 9.3.2.

### **New, changed and removed JSON messages**

There are no new, changed, or removed [JSON format diagnostic messages](#) for IBM MQ 9.3.2.

### **New, changed, and removed z/OS messages**



The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.3.2:

#### **Coupling Facility manager messages (CSQE...)**

CSQE222E (System programmer response extended)

#### **Recovery log manager messages (CSQJ...)**

CSQJ499I (System action extended)

#### **Command server messages (CSQN...)**

CSQN207I to 2CSQN212E (System programmer response reworded slightly)

#### **Utilities messages (CSQU...)**

CSQU030E (Message altered to include variable name "csectname")

#### **Distributed queuing messages (CSQX...)**

CSQX113E (System action reworded)

CSQX213E (System programmer response extended)

CSQX631E (Message and Explanation updated)

CSQX670I (System programmer response updated and extended)

There are no new or removed IBM MQ for z/OS CSQ messages for IBM MQ 9.3.2.

### Related concepts

**V 9.3.2** [What's new in IBM MQ 9.3.2](#)

IBM MQ 9.3.2 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

**V 9.3.2** [What's changed in IBM MQ 9.3.2](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.2** [Deprecated, stabilized, and removed features in IBM MQ 9.3.2](#)

There are deprecations and removals from IBM MQ 9.3.2.

### Related reference

[IBM MQ AMQ messages](#)

[Managed File Transfer diagnostic messages](#)

[Telemetry messages](#)

[REST API messages](#)

[IBM MQ Console messages](#)

[IBM MQ Bridge to blockchain messages](#)

[IBM MQ Bridge to Salesforce messages](#)

[IBM MQ Internet Pass-Thru messages](#)

[MQJMS messages](#)

[JSON format diagnostic messages](#)

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

### **V 9.3.2** **Deprecated, stabilized, and removed features in IBM MQ 9.3.2**

There are deprecations and removals from IBM MQ 9.3.2.

### Deprecated features

**Deprecated**

Feature	Description
Deprecation: The <b>LOG_FORMAT</b> environment variable of the IBM MQ Advanced for Developers container image.	For the IBM MQ Advanced for Developers container image, the <b>LOG_FORMAT</b> environment variable is deprecated across all releases from February 16 2023. It is superseded by the <b>MQ_LOGGING_CONSOLE_FORMAT</b> variable. See <a href="#">IBM MQ Advanced for Developers container image</a> .
Deprecation: Use of the Java security manager with IBM MQ Internet Pass-Thru.	The use of the Java security manager with IBM MQ Internet Pass-Thru (MQIPT) is deprecated from February 16 2023, due to the Java security manager having been deprecated for removal in a future release of Java.

### Removed features

**Removed**

Table 12. Removals at IBM MQ 9.3.2

Feature	Description
Removal: IBM MQ Bridge to blockchain	For Continuous Delivery, the IBM MQ Bridge to blockchain has been removed from the product at IBM MQ 9.3.2. IBM MQ 9.3.1 is the last Continuous Delivery release it is delivered with.

### Related concepts

**V 9.3.2** [What's new in IBM MQ 9.3.2](#)

IBM MQ 9.3.2 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

**V 9.3.2** [What's changed in IBM MQ 9.3.2](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.2** [New, changed, and removed messages in IBM MQ 9.3.2](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.2.

## **V 9.3.1** What's new and changed in IBM MQ 9.3.1

IBM MQ 9.3.1, 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 9.3.1** What's new in IBM MQ 9.3.1

IBM MQ 9.3.1 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 for IBM MQ for Multiplatforms - base and Advanced entitlement

**Multi**

On Multiplatforms, the following features and enhancements are available with both base product entitlement, and with Advanced entitlement.

### Administration

- [“New CAPEXPY attribute” on page 133](#)
- [“New IBM MQ Console layout” on page 134](#)

### Security

- [“Changes to MQCSP password protection in MQIPT” on page 133](#)

### Application development

- **Windows** **Linux** [“New set of .NET 6 libraries” on page 133](#)

## New IBM MQ for Multiplatforms features - Advanced entitlement only

**Multi** **MQ Adv.**

The following features and enhancements are available on Multiplatforms only with Advanced entitlement.

### Configuring IBM MQ

- [“RDQM available on RHEL 9” on page 134](#)

## New for IBM MQ for z/OS - base, Advanced, and Advanced VUE entitlement



The following features and enhancements are available both with base product entitlement, and with IBM MQ Advanced for z/OS (Advanced) and IBM MQ Advanced for z/OS Value Unit Edition (Advanced VUE) entitlement.

### Administration

- [“Increased scalability for channel initiator” on page 135](#)
- [“Enhancements to SMF queue statistics records” on page 135](#)
- [“Streaming queues supported with shared queues” on page 135](#)
- [“New IBM MQ Console layout” on page 135](#)

### Related concepts



[What's changed in IBM MQ 9.3.1](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 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 9.3.1](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.1.



[Deprecated, stabilized, and removed features in IBM MQ 9.3.1](#)

There are deprecations from IBM MQ 9.3.1.

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icon are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related information

[System Requirements for IBM MQ](#)

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



**Advanced entitlement**

For Multiplatforms, IBM MQ 9.3.1 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.



**Administration**

- [“New CAPEXPY attribute” on page 133](#)
- [“New IBM MQ Console layout” on page 134](#)

**Security**

- [“Changes to MQCSP password protection in MQIPT” on page 133](#)

**Application development**

-   [“New set of .NET 6 libraries” on page 133](#)

**New CAPEXPY attribute**

From IBM MQ 9.3.1, **CAPEXPY** becomes a separate attribute, replacing the text based attribute in the **CUSTOM** field.

For more information, see [CAPEXPY](#) in the **ALTER QUEUES** command and [Enforcing lower expiration times](#).

**Changes to MQCSP password protection in MQIPT**



From IBM MQ 9.3.1, IBM MQ Internet Pass-Thru (MQIPT) can add or remove protection for passwords in MQCSP structures, in order to maintain compatibility between the client and queue manager for MQIPT routes that add or remove TLS encryption. MQCSP password protection is not supported in earlier versions of MQIPT, for routes that add or remove TLS encryption.

From IBM MQ 9.3.1, the default value of the new **PasswordProtection** route property allows MQIPT to add, but not remove, MQCSP password protection. Connections to a MQIPT route that adds TLS encryption, that previously worked, might fail with reason code MQRC\_PASSWORD\_PROTECTION\_ERROR. To resolve this issue, set the value of the **PasswordProtection** property to `compatible` in the MQIPT route configuration.

For more information about MQCSP password protection, see [MQCSP password protection](#).

**New set of .NET 6 libraries**

IBM MQ 9.3.1 provides a new set of .NET 6 libraries for IBM MQ .NET (`amqmdnetstd.dll`) and XMS .NET (`amqmxmsstd.dll`), that is libraries built against .NET 6 as the target framework. These files are available in the following locations:

-  On Windows: `MQ_INSTALLATION_PATH/bin`
-  On Linux: `MQ_INSTALLATION_PATH/lib64`

The naming convention for these libraries remains the same as for the IBM MQ .NET Standard libraries, that is `amqmdnetstd.dll` for IBM MQ .NET and `amqmxmsstd.dll` for XMS .NET. Keeping the same naming convention makes migration easier and means that you do not need to re-build your .NET Core or .NET applications.

For more information, see [Installing IBM MQ classes for .NET](#) and [Using IBM MQ classes for XMS .NET](#).

## New IBM MQ Console layout

The console layout has changed at the queue manager view level. The new layout is described in the topics under [Quick tour of the IBM MQ Console - CD only](#).

### Related concepts

[V 9.3.1](#) [Multi](#) [MQ Adv.](#) [What's new in IBM MQ 9.3.1 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.1 delivers an enhancement for IBM MQ that is available only with IBM MQ Advanced for Multiplatforms entitlement.

[V 9.3.1](#) [z/OS](#) [What's new in IBM MQ 9.3.1 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.1 delivers a number of enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[“IBM MQ license information” on page 9](#)

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

[V 9.3.1](#) [Multi](#) [MQ Adv.](#) **[What's new in IBM MQ 9.3.1 for Multiplatforms - Advanced entitlement only](#)**

IBM MQ 9.3.1 delivers an enhancement for IBM MQ that is available only with IBM MQ Advanced for Multiplatforms entitlement.

### Configuration

- [“RDQM available on RHEL 9” on page 134](#)

## RDQM available on RHEL 9

You can now install RDQM on RHEL 9, see [Installing RDQM](#). You can also migrate an existing RDQM configuration from RHEL 7 or RHEL 8 to RHEL 9, see [Migrating an RDQM configuration from RHEL 7 or RHEL 8 to RHEL 9](#).

### Related concepts

[V 9.3.1](#) [Multi](#) [What's new in IBM MQ 9.3.1 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.1 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

[V 9.3.1](#) [z/OS](#) [What's new in IBM MQ 9.3.1 for z/OS - base and Advanced VUE entitlement](#)

On z/OS, IBM MQ 9.3.1 delivers a number of enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

[“IBM MQ license information” on page 9](#)

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

[V 9.3.1](#) [z/OS](#) **[What's new in IBM MQ 9.3.1 for z/OS - base and Advanced VUE entitlement](#)**

On z/OS, IBM MQ 9.3.1 delivers a number of enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

### Administration

- [“Increased scalability for channel initiator” on page 135](#)
- [“Enhancements to SMF queue statistics records” on page 135](#)
- [“Streaming queues supported with shared queues” on page 135](#)
- [“New IBM MQ Console layout” on page 135](#)

## Increased scalability for channel initiator

From IBM MQ 9.3.1, the scalability of the channel initiator has been improved to allow increased numbers of server-connection channels to run concurrently, regardless of the size of the messages that are being transferred. Previously, if large messages were being transferred, the maximum number of server-connection channels that could actually run would be significantly less than the configurable maximum of 9999 channels.

The channel initiator now allocates the buffers used by server-connection channels to transfer messages in 64-bit storage, instead of 31-bit storage. If sufficient 64-bit storage is available to the channel initiator then many more large buffers can be allocated concurrently, providing increased scalability. Buffers used by message channels, for example, sender-receiver channels remain in 31-bit storage.

When migrating to IBM MQ 9.3.1 you must increase the **MEMLIMIT** parameter in your channel initiator JCL. For more information on setting **MEMLIMIT**, see [Storage configuration](#).

## Enhancements to SMF queue statistics records

IBM MQ 9.3.1 enhances the new SMF queue statistics records from IBM MQ 9.3.0. The new statistics include all the **DISPLAY QSTATUS** information in the record to allow you to monitor usage and performance of your queue over time easier than you ever have before. For more information, see [Queue data records IBM MQ 9.3.1 release](#).

## Streaming queues supported with shared queues

From IBM MQ 9.3.1 a shared queue, that is one with **QSGDISP (SHARED)**, can have the **STREAMQ** attribute set on it, or can be referenced by the **STREAMQ** attribute of another queue.

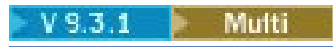
With APAR PH49686, the same functionality is also available on an IBM MQ 9.3.0 queue manager.

For more information, see [Streaming queues](#).

## New IBM MQ Console layout

The console layout has changed at the queue manager view level. The new layout is described in the topics under [Quick tour of the IBM MQ Console - CD only](#).

### Related concepts

 [What's new in IBM MQ 9.3.1 for Multiplatforms - base and Advanced entitlement](#)

For Multiplatforms, IBM MQ 9.3.1 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

 [What's new in IBM MQ 9.3.1 for Multiplatforms - Advanced entitlement only](#)

IBM MQ 9.3.1 delivers an enhancement for IBM MQ that is available only with IBM MQ Advanced for Multiplatforms entitlement.

[“IBM MQ license information” on page 9](#)

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




## What's changed in IBM MQ 9.3.1

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

### Client application changes

- [“Changes to IBM MQ .NET Standard client libraries” on page 136](#)

## Command and configuration changes

-  “Changes to the RECOVER CFSTRUCT command” on page 136
-   “Changes to the output of the fteDisplayVersion command” on page 136

## Installation and migration changes



- “Changes to the features that are supplied with the mqweb server” on page 137


## Security changes

- “Change to SSLCIPH property for AMQP channels” on page 137
- “Change to spelling of Java system property used by Managed File Transfer” on page 137

## Changes to IBM MQ .NET Standard client libraries

From IBM MQ 9.3.1, the existing IBM MQ .NET (amqmdnetstd.dll) and XMS .NET (amqmxmsstd.dll) .NET Standard libraries have been moved to a new location in the IBM MQ client installation package. These files are now available in the following locations:

-  On Windows: `MQ_INSTALLATION_PATH\bin\netstandard2.0`
-  On Linux: `MQ_INSTALLATION_PATH\lib64\netstandard2.0`

 From IBM MQ 9.3.1, a new warning CS0618 is thrown to an application during compile time when IBM MQ .NET Standard libraries are referenced to the application. The IBM MQ .NET Standard libraries are deprecated, and IBM intends to remove them in a future IBM MQ release.

If a .NET Framework application is compiled using `amqmdnetstd.dll` or `amqmxmsstd.dll` from a version lower than IBM MQ 9.3.1 and the same application is run using the .NET 6 based IBM MQ client libraries, then the following `FileLoadException` type of exception will be thrown by .NET:

```
Exception caught: System.IO.FileLoadException: Could not load file or assembly 'amqmdnetstd, Version=x.x.x.x, Culture=neutral, PublicKeyToken=23d6cb914eeaac0e' or one of its dependencies. The located assembly's manifest definition does not match the assembly reference. (Exception from HRESULT: 0x80131040)
```

```
File name: 'amqmdnetstd, Version=x.x.x.x, Culture=neutral, PublicKeyToken=23d6cb914eeaac0e'
```

To resolve this error, the libraries present in `MQ_INSTALLATION_PATH/bin/netstandard2.0` must be copied to the directory from where the .NET Framework application is running.

For more information, see [Installing IBM MQ classes for .NET](#) and [Using IBM MQ classes for XMS .NET](#).

## Changes to the RECOVER CFSTRUCT command



From IBM MQ 9.3.1, **RECOVER CFSTRUCT** processing has been changed to make use of 64 bit storage instead of 31 bit storage. If you are likely to issue the command for structures that contain more than a few million messages you should increase the **MEMLIMIT** parameter in the relevant queue manager's JCL by 500MB.

For more information, see [Queue manager storage configuration](#).

## Changes to the output of the fteDisplayVersion command

Before IBM MQ 9.3.1, the output from the **fteDisplayVersion** command included components that MFT does not use. From IBM MQ 9.3.1, these components are no longer included in the output. For more information, see [fteDisplayVersion \(display installed version of MFT\)](#).

## Changes to the features that are supplied with the mqweb server

The mqweb server is a WebSphere Liberty server that is used to support the IBM MQ Console and REST API. From IBM MQ 9.3.1, the WebSphere Liberty features that are supplied with the mqweb server are reduced to only those that are required to run, secure, and monitor the IBM MQ Console and REST API. This significantly reduces the size of the installation files for the mqweb server.

## Change to SSLCIPH property for AMQP channels

From IBM MQ 9.3.1, AMQP channels support ANY\* generic CipherSpecs. For more information, see [Configuring AMQP clients with TLS](#) and [Enabling CipherSpecs](#).

## Change to spelling of Java system property used by Managed File Transfer

Before IBM MQ 9.3.1, the name of this Java system property that Managed File Transfer uses when checking if a user has specified a file containing the initial key that should be used for encrypting and decrypting credentials was misspelled in the product code as `com.ibm.wmqfte.cred.keyfile`.

From IBM MQ 9.3.1, the spelling of the property name is corrected to be `com.ibm.wmqfte.cred.keyfile`. Managed File Transfer uses both versions of the Java system property when checking if a user has specified a file containing the initial key that should be used for encrypting and decrypting credentials. This allows you to use the correct spelling of the property name, while maintaining backwards compatibility with the old misspelled name. Note that if both Java system properties are set, then the value of the correctly spelled property `com.ibm.wmqfte.cred.keyfile` is used. For more information, see [Protecting passwords in IBM MQ component configuration files](#).

### Related concepts

**V 9.3.1** [What's new in IBM MQ 9.3.1](#)

IBM MQ 9.3.1 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

**V 9.3.1** [New, changed, and removed messages in IBM MQ 9.3.1](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.1.

**V 9.3.1** [Deprecated, stabilized, and removed features in IBM MQ 9.3.1](#)

There are deprecations from IBM MQ 9.3.1.

[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 9.3.1** New, changed, and removed messages in IBM MQ 9.3.1

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.1.

- **Multi** [“New, changed, and removed IBM MQ AMQ messages” on page 138](#)
- [“New, changed, and removed Managed File Transfer messages” on page 138](#)
- **Windows** **Linux** **AIX** [“New, changed and removed MQ Telemetry messages” on page 140](#)
- [“New, changed, and removed REST API messages” on page 140](#)
- [“New, changed, and removed IBM MQ Console messages” on page 140](#)
- **Deprecated** **MQ Adv.** **Linux** [“New, changed, and removed IBM MQ Bridge to blockchain messages” on page 140](#)

- **Deprecated** **Linux** “[New, changed, and removed IBM MQ Bridge to Salesforce messages](#)” on page 140
- **Windows** **Linux** **AIX** “[New, changed and removed IBM MQ Internet Pass-Thru messages](#)” on page 140
- “[New, changed and removed MQJMS messages](#)” on page 140
- “[New, changed and removed JSON messages](#)” on page 140
- **z/OS** “[New, changed, and removed z/OS messages](#)” on page 140

## New, changed, and removed IBM MQ AMQ messages

### Multi

The following AMQ messages are new for IBM MQ 9.3.1:

#### **AMQ5xxx: Installable services**

AMQ5782I

#### **AMQ6xxx: Common Services**

AMQ6217E

AMQ6342E

AMQ6343E

#### **AMQ8xxx: Administration**

AMQ8D43 (IBM i)

The following AMQ messages are changed for IBM MQ 9.3.1:

#### **AMQ3xxx: Utilities and tools**

AMQ3209E (Response extended)

AMQ3235I (Explanation simplified)

AMQ3239E (Response extended)

AMQ3696E ("System directory" changed to "System file or directory" in Message and Explanation)

#### **AMQ5xxx: Installable services**

AMQ5605I (Extra switched added to usage options)

AMQ5774E (Typo fixed)

#### **AMQ6xxx: Common Services**

AMQ6162E (Message and Explanation extended)

AMQ6620I (**addmqm** and **rmvmqinf** removed from the list of available commands)

AMQ6624I (**amqqmutil** and **-o** removed from the list of available commands)

#### **AMQ7xxx: IBM MQ product**

AMQ7059E (Message and Explanation extended)

AMQ7062E (Explanation extended)

#### **AMQ8xxx: Administration**

AMQ8499I (Missing bracket added in Usage. Description of -w switch extended)

#### **AMQ9xxx: Remote**

AMQ9271E (Explanation and Response rewritten)

AMQ9407W (CAPEXPY added to the Explanation and Response)

There are no removed AMQ messages for IBM MQ 9.3.1.

## New, changed, and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.3.1:

**BFGAG0001 - BFGAG9999: MFT agents messages**

BFGAG0213W

**BFGCH0001 - BFCHR9999: MFT command handler messages**

BFGCH0131I

**BFGCL0001 - BFGCL9999: MFT commands messages**

BFGCL0830W - BFGCL0834E

**BFGIO0001 - BFGIO9999: MFT filesystem I/O messages**

BFGIO0416E

**BFGUB0001 - BFGUB9999: MFT configuration and properties messages**

BFGUB0088E

The following Managed File Transfer messages are changed for IBM MQ 9.3.1:

**BFGUB0001 - BFGUB9999: MFT configuration and properties messages**

BFGUB0072E (Message updated)

The following Managed File Transfer messages are removed for IBM MQ 9.3.1:

**BFGCL0001 - BFGCL9999: MFT commands messages**

BFGCL0484E

BFGCL0505E

**BFGCM0001 - BFGCM9999: MFT migrating from File Transfer Edition messages**

BFGCM0004E - BFGCM0005E

BFGCM0008E - BFGCM0017E

BFGCM0020E - BFGCM0023E

BFGCM0028E - BFGCM0031E

BFGCM0034E - BFGCM0037E

BFGCM0040E - BFGCM0043E

BFGCM0046E - BFGCM0049E

BFGCM0052E - BFGCM0055E

BFGCM0068E - BFGCM0069E

BFGCM0072E - BFGCM0073E

BFGCM0076E

BFGCM0080E

BFGCM0084E

BFGCM0088E

BFGCM0106E - BFGCM0107E

BFGCM0112E

BFGCM0114E - BFGCM0118E

BFGCM0120E - BFGCM0121E

BFGCM0124E

BFGCM0126E - BFGCM0127E

BFGCM0129E - BFGCM0130E

BFGCM0132E - BFGCM0133E

BFGCM0135E - BFGCM0136E

BFGCM0143E

BFGCM0149E

BFGCM0151W - BFGCM0159W

BFGCM0203E

## New, changed and removed MQ Telemetry messages



There are no new, changed, or removed MQ Telemetry messages for IBM MQ 9.3.1.

## New, changed, and removed REST API messages

There are no new, changed, or removed REST API messages for IBM MQ 9.3.1.

## New, changed, and removed IBM MQ Console messages

There are no new, changed, or removed [IBM MQ Console](#) messages for IBM MQ 9.3.1.

## 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 9.3.1.

## New, changed, and removed IBM MQ Bridge to Salesforce messages



There are no new, changed, or removed [IBM MQ Bridge to Salesforce](#) messages for IBM MQ 9.3.1.

## New, changed and removed IBM MQ Internet Pass-Thru messages



The following [IBM MQ Internet Pass-Thru](#) messages are changed for IBM MQ 9.3.1:

### **MQCPxxxx: MQIPT messages**

MQCPE079 (Explanation and User Response extended)

MQCPE100 (Explanation and User Response extended)

MQCPE112 (User Response extended)

MQCPE113 (User Response extended)

There are no new or removed [IBM MQ Internet Pass-Thru](#) messages for IBM MQ 9.3.1.

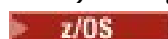
## New, changed and removed MQJMS messages

There are no new, changed, or removed [MQJMS messages](#) for IBM MQ 9.3.1.

## New, changed and removed JSON messages

There are no new, changed, or removed [JSON format diagnostic messages](#) for IBM MQ 9.3.1.

## New, changed, and removed z/OS messages



The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.3.1:

### **Message manager messages (CSQM...)**

CSQM586E - CSQM591I

### **Utilities messages (CSQU...)**

CSQU599I

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.3.1:



### **Distributed queuing messages (CSQX...)**

- CSQX004I (Message and Explanation rewritten)
- CSQX113E (updated System action)
- CSQX208E (shortened System programmer response)
- CSQX476E (typo fixed in System programmer response)
- CSQX645E (extended System programmer response)
- CSQX694E (re-typed as CSQX694I)

### **IBM MQ-IMS bridge Messages (CSQ2...)**

- CSQ2007I (typo fixed in System programmer response)

### **Db2 manager messages (CSQ5...)**

- CSQ5005E (rewritten System programmer response)
- CSQ5007E (updated System action)

"terminate" has changed to "end" in many messages

There are no removed IBM MQ for z/OS CSQ messages for IBM MQ 9.3.1.

### **Related concepts**

**V 9.3.1** [What's new in IBM MQ 9.3.1](#)

IBM MQ 9.3.1 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

**V 9.3.1** [What's changed in IBM MQ 9.3.1](#)

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

**V 9.3.1** [Deprecated, stabilized, and removed features in IBM MQ 9.3.1](#)

There are deprecations from IBM MQ 9.3.1.

### **Related reference**

[IBM MQ AMQ messages](#)

[Managed File Transfer diagnostic messages](#)

[Telemetry messages](#)

[REST API messages](#)

[IBM MQ Console messages](#)

[IBM MQ Bridge to blockchain messages](#)

[IBM MQ Bridge to Salesforce messages](#)

[IBM MQ Internet Pass-Thru messages](#)

[MQJMS messages](#)

[JSON format diagnostic messages](#)

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

**V 9.3.1** **Deprecated, stabilized, and removed features in IBM MQ 9.3.1**

There are deprecations from IBM MQ 9.3.1.

### **Deprecated features**

**Deprecated**

Table 13. Deprecations at IBM MQ 9.3.1

Feature	Description
<a href="#">V 9.3.1</a> Deprecation: IBM MQ .NET Standard libraries	From IBM MQ 9.3.1, the existing IBM MQ .NET (amqmdnetstd.dll) and XMS .NET (amqmxmsstd.dll) .NET Standard libraries are deprecated. For more information, see <a href="#">Installing IBM MQ classes for .NET</a> and <a href="#">Using IBM MQ classes for XMS .NET</a> .  IBM intends to remove support for these libraries in a future IBM MQ release.
Deprecation: IBM MQ Bridge to blockchain	The IBM MQ Bridge to blockchain component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see <a href="#">US Announcement letter 222-341</a> ). Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.
Deprecation: IBM MQ Bridge to Salesforce	The IBM MQ Bridge to Salesforce component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see <a href="#">US Announcement letter 222-431</a> ). Salesforce connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.

### Related concepts

[V 9.3.1](#) What's new in IBM MQ 9.3.1

IBM MQ 9.3.1 delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

[V 9.3.1](#) What's changed in IBM MQ 9.3.1

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

[V 9.3.1](#) [New, changed, and removed messages in IBM MQ 9.3.1](#)

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.3.1.

## **LTS** What's changed in IBM MQ 9.3.0 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 versioning](#) and [IBM MQ FAQ for Long Term Support and Continuous Delivery releases](#).

For Long Term Support, maintenance updates for IBM MQ 9.3.0 for [Multiplatforms](#) and IBM MQ Appliance 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 9.3.0 LTS release is numbered 9.3.0.1.

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

**z/OS** For z/OS, maintenance updates are provided as Program Temporary Fixes (PTFs) or cumulative security updates (CSUs). For z/OS UNIX System Services features (that is, JMS, REST API and IBM MQ Console, 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.

**Note:** **Deprecated** The IBM MQ Bridge to blockchain component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see [US Announcement letter 222-341](#)) and IBM intends to remove the capability from Long Term Support releases in upcoming fix packs. Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration. If you have applications that will be impacted by this change, please contact IBM Support.

## IBM MQ 9.3.0 CSU 17

V9.3.0.17

### Removal of support for RSA key exchange when operating in FIPS mode

From IBM MQ 9.3.0 CSU 17, 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 9.3.0 Fix Pack 15

V9.3.0.15

**Note:**   The IBM MQ Bridge to blockchain component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see [US Announcement letter 222-341](#)) and the capability is removed from Long Term Support at IBM MQ 9.3.0 Fix Pack 15. Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration. If you have applications that will be impacted by this change, please contact IBM Support.

## IBM MQ 9.3.0 Fix Pack 10

V9.3.0.10

- [“Change to spelling of Java system property used by Managed File Transfer” on page 145](#)

## IBM MQ 9.3.0 Fix Pack 5

V9.3.0.5

- [“New OAMLdapResponseWarningTime parameter in TuningParameters stanza of qm.ini” on page 145](#)

## IBM MQ 9.3.0 Fix Pack 2

V9.3.0.2

There are no documentation updates relating to changes to functions and resources in IBM MQ 9.3.0 Fix Pack 2.

## IBM MQ 9.3.0 Fix Pack 1

V9.3.0.1

There are no documentation updates relating to changes to functions and resources in IBM MQ 9.3.0 Fix Pack 1.

### Related concepts

[“What's new in IBM MQ 9.3.0” on page 28](#)

IBM MQ 9.3.0 delivers features and enhancements beyond those that were available in IBM MQ 9.2.0 Long Term Support. The features that you have access to depends on your product entitlement.

[“What's new and changed in IBM MQ 9.3.x Continuous Delivery” on page 81](#)

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

[“What was new and changed in earlier versions” on page 146](#)

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 9.3.

[“Icons used in the product documentation” on page 151](#)

The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icon are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Related tasks

[Applying maintenance to IBM MQ](#)

### Related information

[System Requirements for IBM MQ](#)

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

## **V9.3.0.10 What's changed in IBM MQ 9.3.0 Fix Pack 10**

IBM MQ 9.3.0 Fix Pack 10 includes a resource change.

- [“Change to spelling of Java system property used by Managed File Transfer” on page 145](#)

### **Change to spelling of Java system property used by Managed File Transfer**

Before IBM MQ 9.3.0 Fix Pack 10, the name of this Java system property that Managed File Transfer uses when checking if a user has specified a file containing the initial key that should be used for encrypting and decrypting credentials was misspelled in the product code as `com.ibm.wqmfte.cred.keyfile`.

From IBM MQ 9.3.0 Fix Pack 10, the spelling of the property name is corrected to be `com.ibm.wmqfte.cred.keyfile`. Managed File Transfer uses both versions of the Java system property when checking if a user has specified a file containing the initial key that should be used for encrypting and decrypting credentials. This allows you to use the correct spelling of the property name, while maintaining backwards compatibility with the old misspelled name. Note that if both Java system properties are set, then the value of the correctly spelled property `com.ibm.wmqfte.cred.keyfile` is used. For more information, see [Protecting passwords in IBM MQ component configuration files](#).

#### **Related information**

[System Requirements for IBM MQ](#)

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

## **V9.3.0.5 What's changed in IBM MQ 9.3.0 Fix Pack 5**

IBM MQ 9.3.0 Fix Pack 5 includes a resource change.

- [“New OAMLdapResponseWarningTime parameter in TuningParameters stanza of qm.ini” on page 145](#)
- [“Change to RPM signature version” on page 145](#)

### **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](#).

### **Change to RPM signature version**

The RPM signature version was changed to v4 at IBM MQ 9.3.0 Fix Pack 5 for Long Term Support. As part of this, the private key used by IBM to sign the packages was changed, and so if you want to validate RPM packages at or above these levels, you need to import the newer IBM MQ public signing gpg key. You will also need the old key if you want to retain the ability to verify the signatures on older IBM MQ 9.3.x packages. For more information, see [IBM MQ code signatures](#).

#### **Related information**

[System Requirements for IBM MQ](#)

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



## What was new and changed in earlier versions

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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 9.3.

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 9.2

- [What's new and changed in IBM MQ 9.2.0](#)
-  [What's new and changed in IBM MQ 9.2.x Continuous Delivery](#)
-  [What's changed in Fix Packs for IBM MQ 9.2.x Long Term Support](#)

### IBM MQ 9.1

- [What's new and changed in IBM MQ 9.1.0](#)
-  [What's new and changed in IBM MQ 9.1.x Continuous Delivery](#)
-  [What's changed in IBM MQ 9.1.0.x Long Term Support](#)

### 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 and earlier

For older versions of products, where documentation is provided outside of IBM Documentation, see [Documentation for older versions of IBM MQ](#).

#### Related concepts

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM

MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's new and changed in IBM MQ 9.3.x Continuous Delivery” on page 81](#)

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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](#)

## Notices

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## Accessibility features for IBM MQ

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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 documentation 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/ibm-quantum/1.0.0/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 [Administering IBM MQ for Multiplatforms using control commands](#) and [Administering IBM MQ 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 \(www.ibm.com/able\)](http://www.ibm.com/able).

## Icons used in the product documentation

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The product documentation for all IBM MQ 9.3 release types (LTS, CD, CP4I-LTS), 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. Icons are also used to distinguish between JMS and Jakarta messaging, and to highlight product features that are deprecated, stabilized or removed.

### Icons for release types and release versions

If a product feature applies to a specific release, icons are used to identify the release type to which the feature applies, and the release version at which a feature is first made available. For more information about the different release types, see [“IBM MQ release types and versioning” on page 24](#).

#### Release type icons

##### Long Term Support (LTS)

Information that applies to the IBM MQ Long Term Support release in general is indicated by a dark blue icon with the text LTS:



##### Continuous Delivery (CD)

Information that applies to the Continuous Delivery release in general is indicated by a light blue icon with the text CD:



##### IBM MQ Advanced

Information that applies to the IBM MQ Advanced product in general is indicated by a green icon with the text MQ Adv.:



##### IBM MQ Advanced

Information that applies to the IBM MQ Advanced Value Unit Edition is indicated by a red icon with the text MQ Adv. VUE:



## IBM MQ Advanced Value Unit Edition

Information that applies to the IBM MQ Advanced for z/OS edition is indicated by a red icon with the text MQ Adv. z/OS:



## IBM Cloud Pak for Integration - Long Term Support (CP4I-LTS)

From IBM MQ 9.3.0, information that applies to the IBM Cloud Pak for Integration - Long Term Support release in general (formerly the Extended Update Support release) is indicated by a dark blue icon with the text CP4I-LTS:



## Release version icons

### LTS versions

For Long Term Support release content, the icon is dark blue and contains the LTS release and Fix Pack number. For example:



### CD versions

For Continuous Delivery release content, the icon is light blue and contains the CD release and Fix Pack number. For example:



## Initial release icons

For IBM MQ 9.3, the initial release is both an LTS and a CD release.

### LTS initial release

Product features that are new to LTS customers in the initial release of IBM MQ 9.3 are indicated by a dark blue icon that contains the initial release number. Note that features that are new to LTS customers includes all features that were introduced throughout the lifetime of the previous release for CD customers.



### CD initial release

Product features that are new to CD customers in the initial release of IBM MQ 9.3 are indicated by a light blue icon that contains the initial release number.







## Platform icons

Platform icons are used to identify information that applies only to a specific platform, or group of platforms.

Icon	Platform
	AIX
	All supported UNIX platforms. That is, all platforms listed previously in this table. From IBM MQ 9.2.0, AIX is the only supported UNIX platform.
	Linux
	Windows
	AIX, Linux, and Windows





Table 14. Icons for MQ core platforms (continued)

Icon	Platform
	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 platforms listed previously in this table. <ul style="list-style-type: none"> <li>• For CD releases, this means AIX, Linux, and Windows.</li> <li>• For LTS releases, this means AIX, Linux, Windows, and IBM i.</li> </ul>
	z/OS

**Note:**

- The supported platforms for CD releases are AIX, Linux, Windows, and z/OS.
- The supported platforms for LTS releases are AIX, 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 Solaris for all IBM MQ components, including server and clients, is removed from IBM MQ 9.2.
- Support for HP-UX for all IBM MQ components, including server and clients, is removed from IBM MQ 9.1.

Table 15. Icons for MQ in containers

Icon	Platform
	Red Hat OpenShift. A containers platform. Runs on Linux
	Kubernetes. An open source containers platform.
	IBM Cloud Pak for Integration. Brings together a range of IBM integration products, including IBM MQ in containers.
	IBM MQ Operator. Indicates the operator version from which a containers feature is available.








  From IBM MQ 9.3.0, Jakarta Messaging 3.0 is supported for developing new applications. IBM MQ 9.3.0 continues to support JMS 2.0 for existing applications. It is not supported to use both the Jakarta Messaging 3.0 API and the JMS 2.0 API in the same application. For more information, see [Using IBM MQ classes for JMS/Jakarta Messaging](#). The following icons are used to identify information that applies to either JMS or Jakarta Messaging only.

Table 16. JMS and Jakarta Messaging

Icon	API
	Java Message Service 2.0 (JMS 2.0)
	Jakarta Messaging 3.0

## Icons for product features that are deprecated, stabilized or removed

For IBM WebSphere MQ 7.1 and later versions, [Deprecations, stabilizations, and removals in IBM MQ](#) provides a list of product features that are deprecated, stabilized, or removed. From IBM MQ 9.3, information about each of these features is flagged with one of the following icons.

Icon	Description
	Used to highlight information for an IBM MQ feature that is deprecated.
	Used to highlight information for an IBM MQ feature that is stabilized.
	Used to highlight information for an IBM MQ feature that is removed.

### Related concepts

[“IBM MQ release types and versioning” on page 24](#)

There are two main types of release for IBM MQ; Long Term Support (LTS) and Continuous Delivery (CD). Some versions of the IBM MQ Advanced container are IBM Cloud Pak for Integration - Long Term Support (CP4I-LTS) releases.

[“What's new and changed in IBM MQ 9.3.0 ” on page 26](#)

IBM MQ 9.3.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.2.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.2.5, which is the final CD release for IBM MQ 9.2. IBM MQ 9.3.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.2.1 through IBM MQ 9.2.5 along with some features and enhancements that are new at IBM MQ 9.3.0.

[“What's new and changed in IBM MQ 9.3.x Continuous Delivery” on page 81](#)

Following the initial release of IBM MQ 9.3.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.3.1.

[“What's changed in IBM MQ 9.3.0 Long Term Support” on page 142](#)

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 146](#)

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 9.3.

## Readme for IBM MQ 9.3 and its maintenance

This document contains the readme information for IBM MQ 9.3.0 Long Term Support release and its maintenance, and also for IBM MQ 9.3.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/V9.3/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/OTO5000000024cJGAQ/mq?language=en\\_US&productId=01t0z000006zdYXAAY](https://www.ibm.com/mysupport/s/topic/OTO5000000024cJGAQ/mq?language=en_US&productId=01t0z000006zdYXAAY).

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 9.3 product information is available in IBM Documentation: <https://www.ibm.com/docs/ibm-mq/9.3>.

### Announcement letters

The announcement letters for IBM MQ 9.3 (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.

IBM MQ 9.3.5, IBM API Connect, IBM App Connect Enterprise, Noname Advanced API Security for IBM 1.1.1, and Noname Advanced API Security as a Service for IBM

<https://www.ibm.com/docs/announcements/AD24-0123/index.html>

IBM Cloud Pak for Integration 2023.4.1 and IBM MQ 9.3.4 deliver new integration capabilities; IBM StepZen Graph Server is renamed

<https://www.ibm.com/docs/en/announcements/223-0759/index.html>

IBM MQ Advanced for z/OS includes the Connector Pack

<https://www.ibm.com/docs/en/announcements/223-0578/index.html>

IBM Cloud Pak for Integration 2023.2.1, IBM API Connect Cloud Service, IBM Event Automation 1.0, IBM MQ for Multiplatforms 9.3.3, IBM MQ Appliance 9.3.3, and Noname Advanced API Security for IBM

<https://www.ibm.com/docs/en/announcements/223-110/index.html>

IBM MQ for Multiplatforms, IBM MQ for z/OS, IBM MQ for z/OS Value Unit Edition, IBM MQ Advanced for z/OS Value Unit Edition, IBM MQ Appliance, and IBM MQ on Cloud 9.3.2

<https://www.ibm.com/docs/en/announcements/223-065/index.html>

IBM Cloud Pak for Integration 2022.4.1, IBM Integration Bus for z/OS 10.1, IBM MQ 9.3.1, and IBM App Connect Enterprise as a Service

<https://www.ibm.com/docs/en/announcements/222-341/index.html>

IBM MQ 9.3 for Multiplatforms and IBM MQ on Cloud

<https://www.ibm.com/docs/en/announcements/222-129/index.html>

IBM MQ for z/OS, 9.3, IBM MQ Advanced for z/OS, 9.3, IBM MQ for z/OS VUE 9.3, and IBM MQ Advanced for z/OS VUE 9.3

<https://www.ibm.com/docs/en/announcements/222-131/index.html>

IBM MQ Appliance M2003 (which runs the IBM MQ Appliance 9.3 firmware)

<https://www.ibm.com/docs/en/announcements/222-212/index.html>

## Update history

Date	Summary
26 Apr 2024	Updates for IBM MQ 9.3.5.1 and 9.3.0.17 CSUs
29 Feb 2024	Updates for IBM MQ 9.3.5 and link to the announcement letter
14 Dec 2023	Updates for IBM MQ 9.3.0, Fix Pack 15
31 Oct 2023	Link to the IBM MQ 9.3.4 announcement letter
19 Oct 2023	Updates for IBM MQ 9.3.4
31 Aug 2023	Updates for IBM MQ 9.3.0, Fix Pack 10

Date	Summary
01 Aug 2023	Link to the IBM MQ Advanced for z/OS Connector Pack announcement letter
20 Jun 2023	Updates for IBM MQ 9.3.3
27 Apr 2023	Updates for IBM MQ 9.3.0, Fix Pack 5
16 Feb 2023	Updates for IBM MQ 9.3.2
21 Dec 2022	Updates for IBM MQ 9.3.0, Fix Pack 2
20 Oct 2022	Updates for IBM MQ 9.3.1
22 Sep 2022	Updates for IBM MQ 9.3.0, Fix Pack 1
15 Jul 2022	Link to the IBM MQ Appliance M2003 announcement letter
05 Jul 2022	Updates for IBM MQ 9.3.0 for z/OS
23 Jun 2022	Created for IBM MQ 9.3.0 for Multiplatforms

## Installation instructions

Installation instructions are available as part of the IBM MQ 9.3 product information published in IBM Documentation: [https://www.ibm.com/docs/SSFKSJ\\_9.3.0/install/q008250\\_.html](https://www.ibm.com/docs/SSFKSJ_9.3.0/install/q008250_.html)

## Limitations and known problems for Continuous Delivery releases

### LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.5.1 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 9.3.5



### **Invalid platform value in the ProtocolBridgeProperties.xml file is ignored silently**

In the Managed File Transfer ProtocolBridgeProperties.xml file, the **platform** value must be OS400, UNIX or WINDOWS. However, if you provide a different value the Protocol Bridge Agent does not report an error and defaults to the agent's platform. This can cause unexpected behaviors.

This issue is addressed by APAR IT45102, which is included in IBM MQ 9.3.5. This APAR adds error message BFGPR0156E, which tells you there is an invalid data value in an XML file that you loaded and gives details to help you fix it.

### **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.4**

#### **License entitlement message is received when installing IBM MQ 9.3.4 Developer Edition on Red Hat**

When installing the Developer Edition on Red Hat, you might receive the following message several times:

```
AMQ5770E: Licensed entitlement 'advanced' could not be set for installation at '/opt/mqm'.
```

This issue does not affect operation of IBM MQ 9.3.4 Developer Edition, and the message may be ignored.

### **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.3**

#### **IBM MQ AMQP channel does not start automatically with AMQP service after upgrade**

When a queue manager with a running AMQP channel is upgraded to IBM MQ 9.3, and the queue manager and associated AMQP service are restarted, the previously running AMQP channel does not start automatically.

This issue is fixed by APAR IT37842, which is included in IBM MQ 9.3.3.

Note that migration runs only once; the first time the queue manager is started after an upgrade. Therefore, after you apply IBM MQ 9.3.3:

- If, prior to installing IBM MQ 9.3.3, you have started the queue manager and AMQP channel on any previous IBM MQ 9.3 level, then the AMQP channel will start automatically. You do not need to take any additional action.
- If, prior to installing IBM MQ 9.3.3, you have not started the queue manager and AMQP channel on any previous IBM MQ 9.3 level, then any previously running AMQP channels must be restarted manually when the queue manager and associated AMQP service are restarted.

#### **Linux: Empty directories left after uninstall**

When you uninstall the product on Linux, empty directories are left in the *MQ\_INSTALLATION\_PATH* directory.

This issue is being addressed in a later release. Meanwhile, these empty directories cause no problems with running the product, and can be ignored.

### **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.1 AND 9.3.2**

There are no new limitations or known problems.

## **Limitations and known problems for Long Term Support releases**

### **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.0.17 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 JRE is used by the following IBM MQ components:

- AMQP server
- Managed File Transfer (MFT)
- IBM MQ Console

- IBM MQ Explorer
- IBM MQ REST API
- IBM MQ Telemetry service

For these components, you can no longer use 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

You must use an alternative CipherSuite, or disable FIPS mode. 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 9.3.0, FIX PACK 15**

### **IBM MQ Bridge to blockchain is removed**

The IBM MQ Bridge to blockchain was deprecated across all releases from November 22 2022, and is removed from the product at IBM MQ 9.3.0.15. If your system has the MQSeriesBCBridge component installed, remove it manually after this maintenance update has completed.

## **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.0, FIX PACK 10**

There are no new limitations or known problems.

## **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.0, FIX PACK 5**

### **IBM MQ AMQP channel does not start automatically with AMQP service after upgrade**

When a queue manager with a running AMQP channel is upgraded to IBM MQ 9.3, and the queue manager and associated AMQP service are restarted, the previously running AMQP channel does not start automatically.

This issue is fixed by APAR IT37842, which is included in IBM MQ 9.3.0 Fix Pack 5.

Note that migration runs only once; the first time the queue manager is started after an upgrade. Therefore, after you apply IBM MQ 9.3.0 Fix Pack 5

- If, prior to installing IBM MQ 9.3.0 Fix Pack 5, you have started the queue manager and AMQP channel on any previous IBM MQ 9.3 level, then the AMQP channel will start automatically. You do not need to take any additional action.
- If, prior to installing IBM MQ 9.3.0 Fix Pack 5, you have not started the queue manager and AMQP channel on any previous IBM MQ 9.3 level, then any previously running AMQP channels must be restarted manually when the queue manager and associated AMQP service are restarted.

## **LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.3.0, FIX PACKS 1 AND 2**

There are no new limitations or known problems.

## **Limitations and known problems for the initial IBM MQ 9.3.0 release**

### **Warning messages received from IBM MQ Explorer on Linux startup**

When starting IBM MQ Explorer from a Linux shell, the following messages (or similar) might be seen:

```
(MQExplorer:76481): dbind-WARNING **: 18:20:00.523: Couldn't register with accessibility
bus: Did not receive a reply.
Possible causes include: the remote application did not send a reply, the message bus
```

```
security policy blocked the reply,  
the reply timeout expired, or the network connection was broken.
```

```
(java:76601): dbind-WARNING **: 18:20:00.927: Couldn't register with accessibility bus: Did  
not receive a reply.  
Possible causes include: the remote application did not send a reply, the message bus  
security policy blocked the reply,  
the reply timeout expired, or the network connection was broken.  
SWT SessionManagerDBus: Failed to connect to org.gnome.SessionManager: Could not connect:  
Permission denied  
SWT SessionManagerDBus: Failed to connect to org.xfce.SessionManager: Could not connect:  
Permission denied
```

This issue does not affect operation of IBM MQ Explorer and can be suppressed by setting the following environment variable:

```
NO_AT_BRIDGE=1
```

This issue is fixed in IBM MQ Explorer 9.3.1.

### **Properties are missing from IBM MQ Explorer web console panels**

For the IBM MQ Explorer, when you start a local queue manager, the INITKEY and KEYRPWD properties are missing from the web console panels.

This issue is fixed by APAR IT41181, which is included in IBM MQ Explorer 9.3.1.

### **Windows installer launchpad incorrectly flags Windows Server 2016 as a supported platform**

The IBM MQ 9.3.0 Windows installer launchpad flags Windows Server 2016 as a supported platform. However, this is not correct. Windows Server 2016 is not supported by IBM MQ 9.3.

This issue is fixed by APAR IT41233, which is included in IBM MQ 9.3.0 Fix Pack 1 and IBM MQ 9.3.1.

### **Many entries for message CSQM586E in the IBM MQ for z/OS job log**

On IBM MQ for z/OS, if a queue is configured with a streaming queue and has STRMQOS (BESTEF) set, then any failure to **MQOPEN**, **MQPUT** or **MQPUT1** to the streaming queue will result in message CSQM586E being output to the job log.

If the number of logged messages is deemed excessive, they can be suppressed using **EXCLMSG**.

Alternatively STRMQOS (MUSTDUP) can be used.

### **IBM MQ AMQP channel does not start automatically with AMQP service after upgrade**

When a queue manager with a running AMQP channel is upgraded to IBM MQ 9.3, and the queue manager and associated AMQP service are restarted, the previously running AMQP channel does not start automatically.

This issue is fixed by APAR IT37842, which is included in IBM MQ 9.3.0 Fix Pack 5.

Note that migration runs only once; the first time the queue manager is started after an upgrade. Therefore, after you apply IBM MQ 9.3.0 Fix Pack 5

- If, prior to installing IBM MQ 9.3.0 Fix Pack 5, you have started the queue manager and AMQP channel on any previous IBM MQ 9.3 level, then the AMQP channel will start automatically. You do not need to take any additional action.
- If, prior to installing IBM MQ 9.3.0 Fix Pack 5, you have not started the queue manager and AMQP channel on any previous IBM MQ 9.3 level, then any previously running AMQP channels must be restarted manually when the queue manager and associated AMQP service are restarted.

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## **IBM MQ 9.3 Quick Start Guide**

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Use this guide to get started with IBM MQ 9.3.

### **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, AMQP, MQTT, and the messaging REST API.

## Access the software and documentation

For IBM MQ Long Term Support and Continuous Delivery releases on distributed platforms, this product offering provides the following items, which are available from Passport Advantage:

- A Server eAssembly for the full release on all supported platforms<sup>1</sup>. 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 9.3 \(https://www.ibm.com/support/pages/downloading-ibm-mq-93\)](https://www.ibm.com/support/pages/downloading-ibm-mq-93).
- A Quick Start Guide eImage.

A Quick Start Guide PDF file can be downloaded from [https://public.dhe.ibm.com/software/integration/wmq/docs/V9.3/QuickStartGuide/mq93\\_qsg\\_en.pdf](https://public.dhe.ibm.com/software/integration/wmq/docs/V9.3/QuickStartGuide/mq93_qsg_en.pdf). Alternatively, the Quick Start Guide is available in HTML format from [IBM Documentation \(https://www.ibm.com/docs/ibm-mq/9.3?topic=mq-93-quick-start-guide\)](https://www.ibm.com/docs/ibm-mq/9.3?topic=mq-93-quick-start-guide).

### Notes:

1. IBM i is supported for Long Term Support but not for Continuous Delivery.
2. The non-install packages are provided only for building container images and are not supported for any other use cases. The packages are made available on IBM Fix Central at <http://ibm.biz/mq93noninstallqmgr>.

For more information about downloading the product from Passport Advantage, see [Downloading IBM MQ 9.3 \(https://www.ibm.com/support/pages/downloading-ibm-mq-93\)](https://www.ibm.com/support/pages/downloading-ibm-mq-93) and the [Passport Advantage and Passport Advantage Express® website \(https://www.ibm.com/software/passportadvantage/\)](https://www.ibm.com/software/passportadvantage/).

Online documentation for all supported versions of IBM MQ is available through [IBM Documentation \(https://www.ibm.com/docs/ibm-mq\)](https://www.ibm.com/docs/ibm-mq). Specifically, the IBM MQ 9.3 documentation is available in [IBM Documentation \(https://www.ibm.com/docs/ibm-mq/9.3\)](https://www.ibm.com/docs/ibm-mq/9.3).

The IBM MQ 9.3 documentation is also available as a set of PDF files that can be downloaded from <https://public.dhe.ibm.com/software/integration/wmq/docs/V9.3/PDFs/>.

Information about how to use IBM MQ Explorer can be accessed either from within IBM MQ Explorer or in the IBM MQ 9.3 product information.

## Evaluate the hardware and system configuration

For details of hardware and software requirements on all supported platforms, see the [System Requirements for IBM MQ web page \(https://www.ibm.com/support/pages/node/318077\)](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 of the IBM MQ 9.3 documentation \(https://www.ibm.com/docs/ibm-mq/9.3?topic=mq-planning\)](https://www.ibm.com/docs/ibm-mq/9.3?topic=mq-planning).

For links to additional information, see the [IBM MQ family information roadmap \(https://www.ibm.com/docs/SSFKSJ\\_latest/overview/mq-family-roadmap.html\)](https://www.ibm.com/docs/SSFKSJ_latest/overview/mq-family-roadmap.html).

## Installing the product on a server

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 of the IBM MQ 9.3 documentation \(https://www.ibm.com/docs/ibm-mq/9.3?topic=mq-installing-uninstalling\)](https://www.ibm.com/docs/ibm-mq/9.3?topic=mq-installing-uninstalling).

## Get started

For information to help you get started with IBM MQ, see the [IBM MQ family information roadmap \(https://www.ibm.com/docs/SSFKSJ\\_latest/overview/mq-family-roadmap.html\)](https://www.ibm.com/docs/SSFKSJ_latest/overview/mq-family-roadmap.html).

## 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 from 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 Site](https://www.ibm.com/mysupport) (<https://www.ibm.com/mysupport>)
- [IBM MQ for Multiplatforms Support web page](http://ibm.biz/mqsupport) (<http://ibm.biz/mqsupport>)
- [IBM MQ for z/OS Support web page](https://www.ibm.com/mysupport/s/topic/0TO0z0000006k52GAA/mq-for-zos) (<https://www.ibm.com/mysupport/s/topic/0TO0z0000006k52GAA/mq-for-zos>)
- [IBM Cloud Pak for Integration Support web page](https://www.ibm.com/mysupport/s/topic/0TO0z000000YsIrGAK/cloud-pak-for-integration) (<https://www.ibm.com/mysupport/s/topic/0TO0z000000YsIrGAK/cloud-pak-for-integration>)

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## IBM MQ family information roadmap

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This roadmap helps you navigate through high-level information about IBM MQ.

**Note:** This topic and its children are not IBM MQ version-specific, they are family-level topics. They are always published in the latest IBM MQ version. If you want to bookmark this topic, please bookmark the following link. This link continues to work when a new IBM MQ version is released. [https://www.ibm.com/docs/en/SSFKSJ\\_latest/overview/mq-family-roadmap.html](https://www.ibm.com/docs/en/SSFKSJ_latest/overview/mq-family-roadmap.html).

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

- [“Version-to-version information for IBM MQ” on page 163](#)
- [“Detailed documentation for IBM MQ” on page 164](#)
- [“IBM MQ: Developers” on page 164](#)
- [“IBM MQ: Architects and Administrators” on page 164](#)
- [“Find Support” on page 165](#)

### Version-to-version information for IBM MQ

Version-to-version feature comparison tables, and deprecation information.

- [“IBM MQ features by version” on page 165](#)
- [“Deprecations, stabilizations, and removals in IBM MQ” on page 178](#)
- [Announcements and sales manuals](#)

## Detailed documentation for IBM MQ

Find online documentation for current versions of IBM MQ, IBM MQ Appliance, and IBM MQ on Cloud. For earlier versions, find documentation offline. Available offline formats are PDF, customer-installable Knowledge Center, and Information Center.

### Go to the latest version

- [“IBM MQ” on page 6](#)

### Download offline copies for almost any version, including the latest

- [“IBM Documentation Offline” on page 190](#)
- [IBM MQ documentation download site](#)

### Download offline copies for IBM WebSphere MQ 7.1 and earlier

- [“Documentation for older versions of IBM MQ” on page 191](#)

### View documentation for other IBM MQ products

- [IBM MQ Appliance documentation](#)
- [IBM MQ on Cloud documentation](#)

### Find version-specific information roadmaps for IBM MQ

- [“IBM MQ 9.3 information roadmap” on page 192](#)
- [IBM MQ 9.2 information roadmap](#)
- [IBM MQ 9.1 information roadmap](#)
- [IBM MQ 9.0 information roadmap](#)
- [IBM MQ 8.0 information roadmap](#)
- [IBM MQ 7.5 information roadmap](#)

## IBM MQ: Developers

Learn about developing applications for IBM MQ by visiting the IBM Developer site.

- [IBM MQ Developer Essentials](#) (learn the basics, run a demo, code an app, take more advanced tutorials)
- [IBM MQ Downloads for Developers](#) (including free developer editions and trial versions)

## IBM MQ: Architects and Administrators

Find out about the benefits of using IBM MQ, get downloads, and view other learning resources.

### Find out about the benefits of using IBM MQ


- [“Introduction to IBM MQ” on page 7](#)
- [Technical overview](#)
- [IBM MQ web page \(ibm.com\)](#)
- [IBM MQ Redbooks](#)
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### Get downloads

- [“IBM MQ downloads” on page 189](#)



## View other learning resources

- [IBM MQ on Cloud](#)
- [MQ learning activities on IBM Training](#)
-  [A collection of tutorials for installing and upgrading IBM MQ on AIX, Linux, and Windows. The tutorials cover:](#)
  - [Preparing a host for IBM MQ.](#)
  - [Downloading the IBM MQ code.](#)
  - [Installing and uninstalling the IBM MQ code, and applying fix packs.](#)
  - [Upgrading from one version of IBM MQ to another, and moving a queue manager from one host to another.](#)

## IBM MQ certification

Follow this link then search for "MQ":

- [IBM Professional Certification Program](#)

## Find Support

Links to IBM and IBM MQ support resources including user forums, technotes, cloud and social media support channels and migration guides.

### User forums and technotes

- [IBM Support Forums](#)
- [IBM Community for MQ](#)
- [MQSeries.net forum](#)
- [MQ technotes on IBM Support](#)

### Other Support resources

- [IBM MQ for Multiplatforms Support web page](#)
- [IBM MQ for z/OS Support web page](#)
- [IBM Cloud Pak for Integration Support web page](#)
- [IBM MQ Appliance Support web page](#)
- [IBMSupport @IBMSupport \(Twitter\)](#)
- [Social Media Channels within Cloud Technical Support](#)

### Migration Guides

- [IBM WebSphere MQ / IBM MQ Migration Guide](#)
- [IBM WebSphere MQ / IBM MQ for z/OS Migration Guide](#)

### Related reference

[IBM MQ landing page](#)

## IBM MQ features by version

Version-to-version feature comparison tables.

**Note:** This topic is not IBM MQ version-specific, it is a family-level topic. It is always published in the latest IBM MQ version. If you want to bookmark this topic, please bookmark the following link. This link continues to work when a new IBM MQ version is released. [https://www.ibm.com/docs/en/SSFKSJ\\_latest/overview/mq\\_features.html](https://www.ibm.com/docs/en/SSFKSJ_latest/overview/mq_features.html).

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

- [Features introduced at IBM MQ 9.1 or later](#)

- Features introduced at IBM WebSphere MQ 7.5, IBM MQ 8.0, and IBM MQ 9.0

















<i>Table 18. Features introduced at IBM MQ 9.1 or later</i>			
<b>Feature</b>	<b>IBM MQ 9.1</b>	<b>IBM MQ 9.2</b>	<b>IBM MQ 9.3</b>
Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0 (XLC 17)			 Yes (CD only)
OpenTelemetry tracing support			 Yes (CD only)
Additional JSON Web Token (JWT) support			 Yes (CD only)
Stand-alone IBM MQ Web Server			 Yes (CD only)  Yes (CD only)
IBM MQ Console: Improved application visibility and localized time zone			 Yes (CD only)  Yes (CD only)
IBM MQ Console: add, view, delete and update storage classes			 Yes (CD only)
IBM MQ Console: New Overview tab for queue managers			 Yes (CD only)  Yes (CD only)
Media image scheduling - linear logging			 Yes (CD only)
Environment variables for tuning I/O operations that take too long			 Yes (CD only)
JSON Web Tokens - authentication and authorization			 Yes (CD only)
Application re-balancing support for IBM MQ classes for JMS			 Yes (CD only)
 Media image scheduling - replicated logging			 Yes (CD only)

Table 18. Features introduced at IBM MQ 9.1 or later (continued)

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
<p> <span style="background-color: #c0c0c0;">▶ MQ Adv.</span> <span style="background-color: #c0c0c0;">▶ MQ Adv. VUE</span> <span style="background-color: #c0c0c0;">▶ MQ Adv. z/OS</span>                     Option to run <b>fteRAS</b> for specific MFT agents                 </p>			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p> <p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
Simplified Java application topologies			<p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
<p> <span style="background-color: #c0c0c0;">▶ MQ Adv. z/OS</span>                     Additional capabilities for users with IBM MQ Advanced for z/OS entitlement                 </p>			<p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
Improved processing of AMQP message acknowledgments			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p>
Ability to enable trace for IBM MQ .NET and XMS .NET client libraries with mqclient.ini			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p>
Improvements to IBM MQ .NET and XMS .NET client diagnostic messages			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p>
<p> <span style="background-color: #c0c0c0;">▶ MQ Adv.</span>                     Autorecovery of damaged objects for Native HA queue managers                 </p>			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p>
Enhancements to SMF queue statistics records			<p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
Additions to IBM MQ console			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p> <p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
Remote messaging with the messaging REST API			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p> <p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
<p> <span style="background-color: #c0c0c0;">▶ MQ Adv.</span> <span style="background-color: #c0c0c0;">▶ MQ Adv. VUE</span> <span style="background-color: #c0c0c0;">▶ MQ Adv. z/OS</span>                     Unlocking events from mission-critical data using Kafka Connect                 </p>			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p> <p> <span style="background-color: #c0c0c0;">▶ z/OS</span>                      Yes (CD only)                 </p>
Extension of queue manager status attributes			<p> <span style="background-color: #c0c0c0;">▶ Multi</span>                      Yes (CD only)                 </p>

Table 18. Features introduced at IBM MQ 9.1 or later (continued)




















Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
Addition of Native HA status attributes			 Multi <a href="#">Yes</a> (CD only)
MQIPT trace file configuration enhancements			 Multi <a href="#">Yes</a> (CD only)
Support for TLS1.3 on managed .NET clients			 Multi <a href="#">Yes</a> (CD only)
 Native HA entitlement			<a href="#">Yes</a> (CD only)
Enhancements to SMF accounting data			 z/OS <a href="#">Yes</a> (CD only)
IBM MQ Console: New application view			 Multi <a href="#">Yes</a> (CD only)  z/OS <a href="#">Yes</a> (CD only)
New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging			 Multi <a href="#">Yes</a> (CD only)  z/OS <a href="#">Yes</a> (CD only)
Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging			 Multi <a href="#">Yes</a> (CD only)  z/OS <a href="#">Yes</a> (CD only)
New property to set the user context that is used for authorization in the messaging REST API			 Multi <a href="#">Yes</a> (CD only)  z/OS <a href="#">Yes</a> (CD only)
   Additional Managed File Transfer resource monitor events			 Multi <a href="#">Yes</a> (CD only)  z/OS <a href="#">Yes</a> (CD only)
New CAPEXPY attribute			 Multi <a href="#">Yes</a> (CD only)

Table 18. Features introduced at IBM MQ 9.1 or later (continued)



















Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
Changes to MQCSP password protection in MQIPT			 Multi <a href="#">Yes</a> (CD only)
New set of .NET 6 libraries			 Windows  Linux <a href="#">Yes</a> (CD only)
 MQ Adv. RDQM available on RHEL 9			 Linux <a href="#">Yes</a> (CD only)
Increased scalability for channel initiator			 z/OS <a href="#">Yes</a> (CD only)
Enhancements to SMF queue statistics records			 z/OS <a href="#">Yes</a> (CD only)
Streaming queues supported with shared queues			 z/OS <a href="#">Yes</a> (CD only)
New IBM MQ Console layout			 Multi <a href="#">Yes</a> (CD only)  z/OS <a href="#">Yes</a> (CD only)
Support for PKCS#12 key repositories			 ALW <a href="#">Yes</a>
Support for key repository passwords			 ALW <a href="#">Yes</a>
 MQ Adv. The IBM MQ Advanced container and the CP4I-LTS release model			 Linux <a href="#">Yes</a>
 MQ Adv. IBM MQ Advanced container support for Power Systems			 Linux <a href="#">Yes</a>
User data traced by MQIPT can be configured			 Multi <a href="#">Yes</a>  z/OS <a href="#">Yes</a>

Table 18. Features introduced at IBM MQ 9.1 or later (continued)

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
Support for <a href="#">Jakarta Messaging 3.0</a>			<p>&gt; Multi Yes</p> <p>&gt; z/OS Yes</p>
Enhancements to SMF statistics			<p>&gt; z/OS Yes</p>
<p>&gt; MQ Adv. &gt; MQ Adv. VUE &gt; MQ Adv. z/OS</p> Enable MQCSP support by default for Managed File Transfer commands			<p>&gt; Multi Yes</p> <p>&gt; z/OS Yes</p>
<p>&gt; MQ Adv. &gt; MQ Adv. VUE &gt; MQ Adv. z/OS</p> The REST API and managed calls for Managed File Transfer			<p>&gt; Multi Yes</p> <p>&gt; z/OS Yes</p>
Support for multiple queue manager certificates in MQIPT		<p>&lt; ALW Yes (CD only)</p> <p>&gt; z/OS Yes (CD only)</p>	<p>&gt; Multi Yes</p> <p>&gt; z/OS Yes</p>
TLS support for the IBM MQ .NET XA Monitor application		<p>&gt; Windows &lt; Linux Yes (CD only)</p>	<p>&gt; Windows &lt; Linux Yes</p>
Additional configuration option to control TLS environment in C clients		<p>&lt; ALW Yes (CD only)</p>	<p>&gt; Multi Yes</p>
Support for Transport Layer Security (TLS) 1.3 in MQIPT		<p>&lt; ALW Yes (CD only)</p> <p>&gt; z/OS Yes (CD only)</p>	<p>&gt; Multi Yes</p> <p>&gt; z/OS Yes</p>
REST Messaging API: greater access to message properties when sending and receiving messages using the REST API		<p>&lt; ALW Yes (CD only)</p> <p>&gt; z/OS Yes (CD only)</p>	<p>&gt; Multi Yes</p> <p>&gt; z/OS Yes</p>
New queue managers 64-bit RBA capable by default		<p>&gt; z/OS Yes (CD only)</p>	<p>&gt; z/OS Yes</p>

Table 18. Features introduced at IBM MQ 9.1 or later (continued)

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
<p>MQ Adv. MQ Adv. VUE MQ Adv. z/OS Enhanced  <b>fteRAS</b> logging</p>		<p>ALW                      Yes (CD only)</p> <p>z/OS                      Yes (CD only)</p>	<p>Multi                      Yes</p> <p>z/OS                      Yes</p>
Support for influencing application re-balancing within uniform clusters		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
Encryption of passphrases for MQTT channels		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
.NET client changes for Application Pattern Support		<p>Windows                      Linux                      Yes (CD only)</p>	<p>Windows                      Linux                      Yes</p>
<b>OutboundSNI</b> property for NQMI and XMS .NET clients		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
TLS 1.3 support from IBM MQ Java applications		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
<b>SecureCommOnly</b> setting available on the queue manager		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
Configurable IBM MQ Console message browsing controls		<p>ALW                      Yes (CD only)</p> <p>z/OS                      Yes (CD only)</p>	<p>Multi                      Yes</p> <p>z/OS                      Yes</p>
Additional queue manager configuration attributes to control the connection and operation timeout for LDAP calls		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
Option to capture installation-level diagnostics only with <b>runmqras</b> command		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
IBM MQ code signing support		<p>Yes (CD only)</p>	<p>Yes</p>
Java 17 support for IBM MQ Clients		<p>ALW                      Yes (CD only)</p>	<p>Multi                      Yes</p>
Changes to statistics collection intervals		<p>z/OS                      Yes (CD only)</p>	<p>z/OS                      Yes</p>
CSQUDSPM utility supports upper case and lower case parameters		<p>z/OS                      Yes (CD only)</p>	<p>z/OS                      Yes</p>

Table 18. Features introduced at IBM MQ 9.1 or later (continued)

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
<p>► <b>MQ Adv.</b> ► <b>MQ Adv. VUE</b> ► <b>MQ Adv. z/OS</b> Enhanced credentials protection for Managed File Transfer</p>		<p>► <b>ALW</b> Yes (CD only)</p> <p>► <b>z/OS</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p> <p>► <b>z/OS</b> Yes</p>
<p>► <b>MQ Adv.</b> ► <b>MQ Adv. VUE</b> ► <b>MQ Adv. z/OS</b> Improvements to the <b>fteRAS</b> command</p>		<p>► <b>ALW</b> Yes (CD only)</p> <p>► <b>z/OS</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p> <p>► <b>z/OS</b> Yes</p>
<p>► <b>MQ Adv.</b> ► <b>MQ Adv. VUE</b> ► <b>MQ Adv. z/OS</b> Transfer logging on Managed File Transfer</p>		<p>► <b>ALW</b> Yes (CD only)</p> <p>► <b>z/OS</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p> <p>► <b>z/OS</b> Yes</p>
Streaming queues to realize additional value from data already flowing through IBM MQ		<p>► <b>ALW</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p> <p>► <b>z/OS</b> Yes</p>
Remote queue manager support for the IBM MQ Console		<p>► <b>ALW</b> Yes (CD only)</p> <p>► <b>z/OS</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p> <p>► <b>z/OS</b> Yes</p>
Improved password protection for IBM MQ clients using cryptographic hardware		<p>► <b>ALW</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p>
Support for dynamic balancing of Java Platform, Enterprise Edition inbound connections in a uniform cluster		<p>► <b>ALW</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p>
New client option for <b>runmqdlq</b> command		<p>► <b>ALW</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p>
New client version of <b>amqsdlqc</b> sample		<p>► <b>ALW</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p>
Support for the Apache Qpid JMS client library		<p>► <b>ALW</b> Yes (CD only)</p>	<p>► <b>Multi</b> Yes</p>
<p>► <b>MQ Adv.</b> General availability of Native HA for IBM MQ containers</p>		<p>► <b>CP4I</b> Yes (CD only)</p>	<p>► <b>CP4I</b> Yes</p>
<p>► <b>MQ Adv.</b> RDQM kernel module serviceability enhancements</p>		<p>► <b>Linux</b> Yes (CD only)</p>	<p>► <b>Linux</b> Yes</p>



Table 18. Features introduced at IBM MQ 9.1 or later (continued)






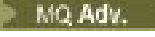



































Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
Browse support for IBM MQ AMQP channels		 Yes (CD only)	 Yes
 RDQM reports when an HA or DR node's replication was last in sync		 Yes (CD only)	 Yes
 RDQM summary status includes the preferred location for HA queue managers		 Yes (CD only)	 Yes
See and clear RDQM HA failed resource actions		 Yes (CD only)	 Yes
Improved password protection for Native Advanced Message Security clients		 Yes (CD only)	 Yes
   New Managed File Transfer commands for starting and stopping resource monitors		 Yes (CD only)  Yes (CD only)	 Yes  Yes
IBM MQ Console Application quick start		 Yes (CD only)  Yes (CD only)	 Yes  Yes
Ability to trace IBM MQ Console JavaScript running inside a browser		 Yes (CD only)  Yes (CD only)	 Yes  Yes
Confirm License Entitlement panel		 Yes (CD only)	 Yes
Permitting non-operating system users in the Object Authority Manager		  Yes (CD only)	  Yes
New IGNSTATE parameter for MQSC DELETE commands		 Yes (CD only)	 Yes
Support for zlibNX compression library		 Yes (CD only)	 Yes
Support for upgrading IBM MQ for Linux without uninstalling the earlier version		 Yes (CD only)	 Yes
Point-to-point messaging on AMQP channels		 Yes (CD only)	 Yes

Table 18. Features introduced at IBM MQ 9.1 or later (continued)



































Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
More flexible configuration for SNI support		 Multi <a href="#">Yes (CD only)</a>  z/OS <a href="#">Yes (CD only)</a>	 Multi <a href="#">Yes</a>  z/OS <a href="#">Yes</a>
 MQ Adv. Deploying containers to IBM Cloud Pak for Integration		 Linux <a href="#">Yes (CD only)</a>	 Linux <a href="#">Yes</a>
 MQ Adv.  MQ Adv. VUE  MQ Adv. z/OS Redistributable Managed File Transfer Logger		 Windows  Linux <a href="#">Yes (CD only)</a>  z/OS <a href="#">Yes (CD only)</a>	 Windows  Linux <a href="#">Yes</a>  z/OS <a href="#">Yes</a>
 MQ Adv.  MQ Adv. VUE  MQ Adv. z/OS Limiting the number of file transfers for each FTP endpoint		 Multi <a href="#">Yes (CD only)</a>  z/OS <a href="#">Yes (CD only)</a>	 Multi <a href="#">Yes</a>  z/OS <a href="#">Yes</a>
Protection of passwords in IBM MQ component configuration files		<a href="#">Yes</a>	<a href="#">Yes</a>
AMQP shared subscription enhancement		 ALW <a href="#">Yes</a>	 ALW <a href="#">Yes</a>
Automatic balancing of application connections across a set of clustered queue managers; uniform clusters, introduction of application instances, single set of configuration files, application resource monitoring	 Multi <a href="#">Yes (CD only)</a>	 Multi <a href="#">Yes</a>	 Multi <a href="#">Yes</a>
JSON format client channel definition table (CCDT)	 Multi <a href="#">Yes (CD only)</a>	 Multi <a href="#">Yes</a>	 Multi <a href="#">Yes</a>
IBM MQ Internet Pass-Thru a fully-supported optional component of IBM MQ	<a href="#">Yes (CD only)</a>	<a href="#">Yes</a>	<a href="#">Yes</a>
Transport Layer Security (TLS) 1.3 support for a range of protocols	 ULW <a href="#">Yes (CD only)</a>	<a href="#">Yes</a>	<a href="#">Yes</a>
CipherSpecs: Dynamic CipherSpec negotiation; list of acceptable TLS CipherSpecs; addition of ANY_TLS1x CipherSpec; support for TLS Handshake Transcript	 ULW <a href="#">Yes (CD only)</a>	<a href="#">Yes</a>	<a href="#">Yes</a>
Version 2 of the REST API	 Multi <a href="#">Yes</a>	<a href="#">Yes</a>	<a href="#">Yes</a>
REST API for administration: Communicate with the queue manager in JSON format	<a href="#">Yes (CD only)</a>	<a href="#">Yes</a>	<a href="#">Yes</a>
REST API for messaging: browse messages on a queue	<a href="#">Yes (CD only)</a>	<a href="#">Yes</a>	<a href="#">Yes</a>

Table 18. Features introduced at IBM MQ 9.1 or later (continued)




















































Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
REST API for messaging: enhanced performance with connection pools	<a href="#">Yes</a> (CD only)	<a href="#">Yes</a>	<a href="#">Yes</a>
REST API for messaging: publish messages to topics	<a href="#">Yes</a> (CD only)	<a href="#">Yes</a>	<a href="#">Yes</a>
Host header validation for the IBM MQ Console and REST API	<a href="#">Yes</a> (CD only)	<a href="#">Yes</a>	<a href="#">Yes</a>
IBM MQ Console	 <a href="#">Yes</a> (CD only)	<a href="#">Yes</a>	<a href="#">Yes</a>
Configurable ephemeral directory	 <a href="#">Yes</a> (CD only) 	 <a href="#">Yes</a> 	 <a href="#">Yes</a> 
Full WebSphere Liberty XA support with client channel definition tables (CCDTs)	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a>	 <a href="#">Yes</a>
IBM MQ classes for .NET Standard: .NET Core support; application development on macOS; available to download from the NuGet repository	 <a href="#">Yes</a> (CD only) 	 <a href="#">Yes</a> 	 <a href="#">Yes</a> 
IBM MQ .NET project template	 <a href="#">Yes</a> (CD only) 	 <a href="#">Yes</a> 	 <a href="#">Yes</a> 
IBM MQ classes for XMS .NET Standard: .NET Core support; application development on macOS; available to download from the NuGet repository	 <a href="#">Yes</a> (CD only) 	 <a href="#">Yes</a> 	 <a href="#">Yes</a> 
IBM MQ XMS .NET project template	 <a href="#">Yes</a> (CD only) 	 <a href="#">Yes</a> 	 <a href="#">Yes</a> 
Data set encryption	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a>	 <a href="#">Yes</a>
zHyperWrite: Improved log throughput	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a>	 <a href="#">Yes</a>
IBM z/OS Connect Enterprise Edition: Support for using client connections; support for Runnable Service Archive	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a>	 <a href="#">Yes</a>
 Red Hat OpenShift support for the IBM MQ Advanced container image	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a>
 RDQM: High Availability and Disaster Recovery notifications combine with log targets for streaming to third-party monitoring tools; disaster recovery for high availability replicated data queue managers	 <a href="#">Yes</a> (CD only)	 <a href="#">Yes</a>	 <a href="#">Yes</a>

Table 18. Features introduced at IBM MQ 9.1 or later (continued)

























Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
 Advanced Message Security interception on server-to-server message channels	 Yes (CD only)	 Yes	 Yes
  Aspera gateway streaming for IBM MQ messages	 Yes (CD only)	  Yes	  Yes
  Highly available MFT agents	Yes (CD only)	Yes	Yes
  REST API for MFT: New REST API calls for administering resource monitors and file transfers; support for the MQWebUser role	Yes (CD only)	Yes	Yes
  Managed File Transfer: <b>fteClearMonitorHistory</b> command for clearing resource monitor history	Yes (CD only)	Yes	Yes
  Managed File Transfer: new <code>logger.properties</code> file options to specify MFT log file permissions and the wait time for database logger shut down	Yes (CD only)	Yes	Yes
 IBM MQ Advanced queue manager identification	Yes	Yes	Yes
 IBM MQ Appliance: Support for the REST API for messaging; floating IP aggregation	Yes	Yes	Yes
AMQP listener auto-enabled	 Yes	 Yes	 Yes
FTP bridge retry time limit	Yes	Yes	Yes
Implicit syncpoint	Yes	Yes	Yes
LDAP using shortnames	Yes	Yes	Yes
Managed cloud offering	Yes	Yes	Yes

Table 19. Features introduced at IBM WebSphere MQ 7.5, IBM MQ 8.0, and IBM MQ 9.0














Feature	IBM WebSphere MQ 7.5	IBM MQ 8.0	IBM MQ 9.0
  Advanced Message Security on JMS for z/OS queue managers			Yes (CD only)
   IBM MQ Bridge to blockchain			Yes (CD only)
 IBM MQ Bridge to Salesforce			Yes (CD only)

Table 19. Features introduced at IBM WebSphere MQ 7.5, IBM MQ 8.0, and IBM MQ 9.0 (continued)

Feature	IBM WebSphere MQ 7.5	IBM MQ 8.0	IBM MQ 9.0
<b>z/OS</b> CICS®: Additional support for messaging within CICS Liberty JVM server			Yes (CD only)
IBM MQ Console			Yes (CD only)
<b>z/OS</b> <b>MQ Adv. VUE</b> Java and JMS client connectivity to z/OS queue managers			Yes (CD only)
Logging: Improvements to the management and output of error logs; automatic management of linear log extents that are no longer required for recovery.			Yes (CD only)
<b>MQ Adv.</b> <b>MQ Adv. VUE</b> MFT: Redistributable MFT Agent; MFT resource monitor event logging; separately installable MFT logger; REST API for MFT			Yes (CD only)
REST API for administration			Yes (CD only)
<b>Multi</b> REST API for messaging			Yes (CD only)
<b>MQ Adv.</b> <b>Linux</b> RDQM: High Availability and Disaster Recovery			Yes (CD only)
<b>z/OS</b> IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition			Yes (CD only)
<b>z/OS</b> IBM MQ for z/OS UNIX System Services Web Components			Yes (CD only)
<b>z/OS</b> IBM MQ for z/OS improved workload balancing options for shared queues			Yes (CD only)
Advanced Message Security encryption-only policy			Yes
Advanced Message Security support for non-IBM Java runtime environment (JRE)			Yes
Client configuration remotely, accessible through URL			Yes
Subscription-based monitoring and activity tracking			Yes
LDAP authentication		Yes	Yes
Use of DNS host names in Channel Authentication Records		Yes	Yes
Routed publish-subscribe in clusters		Yes	Yes
Enhanced status reporting for publish-subscribe		Yes	Yes
Queue manager scaling and multiplexed client performance		Yes	Yes
Support on all platforms for 64-bit queue managers		Yes	Yes
SSL/TLS certificates per channel		Yes	Yes

Table 19. Features introduced at IBM WebSphere MQ 7.5, IBM MQ 8.0, and IBM MQ 9.0 (continued)

Feature	IBM WebSphere MQ 7.5	IBM MQ 8.0	IBM MQ 9.0
Advanced Message Security and Managed File Transfer availability on all platforms		Yes	Yes
Integrated Managed File Transfer	Yes	Yes	Yes
Integrated Advanced Message Security	Yes	Yes	Yes
 Integrated MQ Telemetry	Yes	Yes	Yes
Multi-version install capability on distributed platforms	 Yes	 Yes	 Yes
Cloud support	Yes	Yes	Yes
Multicast capability	Yes	Yes	Yes
Support for .NET APIs	Yes	Yes	Yes
Multi-instance queue managers for higher availability	Yes	Yes	Yes
Automatic client reconnect for higher availability	Yes	Yes	Yes
SSL security support	Yes	Yes	Yes
Service Definition wizard	Yes	Yes	Yes
IBM MQ Message Service Client (XMS) for .NET developers	Yes	Yes	Yes
Windows Communication Foundation support for .NET developers	Yes	Yes	Yes
Simple File Transfer, Quick Tour	Yes	Yes	Yes
Cross-platform configuration tooling	Yes	Yes	Yes
 Exploiting z/OS services	Yes	Yes	Yes
64-bit address space	Yes	Yes	Yes
  Linux and Windows support	Yes	Yes	Yes
Intermediate queue manager	Yes	Yes	Yes
SSL support	Yes	Yes	Yes

**Related reference**

[IBM MQ landing page](#)

**Deprecations, stabilizations, and removals in IBM MQ**

Deprecations, stabilizations, and removals that occurred in IBM MQ.

**Note:** This topic is not IBM MQ version-specific, it is a family-level topic. It is always published in the latest version of the IBM MQ documentation. If you want to bookmark this topic, please bookmark the following link. This link continues to work when a new IBM MQ version is released. [https://www.ibm.com/docs/en/SSFKSJ\\_latest/overview/mq\\_deprecations.html](https://www.ibm.com/docs/en/SSFKSJ_latest/overview/mq_deprecations.html).

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

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## IBM MQ 9.3





Table 20. Deprecations, stabilizations, and removals at IBM MQ 9.3	
Feature	Description
<b>IBM MQ 9.3.0 release</b>	
 <span style="background-color: #0056b3; color: white; padding: 2px;">V 9.3.0</span> <span style="background-color: #0056b3; color: white; padding: 2px;">V 9.3.0</span> <a href="#">Deprecation: Ciphers used by AMS</a>	<p>The following signing and encryption algorithms from the Advanced Message Security (AMS) component are deprecated from IBM MQ 9.3.0: MD5, SHA1, RC2, DES and 3DES. IBM intends to remove support for these algorithms in a future IBM MQ release.</p> <p>Customers using these algorithms should migrate to stronger algorithms such as: SHA256, SHA384, SHA512, AES128 or AES256.</p>
 <span style="background-color: #0056b3; color: white; padding: 2px;">V 9.3.0</span> <span style="background-color: #0056b3; color: white; padding: 2px;">V 9.3.0</span> <a href="#">Deprecation: 32-bit IBM MQ application libraries</a>	<p>The 32-bit IBM MQ application libraries have been deprecated from IBM MQ 9.3.0 for all platforms, both for network and local binding connections. 32-bit applications will be supported for the duration of the IBM MQ 9.3.0 LTS lifecycle, but might be removed in a future CD or LTS release. 32-bit applications should be recompiled as 64-bit to ensure that IBM MQ applications can be migrated to future IBM MQ application libraries.</p>
 <a href="#">Deprecation: IBM MQ Bridge to blockchain</a>	<p>The IBM MQ Bridge to blockchain component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see <a href="#">US Announcement letter 222-341</a>) and IBM intends to remove the capability from Long Term Support releases in upcoming fix packs. Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration. If you have applications that will be impacted by this change, please contact IBM Support.</p>
 <span style="background-color: #0056b3; color: white; padding: 2px;">V 9.3.0</span> <span style="background-color: #0056b3; color: white; padding: 2px;">V 9.3.0</span> <a href="#">Deprecation: Operations Dashboard (IBM MQ in Containers)</a>	<p>From IBM MQ Operator 2.0.0 the Operations Dashboard is deprecated, and receives no further updates. No new uses of the Operations Dashboard should be created.</p>

Table 20. Deprecations, stabilizations, and removals at IBM MQ 9.3 (continued)

Feature	Description
<p>Removed V 9.3.0 V 9.3.0 Removal:  <a href="#">Dashboard Web Console</a></p>	<p>The widget-based Dashboard Web Console is removed from IBM MQ 9.3.0. For more information about the Dashboard Web Console, see <a href="#">The Dashboard Web Console</a> in the IBM MQ 9.1 documentation.</p>
<p>Removed V 9.3.0 V 9.3.0 Removal:  <a href="#">XMS .NET Multicast messaging</a></p>	<p>XMS .NET Multicast messaging (using RMM) is removed from IBM MQ 9.3.0.</p>
<p>Removed V 9.3.0 Removal:  <a href="#">fteMigrateAgent</a>,  <a href="#">fteMigrateConfigurationOptions</a>, and  <a href="#">fteMigrateLogger</a> commands</p>	<p>LTS For Long Term Support, the <a href="#">fteMigrateAgent</a>, <a href="#">fteMigrateConfigurationOptions</a>, and <a href="#">fteMigrateLogger</a> commands are removed at IBM MQ 9.3.0.</p> <p>CD For Continuous Delivery, these commands are removed at IBM MQ 9.2.1.</p>
<p><b>IBM MQ 9.3.1 Continuous Delivery</b></p>	
<p>Deprecated Deprecation: <a href="#">IBM MQ .NET Standard client libraries</a></p>	<p>From IBM MQ 9.3.1, the existing IBM MQ .NET Standard libraries, <code>amqmdnetstd.dll</code> and <code>amqmxmstd.dll</code>, are deprecated.</p> <p>IBM intends to remove support for these libraries in a future IBM MQ release.</p>
<p>Deprecated Deprecation: <a href="#">IBM MQ Bridge to blockchain</a></p>	<p>The IBM MQ Bridge to blockchain component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see <a href="#">US Announcement letter 222-341</a>). Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.</p>
<p>Deprecated Deprecation: <a href="#">IBM MQ Bridge to Salesforce</a></p>	<p>The IBM MQ Bridge to Salesforce component of IBM MQ Advanced is deprecated across all releases from November 22 2022 (see <a href="#">US Announcement letter 222-341</a>). Salesforce connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.</p>
<p><b>IBM MQ 9.3.2 Continuous Delivery</b></p>	
<p>Deprecated Deprecation: The <a href="#">LOG_FORMAT</a> environment variable of the <a href="#">IBM MQ Advanced for Developers container image</a>.</p>	<p>For the IBM MQ Advanced for Developers container image, the <a href="#">LOG_FORMAT</a> environment variable is deprecated across all releases from February 16 2023. It is superseded by the <a href="#">MQ_LOGGING_CONSOLE_FORMAT</a> variable. See <a href="#">IBM MQ Advanced for Developers container image</a>.</p>
<p>Deprecated Deprecation: <a href="#">Use of the Java security manager with IBM MQ Internet Pass-Thru</a></p>	<p>The use of the Java security manager with IBM MQ Internet Pass-Thru (MQIPT) is deprecated from February 16 2023, due to the Java security manager having been deprecated for removal in a future release of Java.</p>



Table 20. Deprecations, stabilizations, and removals at IBM MQ 9.3 (continued)

Feature	Description
<p>Removed Removal: <a href="#">IBM MQ Bridge to blockchain</a></p>	<p>V 9.3.2 For Continuous Delivery, the IBM MQ Bridge to blockchain has been removed from the product at IBM MQ 9.3.2. IBM MQ 9.3.1 is the last Continuous Delivery release it is delivered with.</p>
<p><b>IBM MQ 9.3.3 Continuous Delivery</b></p>	
<p>Removed Removal: <a href="#">traceControl.jar dynamic tracing utility</a></p>	<p>For Continuous Delivery, the trace control utility is removed from the product at IBM MQ 9.3.3. IBM MQ 9.3.2 is the last Continuous Delivery release that it is delivered with. If dynamic trace is needed to diagnose an issue, IBM Support can guide you through the steps to gather trace as required.</p>
<p>Removed Removal: <a href="#">Operations Dashboard</a></p>	<p>From IBM MQ Operator 2.4.0 the Operations Dashboard is removed. Note that the Operations Dashboard may still be used for existing queue managers that are older than 9.3.3.0-r1 if on an IBM MQ Operator that supports that queue manager container image. For version support for the IBM MQ Operator, see <a href="#">Available IBM MQ versions</a>.</p>
<p>Removed Removal: <a href="#">com.ibm.mq.cfg.useIBMCipherMappings Java System Property</a></p>	<p>For Continuous Delivery, the Java System Property <code>com.ibm.mq.cfg.useIBMCipherMappings</code>, which was previously used for configuring IBM Java or Oracle Java Cipher mappings, is removed from the product at IBM MQ 9.3.3.</p> <p>From IBM MQ 9.3.3, a Cipher can be defined as either the <code>CipherSpec</code> or <code>CipherSuite</code> name and is handled correctly by IBM MQ.</p>
<p><b>IBM MQ 9.3.4 Continuous Delivery</b></p>	
<p>Deprecated Deprecation: <a href="#">CMS keystore support for IBM MQ Java applications, AMQP and MQTT and associated tools</a></p>	<p>CMS keystore support for IBM MQ Java applications, AMQP and MQTT is deprecated from IBM MQ 9.3.4. The <code>runmqckm</code>, <code>strmqikm</code>, <code>mqiptKeycmd</code> and <code>mqiptKeyman</code> tools are also deprecated.</p>
<p>Deprecated Deprecation: <a href="#">XPARM utility</a></p>	<p>The XPARM utility for the channel initiator parameter module, used to migrate to IBM WebSphere MQ for z/OS 7.0, is deprecated from IBM MQ 9.3.4.</p>
<p><b>IBM MQ 9.3.5 Continuous Delivery</b></p>	
<p>Deprecated AIX Deprecation: <a href="#">XL C/C++ for AIX 16 compiler support</a></p>	<p>Support for the XL C/C++ for AIX 16 compiler on AIX is deprecated from IBM MQ 9.3.5.</p> <p>From IBM MQ 9.3.5, you can compile AIX programs using the XLC 17 compiler alongside the XLC 16 compiler.</p>

## IBM MQ 9.2

Table 21. Deprecations, stabilizations, and removals at IBM MQ 9.2	
Feature	Description
<b>IBM MQ 9.2.0 initial release</b>	
<p>► <b>Deprecated</b> <a href="#">Deprecation: Secure Sockets Layer v3 (SSLv3) and TLS 1.0</a></p>	<p>For Long Term Support, Secure Sockets Layer v3 (SSLv3) and TLS 1.0 have been deprecated from IBM MQ 9.2.0. This means that IBM MQ 9.2.0 is the last release to provide SSLv3 and TLS 1.0 support for Long Term Support. The plan is to remove support in a future Continuous Delivery release after that.</p>
<p>► <b>Deprecated</b> <a href="#">Deprecation: support for <b>-credentialsFile</b> parameter</a></p>	<p>The <b>-credentialsFile</b> parameter of the <b>fteObfuscate</b> command, used in IBM MQ prior to IBM MQ 9.2, is deprecated from IBM MQ 9.2.0. You can use the <b>-f</b> parameter instead.</p>
<p>► <b>Deprecated</b> <a href="#">Deprecation: Support for all Managed File Transfer environment variables beginning with <b>FTE</b></a></p>	<p>Support for all Managed File Transfer environment variables that begin with <b>FTE</b> is deprecated from IBM MQ 9.2.0. You can substitute <b>FTE</b> environment variables with those that begin with <b>BFG</b>.</p>
<p>► <b>Deprecated</b> <a href="#">Deprecation: Dashboard Web Console</a></p>	<p>The widget-based Dashboard Web Console is deprecated from IBM MQ 9.2.0. In IBM MQ 9.2, the IBM MQ Console is enabled by default, although you can switch back to the Dashboard Web Console if required. See <a href="#">Switching between console types</a> in the IBM MQ 9.2 documentation.</p>
<p>► <b>Deprecated</b> <a href="#">Deprecation: XMS .NET Multicast messaging</a></p>	<p>XMS .NET Multicast messaging (using RMM) is deprecated from IBM MQ 9.2.0.</p>
<p>► <b>Stabilized</b> <a href="#">Stabilization: amqmdnet.dll library</a></p>	<p>The amqmdnet.dll library for .NET Framework is still supplied, but this library is stabilized; that is, no new features will be introduced into it.</p> <p>For any of the latest features you must migrate to the amqmdnetstd.dll library. However, you can continue to use the amqmdnet.dll library on IBM MQ 9.1 or later Long Term Support or Continuous Delivery releases.</p>
<p>► <b>Stabilized</b> <a href="#">Stabilization: IBM.XMS.* libraries</a></p>	<p>All the IBM.XMS.* libraries are still supplied, but these libraries are stabilized; that is, no new features will be introduced into them.</p> <p>For any of the latest features, you must migrate to the amqmxsstd.dll library. However, you can continue to use the existing libraries on IBM MQ 9.1 Long Term Support or Continuous Delivery releases.</p>
<p>► <b>Removed</b> <a href="#">Removal: Support for the Oracle Solaris operating system</a></p>	<p>Support for Solaris for all IBM MQ components, including server and clients, is removed from IBM MQ 9.2.0.</p>

Table 21. Deprecations, stabilizations, and removals at IBM MQ 9.2 (continued)

Feature	Description
<p>Removed Windows Linux Removal: <a href="#">Postcard application and Default Configuration wizard</a></p>	<p>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 9.2.0.</p>
<p>Removed Windows Removal: <a href="#">IBM MQ support for Microsoft Active X</a></p>	<p>From IBM MQ 9.0, support for Microsoft Active X is deprecated, and is removed from the product at IBM MQ 9.2.0. You can use the IBM MQ classes for .NET as the replacement technology.</p>
<p>Removed z/OS Removal: <a href="#">Queue sharing group samples not using Universal Table Spaces</a></p>	<p>The queue sharing group samples for setting up a Db2 environment that did not use Universal Table Spaces are removed at IBM MQ 9.2.0, following their deprecation in IBM MQ 9.1.</p>
<p>Removed Removal: <a href="#">IPT Administration Client</a></p>	<p>The IPT Administration Client graphical user interface is removed at IBM MQ 9.2.0. To configure and administer MQIPT, edit the <code>mqipt.conf</code> configuration file and use the <b>mqiptAdmin</b> command.</p>
<p>Removed z/OS Removal: <a href="#">IBM MQ service provider for IBM z/OS Connect EE no longer shipped with IBM MQ</a></p>	<p>From IBM MQ 9.2.0, the IBM MQ service provider for IBM z/OS Connect EE is no longer shipped as part of the IBM MQ product.</p>
<p><b>IBM MQ 9.2.x Continuous Delivery</b></p>	
<p>Deprecated Deprecation: <a href="#">AllowOutboundSNI property</a></p>	<p>For Continuous Delivery, the <b>AllowOutboundSNI</b> property is deprecated at IBM MQ 9.2.1. You should use the <b>OutboundSNI</b> property instead.</p>
<p>Removed Removal: <b>fteMigrateAgent</b>, <b>fteMigrateConfigurationOptions</b>, and <b>fteMigrateLogger</b> commands</p>	<p>For Continuous Delivery, the <b>fteMigrateAgent</b>, <b>fteMigrateConfigurationOptions</b> and <b>fteMigrateLogger</b> commands are removed at IBM MQ 9.2.1.</p> <p>These commands are still available for IBM MQ 9.2 Long Term Support.</p>

## IBM MQ 9.1

Table 22. Deprecations, stabilizations, and removals at IBM MQ 9.1

Feature	Description
<p><b>IBM MQ 9.1.0 initial release</b></p>	
<p>Deprecated Deprecation: <a href="#">IBM MQ classes for Java package com.ibm.mq.pcf</a></p>	<p>The IBM MQ classes for Java package <code>com.ibm.mq.pcf</code> is deprecated from IBM MQ 9.1.0.</p>
<p>Deprecated Deprecation: <a href="#">IBM Cloud Product Insights service</a></p>	<p>The IBM Cloud Product Insights service is deprecated on all platforms from IBM MQ 9.1.0 and has been replaced by the <i>ICP metering service</i>, referred to within this documentation as the <i>metering service</i>.</p>

Table 22. Deprecations, stabilizations, and removals at IBM MQ 9.1 (continued)

Feature	Description
<p> <span style="background-color: #e67e22; color: white; padding: 2px;">▶ Windows</span> <span style="background-color: #f39c12; color: white; padding: 2px;">▶ Deprecated</span> <span style="background-color: #27ae60; color: white; padding: 2px;">▶ Linux</span> </p> <p><u>Deprecation: Postcard application and Default Configuration wizard</u></p>	<p>The use of the Postcard application and its supporting Default Configuration wizard for installation verification is deprecated from IBM MQ 9.1.0.</p>
<p> <span style="background-color: #f39c12; color: white; padding: 2px;">▶ Deprecated</span> <span style="background-color: #c0392b; color: white; padding: 2px;">▶ z/OS</span> </p> <p><u>Deprecation: Buffer pools located below the bar</u></p>	<p>From IBM MQ 9.1.0, the <b>LOCATION(BELOW)</b> parameter of the <b>DEFINE BUFFPOOL</b> command is deprecated and you should use <b>LOCATION(ABOVE)</b> only. This deprecation applies to buffer pools that were not defined with the <b>LOCATION/LOC</b> attribute, or were defined with <b>LOCATION(BELOW)</b>.</p>
<p> <span style="background-color: #f39c12; color: white; padding: 2px;">▶ Deprecated</span> <span style="background-color: #c0392b; color: white; padding: 2px;">▶ z/OS</span> </p> <p><u>Deprecation: MAKECLNT CSQUTIL tool</u></p>	<p>The MAKECLNT CSQUTIL tool was stabilized at the IBM WebSphere MQ 7.1 level and is deprecated from IBM MQ 9.1.0. You should use <b>runmqsc -n</b> instead.</p>
<p> <span style="background-color: #f39c12; color: white; padding: 2px;">▶ Deprecated</span> <span style="background-color: #c0392b; color: white; padding: 2px;">▶ z/OS</span> </p> <p><u>Deprecation: Use of queue sharing groups with Db2 table spaces of any type other than universal table spaces</u></p>	<p>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 deprecated from IBM MQ for z/OS 9.1.0. 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.</p>
<p> <span style="background-color: #f39c12; color: white; padding: 2px;">▶ Deprecated</span> <span style="background-color: #c0392b; color: white; padding: 2px;">▶ z/OS</span> </p> <p><u>Deprecation: Using hexadecimal strings in the SSLCIPH attribute</u></p>	<p>Using hexadecimal strings in the SSLCIPH attribute is deprecated from IBM MQ for z/OS 9.1.0. In a future release, the <b>SSLCIPH</b> attribute on a channel definition will not accept hexadecimal string values. Only IBM MQ cipher strings will be accepted.</p>
<p> <span style="background-color: #e67e22; color: white; padding: 2px;">▶ Removed</span> </p> <p><u>Removal: Support for HP-UX</u></p>	<p>Support for the HP-UX operating system for all IBM MQ components, including server and clients, is removed at IBM MQ 9.1.0.</p>
<p> <span style="background-color: #e67e22; color: white; padding: 2px;">▶ Removed</span> </p> <p><u>Removal: Support for installing IBM MQ on Linux Ubuntu systems using rpm</u></p>	<p>The ability to install IBM MQ on Linux Ubuntu systems using rpm is removed at IBM MQ 9.1.0. The product must be installed using the supplied Debian-style packages.</p>
<p> <span style="background-color: #e67e22; color: white; padding: 2px;">▶ Removed</span> <span style="background-color: #c0392b; color: white; padding: 2px;">▶ Windows</span> </p> <p><u>Removal: Support for Microsoft Internet Explorer 11 browser</u></p>	<p>Microsoft Internet Explorer 11 browser support is removed at IBM MQ 9.1.0. The Microsoft Edge browser is now supported by the IBM MQ Console.</p>
<p> <span style="background-color: #e67e22; color: white; padding: 2px;">▶ Removed</span> </p> <p><u>Removal: IBM MQ transport for SOAP and HTTP bridge</u></p>	<p>The IBM MQ transport for SOAP, and IBM MQ HTTP bridge components are deprecated from IBM MQ 8.0.0. These components are removed at IBM MQ 9.1.0.</p>
<p> <span style="background-color: #e67e22; color: white; padding: 2px;">▶ Removed</span> <span style="background-color: #c0392b; color: white; padding: 2px;">▶ z/OS</span> </p> <p><u>Removal: Support for the MQ Service Provider in z/OS Connect V1</u></p>	<p>The zosConnectMQ-1.0 feature is removed at IBM MQ for z/OS 9.1.0. You can, instead, use the MQ Service Provider for IBM z/OS Connect EE.</p>
<p><b>IBM MQ 9.1.x Continuous Delivery</b></p>	

Table 22. Deprecations, stabilizations, and removals at IBM MQ 9.1 (continued)

Feature	Description
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> <span style="background-color: #800000; color: white; padding: 2px;">Windows</span> <span style="background-color: #008000; color: white; padding: 2px;">Linux</span>                     Removal: <a href="#">Postcard application and Default Configuration wizard</a> </p>	<p>The Postcard application and its supporting Default Configuration wizard, which were deprecated from IBM MQ 9.1.0, are removed from the product for Continuous Delivery at IBM MQ 9.1.2.</p>

## IBM MQ 9.0

Table 23. Deprecations, stabilizations, and removals at IBM MQ 9.0

Feature	Description
<b>IBM MQ 9.0.0 initial release</b>	
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> <span style="background-color: #008000; color: white; padding: 2px;">IBM i</span>                     Deprecation: <a href="#">compatibility mode for RPG and COBOL applications on IBM i</a> </p>	<p>From IBM MQ 9.0.0, IBM MQ no longer provides support for RPG or COBOL applications that use dynamic linkage known as compatibility mode. Applications that use this compatibility mode of operation need to be recompiled to use the static bound MQ calls that are provided by the LIBMQM and LIBMQM_R service programs.</p>
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span>                     Deprecation: <a href="#">IBM MQ transport for SOAP</a> </p>	<p>The following product features are deprecated from IBM MQ 9.0.0:</p> <ul style="list-style-type: none"> <li>• IBM MQ Java Listener</li> <li>• IBM MQ .NET 1 and 2 Listener</li> <li>• IBM MQ Java Axis2 Client</li> </ul> <p>This is in addition to the deprecation of the <a href="#">IBM MQ transport for SOAP clients and HTTP bridge</a> announced at IBM MQ 8.0.0.</p>
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span>                     Deprecation: <a href="#">MD5 in AMS</a> </p>	<p>From IBM MQ 9.0.0, MD5 and SHA-1 signature algorithms and RC2 and DES encryption algorithms on Advanced Message Security policies are disabled in default configurations. It is not possible to define new security policies that use these algorithms.</p>
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span>                     Deprecation: <a href="#">IBM MQ support for Microsoft Active X and Microsoft Visual Basic 6.0</a> </p>	<p>IBM MQ support for Microsoft Active X and Microsoft Visual Basic 6.0 is deprecated from IBM MQ 9.0.0. IBM MQ classes for .NET are the recommended replacement technology.</p>
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Stabilized</span>                     Stabilization: <a href="#">IBM MQ classes for Java</a> </p>	<p>From IBM MQ 9.0.0, IBM will make no further enhancements to the IBM MQ classes for Java and they are functionally stabilized at the level shipped in IBM MQ 8.0.0.</p>
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Removed</span>                     Removal: <a href="#">Managed File Transfer Web Gateway support</a> </p>	<p>The Web Gateway was deprecated at IBM MQ 8.0.0, and is removed at IBM MQ 9.0.0. The <b>ftCreateWebAgent</b> command is removed at IBM MQ 9.0.0.</p>
<p> <span style="background-color: #f4a460; padding: 2px;">▶ Removed</span>                     Removal: <a href="#">IBM Cloud Product Insights support</a> </p>	<p>The IBM Cloud Product Insights service is no longer available, therefore IBM MQ support for this service is no longer relevant.</p>

Table 23. Deprecations, stabilizations, and removals at IBM MQ 9.0 (continued)

Feature	Description
<b>IBM MQ 9.0.x Continuous Delivery</b>	
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">RPM support for Ubuntu</a>	RPM support for Ubuntu is deprecated from IBM MQ 9.0.2.
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">CipherSpecs (CD)</a>	For Continuous Delivery, from IBM MQ 9.0.1, a number of CipherSpecs are deprecated.
<span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> Removal: <a href="#">JSON4J .jar file and com.ibm.msg.client.mqlight package (CD)</a>	The JSON4J .jar file and com.ibm.msg.client.mqlight package are not needed by the IBM MQ classes for Java and IBM MQ classes for JMS, and are therefore removed at IBM MQ 9.0.5 for Continuous Delivery.
<b>IBM MQ 9.0.0 Long Term Support Fix Packs</b>	
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">CipherSpecs (LTS)</a>	For Long Term Support, from IBM MQ 9.0.0 Fix Pack 1, a number of CipherSpecs are deprecated.
<span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> Removal: <a href="#">JSON4J .jar file and com.ibm.msg.client.mqlight package (LTS)</a>	The JSON4J .jar file and com.ibm.msg.client.mqlight package are not needed by the IBM MQ classes for Java and IBM MQ classes for JMS, and are therefore removed at IBM MQ 9.0.0 Fix Pack 3 for Long Term Support.


## IBM MQ 8.0

Table 24. Deprecations, stabilizations, and removals at IBM MQ 8.0

Feature	Description
<b>IBM MQ 8.0.0 initial release</b>	
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">linking with libmqmcs and libmq</a>	On Solaris, linking with the libmqmcs and libmqmzse libraries is deprecated from IBM MQ 8.0.0. You must relink your applications to avoid using the libmqmcs and libmqmzse libraries.
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">Managed File Transfer Web Gateway</a>	The Managed File Transfer Web Gateway is deprecated from IBM MQ 8.0.0. In future releases, IBM does not expect that any additional enhancements will be applied to the Managed File Transfer Web Gateway function.
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">IBM MQ Explorer Service Definition Wizard</a>	The IBM MQ Explorer Service Definition Wizard, which was introduced in IBM WebSphere MQ 7.0, is deprecated from IBM MQ 8.0.0.
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: <a href="#">IBM MQ transport for SOAP clients and HTTP bridge</a>	The IBM MQ transport for SOAP Java client and listener for JAX-RPC, the IBM MQ transport for SOAP .NET 1 and 2, and the IBM MQ bridge for HTTP are deprecated from IBM MQ 8.0.0.
<span style="background-color: #f4a460; padding: 2px;">▶ Stabilized</span> <span style="background-color: #800000; color: white; padding: 2px;">▶ z/OS</span> Stabilization: <a href="#">MAKECLNT CSQUTIL tool</a>	The MAKECLNT CSQUTIL tool is stabilized from IBM MQ 8.0.0. You should use <b>runmqsc -n</b> instead.



Table 24. Deprecations, stabilizations, and removals at IBM MQ 8.0 (continued)

Feature	Description
<p>Removed Removal: <a href="#">migmbbrk</a> and <a href="#">z/OS CSQUMGMB</a></p>	<p>The <b>migmbbrk</b> command and, on z/OS, the <b>CSQUMGMB</b> command are removed at IBM MQ 8.0.0. These commands were introduced to migrate the publish/subscribe configuration to the IBM WebSphere MQ 7.0 constructs of topics and subscriptions.</p>
<p>Removed Removal: <a href="#">Direct</a> and <a href="#">DirectHTTP</a> transport support</p>	<p><a href="#">Direct</a> and <a href="#">DirectHTTP</a> transport were deprecated in a previous release of IBM MQ and they have been removed at IBM MQ 8.0.0.</p>
<p>Removed Removal: Support for Microsoft Visual Basic</p>	<p>Support for Microsoft Visual Basic is removed at IBM MQ 8.0.0.</p> <p> <b>Attention:</b> Microsoft Visual Basic on .NET is still supported.</p> <p><a href="#">Software product Compatibility report for Windows</a></p>
<p><b>IBM MQ 8.0.0 Fix Packs</b></p>	
<p>Deprecated Deprecation: <a href="#">SSLv3 protocol</a></p>	<p>The SSLv3 protocol and the use of some IBM MQ CipherSpecs is deprecated from IBM MQ 8.0.0 Fix Pack 2.</p>
<p>Deprecated Deprecation: <a href="#">weaker cryptographic algorithms</a></p>	<p>Support for weaker cryptographic algorithms is deprecated from IBM MQ 8.0.0 Fix Pack 3. Changes have been made to the IBM MQ queue manager to disallow the configuration of CipherSpecs using cryptographic algorithms, or protocols, that are considered to be weak.</p>
<p>Deprecated Deprecation: <a href="#">CipherSpecs</a></p>	<p>A number of CipherSpecs are deprecated from IBM MQ 8.0.0 Fix Pack 6.</p>

## IBM WebSphere MQ 7.5

Table 25. Deprecations, stabilizations, and removals at IBM WebSphere MQ 7.5

Feature	Description
<p><b>IBM WebSphere MQ 7.5.0 initial release</b></p>	
<p>Deprecated Removal: <a href="#">dspmqsver</a> command</p>	<p>The <b>dspmqsver</b> command is removed from IBM WebSphere MQ 7.5.0. Before IBM WebSphere MQ 7.5.0, this command was used to display the version of Advanced Message Security. From IBM WebSphere MQ 7.5.0, this information is displayed with the <b>dspmqver</b> command.</p>
<p><b>IBM WebSphere MQ 7.5.0 initial release Fix Packs</b></p>	
<p>Deprecated Deprecation: <a href="#">CipherSpecs</a></p>	<p>A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 6.</p>
<p>Deprecated Deprecation: <a href="#">CipherSpecs</a></p>	<p>A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 7.</p>

Table 25. Deprecations, stabilizations, and removals at IBM WebSphere MQ 7.5 (continued)	
Feature	Description
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: CipherSpecs	A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 8.

## IBM WebSphere MQ 7.1

Table 26. Deprecations, stabilizations, and removals at IBM WebSphere MQ 7.1	
Feature	Description
<b>IBM WebSphere MQ 7.1.0 initial release</b>	
<span style="background-color: #f4a460; padding: 2px;">▶ Deprecated</span> Deprecation: CipherSpecs	A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 6.
<span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> <span style="background-color: #4f7942; color: white; padding: 2px;">▶ AIX</span> Removal: /usr/lpp/mqm symbolic link	On AIX, before IBM WebSphere MQ 6.0, the product placed a symbolic link in /usr/lpp/mqm. The link ensured queue managers and applications migrated from versions before IBM WebSphere MQ 5.3 continued to work, without change. The link is not created in IBM WebSphere MQ 7.1.0 or later.
<span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> <span style="background-color: #4f7942; color: white; padding: 2px;">▶ Linux</span> <span style="background-color: #4f7942; color: white; padding: 2px;">▶ UNIX</span> Removal: <b>rtmqlnk</b> and <b>dltmqlnk</b> commands	On UNIX and Linux, the <b>rtmqlnk</b> and <b>dltmqlnk</b> commands are removed at IBM WebSphere MQ 7.1.0. Before IBM WebSphere MQ 7.1.0, these commands created symbolic links in subdirectories of /usr. From IBM WebSphere MQ 7.1.0 onwards, you must use the setmqinst command instead.
<span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> <span style="background-color: #4f7942; color: white; padding: 2px;">▶ Linux</span> <span style="background-color: #4f7942; color: white; padding: 2px;">▶ UNIX</span> Removal: /usr symbolic links	From IBM WebSphere MQ 7.1.0, on all UNIX and Linux platforms, the links from the /usr file system are no longer made automatically. In order to take advantage of these links, you must set an installation as the primary installation or set the links up manually.
<span style="background-color: #f4a460; padding: 2px;">▶ Removed</span> <span style="background-color: #800000; color: white; padding: 2px;">▶ Windows</span> Removal: amqmsrvn.exe process	On Windows, from IBM WebSphere MQ 7.1.0, the amqmsrvn.exe DCOM process is replaced by a Windows service, amqsvc.exe.
<b>IBM WebSphere MQ 7.1.0 Fix Packs</b>	

**Note:** The IBM WebSphere MQ 7.1 product documentation is provided outside of IBM Documentation. Available formats are PDF files, customer-installable Knowledge Center, and Information Center. For more information, see [“Documentation for older versions of IBM MQ” on page 191](#).

### Related concepts

[“IBM MQ features by version” on page 165](#)  
 Version-to-version feature comparison tables.

### Related reference

[IBM MQ Welcome page](#)



## IBM MQ downloads

The IBM MQ download pages provide links to download the full IBM MQ product, fix packs, cumulative security updates, and additional IBM MQ resources including resource adapters and clients.

**Note:** This topic is not IBM MQ version-specific, it is a family-level topic. It is always published in the latest IBM MQ version. If you want to bookmark this topic, please bookmark the following link. This link continues to work when a new IBM MQ version is released. [https://www.ibm.com/docs/en/SSFKSJ\\_latest/overview/mq\\_downloads\\_admins.html](https://www.ibm.com/docs/en/SSFKSJ_latest/overview/mq_downloads_admins.html).

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

### Any MQ version, all downloads

To download the full product, the latest Continuous Delivery (CD) release, or the latest maintenance release (fix pack or cumulative security update), click one of the following links to go to the download document for your IBM MQ version, then click the tab for the release or modification level that you require.

[IBM MQ 9.3](#) | [IBM MQ 9.2](#) | [IBM MQ 9.1](#) | [IBM MQ 9.0](#) | [IBM MQ 8.0](#) | [IBM MQ 7.5](#)

Each download document also gives additional links to clients and other resources that are available on Fix Central and elsewhere. For the latest version of IBM MQ, these additional links are also given in the following section: “[Resource adapter, clients and other resources](#)” on page 189.

A free 90-day trial version of the LTS release, for each of the last two IBM MQ major versions, is available for download here: <https://www.ibm.biz/ibmmqtrial>. This is useful if you want to try out IBM MQ, or if you are waiting for a full version purchase to complete. When your purchase completes, you can convert your trial installation to a full production copy.

### Resource adapter, clients and other resources

Clients:

- [IBM MQ C and .NET clients](#)
- [IBM MQ Java / JMS client](#)
- [IBM MQ Java client components \(on Maven\)](#)
- [IBM MQ redistributable clients](#)
- [IBM MQ Resource Adapter](#) - For use with any Java EE 7 or Jakarta EE compliant application server
- [IBM MQ redistributable Managed File Transfer \(MFT\) Agents](#)
- [IBM MQ classes for .NET Standard \(on NuGet\)](#)
- [IBM MQ classes for XMS .NET Standard \(on NuGet\)](#)

Components:

- [IBM MQ Internet Pass-Thru](#)
- [IBM MQ Explorer stand-alone install image](#) - CD only, but can be used to perform administration on any supported release of IBM MQ.
- [IBM MQ Native HA on AWS](#)
- [IBM MQ Kafka Connectors](#)

Containers:

- Prebuilt: [IBM MQ Advanced container](#) (subject to entitlement).
- Build your own: <https://github.com/ibm-messaging/mq-container>. This works in conjunction with the non-install (unzippable) IBM MQ images to build an IBM MQ container image that can run under the Red Hat OpenShift anyuid security context constraint (SCC).

- For production environments the three non-install images for Linux (subject to entitlement) are available here:

- [IBM MQ Advanced non-install images for Linux](#)

Note that each version of these non-install images is supported for one year only when used as part of an IBM MQ CD release, or two years (with an optional extension for another year) when used as part of an IBM Cloud Pak for Integration LTS release.

- For development environments the non-install packages can be found at the following locations:

- [IBM MQ Advanced for Developers non-install image for Linux x86-64](#)

- [IBM MQ Advanced for Developers non-install image for Linux PPCLE](#)

- [IBM MQ Advanced for Developers non-install image for Linux systemZ](#)

- [V 9.3.3 IBM MQ Advanced for Developers non-install image for Linux ARM64](#)

- A sample helm chart is available here: <https://github.com/ibm-messaging/mq-helm>

Development:

- IBM MQ Advanced for Developers is available for the Windows and Linux platforms listed in the [IBM MQ 9.3 system requirements](#), running on x86-64 architectures. Also available (as-is, see the [readme](#)) is a 32-bit version for Raspberry Pi. Download from the following locations:

[Windows](#) / [Linux](#) / [Ubuntu](#) / [Raspberry Pi](#)

- The [IBM MQ Mac toolkit for development](#) allows the execution of IBM MQ commands (for example MQSC commands) on macOS devices (both ARM64 and x86-64). It also contains client libraries that facilitate the development of macOS client applications that are executed on macOS devices (both ARM64 and x86-64). The client is used in the [Get started with IBM MQ tutorials](#).
- A pre-built [IBM MQ Advanced for Developers container image](#) is available from the IBM Container Registry. It runs on Linux/x86-64. Or you can [build your own](#) container image.

## SupportPacs

IBM MQ SupportPacs provide downloadable code and documentation that complements the IBM MQ family of products. Each SupportPac supplies a particular function or service that can be used with one or more of the IBM MQ products.

- [SupportPacs for IBM MQ and other project areas](#)
- [IBM MQ - SupportPacs by Product](#)

### Related concepts

[“IBM MQ 9.3 PDF files for product documentation and Program Directories” on page 199](#)

You can download the IBM MQ 9.3 product documentation, and the IBM MQ for z/OS Program Directories, in PDF format.

[Where to find product requirements and support information](#)

[Where to find downloadable installation images](#)

### Related reference

[IBM MQ landing page](#)

### Related information

[IBM MQ downloads for developers](#)

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To download the app, and the documentation packages, you need to log in to IBM Documentation. For more information, see [IBM Documentation Offline](#).

## Documentation for older versions of IBM MQ

For older versions of IBM MQ products, and of scenarios describing connecting IBM MQ with other IBM products, documentation is provided outside of IBM Documentation. Available formats are PDF and Information Center.

**Note:** This topic is not IBM MQ version-specific, it is a family-level topic. It is always published in the latest IBM MQ version. If you want to bookmark this topic, please bookmark the following link. This link continues to work when a new IBM MQ version is released. [https://www.ibm.com/docs/en/SSFKSJ\\_latest/overview/doc\\_older\\_versions.html](https://www.ibm.com/docs/en/SSFKSJ_latest/overview/doc_older_versions.html).

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

<i>Table 27. Older IBM MQ documentation: What exists, where it is, and in what formats</i>		
<b>IBM MQ product or scenario</b>	<b>PDFs or ePubs</b>	<b>Information Center</b>
MQ Advanced Message Security 7.0.1	-	-
MQ Advanced Message Security for z/OS 7.0.1	-	-
MQ File Transfer Edition 7.0.4	<ul style="list-style-type: none"> <li>• <a href="#">MQ FTE 7.0.4 (1 book)</a>, <a href="#">MFT for SOA - July 2009 (1 book)</a></li> </ul>	-
MQ product connectivity scenarios <sup>1</sup>	<ul style="list-style-type: none"> <li>• <a href="#">15 scenarios, grouped under 3 major headings. Each scenario is documented in both PDF and ePub formats.</a></li> </ul>	-
MQSeries Everyplace	<ul style="list-style-type: none"> <li>• <a href="#">1.0, 1.1, 1.2 (12 books)</a></li> </ul>	-
MQTT Clients	-	-
MS81 Internet Pass-Thru 1.2	<ul style="list-style-type: none"> <li>• <a href="#">MS81 IPT 1.2 (1 book)</a></li> </ul>	-
MQ 7.1	<ul style="list-style-type: none"> <li>• <a href="#">MQ 7.1 (5 books)</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">MQ 71 Product Documentation (Windows and Linux)</a></li> </ul>

<sup>1</sup> The product connectivity scenarios give guidance on connecting MQ to other IBM products (WebSphere Application Server classic, Liberty profile, IBM MessageSight, and MQTT mobile apps).

Table 27. Older IBM MQ documentation: What exists, where it is, and in what formats (continued)

IBM MQ product or scenario	PDFs or ePubs	Information Center
MQ 7.0.1	<ul style="list-style-type: none"> <li>• <a href="#">MQ 7.0.1 Features and Enhancements (1 book)</a></li> <li>• <a href="#">MQ 7.0.1.4 (33 books)</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">MQ 7 Information Centers (Windows and Linux)</a></li> </ul>
MQ 7.0	<ul style="list-style-type: none"> <li>• <a href="#">MQ 7.0 2008 (33 books)</a></li> <li>• <a href="#">MQ 7.0 2009 (33 books)</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">MQ 7.0.0 Information Centers (Windows and Linux)</a></li> </ul>
MQ 6.0	<ul style="list-style-type: none"> <li>• <a href="#">10 books</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">MQ 6 Information Centers (Windows and Linux)</a></li> </ul>
MQ 5.3	<ul style="list-style-type: none"> <li>• <a href="#">31 books</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">MQ 5.3 Information Center (Windows)</a></li> </ul>
MQ 5.2	<ul style="list-style-type: none"> <li>• <a href="#">18 books</a></li> </ul>	-
MQ 5.1	<ul style="list-style-type: none"> <li>• <a href="#">33 books</a></li> </ul>	-
MQ 3.0	<ul style="list-style-type: none"> <li>• <a href="#">MQ for zVSE System Management (1 book)</a></li> </ul>	-
MQ 2.1	<ul style="list-style-type: none"> <li>• <a href="#">MQ for zVSE System Management (1 book)</a></li> </ul>	-

**Related reference**

[IBM MQ documentation landing page](#)

**Related information**

[IBM Support Software lifecycle](#)

## IBM MQ 9.3 information roadmap

This roadmap provides two sets of maps that help you navigate particular aspects of IBM MQ 9.3. 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 28. 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> <b><a href="#">“About IBM MQ” on page 5</a></b> Introductory information to help you get started with IBM MQ 9.3, 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><b><a href="#">Learning path: IBM MQ Developer Essentials Badge on the IBM Developer website</a></b> Tutorials to help you get started with IBM MQ.</p> <p><b><a href="#">IBM MQ product web page</a></b> Product web page with links to resources and additional information.</p> <p><b><a href="#">IBM MQ system requirements</a></b> Web page with links to the system requirements for the different releases of IBM MQ.</p> <p><b><a href="#">“IBM MQ 9.3 in the IBM Documentation Offline app” on page 198</a></b> You can download IBM MQ 9.3 messaging documentation into an offline version of IBM Documentation that you install locally.</p> <p><b><a href="#">IBM MQ 9.3 PDF documentation</a></b> You can download IBM MQ 9.3 product documentation as a series of PDF files.</p>
Technical overview	<p> <b><a href="#">Technical overview</a></b> 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> <b><a href="#">Planning</a></b> 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 28. IBM MQ information roadmap for product-level categories (continued)












Category	Information resources
Migrating and upgrading	<p> <b><u>Maintaining and migrating</u></b>  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> <b>Multi</b></p> <p><b><u>IBM WebSphere MQ / IBM MQ Migration Guide</u></b>  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> <b>z/OS</b></p> <p><b><u>IBM WebSphere MQ / IBM MQ for z/OS Migration Guide</u></b>  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> <b><u>Installing and uninstalling</u></b>  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> <b><u>Securing</u></b>  Aspects of security to consider in your IBM MQ installation including identification and authentication, authorization, auditing, confidentiality, and data integrity.</p>
Configuring	<p> <b><u>Configuring</u></b>  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> <b><u>Administering IBM MQ</u></b>  Administer your queue managers and associated resources.</p>
Developing applications	<p> <b><u>Developing applications</u></b>  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> <b><u>Monitoring and performance</u></b>  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 28. IBM MQ information roadmap for product-level categories (continued)

Category	Information resources
Troubleshooting and support	<p> <b><u>Troubleshooting and support</u></b> Techniques to help you diagnose and solve problems with your queue manager network or IBM MQ applications.</p> <p><b><u>IBM Support Assistant web page</u></b> 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><b><u>IBM Support Portal web page</u></b> IBM Support Portal for IBM MQ.</p> <p><b><u>IBM Support Forums</u></b> Search for "MQ".</p>
Reference	<p> <b><u>Reference</u></b> Reference information for configuration, administration, developing applications, telemetry, security, monitoring, troubleshooting and support, and diagnostic messages.</p>

Windows MQ Adv. Linux 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 or Windows](#)
- [Aspera gateway can improve performance over high latency networks](#)

Full Aspera gateway documentation is in a separate collection in IBM Documentation:

- [IBM Aspera faspio 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 or Windows](#):

- [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 9](#) (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 9](#) (entitlement for installing Managed File Transfer)
- Technical overview
  - [Managed File Transfer introduction](#) (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 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 IBM MQ Advanced for z/OS](#) (includes instructions for installing MFT on 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 9](#) (entitlement for installing MQ Telemetry)
- Technical overview
  - [IBM MQ Telemetry](#) (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](#)

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<a href="#">mq93.secure.pdf</a>	Securing IBM MQ
<a href="#">mq93.configure.pdf</a>	Configuring IBM MQ
<a href="#">mq93.administer.pdf</a>	Administering IBM MQ
<a href="#">mq93.develop.pdf</a>	Developing applications for IBM MQ
<a href="#">mq93.monitor.pdf</a>	Monitoring and performance for IBM MQ
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<a href="#">mq93.refadmin.pdf</a>	IBM MQ Administration reference
<a href="#">mq93.refdev.pdf</a>	IBM MQ Developing applications reference
<a href="#">mq93.explorer.pdf</a>	IBM MQ Explorer
<a href="#">mq93.container.pdf</a>	IBM MQ in containers

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## IBM MQ for z/OS Program Directory PDF files

z/OS

LTS

The following IBM MQ for z/OS 9.3.0 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 9.3.0 \(GI13-4469-01\)](#)
- [Program directory for IBM MQ for z/OS Value Unit Edition Long Term Support 9.3.0 \(GI13-4470-00\)](#)
- [Program directory for IBM MQ Advanced for z/OS Long Term Support 9.3.0 \(GI13-4471-01\)](#)
- [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Long Term Support 9.3.0 \(GI13-4472-02\)](#)

CD

The following IBM MQ for z/OS 9.3.x Program Directory documents for Continuous Delivery are available for download as PDF files:

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  - [Program directory for IBM MQ for z/OS Continuous Delivery 9.3.0 \(GI13-4473-00\)](#)
  - [Program directory for IBM MQ for z/OS Continuous Delivery 9.3.1 \(GI13-4473-01\)](#)
  - [Program directory for IBM MQ for z/OS Continuous Delivery 9.3.2 \(GI13-4473-02\)](#)
  - [Program directory for IBM MQ for z/OS Continuous Delivery 9.3.3 \(GI13-4473-03\)](#)
  - [Program directory for IBM MQ for z/OS Continuous Delivery 9.3.4 \(GI13-4473-04\)](#)
  - [Program directory for IBM MQ for z/OS Continuous Delivery 9.3.5 \(GI13-4473-05\)](#)
- Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.x
  - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.0 \(GI13-4474-00\)](#)
  - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.1 \(GI13-4474-01\)](#)
  - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.2 \(GI13-4474-02\)](#)
  - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.3 \(GI13-4474-03\)](#)
  - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.4 \(GI13-4474-04\)](#)
  - [Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.3.5 \(GI13-4474-05\)](#)
- Program directory for IBM MQ Advanced for z/OS Continuous Delivery 9.3.x
  - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery 9.3.0 \(GI13-4475-00\)](#)
  - [Program directory for IBM MQ Advanced for z/OS Continuous Delivery 9.3.1 \(GI13-4475-01\)](#)
  - [Program directory for IBM MQ Advanced for z/OS 9.3.x Continuous Delivery 9.3.2 \(GI13-4475-02\)](#)
  - [Program directory for IBM MQ Advanced for z/OS 9.3.x Continuous Delivery 9.3.3 \(GI13-4475-03\)](#)
  - [Program directory for IBM MQ Advanced for z/OS 9.3.x Continuous Delivery 9.3.4 \(GI13-4475-04\)](#)
  - [Program directory for IBM MQ Advanced for z/OS 9.3.x Continuous Delivery 9.3.5 \(GI13-4475-05\)](#)
- Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.3.x
  - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.3.0 \(GI13-4476-00\)](#)
  - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.3.1 \(GI13-4476-01\)](#)
  - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.3.2 \(GI13-4476-02\)](#)
  - [Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.3.3 \(GI13-4476-03\)](#)
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## Glossary

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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 201](#) [“B” on page 204](#) [“C” on page 205](#) [“D” on page 210](#) [“E” on page 212](#) [“F” on page 213](#) [“G” on page 214](#) [“H” on page 215](#) [“I” on page 215](#) [“J” on page 218](#) [“K” on page 219](#) [“L” on page 219](#) [“M” on page 221](#) [“N” on page 225](#) [“O” on page 225](#) [“P” on page 227](#) [“Q” on page 230](#) [“R” on page 231](#) [“S” on page 233](#) [“T” on page 238](#) [“U” on page 241](#) [“V” on page 242](#) [“W” on page 242](#) [“X” on page 242](#)

## 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 [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 AIX 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 AIX 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 AIX, Linux, and Windows platforms, 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 AIX 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.

**cryptology**

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](#)<sup>®</sup>.

**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.



## LUWID

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 a 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 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](#).

**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 MQ Telemetry is an MQTT server 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](#).

**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 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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Programming interface information, if provided, is intended to help you create application software for use with this program.

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