9.4

IBM MQ Overview

Note

Before using this information and the product it supports, read the information in “Notices” on page 213.

This edition applies to version 9 release 4 of IBM® MQ and to all subsequent releases and modifications until otherwise indicated in new editions.

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About IBM MQ

Introductory information to help you get started with IBM MQ 9.4, 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-premises, 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

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IBM MQ

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-premises, 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 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® product, or to both products. This documentation is for the IBM MQ 9.4 Long Term Support release and its maintenance, as well as for the IBM MQ 9.4 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® 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

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.
- Windows Linux 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 9.4.0 " on page 26
IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ 9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. The features that you have access to depends on your product entitlement.

"What's new and changed in IBM MQ 9.4.x Continuous Delivery" on page 80
Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

"What's changed in IBM MQ 9.4.0 Long Term Support" on page 108
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 163
The product documentation for all IBM MQ 9.4 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.

Technical overview

IBM MQ license information

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

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

Licensed Program Specifications for IBM MQ for z/OS

z/OS

The Licensed Program Specifications publication for IBM MQ for z/OS 9.4 is available for download as a PDF file from the following location: https://publibfp.dhe.ibm.com/epubs/pdf/c3474880.pdf.

What you can purchase with IBM MQ

Multi **5724-H72 IBM MQ for Multiplatforms**

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

- IBM MQ
- IBM MQ High Availability Replica (formerly IBM MQ Idle Standby) "1" on page 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. You can 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.

- 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

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

Where you can purchase IBM MQ licenses

Passport Advantage

All IBM MQ licenses are available here.

1. Go to the IBM MQ 9.4 download page.
2. Click the tab for the IBM MQ product that you want to download (either CD or LTS).
3. Choose the download that you require.

You are asked to log in. If your IBM ID is entitled, you are presented with a set of downloadable files. Otherwise, you are prompted to choose an appropriate license.

AWS Marketplace

When you deploy IBM MQ through the AWS Marketplace, you can get the IBM license at the same time. See the IBM MQ page at the AWS Marketplace.

V 9.4.0 Linux V 9.4.0 **Azure Marketplace**

When you deploy IBM MQ through the Azure Marketplace, you can get the IBM license at the same time. See the IBM MQ page at the Azure Marketplace.

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) "1" 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
Managed File Transfer Tools (unlimited installs)		✓			✓	✓	✓
Managed File Transfer Database Logger component (unlimited installs) "1" on page 13		✓			✓	✓ "2" on page 13	✓
Replicated Data Queue Manager (Red Hat Enterprise Linux for x86-64 only)		✓ "3" on page 13					✓
V 9.4.0 Kafka Connect connectors (unlimited installs) "1" 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 V 9.4.3 and Cross-Region Replication	V 9.4.3 ✓ "9" on page 14	✓ "7" on page 14					✓ "7" on page 14
V 9.4.0 IBM MQ Web Server (unlimited installs)	✓ "8" on page 14	✓ "8" on page 14	✓ "8" on page 14	✓ "8" on page 14	✓ "8" on page 14	✓ "8" on page 14	✓ "8" on page 14
V 9.4.0 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 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. 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.

   Only the active/leader node consumes license entitlement. Refer to the IBM MQ Advanced license for entitlement requirements.
8. Linux Linux for x86-64, Linux on Power® Systems - Little Endian, and Linux on IBM Z® only.
9. V 9.4.3 Add-on entitlement to IBM MQ can be purchased for this capability. For more information, see “What are Native HA and Cross-Region Replication Add-On chargeable components?” on page 18.

Managed File Transfer, Advanced Message Security, and Telemetry

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

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

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

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

IBM MQ product feature	IBM MQ Managed File Transfer Service"1" on page 16	IBM MQ Managed File Transfer Agent"1" on page 16	IBM MQ Advanced Message Security"1" on page 16	MQ Telemetry"1" on page 16	IBM MQ Advanced for z/OS"2" on page 16	IBM MQ Managed File Transfer for z/OS"1" on page 16	IBM MQ Advanced Message Security for z/OS"1" on page 16
Managed File Transfer Agent (unlimited installs)	✓	✓			✓ "3" on page 16	✓	
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)							
V 9.4.0 Kafka Connect connectors (unlimited installs)					✓		
IBM MQ Advanced Container							
IBM MQ Internet Pass-Thru							

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

IBM MQ product feature	IBM MQ Managed File Transfer Service"1" on page 16	IBM MQ Managed File Transfer Agent"1" on page 16	IBM MQ Advanced Message Security"1" on page 16	MQ Telemetry"1" on page 16	IBM MQ Advanced for z/OS"2" on page 16	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 Aspera faspio Gateway					✓		
AMQP							
V 9.4.0 IBM MQ Web Server (unlimited installs)							
V 9.4.0 IBM Instana Tracing Exit							
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 9.4.
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. For example, your 100 PVUs of IBM MQ (Server) entitlement could be split into 50 PVUs of the IBM MQ 9.3 version and 50 PVUs of the IBM MQ 9.4 version of this component.

What are Subscription License parts?

V 9.4.0

- 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.

What are Native HA and Cross-Region Replication Add-On chargeable components?

V 9.4.3

IBM MQ Native HA and Cross-Region Replication capability is available with IBM MQ Advanced entitlement or as an additional Add-On to IBM MQ.

The Add-On to IBM MQ provides entitlement to use IBM MQ Native HA and Cross-Region Replication capability with all the base IBM MQ capabilities to build high availability solutions. The Add-On entitlement does not permit you to use any other IBM MQ Advanced capabilities.

Add-On entitlement parts are available for production and non-production environments:

- IBM MQ Native HA and Cross-Region Replication Add-on
- IBM MQ Native HA and Cross-Region Replication Add-on for Non-Production Environment

IBM MQ Native HA and Cross-Region Replication capability is only available in container deployments.

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 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

None of the components in this list are charged, so do not incur additional costs when installed on systems remote from the IBM MQ queue manager.

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 an 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 9.4, IBM MQ Advanced for Non-Production Environment 9.4, IBM MQ Advanced for z/OS Value Unit Edition 9.4, and IBM MQ Advanced for z/OS 9.4:

- IBM Aspera faspio Gateway 1.3

Related concepts

“What's new and changed in IBM MQ 9.4.0 ” on page 26
IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ 9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. The features that you have access to depends on your product entitlement.

“What's new and changed in IBM MQ 9.4.x Continuous Delivery” on page 80
Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

“What's changed in IBM MQ 9.4.0 Long Term Support” on page 108
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 9.4

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/mq94redistclients
- 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/mq94redistmftagent

IBM MQ for z/OS stub routines

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

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

Requirements:

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

Redistributables:

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

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

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.

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

IBM MQ product offering	Product identifier (PID)	Export classification (ECCN)
IBM MQ "1" on page 23	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
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	5D002.c.1
IBM MQ Advanced Message Security for z/OS "4" on page 23	5655-AM9	EAR99

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 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
   - 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. 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 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

z/OS 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 - Support Cycle 2 (formerly Long Term Support) (CP4I-SC2) 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 9.3.0 and 9.4.0.
- Continuous Delivery releases usually have a modification number that is non-zero. For example 9.4.1, 9.4.2, 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 9.4.0 is the follow-on LTS release to IBM MQ 9.3.0. It is also the follow-on CD release to IBM MQ 9.3.5.

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 **dspmqver**, 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.
- Linux Windows View the queue manager property panel in IBM MQ Explorer.
- z/OS 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

There are two types of maintenance release, **fix packs** for LTS releases and **Cumulative Security Updates** (CSUs) for LTS and CD releases:

- Fix packs provide the latest security and functional fixes.
- CSUs provide the latest security fixes.

Both types of maintenance are mutually cumulative (that is, they contain all fixes included in older CSUs and fix packs) and both are installed using the same mechanisms for applying maintenance. So you can apply any higher numbered fix pack or CSU of the same version/release to upgrade directly to that version level. You do not have to apply the intervening fixes.

Both types of maintenance update the F digit of the VRMF to a higher number than any previous maintenance:

- LTS For LTS releases, the F digit of the VRMF is either a fix pack number, which is a value divisible by 5, or a CSU number, which is a value not divisible by 5. For example, 9.3.0.5 is a fix pack and 9.4.0.1 is an LTS CSU.
- CD For CD releases, the F digit of the VRMF is either a zero or a CSU number, which is a value not divisible by 5. For example, 9.3.2.1 is a CD CSU.

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

For more information, see Changes to IBM MQ's maintenance delivery model.

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

Maintenance delivery model: differences by platform

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

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

V 9.4.0 From IBM MQ 9.4, on Windows and Linux platforms both types of maintenance are full install images that can be used for a new installation or upgrading an existing installation. On AIX® and IBM i the CSU and fix pack maintenance process is unchanged and requires a base install image to apply to.

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

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

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

CP4I-SC2 CD

V 9.4.1 From IBM MQ Advanced 9.4.1, the prebuilt IBM MQ Advanced Container is supported standalone. The prebuilt IBM MQ Advanced Container for version 9.4.0 is only supported when deployed using the IBM MQ Operator on the Red Hat OpenShift Container Platform. IBM MQ 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 - Support Cycle 2 (formerly Long Term Support) (CP4I-SC2) 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. However, if a container image is based on a version of IBM MQ 9.4, 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 9.4

Pricing metric for Virtual Processor Cores (VPCs)

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

Usage of each VPC is measured in Virtual Processor Core-Instance-Hours, and captured in whole minute increments. An Instance is a running copy of IBM MQ (the Program), not including copies of the Program used for backup purposes, specifically those designated as "cold" or "warm", as defined in the IBM Software Licensed under the IPLA - Backup Use Defined Document located here: Software policies.

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

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

Related tasks

Configuring IBM MQ for use with the metering service in IBM Cloud Private

V 9.4.0 V 9.4.0 What's new and changed in IBM MQ 9.4.0

IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ 9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. 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.

Delivery and support model

IBM MQ 9.4.0 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.

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

CD Continuous Delivery releases deliver new functional enhancements, in addition to fixes and security updates, on a much shorter cadence, so providing much more rapid access to those new functions. 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 9.4.0

IBM MQ 9.4.0 includes the features, enhancements and changes of behavior that were previously delivered in the CD releases of IBM MQ 9.3.0 through IBM MQ 9.3.5, along with some features, enhancements, and changes of behavior that are new at IBM MQ 9.4.0:

- Features, enhancements, and changes of behavior that are new to Long Term Support (LTS) users at IBM MQ 9.4.0 are indicated by a dark blue icon V 9.4.0
- Features, enhancements, and changes of behavior that are new to Continuous Delivery (CD) users at IBM MQ 9.4.0 are indicated by a light blue icon V 9.4.0

What's new in 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.

Installation, and migration

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- Windows V 9.4.0 Linux V 9.4.0 "[Windows][MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]New method for applying maintenance on Windows and Linux" on page 34

Security

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- Linux V 9.4.0 AIX "[Linux][AIX]JSON Web Token (JWT) support and token based authentication" on page 35
- V 9.4.0 "[MQ 9.4.0 Jun 2024]New property to set the user context that is used for authorization in the messaging REST API" on page 35
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changes to MQCSP password protection in MQIPT" on page 35
- Windows Linux V 9.4.0 "[Windows][Linux][MQ 9.4.0 Jun 2024]Support for TLS1.3 on managed .NET clients" on page 36

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 Linux V 9.4.0 AIX Administration of token based authentication is significantly simplified with support for JWKS key management
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jul 2024][MQ 9.4.0 Jul 2024][AIX, Linux, Windows]New TLS skip validation mode for IBM MQ client applications on C and JMS" on page 36
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]New property to specify the protocols that MQIPT routes accept" on page 36
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]New commands to manage keys, certificates, and certificate requests" on page 36
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]New command to manage keystores and certificates that are used by MQIPT" on page 36

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "Enhancements to the IBM MQ Console" on page 36

- V 9.4.0 “[MQ 9.4.0 Jun 2024]Stand-alone IBM MQ Web Server” on page 37
- V 9.4.0 “[MQ 9.4.0 Jun 2024]New CAPEXPRY attribute” on page 37
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Media image scheduling - linear logging” on page 37
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Extension of queue manager status attributes” on page 37
- CP4I V 9.4.0 “[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Addition of Native HA status attributes” on page 38
- V 9.4.0 “[MQ 9.4.0 Jun 2024]dspmqver command now reports release type” on page 38
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Environment variables for tuning I/O operations that take too long” on page 38
- V 9.4.0 “[MQ 9.4.0 Jun 2024]MQIPT trace file configuration enhancements” on page 38
- V 9.4.0 “[MQ 9.4.0 Jun 2024]OpenTelemetry tracing” on page 38

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 “[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Enabling JSON formatted logs for AMQP and MQTT” on page 38
- V 9.4.0 V 9.4.0 “[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]LZ4 compression is now available for channels” on page 38

Application development

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 AIX “[MQ 9.4.0 Jun 2024][AIX]Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0” on page 38
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Performance improvements for processing of AMQP message acknowledgments” on page 39
- Windows Linux V 9.4.0 “[Windows][Linux]Enhancements for IBM MQ .NET and XMS .NET” on page 39
- V 9.4.0 “Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging for sharing TCP/IP connections and using modular applications” on page 39
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Application rebalancing support for IBM MQ classes for JMS” on page 40
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Remote messaging with the messaging REST API” on page 40
- Linux V 9.4.0 “[Linux][MQ 9.4.0 Jun 2024]Containers non-install image added for Linux ARM64 / Apple Silicon” on page 40

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 Support for .NET 8 applications using IBM MQ classes for .NET and IBM MQ classes for XMS .NET

What's new in IBM MQ for Multiplatforms - Advanced entitlement only

Multi MQ Adv.

On Multiplatform, the following features and enhancements are available only with Advanced entitlement.

License entitlement, installation and upgrade

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- OpenShift V 9.4.0 "[MQ 9.4.0 Jun 2024]Native HA entitlement" on page 41

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "IBM MQ entitlement through AWS Marketplace or Azure Marketplace" on page 42

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Unlocking events from mission-critical data using Kafka Connect" on page 42
- OpenShift V 9.4.0 "[OpenShift Container Platform][MQ 9.4.0 Jun 2024]Autorecovery of damaged objects for Native HA queue managers" on page 42
- V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Media image scheduling - replicated logging" on page 42
- V 9.4.0 "[MQ 9.4.0 Jun 2024]RDQM available on RHEL 9" on page 42
- V 9.4.0 "Managed File Transfer enhancements for resource monitors and fteRAS" on page 42

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]LZ4 compression now available for Native HA" on page 43

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

z/OS

On z/OS, 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.

Security

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 New property to set the user context that is used for authorization in the messaging REST API

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jul 2024][MQ 9.4.0 Jul 2024]New TLS skip validation mode for IBM MQ JMS client applications on z/OS" on page 44

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jul 2024]Increased scalability for the channel initiator" on page 45
- V 9.4.0 "[MQ 9.4.0 Jul 2024]Enhancements to SMF queue statistics records and SMF accounting data" on page 45
- V 9.4.0 "Enhancements to the IBM MQ Console" on page 45

- V 9.4.0 Stand-alone IBM MQ Web Server

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 Page sets and buffer pools can be viewed in the IBM MQ Console on z/OS
- V 9.4.0 V 9.4.0 “[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]CAPEXPRY attribute available on IBM MQ for z/OS” on page 46
- V 9.4.0 V 9.4.0 “[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Faster log throughput with zHyperLink ” on page 46

Application development

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging for sharing TCP/IP connections and using modular applications
- V 9.4.0 Remote messaging with the messaging REST API

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

z/OS MQ Adv. VUE MQ Adv. z/OS

On z/OS, the following features and enhancements are available with Advanced or Advanced VUE entitlement only.

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 “[MQ 9.4.0 Jul 2024]Additional capabilities for users with IBM MQ Advanced for z/OS entitlement” on page 48
- V 9.4.0 Unlocking events from mission-critical data using Kafka Connect
- V 9.4.0 Managed File Transfer enhancements for resource monitors and **fteRAS**

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

-

What's changed in IBM MQ 9.4.0

IBM MQ 9.4.0 includes changes of behavior that were previously delivered in the CD releases of IBM MQ 9.3.0 through IBM MQ 9.3.5, along with some changes that are new at IBM MQ 9.4.0:

License entitlement, installation and migration

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- Multi V 9.4.0 “[UNIX, Linux, Windows, IBM i][MQ 9.4.0 Jun 2024]Change to nonprod entitlement option of setmqinst command” on page 52
- V 9.4.0 “[MQ 9.4.0 Jun 2024]Changes to the features that are supplied with the mqweb server” on page 52

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 Linux V 9.4.0 “[MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]Migration considerations relating to IBM MQ Bridge to Salesforce removal” on page 52

- Windows V 9.4.0 Linux V 9.4.0 "[MQ 9.4.0 Jun 2024][IBM MQ Advanced] [MQ 9.4.0 Jun 2024][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]IBM Aspera faspio Gateway version upgraded" on page 52

Security

V 9.4.0 The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- Linux V 9.4.0 AIX "[Linux][MQ 9.4.0 Jun 2024][AIX]Changes to Security Policy attribute of the Service stanza of the qm.ini file" on page 53
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Change to SSLCIPH property for AMQP channels" on page 53

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]AMQP channel no longer supports CMS keystores" on page 53
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Removal of support for RSA key exchange when operating in FIPS mode" on page 53

Administration

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changed return code for endmqm" on page 54
- Linux V 9.4.0 AIX "[Linux][MQ 9.4.0 Jun 2024][AIX]runmqdlq tool default permissions change" on page 55
- V 9.4.0 z/OS "[MQ 9.4.0 Jul 2024][z/OS]Changes to the RECOVER CFSTRUCT command" on page 55
- MQ Adv. V 9.4.0 MQ Adv. VUE "[IBM MQ Advanced][MQ 9.4.0 Jun 2024][IBM MQ Advanced VUE]Changes to the output of the MFT fteDisplayVersion command" on page 55
- Windows Linux V 9.4.0 AIX "[MQ 9.4.0 Jun 2024][AIX, Linux, Windows]Changes to entries in the connection log for connections to MQIPT TLS server routes that close without sending any data" on page 55
- V 9.4.0 z/OS "[MQ 9.4.0 Jul 2024][z/OS]Changes to the way the CSQ1LOGP EXTRACT function handles messages with message properties" on page 55
- V 9.4.0 z/OS "[MQ 9.4.0 Jul 2024][z/OS]Changes to zHyperWrite" on page 55

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]RHEL 7 no longer supported for RDQM" on page 55
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]Change to the start of the AMQP Service" on page 56

Application development

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changes to Bouncy Castle JAR file names" on page 56
- V 9.4.0 "[MQ 9.4.0 Jun 2024]com.ibm.mq.cfg.useIBMCipherMappings no longer needed for configuring mappings" on page 56

- Windows Linux V 9.4.0 "[Windows][Linux][MQ 9.4.0 Jun 2024]Error message improvements for security exit failures when a .NET client is connecting to IBM MQ" on page 56

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Use of separately downloadable IBM Semeru Java runtime for IBM MQ client applications" on page 56
- Windows V 9.4.0 Linux V 9.4.0 "[Windows][MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]Removal of IBM MQ .NET Standard client libraries" on page 56
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Changes to how C sample programs with authentication capabilities are built" on page 57
- V 9.4.0 Linux V 9.4.0 "[MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]Removal of 31-bit library support for IBM MQ for Linux on IBM Z" on page 57

Containers

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[Linux][MQ 9.4.0 Jun 2024]Changed environment variables for the IBM MQ Advanced for Developers container image" on page 57
- V 9.4.0 "[OpenShift Container Platform][MQ 9.4.0 Jun 2024]For use in containers, a certificate must have a unique Subject Distinguished Name" on page 57

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 9.4.x Continuous Delivery" on page 80
Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

"What's changed in IBM MQ 9.4.0 Long Term Support" on page 108
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 110
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 9.4.

What's new and what's changed in IBM MQ Explorer

"Icons used in the product documentation" on page 163
The product documentation for all IBM MQ 9.4 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

V 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

Installation and migration

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- Windows V 9.4.0 Linux V 9.4.0 "[Windows][MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]New method for applying maintenance on Windows and Linux" on page 34

Security

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- Linux V 9.4.0 AIX "[Linux][AIX]JSON Web Token (JWT) support and token based authentication" on page 35
- V 9.4.0 "[MQ 9.4.0 Jun 2024]New property to set the user context that is used for authorization in the messaging REST API" on page 35
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changes to MQCSP password protection in MQIPT" on page 35
- Windows Linux V 9.4.0 "[Windows][Linux][MQ 9.4.0 Jun 2024]Support for TLS1.3 on managed .NET clients" on page 36

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 Linux V 9.4.0 AIX Administration of token based authentication is significantly simplified with support for JWKS key management
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jul 2024][MQ 9.4.0 Jul 2024][AIX, Linux, Windows]New TLS skip validation mode for IBM MQ client applications on C and JMS" on page 36
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]New property to specify the protocols that MQIPT routes accept" on page 36
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]New commands to manage keys, certificates, and certificate requests" on page 36
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]New command to manage keystores and certificates that are used by MQIPT" on page 36

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "Enhancements to the IBM MQ Console" on page 36
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Stand-alone IBM MQ Web Server" on page 37
- V 9.4.0 "[MQ 9.4.0 Jun 2024]New CAPEXPRY attribute" on page 37
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Media image scheduling - linear logging" on page 37
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Extension of queue manager status attributes" on page 37
- CP4I V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Addition of Native HA status attributes" on page 38

- V 9.4.0 "[MQ 9.4.0 Jun 2024]dspmqver command now reports release type" on page 38
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Environment variables for tuning I/O operations that take too long" on page 38
- V 9.4.0 "[MQ 9.4.0 Jun 2024]MQIPT trace file configuration enhancements" on page 38
- V 9.4.0 "[MQ 9.4.0 Jun 2024]OpenTelemetry tracing" on page 38

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Enabling JSON formatted logs for AMQP and MQTT" on page 38
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]LZ4 compression is now available for channels" on page 38

Application development

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 AIX "[MQ 9.4.0 Jun 2024][AIX]Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0" on page 38
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Performance improvements for processing of AMQP message acknowledgments" on page 39
- Windows Linux V 9.4.0 "[Windows][Linux]Enhancements for IBM MQ .NET and XMS .NET" on page 39
- V 9.4.0 "Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging for sharing TCP/IP connections and using modular applications" on page 39
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Application rebalancing support for IBM MQ classes for JMS" on page 40
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Remote messaging with the messaging REST API" on page 40
- Linux V 9.4.0 "[Linux][MQ 9.4.0 Jun 2024]Containers non-install image added for Linux ARM64 / Apple Silicon" on page 40

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 Support for .NET 8 applications using IBM MQ classes for .NET and IBM MQ classes for XMS .NET

Installation and migration

Windows V 9.4.0 Linux V 9.4.0 **New method for applying maintenance on Windows and Linux**

From IBM MQ 9.4.0, you apply maintenance to your IBM MQ installations on Windows and Linux by upgrading IBM MQ. This new method simplifies the process to apply maintenance, and removes the need for files from older fix packs to be stored on the system. As these older files are not stored on the system, less disk space is required, and the files do not exist to get flagged by vulnerability scanning tools.

For more information about applying maintenance on Linux, see Applying and removing maintenance on Linux.

For more information about applying maintenance on Windows, see Applying and removing maintenance on Windows.

Security

Linux AIX **JSON Web Token (JWT) support and token based authentication**

- V 9.4.0 From IBM MQ 9.4.0, 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 during connection. If the token contains a user claim, this identity can also be adopted for subsequent authority checks.

  To take advantage of this functionality, the application must be written in C or in Java, and connect to the queue manager by using client bindings. All IBM MQ 9.4 client platforms support token based authentication. For more information, see Working with authentication tokens, Configuring a queue manager to accept authentication tokens using a JWKS endpoint, and Using authentication tokens in an application.

  To avoid application code changes, both IBM MQ MQI clients and Java clients can alternatively use channel security exits to inject authentication tokens during connection processing.

- V 9.4.0 From IBM MQ 9.4.0, applications can use the JMS client API to directly provide JWT credentials.

  For more information, see Using authentication tokens in an application.

- V 9.4.0 V 9.4.0 From IBM MQ 9.4.0, the administration of token based authentication is significantly simplified with support for JWKS key management. JWKS documents are the standard way to share the public keys that are needed to validate authentication tokens. Your OIDC or OAUTH2.0 compliant authentication service already exposes such an endpoint. By directing the queue manager to automatically fetch keys as required, it is no longer necessary to manually install or maintain a local keystore for this purpose. This is particularly valuable for ensuring that as validation keys age out and expire they are seamlessly updated with no further IBM MQ administrator intervention.

  For more information, see Configuring a queue manager to accept authentication tokens using a JWKS endpoint, HTTPSKeyStore, JWKS stanza of the qm.ini file, and the additional return codes in Token authentication error codes.

V 9.4.0 **New property to set the user context that is used for authorization in the messaging REST API**

From IBM MQ 9.4.0, 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 9.4.0, 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 to 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.

V 9.4.0 **Changes to MQCSP password protection in MQIPT**

From IBM MQ 9.4.0, IBM MQ Internet Pass-Thru (MQIPT) can add or remove protection for passwords in MQCSP structures 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 9.4.0, 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.

Windows Linux V 9.4.0 **Support for TLS1.3 on managed .NET clients**

From IBM MQ 9.4.0, support is added for TLS1.3 on managed .NET clients, if the operating system supports TLS1.3.

For more information, see Support for TLS1.3 on managed .NET clients.

V 9.4.0 V 9.4.0 ALW **New TLS skip validation mode for IBM MQ client applications on C and JMS**

IBM MQ 9.4.0 adds a mode for TLS communication that skips TLS server certificate validation for use by C and JMS client applications. This mode allows applications to connect to a TLS-secured endpoint without the need for a truststore or pre-exchanged certificate chain.

- In C, the new option `NONE` is added for the existing **CertificateValPolicy** attribute. For more information, see Configuring certificate validation policies in IBM MQ.
- In JMS, new certificate validation properties have been implemented with options `ANY` and `NONE`. You can configure these properties on clients by using CERTVALPO or the **CERTIFICATE_VALIDATION_POLICY** JMS property. For more information, see Configuring certificate validation policies in IBM MQ.

V 9.4.0 V 9.4.0 **New property to specify the protocols that MQIPT routes accept**

From IBM MQ 9.4.0, the protocols that IBM MQ Internet Pass-Thru (MQIPT) routes accept can be specified by using the property **AllowedProtocols**. This property improves security as MQIPT rejects connections that use a protocol that the route is not configured to accept.

If the new property is not specified, MQIPT routes accept only connections that use the IBM MQ protocol. If MQIPT is used to accept HTTP connections from another instance of MQIPT, use the **AllowedProtocols** property to configure the route to accept HTTP connections before you migrate to MQIPT in IBM MQ 9.4.0.

For more information, see AllowedProtocols.

V 9.4.0 V 9.4.0 ALW **New commands to manage keys, certificates, and certificate requests**

From IBM MQ 9.4.0, the **runmqktool** command can be used to manage keys, certificates, and certificate requests in key repositories that are used by IBM MQ on AIX, Linux, and Windows. This command replaces the **runmqckm** command that is available in earlier versions of IBM MQ.

For more information about the commands that can be used to manage key repositories, see runmqakm and runmqktool commands on AIX, Linux, and Windows.

V 9.4.0 V 9.4.0 ALW **New command to manage keystores and certificates that are used by MQIPT**

From IBM MQ 9.4.0, the **mqiptKeytool** command can be used to keystores and certificates that are used by IBM MQ Internet Pass-Thru (MQIPT) uses. This command replaces the **mqiptKeycmd** command that is available in earlier versions of MQIPT.

For more information about the **mqiptKeytool** command, see mqiptKeytool (manage certificates). For more information about managing MQIPT keystores, see Managing MQIPT keystores.

Administration

Enhancements to the IBM MQ Console

V 9.4.0 From IBM MQ 9.4.0, the IBM MQ Console has a new layout at the queue manager view level. For more information about the new layout and the following enhancements, see Quick tour of the IBM MQ Console.

- V 9.4.0 The Overview tab displays various information about a queue manager and the resources that it is using. 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.
- V 9.4.0 A new feature on the Queues tab provides a view of the IBM MQ objects that are associated with a queue. For more information, see IBM MQ Console: Working with queues.
- V 9.4.0 The Applications Overview tab displays several tiles that give a quick view of applications that are connected to the queue manager that is being viewed. You can then drill down to see more details. For more information, see IBM MQ Console: Working with applications.
- V 9.4.0 The MQ Network Overview tab displays several tiles that give a quick view of the queue manager to queue manager communication for the queue manager that is being viewed.
- V 9.4.0 The timestamps that are associated with queue managers are now displayed in the time zone where the queue manager is running, rather than the time zone of the IBM MQ Console.

V 9.4.0 **Stand-alone IBM MQ Web Server**

From IBM MQ 9.4.0, 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 systems 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.

V 9.4.0 **New CAPEXPRY attribute**

From IBM MQ 9.4.0, **CAPEXPRY** becomes a separate attribute, replacing the text-based attribute in the **CUSTOM** field.

For more information, see CAPEXPRY in the **ALTER QUEUES** command and **CAPEXPRY**: Limit message expiry time.

V 9.4.0 **Media image scheduling - linear logging**

From IBM MQ 9.4.0, how the scheduling of media images is calculated has changed. Where automatic media imaging is enabled, the **IMGLOGLN** and **IMGINTVL** queue manager parameters control the frequency with which media images are taken. 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 change prevents the unnecessary use of computing time on writing to logs when little or no information has changed.

For more information, see Managing log files and ALTER QMGR (alter queue manager settings).

V 9.4.0 **Extension of queue manager status attributes**

From IBM MQ 9.4.0, the **DISPLAY QMSTATUS** command and the response from the MQCMD_INQUIRE_Q_MGR_STATUS PCF command include new attributes. 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.

CP4I V 9.4.0 **Addition of Native HA status attributes**

From IBM MQ 9.4.0, the **DISPLAY QMSTATUS** command and the response from the MQCMD_INQUIRE_Q_MGR_STATUS PCF command include new attributes 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.

V 9.4.0 **dspmqver command now reports release type**

From IBM MQ 9.4.0, the **dspmqver** command is extended to include the release type, which makes it easy to see whether the release is Continuous Delivery or Long Term Support. The release type that is 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 dspmqver (display version information).

V 9.4.0 **Environment variables for tuning I/O operations that take too long**

From IBM MQ 9.4.0, 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 that are written to the log.

For more information, see AMQ_IODELAY, AMQ_IODELAY_INMS and AMQ_IODELAY_FFST.

V 9.4.0 **MQIPT trace file configuration enhancements**

From IBM MQ 9.4.0, the maximum size of the trace files that are produced by IBM MQ Internet Pass-Thru (MQIPT), and the number of trace files that are kept, can be configured by 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.

V 9.4.0 **OpenTelemetry tracing**

From IBM MQ 9.4.0, IBM MQ provides a tracing service that allows you to integrate with an OpenTelemetry tracing system.

For more information, see OpenTelemetry tracing.

V 9.4.0 V 9.4.0 **Enabling JSON formatted logs for AMQP and MQTT**

IBM MQ 9.4.0 adds support for JSON formatted logs in AMQP and MQTT.

JSON formatted logs in AMQP and MQTT are optional, and you need to enable them manually. For more information, see Enabling JSON formatted logs for AMQP and Enabling JSON formatted logs for MQTT.

V 9.4.0 V 9.4.0 **LZ4 compression is now available for channels**

LZ4 compression can now be specified to implement a fast, lossless algorithm to compress data being that is sent on a network. You can choose to prioritize speed or compression when you specify LZ4 compression. These options are available as values for COMPMSG when working with channels (for example, see DEFINE CHANNEL).

Application development

V 9.4.0 AIX **Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0**

From IBM MQ 9.4.0, you can compile AIX programs by using the IBM Open XL C/C++ for AIX 17 compiler alongside the existing IBM XL C/C++ for AIX 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.

V 9.4.0 **Performance improvements for processing of AMQP message acknowledgments**

ALW 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 it sends that message to the application. Before IBM MQ 9.4.0, each message that is acknowledged is removed from the queue individually. From IBM MQ 9.4.0 messages are removed in batches, which improves performance.

For more information, see Removing acknowledged AMQP messages from the queue in batches.

Windows Linux **Enhancements for IBM MQ .NET and XMS .NET**

- V 9.4.0 IBM MQ 9.4.0 provides a new set of .NET 6 libraries for IBM MQ .NET (`amqmdnetstd.dll`) and XMS .NET (`amqmxmsstd.dll`), that is libraries that are built against .NET 6 as the target framework. 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 rebuild your .NET Core or .NET applications. For more information, see Installing IBM MQ classes for .NET and Installing IBM MQ classes for XMS .NET.
- V 9.4.0 From IBM MQ 9.4.0, 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.
- V 9.4.0 From IBM MQ 9.4.0, the IBM MQ .NET and XMS .NET clients 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.
- V 9.4.0 V 9.4.0 From IBM MQ 9.4.0, IBM MQ supports .NET 8 applications using IBM MQ classes for .NET and IBM MQ classes for XMS .NET. If you are using a .NET 6 application, you can run this application without any recompilation being required by making a small edit in the `runtimeconfig` file to set the `targetframeworkversion` to `"net8.0"`. For more information, see Installing IBM MQ classes for .NET and Installing IBM MQ classes for XMS .NET.

Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging for sharing TCP/IP connections and using modular applications

- V 9.4.0 From IBM MQ 9.4.0, 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 strategy is the default strategy for nonreconnectable 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 nonreconnectable 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.

- V 9.4.0 From IBM MQ 9.4.0, 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.

V 9.4.0 **Application rebalancing support for IBM MQ classes for JMS**

From IBM MQ 9.4.0, application rebalancing support is extended to include support for JMS applications.

For more information, see Influencing application re-balancing in IBM MQ classes for JMS.

V 9.4.0 **Remote messaging with the messaging REST API**

From IBM MQ 9.4.0, 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.

Linux V 9.4.0 **Containers non-install image added for Linux ARM64 / Apple Silicon**

If you have strong container development skills, you can use the makefiles supplied in the `mq-container` GitHub repository to build your own production container image. This image works along 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 9.4.0, 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 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only

IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0
Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5
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 9.3.5.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0
A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only

IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

License entitlement, installation and upgrade

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Native HA entitlement" on page 41

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "IBM MQ entitlement through AWS Marketplace or Azure Marketplace" on page 42

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Unlocking events from mission-critical data using Kafka Connect" on page 42
- OpenShift V 9.4.0 "[OpenShift Container Platform][MQ 9.4.0 Jun 2024]Autorecovery of damaged objects for Native HA queue managers" on page 42
- V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Media image scheduling - replicated logging" on page 42
- V 9.4.0 "[MQ 9.4.0 Jun 2024]RDQM available on RHEL 9" on page 42
- V 9.4.0 "Managed File Transfer enhancements for resource monitors and fteRAS" on page 42

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]LZ4 compression now available for Native HA" on page 43

License entitlement, installation and upgrade

V 9.4.0 Native HA entitlement

From IBM MQ 9.4.0, 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). For an introduction to this product feature, see Native HA.

IBM MQ entitlement through AWS Marketplace or Azure Marketplace

When you deploy IBM MQ through the AWS Marketplace or the Azure Marketplace, you can now get the IBM licenses at the same time. By purchasing the licenses alongside other software and infrastructure, you can streamline procurement processes and manage costs effectively. See the IBM MQ page at the AWS Marketplace or the IBM MQ page at the Azure Marketplace.

Administration

V 9.4.0 **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 9.4.0, 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.

The IBM MQ Kafka version 2 connectors provide 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.

OpenShift V 9.4.0 **Autorecovery of damaged objects for Native HA queue managers**

From IBM MQ 9.4.0, 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.

CP4I V 9.4.0 **Media image scheduling - replicated logging**

From IBM MQ 9.4.0, 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.

For more information, see Managing log files and ALTER QMGR (alter queue manager settings).

V 9.4.0 **RDQM available on RHEL 9**

From IBM MQ 9.4.0, you can 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 by recreating your cluster, see Migrating replicated data queue managers.

Managed File Transfer enhancements for resource monitors and `fteRAS`

- V 9.4.0 IBM MQ 9.4.0 adds three additional Managed File Transfer resource monitor verbose level logging events related to connecting and disconnecting from a queue manager. For more information, see Logging MFT resource monitors.
- V 9.4.0 From IBM MQ 9.4.0, you can collect troubleshooting information (MustGather data) for a specific Managed File Transfer agent or agents instead of for all agents on the system. You do this by running the **`fteRAS`** command with the **`-agents`** parameter. 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 9.4.0, **`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. For more information, see fteRAS (collect MFT troubleshooting information).

V 9.4.0 V 9.4.0 **LZ4 compression now available for Native HA**

LZ4 compression can now be specified to implement a fast, lossless algorithm to compress data being sent on a network. You can choose to prioritize speed or compression when you specify LZ4 compression. See `NativeHALocalInstance` stanza of the qm.ini file.

Related concepts

V 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5

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 9.3.5.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0

A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

“IBM MQ license information” on page 9

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

V 9.4.0 V 9.4.0 z/OS MQ Adv. VUE What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 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.

Security

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 New property to set the user context that is used for authorization in the messaging REST API

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jul 2024][MQ 9.4.0 Jul 2024]New TLS skip validation mode for IBM MQ JMS client applications on z/OS" on page 44

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jul 2024]Increased scalability for the channel initiator" on page 45
- V 9.4.0 "[MQ 9.4.0 Jul 2024]Enhancements to SMF queue statistics records and SMF accounting data" on page 45
- V 9.4.0 "Enhancements to the IBM MQ Console" on page 45
- V 9.4.0 Stand-alone IBM MQ Web Server

The following capabilities are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 Page sets and buffer pools can be viewed in the IBM MQ Console on z/OS
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]CAPEXPRY attribute available on IBM MQ for z/OS" on page 46
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Faster log throughput with zHyperLink " on page 46

Application development

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging for sharing TCP/IP connections, using modular applications, and simplified Java application topologies " on page 46
- V 9.4.0 Remote messaging with the messaging REST API

Security

V 9.4.0 **New property to set the user context that is used for authorization in the messaging REST API**

From IBM MQ 9.4.0, 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 9.4.0, 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 to 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.

V 9.4.0 V 9.4.0 **New TLS skip validation mode for IBM MQ JMS client applications on z/OS**

On z/OS, IBM MQ 9.4.0 adds a new mode for TLS communication which skips TLS server certificate validation for use by JMS client applications. This allows applications to connect to a TLS secured endpoint without the need for a truststore or pre-exchanged certificate chain.

In JMS, new certificate validation properties have been implemented with options ANY and NONE. You can configure these properties on clients using CERTVALPO or the **CERTIFICATE_VALIDATION_POLICY** JMS property. For more information, see Configuring certificate validation policies in IBM MQ.

Administration

V 9.4.0 **Increased scalability for the channel initiator**

From IBM MQ 9.4.0, 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 9.4.0 you must increase the **MEMLIMIT** parameter in your channel initiator JCL. For more information on setting **MEMLIMIT**, see Storage configuration.

V 9.4.0 **Enhancements to SMF queue statistics records and SMF accounting data**

- IBM MQ 9.3.0 added the collection of queue statistics to the existing SMF information available to your enterprise. IBM MQ 9.4.0 adds further enhancements to the SMF queue statistics records.

  The new SMF queue 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. Further 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.
- From IBM MQ 9.4.0, 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.

Enhancements to the IBM MQ Console

V 9.4.0 From IBM MQ 9.4.0, the IBM MQ Console has a new layout at the queue manager view level. For more information about the new layout and the following enhancements, see Quick tour of the IBM MQ Console.

- V 9.4.0 The Overview tab displays various information about a queue manager and the resources it is consuming. 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.
- V 9.4.0 A new feature on the Queues tab enables you to view the IBM MQ objects associated with a queue. For more information, see IBM MQ Console: Working with queues.
- V 9.4.0 The Applications Overview tab displays a number of tiles giving a quick view of applications connected to the queue manager being viewed. You can then drill down to see more details. For more information, see IBM MQ Console: Working with applications.
- V 9.4.0 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.

- V 9.4.0 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.
- V 9.4.0 From IBM MQ 9.4.0 on z/OS, 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.
- V 9.4.0 V 9.4.0 From IBM MQ 9.4.0 on z/OS, you can use the IBM MQ Console to view page sets and buffer pools on z/OS queue managers. This further enhances the use of the IBM MQ Console to add, view, delete, and update page sets and buffer pools on z/OS queue managers. For more information, see IBM MQ Console: Working with page sets and buffer pools.

V 9.4.0 **Stand-alone IBM MQ Web Server**

From IBM MQ 9.4.0, 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 systems 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.

V 9.4.0 V 9.4.0 **CAPEXPRY attribute available on IBM MQ for z/OS**

The **CAPEXPRY** attribute introduced on IBM MQ for Multiplatforms at IBM MQ 9.3.1 for Continuous Delivery and at IBM MQ 9.4.0 for Long Term Support, is also available on IBM MQ for z/OS from IBM MQ 9.4.0.

For more information, see CAPEXPRY in the **ALTER QUEUES** command and **CAPEXPRY**: Limit message expiry time.

V 9.4.0 V 9.4.0 **Faster log throughput with zHyperLink**

IBM MQ 9.4.0 adds support for using zHyperLink when writing to active log data sets. zHyperLink technology can reduce I/O latency by providing a fast, reliable, and direct communication path between the CPU and the I/O device. zHyperLink can improve active log throughput and reduce IBM MQ transaction time by up to 3.5 times.

For more information, see Faster log throughput with zHyperLink.

Application development

Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging for sharing TCP/IP connections, using modular applications, and simplified Java application topologies

- V 9.4.0 From IBM MQ 9.4.0, 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.
- V 9.4.0 From IBM MQ 9.4.0, 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 module 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.

- V 9.4.0 From IBM MQ 9.4.0, IBM MQ classes for JMS/Jakarta Messaging and IBM MQ classes for Java applications running in a batch environment can 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.

V 9.4.0 **Remote messaging with the messaging REST API**

From IBM MQ 9.4.0, 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 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only

IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5

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 9.3.5.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0

A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

“IBM MQ license information” on page 9

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

V 9.4.0 V 9.4.0 MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

Administration

The following capabilities first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jul 2024]Additional capabilities for users with IBM MQ Advanced for z/OS entitlement" on page 48
- V 9.4.0 Unlocking events from mission-critical data using Kafka Connect
- V 9.4.0 Managed File Transfer enhancements for resource monitors and **fteRAS**

Administration

V 9.4.0 Additional capabilities for users with IBM MQ Advanced for z/OS entitlement

From IBM MQ 9.4.0, 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.

V 9.4.0 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 9.4.0, 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.

The IBM MQ Kafka version 2 connectors provide 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.

Managed File Transfer enhancements for resource monitors and fteRAS

- V 9.4.0 IBM MQ 9.4.0 adds three additional Managed File Transfer resource monitor verbose level logging events related to connecting and disconnecting from a queue manager. For more information, see Logging MFT resource monitors.
- V 9.4.0 From IBM MQ 9.4.0, you can collect troubleshooting information (MustGather data) for a specific Managed File Transfer agent or agents instead of for all agents on the system. You do this by running the **fteRAS** command with the **-agents** parameter. 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 9.4.0, **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. For more information, see fteRAS (collect MFT troubleshooting information).

Related concepts

V 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement
For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only
IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0
Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0
Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5
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 9.3.5.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0
A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

“IBM MQ license information” on page 9
What you can purchase with IBM MQ and what each purchase entitles you to install.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

IBM MQ 9.4.0 includes changes of behavior that were previously delivered in the CD releases of IBM MQ 9.3.0 through IBM MQ 9.3.5, along with some changes that are new at IBM MQ 9.4.0:

- Changes that are new to Long Term Support (LTS) users at IBM MQ 9.4.0 are indicated by a dark blue icon V 9.4.0
- Changes that are new to Continuous Delivery (CD) users at IBM MQ 9.4.0 are indicated by a light blue icon V 9.4.0

License entitlement, installation and migration

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- Multi V 9.4.0 "[UNIX, Linux, Windows, IBM i][MQ 9.4.0 Jun 2024]Change to nonprod entitlement option of setmqinst command" on page 52
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changes to the features that are supplied with the mqweb server" on page 52

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 Linux V 9.4.0 "[MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]Migration considerations relating to IBM MQ Bridge to Salesforce removal" on page 52
- Windows V 9.4.0 Linux MQ Adv. V 9.4.0 MQ Adv. VUE MQ Adv. z/OS "[MQ 9.4.0 Jun 2024][IBM MQ Advanced][MQ 9.4.0 Jun 2024][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]IBM Aspera faspio Gateway version upgraded" on page 52

The following changes are relevant to Long Term Support only at IBM MQ 9.4.0:

- Linux V 9.4.0 "[MQ 9.4.0 Jun 2024]Name change from Long Term Support (LTS) to Support Cycle 2 (SC2) for IBM MQ in containers" on page 52

Security

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- Linux V 9.4.0 AIX "[Linux][MQ 9.4.0 Jun 2024][AIX]Changes to Security Policy attribute of the Service stanza of the qm.ini file" on page 53
- V 9.4.0 "[MQ 9.4.0 Jun 2024]Change to SSLCIPH property for AMQP channels" on page 53
- V 9.4.0 "MQIPT requires closeClassLoader Java security manager permission to use exits" on page 53

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]AMQP channel no longer supports CMS keystores" on page 53
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Removal of support for RSA key exchange when operating in FIPS mode" on page 53
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]Changes to MQIPT certificate management commands" on page 54
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]Changes to IBM MQ certificate management commands" on page 54
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Managed File Transfer support for secure ciphers extended" on page 54
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]MQIPT rejects HTTP connections by default" on page 54

Administration

The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changed return code for endmqm" on page 54
- Linux V 9.4.0 AIX "[Linux][MQ 9.4.0 Jun 2024][AIX]runmqdlq tool default permissions change" on page 55

- V 9.4.0 z/OS "[MQ 9.4.0 Jul 2024][z/OS]Changes to the RECOVER CFSTRUCT command" on page 55
- MQ Adv. V 9.4.0 MQ Adv. VUE "[IBM MQ Advanced][MQ 9.4.0 Jun 2024][IBM MQ Advanced VUE]Changes to the output of the MFT fteDisplayVersion command" on page 55
- Windows Linux V 9.4.0 AIX "[MQ 9.4.0 Jun 2024][AIX, Linux, Windows]Changes to entries in the connection log for connections to MQIPT TLS server routes that close without sending any data" on page 55
- V 9.4.0 z/OS "[MQ 9.4.0 Jul 2024][z/OS]Changes to the way the CSQ1LOGP EXTRACT function handles messages with message properties" on page 55
- V 9.4.0 z/OS "[MQ 9.4.0 Jul 2024][z/OS]Changes to zHyperWrite" on page 55

The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]RHEL 7 no longer supported for RDQM" on page 55
- V 9.4.0 V 9.4.0 ALW "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024][AIX, Linux, Windows]Change to the start of the AMQP Service" on page 56

Application development

V 9.4.0 The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[MQ 9.4.0 Jun 2024]Changes to Bouncy Castle JAR file names" on page 56
- V 9.4.0 "[MQ 9.4.0 Jun 2024]com.ibm.mq.cfg.useIBMCipherMappings no longer needed for configuring mappings" on page 56
- Windows Linux V 9.4.0 "[Windows][Linux][MQ 9.4.0 Jun 2024]Error message improvements for security exit failures when a .NET client is connecting to IBM MQ" on page 56

V 9.4.0 V 9.4.0 The following changes are new for Long Term Support and Continuous Delivery at IBM MQ 9.4.0:

- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Use of separately downloadable IBM Semeru Java runtime for IBM MQ client applications" on page 56
- Windows V 9.4.0 Linux V 9.4.0 "[Windows][MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]Removal of IBM MQ .NET Standard client libraries" on page 56
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][MQ 9.4.0 Jun 2024]Changes to how C sample programs with authentication capabilities are built" on page 57
- V 9.4.0 V 9.4.0 "[MQ 9.4.0 Jun 2024][Linux][MQ 9.4.0 Jun 2024]Removal of 31-bit library support for IBM MQ for Linux on IBM Z" on page 57

Containers

V 9.4.0 The following changes first appeared in IBM MQ 9.3.x Continuous Delivery releases and are new for Long Term Support at IBM MQ 9.4.0:

- V 9.4.0 "[Linux][MQ 9.4.0 Jun 2024]Changed environment variables for the IBM MQ Advanced for Developers container image" on page 57
- V 9.4.0 "[OpenShift Container Platform][MQ 9.4.0 Jun 2024]For use in containers, a certificate must have a unique Subject Distinguished Name" on page 57

License entitlement, installation and migration

Multi V 9.4.0 **Change to nonprod entitlement option of setmqinst command**

From IBM MQ 9.4.0, 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).

V 9.4.0 **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 9.4.0, 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.

V 9.4.0 Linux V 9.4.0 **Migration considerations relating to IBM MQ Bridge to Salesforce removal**

The IBM MQ Bridge to Salesforce is removed from the product at IBM MQ 9.4.0. Salesforce connectivity can be achieved with IBM App Connect Enterprise. Salesforce Input and Salesforce Request nodes can be used to interact with Salesforce applications. For more information, see Using Salesforce with IBM App Connect Enterprise.

On Linux for x86-64 only, if you are migrating from an installation where the IBM MQ Bridge to Salesforce is present, you must remove it before you upgrade to IBM MQ 9.4.0 or later.

V 9.4.0 MQ Adv. V 9.4.0 MQ Adv. VUE MQ Adv. z/OS **IBM Aspera faspio Gateway version upgraded**

IBM MQ Advanced for Multiplatforms 9.4.0, IBM MQ Advanced 9.4.0, IBM MQ Advanced for z/OS Value Unit Edition 9.4.0, and IBM MQ Advanced for z/OS 9.4.0 upgrade the version of the IBM Aspera faspio Gateway to 1.3.4.

IBM Aspera faspio Gateway 1.3.4 makes a number of breaking changes from earlier versions:

- If you are migrating fromIBM Aspera faspio Gateway 1.2, you now require a license file 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 platforms.
- 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 platforms.

V 9.4.0 **Name change from Long Term Support (LTS) to Support Cycle 2 (SC2) for IBM MQ in containers**

From IBM MQ Operator channel v3.2, Long Term Support (LTS) is renamed to Support Cycle 2 (SC2). This is because the only available LTS path for IBM MQ in containers is two years support under IBM Cloud Pak for Integration entitlement, and IBM Cloud Pak for Integration has adopted the term SC2.

Here is the full picture of entitlement:

- With IBM MQ entitlement, the IBM MQ Operator can deploy only the IBM MQ Continuous Delivery (CD) images.
- With IBM Cloud Pak for Integration entitlement, the IBM MQ Operator can deploy CD or SC2 (formerly LTS) images.

Security

Linux V 9.4.0 AIX **Changes to Security Policy attribute of the Service stanza of the qm.ini file**

From IBM MQ 9.4.0, 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.

V 9.4.0 **Change to SSLCIPH property for AMQP channels**

From IBM MQ 9.4.0, AMQP channels support ANY* generic CipherSpecs.

For more information, see Configuring AMQP clients with TLS and Enabling CipherSpecs.

MQIPT requires `closeClassLoader` Java security manager permission to use exits

From IBM MQ 9.4.0, if IBM MQ Internet Pass-Thru (MQIPT) is configured to use a certificate exit or a security exit, and is also configured to use the Java security manager, an additional permission is required in the Java security manager policy file. Alter the MQIPT Java security manager policy file to grant a **`java.lang.RuntimePermission`** with a `closeClassLoader` permission target.

For more information about using MQIPT with the Java security manager, see Java security manager in MQIPT.

V 9.4.0 V 9.4.0 **AMQP channel no longer supports CMS keystores**

From IBM MQ 9.4.0, the AMQP channel no longer supports CMS keystores. If your queue manager is currently configured with a CMS keystore (that is, a `.kdb` keystore), and you are using an SSL/TLS channel for AMQP, the channel will fail to start. To utilize AMQP SSL channels, you must convert your CMS keystore to a PKCS12 keystore.

For more information on how to perform this conversion, see SSL/TLS support in Securing AMQP Clients.

V 9.4.0 V 9.4.0 **Removal of support for RSA key exchange when operating in FIPS mode**

From IBM MQ 9.4.0, 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
- MQ Telemetry service

For more information, see TLS CipherSpecs and CipherSuites in IBM MQ classes for Java.

V 9.4.0 V 9.4.0 ALW **Changes to MQIPT certificate management commands**

From IBM MQ 9.4.0, the following commands to manage certificates in MQIPT keystores are removed:

- **mqiptKeycmd**
- **mqiptKeyman**

A new command, **mqiptKeytool**, can be used instead of these commands to manage certificates in MQIPT keystores.

The **mqiptKeytool** command runs the Java **keytool** certificate management utility. The parameters that need to be specified when the **mqiptKeytool** command is run are different to the parameters that need to be specified when the **mqiptKeyman** command is run in earlier versions of MQIPT.

For more information about the **mqiptKeytool** command, see mqiptKeytool (manage certificates). For more information about managing MQIPT keystores, see Managing MQIPT keystores.

V 9.4.0 V 9.4.0 ALW **Changes to IBM MQ certificate management commands**

From IBM MQ 9.4.0, the following commands to manage certificates in key repositories that are used by IBM MQ are removed:

- **runmqckm**
- **strmqikm**

The **runmqakm** command, or the new **runmqktool** command, can be used instead to manage key repositories and certificates.

The **runmqktool** command runs the Java **keytool** certificate management utility. The parameters that need to be specified when the **runmqktool** command is run are different to the parameters that need to be specified when the **runmqckm** command is run in earlier versions of IBM MQ.

For more information about the IBM MQ key repository and certificate management commands, see **runmqakm** and **runmqktool** commands on AIX, Linux, and Windows.

V 9.4.0 V 9.4.0 **Managed File Transfer support for secure ciphers extended**

From IBM MQ 9.4.0, Managed File Transfer has increased the number of secure ciphers supported by the product.

In addition, the default values for the **cipherList** and the SFTP server specific attributes have changed from the IBM MQ 9.4.0 release. You are likely to see message BFGBR0127E after you have migrated to IBM MQ 9.4.0.

See Protocol bridge properties file format for details of the additions to the ciphers, and the Important note on how you can resolve the BFGBR0127E error.

V 9.4.0 V 9.4.0 **MQIPT rejects HTTP connections by default**

From IBM MQ 9.4.0, MQIPT routes accept only connections that use the IBM MQ protocol by default. If MQIPT is used to accept HTTP connections from another instance of MQIPT, use the new **AllowedProtocols** property to configure the route to accept HTTP connections before migrating to MQIPT in IBM MQ 9.4.0.

For more information, see AllowedProtocols.

Administration

V 9.4.0 **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. From IBM MQ 9.4.0, an attempt to end a queue manager that is starting up now returns the code 4 ' Queue manager is being started'.

For more information, see endmqm (end queue manager).

Linux V 9.4.0 AIX **runmqdlq tool default permissions change**

From IBM MQ 9.4.0, 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).

V 9.4.0 z/OS **Changes to the RECOVER CFSTRUCT command**

From IBM MQ 9.4.0, **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.

MQ Adv. V 9.4.0 MQ Adv. VUE **Changes to the output of the MFT fteDisplayVersion command**

Before IBM MQ 9.4.0, the output from the **fteDisplayVersion** command included components that Managed File Transfer does not use. From IBM MQ 9.4.0, these components are no longer included in the output.

For more information, see fteDisplayVersion (display installed version of MFT).

V 9.4.0 ALW **Changes to entries in the connection log for connections to MQIPT TLS server routes that close without sending any data**

From IBM MQ 9.4.0, 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 9.4.0, 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.

V 9.4.0 z/OS **Changes to the way the CSQ1LOGP EXTRACT function handles messages with message properties**

From IBM MQ 9.4.0, 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.

V 9.4.0 z/OS **Changes to zHyperWrite**

From IBM MQ 9.4.0, 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.

V 9.4.0 V 9.4.0 **RHEL 7 no longer supported for RDQM**

From IBM MQ 9.4.0, RDQM on RHEL 7 is no longer supported.

You must move to RHEL 8 or RHEL 9 when migrating your RDQM configuration, see Migrating replicated data queue managers.

V 9.4.0 V 9.4.0 ALW **Change to the start of the AMQP Service**

From IBM MQ 9.4.0, the default behavior of the setting of the **CONTROL** attribute for starting the AMQP service has changed. When creating and starting a new queue manager, the AMQP service does not automatically start as part of the queue manager startup process.

For more information, see AMQP Service does not start automatically on queue manager startup.

Application development

V 9.4.0 **Changes to Bouncy Castle JAR file names**

From IBM MQ 9.4.0, 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.

V 9.4.0 **com.ibm.mq.cfg.useIBMCipherMappings no longer needed for configuring mappings**

From IBM MQ 9.4.0, a Cipher can be defined as either the CipherSpec or CipherSuite name and is then handled correctly by IBM MQ.

The Java System Property `com.ibm.mq.cfg.useIBMCipherMappings`, which was previously used for configuring an application to use IBM Java or Oracle Java CipherSuite mapping, is no longer needed for controlling which mappings are used and is removed from the product.

Windows Linux V 9.4.0 **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 9.4.0, 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 could not be loaded correctly then 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.

V 9.4.0 V 9.4.0 **Use of separately downloadable IBM Semeru Java runtime for IBM MQ client applications**

From IBM MQ 9.4.0, you should use a separately downloadable IBM Semeru Runtime for IBM MQ client applications instead of using the Java runtime packaged with IBM MQ.

IBM MQ supports the IBM Semeru Runtime runtime through IBM MQ product entitlement when used for running IBM MQ Java and 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.

Windows V 9.4.0 Linux V 9.4.0 **Removal of IBM MQ .NET Standard client libraries**

The IBM MQ .NET client libraries built using .NET Standard 2.0, which were deprecated at IBM MQ 9.3.1, have been removed from the product from IBM MQ 9.4.0. This means that you will no longer see the folder `netstandard2.0` and the libraries that it contained, that is, `amqmdnetstd.dll` and `amqmxmsstd.dll`, in the following locations:

- Windows *MQ_INSTALLATION_PATH*`\bin\netstandard2.0`
- Linux *MQ_INSTALLATION_PATH*`\lib64\netstandard2.0`

Here are two scenarios that you might encounter following the removal of the `netstandard2.0` libraries:

- If you are using a IBM MQ classes for .NET Framework or IBM MQ classes for XMS .NET Framework application that is built using the `netstandard2.0` libraries such as `amqmdnetstd.dll`, you need to rebuild your application with the Microsoft.NET Framework 4.7.2 libraries such as `amqmdnet.dll`, in order for your application to run successfully. If you do not rebuild your application, you might get an System.IO.Unexceptionable message:

  ```
  Exception caught: System.IO.FileLoadException: Could not load file or assembly
  'amqmdnetstd, Version=9.3.5.0, 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=9.3.5.0, Culture=neutral, PublicKeyToken=23d6cb914eeaac0e'
     at SimplePut.SimplePut.PutMessages()
     at SimplePut.SimplePut.Main(String[] args) in C:\SampleCode\Program.cs:line 132
  ```

- If you are using a .NET 6 application that is built using `netstandard2.0` libraries, then you just need to replace those libraries with the same .NET 6 libraries in the `bin` folder of the application runtime directory. No rebuild is required.

  Note: The replacement .NET 6 library should always be of the same or higher level than the replaced `netstandard2.0` library.

For more information, see Installing IBM MQ classes for .NET and Installing IBM MQ classes for XMS .NET.

V 9.4.0 V 9.4.0 **Changes to how C sample programs with authentication capabilities are built**

The C sample programs that allow users to connect to a queue manager with credentials have been altered so that authentication is only enabled when a new compile flag, **SAMPLE_AUTH_ENABLED**, is defined. Clients that build the shipped source sample files will need to define this compile flag if they wish to use authentication.

For more information on how to build samples with and without authentication, see Preparing and running the sample programs.

V 9.4.0 Linux V 9.4.0 **Removal of 31-bit library support for IBM MQ for Linux on IBM Z**

From IBM MQ 9.4.0, 31-bit library support for IBM MQ for Linux on IBM Z is removed due to some of the supported operating systems removing support. 31-bit applications should be recompiled as 64-bit.

Containers

Linux V 9.4.0 **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**

For more information, see IBM MQ Advanced for Developers container image.

OpenShift V 9.4.0 **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 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only
IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0
Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5
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 9.3.5.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0
A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

Related reference

What's new and what's changed in IBM MQ Explorer

Related information

System Requirements for IBM MQ

IBM MQ, WebSphere MQ, and MQSeries product readmes web page

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 For a list of just the messages that are new, changed or removed since IBM MQ 9.3.5, see “New, changed, and removed messages since IBM MQ 9.3.5” on page 71.

- Multi “New, changed, and removed IBM MQ AMQ messages” on page 59
- ALW “New, changed, and removed AMQP channel messages” on page 62
- “New, changed, and removed IBM MQ Console messages” on page 62
- ALW “[AIX, Linux, Windows]New, changed and removed IBM MQ Internet Pass-Thru messages” on page 62
- “New, changed and removed JSON messages” on page 63
- MQ Adv. MQ Adv. VUE MQ Adv. z/OS “New, changed, and removed Managed File Transfer messages” on page 63
- “New, changed and removed MQJMS messages” on page 64
- “New, changed, and removed REST API messages” on page 64
- MQ Adv. ALW “New, changed and removed MQ Telemetry messages” on page 65

- z/OS “New, changed, and removed z/OS messages” on page 65

New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new for IBM MQ 9.4.0:

AMQ3xxx: Utilities and tools

- AMQ3057I
- AMQ3248I
- AMQ3249I
- AMQ3250I
- AMQ3485E
- AMQ3486E
- AMQ3487I
- AMQ3488E
- AMQ3489W - AMQ3495I
- AMQ3633E - AMQ3634E

AMQ4xxx: User interface messages (Windows and Linux systems)

- AMQ4640E
- AMQ4641W
- AMQ4642W

AMQ5xxx: Installable services

- AMQ5544W
- AMQ5782I
- AMQ5783E
- AMQ5784E
- AMQ5785I
- AMQ5786E
- AMQ5787W
- AMQ5788E
- AMQ5789W

AMQ6xxx: Common Services

- AMQ6217E
- AMQ6342E
- AMQ6343E
- AMQ6344I
- AMQ6345E
- AMQ6346E
- AMQ6729W
- AMQ6862W
- AMQ6863I
- AMQ6864I
- AMQ6865I

- AMQ6866E

AMQ7xxx: IBM MQ product

- AMQ7443E
- AMQ7730E
- AMQ7838W
- AMQ7991I

AMQ8xxx: Administration

- IBM i AMQ8D43 (IBM i)
- AMQ8959I
- AMQ8960E

AMQ9xxx: Remote

- AMQ9855E
- AMQ9856I - AMQ9861I
- AMQ9888W
- AMQ9889W
- AMQ9916E
- AMQ9917W
- AMQ9956W

The following AMQ messages are changed for IBM MQ 9.4.0:

AMQ3xxx: Utilities and tools

- AMQ3031S (MQ L3 Support changed to IBM Support in Response)
- AMQ3043E (MQ L3 Support changed to IBM Support in Response)
- AMQ3209E (Response extended)
- AMQ3221W (Reclassified from AMQ3221E (Error). Response rewritten)
- AMQ3231E (Typographical error fixed in Response)
- AMQ3235I (Explanation simplified)
- AMQ3239W (Reclassified from AMQ3239E (Error). Response rewritten)
- AMQ3241W (Reclassified from AMQ3241E (Error). Response rewritten)
- AMQ3554I (Added a colon to the Message)
- AMQ3583W (Response added)
- AMQ3595W (Explanation extended)
- AMQ3696E (System directory changed to System file or directory in Message and Explanation)

AMQ4xxx: User interface messages (Windows and Linux systems)

- AMQ4642W (Response extended)

AMQ5xxx: Installable services

- AMQ5068W (Reworded Explanation and Response)
- AMQ5534E (Extended Response)
- AMQ5540E (Reworded Message, Explanation and Response)
- AMQ5605I (Extra switched added to usage options)
- Linux AIX AMQ5657W UNIX and Linux (Explanation extended)
- AMQ5708E (Message, Explanation, and Response re-written)

- AMQ5774E (Typo fixed)
- AMQ5779I (-check_only switch added to Usage)
- AMQ5786E (Explanation extended)

AMQ6xxx: Common Services

- AMQ6162E (Message and Explanation extended)
- AMQ6537I (Usage rewritten)
- AMQ6538I (Usage rewritten)
- AMQ6620I (**addmqm** and **rmvmqinf** removed from the list of available commands)
- AMQ6624I (**amqqmutil** and **-o** removed from the list of available commands)
- AMQ6648I (Usage syntax updated)
- AMQ6729W (Explanation extended)

AMQ7xxx: IBM MQ product

- AMQ7006E (Reworded Message)
- AMQ7059E (Message and Explanation extended)
- AMQ7081I (Extended Explanation)
- AMQ7062E (Explanation extended)
- AMQ7081I (Explanation extended)
- AMQ7205E (Message and Explanation rewritten)
- AMQ7443E (Extended Explanation)
- AMQ7472W (Response extended)
- AMQ7486I (Extended Explanation)
- AMQ7493W (Message and Explanation rewritten)
- AMQ7493W (QSTATUS attribute name changed in Response)

AMQ8xxx: Administration

- AMQ8043I (Explanation extended)
- AMQ8350I (Extra fields added to Usage)
- AMQ8373S (Message and Explanation extended)
- AMQ8499I (Missing bracket added in Usage. Description of -w switch extended)
- AMQ8871E (Extended Message and Explanation)
- AMQ8960E ("MQCONNX" replaced with a variable in Response)

AMQ9xxx: Remote

- AMQ9209E (Explanation and Response extended)
- AMQ9271E (Explanation and Response rewritten)
- AMQ9296E (Reworded Response)
- AMQ9297E (Reworded Explanation)
- AMQ9407W (**CAPEXPRY** added to the Explanation and Response)
- AMQ9504E ("or client" added in Explanation)
- AMQ9528W (Extended Message)
- AMQ9546E (Extended Explanation)
- AMQ9557E (Updated Message, Explanation and Response
- AMQ9616E (Explanation and Response updated)
- AMQ9673E (Extended Explanation)

- AMQ9722W (Explanation added)
- AMQ9723I (Explanation and Response added)
- AMQ9795E (Explanation updated)
- AMQ9839I (Usage extended with three more switches)
- AMQ9840I (Usage extended with one more switch)
- AMQ9844I (Message shortened)
- AMQ9846W (Message shortened)

The following AMQ messages are removed for IBM MQ 9.4.0:

AMQ3xxx: Utilities and tools

- AMQ3532E
- AMQ3923E
- AMQ3949E - AMQ3960E

AMQ6xxx: Common Services

- AMQ6555E

All HP Integrity NonStop Server versions of messages are removed for IBM MQ 9.4.0.

New, changed, and removed AMQP channel messages

ALW

There are no new, changed or removed AMQP channel (AMQAM) messages for IBM MQ 9.4.0.

New, changed, and removed IBM MQ Console messages

The following IBM MQ Console messages are changed for IBM MQ 9.4.0:

MQWB20xx: IBM MQ Console messages

- MQWB2027E (Typo fixed in Response)

There are no new or removed IBM MQ Console messages for IBM MQ 9.4.0.

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

The following IBM MQ Internet Pass-Thru messages are new for IBM MQ 9.4.0:

MQCPxxxx: MQIPT messages

- MQCPE120
- MQCPE121
- MQCPE122
- MQCPI158

The following IBM MQ Internet Pass-Thru messages are changed for IBM MQ 9.4.0:

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 removed IBM MQ Internet Pass-Thru messages for IBM MQ 9.4.0.

New, changed and removed JSON messages

There are no new, changed or removed JSON format diagnostic messages for IBM MQ 9.4.0.

New, changed, and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.4.0:

BFGAG0001 - BFGAG9999: MFT agents messages

- BFGAG0213W
- BFGAG0215W - BFGAG0216W

BFGBR0001 - BFGBR9999: MFT protocol bridge messages

- BFGBR0224E - BFGBR0226E

BFGCH0001 - BFCHR9999: MFT command handler messages

- BFGCH0131I

BFGCL0001 - BFGCL9999: MFT commands messages

- BFGCL0830W - BFGCL0834E
- BFGCL0835E

BFGDB0001 - BFGDB9999: MFT database logger messages

- BFGDB0084I - BFGDB0085I

BFGIO0001 - BFGIO9999: MFT filesystem I/O messages

- BFGIO0416E
- BFGIO0417E
- BFGIO0418E
- BFGIO0419E
- BFGIO0420E

BFGUB0001 - BFGUB9999: MFT configuration and properties messages

- BFGUB0088E

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 9.4.0:

BFGBR0001 - BFGBR9999: MFT protocol bridge messages

- BFGBR0046E (In Message, quotation marks added around the variable and a period added at the end)

BFGUB0001 - BFGUB9999: MFT configuration and properties messages

- BFGUB0072E (Message updated)

The following Managed File Transfer messages are removed for IBM MQ 9.4.0:

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
- BFGCM0232E - BFGCM0233E

BFGPR0001 - BFGPR9999: MFT miscellaneous messages

- BFGPR0051E (In Message, quotation marks added around the variable)

New, changed and removed MQJMS messages

Jakarta Messaging 3.0 exception messages are added to the Javadoc information for IBM MQ 9.4.0.

New, changed, and removed REST API messages

The following REST API messages are new for IBM MQ 9.4.0:

MQWB00xx: REST API messages MQWB0000 to 0099

- MQWB0088E

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 9.4.0:

MQWB00xx: REST API messages MQWB0000 to 0099

- MQWB0055E (Explanation and Response extended)
- MQWB0063E (Response extended)
- MQWB0320E (Explanation and Response rewritten)

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 removed REST API messages for IBM MQ 9.4.0.

New, changed and removed MQ Telemetry messages

The following AMQXR MQ Telemetry messages are new for IBM MQ 9.4.0:

Telemetry (AMQXR) messages

- AMQXR2119W
- AMQXR2120I
- AMQXR2121W
- AMQXR2122E
- AMQXR2123E

The following AMQXR MQ Telemetry messages are changed for IBM MQ 9.4.0:

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 AMQXR1006E)
- 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)
- AMQXR2123E (Message and Explanation rewritten)

There are no removed AMQXR MQ Telemetry messages for IBM MQ 9.4.0.

There are also no new, changed, or removed AMQAM, AMQCO or AMQHT MQ Telemetry messages for IBM MQ 9.4.0.

New, changed, and removed z/OS messages

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.4.0:

Data manager messages (CSQI...)

- CSQI050E

Recovery log manager messages (CSQJ...)

- CSQJ169E
- CSQJ600E
- CSQJ601E
- CSQJ602I
- CSQJ603I
- CSQJ604E
- CSQJ605E

Message manager messages (CSQM...)

- CSQM531I - CSQM533I
- CSQM586E - CSQM591I

Utilities messages (CSQU...)

- CSQU180E
- CSQU181E
- CSQU559I

Distributed queuing messages (CSQX...)

- CSQX705E
- CSQX888E
- CSQX889E

Db2® manager messages (CSQ5...)

- CSQ5041E

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.4.0:

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)
- CSQE201E (Link added in Explanation)
- CSQE222E (System programmer response extended)

Security manager messages (CSQH...)

- CSQH004I (Link added in 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)
- CSQJ077E (System programmer response extended)
- CSQJ103E (Link updated in System programmer response)
- CSQJ104E (Typographical errors fixed and Link updated in Explanation)
- CSQJ105E (System programmer response rewritten)
- CSQJ105E (Hyphen added in Explanation)
- CSQJ106E - CSQJ108E (Link updated in Explanation)
- CSQJ117E (Link added to Explanation)
- CSQJ166E (System programmer response extended)
- CSQJ167E (Explanation and System action extended)
- CSQJ228E (Link updated in System programmer response)
- CSQJ302E (Link updated in System programmer response)
- CSQJ370I (Explanation extended)
- CSQJ494E - CSQJ495E (Link updated in System programmer response)
- CSQJ499I (System action extended and "Severity 0" removed from the message)

Message manager messages (CSQM...)

- CSQM056E - CSQM057E (Link updated in System programmer response)
- CSQM111E (Link updated in System programmer response)
- CSQM528E (Link title updated in System programmer response)
- CSQM586E - CSQM587E (Explanation and System programmer response rewritten)

Command server messages (CSQN...)

- CSQN207I to 2CSQN212E (System programmer response reworded slightly)

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)
- CSQU030E (Message altered to include variable name "csectname")
- 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)
- CSQU525E (System programmer response extended)

- CSQU533E (Link added to System programmer response)
- CSQU544E - CSQU545E (Link added to System programmer response)
- CSQU561E (Link added to System programmer response)
- CSQU568E (System programmer response extended and typo fixed)

Agent services messages (CSQV...)

- CSQV453I (Link updated in System programmer response)
- CSQV456E (Link added in System programmer response)
- CSQV457E (Rewritten System programmer response)
- CSQV459I (Rewritten System programmer response)

Instrumentation facilities messages (CSQW...)

- CSQW124E (Explanation extended)
- 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...)

- CSQX004I (Message and Explanation rewritten)
- CSQX004I (Explanation extended)
- CSQX027E - CSQX028E (Link updated in System programmer response)
- CSQX031E (minor change 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)
- CSQX113E (updated System action)
- CSQX110E - CSQX113E (Link added to System programmer response)
- CSQX113E (System action reworded)
- 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)
- CSQX208E (shortened System programmer response)
- CSQX209E - CSQX212E(Link added to System programmer response)
- CSQX213E (System programmer response extended)
- CSQX250E (Rewritten System programmer response)
- CSQX469E (Rewritten System programmer response)
- CSQX476E (typo fixed in System programmer response)
- CSQX477E (Explanation rewritten. System programmer response extended)
- 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 and link title updated in Explanation)
- CSQX631E (Message and Explanation updated. Link title updated in Explanation)
- CSQX633E - CSQX634E (Link updated in System programmer response)
- CSQX635E (Updated System programmer response and link title updated in Explanation)
- CSQX637E - CSQX638E (Link updated in System programmer response)
- CSQX641E (Updated Message and Explanation)
- CSQX645E (extended System programmer response)
- 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)
- CSQX670I (System programmer response updated and extended)
- CSQX683E - CSQX685E (Link updated in System programmer response)
- CSQX686E (Link updated in System programmer response)
- CSQX686E (Extended System programmer response)
- CSQX687E - CSQX689E (Link updated in System programmer response)
- CSQX694E (re-typed as CSQX694I)
- CSQX878I (System programmer response extended)

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)
- CSQY038E (Redundant quotation marks removed; link text updated in System programmer response)
- CSQY040I (Example IBM MQ version number incremented to 9.2.4 in Explanation)
- CSQY041D (Example IBM MQ version numbers incremented to 9.2.0 and 9.3.1 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)

Service facilities messages (CSQ1...)

- CSQ0109E (Link added in System programmer response)

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

- CSQ2005I (MQFB_DATA_LENGTH_TOO_SHORT added to System programmer response)
- CSQ2007I (Typo fixed in System programmer response)

Subsystem support messages (CSQ3...)

- CSQ3111I (Explanation extended)

Db2 manager messages (CSQ5...)

- CSQ5002E (Link added to System programmer response)
- CSQ5005E (Rewritten System programmer response)
- CSQ5007E (Updated System action)
- 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)
- CSQ5103I (Link added in System programmer response)
- CSQ5116E (Link added to System programmer response)

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 and "terminate" has changed to "end". Links are updated to a later version of the CICS® documentation.

The following IBM MQ for z/OS CSQ messages are removed for IBM MQ 9.4.0:

Data manager messages (CSQI...)

- CSQI966I
- CSQI967I

Recovery log manager messages (CSQJ...)

- CSQJ165I

Utilities messages (CSQU...)

- CSQU180E
- CSQU181E

Related concepts

V 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement
For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only
IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0
Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5
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 9.3.5.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0
A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

“New, changed, and removed messages since IBM MQ 9.3.5” on page 71

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 9.3.5.

Related reference

IBM MQ AMQ messages
IBM MQ Console messages
IBM MQ Internet Pass-Thru messages
JSON format diagnostic messages
Managed File Transfer messages and return codes
JMS exception messages
REST API messages
Telemetry messages
z/OS Messages for IBM MQ for z/OS

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5

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 9.3.5.

V 9.4.0 For a list of all the messages that are new, changed or removed since IBM MQ 9.3.0, see “New, changed, and removed messages in IBM MQ 9.4.0” on page 58.

- Multi “New, changed, and removed IBM MQ AMQ messages” on page 71
- “New, changed, and removed IBM MQ Console messages” on page 72
- ALW “[AIX, Linux, Windows]New, changed and removed IBM MQ Internet Pass-Thru messages” on page 72
- “New, changed and removed JSON messages” on page 72
- MQ Adv. MQ Adv. VUE MQ Adv. z/OS “New, changed, and removed Managed File Transfer messages” on page 73
- “New, changed and removed MQJMS messages” on page 73
- “New, changed, and removed REST API messages” on page 73
- MQ Adv. ALW “New, changed and removed MQ Telemetry messages” on page 73
- z/OS “New, changed, and removed z/OS messages” on page 73

New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new since IBM MQ 9.3.5:

AMQ3xxx: Utilities and tools

- AMQ3485E
- AMQ3486E

AMQ5xxx: Installable services

- AMQ5788E
- AMQ5789W

AMQ7xxx: IBM MQ product

- AMQ7838W
- AMQ7991I

AMQ9xxx: Remote

- AMQ9856I - AMQ9861I
- AMQ9956W

The following AMQ messages are changed since IBM MQ 9.3.5:

AMQ3xxx: Utilities and tools

- AMQ3221W (Reclassified from AMQ3221E (Error). Response rewritten)
- AMQ3239W (Reclassified from AMQ3239E (Error). Response rewritten)
- AMQ3241W (Reclassified from AMQ3241E (Error). Response rewritten)

AMQ4xxx: User interface messages (Windows and Linux systems)

- AMQ4642W (Response extended)

AMQ5xxx: Installable services

- AMQ5786E (Explanation extended)

AMQ6xxx: Common services

- AMQ6729W (Explanation extended)

AMQ9xxx: Remote

- AMQ9654E (Explanation extended)
- AMQ9795E (Explanation updated)
- AMQ9839I (Usage extended with three more switches)
- AMQ9840I (Usage extended with one more switch)
- AMQ9844I (Message shortened)
- AMQ9846W (Message shortened)

The following AMQ messages are removed since IBM MQ 9.3.5:

AMQ3xxx: Utilities and tools

- AMQ3532E
- AMQ3923E
- AMQ3949E - AMQ3960E

AMQ6xxx: Common services

- AMQ6555E

New, changed, and removed IBM MQ Console messages

There are no new, changed or removed IBM MQ Console messages since IBM MQ 9.3.5.

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

The following IBM MQ Internet Pass-Thru messages are new since IBM MQ 9.3.5:

MQCPxxxx: MQIPT messages

- MQCPE122
- MQCPI158

There are no changed or removed IBM MQ Internet Pass-Thru messages since IBM MQ 9.3.5.

New, changed and removed JSON messages

There are no new, changed or removed JSON format diagnostic messages since IBM MQ 9.3.5.

New, changed, and removed Managed File Transfer messages

The following Managed File Transfer messages are new since IBM MQ 9.3.5:

BFGBR0001 - BFGBR9999: MFT protocol bridge messages

- BFGBR0224E - BFGBR0226E

There are no changed or removed Managed File Transfer messages since IBM MQ 9.3.5.

New, changed and removed MQJMS messages

Jakarta Messaging 3.0 exception messages are added to the Javadoc information since IBM MQ 9.3.5.

New, changed, and removed REST API messages

The following REST API messages are new since IBM MQ 9.3.5:

MQWB04xx: REST API messages MQWB0400 to 0499

- MQWB0446E
- MQWB0447E
- MQWB0448E

The following REST API messages are changed since IBM MQ 9.3.5:

MQWB00xx: REST API messages MQWB0000 to 0099

- MQWB0320E (Explanation and Response rewritten)

There are no removed REST API messages since IBM MQ 9.3.5.

New, changed and removed MQ Telemetry messages

The following AMQXR MQ Telemetry messages are changed since IBM MQ 9.3.5:

Telemetry (AMQXR) messages

- AMQXR2123E (Message and Explanation rewritten)

There are no new or removed AMQXR MQ Telemetry messages since IBM MQ 9.3.5.

There are also no new, changed, or removed AMQAM, AMQCO or AMQHT MQ Telemetry messages since IBM MQ 9.3.5.

New, changed, and removed z/OS messages

The following IBM MQ for z/OS CSQ messages are new since IBM MQ 9.3.5:

Recovery log manager messages (CSQJ...)

- CSQJ600E
- CSQJ601E
- CSQJ602I
- CSQJ603I
- CSQJ604E
- CSQJ605E

Message manager messages (CSQM...)

- CSQM531I
- CSQM532I
- CSQM533I

The following IBM MQ for z/OS CSQ messages are changed since IBM MQ 9.3.5:

Coupling Facility manager messages (CSQE...)

- CSQE201E (Link added in Explanation)

Security manager messages (CSQH...)

- CSQH004I (Link added in System programmer response)

Recovery log manager messages (CSQJ...)

- CSQJ077E (System programmer response extended)
- CSQJ167E (Explanation extended)
- CSQJ499I ("Severity 0" removed from the message)

Message manager messages (CSQM...)

- CSQM528E (Link title updated in System programmer response)

Utilities messages (CSQU...)

- CSQU568E (Typo fixed in System programmer response)

Agent services messages (CSQV...)

- CSQV456E (Link added in System programmer response)

Instrumentation facilities messages (CSQW...)

- CSQW124E (Explanation extended)

Distributed queuing messages (CSQX...)

- CSQX629E (Link title updated in Explanation)
- CSQX631E (Link title updated in Explanation)
- CSQX635E (Link title updated in Explanation)

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

- CSQY040I (Example IBM MQ version number incremented to 9.2.4 in Explanation)
- CSQY041D (Example IBM MQ version numbers incremented to 9.2.0 and 9.3.1 in Explanation)

Service facilities messages (CSQ1...)

- CSQ0109E (Link added in System programmer response)

Db2 manager messages (CSQ5...)

- CSQ5103I (Link added in System programmer response)

In many messages, links are updated to a later version of the z/OS or CICS documentation.

The following IBM MQ for z/OS CSQ messages are removed since IBM MQ 9.3.5:

Utilities messages (CSQU...)

- CSQU180E
- CSQU181E

Related concepts

What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only
IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement
For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0
Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0
Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0
A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

"New, changed, and removed messages in IBM MQ 9.4.0" on page 58
Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

Related reference
IBM MQ AMQ messages
IBM MQ Console messages
IBM MQ Internet Pass-Thru messages
JSON format diagnostic messages
Managed File Transfer messages and return codes
JMS exception messages
REST API messages
Telemetry messages
z/OS Messages for IBM MQ for z/OS

V 9.4.0 V 9.4.0 Deprecated, stabilized, and removed features in IBM MQ 9.4.0

A number of features are deprecated or removed from the product from IBM MQ 9.4.0.

Attention: This topic lists the deprecations and removals that first occurred in IBM MQ 9.4.0. For deprecations, stabilizations, and removals that occurred in IBM MQ versions from IBM WebSphere MQ 7.1 to the current version, see Deprecations, stabilizations, and removals in IBM MQ.

Deprecations, stabilizations, and removals made at a given version of the product apply to all subsequent versions.

- "Deprecated features" on page 76

- “Removed features” on page 77

Deprecated features

Deprecated

Table 5. Deprecations at IBM MQ 9.4.0	
Feature	**Description**
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.
V 9.4.0 Deprecation: CMS keystores and stash files support for IBM MQ Java applications	V 9.4.0 For Long Term Support, CMS keystores and stash files for IBM MQ Java applications are deprecated from IBM MQ 9.4.0. The migration path is to move to PKCS#12 keystores and use the keystore password feature. **Note:** V 9.4.0 V 9.4.0 From IBM MQ 9.4.0, CMS keystores and stash files are not supported for configuring AMQP and MQTT channels with SSL/TLS. Use PKCS#12 and keystore passwords instead. For more information, see Setting up a key repository on AIX, Linux, and Windows and Telemetry channel configuration for channel authentication using TLS. CD For Continuous Delivery, CMS keystores and stash files for IBM MQ Java applications, AMQP and MQTT were deprecated from IBM MQ 9.3.4.
V 9.4.0 AIX Deprecation: XL C/C++ for AIX 16 compiler support on AIX	V 9.4.0 For Long Term Support, support for the XL C/C++ for AIX 16 compiler on AIX is deprecated from IBM MQ 9.4.0. CD For Continuous Delivery, support for the XL C/C++ for AIX 16 compiler on AIX is deprecated 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 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.

Table 5. Deprecations at IBM MQ 9.4.0 (continued)	
Feature	**Description**
V 9.4.0 V 9.4.0 Deprecation: IBM MQ classes for .NET and IBM MQ classes for XMS .NET methods and classes used for serialization and deserialization of data	From IBM MQ 9.4.0, in IBM MQ classes for .NET and IBM MQ classes for XMS .NET, the methods WriteObject(), ReadObject(), CreateObjectMessage(), and the classes ObjectMessage and XmsObjectMessageImpl used for serialization and deserialization of data are deprecated. For more information, see https://learn.microsoft.com/en-us/dotnet/api/system.runtime.serialization.formatters.binary.binaryformatter?view=net-8.0.
V 9.4.0 V 9.4.0 Deprecation: REST API v1	Version 1 of the REST API is deprecated from IBM MQ 9.4. Migrate applications to use version 3 of the REST API. For more information, see REST API versions.
V 9.4.0 Deprecation: Secure Sockets Layer v3 (SSLv3) and TLS 1.0 support	IBM MQ 9.4 Long Term Support is the last IBM MQ release to provide Secure Sockets Layer v3 (SSLv3) and TLS 1.0 support.
V 9.4.0 Deprecation: Support for AMS Encryption with RC2, DES or 3DES ciphers and AMS Signing with MD5 or SHA1 ciphers	IBM MQ 9.4 Long Term Support is the last IBM MQ release to provide support for Advanced Message Security (AMS) Encryption with RC2, DES or 3DES ciphers and (AMS) Signing with MD5 or SHA1 ciphers, across all IBM MQ form factors

Removed features

Removed

Table 6. Removals at IBM MQ 9.4.0	
Feature	**Description**
V 9.4.0 V 9.4.0 Removal: MQIPT certificate management commands	From IBM MQ 9.4.0, the following commands to manage certificates in MQIPT keystores are removed: • **mqiptKeycmd** • **mqiptKeyman** A new command, **mqiptKeytool**, can be used instead of these commands to manage certificates in MQIPT keystores. For more information about the **mqiptKeytool** command, see mqiptKeytool (manage certificates). For more information about managing MQIPT keystores, see Managing MQIPT keystores.

Table 6. Removals at IBM MQ 9.4.0 (continued)	
Feature	**Description**
CD V 9.4.0 ALW Removal: **runmqckm** and **strmqikm** commands	From IBM MQ 9.4.0, the **runmqckm** and **strmqikm** commands are removed. The **Manage SSL Certificates** option in IBM MQ Explorer, which starts the **strmqikm** (iKeyman) GUI, is also removed. The **runmqakm** command, or the new **runmqktool** command, can be used instead. For more information, see **runmqakm** and **runmqktool** commands on AIX, Linux, and Windows and Working with SSL/TLS on AIX, Linux, and Windows.
V 9.4.0 Linux V 9.4.0 Removal: IBM MQ Bridge to Salesforce	The IBM MQ Bridge to Salesforce is removed from the product at IBM MQ 9.4.0. Salesforce connectivity can be achieved with IBM App Connect Enterprise. Salesforce Input and Salesforce Request nodes can be used to interact with Salesforce applications. For more information, see Using Salesforce with IBM App Connect Enterprise.
V 9.4.0 Removal: Operations Dashboard (IBM MQ in Containers)	From IBM MQ Operator 2.4.0 the Operations Dashboard is removed. For version support for the IBM MQ Operator, see Available IBM MQ versions.
V 9.4.0 Removal: `traceControl.jar` dynamic tracing utility	V 9.4.0 For Long Term Support, the trace control utility is removed from the product at IBM MQ 9.4.0 CD For Continuous Delivery, the trace control utility was removed from the product at IBM MQ 9.3.3. If dynamic trace is needed to diagnose an issue, IBM Support can guide you through the steps to gather trace as required.
V 9.4.0 Removal: com.ibm.mq.cfg.useIBMCipherMappings Java System Property	V 9.4.0 For Long Term Support, the Java System Property `com.ibm.mq.cfg.useIBMCipherMappings`, which was previously used for configuring IBM Java or Oracle Java Cipher mappings, is removed from the product at IBM MQ 9.3.3. A Cipher can be defined as either the CipherSpec or CipherSuite name and is handled correctly by IBM MQ. For more information, see TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS and TLS CipherSpecs and CipherSuites in IBM MQ classes for Java. CD For Continuous Delivery, `com.ibm.mq.cfg.useIBMCipherMappings` was removed from the product at IBM MQ 9.3.3.

Table 6. Removals at IBM MQ 9.4.0 (continued)	
Feature	**Description**
V 9.4.0 V 9.4.0 Removal: IBM MQ .NET Standard libraries	From IBM MQ 9.4.0. the IBM MQ .NET (`amqmdnetstd.dll`) and XMS .NET (`amqmxmsstd.dll`) .NET Standard libraries are removed. For more information, see Installing IBM MQ classes for .NET and Installing IBM MQ classes for XMS .NET.
V 9.4.0 V 9.4.0 z/OS Removal: XPARM utility	The XPARM utility for the channel initiator parameter module used to migrate to IBM WebSphere MQ for z/OS 7.0, is removed from IBM MQ 9.4.0.
V 9.4.0 Linux V 9.4.0 Removal: 31-bit library support for IBM MQ for Linux on IBM Z	From IBM MQ 9.4.0, 31-bit library support for IBM MQ for Linux on IBM Z is removed due to some of the supported operating systems removing support. Deprecated From IBM MQ 9.3.0, the 32-bit IBM MQ application libraries are deprecated for all platforms, both for network and local binding connections.

Related concepts

V 9.4.0 Multi V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.0 delivers a number of new features that are available with base product entitlement, and also with Advanced entitlement.

V 9.4.0 Multi MQ Adv. V 9.4.0 What's new in IBM MQ 9.4.0 for Multiplatforms - Advanced entitlement only

IBM MQ 9.4.0 delivers a number of new features that are available only with IBM MQ Advanced for Multiplatforms entitlement.

V 9.4.0 V 9.4.0 z/OS What's new in IBM MQ 9.4.0 for z/OS - base and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 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 9.4.0 V 9.4.0 z/OS MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ 9.4.0 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.0 delivers a number of new features and enhancements that are available with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

V 9.4.0 V 9.4.0 What's changed in IBM MQ 9.4.0

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.3.0 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

V 9.4.0 New, changed, and removed messages in IBM MQ 9.4.0

Some new messages have been added and some existing messages have been changed or removed since IBM MQ 9.3.0.

V 9.4.0 New, changed, and removed messages since IBM MQ 9.3.5

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 9.3.5.

Deprecated Cipherspecs

CD What's new and changed in IBM MQ 9.4.x Continuous Delivery

Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

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 and changed in IBM MQ 9.4.0 ” on page 26
IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ 9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. The features that you have access to depends on your product entitlement.

“What's changed in IBM MQ 9.4.0 Long Term Support” on page 108
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 110
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 9.4.

“Icons used in the product documentation” on page 163
The product documentation for all IBM MQ 9.4 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

V 9.4.3 What's new and changed in IBM MQ 9.4.3

IBM MQ 9.4.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

What's new in 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.

Security

- “Extended authority events for positive authentication” on page 82

Administration

- “Queue manager status view now available in the IBM MQ Console” on page 82
- “Force option might be required when you change a queue manager CCSID” on page 82

Application development

- “JWT endpoint support in IBM MQ classes for JMS/Jakarta Messaging” on page 83

What's new in IBM MQ for Multiplatforms - Advanced entitlement only

Multi MQ Adv.

On Multiplatforms, the following features and enhancements are available only with Advanced entitlement.

Administration

- “Support for Kafka Connect” on page 83

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

z/OS

On z/OS, 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.

Administration

- “Simpler connectivity to cloud” on page 84
- “Integrated OpenTelemetry tracing” on page 84
- “Improved alternative site recovery” on page 84

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

z/OS MQ Adv. VUE MQ Adv. z/OS

On z/OS, the following features and enhancements are available with Advanced or Advanced VUE entitlement only.

Administration

- “Support for Kafka Connect” on page 85

What's changed in IBM MQ 9.4.3

IBM MQ 9.4.3 includes the following changes of behavior:

Security

- “Changes to FIPS operation” on page 85
- “Support for longer User IDs for connected and authenticated applications” on page 86
- “Stricter validation of User IDs” on page 86

Application development

- Windows JM 3.0 “[Windows][Jakarta Messaging 3.0]Support for IBM MQ resource adapter for Jakarta Messaging in GlassFish Server” on page 86

Related information

System Requirements for IBM MQ
IBM MQ, WebSphere MQ, and MQSeries product readmes web page

Multi V 9.4.3 What's new in IBM MQ for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.3 delivers new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

Security

- “Extended authority events for positive authentication” on page 82

Administration

- “Queue manager status view now available in the IBM MQ Console” on page 82
- “Force option might be required when you change a queue manager CCSID” on page 82

Application development

- “JWT endpoint support in IBM MQ classes for JMS/Jakarta Messaging” on page 83

Containers

- “Native HA and Cross-Region Replication features available on IBM MQ licensed queue managers” on page 83

Security

Extended authority events for positive authentication

From IBM MQ 9.4.3, extended positive authority events can be generated when authority events are enabled. The events are put to the SYSTEM.ADMIN.QMGR.EVENT queue. The scope of the event messages is determined by the new queue manager attribute **AUTHEVSC**.

For more information, see ALTER QMGR (alter queue manager settings) and Queue Manager Events.

Administration

Queue manager status view now available in the IBM MQ Console

You can view status information equivalent to that returned by the **qmstatus** command for a running queue manager. For more information, see IBM MQ Console: Viewing queue manager status.

Force option might be required when you change a queue manager CCSID

If you want to modify a queue manager's coded character set identifier (CCSID) in a manner which might be unsafe, you must now specify the **FORCE** parameter. Unsafe modifications include switching to a smaller character set, for example CCSID 1208 to CCSID 819. For more information, see the description of the **CCSID** parameter in the topics for the various queue manager modification commands: ALTER QMGR and MQCMD_CHANGE_Q_MGR.

Application development

JWT endpoint support in IBM MQ classes for JMS/Jakarta Messaging

From IBM MQ 9.4.3, the IBM MQ classes for JMS/Jakarta Messaging have been enhanced so that a Java client application no longer needs to handle the complexity of connecting to the token issuer or fetching the token. Instead, the process of obtaining a token is fully managed by the IBM MQ classes for JMS/Jakarta Messaging, which interacts with the token issuer on behalf of the client, retrieving a token from a token provider. The token is then sent to the queue manager for authentication. For more information, see Using authentication tokens in an application.

Note: The client must be registered with the token provider to use the client credentials flow to generate the client_id and client_secret.

The following three connection factory properties are provided for retrieving a token from the provider:

- **`TOKEN_ENDPOINT`**: the URI of the endpoint of a token provider.
- **`TOKEN_CLIENT_ID`**: the Client ID as defined in a token provider.
- **`TOKEN_CLIENT_SECRET`**: Client Secret, that is, a secret known only to the client application and token provider.

The JMSAdmin and JMS30Admin tools have also been enhanced to support the new properties of the connection factory. For more information, see Creating JMS objects and Starting the JMSAdmin and JMS30Admin tools.

Containers

Native HA and Cross-Region Replication features available on IBM MQ licensed queue managers

Add-on parts for IBM MQ for Kubernetes and OpenShift are available, providing a cost-effective method of licensing Native High Availability (HA) and Cross Region Replication (CRR) when running IBM MQ in container environments.

Native HA provides a straightforward way of building a highly resilient containerized IBM MQ instance, with 3 synchronous IBM MQ active/passive nodes in a quorum. Cross Region Replication enables asynchronous replication to a second site, enabling a rapid disaster recovery mechanism.

Related concepts

“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 9.4.3 What's new in IBM MQ for Multiplatforms - Advanced entitlement only

For Multiplatforms, IBM MQ 9.4.3 delivers an enhancement for IBM MQ that is available only with IBM MQ Advanced for Multiplatforms entitlement.

Administration

- “Support for Kafka Connect” on page 83

Containers

- “Container audit log compliance” on page 84
- “IPv6 support” on page 84

Administration

Support for Kafka Connect

From IBM MQ 9.4.3, you get access to an IBM provided, and supported Kafka Connect runtime, which can be used for running the IBM MQ source and sink Kafka connectors which are already provided

and supported by IBM. This means you no longer need to obtain separate support for Kafka Connect, simplifying the deployment of the connectors.

For more information, see Kafka Connect scenarios.

Containers

Container audit log compliance

IBM MQ container deployments adhere to the latest US federal audit standards by generating and documenting comprehensive logs for both successful and unsuccessful events. With configurable audit logging, IBM MQ ensures that logs contain sufficient detail to support thorough security investigations.

IPv6 support

The IBM MQ Operator has been validated for IPv6 dual stack environments, aligning with the latest US federal compliance requirements.

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 in IBM MQ 9.4.3 for z/OS - base and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.3 delivers new features and enhancements that are available with base and IBM MQ Advanced for z/OS Value Unit Edition (VUE) entitlement.

Administration

- “Simpler connectivity to cloud” on page 84
- “Integrated OpenTelemetry tracing” on page 84
- “Improved alternative site recovery” on page 84

Administration

Simpler connectivity to cloud

From IBM MQ 9.4.3, TCP channels support **CONNAME**s up to 264 characters, making it easy to connect IBM MQ for z/OS to queue managers running in cloud, OpenShift or Kubernetes environments. Similarly, CHLAUTH records now support an **ADDRESS** of up to 264 characters.

For more information, see DEFINE CHANNEL (define a new channel) and SET CHLAUTH (create or modify a channel authentication record).

Integrated OpenTelemetry tracing

From IBM MQ 9.4.3, IBM MQ for z/OS queue managers are capable of taking part in OpenTelemetry traces initiated either on distributed or z/OS and automatically propagate those traces to other z/OS middleware. This makes it much easier to understand the flow of any application that runs on z/OS, and how it interacts with other platforms.

For more information, see Open Telemetry tracing.

Improved alternative site recovery

From IBM MQ 9.4.3, queue managers will automatically rebuild XCF group entries at start up, removing the need for manually running the **ADD QMGR** command of the CSQ5QPSG utility. For more information, see Step 4 of Recovering a queue sharing group at the alternative site.

Related concepts

“IBM MQ license information” on page 9

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

MQ Adv. VUE V 9.4.3 MQ Adv. z/OS What's new in IBM MQ 9.4.3 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ 9.4.3 delivers an enhancement that is available only with Advanced or IBM MQ Advanced for z/OS Value Unit Edition entitlement.

Administration

- “Support for Kafka Connect” on page 85

Administration

Support for Kafka Connect

From IBM MQ 9.4.3, you get access to an IBM provided, and supported Kafka Connect framework, which can be used for running the IBM MQ source and sink Kafka connectors which are already provided and supported by IBM. This means you no longer need to obtain separate support for Kafka Connect, simplifying the deployment of the connectors.

For more information, see Kafka Connect scenarios.

Related concepts

“IBM MQ license information” on page 9
What you can purchase with IBM MQ and what each purchase entitles you to install.

V 9.4.3 What's changed in IBM MQ 9.4.3

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.4.3 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

Security

- “Changes to FIPS operation” on page 85
- “Support for longer User IDs for connected and authenticated applications” on page 86
- “Stricter validation of User IDs” on page 86

Application development

- Windows JM 3.0 “[Windows][Jakarta Messaging 3.0]Support for IBM MQ resource adapter for Jakarta Messaging in GlassFish Server” on page 86

Security

Changes to FIPS operation

From IBM MQ 9.4.3, FIPS operation has changed to be more compliant with the current FIPS 140-2 specification. IBM MQ defers FIPS requirements to the underlying cryptographic service. The following changes apply due to this:

- Several CipherSpecs that were previously available in FIPS mode are no longer available. Table 1 in Enabling CipherSpecs has been updated to indicate which CipherSpecs are available in FIPS mode.
- A new AMQ9957 warning message has been added to indicate when a **REFRESH SECURITY** command must be executed for changes in FIPS mode to become active.

Note: As FIPS is managed by the underlying cryptographic driver, future versions of IBM MQ might have changes made to conform to FIPS requirements in both Continuous Delivery streams and Long Term Support streams.

Support for longer User IDs for connected and authenticated applications

From IBM MQ 9.4.3, in certain contexts, IBM MQ applications can now use user identities of up to 1024 bytes when connecting to the queue manager. For more information see User identity length limitations (MQMD and downstream authorization).

Stricter validation of User IDs

From IBM MQ 9.4.3, IBM MQ performs more careful validation of the strings representing user identities when connecting to a queue manager, to ensure that these do not cause problems when messages are transmitted between different systems that support different character sets. See Stricter validation of IBM MQ User ID characters.

To assist in detecting any issues during migration, if the IBM-provided Object Authority Manager detects any authority records referring to unsuitable user identities at startup, a warning message AMQ5793 is reported once for each such record found. You should modify such usernames to remove or replace unsupported characters at the earliest opportunity, to avoid unexpected behavior. If modification of users is difficult in your configuration, contact IBM Support.

Application development

Windows JM 3.0 **Support for IBM MQ resource adapter for Jakarta Messaging in GlassFish Server**

From IBM MQ 9.4.3, you can install the IBM MQ resource adapter for Jakarta Messaging in a GlassFish Server 7.0 application server and test it using the installation verification test (IVT) application. You must be using GlassFish Server 7.0 Full version, not GlassFish Server 7.0 Web version.

For more information, see Installing and testing the IBM MQ resource adapter for Jakarta Messaging in GlassFish Server.

Related concepts

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 9.4.3 New, changed, and removed messages in IBM MQ 9.4.3

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.4.3.

- Multi “New, changed, and removed IBM MQ AMQ messages” on page 86
- “New, changed, and removed IBM MQ Console messages” on page 87
- ALW “New, changed, and removed IBM MQ Internet Pass-Thru messages” on page 88
- “New, changed and removed JMS exception messages” on page 88
- “New, changed, and removed JSON messages” on page 88
- “New, changed, and removed Managed File Transfer messages” on page 88
- ALW “New, changed, and removed MQ Telemetry messages” on page 88
- “New, changed, and removed REST API messages” on page 88
- z/OS “New, changed, and removed z/OS messages” on page 88

New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new for IBM MQ 9.4.3:

AMQ3xxx: Utilities and tools

AMQ3472-84 (Messages for Open Telemetry Tracing)

AMQ5xxx: Installable services

AMQ5792I (Warning about certain operating system directories preventing the full removal of queue manager files)

AMQ5793-7 (Messages about user name and ID length and contents)

AMQ6xxx: Common Services

AMQ6349 (Message about FIPS)

AMQ8xxx: Administration

AMQ7374 (Message about log replay)

AMQ7375 (Message about queue managers and authority events)

AMQ9xxx: Remote

AMQ9895 (Process ending with unreported reason code)

AMQ9957W (FIPS mode change requires an environment refresh)

The following AMQ messages are changed for IBM MQ 9.4.3:

AMQ3xxx: Utilities and tools

AMQ3058I (New command parameters added)

AMQ3286I (Explanation expanded to include information about logs)

AMQ3288I (Explanation updated to include additional reason for operation failure (relating to log data))

AMQ3632I (New command parameter added)

AMQ5xxx: Installable services

AMQ5788E (Response updated to include information about FIPS)

AMQ6xxx: Common Services

AMQ6581I (New command parameter added, for Open Telemetry Tracing logs)

AMQ6620I (New commands added to the list: **dspmqots** and **setmqots**)

AMQ7xxx: IBM MQ product

AMQ7026E (Further information about principal or group name validity)

AMQ7353E (Explanation updated to add information about the syncfile)

AMQ7472W (More detail added to explanation)

AMQ8xxx: Administration

AMQ8586I (Usage updated to add where parameters are not valid for unregistered or non-installed versions of IBM MQ)

AMQ8920E (Further explanation added)

AMQ9xxx: Remote

AMQ9209E (Explanation expanded to include another possible cause)

AMQ9528W (Explanation expanded to include another possible cause)

AMQ9556E (Explanation updated to add information about the syncfile)

AMQ9719E (Further explanation added)

There are no removed AMQ messages for IBM MQ 9.4.3.

New, changed, and removed IBM MQ Console messages

The following IBM MQ Console messages are new for IBM MQ 9.4.3:

MQWB20xx: IBM MQ Console messages

MQWB2030E (FIPS mode was requested but is unavailable)

There are no changed or removed IBM MQ Console messages for IBM MQ 9.4.3.

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

ALW

There are no new, changed, or removed IBM MQ Internet Pass-Thru messages for IBM MQ 9.4.3.

New, changed and removed JMS exception messages

There are no new, changed or removed JMS exception messages for IBM MQ 9.4.3.

New, changed, and removed JSON messages

There are no new, changed, or removed JSON format diagnostic messages for IBM MQ 9.4.3.

New, changed, and removed Managed File Transfer messages

The following Managed File Transfer messages are new for IBM MQ 9.4.3:

BFGPR0001 - BFGPR9999: MFT miscellaneous messages

BFGPR0157W (Message about empty credential)

BFGPR0158E (FIPS Mode was requested but is unavailable)

There are no changed or removed Managed File Transfer messages for IBM MQ 9.4.3.

New, changed, and removed MQ Telemetry messages

ALW

The following MQ Telemetry messages are new for IBM MQ 9.4.3:

Telemetry (AMQXR) messages

AMQXR2073E (No password specified to access the TLS key repository)

There are no changed or removed MQ Telemetry messages for IBM MQ 9.4.3.

New, changed, and removed REST API messages

There are no new, changed, or removed REST API messages for IBM MQ 9.4.3.

New, changed, and removed z/OS messages

z/OS

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.4.3:

Message manager messages (CSQM...)

CSQM200I (Overlong connection name for a channel with a transmission protocol type of LU6.2)

CSQM534I (Connection names are incompatible between members of a queue-sharing group)

CSQM592E (The queue manager received a non-zero return code when writing data to SMF, so OTel data is lost)

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

CSQY046I (Detection of a connection name that exceeds 48 characters during backwards migration to an IBM MQ version that supports no more than 48 characters)

CSQY047D (A number of channels have a connection name that exceeds 48 characters)

CSQY048I (Detection of a channel authentication record with an **ADDRESS** longer than 48 characters during backwards migration to an IBM MQ version that supports no more than 48 characters)

CSQY049D (A number of CHLAUTH records have an **ADDRESS** that exceeds 48 characters)

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.4.3:

Message manager messages (CSQM...)

CSQM532I (System programmer response updated to state that the **OTELTRAC** and **OTELPCTL** attributes are supported from IBM MQ 9.4.3)

CSQM533I (System programmer response updated to state that the OTELTRAC and OTELPCTL attributes are supported from IBM MQ 9.4.3)

Distributed queuing messages (CSQX...)

CSQX407I (System programmer response updated to add further information)

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

CSQY228E (Corrected an error in the message number mentioned in system action)

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

CSQ2001I (System programmer response updated to add a more specific link to the IMS documentation for OTMA sense codes for NAK messages)

There are no removed IBM MQ for z/OS CSQ messages for IBM MQ 9.4.3.

Related reference

IBM MQ AMQ messages
IBM MQ Console messages
IBM MQ Internet Pass-Thru messages
JMS exception messages
JSON format diagnostic messages
Managed File Transfer messages and return codes
MQ Telemetry messages
REST API messages
Messages for IBM MQ for z/OS

V 9.4.3 Deprecated, stabilized, and removed features in IBM MQ 9.4.3

There are some deprecations from IBM MQ 9.4.3.

Deprecated features

Deprecated

Table 7. Deprecations at IBM MQ 9.4.3

Feature	Description
Deprecation: 3DES CipherSpecs for TLS communications	IBM intends to remove 3DES CipherSpecs for TLS communications, including the deprecated TLS 1.2 3DES CipherSpecs ECDHE_ECDSA_3DES_EDE_CBC_SHA256 and ECDHE_RSA_3DES_EDE_CBC_SHA256, in the next mod level release of IBM MQ 9.4.x.
Deprecation: RSA certificates with a key size less than 2048 bits	IBM intends to remove support for RSA certificates with a key size less than 2048 bits, for IBM MQ for Multiplatforms and IBM MQ Appliance firmware.
Deprecation: IBM MQ MacOS Toolkit support for macOS x86-64 hardware	IBM MQ MacOS Toolkit support for macOS x86-64 hardware is deprecated. The IBM MQ MacOS Toolkit continues to support ARM64 hardware.

V 9.4.2 What's new and changed in IBM MQ 9.4.2

IBM MQ 9.4.2, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

What's new in 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.

Security

- “JWKS support for automatic queue manager side certificate management” on page 91
- “Support for the IBM Semeru Runtime FIPS 140-3 security provider” on page 92

Administration

- “Customize column view in the IBM MQ Console” on page 92
- “Performance monitoring enhancements” on page 92

Application development

- “Multiple JMS connections can be treated as a single application instance” on page 92
- “Simplified configuration of AMQP and MQTT application properties” on page 92

What's new in IBM MQ for Multiplatforms - Advanced entitlement only

Multi MQ Adv.

On Multiplatforms, the following features and enhancements are available only with Advanced entitlement.

Security

- Linux AIX “[Linux][MQ 9.4.2 Feb 2025][AIX]Managed File Transfer support for OpenSSH type Private key for SFTP servers” on page 93

Administration

- CP4I Kubernetes “[IBM Cloud Pak for Integration][Kubernetes]Native HA cross-region replication in containers” on page 93
- “Simplifying data conversion with the Kafka Connect XML Converter” on page 93
- “Update to the Kafka Source and Sink connectors” on page 93

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

z/OS

On z/OS, 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.

Administration

- “The ability to administer z/OS coupling facility (CF) structures in the IBM MQ Console” on page 94
- “The ability to monitor shared message datasets in the IBM MQ Console” on page 94
- “Customize column view in the IBM MQ Console” on page 94
- “Data conversion support for the latest GB18030 standard” on page 94

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

z/OS MQ Adv. VUE MQ Adv. z/OS

On z/OS, the following features and enhancements are available with Advanced or Advanced VUE entitlement only.

Administration

- "Simplifying data conversion with the Kafka Connect XML Converter" on page 95
- "Update to the Kafka Source and Sink connectors" on page 95

What's changed in IBM MQ 9.4.2

IBM MQ 9.4.2 includes the following changes of behavior:

Security

- Linux AIX "[Linux][AIX]JWT token typ parameter is now optional" on page 95
- "Migrating FIPS clients from Java 8 to IBM Semeru Runtime Java with FIPS 140-3 " on page 95
- Linux "[Linux]Changes to operating system authentication for the IBM MQ Console and REST API" on page 96

Administration

- MQ Adv. "[IBM MQ Advanced]Addition of a toString() method to the TransferExitResult class to output the attributes of the current object" on page 96
- "Changes to allow IBM MQ Java client properties com.ibm.mq.cfg.TCP.ClntRcvBuffSize and com.ibm.mq.cfg.TCP.ClntSndBuffSize to be set to zero" on page 96

Related information

System Requirements for IBM MQ
IBM MQ, WebSphere MQ, and MQSeries product readmes web page

Multi V 9.4.2 What's new in IBM MQ 9.4.2 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.2 delivers a number of new features and enhancements that are available with base product entitlement, and also with Advanced entitlement.

Security

- "JWKS support for automatic queue manager side certificate management" on page 91
- "Support for the IBM Semeru Runtime FIPS 140-3 security provider" on page 92

Administration

- "Customize column view in the IBM MQ Console" on page 92
- "Performance monitoring enhancements" on page 92

Application development

- "Multiple JMS connections can be treated as a single application instance" on page 92
- "Simplified configuration of AMQP and MQTT application properties" on page 92

Security

JWKS support for automatic queue manager side certificate management

From IBM MQ 9.4.2, two new attributes are added to the SSL stanza of the `qm.ini` file.

- HTTPSCertRevocation=REQUIRED(default)|OPTIONAL|DISABLED sets the level of CRL/OCSP extension checks for HTTPS certificates.

- HTTPSCertValidation=HOSTNAMECN(default)|ANY|NONE sets the level of certificate peer name validation performed when establishing HTTPS connections.

Support for the IBM Semeru Runtime FIPS 140-3 security provider

The IBM Semeru Runtime FIPS 140-3 implementation has now been certified by NIST. From IBM MQ 9.4.2, the handling of IBM MQ classes for JMS and IBM MQ classes for Java client connections using TLS for IBM Semeru Runtime versions 8.0.8.30, 11.0.24, 17.0.12, and Java 21.0.4 or higher has been updated to support the FIPS 140-3 implementation on the following platforms:

-

AIX
-

Linux for x86-64
-

Linux on Power Systems - Little Endian
-

Windows

For more information, see TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS and TLS CipherSpecs and CipherSuites in IBM MQ classes for Java.

Administration

Customize column view in the IBM MQ Console

You can now customize which columns are displayed in certain views in the IBM MQ Console. You can define different views and switch between them, hiding, revealing, and rearranging columns.

For more information, see Quick tour of the IBM MQ Console.

Performance monitoring enhancements

From IBM MQ 9.4.2, you can use the **mqperfck** command to generate an HTML report containing performance metrics for specified queues or channels over a set time period. The report shows key system and queue manager metrics such as CPU load and IO rate, as well as metrics for the object(s) under observation such as lock contention, MQI counts, selector and match-option mismatches, and network time. The report allows customers and IBM Support to review and compare workload between normal and problematic time periods or performant and non-performant environments. It is intended to gain insight into workload patterns during times of performance sensitivity without the need to capture IBM MQ trace.

For more information, see mqperfck (MQ performance check) and Metrics published on the system topics.

Application development

Multiple JMS connections can be treated as a single application instance

From IBM MQ 9.4.2, for applications that use IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging, you can specify a mode of operation in which all JMS connections that are created by the same Java virtual machine are treated as a single application instance and connect or reconnect to the same queue manager. This new behavior can be useful for some applications, such as microservices.

You enable this mode by specifying a new environment variable, **AMQ_APP_INSTANCE_MODE**, or a new Java system property, `com.ibm.mq.cfg.jmqi.AppInstanceMode=JVM`. Restrictions apply. For more information, see Application Instances in IBM MQ classes for JMS/Jakarta Messaging.

Simplified configuration of AMQP and MQTT application properties

IBM MQ 9.4.2 provides a simpler way for you to configure properties in the AMQP and MQTT configuration files. Instead of having to edit these files manually, you can use the new **setamqp**, **dspamqp**, **setmqxr**, **dspmqxr** commands to create, modify, or view them.

Related concepts

“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 9.4.2 What's new in IBM MQ 9.4.2 for Multiplatforms - Advanced entitlement only

IBM MQ 9.4.2 delivers a number of enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

Security

- Linux AIX "[Linux][MQ 9.4.2 Feb 2025][AIX]Managed File Transfer support for OpenSSH type Private key for SFTP servers" on page 93

Administration

- CP4I Kubernetes "[IBM Cloud Pak for Integration][Kubernetes]Native HA cross-region replication in containers" on page 93
- "Simplifying data conversion with the Kafka Connect XML Converter" on page 93
- "Update to the Kafka Source and Sink connectors" on page 93

Security

Linux V 9.4.2 AIX Managed File Transfer support for OpenSSH type Private key for SFTP servers

From IBM MQ 9.4.2, in addition to supporting private keys generated in RSA format, Managed File Transfer (MFT) supports private keys generated in the newer OpenSSH format. Both of these formats are compatible with the protocol bridge agent.

For more information, see Example: How to configure a protocol bridge agent to use private key credentials with a UNIX SFTP server.

Administration

CP4I Kubernetes Native HA cross-region replication in containers

Native HA cross-region replication (CRR) is now available in the container environment. This feature involves having replication between two Native HA groups in different regions. You can manually switch from running a queue manager in one region to running in another. You can use Native HA CRR to provide a disaster recovery solution. If some disaster befalls a live site whereby the queue manager can no longer run or communicate, you can start that queue manager on the recovery site with little or no loss of data. You can also perform a managed switchover to enable you to complete maintenance on what is normally the live site (in this case there is no loss of data).

For more information, see Native HA Cross-Region Replication.

Simplifying data conversion with the Kafka Connect XML Converter

The Kafka Connect XML Converter and transformation plug-ins, previously only available on GitHub, are now included on Fix Central alongside the existing Kafka sink and source connectors. The Kafka Connect XML Converter and transformation plug-ins make it easier to work with XML data in Kafka Connect pipelines.

For more information, see Kafka Connect scenarios.

Update to the Kafka Source and Sink connectors

The Kafka Source and Sink connectors included on Fix Central have been updated to their latest versions. The Source connector the version has been upgraded from version 2.1.0 to 2.3.0 and the Sink connector has been upgraded from version 2.2.0 to 2.2.1. For more information see, Kafka Connect scenarios.

For more information, see Kafka Connect scenarios.

Related concepts

“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 9.4.2 MQ Adv. VUE What's new in IBM MQ for z/OS 9.4.2 for z/OS - base and Advanced VUE entitlement

For z/OS, IBM MQ for z/OS 9.4.2 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

- “The ability to administer z/OS coupling facility (CF) structures in the IBM MQ Console” on page 94
- “The ability to monitor shared message datasets in the IBM MQ Console” on page 94
- “Customize column view in the IBM MQ Console” on page 94
- “Data conversion support for the latest GB18030 standard” on page 94

Administration

The ability to administer z/OS coupling facility (CF) structures in the IBM MQ Console

From IBM MQ 9.4.2, you can use the IBM MQ Console to add, view, delete and update coupling facility structures on z/OS queue managers.

For more information, see IBM MQ Console: Working with coupling facility structures.

The ability to monitor shared message datasets in the IBM MQ Console

From IBM MQ 9.4.2, you can use the IBM MQ Console to view shared message data sets on z/OS queue managers.

For more information, see IBM MQ Console: Working with shared message data sets.

Customize column view in the IBM MQ Console

From IBM MQ 9.4.2, you can now customize which columns are displayed in certain views in the IBM MQ Console. You can define different views and switch between them, hiding, revealing, and rearranging columns.

For more information, see Quick tour of the IBM MQ Console.

Data conversion support for the latest GB18030 standard

IBM MQ 9.4.2 adds support for the latest version of the GB18030 standard. Messages can be converted between GB18030-2022 level 1 and level 2 characters (CCSID 1388) and Unicode (UTF-8, CCSID 1208 and UTF-16, CCSID 1200) and vice-versa. Earlier versions supported conversion to the GB18030-2005 standard.

For more information, see Simplified Chinese.

Related concepts

“IBM MQ license information” on page 9
What you can purchase with IBM MQ and what each purchase entitles you to install.

V 9.4.2 MQ Adv. VUE MQ Adv. z/OS What's new in IBM MQ for z/OS 9.4.2 for z/OS - Advanced and Advanced VUE entitlement

For z/OS, IBM MQ for z/OS 9.4.2 delivers some new features and enhancements that are available with Advanced and IBM MQ Advanced for z/OS Value Unit Edition entitlement.

Administration

- “Simplifying data conversion with the Kafka Connect XML Converter” on page 95
- “Update to the Kafka Source and Sink connectors” on page 95

Administration

Simplifying data conversion with the Kafka Connect XML Converter

The Kafka Connect XML Converter and transformation plug-ins, previously only available on GitHub, are now included in the Kafka Connector Pack alongside the existing Kafka sink and source connectors. The Kafka Connect XML Converter and transformation plug-ins make it easier to work with XML data in Kafka Connect pipelines.

For more information, see Kafka Connect scenarios.

Update to the Kafka Source and Sink connectors

The Kafka Source and Sink connectors included in the Kafka Connector Pack have been updated to their latest versions. The Source connector the version has been upgraded from version 2.1.0 to 2.3.0 and the Sink connector has been upgraded from version 2.2.0 to 2.2.1.

For more information, see Kafka Connect scenarios.

Related concepts

"IBM MQ license information" on page 9
What you can purchase with IBM MQ and what each purchase entitles you to install.

V 9.4.2 What's changed in IBM MQ 9.4.2

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.4.2 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

Security

- Linux AIX "[Linux][AIX]JWT token typ parameter is now optional" on page 95
- "Migrating FIPS clients from Java 8 to IBM Semeru Runtime Java with FIPS 140-3 " on page 95
- "Disabled CipherSuites in MQIPT" on page 96
- Linux "[Linux]Changes to operating system authentication for the IBM MQ Console and REST API" on page 96

Administration

- MQ Adv. "[IBM MQ Advanced]Addition of a toString() method to the TransferExitResult class to output the attributes of the current object" on page 96
- "Changes to allow IBM MQ Java client properties com.ibm.mq.cfg.TCP.ClntRcvBuffSize and com.ibm.mq.cfg.TCP.ClntSndBuffSize to be set to zero" on page 96

Security

Linux AIX **JWT token `typ` parameter is now optional**

From IBM MQ 9.4.2, the **`typ`** (token type) parameter in a JSON Web Token (JWT) header is no longer required. If you do not specify this parameter, you no longer receive an error message. If you do specify this parameter, its value must be "JWT". This change increases the compatibility of IBM MQ with various identity platforms.

For more information about this parameter and other JWT token requirements, see Requirements for authentication tokens.

Migrating FIPS clients from Java 8 to IBM Semeru Runtime Java with FIPS 140-3

When migrating to IBM MQ 9.4.2, you will not see any change in behavior of your existing IBM MQ classes for JMS and IBM MQ classes for Java clients. However, if you are migrating FIPS clients from Java 8 to IBM Semeru Runtime Java, you will need to make changes to the clients to account for the new Java properties that you must specify to enable the FIPS 140-3 security provider.

With FIPS 140-2 , you can add **SSLFIPSREQUIRED** to the connection factory to specify a that FIPS certified security provider is required. This property is not supported by IBM Semeru Runtime

Java and is no longer necessary to create a FIPS certified connection. If a client connects with **SSLFIPSREQUIRED** set on the connection factory using IBM Semeru Runtime 11+ but the IBM Semeru Runtime Java properties are not specified, a JMS SSL configuration exception is thrown. For more information, see TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS and TLS CipherSpecs and CipherSuites in IBM MQ classes for Java.

From Java 11, the support for being able to use the SSL_ and TLS_ prefixes interchangeably in Cipher Suites has been removed so the cipher definition must be correctly defined.

IBM Semeru Runtime FIPS 140-3 does not support 32 bit clients. If your 32 bit client cannot be updated, you can override hardcoded connection factory properties by providing an override file.

Disabled CipherSuites in MQIPT

From IBM MQ 9.4.2, SSL_ECDH CipherSuites are disabled by default in IBM MQ Internet Pass-Thru (MQIPT). For more information about the CipherSuites that MQIPT supports, see CipherSuites supported by MQIPT.

Linux **Changes to operating system authentication for the IBM MQ Console and REST API**

To resolve issues with only the user primary group being reported when verifying group membership for access or authorisation, from IBM MQ 9.4.2, the IBM MQ Console and REST API allow operating system authentication to be done in a similar way to the queue manager. To enable this behavior, you must set the **MQS_GETGROUPLIST_API** environment variable before starting the mqweb server hosting the IBM MQ Console.

For more information, see Solving certain group membership problems on Linux.

Administration

MQ Adv. **Addition of a toString() method to the TransferExitResult class to output the attributes of the current object**

When customizing Managed File Transfer (MFT) with user exits, TransferExitResult objects are used to store the result code returned by an exit, along with an optional string containing an explanatory message. From IBM MQ 9.4.2, the TransferExitResult class has been updated to include a toString() method which outputs the result code stored in the object, along with the optional explanatory message if it is present. For example:

```
[CANCEL_TRANSFER, FileFilterExit: NullPointerException]
```

For more information, see FileTransferResult.java interface.

Changes to allow IBM MQ Java client properties com.ibm.mq.cfg.TCP.ClntRcvBuffSize and com.ibm.mq.cfg.TCP.ClntSndBuffSize to be set to zero

From IBM MQ 9.4.2, if the value of either the **com.ibm.mq.cfg.TCP.ClntRcvBuffSize** or the **com.ibm.mq.cfg.TCP.ClntSndBuffSize** property is set as zero for an IBM MQ Java client, the Java Message Queuing Interface (JMQI) uses the buffer size provided by the network layer. This resolves a previous issue where setting the properties to zero would incorrectly result in the JMQI using TCP/IP send and/or receive buffers of size 32K when communicating with a queue manager. For more information, see TCP stanza of the client configuration file.

Related concepts

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 9.4.2 New, changed, and removed messages in IBM MQ 9.4.2

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.4.2.

- Multi "New, changed, and removed IBM MQ AMQ messages" on page 97

- “New, changed, and removed IBM MQ Console messages” on page 98
- ALW “New, changed and removed IBM MQ Internet Pass-Thru messages” on page 98
- “New, changed and removed JSON messages” on page 98
- “New, changed, and removed Managed File Transfer messages” on page 98
- “New, changed and removed MQJMS messages” on page 98
- “New, changed, and removed REST API messages” on page 99
- ALW “New, changed and removed MQ Telemetry messages” on page 99
- z/OS “New, changed, and removed z/OS messages” on page 99

New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new for IBM MQ 9.4.2:

AMQ3xxx: Utilities and tools

AMQ3069 - AMQ3070

AMQ3072 - AMQ3086

AMQ3251 - AMQ3268

AMQ3270 - AMQ3299

AMQ3305 - AMQ3311

AMQ3461 - AMQ3471

AMQ3631E

AMQ6xxx: Common Services

AMQ6176W

AMQ6347W

AMQ6348E

AMQ7xxx: IBM MQ product

AMQ7738I

AMQ8xxx: Administration

AMQ8013I

AMQ8067I

AMQ8100I

AMQ8244I

AMQ8246 - AMQ8248

AMQ8252 - AMQ8255

AMQ8329I

AMQ8400I

IBM i AMQ8D44 (IBM i)

AMQ9890I

The following AMQ messages are changed for IBM MQ 9.4.2:

AMQ3xxx: Utilities and tools

AMQ3240I (Added more information to explanation, regarding recovery group leader)

AMQ3762I (Added new command parameter, for Native HA groups)

AMQ3821E (Added more information to message text)

AMQ3966I (Added new command parameters)

AMQ3969I (Added new command parameters)

AMQ5xxx: Installable services

AMQ5600I (Added new command parameter, for authorization policy)

AMQ5613I (Added new command parameter, for Native HA groups)

AMQ6xxx: Common Services

Windows AMQ6150W (Windows) (Added extra information to Explanation and Response)

AMQ6620I (Added new commands)

AMQ6636I (Added new information to the **-n** parameter)

AMQ6637I (Added new information to the **-n** parameter)

AMQ6729W (Updated Explanation to specify exact time)

AMQ7xxx: IBM MQ product

AMQ7230I (Added more information to Explanation)

AMQ7486I (Added more information to Explanation)

AMQ7705I (Added new command parameters)

MQ Appliance AMQ7705I (IBM MQ Appliance) (Added new command parameters)

IBM i AMQ7705I (IBM i) (Added new command parameter)

AMQ8xxx: Administration

AMQ8106I (Added more information to Response)

The following AMQ messages are removed for IBM MQ 9.4.2:

AMQ9xxx: Remote

AMQ9767I - AMQ9769I

New, changed, and removed IBM MQ Console messages

There are no new, changed, or removed IBM MQ Console messages for IBM MQ 9.4.2.

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

ALW

The following IBM MQ Internet Pass-Thru messages are changed for IBM MQ 9.4.2:

MQCPxxxx: MQIPT messages

MQCPE014: (Updated User response to change the range from "1024 to 65535" to "0 to 65535")

There are no new or removed IBM MQ Internet Pass-Thru messages for IBM MQ 9.4.2.

New, changed and removed JSON messages

There are no new, changed, or removed JSON format diagnostic messages for IBM MQ 9.4.2.

New, changed, and removed Managed File Transfer messages

There are no new, changed, or removed Managed File Transfer messages for IBM MQ 9.4.2.

New, changed and removed MQJMS messages

The following JMS exception messages are new for IBM MQ 9.4.2:

JMS exception messages

JMSCS0061

JMSCS0062

JMSMQ1124

JMSWMQ2034

There are no changed, or removed JMS exception messages for IBM MQ 9.4.2.

New, changed, and removed REST API messages

The following REST API messages are changed for IBM MQ 9.4.2:

MQWB11xx: REST API messages MQWB1100 to 1199

- MQWB1144E (Added more characters to the allowed list)

There are no new or removed REST API messages for IBM MQ 9.4.2.

New, changed and removed MQ Telemetry messages

The following MQ Telemetry messages are new for IBM MQ 9.4.2:

Telemetry (AMQXR) messages

- AMQXR0107E (Note that this message has the same number as an existing message, but different text)

Telemetry command utility (AMQXR) messages

- AMQXR3100 - AMQXR3123

There are no changed or removed MQ Telemetry messages for IBM MQ 9.4.2.

New, changed, and removed z/OS messages

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.4.2:

Coupling Facility manager messages (CSQE...)

- CSQ0629E (Expanded message text to include return code)
- CSQE042E (Corrected error in System programmer response)
- CSQE222E (Added a link to more information about reason codes)

Security manager messages (CSQH...)

- CSQH004I (Changed link in System programmer response from a PDF download to the IBM Documentation website)

Recovery log manager messages (CSQJ...)

- CSQJ167E (Corrected IBM MQ version in Explanation and System action, and added further information to System programmer response)

Utilities messages (CSQU...)

- CSQU568E (Added links for further information to System programmer response)
- CSQU569E (Added links for further information to System programmer response)
- CSQU680E (Added links for further information to System programmer response)
- CSQU681I (Added links for further information to System programmer response)
- CSQU682I (Added links for further information to System programmer response)
- CSQU683E (Added links for further information to System programmer response)
- CSQU688E (Added links for further information to System programmer response)

Distributed queuing messages (CSQX...)

- CSQX633E (Extra information added to System programmer response)

Advanced Message Security (CSQ0...)

- CSQ0629E (Expanded message text to include return code)

There are no new or removed IBM MQ for z/OS CSQ messages for IBM MQ 9.4.2.

Related reference
IBM MQ AMQ messages
Managed File Transfer messages and return codes
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
JMS exception messages
JSON format diagnostic messages
Messages for IBM MQ for z/OS

V 9.4.2 Deprecated, stabilized, and removed features in IBM MQ 9.4.2

There are deprecations and removals from IBM MQ 9.4.2.

- “Deprecated features” on page 100
- “Removed features” on page 100

Deprecated features

Deprecated

Table 8. Deprecations at IBM MQ 9.4.2	
Feature	**Description**
z/OS Deprecation: system.broker.clients.data queue	On z/OS, the system.broker.clients.data queue from the `CSQ4INSR.jcl` sample is deprecated as the queue is not used within the product.

Removed features

Removed

Table 9. Removals at IBM MQ 9.4.2	
Feature	**Description**
AIX Removal: IBM XL C/C++ for AIX 16 compiler	For Continuous Delivery, the IBM XL C/C++ for AIX 16 compiler is removed from the product at IBM MQ 9.4.2. Compile AIX programs by using the IBM Open XL C/C++ for AIX 17 compiler instead.

V 9.4.1 What's new and changed in IBM MQ 9.4.1

IBM MQ 9.4.1, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on AIX, Linux, Windows, and z/OS.

What's new in 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.

Security

- "New dspmqcert program for checking SSL/TLS certificate dates" on page 102
- "HTTPS now supported for accessing a CCDT through a URL" on page 102

Application development

- "Java heap dump generation to troubleshoot low memory exceptions for AMQP and MQTT" on page 103

What's new in IBM MQ for Multiplatforms - Advanced entitlement only

Multi MQ Adv.

On Multiplatforms, the following features and enhancements are available only with Advanced entitlement.

Containers

- Linux "Support for deployments outside OpenShift with the IBM MQ Advanced container image" on page 103
- Linux "License tagging for non-production container workloads" on page 103

What's changed in IBM MQ 9.4.1

IBM MQ 9.4.1 includes the following changes of behavior:

License entitlement, installation and migration

- Windows Linux MQ Adv. MQ Adv. VUE MQ Adv. z/OS "[IBM MQ Advanced][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]IBM Aspera faspio Gateway version upgraded" on page 104
-

Security

- Deprecated "[Deprecated]Deprecation of RSA key exchange CipherSpecs" on page 104
- Deprecated "[Deprecated]Deprecation of SSL 3.0 and TLS 1.0 protocols" on page 104

Administration

- "[IBM MQ Advanced][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]IBM Kafka Source and Sink Connector version upgraded" on page 104
- "New return code 2491" on page 104
- "Message AMQ7366W added to ExcludeMessage and SuppressMessage lists" on page 105

Related information

System Requirements for IBM MQ
IBM MQ, WebSphere MQ, and MQSeries product readmes web page

Multi V 9.4.1 What's new in IBM MQ 9.4.1 for Multiplatforms - base and Advanced entitlement

For Multiplatforms, IBM MQ 9.4.1 delivers new enhancements that are available with base product entitlement, and also with Advanced entitlement.

Security

- “New dspmqcert program for checking SSL/TLS certificate dates” on page 102
- “HTTPS now supported for accessing a CCDT through a URL” on page 102

Application development

- “Java heap dump generation to troubleshoot low memory exceptions for AMQP and MQTT” on page 103

Security

New `dspmqcert` program for checking SSL/TLS certificate dates

From IBM MQ 9.4.1, the **`dspmqcert`** program provides an easy way to query SSL/TLS certificates for queue managers. A typical use for **`dspmqcert`** is to check the validity of SSL/TLS certificate dates. Checking SSL/TLS certificate dates is crucial because they expire and must be renewed to meet current security standards. Failure to renew before expiry disrupts TLS communication between applications.

For more information, see dspmqcert (display IBM MQ certificates).

HTTPS now supported for accessing a CCDT through a URL

A client channel definition table (CCDT) defines client connection channels and their attributes. You can save a CCDT file in a central location that can be accessed through a URL, so you don't have to individually update the CCDT file for each deployed client. From IBM MQ 9.4.1, this URL can use the `https` protocol in addition to `http`, `ftp`, and `file`. Using HTTPS URLs protects the integrity of the CCDT file in transit.

To use an HTTPS URL, you must first configure an HTTPS keystore. This keystore is a PKCS #12 key repository that the IBM MQ client library can use as a truststore when it creates the outgoing HTTPS connection to fetch the CCDT file.

You can specify information about the HTTPS keystore by using the following attributes in the client configuration file, as described in SSL stanza of the client configuration file:

- HTTPSKeyStore
- HTTPSCertValidation
- HTTPSCertRevocation

IBM MQ MQI client applications can use the following fields of the MQSCO structure to specify information about the HTTPS keystore, as described in MQSCO - SSL/TLS configuration options:

- HTTPSKeyStorePtr
- HTTPSKeyStoreOffset
- HTTPSKeyStoreLength
- HTTPSCertValidation
- HTTPSCertRevocation

For more information about accessing CCDTs through URLs, see URL access to the CCDT and Locations for the CCDT.

If an HTTPS connection fails, diagnostic information is provided by new error codes for message AMQ9795E, as described in HTTP error codes.

Application development

Java heap dump generation to troubleshoot low memory exceptions for AMQP and MQTT

From IBM MQ 9.4.1, you can set the system property **`com.ibm.mq.MQXR.GenerateHeapDump`** to enable automatic generation of a Java heap dump when the AMQP or MQTT service reports a low memory exception. This will assist IBM Support in diagnosing low memory problems.

For more information, see Enabling Java heap dump generation to troubleshoot low memory exceptions for AMQP and Enabling Java heap dump generation to troubleshoot low memory exceptions for MQTT.

Related concepts

"IBM MQ license information" on page 9
What you can purchase with IBM MQ and what each purchase entitles you to install.

Multi V 9.4.1 MQ Adv. What's new in IBM MQ 9.4.1 for Multiplatforms - Advanced entitlement only

IBM MQ 9.4.1 delivers new enhancements for IBM MQ that are available only with IBM MQ Advanced for Multiplatforms entitlement.

Containers

- Linux "Support for deployments outside OpenShift with the IBM MQ Advanced container image" on page 103
- Linux "License tagging for non-production container workloads" on page 103

Containers

Linux **Support for deployments outside OpenShift with the IBM MQ Advanced container image**

You can now deploy IBM MQ into container runtime environments provided by containerd, cri-o, Podman or Docker with the pre-built IBM MQ Advanced container image. This image is available from the IBM Container Registry.

For more information, see Support for the IBM MQ Advanced container images.

Linux **License tagging for non-production container workloads**

In the IBM MQ Operator, you can now select the appropriate licenses for non-production workloads in the IBM MQ Advanced Container.

For more information, see Correcting license annotations for deployed queue managers.

Related concepts

"IBM MQ license information" on page 9
What you can purchase with IBM MQ and what each purchase entitles you to install.

V 9.4.1 What's changed in IBM MQ 9.4.1

Before upgrading your queue managers to the latest product version, review these changes to functions and resources since IBM MQ 9.4.1 and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

License entitlement, installation and migration

- Windows Linux MQ Adv. MQ Adv. VUE MQ Adv. z/OS "[IBM MQ Advanced][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]IBM Aspera faspio Gateway version upgraded" on page 104

Security

- Deprecated "[Deprecated]Deprecation of RSA key exchange CipherSpecs" on page 104

- Deprecated “[Deprecated]Deprecation of SSL 3.0 and TLS 1.0 protocols” on page 104

Administration

- “[IBM MQ Advanced][IBM MQ Advanced VUE][IBM MQ Advanced for z/OS]IBM Kafka Source and Sink Connector version upgraded” on page 104
- “New return code 2491” on page 104
- “Message AMQ7366W added to ExcludeMessage and SuppressMessage lists” on page 105

License entitlement, installation and migration

MQ Adv. MQ Adv. VUE MQ Adv. z/OS **IBM Aspera faspio Gateway version upgraded**

From IBM MQ 9.4.1, the version of the IBM Aspera faspio Gateway is upgraded to 1.3.5. For more information, see Defining an Aspera gateway connection on Linux or Windows platforms.

Security

Deprecated **Deprecation of RSA key exchange CipherSpecs**

Following a recommendation from NIST, the CipherSpecs that use RSA for key exchange are deprecated and disabled by default from IBM MQ 9.4.1. This affects the following CipherSpecs:

- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_256_GCM_SHA384

You are advised to migrate to use the equivalent Diffie-Hellmen key exchange CipherSpecs. These are:

- ECDHE_RSA_AES_128_CBC_SHA256
- ECDHE_RSA_AES_256_CBC_SHA384
- ECDHE_RSA_AES_128_GCM_SHA256
- ECDHE_RSA_AES_256_GCM_SHA384

Alternatively, the CipherSpecs can be re-enabled. For more information, see Enabling deprecated CipherSpecs on IBM MQ for Multiplatforms.

Important: When using IBM MQ as a Service, these CipherSpecs are not able to be re-enabled and are permanently deprecated.

Deprecated **Deprecation of SSL 3.0 and TLS 1.0 protocols**

The SSL 3.0 and TLS 1.0 protocols in IBM MQ .NET are deprecated from IBM MQ 9.4.1. Cipherspecs defined under property MQC.SSL_CIPHER_SPEC_PROPERTY or SSLCipherSpec in MQEnvironment that use SSL 3.0 or TLS 1.0 protocols should be avoided due to security vulnerabilities, and will be removed from support in the future releases. A warning message is produced in the client application error logs if either of these protocols is used and it is recommended to use TLS 1.2 protocol or higher.

Administration

MQ Adv. MQ Adv. VUE MQ Adv. z/OS **IBM Kafka Source and Sink Connector version upgraded**

From IBM MQ 9.4.1, IBM MQ Advanced for z/OS, IBM MQ Advanced for z/OS Value Unit Edition, IBM MQ Advanced for Multiplatforms, and IBM MQ Appliance upgrade the version of the IBM provided Kafka source connector from 2.0.0 to 2.1.0 and sink connector from 2.1.0 to 2.2.0.

For more information, see Kafka Connect common topologies.

New return code 2491

IBM MQ 9.4.1 adds a new return code (2491) that can appear in messages that are moved to the dead letter queue.

For more information, see 2491 0x000009bb MQRC_MSG_LENGTH_ERROR.

Message AMQ7366W added to ExcludeMessage and SuppressMessage lists
From IBM MQ 9.4.1, `7366 - Unable to identify queue manager to handle balance request for application` is added to the ExcludeMessage and SuppressMessage lists. For more information, see Diagnostic message service stanzas and AMQ7xxx: IBM MQ product.

Related concepts
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 9.4.1 New, changed, and removed messages in IBM MQ 9.4.1

Some new messages have been added and some existing messages have been changed or removed in IBM MQ 9.4.1.

- Multi "New, changed, and removed IBM MQ AMQ messages" on page 105
- "New, changed, and removed IBM MQ Console messages" on page 106
- ALW "New, changed and removed IBM MQ Internet Pass-Thru messages" on page 106
- "New, changed and removed JSON messages" on page 106
- "New, changed, and removed Managed File Transfer messages" on page 106
- "New, changed and removed MQJMS messages" on page 106
- "New, changed, and removed REST API messages" on page 106
- ALW "New, changed and removed MQ Telemetry messages" on page 106
- z/OS "New, changed, and removed z/OS messages" on page 106

New, changed, and removed IBM MQ AMQ messages

Multi

The following AMQ messages are new for IBM MQ 9.4.1:

AMQ3xxx: Utilities and tools
AMQ3058I - AMQ3064E

AMQ3067E - AMQ3068E

AMQ5xxx: Installable services
AMQ5709E

AMQ5790E - AMQ5791I

AMQ7xxx: IBM MQ product
AMQ7842W - AMQ7844E

AMQ8xxx: Administration
AMQ8515W

AMQ8961E

AMQ9xxx: Remote
AMQ9680E

AMQ9891I - AMQ9894W

The following AMQ messages are changed for IBM MQ 9.4.1:

AMQ5xxx: Installable services
AMQ5788E (Response is extended)

AMQ6xxx: Common Services
AMQ6581I (Usage is extended)

AMQ8xxx: Administration
AMQ8499I (Typo fixed in Usage)

AMQ9xxx: Remote
AMQ9773I (Usage expanded)

AMQ9795E (Explanation and Response expanded)

The following AMQ messages are removed for IBM MQ 9.4.1:

AMQ9xxx: Remote
AMQ9767I - AMQ9769I

New, changed, and removed IBM MQ Console messages

There are no new, changed, or removed IBM MQ Console messages for IBM MQ 9.4.1.

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

ALW

The following IBM MQ Internet Pass-Thru messages are changed for IBM MQ 9.4.1:

MQCPxxxx: MQIPT messages
MQCPE061 (URL updated for link to *CipherSuites supported by MQIPT*)

MQCPE062 (URL updated for link to *CipherSuites supported by MQIPT*)

There are no new or removed IBM MQ Internet Pass-Thru messages for IBM MQ 9.4.1.

New, changed and removed JSON messages

There are no new, changed, or removed JSON format diagnostic messages for IBM MQ 9.4.1.

New, changed, and removed Managed File Transfer messages

There are no new, changed, or removed Managed File Transfer for IBM MQ 9.4.1.

New, changed and removed MQJMS messages

There are no new, changed, or removed JMS exception messages for IBM MQ 9.4.1.

New, changed, and removed REST API messages

There are no new, changed, or removed REST API messages for IBM MQ 9.4.1.

New, changed and removed MQ Telemetry messages

ALW

The following AMQXR MQ Telemetry messages are new for IBM MQ 9.4.1:

Telemetry (AMQXR) messages
AMQXR2124W

There are no changed, or removed MQ Telemetry messages for IBM MQ 9.4.1.

New, changed, and removed z/OS messages

z/OS

The following IBM MQ for z/OS CSQ messages are new for IBM MQ 9.4.1:

The following IBM MQ for z/OS CSQ messages are changed for IBM MQ 9.4.1:

Recovery log manager messages (CSQJ...)

CSQJ077E (Typo fixed in System programmer response)

CSQJ111A (System programmer response reworked)

CSQJ370I (Explanation greatly extended)

Utilities messages (CSQU...)

CSQU568E (Explanation extended)

Distributed queuing messages (CSQX...)

CSQX634E (Certificate name format updated in System programmer response)

CSQX642E (Certificate name format updated in System programmer response)

CSQX644E (Certificate name format updated in System programmer response)

CSQX645E (Certificate name format updated in System programmer response)

CSQX686E (Certificate name format updated in Explanation)

Subsystem support messages (CSQ3...)

CSQ3111I (Explanation extended)

There are no new or removed IBM MQ for z/OS CSQ messages for IBM MQ 9.4.1.

Related reference

IBM MQ AMQ messages
Managed File Transfer messages and return codes
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
JMS exception messages
JSON format diagnostic messages
Messages for IBM MQ for z/OS

V 9.4.1 Deprecated, stabilized, and removed features in IBM MQ 9.4.1

There are deprecations from IBM MQ 9.4.1.

Deprecated features

Deprecated

Table 10. Deprecations at IBM MQ 9.4.1

Feature	Description
Deprecation: RSA key exchange CipherSpecs	Following a recommendation from NIST, the CipherSpecs that use RSA for key exchange are deprecated and disabled by default from IBM MQ 9.4.1. For more information, see “[Deprecated]Deprecation of RSA key exchange CipherSpecs” on page 104.

Table 10. Deprecations at IBM MQ 9.4.1 (continued)	
Feature	**Description**
Deprecation: SSL 3.0 and TLS 1.0 protocols	The SSL 3.0 and TLS 1.0 protocols in IBM MQ .NET are deprecated from IBM MQ 9.4.1. Cipherspecs defined under property MQC.SSL_CIPHER_SPEC_PROPERTY or SSLCipherSpec in MQEnvironment that use SSL 3.0 or TLS 1.0 protocols should be avoided due to security vulnerabilities, and will be removed from support in the future releases. A warning message is produced in the client application error logs if either of these protocols is used and it is recommended to use TLS 1.2 protocol or higher.
Deprecation: MQIPT service on Linux	The service that is used to start MQIPT automatically at system startup on Linux is deprecated in IBM MQ 9.4.1. The service on Linux uses System V init, which is not supported on some recent versions of Linux. An alternative, such as `systemd`, can be used to start MQIPT automatically.

LTS What's changed in IBM MQ 9.4.0 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 9.4.0 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.

IBM MQ 9.4.0 Fix Pack 10

V 9.4.0.10

Performance monitoring enhancements

From IBM MQ 9.4.0 Fix Pack 10, you can use the **mqperfck** command to generate an HTML report containing performance metrics for specified queues or channels over a set time period. The report shows key system and queue manager metrics such as CPU load and IO rate, as well as metrics for the object(s) under observation such as lock contention, MQI counts, selector and match-option mismatches, and network time. The report allows customers and IBM Support to review and compare workload between normal and problematic time periods or performant and non-performant environments. It is intended to gain insight into workload patterns during times of performance sensitivity without the need to capture IBM MQ trace. For more information, see mqperfck (MQ performance check) and Metrics published on the system topics.

You can suppress the publication of the new statistics and their metadata by setting the **AMQ_NO_MQPERFCK_STATS** environment variable to any value before starting the queue manager.

MQ Adv. **Addition of a toString() method to the TransferExitResult class to output the attributes of the current object**

When customizing Managed File Transfer (MFT) with user exits, TransferExitResult objects are used to store the result code returned by an exit, along with an optional string containing an explanatory message. From IBM MQ 9.4.0 Fix Pack 10, the TransferExitResult class has been updated to include a toString() method which outputs the result code stored in the object, along with the optional explanatory message if it is present. For example:

```
[CANCEL_TRANSFER, FileFilterExit: NullPointerException]
```

For more information, see FileTransferResult.java interface.

Disabled CipherSuites in MQIPT

From IBM MQ 9.4.0 Fix Pack 10, SSL_ECDH CipherSuites are disabled by default in IBM MQ Internet Pass-Thru (MQIPT).

For more information about the CipherSuites that MQIPT supports, see CipherSuites supported by MQIPT.

Changes to allow IBM MQ Java client properties com.ibm.mq.cfg.TCP.ClntRcvBuffSize and com.ibm.mq.cfg.TCP.ClntSndBuffSize to be set to zero

From IBM MQ 9.4.0 Fix Pack 10, if the value of either the **com.ibm.mq.cfg.TCP.ClntRcvBuffSize** or the **com.ibm.mq.cfg.TCP.ClntSndBuffSize** property is set as zero for an IBM MQ Java client, the Java Message Queuing Interface (JMQI) uses the buffer size provided by the network layer. This resolves a previous issue where setting the properties to zero would incorrectly result in the JMQI using TCP/IP send and/or receive buffers of size 32K when communicating with a queue manager. For more information, see TCP stanza of the client configuration file.

IBM MQ 9.4.0 Fix Pack 5

V 9.4.0.5

V 9.4.0.5 **New return code 2491**

IBM MQ 9.4.0 Fix Pack 5 adds a new return code (2491) that can appear in messages that are moved to the dead letter queue. For more information, see 2491 0x000009bb MQRC_MSG_LENGTH_ERROR.

Related concepts

“What's new and changed in IBM MQ 9.4.0 ” on page 26

IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ

9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. The features that you have access to depends on your product entitlement.

"What's new and changed in IBM MQ 9.4.x Continuous Delivery" on page 80
Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

"What was new and changed in earlier versions" on page 110
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 9.4.

"Icons used in the product documentation" on page 163
The product documentation for all IBM MQ 9.4 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

Recommended Fixes for IBM MQ

IBM MQ planned maintenance release dates

What was new and changed in earlier versions

Links to information about new features and changes to functions and resources, including stabilizations, deprecations and removals, that occurred in versions of the product before IBM MQ 9.4.

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 9.3

- What's new and changed in IBM MQ 9.3.0
- What's new and changed in IBM MQ 9.3.x Continuous Delivery
- What's changed in IBM MQ 9.3.0 Long Term Support

IBM MQ 9.2

- What's new and changed in IBM MQ 9.2.0
- CD What's new and changed in IBM MQ 9.2.x Continuous Delivery
- LTS 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
- CD What's new and changed in IBM MQ 9.1.x Continuous Delivery
- LTS 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
- CD What's new and changed in IBM MQ 9.0.x Continuous Delivery
- LTS 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 9.4.0 ” on page 26
IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ 9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. The features that you have access to depends on your product entitlement.

“What's new and changed in IBM MQ 9.4.x Continuous Delivery” on page 80
Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

“What's changed in IBM MQ 9.4.0 Long Term Support” on page 108
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

Readme for IBM MQ 9.4 and its maintenance

This document contains the readme information for IBM MQ 9.4.0 Long Term Support release and its maintenance, and also for IBM MQ 9.4.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/V9.4/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/0TO5000000024cJGAQ/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 9.4 product information is available in IBM Documentation: https://www.ibm.com/docs/ibm-mq/9.4.

Announcement letters

The announcement letters for IBM MQ 9.4 (US English) are available at the following locations. The announcement letters provide these types of information:

- Detailed product description, including description of new function.
- Product-positioning statement.
- Ordering details.
- Hardware and software requirements.
- Hourly pricing.

Announcement letters for IBM MQ 9.4.0

IBM MQ 9.4.3 provides administration enhancements for IBM MQ and IBM MQ Advanced, and administration and OpenTelemetry tracing enhancements for IBM MQ Appliance
https://www.ibm.com/docs/en/announcements/AD25-1015/index.html
IBM MQ 9.4.2 delivers improved resiliency using cross-region replication in MQ containers
https://www.ibm.com/docs/en/announcements/AD25-0083/index.html
IBM MQ 9.4.1; IBM MQ as a Service Reserved Instance; IBM MQ on Cloud offering name change
https://www.ibm.com/docs/en/announcements/AD24-2038/index.html
IBM MQ 9.4 for Multiplatforms and IBM MQ on Cloud
https://www.ibm.com/docs/en/announcements/AD24-0520
IBM MQ for z/OS 9.4 and IBM MQ Appliance 9.4
https://www.ibm.com/docs/en/announcements/AD24-0535

Update history

Date	Summary
17 Jun 2025	Updated for IBM MQ 9.4.3
27 Feb 2025	Updated for IBM MQ 9.4.0.10 Fix Pack
27 Feb 2025	Updated for IBM MQ 9.4.2
24 Oct 2024	Updated for IBM MQ 9.4.1
05 Sep 2024	Updated for IBM MQ 9.4.0.5 Fix Pack
02 Jul 2024	Updated for IBM MQ for z/OS 9.4 and IBM MQ Appliance 9.4
18 Jun 2024	Created for IBM MQ 9.4.0 for Multiplatforms

Installation instructions

Installation instructions are available as part of the IBM MQ 9.4 product information published in IBM Documentation: https://www.ibm.com/docs/SSFKSJ_9.4.0/install/q008250_.html

Limitations and known problems for Continuous Delivery releases

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.4.3

IBM MQ Explorer does not install on Windows Server 2025

If you are using the continuous delivery (CD) release of IBM MQ on Windows Server 2025, IBM MQ Explorer fails to install due to an InstallAnywhere issue. This limitation does not apply to the long term support (LTS) release.

Windows Server 2025 is incorrectly reported

On Windows Server 2025 (CD or LTS), the following components incorrectly report the operating system as Windows Server 2022: IBM MQ Launchpad, the **dspmqver** command, and diagnostic information.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.4.2

There are no new limitations or known problems.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.4.1

There are no new limitations or known problems.

Limitations and known problems for Long Term Support releases

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.4.0, FIX PACK 10

On Linux, upgrading to IBM MQ 9.4.0.10 fails if the existing installation is in a top-level directory

If you installed an earlier IBM MQ 9.4 release into a top-level directory on an RPM-based Linux operating system, a direct upgrade to IBM MQ 9.4.0.10 fails.

For example, suppose you have IBM MQ 9.4.0.5 installed into the /mq94 directory and you attempt to upgrade to IBM MQ 9.4.0.10 by using the following command:

```
sudo rpm -U --prefix /mq94 MQSeriesRuntime-9.4.0-10.x86_64.rpm
MQSeriesServer-9.4.0-10.x86_64.rpm MQSeriesGSKit-9.4.0-10.x86_64.rpm
```

The upgrade fails with the following error messages:

```
ERROR: Specified installation path '/mq94' is not empty
error: %prein(MQSeriesRuntime-9.4.0-10.x86_64) scriptlet failed, exit status 1
error: MQSeriesRuntime-9.4.0-10.x86_64: install failed
error: MQSeriesRuntime-9.4.0-5.x86_64: erase skipped
```

If you experience this problem, instead of upgrading in a single step by using the -U RPM option, first uninstall the existing IBM MQ RPM filesets, then install the IBM MQ 9.4.0.10 filesets. For example:

```
sudo rpm -e MQSeriesRuntime-9.4.0-5
MQSeriesServer-9.4.0-5 MQSeriesGSKit-9.4.0-5
sudo rpm -i --prefix /mq94
MQSeriesRuntime-9.4.0-10.x86_64.rpm MQSeriesServer-9.4.0-10.x86_64.rpm
MQSeriesGSKit-9.4.0-10.x86_64.rpm
```

This problem will be addressed by APAR IT47747.

LIMITATIONS AND KNOWN PROBLEMS FOR IBM MQ 9.4.0, FIX PACK 5

On Linux, using the IBM MQ console to migrate to IBM MQ 9.4.0.5 generates many system messages

While upgrading , there should be a limited number of messages displayed in the console output. However on Linux systems, If you upgrade to IBM MQ 9.4.0.5 using rpm -U MQ*, more than 6000 lines

of messages are displayed in the console output. So even if the upgrade completes successfully, you might miss valid error messages or warning messages.

This issue affects only Linux installations.

This issue is addressed by APAR IT46528.

Limitations and known problems for the initial IBM MQ 9.4.0 release

libcurl is missing from dspmqver -a output

dspmqver should load GSKit if libcurl requires it. However, libCurl is not currently in the output of the `dspmqver -a` command.

This issue will be fixed in future CD updates and LTS maintenance releases.

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
- 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.

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IBM MQ 9.4 Quick Start Guide

Use this guide to get started with IBM MQ 9.4.

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-premises, 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[1]. The eImages that make up the full release can be downloaded individually if you do not need the full release.
- A Quick Start Guide eImage.

For more information on LTS and CD releases, fixpacks, security updates and optional components of IBM MQ, see Downloading IBM MQ 9.4 (https://www.ibm.com/support/pages/downloading-ibm-mq-94).

A Quick Start Guide PDF file can be downloaded from https://www.ibm.com/support/pages/downloading-ibm-mq-94. Alternatively, the Quick Start Guide is available in HTML format from IBM Documentation (https://www.ibm.com/docs/ibm-mq/9.4?topic=mq-94-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/mq94noninstallqmgr.

For more information about downloading the product from Passport Advantage, see Downloading IBM MQ 9.4 (https://www.ibm.com/support/pages/downloading-ibm-mq-94) and the Passport Advantage and Passport Advantage Express website (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). Specifically, the IBM MQ 9.4 documentation is available in IBM Documentation (https://www.ibm.com/docs/ibm-mq/9.4).

The IBM MQ 9.4 documentation is also available as a set of PDF files that can be downloaded from https://public.dhe.ibm.com/software/integration/wmq/docs/V9.4/PDFs/.

Information about how to use IBM MQ Explorer can be accessed either from within IBM MQ Explorer or in the IBM MQ 9.4 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).

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 9.4 documentation (https://www.ibm.com/docs/ibm-mq/9.4?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).

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 9.4 documentation (https://www.ibm.com/docs/ibm-mq/9.4?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).

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 (LTS) 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).

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).

IBM Support information

Support information includes the following resources:

- IBM Support Site (https://www.ibm.com/mysupport)
- IBM MQ for Multiplatforms Support web page (http://ibm.biz/mqsupport)
- IBM MQ for z/OS Support web page (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)

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IBM MQ 9.4 PDF files for product documentation and Program Directories

You can download the IBM MQ 9.4 product documentation, and the IBM MQ for z/OS Program Directories, in PDF format.

IBM MQ 9.4 product documentation PDF files

The IBM MQ 9.4 PDF files contain the same information as the HTML version of the product documentation published in IBM Documentation. You can download them by clicking the links in the following table.

Note: You can also download the IBM MQ 9.4 product documentation in HTML format into an offline version of IBM Documentation that you install locally. For more information, see "IBM MQ 9.4 in the IBM Documentation Offline app" on page 120.

Table 11. PDF files for the product documentation and how they correspond to the sections in IBM Documentation

PDF file name and download link	Equivalent section in IBM Documentation
mq94_readme_en.pdf Translations of this readme file are available to download here.	Readme for IBM MQ 9.4 and its maintenance
mq94_qsg_en.pdf Translations of this Quick Start Guide are available to download here.	IBM MQ 9.4.0 Quick Start Guide
mq94.overview.pdf Translations of this PDF, and the PDFs in subsequent rows in this table, are available to download here.	About IBM MQ
mq94.techoview.pdf	Technical overview

Table 11. PDF files for the product documentation and how they correspond to the sections in IBM Documentation (continued)	
PDF file name and download link	**Equivalent section in IBM Documentation**
mq94.scenarios.pdf	Scenarios
mq94.plan.pdf	Planning for IBM MQ
mq94.install.pdf	Installing and migrating IBM MQ
mq94.secure.pdf	Securing IBM MQ
mq94.configure.pdf	Configuring IBM MQ
mq94.administer.pdf	Administering IBM MQ
mq94.develop.pdf	Developing applications for IBM MQ
mq94.monitor.pdf	Monitoring and performance for IBM MQ
mq94.troubleshoot.pdf	Troubleshooting and support for IBM MQ
mq94.reference.pdf	IBM MQ Reference
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mq94.refadmin.pdf	IBM MQ Administration reference
mq94.refdev.pdf	IBM MQ Developing applications reference
mq94.explorer.pdf	IBM MQ Explorer
mq94.container.pdf	IBM MQ in containers

Note: The PDF files must be in the same folder for links between PDF files to function correctly.

IBM MQ for z/OS Program Directory PDF files

z/OS

LTS The following IBM MQ for z/OS 9.4.0 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 9.4.0 (GI13-4488-00)
- Program directory for IBM MQ for z/OS Value Unit Edition Long Term Support 9.4.0 (GI13-4489-00)
- Program directory for IBM MQ Advanced for z/OS Long Term Support 9.4.0 (GI13-4490-00)
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- Program directory for IBM MQ for z/OS Continuous Delivery 9.4.x
  - Program directory for IBM MQ for z/OS Continuous Delivery 9.4.0 (GI13-4492-00)
  - Program directory for IBM MQ for z/OS Continuous Delivery 9.4.1 (GI13-4492-01)
  - Program directory for IBM MQ for z/OS Continuous Delivery 9.4.2 (GI13-4492-02)
  - Program directory for IBM MQ for z/OS Continuous Delivery 9.4.3 (GI13-4492-03)
- Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.4.x
  - Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.4.0 (GI13-4493-00)
  - Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.4.1 (GI13-4493-01)

  - Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.4.2 (GI13-4493-02)
  - Program directory for IBM MQ for z/OS Value Unit Edition Continuous Delivery 9.4.3 (GI13-4493-03)
- Program directory for IBM MQ Advanced for z/OS Continuous Delivery 9.4.x
  - Program directory for IBM MQ Advanced for z/OS Continuous Delivery 9.4.0 (GI13-4494-00)
  - Program directory for IBM MQ Advanced for z/OS Continuous Delivery 9.4.1 (GI13-4494-01)
  - Program directory for IBM MQ Advanced for z/OS 9.3.x Continuous Delivery 9.4.2 (GI13-4494-02)
  - Program directory for IBM MQ Advanced for z/OS 9.3.x Continuous Delivery 9.4.3 (GI13-4494-03)
- Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.4.x
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  - Program directory for IBM MQ Advanced for z/OS Value Unit Edition Continuous Delivery 9.4.3 (GI13-4495-03)

IBM MQ 9.4 in the IBM Documentation Offline app

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Note:

You can install multiple IBM documentation sets in one copy of the app. For example you might want to install IBM MQ 9.4, IBM MQ 9.3, IBM z/OS 2.4, and IBM Cloud Pak for Integration 9.3.

From IBM WebSphere MQ 7.5 onwards, when an IBM MQ version is no longer available in IBM Documentation, you can still download the documentation set from the IBM MQ documentation download site. See “Documentation for older versions of IBM MQ” on page 161.

IBM MQ family information

Guidance to help 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.

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 121
- “Detailed documentation for IBM MQ” on page 121
- “IBM MQ: Developers” on page 121

- “IBM MQ: Architects and Administrators” on page 121
- “Find Support” on page 122

Version-to-version information for IBM MQ

Version-to-version feature comparison tables, and deprecation information.

- “IBM MQ features by version” on page 122
- “Deprecations, stabilizations, and removals in IBM MQ” on page 144
- 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, IBM Documentation Offline, and Information Center.

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- Technical overview
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- IBM MQ on Cloud
- MQ learning activities on IBM Training

- ALW 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

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Links to IBM and IBM MQ support resources including user forums, technotes, cloud and social media support channels and migration guides.

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- MQSeries.net forum
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Other Support resources

- IBM MQ for Multiplatforms Support web page
- z/OS IBM MQ for z/OS Support web page
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- Social Media Channels within Cloud Technical Support

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.

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Features introduced at IBM MQ 9.4

The following tables show the features introduced at the IBM MQ 9.4.0 initial release and at each IBM MQ 9.4.x CD.

- Table 1 IBM MQ 9.4 license entitlement, installation and migration features
- Table 2 IBM MQ 9.4 security features
- Table 3 IBM MQ 9.4 administration features

- Table 4 IBM MQ 9.4 application development features
- Table 5 IBM MQ 9.4 Containers features

For feature tables for earlier versions of IBM MQ, see “IBM MQ features introduced at older versions” on page 131.

IBM MQ 9.4 License entitlement, installation and migration features

Table 12. License entitlement, installation and migration

Feature	Requires entitlement	IBM MQ 9.4.0 initial release	IBM MQ 9.4.x CD only
V 9.4.0 V 9.4.0 New method for applying maintenance on Windows and Linux		Windows Linux 9.4.0	
V 9.4.0 Native HA entitlement	CP4I-SC2 MQ Adv.	CP4I Kubernetes 9.4.0	

IBM MQ 9.4 security features

Table 13. Security

Feature	Requires entitlement	IBM MQ 9.4.0 initial release	IBM MQ 9.4.x CD only
JSON Web Token (JWT) support and token based authentication: • V 9.4.0 JSON Web Token (JWT) support - authentication and authorization • JWT JMS client support • V 9.4.0 V 9.4.0 Administration of token based authentication is significantly simplified with support for JWKS key management		Linux AIX 9.4.0	
• V 9.4.2 JWKS support for automatic queue manager side certificate management			Multi 9.4.2
• V 9.4.3 JWT endpoint support in IBM MQ classes for JMS/Jakarta Messaging			Multi 9.4.3

Table 13. Security (continued)

Feature	Requires entitlement	IBM MQ 9.4.0 initial release	IBM MQ 9.4.x CD only
V 9.4.0 New property to set the user context that is used for authorization in the messaging REST API		Multi 9.4.0 z/OS 9.4.0	
V 9.4.0 Changes to MQCSP password protection in MQIPT		Multi 9.4.0	
V 9.4.0 Support for TLS1.3 on managed .NET clients		Windows Linux 9.4.0	
V 9.4.0 V 9.4.0 New TLS skip validation mode for IBM MQ client applications on C and JMS		ALW 9.4.0 z/OS 9.4.0	
V 9.4.0 V 9.4.0 New property to specify the protocols that MQIPT routes accept		Multi 9.4.0	
V 9.4.0 V 9.4.0 New commands to manage keys, certificates, and certificate requests		ALW 9.4.0	
V 9.4.0 V 9.4.0 New command to manage keystores and certificates that are used by MQIPT		ALW 9.4.0	
V 9.4.1 New **dspmqcert** program for checking SSL/TLS certificate dates			Multi 9.4.1
V 9.4.1 HTTPS supported for accessing a CCDT through a URL			Multi 9.4.1
V 9.4.2 Support for the IBM Semeru Runtime FIPS 140-3 security provider			Multi 9.4.2
V 9.4.2 Managed File Transfer support for OpenSSH type Private key for SFTP servers	MQ Adv.		Linux AIX 9.4.2

Table 13. Security (continued)			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
V 9.4.3 Extended authority events for positive authentication			Multi 9.4.3

IBM MQ 9.4 administration features

Table 14. Administration			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
IBM MQ Console enhancements: • V 9.4.0 New IBM MQ Console layout at queue manager view level • V 9.4.0 Overview tab showing overall state of a queue manager • V 9.4.0 Queues tab view of objects associated with a queue • V 9.4.0 Applications Overview tab • V 9.4.0 MQ Network Overview tab • V 9.4.0 Improved application visibility and localized time zone • V 9.4.0 Add, view, delete and update storage classes on z/OS • V 9.4.0 V 9.4.0 View page sets and buffer pools can be viewed on z/OS		Multi 9.4.0 z/OS 9.4.0	
• V 9.4.2 Customized column view • V 9.4.2 Administer z/OS coupling facility (CF) structures • V 9.4.2 Monitor shared message datasets on z/OS			Multi 9.4.2 z/OS 9.4.2
• V 9.4.3 Queue manager status view now available in the IBM MQ Console			Multi 9.4.3

Table 14. Administration (continued)			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
V 9.4.0 Stand-alone IBM MQ Web Server		Multi 9.4.0 z/OS 9.4.0	
New **CAPEXPRY** attribute: • V 9.4.0 **CAPEXPRY** attribute available on Multiplatforms • V 9.4.0 V 9.4.0 **CAPEXPRY** attribute available on z/OS		Multi 9.4.0 z/OS 9.4.0	
V 9.4.0 Media image scheduling - linear logging		Multi 9.4.0	
V 9.4.0 Extension of queue manager status attributes		Multi 9.4.0	
CP4I V 9.4.0 Addition of Native HA status attributes		CP4I 9.4.0	
V 9.4.0 **dspmqver** command now reports release type		Multi 9.4.0	
V 9.4.0 Environment variables for tuning I/O operations that take too long		Multi 9.4.0	
V 9.4.0 MQIPT trace file configuration enhancements		Multi 9.4.0	
OpenTelemetry tracing support • V 9.4.0 OpenTelemetry tracing with IBM MQ on AIX, Linux, and Windows • V 9.4.3 OpenTelemetry tracing with IBM MQ on z/OS		Multi 9.4.0	z/OS 9.4.3
V 9.4.0 V 9.4.0 Enabling JSON formatted logs for AMQP and MQTT		ALW 9.4.0	

Table 14. Administration (continued)

Feature	Requires entitlement	IBM MQ 9.4.0 initial release	IBM MQ 9.4.x CD only
V 9.4.0 V 9.4.0 LZ4 compression available for channels		Multi 9.4.0	
V 9.4.0 V 9.4.0 LZ4 compression available for Native HA		CP4I MQ Adv. 9.4.0	
V 9.4.0 Increased scalability for channel initiator		z/OS 9.4.0	
Enhancements to SMF: • V 9.4.0 Enhancements to SMF queue statistics records • V 9.4.0 Enhancements to SMF accounting data		z/OS 9.4.0	
V 9.4.0 V 9.4.0 Faster log throughput with zHyperLink		z/OS 9.4.0	
V 9.4.0 Autorecovery of damaged objects for Native HA queue managers	MQ Adv.	OpenShift 9.4.0	
V 9.4.0 Media image scheduling - replicated logging	MQ Adv.	Multi 9.4.0	
V 9.4.0 RDQM available on RHEL 9	MQ Adv.	Linux 9.4.0	
Kafka Connect • V 9.4.0 Unlocking events from mission-critical data using Kafka Connect	MQ Adv. MQ Adv. VUE MQ Adv. z/OS	Multi 9.4.0 z/OS 9.4.0	
• V 9.4.2 Simplifying data conversion with the Kafka Connect XML Converter • V 9.4.2 Update to the Kafka Source and Sink connectors	MQ Adv. MQ Adv. VUE MQ Adv. z/OS		Multi 9.4.2 z/OS 9.4.2

Table 14. Administration (continued)			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
• V 9.4.3 Support for Kafka Connect	MQ Adv. MQ Adv. VUE MQ Adv. z/OS		Multi 9.4.3 z/OS 9.4.3
Enhancements to Managed File Transfer: • V 9.4.0 Managed File Transfer resource monitor verbose level logging events • V 9.4.0 Option to run **fteRAS** for specific MFT agents	MQ Adv. MQ Adv. VUE MQ Adv. z/OS	Multi 9.4.0 z/OS 9.4.0	
V 9.4.0 Additional capabilities for users with IBM MQ Advanced for z/OS entitlement	MQ Adv. z/OS	z/OS 9.4.0	
V 9.4.2 Performance monitoring enhancements			Multi 9.4.2
V 9.4.2 Data conversion support for the latest GB18030 standard			z/OS 9.4.2
V 9.4.3 Force option might be required when you change a queue manager CCSID			Multi 9.4.3
V 9.4.3 Simpler connectivity to cloud			z/OS 9.4.3
V 9.4.3 Improved alternative site recovery			z/OS 9.4.3

IBM MQ 9.4 application development

Table 15. Application development			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
V 9.4.0 Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0		AIX 9.4.0	

Table 15. Application development (continued)

Feature	Requires entitlement	IBM MQ 9.4.0 initial release	IBM MQ 9.4.x CD only
Enhancements to AMQP and MQTT • V 9.4.0 Performance improvements for processing of AMQP message acknowledgments		ALW 9.4.0	
• V 9.4.1 Java heap dump generation to troubleshoot low memory exceptions for AMQP and MQTT			ALW 9.4.1
• V 9.4.2 Simplified configuration of AMQP and MQTT application properties			Multi 9.4.2
Enhancements to IBM MQ .NET and XMS .NET: • V 9.4.0 New set of .NET 6 libraries • V 9.4.0 Ability to enable trace for IBM MQ .NET and XMS .NET client libraries with `mqclient.ini` • V 9.4.0 Improvements to IBM MQ .NET and XMS .NET client diagnostic messages • V 9.4.0 V 9.4.0 Support for .NET 8 applications using IBM MQ classes for .NET and IBM MQ classes for XMS .NET		Windows Linux 9.4.0	
V 9.4.0 Application re-balancing support for IBM MQ classes for JMS		Multi 9.4.0	

Table 15. Application development (continued)			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
Enhancements to IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging: • V 9.4.0 New property to set the strategy for sharing TCP/IP connections in IBM MQ classes for JMS or IBM MQ classes for Jakarta Messaging • V 9.4.0 Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging		Multi 9.4.0 z/OS 9.4.0	
• V 9.4.2 Multiple JMS connections can be treated as a single application instance			Multi 9.4.2
V 9.4.0 Remote messaging with the messaging REST API		Multi 9.4.0 z/OS 9.4.0	

IBM MQ 9.4 Containers features

Table 16. Containers			
Feature	**Requires entitlement**	**IBM MQ 9.4.0 initial release**	**IBM MQ 9.4.x CD only**
V 9.4.0 Containers non-install image added for Linux ARM64 / Apple Silicon		Linux 9.4.0	
V 9.4.1 Support for deployments outside OpenShift with the IBM MQ Advanced container image			Linux 9.4.1
V 9.4.1 License tagging for non-production container workloads			Linux 9.4.1
V 9.4.2 Native HA cross-region replication in containers			CP4I Kubernetes 9.4.2

Related concepts

"Icons used in the product documentation" on page 163
The product documentation for all IBM MQ 9.4 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.

"IBM MQ features introduced at older versions" on page 131
Version-to-version feature comparison tables for versions before IBM MQ 9.4.

Related reference

IBM MQ landing page

IBM MQ features introduced at older versions

Version-to-version feature comparison tables for versions before IBM MQ 9.4.

Note: This information is not IBM MQ version-specific. It is a family-level information that is always published in the latest IBM MQ version. If you want to bookmark this information,, please bookmark the following link. This link continues to work when a new version of IBM MQ is released. 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.

- Table 2. Features introduced at IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3
- Table 3. Features introduced at IBM WebSphere MQ 7.5, IBM MQ 8.0, and IBM MQ 9.0

Features introduced at IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
Support for AIX compiler IBM Open XL C/C++ for AIX 17.1.0			AIX Yes (CD only)
OpenTelemetry tracing support			Multi Yes (CD only)
Additional JSON Web Token (JWT) support			Multi Yes (CD only)
Stand-alone IBM MQ Web Server			Multi Yes (CD only) z/OS Yes (CD only)
IBM MQ Console: Improved application visibility and localized time zone			Multi Yes (CD only) z/OS Yes (CD only)

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
IBM MQ Console: add, view, delete and update storage classes			z/OS Yes (CD only)
IBM MQ Console: New Overview tab for queue managers			Multi Yes (CD only) z/OS Yes (CD only)
Media image scheduling - linear logging			Multi Yes (CD only)
Environment variables for tuning I/O operations that take too long			Multi Yes (CD only)
JSON Web Token (JWT) support - authentication and authorization			Multi Yes (CD only)
Application re-balancing support for IBM MQ classes for JMS			Multi Yes (CD only)
MQ Adv. Media image scheduling - replicated logging			Multi Yes (CD only)
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Option to run **fteRAS** for specific MFT agents			Multi Yes (CD only) z/OS Yes (CD only)
Simplified Java application topologies			z/OS Yes (CD only)
MQ Adv. z/OS Additional capabilities for users with IBM MQ Advanced for z/OS entitlement			Yes (CD only)
dspmqver command now reports release type			Multi Yes
Improved processing of AMQP message acknowledgments			Multi Yes (CD only)
Ability to enable trace for IBM MQ .NET and XMS .NET client libraries with mqclient.ini			Multi Yes (CD only)
Improvements to IBM MQ .NET and XMS .NET client diagnostic messages			Multi Yes (CD only)

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
OpenShift MQ Adv. Autorecovery of damaged objects for Native HA queue managers			Multi Yes (CD only)
Enhancements to SMF queue statistics records			z/OS Yes (CD only)
Additions to IBM MQ console			Multi Yes (CD only) z/OS Yes (CD only)
Remote messaging with the messaging REST API			Multi Yes (CD only) z/OS Yes (CD only)
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Unlocking events from mission-critical data using Kafka Connect			Multi Yes (CD only) z/OS Yes (CD only)
Extension of queue manager status attributes			Multi Yes (CD only)
Addition of Native HA status attributes			Multi Yes (CD only)
MQIPT trace file configuration enhancements			Multi Yes (CD only)
Support for TLS1.3 on managed .NET clients			Multi Yes (CD only)
MQ Adv. Native HA entitlement			Yes (CD only)
Enhancements to SMF accounting data			z/OS Yes (CD only)
IBM MQ Console: New application view			Multi Yes (CD only) z/OS Yes (CD only)

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
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 Yes (CD only) z/OS Yes (CD only)
Support for using modular applications with IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging			Multi Yes (CD only) z/OS Yes (CD only)
New property to set the user context that is used for authorization in the messaging REST API			Multi Yes (CD only) z/OS Yes (CD only)
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Additional Managed File Transfer resource monitor events			Multi Yes (CD only) z/OS Yes (CD only)
New CAPEXPRY attribute			Multi Yes (CD only)
Changes to MQCSP password protection in MQIPT			Multi Yes (CD only)
New set of .NET 6 libraries			Windows Linux Yes (CD only)
MQ Adv. RDQM available on RHEL 9			Linux Yes (CD only)
Increased scalability for channel initiator			z/OS Yes (CD only)
Enhancements to SMF queue statistics records			z/OS Yes (CD only)
Streaming queues supported with shared queues			z/OS Yes (CD only)

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
New IBM MQ Console layout			Multi Yes (CD only) z/OS Yes (CD only)
Support for PKCS#12 key repositories			ALW Yes
Support for key repository passwords			ALW Yes
MQ Adv. The IBM MQ Advanced Container and the CP4I-LTS release model			Linux Yes
MQ Adv. IBM MQ Advanced Container support for Power Systems			Linux Yes
User data traced by MQIPT can be configured			Multi Yes z/OS Yes
Support for Jakarta Messaging 3.0			Multi Yes z/OS Yes
Enhancements to SMF statistics			z/OS Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Enable MQCSP support by default for Managed File Transfer commands			Multi Yes z/OS Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS The REST API and managed calls for Managed File Transfer			Multi Yes z/OS Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
Support for multiple queue manager certificates in MQIPT		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
TLS support for the IBM MQ .NET XA Monitor application		Windows Linux Yes (CD only)	Windows Linux Yes
Additional configuration option to control TLS environment in C clients		ALW Yes (CD only)	Multi Yes
Support for Transport Layer Security (TLS) 1.3 in MQIPT		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
REST Messaging API: greater access to message properties when sending and receiving messages using the REST API		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
New queue managers 64-bit RBA capable by default		z/OS Yes (CD only)	z/OS Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Enhanced **fteRAS** logging		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Support for influencing application re-balancing within uniform clusters		ALW Yes (CD only)	Multi Yes
Encryption of passphrases for MQTT channels		ALW Yes (CD only)	Multi Yes
.NET client changes for Application Pattern Support		Windows Linux Yes (CD only)	Windows Linux Yes
OutboundSNI property for NQMI and XMS .NET clients		ALW Yes (CD only)	Multi Yes
TLS 1.3 support from IBM MQ Java applications		ALW Yes (CD only)	Multi Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
SecureCommsOnly setting available on the queue manager		ALW Yes (CD only)	Multi Yes
Configurable IBM MQ Console message browsing controls		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Additional queue manager configuration attributes to control the connection and operation timeout for LDAP calls		ALW Yes (CD only)	Multi Yes
Option to capture installation-level diagnostics only with **runmqras** command		ALW Yes (CD only)	Multi Yes
IBM MQ code signing support		ALW Yes (CD only)	Multi Yes
Java 17 support for IBM MQ Clients		ALW Yes (CD only)	Multi Yes
Changes to statistics collection intervals		z/OS Yes (CD only)	z/OS Yes
CSQUDSPM utility supports upper case and lower case parameters		z/OS Yes (CD only)	z/OS Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Enhanced credentials protection for Managed File Transfer		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Improvements to the **fteRAS** command		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Transfer logging on Managed File Transfer		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Streaming queues to realize additional value from data already flowing through IBM MQ		ALW Yes (CD only)	Multi Yes z/OS Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
Remote queue manager support for the IBM MQ Console		ALW Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Improved password protection for IBM MQ clients using cryptographic hardware		ALW Yes (CD only)	Multi Yes
Support for dynamic balancing of Java Platform, Enterprise Edition inbound connections in a uniform cluster		ALW Yes (CD only)	Multi Yes
New client option for **runmqdlq** command		ALW Yes (CD only)	Multi Yes
New client version of **amqsdlqc** sample		ALW Yes (CD only)	Multi Yes
Support for the Apache Qpid JMS client library		ALW Yes (CD only)	Multi Yes
MQ Adv. General availability of Native HA for IBM MQ containers		CP4I Yes (CD only)	CP4I Yes
MQ Adv. RDQM kernel module serviceability enhancements		Linux Yes (CD only)	Linux Yes
Browse support for IBM MQ AMQP channels		ALW Yes (CD only)	ALW Yes
MQ Adv. RDQM reports when an HA or DR node's replication was last in sync		Linux Yes (CD only)	Linux Yes
MQ Adv. RDQM summary status includes the preferred location for HA queue managers		Linux Yes (CD only)	Linux Yes
See and clear RDQM HA failed resource actions		Linux Yes (CD only)	Linux Yes
Improved password protection for Native Advanced Message Security clients		Multi Yes (CD only)	Multi Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS New Managed File Transfer commands for starting and stopping resource monitors		Multi Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
IBM MQ Console Application quick start		Multi Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Ability to trace IBM MQ Console JavaScript running inside a browser		Multi Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Confirm License Entitlement panel		Windows Yes (CD only)	Windows Yes
Permitting non-operating system users in the Object Authority Manager		Linux AIX Yes (CD only)	Linux AIX Yes
New IGNSTATE parameter for MQSC DELETE commands		ALW Yes (CD only)	ALW Yes
Support for zlibNX compression library		AIX Yes (CD only)	AIX Yes
Support for upgrading IBM MQ for Linux without uninstalling the earlier version		Linux Yes (CD only)	Linux Yes
Point-to-point messaging on AMQP channels		ALW Yes (CD only)	ALW Yes
More flexible configuration for SNI support		Multi Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
MQ Adv. Deploying containers to IBM Cloud Pak for Integration		Linux Yes (CD only)	Linux Yes
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Redistributable Managed File Transfer Logger		Windows Linux Yes (CD only) z/OS Yes (CD only)	Windows Linux Yes z/OS Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
MQ Adv. MQ Adv. VUE MQ Adv. z/OS Limiting the number of file transfers for each FTP endpoint		Multi Yes (CD only) z/OS Yes (CD only)	Multi Yes z/OS Yes
Protection of passwords in IBM MQ component configuration files		Yes	Yes
AMQP shared subscription enhancement		ALW Yes	ALW Yes
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 Yes (CD only)	Multi Yes	Multi Yes
JSON format client channel definition table (CCDT)	Multi Yes (CD only)	Multi Yes	Multi Yes
IBM MQ Internet Pass-Thru a fully-supported optional component of IBM MQ	Yes (CD only)	Yes	Yes
Transport Layer Security (TLS) 1.3 support for a range of protocols	ULW Yes (CD only)	Yes	Yes
CipherSpecs: Dynamic CipherSpec negotiation; list of acceptable TLS CipherSpecs; addition of ANY_TLS1x CipherSpec; support for TLS Handshake Transcript	ULW Yes (CD only)	Yes	Yes
Version 2 of the REST API	Multi Yes	Yes	Yes
REST API for administration: Communicate with the queue manager in JSON format	Yes (CD only)	Yes	Yes
REST API for messaging: browse messages on a queue	Yes (CD only)	Yes	Yes
REST API for messaging: enhanced performance with connection pools	Yes (CD only)	Yes	Yes
REST API for messaging: publish messages to topics	Yes (CD only)	Yes	Yes
Host header validation for the IBM MQ Console and REST API	Yes (CD only)	Yes	Yes
IBM MQ Console	Multi Yes (CD only)	Yes	Yes
Configurable ephemeral directory	Linux UNIX Yes (CD only)	Linux AIX Yes	Linux AIX Yes
Full WebSphere Liberty XA support with client channel definition tables (CCDTs)	Multi Yes (CD only)	Multi Yes	Multi Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)

Feature	IBM MQ 9.1	IBM MQ 9.2	IBM MQ 9.3
IBM MQ classes for .NET Standard: .NET Core support; application development on macOS; available to download from the NuGet repository	Windows Linux Yes (CD only)	Windows Linux Yes	Windows Linux Yes
IBM MQ .NET project template	Windows Linux Yes (CD only)	Windows Linux Yes	Windows Linux Yes
IBM MQ classes for XMS .NET Standard: .NET Core support; application development on macOS; available to download from the NuGet repository	Windows Linux Yes (CD only)	Windows Linux Yes	Windows Linux Yes
IBM MQ XMS .NET project template	Windows Linux Yes (CD only)	Windows Linux Yes	Windows Linux Yes
Data set encryption	z/OS Yes (CD only)	z/OS Yes	z/OS Yes
zHyperWrite: Improved log throughput	z/OS Yes (CD only)	z/OS Yes	z/OS Yes
IBM z/OS Connect Enterprise Edition: Support for using client connections; support for Runnable Service Archive	z/OS Yes (CD only)	z/OS Yes	z/OS Yes
MQ Adv. Red Hat OpenShift support for the IBM MQ Advanced Container image	Linux Yes (CD only)	Linux Yes (CD only)	Linux Yes
MQ Adv. 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	Linux Yes (CD only)	Linux Yes	Linux Yes
MQ Adv. VUE Advanced Message Security interception on server-to-server message channels	z/OS Yes (CD only)	z/OS Yes	z/OS Yes
MQ Adv. MQ Adv. VUE Aspera gateway streaming for IBM MQ messages	Linux Yes (CD only)	Windows Linux Yes	Windows Linux Yes
MQ Adv. MQ Adv. VUE Highly available MFT agents	Yes (CD only)	Yes	Yes
MQ Adv. MQ Adv. VUE 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
MQ Adv. MQ Adv. VUE Managed File Transfer: **fteClearMonitorHistory** command for clearing resource monitor history	Yes (CD only)	Yes	Yes

Table 17. IBM MQ 9.1, IBM MQ 9.2, and IBM MQ 9.3 (continued)			
Feature	**IBM MQ 9.1**	**IBM MQ 9.2**	**IBM MQ 9.3**
MQ Adv. MQ Adv. VUE Managed File Transfer: new `logger.properties` file options to specify MFT log file permissions and the wait time for database logger shut down	Yes (CD only)	Yes	Yes
MQ Adv. IBM MQ Advanced queue manager identification	Yes	Yes	Yes
MQ Appliance IBM MQ Appliance: Support for the REST API for messaging; floating IP aggregation	Yes	Yes	Yes
AMQP listener auto-enabled	ULW Yes	ALW Yes	ALW 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

Features introduced at IBM WebSphere MQ 7.5, IBM MQ 8.0, and IBM MQ 9.0

Table 18. 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**
z/OS MQ Adv. VUE Advanced Message Security on JMS for z/OS queue managers			Yes (CD only)
Linux MQ Adv. MQ Adv. VUE IBM MQ Bridge to blockchain			Yes (CD only)
Linux IBM MQ Bridge to Salesforce			Yes (CD only)
z/OS CICS: Additional support for messaging within CICS Liberty JVM server			Yes (CD only)
IBM MQ Console			Yes (CD only)
z/OS MQ Adv. VUE 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)
MQ Adv. MQ Adv. VUE 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)

Table 18. 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
Multi REST API for messaging			Yes (CD only)
Linux MQ Adv. RDQM: High Availability and Disaster Recovery			Yes (CD only)
z/OS IBM MQ for z/OS Service Provider for IBM z/OS Connect Enterprise Edition			Yes (CD only)
z/OS IBM MQ for z/OS UNIX System Services Web Components			Yes (CD only)
z/OS 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
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
ALW Integrated MQ Telemetry	Yes	Yes	Yes
Multi-version install capability on distributed platforms	ULW Yes	ULW Yes	ULW 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

Table 18. 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**
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
z/OS Exploiting z/OS services	Yes	Yes	Yes
64-bit address space	Yes	Yes	Yes
Windows Linux Linux and Windows support	Yes	Yes	Yes
Intermediate queue manager	Yes	Yes	Yes
SSL support	Yes	Yes	Yes

Related concepts

"Icons used in the product documentation" on page 163
The product documentation for all IBM MQ 9.4 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.

"IBM MQ features by version" on page 122
Version-to-version feature comparison tables.

Related reference

IBM MQ landing page

Deprecations, stabilizations, and removals in IBM MQ

Deprecations, stabilizations, and removals that occurred in IBM MQ versions from the current version back to IBM WebSphere MQ 7.1.

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.

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

Attention:

Deprecations, stabilizations, and removals made at a given version of the product apply to all subsequent versions.

- "IBM MQ 9.4" on page 145
- "IBM MQ 9.3" on page 149
- "IBM MQ 9.2" on page 152

- “IBM MQ 9.1” on page 153
- “IBM MQ 9.0” on page 155
- “IBM MQ 8.0” on page 156
- “IBM WebSphere MQ 7.5” on page 157
- “IBM WebSphere MQ 7.1” on page 158

IBM MQ 9.4

Table 19. Deprecations, stabilizations, and removals at IBM MQ 9.4

Feature	Description
IBM MQ 9.4.0 release	
Deprecated 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.
Deprecated V 9.4.0 Deprecation: CMS keystores and stash files support for IBM MQ Java applications	V 9.4.0 For Long Term Support, CMS keystores and stash files for IBM MQ Java applications are deprecated from IBM MQ 9.4.0. The migration path is to move to PKCS#12 keystores and use the keystore password feature. **Note:** V 9.4.0 V 9.4.0 From IBM MQ 9.4.0, CMS keystores and stash files are not supported for configuring AMQP and MQTT channels with SSL/TLS. Use PKCS#12 and keystore passwords instead. For more information, see Setting up a key repository on AIX, Linux, and Windows and Telemetry channel configuration for channel authentication using TLS. CD For Continuous Delivery, CMS keystores and stash files for IBM MQ Java applications, AMQP and MQTT were deprecated from IBM MQ 9.3.4.
Deprecated V 9.4.0 AIX Deprecation: XL C/C++ for AIX 16 compiler support on AIX	V 9.4.0 For Long Term Support, support for the XL C/C++ for AIX 16 compiler on AIX is deprecated from IBM MQ 9.4.0. CD For Continuous Delivery, support for the XL C/C++ for AIX 16 compiler on AIX is deprecated from IBM MQ 9.3.5. You can compile AIX programs using the IBM Open XL C/C++ for AIX 17 compiler alongside the IBM XL C/C++ for AIX 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.

Table 19. Deprecations, stabilizations, and removals at IBM MQ 9.4 (continued)	
Feature	**Description**
Deprecated V 9.4.0 V 9.4.0 Deprecation: IBM MQ classes for .NET and IBM MQ classes for XMS .NET methods and classes used for serialization and deserialization of data	From IBM MQ 9.4.0, in IBM MQ classes for .NET and IBM MQ classes for XMS .NET, the methods WriteObject(), ReadObject(), CreateObjectMessage(), and the classes ObjectMessage and XmsObjectMessageImpl used for serialization and deserialization of data are deprecated. For more information, see https://learn.microsoft.com/en-us/dotnet/api/system.runtime.serialization.formatters.binary.binaryformatter?view=net-8.0.
Deprecated V 9.4.0 V 9.4.0 Deprecation: REST API v1	The REST API v1 is deprecated from IBM MQ Advanced for Multiplatforms 9.4.0. The replacement is the REST API v2.
Deprecated V 9.4.0 Deprecation: Secure Sockets Layer v3 (SSLv3) and TLS 1.0 support	IBM MQ 9.4 Long Term Support is the last IBM MQ release to provide Secure Sockets Layer v3 (SSLv3) and TLS 1.0 support.
Deprecated V 9.4.0 Deprecation: Support for AMS Encryption with RC2, DES or 3DES ciphers and AMS Signing with MD5 or SHA1 ciphers	IBM MQ 9.4 Long Term Support is the last IBM MQ release to provide support for Advanced Message Security (AMS) Encryption with RC2, DES or 3DES ciphers and (AMS) Signing with MD5 or SHA1 ciphers, across all IBM MQ form factors
Removed V 9.4.0 V 9.4.0 Removal: MQIPT certificate management commands	From IBM MQ 9.4.0, the following commands to manage certificates in MQIPT keystores are removed: • **mqiptKeycmd** • **mqiptKeyman** A new command, **mqiptKeytool**, can be used instead of these commands to manage certificates in MQIPT keystores. For more information about the **mqiptKeytool** command, see mqiptKeytool (manage certificates). For more information about managing MQIPT keystores, see Managing MQIPT keystores.
Removed CD V 9.4.0 ALW Removal: **runmqckm** and **strmqikm** commands	From IBM MQ 9.4.0, the **runmqckm** and **strmqikm** commands are removed. The **Manage SSL Certificates** option in IBM MQ Explorer, which starts the **strmqikm** (iKeyman) GUI, is also removed. The **runmqakm** command, or the new **runmqktool** command, can be used instead. For more information, see **runmqakm** and **runmqktool** commands on AIX, Linux, and Windows and Working with SSL/TLS on AIX, Linux, and Windows.

Table 19. Deprecations, stabilizations, and removals at IBM MQ 9.4 (continued)	
Feature	**Description**
Removed V 9.4.0 Linux V 9.4.0 Removal: IBM MQ Bridge to Salesforce	The IBM MQ Bridge to Salesforce is removed from the product at IBM MQ 9.4.0. Salesforce connectivity can be achieved with IBM App Connect Enterprise. Salesforce Input and Salesforce Request nodes can be used to interact with Salesforce applications. For more information, see Using Salesforce with IBM App Connect Enterprise.
Removed V 9.4.0 Removal: Operations Dashboard (IBM MQ in Containers)	From IBM MQ Operator 2.4.0 the Operations Dashboard is removed. For version support for the IBM MQ Operator, see Available IBM MQ versions.
Removed V 9.4.0 Removal: `traceControl.jar` dynamic tracing utility	V 9.4.0 For Long Term Support, the trace control utility is removed from the product at IBM MQ 9.4.0 CD For Continuous Delivery, the trace control utility was removed from the product at IBM MQ 9.3.3. If dynamic trace is needed to diagnose an issue, IBM Support can guide you through the steps to gather trace as required.
Removed V 9.4.0 Removal: com.ibm.mq.cfg.useIBMCipherMappings Java System Property	V 9.4.0 For Long Term Support, the Java System Property `com.ibm.mq.cfg.useIBMCipherMappings`, which was previously used for configuring IBM Java or Oracle Java Cipher mappings, is removed from the product at IBM MQ 9.3.3. A Cipher can be defined as either the CipherSpec or CipherSuite name and is handled correctly by IBM MQ. For more information, see TLS CipherSpecs and CipherSuites in IBM MQ classes for JMS and TLS CipherSpecs and CipherSuites in IBM MQ classes for Java. CD For Continuous Delivery, `com.ibm.mq.cfg.useIBMCipherMappings` was removed from the product at IBM MQ 9.3.3.
Removed V 9.4.0 V 9.4.0 Removal: IBM MQ .NET Standard libraries	From IBM MQ 9.4.0. the IBM MQ .NET (`amqmdnetstd.dll`) and XMS .NET (`amqmxmsstd.dll`) .NET Standard libraries are removed. For more information, see Installing IBM MQ classes for .NET and Installing IBM MQ classes for XMS .NET.
Removed V 9.4.0 V 9.4.0 z/OS Removal: XPARM utility	The XPARM utility for the channel initiator parameter module, used to migrate to IBM WebSphere MQ for z/OS 7.0, is removed from IBM MQ 9.4.0.

Table 19. Deprecations, stabilizations, and removals at IBM MQ 9.4 (continued)	
Feature	**Description**
Removed V 9.4.0 Linux V 9.4.0 Removal: 31-bit library support for IBM MQ for Linux on IBM Z	From IBM MQ 9.4.0, 31-bit library support for IBM MQ for Linux on IBM Z is removed due to some of the supported operating systems removing support. Deprecated From IBM MQ 9.3.0, the 32-bit IBM MQ application libraries are deprecated for all platforms, both for network and local binding connections.
IBM MQ 9.4.1 Continuous Delivery	
Deprecated V 9.4.1 Deprecation: RSA key exchange CipherSpecs	Following a recommendation from NIST, the CipherSpecs that use RSA for key exchange are deprecated and disabled by default from IBM MQ 9.4.1.
Deprecated V 9.4.1 Deprecation: SSL 3.0 and TLS 1.0 protocols	The SSL 3.0 and TLS 1.0 protocols in IBM MQ .NET are deprecated from IBM MQ 9.4.1. Cipherspecs defined under property MQC.SSL_CIPHER_SPEC_PROPERTY or SSLCipherSpec in MQEnvironment that use SSL 3.0 or TLS 1.0 protocols should be avoided due to security vulnerabilities, and will be removed from support in the future releases. A warning message is produced in the client application error logs if either of these protocols is used and it is recommended to use TLS 1.2 protocol or higher.
Deprecated Linux V 9.4.1 Deprecation: MQIPT service on Linux	The service that is used to start MQIPT automatically at system startup on Linux is deprecated in IBM MQ 9.4.1. The service on Linux uses System V init, which is not supported on some recent versions of Linux. An alternative, such as `systemd`, can be used to start MQIPT automatically.
IBM MQ 9.4.2 Continuous Delivery	
Deprecated z/OS V 9.4.2 Deprecation: system.broker.clients.data queue	On z/OS, the system.broker.clients.data queue from the `CSQ4INSR.jcl` sample is deprecated as the queue is not used within the product.
Removed V 9.4.2 AIX Removal: IBM XL C/C++ for AIX 16 compiler	For Continuous Delivery, the IBM XL C/C++ for AIX 16 compiler is removed from the product at IBM MQ 9.4.2. Compile AIX programs by using the IBM Open XL C/C++ for AIX 17 compiler instead.
IBM MQ 9.4.3 Continuous Delivery	
Deprecated Deprecation: 3DES CipherSpecs for TLS communications	IBM intends to remove 3DES CipherSpecs for TLS communications, including the deprecated TLS 1.2 3DES CipherSpecs ECDHE_ECDSA_3DES_EDE_CBC_SHA256 and ECDHE_RSA_3DES_EDE_CBC_SHA256, in the next mod level release of IBM MQ 9.4.x.

Table 19. Deprecations, stabilizations, and removals at IBM MQ 9.4 (continued)	
Feature	**Description**
Deprecation: 3DES CipherSpecs for TLS communications	IBM intends to remove support for RSA certificates with a key size less than 2048 bits, for IBM MQ for Multiplatforms and IBM MQ Appliance firmware.
Deprecation: 3DES CipherSpecs for TLS communications	IBM MQ MacOS Toolkit support for macOS x86-64 hardware is deprecated. The IBM MQ MacOS Toolkit continues to support ARM64 hardware.

IBM MQ 9.3

Table 20. Deprecations, stabilizations, and removals at IBM MQ 9.3	
Feature	**Description**
IBM MQ 9.3.0 release	
Deprecated Deprecation: Ciphers used by AMS	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. Customers using these algorithms should migrate to stronger algorithms such as: SHA256, SHA384, SHA512, AES128 or AES256.
Deprecated Deprecation: 32-bit IBM MQ application libraries	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.
Deprecated 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 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.
Deprecated Deprecation: Operations Dashboard (IBM MQ in Containers)	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.

Table 20. Deprecations, stabilizations, and removals at IBM MQ 9.3 (continued)	
Feature	**Description**
Removed Removal: Dashboard Web Console	The widget-based Dashboard Web Console is removed from IBM MQ 9.3.0. For more information about the Dashboard Web Console, see The Dashboard Web Console in the IBM MQ 9.1 documentation.
Removed Removal: XMS .NET Multicast messaging	XMS .NET Multicast messaging (using RMM) is removed from IBM MQ 9.3.0.
Removed Removal: **fteMigrateAgent**, **fteMigrateConfigurationOptions**, and **fteMigrateLogger** commands	LTS For Long Term Support, the **fteMigrateAgent**, **fteMigrateConfigurationOptions**, and **fteMigrateLogger** commands are removed at IBM MQ 9.3.0. CD For Continuous Delivery, these commands are removed at IBM MQ 9.2.1.
IBM MQ 9.3.1 Continuous Delivery	
Deprecated Deprecation: IBM MQ .NET Standard client libraries	From IBM MQ 9.3.1. the existing IBM MQ .NET Standard libraries, `amqmdnetstd.dll` and `amqmxmsstd.dll`, are deprecated. IBM intends to remove support for these libraries in a future IBM MQ release.
Deprecated 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 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.
Deprecated 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 US Announcement letter 222-341). Salesforce connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.
IBM MQ 9.3.2 Continuous Delivery	
Deprecated Deprecation: The **LOG_FORMAT** environment variable of the IBM MQ Advanced for Developers container image.	For the IBM MQ Advanced for Developers container image, the **LOG_FORMAT** environment variable is deprecated across all releases from February 16 2023. It is superseded by the **MQ_LOGGING_CONSOLE_FORMAT** variable. See IBM MQ Advanced for Developers container image.
Deprecated 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.

Table 20. Deprecations, stabilizations, and removals at IBM MQ 9.3 (continued)	
Feature	**Description**
Removed Removal: IBM MQ Bridge to blockchain	CD For Continuous Delivery, the IBM MQ Bridge to blockchain is removed from the product at IBM MQ 9.3.2. LTS For Long Term Support, IBM MQ Bridge to blockchain is removed at IBM MQ 9.3.0 Fix Pack 15.
IBM MQ 9.3.3 Continuous Delivery	
Removed 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.
Removed Removal: Operations Dashboard (IBM MQin 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 Available IBM MQ versions.
Removed Removal: com.ibm.mq.cfg.useIBMCipherMappings Java System Property	For Continuous Delivery, the Java System Property `com.ibm.mq.cfg.useIBMCipherMappings`, 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 CipherSpec or CipherSuite name and is handled correctly by IBM MQ.
IBM MQ 9.3.4 Continuous Delivery	
Deprecated Deprecation: CMS keystore support for IBM MQ Java applications, AMQP and MQTT and associated tools	CMS keystore support for IBM MQ Java applications, AMQP and MQTT is deprecated from IBM MQ 9.3.4. The **runmqckm**, **strmqikm**, **mqiptKeycmd** and **mqiptKeyman** tools are also deprecated.
Deprecated 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.
IBM MQ 9.3.5 Continuous Delivery	
Deprecated AIX Deprecation: XL C/C++ for AIX 16 compiler support	Support for the XL C/C++ for AIX 16 compiler on AIX is deprecated from IBM MQ 9.3.5. From IBM MQ 9.3.5, you can compile AIX programs using the IBM Open XL C/C++ for AIX 17 compiler alongside the IBM XL C/C++ for AIX 16 compiler.

IBM MQ 9.2

Table 21. Deprecations, stabilizations, and removals at IBM MQ 9.2	
Feature	**Description**
IBM MQ 9.2.0 initial release	
Deprecated Deprecation: Secure Sockets Layer v3 (SSLv3) and TLS 1.0	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.
Deprecated Deprecation: support for **-credentialsFile** parameter	The **-credentialsFile** parameter of the **fteObfuscate** command, used in IBM MQ prior to IBM MQ 9.2, is deprecated from IBM MQ 9.2.0. You can use the **-f** parameter instead.
Deprecated Deprecation: Support for all Managed File Transfer environment variables beginning with **FTE**	Support for all Managed File Transfer environment variables that begin with **FTE** is deprecated from IBM MQ 9.2.0. You can substitute **FTE** environment variables with those that begin with **BFG**.
Deprecated Deprecation: Dashboard Web Console	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 Switching between console types in the IBM MQ 9.2 documentation.
Deprecated Deprecation: XMS .NET Multicast messaging	XMS .NET Multicast messaging (using RMM) is deprecated from IBM MQ 9.2.0.
Stabilized Stabilization: amqmdnet.dll library	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. 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.
Stabilized Stabilization: `IBM.XMS.*` libraries	All the `IBM.XMS.*` libraries are still supplied, but these libraries are stabilized; that is, no new features will be introduced into them. For any of the latest features, you must migrate to the `amqmxmsstd.dll` library. However, you can continue to use the existing libraries on IBM MQ 9.1 Long Term Support or Continuous Delivery releases.
Removed Removal: Support for the Oracle Solaris operating system	Support for Solaris for all IBM MQ components, including server and clients, is removed from IBM MQ 9.2.0.

Table 21. Deprecations, stabilizations, and removals at IBM MQ 9.2 (continued)	
Feature	**Description**
Removed Windows Linux Removal: Postcard application and Default Configuration wizard	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.
Removed Windows Removal: IBM MQ support for Microsoft Active X	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.
Removed z/OS Removal: Queue sharing group samples not using Universal Table Spaces	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.
Removed Removal: IPT Administration Client	The IPT Administration Client graphical user interface is removed at IBM MQ 9.2.0. To configure and administer MQIPT, edit the `mqipt.conf` configuration file and use the **`mqiptAdmin`** command.
Removed z/OS Removal: IBM MQ service provider for IBM z/OS Connect EE no longer shipped with IBM MQ	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.
IBM MQ 9.2.x Continuous Delivery	
Deprecated Deprecation: AllowOutboundSNI property	For Continuous Delivery, the **`AllowOutboundSNI`** property is deprecated at IBM MQ 9.2.1. You should use the **`OutboundSNI`** property instead.
Removed Removal: **`fteMigrateAgent`**, **`fteMigrateConfigurationOptions`**, and **`fteMigrateLogger`** commands	For Continuous Delivery, the **`fteMigrateAgent`**, **`fteMigrateConfigurationOptions`** and **`fteMigrateLogger`** commands are removed at IBM MQ 9.2.1. These commands are still available for IBM MQ 9.2 Long Term Support.

IBM MQ 9.1

Table 22. Deprecations, stabilizations, and removals at IBM MQ 9.1	
Feature	**Description**
IBM MQ 9.1.0 initial release	
Deprecated Deprecation: IBM MQ classes for Java package `com.ibm.mq.pcf`	The IBM MQ classes for Java package `com.ibm.mq.pcf` is deprecated from IBM MQ 9.1.0.
Deprecated Deprecation: IBM Cloud Product Insights service	The IBM Cloud Product Insights service is deprecated on all platforms from IBM MQ 9.1.0 and has been replaced by the *ICP metering service*, referred to within this documentation as the `metering service`.

Table 22. Deprecations, stabilizations, and removals at IBM MQ 9.1 (continued)	
Feature	**Description**
Windows Deprecated Linux Deprecation: Postcard application and Default Configuration wizard	The use of the Postcard application and its supporting Default Configuration wizard for installation verification is deprecated from IBM MQ 9.1.0.
Deprecated z/OS Deprecation: Buffer pools located below the bar	From IBM MQ 9.1.0, the **LOCATION(BELOW)** parameter of the **DEFINE BUFFPOOL** command is deprecated and you should use **LOCATION(ABOVE)** only. This deprecation applies to buffer pools that were not defined with the **LOCATION/LOC** attribute, or were defined with **LOCATION(BELOW)**.
Deprecated z/OS Deprecation: MAKECLNT CSQUTIL tool	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 **runmqsc -n** instead.
Deprecated z/OS Deprecation: Use of queue sharing groups with Db2 table spaces of any type other than universal table spaces	Db2 11 deprecated support for any table space type that was not a universal table space. Support for queue sharing groups using non-universal table spaces is 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.
Deprecated z/OS Deprecation: Using hexadecimal strings in the SSLCIPH attribute	Using hexadecimal strings in the SSLCIPH attribute is deprecated from IBM MQ for z/OS 9.1.0. In a future release, the **SSLCIPH** attribute on a channel definition will not accept hexadecimal string values. Only IBM MQ cipher strings will be accepted.
Removed Removal: Support for HP-UX	Support for the HP-UX operating system for all IBM MQ components, including server and clients, is removed at IBM MQ 9.1.0.
Removed Removal: Support for installing IBM MQ on Linux Ubuntu systems using rpm	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.
Removed Windows Removal: Support for Microsoft Internet Explorer 11 browser	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.
Removed Removal: IBM MQ transport for SOAP and HTTP bridge	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.
Removed z/OS Removal: Support for the MQ Service Provider in z/OS Connect V1	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.
IBM MQ 9.1.x Continuous Delivery	

Table 22. Deprecations, stabilizations, and removals at IBM MQ 9.1 (continued)	
Feature	**Description**
Removed Windows Linux Removal: Postcard application and Default Configuration wizard	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.

IBM MQ 9.0

Table 23. Deprecations, stabilizations, and removals at IBM MQ 9.0	
Feature	**Description**
IBM MQ 9.0.0 initial release	
Deprecated IBM i Deprecation: compatibility mode for RPG and COBOL applications on IBM i	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.
Deprecated Deprecation: IBM MQ transport for SOAP	The following product features are deprecated from IBM MQ 9.0.0: • IBM MQ Java Listener • IBM MQ .NET 1 and 2 Listener • IBM MQ Java Axis2 Client This is in addition to the deprecation of the IBM MQ transport for SOAP clients and HTTP bridge announced at IBM MQ 8.0.0.
Deprecated Deprecation: MD5 in AMS	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.
Deprecated Deprecation: IBM MQ support for Microsoft Active X and Microsoft Visual Basic 6.0	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.
Stabilized Stabilization: IBM MQ classes for Java	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.
Removed Removal: Managed File Transfer Web Gateway support	The Web Gateway was deprecated at IBM MQ 8.0.0, and is removed at IBM MQ 9.0.0. The **fteCreateWebAgent** command is removed at IBM MQ 9.0.0.
Removed Removal: IBM Cloud Product Insights support	The IBM Cloud Product Insights service is no longer available, therefore IBM MQ support for this service is no longer relevant.

Table 23. Deprecations, stabilizations, and removals at IBM MQ 9.0 (continued)	
Feature	**Description**
IBM MQ 9.0.x Continuous Delivery	
Deprecated Deprecation: RPM support for Ubuntu	RPM support for Ubuntu is deprecated from IBM MQ 9.0.2.
Deprecated Deprecation: CipherSpecs (CD)	For Continuous Delivery, from IBM MQ 9.0.1, a number of CipherSpecs are deprecated.
Removed Removal: `JSON4J.jar` file and `com.ibm.msg.client.mqlight` package (CD)	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.
IBM MQ 9.0.0 Long Term Support Fix Packs	
Deprecated Deprecation: CipherSpecs (LTS)	For Long Term Support, from IBM MQ 9.0.0 Fix Pack 1, a number of CipherSpecs are deprecated.
Removed Removal: `JSON4J.jar` file and `com.ibm.msg.client.mqlight` package (LTS)	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**
IBM MQ 8.0.0 initial release	
Deprecated Deprecation: linking with libmqmcs and libmq	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.
Deprecated Deprecation: Managed File Transfer Web Gateway	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.
Deprecated Deprecation: IBM MQ Explorer Service Definition Wizard	The IBM MQ Explorer Service Definition Wizard, which was introduced in IBM WebSphere MQ 7.0, is deprecated from IBM MQ 8.0.0.
Deprecated Deprecation: IBM MQ transport for SOAP clients and HTTP bridge	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.
Stabilized z/OS Stabilization: MAKECLNT CSQUTIL tool	The MAKECLNT CSQUTIL tool is stabilized from IBM MQ 8.0.0. You should use **`runmqsc -n`** instead.

Table 24. Deprecations, stabilizations, and removals at IBM MQ 8.0 (continued)	
Feature	**Description**
Removed Removal: **migmbbrk** and z/OS **CSQUMGMB**	The **migmbbrk** command and, on z/OS, the **CSQUMGMB** 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.
Removed Removal: `Direct` and `DirectHTTP` transport support	`Direct` and `DirectHTTP` transport were deprecated in a previous release of IBM MQ and they have been removed at IBM MQ 8.0.0.
Removed Removal: Support for Microsoft Visual Basic	Support for Microsoft Visual Basic is removed at IBM MQ 8.0.0. **Attention:** Microsoft Visual Basic on .NET is still supported. Software product Compatibility report for Windows
IBM MQ 8.0.0 Fix Packs	
Deprecated Deprecation: SSLv3 protocol	The SSLv3 protocol and the use of some IBM MQ CipherSpecs is deprecated from IBM MQ 8.0.0 Fix Pack 2.
Deprecated Deprecation: weaker cryptographic algorithms	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.
Deprecated Deprecation: CipherSpecs	A number of CipherSpecs are deprecated from IBM MQ 8.0.0 Fix Pack 6.

IBM WebSphere MQ 7.5

Table 25. Deprecations, stabilizations, and removals at IBM WebSphere MQ 7.5	
Feature	**Description**
IBM WebSphere MQ 7.5.0 initial release	
Deprecated Removal: **dspmqsver** command	The **dspmqsver** 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 **dspmqver** command.
IBM WebSphere MQ 7.5.0 initial release Fix Packs	
Deprecated Deprecation: CipherSpecs	A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 6.
Deprecated Deprecation: CipherSpecs	A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 7.

Table 25. Deprecations, stabilizations, and removals at IBM WebSphere MQ 7.5 (continued)	
Feature	**Description**
Deprecated 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**
IBM WebSphere MQ 7.1.0 initial release	
Deprecated Deprecation: CipherSpecs	A number of CipherSpecs are deprecated from IBM WebSphere MQ 7.5.0 Fix Pack 6.
Removed AIX 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.
Removed Linux UNIX Removal: **`rtmqlnk`** and **`dltmqlnk`** commands	On UNIX and Linux, the **`crtmqlnk`** and **`dltmqlnk`** 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.
Removed Linux UNIX 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.
Removed Windows 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`.
IBM WebSphere MQ 7.1.0 Fix Packs	

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 161.

Related concepts

“IBM MQ features by version” on page 122
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, CSUs, 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.

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 **CD** tab for the latest Continuous Delivery release or Cumulative Security Update (CSU), or the **LTS** tab for the latest Long Term Support fix pack or CSU.

IBM MQ 9.4 |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 159.

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 Message Service Client (XMS) for C/C++ (IA94 SupportPac) and IA94 SupportPac documentation (1 book)
- 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 (MQIPT)
- 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
- V 9.4.0 IBM MQ Web Server stand-alone install image
- V 9.4.0 IBM Instana Tracing Exit for IBM MQ

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
  - 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 9.4.0 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 as an installable package for the following platforms:
  - Windows
  - Linux x86-64 (rpm)
  - Ubuntu x86-64 (deb)
  - V 9.4.0 Linux ARM64 (deb)
  - Raspberry Pi (deb) (ARM32, as-is, see the readme)
- IBM MQ Mac toolkit for development lets you run IBM MQ commands (for example MQSC commands) on macOS (both ARM64 and x86-64). It also contains client libraries for developing client applications that are executed on macOS. The client is used in the IBM MQ Developer Essentials tutorials.
- IBM MQ Advanced for Developers container image (Linux x86-64) is available on IBM Container Registry. Or you can build your own container image to run on ARM64 and Linux x86-64.
- IBM MQ Managed File Transfer Agent for Developers container image is available on IBM Container Registry. Or you can build your own.

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 9.4 PDF files for product documentation and Program Directories” on page 118
You can download the IBM MQ 9.4 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

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, IBM Documentation Offline, 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.

To go to the main IBM MQ documentation landing page, click **IBM MQ** in the breadcrumb trail at the top of this page.

Table 27. Older IBM MQ documentation: What exists, where it is, and in what formats

IBM MQ product or scenario	PDFs or ePubs	IBM Documentation Offline[1]	Information Center
MQ Advanced Message Security 7.0.1	-	-	-
z/OS MQ Advanced Message Security for z/OS 7.0.1	-	-	-
MQ File Transfer Edition 7.0.4	• MQ FTE 7.0.4 (1 book), MFT for SOA - July 2009 (1 book)	-	-
MQ product connectivity scenarios[2]	• 15 scenarios, grouped under 3 major headings. Each scenario is documented in both PDF and ePub formats.	-	-
MQSeries Everyplace	• 1.0, 1.1, 1.2 (12 books)	-	-
MQTT Clients	-	-	-
MS81 Internet Pass-Thru 1.2	• MS81 IPT 1.2 (1 book)	-	-
MQ 7.5	• MQ 7.5 (20 books)	WebSphere-MQ-75-Product-Documentation-Windows.zip	-

[1] IBM Documentation Offline has two components:

- **The IBM Documentation Offline app**. This is a locally-installable offline version of IBM Documentation.
- **The documentation packages that you install into the IBM Documentation Offline app**. These packages contain the same documentation as is published online in IBM Documentation.

For older versions of IBM MQ, use the links in this table to download the documentation packages. To download the app, see IBM Documentation Offline.

[2] 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**	**IBM Documentation Offline[1]**	**Information Center**
MQ 7.1	• MQ 7.1 (5 books)	-	• MQ 71 Product Documentation (Windows and Linux)
MQ 7.0.1	• MQ 7.0.1 Features and Enhancements (1 book) • MQ 7.0.1.4 (33 books)	-	• MQ 7 Information Centers (Windows and Linux)
MQ 7.0	• MQ 7.0 2008 (33 books) • MQ 7.0 2009 (33 books)	-	• MQ 7.0.0 Information Centers (Windows and Linux)
MQ 6.0	• 10 books	-	• MQ 6 Information Centers (Windows and Linux)
MQ 5.3	• 31 books	-	• MQ 5.3 Information Center (Windows)
MQ 5.2	• 18 books	-	-
MQ 5.1	• 33 books	-	-
MQ 3.0	• MQ for zVSE System Management (1 book)	-	-
MQ 2.1	• MQ for zVSE System Management (1 book)	-	-

Related concepts

“IBM MQ 9.4 in the IBM Documentation Offline app” on page 120

If you are in an airgap environment without access to the internet, use our Dark Shop app "IBM Documentation Offline" to view downloads of the IBM MQ 9.4 product documentation.

Related reference

IBM MQ documentation landing page

Related information

IBM Support Software lifecycle

[1] IBM Documentation Offline has two components:

- **The IBM Documentation Offline app**. This is a locally-installable offline version of IBM Documentation.
- **The documentation packages that you install into the IBM Documentation Offline app**. These packages contain the same documentation as is published online in IBM Documentation.

For older versions of IBM MQ, use the links in this table to download the documentation packages. To download the app, see IBM Documentation Offline.

Accessibility features for IBM MQ

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

Accessibility features

IBM MQ includes the following major accessibility features:

- Keyboard-only operation
- Operations that use a screen reader

IBM MQ uses the latest W3C Standard, WAI-ARIA 1.0 (https://www.w3.org/TR/wai-aria/), 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), and Web Content Accessibility Guidelines (WCAG) 2.0 (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.

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 msiexec.

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).

Icons used in the product documentation

The product documentation for all IBM MQ 9.4 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.

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 - Support Cycle 2 (formerly Long Term Support)

Information that applies to the IBM Cloud Pak for Integration - Support Cycle 2 (formerly Long Term Support) release in general is indicated by a dark blue icon with the text CP4I-SC2:

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 9.4, 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 9.4 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.

V 9.4.0

CD initial release

Product features that are new to CD customers in the initial release of IBM MQ 9.4 are indicated by a light blue icon that contains the initial release number.

V 9.4.0

Platform icons

Platform icons are used to identify information that applies only to a specific platform, or group of platforms.

Table 28. Icons for MQ core platforms

Icon	Platform
AIX	AIX
UNIX	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	Linux
Windows	Windows
ALW	AIX, Linux, and Windows
ULW	All supported UNIX, Linux, and Windows platforms. That is, all platforms listed previously in this table.
IBM i	IBM i. Not supported for CD releases.
Multi	Multiplatforms. That is, all platforms listed previously in this table. • For CD releases, this means AIX, Linux, and Windows. • For LTS releases, this means AIX, Linux, Windows, and IBM i.
z/OS	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 29. 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 and later continue 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 30. 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. Information about each of these features is flagged with one of the following icons.

Table 31. Deprecated, stabilized or removed features	
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 - Support Cycle 2 (formerly Long Term Support) (CP4I-SC2) releases.

“What's new and changed in IBM MQ 9.4.0 ” on page 26
IBM MQ 9.4.0 is the follow-on Long Term Support (LTS) release to IBM MQ 9.3.0. It is also the follow-on Continuous Delivery (CD) release to IBM MQ 9.3.5, which is the final CD release for IBM MQ 9.3. IBM MQ 9.4.0 includes the features and enhancements that were previously delivered in the CD releases of IBM MQ 9.3.1 through IBM MQ 9.3.5 along with some features and enhancements that are new at IBM MQ 9.4.0. The features that you have access to depends on your product entitlement.

“What's new and changed in IBM MQ 9.4.x Continuous Delivery” on page 80

Following the initial release of IBM MQ 9.4.0, new function and enhancements are made available by incremental updates within the same version and release as modification releases, for example IBM MQ 9.4.1.

“What's changed in IBM MQ 9.4.0 Long Term Support” on page 108
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 110
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 9.4.

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Glossary

This glossary provides terms and definitions for the IBM MQ software and products.

The following cross-references are used in this glossary:

- *See* refers you from a nonpreferred term to the preferred term or from an abbreviation to the spelled-out form.
- *See also* refers you to a related or contrasting term.

“A” on page 170 “B” on page 173 “C” on page 174 “D” on page 179 “E” on page 181 “F” on page 182 “G” on page 183 “H” on page 184 “I” on page 184 “J” on page 187 “K” on page 188 “L” on page 188 “M” on page 190 “N” on page 194 “O” on page 195 “P” on page 196 “Q” on page 199 “R” on page 200 “S” on page 203 “T” on page 208 “U” on page 210 “V” on page 211 “W” on page 211 “X” on page 211

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.

cryptography
A method for protecting information by transforming it (encrypting it) into an unreadable format, called ciphertext. Only users who possess a secret key can decipher (or decrypt) the message into plaintext.

D

DAE
See dump analysis and elimination.

daemon
A program that runs unattended to perform continuous or periodic functions, such as network control.

data bag
A container of object properties that the MQAI uses in administering queue managers. There are three types of data bag: user (for user data), administration (for administration with assumed options), and command (for administration with no options assumed).

data-conversion interface (DCI)
The IBM MQ interface to which customer-written or vendor-written programs that convert application data between different machine encodings and CCSIDs must conform.

data-conversion service
A service that converts application data to the character set and encoding that are required by applications on other platforms.

datagram
A form of asynchronous messaging in which an application sends a message, but does not require a response. See also request/reply.

data integrity
The security service that detects whether there has been unauthorized modification of data, or tampering. The service detects only whether data has been modified; it does not restore data to its original state if it has been modified.

data item
In the MQAI, an integer or character-string item that is contained within a data bag. A data item can be either a user item or a system item.

DCE
See Distributed Computing Environment.

DCE principal
A user ID that uses the distributed computing environment.

DCI
See data-conversion interface.

DCM
See Digital Certificate Manager.

dead-letter queue (DLQ)
A queue to which a queue manager or application sends messages that cannot be delivered to their correct destination.

dead-letter queue handler
A utility that monitors a dead-letter queue (DLQ) and processes messages on the queue in accordance with a user-written rules table. A sample dead letter queue handler is provided by IBM MQ.

decryption
The process of decoding data that has been encrypted into a secret format. Decryption requires a secret key or password.

default object
A definition of an object (for example, a queue) with all attributes defined. If a user defines an object but does not specify all possible attributes for that object, the queue manager uses default attributes in place of any that were not specified.

deferred connection
A pending event that is activated when a CICS subsystem tries to connect to IBM MQ for z/OS before it has started.

derivation
In object-oriented programming, the refinement or extension of one class from another.

destination

1. An end point to which messages are sent, such as a queue or topic.
2. In JMS, an object that specifies where and how messages should be sent and received.

Diffie-Hellman key exchange
A public, key-exchange algorithm that is used for securely establishing a shared secret over an insecure channel.

digital certificate
An electronic document used to identify an individual, a system, a server, a company, or some other entity, and to associate a public key with the entity. A digital certificate is issued by a certification authority and is digitally signed by that authority.

Digital Certificate Manager (DCM)
On IBM i systems, the method of managing digital certificates and using them in secure applications on the IBM i server. Digital Certificate Manager requests and processes digital certificates from certification authorities (CAs) or other third-parties.

digital signature
Information that is encrypted with a private key and is appended to a message or object to assure the recipient of the authenticity and integrity of the message or object. The digital signature proves that the message or object was signed by the entity that owns, or has access to, the private key or shared-secret symmetric key.

direct routing
An option for routing publications in a publish/subscribe cluster. With direct routing, every queue manager in the cluster sends publications from any publishing queue manager direct to any other queue manager in the cluster with a matching subscription.

disconnect
To break the connection between an application and a queue manager.

distinguished name (DN)
A set of name-value pairs (such as CN=person name and C=country or region) that uniquely identifies an entity in a digital certificate.

distributed application
In message queuing, a set of application programs that can each be connected to a different queue manager, but that collectively comprise a single application.

Distributed Computing Environment (DCE)
In network computing, a set of services and tools that supports the creation, use, and maintenance of distributed applications across heterogeneous operating systems and networks.

distributed publish/subscribe
Publish/subscribe messaging performed in a multiple queue manager environment.

distributed queue management
In message queuing, the setup and control of message channels between distributed queue managers.

distributed queuing
Sending messages from one queue manager to another. The receiving queue manager could be on the same machine or on a remote one.

distribution list
A list of queues to which a message can be put with a single statement.

DLQ
See dead-letter queue.

DN
See distinguished name.

dual logging
A method of recording IBM MQ for z/OS activity, where each change is recorded on two data sets, so that if a restart is necessary and one data set is unreadable, the other can be used. See also single logging.

dual mode
See dual logging.

dump analysis and elimination (DAE)
A z/OS service that enables an installation to suppress SVC dumps and ABEND SYSUDUMP dumps that are not needed because they duplicate previously written dumps.

durable subscription
A subscription that is retained when the connection from a subscribing application to the queue manager is closed. When the subscribing application disconnects, the durable subscription remains in place and publications continue to be delivered. When the application reconnects, it can use the same subscription by specifying the unique subscription name. See also nondurable subscription.

dynamic queue
A local queue created when a program opens a model queue object.

E

eavesdropping
A breach of communication security in which the information remains intact, but its privacy is compromised. See also impersonation, tampering.

Eclipse
An open-source initiative that provides independent software vendors (ISVs) and other tool developers with a standard platform for developing plug-compatible application development tools.

encapsulation
In object-oriented programming, the technique that is used to hide the inherent details of an object, function, or class from client programs.

encryption
In computer security, the process of transforming data into an unintelligible form in such a way that the original data either cannot be obtained or can be obtained only by using a decryption process.

enqueue
To put a message or item in a queue.

entity
A user, group, or resource that is defined to a security service, such as RACF®.

environment variable
A variable that specifies how an operating system or another program runs, or the devices that the operating system recognizes.

ESM
See external security manager.

ESTAE
See extended specify task abnormal exit.

event data
In an event message, the part of the message data that contains information about the event (such as the queue manager name, and the application that gave rise to the event). See also event header.

event header
In an event message, the part of the message data that identifies the event type of the reason code for the event. See also event data.

event message
A message that contains information (such as the category of event, the name of the application that caused the event, and queue manager statistics) relating to the origin of an instrumentation event in a network of IBM MQ systems.

event queue
The queue onto which the queue manager puts an event message after it detects an event. Each category of event (queue manager, performance, configuration, instrumentation, or channel event) has its own event queue.

Event Viewer
A tool provided by Windows systems to examine and manage log files.

exception listener
An instance of a class that can be registered by an application and for which the onException() method is called to pass a JMS exception to the application asynchronously.

exclusive method
In object-oriented programming, a method that is not intended to exhibit polymorphism; one with specific effect.

extended specify task abnormal exit (ESTAE)
A z/OS macro that provides recovery capability and gives control to the user-specified exit routine for processing, diagnosing an abend, or specifying a retry address.

external security manager (ESM)
A security product that performs security checking on users and resources. RACF is an example of an ESM.

F

failover
An automatic operation that switches to a redundant or standby system or node in the event of a software, hardware, or network interruption.

FAP
See Formats and Protocols.

Federal Information Processing Standard
A standard produced by the National Institute of Standards and Technology when national and international standards are nonexistent or inadequate to satisfy the U.S. government requirements.

FFDC
See first-failure data capture.

FFST
See First Failure Support Technology.

FFST file
See First Failure Support Technology file.

FIFO
See first-in first-out.

FIPS
See Federal Information Processing Standard.

first-failure data capture (FFDC)

1. The i5/OS implementation of the FFST architecture providing problem recognition, selective dump of diagnostic data, symptom string generation, and problem log entry.

2. A problem diagnosis aid that identifies errors, gathers and logs information about these errors, and returns control to the affected runtime software.

First Failure Support Technology (FFST)
An IBM architecture that defines a single approach to error detection through defensive programming techniques. These techniques provide proactive (passive until required) problem recognition and a description of diagnostic output required to debug a software problem.

First Failure Support Technology file (FFST file)
A file containing information for use in detecting and diagnosing software problems. In IBM MQ, FFST files have a file type of FDC.

first-in first-out (FIFO)
A queuing technique in which the next item to be retrieved is the item that has been in the queue for the longest time.

forced shutdown
A type of shutdown of the CICS adapter where the adapter immediately disconnects from IBM MQ for z/OS, regardless of the state of any currently active tasks. See also quiesced shutdown.

format
In message queuing, a term used to identify the nature of application data in a message.

Formats and Protocols (FAP)
In message queuing, a definition of how queue managers communicate with each other, and of how clients communicate with server queue managers.

Framework
In IBM MQ, a collection of programming interfaces that allow customers or vendors to write programs that extend or replace certain functions provided in IBM MQ products. The interfaces are the following: data conversion interface (DCI), message channel interface (MCI), name service interface (NSI), security enabling interface (SEI), trigger monitor interface (TMI).

friend class
A class in which all member functions are granted access to the private and protected members of another class. It is named in the declaration of another class and uses the keyword friend as a prefix to the class.

FRR
See functional recovery routine.

full repository
A complete set of information about every queue manager in a cluster. This set of information is called the repository or sometimes the full repository and is usually held by two of the queue managers in the cluster. See also partial repository.

function
A named group of statements that can be called and evaluated and can return a value to the calling statement.

functional recovery routine (FRR)
A z/OS recovery and termination manager that enables a recovery routine to gain control in the event of a program interrupt.

G

gateway queue manager
A cluster queue manager that is used to route messages from an application to other queue managers in the cluster.

generalized trace facility (GTF)
A z/OS service program that records significant system events such as I/O interrupts, SVC interrupts, program interrupts, and external interrupts.

Generic Security Services API
See Generic Security Services application programming interface.

Generic Security Services application programming interface (Generic Security Services API, GSS API)
A common application programming interface (API) for accessing security services.

get
In message queuing, to use the MQGET call to remove a message from a queue and return its contents to the calling application. See also browse, put.

globally defined object
On z/OS, an object whose definition is stored in the shared repository. The object is available to all queue managers in the queue sharing group. See also locally defined object.

global trace
An IBM MQ for z/OS trace option where the trace data comes from the entire IBM MQ for z/OS subsystem.

global transaction
A recoverable unit of work performed by one or more resource managers in a distributed transaction environment and coordinated by an external transaction manager.

GSS API
See Generic Security Services application programming interface.

GTF
See generalized trace facility.

H

handshake
The exchange of messages at the start of a Secure Sockets Layer session that allows the client to authenticate the server using public key techniques (and, optionally, for the server to authenticate the client) and then allows the client and server to cooperate in creating symmetric keys for encryption, decryption, and detection of tampering.

hardened message
A message that is written to auxiliary (disk) storage so that the message is not lost in the event of a system failure.

header
See message header.

heartbeat
A signal that one entity sends to another to convey that it is still active.

heartbeat flow
A pulse that is passed from a sending message channel agent (MCA) to a receiving MCA when there are no messages to send. The pulse unblocks the receiving MCA, which would otherwise remain in a wait state until a message arrived or the disconnect interval expired.

heartbeat interval
The time, in seconds, that is to elapse between heartbeat flows.

hierarchy
In publish/subscribe messaging topology, a local queue manager connected to a parent queue manager.

HTTP
See Hypertext Transfer Protocol.

Hypertext Transfer Protocol (HTTP)
An Internet protocol that is used to transfer and display hypertext and XML documents on the web.

I

IBM MQ
A family of IBM licensed programs that provides message queuing services.

IBM MQ Administration Interface (MQAI)
A programming interface that performs administration tasks on an IBM MQ queue manager through the use of data bags. Data bags allow the user to handle properties (or parameters) of IBM MQ objects.

IBM MQ classes for .NET
A set of classes that allow a program written in the .NET programming framework to connect to IBM MQ as an IBM MQ client or to connect directly to an IBM MQ server.

IBM MQ classes for C++
A set of classes that encapsulate the IBM MQ Message Queue Interface (MQI) in the C++ programming language.

IBM MQ classes for Java
A set of classes that encapsulate the IBM MQ Message Queue Interface (MQI) in the Java programming language.

IBM MQ fully managed .NET client
Part of an IBM MQ product that can be installed on a system without installing the full queue manager. The IBM MQ .NET client is used by fully-managed .NET applications and communicates with a queue manager on a server system. A .NET application that is not fully managed uses the IBM MQ MQI client. See also client, IBM MQ Java client, IBM MQ MQI client.

IBM MQ Java client
Part of an IBM MQ product that can be installed on a system without installing the full queue manager. The IBM MQ Java client is used by Java applications (both IBM MQ classes for Java and IBM MQ classes for JMS) and communicates with a queue manager on a server system. See also client, IBM MQ fully managed .NET client, IBM MQ MQI client.

IBM MQ MQI client
Part of an IBM MQ product that can be installed on a system without installing the full queue manager. The IBM MQ MQI client accepts MQI calls from applications and communicates with a queue manager on a server system. See also client, IBM MQ fully managed .NET client, IBM MQ Java client.

IBM MQ script commands (MQSC)
Human readable commands, uniform across all platforms, that are used to manipulate IBM MQ objects. See also programmable command format.

IBM MQ server
A queue manager that provides queuing services to one or more clients. All the IBM MQ objects, for example queues, exist only on the queue manager system, that is, on the MQI server machine. A server can support normal local MQI applications as well.

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 MQ Telemetry service to publish and subscribe messages reliably with IBM MQ.

MQ Telemetry daemon for devices
See MQTT daemon for devices.

identification
The security service that enables each user of a computer system to be identified uniquely. A common mechanism for implementing this service is to associate a user ID with each user.

identity context
Information that identifies the user of the application that first puts the message on a queue

IFCID
See instrumentation facility component identifier.

ILE
See Integrated Language Environment®.

immediate shutdown
In IBM MQ, a shutdown of a queue manager that does not wait for applications to disconnect. Current message queue interface (MQI) calls are allowed to complete, but new MQI calls fail after an immediate shutdown has been requested. See also preemptive shutdown, quiesced shutdown.

impersonation
A breach of communication security in which the information is passed to a person posing as the intended receiver or information is sent by a person posing as someone else. See also eavesdropping, tampering.

inbound channel
A channel that receives messages from another queue manager.

in-built format
See built-in format.

index
In the IBM MQ Administration Interface (MQAI), a means of referencing data items.

indoubt unit of recovery
The status of a unit of recovery for which a sync point has been requested but not yet confirmed.

inflight
The state of a resource or unit of recovery that has not yet completed the prepare phase of the commit process.

inheritance
An object-oriented programming technique in which existing classes are used as a basis for creating other classes. Through inheritance, more specific elements incorporate the structure and behavior of more general elements.

initialization input data set
A data set that is used by IBM MQ for z/OS when it starts.

initiation queue
A local queue on which the queue manager puts trigger messages.

initiator
In distributed queuing, a program that requests network connections on another system. See also responder.

input parameter
A parameter of an MQI call in which information is supplied.

insertion order
In the IBM MQ Administration Interface (MQAI), the order that data items are placed into a data bag.

installable service
In IBM MQ on UNIX and Linux systems and IBM MQ for Windows, additional functionality provided as independent component. The installation of each component is optional: in-house or third-party components can be used instead.

instance
A specific occurrence of an object that belongs to a class. See also object.

instance data
In object-oriented programming, state information associated with an object.

intermediate certificate
A signer certificate that is not the root certificate. It is issued by the trusted root specifically to issue end-entity server certificates. The result is a certificate chain that begins at the trusted root CA, through a number of intermediates, and ends with the SSL certificate issued to the organization.

instrumentation event
A way of monitoring queue manager resource definitions, performance conditions, and channel conditions in a network of IBM MQ systems.

instrumentation facility component identifier (IFCID)
In Db2 for z/OS, a value that names and identifies a trace record of an event. As a parameter on the START TRACE and MODIFY TRACE commands, it specifies that the corresponding event is to be traced.

Integrated Language Environment (ILE)
A set of constructs and interfaces that provides a common runtime environment and runtime bindable application programming interfaces (APIs) for all ILE-conforming high-level languages.

Interactive Problem Control System (IPCS)
A component of MVS and z/OS that permits online problem management, interactive problem diagnosis, online debugging for disk-resident abend dumps, problem tracking, and problem reporting.

Interactive System Productivity Facility (ISPF)
An IBM licensed program that serves as a full-screen editor and dialog manager. Used for writing application programs, it provides a means of generating standard screen panels and interactive dialogs between the application programmer and the terminal user.

interface
In object-oriented programming, an abstract model of behavior; a collection of functions or methods.

Internet Protocol (IP)
A protocol that routes data through a network or interconnected networks. This protocol acts as an intermediary between the higher protocol layers and the physical network. See also Transmission Control Protocol.

interprocess communication (IPC)
The process by which programs send messages to each other. Sockets, semaphores, signals, and internal message queues are common methods of interprocess communication. See also client.

intersystem communication (ISC)
A CICS facility that provides inbound and outbound support for communication from other computer systems.

IP
See Internet Protocol.

IPC
See interprocess communication.

IPCS
See Interactive Problem Control System.

ISC
See intersystem communication.

ISPF
See Interactive System Productivity Facility.

J

JAAS
See Java Authentication and Authorization Service.

Java Authentication and Authorization Service (JAAS)
In Java EE technology, a standard API for performing security-based operations. Through JAAS, services can authenticate and authorize users while enabling the applications to remain independent from underlying technologies.

Java Message Service (JMS)
An application programming interface that provides Java language functions for handling messages. See also Message Queue Interface.

Java runtime environment (JRE)
A subset of a Java developer kit that contains the core executable programs and files that constitute the standard Java platform. The JRE includes the Java virtual machine (JVM), core classes, and supporting files.

JMS
See Java Message Service.

JMSAdmin
An administration tool that enables administrators to define the properties of JMS objects and to store them within a JNDI namespace

journal
A feature of OS/400® that IBM MQ for IBM i uses to control updates to local objects. Each queue manager library contains a journal for that queue manager.

JRE
See Java runtime environment.

K

keepalive
A TCP/IP mechanism where a small packet is sent across the network at predefined intervals to determine whether the socket is still working correctly.

Kerberos
A network authentication protocol that is based on symmetric key cryptography. Kerberos assigns a unique key, called a ticket, to each user who logs on to the network. The ticket is embedded in messages that are sent over the network. The receiver of a message uses the ticket to authenticate the sender.

key authentication
See authentication.

key repository
A store for digital certificates and their associated private keys.

key ring
In computer security, a file that contains public keys, private keys, trusted roots, and certificates.

keystore
In security, a file or a hardware cryptographic card where identities and private keys are stored, for authentication and encryption purposes. Some keystores also contain trusted or public keys. See also truststore.

L

last will and testament
An object that is registered with a monitor by a client, and used by the monitor if the client ends unexpectedly.

LDAP
See Lightweight Directory Access Protocol.

Lightweight Directory Access Protocol (LDAP)
An open protocol that uses TCP/IP to provide access to directories that support an X.500 model and that does not incur the resource requirements of the more complex X.500 Directory Access Protocol (DAP). For example, LDAP can be used to locate people, organizations, and other resources in an Internet or intranet directory.

linear logging
In IBM MQ on UNIX and Linux systems, and IBM MQ for Windows, the process of keeping restart data in a sequence of files. New files are added to the sequence as necessary. The space in which the data is written is not reused. See also circular logging. For further information, see the topic Types of logging.

link level security
The security services that are started, directly or indirectly, by a message channel agent (MCA), the communications subsystem, or a combination of the two working together.

listener
A program that detects incoming requests and starts the associated channel.

local definition of a remote queue
An IBM MQ object belonging to a local queue manager that defines the attributes of a queue that is owned by another queue manager. In addition, it is used for queue manager aliasing and reply-to-queue aliasing.

locale
A setting that identifies language or geography and determines formatting conventions such as collation, case conversion, character classification, the language of messages, date and time representation, and numeric representation.

locally defined object
On z/OS, an object whose definition is stored on page set zero. The definition can be accessed only by the queue manager that defined it. See also globally defined object.

local queue
A queue that belongs to the local queue manager. A local queue can contain a list of messages waiting to be processed. See also remote queue.

local queue manager
The queue manager to which the program is connected and that provides message queuing services to the program. See also remote queue manager.

log
In IBM MQ, a file recording the work done by queue managers while they receive, transmit, and deliver messages, to enable them to recover in the event of failure.

log control file
In IBM MQ on UNIX and Linux systems, and IBM MQ for Windows, the file containing information needed to monitor the use of log files (for example, their size and location, and the name of the next available file).

log file
In IBM MQ on UNIX and Linux systems, and IBM MQ for Windows, a file in which all significant changes to the data controlled by a queue manager are recorded. If the primary log files become full, IBM MQ allocates secondary log files.

logical unit (LU)
An access point through which a user or application program accesses the SNA network to communicate with another user or application program.

logical unit 6.2 (LU 6.2)
An SNA logical unit that supports general communication between programs in a distributed processing environment.

logical unit of work identifier (LUWID)
A name that uniquely identifies a thread within a network. This name consists of a fully qualified logical unit network name, a logical unit of work instance number, and a logical unit of work sequence number.

log record
A set of data that is treated as a single unit in a log file.

log record sequence number (LRSN)
A unique identifier for a log record that is associated with a data sharing member. Db2 for z/OS uses the LRSN for recovery in the data sharing environment.

LRSN
See log record sequence number.

LU
See logical unit.

LU 6.2
See logical unit 6.2.

LU 6.2 conversation
In SNA, a logical connection between two transaction programs over an LU 6.2 session that enables them to communicate with each other.

LU 6.2 conversation level security
In SNA, a conversation level security protocol that enables a partner transaction program to authenticate the transaction program that initiated the conversation.

LU 6.2 session
In SNA, a session between two logical units (LUs) of type 6.2.

LU name
The name by which VTAM® refers to a node in a network.

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, used in some UNIX systems, 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, used in some UNIX systems, 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 MQ Telemetry service is an IBM MQ service that handles the server side of the MQTT protocol (see *MQTT Server*). The MQ 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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