

IBM MQ What's New Since 9.3.0: 9.3.1 -> 9.3.4

Rob Parker

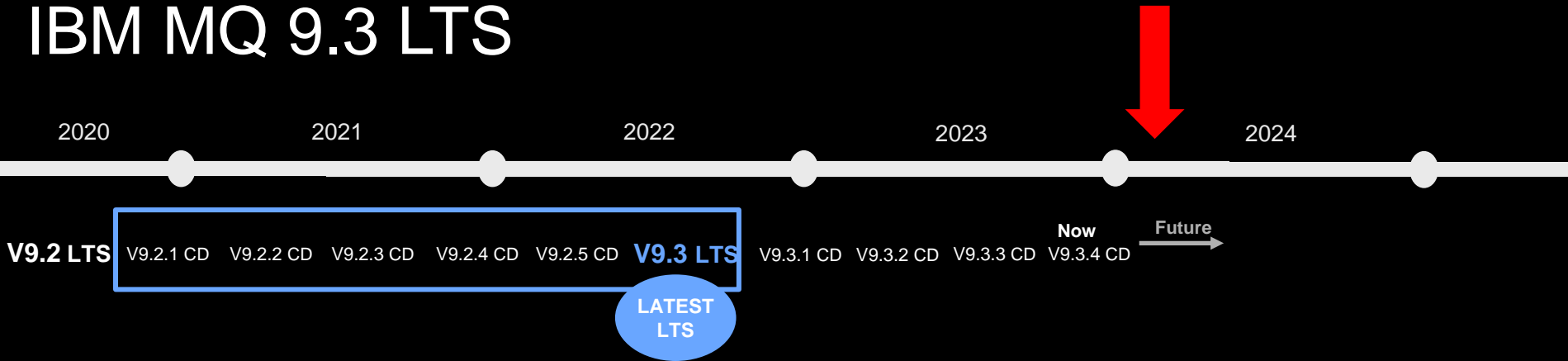
Security Architect, MQ Distributed
parrobe@uk.ibm.com

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IBM MQ 9.3 LTS



In 2016 MQ introduced a dual Long-Term Support and a Continuous Delivery model.

Continuous Delivery

New CD versions of MQ are released approximately every four months, incrementally introducing new product capabilities.

Intended for those who can continually integrate.

Long-Term Support

Approximately every two years a new LTS version is released, rolling up many of the CD capabilities into a release with 5+3 support.

Required by those looking for fixed function.

Mix and Match

Both are available under the same license.

Both can interoperate, just like any previous version of MQ.

All the function delivered in the 9.2.x CD releases is available in the long-term support release **V9.3 LTS**



What's new in 9.3.0?

IBM MQ 9.3 LTS enhancements since 9.2 LTS (2020-2022)

Simplified Linux install	dspmjinst for IBM i	Stream MQ Appliance error logs	MQ Console application quick start	Key repository passwords	Idempotent MQSC DELETE commands	Hardware accelerated compression for AIX	Non-OS user authorizations	TLS 1.3 across all protocols	TLS 1.3 support for MQIPT
Encrypted MQTT channel passphrases	TLS-only communication switch	Streaming queues	Multiple queue manager certificates for MQIPT	TLS enabled .NET XA monitor	Cryptographic hardware support for client passwords	PKCS#12 key repository support	SNI hostname support for channel routing	Uniform Cluster support for request/reply flows	Transaction boundary aware Uniform Cluster
Uniform Cluster aware MDBs	IBM MQ scaler for KEDA	Apache Qpid JMS support over AMQP	Point-to-point support for AMQP	Java 17 support for applications	MQ Console remote queue manager support	Jakarta Messaging 3.0 support	64-bit RBA default for z/OS	MQ Appliance synchronous DR replication	Disk encryption for the MQ Appliance
OpenShift Operator managed rolling upgrade	OpenShift support for zLinux and Power	OpenShift Prometheus integration with ServiceMonitor	Helm chart sample for Kubernetes deployments	Client attached dead-letter handler	MQ Appliance failed resource action control	IBM MQ on Cloud LogDNA integration	Raft based Native HA for OpenShift and Kubernetes	Transfer logging for Managed File Transfer	AT-TLS support for z/OS
Separate statistics and accounting intervals for z/OS	Browse support for AMQP applications	Start/stop of MFT resource monitors	Redistributable MFT Logger	MFT managed call control over REST	IBM MQ AsyncAPI binding	AsyncAPI code generator for IBM MQ JMS applications	Queue depth SMF data for z/OS	.NET 6 application support	Extended REST API message properties

IBM MQ | What's new in 9.3 LTS

IBM MQ v9.3 Long Term Support release delivers the latest innovations to clients on the Enhanced support lifecycle (5+3).

For a full list of What's new and changed, visit the [IBM MQ 9.3 Documentation](#)

9.3 LTS June / July 2022 [Read the announce here](#)

Hybrid cloud software, MQ Appliance, & MQ on Cloud / zOS

9.3.1 CD October / November 2022

9.3.2 CD February / March 2023

9.3.3 CD June / July 2023

.... Future!



Easier getting-started experience

Enhancements to the IBM MQ Console (GUI) enable new users to get started more easily than ever before, and connect to a broader range of apps through additional API and language support.



Increased resilience

Rapid quorum-controlled failover with Native HA delivers full protection for every recoverable operation and message – no loss or duplication! Plus intelligent workload balancing for mission critical apps.



Streaming queues

Make data available to Apache Kafka, AI, and analytics applications to gain insights, or store for auditing or replay purposes without impacting the flow of data between mission-critical applications.



Simplified administration

View and manage MQ estate from a single user interface, additional commands make it easier to configure queue managers consistently, and use the enhanced REST APIs to interact with MQ.



Hardened security

Several security enhancements build on existing robust security mechanisms to protect mission-critical data. These include TLS 1.3 support and a simplified container authority model



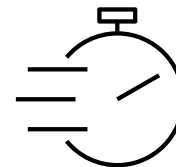
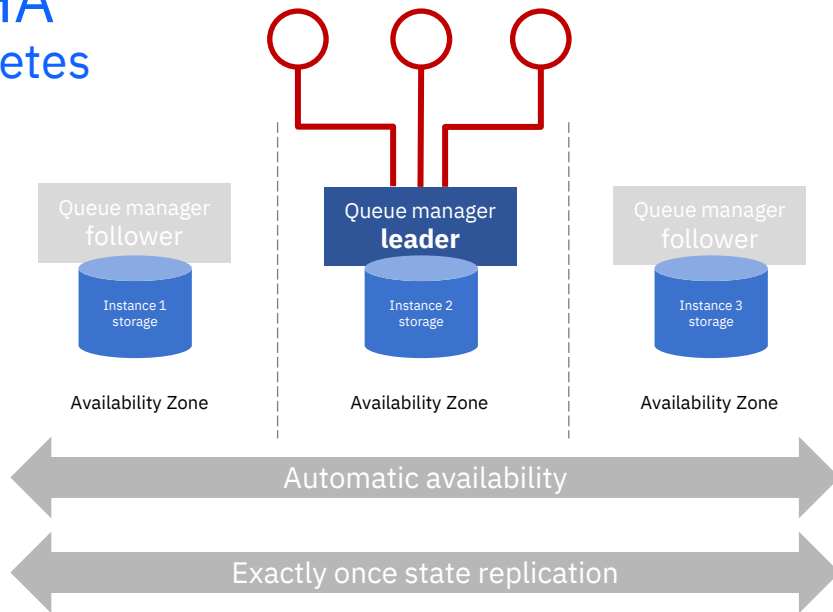
Sophisticated Managed File Transfers

Enhancements to prioritize transfers, diagnose and resolve issues more rapidly, and deploy file transfer capabilities in containers for reliable, efficient, and secure data and file transfer.

IBM MQ Native HA

OpenShift and Kubernetes

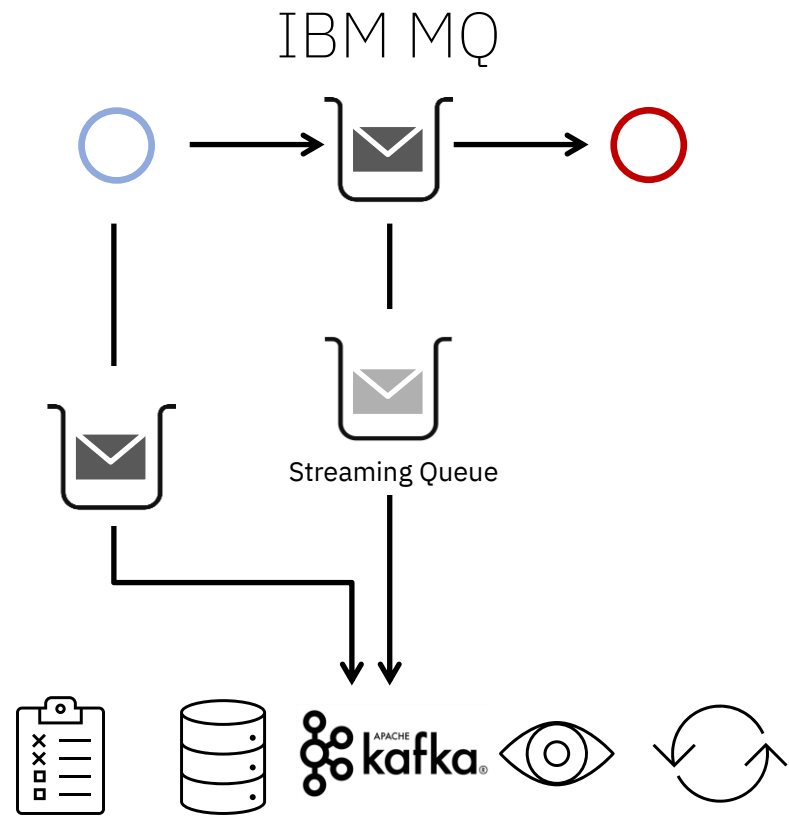
RAFT



Replicated in real-time
Exact replicas

No external dependencies
RAFT based, leader/follower quorum

IBM MQ Streaming Queues

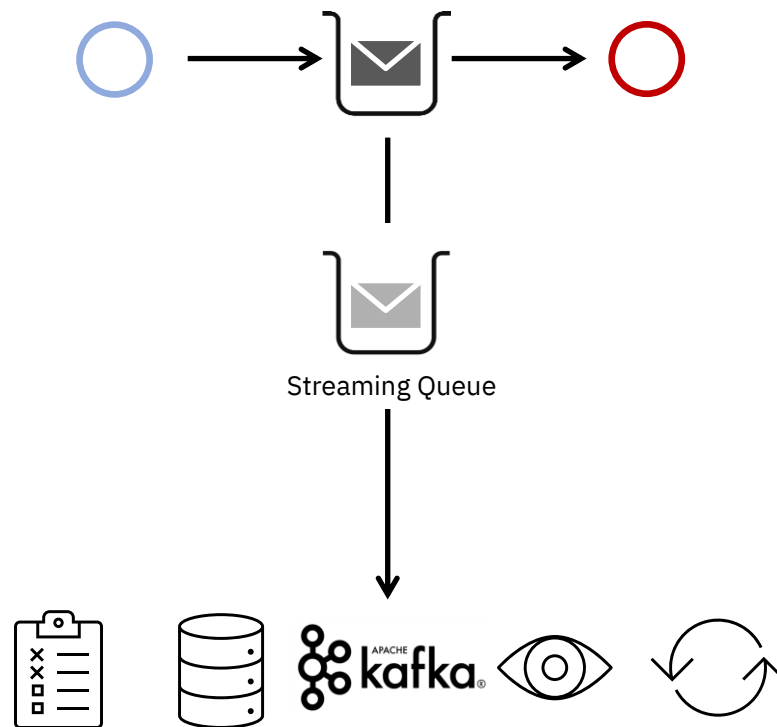


IBM MQ Streaming Queues

Tap into the value of existing data flowing over MQ

Zero change to the existing applications

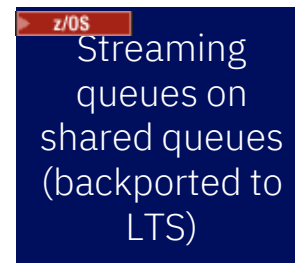
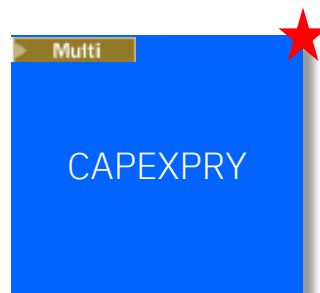
- Stream Processing
- Collect real world data
- Auditing
- Replay
- Investigation
- Test data





What's new in 9.3.1?

IBM MQ 9.3.1 CD enhancements



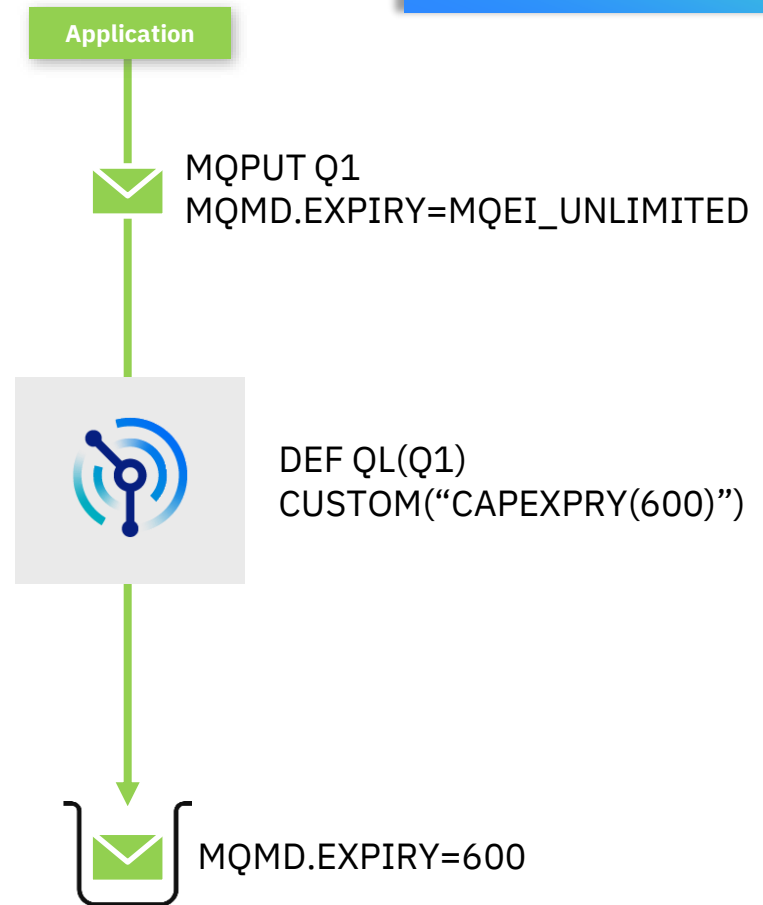
CAPEXPY

CAPEXPY provides an administrative way to set the maximum expiry value that a message can have when sent to a queue / published to a topic

Useful if you have a “badly behaved” application which sends messages without setting an expiry value and you can’t easily change it

Originally provided in the MQ 8 time frame (via an APAR) as a custom property

Custom property approach was always intended to be a temporary solution



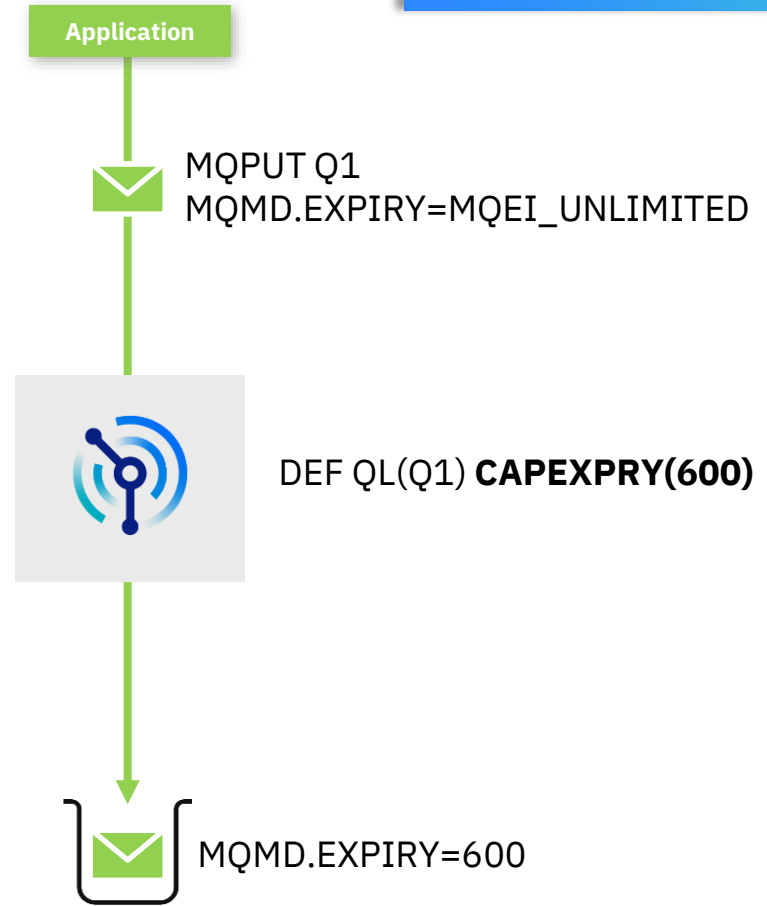
CAPEXPYRY

In 9.3.1, on distributed platforms,
CAPEXPYRY now becomes a first class
attribute

z/OS will add support later

For any given object you can either use the
custom CAPEXPYRY or the first class
CAPEXPYRY attribute, but you can't use both
at once

Works the same as before, but is now cluster
aware



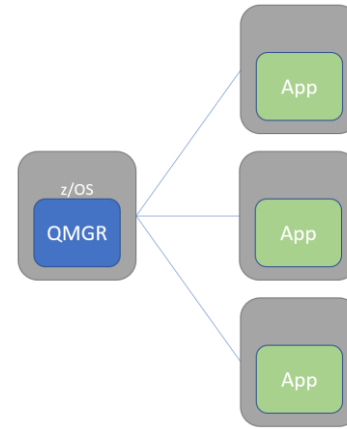
64-bit channel initiator

Previously server-connection channel messages were staged in the channel initiator in a set of buffers in 31 bit storage

Large messages could limit the maximum number of active channels

Now with 64 bit storage in the channel initiator, a larger number of applications can connect at the same time

Samples will be changed to have MEMLIMIT=2G (2GB 64 storage as a starting point)



104 concurrent clients sending 10MB messages.
Memory footprint per client

	9.3.0	9.3.x
31 bit	10.4MB	112KB
64 bit	0	11.6MB

Assuming 1.3GB spare space below the bar this implies max 128 clients at 9.3.0.

At 9.3.1 we could get to 9999 clients (the max) assuming suitable MEMLIMIT

More flexible monitoring

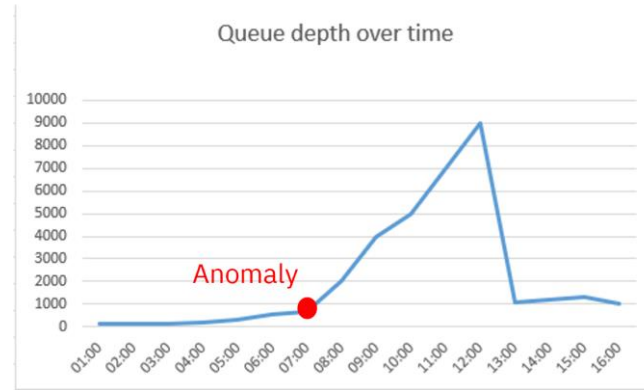
9.3.0 added a new set of per queue statistics

Enabled by setting STATQ(ON) on individual queues or by setting STATQ(ON) on the queue manager and STATQ(QMGR) on the queues

No detectable performance impact when enabled, even when writing records out every second

9.3.1 added DISPLAY QSTATUS information to these

NB: data is output regardless of the MONQ attribute on the queue



Sample MP1B output

MV41,MQ27,2022/06/24,11:27:29,VRM:931

Queue Name.....Q1

Disposition.....Private

Pageset ID.....4

Bufferpool ID.....2

Current Depth.....10

Open Output Count....2

Open Input Count.....1

QTIME Short.....5029503

QTIME Long.....5029503

Last Put Time.....2022/06/24,11:17:33.902190

Last Get Time.....2022/06/24,11:18:33.902190

Uncommitted Changes.No

Oldest Message Age.....64

IBM z Anomaly Analytics now supports MQ

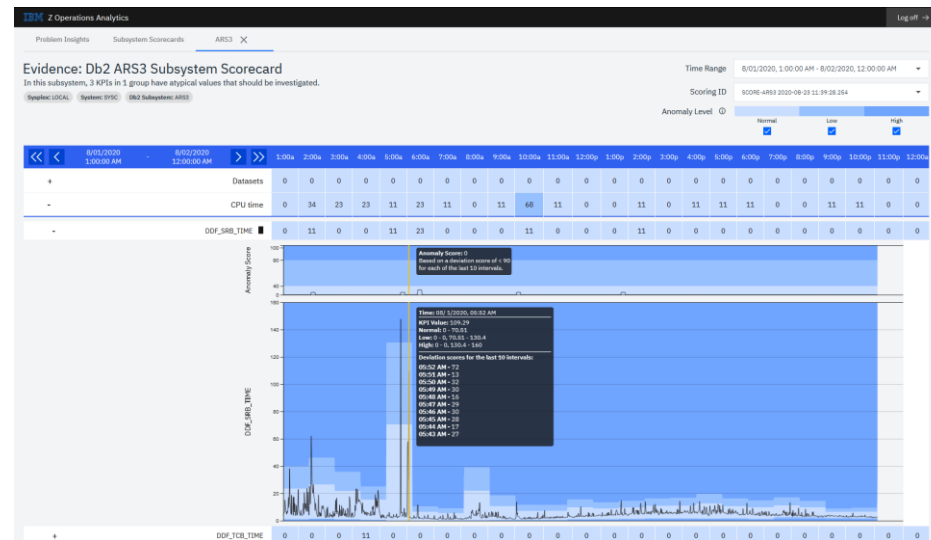
Proactively detect problems

IBM MQ | 30 Years of Innovation

Machine learning and AI to identify anomalous behavior

- Leverage historical data to build a model representative of normal operations
- Real time scoring of subsystem KPIs against the model helps detect operational anomalies through analytics and trend analysis
- Anomalies may point to broader issues impacting the environment
- Generate events to alert operations of when anomalous behavior has been detected
- Events can be correlated with data from your enterprise providing a hybrid cloud view of your entire enterprise

Supports MQ SMF 115 (statistics data)



IBM Z Operational Log and Data Analytics

Advanced Data Streaming

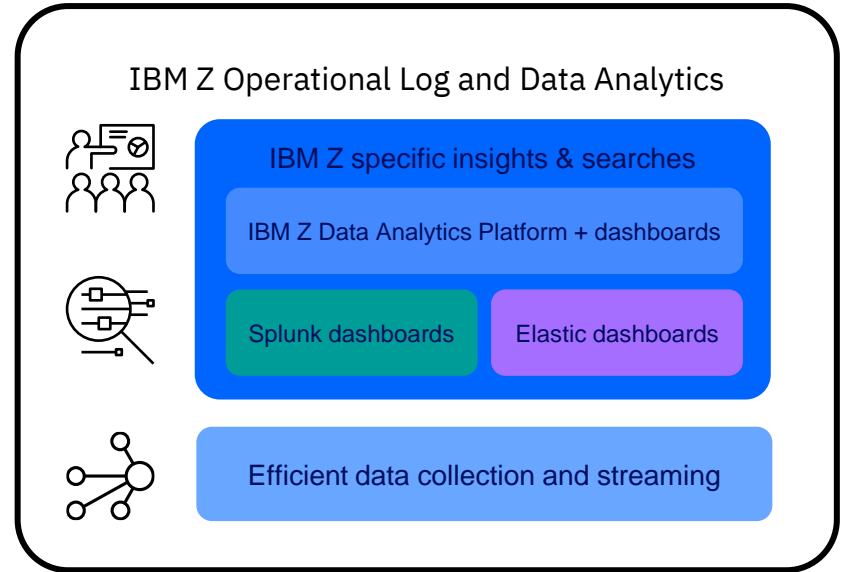
Gain near real-time access to IBM Z operational data where you want to run analytics

Dashboards and searches

Leverage powerful dashboards to extract contextualized insights from your IBM Z operational data. Prebuilt searches save valuable time and resources when doing deeper analysis

IBM Z Data Analytics Platform

Determine the cause of incidents on platform with the included log analysis platform based on an industry leading open-source solution



MQ Dashboards and Log Searches

MQ Channel Error Messages

Last 24 hours
1,639 results

- MQ Messages
- MQ Action, Decision, or Error Messages
- MQ Buffer Pool Error Messages
- MQ Channel Error Messages
- MQ Channel Initiator Error Messages
- MQ Interesting Informational Messages
- MQ Key Messages
- MQ Logs Start and Stop Messages
- MQ Queue Manager Storage Messages
- MQ Job Performance Metrics

MQ for z/OS Queue Sharing Group Dashboard

Filter your MQ data queries by time range, sysplex, system, queue sharing group, queue manager, and structure name

Time range: Last 24 hours
Sysplex: All X
System: All X

Queue Sharing Group: []
Queue Manager: []
Structure Name: []

MQ for z/OS Queue Manager Dashboard

Filter your MQ data queries by time range, sysplex, system, and queue manager

Time range: Last 24 hours
Sysplex: PLEX1 X
System: All X

Queue Manager: MQ2A X

MQ for z/OS Channel Initiator Dashboard

Filter your MQ data queries by time range, sysplex, system, queue manager, and applicable tasks

Time range: Last 24 hours
Sysplex: All X
System: All X
Queue Manager: All X

Dispatcher Task: []
Adapter Task: []
DNS Task: []
SSL Task: []

Table: Maximum and Average Percent of Current Channels Used, Percent of Active Channels Used, and Storage Used by CHINIT for all Channel Initiators in Sysplex * and System * and Queue Manager *

Time	Maximum Percent of Current Channels Used	Average Percent of Current Channels Used	Maximum Percent of Active Channels Used	Average Percent of Active Channels Used	Maximum Storage Used by CHINIT (MB)	Average Storage Used by CHINIT (MB)	Sysplex	System	Queue Manager
2023-10-04 10:00:00	839.96	276.4648	219.84	113.7533	2845	1033.75	PLEX3	TYT411	MQ10
2023-10-04 90:00:00	758.81	237.8604	433.44	137.2613	1877	1206.83	PLEX3	TYT411	MQ10
2023-10-04 80:00:00	762.46	196.6287	221.76	96.2311	2015	1384.52	PLEX3	TYT411	MQ10
2023-10-04 70:00:00	735.61	279.5389	383.52	114.4618	2187	1177.81	PLEX3	TYT411	MQ10
2023-10-04 60:00:00	724.21	222.7917	248.75	84.5617	2143	1128.32	PLEX3	TYT411	MQ10
2023-10-04 50:00:00	711.88	203.8553	182.84	83.8581	1851	1128.83	PLEX3	TYT411	MQ10




What's new in 9.3.2?

IBM MQ 9.3.2 CD enhancements

MQ Console
application view

Multi
More
information in
DIS QMSTATUS

MQ Adv. 
More
information in
DIS QMSTATUS
for Native HA


Windows Linux
TLS 1.3 support
for managed
.NET clients


Java modular
application
support

Simplified
messaging
REST API
security

MQ Adv.
Native HA
entitlement with
advanced in
addition to CP4I

z/OS
SMF116
STREAMEDN for
streaming
queues

Appliance 
DR between 2
HA pairs

More Native HA info in DIS QMSTATUS

For Native HA, DIS QMSTATUS has been enhanced to make it easy to discover where the active instance of the queue manager is running, and the status of the replicas (similar to dspmq -o nativeha)

```
DISPLAY QMSTATUS TYPE(NATIVEHA)
```

```
3: DISPLAY QMSTATUS TYPE(NATIVEHA)
```

```
AMQ8705I: Display Queue Manager Status Details.
```

```
INSTANCE(nha_qm1.0)          TYPE(NATIVEHA)
ROLE(ACTIVE)
HAINITDA(2022-06-08)         HAINITL(0:0:13:54372)
HAINITTI(16.06.54)
REPLADDR(172.30.195.172(8844))
```

```
INSTANCE(nha_qm1.1)          TYPE(NATIVEHA)
ROLE(REPLICA)
BACKLOG(0)                  CONNACTV(YES)
INSYNC(YES)
REPLADDR(172.30.195.172(8845))
```

```
INSTANCE(nha_qm1.2)          TYPE(NATIVEHA)
ROLE(REPLICA)
BACKLOG(661)                CONNACTV(YES)
INSYNC(NO)
REPLADDR(172.30.195.172(8846))
```

MQ Ansible samples

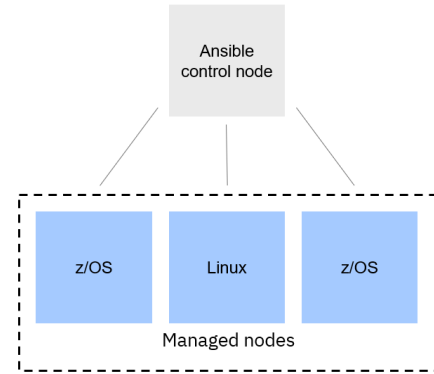
Ansible provides a simple way to automate configuration and management of applications and infrastructure

Ansible playbooks can be run against z/OS providing a common approach across all your IT infrastructure

The IBM z/OS core collection makes it easy for Ansible to interact with data sets, submit jobs, run commands, etc

Sample MQ for z/OS playbooks are now available for creating, altering, displaying and deleting queues. These playbooks can be easily adjusted to work with the other MQ object

An alternative set of playbooks are also available for configuring MQ using simple YAML templates. These can be used on all platforms, via the MQ REST API



https://github.com/IBM/z_ansible_collections_samples/tree/master/zos_su_bsystems/mq

```
zos_operator:
  cmd: "{{ mq_cpf }}" DEF QL ({{ mq_queue_name }}) DESCR("A QUEUE")
```

<https://github.com/ibm-messaging/mq-ansible-yaml-commands>

```
# Start a TCP listener.
- command: start
  parameters:
    port: 1407
    qualifier: listener
# Start a channel.
- command: start
  name: MQ07.TO.MQ08
  qualifier: channel
```

Support for Java Modules

MQ classes for JMS / Jakarta enhanced to allow them to be used properly with modular applications (introduced in Java 9)

1) Import the MQ modules into your modular app

```
module do.jms {  
    requires com.ibm.mq.javax;  
}
```

2) Use the MQ modules in your app

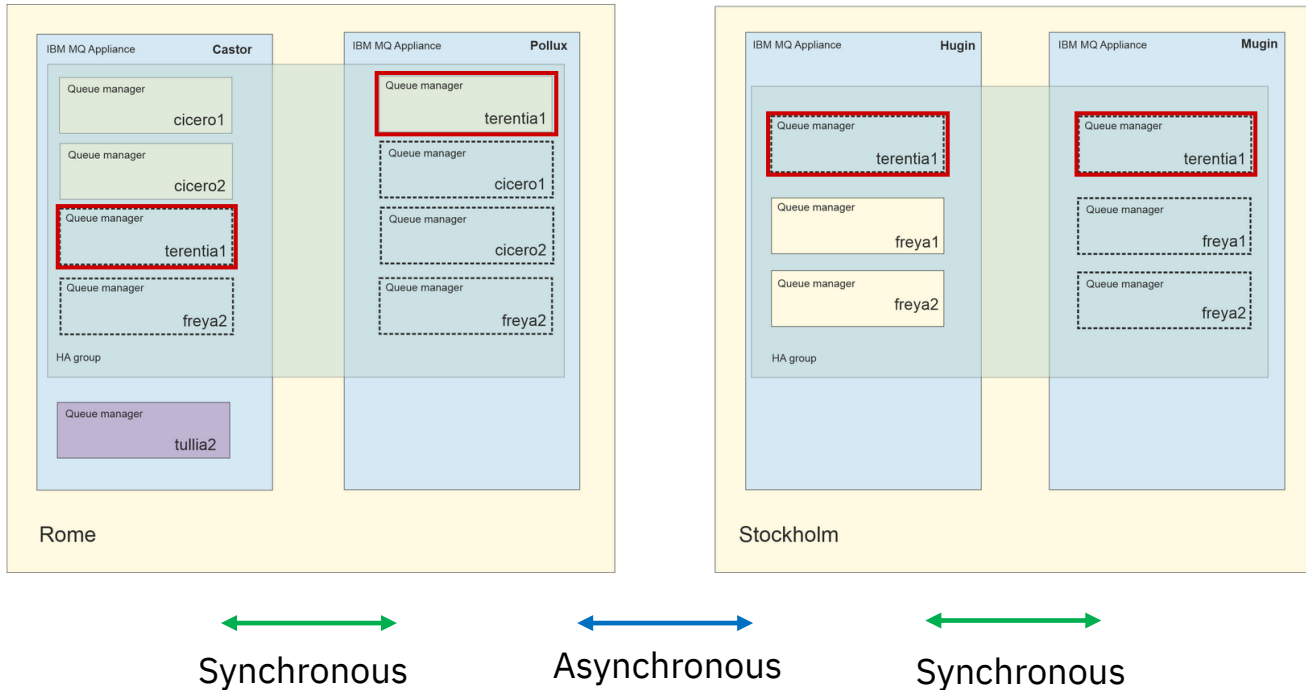
```
package mleming.apps;  
  
import javax.*;  
import com.ibm.mq.jms.*  
public class DoJMS {  
    public static void main(String[] args) {  
        //do some messaging  
    }  
}
```

3) Run app with MQ modules

```
java --module-path MQ_HOME/java/lib/modules/javax  
-m do.jms/mleming.apps.DoJMS
```


DR between two HA pairs on MQ Appliance

The MQ appliance now supports DR between two HA pairs, meaning that HA is automatically available after a DR failover, removing the manual steps that are currently required to setup an HA group after a DR failover





What's new in 9.3.3?

IBM MQ 9.3.3 CD enhancements

MQ Console
better linking,
and objects
associated with
queues

Multi
AMQP
performance
improvements

Remote REST
messaging

MQ Adv.
MQ Adv. VUE
Supported
MQ/Kafka
Connectors

MQ Adv.
Native HA
damaged object
auto recovery

z/OS
More per queue
SMF data

Appliance
CLI SSH
authentication
using certificate

Appliance
Disk space
monitoring

Remote REST messaging

We are seeing more and more customers using the MQ web server

We are gradually removing the requirement that the server is collocated with the queue managers that it interacts with:

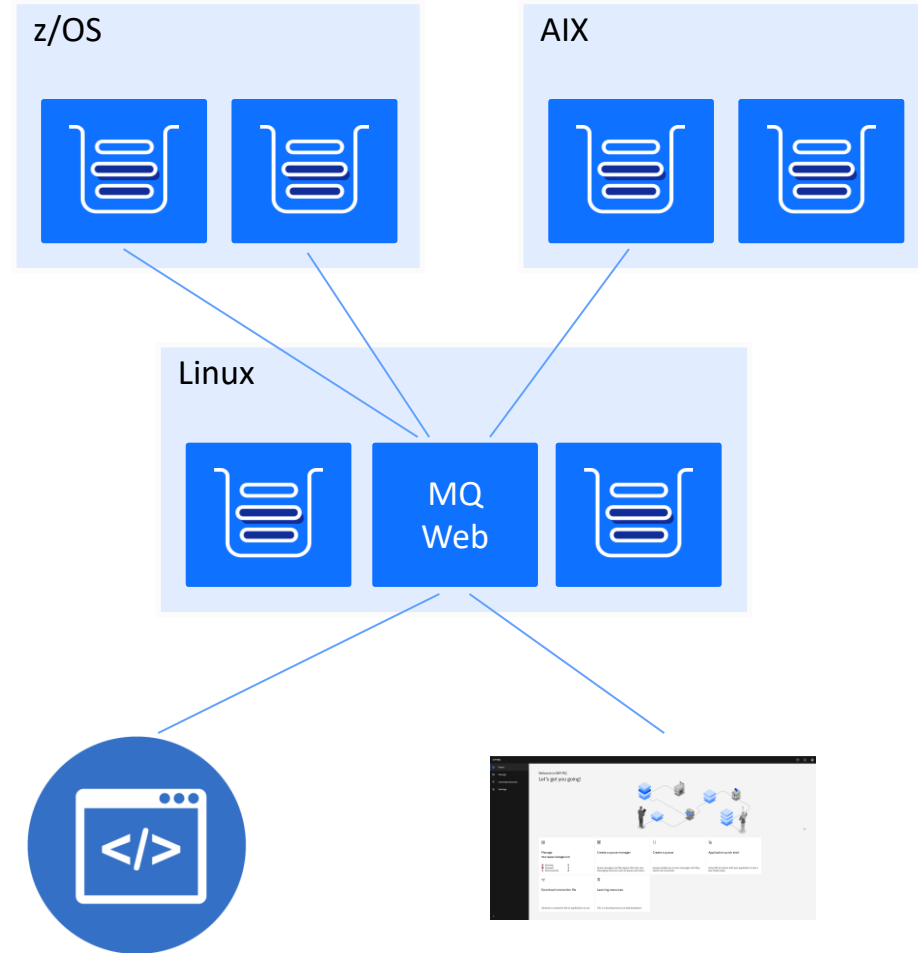
Admin REST API: REST admin gateway in 9.1.0

MQ Console: remote support in 9.3.0

Messaging REST API: remote support in 9.3.3

The last two use JSON CCDTs to connect to remote queue managers via client connections

Very useful if you want to interact with MQ on z/OS but not install the web console there



More flexible monitoring

Full set of per queue statistics completed

65 data points per queue

```
unsigned long long int qqstnppt; /* Num of non-persistent */
/* MQPUTs in interval */
unsigned long long int qqstppt; /* Num of persistent MQPUTs */
/* in interval */
unsigned long long int qqstnppl; /* Num of non-persistent */
/* MQPUTls in interval */
unsigned long long int qqstppl; /* Num of persistent MQPUTls */
/* in interval */
unsigned long long int qqstputb; /* Num of MQPUT bytes in */
/* interval */
unsigned long long int qqstptlb; /* Num of MQPUTl bytes in */
/* interval */
unsigned long long int qqstnppb; /* Num of non-persistent */
/* MQPUT bytes in interval */
unsigned long long int qqstppb; /* Num of persistent MQPUT */
/* bytes in interval */
unsigned long long int qqstnplb; /* Num of non-persistent */
/* MQPUTl bytes in interval */
unsigned long long int qqstplb; /* Num of persistent MQPUTl */
/* bytes in interval */
unsigned long long int qqstflpt; /* Num of MQPUTs failed in */
/* interval */
unsigned long long int qqstflpl; /* Num of MQPUTls failed in */
/* interval */
unsigned long long int qqstfptc; /* Num of messages fast put to*/
/* waiting getter in interval */
unsigned long long int qqstfptb; /* Num of bytes fast put to a */
/* waiting getter in interval */
unsigned long long int qqststrm; /* Num of successfully */
/* streamed messages in */
/* interval */
unsigned long long int qqstmsmi; /* Minimum message size put in*/
/* bytes in interval */
unsigned long long int qqstmsma; /* Maximum message size put in*/
/* bytes in interval */
unsigned long long int qqstmsav; /* Average message size put in*/
/* bytes in interval */
unsigned long long int qqstgets; /* Num of destructive MQGETs */
/* in interval */
unsigned long long int qqstnpgd; /* Num of Persistent */
/* destructive MQGETs */
/* in interval */
```

AMQP performance improvements

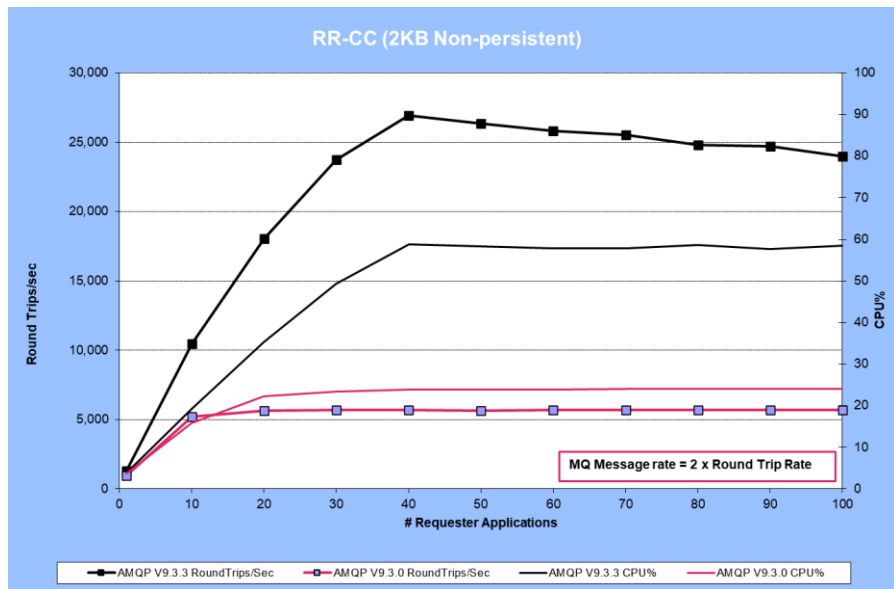
AMQP apps using QOS_AT_LEAST_ONCE have to acknowledge a message once they have processed it

When the queue manager receives the acknowledgement, it deletes the message

Prior to 9.3.3 this delete was done on a per-message basis

From 9.3.3 messages are acknowledged in batches or after a period of time has expired

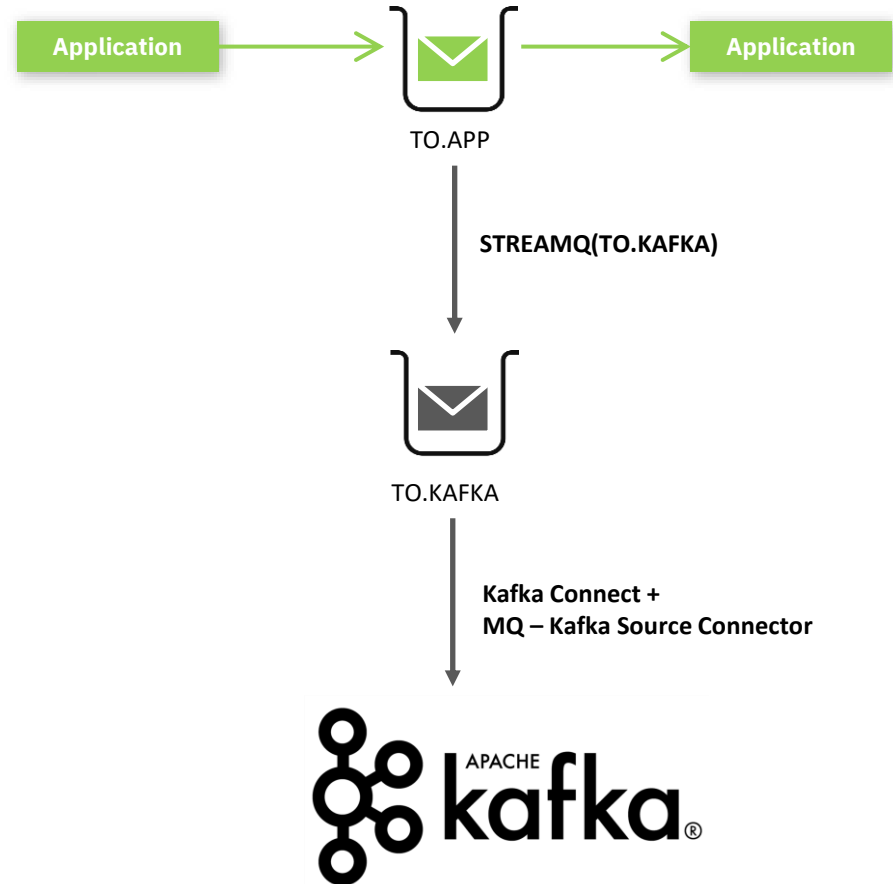
This new approach provides a big improvement in throughput



MQ and Kafka

We see many customers wanting to use MQ and Kafka together

Either because they want to stream a copy of existing data moving through MQ into Kafka



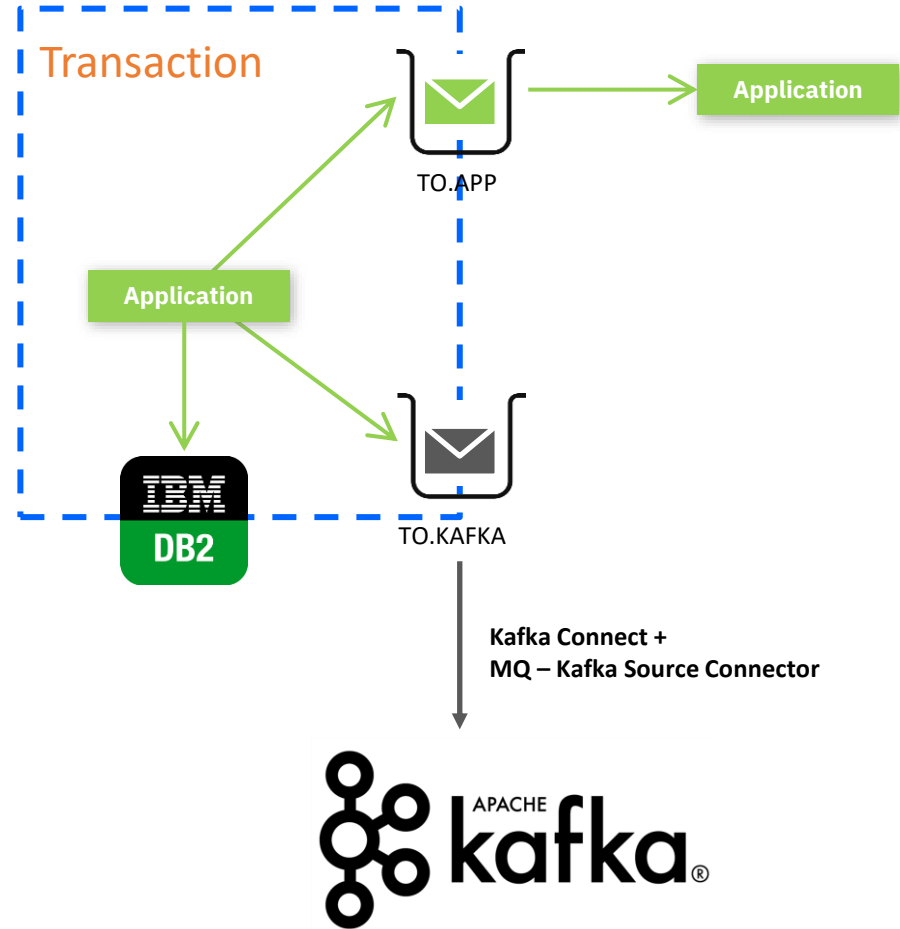
MQ and Kafka

We see many customers wanting to use MQ and Kafka together

Either because they want to stream a copy of existing data moving through MQ into Kafka

Or because they want a way to get data into Kafka that ensures data is only sent if their transaction commits

This is a very common z/OS use case



The IBM MQ / Kafka connector

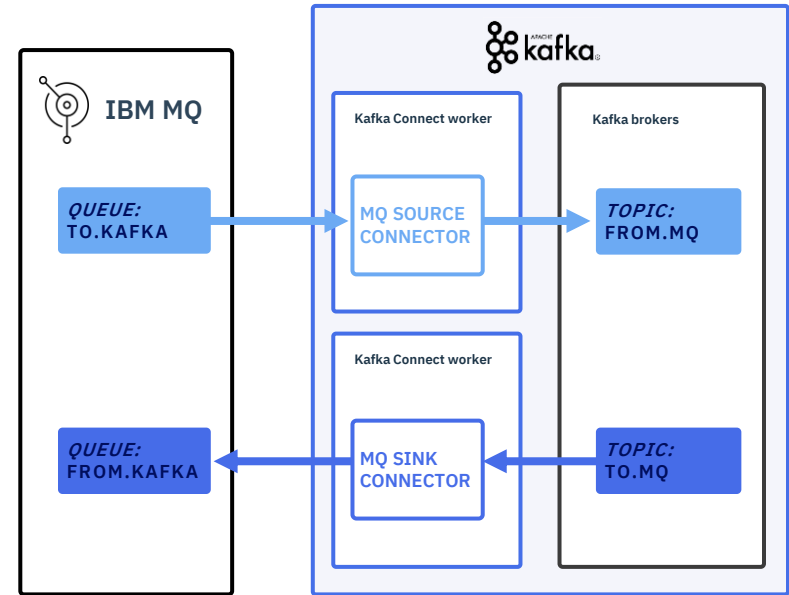
IBM provides MQ-Kafka connectors which can be used to move data between MQ and Kafka

The connectors can be used with any queue manager including those running on z/OS

Supported with either IBM Event Streams or IBM MQ Advanced entitlement, also available unsupported as open source

Connectors will be available from:

- Connector pack on z/OS (9.3.3 onwards)
- Fix Central – distributed (any version)
- GitHub releases page (any version)

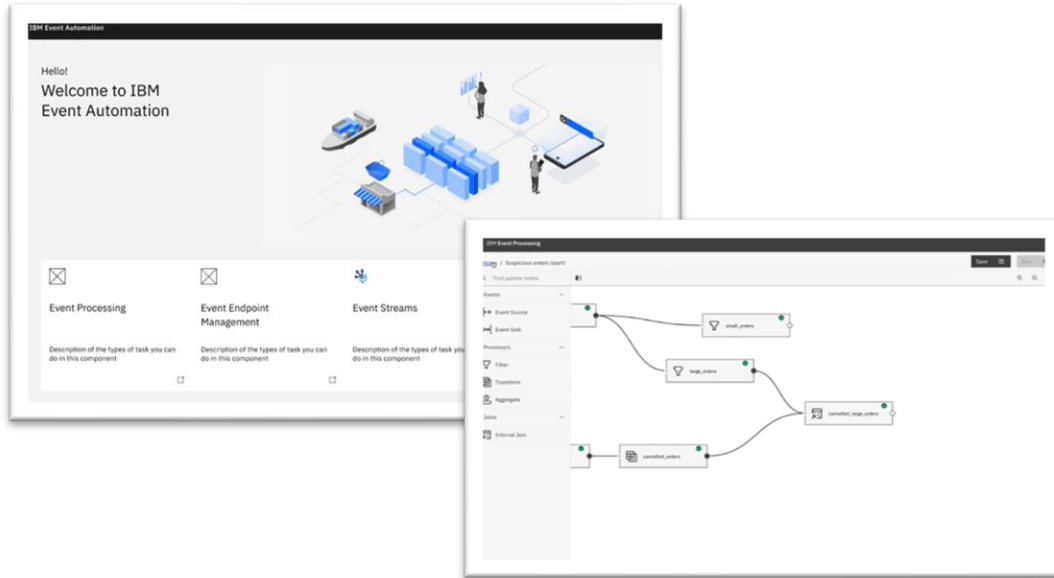


<https://github.com/ibm-messaging/kafka-connect-mq-sink/releases>

<https://github.com/ibm-messaging/kafka-connect-mq-source/releases>

IBM Event Automation

Put business event to work by enabling users to **detect** situations, **act** in real time, **automate** decisions, and maximize their revenue potential



Composable set of capabilities



Distribution

Collect streams of real-time business events with enterprise-grade Apache Kafka



Discovery

Build a self-service catalog of event sources for users to securely browse and utilize



Processing

Define business situations in an intuitive, easy-to-use authoring canvas in order to act in real-time and automate decisions



What's new in 9.3.4?

IBM MQ 9.3.4 CD enhancements



MQ Console
qmgr overview
tab

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Multi
Improvements
in media image
scheduling

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Multi
Tuning options
for log I/O
warnings

A blue square with a dark blue header bar containing the word "Multi".



Linux AIX
JSON web
tokens

A dark blue square with a green header bar containing the words "Linux" and "AIX". A red star is in the top right corner.



Multi
JMS support for
influencing
rebalancing

A blue square with a dark blue header bar containing the word "Multi".



MQ Adv.
Native HA,
smarter media
image
scheduling

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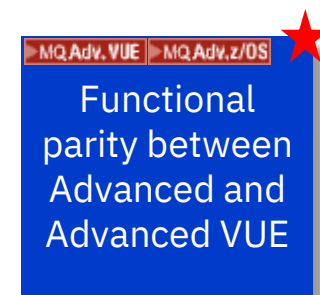
MQ Adv. MQ Adv. z/OS
MQ Adv. VUE
Exactly-once
MQ/Kafka
Connectors

A dark blue square with a dark blue header bar containing "MQ Adv." and "MQ Adv. z/OS". A red star is in the top right corner.



z/OS
Simplified Java
/ JMS
Topologies

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MQ Adv. VUE MQ Adv. z/OS
Functional
parity between
Advanced and
Advanced VUE

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z/OS
CSQ1LOGP can
deal with
message
properties

A blue square with a dark blue header bar containing the text "z/OS". A red star is in the top right corner.



Appliance
SSH support for
rsa-sha2-256 &
rsa-sha2-512
signatures

A blue square with a dark blue header bar containing the text "Appliance".

IBM MQ | What's new in v9.3.4

Upgraded resiliency, security, and ease of use across platforms.

IBM MQ | 30 Years of Innovation

eGA: October 19th 2023 (Distributed, MQ Appliance, MQ on Cloud), November 3rd 2023 (MQ for z/OS)

IBM MQ distributed and 'MQ on Cloud'



Token-based authentication ★

A new method for authentication with tokens added, improving security and centralizing identity management for queue managers running on Unix-based platforms.



Rapidly identify and resolve issues ★

Enable rapid identification and resolution of issues using a new overview dashboard in the IBM MQ Console, regardless of where or how IBM MQ is deployed.



Automated workload balancing for JMS apps

Uniform Clusters is enhanced to automatically balance JMS workloads, enabling users to build resilient, horizontally scalable messaging systems.



Faster diagnosis of OS and storage issues

New 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.



The industry's first assured MQ/Kafka connectors ★

IBM MQ Advanced now offers assured ('once-and-only-once'), bidirectional delivery of data for Apache Kafka systems with [updated Sink and Source connectors](#) so businesses can discover and act on events without loss or duplication.



Intelligent media imaging for Native HA

Automatic media imaging is provided for Native HA queue managers, reducing the network load between Native HA queue managers.



Enhanced security for containers

A read only root filesystem is enabled so that administrators can make IBM MQ containers tamper-proof and ensure no foreign executables can be written to disk in a security breach.



Containers for MacOS

MacOS developers can now build and run an IBM MQ container image natively on Apple Silicon without the need for Rosetta emulation. Instructions are published in the MQ Container [GitHub repo](#).

IBM MQ for z/OS



Message recovery from logs

z/OS administrators can use improved tools to recover messages containing message properties from logs.



Simplified MQ architecture

IBM MQ classes for JMS/Jakarta Messaging and Java applications running in a batch environment will be able to use client connectivity to any z/OS queue manager, simplifying MQ architecture.

MQ for z/OS also benefits from the MQ Console overview dashboard. Assured MQ Sink & Source connectors are made available for MQ Advanced z/OS / Advanced VUE.

IBM MQ Appliance



Industry Standard Authentication support for SSH

Using SSH certificates provides stronger security than using passwords and enables many businesses to automate deployment in a more secure manner that is consistent with other parts of their IT estate.

MQ Appliance clients benefit from the IBM MQ Console updates, automated workload balancing, and assured Kafka connectors listed in the distributed section.

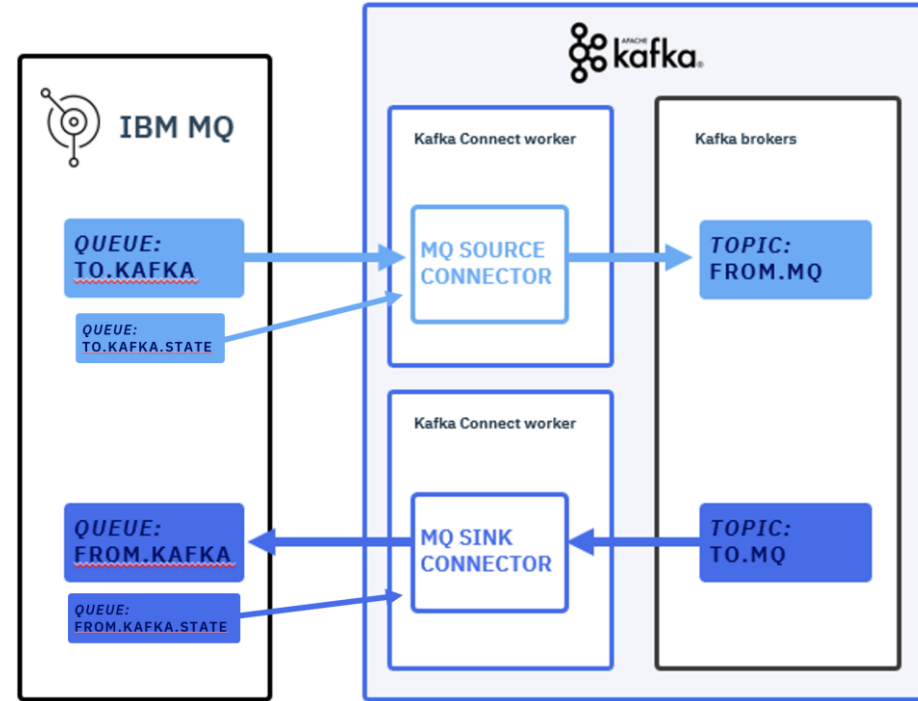
Exactly-once support

In 9.3.4, the MQ / Kafka connectors have been updated so that they support at-least-once **and exactly-once** message delivery semantics

Previous connectors only supported at-least-once. No other vendor has exactly-once MQ connectors

Updated connectors aren't open source. Can only be obtained with MQ Advanced or IBM ES entitlement

Exactly-once requires extra configuration to enable, both in MQ (a state queue), and Kafka. A relatively recent version of Kafka is also required



MQ offerings: before

OTC IBM MQ Advanced for z/OS (5655-AV9)

IBM MQ MFT for z/OS
Integrate file data into an MQ network

IBM MQ AMS for z/OS
End to end protection for message data

MLC IBM MQ z/OS (5655-MQ9)
Core MQ product

OTC IBM MQ z/OS VUE (5655-VU9)
Core MQ product

OTC IBM MQ Advanced for z/OS VUE (5655-AV1)

Connector Pack
Aspera fasp.io Gateway and Kafka Connector

Extra support for TCP/IP
Java/JMS/MFT agents connecting to remote z/OS queue managers

IBM MQ MFT for z/OS
Integrate file data into an MQ network

IBM MQ AMS for z/OS
End to end protection for message data

IBM MQ for z/OS VUE
Core MQ product

MQ offerings: now

JMS/Java batch connections will be supported to remote z/OS queue managers regardless of product entitlement

*APAR required for 9.3 and 9.2

OTC IBM MQ Advanced for z/OS (5655-AV9)

Connector Pack
Aspera fasp.io Gateway and Kafka Connector

Extra support for TCP/IP
MFT agents connecting to remote z/OS queue managers

IBM MQ MFT for z/OS
Integrate file data into an MQ network

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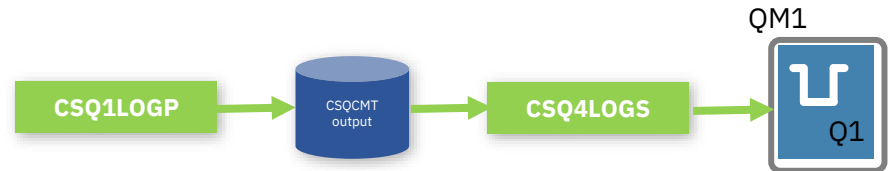
IBM MQ for z/OS VUE
Core MQ product

CSQ1LOGP EXTRACT supports message properties

CSQ1LOGP EXTRACT enhanced to fully extract messages with message properties, with the message properties going into an RFH2 header

This means that, if needed, those messages can be replayed, including the properties, using CSQ4LOGS, just like any other message

```
//STEP1 EXEC PGM=CSQ1LOGP,REGION=0M
//STEPLIB DD DISP=SHR,DSN=thlqua1.SCSQANLE
//          DD DISP=SHR,DSN=thlqua1.SCSQAUTH
//          DD DISP=SHR,DSN=thlqua1.SCSQLOAD
//ARCHIVE DD DISP=SHR,DSN=xxx.yyy.A0030620
//          DD DISP=SHR,DSN=xxx.yyy.A0030621
//SYSPRINT DD SYSOUT=*
//SYSSUMRY DD SYSOUT=*
//CSQCMT DD DSN=xxx.MSGS.COMMIT,
// DISP=(NEW,CATLG),SPACE=(CYL,(1,10),RLSE),UNIT=SYSDA
//SYSIN DD *
EXTRACT(YES) SUMMARY(NO)
URID(XXXXXXXXXXXX)
/*
//STEP2 EXEC PGM=CSQ4LOGS,PARM=('QM1 REPLAY'),REGION=0M
//STEPLIB DD DSN=thlqua1.SCSQANLE,DISP=SHR
//          DD DSN=thlqua1.SCSQAUTH,DISP=SHR
//          DD DSN=thlqua1.SCSQLOAD,DISP=SHR
//FILEIN DD DSN=xxx.MSGS.COMMIT,DISP=SHR
//SYSDBOUT DD SYSOUT=*
//SYSABOUT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
/*
```

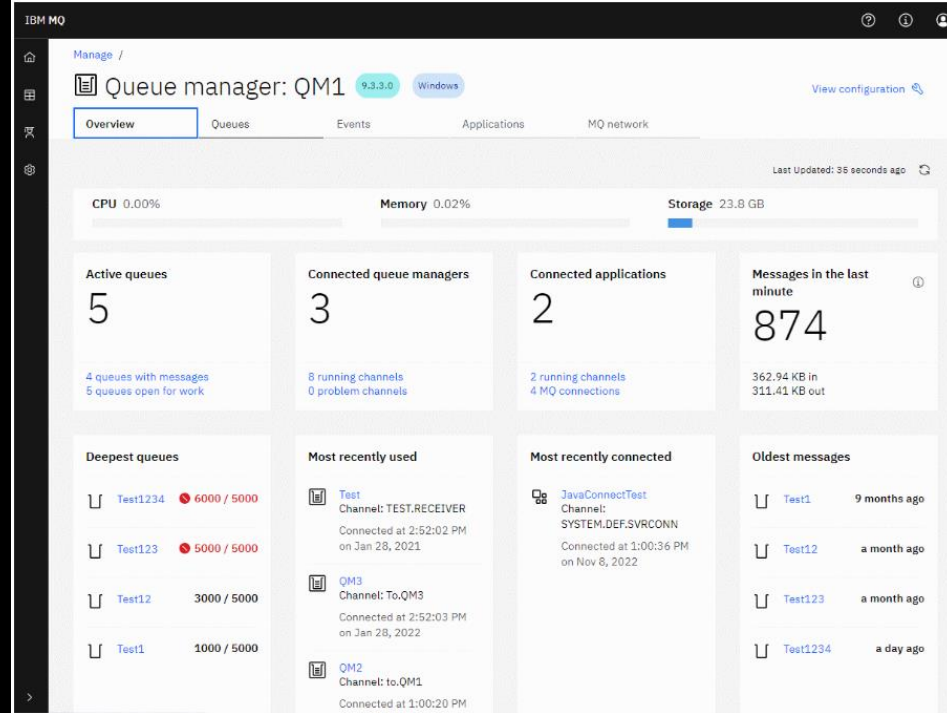


New overview tab for queue managers in IBM MQ Console

The IBM MQ Console **overview** tab of the queue manager page, introduced in v9.3.4, displays information about a queue manager and the resources it is consuming

- ✓ Eliminate manual look-up
- ✓ Immediately understand the overall state of a queue manager
- ✓ Act on any emerging problems before they become issues

Some of the information is derived from monitoring system topics so not everything is available on z/OS



Small demo

IBM MQ | 9.3.4 MQ Console Overview Dashboard

Available in IBM MQ v9.3.4



v9.3.4 introduces a Console **overview** tab displaying information about a queue manager and the resources it is consuming.

- ✓ Eliminate manual look-up
- ✓ Immediately understand the overall state of a queue manager
- ✓ Act on any emerging problems before they become issues

Queue manager: QM1 9.3.3.0 Windows

Overview Queues Events

CPU 0.00% Memory Storage 23.1%

Active queues 5

Connected queue managers 3

Connected applications 2

Messages in the last minute 874

Deepest queues

Queue Name	Current	Limit
Test1234	6000	5000
Test123	5000	5000
Test12	3000	5000
Test1	1000	5000

Most recently used

- Test Channel: TEST.RECEIVER Connected at 2:52:02 PM on Jan 28, 2021
- QM3 Channel: To,QM3 Connected at 2:52:03 PM on Jan 28, 2022
- QM2 Channel: to,QM1 Connected at 1:00:20 PM

Most recently connected

- JavaConnectTest Channel: SYSTEM.DEF.SVRCONN Connected at 1:00:36 PM on Nov 8, 2022

Oldest messages

- Test1 9 months ago
- Test12 a month ago
- Test123 a month ago
- Test1234 a day ago

Callout Boxes:

- See if the Queue Manager is under pressure (CPU, Memory, Storage). These will map to different metrics on each form factor.
- See the number of connected applications, channel instances and MQ connections.
- Gain confidence that everything is fine, by seeing the number of messages passing through the Queue Manager.
- If the queue manager is part of a "MQ Network", show the connected Queue Managers.
- See if any queues are becoming full – and need action.
- See activity within the MQ Network from this Queue Managers view point.

MQ available in IBM z/OS Cloud Broker

IBM MQ | 30 Years of Innovation

The screenshot shows the Red Hat OpenShift console interface. The left sidebar contains navigation options: Administrator, Home, Operators (OperatorHub, Installed Operators), Workloads, Networking, Storage, Builds, Pipelines, Observe, Compute, User Management, and Administration. The main content area displays the 'Installed Operators' for the 'Project: mayur-test' namespace. A table lists several operators, with the 'IBM Z and Cloud Modernization Stack - MQ Resources Operator' highlighted by a red border. This operator is managed in the 'mayur-test' namespace and is in a 'Succeeded' state. It provides APIs for managing local queues, alias queues, and server connection channels.

Name	Managed Namespaces	Status	Last updated	Provided APIs
DevWorkspace Operator 0.22.0 provided by Devfile	All Namespaces	Succeeded Up to date	13 Sept 2023, 17:44	DevWorkspace DevWorkspaceTemplate DevWorkspaceOperatorConfig
IBM Cloud Pak foundational services 3.23.7 provided by IBM	All Namespaces	Succeeded Up to date	13 Sept 2023, 17:46	CommonService
IBM Wazi for Dev Spaces 3.0.0 provided by IBM	All Namespaces	Succeeded Up to date	13 Sept 2023, 17:46	IBM Wazi for Dev Spaces IBM Wazi for Dev Spaces - License
IBM® z/OS® Cloud Broker 2.2.3-d090f22 provided by IBM	NS mayur-test	Succeeded Up to date	26 Sept 2023, 15:03	Operator Collection SubOperator Config z/OS Endpoint z/OS Cloud Broker
IBM Z and Cloud Modernization Stack - MQ Resources Operator 1.0.0 provided by IBM	NS mayur-test	Succeeded Up to date	28 Sept 2023, 19:48	Manage MQ Local Queues Manage MQ Alias Queues Manage MQ SvcConn Channels
Red Hat OpenShift Pipelines 1.11.1 provided by Red Hat	All Namespaces	Succeeded	13 Sept 2023, 17:43	-

Use Red Hat OpenShift to easily deploy resources to z/OS, in your hybrid cloud. Now including:

- Local and alias queues
- Server connection channels

https://github.com/IBM/zos_mq_operator

IBM MQ | v9.3.4 Token-based authentication

Available in IBM MQ v9.3.4 and above on Unix-based platforms (inc. AIX®, Linux®, and OpenShift® Container Platforms.)

IBM MQ uses a password-less approach to authentication with JSON Web Tokens (JWT) enabling applications to operate in a secure, Multi-Factor Authentication (MFA) environment.

Secure

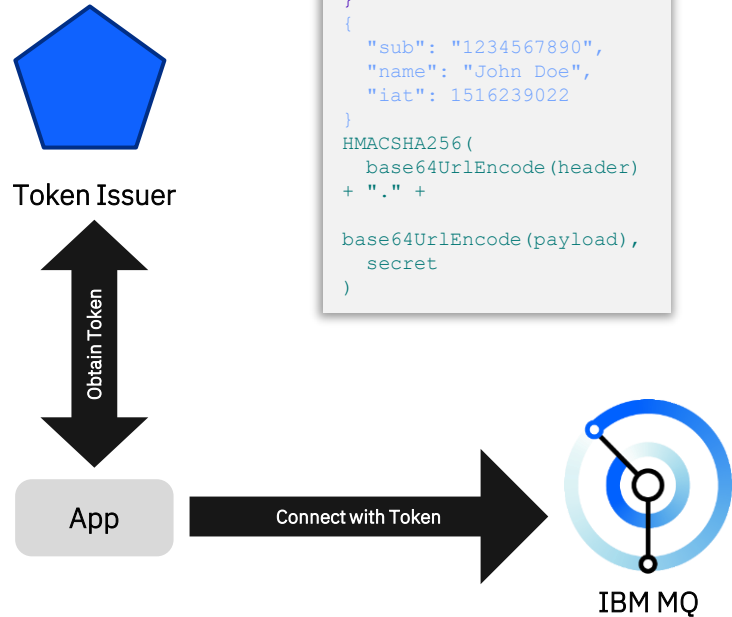
Token-based authentication eliminates the need for storing and transmitting passwords, which can be a security vulnerability.

Scalable

You can use one trusted issuer so your applications can authenticate with many services without separately registering with all of them.

Flexible

Tokens can be used across multiple, diverse applications or other endpoints, enabling easier secure collaboration between enterprises and platforms.



IBM MQ Appliance SSH Password and Certificate Authentication

- SSH service enhanced to support standard password and certificate authentication
- CA-signed certificates simplify automation and offer improved security over passwords
- Revoke individual user certificates, if required

The screenshot shows the 'Modify RBM Settings' page in the IBM MQ Appliance web interface. The page title is 'Modify RBM Settings' with a star icon. Below the title, there are buttons for 'Apply', 'Cancel', and 'Undo'. The 'RBM-Settings status: [up]' is displayed. The navigation menu includes 'Main', 'Authentication', 'Credential-mappi...', 'Password policy', 'Account policy', and 'SSH authenticati...'. The 'SSH authentication method' is set to 'CA-signed user certificate, Password'. The 'CA user public key file (Required)' section includes a 'Select a directory (Required)' field with the value 'cert:///', a 'Select a file (Required)' field with the value 'mqa-ssh-user-ca.pub', and an 'Add' button. The 'Revoked Keys' section shows a table with one entry: 'bob-key.pub' with a 'Remove Item' button.

```
$ ssh -i admin-key admin@m2003a00
m2003a00
Unauthorized access prohibited.

Welcome to IBM MQ Appliance M2003A console configuration.
Copyright IBM Corporation 1999, 2023

Version: MQ00.9.3.3.0 build 351779mq on May 11, 2023 12:31:32 PM
Delivery type: CD
Serial number: 0123456

mqa#
```



Other MQ news

IBM MQ maintenance

Effective January 2023 for all in-support releases.

Two types of maintenance for distributed platforms:

- **Fix packs**
Cumulative updates for Long Term Support (LTS) releases, as per previous practice.
- **Cumulative security updates (CSUs)**
Smaller updates that provide security fixes and which are released monthly (when required).

This model also applies to the JMS, MFT and web UI features on z/OS, but the model for other z/OS maintenance remains unchanged.

How do I obtain and install CSUs?

CSUs are provided as per fix packs and they are installed in the same way.

How do I identify fix packs and CSUs?

The V.R.M.F is updated for both. Fix packs are identified by an F-digit that is a multiple of 5 (5, 10, 15, ...), and CSUs use the other F-digit values (1, 2, 3, 4, 6, 7, ...).

Are updates cumulative?

Yes. Each CSU is built on the latest fix pack that precedes it.

What releases are CSUs produced for?

All LTS releases (including those in extended support), plus the latest CD release.

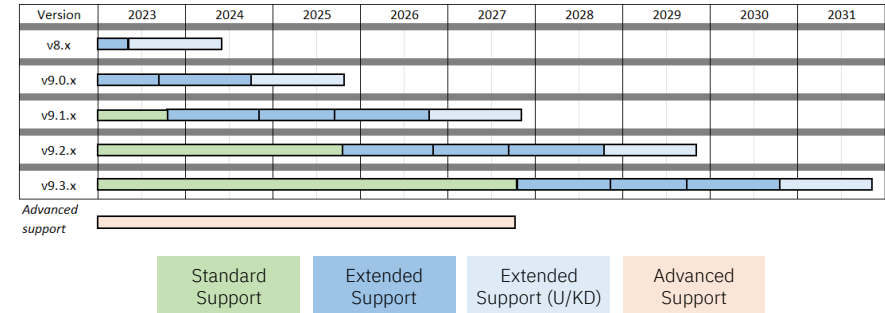
<https://www.ibm.com/support/pages/changes-ibm-mqs-maintenance-delivery-model>

IBM MQ | Extended Support changes

On April 18th 2023, IBM announced [expanded support options for select software programs](#) for clients with active S&S:

- **IBM Extended Support** - provides an additional four years of extended support for end-of-support versions or releases to enable a client to execute a migration or upgrade.
- **IBM Advanced Support** - an enhanced experience with prioritized case handling and shorter response time objectives. Available during Standard Support phase only.
- **IBM Sustained Support** – for IBM programs that have been withdrawn from market and their end-of-support date reached.

Version	V8.x	V9.0.x	V9.1.x	V9.2.x	V9.3.x
Standard support	Ended 30-Apr-2020	Ended 30-Sep-2021	Available until 30-Sep-2023	End of Support has not yet been announced GA: 2020 with 5 years of support so EoS is estimated 30-Sep-2025	End of Support has not yet been announced GA: 2022 with 5 years of support so EoS is estimated 30-Sep-2027
Extended support	Available for +3 years until 30-Apr-2023	Available for 3 years until 30-Sep-2024 Support includes: • fixes for new defects • fixes for known defects • usage • security patches	Available for 3 years until 30-Sep-2026 Support includes: • fixes for new defects • fixes for known defects • usage • security patches	Available for 3 years until ~30-Sep-2028 Support includes: • fixes for new defects • fixes for known defects • usage • security patches	Available for 3 years until ~30-Sep-2030 Support includes: • fixes for new defects • fixes for known defects • usage • security patches
Extended Support (Usage & Known Defect only – U/KD)	Available for +1 year until 30-Apr-2024	Available for +1 year until 30-Sep-2025	Available for +1 year until 30-Sep-2027	Available for +1 year (until ~30-Sep-2029)	Available for +1 year (until ~30-Sep-2031)



IBM MQ will move to a 5+1+3 model at the next LTS

The next major version of IBM MQ has not been announced but it is expected in mid-2024 (IBM MQ typically releases a major version every 2 years).

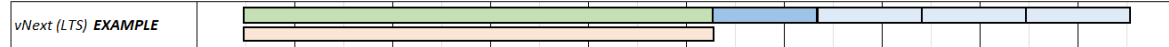
The next major version will communicate the lifecycle as part of the Announcement Letter which is standard practice.

5 years	1 year	3 years
Standard support	Extended Support <ul style="list-style-type: none"> Fixes for new critical defects Support for routine usage and how-to questions Basic troubleshooting Standard SLOs (Sev1 = 24x7) Unlimited number of technical support incidents Existing code patches and fixes (known defects) English language only support 	Extended Support <ul style="list-style-type: none"> Support for routine usage and how-to questions Basic troubleshooting Standard SLOs (Sev1 = 24x7) Unlimited number of technical support incidents Existing code patches and fixes (known defects) English language only support

Critical Defect Statement

Only for the first twelve (12) months following the announced end-of-support date of a specified version or release of the IBM Program, IBM Extended Support also includes support for new critical Program defects and certain security vulnerabilities as follows: If the Program contains a Critical/Severity 1 defect (as defined in the IBM Support Guide) when properly used in the supported operating system environment for which the Program was designed, or contains a Critical or High security vulnerability (as categorized by the Common Vulnerability Scoring System (CVSS)), IBM will use commercially reasonable efforts to provide a corrective restriction, mitigation, bypass, update, patch, or fix (collectively, a "Correction"). A Correction, if any, may require prerequisite or co-requisite fix packages, and is provided at the then-current maintenance level for the Program. IBM will not always be able to provide a Correction for a security issue. For example, IBM may determine at its sole discretion that a Correction is not feasible due to size, complexity, third party dependencies, or risk factors associated with code implementation and dependent architectural modifications.

vNext is not announced or released, this is to show an example of how the support lifecycle will change in future releases.



Key: E part Standard support X part Extended Support Y part Sustained Support Z part Advanced Support

Note that in years marked in light blue, extended support via the same X part only offers UK/D.

Deprecation statements

32-bit client app

- Both network and local bindings
- Supported throughout 9.3.0 LTS, but will be removed in a later CD or LTS release
- Customers should recompile their applications as 64-bit

AMS ciphers

- MD5, SHA1 RC2, DES and 3DES ciphers are deprecated
- Customers should migrate to use a stronger algorithm

SSLv3/TLS 1.0

- All SSLv3 and TLS 1.0 ciphers are deprecated
- Currently these must be re-enabled to be used
- Customers should migrate to stronger ciphers, either TLS 1.2 or TLS 1.3

MFT deprecations

- The `-credentialsFile` parameter of `fteObfuscate` has been replaced
- Several FTE environment variables have also been replaced
- See [documentation page](#) for details

<https://www.ibm.com/docs/en/ibm-mq/9.3?topic=930-deprecated-stabilized-removed-features-in-mq>

Deprecation statements

Blockchain Bridge

- Now removed from all supported releases
- Blockchain connectivity can be achieved with IBM App Connect or through App Connect capabilities available with IBM Cloud Pak for Integration.

CMS keystore support for Java, AMQP & MQTT

- MD5, SHA1 RC2, DES and 3DES ciphers are deprecated
- Customers should migrate to PKCS#12

runmqckm, strmikm, mqiptkeycmd & mqiptkeyman

- Runmqakm and keytool are available as alternatives

XPARM utility

The -credentialsFile parameter of fteObfuscate has been replaced

- used to migrate to Websphere MQ for z/OS® 7.0

https://www.ibm.com/docs/en/announcements/cloud-pak-integration-202341-mq-934-deliver-new-integration-capabilities-stepzen-graph-server-is-renamed#abstr__title__1

IBM MQ | AWS Partner Solution

Available now! Released 2Q 2023

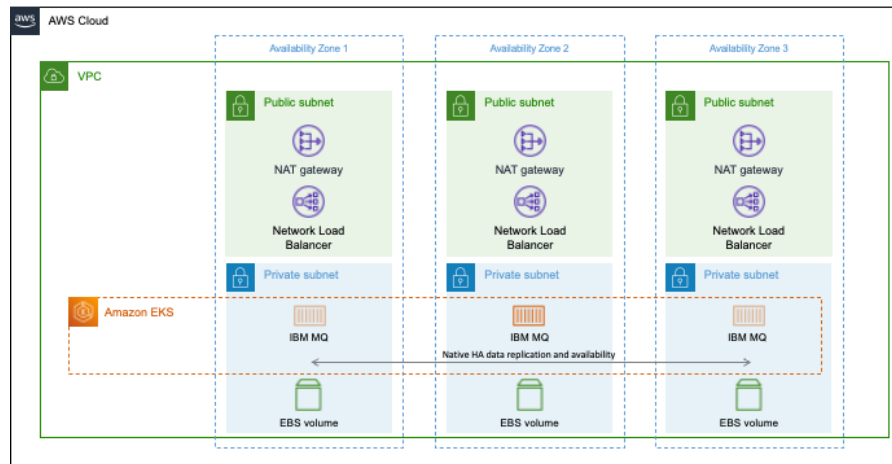
IBM MQ | 30 Years of Innovation

The IBM MQ AWS Partner Solution is a best-practice deployment of an IBM MQ Native HA queue manager running on the AWS Elastic Kubernetes Service (EKS) platform.

Reduce hundreds of manual procedures to just a few steps to build and start a best-practice deployment of IBM MQ on AWS Elastic Kubernetes Service (EKS) within minutes.

To get started, visit:

aws.amazon.com/solutions/partners/ibm-mq/



Rapid deployment

Deploy fully functional MQ software on the AWS Cloud with a single click



Proven topology

Benefit from container-ready, highly available reference architecture



Resilient connectivity

Use the market leader for reliable, secure, scalable message distribution

IBM Early Experience Programs

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- Understand and help define our future strategy and direction for the product
- Attend product Design Thinking sessions where IBM Development teams will share ideas, plans and 'mock ups' of future products and capabilities/features
- Become a 'Sponsor User' for features that interest you significantly, influencing design and implementation
- Try out the early release versions of new features in our cloud environment, no install, no hassle access
- Be invited to no-cost enablement sessions on the new features or product to understand how new features benefit your businesses and how to implement them quickly and easily

Email MQ.Early.Program@uk.ibm.com or for more details visit <https://www.ibm.com/uk-en/campaign/early-experience-programs>



About this badge:

- ✓ Fundamental IBM MQ messaging concepts
- ✓ Create and configure a queue manager
- ✓ Working understanding of MQ objects such as channels, queues, and topics.
- ✓ Develop a JMS application to solve a high-level application integration scenario

To earn the badge visit: developer.ibm.com/learningpaths/ibm-mq-badge/ or ibm.biz/learn-mq

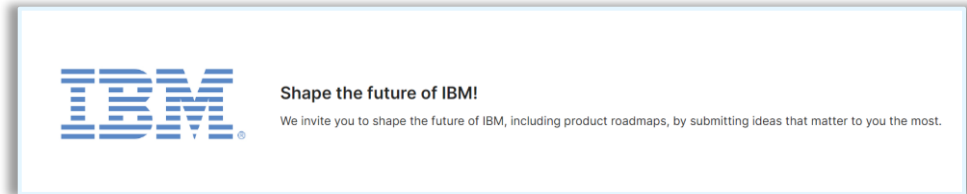
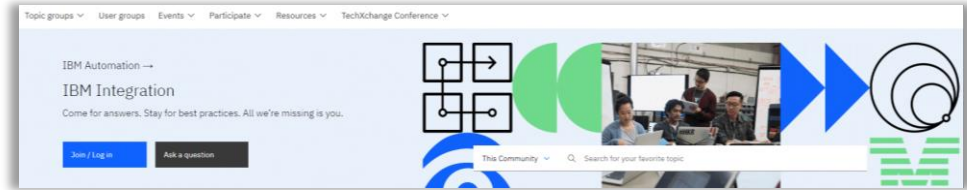


NEW! About this badge:

- ✓ Understand the benefits of deploying IBM MQ solutions on AWS cloud.
- ✓ Demonstrate skills to deploy a queue manager by using docker⁵⁶ compose, and they know about the AWS services that are used.
- ✓ Deploy an interactive sample application on AWS to showcase messaging concepts,
- ✓ Develop extensions with Node.JS.

To earn the badge visit: developer.ibm.com/learningpaths/ibm-mq-on-aws-badge/

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ibm.biz/mq-virtual

Dec 12th | IBM New York City

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ibm.biz/mq-newyork

Agenda Highlights:

- IBM MQ Innovation: Future Proof your Business
- Asynchronous Integration: MQ & Apache Kafka
- Fireside Chat: An IBM MQ Journey
- Ask the - IBM MQ Experts - Anything



David Ware, IBM MQ
CTO & Chief Architect



Eileen Lowry, IBM
VP, Product Management

... and more!

Thank you.

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