What's New in IBM MQ

April 2022 – includes IBM MQ 9.3.0

Mark Taylor

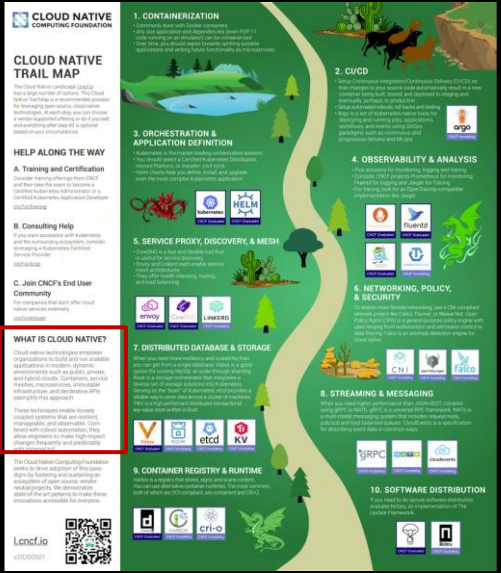
marke_taylor@uk.ibm.com

IBM Hursley

Vision: IBM MQ is the **cloud native** choice for enterprise messaging

How can IBM MQ be cloud native? What is *cloud native?*

CLOUD NATIVE
COMPUTING FOUNDATION



CLOUD NATIVE
COMPUTING FOUNDATION

CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape l.cncf.io has a large number of options. This Cloud Native Trail Map is a recommended process for leveraging open source, cloud native technologies. At each step, you can choose a vendor-supported offering or do it yourself, and everything after step #3 is optional based on your circumstances.

HELP ALONG THE WAY

A. Training and Certification

Consider training offerings from CNCF and then take the exam to become a Certified Kubernetes Administrator or a Certified Kubernetes Application Developer

cncf.io/training

B. Consulting Help

If you want assistance with Kubernetes and the surrounding ecosystem, consider leveraging a Kubernetes Certified Service Provider

cncf.io/kcsp

C. Join CNCF's End User Community

For companies that don't offer cloud native services externally

cncf.io/enduser

WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

The Cloud Native Computing Foundation seeks to drive adoption of this paradigm by fostering and sustaining an ecosystem of open source, vendor-neutral projects. We democratize state-of-the-art patterns to make these innovations accessible for everyone.

l.cncf.io

v20200501

1. CONTAINERIZATION

- Commonly done with Docker containers
- Any size application and dependencies (even PDP-11 code running on an emulator) can be containerized
- Over time, you should aspire towards splitting suitable applications and writing future functionality as microservices

2. CI/CD

- Setup Continuous Integration/Continuous Delivery (CI/CD) so that changes to your source code automatically result in a new container being built, tested, and deployed to staging and eventually, perhaps, to production
- Setup automated rollouts, roll backs and testing
- Argo is a set of Kubernetes-native tools for deploying and running jobs, applications, workflows, and events using GitOps paradigms such as continuous and progressive delivery and MLops

3. ORCHESTRATION & APPLICATION DEFINITION

- Kubernetes is the market-leading orchestration solution
- You should select a Certified Kubernetes Distribution, Hosted Platform, or Installer: cncf.io/ck
- Helm Charts help you define, install, and upgrade even the most complex Kubernetes application

4. OBSERVABILITY & ANALYSIS

- Pick solutions for monitoring, logging and tracing
- Consider CNCF projects Prometheus for monitoring, Fluentd for logging and Jaeger for Tracing
- For tracing, look for an OpenTracing-compatible implementation like Jaeger

5. SERVICE PROXY, DISCOVERY, & MESH

- CoreDNS is a fast and flexible tool that is useful for service discovery
- Envoy and Linkerd each enable service mesh architectures
- They offer health checking, routing, and load balancing

6. NETWORKING, POLICY, & SECURITY

To enable more flexible networking, use a CNI-compliant network project like Calico, Flannel, or Weave Net. Open Policy Agent (OPA) is a general-purpose policy engine with uses ranging from authorization and admission control to data filtering. Falco is an anomaly detection engine for cloud native.

7. DISTRIBUTED DATABASE & STORAGE

When you need more resiliency and scalability than you can get from a single database, Vitess is a good option for running MySQL at scale through sharding. Rook is a storage orchestrator that integrates a diverse set of storage solutions into Kubernetes. Serving as the "brain" of Kubernetes, etcd provides a reliable way to store data across a cluster of machines. TiKV is a high performant distributed transactional key-value store written in Rust.

8. STREAMING & MESSAGING

When you need higher performance than JSON-REST, consider using gRPC or NATS. gRPC is a universal RPC framework. NATS is a multi-modal messaging system that includes request/reply, pub/sub and load balanced queues. CloudEvents is a specification for describing event data in common ways.

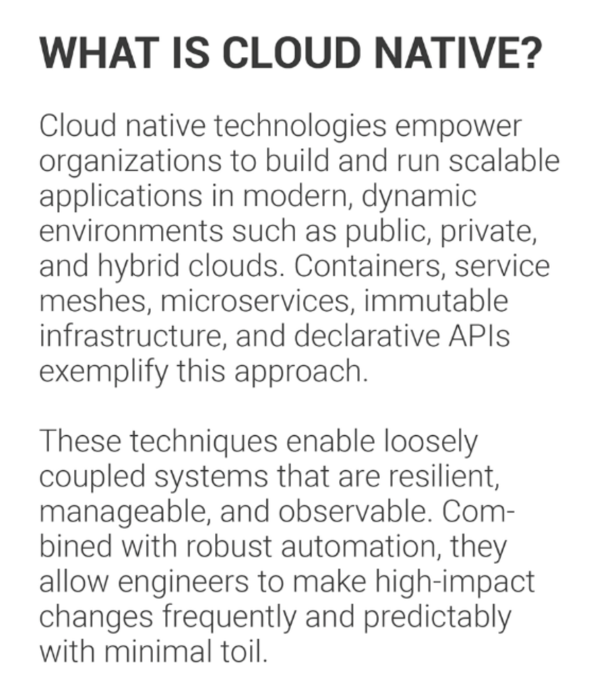
9. CONTAINER REGISTRY & RUNTIME

Harbor is a registry that stores, signs, and scans content. You can use alternative container runtimes. The most common, both of which are OCI-compliant, are containerd and CRI-O.

10. SOFTWARE DISTRIBUTION

If you need to do secure software distribution, evaluate Notary, an implementation of The Update Framework.

github.com/cncf/landscape#trail-map



WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

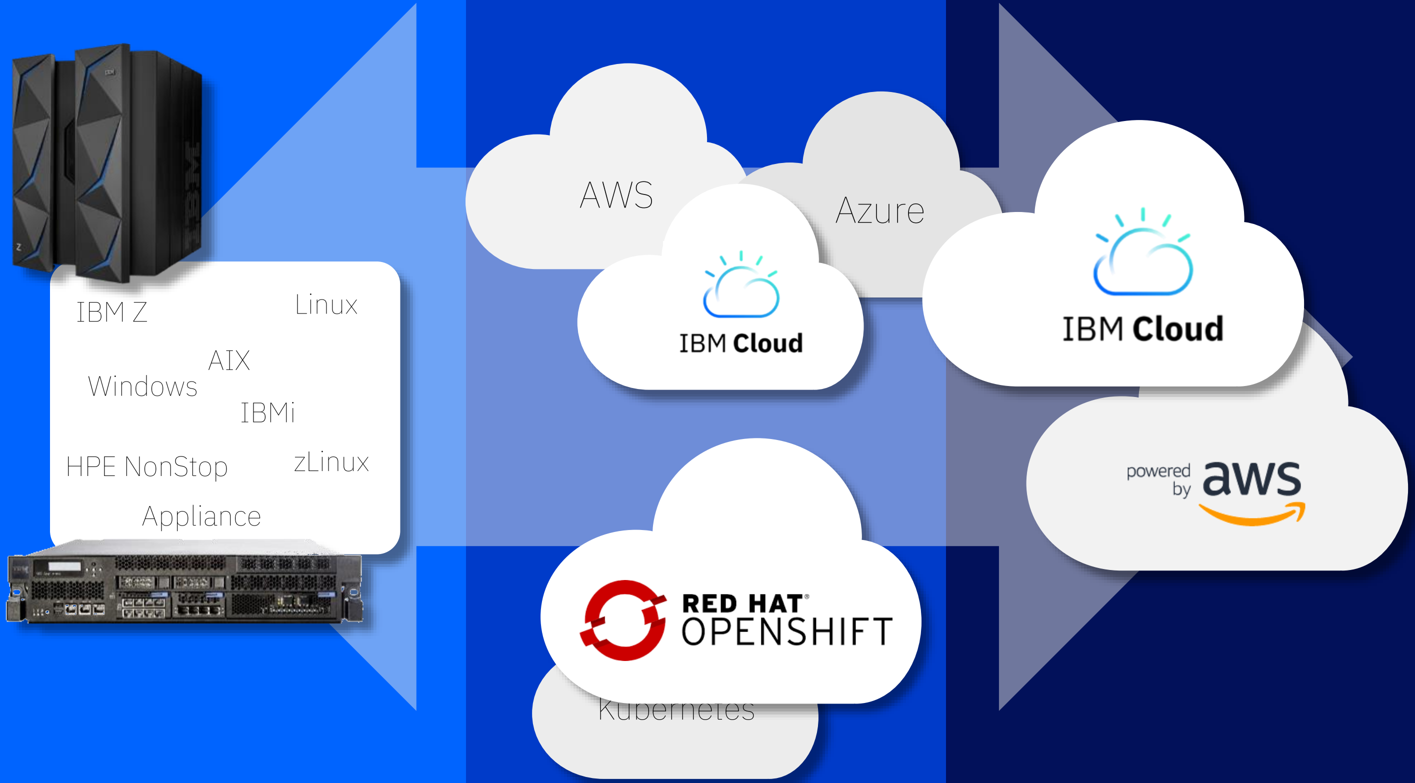
These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

A focus on where you need MQ today and tomorrow

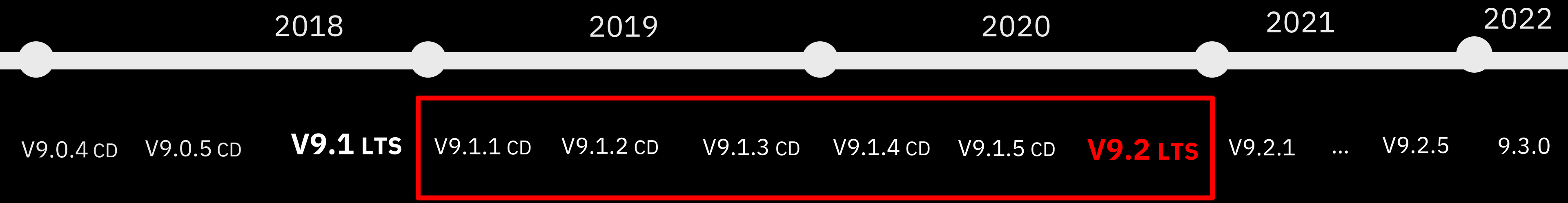
On-premise, software and the MQ Appliance, exactly as you need it

Run MQ yourself in public or private clouds, virtual machines or containers

Let IBM host MQ for you with its managed SaaS MQ service in public clouds, IBM Cloud and AWS



IBM MQ: long term support and continuous delivery



2018 2019 2020 2021 2022

V9.0.4 CD V9.0.5 CD **V9.1 LTS** V9.1.1 CD V9.1.2 CD V9.1.3 CD V9.1.4 CD V9.1.5 CD **V9.2 LTS** V9.2.1 … V9.2.5 9.3.0

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.

Requires users to migrate forward within 12 months.

Long Term Support

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

Required by those looking for fixed function.

Mix and Match

Both are available under the same license.

Both can interoperate either between servers or clients, just like any previous version of MQ.

All the function delivered in the 9.1.x CD releases is available in the long term support release **V9.2 LTS**

MQ 9.2 LTS content…

- Uniform Cluster automatic application rebalancing
- Microsoft .NET Core support
- Client connectivity with zCEE
- Developer toolkit for MacOS
- Automatic TLS CipherSpec negotiation
- Enhanced Salesforce Bridge
- Build toolkit for zCEE
- Idempotent MQSC commands
- Browse messages using REST
- MQ Appliance certificate expiry notifications
- Channel enabled AMS policies for z/OS
- JSON format CCDT
- Permitted TLS CipherSpec control
- REST messaging performance enhancements
- Full JSON-syntax REST administration
- MQ Appliance HA event notifications
- Improved distributed queue manager restart times
- Stream MQ Appliance error logs
- Rapid Uniform Cluster rebalancing
- Improved MQIPT management
- New application status checking
- ini file and MQSC injection at startup
- Escalating end queue manager
- MQFT REST list resource monitors
- Enhanced Blockchain Bridge
- WebSphere Liberty MDB pause
- New consistent MQ samples
- MFT REST create file transfer
- FTP server support on IBM I for MFT
- AMS HSM with Oracle JRE
- MQ Appliance admin activity audit logging
- XA support in Liberty for decoupled JMS connections
- Automatic Uniform Cluster configuration
- Packaged MQ Internet Passthru (IPT)
- Highly available MFT Agent deployments
- z/OS data set encryption support
- User controlled application naming
- TLS 1.3 support …
- High speed transfer over long distances with Fasp.io
- Qpid JMS shared subscriptions
- Publish messages over REST
- .NET project templates
- Increased queue size support for Distributed
- New improved Web Console
- Full HA-DR-HA replicated data queue manager deployments
- Uniform Cluster application monitoring
- Java 11 application support
- Distributed queue size control

And since then with CD ...

Idempotent delete operations	Linux upgrade in place	New Web Console accelerated experiences	**Hostname SNI routing**	Default long password support for Java apps	**AMQP point-to-point support**	**Keda scaler for autoscaling container apps**	Syncronous replication for Appliance DR	**Recreate Appliance DR secondary operation**	Native HA for CP4I
Reduced cost non-prod license	Start/stop resource monitors independently	**Containerised MFT agents on DockerHub**	Last in sync reporting for RDQM	**Failed resource action resolution control**	**TLS enabled by default for MQ on Cloud**	**Streaming Queues**	**Ansible improvements for z/OS**	Remote Admin for Web Console	**Uniform Cluster Patterns**
AT-TLS	**Java 17**	**SMF timer granularity**	Web Console Message Handling	Appliance REST API extensions					

Breaking News …

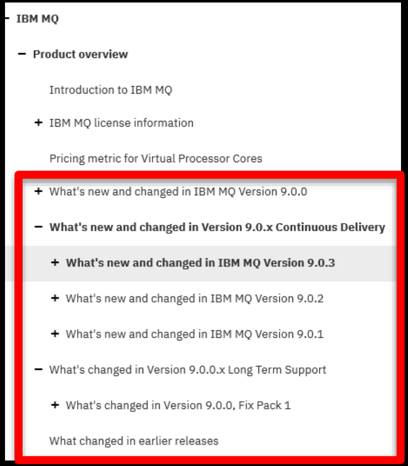
- MQ 9.3.0 (Distributed)

  announced TODAY, availability June

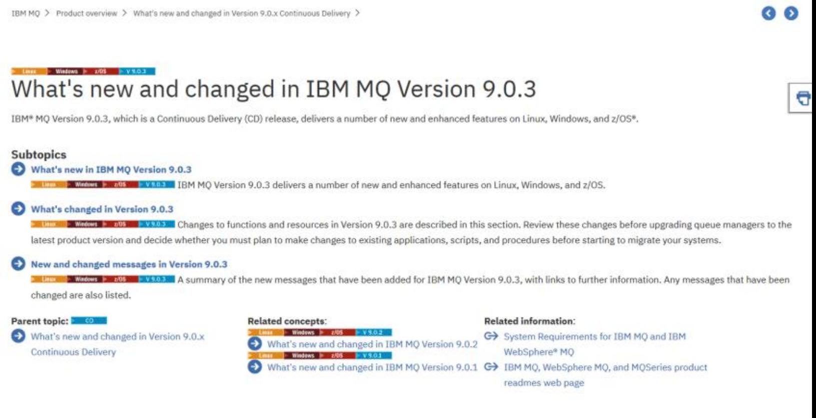
- SoD for MQ 9.3 on z/OS and Appliance

MQ release-to-release changes

Always read the **What’s new and changed** sections of the Documentation to see what each release adds



- IBM MQ
  - − Product overview
    - Introduction to IBM MQ
    - + IBM MQ license information
    - Pricing metric for Virtual Processor Cores
    - + What's new and changed in IBM MQ Version 9.0.0
    - − **What's new and changed in Version 9.0.x Continuous Delivery**
      - + **What's new and changed in IBM MQ Version 9.0.3**
      - + What's new and changed in IBM MQ Version 9.0.2
      - + What's new and changed in IBM MQ Version 9.0.1
    - − What's changed in Version 9.0.0.x Long Term Support
      - + What's changed in Version 9.0.0, Fix Pack 1
    - What changed in earlier releases



IBM MQ > Product overview > What's new and changed in Version 9.0.x Continuous Delivery >

Linux Windows z/OS V 9.0.3

What's new and changed in IBM MQ Version 9.0.3

IBM® MQ Version 9.0.3, which is a Continuous Delivery (CD) release, delivers a number of new and enhanced features on Linux, Windows, and z/OS®.

Subtopics

What's new in IBM MQ Version 9.0.3
Linux Windows z/OS V 9.0.3 IBM MQ Version 9.0.3 delivers a number of new and enhanced features on Linux, Windows, and z/OS.

What's changed in Version 9.0.3
Linux Windows z/OS V 9.0.3 Changes to functions and resources in Version 9.0.3 are described in this section. Review these changes before upgrading queue managers to the latest product version and decide whether you must plan to make changes to existing applications, scripts, and procedures before starting to migrate your systems.

New and changed messages in Version 9.0.3
Linux Windows z/OS V 9.0.3 A summary of the new messages that have been added for IBM MQ Version 9.0.3, with links to further information. Any messages that have been changed are also listed.

Parent topic: CD
What's new and changed in Version 9.0.x Continuous Delivery

Related concepts:
Linux Windows z/OS V 9.0.2
What's new and changed in IBM MQ Version 9.0.2
Linux Windows z/OS V 9.0.1
What's new and changed in IBM MQ Version 9.0.1

Related information:
System Requirements for IBM MQ and IBM WebSphere® MQ
IBM MQ, WebSphere MQ, and MQSeries product readmes web page

MQ in Containers, continually evolving

MQ first supported Docker containers in 2015, showing how a stateful solution can run in an often stateless world.

docker

MQ was one of the first certified containers available on IBM's Kubernetes platform, IBM Cloud Private. Showing how to run MQ in a managed container environment.

MQ added support for running on Red Hat OpenShift

Red Hat OpenShift

MQ is a core component of IBM's Cloud Pak for Integration, providing enterprise messaging for the Integration Platform solution

2015 **hub.docker.com/r/ibmcom/mq** **github.com/ibm-messaging/mq-container** 2021

MQ within the Cloud Pak for Integration

Strategic focus

IBM is committed to building ever increasing value into its IBM and Red Hat OpenShift platform

Red Hat OpenShift

Certified Container

Production ready container images with a Kubernetes Operator that simplifies the operational activities

Deep Insight

Built-in emission of logging and tracing data, empowering developers and administrator to observe and troubleshoot

Flexible Adoption

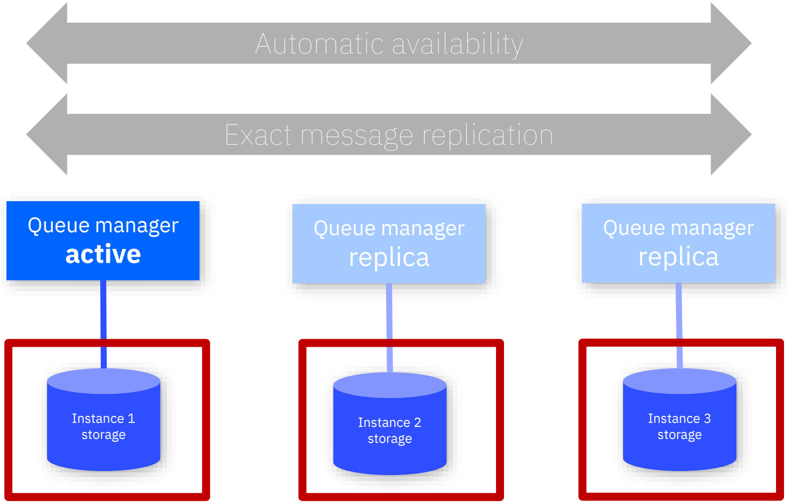
A flexible deployment model allowing traditional software and container technology to be adopted at your own speed

Cloud native availability

Replication and consensus

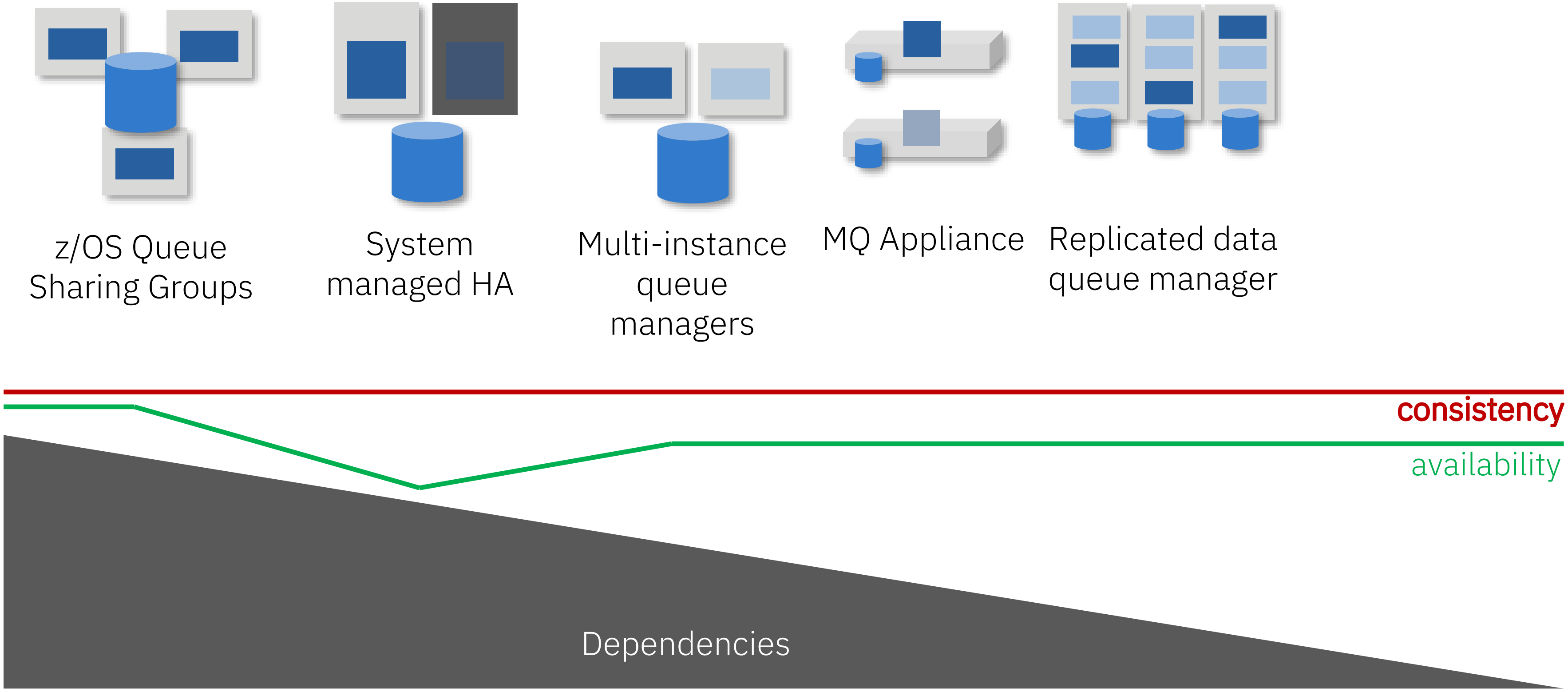
MQ Native HA

New in MQ 9.2.3
Available for OpenShift with
Cloud Pak for Integration



Messages persisted in three locations
Exact replicas, maintaining configuration, message order, transactional state
Quorum ensures consistency and rapid failure detection and recovery

Constantly evolving to meet your availability needs



z/OS Queue Sharing Groups

System managed HA

Multi-instance queue managers

MQ Appliance

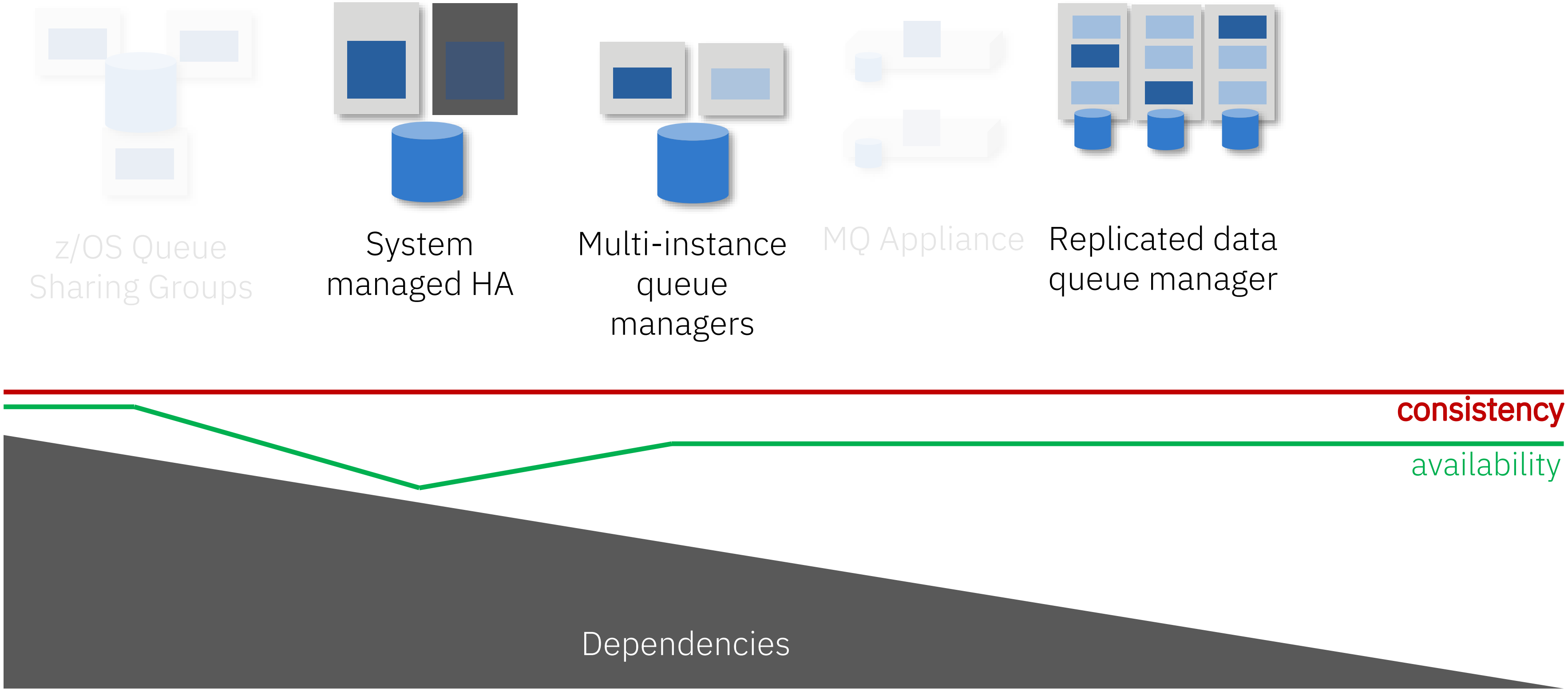
Replicated data queue manager

consistency

availability

Dependencies

Message availability in the cloud



z/OS Queue Sharing Groups

System managed HA

Multi-instance queue managers

MQ Appliance

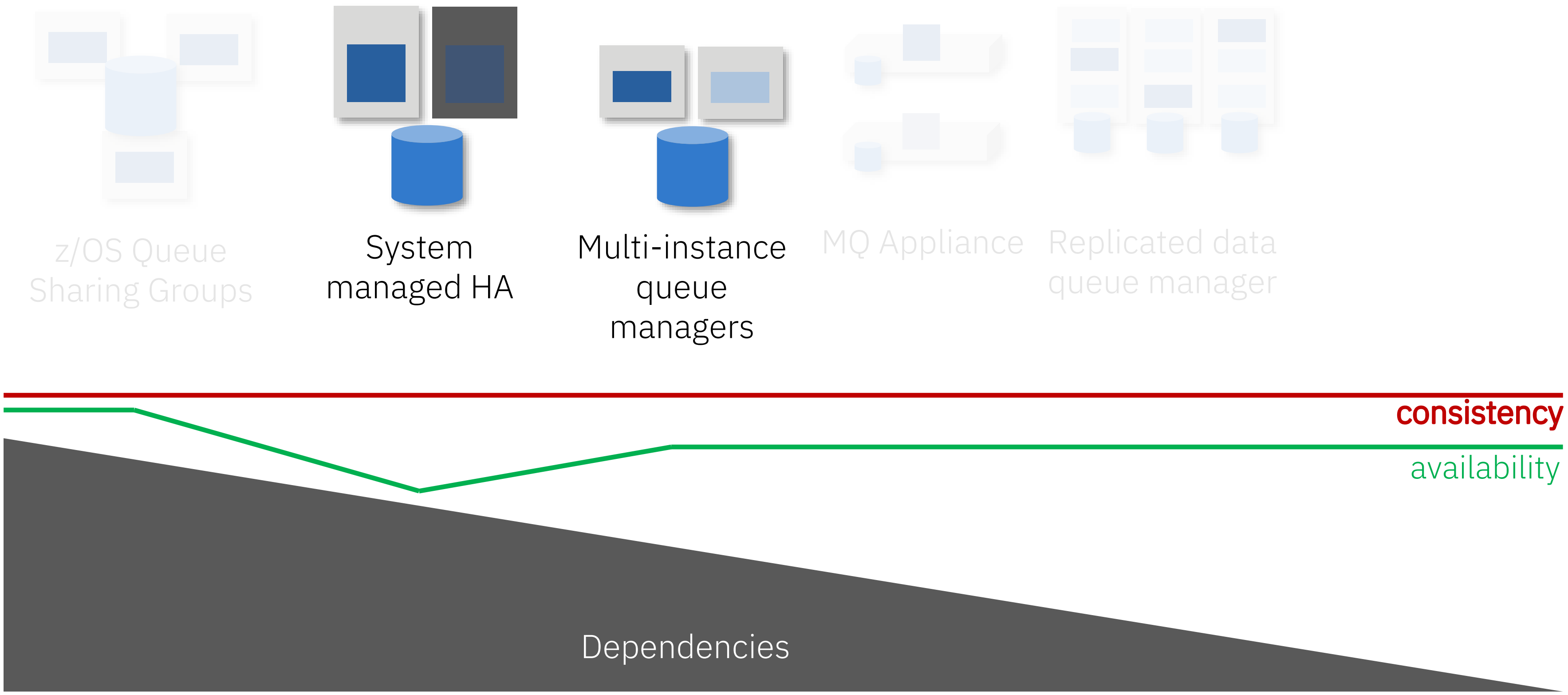
Replicated data queue manager

consistency

availability

Dependencies

Message availability in containers



z/OS Queue Sharing Groups

System managed HA

Multi-instance queue managers

MQ Appliance

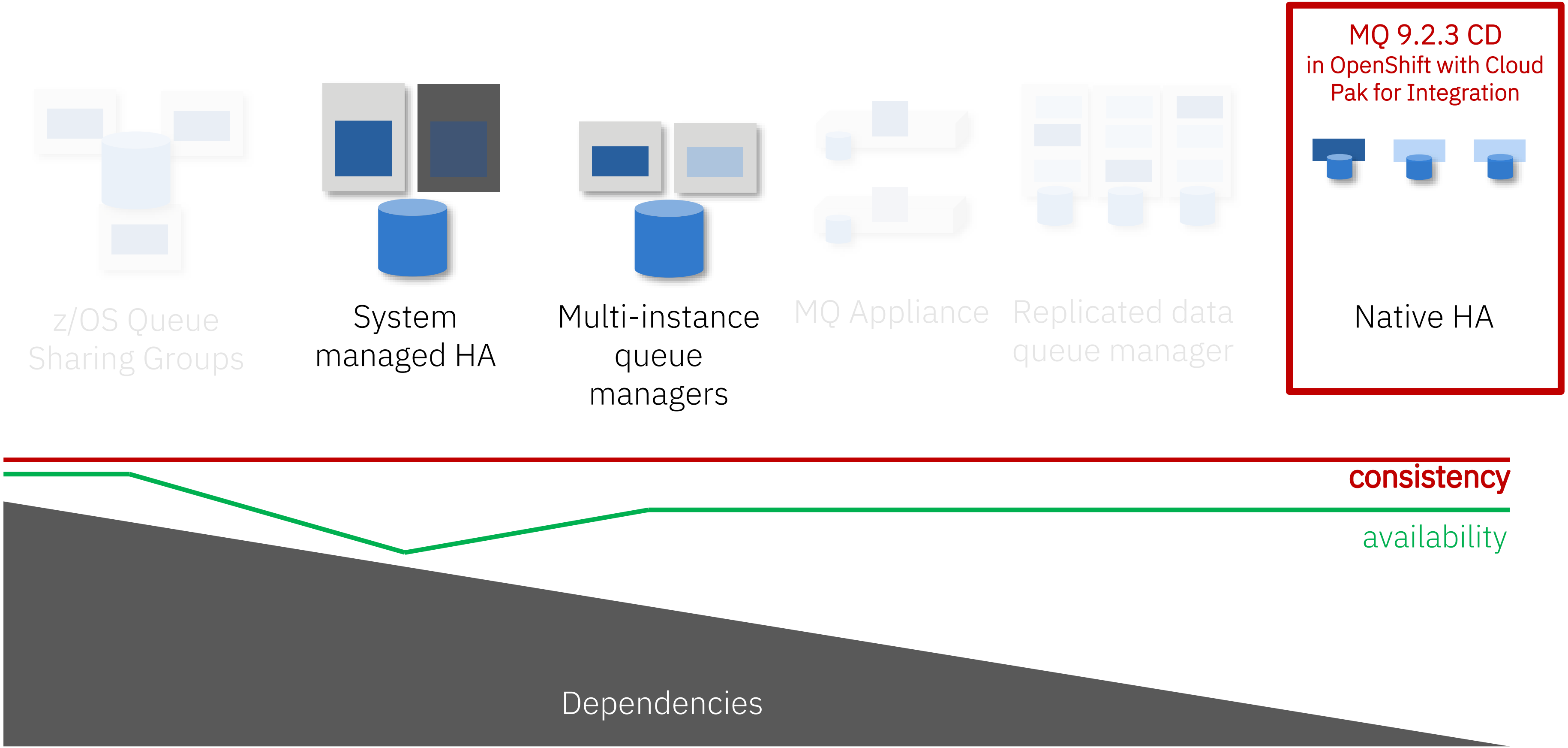
Replicated data queue manager

consistency

availability

Dependencies

Cloud native message availability


MQ 9.2.3 CD
in OpenShift with Cloud Pak for Integration
z/OS Queue Sharing Groups
System managed HA
Multi-instance queue managers
MQ Appliance
Replicated data queue manager
Native HA
consistency
availability
Dependencies

MQ Native HA

Solution: Convert MQ’s persistence layer to be cloud native

New in MQ 9.2.3
Available for OpenShift with
Cloud Pak for Integration

Problems to solve: MQ persistent data replicated across AZs
Consistency across replicas guaranteed
Fast and reliable failure detection and fail over

Raft

A proven, yet *understandable*, consensus algorithm

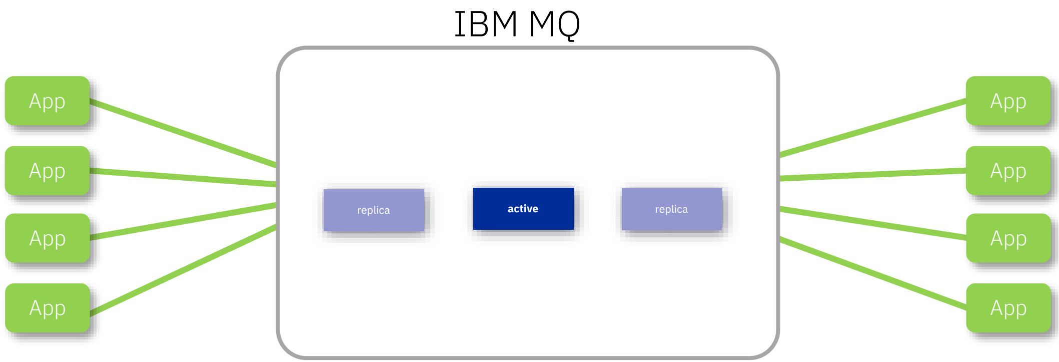
Based on the concept of a **sequential log of state changes**

IBM MQ

A proven, high performing and reliable, messaging solution

Built from day one around a **sequential log of state changes**

A messaging and event service



Purpose

Loosely couple applications

Shield applications from their own availability issues

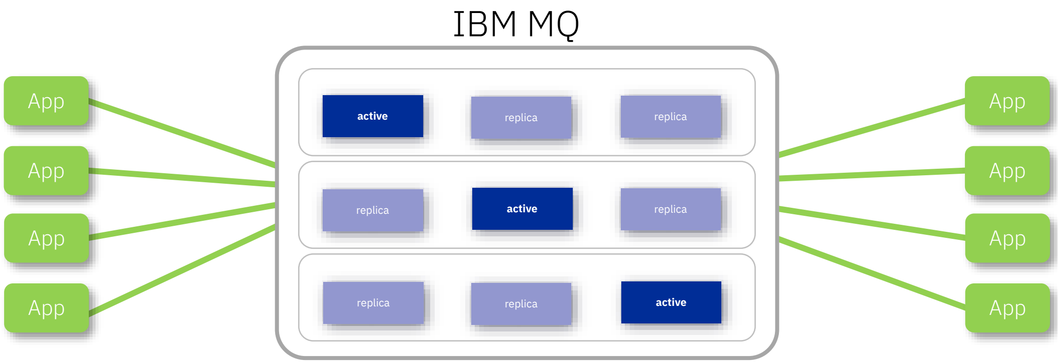
Requirements

Scale with the application

Don’t lose the messages

Be more available than the applications

A messaging and event service



Purpose

Loosely couple applications

Shield applications from their own availability issues

Requirements

Scale with the application

Don’t lose the messages

Be more available than the applications

Always-on

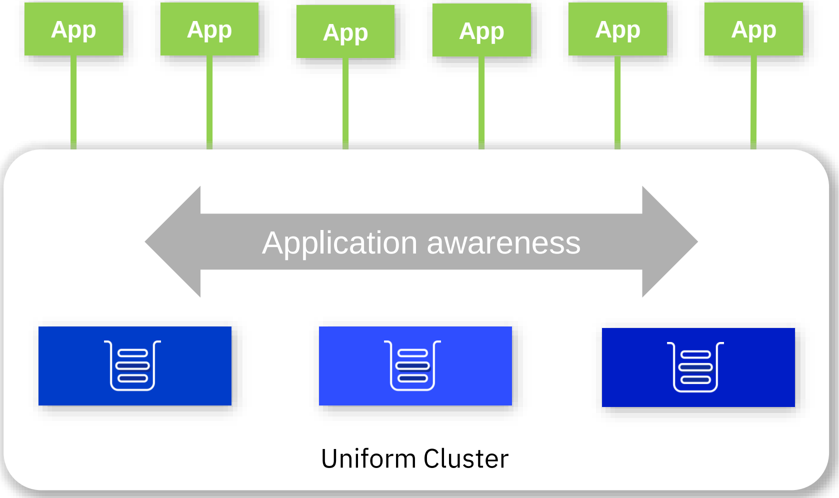
Building scalable, active-active, solutions

Always-on MQ

To provide an active/active, solution you need to consider multiple active queue managers acting as a *single messaging service*

Applications should treat the queue managers as interchangeable and want to connect to the group in the most efficient and available distribution

With IBM MQ 9.2 LTS, queue managers can form a **uniform cluster**, each queue manager provides the same messaging capabilities

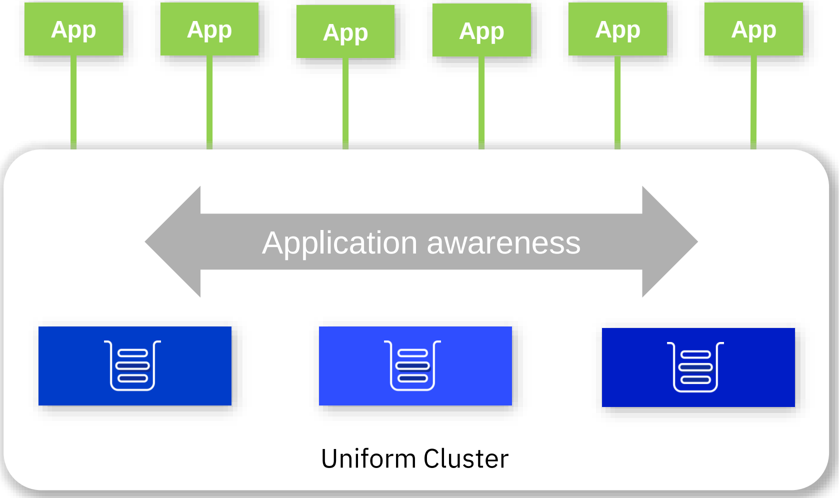


Always-on MQ

To provide an active/active, solution you need to consider multiple active queue managers acting as a *single messaging service*

Applications should treat the queue managers as interchangeable and want to connect to the group in the most efficient and available distribution

With IBM MQ 9.2 LTS, queue managers can form a **uniform cluster**, each queue manager provides the same messaging capabilities



Application language and environment support has been growing ever since MQ first delivered uniform clusters.

IBM MQ 9.2.3 Resource Adapter adds JEE Message Driven Bean support to automatically balance your clustered MDB applications.

New in MQ 9.2.3 Resource Adapter

Java EE™

As of MQ 9.2.3

Increased range of application styles supported with uniform clusters

Uniform clusters work best with decoupled applications, ones that have little affinity or have been designed appropriately for active/active deployments

Good use cases

Applications that can handle being moved from one queue manager to another without even realising and can run with multiple instances

- Datagram producers, e.g. events
- Services that respond to request messages
- No message ordering requirements
- MDBs

Poor use cases

Applications that create persistent state across multiple messaging operations, or require a single instance to be running

- Requestors waiting for specific replies
- Dependant on message ordering
- Transactional applications (‘works’, but far from optimal)
- ‘Managed’ environments (e.g. JEE)

From MQ 9.2.4

Increased range of application styles supported with uniform clusters

Uniform clusters work best with decoupled applications, ones that have little affinity or have been designed appropriately for active/active deployments

Good use cases

Applications that can handle being moved from one queue manager to another without even realising and can run with multiple instances

- **Requestors waiting for specific replies**
- **Transactional applications**
- Datagram producers, e.g. events
- Services that respond to request messages
- No message ordering requirements
- MDBs

Poor use cases

Applications that create persistent state across multiple messaging operations, or require a single instance to be running

- Dependant on message ordering
- ‘Managed’ environments (e.g. JEE)

Transactional applications

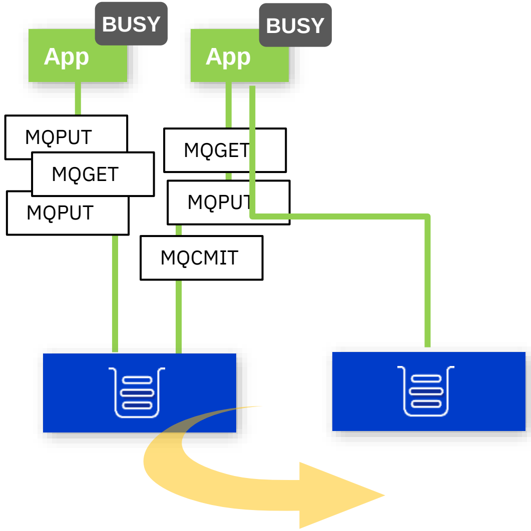
From MQ 9.2.4

To avoid frequent rollbacks, the **default** behaviour will change for applications which are in a transaction

This can be overridden if you **want** the interruptions!

Applications currently processing a unit of work will wait until commit/rollback to reconnect

If no application eligible to move before configurable time limit reached, one will be interrupted anyway



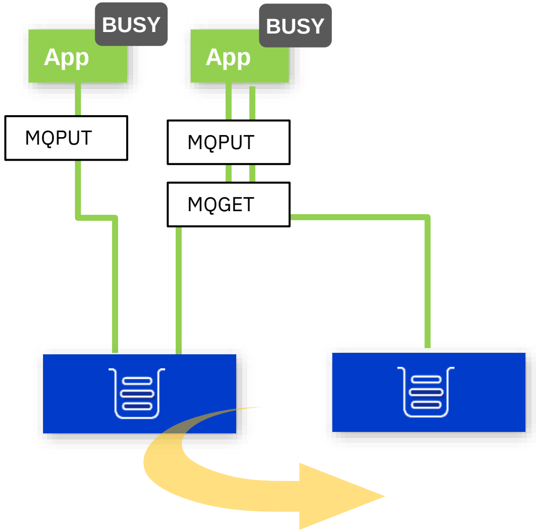
Request/reply applications

From MQ 9.2.4

If you tell MQ that an application is performing request/reply messaging, it will wait until any outstanding response arrives before moving a connection

’Outstanding’ will take into account request expiry if any

As with transactional applications, there will be a configurable backstop ‘timeout’ mechanism to prevent applications refusing to move forever



From MQ 9.2.4

How to use the new options:

In code:

(and/or)

In config(client.ini):

```
MQCNO cno = {MQCNO_DEFAULT};
MQBNO bno = {MQBNO_DEFAULT};

cno.Version = MQCNO_VERSION_8;
cno.BalanceParmsPtr = &bno;

bno.Timeout = 50;
bno.ApplType = MQBNO_BALTYPE_SIMPLE;
```

```
[...]

Application:
  Name=MyApp
  Type=Simple
  BalanceTimeout=default
```

Changes are a collaboration between queue manager and client so both should be at 9.2.4
If you just update the queue manager then the defaults will change for transactions, but request reply will work as before

Insight to your data

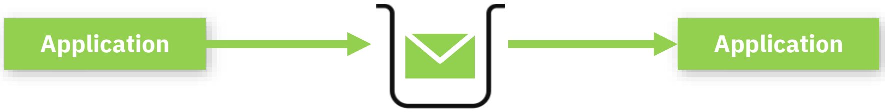
Stream MQ data to new applications

MQ Streaming Queues

New in MQ 9.2.3
Distributed platforms

Tap into the value of existing data flowing over MQ by making message data available to Kafka, AI, and analytics applications with **zero impact to the existing applications or their messages**, and without a need for re-architecting your message flows.

1. **Streaming Processing** to accelerate time to insight from existing data.
2. **Real world data** to accurately simulate production workloads to test the impact of architectural changes on applications.
3. **Auditing and Replay** of data in the event of disasters. Auditing and replay use cases require exact duplicates of message content as well as message attributes including Message IDs, Correl IDs etc.

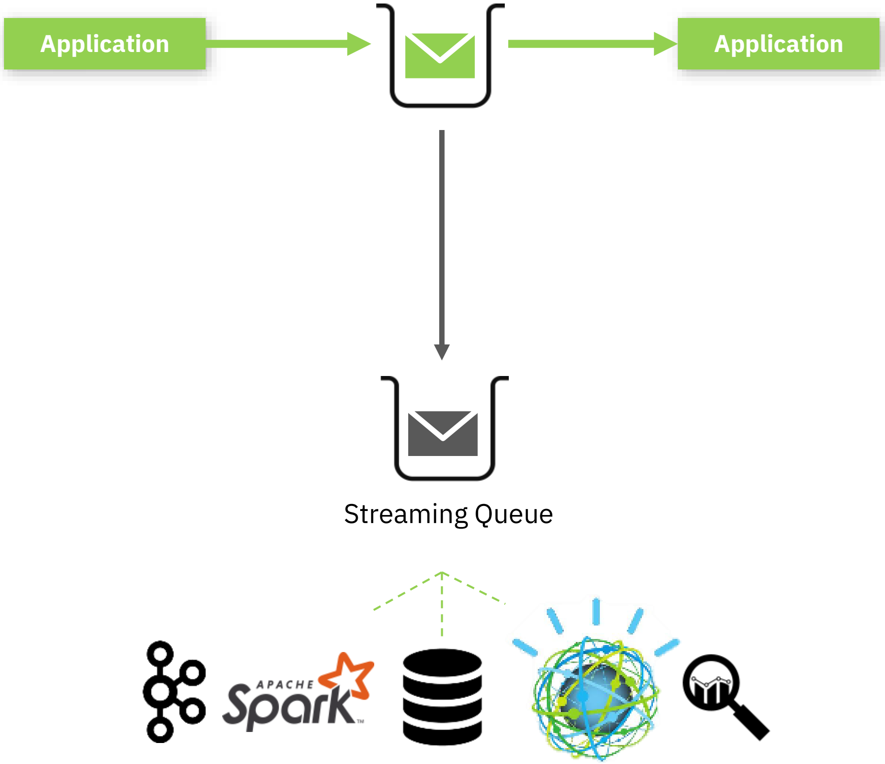


MQ Streaming Queues

Tap into the value of existing data flowing over MQ by making message data available to Kafka, AI, and analytics applications with **zero impact to the existing applications or their messages**, and without a need for re-architecting your message flows.

1. **Streaming Processing** to accelerate time to insight from existing data.
2. **Real world data** to accurately simulate production workloads to test the impact of architectural changes on applications.
3. **Auditing and Replay** of data in the event of disasters. Auditing and replay use cases require exact duplicates of message content as well as message attributes including Message IDs, Correl IDs etc.

New in MQ 9.2.3
Distributed platforms



Streaming queues configuration

New attributes for LOCAL and MODEL queues:

- STREAMQ - The name of the streaming queue to put duplicate messages
- STRMQOS - The quality of service to use when delivering messages to the streaming queue. Either:
  - MUSTDUP - Put of message to both original and streaming queues must succeed, otherwise overall put operation fails
  - BESTEF - A failure to put message to streaming queue will not affect the outcome of the put of the message to the original queue (this is the default)

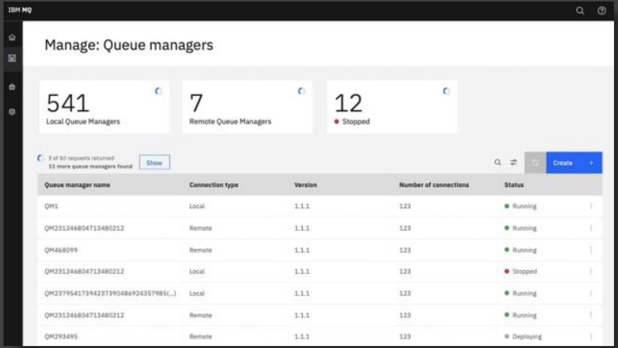
```
DEFINE QLOCAL(Q1)
  STREAMQ(QDUP)
  STRMQOS(MUSTDUP)
```

Managing MQ

New Web Console

MQ 9.2 replaces the existing web console with a new web console across all platforms

Focus is on user experience and consistency across IBM products



Manage: Queue managers

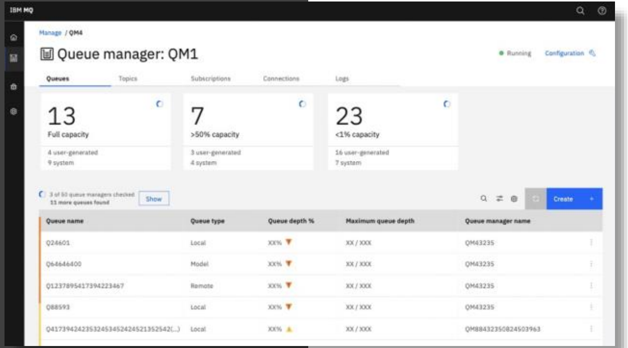
541 Local Queue Managers

7 Remote Queue Managers

12 ● Stopped

3 of 50 requests returned
11 more queue managers found

Queue manager name	Connection type	Version	Number of connections	Status
QM1	Local	1.1.1	123	● Running
QM231246804713480212	Remote	1.1.1	123	● Running
QM468099	Remote	1.1.1	123	● Running
QM231246804713480212	Local	1.1.1	123	● Stopped
QM23795417394237390486924357985(...)	Local	1.1.1	123	● Running
QM231246804713480212	Remote	1.1.1	123	● Running
QM293495	Remote	1.1.1	123	● Deploying



Queue manager: QM1

● Running

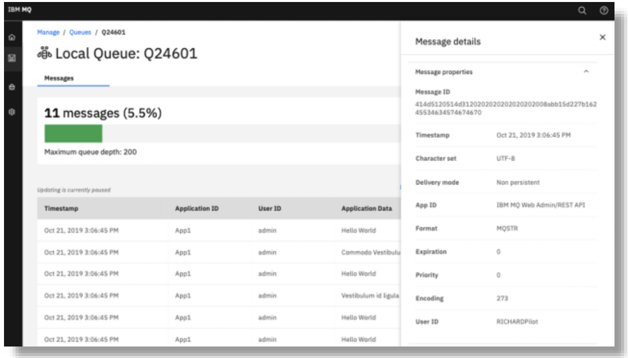
13 Full capacity
4 user-generated
9 system

7 >50% capacity
3 user-generated
4 system

23 <1% capacity
16 user-generated
7 system

3 of 50 queue managers checked
11 more queues found

Queue name	Queue type	Queue depth %	Maximum queue depth	Queue manager name
Q24601	Local	XX% ▼	XX / XXX	QM43235
Q64646400	Model	XX% ▼	XX / XXX	QM43235
Q1237895417394223467	Remote	XX% ▼	XX / XXX	QM43235
Q88593	Local	XX% ▼	XX / XXX	QM43235
Q4173942423532453452424521352542(...)	Local	XX% ▲	XX / XXX	QM88432350824503963



Local Queue: Q24601

11 messages (5.5%)

Maximum queue depth: 200

Updating is currently paused

Timestamp	Application ID	User ID	Application Data
Oct 21, 2019 3:06:45 PM	App1	admin	Hello World
Oct 21, 2019 3:06:45 PM	App1	admin	Commodo Vestibulu
Oct 21, 2019 3:06:45 PM	App1	admin	Hello World
Oct 21, 2019 3:06:45 PM	App1	admin	Vestibulum id ligula
Oct 21, 2019 3:06:45 PM	App1	admin	Hello World
Oct 21, 2019 3:06:45 PM	App1	admin	Hello World

Message details

Message properties

Message ID
414d5120514d312020202020202020202008abb15d227b16245534634574674670

Timestamp	Oct 21, 2019 3:06:45 PM
Character set	UTF-8
Delivery mode	Non persistent
App ID	IBM MQ Web Admin/REST API
Format	MQSTR
Expiration	0
Priority	0
Encoding	273
User ID	RICHARDPilot

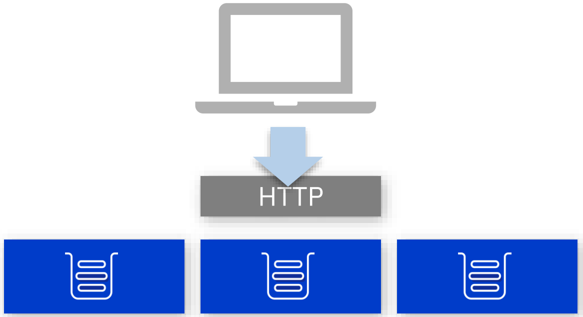
https://community.ibm.com/community/user/imwuc/blogs/callum-jackson1/2020/04/09/enhanced-web-console-in-ibm-mq-915

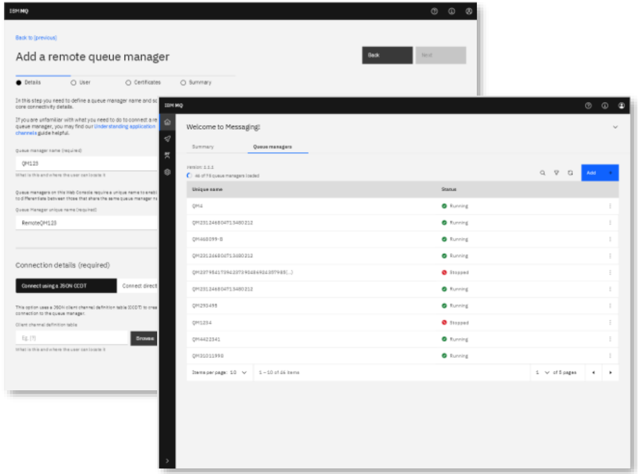
Central Web Console

New in MQ 9.2.3
All installable platforms

Originally, the web server component of MQ that underpins the web console was co-located with the queue managers. A simple way to point at each MQ installation and see the queue managers there.

With IBM MQ 9.2.3 CD you can point a browser at a single system, one that just hosts the MQ web server, and now manage multiple queue managers across multiple systems, of any type.




IBM MQ

Back to [previous]

Add a remote queue manager

Back Next

● Details ○ User ○ Certificates ○ Summary

In this step you need to define a queue manager name and s... core connectivity details.

If you are unfamiliar with what you need to do to connect a re... queue manager, you may find our Understanding application channels guide helpful.

Queue manager name (required)
QM123
What is this and where the user can locate it

Queue managers on this Web Console require a unique name to enabl... to differentiate between those that share the same queue manager n...

Queue Manager unique name (required)
RemoteQM123

Connection details (required)

Connect using a JSON CCDT | Connect direct

This option uses a JSON client channel definition table (CCDT) to crea... connection to the queue manager.

Client channel definition table
Eg. [?] Browse
What is this and where the user can locate it

IBM MQ

Welcome to Messaging!

Summary | Queue managers

Version: 1.1.1
46 of 75 queue managers loaded

Add +

Unique name	Status
QM4	Running
QM231246804713480212	Running
QM468099-8	Running
QM231246804713480212	Running
QM23795417394237390486924357985(...)	Stopped
QM231246804713480212	Running
QM293495	Running
QM1234	Stopped
QM4422341	Running
QM31011998	Running

Items per page: 10 | 1 – 10 of 46 items | 1 of 5 pages

Further web console improvements

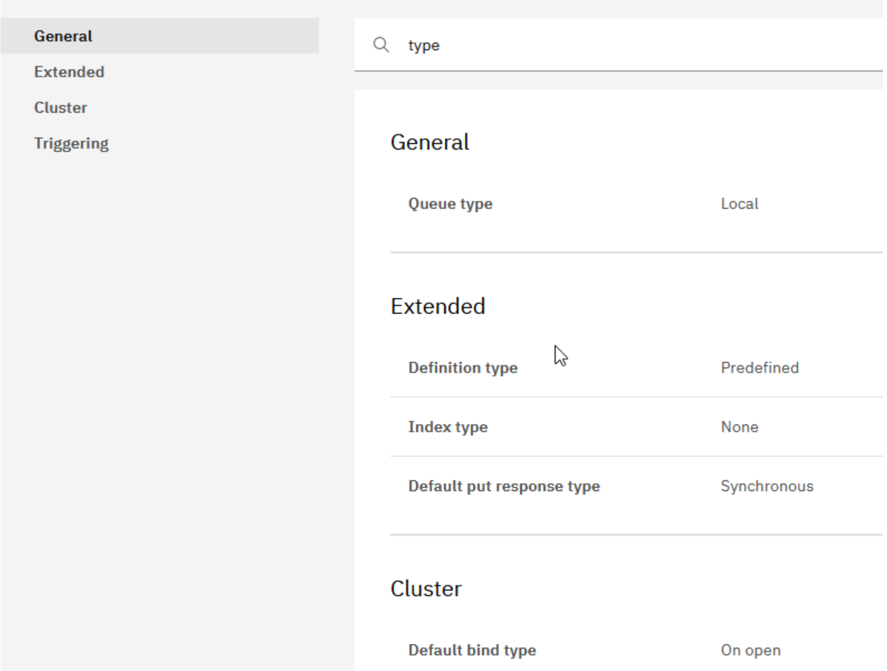
New in MQ 9.2.4
All installable platforms

Filtering for attributes on property pages (shown)

Messages can now be downloaded from queues, both text and binary

The ability to control how much message text is shown / downloaded (previously limited to 1000 characters)

Can toggle dark mode from settings



General

Queue type	Local

Extended

Definition type	Predefined
Index type	None
Default put response type	Synchronous

Cluster

Default bind type	On open

New in MQ 9.2.4
MQ Appliance

MQ Appliance enhancements

The MQ administrative REST API has been enhanced so that HA and DR state information can be queried

Similar information is provided to the output of the dspmq –o ha | dr commands

The MQ Console has also been enhanced to support the failed resource action capability added in 9.2.2 for HA enabled queue managers

I.e. the ability to see any resource that has a failure associated with it, and to clear it if required

```
HTTP GET:
https://host:port/ibmmq/rest/v2/admin/qmgr?ha=*
```

```
{"qmgr": [{
  "name": "HAQM1",
  "state": "running",
  "ha": {
    "type": "replicated",
    "floatingIPAddress": “9.20.10.4”,
    "floatingIPInterface": “eth10”
  }
}]}
```

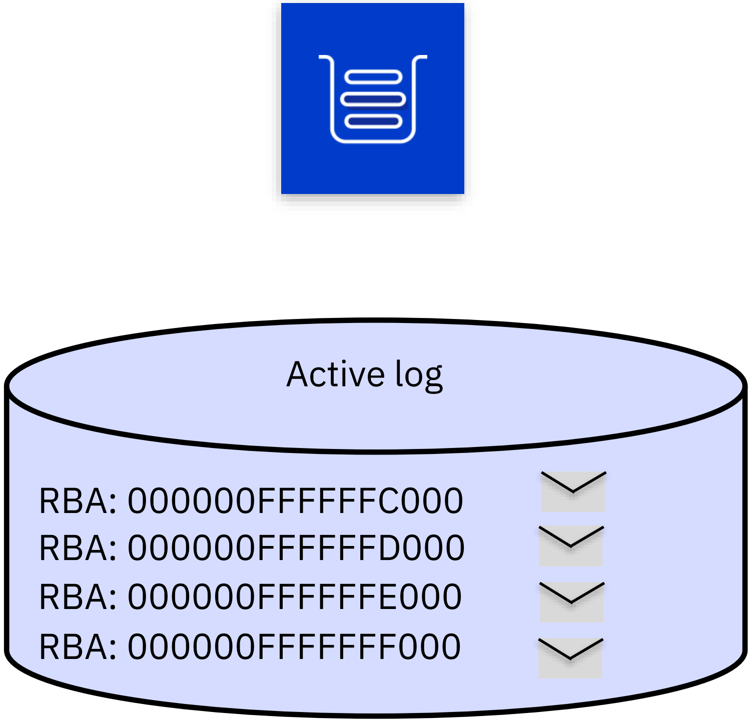
New in MQ 9.2.5

64 bit RBA enabled by default

The queue manager uses a relative byte address (RBA) to address data in its log. Originally the queue manager used a 48 bit RBA. If the queue manager reaches the limit of the RBA, it needs to be shutdown and the RBA reset back to zero

From version 8 it’s possible to have a queue manager use a 64 bit RBA meaning that the RBA for a queue manager should only be need to be reset every 1000 years or so

By default all queue managers use 48 bit RBA, and need to be converted to use 64 bit RBA. From 925 this conversion is no longer needed for new queue managers which will be 64 bit RBA by default



New in MQ 9.2.4
MQ for z/OS

More flexible monitoring

Customers increasingly want to understand what their messaging system is doing and SMF is a natural way to do this on z/OS

With MQ 9.2.4 it is possible to generate statistics records (SMF 115) every second allowing for high fidelity monitoring

However customers typically don’t require collection of accounting data (SMF 116) at the same frequency so 9.2.4 also allows statistics and accounting data to be collected at different intervals

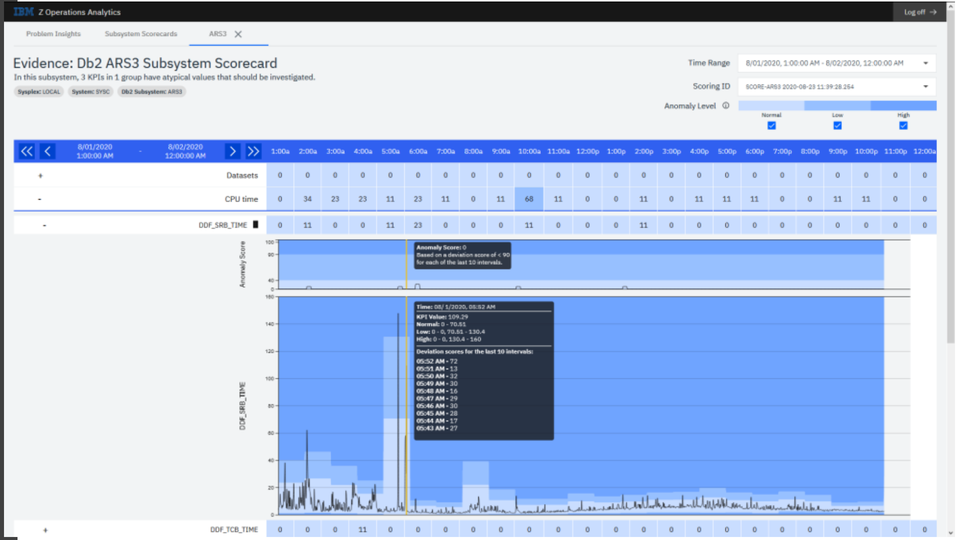
SET SYSTEM STATIME(0.05) ACCTIME(30)

Collect stats data every 5 seconds and accounting data every 30 minutes

IBM z Anomaly Analytics now supports MQ
Proactively detect problems

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



Evidence: Db2 ARS3 Subsystem Scorecard

In this subsystem, 3 KPIs in 1 group have atypical values that should be investigated.

Sysplex: LOCAL · System: SYSC · Db2 Subsystem: ARS3

Time Range: 8/01/2020, 1:00:00 AM - 8/02/2020, 12:00:00 AM

Scoring ID: SCORE-ARS3 2020-08-23 11:39:28.254

Anomaly Level: ☑ Normal ☑ Low ☑ High

8/01/2020 1:00:00 AM - 8/02/2020 12:00:00 AM	1:00a	2:00a	3:00a	4:00a	5:00a	6:00a	7:00a	8:00a	9:00a	10:00a	11:00a	12:00p	1:00p	2:00p	3:00p	4:00p	5:00p	6:00p	7:00p	8:00p	9:00p	10:00p	11:00p	12:00a
+ Datasets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- CPU time	0	34	23	23	11	23	11	0	11	68	11	0	0	11	0	11	11	11	0	0	11	11	0	0
- DDF_SRB_TIME	0	11	0	0	11	23	0	0	0	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0
+ DDF_TCB_TIME	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Anomaly Score: 0
Based on a deviation score of < 90 for each of the last 10 intervals.

Time: 08/ 1/2020, 05:52 AM
KPI Value: 109.29
Normal: 0 - 70.51
Low: 0 - 0, 70.51 - 130.4
High: 0 - 0, 130.4 - 160

Deviation scores for the last 10 intervals:
05:52 AM - 72
05:51 AM - 13
05:50 AM - 32
05:49 AM - 30
05:48 AM - 16
05:47 AM - 29
05:46 AM - 30
05:45 AM - 28
05:44 AM - 17
05:43 AM - 27

Now supports MQ SMF 115 (statistics data)

New in MQ 9.2.4
MQ for z/OS

CSQUDSPM

In the 9.0.* CD releases a new utility was added to z/OS: CSQUDSPM

This is the equivalent to dspmq on distributed and gives details about queue managers available on an LPAR

Not many people know about it, so here is a bit of advertising… In 9.2.4 we made a minor tweak so that it will accept upper case parameters which makes it easier to call from JCL

```
DSPMQ -O ALL

QMNAME(MQ21) STATUS(Running) INSTVER(9.2.4)
ERLYVER(9.2.4) CMDPFX(!MQ21) QSGNAME(SQ21)
RELTYPE(CDR)

QMNAME(MQ22) STATUS(Running) INSTVER(9.2.4)
ERLYVER(9.2.4) CMDPFX(!MQ22) QSGNAME(SQ21)
RELTYPE(CDR)

QMNAME(MQ23) STATUS(Running) INSTVER(9.2.0)
ERLYVER(9.2.4) CMDPFX(!MQ23) QSGNAME(SQ21)
RELTYPE(LTS)

QMNAME(MQ24) STATUS(Running) INSTVER(9.2.0)
ERLYVER(9.2.4) CMDPFX(!MQ24) QSGNAME(SQ21)
RELTYPE(LTS)
```

Simpler backwards migration

There is no longer a need to apply migration and coexistence PTFs to earlier versions of MQ before migrating to version 9.2

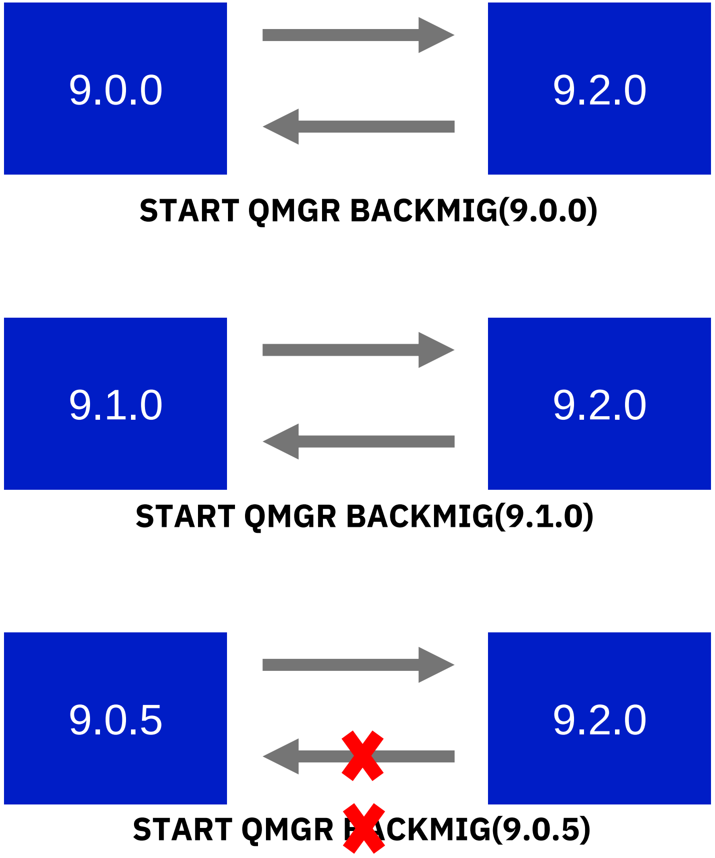
Instead if you need to backwards migrate from 9.2 you run the following command:

START QMGR BACKMIG(target_version)

This starts the queue manager up, performs the necessary migration, and shuts the queue manager down again

The queue manager can then be started up at the earlier release

For 9.2.0 backwards migration will be supported to 9.0.0 and 9.1.0. Version 8.0.0 will not be supported, and neither will any CD releases



START QMGR BACKMIG(9.0.0)

START QMGR BACKMIG(9.1.0)

START QMGR BACKMIG(9.0.5)

Securing MQ

Security on Distributed platforms

It is now possible to define permissions for users without users having to be defined in a LDAP repository. This is driven by the OpenShift security best practices.

A custom hostname instead of a channel name can now be set in the TLS SNI (Server Name Indicator) header. This makes it easier to route through third-party network layers. This change improves the experience of configuring MQ with OpenShift network routing.

MQ Java clients will now support long passwords by default. Previously the default was limited to 12 characters.

Many components that store passwords in files have been upgraded for improved security

New in MQ 9.2.4
MQ client

MQ client enhancements

Java 17 (Oracle or Adoptium) now supported with MQ classes for Java and JMS ensuring application currency

TLS 1.3 support is now provided when using the JRE that comes with MQ

The .NET client now provides parity with other clients by allowing users to control whether the name of the channel or the hostname is sent in the TLS SNI extension. This simplifies configuration when connecting to Red Hat OpenShift as you don’t need to define an OpenShift route

AT-TLS

All versions of MQ for z/OS

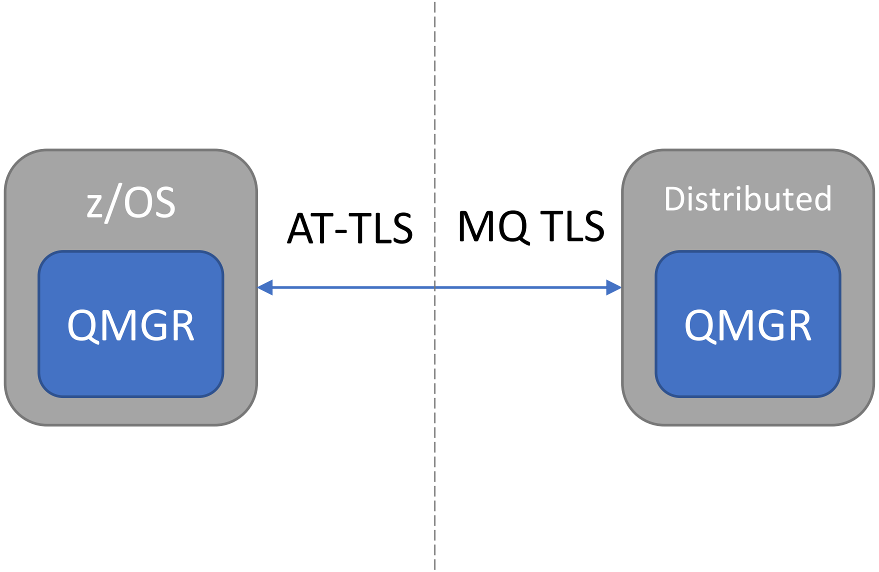
More and more z/OS customers are centralizing their TLS configuration by defining AT-TLS policies for all their middleware

This is trivial when connecting a pair of z/OS queue managers, but more tricky when going between distributed and z/OS

IBM documentation now provides guidance on how to use AT-TLS with MQ for z/OS for the following scenarios:

- z/OS to z/OS
- z/OS to distributed and vice-versa
- Distributed client to z/OS

For both single, and alias CipherSpecs



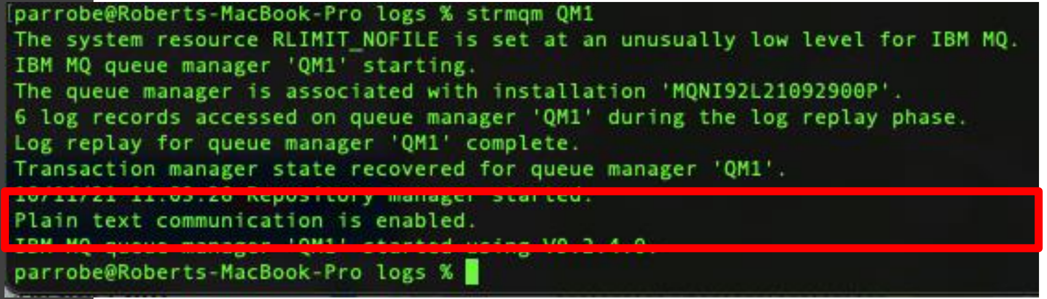
SecureCommsOnly

Distributed queue managers can now be configured so that they will only allow channels to be started up if they are TLS enabled

This ensures that administrative errors where a channel is defined with a blank SSLCIPH can't lead to a security breach

Enabled via the SecureCommsOnly = YES | NO parameter in the TCP stanza of the qm.ini file

A message indicating whether the function is enabled or not is output at queue manager start up and also in the error logs



```
parrobe@Roberts-MacBook-Pro logs % strmqm QM1
The system resource RLIMIT_NOFILE is set at an unusually low level for IBM MQ.
IBM MQ queue manager 'QM1' starting.
The queue manager is associated with installation 'MQNI92L21092900P'.
6 log records accessed on queue manager 'QM1' during the log replay phase.
Log replay for queue manager 'QM1' complete.
Transaction manager state recovered for queue manager 'QM1'.
10/11/21 11:03:28 Repository manager started.
Plain text communication is enabled.
IBM MQ queue manager 'QM1' started using V9.2.4.0.
parrobe@Roberts-MacBook-Pro logs %
```

Helping developers

Making it easy to build MQ into your applications

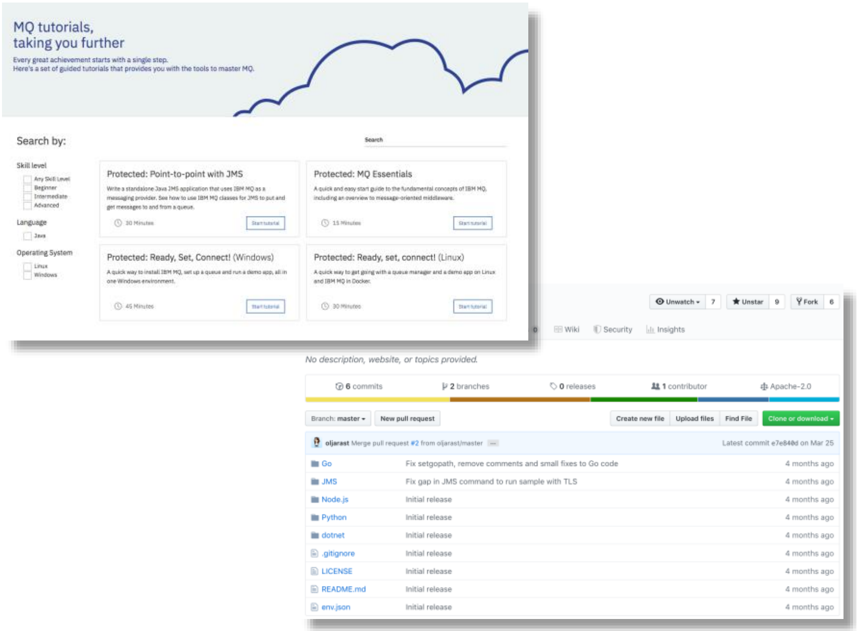
Getting Started

Teach yourself the basics of MQ

ibm.biz/learn-mq

Build on top of simple samples

ibm.biz/mq-dev-patterns



MQ tutorials,
taking you further

Every great achievement starts with a single step.
Here's a set of guided tutorials that provides you with the tools to master MQ.

Search by:

Search

Skill level
- □ Any Skill Level
- □ Beginner
- □ Intermediate
- □ Advanced

Language
- □ Java

Operating System
- □ Linux
- □ Windows

Protected: Point-to-point with JMS

Write a standalone Java JMS application that uses IBM MQ as a messaging provider. See how to use IBM MQ classes for JMS to put and get messages to and from a queue.

30 Minutes — Start tutorial

Protected: MQ Essentials

A quick and easy start guide to the fundamental concepts of IBM MQ, including an overview to message-oriented middleware.

15 Minutes — Start tutorial

Protected: Ready, Set, Connect! (Windows)

A quick way to install IBM MQ, set up a queue and run a demo app, all in one Windows environment.

45 Minutes — Start tutorial

Protected: Ready, set, connect! (Linux)

A quick way to get going with a queue manager and a demo app on Linux and IBM MQ in Docker.

30 Minutes — Start tutorial

No description, website, or topics provided.

6 commits · 2 branches · 0 releases · 1 contributor · Apache-2.0

oljarast Merge pull request #2 from oljarast/master … Latest commit e7e840d on Mar 25

Go	Fix setgopath, remove comments and small fixes to Go code	4 months ago
JMS	Fix gap in JMS command to run sample with TLS	4 months ago
Node.js	Initial release	4 months ago
Python	Initial release	4 months ago
dotnet	Initial release	4 months ago
.gitignore	Initial release	4 months ago
LICENSE	Initial release	4 months ago
README.md	Initial release	4 months ago
env.json	Initial release	4 months ago

…and prove your skills

Developing applications

Build your applications simply, with no need for an MQ installation

- Pull Java directly from the Maven repository since MQ 9.0.4 CD
- MQ 9.1.1 CD added the **SDK** to the MQ redistributable client
- The redistributable client is now available directly, no need to log into IBM
- MQ 9.1.4 CD added .NET clients to NuGet

ibm.biz/MQdownloads

IBM npm

Maven NuGet

MQ 9.3 brings support for JMS 3 standard

Develop your applications on the platform of your choice with the addition of the MacOS version of the 9.1.1 MQ client and SDK for Developers

ibm.biz/mqmacos

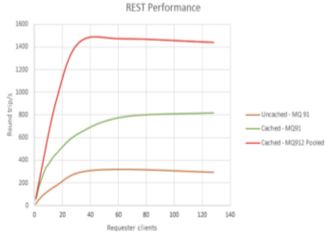
(The MQ for MacOS toolkit includes runmqsc)

Mac for Developers

Writing new applications

REST Messaging

Providing a very simple way to get messages in and out of your MQ system
9.1.2 CD boosted the performance capability, 9.1.3 CD added message browse and 9.1.5 CD added publish, **9.2.5 added message property support**



REST

put, get, browse, publish

.NET Core

9.1.1 CD brought support for .NET Core on Windows
9.1.2 CD added Linux support

.NET Core

Windows

Linux

Open Source language bindings

Write MQI applications in Node.js and Golang
New simpler JMS style API for Golang

github.com/ibm-messaging

Node.js MQI **Golang MQI** **Golang JMS**

Vision: IBM MQ is the **cloud native** choice for enterprise messaging

WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

☑ IBM MQ

...continually evolving

Thank you