What's new in the world of IBM MQ?

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Run MQ, exactly how and where you need it



IBM MQ



IBM MQ has been regularly delivering new function release on release

Through releases

New platforms and environments

2016 was the start of MQ's continuous delivery model

End of Service for the old versions



Continuous Delivery

Previously: Service and continuous delivery combined



Today: Service and continuous delivery separated



IBM MQ V9 LTS June 2016

IBM MQ V9 LTS

Made available **June 2016** for Distributed and z/OS platforms

Primary objective for MQ V9 was as the basis for the new long term support (LTS) and continuous delivery (CD) model

Rolls up all post-V8 features into a GA version

Plus further capabilities...



Advanced Message Security high performance policy

New quality of service for AMS

We already had *Integrity*

This proves authenticity through digital signing

And *privacy*

This adds encryption to the digital signing

We've added **Confidentiality** to provide encryption without the digital signing

Significant performance gains over Integrity and Privacy

Especially with key reuse

Only receiver's certs require distribution to applications

Available for Distributed and z/OS

AMS Performance



Central provisioning of CCDT

Client Channel Definition Table is a method to configure MQ client connectivity

Holds all the information needed for a client to connect to any queue manager it may need

When queue managers or their channel configuration changes new CCDTs are required

Usually necessary to push the CCDT out to each client machine from a central point

Java and .Net clients have already been able to refer to CCDT via URI

Now also available for C clients to simplify provisioning Automatically retrieved from http or ftp address export MQCCDTURL=http://ccdt.example.com/ccdt/MyApp.ccdt



System topics on distributed queue managers

Distributed queue manager information is published to a range of system topic strings \$SYS/MQ/INFO/QMGR/....

Authorised subscriptions receive their own stream of publications based on the topic string

Administrative subscriptions

E.g. For information to be continually sent to defined queues Application subscriptions

E.g. To dynamically listen to information as required

Unlocks system level information for MQ administrators and DevOps teams

Administrators can grant access to subsets of the data, pertinent to different application teams



Application Activity Trace

Application activity trace enabled through subscriptions rather than queue manager configuration

Subscribe to meta topics

E.g. \$SYS/MQ/INFO/QMGR/QMGR1/... ActivityTrace/ApplName/amqsput

Filter by application name, channel or connection id

When a subscription is created, PCF messages start to flow to the subscriber's queue. When the subscription is deleted, messages stop

Sample provided to demonstrate usage and format output – great for problem diagnosis

\$ amqsput QUEUE1 QMGR1 Sample AMQSPUT0 start target queue is Q1 Hello World

Sample AMQSPUT0 end

\$

\$ amqsact -m QMGR1 -a amqsput -w 60 Subscribing to the activity trace topic: '\$SYS/MQ/INFO/QMGR/QMGR1/ActivityTrace/ApplName/amqsput'

MonitoringType: MQI Activity Trace

QueueManager: 'QMGR1' ApplicationName: 'amqsput' Application Type: MQAT_UNIX

	CompCode MQRC HObj ((ObjName)
001 2016-04-14 09:56:53 MQXF_CONN 001 2016-04-14 09:56:53 MQXF_OPEN 001 2016-04-14 09:56:53 MQXF_PUT 001 2016-04-14 09:56:53 MQXF_PUT 001 2016-04-14 09:56:53 MQXF_CLOS 001 2016-04-14 09:56:53 MQXF_DISC	MQCC_OK 0000 2 (QUE MQCC_OK 0000 2 (QUE MQCC_OK 0000 2 (QUE	EUE1) EUE1) EUE1) EUE1)

System Monitoring

Familiar statistics available through subscriptions

Queue manager wide statistics (connects, disconnects, opens, closes, puts, gets, ...)

Queue level statistics (opens, closes, puts, gets, ...)

Extended to include CPU and Disk usage. For example...

Queue manager CPU time, memory usage Disk reads/writes, disk latency,

Subscribe to meta-topic to learn which classes of statistics are available

\$SYS/MQ/INFO/QMGR/QMGR1/Monitor/METADATA/CLASSES

Then subscribe to specific topics

See amqsrua sample program



This capability already underpins the charting in the MQ Appliance WebUI



Or use the data to feed your own dashboard See github.com/ibm-messaging/mq-golang

New MQ Java resource adaptor





WAS traditional V9

WAS traditional will contain an MQ V9 level resource adaptor

Previous level was MQ 7.1

Bringing with it the JMS 2.0 capabilities

The first time AMS support has been built into the WAS traditional RA, simplifying its configuration

Other application servers

New AMS capability for non-IBM JREs opens up AMS to a wide range of application servers with the MQ V9 resource adaptor

Command recall and editing for runmqsc on Unix!

When running runmqsc on Unix/Linux platforms you can now use **cursor keys**!

Up/down keys for command line recall Customisable for common editing control sequences (emacs/vi modes)

Much easier to fix bad typing

Similar to what has always been available on Windows

With the added capability of command completion Hit TAB to cycle through and accept possible keywords



IBM MQ V9.0.1 CD November 2016

Software MQ Web Console

In 2015 the IBM MQ Appliance introduced a web based admin console. MQ 9.0.1 saw this across all CD platforms (Linux, z/OS, Windows)

Point a browser at the MQ installation to create and manage queue managers and their resources

Provides a simple way to access MQ resources

Introducing new roles such as "read-only"

Will not see the full richness of capability from MQ Explorer

Targeted at each individual installation, not a network of MQ systems

IBM MQ Console	Dashboard					[
My simple tab	All details tab -	+				
						O Add wide
Local Queue Ma	anagers		S ¢ ×	Queues on qmgr1		C ¢ ×
+ î 🖽	More Search			🕂 î 🖽 🖾 🚔 More	Search	
	▲ Name	1	Status	▲ Name	Queue type	Queue depth
qmgr1		1 Running		SYSTEM.ADMIN.ACCOUNTING	Local	0
qmgr2		1 Running		SYSTEM.ADMIN.ACTIVITY.QUEUE	Local	0
De la				SYSTEM.ADMIN.CHANNEL.EVENT	Local	0
18				SYSTEM.ADMIN.COMMAND.EVE	Local	0
				SYSTEM.ADMIN.COMMAND.QUE	Local	0
				SYSTEM.ADMIN.CONFIG.EVENT	Local	0
				SYSTEM.ADMIN.LOGGER.EVENT	Local	0
				SYSTEM.ADMIN.PERFM.EVENT	Local	0
				SYSTEM.ADMIN.PUBSUB.EVENT	Local	0
					Local	1
Total: 2 Selected: 1	1		Updated: 12:04:08 PM	Total: 57 Selected: 0		Updated: 12:02:21 Ph
			0 X	Channels on qmgr1		C 🗘 🗙
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			🔵 qmgr1 🛛 🔵 qmgr2	▲ Name	Туре	Overall channel status
12.26		\sim		SYSTEM.AUTO.RECEIVER	Receiver	Inactive
10	\sim			SYSTEM.AUTO.SVRCONN	Server-connection	+ Inactive
				SYSTEM.DEF.CLUSRCVR	Cluster-receiver	+ Inactive
			~	SYSTEM.DEF.CLUSSDR	Cluster-sender	Inactive
0				SYSTEM.DEF.RECEIVER	Receiver	+ Inactive
				SYSTEM.DEF.REQUESTER	Requester	↓ Inactive
				SYSTEM.DEF.SENDER	Sender	↓ Inactive
12:01:01	12:01:40	12:02:30 12 Time	03:20 12:04:01	SYSTEM.DEF.SERVER	Server	↓ Inactive
				SYSTEM.DEF.SVRCONN	Server-connection	Inactive

First RESTful steps

MQ 9.0.1 introduced initial pieces of the RESTful administrative interface

The start of a new alternative to MQSC or PCF based administration

Enables web based administration

Simpler to get going and understand

Intuitive URLs and JSON payloads

Ability to query the MQ installation details and queue managers

Think *dspmqver* and *dspmq*

Disabled by default, with no security But remember, this is continuous delivery...

REST API Documentation Liberty REST APIs Discover REST APIs available within Libert API Discovery : APIs available from the API Discovery feature /Hide List Operations Expand Operation default installation /ibmmq/rest/v1/installation mmg/rest/v1/installation mmg/rest/v1/installation ng/rest/v1/installation/{instNa mg/rest/v1/installation/{gmg bmmg/rest/v1/installation/{gmg Show/Hide List Operations Expand Operation mma/rest/v1/ams /ibmmq/rest/v1/qm ihmma/rest/v1/am ed for completeness only - this operation will be rejecte



Sample z/OS Management Facility Workflows

z/OSMF provides services to help customers rapidly provision/de-provision z/OS middleware

Including MQ, DB2, CICS, IMS, WAS

Workflows can be implemented to automate tasks

Self-service/click of a button

Rapidly stand-up/down MQ resources for development/test purposes

Help to address future z/OS skills shortage

Updated for "IBM Cloud Provisioning and Management for z/OS"



Advanced Message Security – even better on z/OS

Further performance enhancements to the Confidentiality profile on z/OS

AMS Confidentiality reaches CPU cost parity with moving messages across a TLS channel

Acceptable cost for encryption at rest



z/OS Connect: MQ Service Provider

z/OS Connect is about exposing mainframe resources to applications via a modern REST and JSON interface in a way that enables developers to rapidly take advantage of the assets that exist there.

The MQ Service Provider allows existing services that are fronted by MQ to be accessed via a RESTful front end

Both z/OS Connect V1 and zCEE are supported Same MQ capabilities in both versions zCEE API editor can be used with MQ

~ <u> </u>					
🖗 oneway AP					
z/OS Con	nect EE API Editor				
 Describe 	your API				
Name:	oneway	Description:			*
Base path:	/oneway				
Version:	1.0.0				-
🔶 Path					
/{nam	ne}?zipcode				
+ M	ethods 💌				
•	POST MQ1WayBackend		Service	Mapping 🗘 🔶	×
•	GET MQ1WayBackend		Service	Mapping 🔂 🔶	×
•	DELETE MQ1WayBackend		Service	Mapping 🗘 🔶	×



Client's applications need have no knowledge of MQ

MQ JMS in CICS Liberty Profile

Allow CICS Liberty to use MQ resource adapter Just like normal Liberty

Run existing Liberty messaging apps such as MDBs inside CICS

Connections to MQ supported using either client or bindings mode

Prereqs CICS V5.3 +PI58375 + MQ 9.0.1 RA





MQ REST continues to grow

REST is enabled and secured as part of the web setup

Security

Secured by default, samples provided to make setup simple Caller can either login via userid & password or certificate Or use HTTP basic-authentication CORS support added when called from a web-browser

More commands added for 9.0.2

Queue definitions

Create, delete, display and alter

Display queue status

\Program Files\IBM\Latest902\bin>cur1 -k "https://localh queue": [{ "name": "Q.LOCAL", "status": { "currentDepth": 0, "lastGet": "" "lastPut": "", "mediaRecoveryLogExtent": "", "monitoringRate": "off", "oldestMessageAge": -1, "onQueueTime": "longSamplePeriod": -1 "shortSamplePeriod": -1 "openInputCount": 0, "openOutputCount": 0, "uncommittedMessages": 0 'tupe": "local'

Distributed recovery logs

MQ always logs all the data you need to recover from a queue manager failure in a recovery log

Restart recovery (circular and linear logging)

Enough information held in the log files to rebuild MQ resources to the level that they were at prior to the queue manager stopping

Media recovery (linear logging only)

Enough information held in the log files to rebuild MQ resources in the event of losing or corrupting MQ data



Circular logging



Significantly reducing the overheads of linear logging

Automatic Media Imaging

Media images allow logs to be archived or reused, reducing space and speeding up recovery time

Previously this was up to the administrator

New ability for the queue manager to **automatically schedule** the recording of media images

The frequency of imaging can be controlled based on time interval or data written

New ability to exclude certain objects from media recovery logging to reduce overheads

Queue manager controlled imaging reduces the impact on other workload during recording







Significantly reducing the overheads of linear logging

Automatic log reuse

Linear log extents must be removed from the system to free up space

You may choose to archive them before deleting

You can now create a queue manager where **log extents are automatically reused** as soon as they are no longer required for media recovery

Alternatively they can be automatically reused when no longer required and have been marked as archived

Significant performance improvements over user managed linear logging, comparable to circular logging

And in general

Extra information added to queue manager status on log utilization to aid better log configurations



New install options

JRE is now an optional install component on Windows

For those installations where the bare minimum is needed If not selected then dependant components such as MQWeb, MQExplorer, etc will not get installed

IBM MQ V9.0.2 Setup Features Select the features you want installed Click on an icon in the list below to change how a feature is installed. Feature Description - Server X - Telemetry Service Adds Java Runtime Environment X - AMQP Service (JRE) for use by MQ, containing additional IBM Security Providers X - Advanced Message Security × - Managed File Transfer Service 🗙 🚽 Managed File Transfer Logger × - Managed File Transfer Agent × - Managed File Transfer Tools This feature requires 0 KB on your ■ MQ Explorer hard drive. X - MQI Client ■ Extended Messaging APIs ■ Web Administration X - Java Runtime Environment Help Space < Back Next > Cancel

MQ packages available in Debian installer format on Ubuntu

More natural for Ubuntu users Available on all three supported architectures (amd64, s390x, ppc64el) Installs to default location Will replace RPMs on Ubuntu



IBM Cloud Product Insights

IBM has just launched the IBM Cloud Product Insights Bluemix service

Product Insights enhances the way IBM on-premise products can be registered and tracked, organizations can extend on-premise products achieving the benefits of cloud environments.

IT administrators can register on-premise traditional IBM Enterprise Software and create an inventory to track each instance, report on usage metrics, and get advice on other cloud services.

Enables you to connect to the IBM cloud for new insights on your on-prem environment and guidance for cloud service patterns



What does that mean for you and MQ?

Registration and Usage

Users register instances of their IBM products with a central IBM cloud hosted service

Keeps track in a single place which queue managers you have

What level of MQ What is installed When they were last running

High level usage information is regularly collected to give a high level overview of the system usage and any trends How many persistent and non-persistent messages put How many persistent and non-persistent bytes put Giving a very high level overview of the system usage.





What does that mean for you and MQ?

Log Management beta

Registered queue managers forward error logs to the Product Insights service Using the IBM Logmet service based on ELK

Provides a central place from which to aggregate and view all of your IBM product logs

Preconfigured and customisable dashboards provided

Opportunities for centralised analysis across multiple logs and products



IBM MQ Appliance MQ in a box

The IBM MQ Appliance

The scalability, security and reliability of IBM MQ

The convenience, fast time-to-value and low total cost of ownership of an appliance

Built in high availability and disaster recovery capabilities

Ideal for use as a messaging hub running queue managers accessed by clients, or to extend MQ connectivity to a remote location

Familiar feel for existing MQ users – application interfaces, administration, networking/clustering, security....



MQ Appliance high availability and disaster recovery

Fully built-in HA and DR capabilities No external components required Per queue manager active/passive topologies

High availability (GA)

Short distance configurations All recoverable data replicated immediately Failures automatically detected and queue managers restarted

Disaster recovery (firmware update 4) Long distance configurations Manual queue manager takeover

Combined HA and DR (firmware update 5)



Hardware updated in June 2016 to the M2001



10GB network ports extended from 2 to 4

For combined HA and DR configurations two 10GB ports are required Leaving two 10GB ports for messaging traffic
Firmware update: MQ 9.0.1 CD

Floating IP support

In version 8 of the MQ Appliance, clients connecting to HA queue managers must be aware of all possible IP addresses (e.g. via comma separated list or CCDT)

Each HA queue manager can now be associated with a **floating IP address** which is automatically adopted by whichever appliance the the queue managers is currently active on

Client applications are now able to use a single IP address, requiring no changes on the application side.



Firmware update: MQ 9.0.1 CD

SNMP

Full support of SNMP for remote monitoring and alerting of MQ Appliances SNMP data on the appliance itself and the queue managers running on it

RESTful Administration

Enablement of appliance administration over REST

Administrative Security

New options for managing the authentication and roles granted to appliance administrators

Backup and Restore

Ability to backup and restore queue manager data and configuration

Automatic Queue Manager start-up

Now all queue managers, not just those under HA control can be started automatically on start-up of an appliance



Firmware update: MQ 9.0.2 CD

HA SSH key renewal

Appliances in a HA group use SSH keys for internal communication

Keys are not exposed to users. However, security best practice recommends periodically regenerating SSH keys

New capability introduced to allow administrators to do this without disrupting the HA system

MQ RESTful admin API

9.0.1 added RESTful admin for the appliance itself

9.0.2 adds RESTful support for the queue managers running on the appliance

The appliance sees the same RESTful API for administering MQ resources as added to software MQ Uses the same user authority model and roles as for software MQ



mqa(mqcli)# dsphakeys SSH key generation time: 2017-02-13 16:47:55

IBM MQ Managed File Transfer

Managed File Transfer

MQ 9.0.0.0 LTS

Comprehensive fine grain coverage of FTP errors Enhanced logging of FTP communications for post diagnosis

MQ 9.0.1 CD

Redistributable MFT agent available from FixCentral, users simply download and unzip

File transfer recovery timeout control, new option to automatically cancel failing transfers

MQ 9.0.2 CD

MFT agent status reporting, aids problem diagnosis by reporting last contact time



MFT Agents are now no longer separately and individually licensed but are **free** to deploy and use when connected to **MQ Advanced** entitled queue managers

IBM MQ in the Cloud

MQ is everywhere

Run MQ, exactly how and where you need it



Help and advice with MQ in the Cloud

It has always been critical for MQ to run where it is needed and integrated into the tools of your choice

For many that means clouds

We have investigated running MQ in various **public** and **private** clouds.

Using a variety of tooling for provisioning, configuration and monitoring

And we've been sharing that information to everyone to use

TBM developerWorks > Developer Centers		Marketplace	্ ≗ ≣	
IBM Messaging	Products \vee Dow	nloads Videos Sample Code Blogs	✓ Docs ✓ Get Help ✓	
MQ on C	loud		Feedback on our new design? Email us	
All IBM MQ MQ on Distributed MQ	Appliance MQ on z/OS MQ on Cloud	pabilities. And by doing this you'll also reap th	e benefits that a cloud	
deployment brings, whether it's automated deployments, scaleable arc on AWS, Azure, OpenStack and Docker. You can also see examples of	hitectures, centralised administration. If you're running MQ in a cloud how to centralize key MQ metrics and MQ error logs.	environment, visit the MQdev blog to see exar	nples of how to run IBM MQ	
Latest AWS blog updates	Latest OpenStack blog updates	Latest Docker blog updates	atest Docker blog updates	
 IBM MQ - Using Active Directory for authorisation in Unix queue managers 	 MQ on OpenStack, part three: Automated client connection PoC using MQ v9 CCDT URL feature. 	 MQ in Docker is now supported for proc 		
IBM MQ - Using AWS CloudWatch to monitor queue managers	MQ on OpenStack, part two: Managing an MQ environment	 Introducing a Docker image for MQ Adv 	anced for Developers	
 MQ on AWS: Sending MQ error logs to CloudWatch 	using Heat			
 MQ on AWS: PoC of high availability using EFS 	MQ on OpenStack, part one: Creating an image using Packer			
 Basic deployment of MQ on AWS 				
Latest Error logging blog updates	Latest Monitoring blog updates	GitHub Repositories		
MQ on AWS: Sending MQ error logs to CloudWatch	 Sending MQ metrics to the Bluemix Logmet service 	• AWS		
 Sending MQ error logs to the Bluemix Logmet service 	 IBM MQ - Further integration with open-source monitors 	Azure		
 Storing and searching MQ error logs in Elasticsearch 	 IBM MQ - Using Prometheus and Grafana to monitor queue 	OpenStack		
	managers	Docker		
Useful links				
Downloads	Sample Code • • >			
Contact Privacy Terms of use Accessibility Feedback	Cookie preferences	United 3	States - English 🗸 🗸	
<u>https://develope</u> <u>cloud/</u>	er.ibm.com/messag	<u>ging/mq-on</u>	-	



MQ in Docker containers

IBM MQ is supported to run inside Docker containers, bringing the benefits of containers to MQ Lightweight containers for running MQ Predictable and standardized units for deploying MQ Process, resource and dependency isolation Best practice guidance

IBM provided sample Docker files for customizing and building your own Docker images

IBM MQ Advanced for Developers V9 available direct from Docker Hub

Docker enables MQ deployments to be provisioned and managed within the same orchestration frameworks that make Docker so exciting

Kubernetes, Mesos, Swarm, Fleet, ...

Or individual laaS cloud container services

Bluemix, Amazon EC2, Azure, ...

Explore Help	Personal Open source Business Explore
PUBLIC AUTOMATED BUILD	ibm-messaging / mq-docker ↔ Code ① Issues 2 ① Pull requests 0 ↔ Pulse
Repo Info Tags Dockerfile Build Details	Docker image for IBM® MQ
Short Description	(r) 49 commits (r) 1 branch
IBM® MQ for Developers	Branch: master - New pull request





MQ Advanced for Developers in the Bluemix Container Service

It is now possible to spin up MQ queue managers in the Bluemix Container Service with a couple of clicks

The fastest way to get up and running with MQ for development and experimentation

Pre-configured defaults mean instant access for administration and messaging applications



A MQ Console Dawboard ab 1 - + C Add widget c > A dames on OMGR1 C O X A mane Develor Names on OMGR1 C O X Their 2 Seecher 0 Updeter 239-44 PW Their 2 Seecher 0 Updeter 239-24 PW Their 2 Seecher 0 Updeter 239-26 PW Comments on OMGR1 C O X C Their 2 Seecher 0 Updeter 239-26 PW C Their 2 Seecher 0 Updeter 2 Sec						
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Message Hub Bridge

Message Hub is a scalable messaging service for **IBM Bluemix**. Based on Apache Kafka and ideally suited for streaming analytics

You can use the **new MQ Bridge** capability to connect your MQ network to your Message Hub service in Bluemix, enabling the flow of MQ message data into your Bluemix applications

Connects to MQ as an MQI client

At-least-once reliability (as expected by Kafka)

Data partitioned into Kafka topics



MQ Bridge for Salesforce

Safesforce's cloud-based CRM platform enables events to be emitted when changes are made to data, or when applications run

You can inject these Salesforce events into your own systems using the new MQ Bridge for Salesforce with no need for your backend applications to connect to Salesforce

Supports Salesforce Platform Events and PushTopics

Events are published into the MQ network

The bridge runs on Linux, but connects to any queue manager and is enabled for monitoring with system topic metrics



Run MQ, exactly how and where you need it



... or Let IBM host MQ for you and use it from where you need it?



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