What's new in the world of IBM MQ?

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Run MQ, exactly how and where you need it

Cloud

IBM MQ

Spark

Message Hub

IBM Bluemix
(including Softlayer)

IBM MQ
amazon web services

IBM MQ
Windows Azure

IBM MQ
Google Cloud Platform

docker
vmware
MESOS
openstack
CLOUD SOFTWARE
kubernetes
by Google
...

On-prem

Linux
Windows
for Business
hp UX
AIX
Hewlett Packard Enterprise
ORACLE
SOLARIS
...

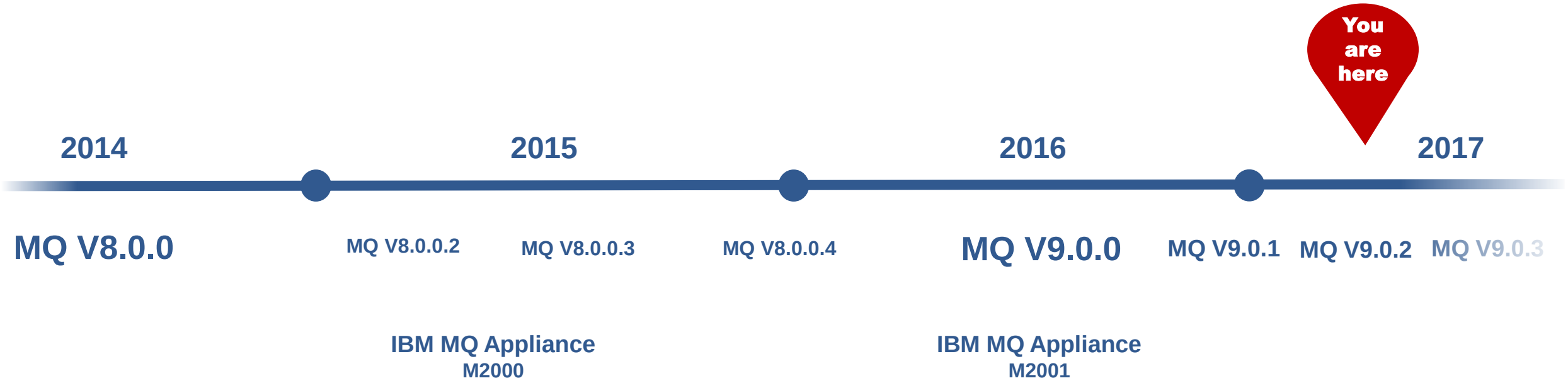
Distributed platforms

IBM MQ

Private cloud

IBM MQ Appliance

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

WebSphere MQ 7.1

End of Service (Distributed) will be **April 2017**

End of Service (z/OS VUE) will be **September 2017**

End of Service (z/OS) will be **November 2017**

WebSphere MQ 7.5

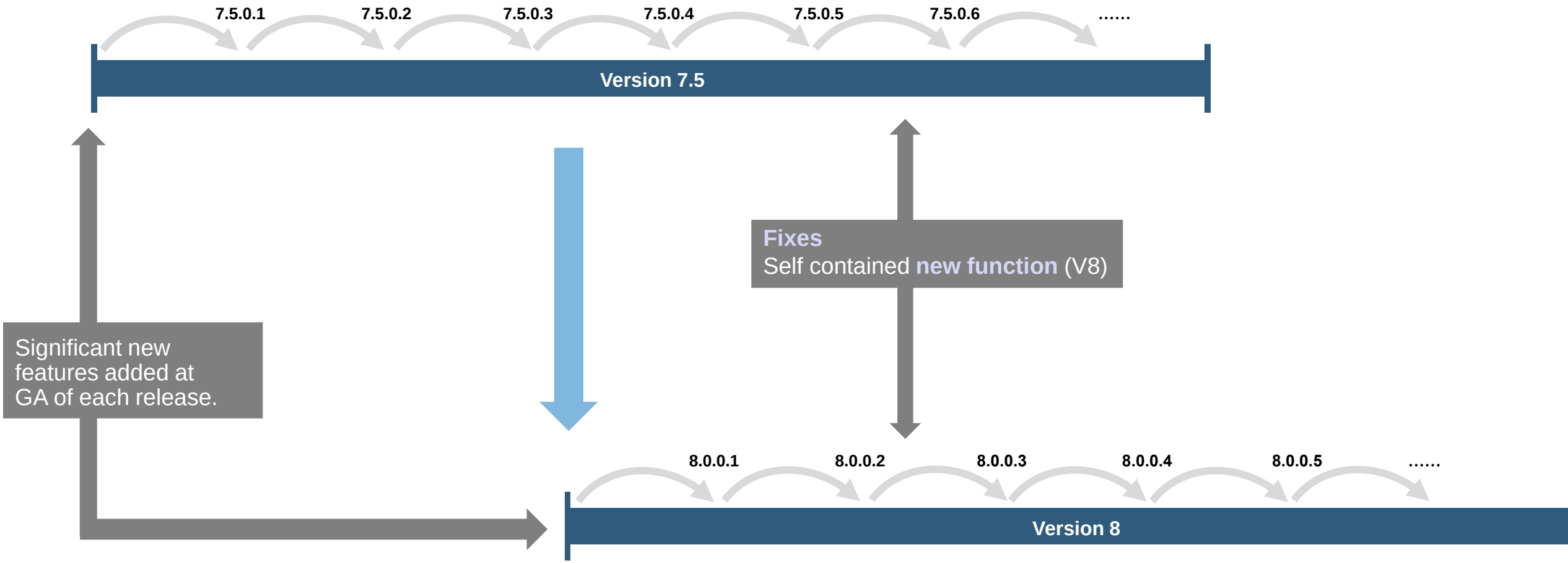
End of Service (Distributed) will be **April 2018**

MQ FTE V7.0.x, **MQ AMS 7.0.x** & **MQ HVE 7.0.1**

EOS will be **September 2017**

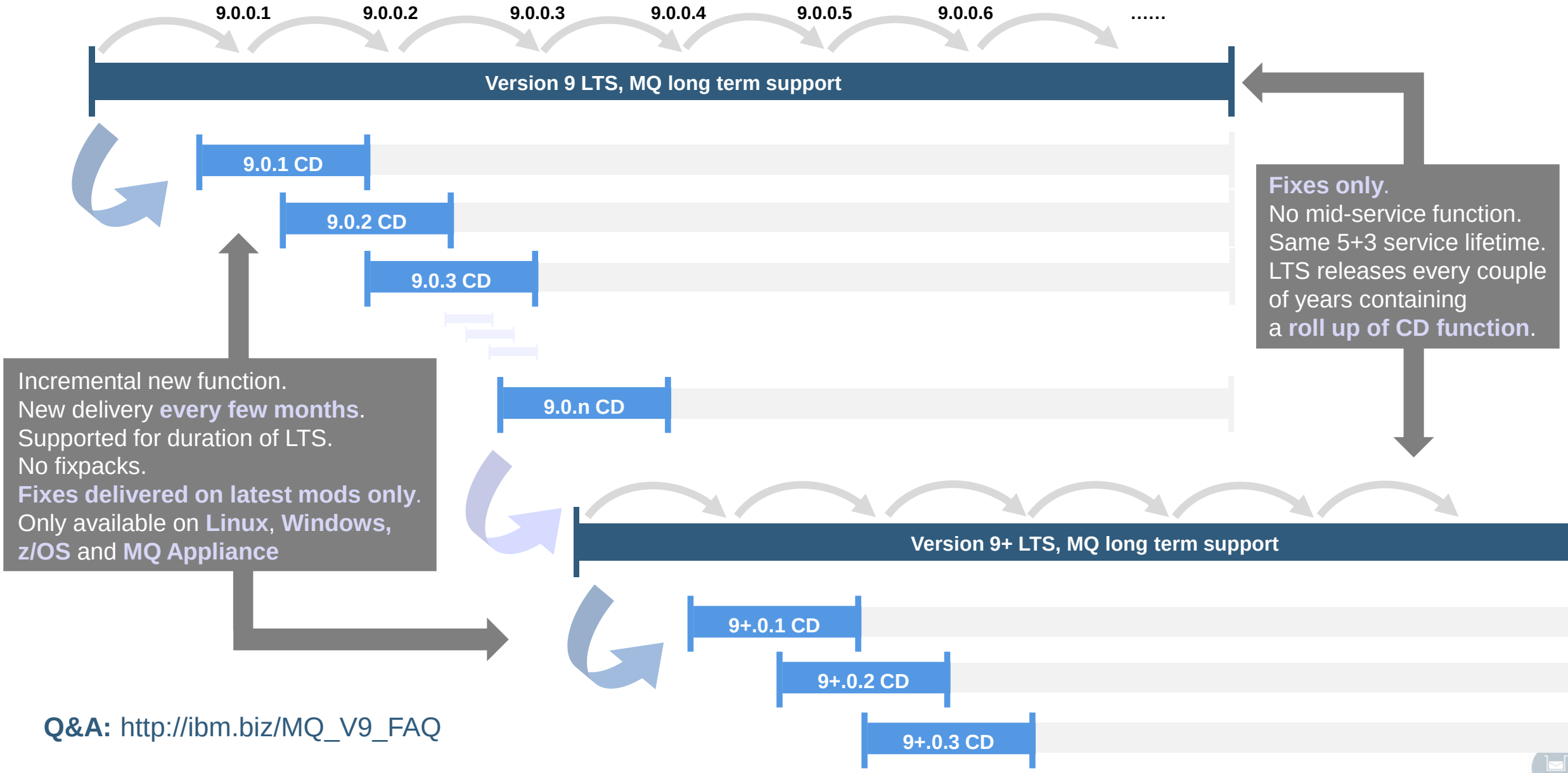
Continuous Delivery

Previously: Service and continuous delivery combined



Q&A: http://ibm.biz/MQ_V9_FAQ

Today: Service and continuous delivery separated



Q&A: http://ibm.biz/MQ_V9_FAQ

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

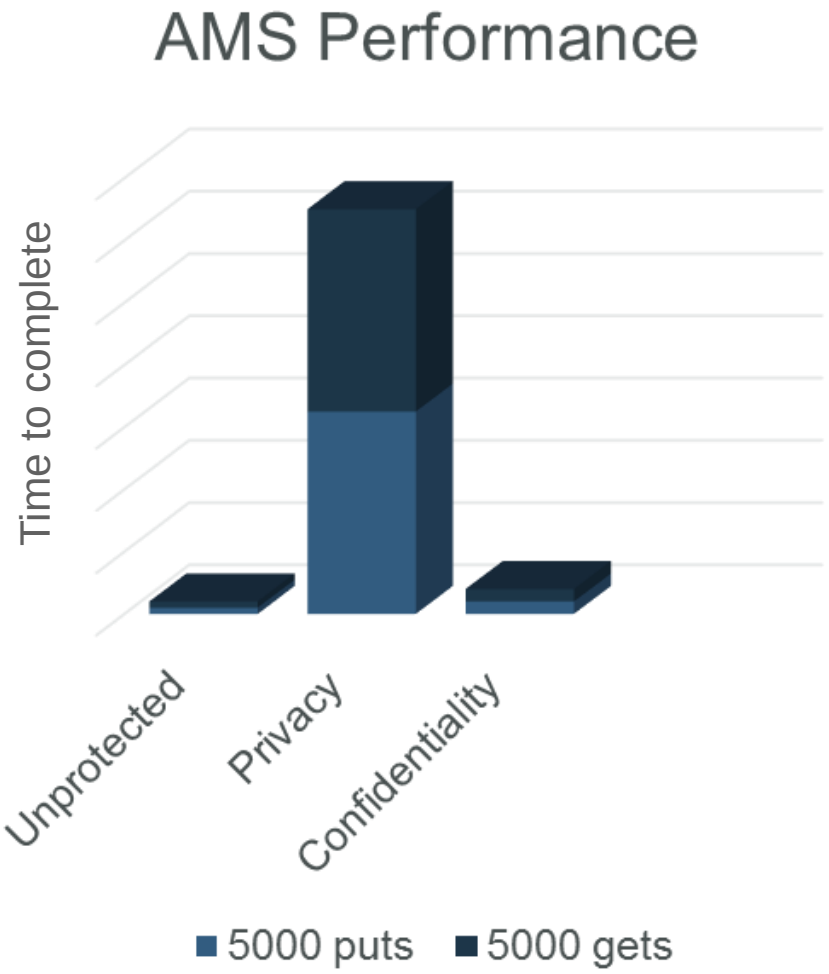
New quality of service for AMS

- 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



Central provisioning of CCDT

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

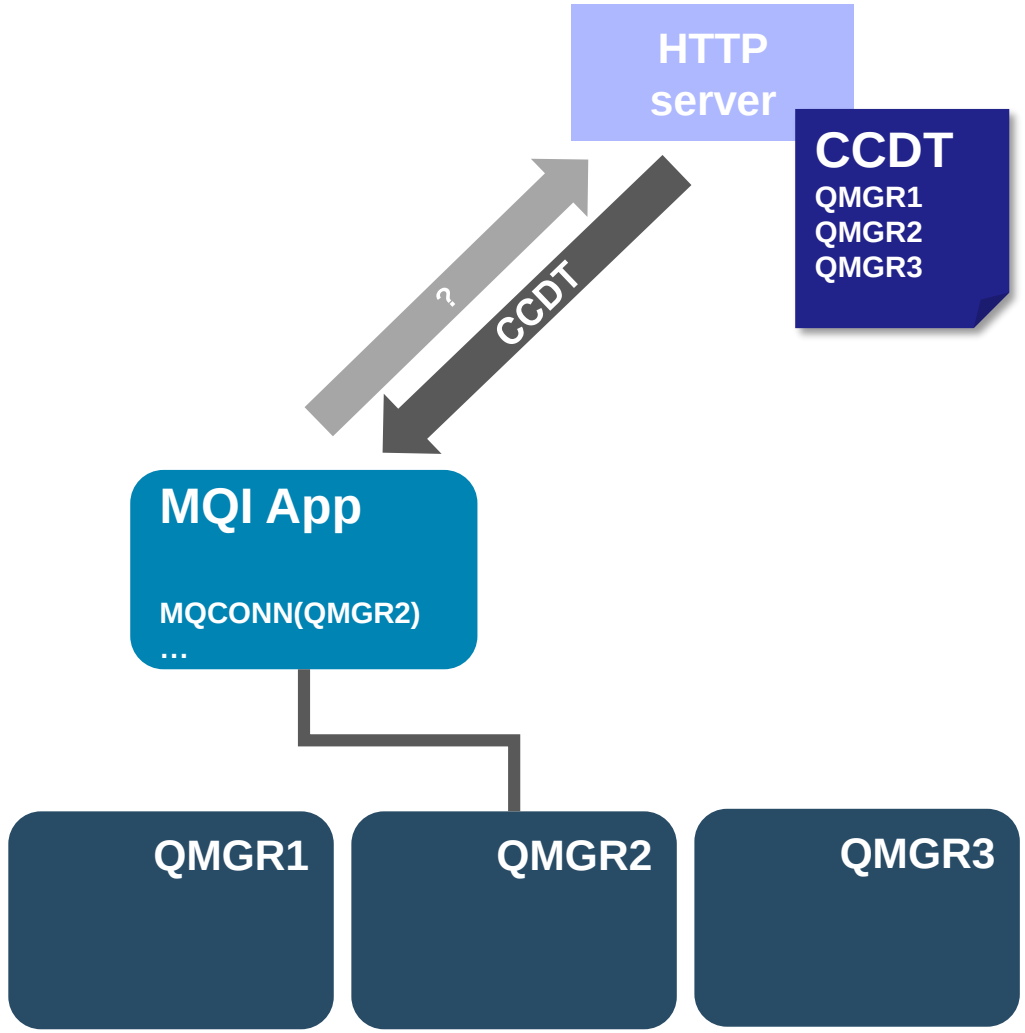
- Holds all the information needed for a client to connect to any queue manager it may need
- When queue managers or their channel configuration changes new CCDTs are required
- Usually necessary to push the CCDT out to each client machine from a central point

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

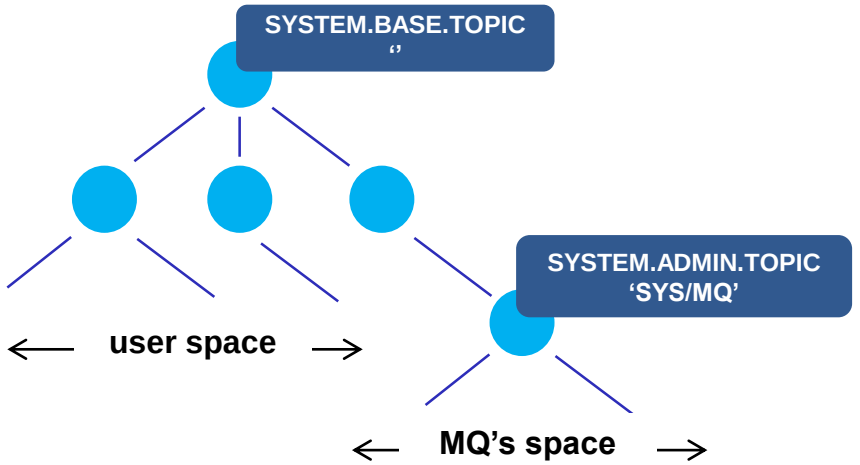
$SYS/MQ/INFO/QMGR/….

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
…
==========================================================================================
  Tid Date       Time      Operation       CompCode      MQRC  HObj (ObjName)

  001 2016-04-14 09:56:53  MQXF_CONNX      MQCC_OK       0000  -
  001 2016-04-14 09:56:53  MQXF_OPEN       MQCC_OK       0000  2 (QUEUE1)
  001 2016-04-14 09:56:53  MQXF_PUT        MQCC_OK       0000  2 (QUEUE1)
  001 2016-04-14 09:56:53  MQXF_PUT        MQCC_OK       0000  2 (QUEUE1)
  001 2016-04-14 09:56:53  MQXF_CLOSE      MQCC_OK       0000  2 (QUEUE1)
  001 2016-04-14 09:56:53  MQXF_DISC       MQCC_OK       0000  -
==========================================================================================
```

System Monitoring

Familiar statistics available through subscriptions

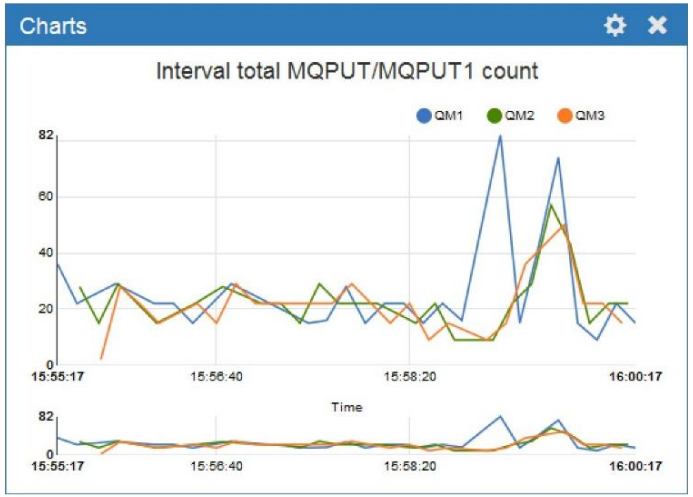
- Queue manager wide statistics (connects, disconnects, opens, closes, puts, gets, …)
- Queue level statistics (opens, closes, puts, gets, …)

Extended to include CPU and Disk usage. For example…

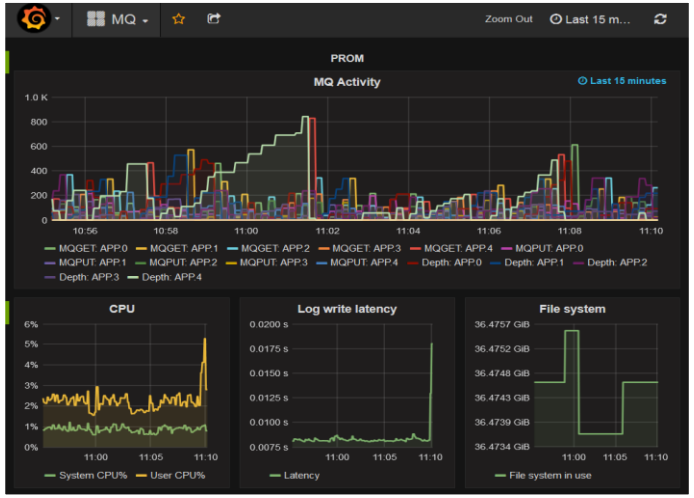
- Queue manager **CPU time**, **memory usage**
- **Disk reads/writes**, **disk latency**,

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

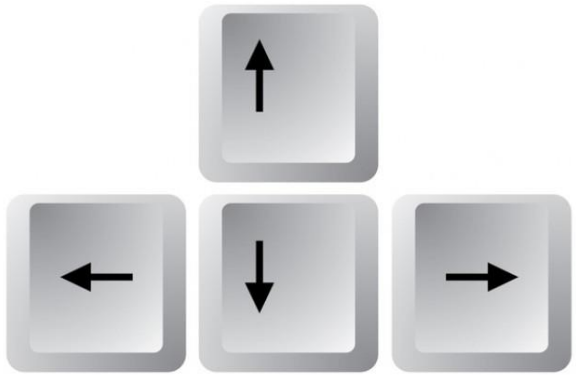
Other application servers

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)

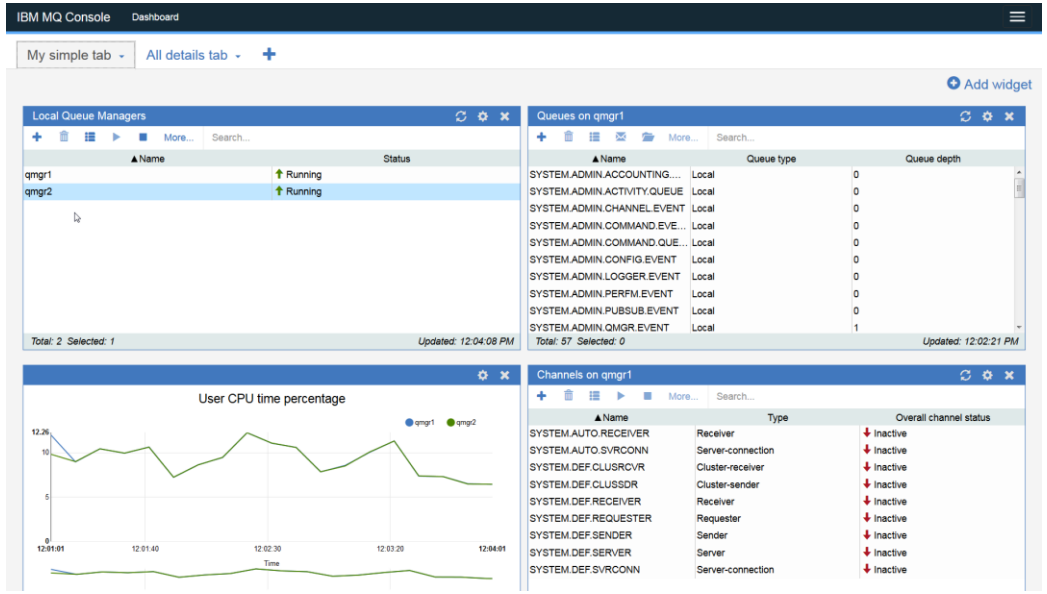
Point a browser at the MQ installation to create and manage queue managers and their resources

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



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

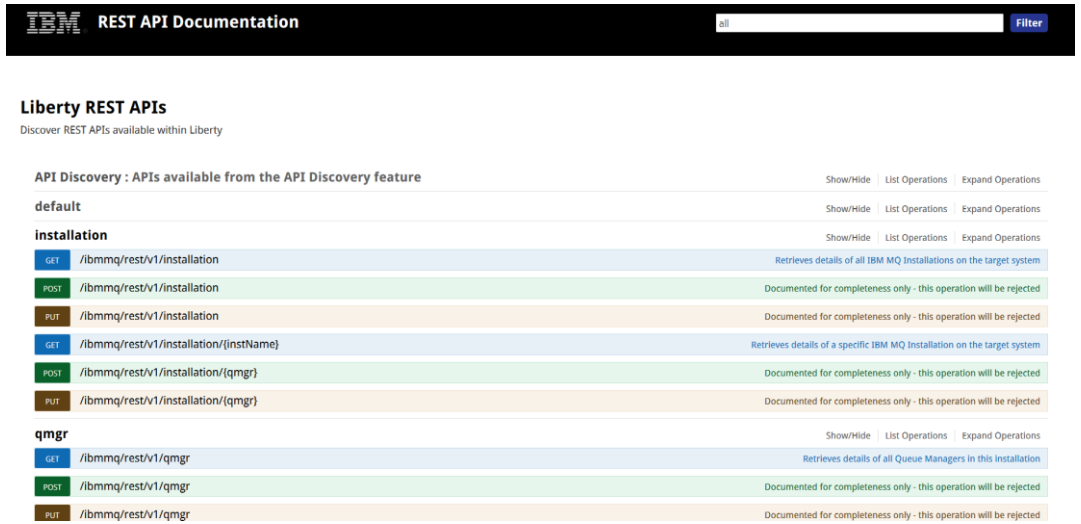
- Enables web based administration
- Simpler to get going and understand
  - Intuitive **URLs** and **JSON** payloads

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…



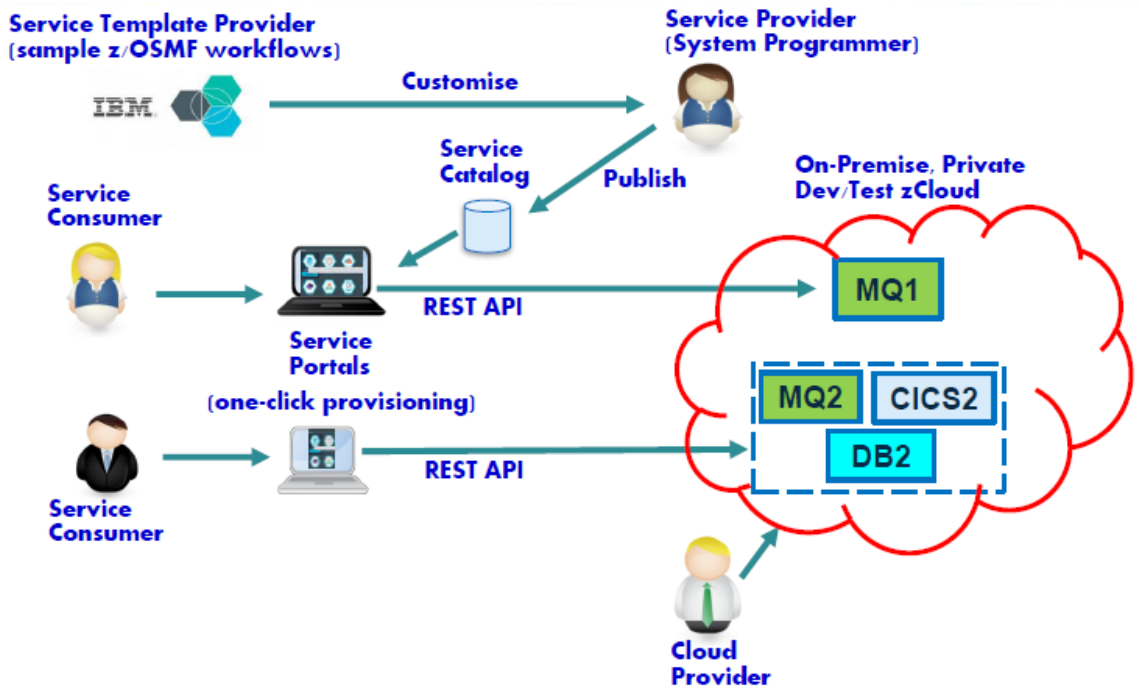

```
$ curl http://localhost:9080/ibmmq/rest/v1/qmgr

{"qmgr": [
  {
    "qmgrName": "QM901A",
    "status": "running"
  },
  {
    "qmgrName": "QM901B",
    "status": "endedImmediately"
  }
]}
```

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”

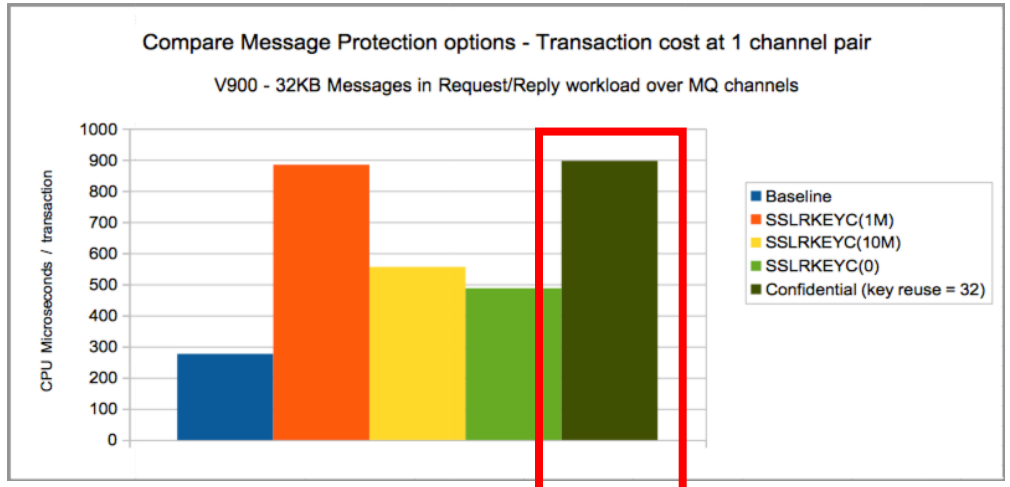


Advanced Message Security – even better on z/OS

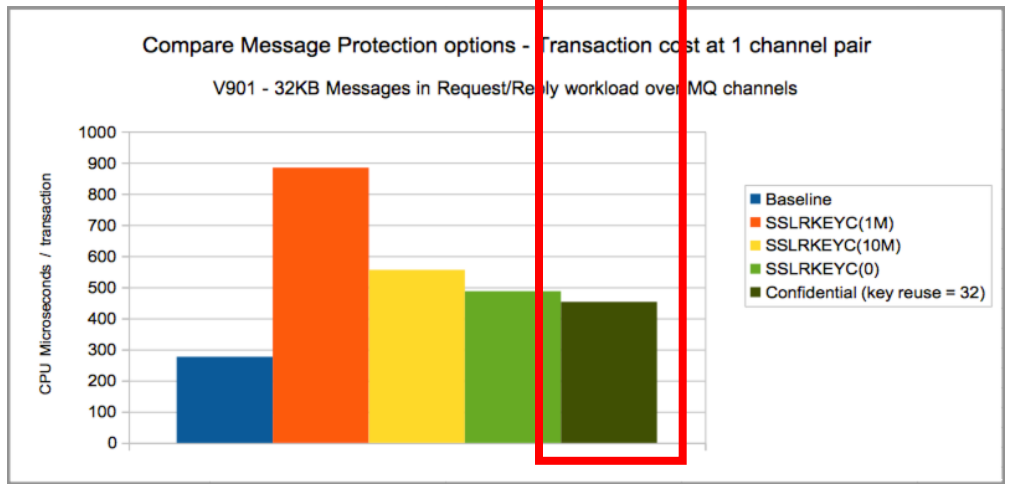
Further performance enhancements to the Confidentiality profile on z/OS

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

Acceptable cost for encryption at rest



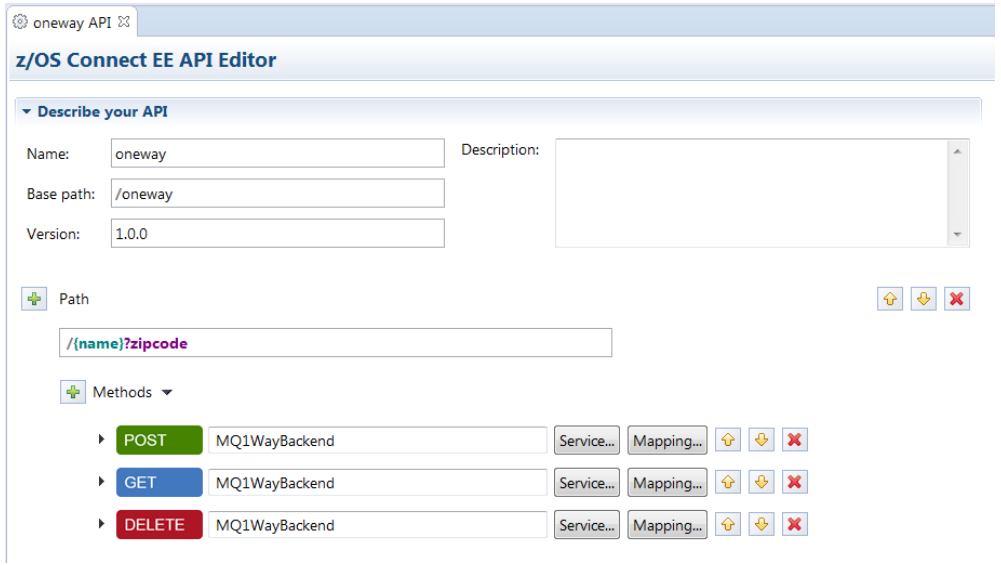
MQ for z/OS 9.0.0



MQ for z/OS 9.0.1

z/OS Connect: MQ Service Provider

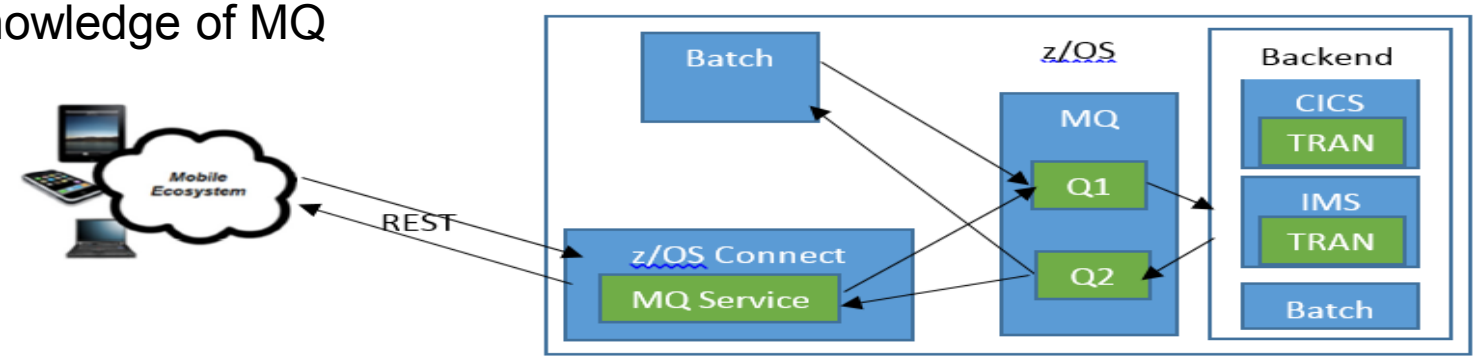
z/OS Connect is about exposing mainframe resources to applications via a modern REST and JSON interface in a way that enables developers to rapidly take advantage of the assets that exist there.



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

Client's applications need have no knowledge of MQ



MQ JMS in CICS Liberty Profile

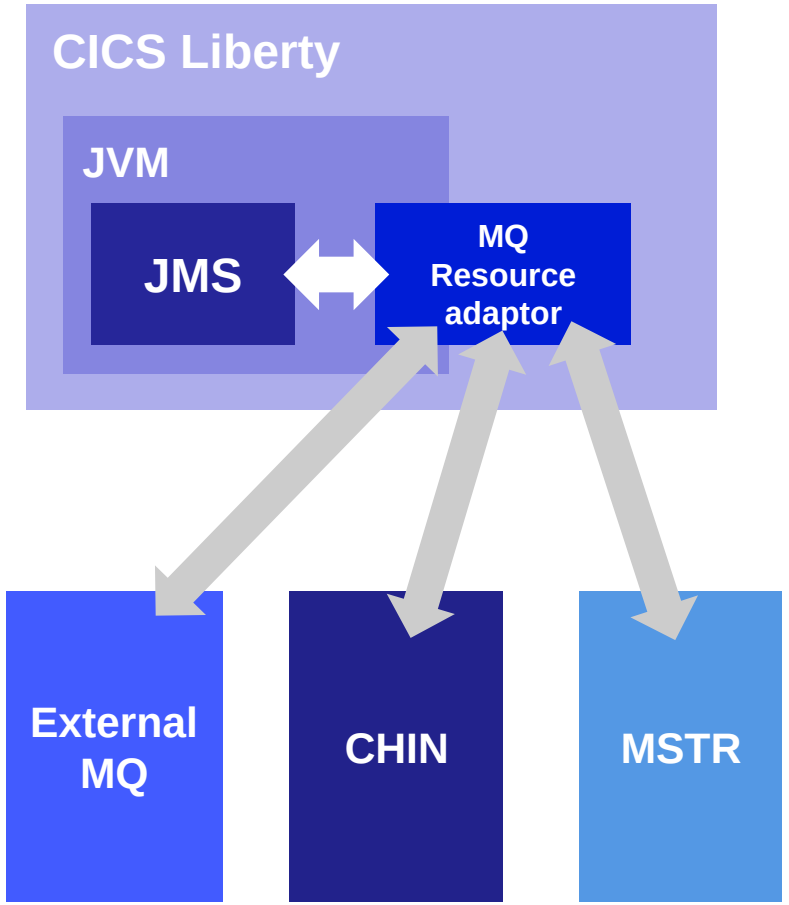
Allow CICS Liberty to use MQ resource adapter

- 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



IBM MQ V9.0.2 CD

March 2017 **NEW!**

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

Distributed recovery logs

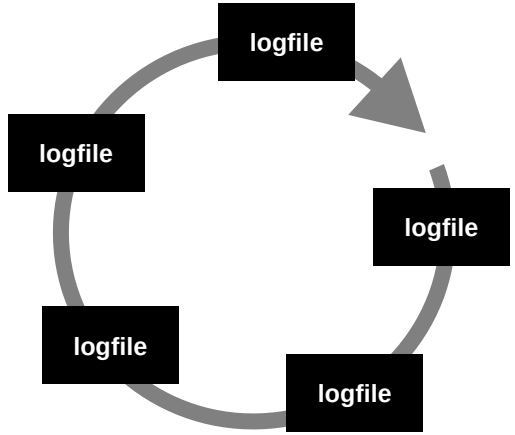
MQ always logs all the data you need to recover from a queue manager failure in a recovery log

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

Linear 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

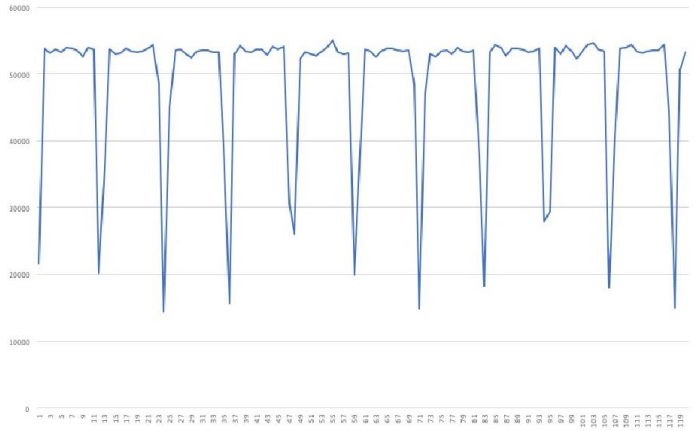
Previously this was up to the administrator

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

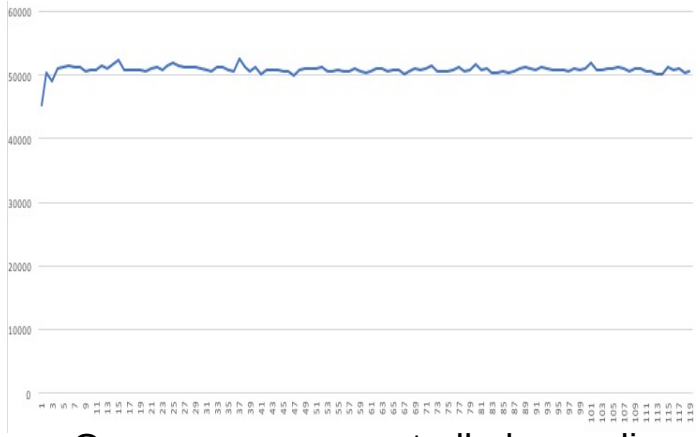
The frequency of imaging can be controlled based on **time interval** or **data written**

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



Manually controlled recording



Queue manager controlled recording

Significantly reducing the overheads of linear logging

Automatic log reuse

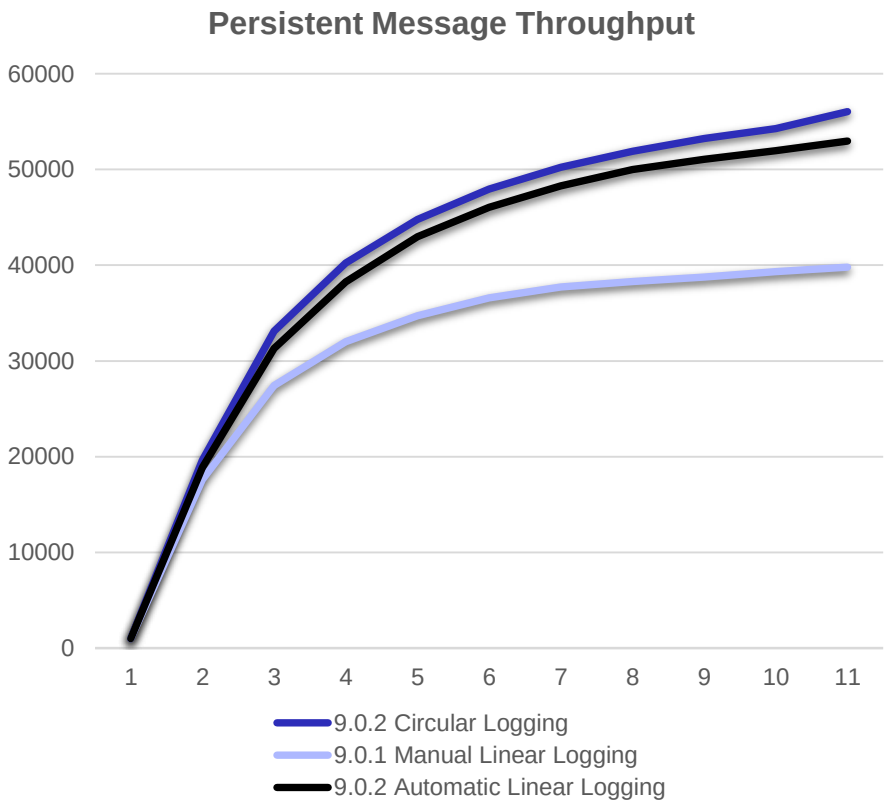
Linear log extents must be removed from the system to free up space

- 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

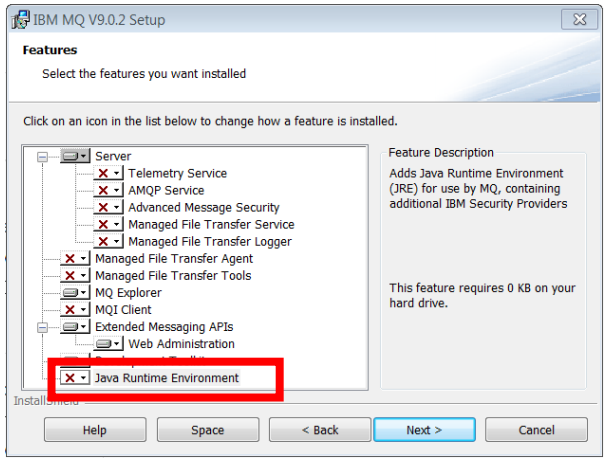
Extra information added to queue manager status on log utilization to aid better log configurations

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



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

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

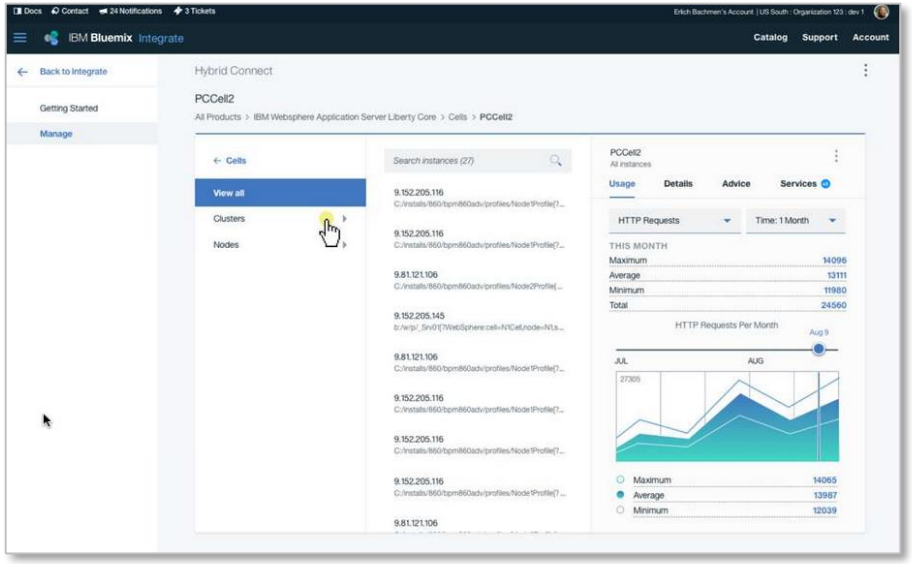
Users register instances of their IBM products with a central IBM cloud hosted service

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*

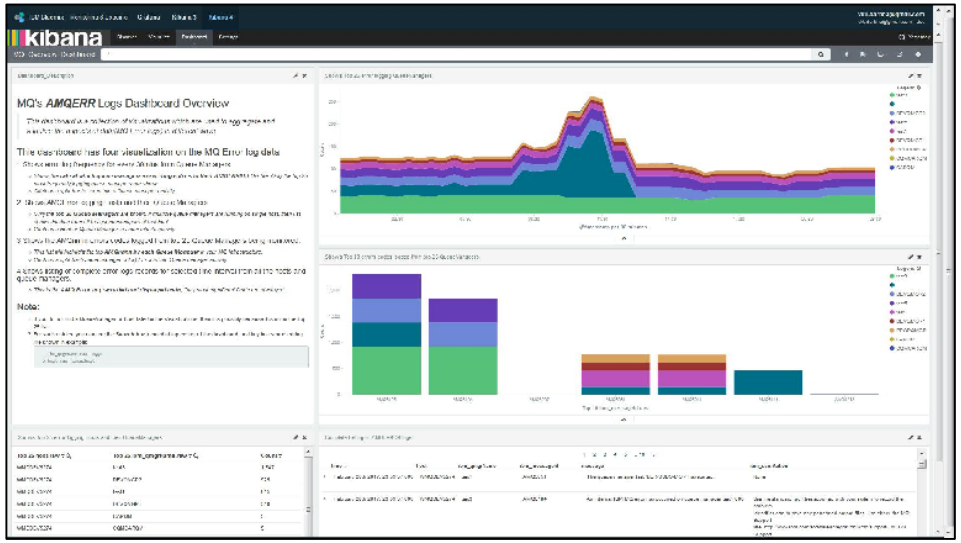
Registered queue managers forward **error logs** to the Product Insights service

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….

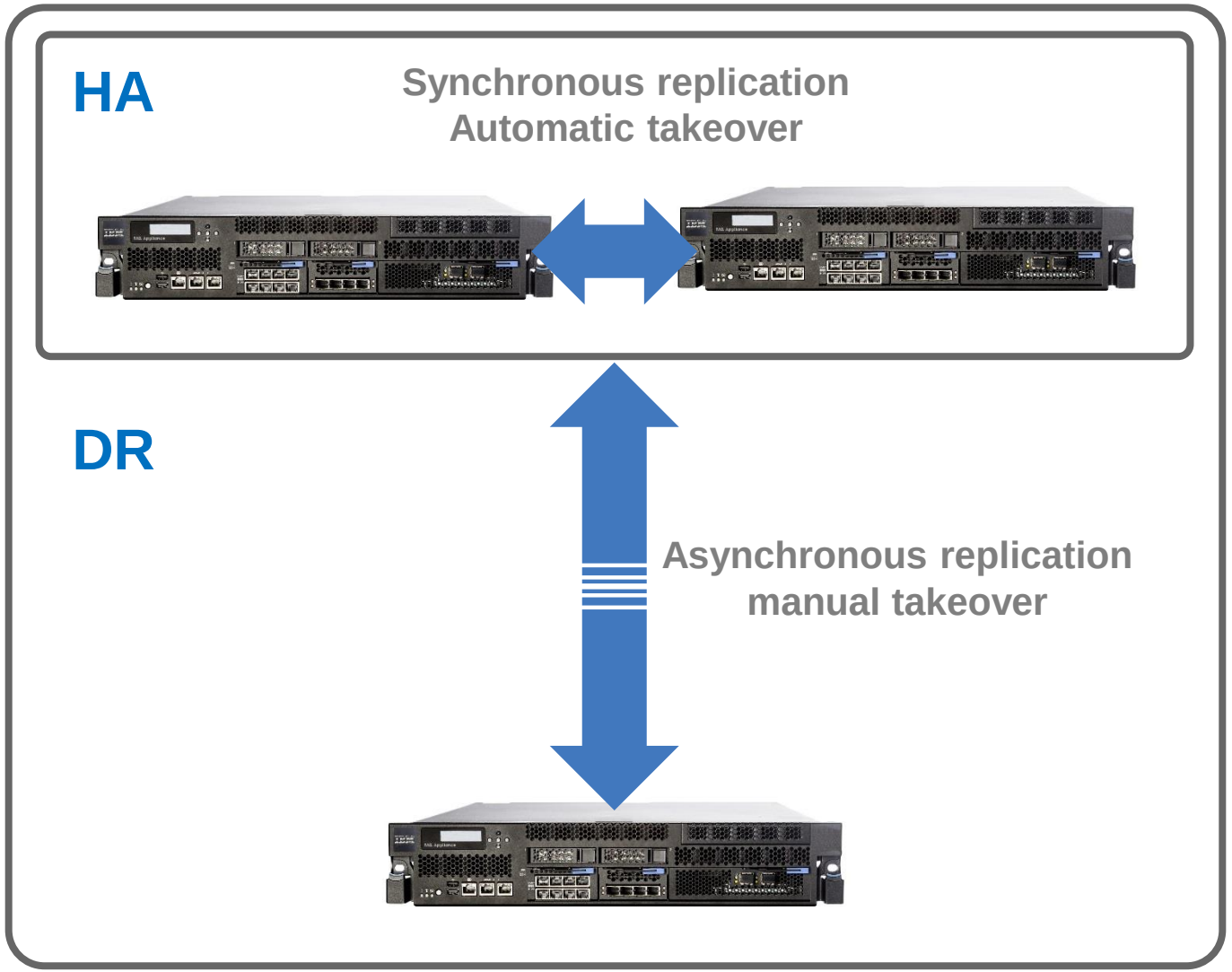
MQ Appliance high availability and disaster recovery

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

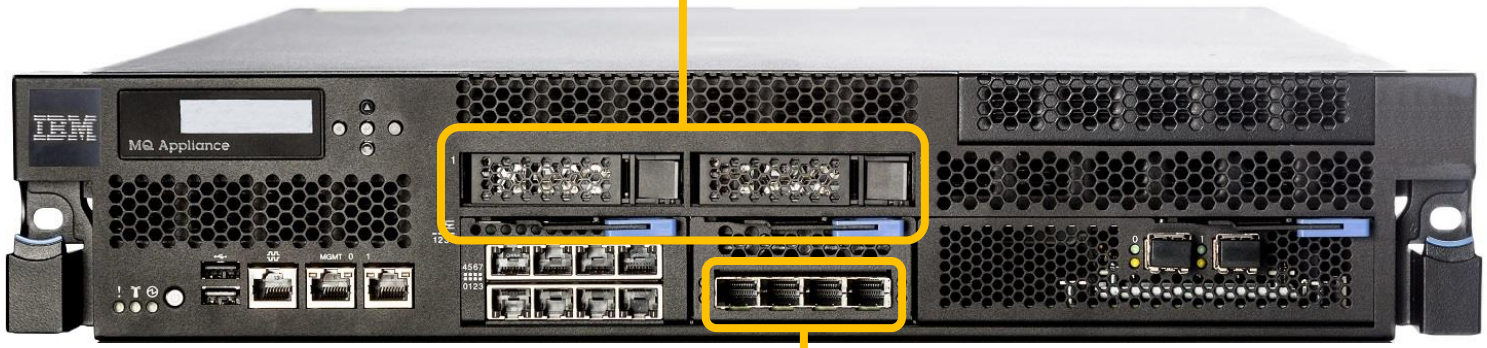
Combined HA and DR **(firmware update 5)**



Hardware updated in June 2016 to the M2001

Original 1.2TB HDDs replaced with 3.2TB SSDs

A potential 3x performance gain for heavily persistent workloads



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

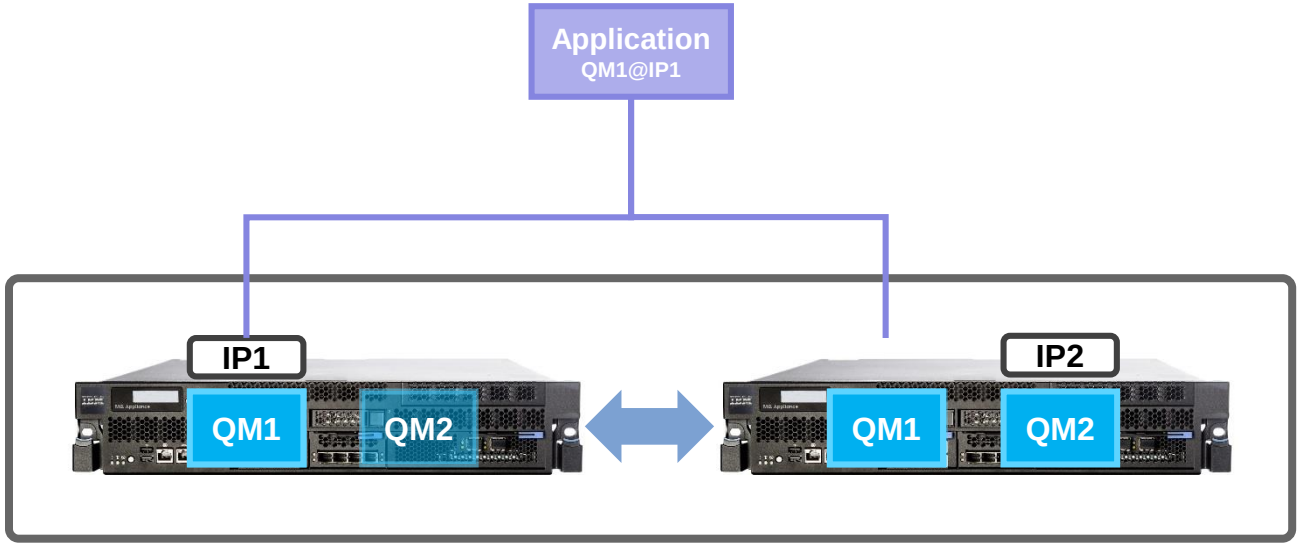
Firmware update: MQ 9.0.1 CD

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

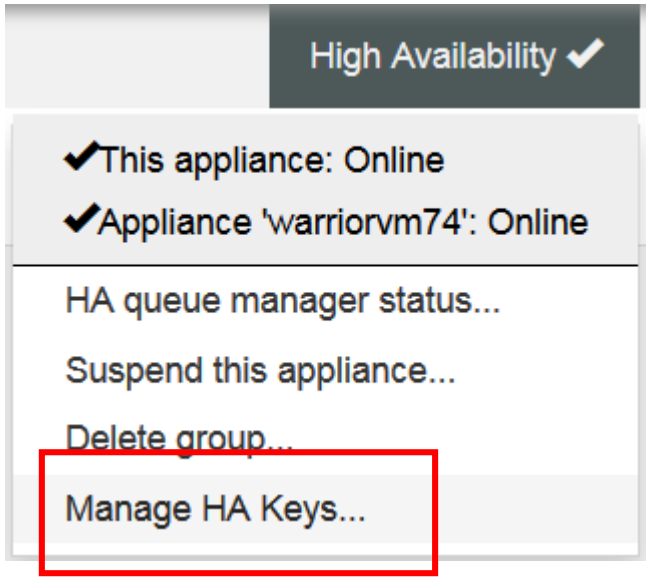
Firmware update: MQ 9.0.2 CD

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




```
mqa(mqcli)# crthakeys
The crthakeys command succeeded.

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

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

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

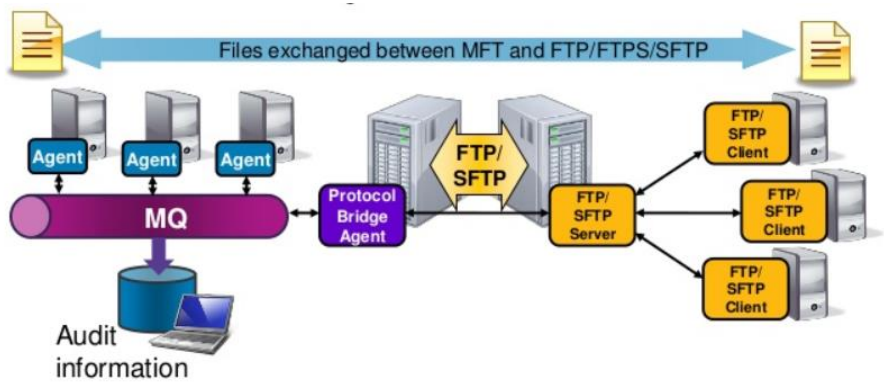
MQ 9.0.1 CD

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

Cloud

IBM MQ

Spark

Message Hub

IBM Bluemix
(including Softlayer)

IBM MQ
amazon web services

IBM MQ
Windows Azure

IBM MQ
Google Cloud Platform

docker
vmware
MESOS
openstack
CLOUD SOFTWARE
kubernetes
by Google
...

On-prem

Linux
Windows
for Business
hp UX
AIX
Hewlett Packard Enterprise
ORACLE
SOLARIS
...

Distributed platforms

IBM MQ

Private cloud

IBM MQ Appliance

Help and advice with MQ in the Cloud

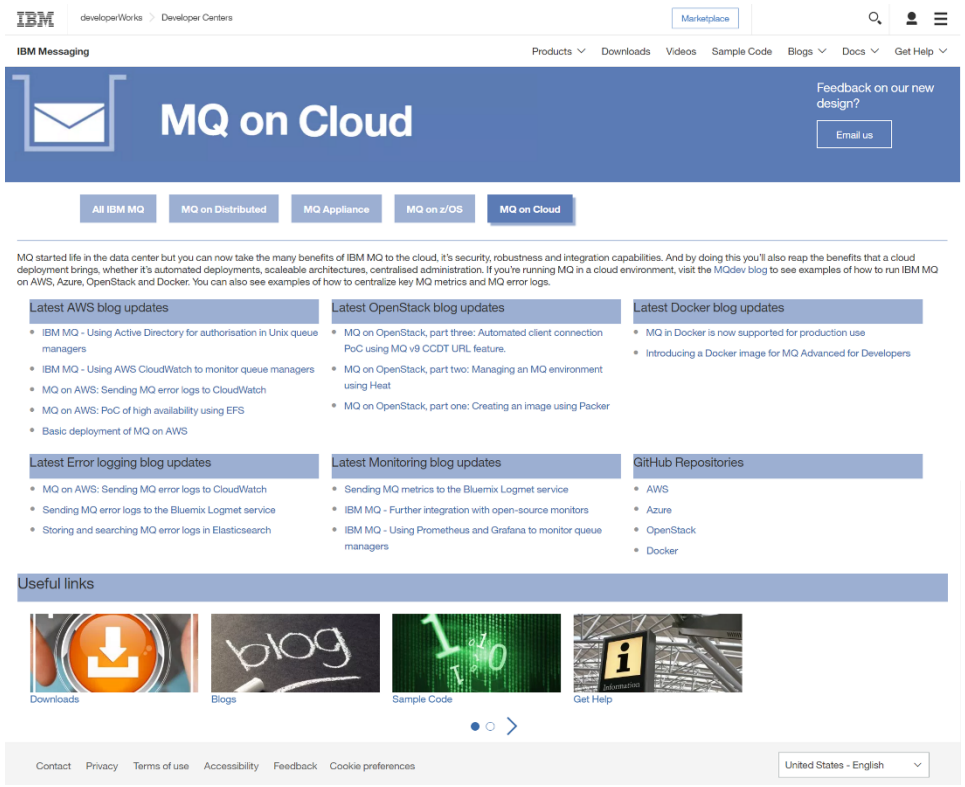
It has always been critical for MQ to run where it is needed and integrated into the tools of your choice

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



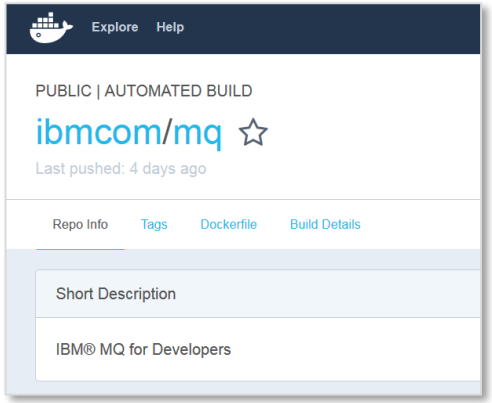
https://developer.ibm.com/messaging/mq-on-cloud/

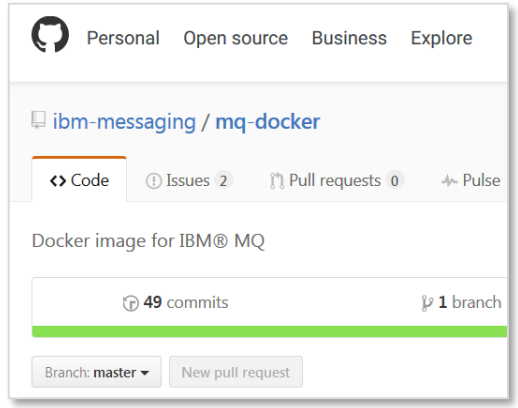
kubernetes by Google
CHEF
docker
Grafana
Windows Azure
ceph
openstack CLOUD SOFTWARE
amazon web services™

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





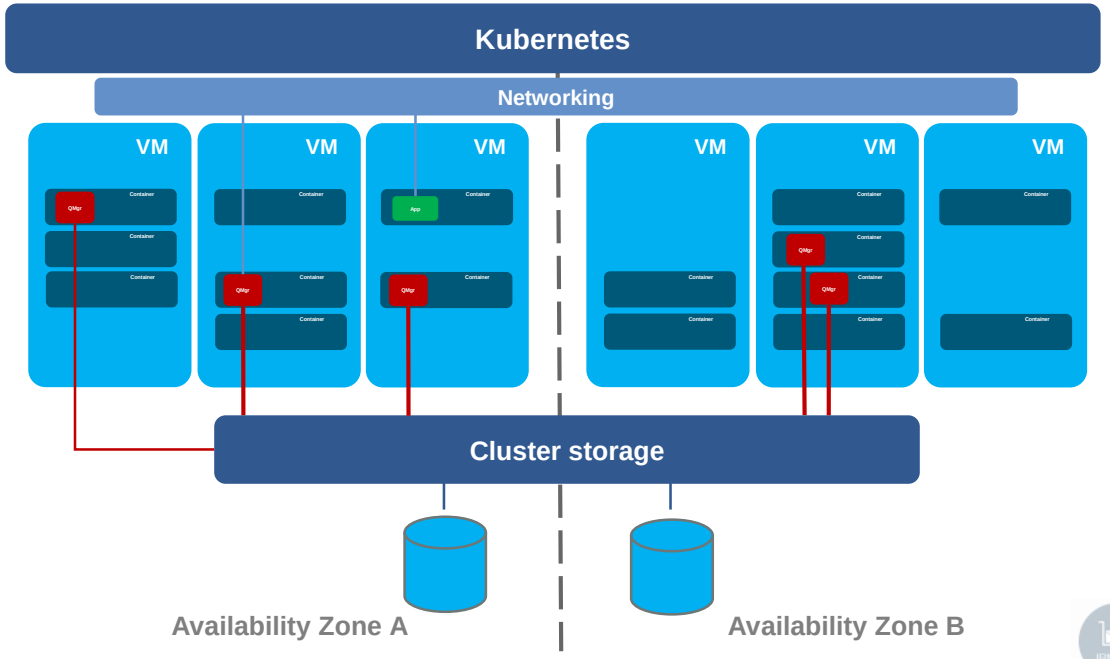
IBM provided sample Docker files for customizing and building your own Docker images

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 IaaS cloud container services
  - Bluemix, Amazon EC2, Azure, …

kubernetes by Google

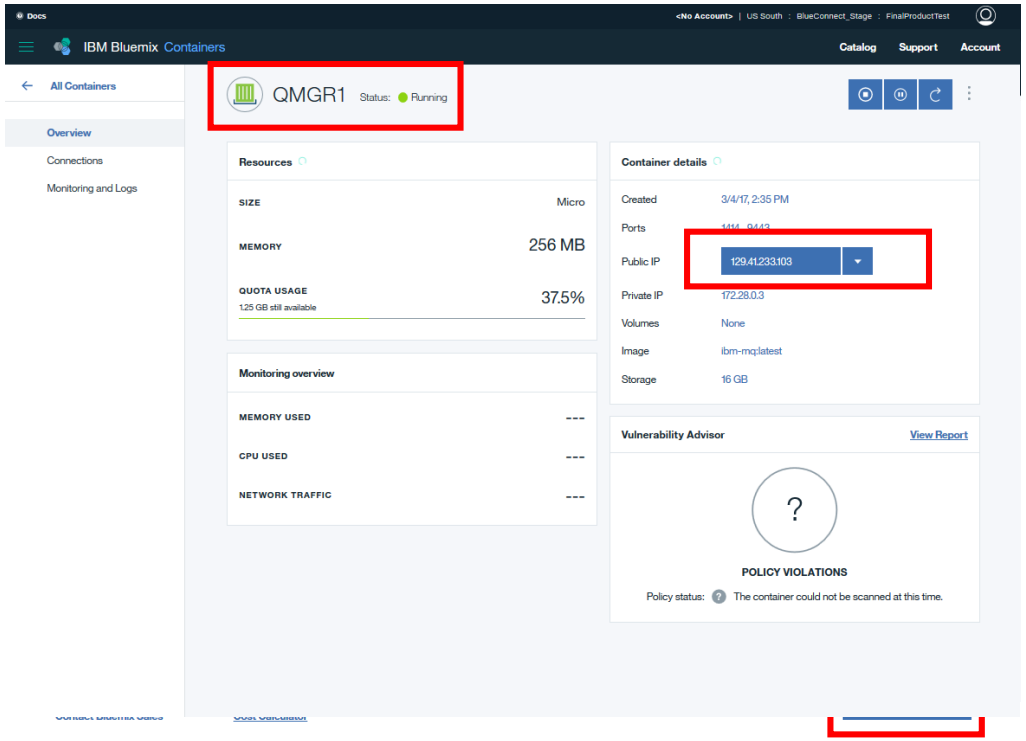


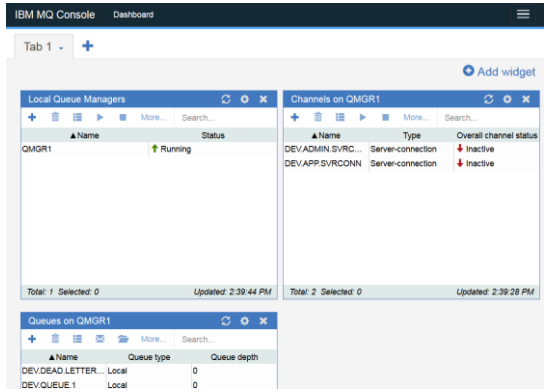
MQ Advanced for Developers in the Bluemix Container Service

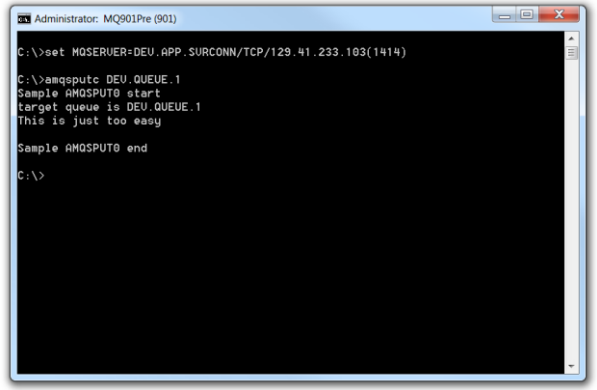
It is now possible to spin up MQ queue managers in the Bluemix Container Service with a couple of clicks

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



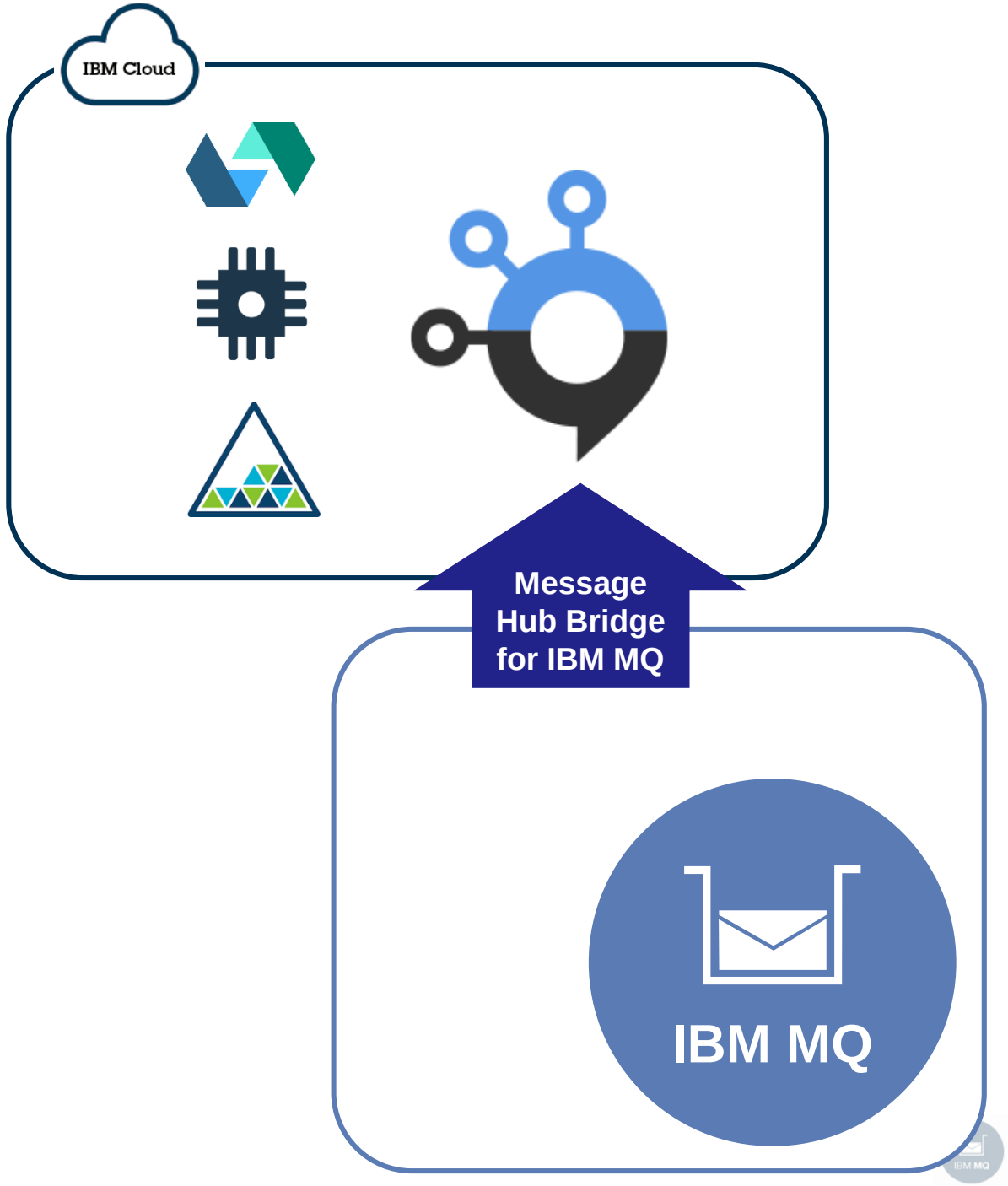




Message Hub Bridge

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

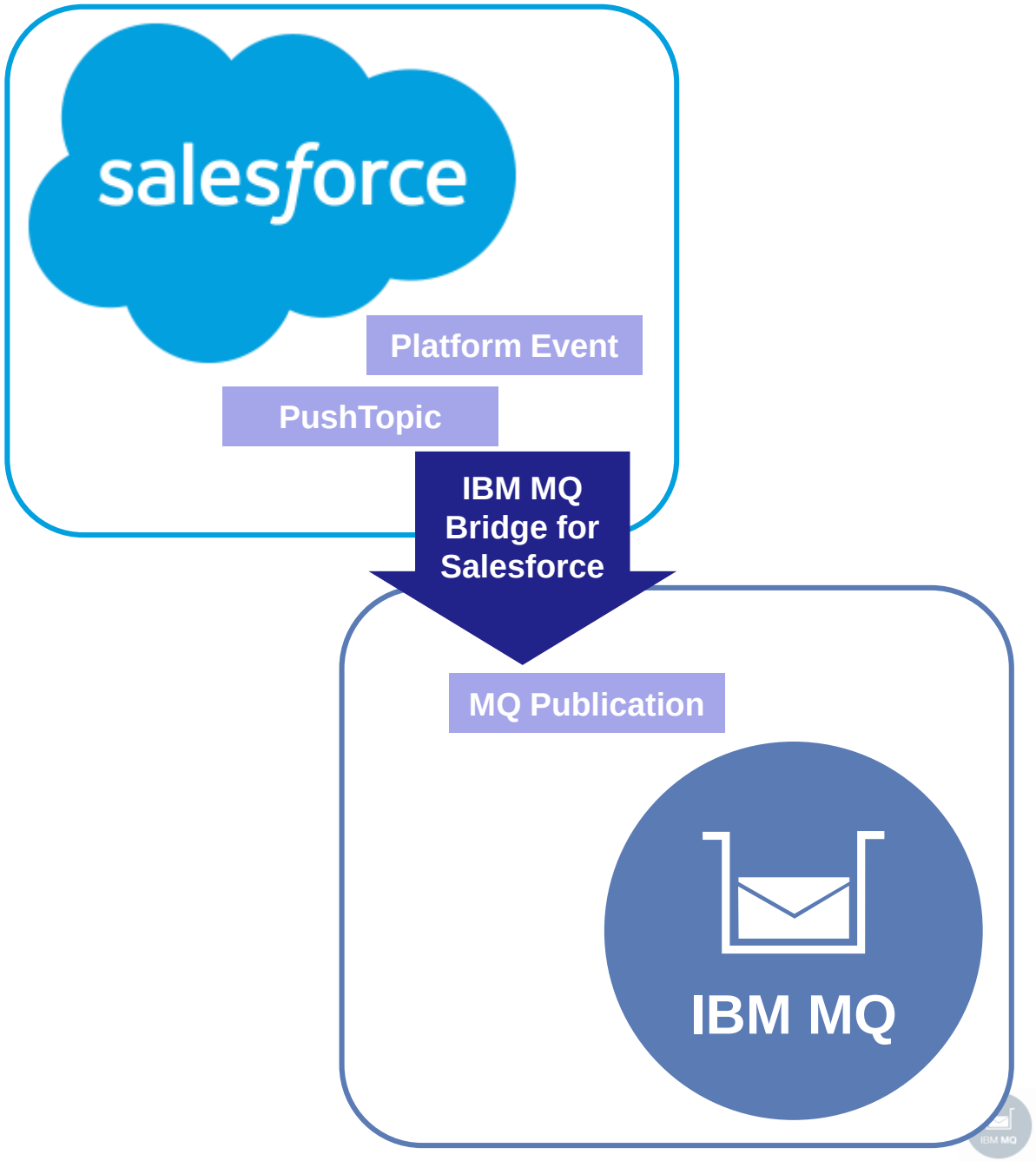
Safesforce's cloud-based CRM platform enables events to be emitted when changes are made to data, or when applications run

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

Cloud

IBM MQ

Spark

Message Hub
(Based on Apache Kafka)

IBM Bluemix
(including Softlayer)

IBM MQ — amazon web services

IBM MQ — Windows Azure

IBM MQ — Google Cloud Platform

docker · vmware · MESOS · openstack · kubernetes by Google · ...

On-prem

IBM MQ — z/OS

IBM MQ — Linux · for Business · Windows · hp UX · AIX · Hewlett Packard Enterprise · ORACLE SOLARIS · ...

Distributed platforms

IBM MQ

Private cloud

IBM MQ

IBM MQ Appliance

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

Cloud

IBM MQ

Spark

Message Hub
(Based on Apache Kafka)

IBM Bluemix
(including Softlayer)

IBM MQ

amazon web services™

IBM MQ

Windows Azure

IBM MQ

Google Cloud Platform

MQ hosted SaaS

docker

bernetes by Google

...

On-prem

IBM MQ

z/OS

IBM MQ

Linux

for Business

Windows

hp UX

AIX

Hewlett Packard Enterprise

ORACLE SOLARIS

...

Distributed platforms

IBM MQ

IBM MQ

Private cloud

IBM MQ

IBM MQ Appliance

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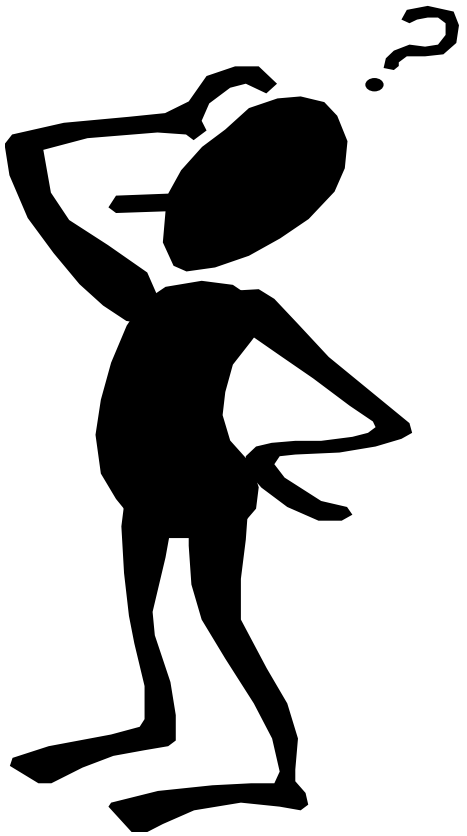

Any questions?