What's new in IBM MQ for z/OS 9.1

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IBM MQ Development

MQ for z/OS enhancements

MQ Advanced for z/OS VUE enhancements

Celebrating

25 years

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MQ for z/OS enhancements

MQ Console for web-based administration

MQ REST API for administration & messaging

Learn MQ

Improved Java support in CICS

MQ service provider for IBM z/OS Connect Enterprise Edition

Dataset and CF encryption

Improved workload balancing options for shared queues

Simplified migration experience

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years

Improving Java support within CICS

MQ V8 added support for MQ JMS in CICS OSGi JVM Servers

CICS now provides embedded Liberty server – JEE resources can exploit CICS resources

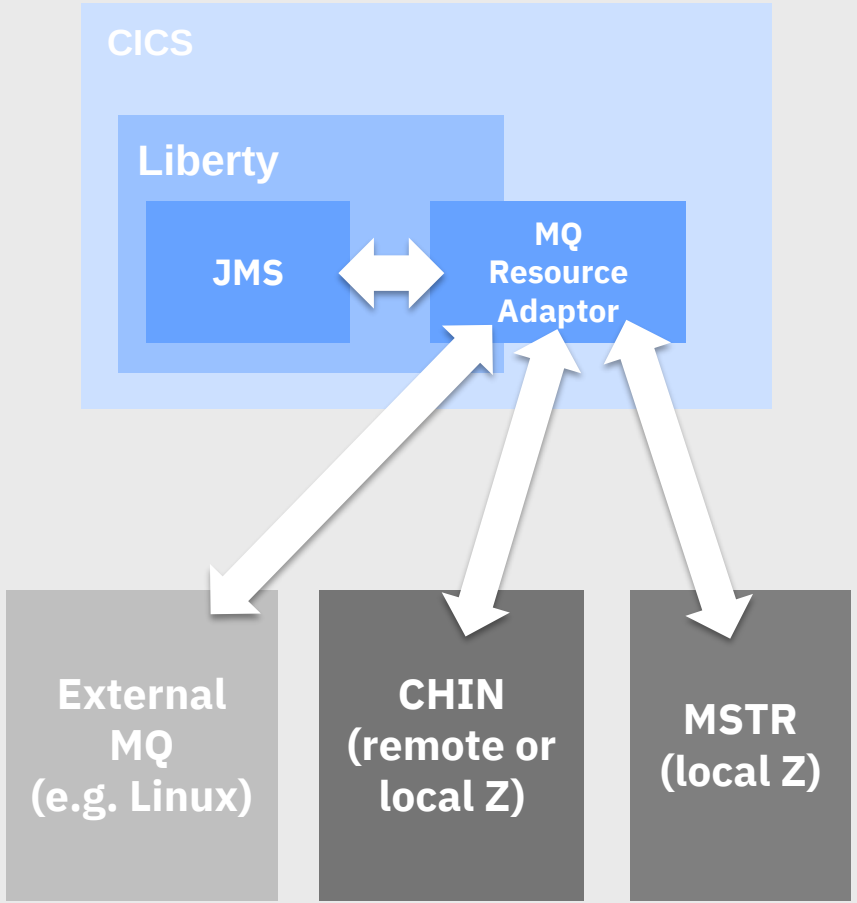
Allows CICS Liberty to use MQ Resource Adapter just like normal Liberty

Run existing Liberty messaging apps such as MDBs inside CICS

Connections to MQ supported using either client or bindings mode

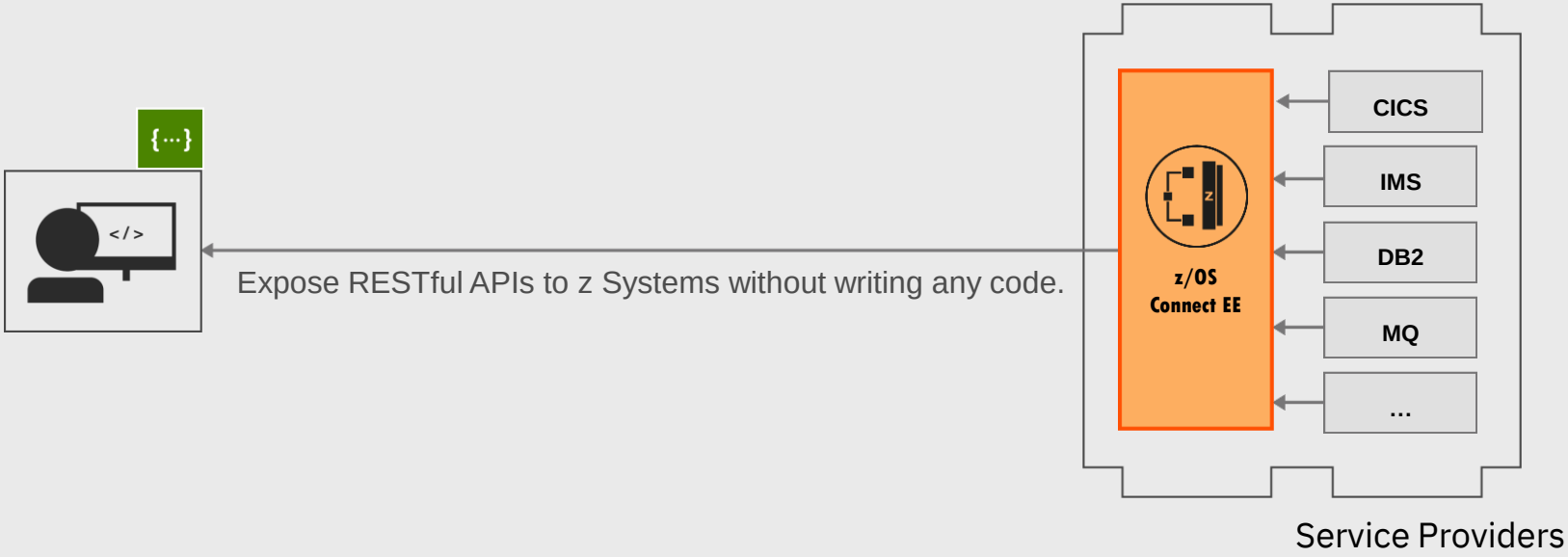
Requires CICS 5.3 + PI58375 + MQ 9.1.0 resource adapter, or one from an earlier CD release (9.0.1 and later)

MQ JMS in CICS Liberty Profile



z/OS Connect EE

z/OS Connect EE provides a single, RESTful entry point to your z systems assets and data
Enables reuse of existing assets, exposing them to environments where it is natural to use REST
Those new consumers do not need to understand or be aware of the specifics of the subsystems
No changes to subsystems required, all handled via configuration



New MQ service provider for IBM z/OS Connect Enterprise Edition

Free of charge z/OS Connect service provider that allows existing services that are fronted by MQ to be accessed via a RESTful front end

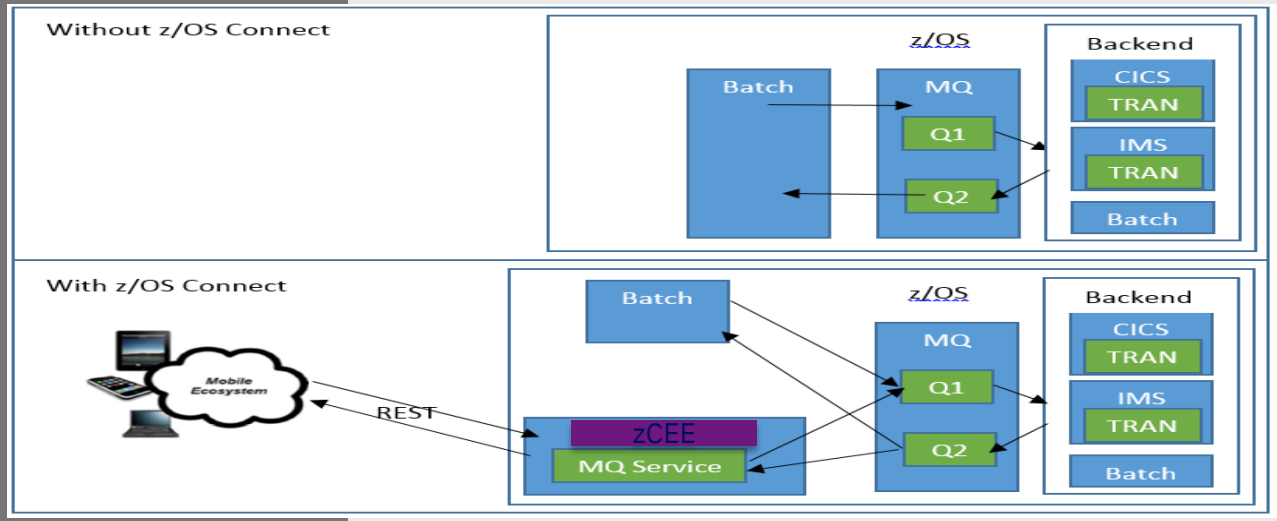
Supported with MQ 8 and onwards

Shipped with MQ 9.1.0 (plus earlier CD releases) or obtain from FixCentral

Clients need have no knowledge of MQ

MQ information hidden by configuration, but advanced users can specify some MQ attributes using HTTP headers

Existing MQ environment, CICS and IMS consuming data via MQI, driven by batch or WAS environments



Expose **bespoke** REST APIs for particular MQ resources to new consumers, who don't understand COBOL copybooks / PL/I. Backend is hidden and invoked using JSON / HTTP. No changes to batch etc.

CF encryption

z/OS 2.3 added support for encryption of data sent to CF list and cache structures

Encryption protects data both inflight, and when at rest in the structure

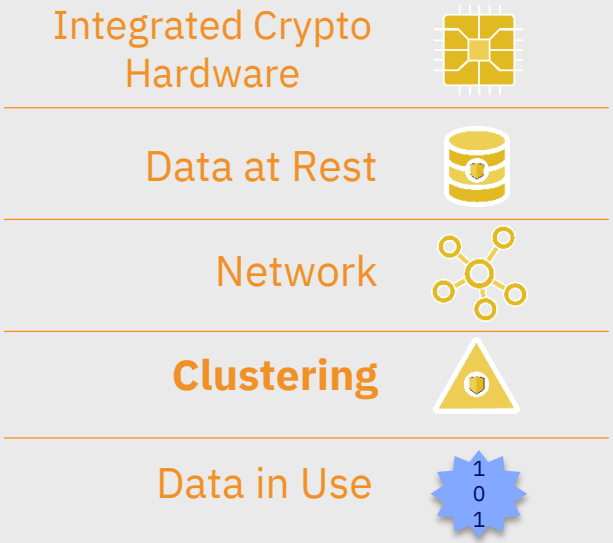
Encryption/decryption is performed by z/OS LPARs connected to the CF, not the CF itself

Requires a CryptoExpress coprocessor to use!

Entirely transparent to MQ, and fully supported

Measurements in the lab have shown that using CF encryption with MQ has a low overhead, less than 6%

Pervasive encryption with IBM z Systems



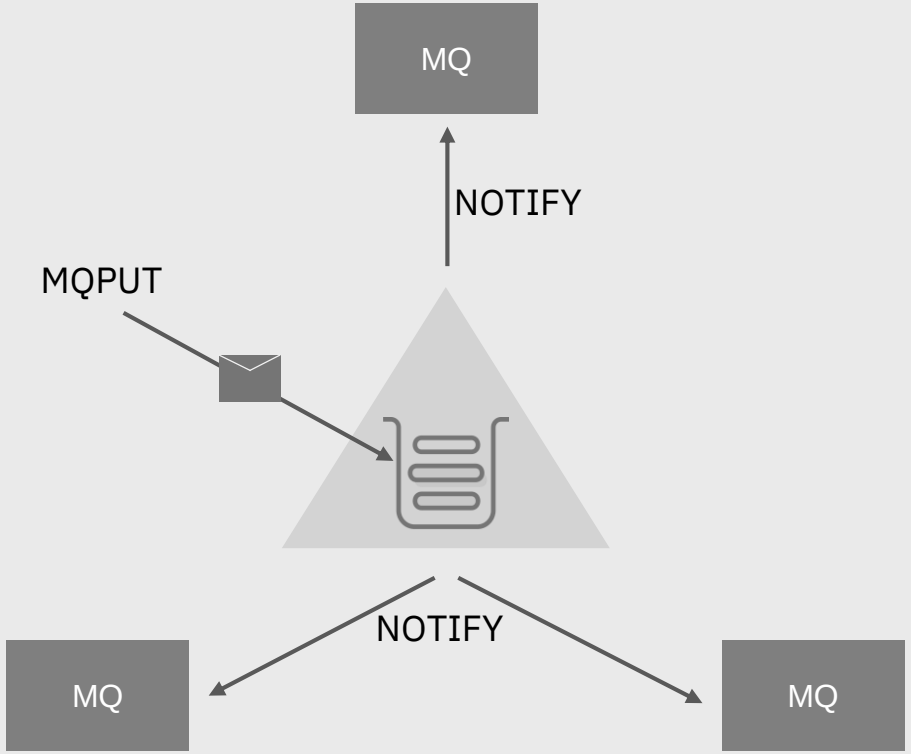
Improved workload balancing options for shared queues

CF list monitoring is used to monitor the state of list structures containing shared queues

When a queue's depth transitions from zero to non-zero, the CF notifies queue managers in the queue sharing group

The queue managers might perform a number of actions, including notifying trigger monitors that are using TRIGGER(FIRST), or applications which are performing a get-wait

All queue managers notified at the same time which causes a race for the messages and in some cases workload skewing or a large number of empty gets



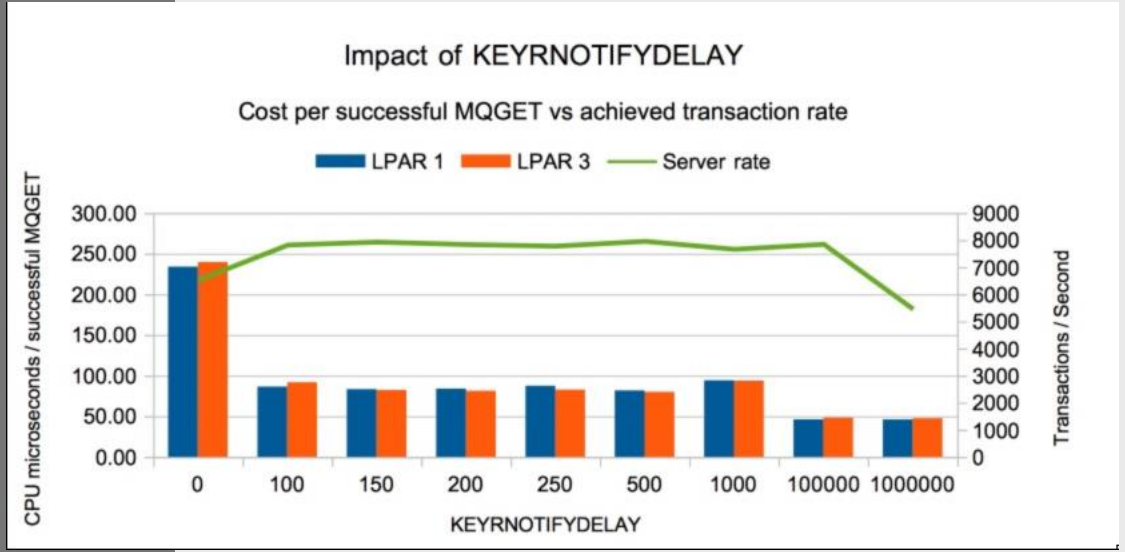
Improved workload balancing options for shared queues

z/OS 2.3 introduces a new CFRM attribute: KEYRNOTIFYDELAY

Can be used to notify one queue manager earlier than the others which **might** reduce skewing/empty gets

If the target queue manager doesn't action the notify in the time period, in microseconds, specified by the attribute, all other queue managers are notified

Very dependent on environment and workload. Your mileage may vary!




```
STRUCTURE
   NAME(QSG1STRUCT1)
   SIZE(1024M)
   KEYRNOTIFYDELAY(500)
   ...
```

https://developer.ibm.com/messaging/2018/06/22/z-os-v2r3-new-cfrm-policy-attributes-impact-mq/

Simplified migration experience

OPMODE removed at 9.1.0

Recompiling zparm at 9.1.0 with OPMODE specified will generate a warning. But old zparm modules can be used

OPMODE output removed from the DIS SYSTEM command

New message indicates whether backwards migration is support or not, and if it is where you can migrate back to

Backwards migration always supported to 8.0.0 or 9.0.0 if migration PTFs applied

PI95928 for 8.0.0
PI95939 for 9.0.0

CSQY039I !MQ21 Backwards migration is supported to Version 9.0.0

CSQY040I !MQ21 Backwards migration not supported

Reminder: backwards migration is not supported in continuous delivery.

I.e. you can go from 9.0.5 to 9.1.0 but you can’t go back

Similarly you can go from 9.0.0 to 9.0.5 but you can’t go back

qTypes

There will be two qType APARs. Numbers are:

PH02328
PH02329

We recommend that you apply these APARs as soon as they become available and before going into production with 9.1.0

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IBM MQ Advanced for z/OS Value Unit Edition

The Richest Set of z/OS Messaging Capabilities in a Single, Simple to Deploy Offering

IBM MQ Advanced for z/OS Value Unit Edition

Enables applications and systems to participate in a Blockchain network via MQ, performing CRUD operations on Hyperledger Fabric Blockchain running in IBM Cloud or running locally

Provides reliable, secure and auditable file transfer that reduces the need for manual processes, and management tools that help reduce wasted time when dealing with failure analysis

Provides end-to-end encryption of message contents to protect sensitive data from all forms of intrusion, attack or accidental disclosure, and with no need for application change

Enables the secure, reliable exchange of business data across applications, systems and services on-premises, in the Cloud, or in Hybrid environments

MQ Advanced for z/OS VUE enhancements

- AMS performance improvements
- Managed File Transfer enhancements
- Enhanced Blockchain connectivity
- Client connection flexibility

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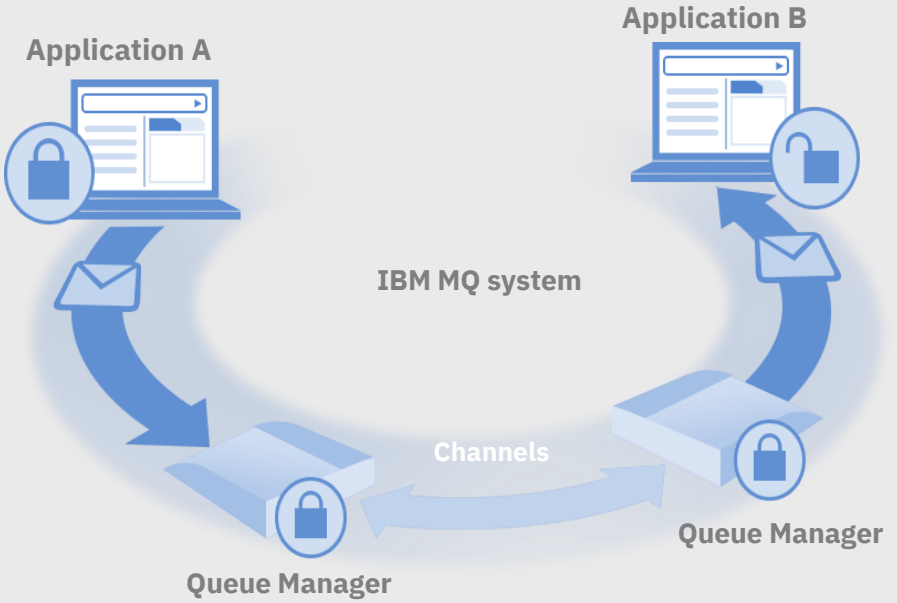
MQ Advanced for z/OS VUE delivers pervasive encryption

- Apply end-to-end encryption to existing messaging infrastructure easily and with no application changes
- Authenticate and protect messages across the enterprise making audit simple
- Reduce time and skills needed to comply with aspects of common security standards
- Detect and remove rogue messages
- New Confidentiality option for encryption has minimal performance impact

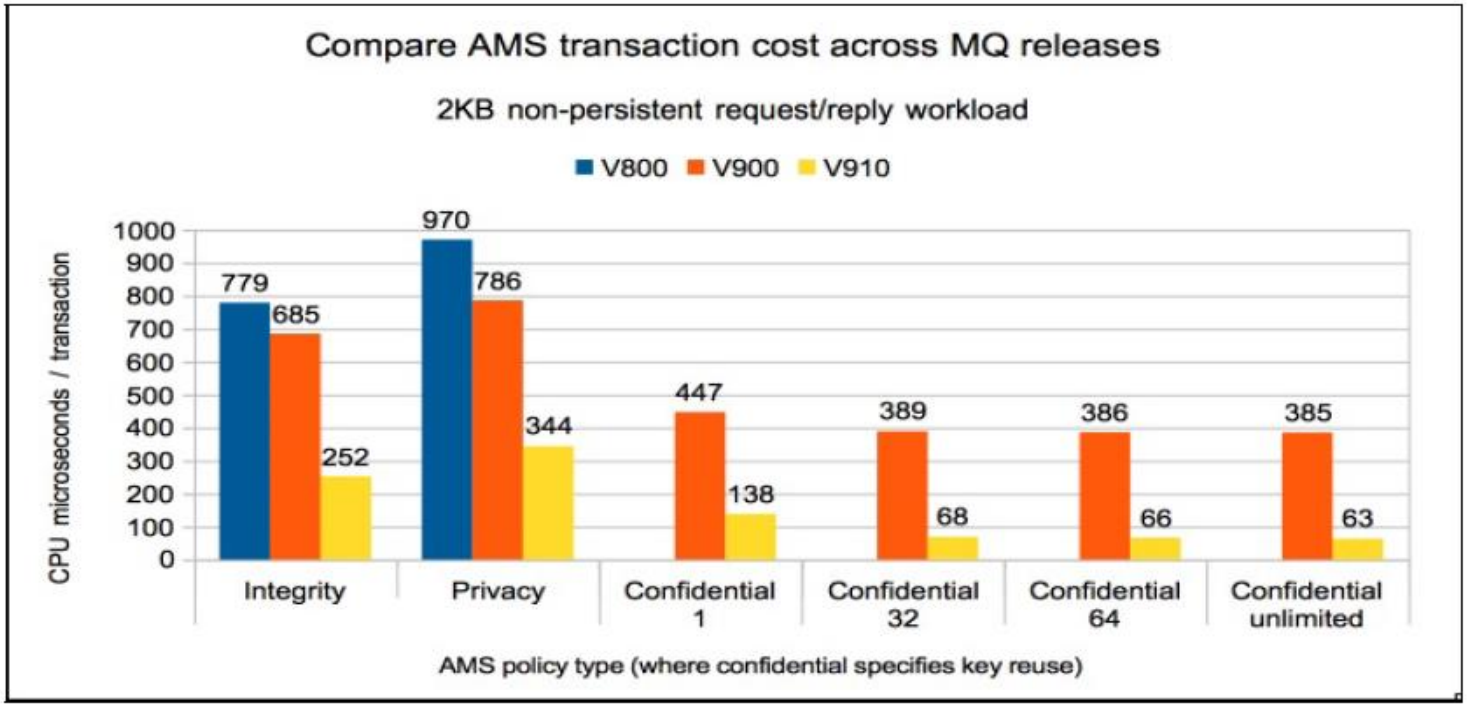
Advanced Message Security (AMS) protects data at rest, in-flight and in-memory to guarantee privacy of message contents



Significant improvement in performance when applying AMS policies

A cost comparison between version 9.1.0 and 9.0.0 shows:

Integrity: 37% of the equivalent version 9.0.0 measurement
Privacy: 44% of the equivalent version 9.0.0 measurement
Confidentiality: 17-32% of the equivalent version 9.0.0 measurements (depending on the key reuse value)



Move Data and Files with MQ Advanced for z/OS VUE

How:

- ⇨ File-to-file
- ⇨ File-to-message
- ⇨ Message-to-file

Benefits:

Reliability of delivery
Increased security of system and data
Integrated management and recovery

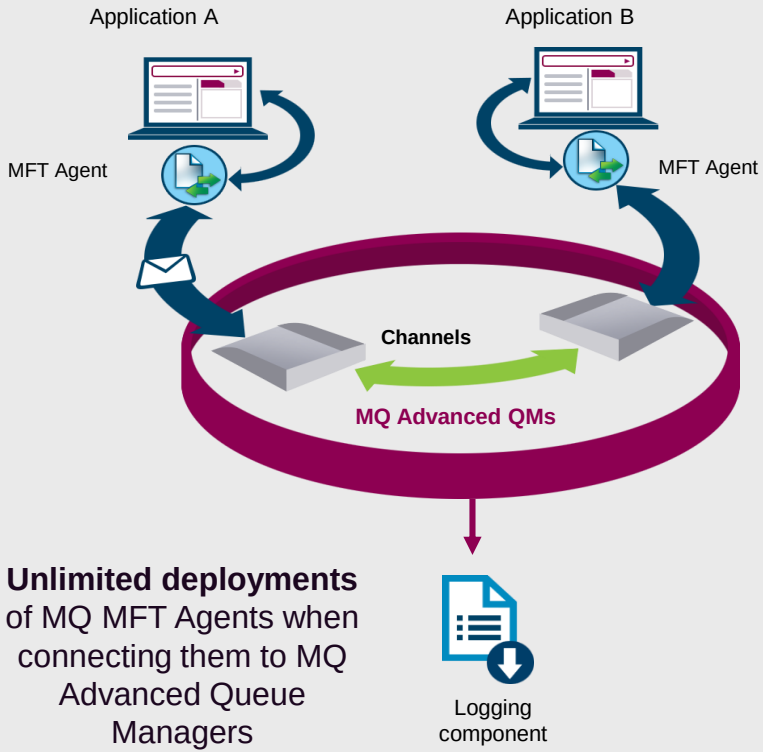
MFT Agent:

Performs the fundamental file transfer function of sending and receiving files from the local system

MFT Service:

Installs a file transfer agent on MQ server with additional capabilities

Managed File Transfer (MFT) enables a consistent approach to transporting application data and file data as messages



Unlimited deployments of MQ MFT Agents when connecting them to MQ Advanced Queue Managers

Managed File Transfer Enhancements

Create a “File Hub” using simplified MFT Agent connectivity

MFT agents deployed wherever files are to be sourced or delivered

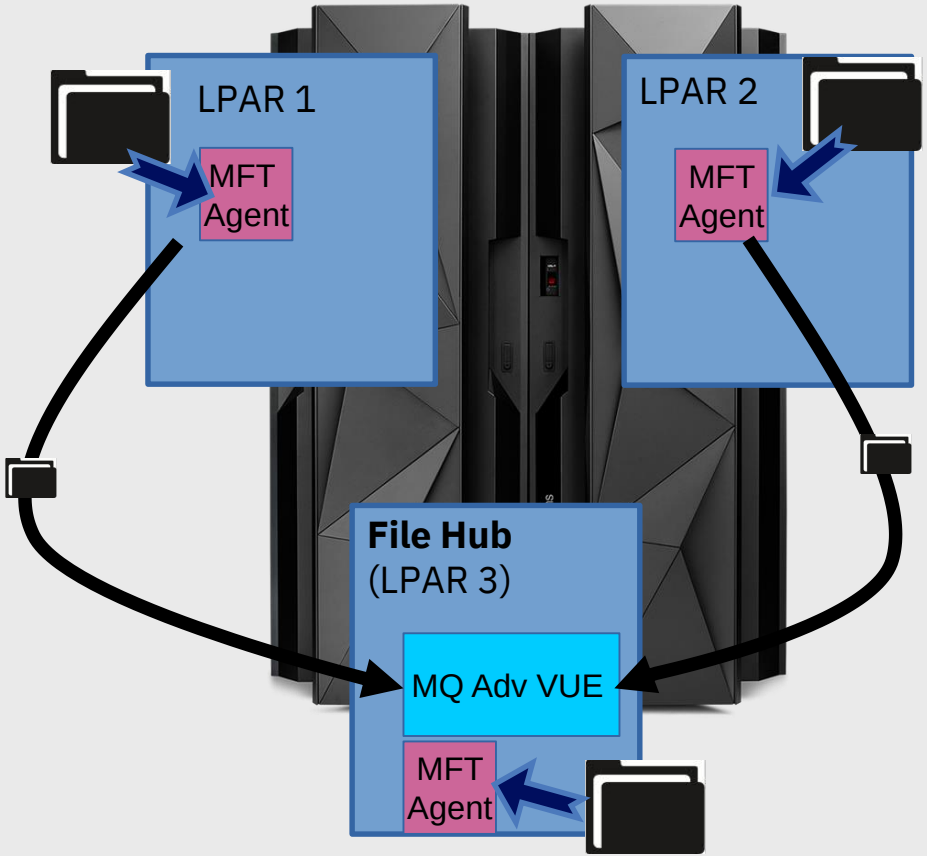
No requirement for a local z/OS queue manager - choose where to handle file workload

Files transferred across the MQ network between local and remote agents

Reduce the number of queue managers required - simplified topology for easier administration

MFT file logger can now use client mode to connect to the coordination queue manager

Monitor current MFT transfers via the MQ REST API and query the status of MFT agents



Blockchain requires connectivity for data sharing

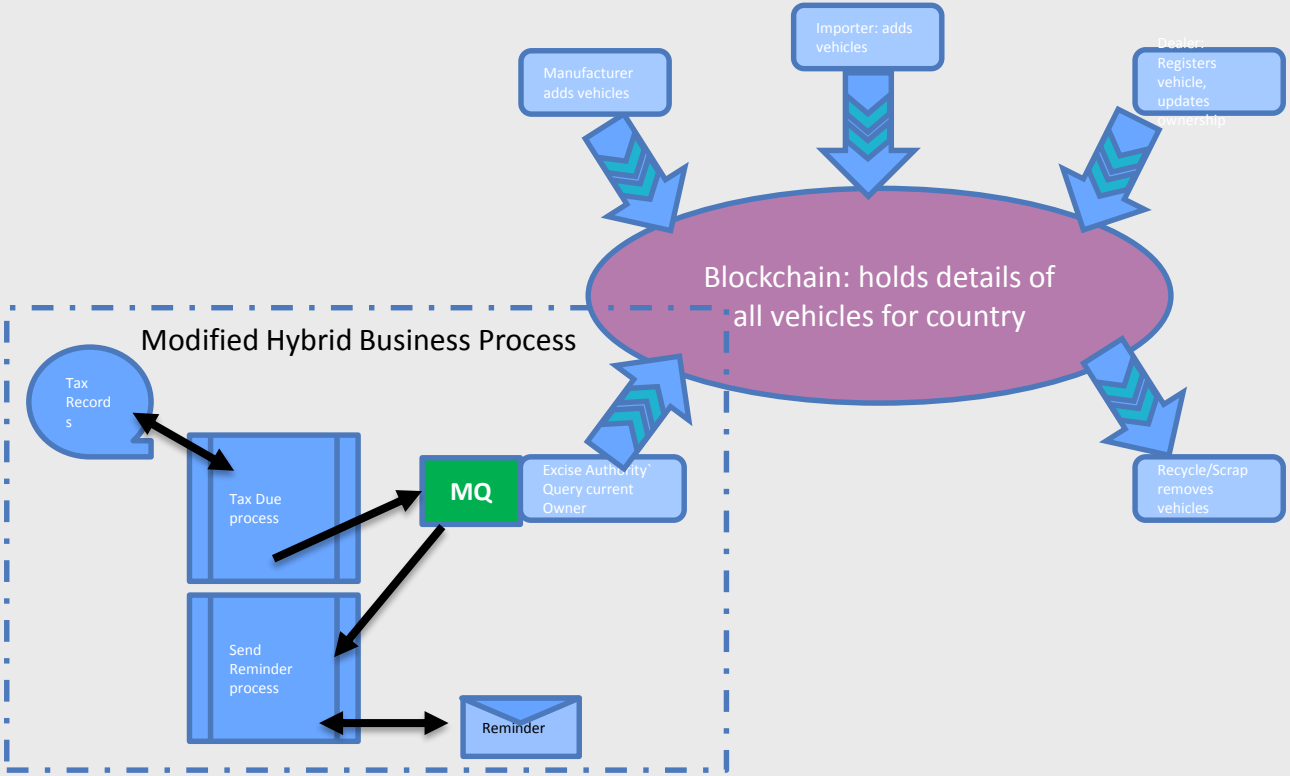
Parties in the business network need to exchange data often held in Systems of Record

Requirements…

Enable a range of different applications and systems to send updates to a Blockchain network

Ensure data integrity following changes to shared assets

Transport critical business data securely and reliably



Connect to Blockchain with MQ Advanced for z/OS VUE

Deploy IBM MQ Bridge to Blockchain to enable applications and systems to participate

Bridge allows an MQ application to connect to Hyperledger Composer Blockchain running in IBM Cloud or running locally

Utilise request-reply MQ messages to query information from Blockchain (e.g. what is the value of the balance on this account)

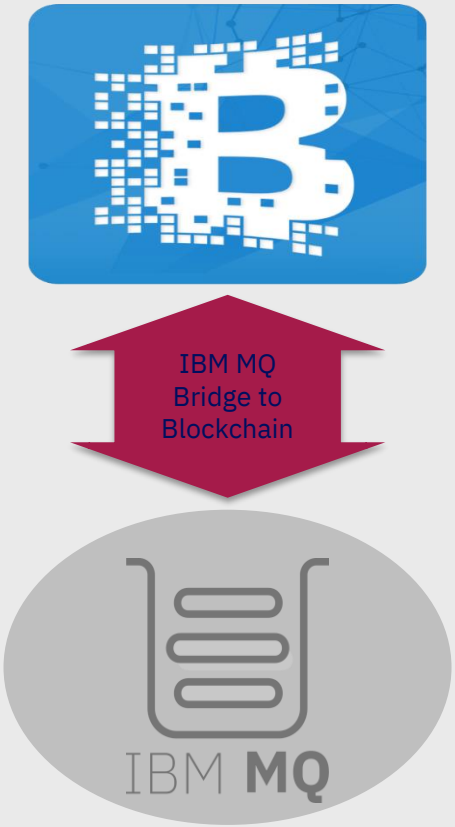
Use MQ to drive create, read, update and delete operations on Blockchain-managed assets

No need to understand the ledger-specific APIs, configuration or controls

```
Connection to Queue Manager
---------------------------
Queue Manager                          : []MQ21
Bridge Input Queue                     :
[SYSTEM.BLOCKCHAIN.INPUT.QUEUE]
MQ Channel                             : []
MQ Conname                             : []
MQ CCDT URL                            : []
JNDI implementation class              :
[com.sun.jndi.fscontext.RefFSContextFactory]
JNDI provider URL                      : []
MQ Userid                              : []MLEMING
MQ Password                            : []


User Identification
-------------------
Userid                                 : []MLEMING
Password                               : []

API path for login                     : [auth/users/login]
```



Run the IBM MQ bridge to Blockchain on z/OS

The bridge can be run on USS and connect via bindings to your z/OS queue manager

No need to install in an x86 Linux environment

Three step process to set up

1) Define necessary queues using CSQ4BCBQ

2) Generate configuration file in USS: runmqbcb -o config.json

3) Run the bridge either in USS or using JCL: CSQ4BCB sample provided

```
/u/mleming/mqm/V9R1M0/mqbc:>ls -1
bin
lib
prereqs
samp
/u/mleming/mqm/V9R1M0/mqbc:>ls bin
runmqbcb
```

```
/u/mleming/mqm/V9R1M0/mqbc/bin:>./runmqbcb -o ~config.json
2018-06-21 09:56:05.970 BST IBM MQ Bridge to Blockchain
5724-H72 (C) Copyright IBM Corp. 2017, 2018
Level : V910-DFCT6-L180619

Enter new values for the configuration attributes.
Current values are shown in square brackets.

Press ENTER to accept current values; use SPACE+ENTER
to clear values; use <new value>ENTER to set a new value.

If lists of values are required these may be separated by commas
or entered on multiple lines. A blank line terminates the list.

NOTE: You cannot edit existing values - you can only keep, replace or

Connection to Queue Manager
---------------------------
Queue Manager                          : []MQ21
Bridge Input Queue                     : [SYSTEM.BLOCKCHAIN.INPUT.QUEUE]
MQ Channel                             : []
MQ Connname                            : []
```

```
//CSQ4BCB  JOB MSGCLASS=H,NOTIFY=&SYSUID
//*
//   SET INSTDIR='/u/mleming/mqm/V9R1M0/mqbc'
//*
//STEP1   EXEC PGM=BPXBATSL,REGION=0M,TIME=NOLIMIT,MEMLIMIT=NOLIMIT,
//   PARM='PGM &INSTDIR./bin/runmqbc -f /u/mleming/bcb/config.json -d 2'
//STEPLIB  DD DSN=ANTZ.MQ.V910.DFCT.OUT.SCSQANLE,DISP=SHR
//         DD DSN=ANTZ.MQ.V910.DFCT.OUT.SCSQAUTH,DISP=SHR
//STDOUT   DD SYSOUT=*
//STDERR   DD SYSOUT=*
//STDIN    DD DUMMY
//STDENV   DD PATH='/u/mleming/bcb/stdenv.txt',PATHOPTS=ORDONLY
```

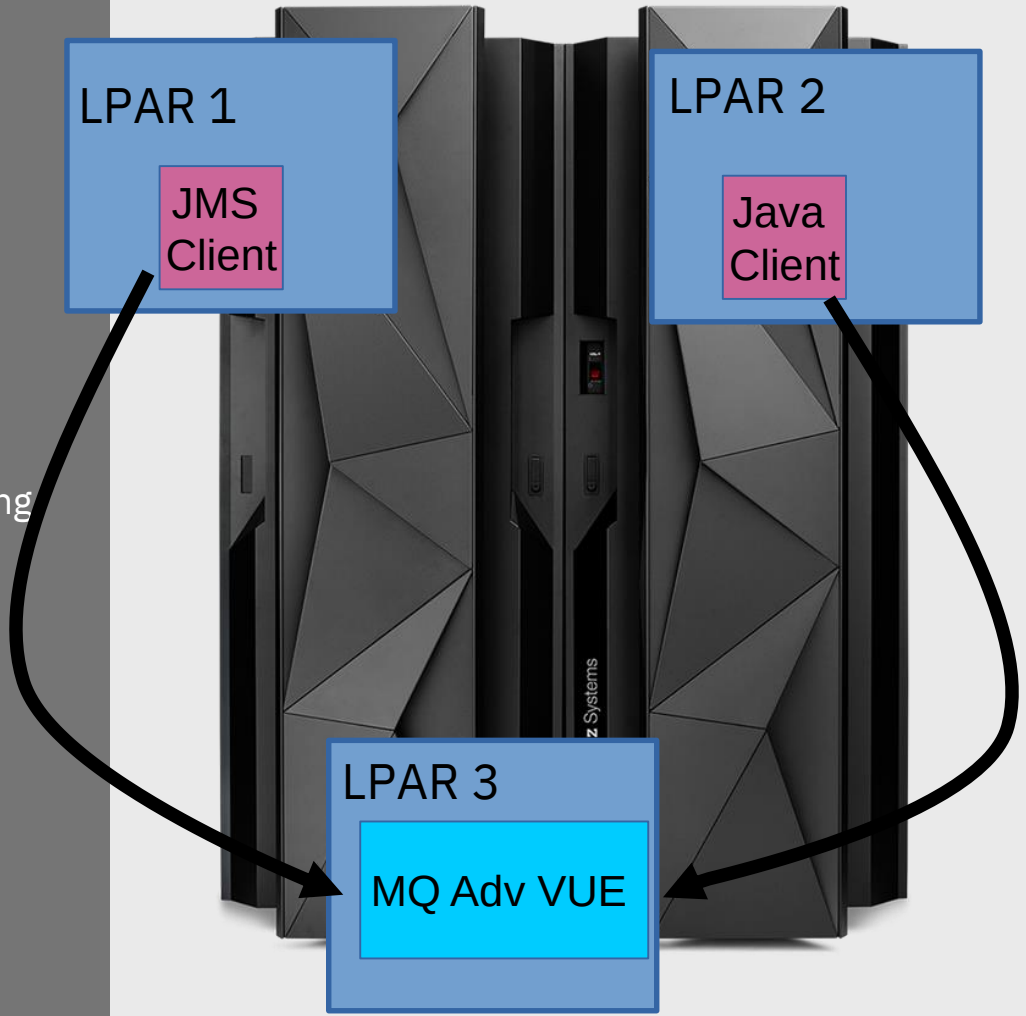
Client connection flexibility

Traditionally we have supported Java client connections in JEE environments only (tWAS, Liberty, and now CICS Liberty)

Support now added for client connections from Java applications to MQ Advanced for z/OS VUE queue managers running on other LPARs

Including AMS support for Java applications using client connections

Allows you to have more flexibility when setting up your MQ topologies



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