

zMasters 2017

L03 – What's new in IBM MQ for z/OS

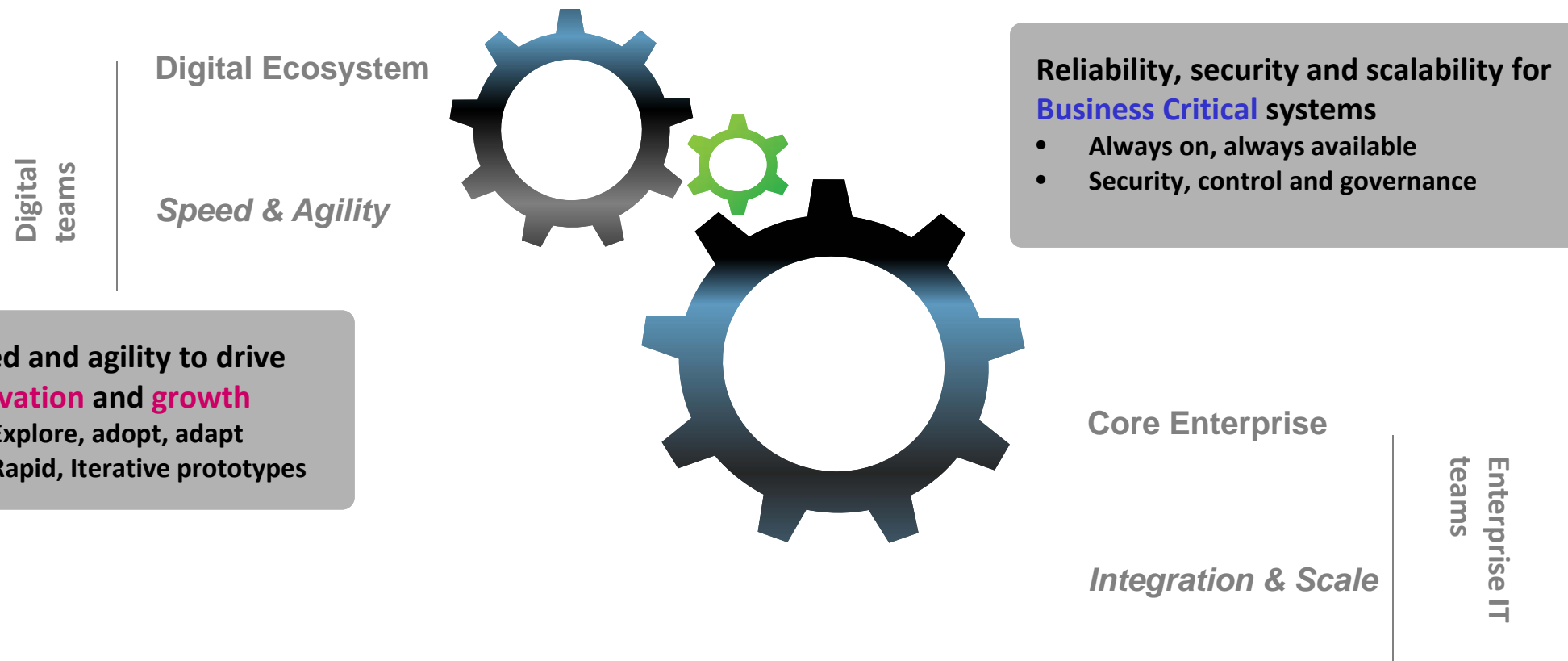
Session L03

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IBM MQ, z/OS Connect EE and IBM ODM on z/OS



Digital Transformation = Many Modes of IT



IBM Messaging has Solutions to Meet All Needs

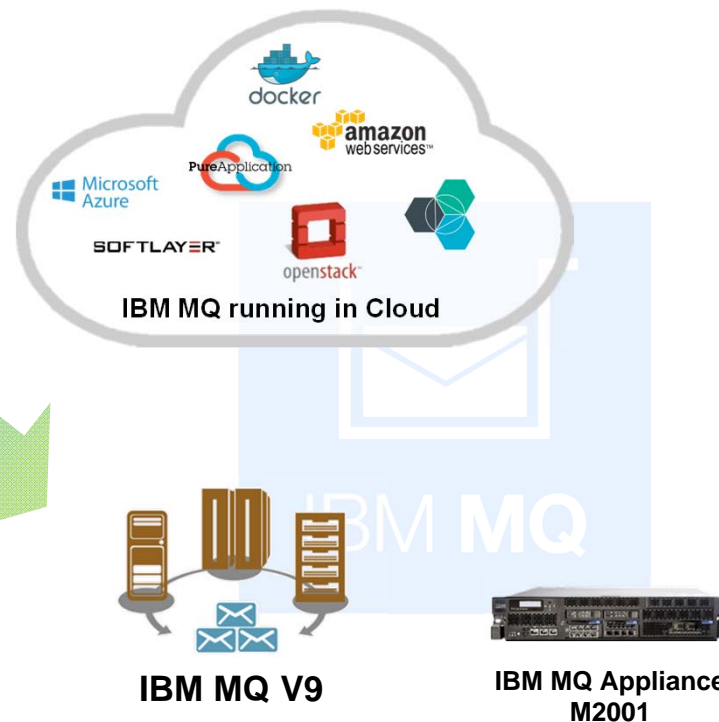
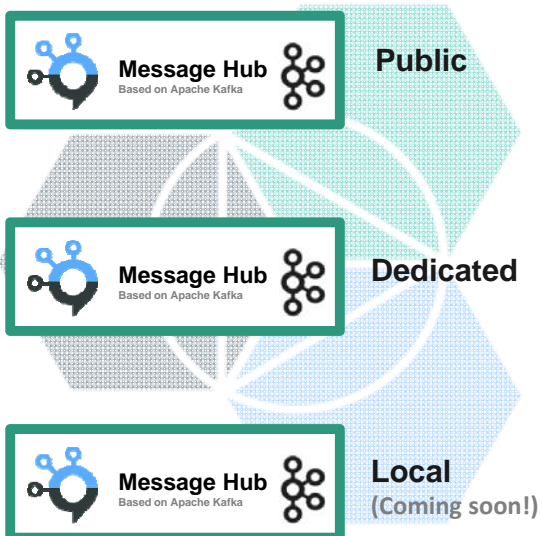
Digital

Enterprise

Cloud

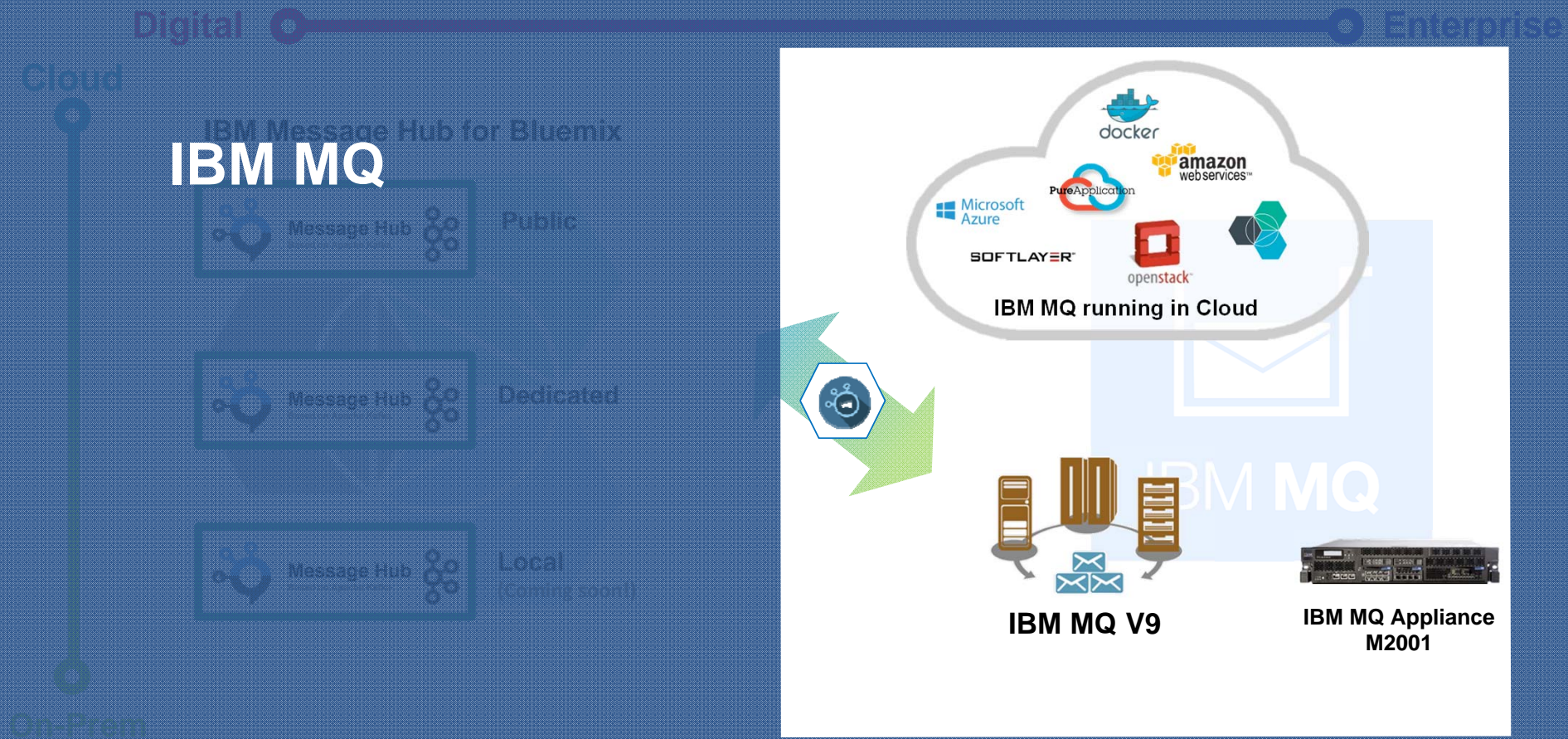
On-Prem

IBM Message Hub for Bluemix



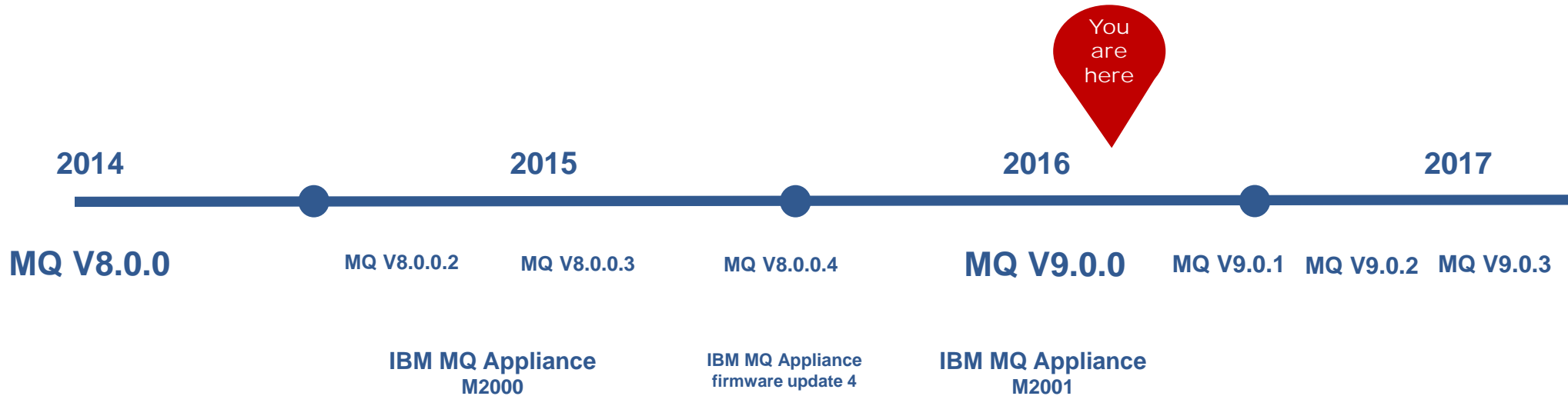
*Secure, reliable exchange of data across applications, systems and services
in the Cloud, on-premise, or in Hybrid environments*

IBM Messaging has Solutions to Meet All Needs



*Secure, reliable exchange of data across applications, systems and services
in the Cloud, on-premise, or in Hybrid environments*

IBM MQ Deliveries



- IBM MQ has been regularly delivering significant new function since MQ V8
 - Through major releases and fix packs
 - New platforms and environments
- Future releases will see **continuous delivery** of new function

End of Service for the old versions



WebSphere MQ 7.0.1

- Already end of service (**September 2015**)

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**

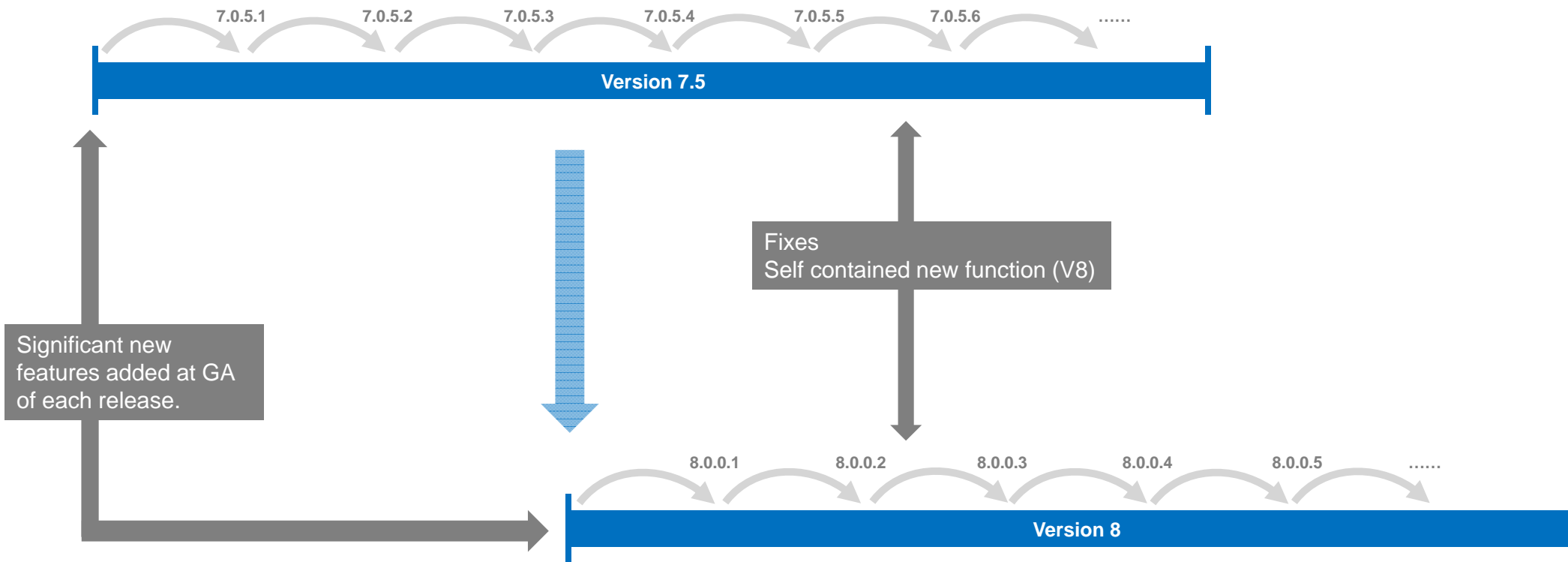
IBM MQ Deliveries



A new delivery model going forward

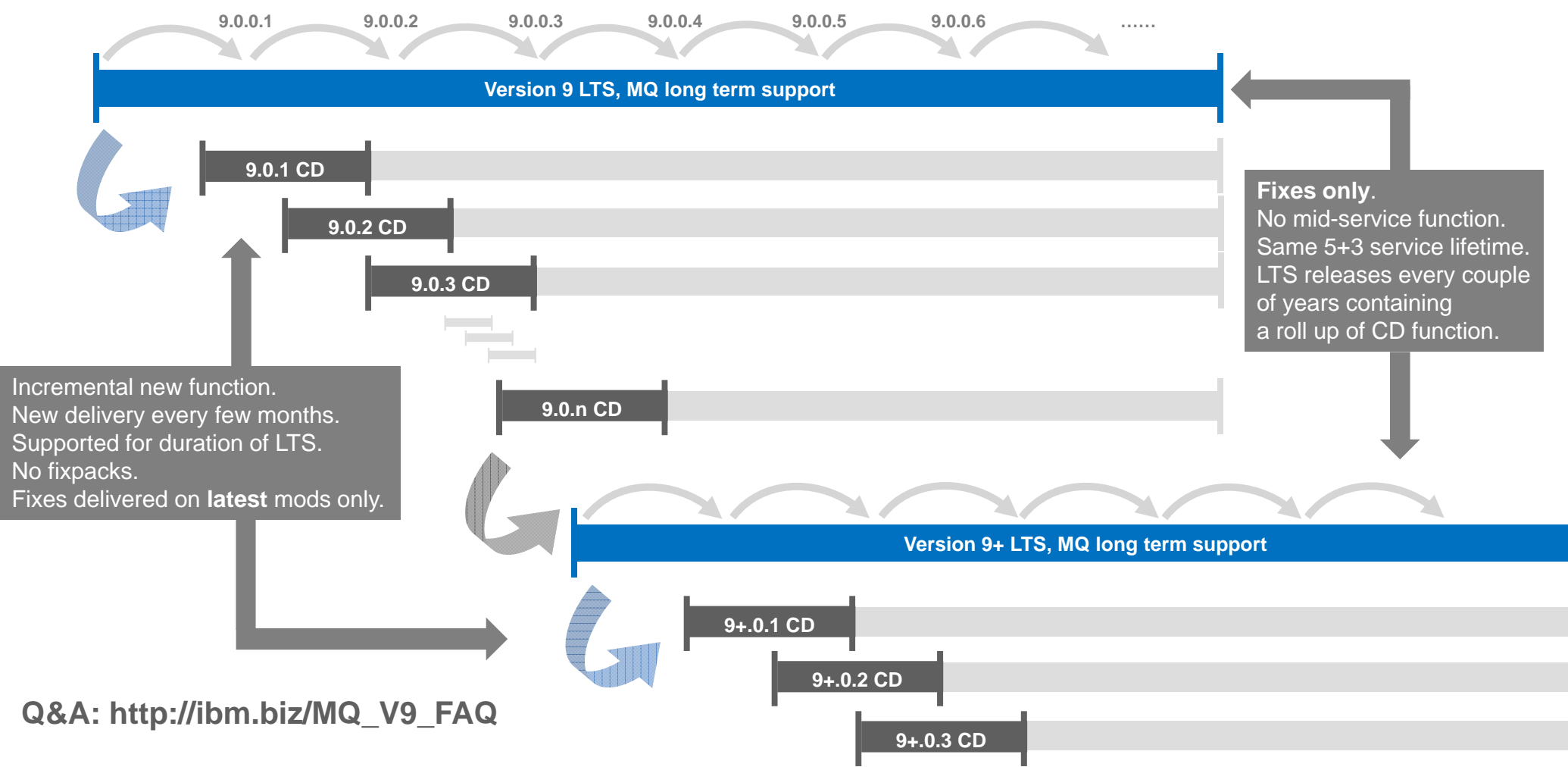
- IBM MQ has been regularly delivering significant new function since MQ V8
 - Through major releases and fix packs
 - New platforms and environments
- Future releases will see **continuous delivery** of new function

Previously: Stable and continuous delivery combined



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

Today: Stable and continuous delivery separated



IBM MQ Deliveries

2014

MQ V8.0.0

MQ V8.0.0.2

MQ V8.0.0.3

MQ V8.0.0.4

2015

IBM MQ Appliance
M2000

IBM MQ Appliance
firmware update 4

2016

IBM MQ Applix
M2001

You
are
here

A recap on
IBM MQ V8+

- IBM MQ has been regularly delivering significant new function since MQ V8
 - Through major releases and fix packs
 - New platforms and environments
- Future releases will see **continuous delivery** of new function

IBM MQ V8 (2014)

<i>Platforms & Standards</i>	<i>Security</i>	<i>Scalability</i>	<i>System z exploitation</i>
64-bit for all platforms	Userid authentication via OS & LDAP	Multiplexed client performance	64-bit buffer pools in MQ for z/OS means less paging, more performance
Multiple Cluster Transmit Queue on all platforms	User-based authorisation for Unix	Queue manager vertical scaling	Performance and capacity
Support for JMS 2.0	AMS for IBM i & z/OS	Publish/Subscribe improvements	Performance enhancements for IBM Information Replicator (QRep)
Improved support for .Net and WCF	DNS Hostnames in CHLAUTH records	Routed publish/subscribe	Exploit zEDC compression accelerator
SHA-2 for z, i & NSS	Multiple certificates per queue manager		SMF and shared queue enhancements

- IBM MQ delivered improved scalability, enhanced security and updates to standards and currency.
- A major release, particularly for z/OS

And we didn't stop there...

- The early V8 fixpacks contained more than just fixes
 - *But no more beyond fixpack 4 with the new delivery model!*
- We concentrated on tackling those RFEs that you ask for...

Incremental feature delivery

- V8.0.0.3 FixPack released June 2015 for all distributed platforms
- V8.0.0.4 FixPack released October 2015
 - As in previous V8 updates, new function alongside the usual APARs
 - Last update containing new function
- Some new function automatically enabled, some requires specific configuration
 - Often gated by CMDLEVEL (similar to NEWFUNC on z/OS)
 - Have to restart queue manager to say that you want to use new configuration
 - `strmqm -e CMDLEVEL=802 QMGR`
- CMDLEVEL has no direct relationship to VRMF
 - CMDLEVEL associated with V8.0.0.2 was 801
- No new CMDLEVEL associated with V8.0.0.4

Distributed Fixpack 2 (February 2015)

- **Built on the new LDAP features in MQ V8 to support authority records for LDAP users and groups**
 - No need to define OS users/groups for applications
 - Supported for Unix, Linux and IBM i
- **Activity trace data extended to include microsecond call durations**
 - Gives you the insight to see if that performance problem really is in MQ?

RFE
32813

RFE
58147

Distributed Fixpack 2 - Authorisation using LDAP

- Fixpack 2 for Unix/Linux/i **and V9 for Windows** builds on LDAP authentication
- User and group information can now be centrally located in LDAP
 - No need to define OS users/groups other than mqm
 - And "mqm" group loses a lot of its automatic power

```
setmqaut -t qmgr -p "cn=User 1,ou=users,o=ibm,c=uk" +connect  
setmqaut -t qmgr -g "cn=Group 1,ou=groups,o=ibm,c=uk" +connect
```

- New attributes on AUTHINFO/IDPWLDAP object show how to discover groups
 - Very similar to the authentication attributes for discovery of identities
- Requires queue manager command level to be updated

```
strmqm -e CMDLEVEL=801 QMgr
```

- Authorities can be set for individual users
 - Does not use "primary groups"

Distributed Fixpack 3 (June 2015)

– **Support for authentication via PAM on Unix platforms**

- Configure authentication to go via PAM modules
- Gives more flexibility in mechanisms for verification and account validation

RFE
61007

– **Protection against SSL security vulnerabilities** *Includes z/OS*

- This was the time of Heartbleed, POODLE, BEAST, FREAK, Bar Mitzvah, LogJam, ...
- Before V8.0.0.3, **44** different CipherSpecs to choose from
- With V8.0.0.3, subset of just **17** CipherSpecs

– **Extended start events**

- Allows system monitoring applications to see when a multi-instance queue manager has failed over and where it is now running

RFE
66286

– **Channel exits passed additional information on the connection**

- Enables exits to block or log connections from back level clients

RFE
67730
64210
60616

Distributed Fixpack 3 - Extended Start events

- Allows system monitoring applications to see when a multi-instance qmgr has failed over and where it is now running
- Event now includes a reason and the hostname where qmgr is running
- New MQRQ values – failover permitted, failover not permitted, started from standby
- Live demo at
 - <https://youtu.be/crzmPciJc9g>

Event Type	: Queue Mgr Event
Reason	: Queue Mgr Active
Event created	: 2015/06/16 10:24:58.02 GMT
Queue Mgr Name	: V8004 A
Host Name	: rockall.hursley.ibm.com
Reason Qualifier	: Failover Not Permitted

FP3 - Extended channel exit interface

- Channel exits are now told more information about what is at the other end of the connection
 - MQCXP structure contains RemoteProduct and RemoteVersion fields
 - Gives VRMF of what is connecting eg 07050003 (interpreted as 7.5.0.3)
 - Blank implies V6 or older
 - Gives type of connection – client (C, Java etc), queue manager (Dist, z/OS)
- Typical use to allow an exit to block or log connections from backlevel clients
 - [MQ V9 on z/OS includes such an exit to log activity](#)
- RPRODUCT strings are described in DIS CHSTATUS
 - Search for q086090_ in KnowledgeCenter

Distributed Fixpack 4 (October 2015)

- **Capped message expiry** *Includes z/OS*
 - Administratively impose minimum expiries
 - Applies to queues and topics
- **Redistributable clients**
 - Simple tar/zip image for Windows and Linux
 - Permitted to embed clients with applications
- **Event formatting sample program**
 - Sample amqsevt formats events into readable English(ish) text
- **Security change configuration events**
 - Coverage for all security changes
 - Includes new event formatting sample
- **Obfuscation of database passwords**
 - Queue manager configuration for connecting to resource managers

RFE
21984
37837

RFE
26670
38765
26671
30697
...

RFE
53559

RFE
53133

FP4 – Capped expiry

- Capped message expiry
 - Administratively impose minimum expiries
 - Applies to queues and topics
 - ALTER QL(X) CUSTOM('CAPEXPY(nnn)')
 - ALTER TOPIC(X) CUSTOM('CAPEXPY(ASPARENT)')
 - Apply APAR for MQ on z/OS: PI50761

FP4 - Event formatting sample program

- No sample ever shipped to format "standard" events
 - Authorisation, queue full, service interval, command/config etc
 - Other samples are available for acct/stats, activity reports
 - Several SupportPacs but product only has out-of-date source code in the KC
- New sample **amqsevt** formats events into readable English-ish text
 - Option to stay with full MQI constant name instead of making it look nice
 - Uses MQCB to read from multiple event queues. No polling required
 - Can connect as client to any remote queue manager including z/OS
 - Source code included

Event formatting examples

**** Message #1 (320 Bytes) on Queue SYSTEM.ADMIN.QMGR.EVENT ****

Event Type : Queue Mgr Event [44]
Reason : Unknown Alias Base Queue [2082]
Event created : 2015/07/07 10:54:51.17 GMT
Queue Mgr Name : V8004_A
Queue Name : EVT.NO.BASE.QUEUE
Base Object Name : EVT.NOT.DEFINED
Appl Type : Unix
Appl Name : amqsput
Base Type : Queue

**** Message #4 (300 Bytes) on Queue SYSTEM.ADMIN.QMGR.EVENT ****

Event Type : Queue Mgr Event[44]
Reason : Not Authorized [2035]
Event created : 2015/07/07 10:54:51.30 GMT
Queue Mgr Name : V8004_A
Reason Qualifier : Open Not Authorized
Queue Name : EVT.NO.PUT
Open Options : 0x00002010 [fiq out]
User Identifier : db2inst1
Appl Type : Unix
Appl Name : amqsput

FP4 - MQI string formatting assistance

- C header file now included to help convert MQI numbers to strings
- Many developers have MQI strerror-like functions
 - The hard work is now done for you
 - The new cmqstrc .h is automatically updated (300+ new verbs!)
- Similar to Java MQConstants.lookup() capability for all sets of constants

```
printf("Error is %s\n",MQRC_STR(2035));  
printf("Completion Code is %s\n",MQCC_STR(CompCode));  
printf("%s is %s\n",  
        MQIA_STR(MQIA_PLATFORM),MQPL_STR(MQPL_UNIX));
```

will show

```
MQRC_NOT_AUTHORIZED  
MQCC_OK  
MQIA_PLATFORM is MQPL_UNIX
```


FP4 - Command/Config Events for security changes

- Configuration events give an audit trail of object changes
 - Reports complete set of object attributes
- Command events are "who did what, how"
 - Show which parameters were used in the command
- Existing command events for MQSC SET AUTHREC and PCF equivalent
 - Not for setmqaut
- No config events for any of these operations
- V8.0.0.4 adds command events for setmqaut
- Also adds configuration events for all mechanisms

FP4 - Certificate expiry made easier to parse

- New option for runmqkm to print dates in a standard format

```
$ ./runmqkm -cert -list -db ./key.kdb -pw passw0rd -expiry
Certificates found
* default, - personal, ! trusted, # secret key
!      "Entrust.net Certification Authority (2048)"
      Not After : 24 December 2019 18:20:51 GMT
!      "Entrust.net Client Certification Authority"
      Not After : 12 October 2019 20:54:30 GMT+01:00
!      "Entrust.net Global Client Certification Authority"
      Not After : 7 February 2020 16:46:40 GMT

$ ./runmqkm -cert -list -db ./key.kdb -pw passw0rd -expiry -rfc3339
Certificates found
* default, - personal, ! trusted, # secret key
!      "Entrust.net Certification Authority (2048)"
      Not After : 2019-12-24T18:20:51Z
!      "Entrust.net Client Certification Authority"
      Not After : 2019-10-12T19:54:30Z
!      "Entrust.net Global Client Certification Authority"
      Not After : 2020-02-07T16:46:40Z
```

FP4 - SSL/TLS Configuration verification

- SupportPac MH03 provided a tool to validate SSL/TLS configurations
- Checks included
 - Missing files, Incorrect SSLKEYR queue manager attribute
 - Password settings, Certificate labels, expiry dates and trust chains
 - Validate queue manager and client certificates against each other
 - Verifies SSLCAUTH/SSLPEER settings with queue manager
- MH03 does not work with current MQ versions – built on old toolkits
- Now part of MQ product
 - Renamed to **mqcertck**
 - Updated to work with current MQ versions and recognise new features such as per-channel certificates

FP4 - XA Configuration

- When MQ is a TM, qm.ini defines how to connect to an RM (database)
 - String can contain connection credentials
- Long-lived requirement not to have plain-text passwords in the file
 - Most people have used OS authentication (ie which id is running the program) with no need to provide additional credentials
 - Sample exits have shown how to solve this but you had to write some code
- V8.0.0.4 includes an official solution
- New command setmqxacred to define id/password for DB connection
 - XAOpenString now can refer to ++USERID++, ++PASSWORD++ variables
 - Separate file contains obfuscated password similar to mqcccred channel exit

And specifically for z/OS...

– Enhanced Java SE support for MQ JMS on z/OS

- CICS Transaction Server
 - MQ JMS applications in a CICS OSGi JVM server
 - CICS TS V5.2+/V5.3
 - IBM MQ V7.1+/V8+
- IMS
 - MQ JMS applications in IMS
IMS V13 (MPR, BMP, IFP, JMP, JBP regions)
 - MQ V8+
- Plus a statement of direction for MQ JMS in CICS liberty

RFE
27251
44262
61798
31984

– Additional Active Logs on z/OS

- Maximum active log capacity increased 10x
- Improve resilience to issues affecting log archiving
- Now up to 310 x 4GB active logs.

RFE
21444

Enhanced Java SE support for MQ JMS on z/OS

– CICS TS

CICS java programs can use the IBM MQ classes for JMS in the CICS® Open Services Gateway initiative (OSGi) Java™ Virtual Machine (JVM) server

- JMS 1.1 if using MQ for z/OS V7.1
- JMS 2.0 (requires Java 7) if using MQ for z/OS V8.0
- CICS TS
 - V5.2 + PI32151
 - V5.3
- MQ
 - V7.1 – JMS PI29770 (supersedes 7.1.0.6) or later CSD
 - V8 – JMS 8.0.0.2 PI33038 or later CSD + MQ base PI28482
- For more details, see <http://ibm.biz/MQCICSJMS>

– IMS

IMS java programs can use the IBM MQ classes for JMS, JMS 2.0 spec

- IMS V13 MPR, BMP, IFP, JMP, JBP regions
- MQ V8
 - V8 – JMS 8.0.0.4 PI41909 + MQ base PI45236
- For more details, see <http://ibm.biz/MQIMSJMS>

Additional Active Logs on z/OS

- Improve resilience to issues affecting log archiving
- Maximum active log capacity increased 10x
- Now up to 310 x 4GB active logs.
- Requires:
 - MQ V8 in NewFunc mode
 - V2 format BSDS (introduced in V8 for 64bit wide RBA)
 - APAR PI46853

Some SupportPacs now on github

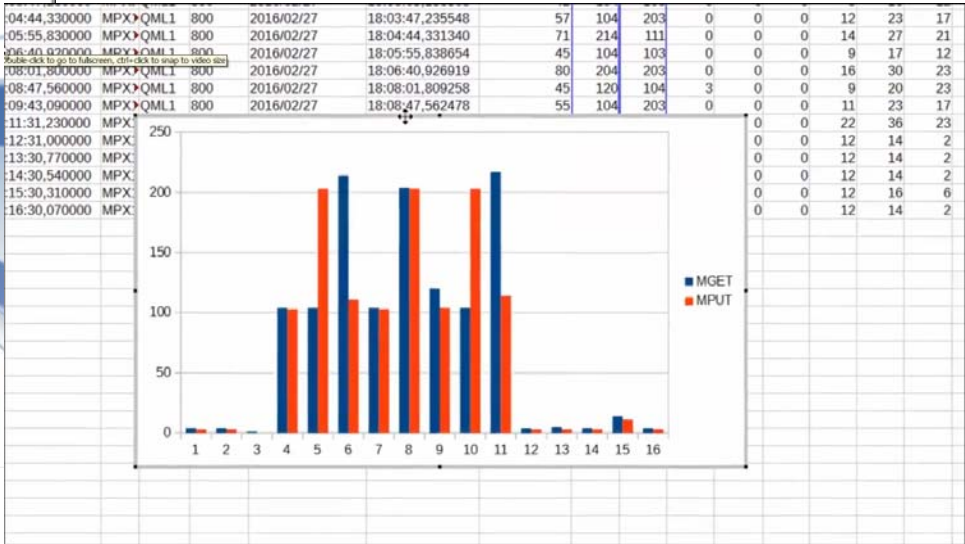
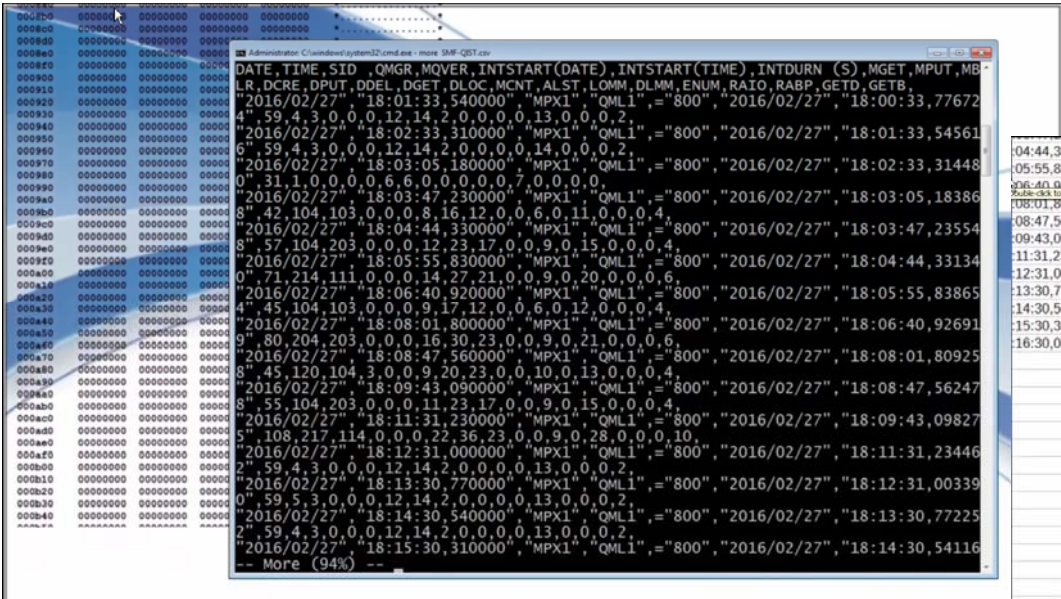
- Source code to make it easier to extend platform coverage
- Can accept public submissions for new function (or bug fixes)
- Includes MA01 and MO03 (q and qload)
- See <https://ibm-messaging.github.io/>
- Preferred route, instead of releasing new SupportPacs



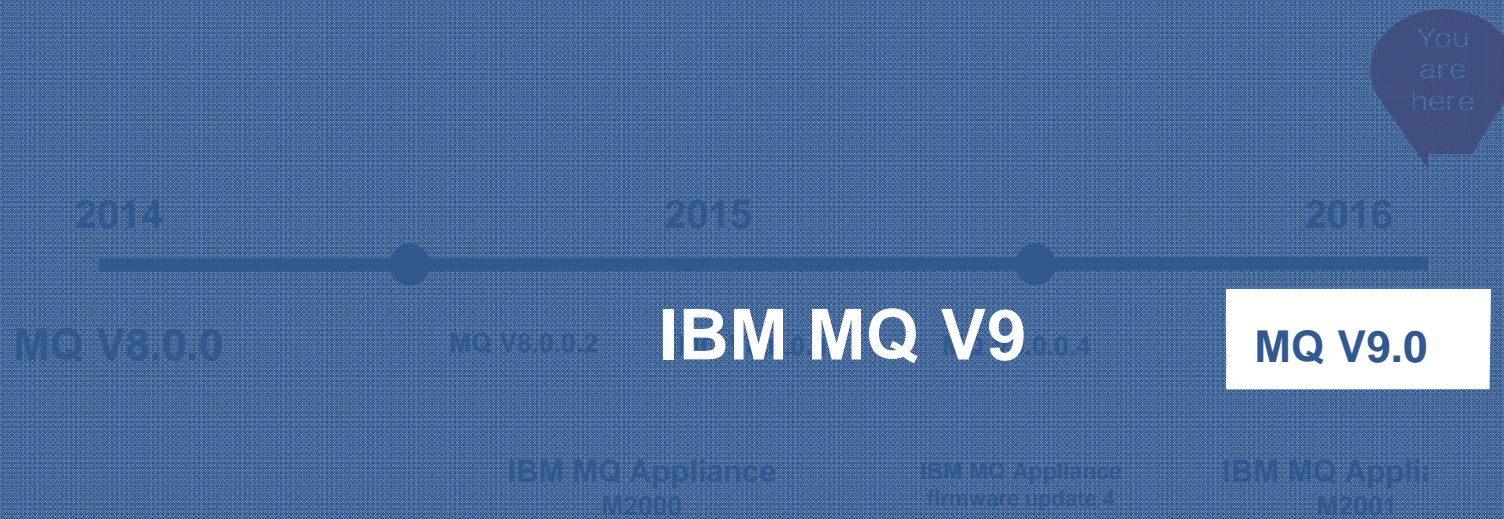
RFE
57889

New tool on github for SMF processing

- By popular demand ... open source tool to format MQ z/OS SMF records for easy import to spreadsheets and databases
 - <http://github.com/ibm-messaging/mq-smf-csv>
 - <http://youtube.com/marktaylorhursley>



IBM MQ Deliveries



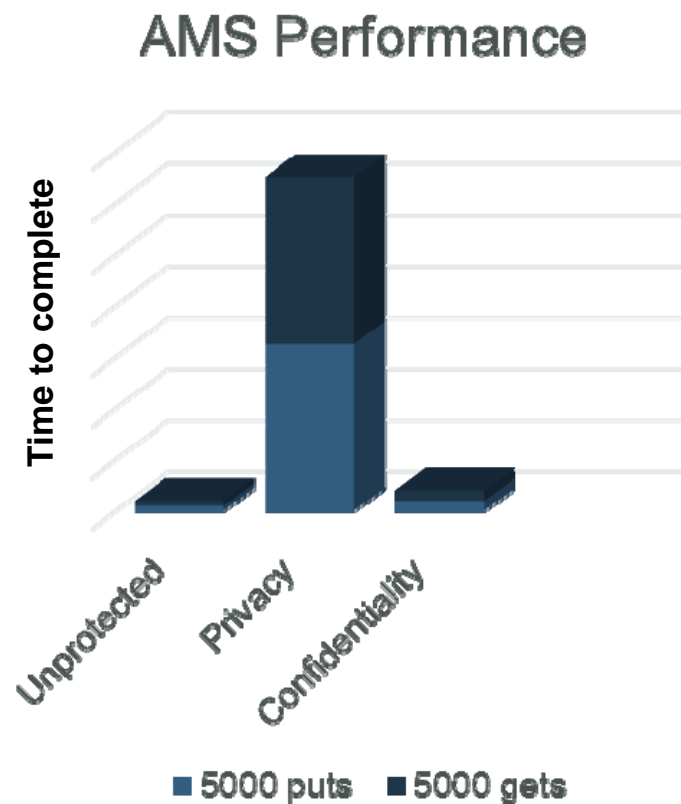
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Overview

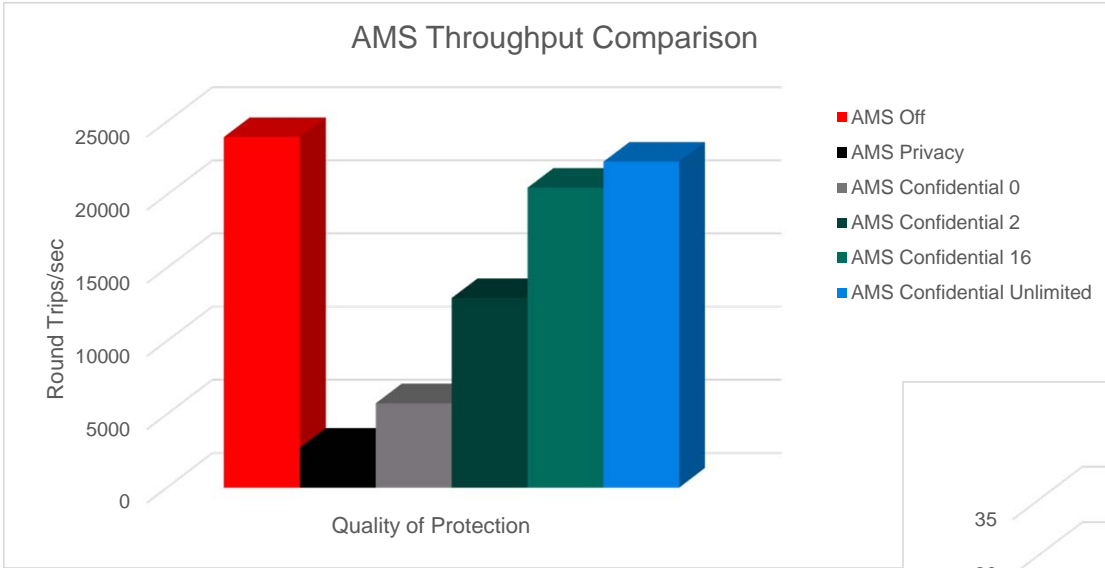
- Available **June 2016** for Distributed and z/OS platforms
 - Plus a new MQ for z/OS Advanced VUE
- Primary objective for MQ V9 is as the basis for the new long term service and continuous delivery model
- Rolls up all those post-V8 features into a GA version
- Plus functional changes on top of MQ 8.0.0.4...

AMS – high performance policy

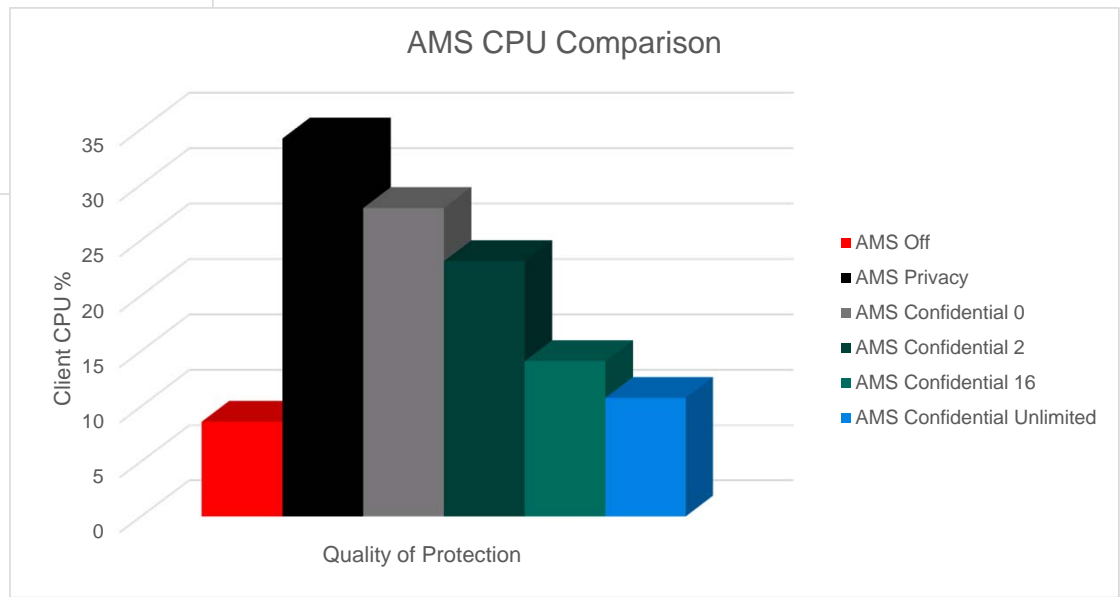
- New quality of service for AMS
 - We have **Integrity**
 - This proves authenticity through digital signing
 - And **privacy**
 - This adds encryption to the digital signing
- We've added **Confidentiality** to provide encryption *without the digital signing*
 - Significant performance gains over Integrity and Privacy
 - Especially with key reuse
 - Only receiver's certs require distribution
- Available for Distributed and z/OS



AMS Confidentiality performance



2K Persistent Message
20 Requesters



AMS support for non-IBM JREs

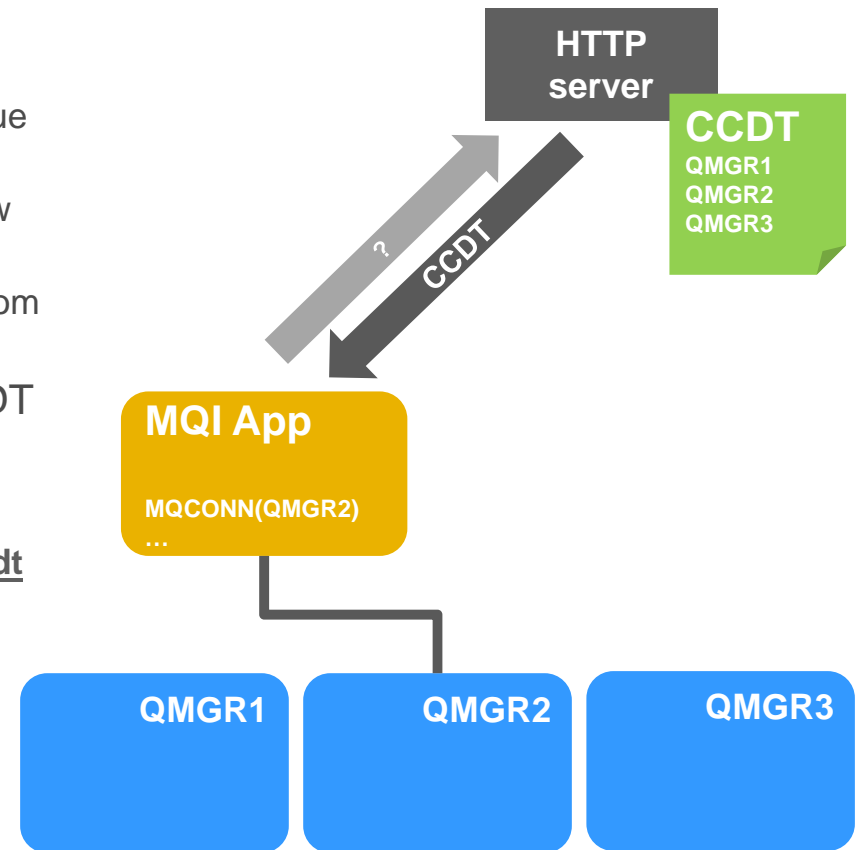
- AMS interceptor for Java programs relied on IBM-provided encryption packages
 - Included in the JRE/JSSE shipped with MQ and other IBM products
 - But not available separately for integration with other JREs
- With V9, AMS layer has been redesigned to use an alternative crypto library
 - The open source Bouncy Castle implementation
 - Built into the MQ Java layer, not the Java Runtime Environment
- Can now use alternative JREs with no need to install additional libraries



RFE
45817
72893

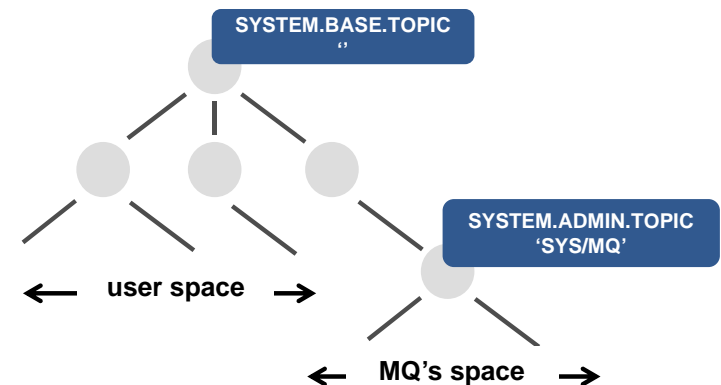
Central provisioning of CCDT

- 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
 - **export MQCCDTURL=<http://ccdt.example.com/ccdt/MyApp.ccdt>**
 - Automatically retrieved from http or ftp address



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/AppName/amqspu`
 - Filter by application name, channel or connection id
- When a subscription is created, PCF messages start to flow to the subscriber's queue. When subscription is deleted, messages stop.

Application Activity Trace Sample

Sample provided to demonstrate usage and format output

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

```
MonitoringType: MQI Activity Trace
...
QueueManager: 'QMGR1'
ApplicationName: 'amqspout'
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	-
=====						

```
$ amqspout QUEUE1 QMGR1
Sample AMQSPUT0 start
target queue is Q1
Hello
World

Sample AMQSPUT0 end

$
```

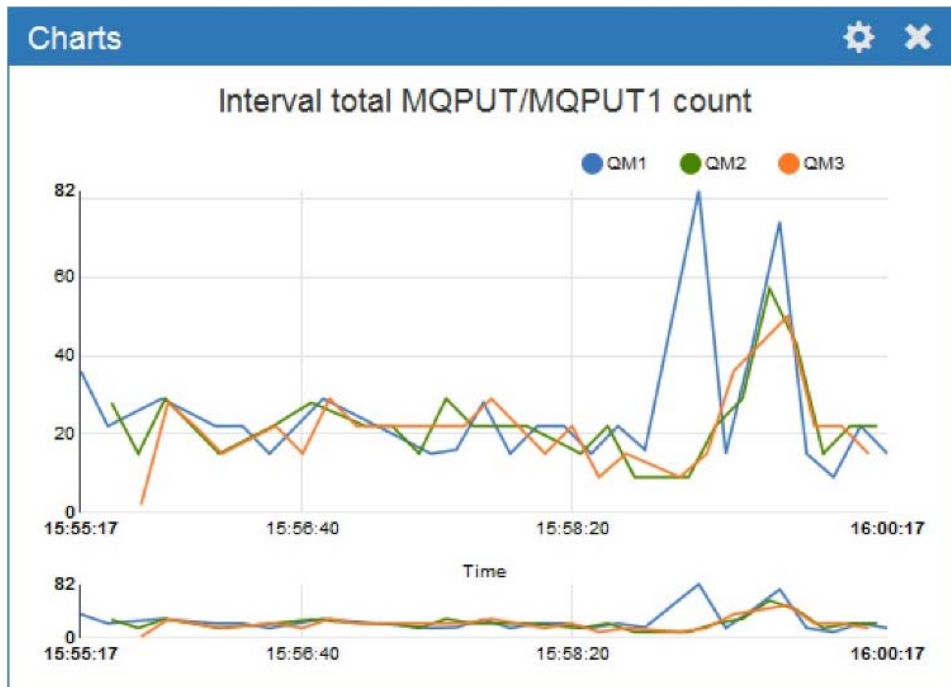
System Monitoring

- 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

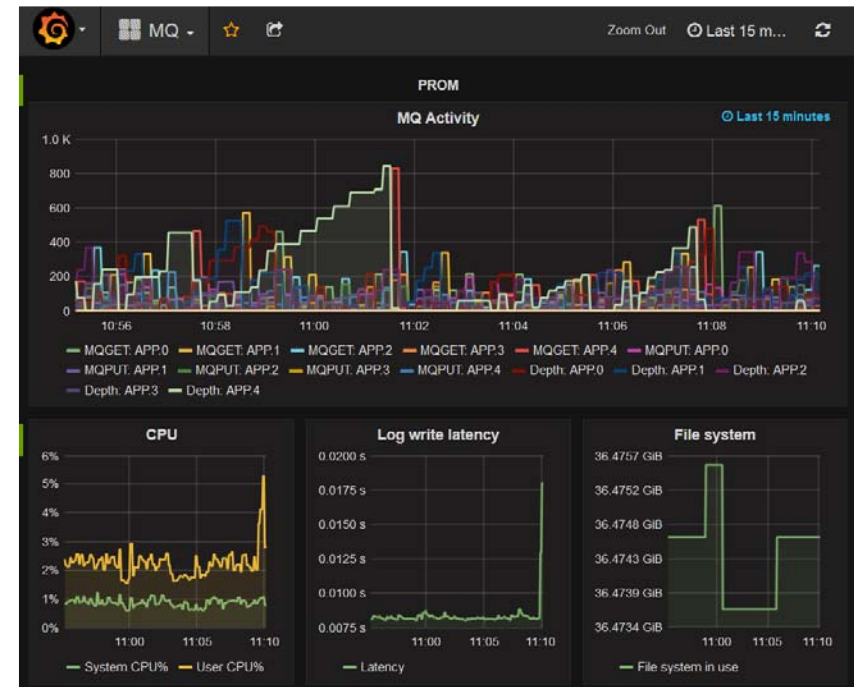
System Monitoring Sample

```
$ amqsrua -m V9000_A
CPU : Platform central processing units
DISK : Platform persistent data stores
STATMQI : API usage statistics
STATQ : API per-queue usage statistics
Enter Class selection
==> CPU
SystemSummary : CPU performance - platform wide
QMgrSummary : CPU performance - running queue manager
Enter Type selection
==> SystemSummary
Publication received PutDate:20160411 PutTime:10465573
User CPU time percentage 0.01%
System CPU time percentage 1.30%
CPU load - one minute average 8.00
CPU load - five minute average 7.50
CPU load - fifteen minute average 7.30
RAM free percentage 2.02%
RAM total bytes 8192MB
Publication received PutDate:20160411 PutTime:10466573
User CPU time percentage 0.01%
System CPU time percentage 1.30%
...
```


Feed that data into tooling



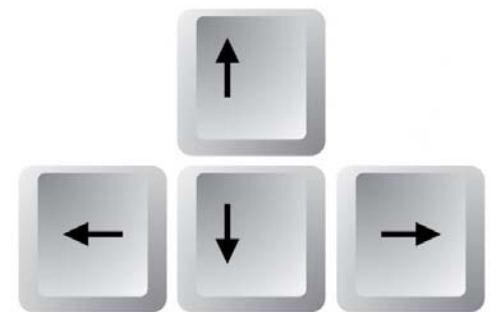
This capability already underpins the charting in the MQ Appliance WebUI



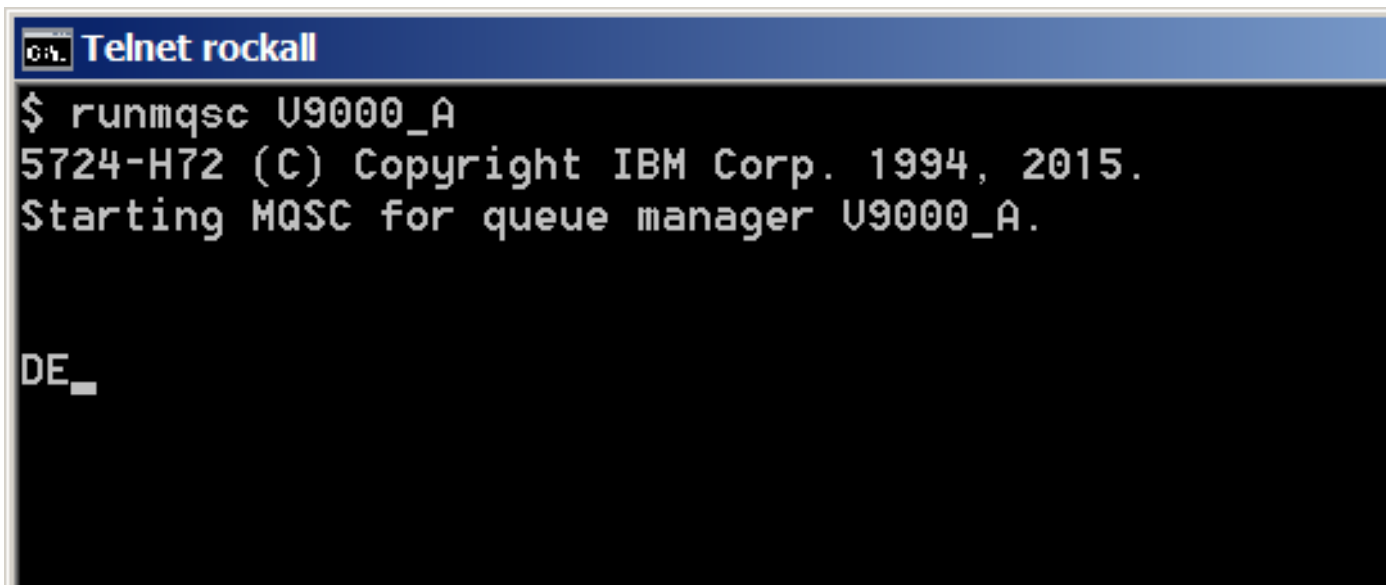
Or use the data to feed your own dashboard
See github.com/ibm-messaging/mq-golang

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



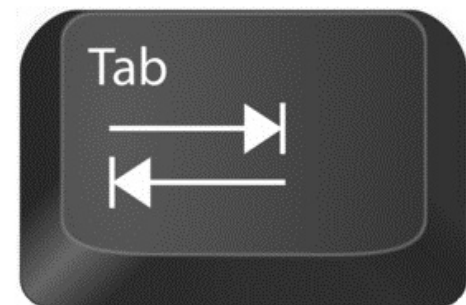
Command completion example



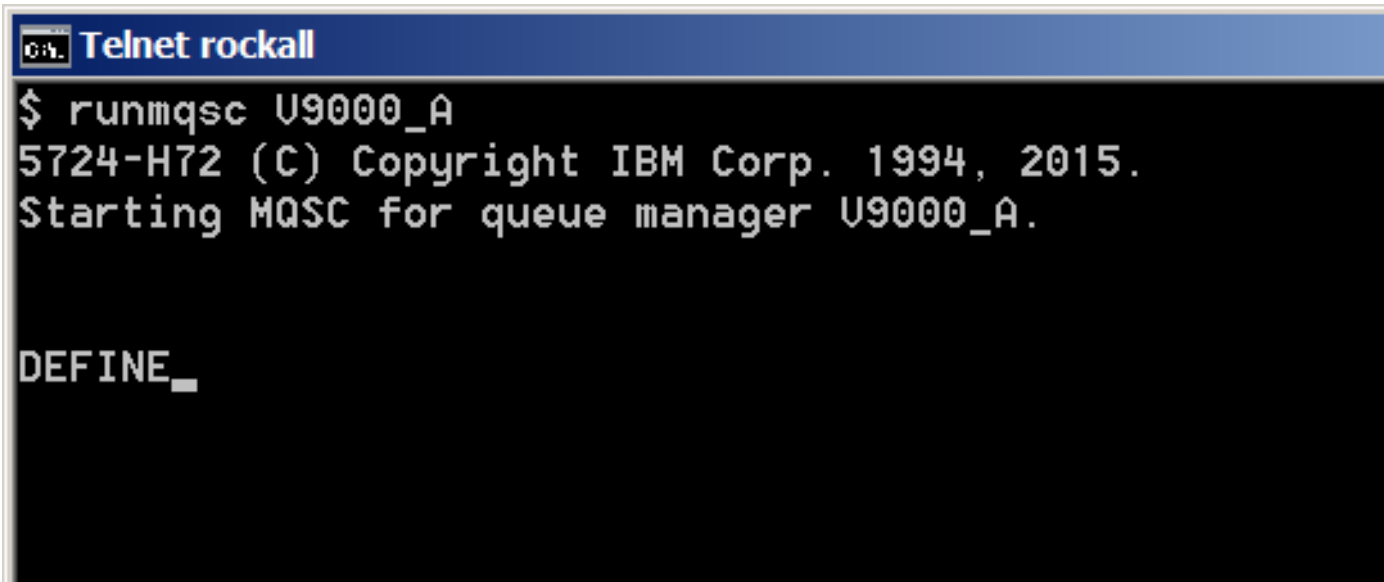
A terminal window titled "Telnet rockall" with a blue header bar. The terminal text is as follows:

```
$ runmqsc U9000_A
5724-H72 (C) Copyright IBM Corp. 1994, 2015.
Starting MQSC for queue manager U9000_A.

DE_
```

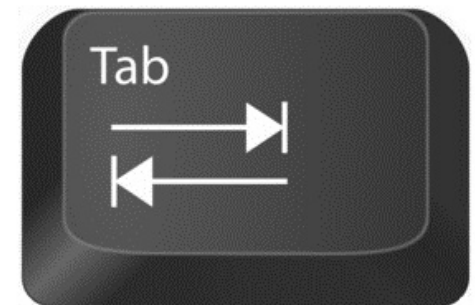


Command completion example




```
OV Telnet rockall
$ runmqsc U9000_A
5724-H72 (C) Copyright IBM Corp. 1994, 2015.
Starting MQSC for queue manager U9000_A.

DEFINE_
```



Command completion example

 Telnet rockall

```
$ runmqsc U9000_A
```

```
5724-H72 (C) Copyright IBM Corp. 1994, 2015.
```

```
Starting MQSC for queue manager U9000_A.
```

```
DELETE
```

Updated MQ Unicode support

- IBM MQ supports all Unicode characters defined in the Unicode 8.0 standard in data conversion
 - Both z/OS and Distributed platforms
- This includes requirements for Chinese characters
- Support added for input and output in
 - UTF-16 surrogate pairs
 - UTF-32 (on distributed platforms only)
 - Extending UTF-8 support for 4 byte characters.



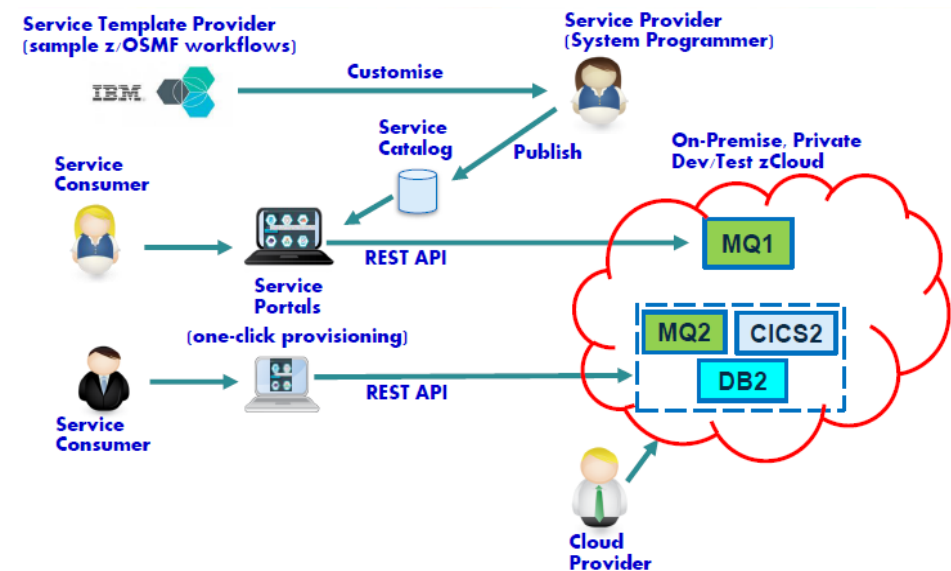
z/OS SMF statistics for pageset usage

RFE
79681

- New SMF information
 - Capacity planning:
 - e.g. how much is my pageset utilization increasing?
 - Problem resolution:
 - e.g. why are private messages slow?
 - System management:
 - e.g. which pageset should I move into a different buffer pool?
- This allows you to see early indicators of pageset storage shortage
- Same data as returned by the `DISPLAY USAGE TYPE(PAGESET)` command
 - SMF makes it easier for automation tools to analyze
- As an added bonus, the log manager checkpoint count also includes the number of log switches.

Sample z/OSMF 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



New MQ Java resource adaptor



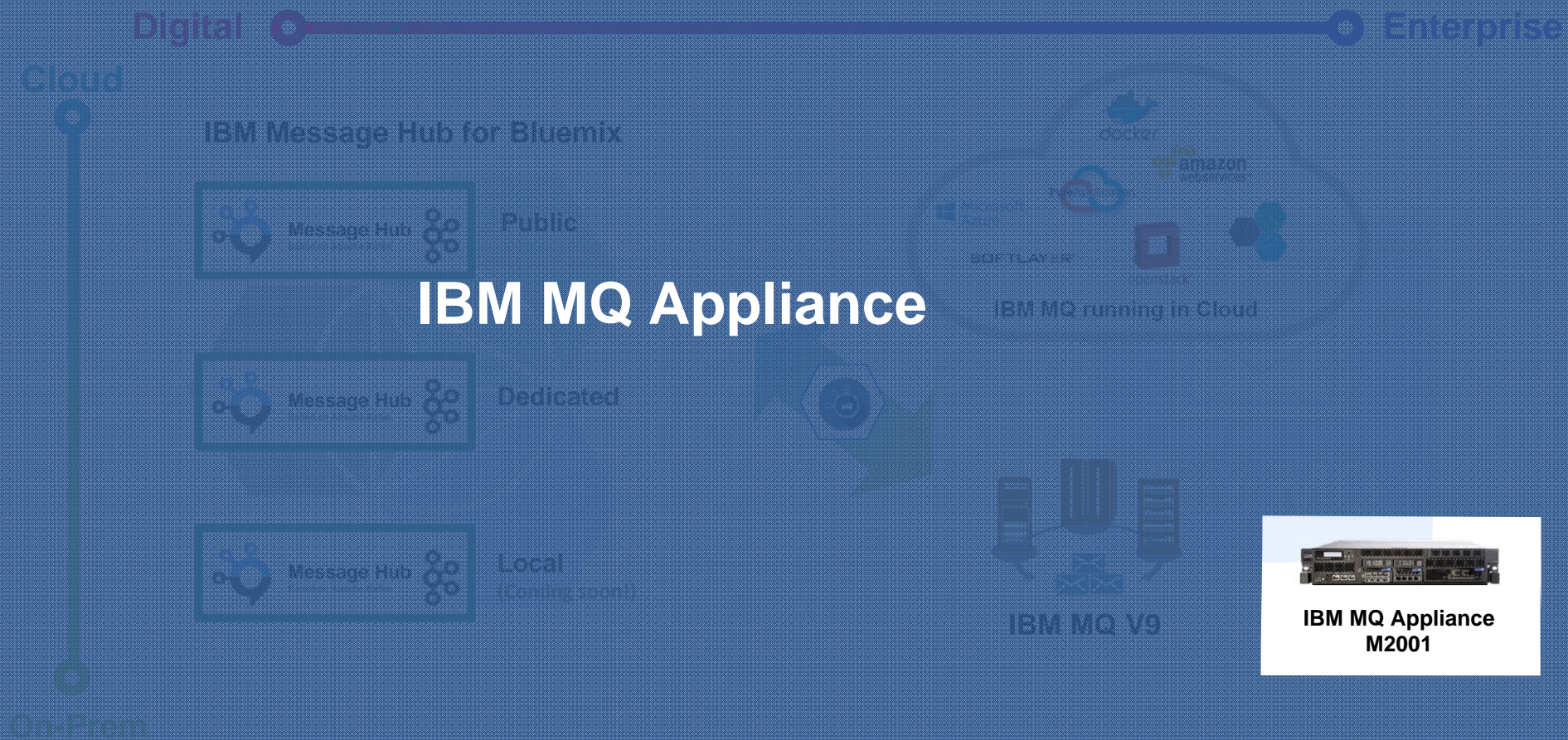
WAS traditional V9

- 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

IBM Messaging has Solutions to Meet All Needs



*Secure, reliable exchange of data across applications, systems and services
in the Cloud, on-premise, or in Hybrid environments*

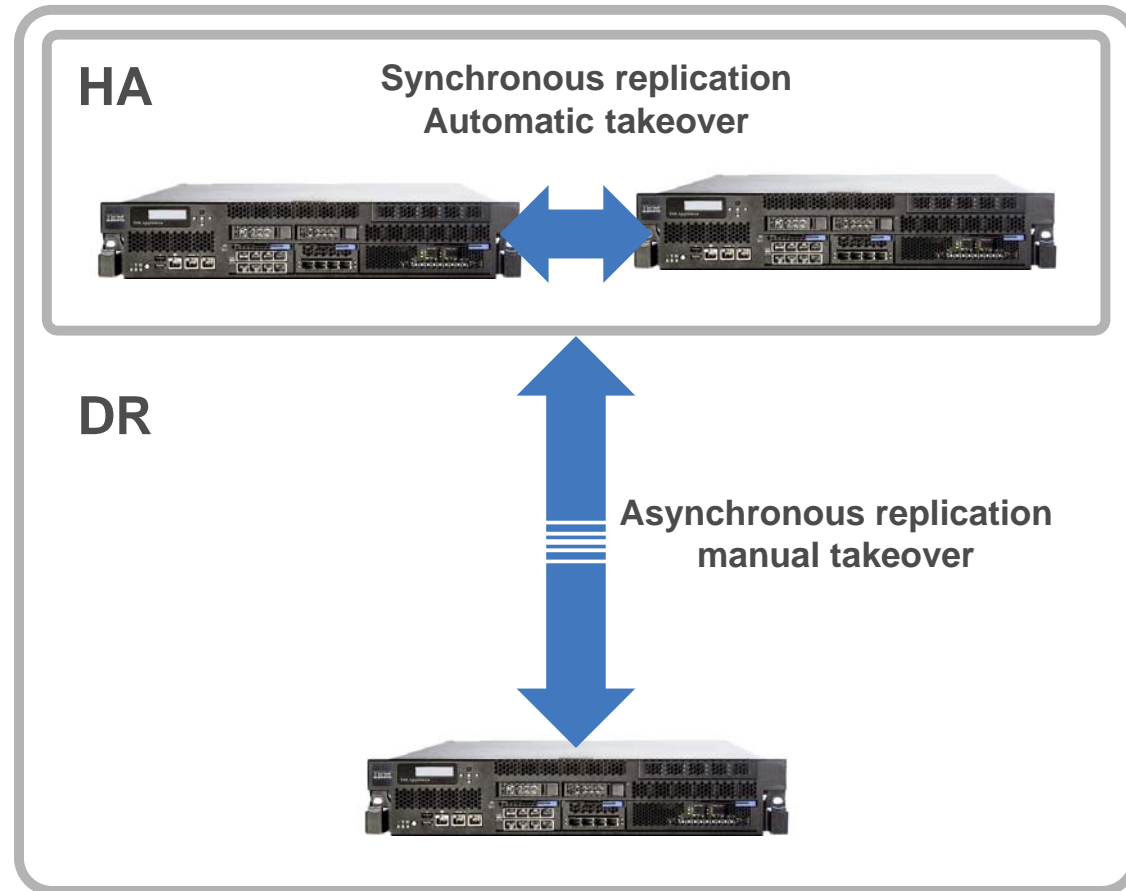
The IBM MQ Appliance



- 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 (HA)
 - 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 update, the M2001 (June 2016)

Original 1.2TB HDDs replaced with 3.2TB SSDs
A potential 3x performance gain for heavily persistent workloads



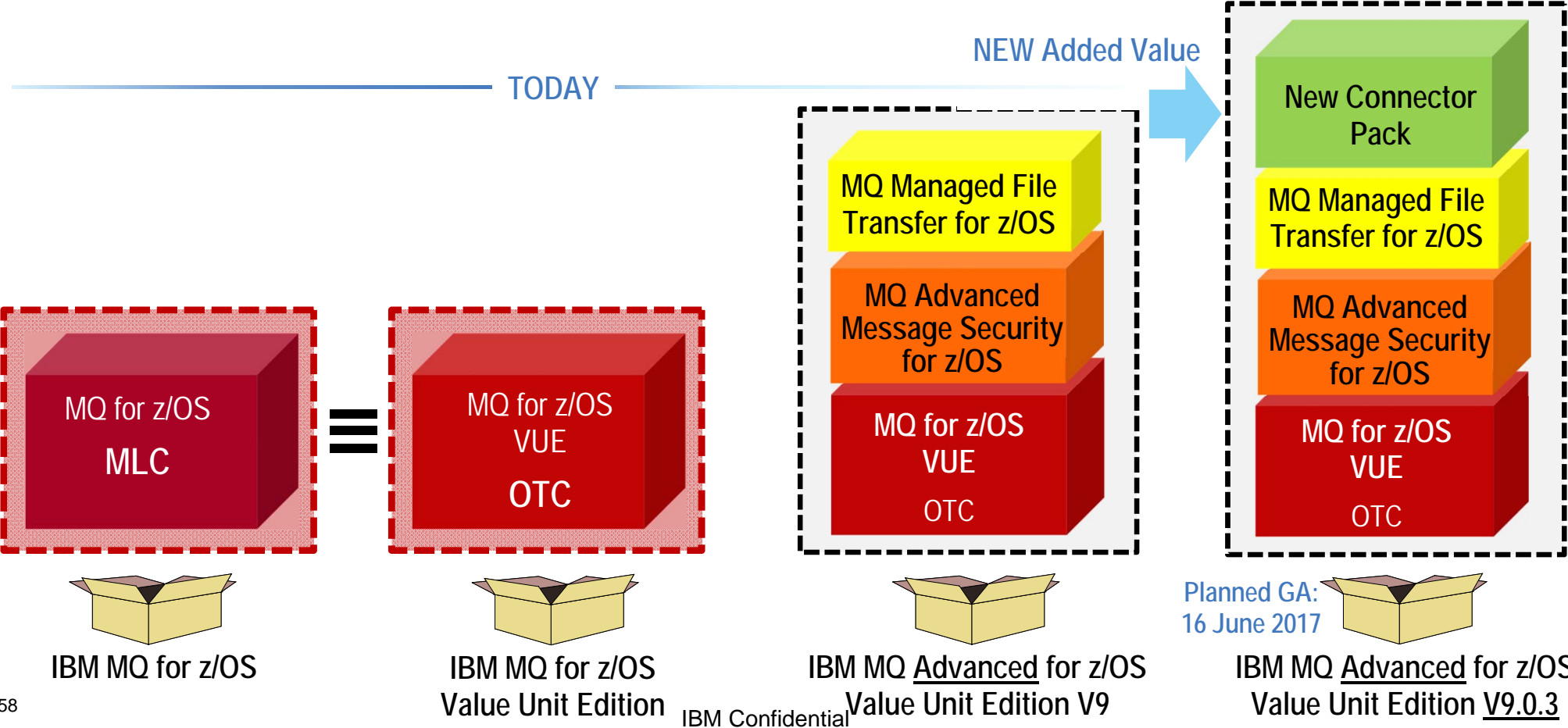
10GB network ports extended from 2 to 4
For combined HA and DR configurations two 10GB ports are required
Leaving two 10GB ports for messaging traffic

And Brand NEW for MQ on z/OS – MQ Advanced VUE V9.0.3

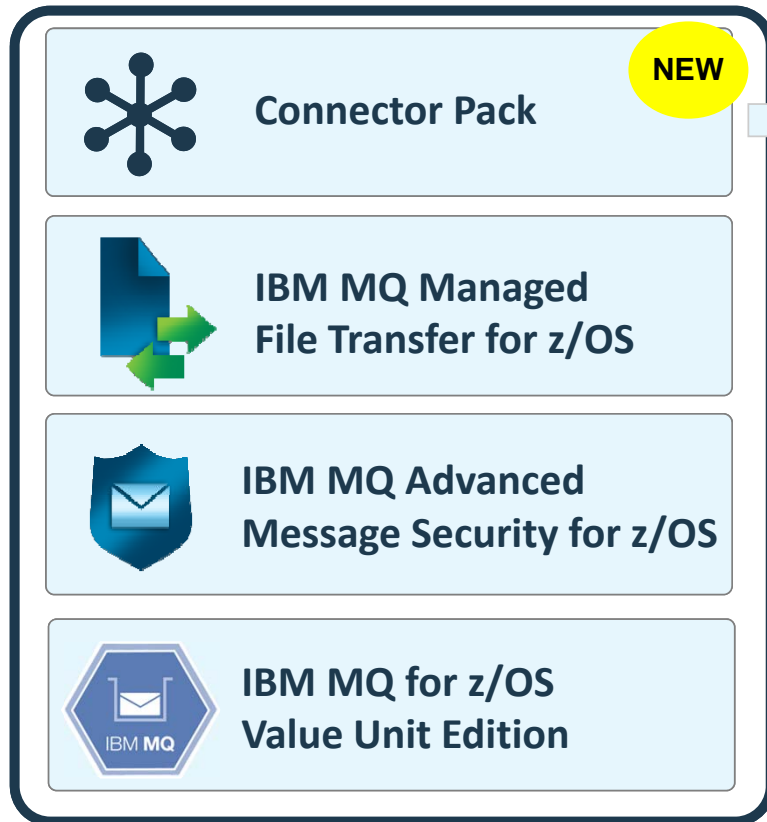


IBM

MQ Advanced VUE – V9.0.2



What's in the New Connector Pack?



IBM Cloud Product Insights support

- Provides registration and usage information to the Cloud Product Insights service to offer insight into the usage of the MQ estate across z/OS and distributed systems

Blockchain connector

- Provides the ability to perform a message-driven query into the IBM Blockchain for Bluemix service to gain insight into activity within the Blockchain

Managed File Transfer (MFT) Agent Connectivity

- Simplifies the deployment of MFT on z/OS by allowing a z/OS MFT Agent to remotely connect to a z/OS Queue Manager
 - ⇒ Same MFT workload will require fewer z/OS queue managers

IBM Cloud Product Insights support

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



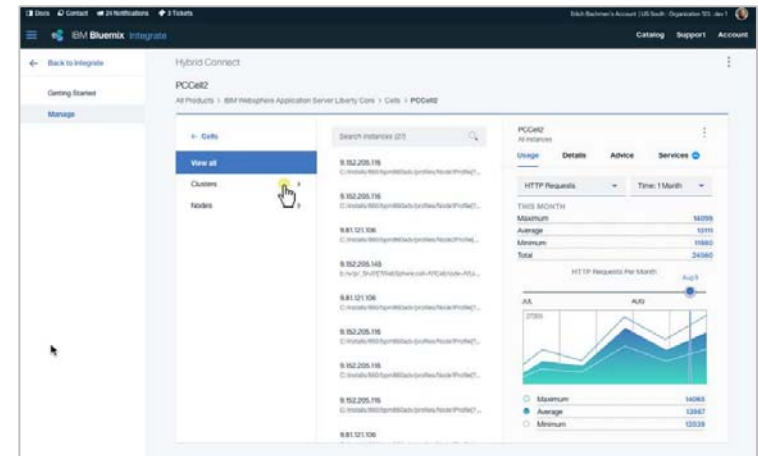
What does that mean for you and MQ on z/OS ?

Users register instances of their **IBM MQ Advanced for z/OS VUE** Queue Managers products with a central, IBM cloud hosted repository

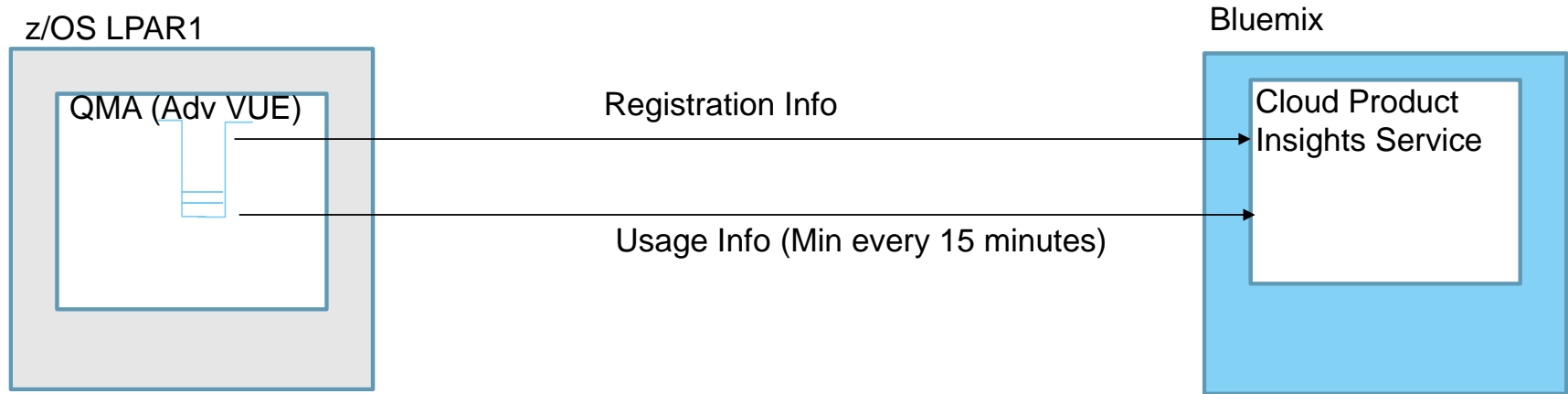
Keeps track in a single place which queue managers you have, what levels they are running at, when they were last running etc.

High level usage information is collected (e.g. how many messages have gone through a QM). Giving a very high level overview of the system usage.

Mirrors V902 Distributed Registration+Usage Information



MQ and Cloud Product Insights



- CSQMQMIN – new QMGR DD statement
- QMST updated – new SMF stats added (always updated)
- Various new startup activities for CPSI
- DD DSN=++THLQUAL++.SCSQPROC(CSQ4INSC),DISP=SHR
 - SYSTEM.BLUEMIX.REGISTRATION.QUEUE
 - (Default Persistence can change behaviour)
- New CHIN task CSQXBLUR – talks to CPIS
- Various new QMGR and CHIN error messages

CSQXBLUR is only started if in Advanced VUE and if we have a valid CSQMQMIN DD card. **CSQXBLUR -LE task.**

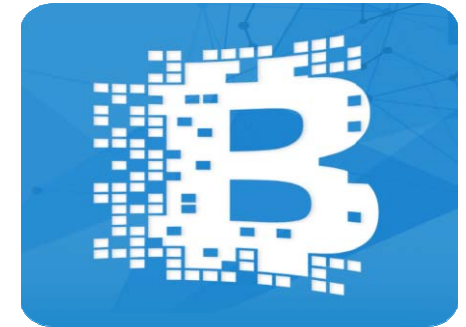
MQ Blockchain connector

MQ → Blockchain

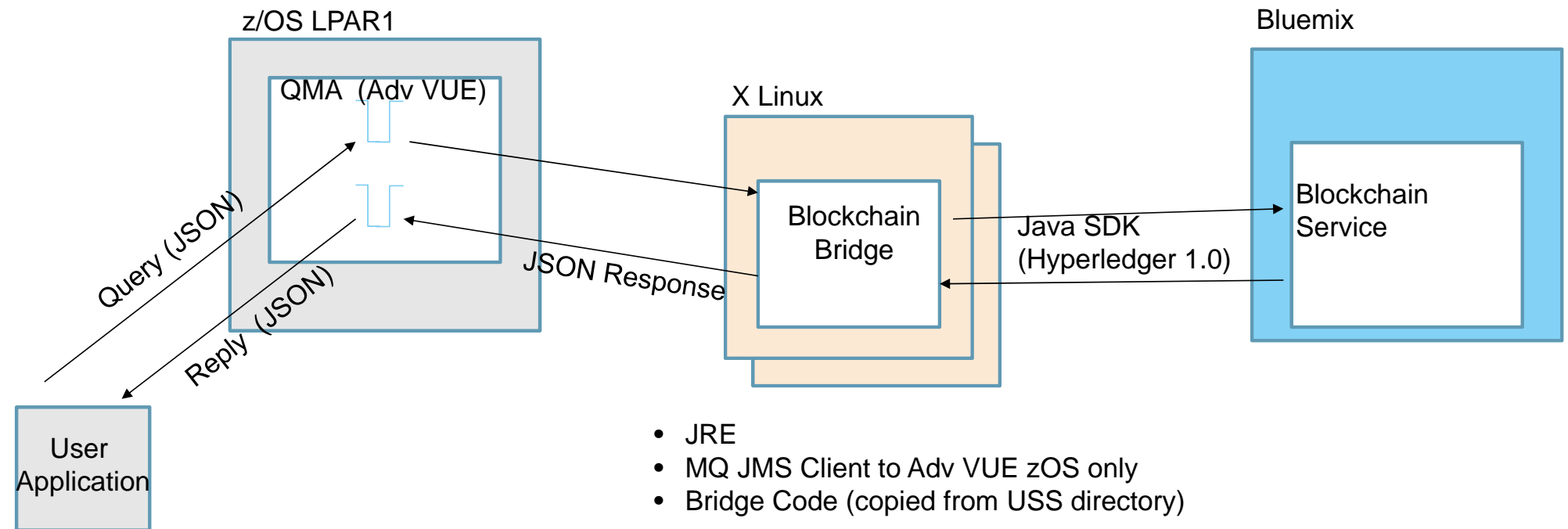
Request reply MQ message flow for applications to request information from Blockchain ("what is the value of the balance on this account") over MQ queues

Access to IBM Bluemix Blockchain Service

- We treat Blockchain as a DB
- Message driven query into the Blockchain using name/value pairs
- Retrieves information from the Blockchain



MQ Blockchain Connector

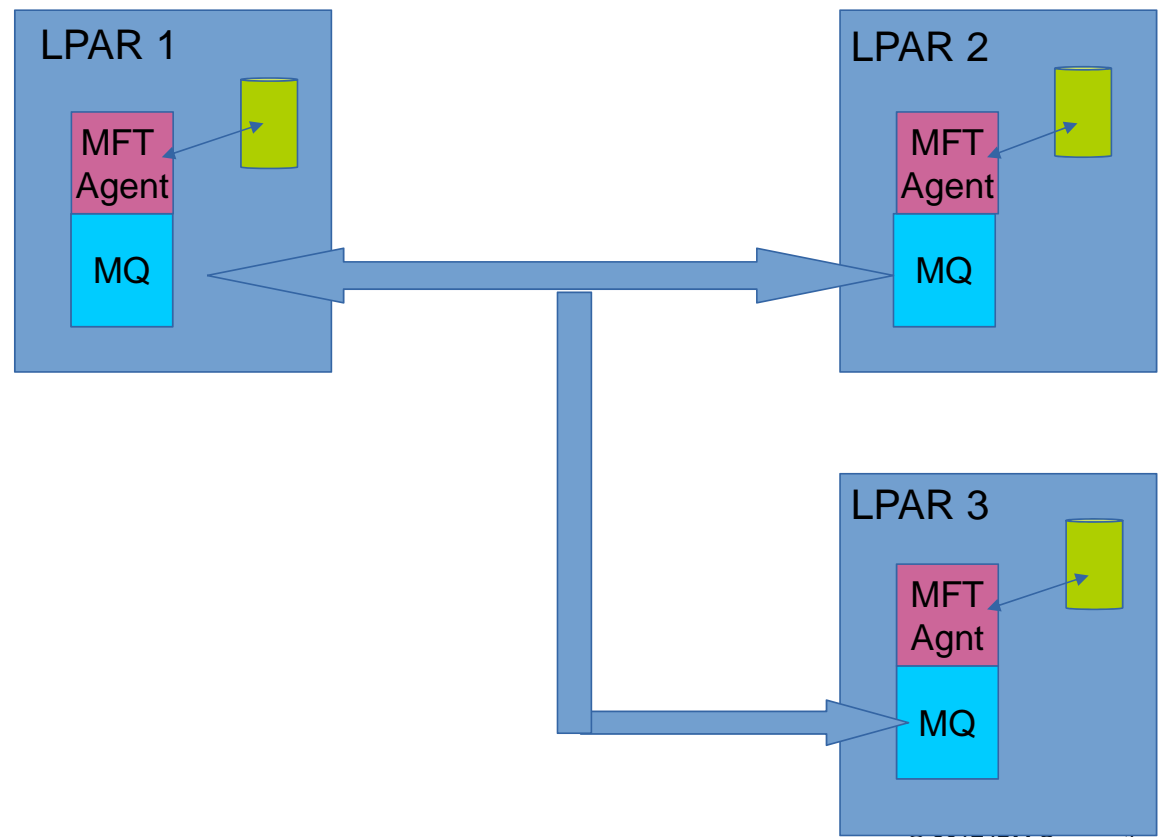


Managed File Transfer (MFT) Agent Connectivity – Before

Each LPAR

MFT Agent

- Make bindings mode connections to queue managers.
- Transfer files to and from other Managed File Transfer agents.
- Transfer files to and from Connect:Direct® nodes

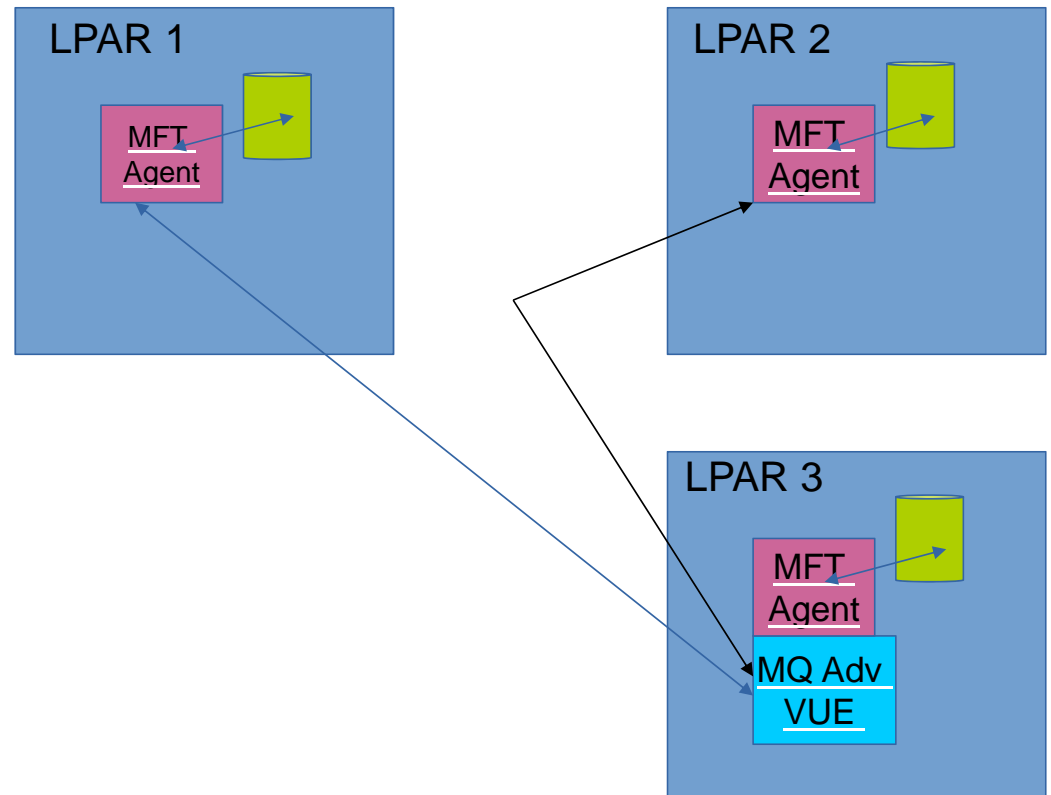


Managed File Transfer (MFT) Agent Connectivity - Simplified

Each LPAR

MFT Agent

- Make client to z/OS queue managers or bindings mode connections to queue managers.
- Transfer files to and from other Managed File Transfer agents.
- Transfer files to and from Connect:Direct® nodes
- **Reduces the number of Queue Managers required on z/OS**
 - Simplified topology
 - Reduced/Easier Administration



Where do I get more information?

IBM Messaging developerWorks

developer.ibm.com/messaging

<https://developer.ibm.com/messaging/ibm-mq/>

LinkedIn

[ibm.biz/ibmmessaging](https://www.linkedin.com/company/ibmmessaging)

Lyn's Blog

<http://www.lynsmq4zos.com>



The MQ WSC team

Lyn Elkins – elkinsc@us.ibm.com

Mitch Johnson – mitchj@us.ibm.com

IBM Messaging has Solutions to Meet All Needs

Digital

Enterprise

Cloud

New IBM MQ environments and the Cloud

Public

Message Hub

Dedicated

Message Hub

Local
(Coming soon!)

On-Prem



IBM MQ V9



IBM MQ Appliance
M2001

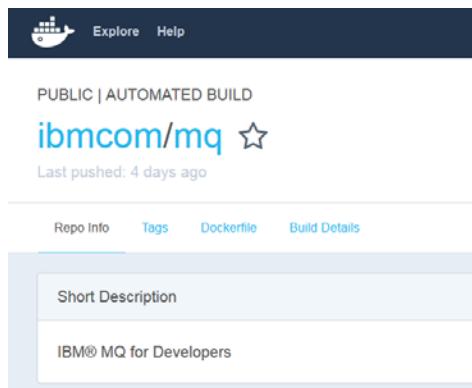
*Secure, reliable exchange of data across applications, systems and services
in the Cloud, on-premise, or in Hybrid environments*

MQ in Docker containers

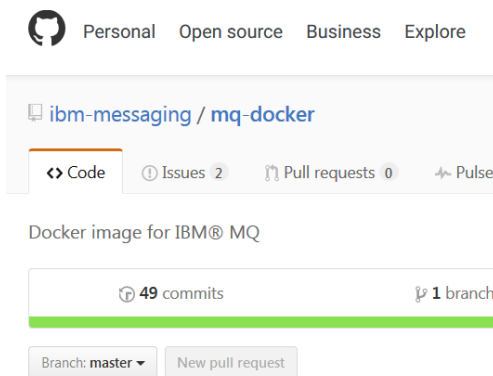


- IBM MQ is supported to run inside a Docker container
- This brings the benefits of Docker to MQ
 - Lightweight containers for running MQ
 - Predictable and standardized units for deploying MQ
 - Process, resource and dependency isolation
 - Best practice guidance

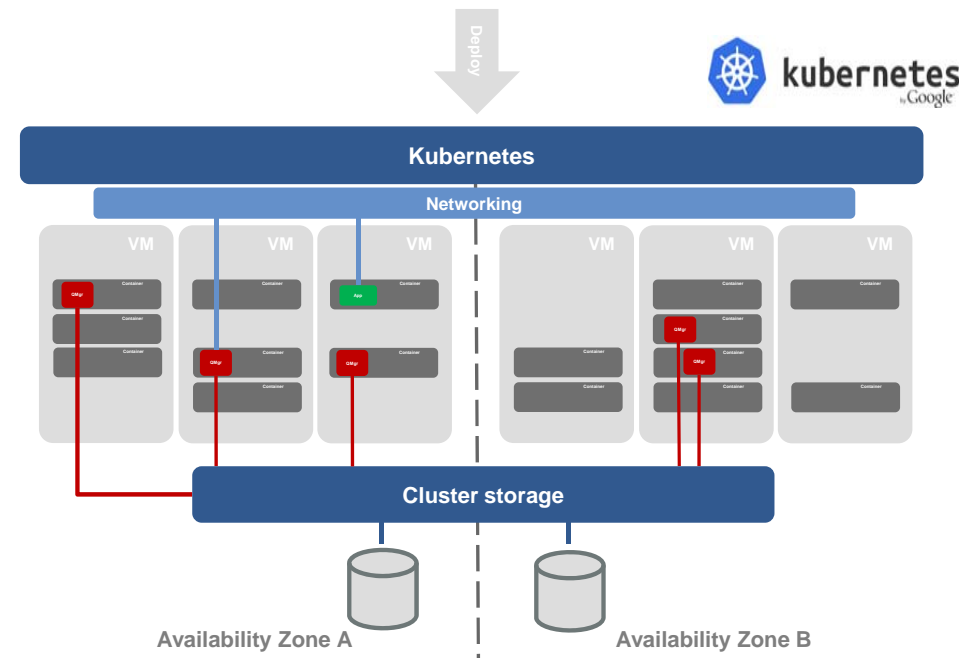
- Docker enables MQ deployments to be provisioned and managed within the same orchestration frameworks that make Docker so exciting
 - Kubernetes, Mesos, Swarm, Fleet, ...
 - Or individual IaaS cloud container services
 - Bluemix, Amazon EC2, Azure, ...



IBM MQ Advanced for Developers V9 available direct from Docker Hub



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



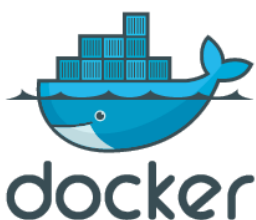
Supporting MQ deployed to the cloud

- Enterprise applications are expanding beyond the datacenter and asynchronous enterprise messaging is expanding with them. It's also the easiest and most efficient way to bridge between globally distributed clouds and datacenters.
- MQ offerings are available on popular public cloud platforms
 - E.g. Azure, EC2, Softlayer
 - Monthly or hourly license options for MQ are available, depending on the platform
 - Or bring your own license
- Or build your own image or container and deploy to the cloud of your choice



The wider MQ ecosystem

- The ways in which MQ is deployed and managed and where it is installed is continually changing
- Recent updates include...



MQ V9 is available in Docker Hub



Sample cookbook for installing and configuring MQ using Chef



Building an MQ OpenStack image and managing it using Heat



Using Prometheus and Grafana with MQ



Setting up MQ on Azure for HA



Deploying MQ and managing MQ in AWS

For the latest updates, check out <https://www.ibm.com/developerworks/community/blogs/messaging?tags=cloud>
Some favourite supportpacs and new samples and tools available on Github: <https://ibm-messaging.github.io/>

MQ Light : Software and Cloud

Messaging that application developers will love to use, helping them make responsive applications that scale easily

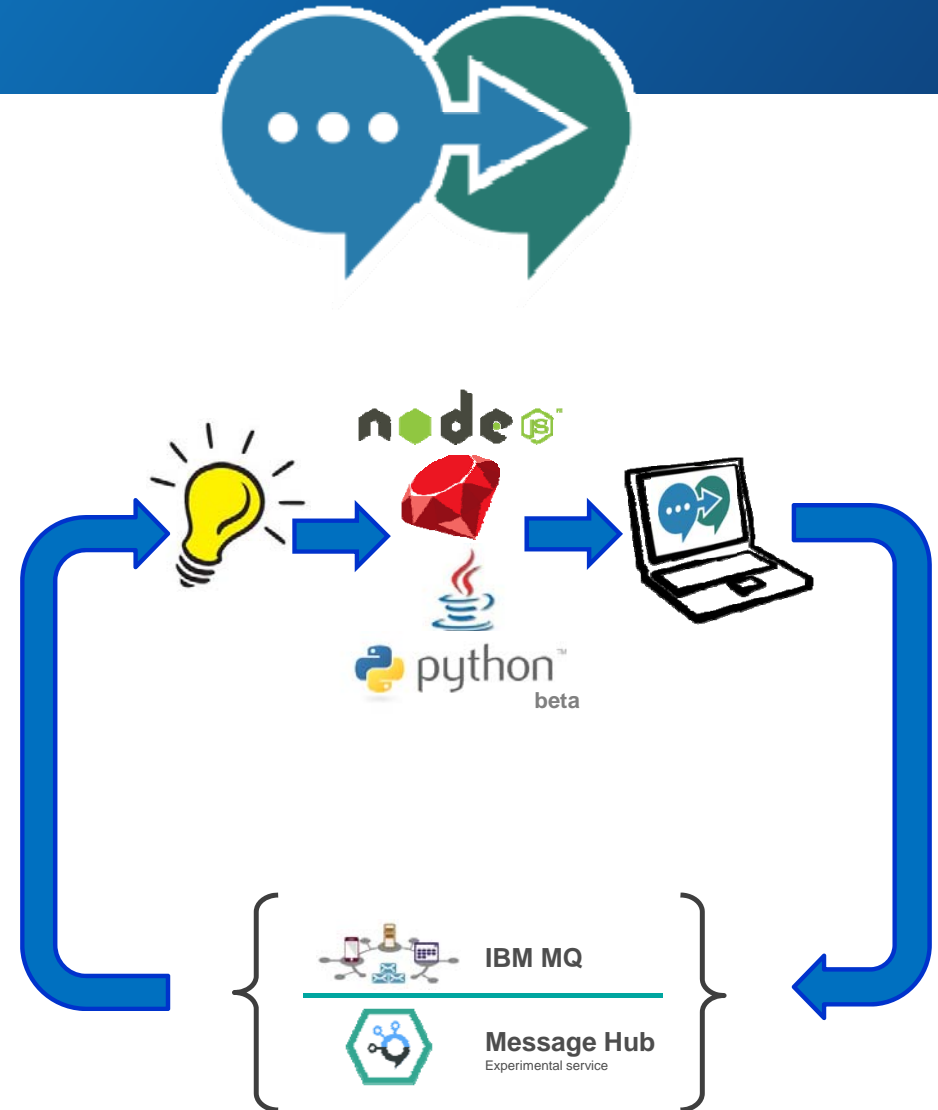
A very simple messaging API

Dedicated development tooling

- **MQ Light software download for developers**

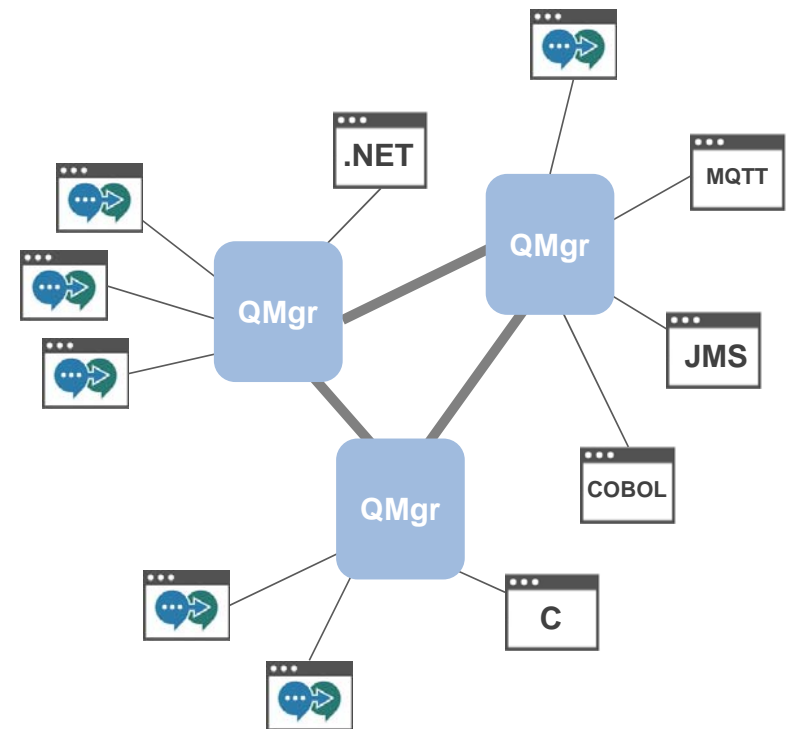
Multiple deployment options

- Directly connected to **MQ V8**
- Connected to **Message Hub**, a managed **Bluemix** service
 - *MQ Light support in experimental service*
 - *Replaces the “MQ Light Service”*



Connecting MQ Light applications to IBM MQ

- MQ Light applications connect directly into distributed MQ queue managers
- A new MQ channel type of “AMQP”
 - Supported from **MQ 8.0.0.4**
 - Similar in style to an MQTT channel
 - Supports the subset of the AMQP 1.0 Oasis specification required for MQ Light applications
- MQ Light applications interoperable with all other MQ applications
 - All share the same topic space



IBM Messaging has Solutions to Meet All Needs

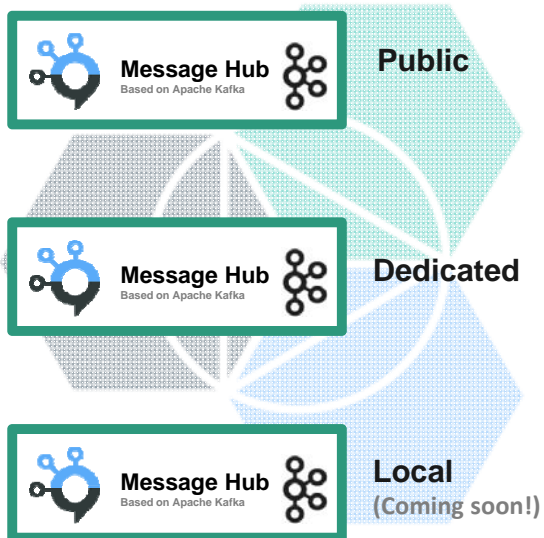
Digital

Enterprise

Cloud

On-Prem

IBM Message Hub for Bluemix



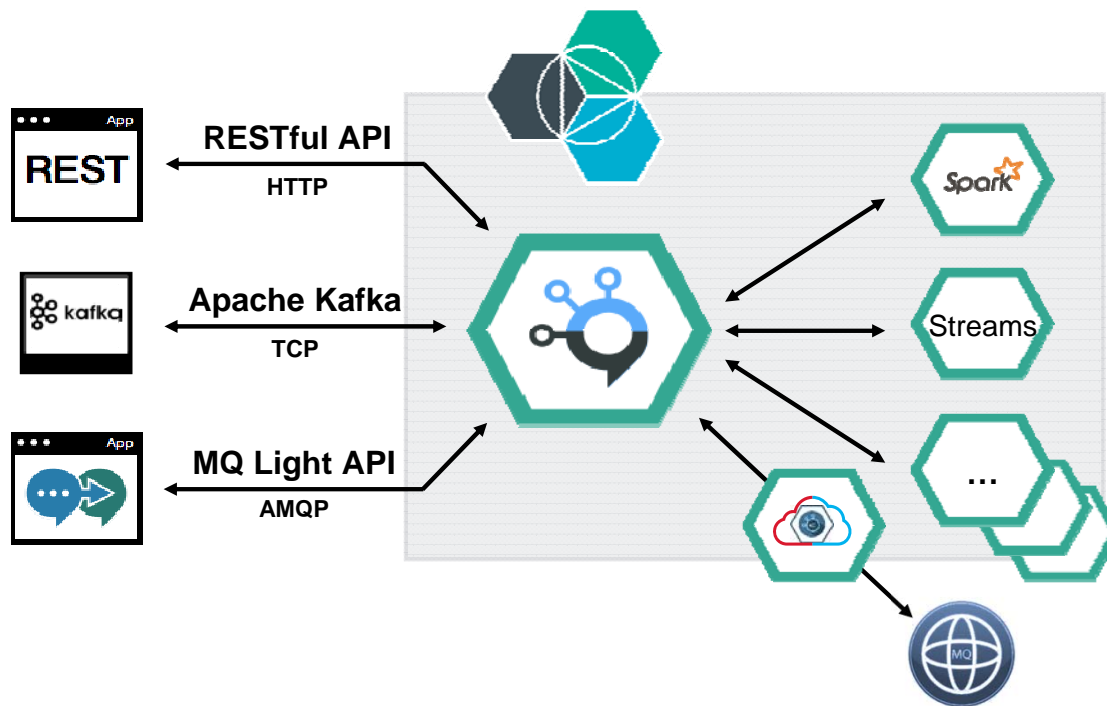
Connecting MQ with Bluemix messaging



Secure, reliable exchange of data across applications, systems and services in the Cloud, on-premise, or in Hybrid environments

Message Hub

- A scalable, distributed, high throughput message bus based on Apache Kafka
- Wide compatibility via 3 APIs : REST, Kafka and MQ Light over AMQP
- Tightly



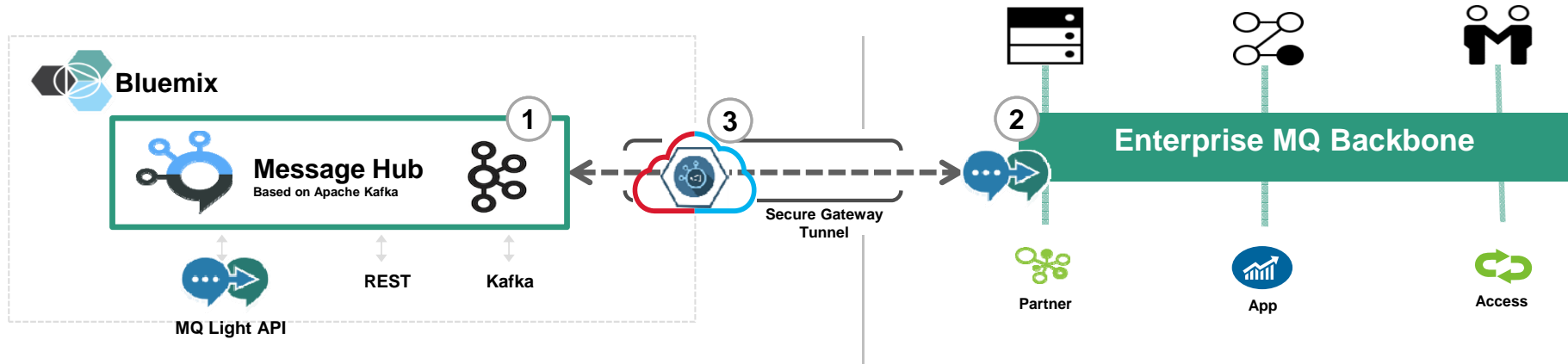
Available for ...		
	Bluemix Public	<input checked="" type="checkbox"/>
	Bluemix Dedicated	<input checked="" type="checkbox"/>
	Bluemix Local (Coming soon)	

Hybrid Messaging

- **Connects IBM MQ with your cloud native Bluemix applications**

- Driving cloud applications with events from back-end systems creates minimal additional load

1. **Message Hub :** Managed messaging service on Bluemix
2. **AMQP Channel in MQ :** Accepts AMQP protocol connections into IBM MQ
3. **Message Connect :** Bridging messaging systems using MQ Light API

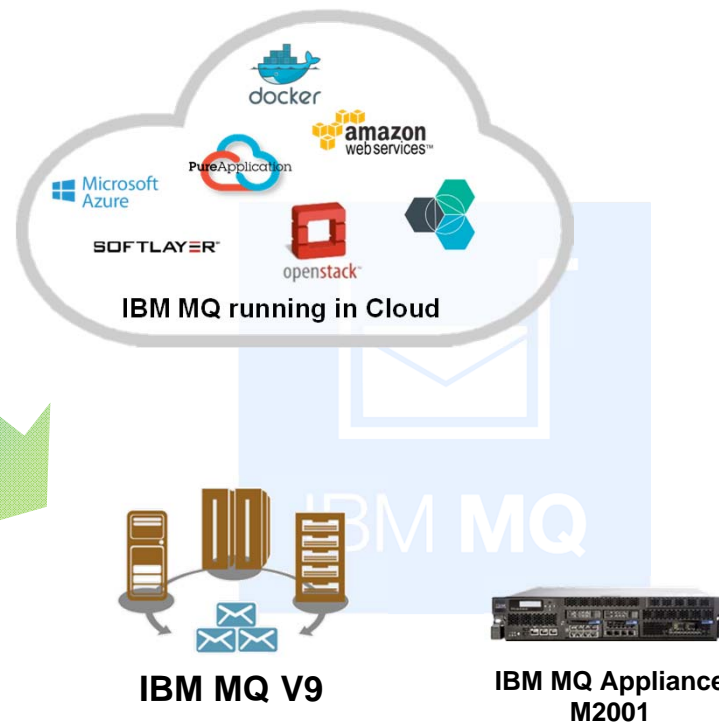
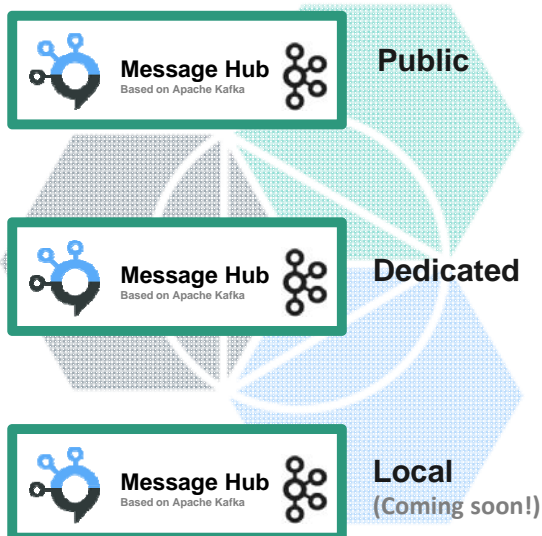


IBM Messaging has Solutions to Meet All Needs

Digital  Enterprise

Cloud

IBM Message Hub for Bluemix



On-Prem

*Secure, reliable exchange of data across applications, systems and services
in the Cloud, on-premise, or in Hybrid environments*