What's New in the IBM Messaging Family including MQ V9

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A New Era of Teamwork

Digital

Speed and agility to drive innovation and growth
• Explore, adopt, adapt
• Rapid, Iterative prototypes

Enterprise

Reliability, security and scalability for Business Critical systems
• Always on, always available
• Security, control and governance

LoB roles
Application Developer
LoB Developer

CIO roles
Integration Architect
Administrator/ Developer

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IBM Messaging has Solutions to Suit All Needs

**Digital IT**
- IBM Message Hub
  - Public
    - Based on Apache Kafka
    - (GA: Dec 2015)
  - Dedicated
    - Based on Apache Kafka
    - (1Q 2016)
  - Local
    - Based on Apache Kafka
    - (Coming soon!)

**Enterprise IT**
- MQ cloud options
  - IBM MQ
  - IBM MQ Appliance

IBM MQ Light (API)
Enterprise Messaging Update

MQ cloud options

IBM MQ

IBM MQ Appliance

IBM MQ Light (API)

Message Hub
Based on Apache Kafka

Public

Dedicated

Local

Cloud

Digital IT

IBM Message Hub

On-Prem

Enterprise IT
Our messaging focus areas

**Our users** include application developers, cloud application developers, system administrators and operators, enterprise architects.

**Want** to build business critical messaging applications quickly; be able to operate and manage resulting systems.

**Expect** fast time-to-value, simplicity, flexibility, clear documentation.

**Extending today’s messaging**
- Deploy messaging everywhere needed, to enable the hybrid enterprise with simplicity and fast time to value
- Connect hybrid applications in clouds, virtualized systems and containers, with choices of messaging styles and APIs

**Delivering additional and new capabilities for messaging**
- Streamline messaging deployment and operation with self-service administration, location transparency and elastic scaling
- User driven updates to core messaging capabilities to extend the value of IBM MQ across multiple use cases

**Increasing usability and enhancing value of messaging deployments**
- Additional flexibility for configuration and management for MQ to meet individual business needs
- Extend the value of MQ deployments through improvements to further use cases such as MQ MFT
IBM MQ
MQ Vision

- MQ provides the underlying connectivity mechanism for the increasingly connected world
  - Messaging-based enterprise nervous system
  - First responder to every business event
- Reduced burden of administration
  - Infrastructure team can focus on more complex issues
  - Simplifies task of connecting together disparate applications
- Deploy and connect anything, anywhere with security
  - The same messaging environment, the same messaging applications
  - On-premise, in cloud, on appliance
  - Adapting to new business drivers
End of Service for old platforms and versions

- MQ V7.0.1 already EOS
- MQ V7.1 End of Service (Distributed) will be April 2017
- MQ V7.5 End of Service (Distributed) will be April 2018
- MQ V7.1 End of Service (z/OS VUE) will be September 2017
- MQ V7.1 End of Service (z/OS) will be November 2017
- MQ FTE V7.0.x, MQ AMS 7.0.x & MQ HVE 7.0.1 EOS will be September 2017
MQ V9 now available

• Announcement on April 19 2016

• Availability 2 June for Distributed platforms
• Availability 17 June for z/OS

• Also now available
  – MQ for z/OS Advanced VUE
New Approach to Delivery
A new OPTIONAL delivery model

- Customers want new features faster
  - But they also want stability of existing function
- V8 has delivered a range of new capability in the service stream
  - But that has some constraints
  - And not everyone wants those new features
  - Many lessons learned on practical aspects
- And so MQ V9 starts the move to a 2-stream mechanism
  - "Long-term support" aka "stable delivery"
  - Rapid function delivery
  - For both z/OS and Distributed products
- **You** get to choose which stream to follow
Stable Delivery (traditional support model)

Version 9, MQ long term service

Fixes only. **No mid-service function.**
Same 5+3 service lifetime
LTS releases every couple of years

Version X, MQ long term service
Stable and Rapid Delivery

Version 9, MQ long term service

9.0.0.1  9.0.0.2  9.0.0.3  9.0.0.4  9.0.0.5  9.0.0.6  ......

Fixes only. No mid-service function. Same 5+3 service lifetime. LTS releases every couple of years.

Fixes, plus new function. New delivery every few months. Fixes on latest mods only.

Version X, MQ long term service

X.0.1  X.0.2  X.0.3
Continuous delivery

- Incremental delivery of future features
- Customer feedback shapes each feature as they are delivered
Product Features
### Starting from MQ V8 base

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<td></td>
<td>SMF and shared queue enhancements</td>
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- **Availability:**
  - May 2014 (eGA Distributed)
  - June 2014 (z/OS and pGA Distributed)

- **FixPack 5 on Distributed platforms now available**
  - No new function beyond FP4!
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

• Builds on V8 authentication enabling authorisations for LDAP users and groups
  – No need to define OS users/groups for applications
  – Supported for Unix, Linux and IBM I
  – Windows gets the same capability in V9

• Activity trace data extended to include microsecond call durations
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"
• Activity trace data extended to include microsecond call durations
Distributed Fixpack 3

• 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

• Protection against SSL security vulnerabilities
  – 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

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Distributed Fixpack 3 - Security

• 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
    • For example, use in conjunction with nsswitch to store Unix account information in Active Directory

• Protection against SSL security vulnerabilities
  – This was 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
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

RFE 67730, 64210, 60616
Distributed Fixpack 4

- Capped message expiry
  - Administratively impose minimum expiries on queues and topics
- Redistributable clients
  - Simple tar/zip image for Windows and Linux
  - Permitted to embed clients with applications
- Security change configuration events
  - Coverage for all security changes
  - Includes new event formatting sample
- Certificate management assistance
  - Configuration checker
  - Locale-independent expiry display
- Obfuscation of database passwords

Includes z/OS

RFE 21984, 37837
RFE 26670, 38765, 26671, 30697 etc
RFE 53559
RFE 53133
RFE 65496
FP4 – Capped expiry, redistributable clients

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

• Redistributable clients
  – Simple tar/zip image for Windows and Linux
  – Permitted to embed clients with applications

Includes z/OS

RFE 21984, 37837
RFE 26670, 38765, 26671, 30697 etc
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
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

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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

```c
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

RFE 53559
$ setmqaut -m V8004_A -t qmgr -p db2inst1 +connect
The setmqaut command completed successfully.
**** Message #2 (316 Bytes) on Queue SYSTEM.ADMIN.CONFIG.EVENT ****

Event Type : Config Event
Reason : Config Change Object
Object state : Before Change
Correlation Id : 414D5120563830335F41202020202CC001F03
Event created : 2015/07/07 10:26:47.82 GMT
  Event User Id : metaylor
  Event Origin : Console
  Event Queue Mgr : V8004_A
  Object Type : Auth Rec
  Auth Profile Name : self
  Auth Rec Type : Queue Mgr
  Entity Name : db2inst1
  Entity Type : Principal
Authorization List : None

**** Message #3 (316 Bytes) on Queue SYSTEM.ADMIN.CONFIG.EVENT ****

Event Type : Config Event
Reason : Config Change Object
Object state : After Change
Correlation Id : 414D5120563830335F41202020202CC001F03
Event created : 2015/07/07 10:26:47.82 GMT
  Event User Id : metaylor
  Event Origin : Console
  Event Queue Mgr : V8004_A
  Object Type : Auth Rec
  Auth Profile Name : self
  Auth Rec Type : Queue Mgr
  Entity Name : db2inst1
  Entity Type : Principal
Authorization List : Connect
FP4 - Certificate expiry made easier to parse

• New option for runmqakm to print dates in a standard format

$ ./runmqakm -cert -list -db ./key.kdb -pw passw0rd -expiry
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

$ ./runmqakm -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
  – XAOOpenString now can refer to ++USERID++, ++PASSWORD++ variables
  – Separate file contains obfuscated password similar to mqccred channel exit
Increased active logs for MQ on z/OS

- Advice has always been: "Consider having enough active log space to keep a day's worth of data, in case the system is unable to archive because of lack of DASD or because it cannot write to tape."
  - But "a day's worth" is rather more than the original design point
- And so … MQ on z/OS now supports up to 310 active logs

- If you want to define more than 31 active log data sets, you must apply APAR PI46853 and configure your logging environment to use a version 2 format BSDS.
  - Once a version 2 format BSDS is in use, up to 310 active log data sets can be defined for each log copy ring.
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+

Statement of Direction to provide MQ JMS in CICS Liberty

RFE 27251, 44262, 61798, 31984
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
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
MQ V9 Features
Overview

• MQ V9 includes all of the MQ V8 FixPack/PTF features

• A convenient roll-up, single install

• And V9.0 is the starting-point for the new delivery streams
Central provisioning of CCDT

• Client Channel Definition Table is method to configure MQ client connectivity
  – Usually pushed out to client machines from a central point to local filesystems
• Java and .Net clients have been able to refer to CCDT via URI
  – Automatically retrieved from http or ftp address
• Now also available for C clients to simplify provisioning
  – export MQCCDTURL="ftp://ccdt.example.com/ccdt/MyApp.ccdt"
AMS – high performance policy

• New quality of service for Advanced Message Security feature
  – We have *Integrity* to prove authenticity through signing
  – And *Privacy* which adds encryption to the authenticity

• We are adding *Confidentiality* to provide encryption without the digital signing
  – Significant performance gains over Integrity and Privacy
  – Especially with key reuse

• Available for Distributed and z/OS
AMS Confidentiality performance

AMS Throughput Comparison

- AMS Off
- AMS Privacy
- AMS Confidential 0
- AMS Confidential 2
- AMS Confidential 16
- AMS Confidential Unlimited

AMS CPU Comparison

- AMS Off
- AMS Privacy
- AMS Confidential 0
- AMS Confidential 2
- AMS Confidential 16
- AMS Confidential Unlimited

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 classes, not the Java Runtime Environment

- Can now use alternative JREs with no need to install additional libraries

RFE 45817, 72893
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

• Information published for…
  – Application activity trace
  – Resource monitoring
Activity Trace

• Application Activity Trace now available via pub/sub without additional config
  – Can have multiple consumers of information

• Subscribe to special topics
  – $SYS/MQ/INFO/QMGR/<qmgr>/ActivityTrace/AppName/amqsputc

• Filter by application name, channel or connection id
  – Previous configuration only allowed program name filters

• Once subscription is created, PCF messages flow to subscriber

• Distributed platforms only
Activity Trace Example

$ amqsact -m V9000_A -a amqsput -w 60
Subscribing to the activity trace topic:
'$$SYS/MQ/INFO/QMGR/V9000_A/ActivityTrace/AppName/amqsput'

MonitoringType: MQI Activity Trace

QueueManager: 'V9000_A'
ApplicationName: 'amqsput'
Application Type: MQAT_UNIX

=============================================================================
<table>
<thead>
<tr>
<th>Tid Date</th>
<th>Time</th>
<th>Operation</th>
<th>CompCode</th>
<th>MQRC</th>
<th>HObj (ObjName)</th>
</tr>
</thead>
<tbody>
<tr>
<td>001 2016-04-14</td>
<td>09:56:53</td>
<td>MQXF_CONNX</td>
<td>MQCC_OK</td>
<td>0000</td>
<td>-</td>
</tr>
<tr>
<td>001 2016-04-14</td>
<td>09:56:53</td>
<td>MQXF_OPEN</td>
<td>MQCC_OK</td>
<td>0000</td>
<td>2 (SYSTEM.DEFAULT.LOCAL.QUEUE)</td>
</tr>
<tr>
<td>001 2016-04-14</td>
<td>09:56:53</td>
<td>MQXF_PUT</td>
<td>MQCC_OK</td>
<td>0000</td>
<td>2 (SYSTEM.DEFAULT.LOCAL.QUEUE)</td>
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<tr>
<td>001 2016-04-14</td>
<td>09:56:53</td>
<td>MQXF_CLOSE</td>
<td>MQCC_OK</td>
<td>0000</td>
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<tr>
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<td>09:56:53</td>
<td>MQXF_DISC</td>
<td>MQCC_OK</td>
<td>0000</td>
<td>-</td>
</tr>
</tbody>
</table>
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System Monitoring

• More statistics available via a pub/sub model

• Includes CPU and Disk usage
  – As well as MQ statistics

• Subscribe to meta-topic to learn which classes of statistics are available
  – $SYS/MQ/INFO/QMGR/<qmgr>/Monitor/METADATA/CLASSES
  – Then subscribe to specific topics
  – See amqsrua sample program

• Distributed platforms only
$ amqsr ua -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
Feeding a 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
  – And common editing control sequences (emacs/vi modes)
  – Much easier to fix bad typing

• Similar to what has always been available on Windows

• With a new capability of command completion
  – Hit TAB to cycle through and accept possible keywords
Command completion example

```
$ runmqsc V9000_A
5724-H72 (C) Copyright IBM Corp. 1994, 2015.
Starting MQSC for queue manager V9000_A.
```

DE-
Command completion example

```
$ runmqsc V9000_A
5724-H72 (C) Copyright IBM Corp. 1994, 2015.
Starting MQSC for queue manager V9000_A.

DEFINE_
```
Command completion example

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

DELETE
Updated MQ Unicode support

- MQ now supports CCSIDs which contain "upper plane" Unicode characters
  - 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.

RFE 35637, 58573
SMF statistics for pageset usage

- New SMF information
  - Capacity planning: eg how much is my pageset utilization increasing?
  - Problem resolution: eg why are private messages slow?
  - System management: eg 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 analyse
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
Managed File Transfer

• Enhanced FTP diagnostics and problem handling
  – Comprehensive fine grain coverage of FTP errors
  – Enhanced logging of FTP communications for post diagnosis

RFE 66425
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
New MQ environments
IBM PureApplication

• PureApplication provides a fully integrated IaaS for automated provisioning of machines and software deployments
  – Available as a hardware system, software or a Softlayer service
  – Repeatable and reliable MQ deployments for consistency

• MQ vSys.Next Support in IBM PureApplication V2.0 from MQ V8.0.0.3 onwards
  – Concept similar to hypervisor but software components separated from O/S
  – Drag and drop MQ onto Core O/S image to compose VM configuration

• Management and maintenance of MQ via PureApp console
• Pattern support for highly available queue managers
• Power/AIX support added to Linux x86 support with MQ 8.0.0.4
MQ in Docker

- **MQ** supported to run inside a Docker image.
  Details: [https://ibm.biz/mqdocker](https://ibm.biz/mqdocker)

- Brings the benefits of Docker to MQ
  - Lightweight containers for running MQ
  - Predictable and standardized units for deploying MQ
  - Process, resource and dependency isolation

- IBM sample Docker files for customizing and building your own Docker images
  - Best practice guidance
  - Runs an MQ queue manager inside a container, isolated from the rest of your system

- V9 image now available on docker hub
Supporting MQ deployed to the cloud

• Enterprise applications are expanding beyond the datacentre and asynchronous Enterprise Messaging is the easiest and most efficient way to bridge between the applications in globally distributed cloud datacentres.

– MQ offerings available on popular public cloud platforms
  • E.g. Azure, EC2, Softlayer
  • Monthly or hourly license options for MQ are available
  • Or BYOL
– Or build your own VM or container and deploy
Using MQ as a service

• Not an environment, more a lifestyle choice!
• Addresses the increasing demands on agility and scale of messaging infrastructures
• As a service goes hand in hand with self service

• Many clients have built MQ as a service today
  – Orchestration and automation of MQ resources
    • E.g. IBM UrbanCode Deploy, Chef, Puppet, etc.
  – Running on bare metal or in a cloud

• Redpaper now available [http://ibm.biz/mqaas_red](http://ibm.biz/mqaas_red)
MQ ecosystem – what’s new

- The ways in which MQ is deployed and managed and where it is installed into is continually changing

- Running MQ in Docker is now supported for production use
  [GitHub](https://github.com/ibm-messaging/mq-docker)

- Sample cookbook for installing and configuring MQ using Chef
  [GitHub](https://github.com/ibm-messaging/mq-chef)

- Building an MQ OpenStack image and managing it using Heat
  [Link](https://www.ibm.com/developerworks/community/blogs/messaging/entry/mq_openstack_part1_packer)

- Designing a self service and as-a-service MQ system
  [Link](http://ibm.biz/mqaas_red)

- Setting up MQ on Azure for HA
  [Link](https://www.ibm.com/developerworks/community/blogs/messaging/entry/How_to_setup_IBM_MQ_Multi_instance_queue_manager_with_Microsoft_Azure_File_Service)

- Deploying MQ and managing MQ in AWS
  [Link](https://www.ibm.com/developerworks/community/blogs/messaging/entry/mq_aws_basic)

- With many more areas that we could investigate, tell us what’s on your list…

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Recent MQDev articles on cloud technologies

- Introducing Docker image for MQ Advanced for Developers
- MQ in Docker is now supported for production use
- MQ High availability using Ceph block storage
- Connecting MQ with the Cloud (Docker, Chef, OpenStack, or Bluemix)
- How to setup Multi instance queue manager with Microsoft Azure File Service
- Calling IBM MQ from Go applications
- Using Prometheus and Grafana to monitor queue managers
- Further integration with open-source monitors
- Using AWS CloudWatch to monitor queue managers
- MQ on OpenStack, part one: Creating an image using Packer
- MQ on OpenStack, part two: Managing an MQ environment using Heat
- MQ on OpenStack, part three: Automated client connection PoC using MQ v9 CCDT URL feature.
- Sending MQ error logs to the Bluemix Logmet service
- Sending MQ metrics to the Bluemix Logmet service
- Storing and searching MQ error logs in Elasticsearch
- Basic deployment of MQ on AWS
- MQ on AWS: PoC of high availability using EFS
- MQ on AWS: Sending MQ error logs to CloudWatch

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The IBM MQ Appliance
The IBM MQ Appliance

- The scalability, security and reliability of IBM MQ V8
- 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 HA and DR

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

• High availability
  – Short distance configurations
  – All recoverable data replicated immediately
  – Failures automatically detected and queue managers restarted

• Disaster recovery
  – Long distance configurations
  – Manual queue manager takeover
MQ Appliance console

- Browser-based UI for administering the appliance
  - Administration
    - Configuration of the appliance and the MQ resources
  - Monitoring
    - Exposes machine level metrics
    - And MQ operations

Statement of Direction to provide the console across multiple MQ platforms in the future
Hardware update – the M2001 appliance

Current 1.2TB HDDs to be replaced with 3.2TB SSDs

10GB network ports extended from 2 to 4
For combined HA and DR configurations two 10GB ports are required
This will free up two 10GB ports for messaging traffic
Firmware update

• Support for new hardware configurations

• MQ Light client connectivity

• Combined HA and DR options
  – Do not have to choose between them

Statement of Direction to provide MQ V9-based firmware
MQ Light
Messaging that application developers will love to use, helping them make responsive applications that scale easily

A very simple messaging API

Multiple ways to access MQ Light

- An MQ Light software download for developers
- A managed Bluemix service
  - Message Hub (MQ Light support coming soon)
- Directly connected to MQ V8 and V9
Connecting MQ Light applications to MQ

- MQ Light applications connect directly into 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
Message Hub
What does Message Hub enable?

1. Hub for asynchronously connecting services inside Bluemix or beyond. Applications connected to events happening in other Bluemix services, or from beyond the cloud.

2. Microservices allow applications to evolve rapidly. Open protocols support polyglot runtimes, application controlled behavior and reactive scale.

3. Insights from the data you already have. Data needs to be streamed from anywhere to one or many analytics engines.

4. MQ plus other on-prem data sources.
Why Apache Kafka?

**Fast:** Responds to your needs

**Scalable:** Scales according to demands

**Durable:** Prevents data loss

**Distributed:** Fault-tolerant

Used by companies including:
- LinkedIn
- Yahoo
- Twitter
- Netflix
- Spotify
- Pinterest
- Paypal
- Tumblr
MQ – all about communicating…

• Tell us your priorities
  – Raise RFEs. Vote on them

• Sign up to the beta program
  – Get your first look at what’s coming

• Engage with your Lab Advocates
  – Stay connected

• Tell us what you think
  – What’s important to you?
IBM MQ Summary

- IBM MQ has been regularly delivering significant new function since MQ V8
  - Through major releases and fix packs
  - V9 builds on those updates
- Future releases will see a true **continuous delivery** of new function
Any questions?