What's new in the world of IBM MQ?

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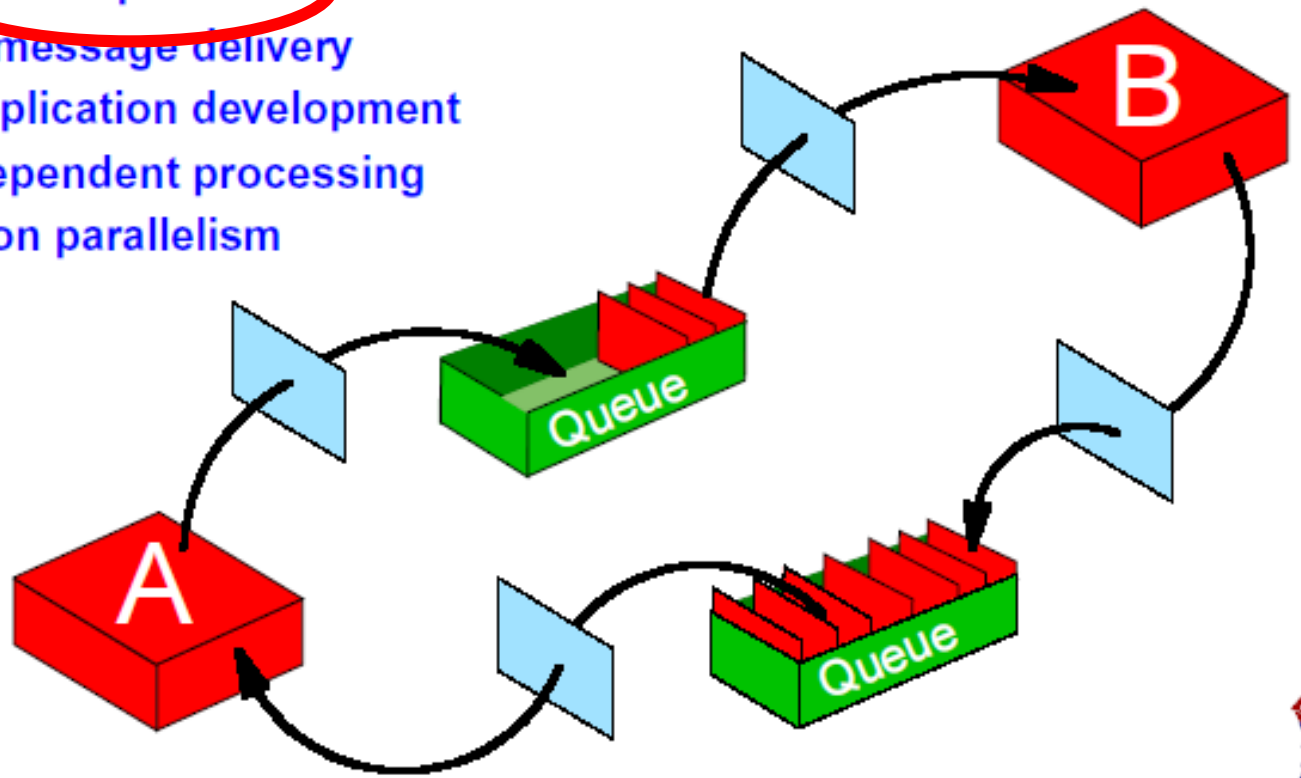
What is MQ – the 1995 version

IBM Software

MQSeries Commercial Messaging

- A single, multi-platform API
- Assured message delivery
- Faster application development
- Time independent processing
- Application parallelism



MQSeries
Commercial Messaging

Run MQ, exactly how and where you need it

Cloud

IBM MQ

Spark

Message Hub

IBM Bluemix
(including Softlayer)

IBM MQ

amazon web services

IBM MQ

Windows Azure

IBM MQ

Google Cloud Platform

docker

vmware

MESOS

openstack
CLOUD SOFTWARE

kubernetes
by Google

...

On-prem

Linux

Windows

HP-UX

AIX

Hewlett Packard Enterprise

ORACLE SOLARIS

...

Distributed platforms

IBM MQ

Private cloud

IBM MQ Appliance

End of Service for old platforms and versions

- MQ V7.0.1 already EOS

- MQ V7.1 End of Service (Distributed) was **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**

Look for scrolls …

See: another session for details

Starting from MQ V8 base

Platforms & Standards	*Security*	*Scalability*	*System z exploitation*
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

- Availability:
  - May 2014 (eGA Distributed)
  - June 2014 (z/OS and pGA Distributed)
- FixPack 7 on Distributed platforms now available
  - No new function beyond FP4!

Service Stream updates for Distributed platforms

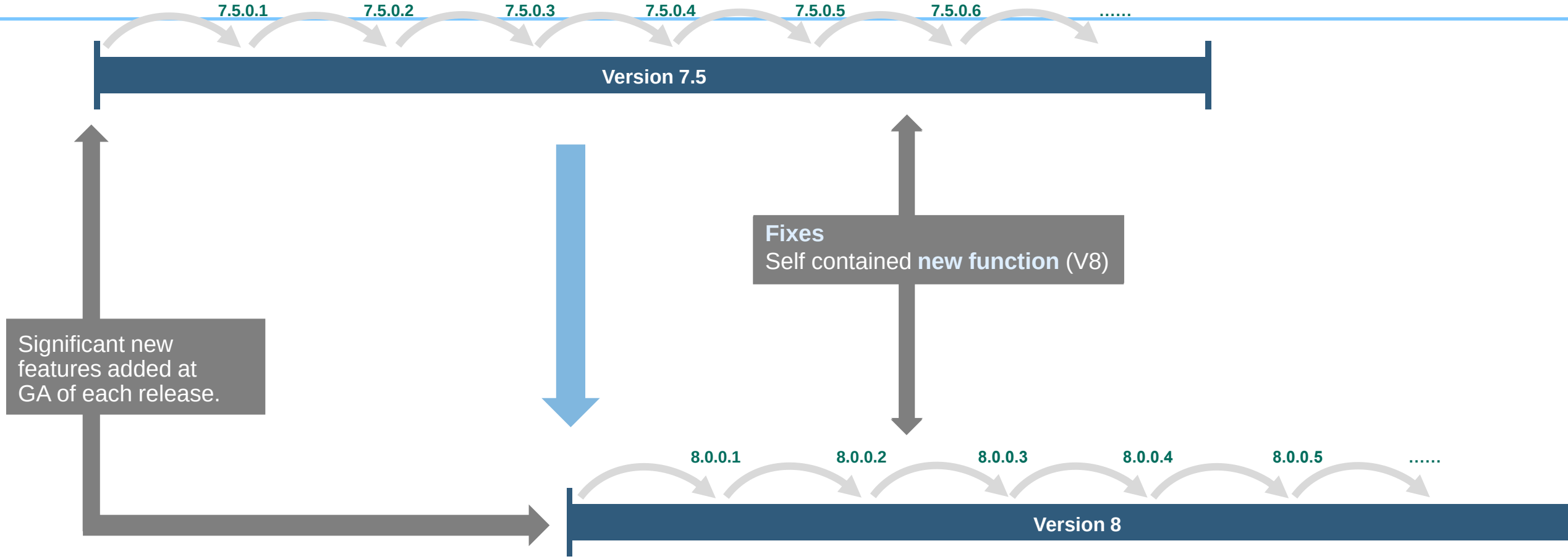
- Fixpack 2
  - LDAP authorisation, Activity Trace
- Fixpack 3
  - Support for authentication via PAM on Unix platforms
  - Protection against SSL/TLS security vulnerabilities
  - Extended start events
- Fixpack 4
  - Capped message expiry
  - Redistributable clients
  - Security change configuration events
  - Certificate management assistance
  - Obfuscation of database passwords

Service Stream updates for z/OS

- Protection against SSL security vulnerabilities
- Capped message expiry
- Increased active logs for MQ on z/OS
- MQ JMS applications in a CICS OSGi JVM server
- MQ JMS applications in IMS

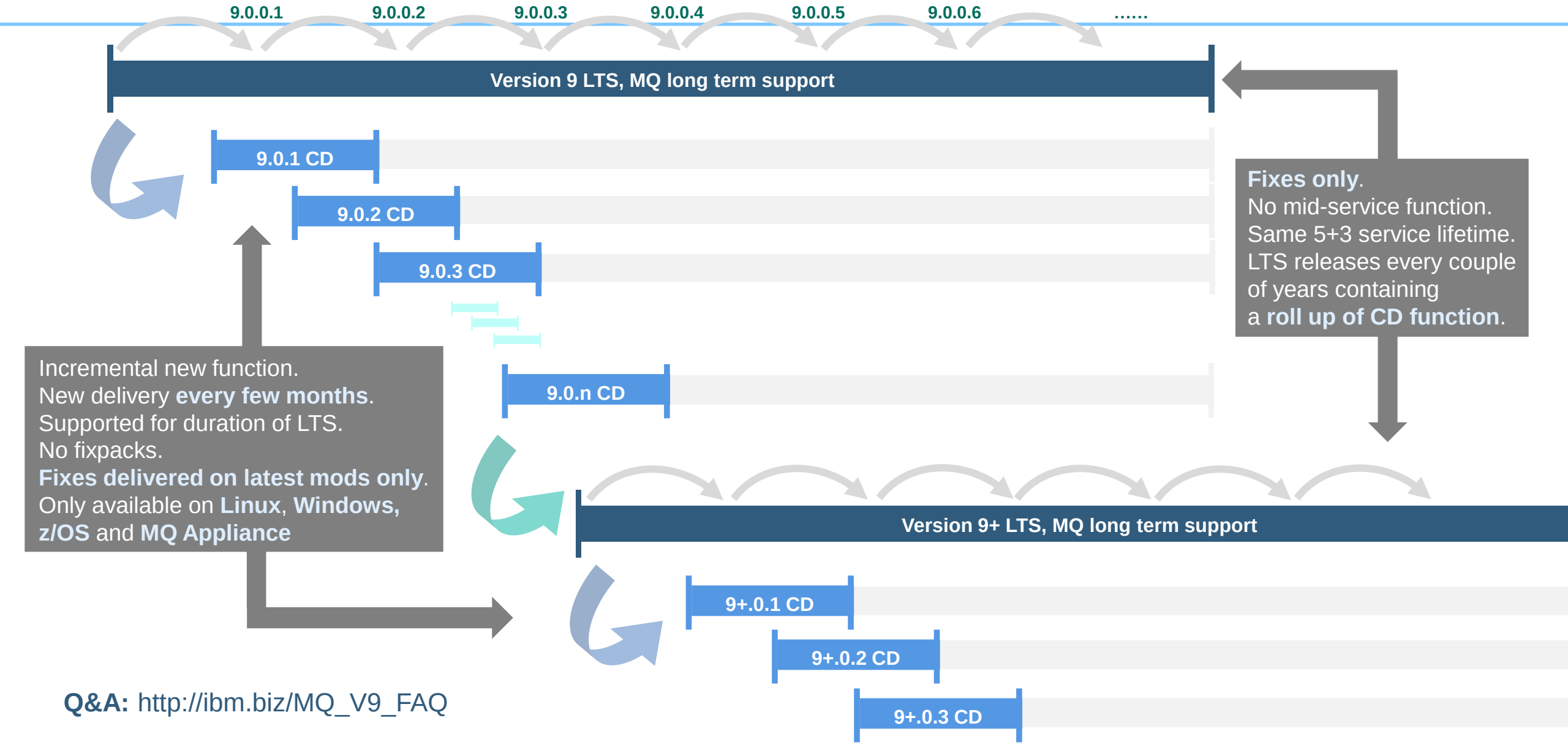
New Approach to Delivery

Previously: Service and continuous delivery combined



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

Today: Service and continuous delivery separated



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

Updated platform

- New MQ for HPE NonStop (once known as Tandem and various alternatives)
- Version 8 – client and server
- To replace V5.3

- Available from June 2017
  - For both J-Series and L-Series hardware

- Exploits NonStop capabilities
- Will use Continuous Delivery model only for now
  - Until all relevant V5.3 unique features available

MQ V9 Features

MQ V9 is current version

- 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

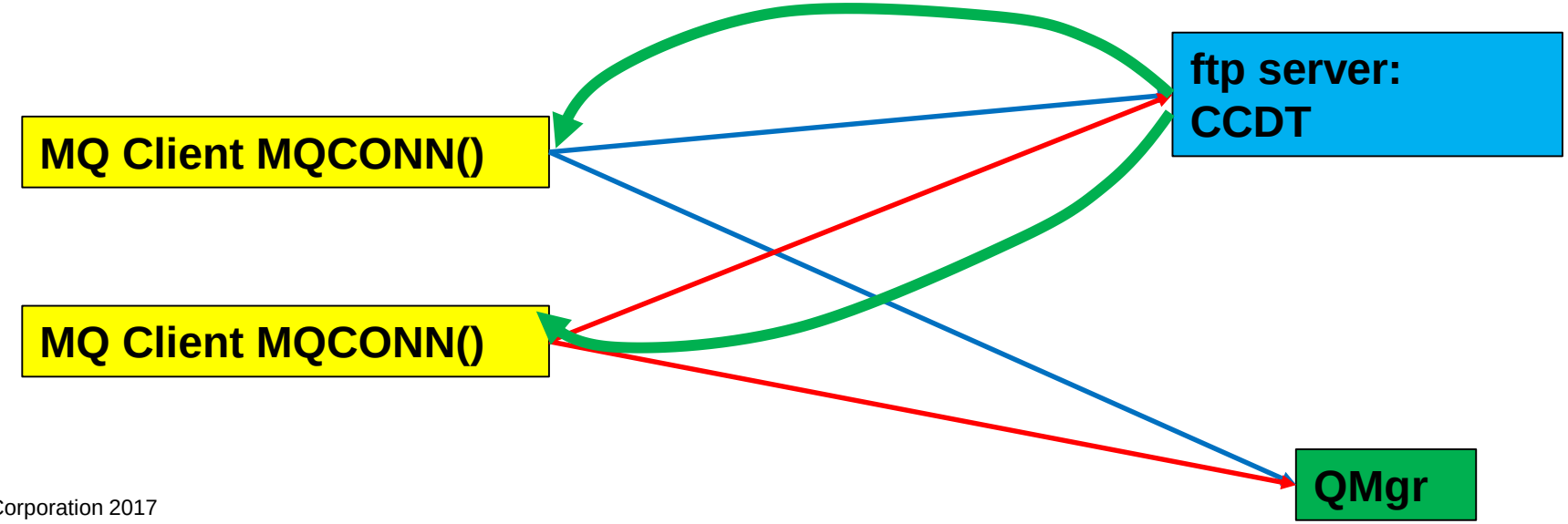
- FixPack 9.0.0.1 available
  - 9.0.0.2 planned for 3Q17

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
- Can migrate direct from V7.1/V7.5 to V9.0

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"

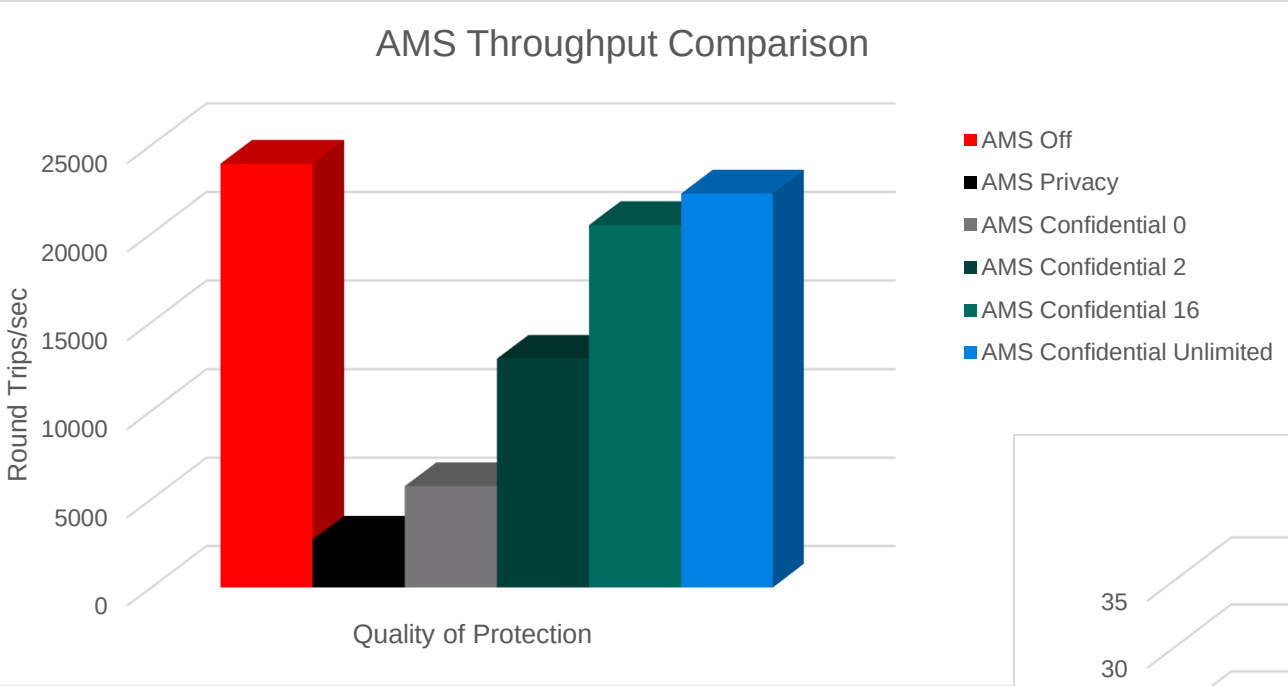


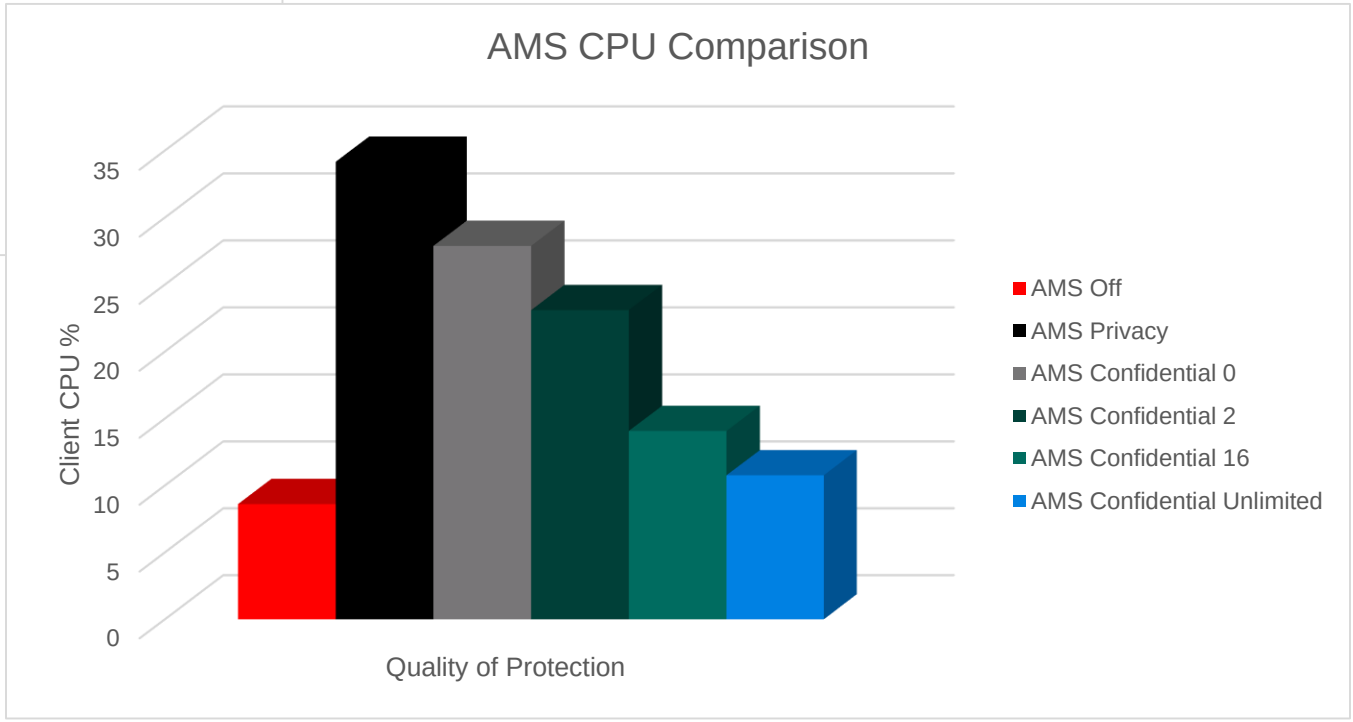
AMS – high performance policy

See: Security Deep Dive

- 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
- V9 adds ***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





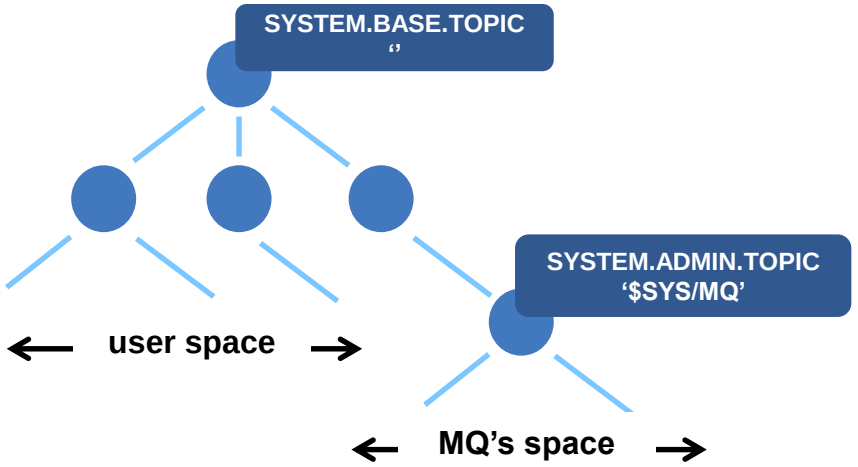
2K Persistent Message
20 Requesters

System topics on distributed queue managers

- **Distributed queue manager information published to a range of system topic strings**
  - ***$SYS/MQ/INFO/QMGR/….***

- **Authorised subscriptions receive 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/ApplName/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/ApplName/amqsput'

MonitoringType: MQI Activity Trace
…
QueueManager: 'V9000_A'
ApplicationName: 'amqsput'
Application Type: MQAT_UNIX
…
==========================================================================
  Tid Date       Time       Operation       CompCode       MQRC  HObj  (ObjName)

  001 2016-04-14 09:56:53  MQXF_CONNX      MQCC_OK        0000  -
  001 2016-04-14 09:56:53  MQXF_OPEN       MQCC_OK        0000  2  (SYSTEM.DEFAULT.LOCAL.QUEUE)
  001 2016-04-14 09:56:53  MQXF_PUT        MQCC_OK        0000  2  (SYSTEM.DEFAULT.LOCAL.QUEUE)
  001 2016-04-14 09:56:53  MQXF_CLOSE      MQCC_OK        0000  2  (SYSTEM.DEFAULT.LOCAL.QUEUE)
  001 2016-04-14 09:56:53  MQXF_DISC       MQCC_OK        0000  -
==========================================================================
```

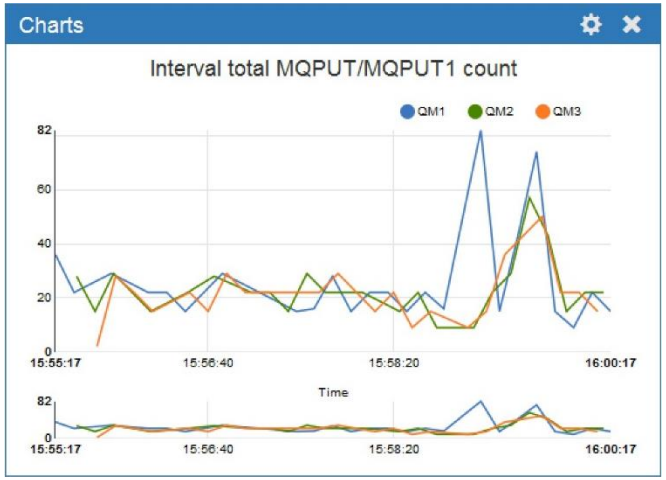
System Monitoring

- 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

System Monitoring Example

```
$ 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
```

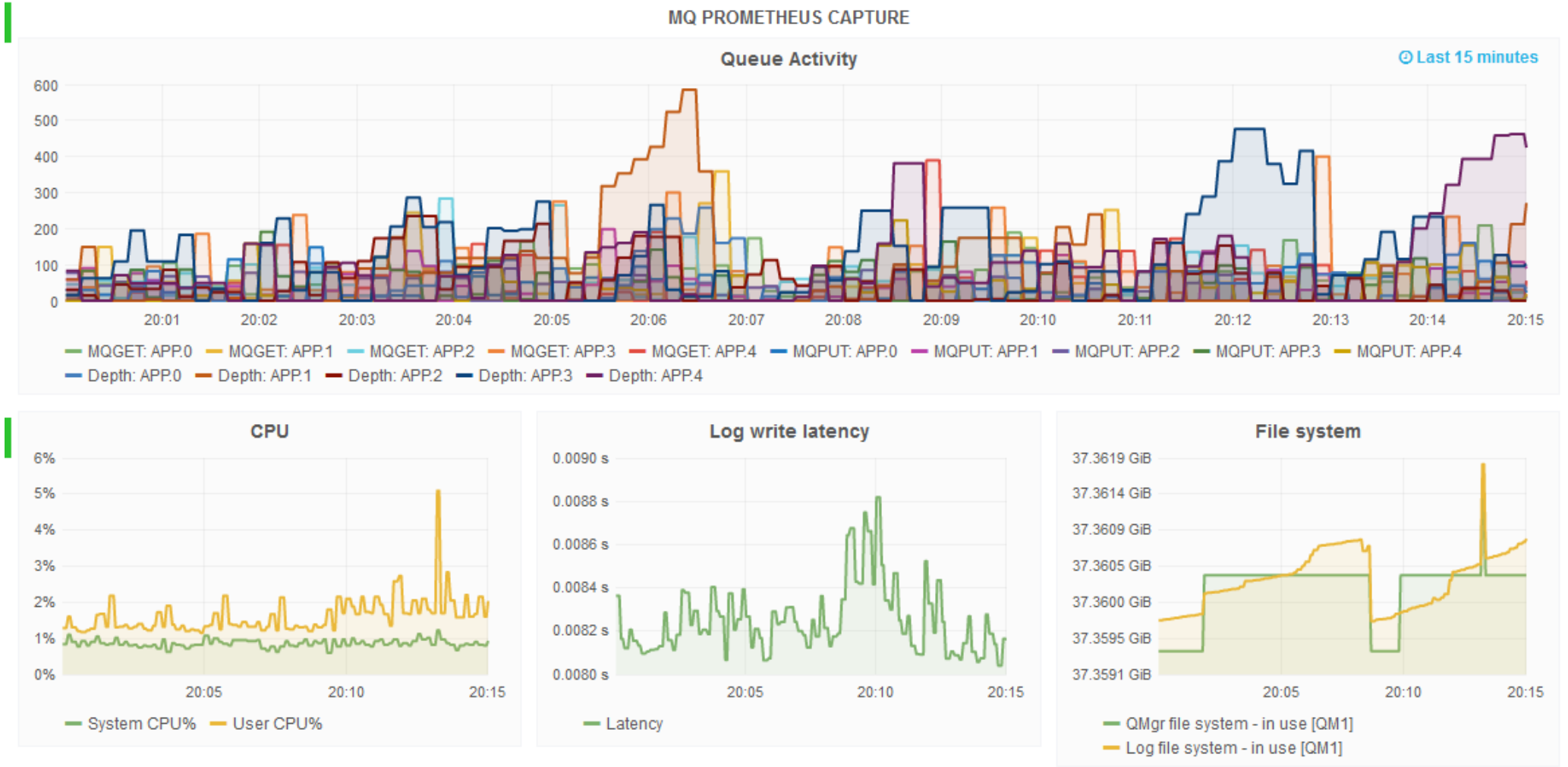
This capability underpins the charting in the MQ Console UI



Feeding a dashboard

See: Open Source Monitoring

- 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

SMF statistics for pageset usage

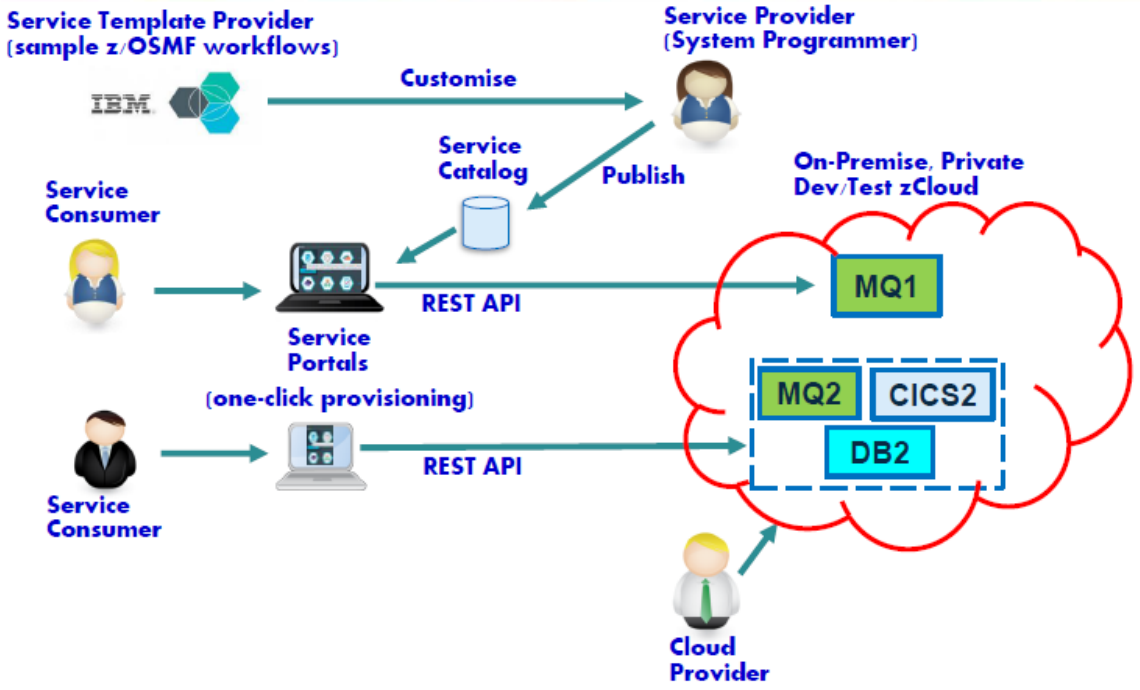
- New SMF information
  - Capacity planning: eg how much is my pageset utilization increasing?
  - Problem resolution: eg why are private messages slow?
  - System management: eg which pageset should I move into a different buffer pool?

- 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

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

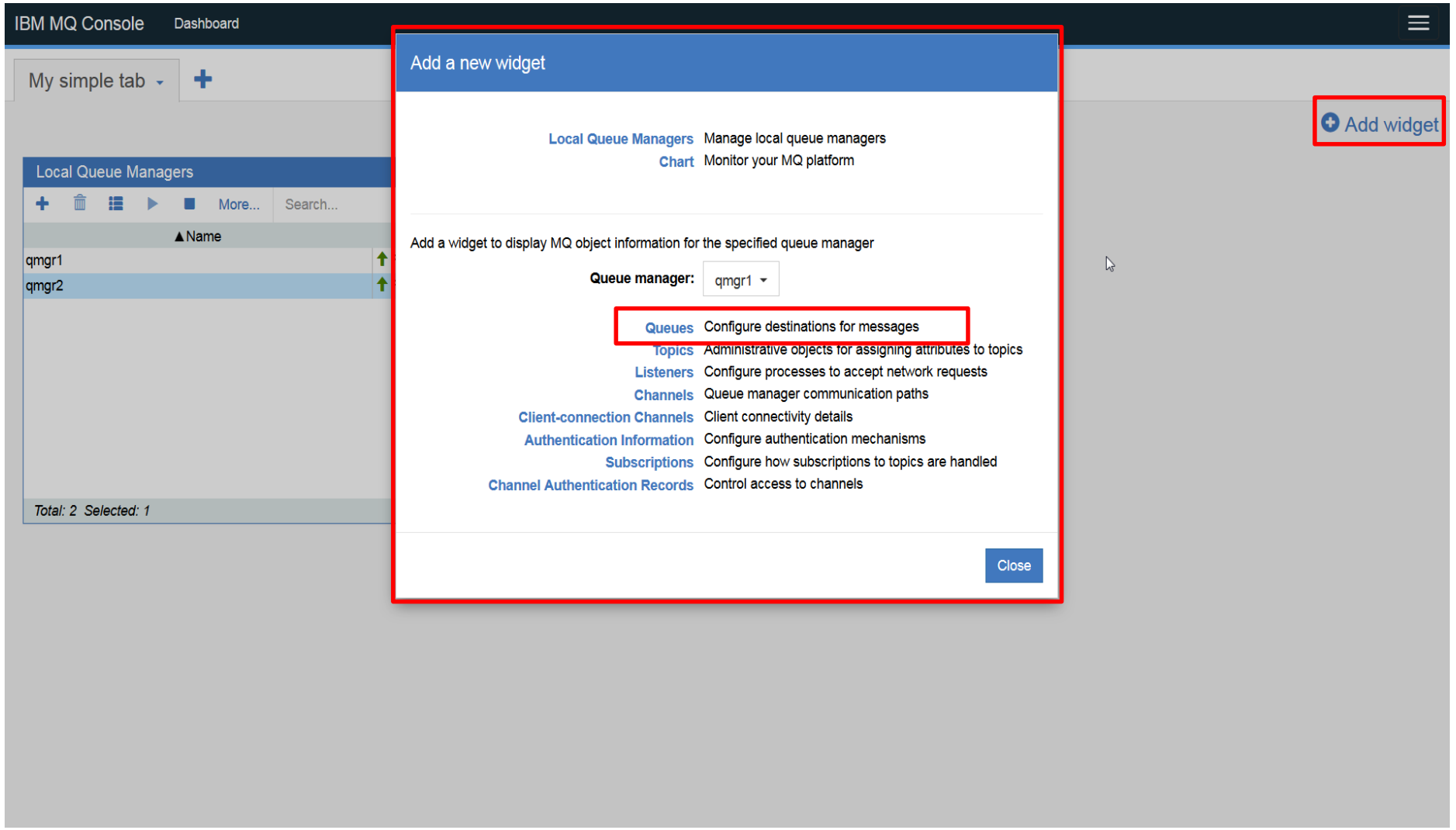
IBM MQ V9.0.1 CD

Nov 2016

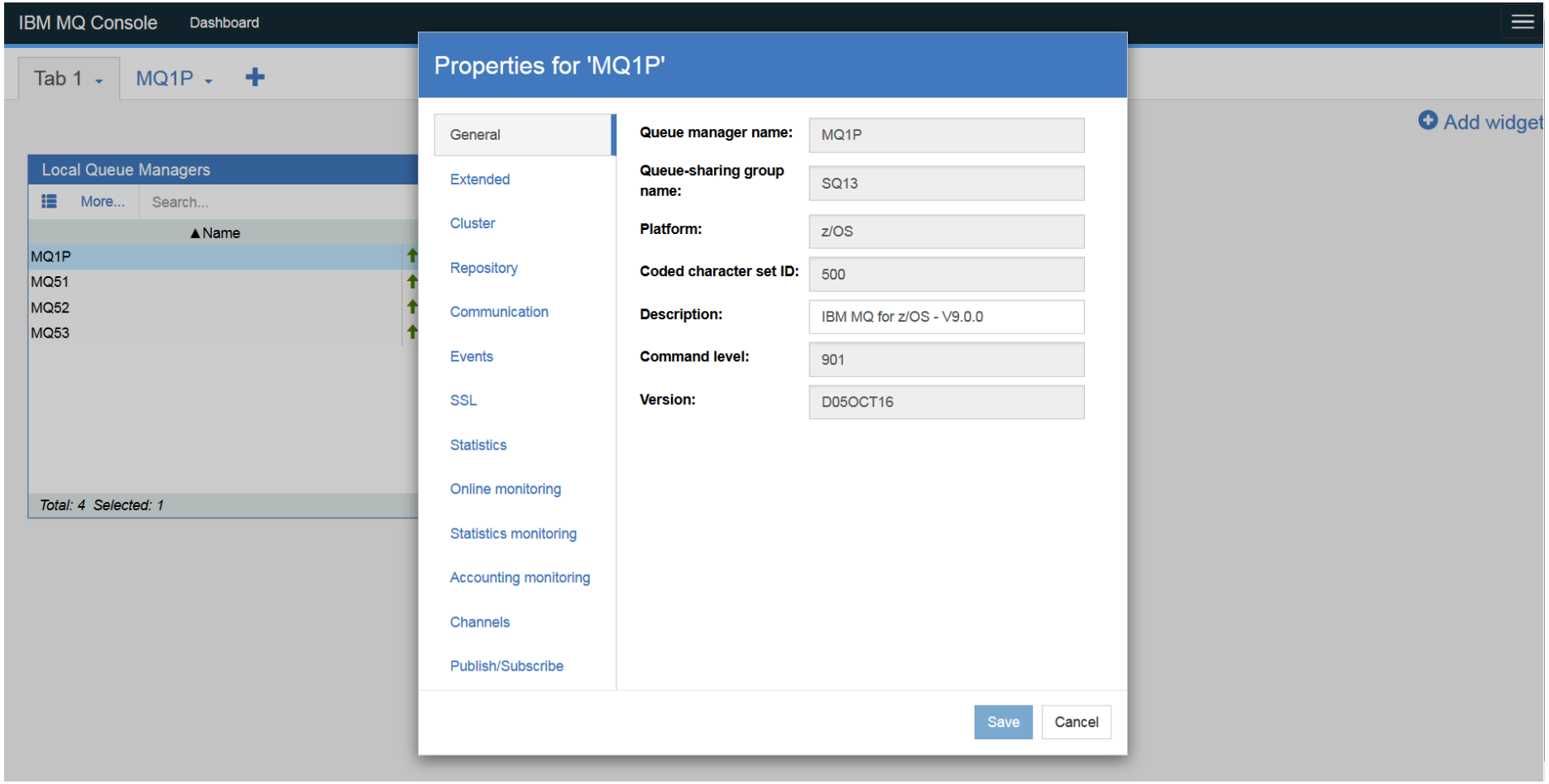
MQ Console

- Browser based interface for administering and managing MQ
  - No client side install needed
- Common capability across Appliance and software MQ
  - Re-engineered on AngularJS so different browser code than on 8.0.0.* Appliance
  - Functional parity with MQ Console in 8.0.0.* Appliance
- Some capabilities currently restricted on z/OS
  - Can’t create/delete/start/stop queue managers etc
- All capabilities restricted to queue managers associated with a specific 9.0.1 CD installation
  - On z/OS all queue managers at 9.0.1 CD level

MQ Console – add widgets



MQ Console – runs on z/OS

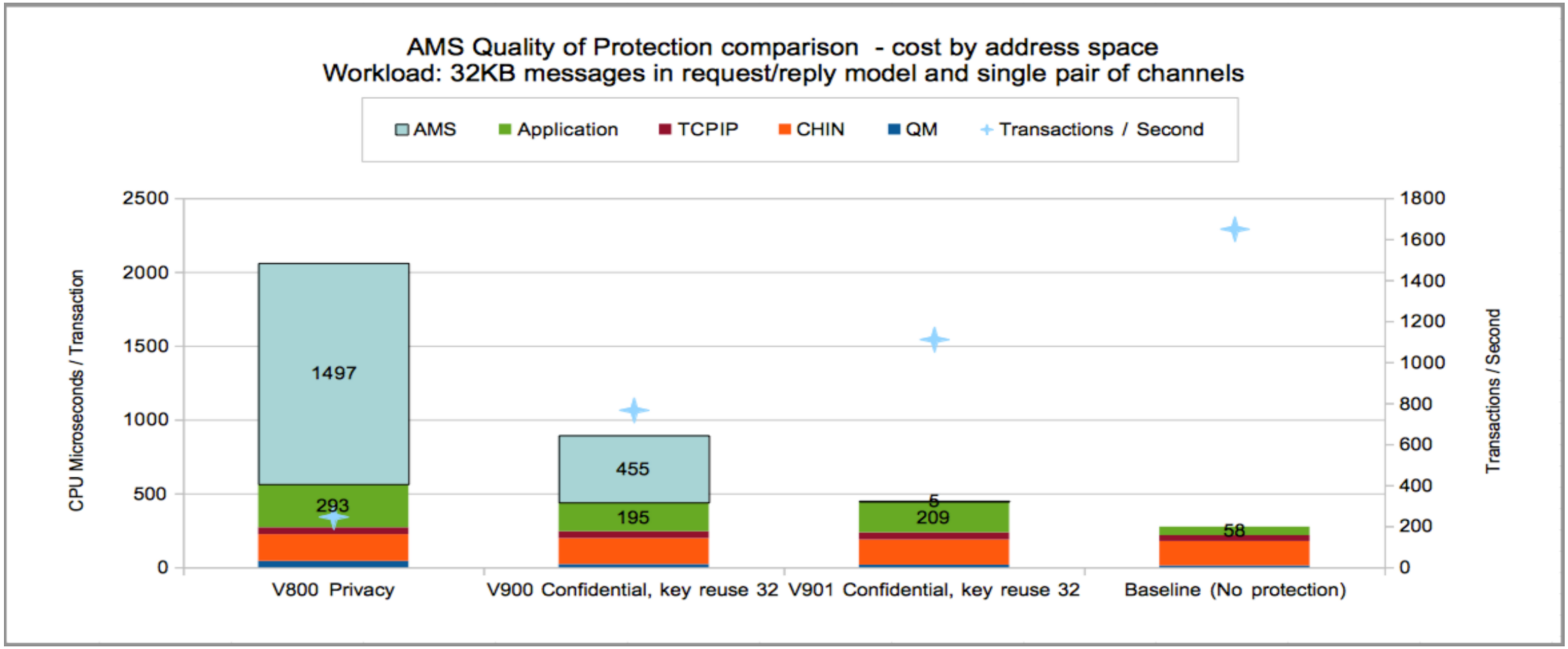


MQ REST API

See: Console and REST API

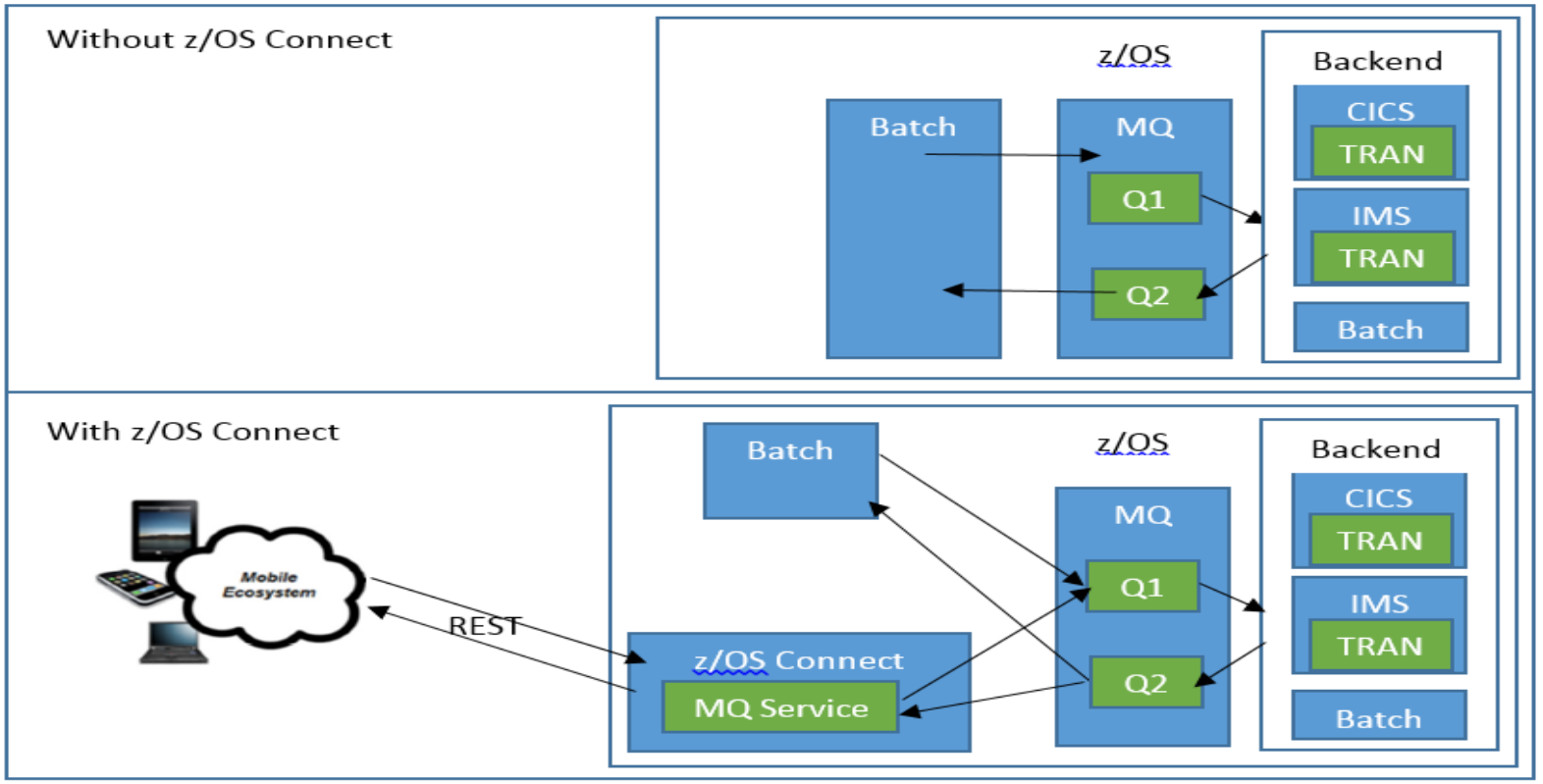
- An administrative API for managing MQ via REST
  - Data format is JSON (JavaScript Object Notation)
- Initial release provides:
  - The ability to list queue managers (dspmq)
  - And their installation (dspmqinst)
- Same function on distributed and z/OS
  - Though some differences
- Restricted to the installation associated with the MQ install
  - On z/OS queue managers must be at the 9.0.1 CD level
- Very much a work in progress
  - Expect to enhance in future CD releases to cover management of other object types
  - Disabled by default in V9.0.1 as not integrated into security

AMS Performance for z/OS further improved



MQ Service Provider for z/OS Connect

- z/OS Connect service provider allows existing services that are accessed by MQ to be accessed via a RESTful front end
  - Both V1 and EE supported
  - Same capabilities in both versions
- Clients need have no knowledge of MQ



See: z/OS Connect

IBM MQ V9.0.2 CD

March 2017

MQ REST continues to grow

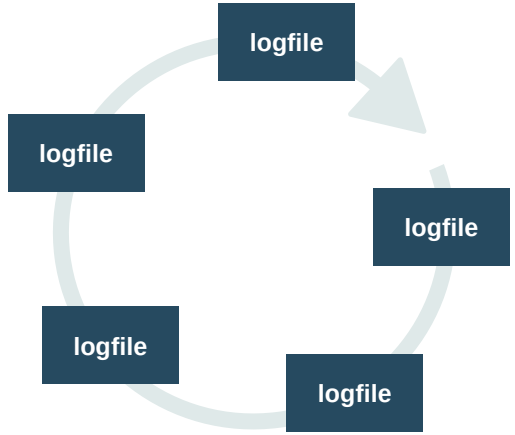
- REST is enabled and secured as part of the web setup
- Security
  - Secured by default, samples provided to make setup simple
  - Caller can either login via userid & password or certificate
  - Or use HTTP basic-authentication
  - CORS support added when called from a web-browser
- More commands added for 9.0.2
- Queue definitions
  - Create, delete, display and alter
- Display queue status

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

Distributed recovery logs

See: What's New with Logging

- MQ always logs all the data you need to recover from a queue manager failure in a recovery log
  - Restart recovery (circular and linear logging)
    - Enough information held in the log files to rebuild MQ resources to the level that they were at prior to the queue manager stopping
  - Media recovery (linear logging only)
    - Enough information held in the log files to rebuild MQ resources in the event of losing or corrupting MQ data



Circular logging

Linear logging

Significantly reducing overheads of linear logging

Automatic Media Imaging

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

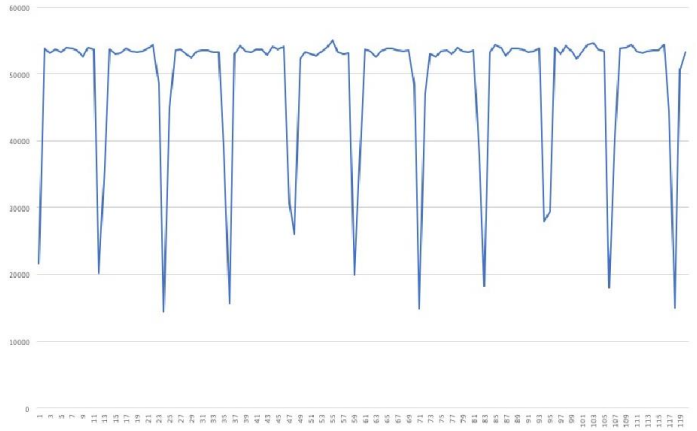
Previously this was up to the administrator

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

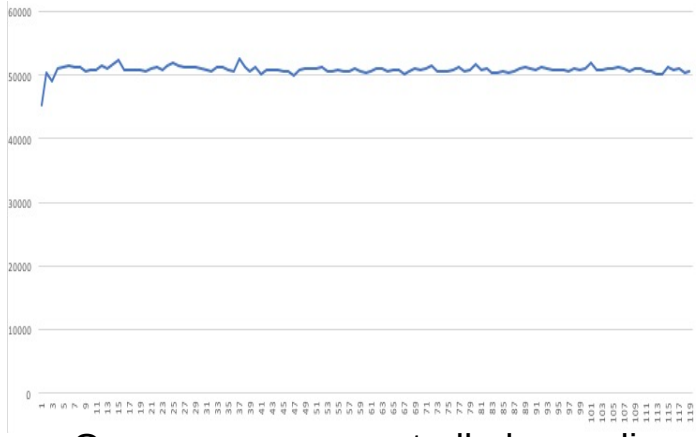
The frequency of imaging can be controlled based on **time interval** or **data written**

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

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



Manually controlled recording



Queue manager controlled recording

Significantly reducing overheads of linear logging

Automatic log reuse

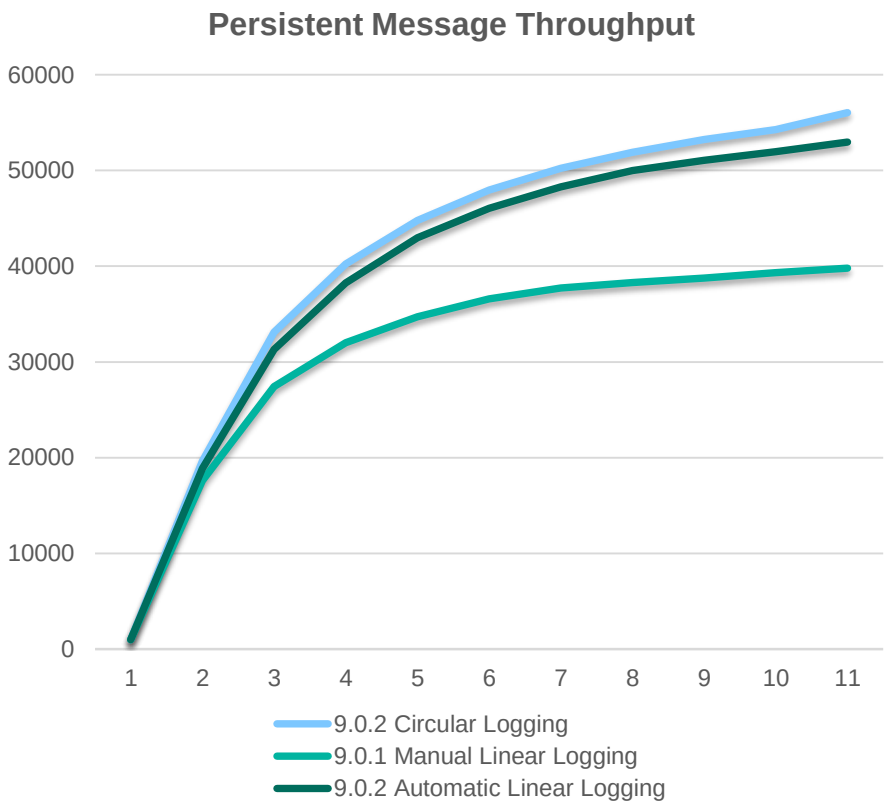
Linear log extents must be removed from the system to free up space

- You may choose to archive them before deleting

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

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

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



And in general

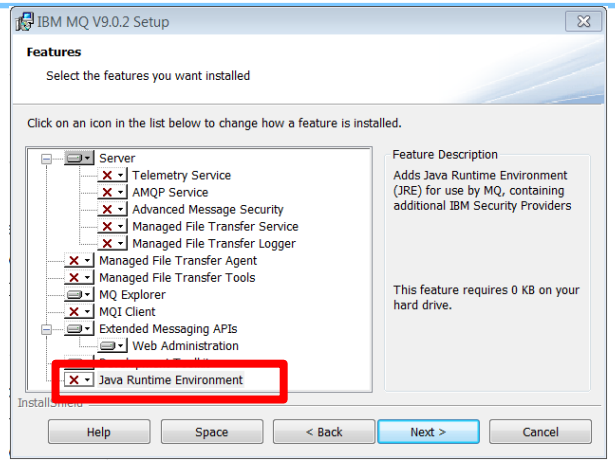
Extra information added to queue manager status on log utilization to aid better log configurations

New install options

JRE is now an optional install component on Windows

For those installations where the bare minimum is needed

If not selected then dependant components such as MQWeb, MQExplorer, etc will not get installed



MQ packages available in Debian installer format on Ubuntu

More natural for Ubuntu users

Available on all three supported architectures (amd64, s390x, ppc64el)

Installs to default location

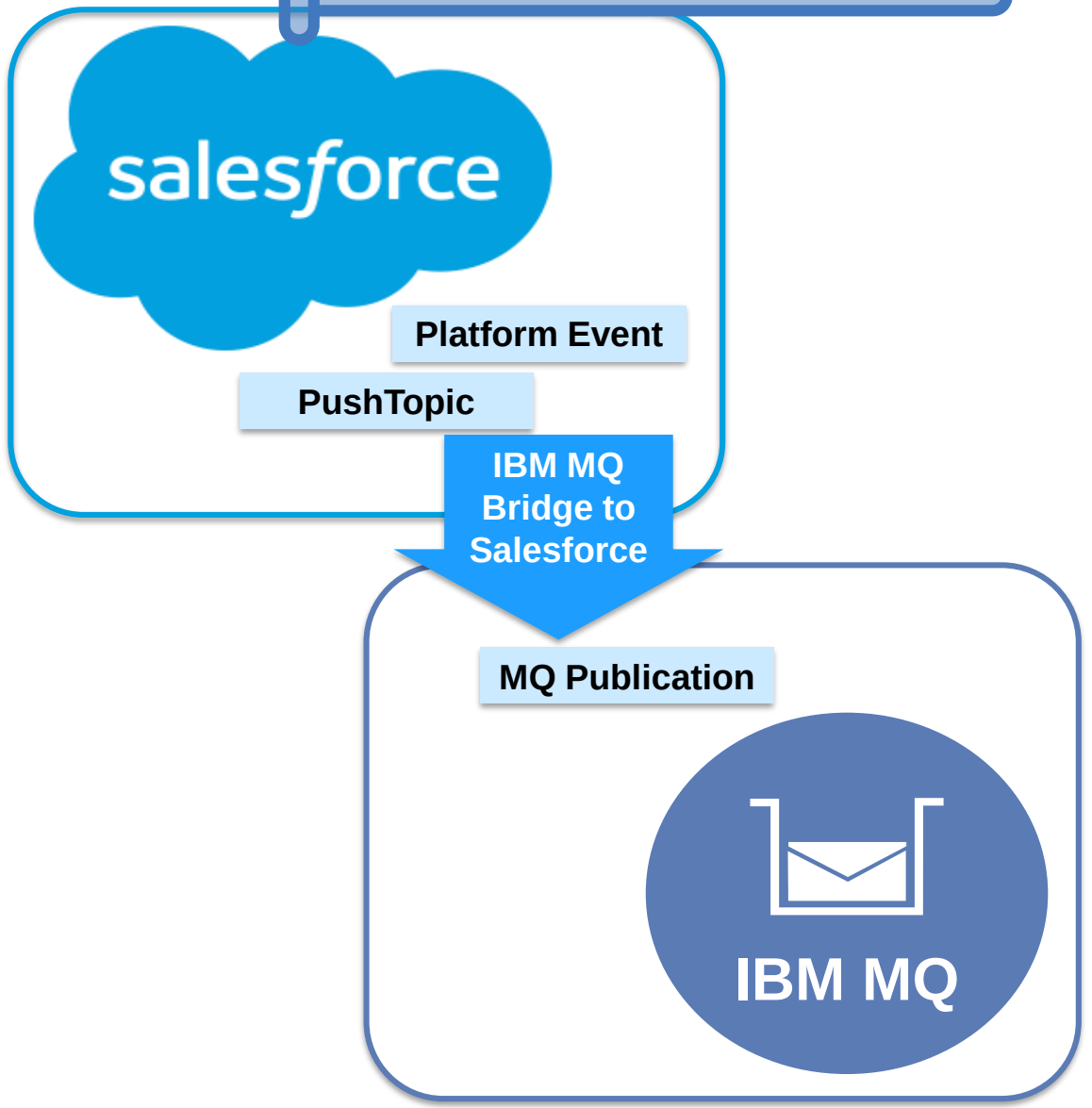
Will replace RPMs on Ubuntu

MQ Bridge to Salesforce

See: Connecting to the World

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

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



Supports Salesforce Platform Events and PushTopics

Events are published into the MQ network

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

IBM MQ V9.0.3 CD

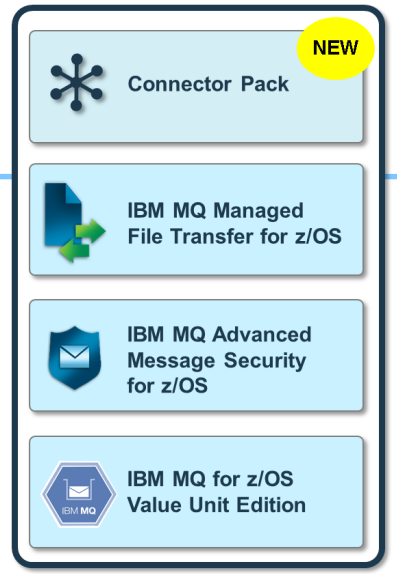
June 2017

NEW!

MQ V9.0.3 CD June 2017

New Connector Pack in IBM Advanced for z/OS VUE

Now the most functionally rich offering with connectors to IBM Blockchain and Product Insights cloud services, plus a simplification of MFT deployments across z/OS estate.



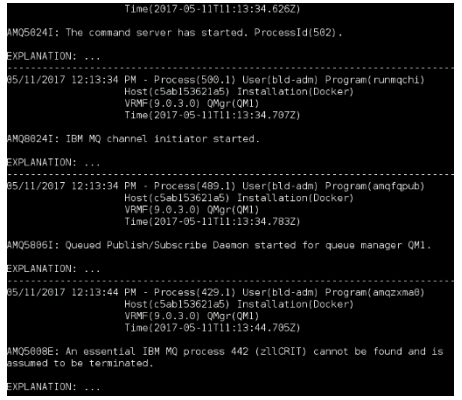
Evolution of RESTful admin interface

Queue manager status. Service availability and active connections

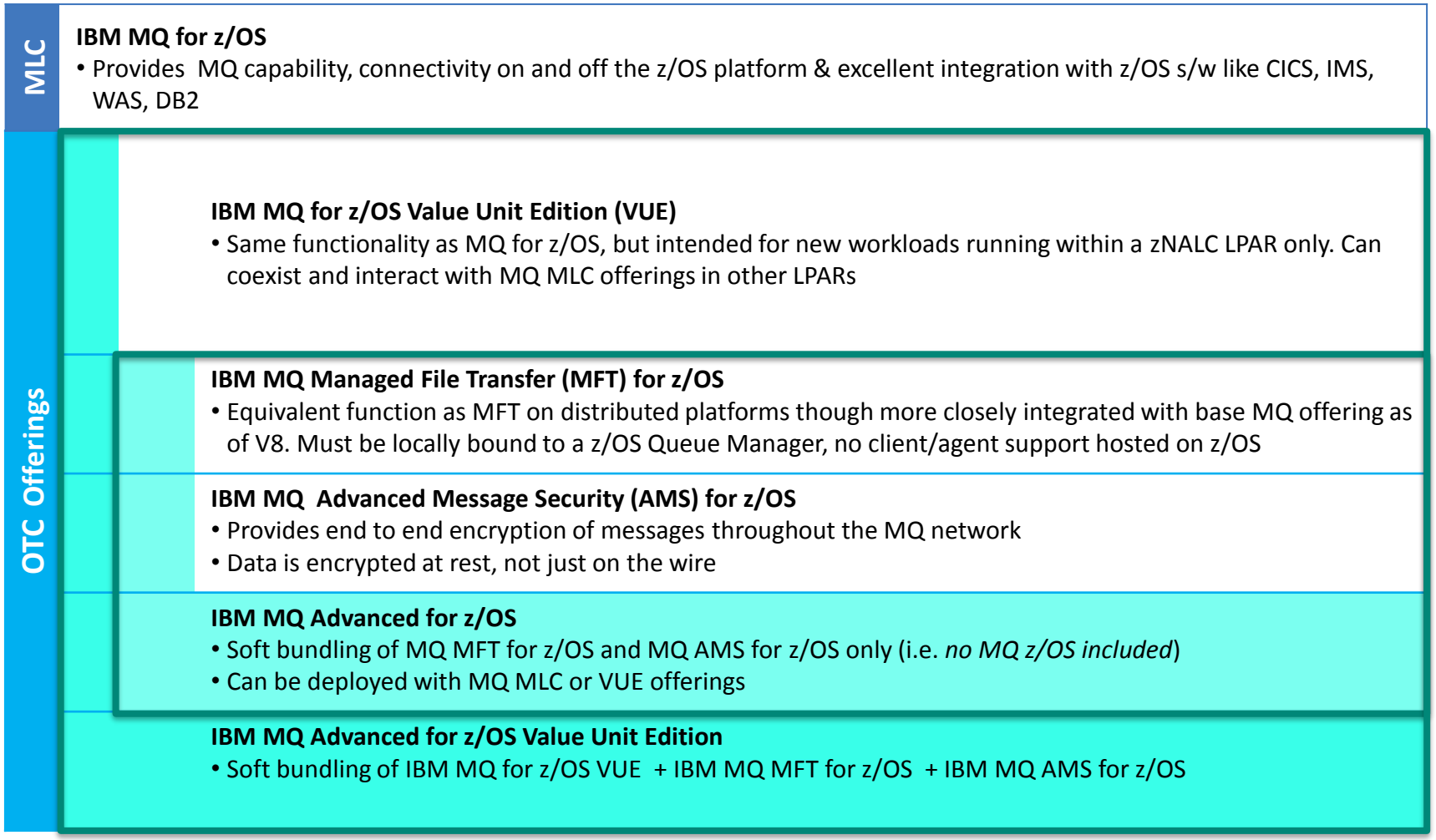
```
$ curl
http://localhost:9080/ibmmq/rest/v1/qmgr

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

Enhanced Error Logging

Simplify log analytics. Error messages now contain a severity indicator and ISO timestamp to quickly identify important and related messages.



Quick Reminder: MQ for z/OS Portfolio



MQ Advanced for z/OS VUE unique function

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

IBM Cloud Product Insights support

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

MQ Blockchain connector

Enables application integration with the IBM Blockchain service running in Bluemix, mediated via MQ.

Managed File Transfer Agent Connectivity

Allows a z/OS Managed File Transfer Agent to remotely connect to a z/OS Queue Manager to simplify the deployment of MFT on z/OS

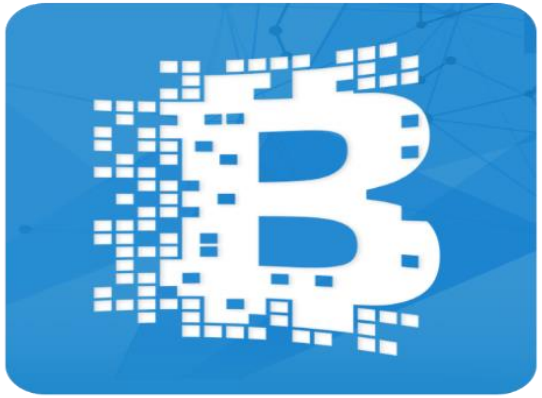
Same MFT workload will require fewer z/OS queue managers

MQ Blockchain connector

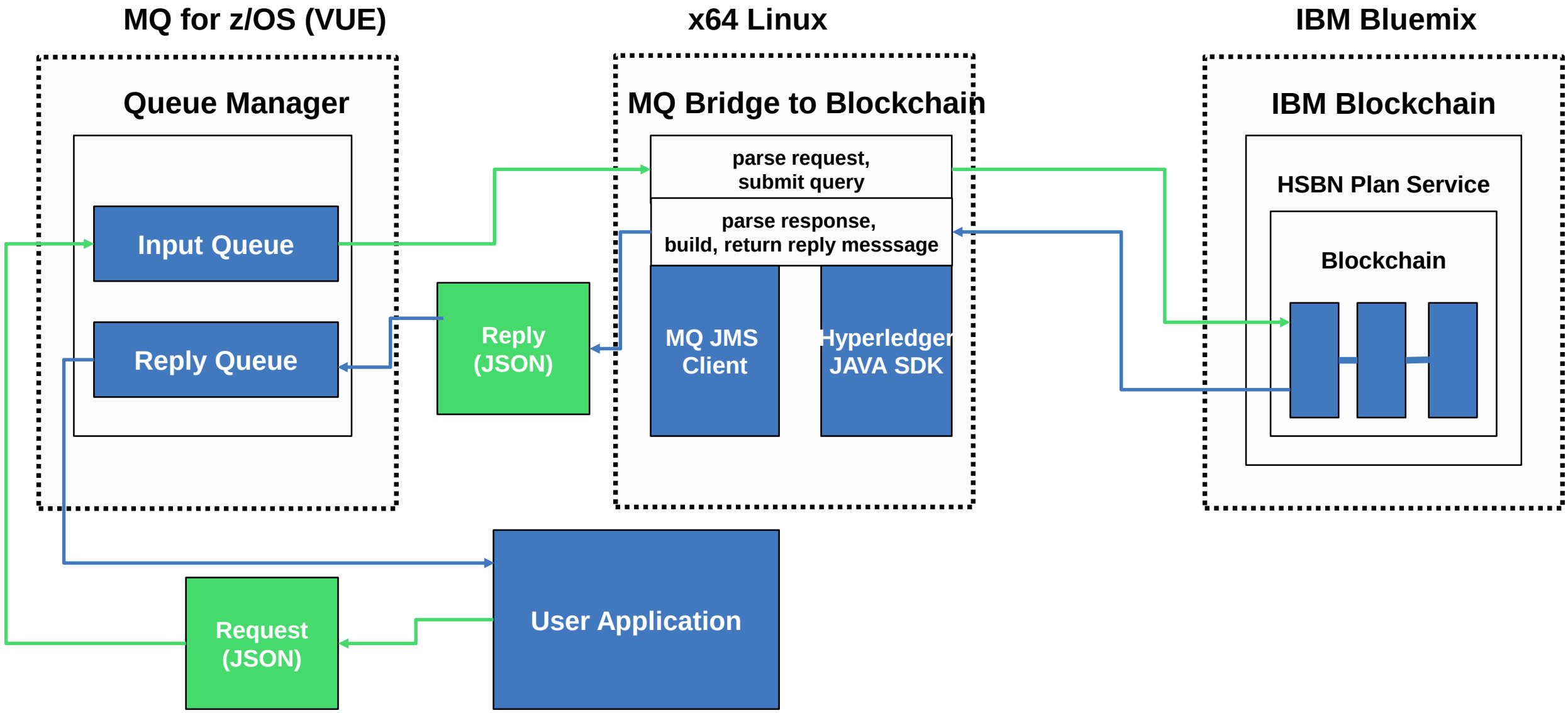
See: Connecting to the World

- 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
- Message driven query into the Blockchain using name/value pairs
- Retrieves information from the Blockchain



In V9.0.3 Release



MQ Managed File Transfer

MFT Agent redistributable package

- IBM MQ Managed File Transfer Agent is optionally provided as an individual redistributable component, available to be downloaded as a zip/tar.gz package from FixCentral
- Still requires entitlement to use the product where installed
- Customer can download and simply unzip without requiring installation and can use the product.
- Customer can configure agent using IBM MQ Managed File Transfer Agent redistributable component, connect to an existing IBM MQ infrastructure and enable users to transfer files without installing IBM MQ to get the Managed File Transfer functionality.

File Transfer Recovery Timeout

- Original behaviour:
  - A transfer which goes into “Recovering” state, continues to be in the “Recovering” state until the transfer is complete/successful or the operation has been manually cancelled by the user
- V9.0.1 has option to configure timeout for recovering file transfer.
  - A managed file transfer will be aborted by the Source Agent if not recovered within timeout. Agent can then continue to process other transfers.
- Default behaviour is still to recover until transfer is successful

Managed File Transfer

MQ 9.0.0.0 LTS

Comprehensive fine grain coverage of FTP errors

Enhanced logging of FTP communications for post diagnosis

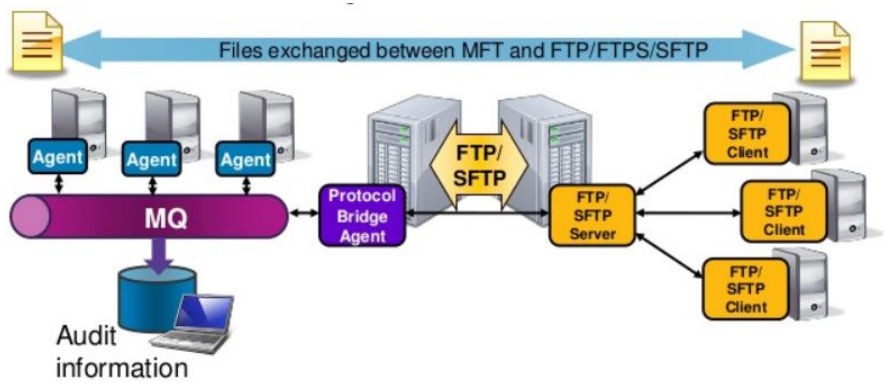
MQ 9.0.1 CD

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

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

MQ 9.0.2 CD

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



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

The IBM MQ Appliance

IBM MQ Appliance

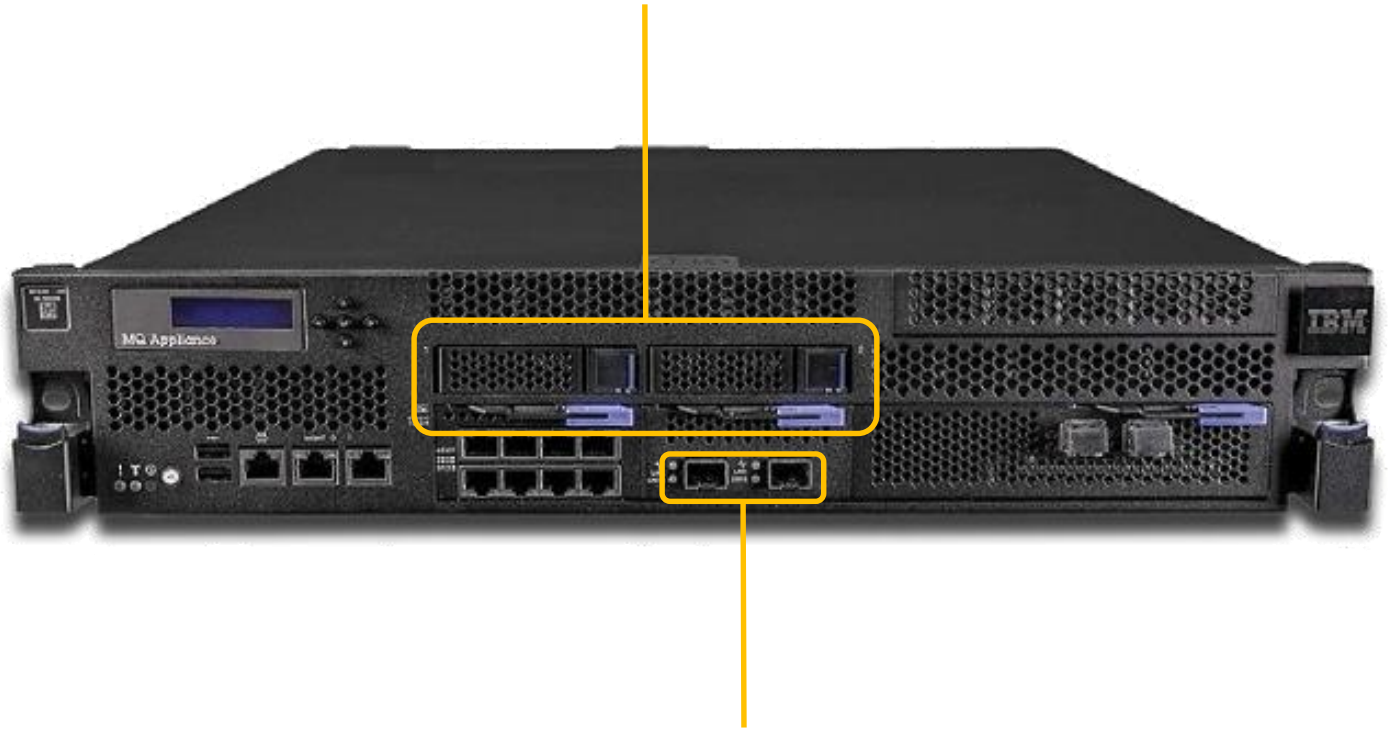
- The scalability and security of IBM MQ
  - Integrates seamlessly into MQ networks and clusters
  - Familiar administration model for administrators with MQ skills
- The convenience, fast time-to-value and low total cost of ownership of an appliance
- Ideal for use as a messaging hub running queue managers accessed by clients, or to extend MQ connectivity to a remote location

Key characteristics of the IBM MQ Appliance

- Current levels of MQ delivered as a state-of-the-art appliance
- Built using the latest DataPower appliance hardware and OS
- Firmware includes the MQ product and capabilities
  - Participates in MQ networks or clusters
  - Existing MQ applications connect as clients, with no code changes
- Two models, to suit different uses and performance requirements
  - Either model of appliance can run multiple queue managers, subject to overall throughput
- Familiar administration concepts and syntax, with a choice of interfaces
- Familiar security model for authentication and authorisation of messaging users, with greater flexibility for scalable administration
- Built-in High Availability and Disaster Recovery

Hardware update – the M2001 appliance

Current 1.2TB HDDs 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

New function in 9.0.x

See: Appliance Intro, Deep Dive

- Floating IP support

- SNMP
- RESTful Administration
- Administrative Security
- Backup and Restore
- Automatic Queue Manager start-up

- HA SSH key renewal
- REST APIs for Queue Manager

New MQ environments

MQ and the Cloud

Planning for MQ in the Cloud
MQ in Containers
Deploying MQ to the Cloud
MQ Hybrid Cloud Architectures

- Separate presentations on this important topic

- But the summary is:

MQ can and does run in clouds

Help and advice with MQ in the Cloud

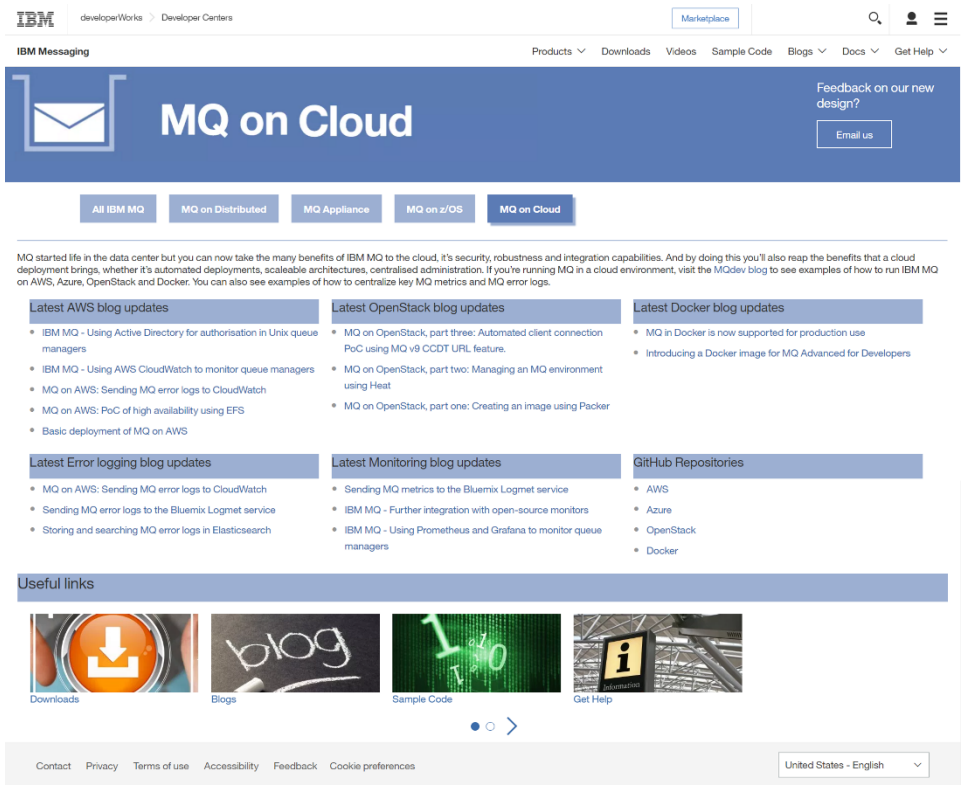
It has always been critical for MQ to run where it is needed and integrated into the tools of your choice

For many that means **clouds**

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

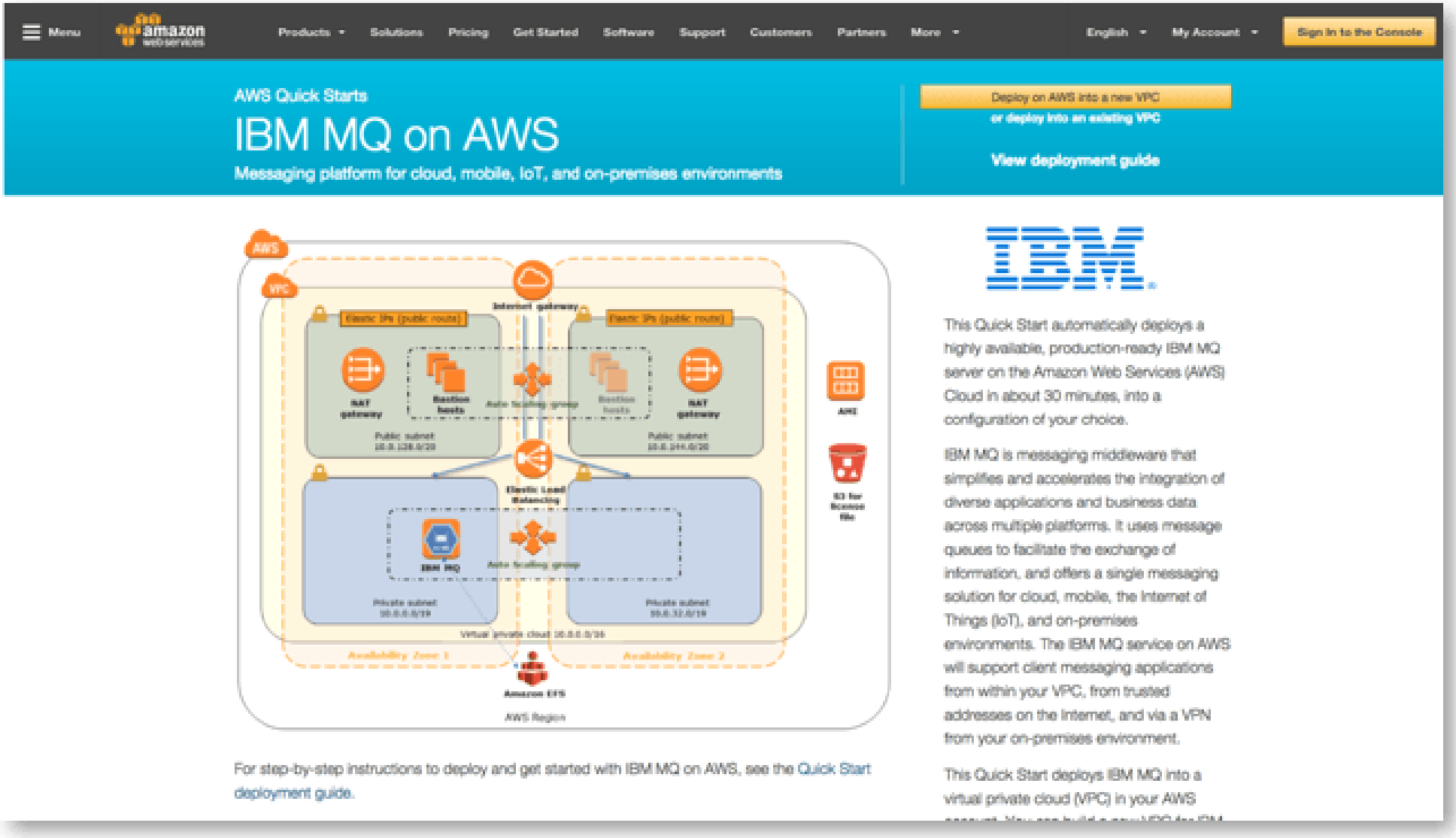
Using a variety of tooling for provisioning, configuration and monitoring

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



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

MQ on AWS – Quick Start



IBM Cloud Product Insights

- IBM has just launched the IBM Cloud Product Insights Bluemix service

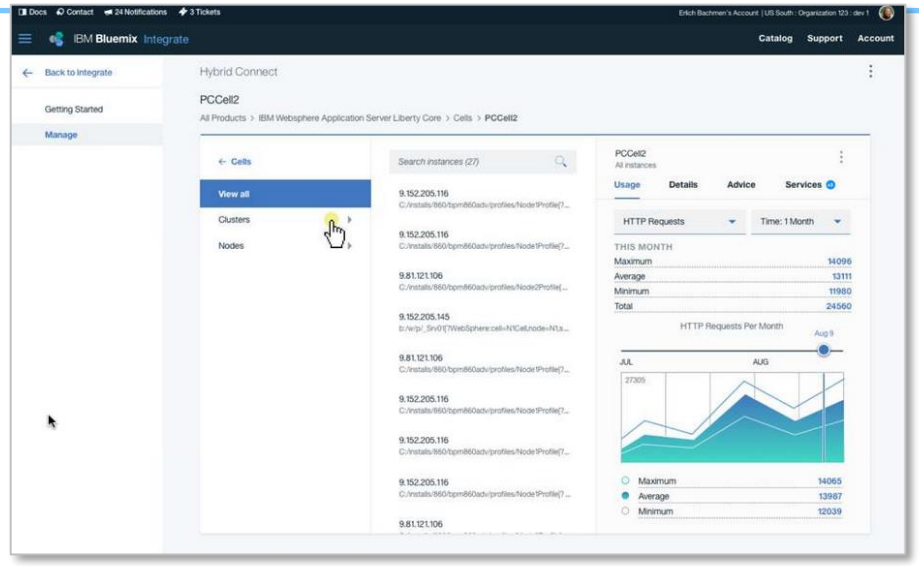
- Product Insights enhances the way IBM on-premise products can be registered and tracked, organizations can extend on-premise products achieving the benefits of cloud environments.

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

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

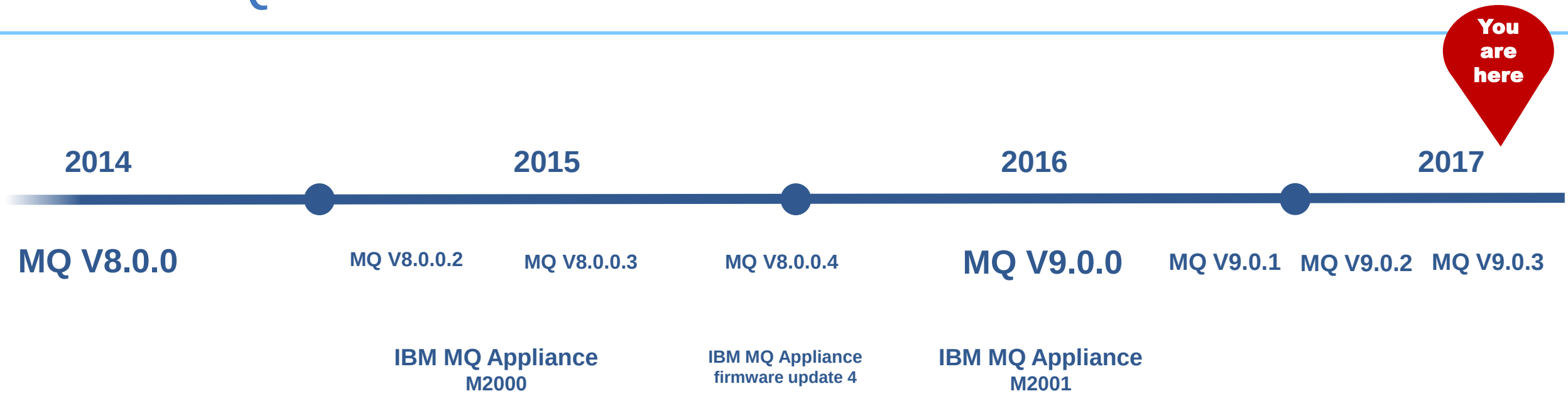
Registration and usage

- Users register instances of their IBM products with a central IBM cloud hosted service
  - Keeps track in a single place which queue managers you have
  - What level of MQ
  - What is installed
  - When they were last running



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

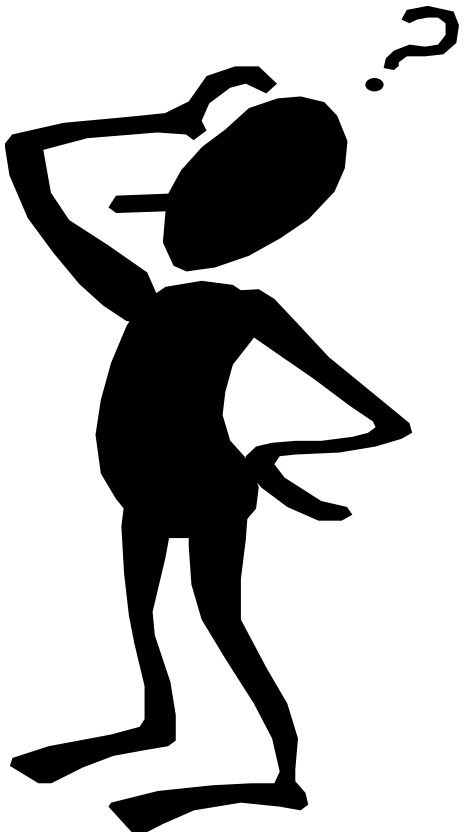
IBM MQ Deliveries



IBM MQ has been regularly delivering significant new function since MQ V8

- Through major releases and fix packs
- New platforms and environments

2016 was the start of MQ's **continuous delivery** model



Any questions?