

MQ on IBM Cloud

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(With thanks to Matt Roberts and David Richards)

IBM Messaging
Monday, 26 March 2018

MQ is the connectivity between the different parts of your business

Securely & reliably taking data where it needs to go

So you can do real business

IBM MQ





IBM MQ is the worlds leading messaging technology

- Provides quick, secure and reliable messaging, from mainframe to mobile, in a single robust messaging backbone.
- Connects virtually any commercial IT system, with support for more than 80 platforms.
- Messaging is a \$1.2b business and IBM MQ has over 60% of the market (Gartner 2015)



MQ customers consist of

- 70% of the Global 500 companies
- 94% of the top 100 global banks
- 85% of the Fortune 100
- 59 of 100 top US retailers
- 18 of the top 20, and all of the top 10 US retailers

Run MQ exactly how and where you need it

Options Available today



IBM MQ Appliance

**Distributed
Platforms**

Linux, Windows, AIX,
HP-UX, Solaris, ...

Azure

SoftLayer

Docker

OpenStack

AWS

IBM Cloud

Kubernetes

Packer

Currently in Beta
GA for Think 2018



**Traditional on-premises,
customer managed**

**Public or Private clouds
(bring-your-own license)**

**Hosted SaaS offering
managed by IBM**

Goals



Get up and running with MQ in minutes

- Administrators can provision additional MQ capacity in under 10 minutes, instead of months
- Relieves the MQ admins of their dependency on other teams



Admins can stay MQ focused

- Customers no longer have to maintain, monitor, upgrade or patch their systems running MQ
- Reducing the TCO of MQ by ~40%



Seamlessly scale MQ

- Customers can scale the size of their MQ estate hourly along with their application needs

High level solution

Configured & monitored by the customer



Queues, topics, channels, clustering, applications

Managed & operated by IBM



MQ installation, basic configuration, security, maintenance

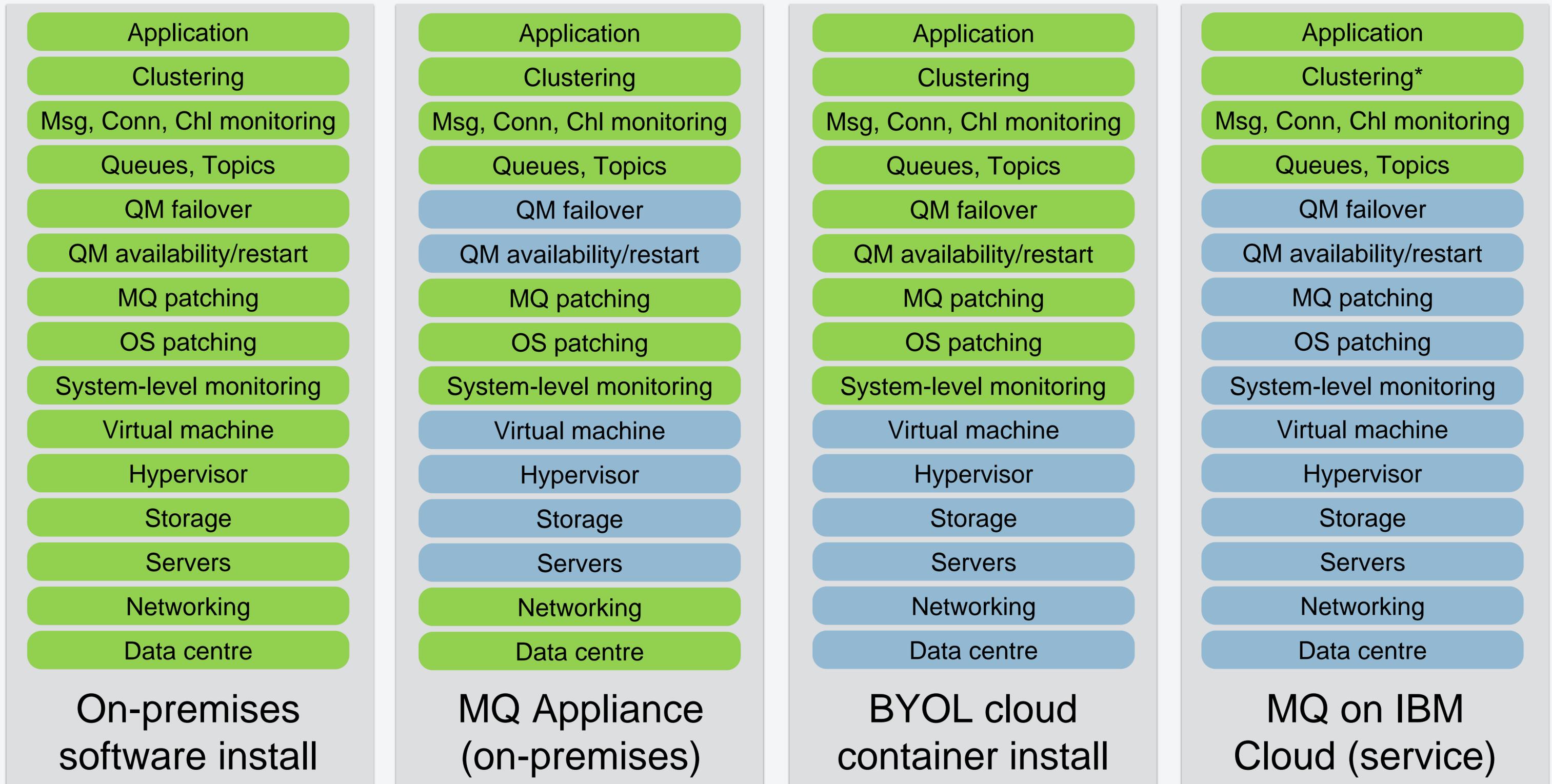
Hardware, virtualization, servers, network, storage



Hosted initially on



Responsibility under different MQ consumption models

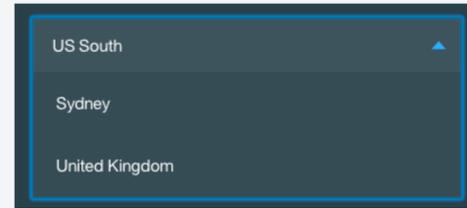


Customer Journey

Customer Actions



Logs onto their IBM Cloud account & selects the MQ service



Creates a new MQ queue manager by selecting the name, location and size of MQ queue manager



Configures & maintains the queue manager

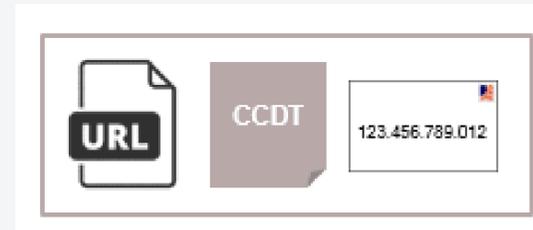


Connects their applications on premise, on IBM Cloud or on any other cloud to the queue manager

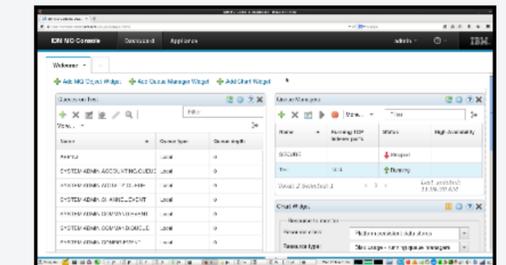


Monitor MQ queues, applications

Visible to customer



Connection details to the queue manager



Observe queue manager run time information

IBM Actions



Provision a queue manager for the customer within IBM's cloud account



Maintain and monitor the infrastructure

Getting started.... Create "Service"

<https://console.eu-gb.ibm.com/>

The image consists of four overlapping screenshots from the IBM Cloud console:

- Top-left:** The IBM Cloud Dashboard. The 'All Categories' sidebar is visible, with the 'Integrate' option highlighted in a red box.
- Top-right:** The 'MQ - IBM Cloud' service page. It shows the service title, a brief description, and a 'View Docs' link.
- Bottom-left:** A list of Cloud Foundry Apps. The 'Integrate' option in the sidebar is highlighted in a red box.
- Bottom-right:** The 'Service Details - IBM Cloud' page for MQ-Carl. It shows the service name, resource group, location, and a 'Getting started with MQ on IBM Cloud' section with a list of steps.

Getting started.... Create "QM"

Service Details - IBM Cloud

Integrate / MQ-Carl

Resource Group: default Location: United Kingdom

Create a queue manager Step 1 of 3

Name	Display name	Version	Location	Status	Actions
NuageQM	Nuage de Carl	9.0.5 r1	IBM Cloud United Kingdom	Deploying	View details Download connection info (JSON)

```
{
  "platform": "ibmmq-on-cloud",
  "queueManagerName": "NuageQM",
  "hostname": "nuageqm-34a8.qm.eu-gb.mqcloud.ibm.com",
  "listenerPort": 30968,
  "applicationChannelName": "CLOUD.APP.SVRCONN",
  "adminChannelName": "CLOUD.ADMIN.SVRCONN",
  "deploymentLocation": "bmx-eu-gb",
  "webConsoleURL": "https://web-nuageqm-34a8.qm.eu-gb.mqcloud.ibm.com/ibmmq/console"
}
```

Getting started.... Administer your QM

The image displays three overlapping screenshots of the IBM MQ console interface. The leftmost screenshot shows the 'MQ-Carl' service details page, including the 'Your Access' section with a yellow code block containing configuration snippets. The middle screenshot shows the login page for the IBM MQ Console. The rightmost screenshot shows the main dashboard with tables for 'Queues on NuageQM' and 'Topics on NuageQM'. A red box highlights the 'Reset IBM Cloud API Key' button in the bottom left of the leftmost screenshot.

MQ-Carl Configuration Snippets:

```
{  
  "name": "MQ-Carl",  
  "description": "MQ-Carl",  
  "username": "farkas",  
  "password": "your IBM Cloud API Key",  
  "application": "MQ-Carl"  
}
```

Queues on NuageQM Table:

Name	Queue type	Queue depth
CarlQ	Local	0
DEV.DEAD.LETT	Local	0
DEV.QUEUE.1	Local	1
DEV.QUEUE.2	Local	0
DEV.QUEUE.3	Local	0
Total: 6		Last updated: 12:00:34 PM

Topics on NuageQM Table:

Name	Topic String
DEV.BASE.TOPIC	dev/
SYSTEM.ADMIN.TOPIC	\$SYS/MQ
SYSTEM.BASE.TOPIC	
SYSTEM.BROKER.ADMIN.	SYSTEM.BROKER.ADMIN.:
SYSTEM.BROKER.DEFAUI	
Total: 7	Last updated: 12:00:50 PM

Getting started.... Administer your QM for pros...

The screenshot displays the IBM MQ Explorer (MQv8Fresh) interface. The 'Add Queue Manager' wizard is open, showing the 'Specify user identification details' step. The 'Queue manager name' is 'NuageQM', the 'Userid' is 'farkas', and the 'Password' is 'Prompt for password'. The 'Channels' table in the 'MQ Explorer - Content' pane shows the following data:

Channel name	Channel type	Overall channel status	Conn name	Transmission queue
CarlWin_TO_NuageQM	Receiver	Running		
CLOUD.ADMIN.SVRCONN	Server-connection	Running		
CLOUD.APP.SVRCONN	Server-connection	Inactive		
NuageQM_TO_CarlWin	Server	Running		QM_CarlWin

Getting started.... Admin for real men....



```
c:\$user\Junk>set MQSERVER=CLOUD.ADMIN.SVRCONN/TCP/nuageqm-34a8.qm.eu-  
gb.mqcloud.ibm.com(30968)
```

```
c:\$user\Junk>runmqsc -u farkas -c NuageQM  
5724-H72 (C) Copyright IBM Corp. 1994, 2017.  
Enter password:
```

```
*****
```

```
Starting MQSC for queue manager NuageQM.
```

```
dis qmgr
```

```
2 : dis qmgr
```

```
AMQ8408I: Display Queue Manager details.
```

QMNAME (NuageQM)	ACCTCONO (DISABLED)
ACCTINT (1800)	ACCTMQI (OFF)
ACCTQ (OFF)	ACTIVREC (MSG)
ACTVCONO (DISABLED)	ACTVTRC (OFF)
ADVCAP (DISABLED)	ALTDATE (2018-03-16)
:	

And for applications....

The screenshot shows the IBM Cloud console interface. The main content area displays 'Integrate / MQ-Carl'. A 'Find Accumulated Authorities' dialog box is open, showing 'Entity type: User', 'Entity name: carlapp', 'Object type: Queue', and 'Profile name: DEV.QUEUE.1'. A terminal window is overlaid on the console, showing the following commands and output:

```
c:\$user\Junk>set MQSERVER=CLOUD.APP.SVRCONN/TCP/nuageqm-34a8.qm.eu-gb.mqcloud.ibm.com(30968)

c:\$user\Junk>set MQSAMP_USER_ID=carlapp

c:\$user\Junk>amqsputc DEV.QUEUE.1 NuageQM
Sample AMQSPUT0 start
Enter password: *****
target queue is DEV.QUEUE.1
Carl's message from AMQSPUTC

Sample AMQSPUT0 end
```

Use cases

0. Single Location

Applications within the same cloud and same geo need to communicate

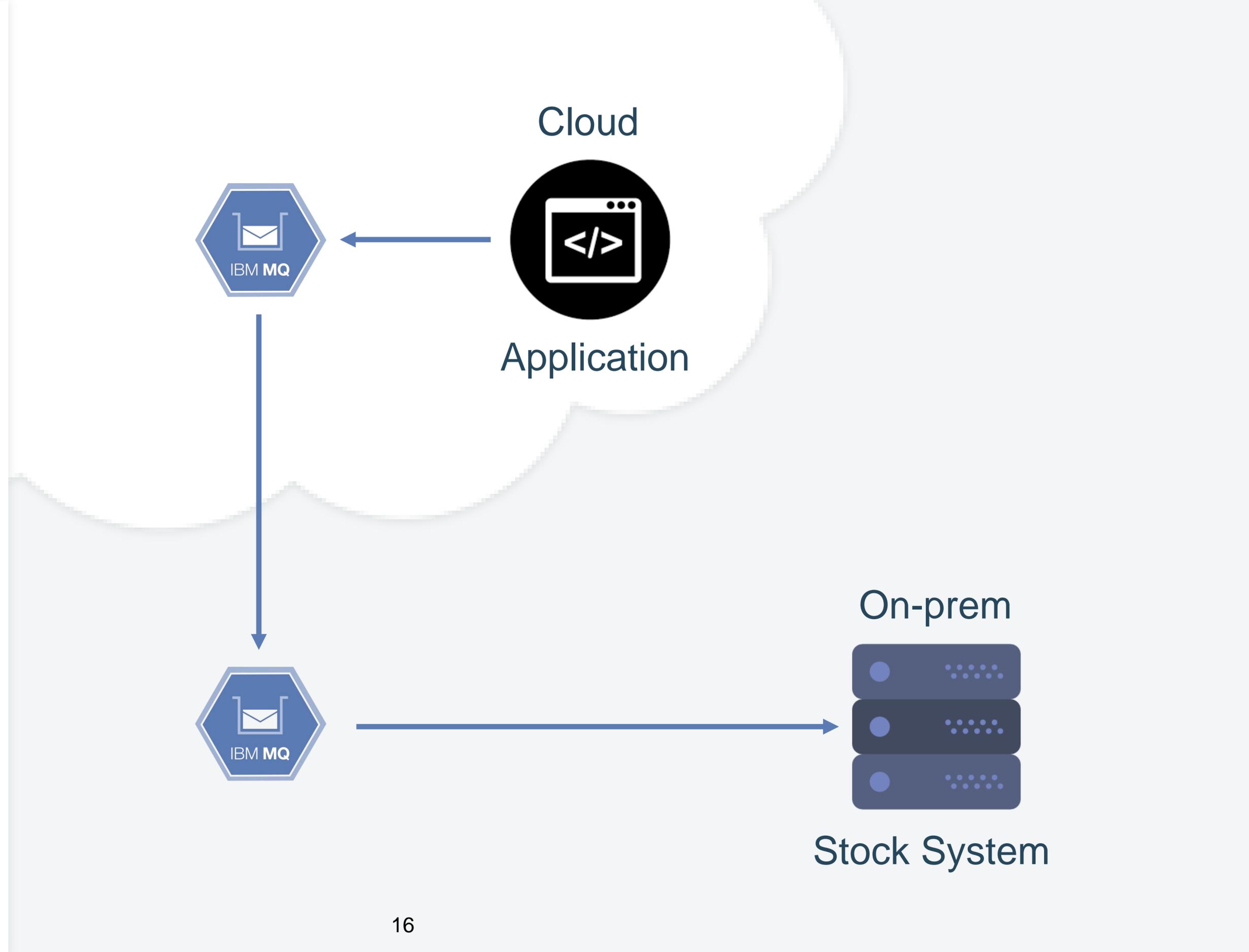


1. On-Prem Bridge

A retailer is writing a new mobile app to enable users to check stock in their local store.

The app will be deployed on the cloud so that it can be easily accessed by mobile devices

To find stock levels, the app needs to connect to the on-premise stock system which is accessed through MQ queues.



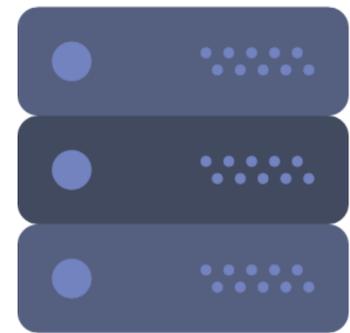
2. Geo Bridge

A US delivery company has a depot in London, UK that processes packages but their core IT systems are based in Georgia, USA.

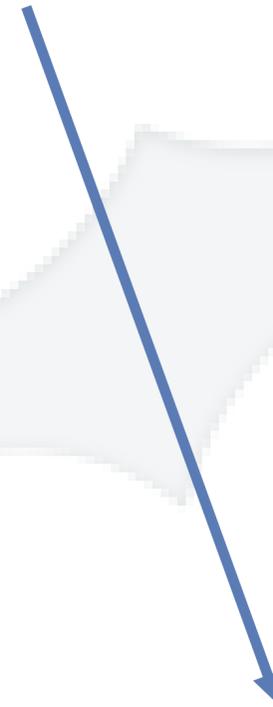
The London depot notifies the central systems in Georgia of every package to be tracked.

MQ allows the application to offload the messages about each package locally in London, and have them reliably transmitted to the core IT processing location in the US.

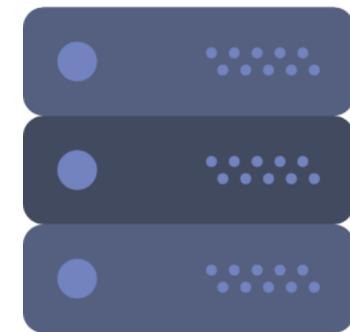
London, UK



Processing



Georgia, USA



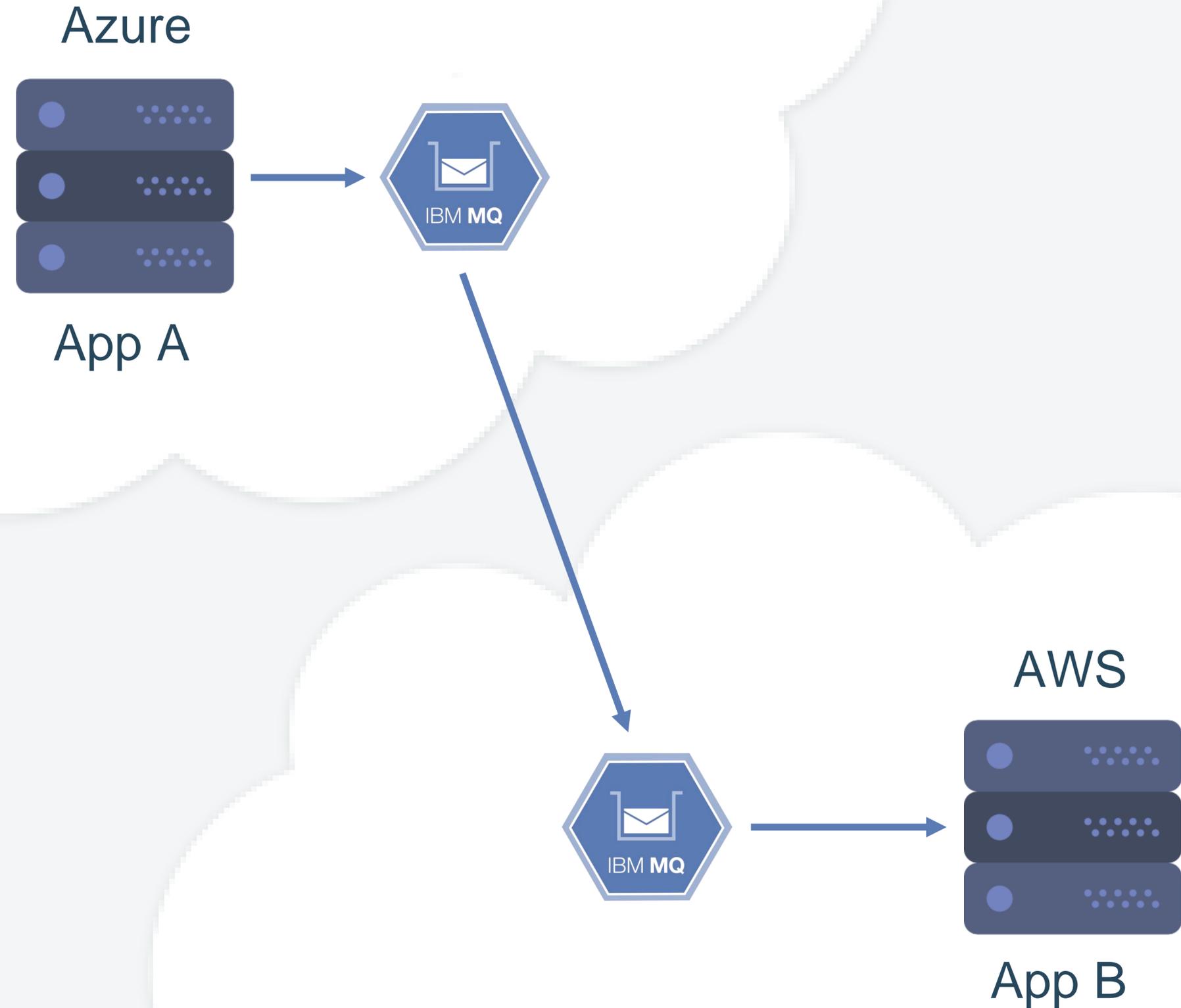
Core IT

3. Cross Provider

To insulate themselves from the risk of failure of any given Cloud Provider this online TV services company has distributed their core cloud systems across AWS and Azure.

MQ provides the reliable transport of data between the two clouds in order to replicate state so there is a consistent view of enterprise data, and they can continue to successfully process business requests even if one provider has a total outage.

MQ also provides the ability to queue updates while the second cloud is unavailable, ensuring that it recovers to a consistent state when the failed provider later comes back online.



Backup

IBM Messaging
Monday, 26 March 2018

Supported capabilities under different MQ consumption models

	On-premises software install	MQ Appliance (on-premises)	BYOL cloud container install	MQ on IBM Cloud (service)
Customer-defined MQ Exits, Services and Processes	Yes	No	Yes	No
Custom monitoring agents local to the queue manager	Yes	No	Yes	No
Server binding (local) applications	Yes	No	Yes (at customer's discretion)	No
Client binding (remote) applications	Yes	Yes	Yes	Yes
Non-TLS MQ channels	Yes	Yes	Yes (at customer's discretion)	Yes (but not recommended)
Encryption of data at rest	If configured by customer	Requires use of AMS	If configured by customer	Disk encryption by default (does not require AMS)
Advanced Message Security (AMS)	Yes (with MQ Advanced license)	Yes – out of the box	Yes (with MQ Advanced license)	Not yet (potential future AMS support)

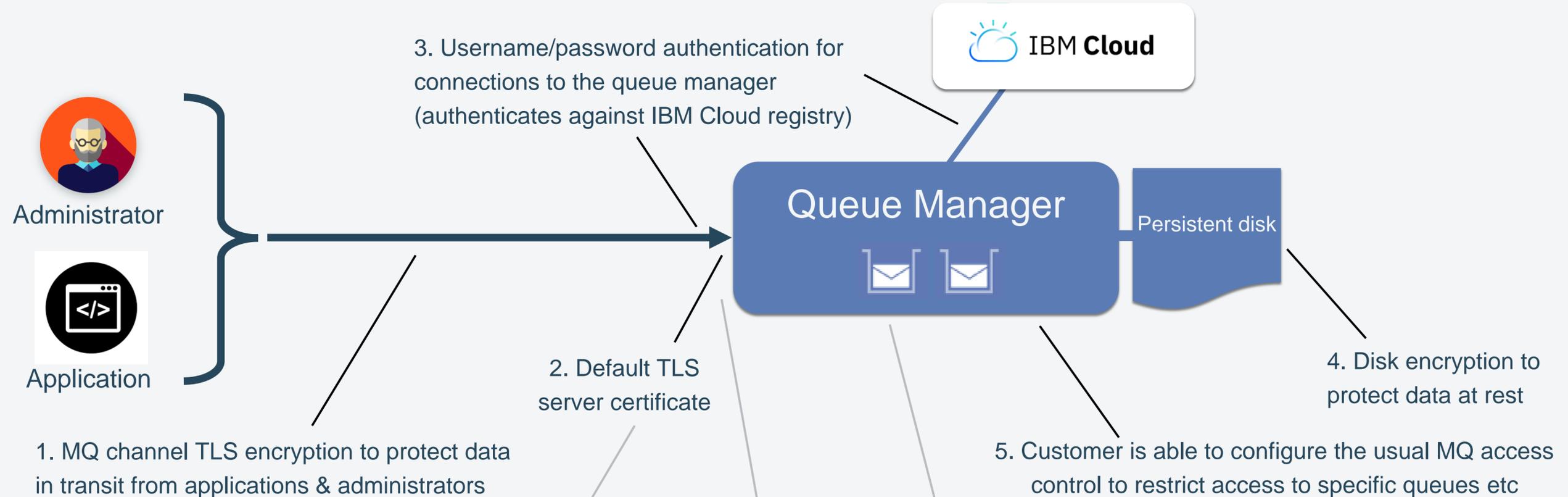
MQ on IBM Cloud - Frequently asked questions

Question	Answer
Is “MQ on IBM Cloud” a fully managed service?	Depends on your definition of “fully managed” – the customer is responsible for managing some aspects of the deployment such as creating queues for applications to use, monitoring queue depth and application availability etc.
Does IBM monitor my queue manager?	Yes (and No) – IBM monitors the availability of the queue manager and the networking that routes requests through to the queue manager. The customer is responsible for monitoring “inside” the queue manager, such as queue depths
Can I configure my own TLS server certificate and/or TLS mutual authentication for my queue manager channel?	Not currently, but intended for future – IBM configures your MQ channel with a pre-defined one-way TLS certificate out of the box. In the future we intend you will be able to change the TLS configuration of the channel using the capabilities provided through the IBM Cloud service console
How do I debug problems in my deployed queue managers?	Customers is able to self-service download queue manager logs. Potential future option to push logs to logging services like IBM Cloud Log Analysis service.
How do I raise support tickets for problems encountered through my use of the “MQ on IBM Cloud” service?	Customers must raise support tickets through the IBM Cloud support system (not the Service Request tool) for queue managers deployed using the “MQ on IBM Cloud” service. If the problem is determined to require an APAR fix in the queue manager or other components provided by IBM then that process will be handled transparently via the same IBM Cloud support ticket.

Security

A deployed queue manager is automatically configured with an appropriate level of out-of-the-box security that protects customer application data while enabling users to get started quickly

Out of the box configuration

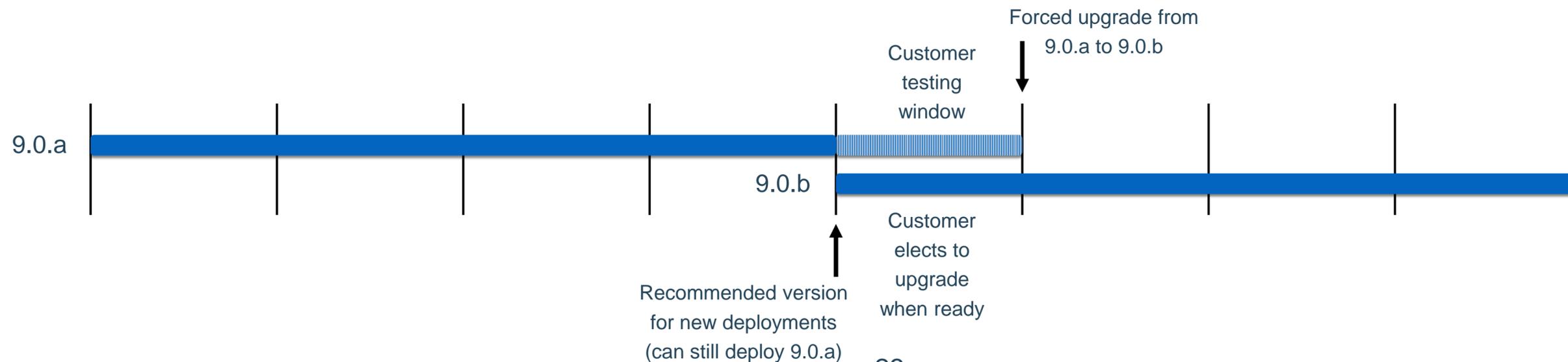


Potential future options

6. Future intention to allow customers to provide own TLS server certificate, configure mutual TLS client authentication
7. Considering future option to enable AMS, to provide end-to-end message encryption
8. Soliciting input on strength of requirement for IP whitelisting of incoming connections

Versions and Upgrade

- The MQ on IBM Cloud service provides the MQ Continuous Delivery (CD) release for customers to deploy
 - This is the same approach taken by the MQ Appliance, and enables new features and capabilities to be made available faster than the LTS release cycle
- The service provides an automated mechanism to upgrade from one build/release to the next, for example;
 - Customer initiates the upgrade to take place immediately
- Each update comes with a required update window, e.g. 30 days for the next CD release
 - Updates will be automatically applied by the system when the update window expires if the customer has not already elected to trigger the upgrade

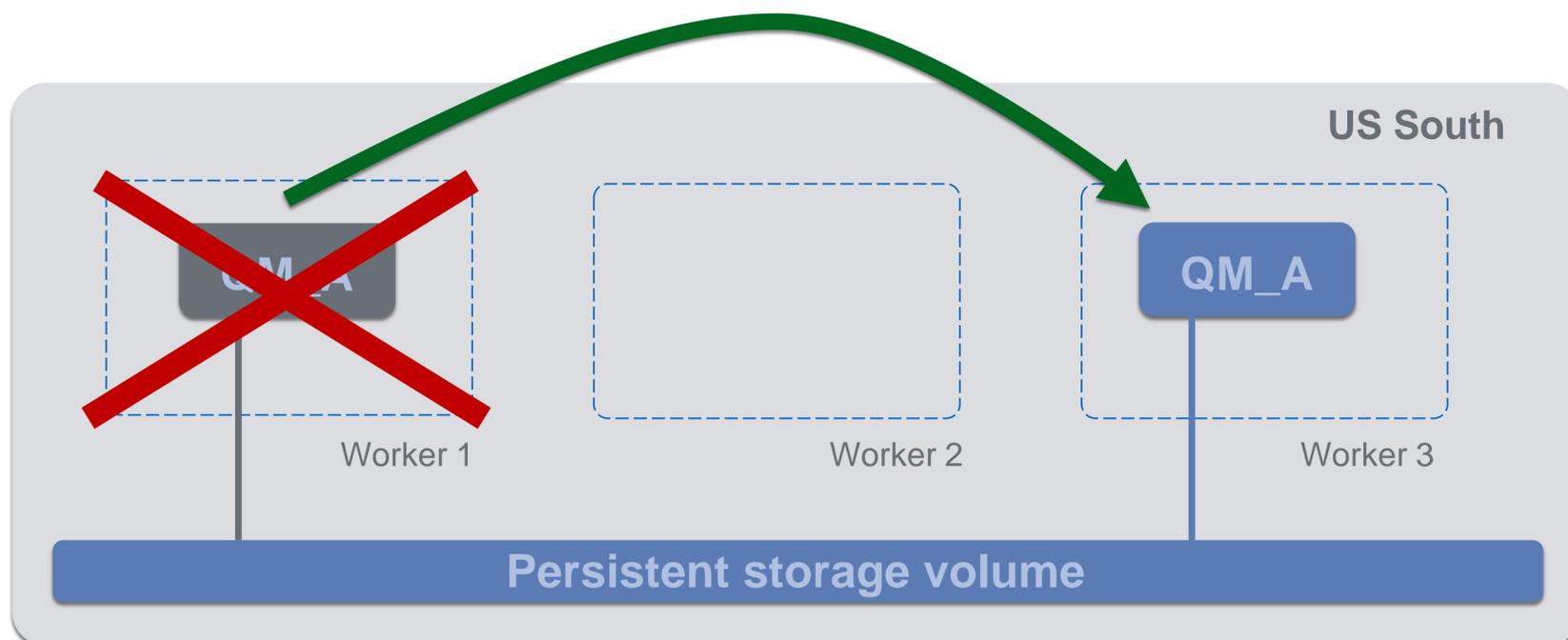


Availability and failover

- IBM Cloud public provides a standard SLA that all services are required to comply with ([section 3.2.1](#))

IBM provides a 99.95% availability SLA for Platform Services configured for high availability and distributed across multiple IBM Cloud public regions

- For example two queue managers with identical configuration deployed across multiple regions, so traffic can be served independently of any single failure
- Use MQ client capabilities such as CCDT, ConnectionNameList, Auto Re-connect to provide automatic failover



- Within a data centre, high availability is provided by automatic failover of the queue manager across multiple available instances, backed by network storage

Security fixes

- Within a CD release (such as 9.0.4.0) IBM will periodically make available new revisions of the server image in order to apply **high priority** security updates in the operating system or MQ components
 - High severity security updates are generally much less common than low severity, but do occur
 - Each revision comes with an update window based on the severity of the fix, e.g. 7, 30, 90 days
 - Revisions are cumulative, and the latest revision is automatically selected for any new queue manager deployments
 - The user may initiate the upgrade to any pending revision, including applying multiple at once
 - In order to minimize the number of updates, a forced upgrade will apply the latest available revision with an expiry less than 14 days in the future (to avoid doing one upgrade immediate after another)
 - Low priority security updates (e.g. 180+ days window) are rolled in to the next CD release
- From time to time MQ iFixes for urgent customer problems may also be made available within a CD release. These are optional upgrades, but will be picked up as part of cumulative security fixes

