

# IBM MQ AMQP

## WHAT IS IT?

## IS IT REQUIRED?

# E-BOOK



# What is AMQP?

The Advanced Message Queuing Protocol (AMQP) is an open standard for passing business messages between applications or organisations. It connects systems, feeds business processes with the information they need and reliably transmits onward the instructions that achieve their goals.

The key feature of AMQP is rapid and guaranteed message deliveries, along with reliability and message acknowledgments. These features assist in the distribution of messages in a multi-client environment, in the delegation of time-consuming tasks and aiding servers to deal with immediate requests faster. The AMQP protocol has the capability to globally share and monitor updates and communicate between different systems, applications and platforms.

As part of the IBM MQ install process, the AMQP package can be selected.

AMQP Service	Install this component to make AMQP channels available. AMQP channels support MQ Light APIs. You can use AMQP channels to give AMQP applications access to the enterprise-level messaging facilities provided by IBM MQ.
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However, if AMQP is not selected for installation, the default objects for it are created upon the creation of a queue manager. These include:

- SYSTEM.AMQP.SERVICE - a service to enable the use of AMQP
- SYSTEM.DEF.AMQP – the default channel for AMQP connectivity



# Is AMQP Required?

Advanced Message Queuing Protocol acts on the application layer, establishing a common base, allowing different organisations and applications, utilising different languages to communicate with each other.

AMQP ensures a robust data transfer, while also allowing messages to be stored in a queue, advocating asynchronous communication between sender and recipient. Messages are queued and collected when capacity becomes available, freeing the message producer to continue working with no idle time.

The protocol brings great benefits including;

- Connections to business partners systems and applications,
- Connections across multiple platforms and systems
- Asynchronous communication
- Reduced costs associated with application integration
- Resource light
- Open-source standard

Introduced under IBM MQ V9, MQ Light is based on the OASIS Standard AMQP 1.0 wire protocol. AMQP specifies how messages are sent between senders and receivers. An application acts as a sender when it sends a message to a message broker, such as IBM MQ. IBM MQ acts as a sender when it sends a message to an AMQP application.

In an environment where applications already use AMQP and it is a requirement to extend its province then linking to IBM MQ can ensure that extension. However, if AMQP is not already being implemented, then it is not required and does not need to be installed. At a later date the functionality can be installed separately and the IBM MQ objects are already in place to integrate the two protocols.



# Control of AMQP Objects

## Default Locations

Within the standard install of IBM MQ, a directory structure and associated files are created. Any AMQP interaction is controlled at queue manager level and under the standard default directory structure of: /var/mqm/qmgrs/<QueueManager>, a folder is created call amqp

@app	amq1chk.fil	channel	master	procdef	scratch	topic
@ipcc	amqp	clntconn	mqat.ini	qm.ini	services	userdata
@qmgr	authinfo	comminfo	mqxr	qmanager	ssl	
@qmpersist	autocfg	errors	namelist	qmstatus.ini	standby	
active	blockaddr.ini	listener	plugcomp	queues	startprm	

Unless the intention is to use AMQP this folder can be deleted.

## Object Control

Any IBM MQ AMQP objects can be controlled via the standard IBM MQ interfaces (i.e. using runmqsc to stop, start, delete, etc). However, it is recommended NOT to delete the SYSYTEM.DEF.AMQP channel as a precaution against issues within IBM MQ.



# Logging of AMQP

## Location

AMQP creates its own log outside of the standard IBM MQ (AMQERR\*\*\*.LOG) logs. This location can be configured for a remote location if required by amending the qm.ini file.

The standard location of /var/mqm/errors is used by default and the amqp log can be seen there.

```
drwxrwsrwx 2 1001 root 4096 Dec 17 10:44 .
drwxrwsr-x 1 1001 root 4096 Dec 17 10:22 ..
-rw-rw-r-- 1 1001 root 2391 Dec 17 10:30 AMQERR01.LOG
-rw-rw-r-- 1 1001 root 1701 Dec 17 10:30 AMQERR01.json
-rw-rw-r-- 1 1001 root 0 Dec 17 10:22 AMQERR02.LOG
-rw-rw-r-- 1 1001 root 0 Dec 17 10:22 AMQERR02.json
-rw-rw-r-- 1 1001 root 0 Dec 17 10:22 AMQERR03.LOG
-rw-rw-r-- 1 1001 root 0 Dec 17 10:22 AMQERR03.json
-rw-r--r-- 1 1001 root 2683 Dec 17 10:30 amqpasdev.log
```

## Content

The content of each log entry is configurable but by default it contains

- user
- application name
- application ID
- environment
- application PID
- application TID
- completion code
- reason code

```
-----
Local time: Fri Dec 17 10:22:15 2021
UTC time:  Fri Dec 17 10:22:15 2021
  User      : "mqm"      "
  EffUser   : "mqm"      "
  AppName    : "runmqsc"  "
  ApIdDt     : "          "
  Env        : "MQSC"
  App Pid    : 313
  App Tid    : 1
  UID       : mqm
  PAS-Compcode:1
  PAS-Reasoncode:0
-----
```

Whenever an application, within IBM MQ or external to IBM MQ, connects with or touches an IBM MQ object an entry is written to the log.

WARNING: This is ON by default, so limited space is an issue; consider the log size as it is not fixed and will continue to grow until the file system space is exhausted.



# Configuration of AMQP

## Configuration

AMQP is linked to the AuthorizationService, within the Service stanza, included as default within the qm.ini file.

```
Service:  
  Name=AuthorizationService  
  EntryPoints=14  
  SecurityPolicy=User
```

There are two entries relevant to AMQP configuration within the qm.ini file

### Functional (required)

ServiceComponent:

```
Service=AuthorizationService  
Name=MQSeries.UNIX.auth.service  
Module=amqzfu  
ComponentDataSize=0
```

### Logging (optional)

ServiceComponent:

```
Service=AuthorizationService  
Name=Dev.HtpAuth.Service  
Module=/opt/mqm/lib64/amqpasdev.so  
ComponentDataSize=0
```

The service is defined in such a manner that if no logging is required it can be removed from the qm.ini file. However, the AuthorizationService is a requirement of any secure IBM MQ install so the Functional portion should **always** be included.



# AMQP in Container Images

## Information

As with any Container environment e.g. Docker, automatic rebuilds are assumed and so certain constraints are set on the Queue Manage. Hence, set values are stored outside of IBM MQ paths so that any changes to configuration within the IBM MQ paths are valid. However, when a Queue Manager is restarted the default Queue Manager configuration is used and, therefore, permanent changes need to be made to configuration files to ensure they are not lost.

Typically these permanent configurations are stored under /etc/mqm

```
-rw-rw---- 1 1001 root 132 Dec 17 10:22 mq.htpasswd
-rw-r--r-- 1 1001 root 126 Dec 17 11:34 qm-service-component.ini
-rw-rw-r-- 1 root root 178 Dec 16 11:13 qmintsetup.ini
drwxrwsr-x 1 1001 root 4096 Sep 15 2020 web
```

In order to ensure that the AMQP logging does not start again on Queue Manager restart, the qm-service-component.ini file should be edited to remove the Logging component.

Note: this can be reinstated at a later date if required.

Once the file is updated and the Queue Manager restarted then logging will stop or start depending on actions made.



THIS DOCUMENT WAS PRODUCED AS A GUIDE TO IBM MQ AMQP SUB-PROCESSES.

FOR MORE INFORMATION OR TO DISCUSS AMQP AND IBM MQ  
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## References

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[HTTP://SETGETWEB.COM/P/MQ92/CON/TAMQP\\_CREATING.HTM](http://setgetweb.com/p/mq92/con/tamqp_creating.htm)  
[HTTPS://WWW.IBM.COM/DOCS/EN/IBM-MQ/9.0?TOPIC=APPLICATIONS-MQ-LIGHT-AMQP-ADVANCED-MESSAGE-QUEUING-PROTOCOL](https://www.ibm.com/docs/en/ibm-mq/9.0?topic=applications-mq-light-amqp-advanced-message-queuing-protocol)  
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