# An Introduction to IBM MQ

Powering cloud-native apps, everywhere!

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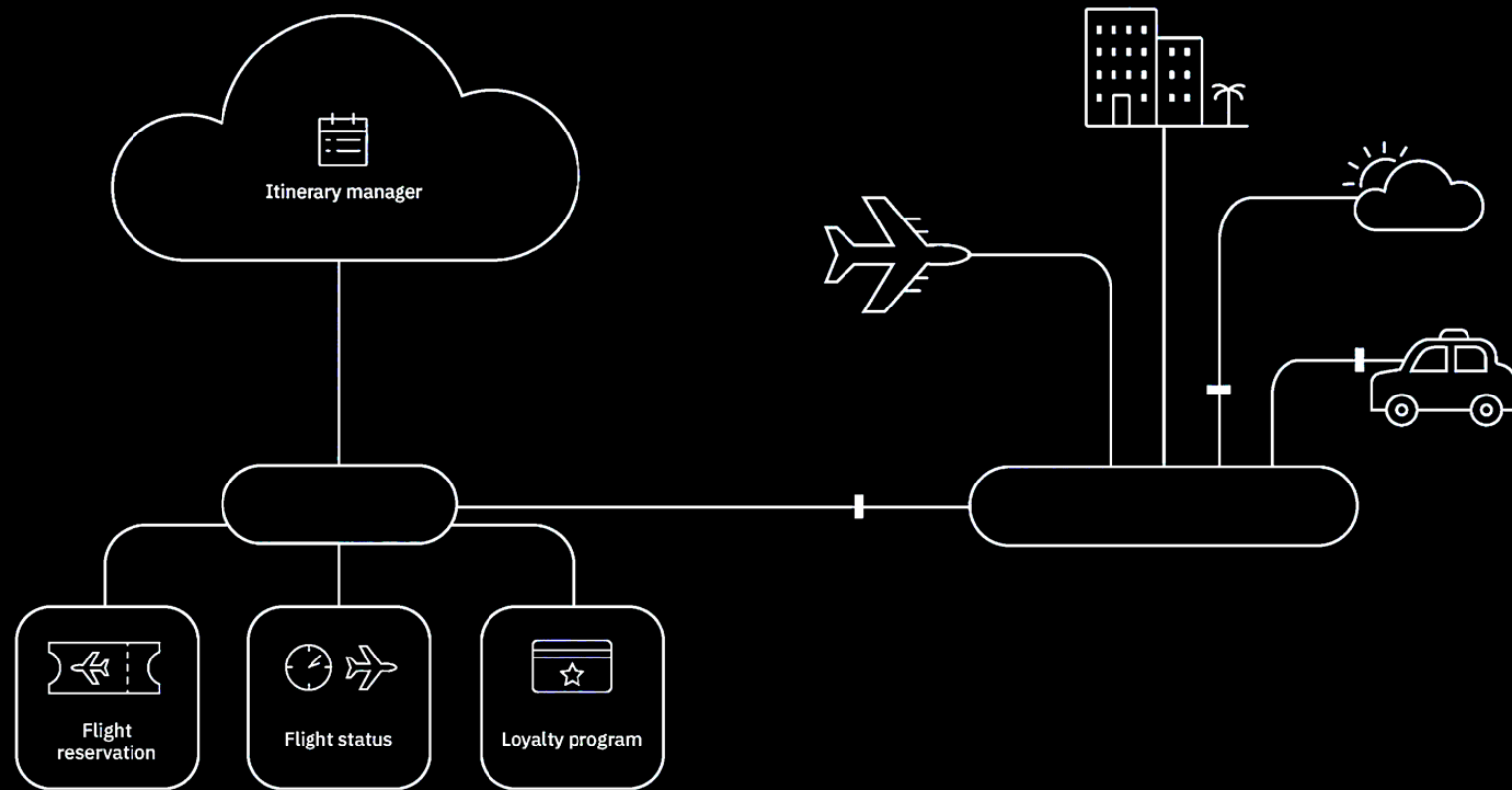
**Amy McCormick**
IBM MQ – Principal Product Manager
amymccormick@uk.ibm.com

IBM **Automation**

IBM

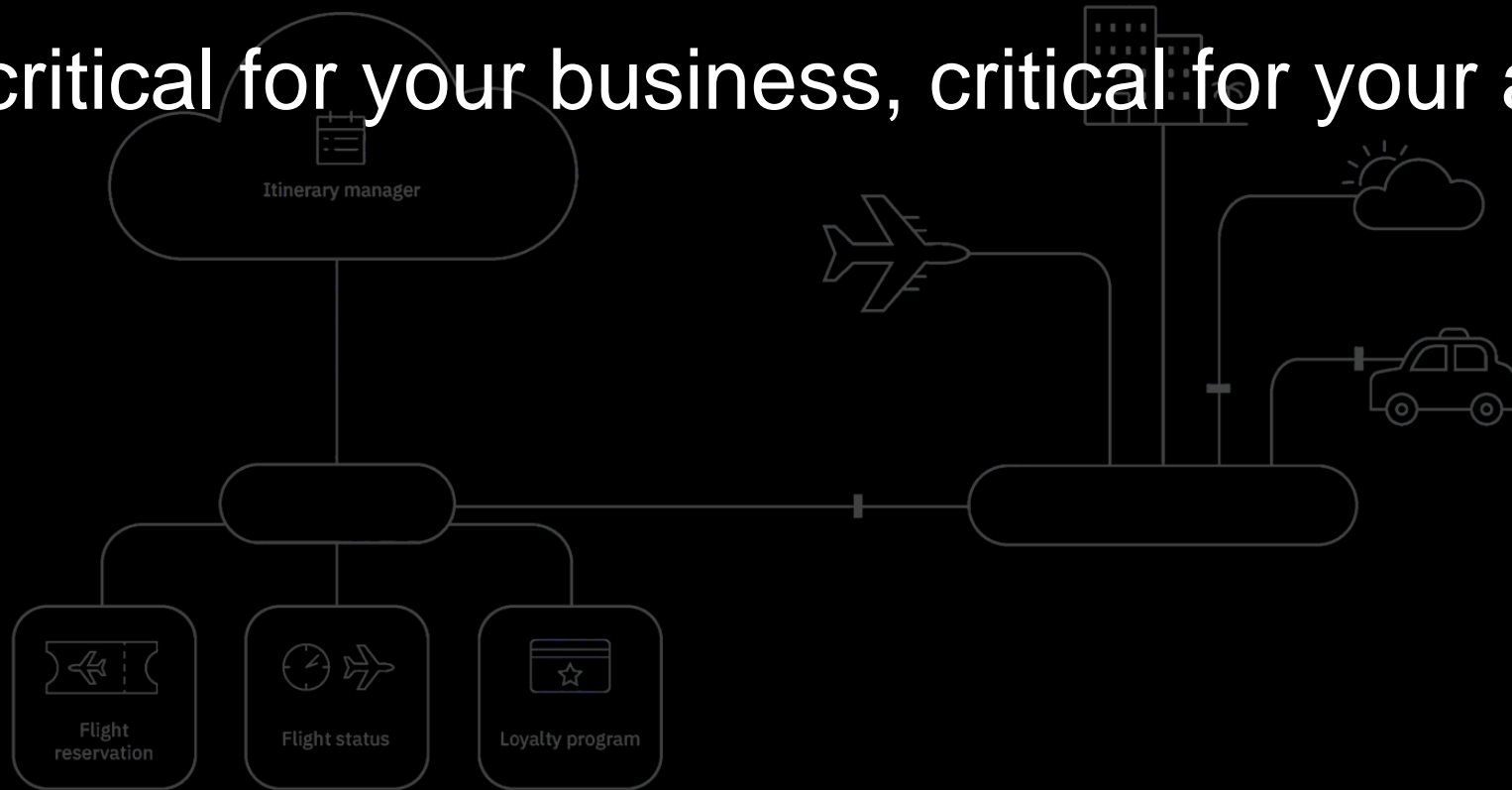Messaging is essential for building fully connected, efficient and scalable solutions.
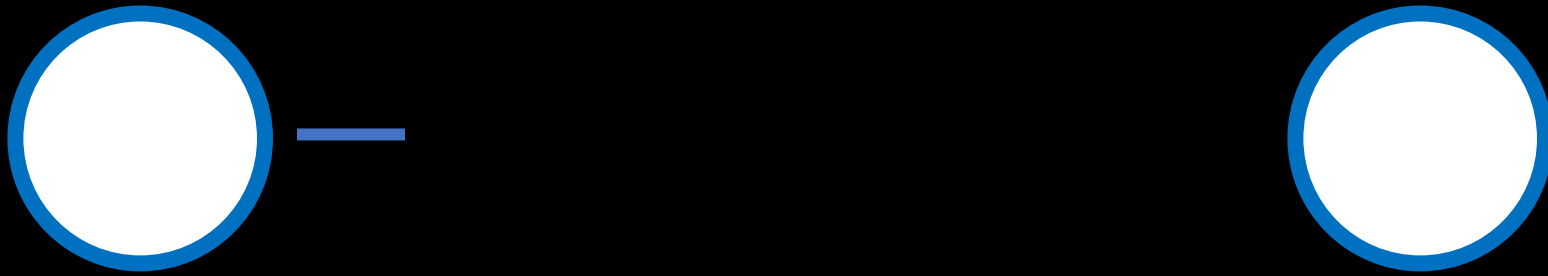
More now than ever before…

Messaging is essential for building fully connected, efficient and scalable solutions.

More now than ever before…

# IBM MQ, critical for your business, critical for your applications



Itinerary manager

Flight reservation
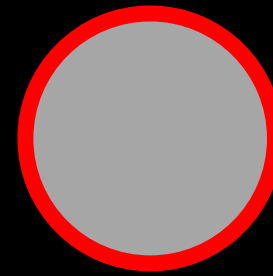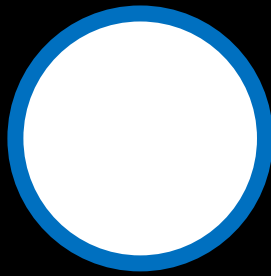
Flight status

Loyalty program

# Why does enterprise messaging exist?

Messages are sent between applications, systems, services, devices and all kinds of programs. These messages contain data that is used by the receiving application. Generally, it's important that when a message is sent, it is received. Not for all applications, but for some it's critical – these are generally referred to as 'mission critical' applications. For instance, it could be a flight booking, a payment, an order, a notification about a shipment, information about a patient, instructions to release funds, and so on.

# Why does enterprise messaging exist?

If the receiving program isn't available, either because the infrastructure connecting the programs has suffered an issue or if the application itself is unavailable (maintenance, cyber attack, or becomes overloaded due to a sudden traffic increase for instance), this could cause messages to become lost. The sending application may continue to send messages which can cause downstream systems to become out of sync and cause customer or business issues (loss of trust, brand damage, etc).

It is possible to implement retry logic within the application itself, however this can quickly become complex for application developers and cause significant issues if applications need to be changed at any point. It also means that while an application is retrying, it is not moving on to process the next request causing further delays.

# Why does enterprise messaging exist?

By putting IBM MQ between programs, you provide a safe space for messages. An application sends the message to an MQ 'queue' and it sits there until the receiving application is ready to receive the message. Administrators can apply different levels of security depending on business needs and define what to do with messages that cannot be delivered after a certain time.
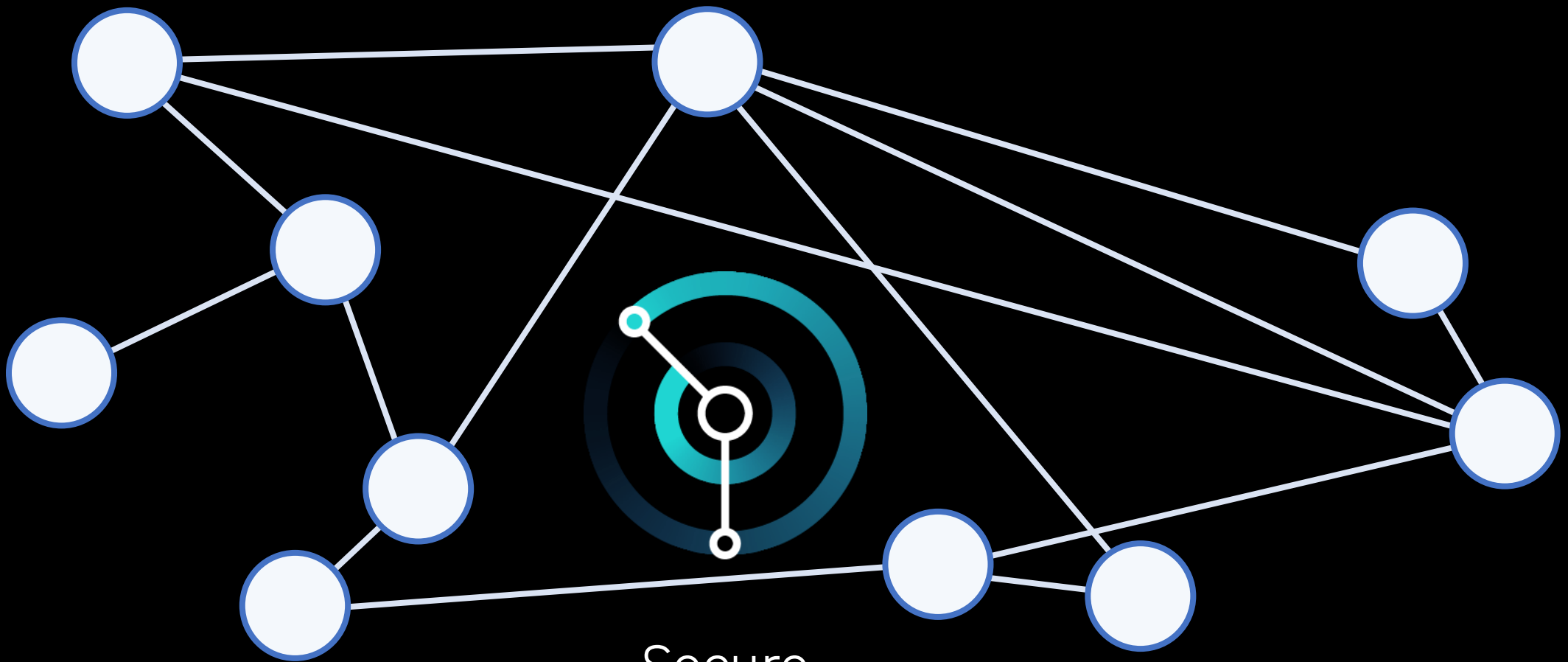
# Why does enterprise messaging exist?

So, if infrastructure or the receiving application isn't ready, mission critical messages aren't lost – they remain on the secure queue until delivery can be assured.

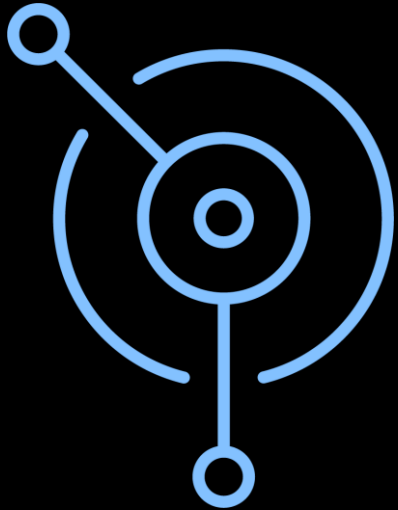# Why does enterprise messaging exist?



Secure
Assured delivery

Secure
Assured delivery
Everywhere

IBM MQ's critical capabilities across your hybrid cloud

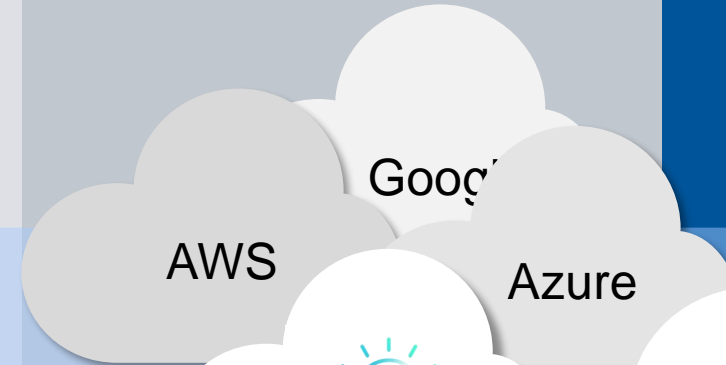On-premise, software and the MQ Appliance, exactly as you need it

Run MQ yourself in public or private clouds, virtual machines or containers

Let IBM host MQ for you with its SaaS IBM MQ service in public clouds, IBM Cloud and AWS

IBM Z
Linux
AIX
Windows
IBMi
HPE NonStop
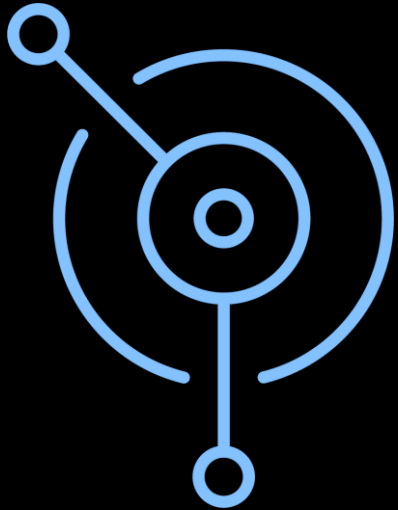zLinux
Appliance

Goog
AWS
Azure
IBM Cloud

IBM Cloud

powered by aws
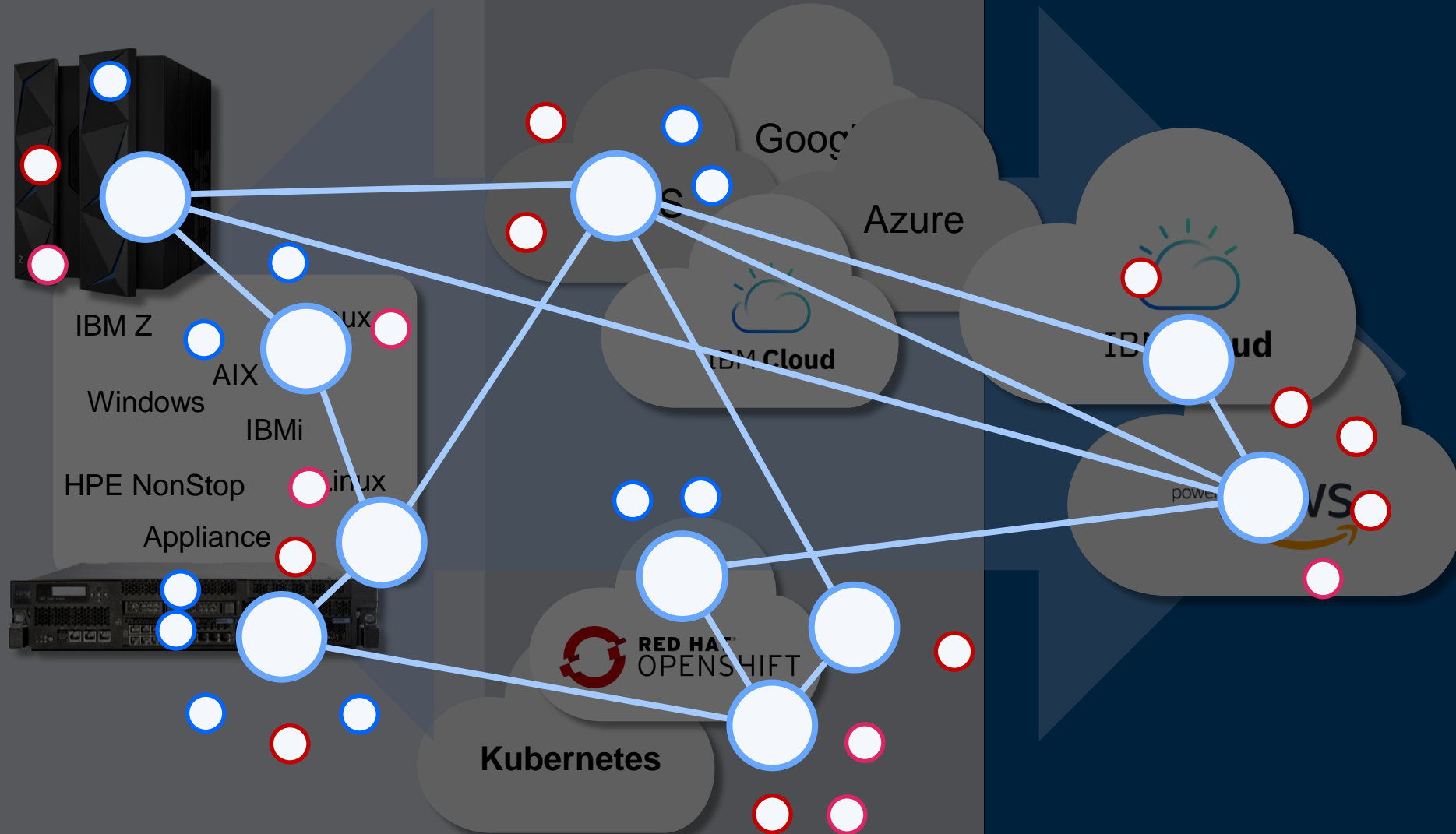
RED HAT OPENSHIFT

Kubernetes

# IBM MQ, connecting your enterprise

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IBM Cloud

power

AWS

RED HAT OPENSHIFT

Kubernetes

# Other ways to connect IT assets

## HTTP

Need to consciously implement required QoS (security, transactionality, etc), scaling may cause challenges, knock-on effect to other applications when changing an endpoint

## REST / HTTP APIs

Additional client reconnection logic implementation required, services may be waiting for responses due to synchronous pattern

## Kafka

Complementary technology. Not designed for conversational messaging. Lots of components so more heavyweight and costly vs MQ. Additional data storage requirements. Challenges with transactionality (ACID properties)

# IBM MQ is *the* solution for mission-critical hybrid cloud messaging

The world depends on reliable, secure messaging and **85% of the fortune 100** depend on IBM MQ[1]

- 98 of the top 100 global **banks** using IBM MQ[2]

- 8 of the top 10 global **manufacturers**[3]

- 9 of the top 10 global **healthcare providers**[4]

- 6 of the top 10 global **retailers**[5]

- 9 of the world's top 10 global **airlines**[6]

- 9 of the top 10 global **insurers**[7]

- 9 of the top 10 global **IT services companies**[8]

$$1 + 1 = 2$$

**Simple**

**Scalable**

**Connected**

**Reliable**

**Secure**

IBM MQ connects data within and across **hybrid multi-cloud**, ensuring your mission-critical applications, wherever they are, get the data they need.
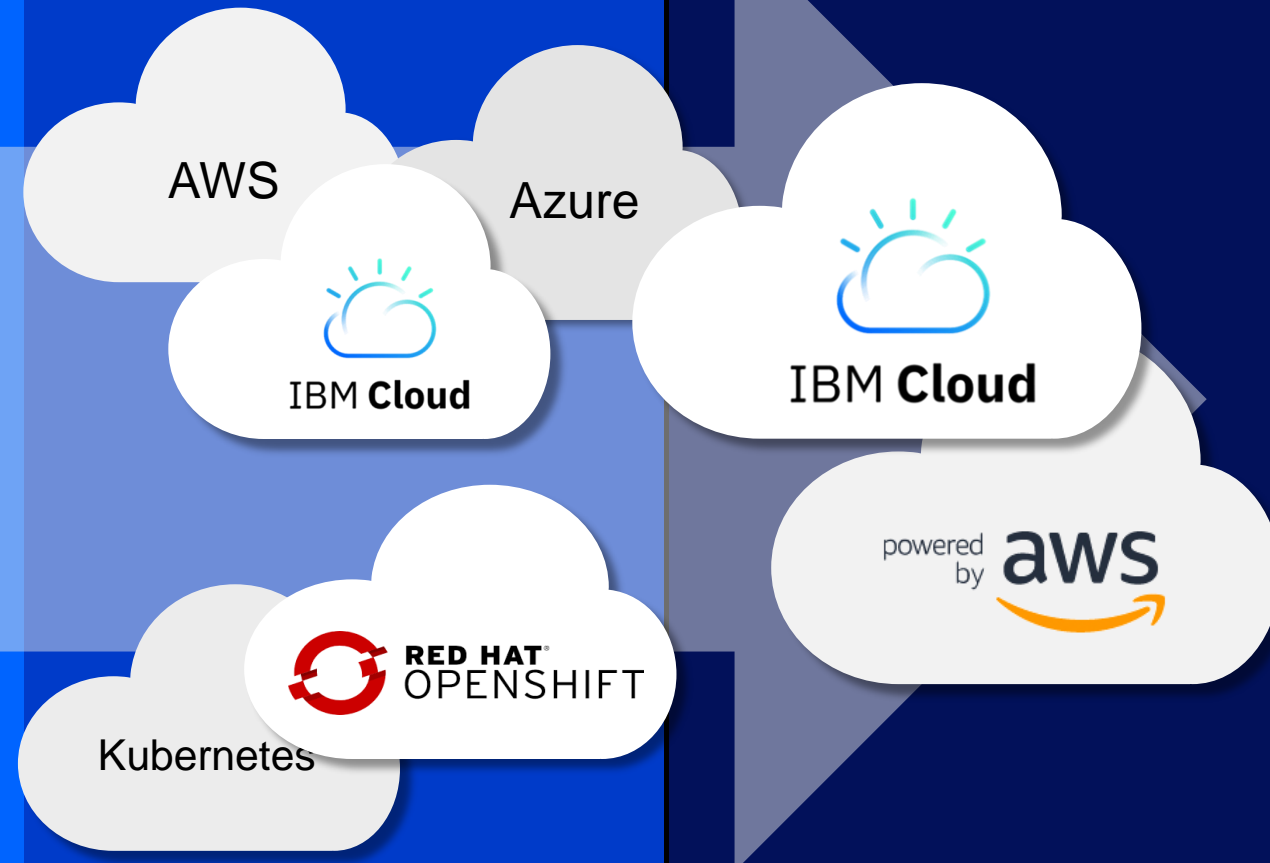
## Private datacenters

**Software** for VMs or containers and a dedicated **MQ Appliance**

**IBM Z**  Linux

AIX

Windows

IBMi

HPE NonStop  zLinux

**Appliance**

## Public clouds

Customer-managed **software** deployed to VMs or in **containers**

AWS

Azure

IBM **Cloud**

RED HAT OPENSHIFT

Kubernetes

## SaaS

IBM-managed **SaaS**, hosted in IBM Cloud and AWS **public cloud**

IBM **Cloud**

powered by aws

# Delivering exceptional customer experiences

# Usecase: Real-time inventory

To deliver exceptional customer experiences, **sales channel data needs to be united** with third-party providers to gain **clear visibility into inventory** levels.

Data may be locked away in silos at the far reaches of the business, or one of a hundred applications may be down due to a fault, causing systems to be updated with incorrect data or missing key information.

Improving the accuracy of inventory records can grow sales by 4-8%, for a businesses and ensures your customers can get what they want, across every channel, exactly when they want it.



Image credit: Fluxvision

# How MQ helps

## Responsive

- Publish/subscribe model to act on events
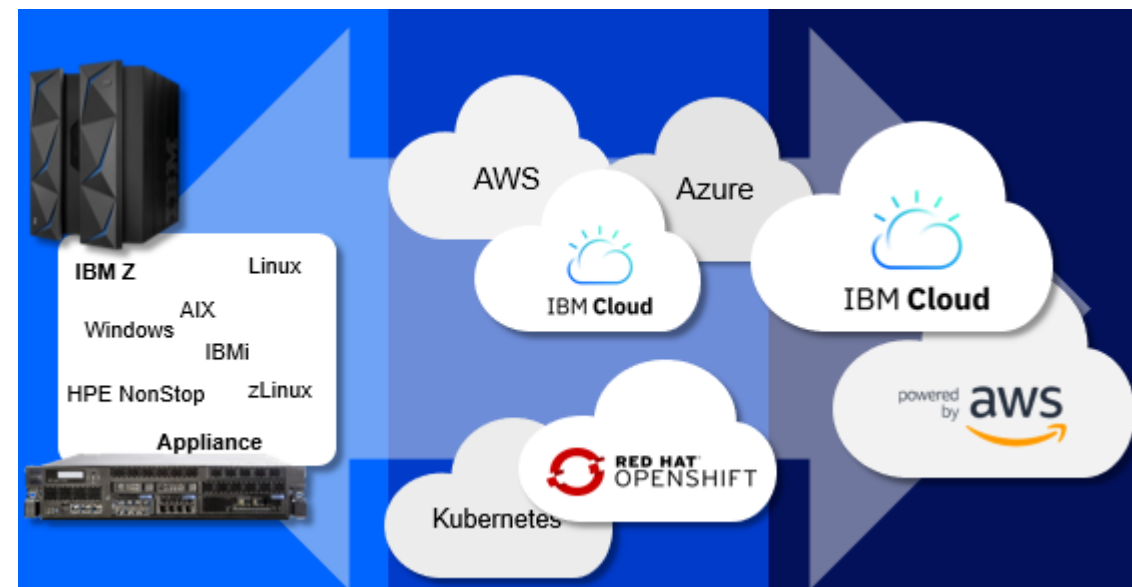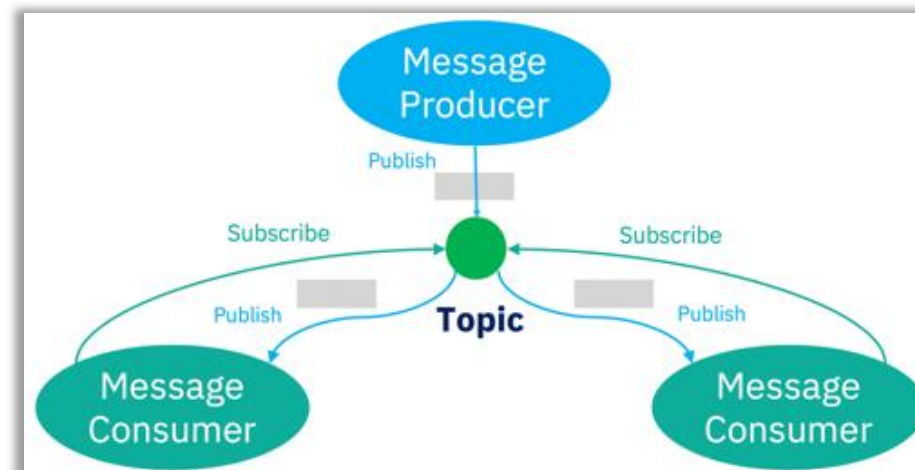- Use MQ as a Kafka producer

## Simple integration, everywhere

- Run MQ where your applications run today
- Multiple form factors to support different business needs

## Flexible, high performance

- Intelligent, automated scaling for peaks in traffic
- 'Always-on' communication for enterprise applications

ibm.biz/MessagesAndEventsDifferences

Achieving better outcomes through surfacing data in real-time to analytics or machine learning technologies

# Use case: Powering AI / Machine Learning

Data is the fuel that powers artificial intelligence.

It takes hard work to get data to the point where it's usable for AI, but ultimately it comes down to two things: data quantity and data quality.

Digital transformation and modernization can intensify data issues.

Before taking the AI plunge, you need to have the right data and enough of it to can gain insights, predict future outcomes, and transform business decision-making.

AI

**INFUSE** – Operationalize AI with trust and transparency

**ANALYZE** - Scale insights with AI everywhere

**ORGANIZE** - Create a trusted analytics foundation

**COLLECT** - Make data simple and accessible

Data of every type, regardless of where it is
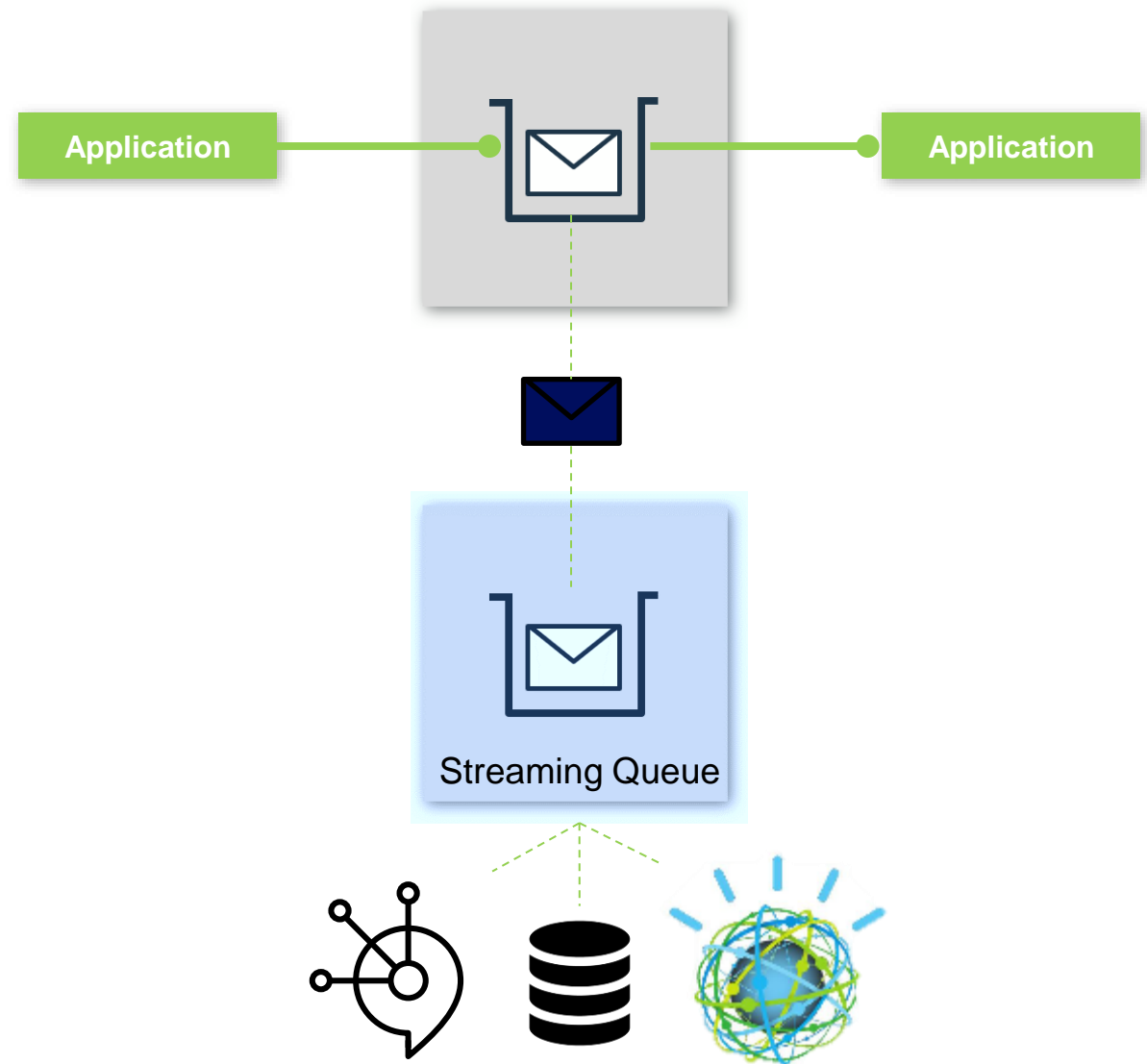
# How MQ helps

## Universal connectivity

- Connect data across hybrid and multi-cloud
- Support for a open protocols such as **AMQP** as well as IoT devices using **MQTT**

## Smart data collection

- MQ streaming queues can capture a copy of messages without interrupting the main flow of data to mission-critical applications
- Capture event data for AI with durable Publish and Subscribe

## Assured message delivery

- Exactly once-delivery of messages so Analytics / AI system receive the right data for insights and predictions.
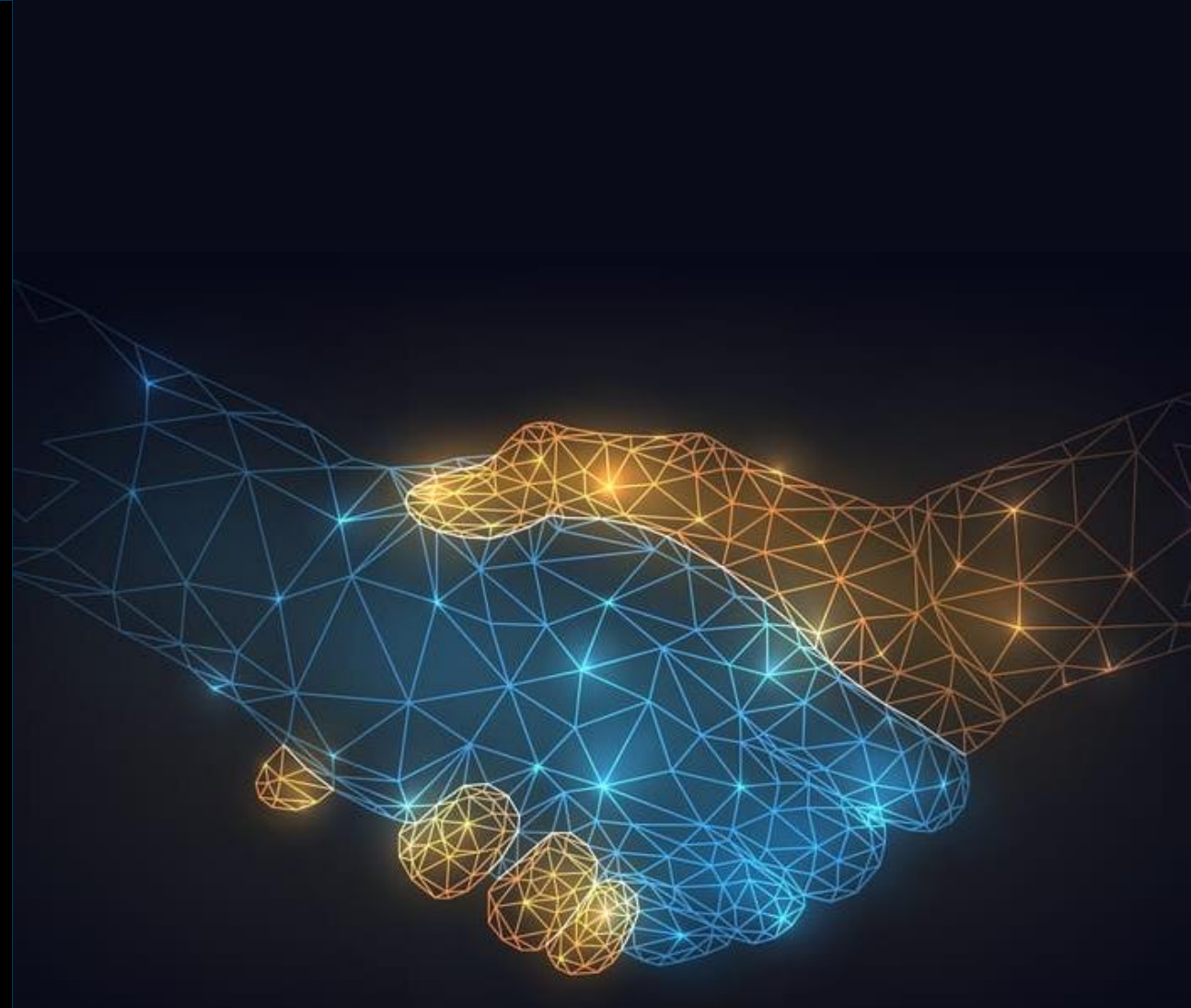- Highly scalable for peaks in workloads

Application

Application

Streaming Queue

# Business-wide hybrid cloud connectivity

# Usecase: Securing partner transactions

Participating in an ecosystem requires the ability to manage relationships securely and with trust, as well as enabling the business to generate the right products and services that will drive growth.

Business have different connectivity requirements depending on factors like industry and business size

All organizations share the need for resilience and availability. Customers, trading partners and stakeholders want to be assured that operations are secured against cyberthreats.

Image credit: performancein.com

# How MQ helps

## Low cost standardisation

- [Redistribute IBM MQ](#) to third parties for free to enable partners to transfer messages into an MQ network.

- MQ has a small install footprint – perfect for containerized deployments as well as reducing TCO
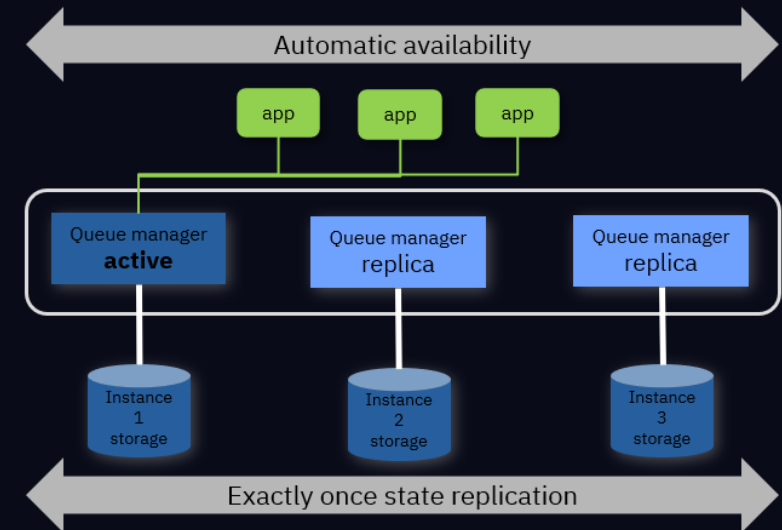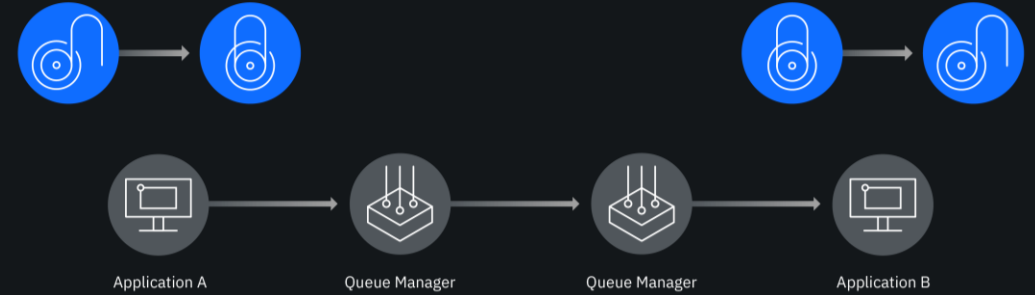
## Secure

- Keep data safe with TLS secured communications, identity access management, message-level security, and more.

- Event messages can also be issued to record activity for auditing

## Always-on messaging

- Minimal infrastructure and a light footprint make MQ perfect for cloud-native, highly available deployments.

- Automated and intelligent workload balancing so that you can design applications for scale.

# MQ in containers

## Light footprint

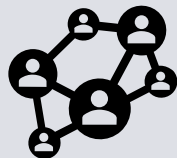MQ is designed to be lightweight and to scale to run at any size

IBM itself maintains ½ core queue managers in production

## Loosely coupled

Building large networks of application centric messaging servers is fundamental to MQ

MQ Clustering enables building of dynamic networks with automatic routing from source to target

## Availability and scale

Deploy highly available, replicated queue managers with ease

Active/active, horizontally scaled deployment patterns for *always on* systems

## Enterprise

Production ready certified container image with Cloud Pak for Integration and OpenShift

Operator managed deployments for native Kubernetes experience

**Red Hat OpenShift**

**CLOUD NATIVE**
COMPUTING FOUNDATION

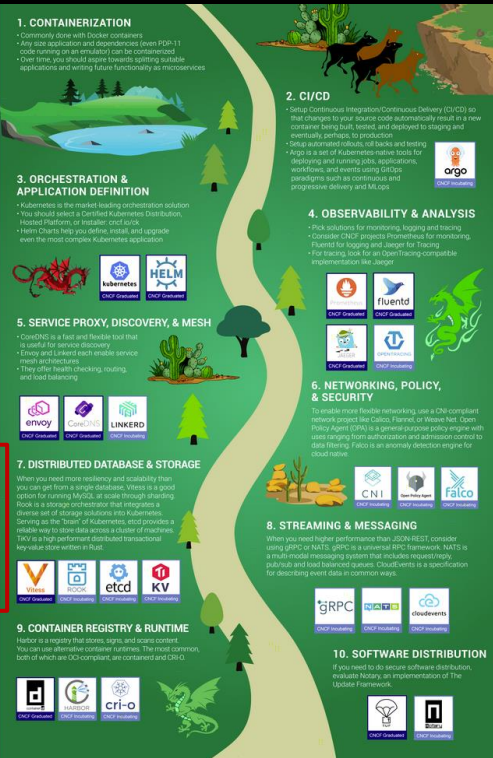github.com/cncf/landscape#trail-map

## WHAT IS CLOUD NATIVE?

Cloud native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

These techniques enable loosely coupled systems that are resilient, manageable, and observable. Combined with robust automation, they allow engineers to make high-impact changes frequently and predictably with minimal toil.

Container native

Loosely coupled

Horizontally scalable

Replicated data

Declarative deployments

Open APIs and protocols

# Real life customer success metrics

Cloud native application IBM MQ system deployment time

## 3 minutes

IBM MQ New maintenance and version adoption lead time

## 3 days

IBM MQ system downtime

## 0 seconds

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More now than ever before…

IBM MQ, critical for your business, critical for your applications

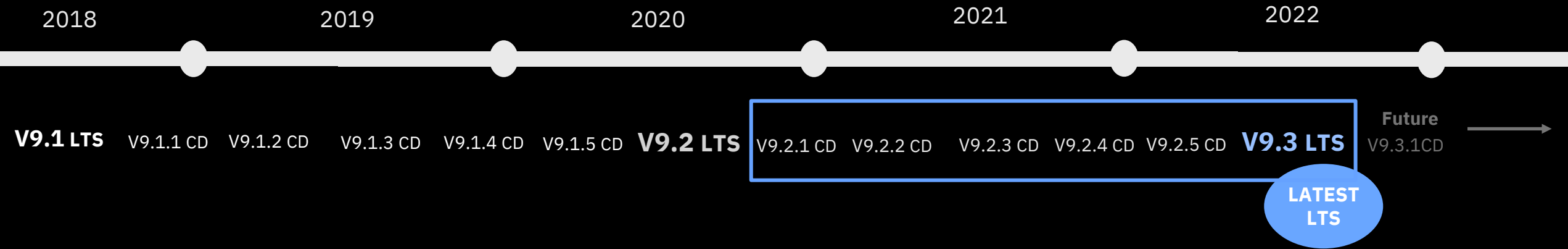Constantly evolving and innovating

Itinerary manager

Flight reservation

Flight status

Loyalty program

"I think it's a record — to go live within a year of starting the discussion with the Federal Reserve is rare."

*Kent Brown, CTO of ModusBox*

# New IBM MQ v9.3

*Read the announcement [here](here)*

2018    2019    2020    2021    2022

**V9.1 LTS**  V9.1.1 CD  V9.1.2 CD  V9.1.3 CD  V9.1.4 CD  V9.1.5 CD  **V9.2 LTS**  V9.2.1 CD  V9.2.2 CD  V9.2.3 CD  V9.2.4 CD  V9.2.5 CD  **V9.3 LTS**  **Future** V9.3.1CD

**LATEST LTS**

In 2016 MQ introduced a dual Long-Term Support and a Continuous Delivery model.

## Continuous Delivery

New CD versions of MQ are released approximately every four months, incrementally introducing new product capabilities.

Intended for those that can continually integrate.

## Long Term Support

Approximately every two years a new LTS version is released, rolling up many of the CD capabilities into a release with 5+3 support attached.

Required by those looking for fixed function.

## Mix and Match

Both are available under the same license.

Both can interoperate, just like any previous version of MQ.

All the function delivered in the 9.2.x CD releases is available in the long term support release **V9.3 LTS**

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# IBM MQ 9.3 LTS
## Enhancements since 9.2 LTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Simplified Linux install | Dspmqinst for IBM i | Stream MQ Appliance error logs | MQ Console application quick start | Key repository passwords | Idempotent MQSC DELETE commands | Hardware accelerated compression for AIX | Non-OS user authorisations | TLS 1.3 across all protocols | TLS 1.3 support for MQIPT |
| Encrypted MQTT channel passphrases | TLS-only communication switch | Streaming queues | Multiple queue manager certificates for MQIPT | TLS enabled .NET XA monitor | Cryptographic hardware support for client passwords | PKCS#12 key repository support | SNI hostname support for channel routing | Uniform Cluster support for request/reply flows | Transaction boundary aware Uniform Cluster |
| Uniform Cluster aware MDBs | IBM MQ scaler for KEDA | Apache Qpid JMS support over AMQP | Point-to-point support for AMQP | Java 17 support for applications | MQ Console remote queue manager support | Jakarta Messaging 3.0 support | 64-bit RBA default for z/OS | MQ Appliance synchronous DR replication | Disk encryption for the MQ Appliance |
| OpenShift Operator managed rolling upgrade | OpenShift support for zLinux and Power | OpenShift Prometheus integration with ServiceMonitor | Helm chart sample for Kubernetes deployments | Client attached dead-letter handler | MQ Appliance failed resource action control | IBM MQ on Cloud LogDNA integration | Raft based Native HA for OpenShift | Transfer logging for Managed File Transfer | AT-TLS support for z/OS |
| Separate statistics and accounting intervals for z/OS | Browse support for AMQP applications | Start/stop of MFT resource monitors | Redistributable MFT Logger | MFT managed call control over REST | IBM MQ AsyncAPI binding | AsyncAPI code generator for IBM MQ JMS applications | Queue depth SMF data for z/OS | .NET 6 application support | Extended REST API message properties |

# Thank you!

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