Introduction to the IBM MQ Appliance

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IBM MQ

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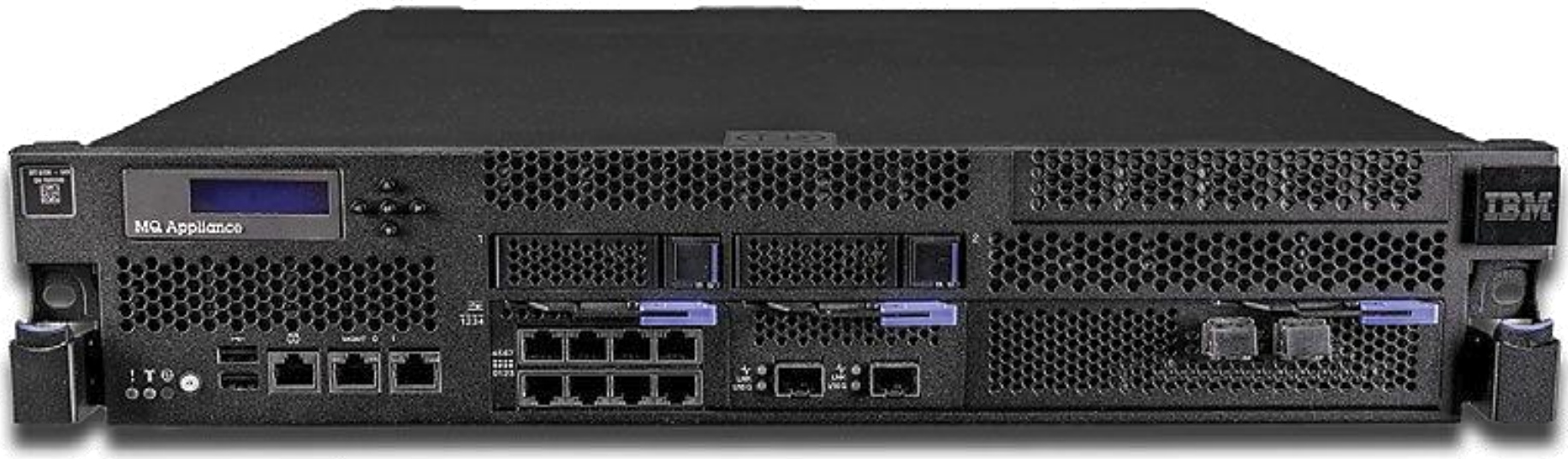
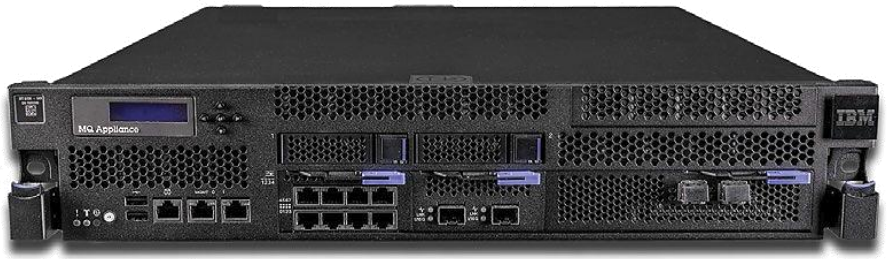


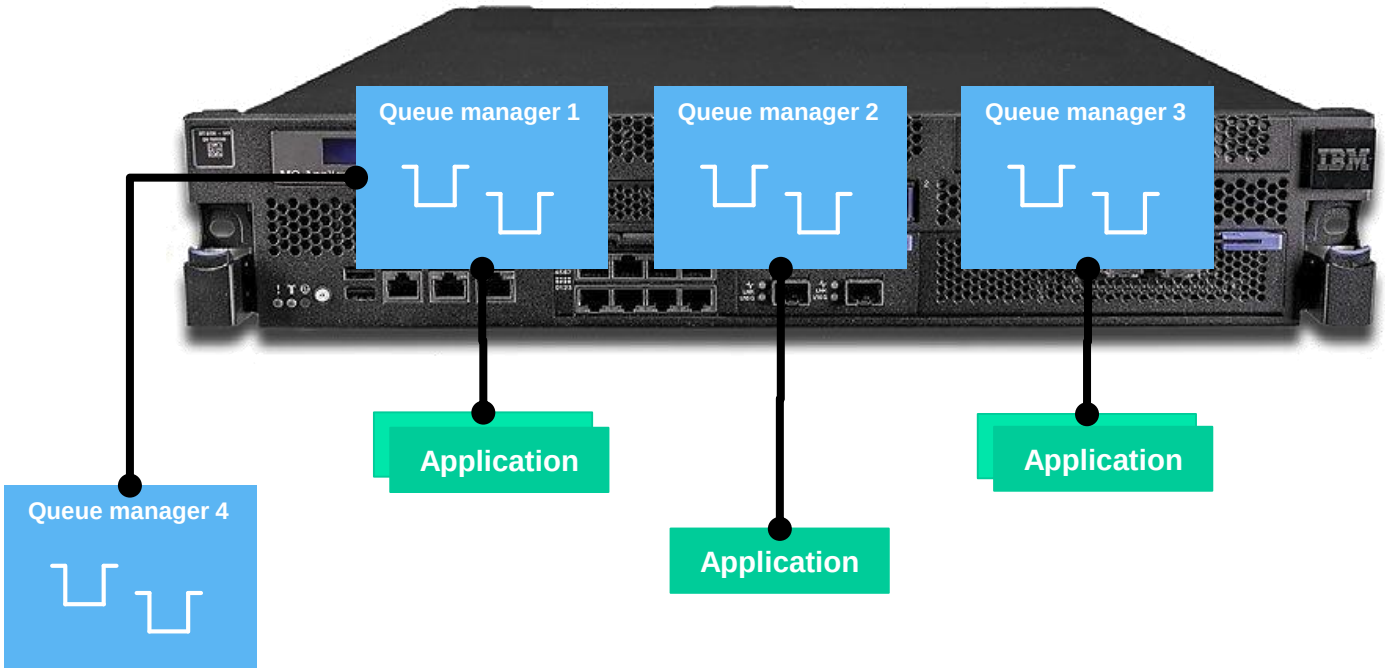
Overview



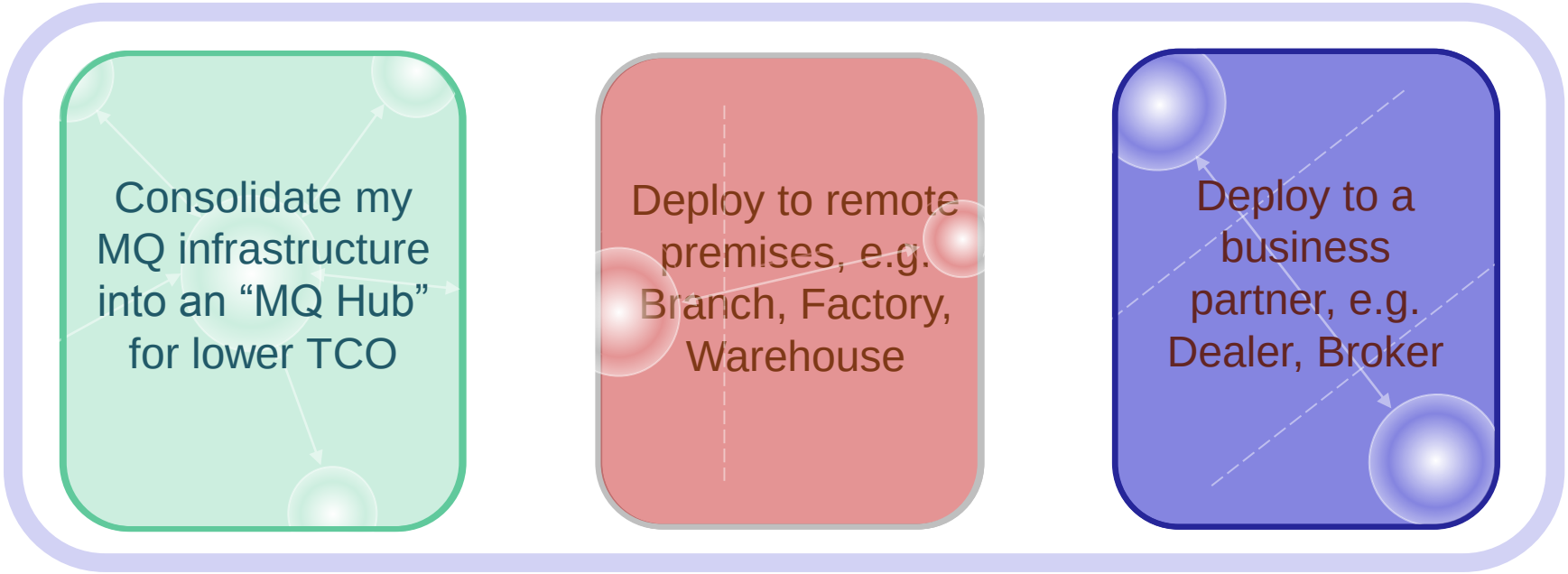
- **The scalability, security and reliability of IBM MQ V8**
  - Integrates seamlessly into MQ networks and clusters
- **The convenience, fast time-to-value and low total cost of ownership of an appliance**
- **Ideal for use as a messaging hub running queue managers accessed by clients, or to extend MQ connectivity to a remote location**
- **Familiar feel for existing MQ users – application interfaces, administration, networking/clustering, security….**
- **New *appliance specific features***

But what is it really?

- A box where you create and run queue managers…



What do you want to do?



IBM MQ Appliance offers:

Optimized solutions to meet the needs of these use cases

Differentiation compared to MQ software deployment approaches

2 price points to meet different deployment-based business needs

Consolidate my MQ infrastructure into an “MQ Hub” for lower TCO

Objectives

Reduce TCO

Reduce footprint

Standardise deployments

Build 'hub' - concentrate expertise

Challenges

Mixture of platforms and versions

Complex dependencies

Migrations difficult – lack of standardization

Application downtime impacts other applications

Benefits

Easy to deploy
Simplified maintenance
Familiar administration
Separates applications from Infrastructure
Supports existing MQ definitions, concepts and security model
HA avoiding external dependencies

Deploy to a remote premises

Objectives

Resilient connectivity to remote location

Robust and secure

Flexibility, minimal time to value at new sites

Challenges

Avoiding single points of failure

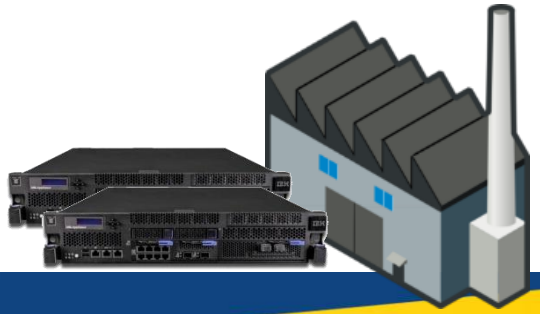
Outside assistance needed – lack of local skills and resources

Benefits

Standardization makes ‘pre-canned’ rollout simpler

Remote configuration and management

High availability requires no additional systems or skills



Deploying to business partner: Appliances as 'Gateways'

Objectives

Extend connectivity to external business partner

Rapid onboarding

Control and limit access

QoS expectations from both parties

Challenges

Partner may not have MQ or MQ skills today

Time to build and deploy

Configuration needs to meet our standards

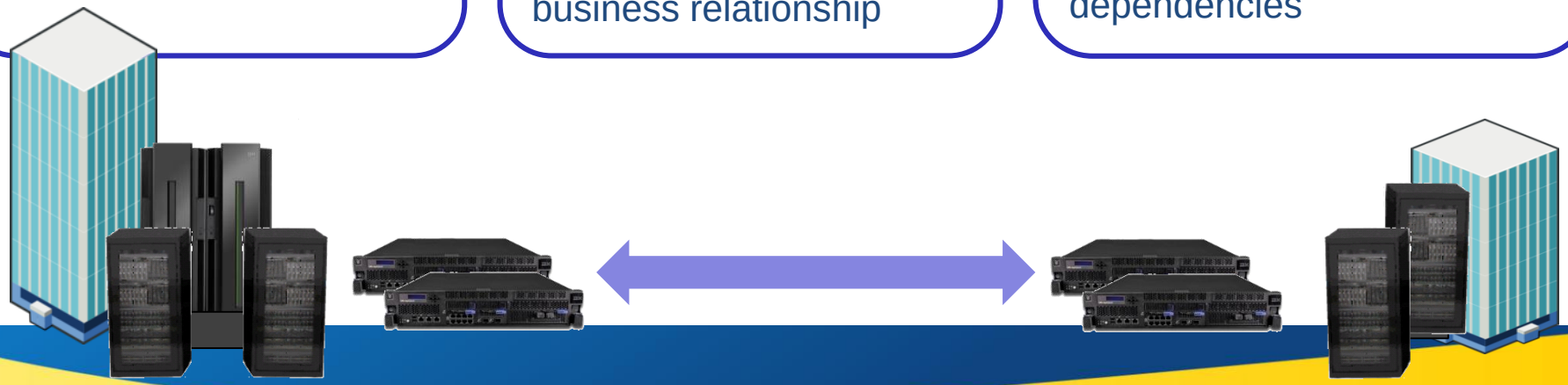
Downtime directly effects business relationship

Benefits

Easy to deploy
Simplified maintenance

Ability to preconfigure a very standard system both helps ensure standards applied and speed deployment

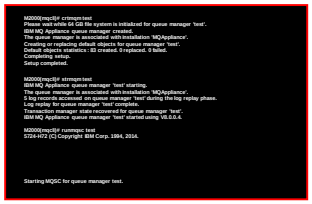
HA avoiding external dependencies



IBM MQ Appliance capabilities

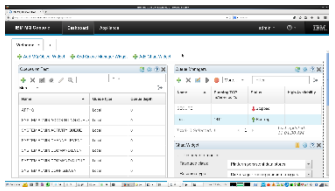
- Administration
- Security
- Connectivity
- High Availability
- External Storage (statement of direction)
- Performance and Capacity
- Key differences between MQ Appliance and installable MQ

Administration

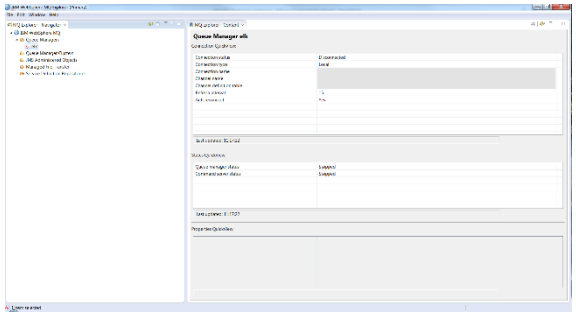


Serial/SSH

HTTP



Existing administration tooling



Command Line Interface

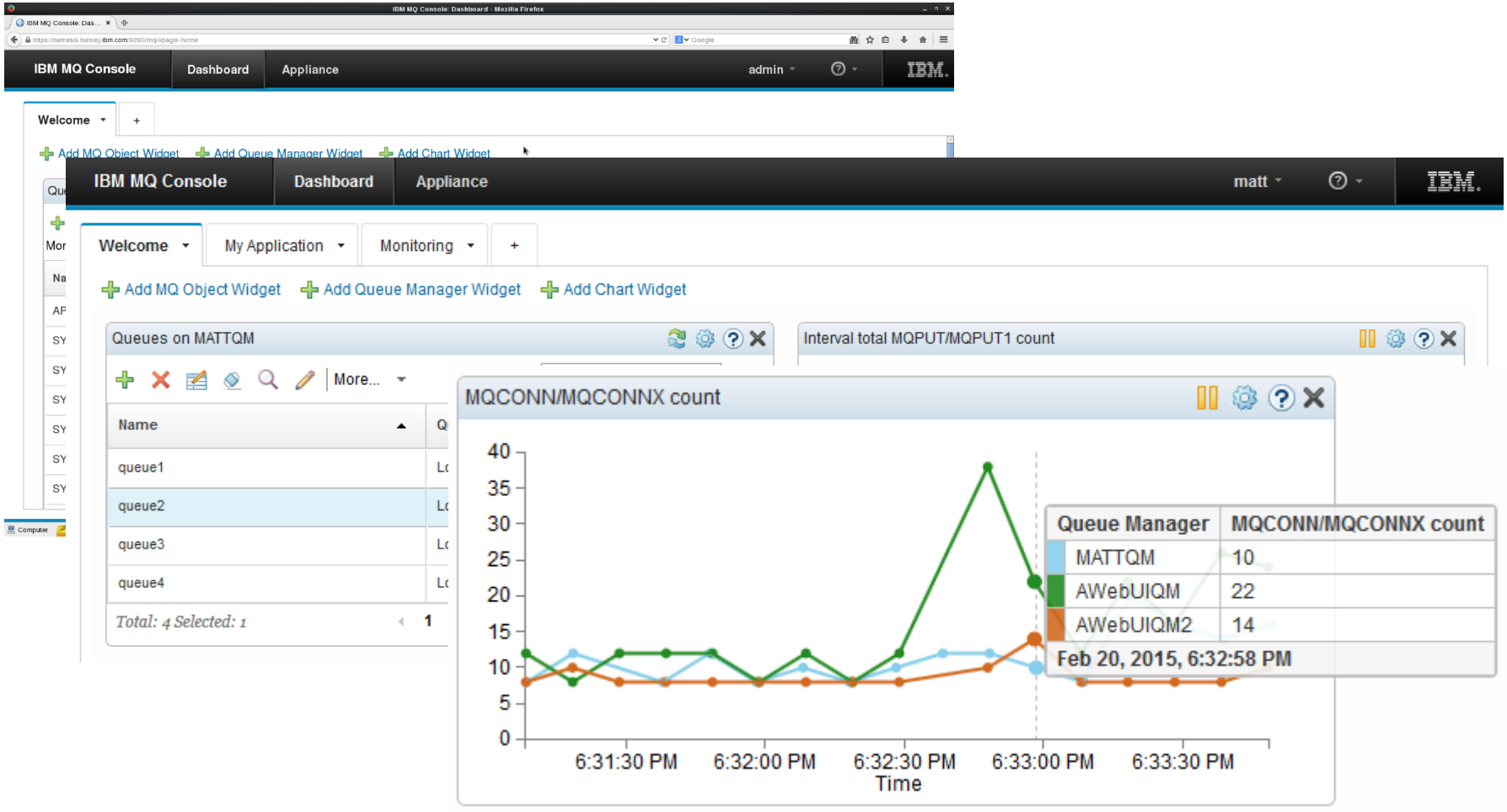
Appliance-specific commands such as configuring network interfaces, importing certificates, …

MQ-specific commands offers a familiar subset of MQ control commands

Some new commands, some not available

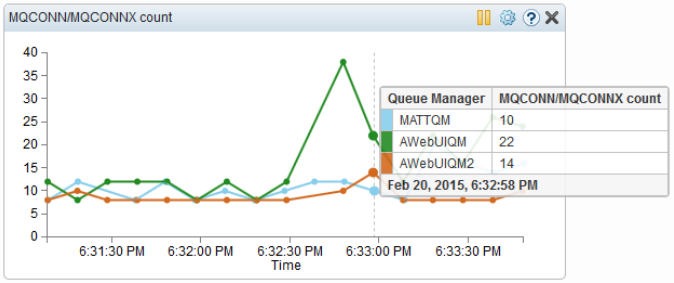
```
login: admin
Password: ********

Welcome to IBM MQ Appliance M2000B console configuration.
Copyright IBM Corporation 1999-2015

Version: MQ00.8.0.0.3 build mq-rel.265326 on Aug 12, 2015 11:10:38 AM
Serial number: 7800537

M2000# mqcli
M2000(mqcli)# dspmqver
Name:        IBM MQ Appliance
Version:     8.0.0.3
Level:       p800-L150812.2
BuildType:   IKAP - (Production)
Platform:    IBM MQ Appliance
MaxCmdLevel: 802

M2000(mqcli)# strmqm test
IBM MQ Appliance queue manager 'test' starting.
The queue manager is associated with installation 'MQAppliance'.
5 log records accessed on queue manager 'test' during the log replay phase.
Log replay for queue manager 'test' complete.
Transaction manager state recovered for queue manager 'test'.
IBM MQ Appliance queue manager 'test' started using V8.0.0.3.

M2000(mqcli)# runmqsc test
5724-H72 (C) Copyright IBM Corp. 1994, 2015.
Starting MQSC for queue manager test.
```

Web UI and MQ Console



System and queue manager monitors

- **New set of MQ-delivered data**
  - Giving information that would normally be via OS-level monitors
- **Also a new style of event generation**
  - Based on publish/subscribe
  - Allows multiple consumers of the same information
  - More dynamic to enable and disable
- **A monitoring application can subscribe to well-known (meta-)topics**
  - Possible topics include CPU, Disk and MQI statistics, for example
    - ***$SYS/MQ/INFO/QMGR/<qmgrname>/Monitor/DISK/QmgrSummary***
    - ***$SYS/MQ/INFO/QMGR/<qmgrname>/Monitor/STATMQI/PUT***
- **The queue manager periodically publishes messages to the subscribers**
  - Each publication is in PCF format



Application Activity Trace

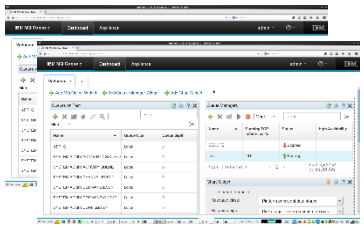
- **No exits doesn't mean no application tracking**
- **Application activity trace events record MQI calls**
  - Something that's often been done via API exits
- **Available since MQ V7.1 but normally configured by defining rules in a queue manager ini file**
  - Not possible on the appliance
- **New alternative is to subscribe to topics**
  - Subscription dynamically enables and disables trace data
  - Allows multiple consumers
  - Finer grain authorisation
  - Better selection criteria than with the ini file

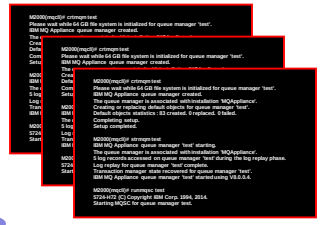
```
>amqsactc -m QMGR1 -w 60 -a amqsputc.exe
Subscribing to the activity trace topic:
  '$SYS/MQ/INFO/QMGR/QMGR1/ActivityTrace/ApplName/amqsputc.exe'

…..

==========================================================================
  Tid Date       Time       Operation       CompCode       MQRC  HObj(ObjName)
  001 2015-09-15 12:55:29  MQXF_CONNX      MQCC_OK        0000  -
  001 2015-09-15 12:55:29  MQXF_OPEN       MQCC_OK        0000  2 (QUEUE1)
  001 2015-09-15 12:55:29  MQXF_PUT        MQCC_OK        0000  2 (QUEUE1)
  001 2015-09-15 12:55:29  MQXF_PUT        MQCC_OK        0000  2 (QUEUE1)
==========================================================================
…..
```

- **Basic topic is *$SYS/MQ/INFO/QMGR/<qmgr name>/ActivityTrace***
  - You then add ***…/ApplName/amqsputc.exe***
  - Or ***…/ChannelName/SYSTEM.DEF.SVRCONN***
  - Or ***…/ConnectionId/414D5143514D4752312020202020206B576B5420000701***

Security – Users

Administrators are always defined locally on the appliance and can connect via SSH or WebUI to administer all aspects of the system





Administrative user repository

Messaging Users may be defined locally or in LDAP repository (choice per QM), and remote applications always connect with these credentials.

Messaging user repository

Security – Messages and connections

Certificate management commands in CLI to create, request, receive certificates

```
M2000(mqcli)# crtmqm test
Please wait while 64 GB file system
IBM MQ Appliance queue manager
The queue manager is associated with installation 'MQAppliance'.
Creating or replacing default objects for queue manager 'test'.
Default objects statistics : 83 created. 0 replaced. 0 failed.
Completing setup.
Setup completed.

M2000(mqcli)# strmqm test
IBM MQ Appliance queue manager 'test' starting.
The queue manager is associated with installation 'MQAppliance'.
5 log records accessed on queue manager 'test' during the log replay phase.
Log replay for queue manager 'test' complete.
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M2000(mqcli)# runmqsc test
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Starting MQSC for queue manager test.
```
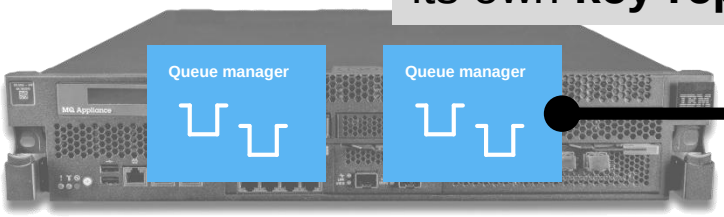

Each queue manager has its own **key repository**



Application

TLS on channels

Queue manager

End to end and at-rest encryption using **AMS** built in and included as standard

Application

Connectivity

- The IBM MQ Appliance will support a number of protocols for message transmission
- The first version of the appliance will support
  - **MQ client protocol** – for connectivity from applications
    - Client libraries available in the usual places, not shipped with the appliance
  - **MQ server protocol** – for connectivity with other queue managers
    - This will support sender-receiver channels and server-requester channels, including cluster flows
- Subject to customer interest we may add further protocols such as
  - **MQTT** – for internet of things and mobile/web messaging
  - **AMQP** – for MQ Light API client connectivity

High Availability

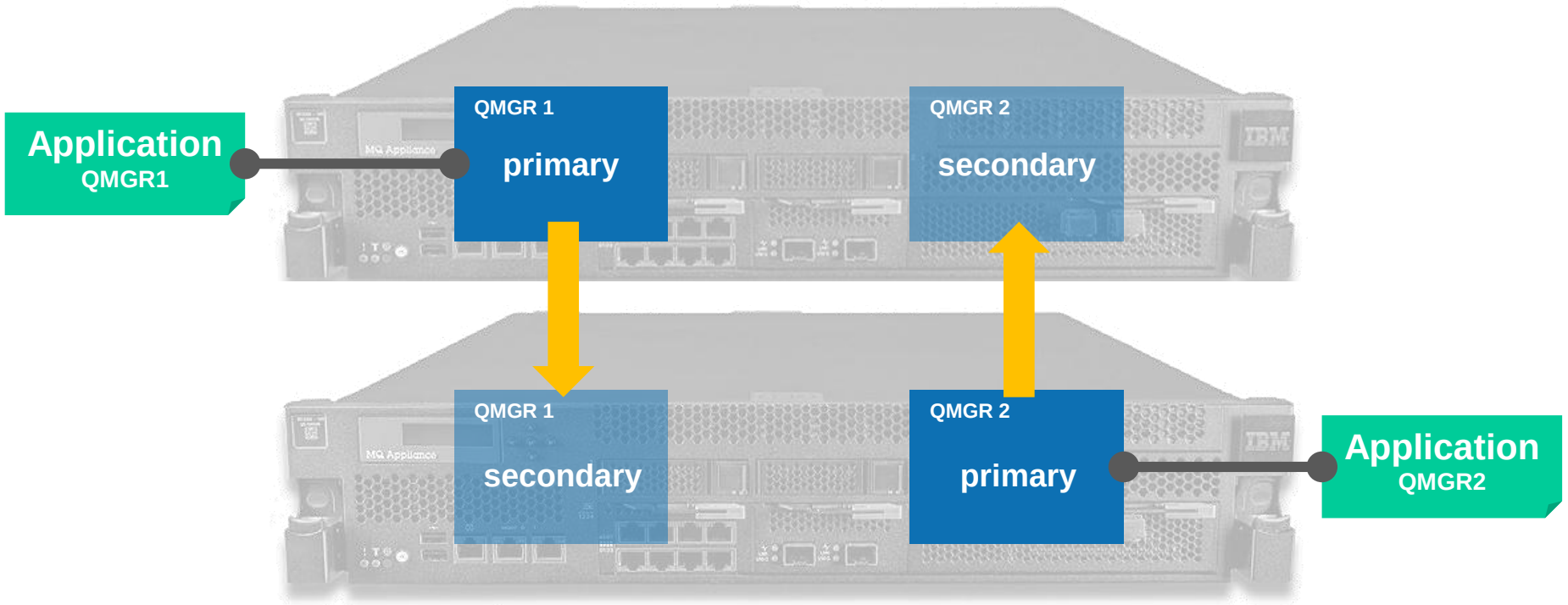
- No external storage
- No additional skills required

Fully synchronous replication

- All recoverable data replicated immediately
- Manual control of failover for migration/maintenance
- Queue manager level active/passive (i.e. both appliances can run workload)

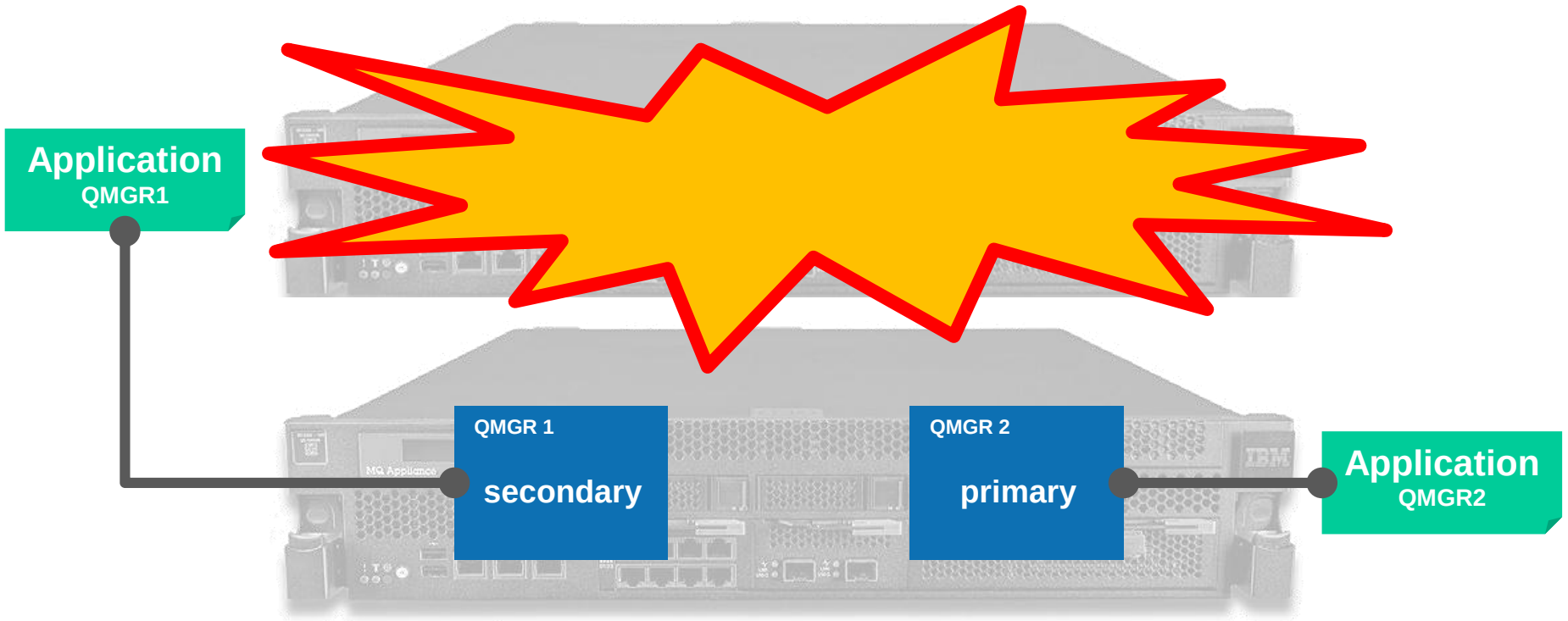
High Availability

- Individual queue managers active on either appliance and continually replicating
  - Active preference configurable



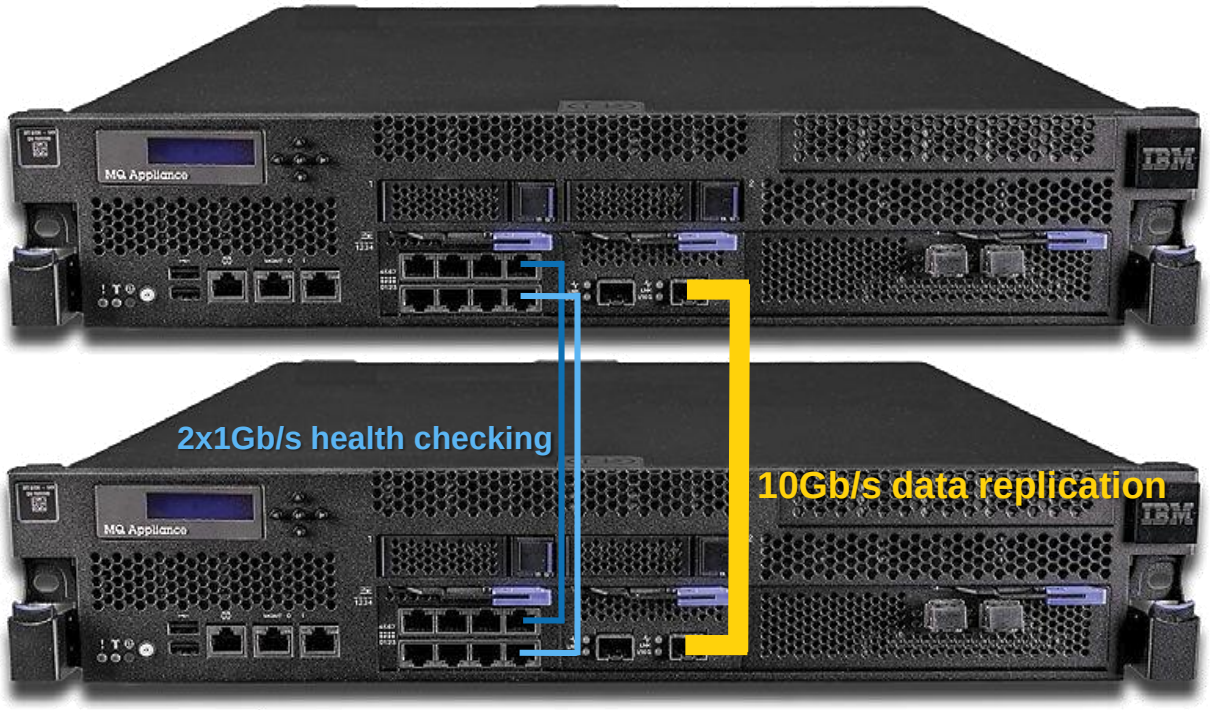
High Availability

- Individual queue managers active on either appliance and continually replicating
  - Active preference configurable
- Any active queue managers are immediately started on their secondary appliance in the event of a failure of the primary
- Clients and other Queue managers reconnect to alternative IP using existing techniques



High Availability

- Wiring it up



HA setup

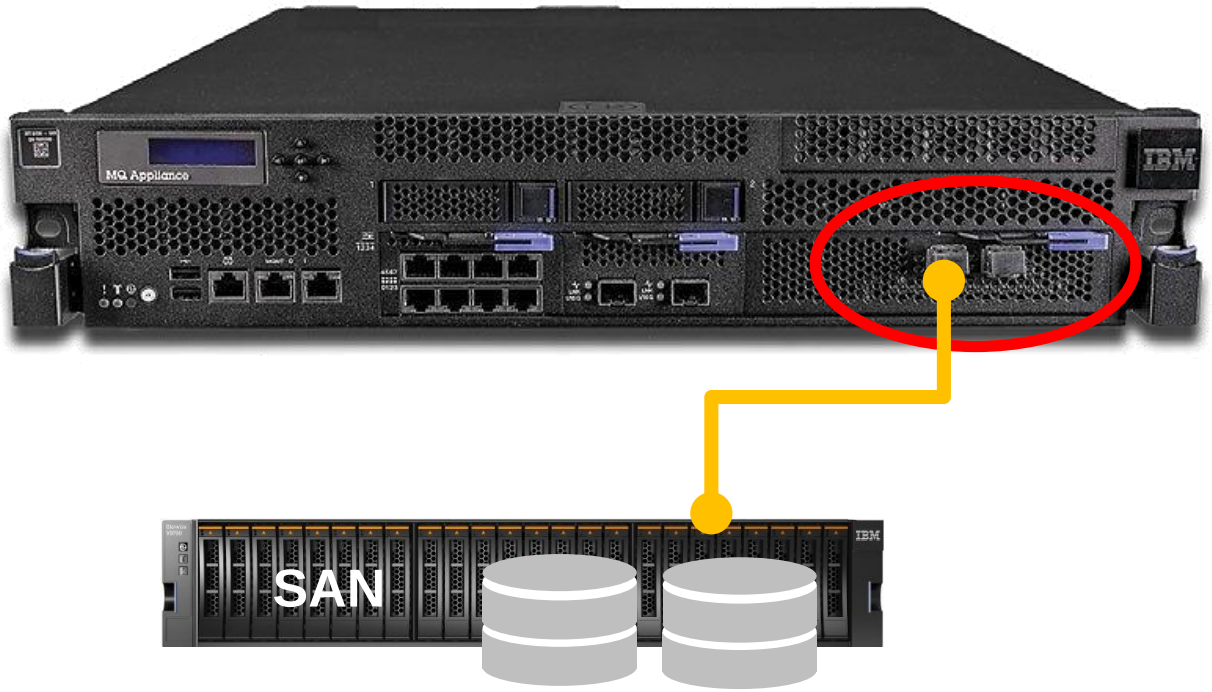
- **HA Group**
  - A configuration of two MQ Appliances that monitor each other and the HA queue managers defined to ensure that each HA queue manager runs on one appliance but can fail over to the other if necessary
  - On appliance 1:
    - **prepareha** -s *<some random text>* -a *<address of appliance 2>*
  - On appliance 2:
    - **crthagrp** -s *<the same random text>* -a *<address of appliance 1>*

- **HA Queue Manager**
  - A queue manager that is under the control of the HA Group and which has its data replicated between the appliances
  - On one appliance:
    - **crtmqm -sx** HAQM1

- **Preferred Location**
  - The appliance on which the HA software will run the queue manager, all else being equal
  - Initially the appliance on which the HA Queue Manager is created

External Storage (statement of direction)

- **From the announce letter: "***In a future version of the appliance* IBM intends to support fibre channel connection to external storage, enabling additional capabilities…"



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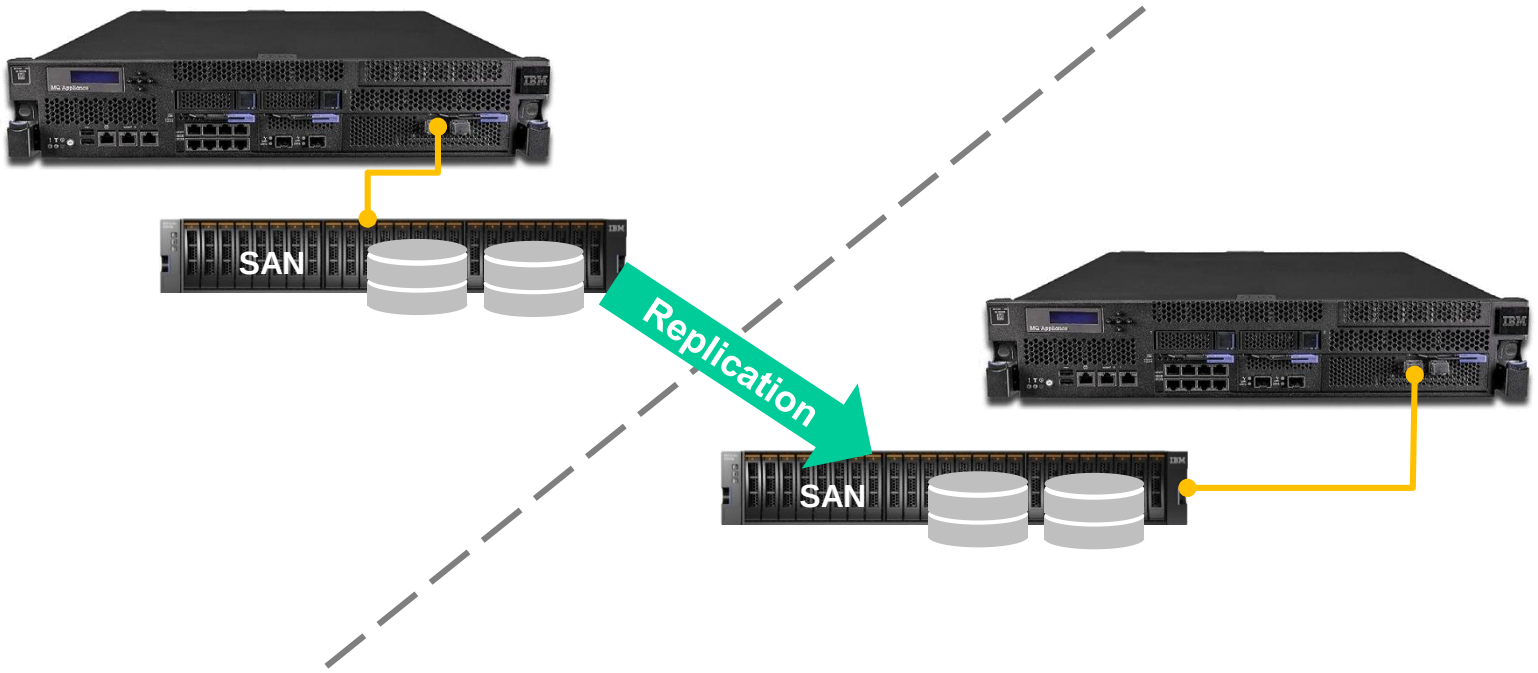
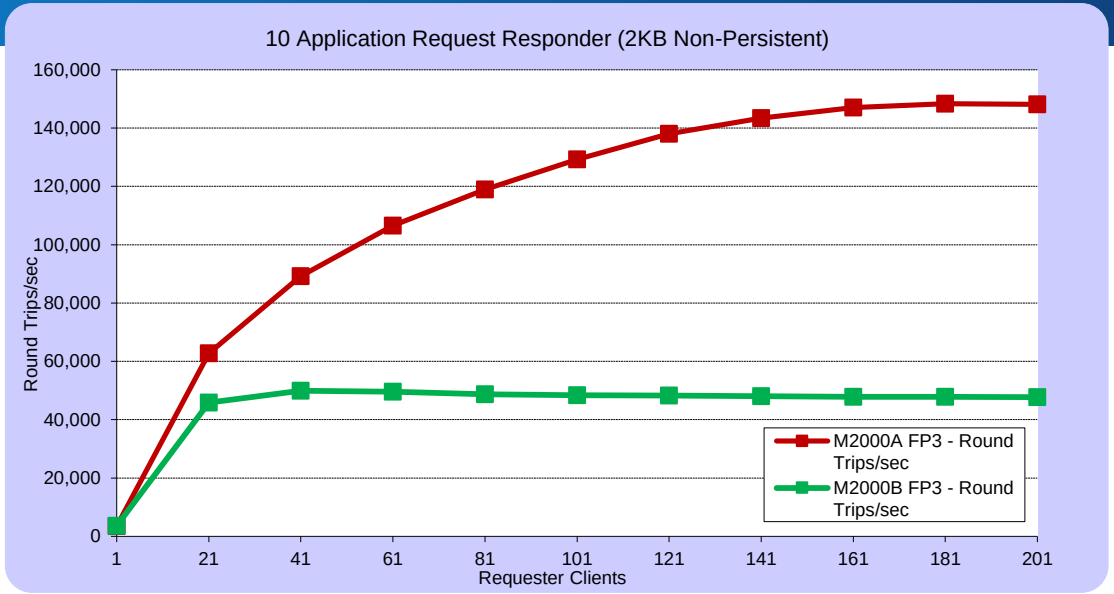


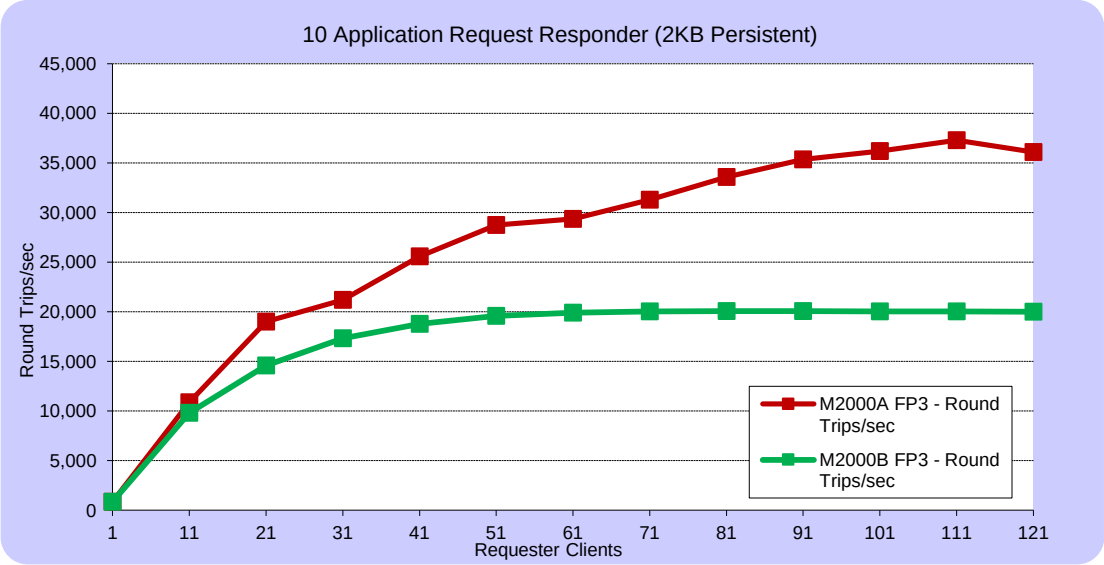
Performance and Capacity

- The IBM MQ Appliance will be available in **two models**, A and B, to suit a range of performance and capacity requirements
  - They're not sold on a PVU basis – but approximately 420 & 1400 PVU
- Appliance is dedicated to running messaging server workload
  - No other workload (applications or middleware)
  - Performance should be predictable
  - Capacity planning should be easier
- Performance report **MPA1** available
  - Based on latest firmware level (8.0.03),
  - Includes scenario driven examples and M2000A/B comparisons.
- Firmware comes **pre-tuned** for maximum messaging performance
  - Placement of workload, resource utilisation, etc.

Performance



Non-Persistent



Persistent

Which MQ Appliance is right for *you?*

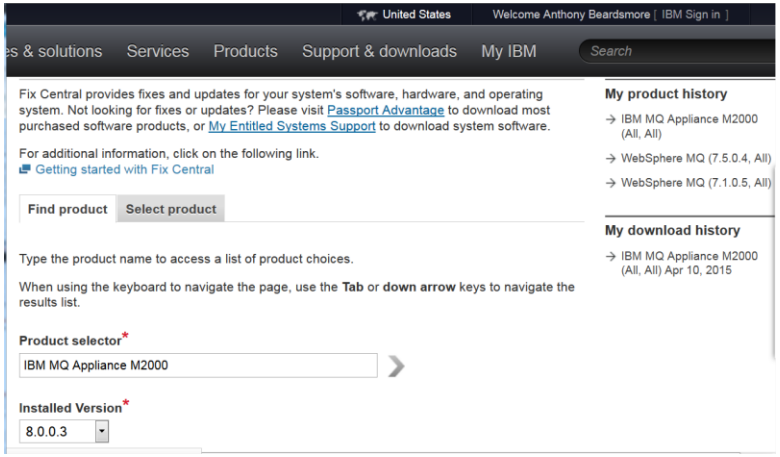
IBM MQ Appliance M2000A (for Enterprise)

- High-end solution for enterprise consolidation use case
- Capable of handling large MQ workloads for persistent and non-persistent messaging
- Host multiple Queue Managers to act as a messaging hub
- A possible replacement for multiple separate MQ servers
- Built-in High Availability when paired to a 2nd appliance
- Supports MQ AMS, and can be used to move MQ MFT files between MFT endpoints

IBM MQ Appliance M2000B (Branch etc.)

- Lower-end solution for branch office or factory deployment
- Same software and hardware as the Enterprise appliance, but processor usage limited
- Designed to meet lower messaging throughput requirements
- Supports all other features of M2000A, including High Availability and MQ AMS
- Trade-up part available from M2000B capacity to M2000A capacity

Updating and maintaining



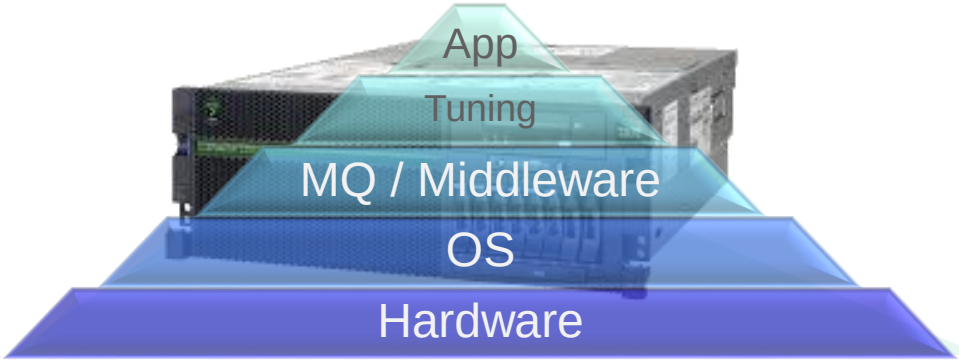
Visit fix central to download appliance updates to a local server ready to deploy

Updates are supplied as a simple single file download, signed and secure, and are the only thing which can be installed on the appliance hardware.

Mq-appliance-8.0.0.3.scrypt3

Copy to appliance – update, and reboot. All driver, system and MQ updates are applied as a single operation

Key Differences with Appliance Form-factor



IBM MQ Appliance

- Prebuilt for Hub pattern – no Apps on device
- No additional software installation
  - No user Exits in MQ
  - Monitoring agents must be remote
- High Availability out-of-the-box
- No external disk support (yet)
- Pre-tuned
- Single Firmware update for whole appliance
  - Firmware update inc. appliance and MQ Fixpack
  - Can be rolled back as an single unit
  - Fixes on latest firmware only

IBM MQ V8 on Custom Server

- DIY Hub *or* Generic server – Apps + Middleware
- Install any software
  - Build & maintain your own custom extensions
  - Add local monitoring agents
- Needs HA Cluster SW or Network Storage for HA
- Access to MQ files
- Custom tuning for each layer (OS/Middleware)
- Discrete maintenance for each layer
  - MQ Fixpacks
  - OS maintenance, security patches etc.
  - Individual MQ fixes possible

Summary

- What the appliance form factor brings
- What MQ capabilities are available
- How does it compare to MQ

Questions & Answers