Benefitting from the MQ Appliance

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IBM MQ L3 Service

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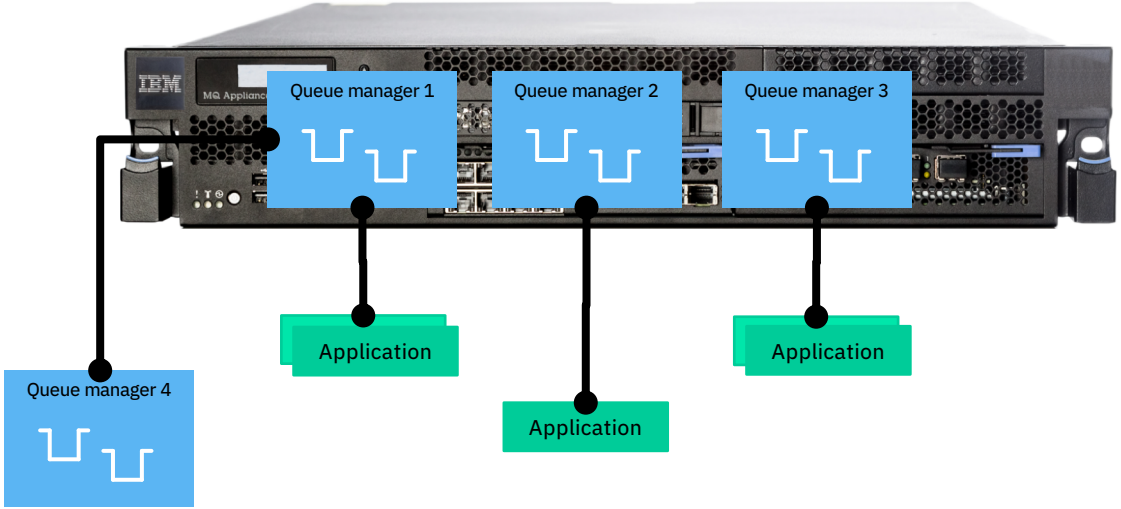
Introducing the MQ Appliance M2002

- The scalability and security of IBM MQ now V9.1.0
- 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
- Familiar feel for existing MQ users – application interfaces, administration, networking and security

- **Easy integration**
  - Integrates seamlessly into MQ networks and clusters
- **High availability**
  - Built-in support for high availability and disaster recovery

Or, to really simplify it...

- A box where you create and run queue managers...



Why an appliance?

Fixed hardware specification allows IBM to simplify and tune the firmware

Fewer variables makes it easier to deploy and manage

Standardisation accelerates deployment

Repeatable and fast, less configuration or tuning required

Hub pattern separates messaging from applications

Improved availability, due to reduced downtime

Predictable performance, simpler capacity planning

Simplified ownership

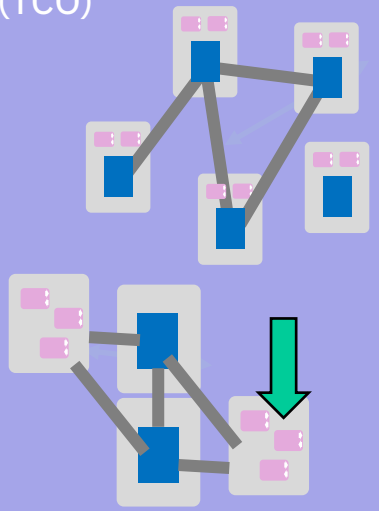
Avoids dependencies on other resources and teams

Simpler licensing

What do you want to do?

- 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

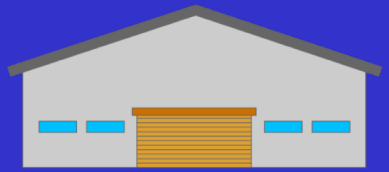
Consolidate MQ infrastructure into an MQ hub for lower total cost of ownership (TCO)



Single point of failure?

Deploy to remote premises:

- Branch
- Factory
- Warehouse



- Single points of failure
- Little expertise

Deploy to a business partner:

- Dealer
- Broker

- Single point of failure?
- Little expertise

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**
- **Pre-tuned**
- **Single firmware update for whole appliance (rollback as single unit)**

IBM MQ on custom server

- **DIY hub or generic server – apps + middleware**
- **Install any software**
  - → Build & maintain custom extensions
  - → Can add local monitoring agents
- **HA cluster SW or network storage for HA**
- **Custom tuning for OS and middleware**
- **Discrete maintenance (OS, MQ, etc.)**

Command Line Interface

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

Welcome to IBM MQ Appliance M2001A console configuration.
Copyright IBM Corporation 1999-2018

Version: MQ00.9.1.0.0 build mq-rel.265326 on Mar 05, 2018 11:10:38 AM
Serial number: 7800537

M2000# mqcli
M2000(mqcli)# dspmqver
Name:         IBM MQ Appliance
Version:      9.1.0.0
Level:        p903-L180305
BuildType:    IKAP - (Production)
Platform:     IBM MQ Appliance
MaxCmdLevel: 910
```

Command Line Interface

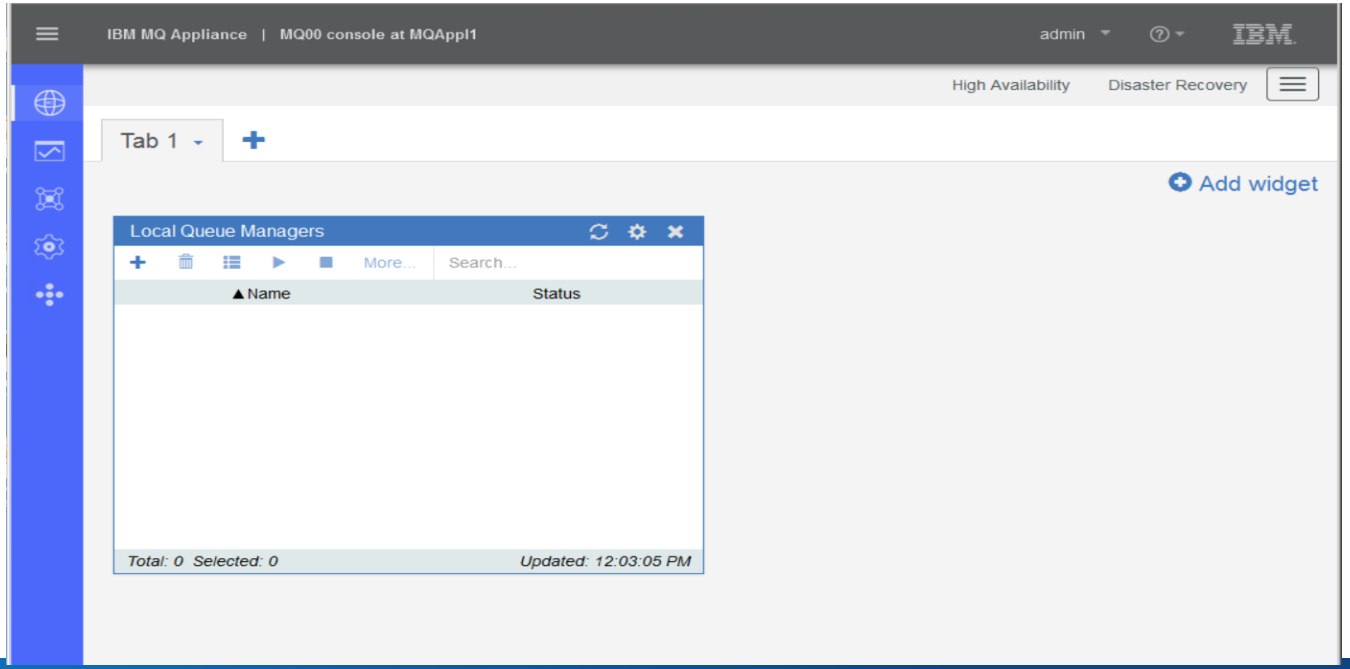
```
M2000(mqcli)# crtmqm test
Please wait while 64 GB file system is initialized for queue manager 'test'.
IBM MQ Appliance queue manager created.
The queue manager is associated with installation 'MQAppliance'.
Creating or replacing default objects for queue manager 'test'.
Default objects statistics : 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.
Transaction manager state recovered for queue manager 'test'.
IBM MQ Appliance queue manager 'test' started using V9.1.0.0

M2000(mqcli)# runmqsc test
5724-H72 (C) Copyright IBM Corp. 1994, 2014.
Starting MQSC for queue manager test.
```

File System

```
mqa(config)# dir
Options:
  temporary:
  image:
  config:
  local:
  backtraces:
  extbacktraces:
  fdbacktraces:
  dpmon:
  dpmonconfig:
  mqerr:
  mqdiag:
  mqtrace:
  mqpubcert:
  fcvolumes:
  mqqmdata:
  mqwebui:
  mqbackup:
  mqtemporary:
```

Web-based Administration - IBM MQ Appliance web UI

- Browser-based user interface allows management of the physical appliance (Ethernet ports, security, etc.) and MQ, with role based access

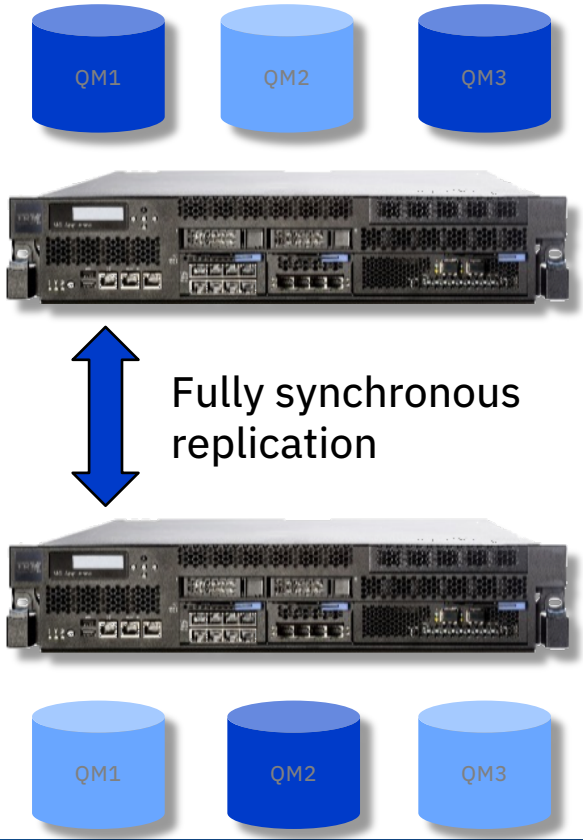


High availability

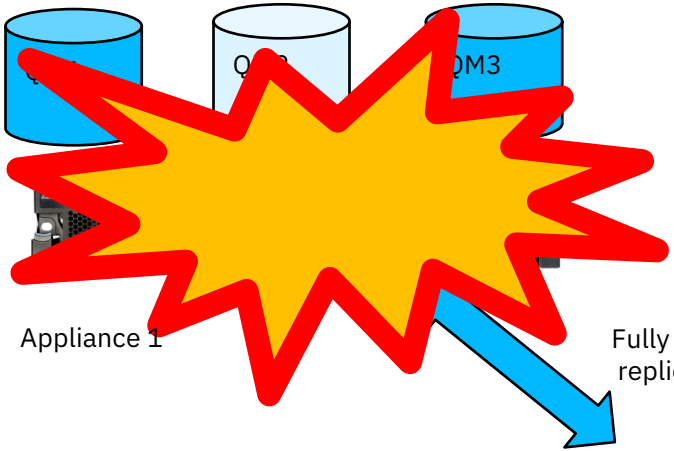
- ✓ Automatic failover, plus manual failover for migration or maintenance
- ✓ Independent failover for queue managers so both appliances can run workload

- × No persistent data loss on failure
- × No external storage
- × No additional skills required

https://www.youtube.com/watch?v=BGaLpIwG0NM

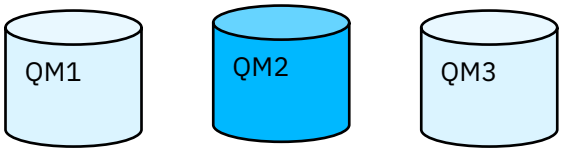


High Availability – Failure scenario



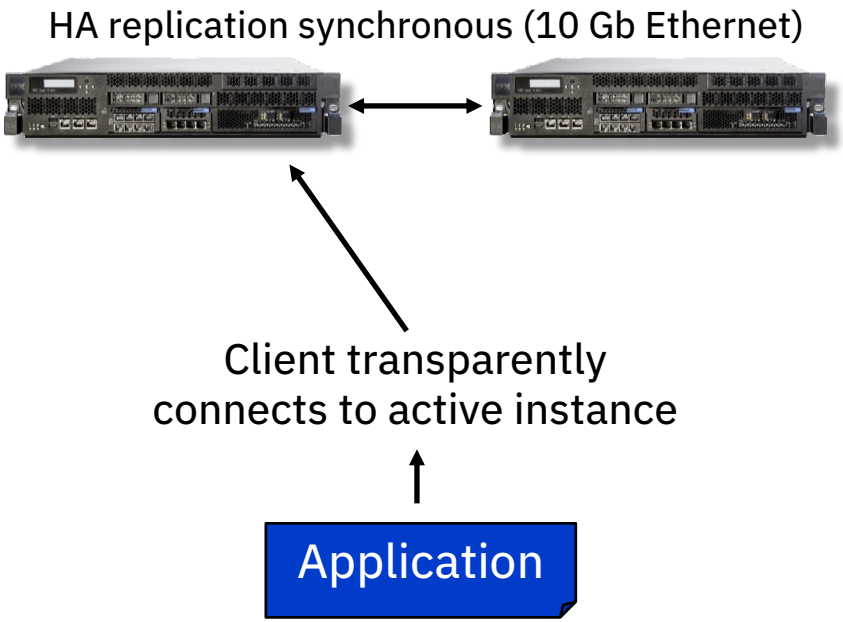
- **Clients (and other Queue managers) reconnect to alternative IP**
- **Usually transparent to application**

Appliance 2



High availability floating IPs

- Optional IP address associated with an HA queue manager
- IP address automatically adopted by the active HA appliance
- Single logical end-point per queue manager for client applications
- No need for comma-separated list of IP addresses, CCDTs, or other routing
- Exploit aggregate interfaces for enhanced network availability



Floating IP configuration (CLI)

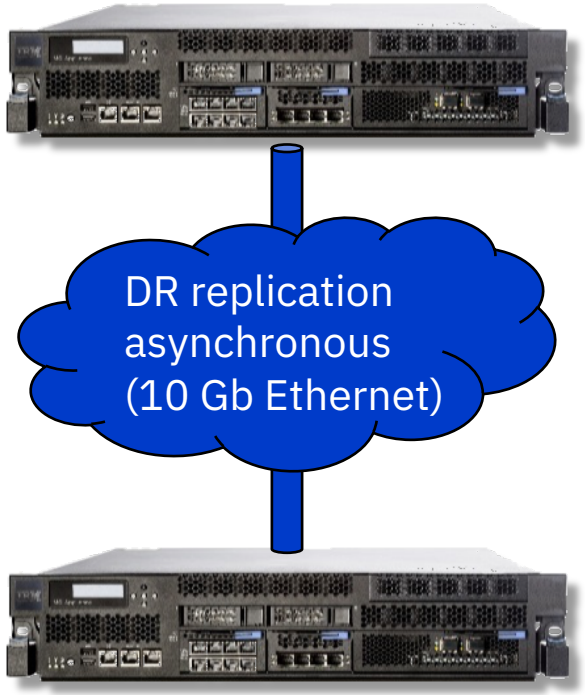
- **sethaint** command can be used to configure a HA floating IP address for a queue manager
- The **dspmq** command displays the IP information

```
mqa(mqcli)# sethaint -m HA1 -a -f 9.20.87.200 -l eth10
The sethaint command succeeded.

mqa(mqcli)# dspmq –o ha
QMNAME(HA1)     HA(Replicated) HALSADDR(9.20.87.200) HALSINT(eth10)
```

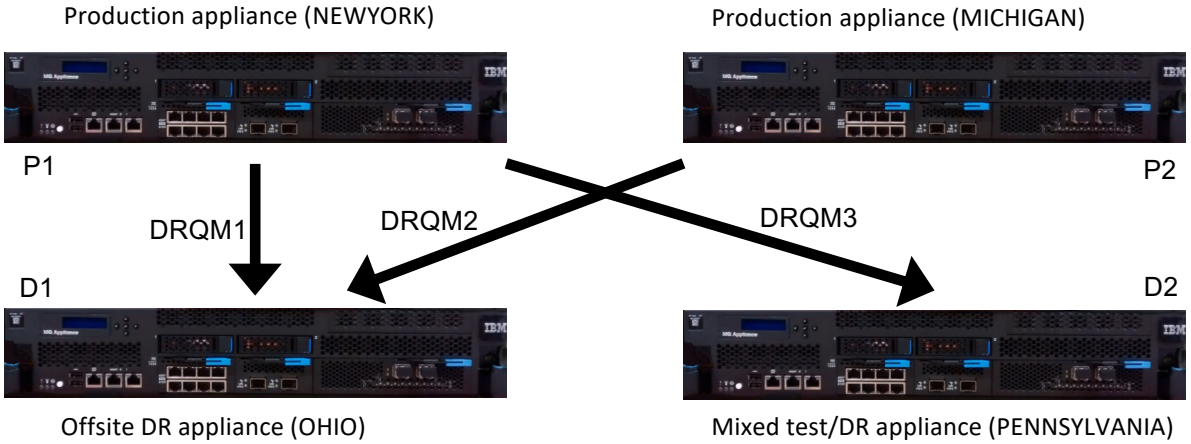
- Define a listener to use the floating IP for inbound connections
  - DEFINE LISTENER(mylist) IPADDR(9.20.87.200)
- Use LOCLADDR for outbound connections
  - DEFINE CHANNEL(mysdr) CHLTYPE(SDR) LOCLADDR(9.20.87.200)

Disaster recovery

- **Provides for longer distance recovery than HA – e.g. out-of-region standby site**
- **High bandwidth connectivity required to mirror all persistent data**
- **Asynchronous replication, so better than HA for higher latency, 'bursty' or 'lossy' networks**
  - → Most recent messages potentially lost on failover so application logic must consider this
- **Manual failover**



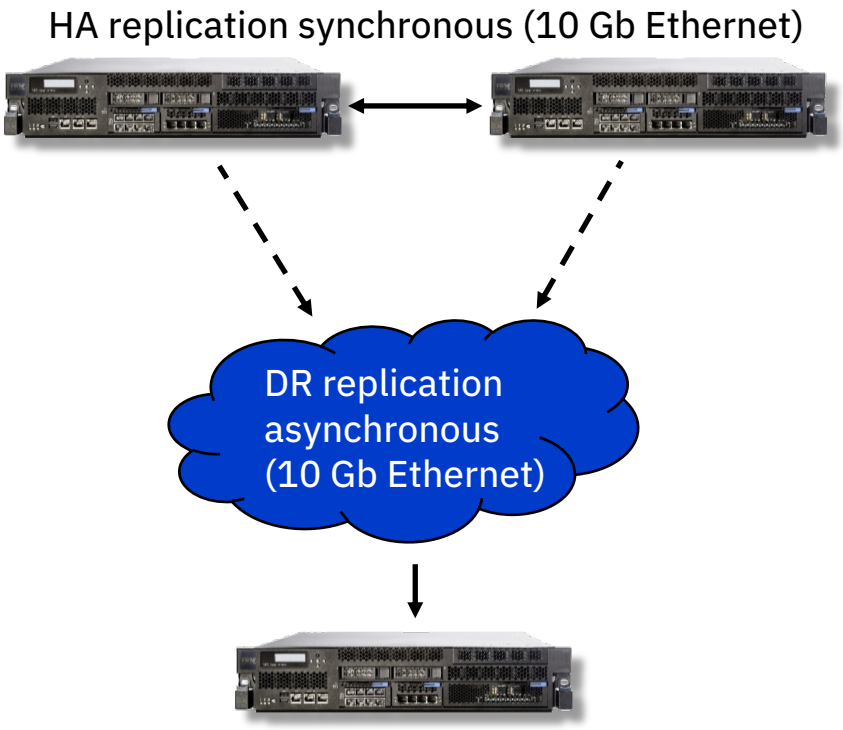
Disaster recovery: Flexible topologies



Each QM independently configures replication to a particular appliance. You can configure a single ‘DR’ site covering live appliances at multiple sites

Disaster recovery for HA groups

- Support for both HA and DR
- DR appliance asynchronously updated from whichever HA appliance is active
- DR configured independently for each queue manager
  - → One HA partner per appliance
  - → One DR recovery appliance per queue manager



Managing queue managers

- Configure queue managers to automatically start when the appliance boots
- Expand the filesystem allocated for a queue manager to respond to growing workload patterns
- Backup and restore queue managers
  - Provides a fall back option when upgrading MQ versions
  - Move a queue manager to an alternative appliance

Administrative security

Two distinct types of user on the appliance

- Users who administer the system (appliance users)
- Users who perform messaging operations (messaging users)

Role-Based Management (RBM)

Security model for managing appliance users

Granular and flexible user and authority management

Authenticate using:

Local users

LDAP repository

Users defined in an XML file

Password and account policy

Authorization

Assign authority to users, or local/LDAP groups

Quickly define simple rules or build granular definitions for complex policies

Useful for multiple appliances with the same user

Restrict access to specific interfaces:

- Require local access for sensitive operations
- Independently grant access to the web UI, REST and SSH

Monitoring

- SNMP support
- Respond to hardware failures, temperature alerts, network errors and other system events
- SNMP versions 1, 2c and 3

MQSC / PCF

MQ Explorer

MQ Console

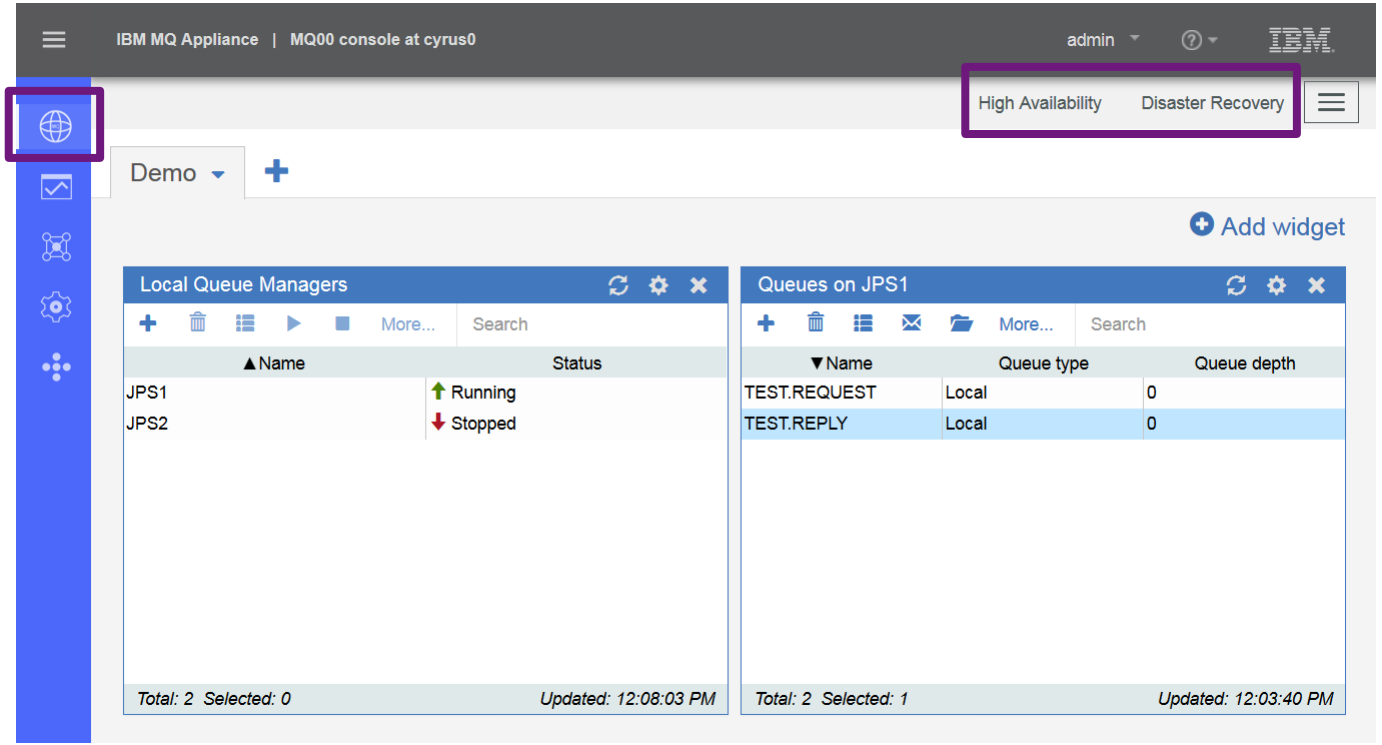
SSH (expect)

- Most traditional MQ monitoring products will work in exactly the same way with an appliance queue manager (‘remote agent’ configuration).
- Flexible system logging configuration with a variety of target types, for integration into whatever wider management tooling you prefer, e.g. remote syslog

- REST administration
- Powerful REST API for system administration and monitoring
- … plus an evolving API for MQ administration

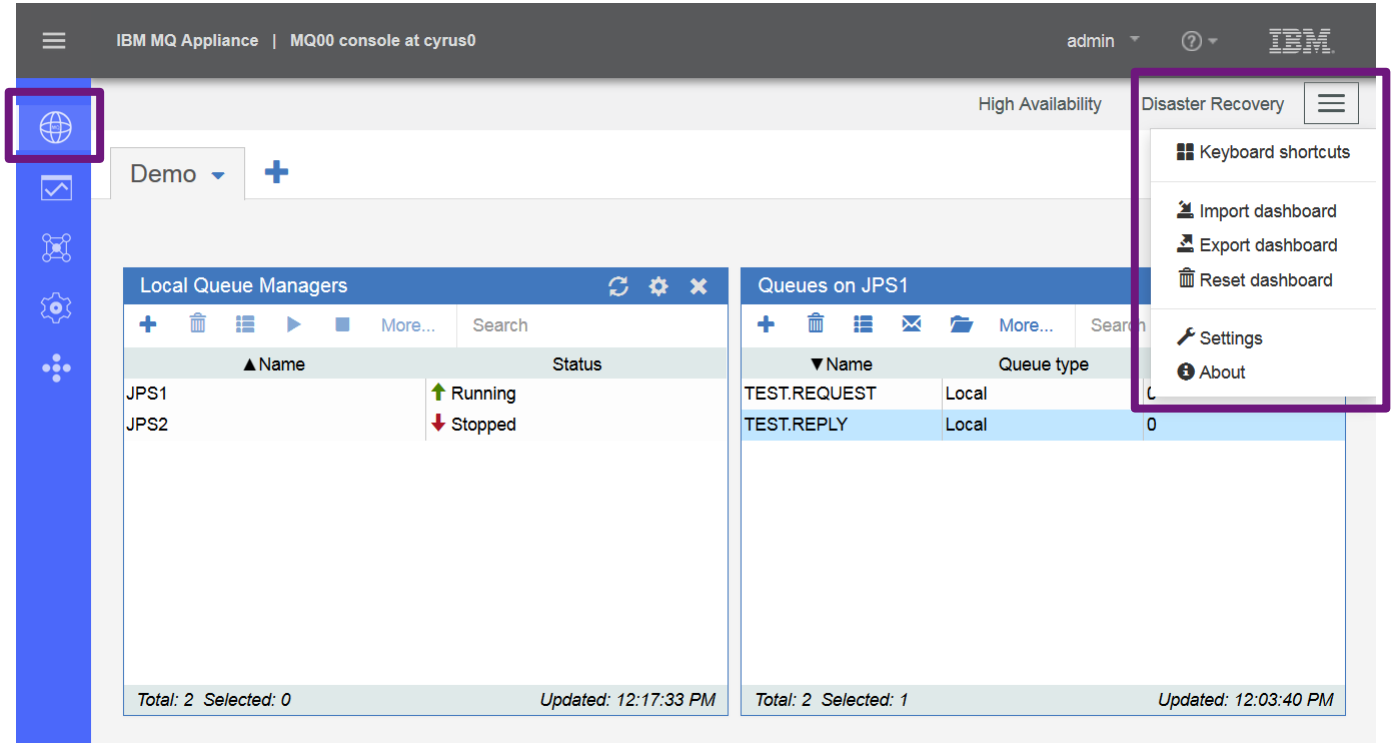
Web user interface

- **Embedded MQ Console**
- **Easy access to configure high availability and disaster recovery**



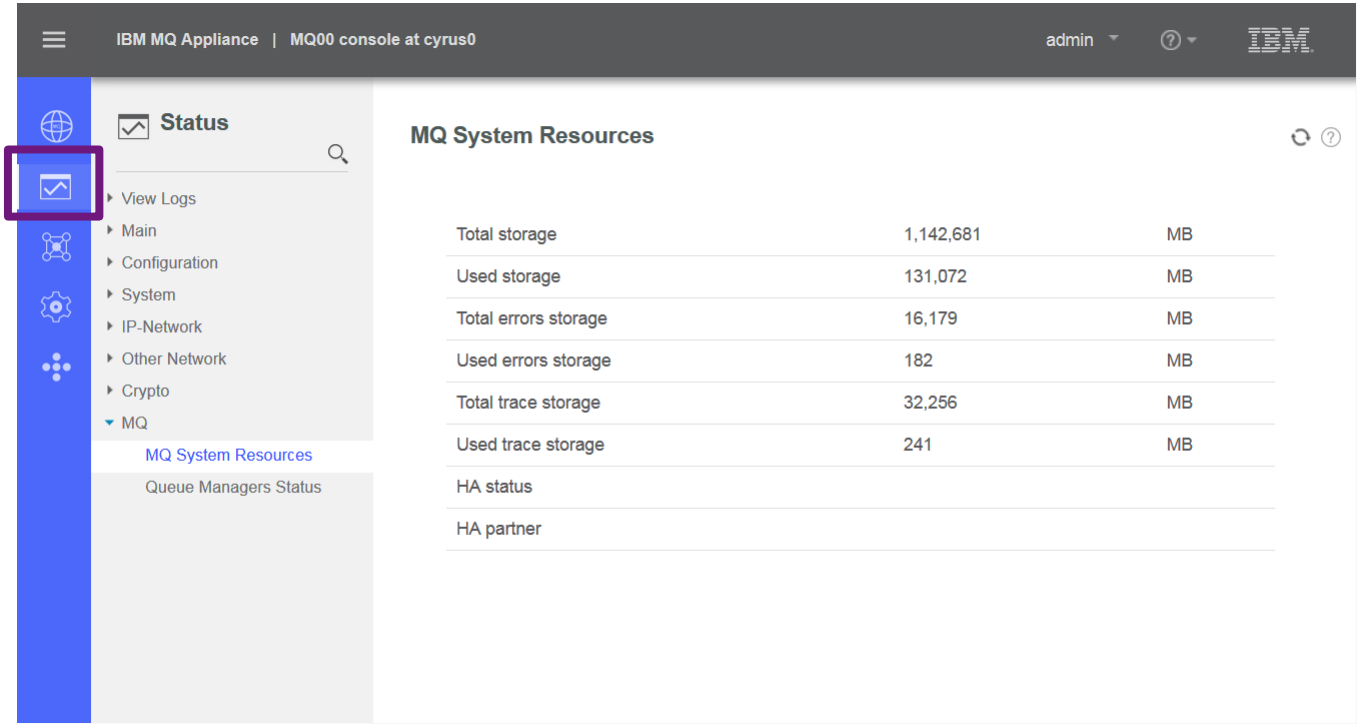
Web user interface

- **Options to import, export and reset the MQ Console dashboard**
- **Ideal for replicating between appliances**



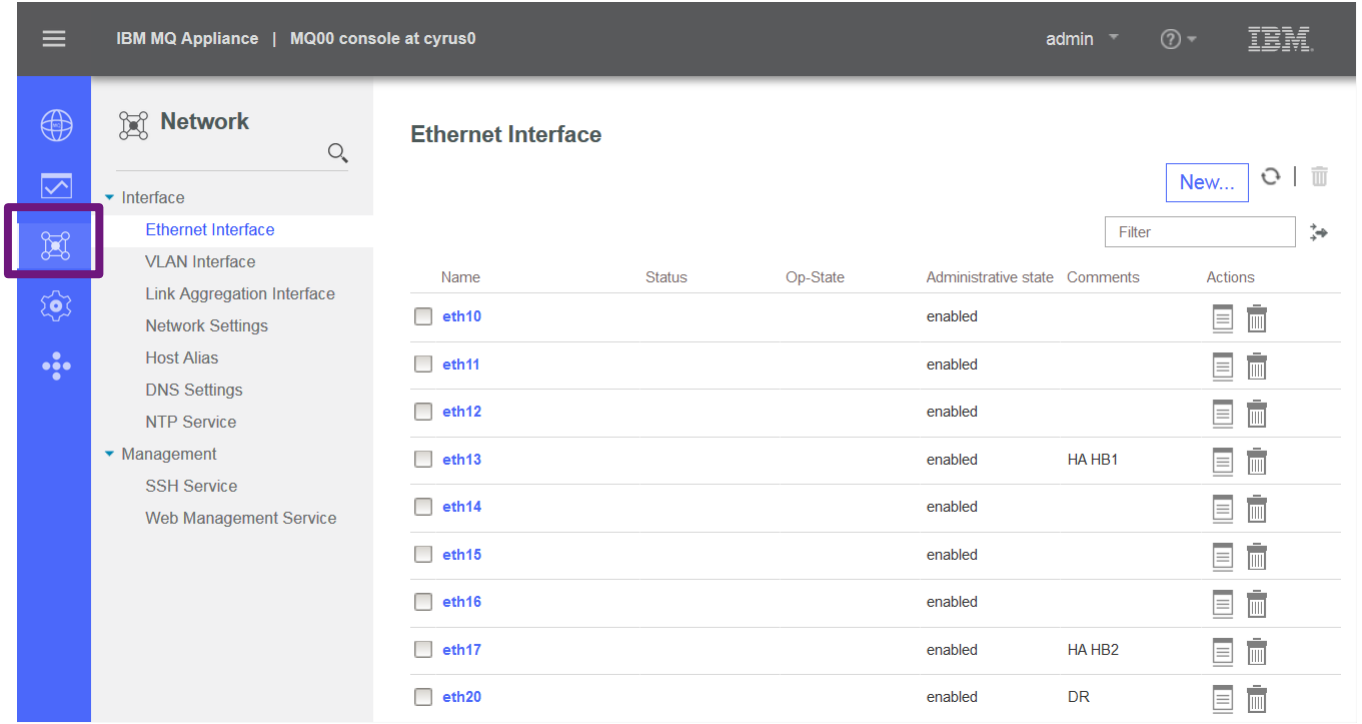
Web user interface

- **View status information about resources, hardware sensors, networking, active users, system logs and more**



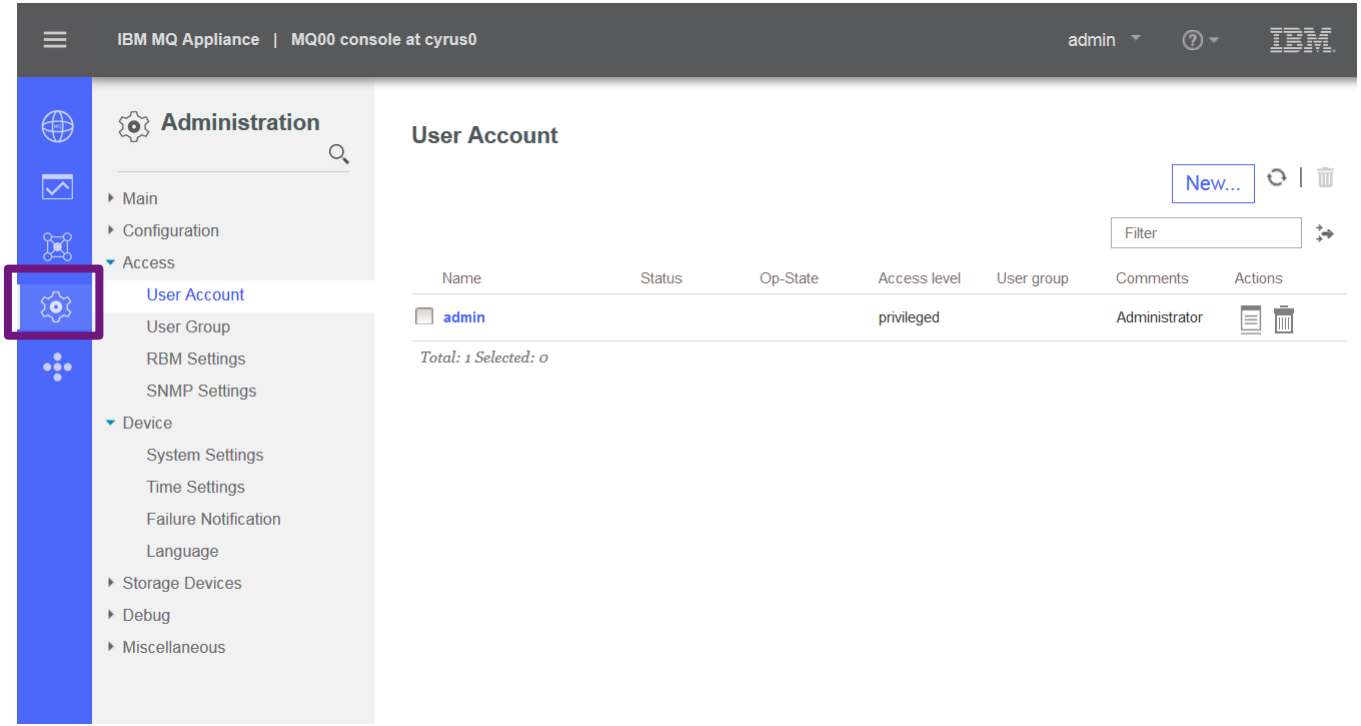
Web user interface

- **Configure the Ethernet interfaces, VLANs, link aggregation and other network settings**
- **Configure SSH and the web UI**



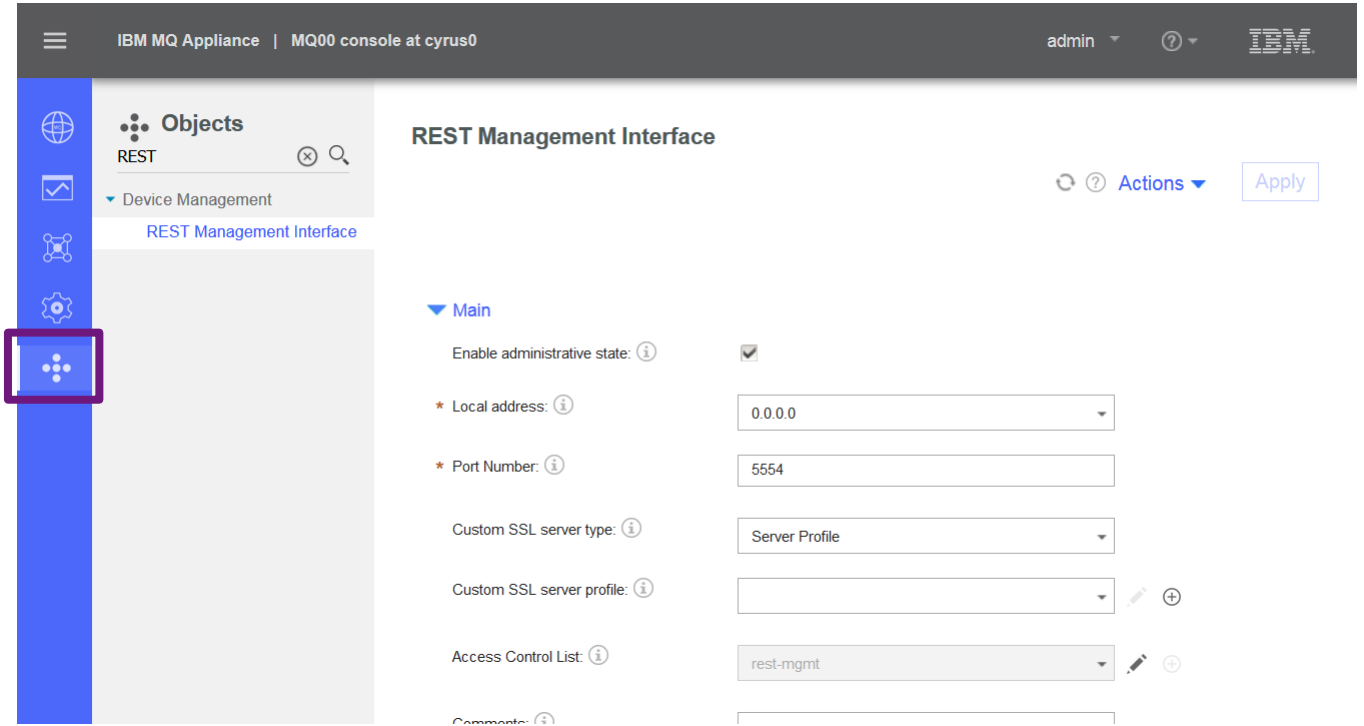
Web user interface

- **Administer local user accounts, role-based management (RBM), SNMP and other system settings**



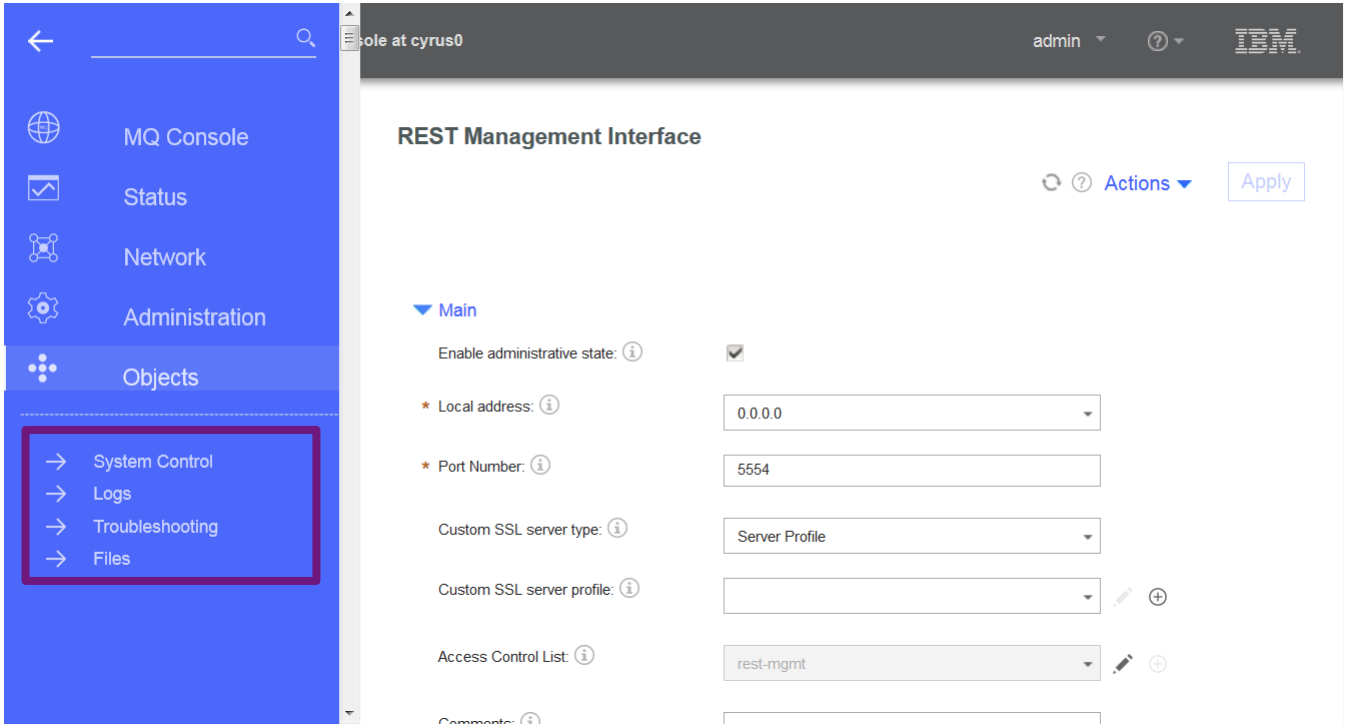
Web user interface

- Manage all system objects in a single view
- Search for object types using keywords



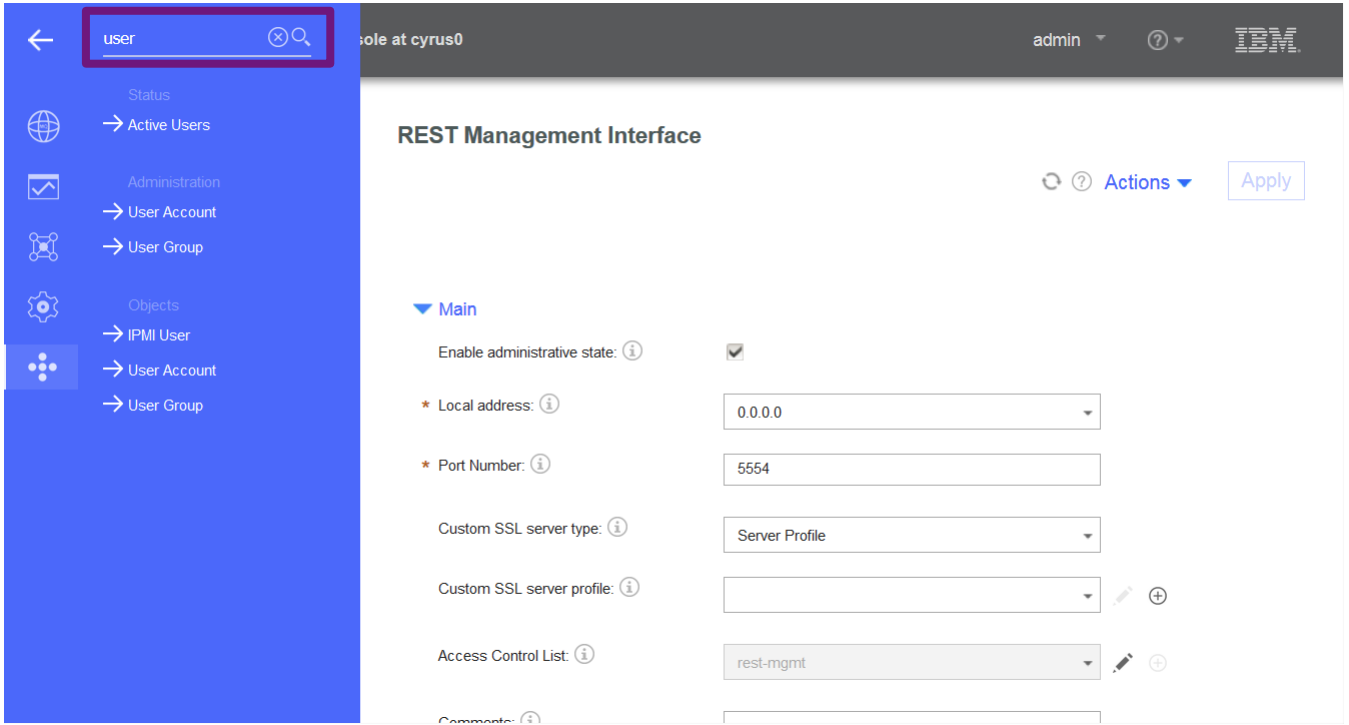
Web user interface

- **Access system logs and files at the click of a button**



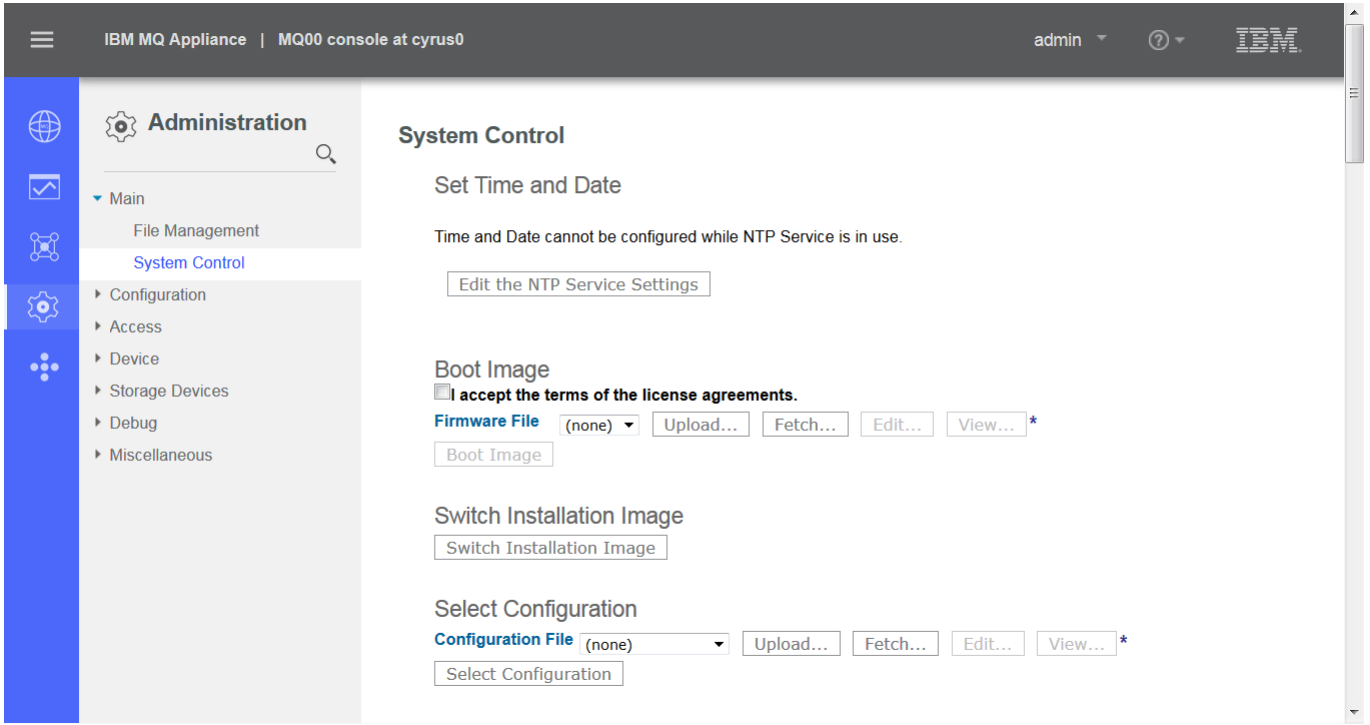
Web user interface

- **Use keywords to search for relevant information throughout the UI**



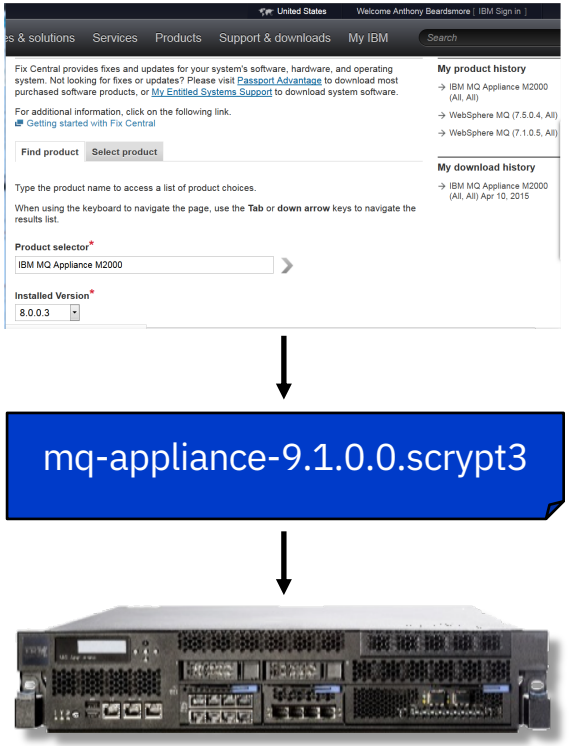
Web user interface

- **Use System Control to:**
  - **Apply firmware updates**
  - **Shutdown or reboot the appliance**
  - **Change the logged in user's password (if applicable)**
  - **Control the blue locator LED**

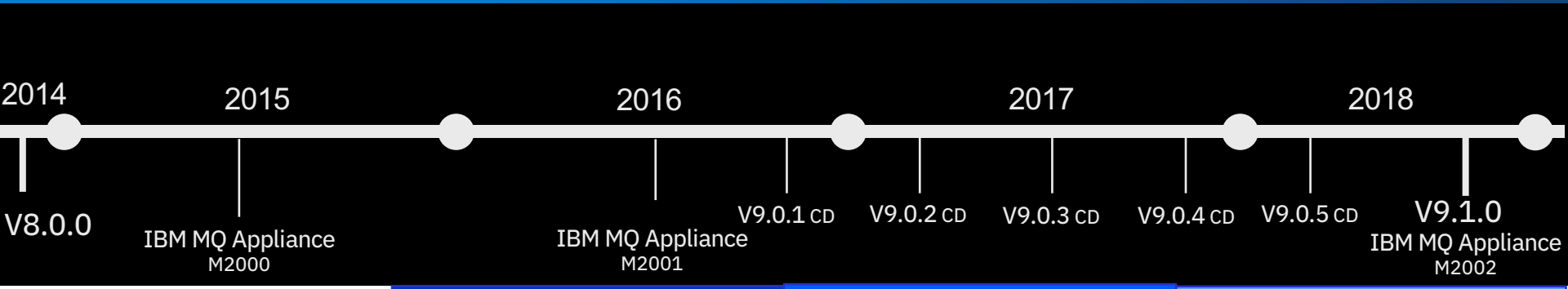


Updates and maintenance

- **Appliance updates supplied as a simple single file; signed and secure.**
  - → Nothing else can be installed
- **All system and MQ updates provided in one consumable package**
- **Rolling updates for HA and DR**
- **To install maintenance:**
  1. Download updates from Fix Central
  2. Copy firmware image to the appliance
  3. Initiate update and reboot



IBM MQ Appliance: long term support and continuous delivery



- 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.

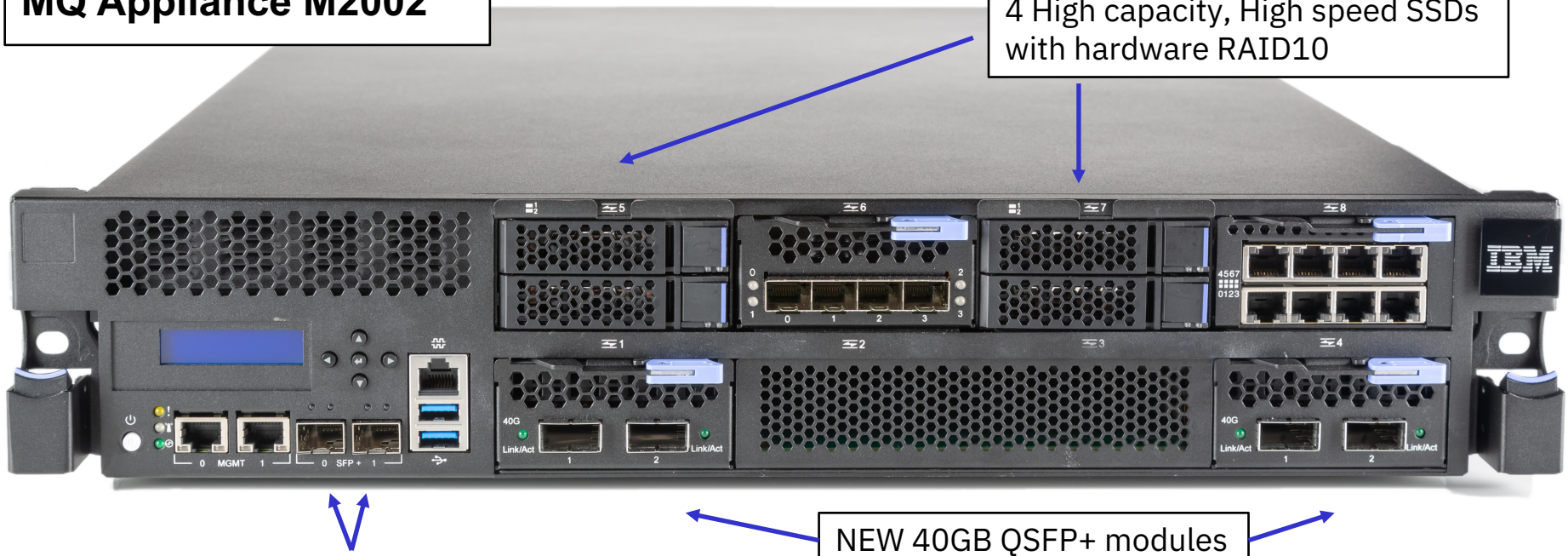
- MQ Appliance
- Current LTS is V9.1.0
- No V9.0.0 LTS.
- Many capabilities discussed in this session have been introduced throughout V9.0.x.

MQ Appliance V9.1 – August 2018

- **V9.1 of MQ has just been released**
  - Aligns the Continuous Delivery and Long Term Service releases of MQ.
- **Includes a roll up of all 9.0.x CD function**
  - Integration of Floating IP and link aggregation
  - REST Management enhancements including remote ‘MQSC’ commands
  - SAN storage support
  - QM Resize
  - MFT logger support
- **New option to select which interfaces are used for data replication in HA and DR configurations**
  - Including option to use Link Aggregations for replication
- **Significant performance enhancements on existing hardware for some scenarios, especially high workload HA**

AND….

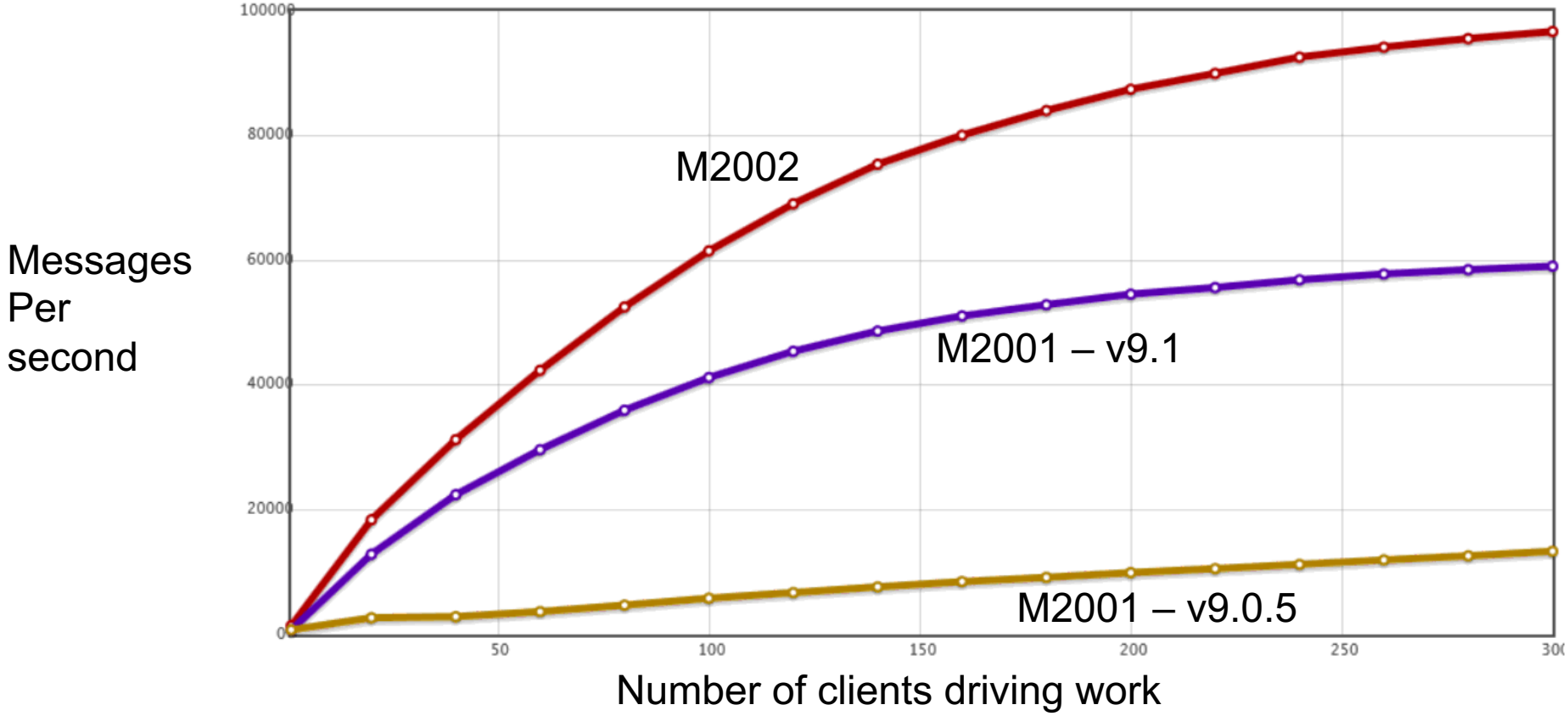
Introducing the IBM MQ Appliance M2002



Plus what you can't see...

- increased CPU cores
- significant jump from Intel™ 'Ivy Bridge' to 'Skylake' architecture
- doubled RAID cache for increased I/O performance

Relative Performance (multi-queue manager, Highly Available, many client applications)



M2002 Hardware Refresh

- Available 3Q 2018 (7/27/18)
  - (replaces M2001 which will cease marketing).
- Choice of A/B models as today
- Adds new 40GB network connectivity
  - Useful for HA replication even if wider infrastructure unavailable today
- Doubled storage capacity and new RAID10 controller with larger cache
- Significant performance improvements across the board
- Based on latest MQ V9.1: Will be available as both LTS and CD releases on the MQ Appliance

Thank you for listening
Questions?

Sam Goulden
IBM MQ L3 Service

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