

All about IBM MQ V8

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IBM Hursley

Session Number: 16195

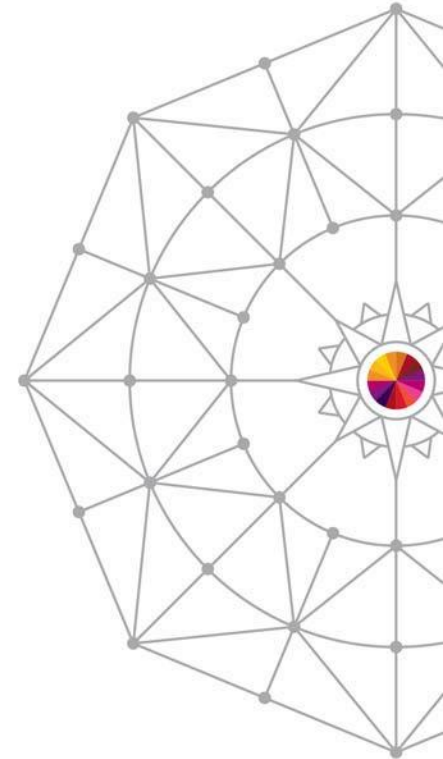


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IBM Messaging – Market segments



Deliver Messaging Backbone for Enterprise

Focus on traditional MQ values, rock-solid enterprise-class service, ease-of-operation, breadth of platform coverage, availability, z/OS exploitation



Capture Big Data from Mobile and Internet of Things

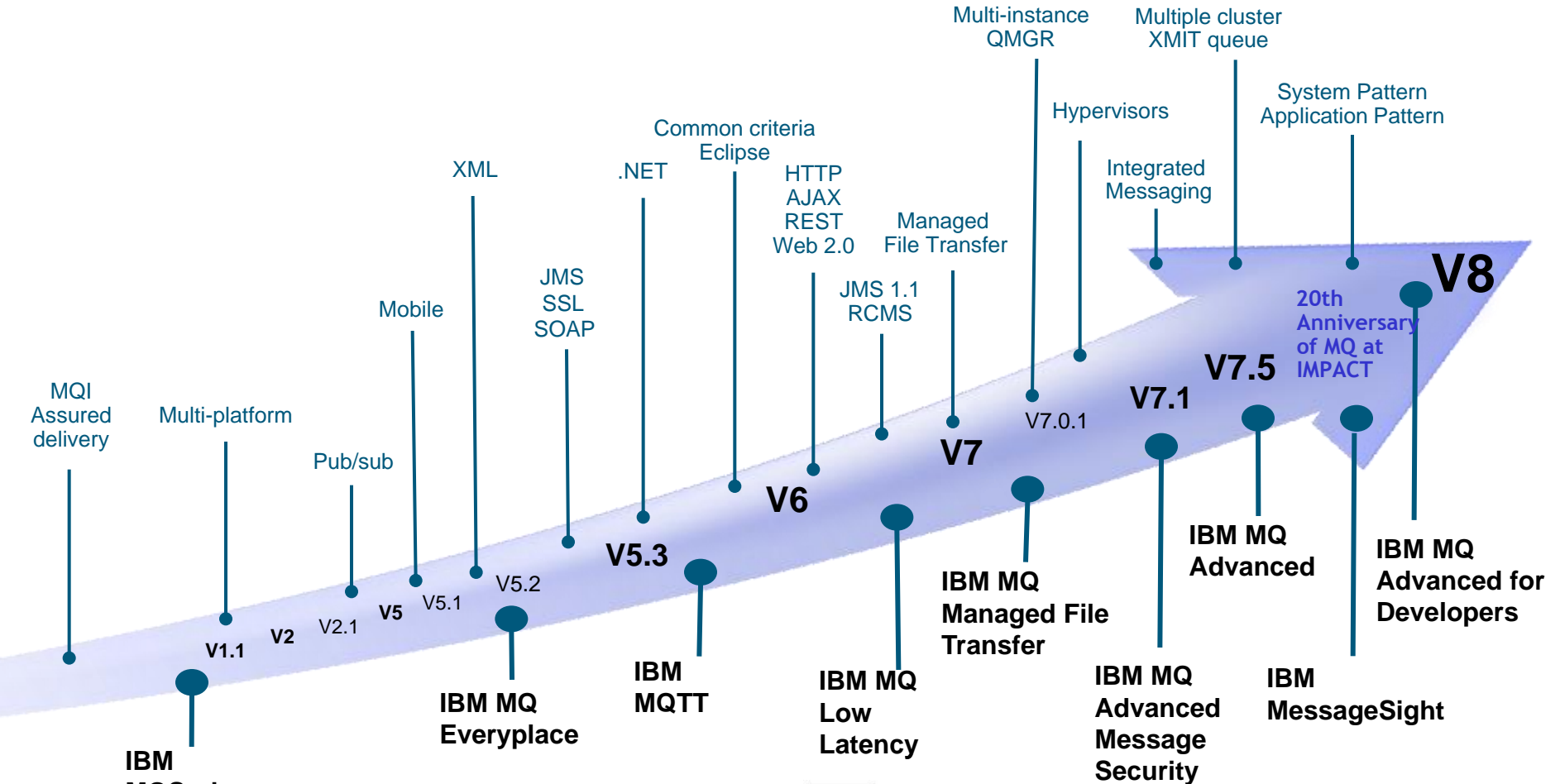
Focus on Internet-scale events, m2m device enablement, zero-admin, security and privacy, feed into real-time analytics, location-based notifications



Enable Developers to build more scalable, responsive applications

Focus on new app dev use cases, breadth of languages, ease-of-deployment, lightweight services, integration with developer frameworks

Timeline



1990s



2000s



2010s

WebSphere MQ V7.1: Feature Summary (Nov 2011)

<i>New Feature</i>	<i>Benefits</i>	<i>Details</i>
Multi-Version Install capability on Distributed platforms	Makes it easier to deploy and upgrade systems and stage version to version migration	Unix and Windows support for multiple versions of MQ V7.x (AND one copy of MQ V7.0.1) down to fixpack levels. Relocatable installation support. Applications can connect to any Qmgr
Enhanced Security	Simplified Configuration Enhanced Authorisation and Auditing	IP address Authorisation capability Additional crypto algorithms More granular authorisation for non-local queues Application Activity Reports
Cloud Support	Simplifies and support Cloud deployments	Additional HVE images
Enhanced Clustering	Improves ease-of-use	Authorisation on Cluster Q rather than XMIT Q on Dist. Platforms Bind-on-Group Support
Multicast capability	New messaging QoS provides low latency with high fan-out capability	MQ Pub/Sub Topic space can now map to multicast Group Addresses Provides direct interoperability with MQ LLM
Improved scalability and availability on z/OS	Further exploitation of z196 Customer control over CF storage use CF Connectivity Loss improvements	Code contention reduced to improve multi-processor linear scaling Use of MQ Datasets rather than DB2 significantly improves “large” message capability Structure rebuild capability for CF Connectivity Loss scenarios
Improved Performance on Dist platforms	Improved multiprocessor exploitation	Various code improvements

WebSphere MQ V7.5: Feature Summary (June 2012)

- For Windows, Unix and Linux

<i>New Feature</i>	<i>Benefits</i>	<i>Details</i>
Integrated Installation	Makes it easier to deploy systems Simpler licensing	Combines several products into a single package Common experience
Enhanced Clustering	Improves ease-of-use Improves application isolation	Split Cluster Transmission Queue
Java Application Identification	Makes it easier to distinguish applications	Applications no longer to all have the same name
AMS channel interception	Provides a level of message protection even when application environment cannot run AMS	Interception in the SVRCONN still protects messages before hitting queues
FTE Logger Options	Can write FTE audit records to flat file	No longer a requirement for an enterprise database Easier to read data immediately

2013 Updates

WebSphere MQ: Feature Summary (2013)

- Updates to pricing and function during 2013

<i>New Feature</i>	<i>Benefits</i>	<i>Details</i>
MQ 7.1 Value Unit Edition introduced for z/OS	One time charge (OTC) pricing for zNALC workloads	Queue managers supporting qualified workloads on System z New Application License Charge (zNALC) LPARs Includes WebSphere MQ Client Attach, allowing free-of-charge connections from MQ Clients to z/OS
SHA-2 CipherSpecs for SSL/TLS on z/OS	Stronger hashing algorithms Required/recommended by some authorities	Available from V7.1 GA on distributed platforms Now also available on z/OS 7.1, with two APARs*
Internet PassThru (MS81) refresh	Updates to SOE and crypto algorithms Consistent SSL/TLS support and certificate DN attributes with MQ V7.1	Uses JRE-provided Java Secure Sockets Extension (JSSE) Support for SHA-2 and elliptic curve encryption, in line with US NIST standard SP800-131A recommendation
MQ JCA RA support in WAS Liberty profile	MQ 7.5.0.2 RA is easily configured in Liberty Connects to any supported version of MQ	Liberty profile expects resource providers (database, messaging) to supply provider-specific classes Configure “wmqJmsClient.rar.location” variable in server.xml
MQ 7.1 Extended Transactional client for HP NSS platform	MQ V7.1 function for NonStop applications accessing MQ on other systems Free and fully supported	Supports C/C++, COBOL, pTAL, JMS Supports Guardian and OSS applications including OSS multi-threaded applications Available as SupportPac MAT1

*APAR OA39422 needed on z/OS V1R13 for System SSL

*APAR PM77341 for MQ on z/OS V7.1

2013 enhancements: **Developer**



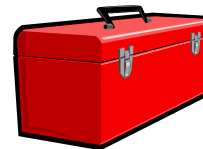
<i>Enhancement</i>	<i>Benefits</i>	<i>Details</i>
MQ Advanced for Developers – free for devt use!!	Development use only edition Free of charge	Full MQ Advanced V7.5 functionality Available free of charge for development use only Download from developerWorks, MQdev community Best effort community assistance
IBM MessageSight for Developers – free for devt use!!	Development use only edition Free of charge	Virtual MessageSight image, updated to V1.1 Available free of charge for development use only Download from developerWorks, IBM Messaging community Best effort community assistance
Mosquitto - Open source MQTT server	Simple, open access to get on-board with MQTT and MQTT-SN	Proposed Eclipse Mosquitto project for open-source MQTT server for lightweight devt use MQTT-SN (MQTT for sensor networks) specification available
IBM MQ Light – alpha release	Straight forward, easy to use messaging API for writing scalable and responsive applications	Download and feedback via developerWorks community Available free of charge for development use Currently new API available in Java, more languages to come Regular updates planned introducing new features and responding to feedback

IBM MQ Light

- Simplifying Development for developer-led Messaging Applications
- “MQ Light” - a new messaging form factor, easy for developers
 - Straightforward download and unzip – zero install
 - Simple Web UI– no need to be an infrastructure specialist
- Focus on your application – using simplified messaging API
- Support for popular languages and tooling with seamless migration from development into production
- MQ Light runtime not for advanced messaging uses cases, enterprise backbone or highly available/scalable apps



Developer coding in
**JavaScript, Java, Python,
Ruby, C#, PHP**



**Builds messaging into applications
using preferred IDE or CLI
and tests in developer sandbox**



Download “MQ Light” alpha and try it today

<https://www.ibm.com/developerworks/messaging/mq-light>

IBM developerWorks Sign in dW

IBM Messaging Blogs Answers

MQ Light **alpha**



The alpha release for MQ Light is now available. You can help shape the product we release by trying out the alpha code and leaving your feedback.

[Download Windows 7 64-bit](#)

[Download Linux x86-64](#)

Latest version released: 29th November 2013

Application Developers can use MQ Light to make their apps more responsive and scalable. Share and offload work between applications with a simple, powerful API.

Learn about MQ Light

How can MQ Light help my Applications?
MQ Light provides a configurable messaging runtime, for developers to write apps in just a few minutes.
[Read more...](#)

Getting started with MQ Light
Install and start MQ Light in just three steps.
[Read more...](#)

MQ Light Concepts & API
Learn more about the concepts behind MQ Light, and its simple, yet powerful API.
[Read more...](#)

API Samples

[Java](#) [Ruby*](#) [JavaScript*](#) *coming soon [Don't see your favourite language? Let us know: leave feedback](#)

Sending a message - The following snippet sends a message to an address called address1

```
Client client = new Client("client-id1");
client.send("address1", "Hello World!");
client.close();
```

Receiving messages - The following snippet receives a message from an address called address1

```
Client client = new Client("client-id2");
Destination dest = client.createDestination("address1", 60000);
Message msg = dest.receive(30000);
System.out.println(msg == null ? "No message" : msg.getTextPayload());
client.close();
```

2013 enhancements: Internet of Things, mobile & m2m



<i>Enhancement</i>	<i>Benefits</i>	<i>Details</i>
IBM MessageSight V1.1	High-performance, reliable, and scalable messaging - designed specifically for M2M and Mobile scenarios	<ul style="list-style-type: none"> Balance mobile workloads across your enterprise application server clusters Single sign-on from mobile devices to your enterprise apps Disconnected app notification that messages are waiting
IBM Internet of Things Cloud – statement of direction	<ul style="list-style-type: none"> Fully cloud hosted solution for internet of things Freemium, PAYG & custom pricing 	<ul style="list-style-type: none"> Scalable connectivity for small and large numbers of devices Uses industry-standard, MQTT transport Registration of devices for access to the cloud service offering Ability for devices to produce and consume events and messages in near real-time
Mobile Messaging clients	Updated clients for mobile platforms	Updated clients for Android, iOS & hybrid mobile apps

IBM MessageSight – a messaging Appliance

- Extends the IBM Messaging family with a secure, easy to deploy appliance-based messaging server, optimized to address the massive scale requirements of machine to machine (m2m) and mobile use cases
- A million connections, and millions of messages per second
 - Exploits hardware acceleration for performance
- Designed to sit at the edge of the enterprise
- Can extend your existing messaging infrastructure or used standalone
- Complements MQ - provides an offload/accelerator for edge of enterprise scenarios
- Supports familiar APIs with a mixture of standard and high-speed protocols



2014 Updates

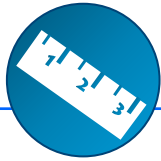
End of Service for old platforms and versions

- MQ V7.0.0 and V7.0.1 for multiplatforms – EOM, EOS effective **September 2015**
 - V7.0 will have had more than 7 years of support

- MQ V7.0.1 for z/OS – EOM, EOS effective **September 2015**
 - V7.0 .0 already out of service

- MQ V3 for VSE – EOM, EOS effective **September 2015**
 - Extended support contracts available

IBM MQ V8 delivering best in class enterprise messaging



Platforms & Standards

Security

Scalability

System z exploitation

64-bit for all platforms

Userid authentication via OS & LDAP

Multiplexed client performance

64-bit buffer pools in MQ for z/OS means less paging, more performance

Multiple Cluster Transmit Queue on all platforms

User-based authorisation for Unix

Queue manager vertical scaling

Performance and capacity

Support for JMS 2.0

AMS for IBM i & z/OS

Publish/Subscribe improvements

Performance enhancements for IBM Information Replicator (QRep)

Improved support for .Net and WCF

DNS Hostnames in CHLAUTH records

Routed publish/subscribe

Exploit zEDC compression accelerator

SHA-2 for z, i & NSS

Multiple certificates per queue manager

SMF and shared queue enhancements

MQ V8 Dates

- Announce: 22 April 2014
- Availability:
 - 23 May 2014 (eGA Distributed)
 - 13 June 2014 (z/OS and pGA Distributed)

MQ platform and product consistency

- 64-bit server support for all queue manager platforms
 - Completion of platform coverage by adding Windows 64-bit engine
 - Requires Windows 7 or later
- Multiple Cluster Transmit Queue availability on z/OS and IBM i platforms
 - Permits separate monitoring of cluster traffic and prevents one message stream from affecting throughput of others
- Integration of AMS and MFT capabilities into z/OS and IBM i platforms
 - Previously separately installable products
- Client Attach Feature no longer needed on z/OS
 - Single price includes support for clients

MQ Security - Authentication

- Verify userid and password
 - Typically supplied in MQI CSP structure or from channel security exit
 - Or JMS connect(user,pass) method
 - New client exit and tool provided to help unchanged applications insert passwords
- Can verify against operating system
 - Including PassPhrase for z/OS
- Can verify against LDAP repository on Distributed platforms
 - Enabling centralised identity control
- Still constrained to 12 character userids
 - With LDAP, supplied username may be "long" (eg an email address or full DN)
 - But must have an associated 12 character shortname
- Independent configuration for local bindings and clients
 - Ignored, Optional, Required, Required for admin id

MQ Security - Authorisation

- Make Unix OAM userid-based
 - Optional configuration
 - Consistent with other platforms
 - Will no longer add primary group to authorities during setmqaut
 - Chosen at queue manager creation or by editing qm.ini
- Default is still group-based authorisations

```
$ crtmqm -oa user QMU
```

```
-----
```

```
Service:
```

```
    Name=AuthorizationService
```

```
    EntryPoints=14
```

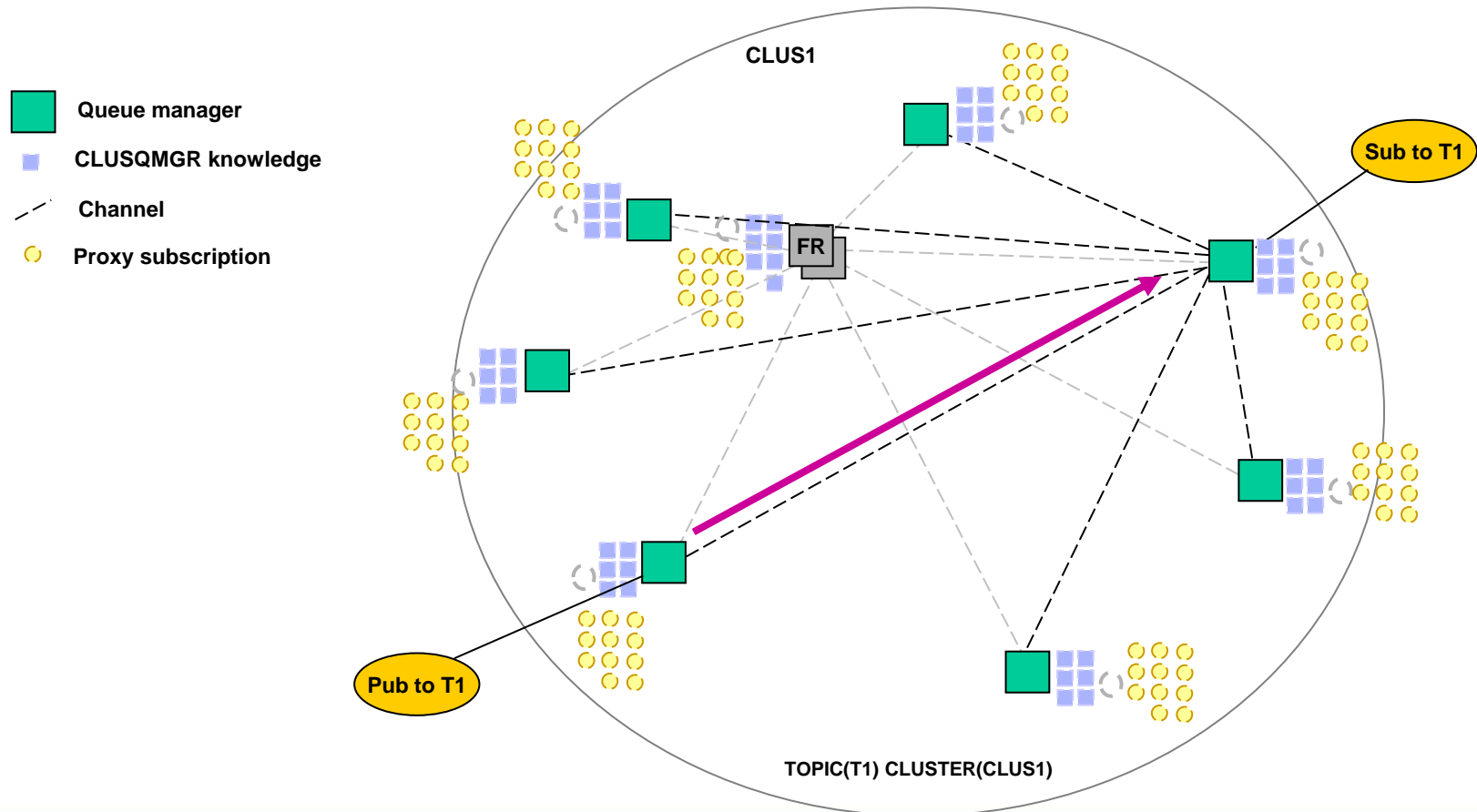
```
    SecurityPolicy=User
```

MQ Security - Other

- Use DNS hostnames in CHLAUTH records
 - Also provide a way to disable reverse lookup
- Configurable default certificate label for qmgrs and clients
 - Instead of "ibmwebspheremq<qmgr>" or "ibmwebspheremq<userid>"
- Channel-level certificates
 - To support different business partners using different CAs.
 - For queue managers and C clients
 - Not Java yet, because Java 7 JSSE does not fully support SNI
 - Both ends must be V8
- Delete Authority record by SID
 - Solve problem of orphaned authorities when Windows id is deleted

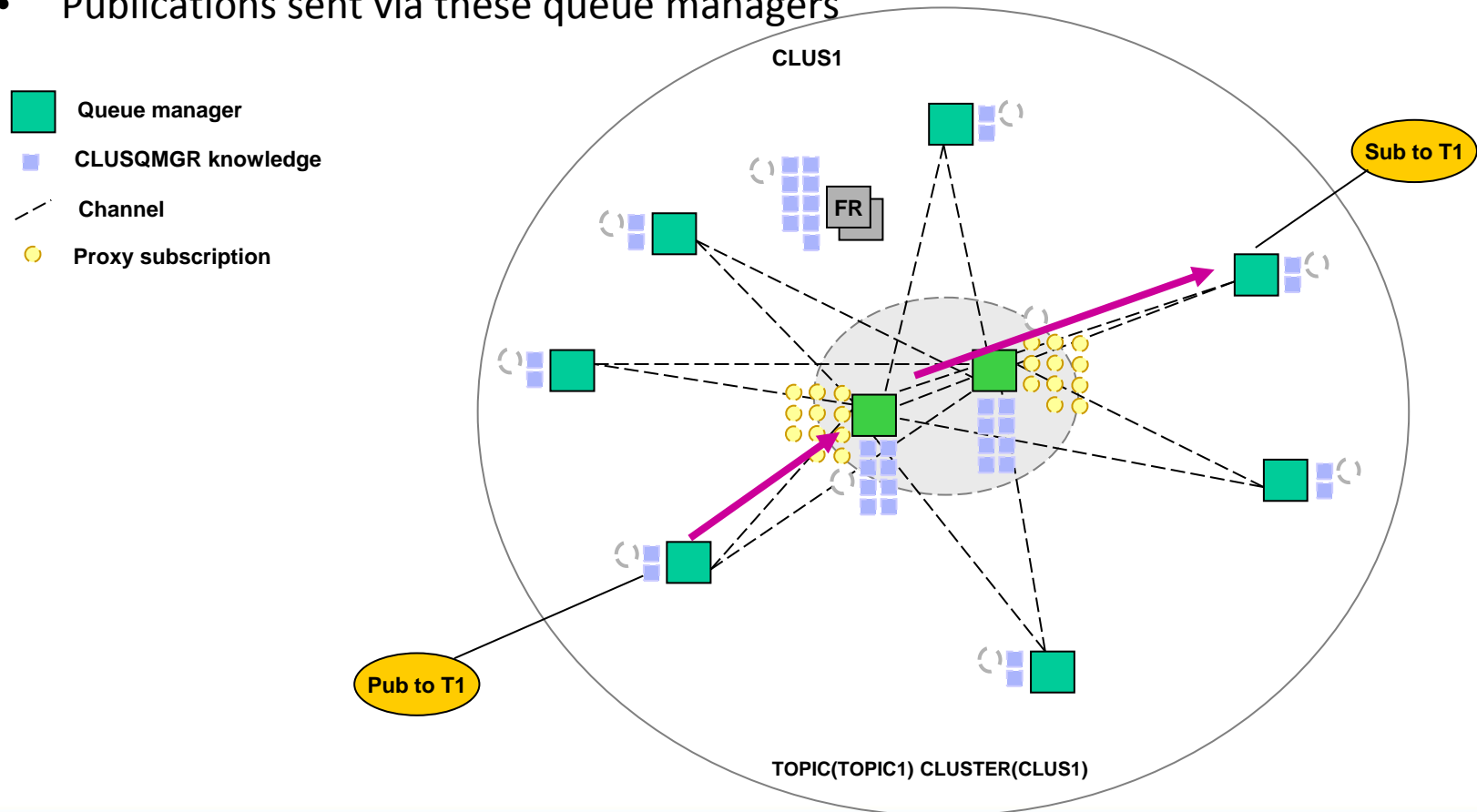
Pub/sub scalability - cluster behaviour before V8

- All queue managers in a cluster know everything and need to be able to connect to anyone



Pub/sub scalability - cluster behaviour with V8

- New concept of "**routed**" topics
- Configure subset of queue managers to know everything and connect to everyone
- Publications sent via these queue managers



Configuration of routed topics

- Topic routing is configured in the TOPIC object definition
 - Uses the CLROUTE property:

```
DEFINE TOPIC(topic)  
  CLUSTER(clustername)  
  CLROUTE(DIRECT|TOPICHOST)
```

- DIRECT: Provides V7 behaviour, publications travel directly from publishing queue managers to subscribing queue managers
 - TOPICHOST: publications travel via a topic hosting queue manager
- New function in MQ V8
 - Only V8 queue managers can participate in routed clustered publish/subscribe
 - Full repositories must also be at V8
 - Older queue managers are not told of the routed topic definitions and therefore behave as if the topic was not clustered.
 - All V7 queue managers can continue to participate in direct clustered pub/sub

Improved pub/sub status reporting

- Additional display attributes on DISPLAY PUBSUB.
- Permits detection of unexpected growth in topics/subscriptions
 - Can gauge the magnitude of a DISPLAY TPSTATUS/SUB/SBSTATUS command.

```
DISPLAY PUBSUB ALL
```

```
3 : DISPLAY PUBSUB ALL
```

```
AMQ8723: Display pub/sub status details.
```

```
QMNAME(QMGR3)
```

```
TYPE(LOCAL)
```

```
STATUS(ACTIVE)
```

```
SUBCOUNT(241)
```

```
TPCOUNT(105)
```


General pub/sub improvements

- More efficient handling of subscriptions for popular topic sub-trees and dynamic subscriptions
 - MQ V7.x behaviour sends out individual proxy subscriptions
 - MQ V8 topic object with PROXYSUB set to FORCE
 - Generates a single wildcarded subscription
 - Disables individual proxy subs for topic strings lower in the topic tree
- Better pub/sub error handling in multi-queue manager environments
- Selectors are evaluated on the message as published, before modification by the publish operation, for delivery to each subscriber
- More efficient handling of large numbers of topics
 - Linear scaling to at least a million topics

Changes to runmqsc

- Can now be run by any user (not just mqm group)
 - Can take a userid/password for authentication: new "-u" flag
- Can now connect as a client to remote systems: new "-c" flag
 - Client channel definitions located by MQSERVER -> MQCHLLIB -> MQCHLTAB
- Can act as standalone program to create local CCDT: new "-n" flag
 - Does not connect to queue manager; commands subset to update local channel definition file

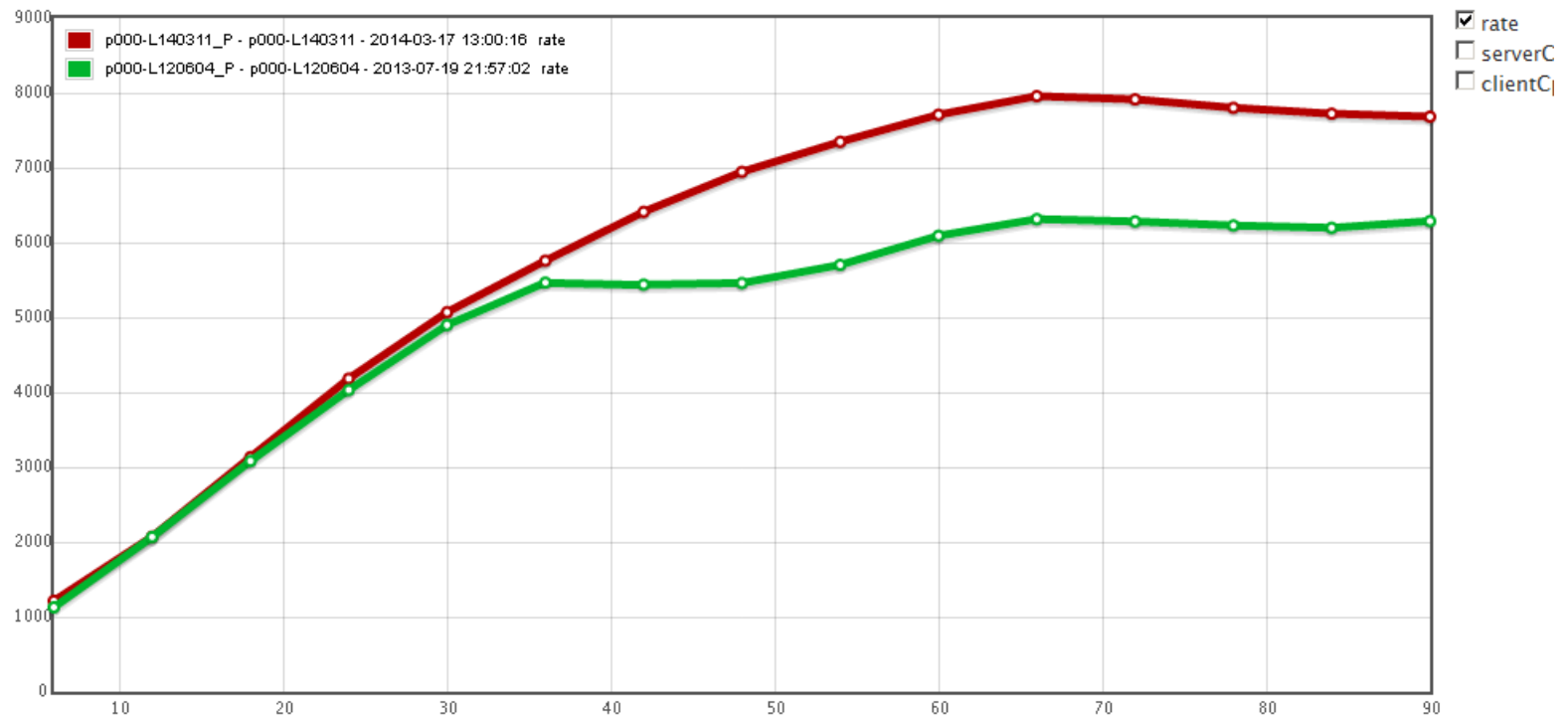
Distributed Performance

- Improvements to distributed queue manager scaling
 - Improve efficiency
 - Better exploitation of wider SMP machines
- Multiplexed client performance
 - Increase the performance of multiplexed client channels (SHRCONV > 0)
 - Especially for SHRCONV=1
- Other areas that helped:
 - Cache alignment for internal structures
 - Extended 64-bit exploitation for locking primitives
 - RFH2 handling, particularly for waiting-getter
 - Fewer copies of data are needed
 - Better compiler optimisations
 - Faster data conversion (especially for 1208)
 - Many messages are in 1208 codepage
 - Optimised handling when the queue manager needs to convert them

Distributed Performance: Persistent Messaging

- A realistic view of how persistent message performance has improved

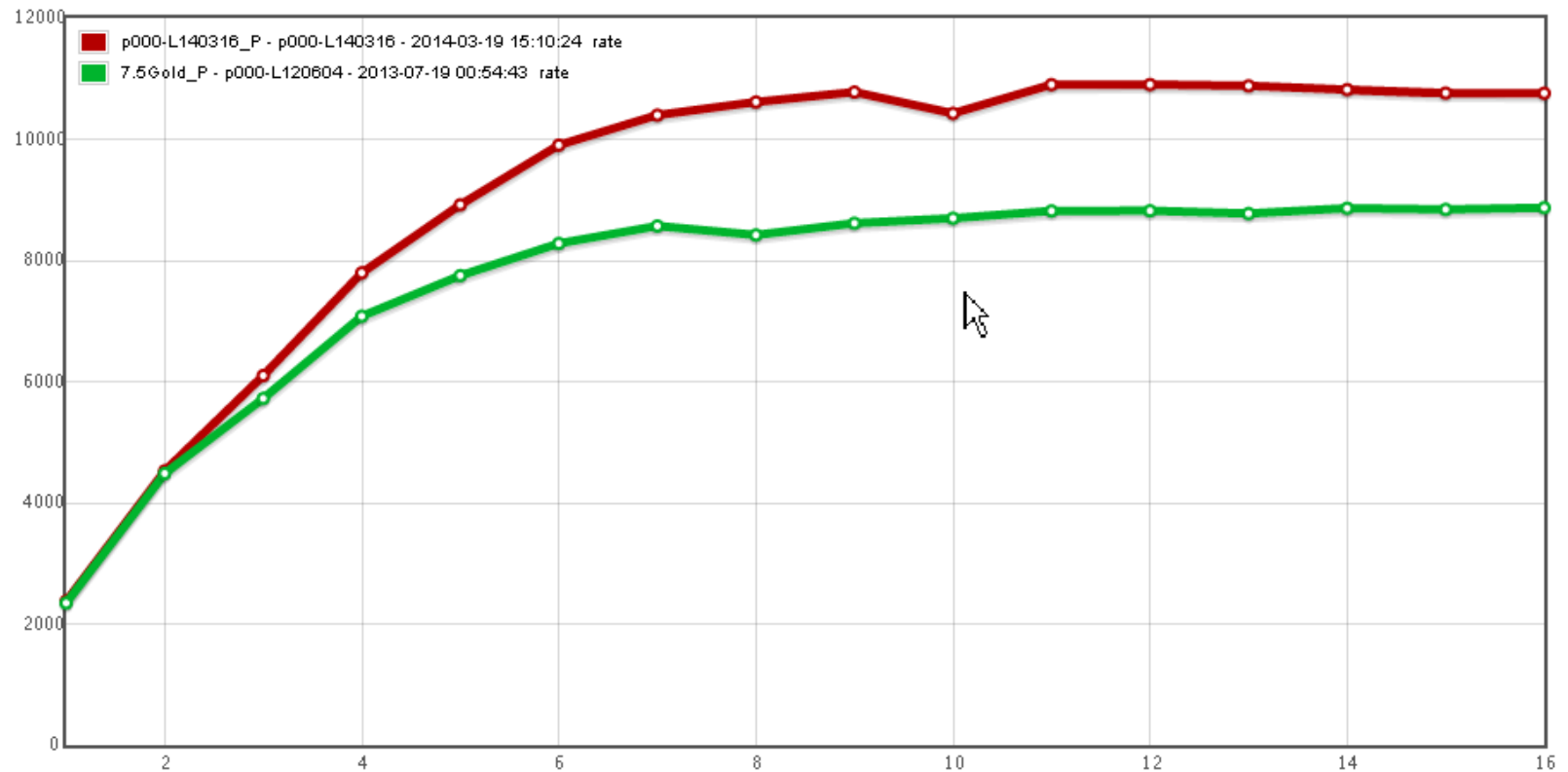
mqi_rt_rs_p_t_mqb_hpux



Distributed Performance: Non-persistent Messaging

- CPU Limited example

mqi_rt_rs_np_nt_windows

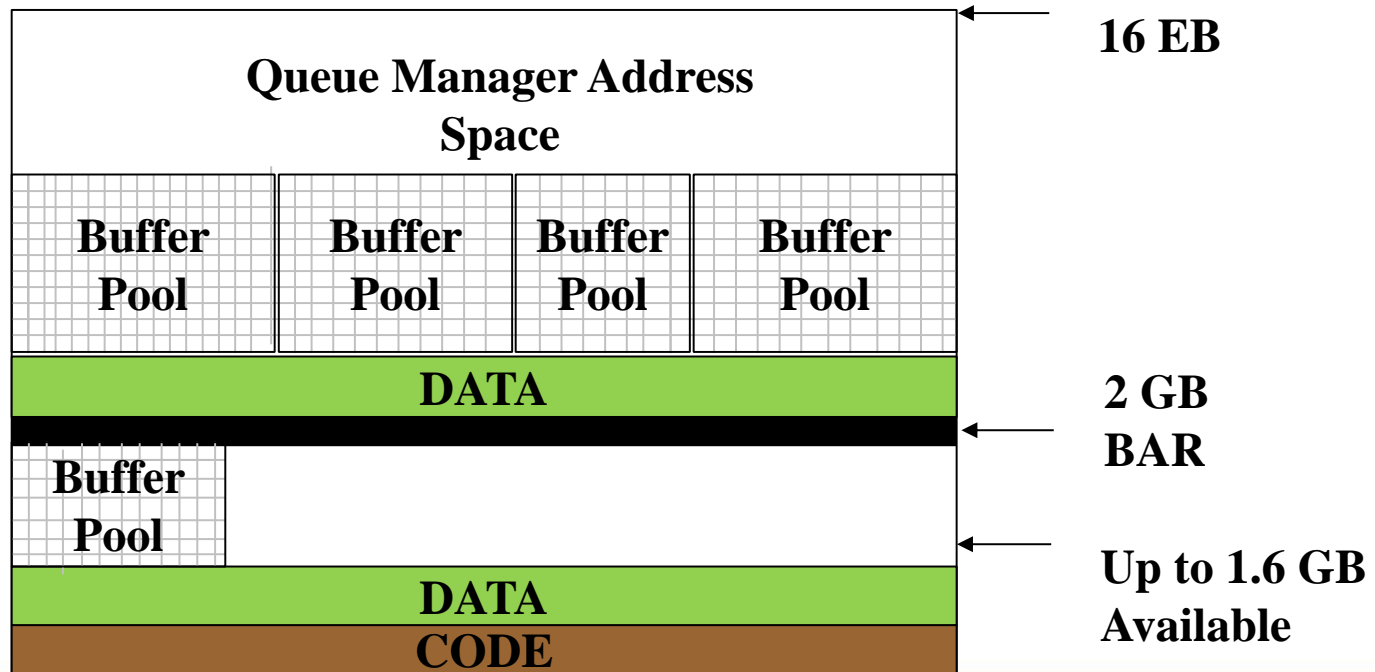


MQ for z/OS: 64-bit bufferpools

- 64-bit buffer pools in MQ for z/OS
 - Allows large numbers of messages to be cached before writing to pagesets
 - Allows MQ to exploit the vast amount of storage on today's machines
- Improves performance of putting/getting messages by minimizing disk I/O
- Minimizes administrative overhead of managing buffer pools
- Buffer pool LOCATION attribute says where it is located relative to the bar
 - BELOW: The default. Buffer pool is located below the bar in 31 bit storage
 - ABOVE: Buffer pool is located above the bar in 64 bit storage
 - This can be altered dynamically
- Storage can be pinned based on pageclass attribute

MQ for z/OS: 64-bit bufferpools

- Buffer pools above the bar can (theoretically) use up to 16 EB storage
- Increased maximum size of pool to 999,999,999 buffers
 - Was 500,000
- Allows up to 100 buffer pools
 - Was 16
 - Can have a 1-1 page set – buffer pool mapping



MQ for z/OS: Performance and Capacity

- Log RBA constraint relief
 - Already improved messages to warn of approaching RBA
 - Now widening RBA field from 6 to 8 bytes
 - At 100MB/sec this will now take about 5578 years to fill
- Support for LP64 batch/RRS C applications
- Performance enhancements for IBM Information Replicator (QRep) and similar application patterns
 - Read-ahead and changes to deferred write processing allows MQ to increase sustainable data rates
- General improvements to channel performance

MQ for z/OS: Other features

- Exploitation of zEDC compression accelerator
 - SMF
 - Channel compression (zlibfast option) can be useful when using SSL
- Support for Flash Express feature on zEC12 and zBC12 servers
 - Improves resiliency of Coupling Facility with cost-effective standby capacity to handle overflow of shared queues
 - Messages <63K fully held in Flash
 - Messages >63K have pointers in Flash, body in SMDS just as for traditional CF structures
- SMF enhancements
 - Channel statistics allow better monitoring and tuning of channel behaviour
 - Correlation of MQ and CICS statistics
- Message suppression
 - Up to 16 message numbers (particularly X500,X501) can be defined to be excluded
 - Removes cost of writing WTO messages which are then ignored
 - Can now differentiate between messages for client channels and other types

AMS and MFT integration with z/OS

- Following the model used by MQ V7.5 on distributed for closer integration
- AMS
 - Starts automatically with qmgr
 - Reduced overhead (now only one started task instead of 2)
 - Policies and their administration remain unchanged
- MFT
 - Now looks more natural for a z/OS person
 - Closer integration with standard system facilities such as ARM
 - Started task templates
 - Supported JCL provided instead of samples
 - Job info logged to JCL task
- Both features still separately licensed

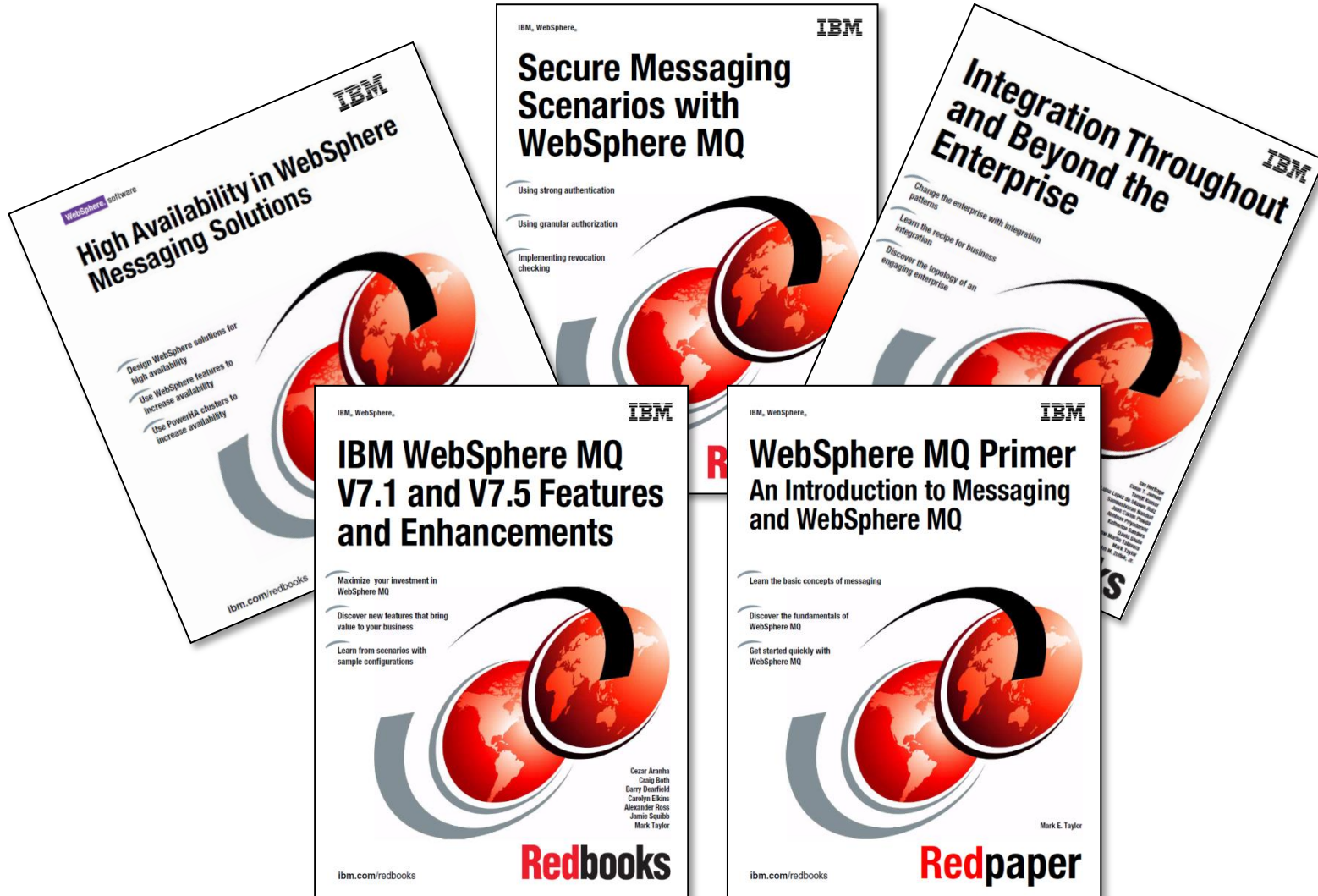
JMS 2.0

- Long-awaited update from JMS 1.1 standard
- JMS 2.0 – JSR 343 Java Message Service (JMS 2.0)
 - Final release on 21 May 2013.
 - <https://java.net/projects/jms-spec/pages/JMS20FinalRelease>
- New Messaging Features
 - Delivery Delay
 - Asynchronous Send
 - Subscriptions can be shared across a messaging provider
- API Changes
 - Use of `java.lang.AutoCloseable`
 - Simplified API [combined connection/session]
 - Session doesn't need parameters (for Java EE)
- Java 7 prereq
- Java EE 7 prereq for use of the Resource Adapter in Application Servers

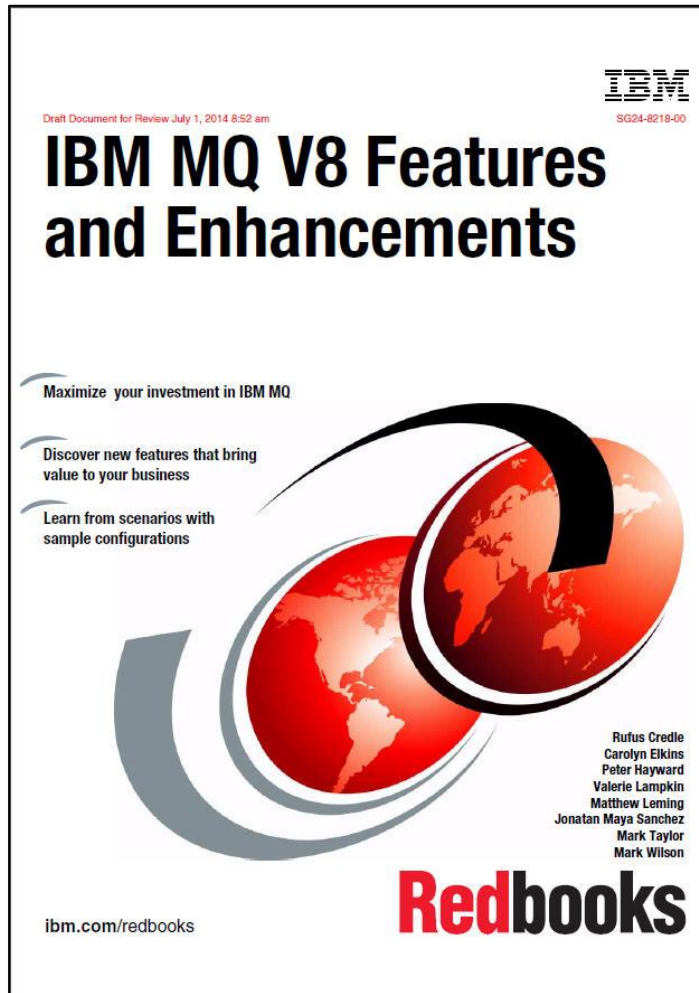
.Net enhancements

- MQ .Net classes can now use SSL without needing the C client installed
 - A secure fully-managed .Net implementation
 - Uses Windows native certificate stores
- For MQ .NET classes (aka Base .NET Classes) SSL properties can be set at
 - MQEnvironment.cs
 - Hashtable properties (input parameter to MQQueueManager constructor)
- For XMS .NET, SSL properties can be set as ConnectionFactory properties
- WCF interface extended to non-SOAP, non-JMS messages
 - Making it easier for apps using WCF to communicate with any other MQ application

Further information in real books



And ... already available (draft)



<https://www.redbooks.ibm.com/Redbooks.nsf/RedpieceAbstracts/sg248218.html>

This was session 16195 - The rest of the week ...

	Monday	Tuesday	Wednesday	Thursday	Friday
08:30			Application programming with MQ verbs	The Dark Side of Monitoring MQ - SMF 115 and 116 Record Reading and Interpretation	CICS and MQ - Workloads Unbalanced!
10:00					
11:15	Introduction to MQ	What's New in IBM Integration Bus & WebSphere Message Broker	MQ – Take Your Pick Lab	Using IBM WebSphere Application Server and IBM WebSphere MQ Together	
12:15					
01:30		All about the new MQ v8	MQ Security: New v8 features deep dive	New MQ Chinit monitoring via SMF	
03:00	MQ Beyond the Basics	MQ & DB2 – MQ Verbs in DB2 & InfoSphere Data Replication (Q Replication) Performance	What's wrong with MQ?	IIIB - Internals of IBM Integration Bus	
04:15	First Steps with IBM Integration Bus: Application Integration in the new world	MQ for z/OS v8 new features deep dive	MQ Clustering - The Basics, Advances and What's New in v8		

Evaluations please ...

