

AVP-2931

Migrating WebSphere WMQ V6 to V7 - Recommendations and Focus Areas

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Migrating WebSphere WMQ V6 to V7



- Agenda
 - Why Migrate?
 - Migration Steps Review
 - A Deeper Dive into Selected Topics





Migrating WebSphere WMQ V6 to V7

- Disclaimers
 - Focus on Distributed
 - Not a primer on migration mechanics
 - Topic is covered in detail in other sources
 - Your details **will** be different...
- Please ask questions and make comments as we go
- Recognition to:
 - Emma Bushby
 - Leonard Ponich
 - Alan Ethell
 - Matthew White
 - Many others that I'm sure I've neglected to mention





Migrating WebSphere WMQ V6 to V7

■ Agenda

- Why Migrate?
 - Maintain Infrastructure
 - New Functionality
 - New Product Requirements
- Migration Steps Review
- A Deeper Dive into Selected Topics





Why Migrate?...Maintain Infrastructure

- Supported Versions of WebSphere MQ
 - **V6 End of Support September 30, 2011 2012!**
 - <http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&infotype=an&appname=iSource&supplier=897&letternum=ENUS211-072>
 - http://www-01.ibm.com/software/support/lifecycle/index_w.html
 - 7.0.1.4 is currently available (7 releases since 7.0.0.0)
 - 7.0.1.5 release scheduled for 2Q2011
 - 7.0.0.0 June 2008; 7.0.1.0 Refresh Pack Sep 2009
 - V5.3 End of Support September 2007
 - Look **carefully** at the *Migrating from WebSphere MQ Version 5.3* documentation:
 - http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.csqzao.doc/mi11030_.htm



Why Migrate?...Maintain Infrastructure

- Supported Versions of WebSphere MQ

- End of Support September 30, 2012!

- <http://www.ibm.com/common/ssi/cgi-bin/ssialias?subtype=ca&doctype=an&appname=iSource&supprod=78&letter=ENR&num=072>

- http://www.ibm.com/software/support/lifecycle/index_w.html

- 7.0.1.4 is currently available (7 releases since 7.0.0)

- 7.0.1.5 release scheduled for Q2 2011

- 7.0.0.0 June 2008; 7.0.1.0 Release in February 2009

- V5.3 End of Support September 2007

- Look **carefully** at the *Migrating from WebSphere 4.0 Versions on 5.3* documentation:

- http://publib.boulder.ibm.com/infocenter/wmqv7/v7r1/topic/com.ibm.mq.csqzao.doc/mi11030_.htm





Why Migrate?...Maintain Infrastructure

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Why Migrate?...New Functionality

- Take advantage of new functionality in WebSphere MQ version 7
 - New Features and Enhancements
 - Publish/Subscribe engine integral to queue manager
 - Message Properties
 - Multi-Instance Queue Managers (7.0.1)
 - Automatic Client Reconnect (7.0.1)
 - Client Connection Management
 - Client Enhancements
 - WMQ Bridge for HTTP
 - References:
 - *Migration and Quick Beginning* sections of InfoCenter
 - *WebSphere MQ v7.0 Features and Enhancements* (Redbook)
 - <http://www.redbooks.ibm.com/redbooks/pdfs/sg247583.pdf>





Why Migrate?...New Functionality

- Take advantage of new functionality in WebSphere MQ version 7
 - WMQ version 7 – “**JMS Release**”
 - **Central requirement was to improve JMS implementation**
 - But it also leads to enhancements for ALL applications
 - **Integration and Extension of publish/subscribe capabilities**
 - Designed with Message Broker in mind
 - Easier programming in any environment
 - Some features suggested by JMS requirements are useful in MQI
 - Administration model and APIs natural evolution of existing interfaces





Why Migrate?...New Product Requirements

- New Products that pre-req WMQ v7
 - WebSphere Message Broker v7
 - WebSphere MQ/FTE (File Transfer Edition)
 - GSKIT v8 (as of WMQ 7.0.1.4)
 - WebSphere Application Server v7
 - WMQ v7 Resource Adapter*
 - WebSphere MQTT (Telemetry Transport)

- Exploit New Hardware and Operating Systems
 - AIX v7.1
 - RHEL V6

- Software Compatibility
 - Resource Managers - DB2 9.5, Oracle 11g



Migrating WebSphere WMQ V6 to V7



- Agenda
 - Why Migrate?
 - Migration Steps
 - Before Migrating
 - Migration Mechanics
 - After Migrating
 - A Deeper Dive into Selected Topics





Migration Steps...Before Migrating

- Background
 - Application Compatibility
 - **Goal:**
 - application built on the present version of WebSphere MQ to continue to work, without migration, on future versions of WebSphere MQ
 - Migration Types:
 - Queue manager
 - WebSphere MQ client
 - Application
 - Operating Environment
 - Migration might really mean *system replacement* in your environment
 - This a perfectly valid (perhaps even preferred?) approach





Migration Steps...Before Migrating

■ General Preparation

- Understand (and verify) what needs to be tested and what's likely to be impacted
- Catalog your system environment
 - Current version levels of MQ and OS
 - For queue managers and WMQ client systems
 - Installed
 - SupportPacs
 - Customizations (user exits)
 - APARs
 - Co-resident and interacting software versions
 - Distributed queueing topology
 - Clusters
 - Channel security





Migration Steps...Before Migrating

- General Preparation
 - Catalog your applications environment
 - Language and runtime environment dependencies
 - Messaging patterns
 - Messaging models
 - Point to point (classic queueing)
 - PubSub
 - Transactional environment
 - Interacting systems and software





Migration Steps...Before Migrating

■ General Preparation

- Review migration documentation
 - **Migration section from InfoCenter**
 - <http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.csqzao.doc/mi10120.htm>
 - **Quick Beginnings for ... from InfoCenter**
 - http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.doc/help_home_wmq.htm
 - **TechNotes**
 - WebSphere MQ for z/OS: Avoid migration, upgrade and fallback problems for V6, V7, V7.0.1
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21432940>
 - **Version-specific release notes (README.TXT)**
 - <http://www-01.ibm.com/support/docview.wss?uid=swg27020722>





Migration Steps...Before Migrating

■ General Preparation

- Check software compatibility

- ***Supported Software table***

- <http://www-01.ibm.com/support/docview.wss?uid=swg27012075>
- <http://www-01.ibm.com/support/docview.wss?uid=swg27018952>

- Software product compatibility reports

- <http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.jsp>





Migration Steps...Before Migrating

■ General Preparation

- Take advantage of previously published collateral on Migration
 - WSTE Webcast Replays (presentations and audio)
 - **WebSphere MQ for z/OS V7.0.1 - Installation, Migration, New Functions and Common Problems**
 - » <http://www-01.ibm.com/support/docview.wss?uid=swg27019916>
 - **Installation and Migration of WebSphere MQ V7 including Publish/Subscribe Configuration**
 - » <http://www-01.ibm.com/support/docview.wss?uid=swg27016064>
 - **WebSphere MQ: Tips and tricks for avoiding problems during migration**
 - » <http://www-01.ibm.com/support/docview.wss?uid=swg27013109>
 - Redbooks





Migration Steps...Before Migrating

■ General Preparation

– Decide what version to migrate to

• **Default: Target latest maintenance release**

– 7.0.1.4 is (currently) latest fixpack

– You **definitely** want to target this version

– ...especially if the migration rollout timeframe is long

– ...except when you don't

» N-1 maintenance strategy

» Stake in the ground at another version

• **WebSphere MQ Recommended Fixes**

– <http://www-1.ibm.com/support/docview.wss?&uid=swg27006037>

• **And Fix List**

– <http://www-01.ibm.com/support/docview.wss?&uid=swg27014224>





Migration Steps...Before Migrating

- General Preparation

- Review APARs

- Search for `APAR` from Support Portal

- http://www.ibm.com/support/entry/portal/Overview/Software/WebSphere/WebSphere_MQ

- » sort by *Newest First*

- » Select, Review *Alert, APARs*

- Migration PTFs for z/OS

- <http://www-01.ibm.com/support/docview.wss?uid=swg27006519>





Migration Steps...Before Migrating

■ System Preparation

- Multiple versions of WMQ on single OS image are not supported
 - Also referred to as *Coexistence*
 - Except on z/OS
- **Must** use WebSphere MQ Server software to install both WebSphere MQ server and client on the same machine
 - Clients – SupportPac MQC7
 - MQExplorer – SupportPac MS0T
 - <http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg27007197#1>





Migration Steps...Before Migrating

■ System Preparation

- Ensure your system meets the software and hardware requirements for WebSphere MQ v7.0
 - See the *System Requirements* Table:
 - <http://www.ibm.com/software/integration/wmq/requirements/index.html>
 - Pay particular attention to **32-bit vs. 64-bit options** where they exist (Linux, Windows)
 - And to the **Notes!**
- Validate and configure OS resources
 - See *Quick Beginnings*
 - Shared memory
 - **How to configure UNIX IPC resources for WebSphere MQ**
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21271236>





Migration Steps...Before Migrating

■ System Preparation

- Review platform-specific install **and** uninstall procedures
 - Have software in-hand
 - Base, Fix pack, iFixes for any required APARs
- Cleanup Activities
 - Cleanup obsolete/unused objects
 - Convert to v6 functionality (e.g. LISTENER instead of *inetd*)
- Develop and **TEST** a backout plan
 - Backup **and** restore procedures
 - **Test** the process in staging environments
 - Include fallback testing and planning
 - » **how will you recover and/or reconcile *state changes* in your messaging infrastructure?**





Migration Steps...Before Migrating

■ Environment Preparation

- Verify version requirements of interacting software
 - Application Servers, Transaction Managers, Databases (as Resource Managers), JVM, ... applicable to your environment
 - Pay attention to the detail notes!
- Virtualization environments?
 - *System Requirements*
 - Solaris Zones
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21233258>
 - AIX WPARs
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21320429>
 - VMWare
 - <https://www-304.ibm.com/support/docview.wss?uid=wws1e333ce0912f7b152852571f60074d175>





Migration Steps...Before Migrating

■ Environment Preparation

- Consider HA environment
 - Cannot failover back to v6 after conversion to v7
- Multi-Instance queue managers (v7.0.1) vs. HA
 - Multi-Instance queue manager functionality is **not** equivalent to HA
 - HA provides general coordination (failover) of arbitrary resource groups
 - SupportPac MC91 *deprecated*
 - But **still** available
 - » <http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg24011869>
 - Many of the failover implementation details in MC91 can now be implemented with *native* WMQ features rather than scripted parts of MC91 – see the InfoCenter
 - Directory patching no longer required





Migration Steps...Before Migrating

■ BACKUP

- Backup plans *should* already be implemented to cover other (non-migration) scenarios
 - If they are not, **now** is the time to develop and test them
- Backup the queue manager (definitions)
 - For example: SupportPac **MS03**
 - Saves all of the objects (queues, channels, etc) defined in a either local or remote queue manager to a file
 - Allows you to recreate a queue manager (**without state**)
 - <http://ibm.com/support/docview.wss?rs=171&uid=swg24000673>





Migration Steps...Before Migrating

■ BACKUP

- Backup the queue manager state information
 - queue manager must be stopped
 - queue manager and log directories
 - On UNIX's (default):
 - /var/mqm/qmgrs
 - /var/mqm/logs
 - Windows (default):
 - C:\Program Files\IBM\WebSphere MQ\qmgrs
 - C:\Program Files\IBM\WebSphere MQ\logs
 - HKLM\SOFTWARE\IBM\MQSeries\
CurrentVersion\Configuration\QueueManager
 - **Note:** Make sure you track down & capture logs and data stored on other file systems





Migration Steps...Before Migrating

- Identify Obsolete SupportPacs that will need to be removed
 - Per-Platform SupportPacs to be removed are described in *Quick Beginnings for ... Migrating to MQ v7.0* specific to each platform
 - MA0Y WebSphere MQ Bridge for HTTP
 - MA0C Publish/subscribe
 - MA0R WebSphere MQ transport for SOAP
 - MA88 WebSphere MQ Classes for Java and JMS
 - MACS Client libraries for AIX (64-bit)
 - MACZ Client libraries for HP-UX (64-bit)
 - MACR Client libraries for Sun Solaris (64-bit)
 - MA6P XA libraries for TxSeries for IPF





Migration Steps...Before Migrating

- If you are migrating a Publish/Subscribe infrastructure
 - *WebSphere MQ version 6 publish/subscribe migration*
 - This is a entire topic in itself...
- Use **separate** clusters for PubSub clusters (clustered TOPICS)
 - PubSub clusters are **fully** interconnected; different model and size constraints than clustered queues





Migration Steps...Before Migrating

- Assess Impact of v7 Changes and New Functionality
 - JMS architecture changes
 - Shared Conversations
 - 32/64-bit considerations
 - IC72897 (to be included in WMQ v7.0.1.5)
 - WebSphere Application Server v7 migration
- We'll dive into the details of these topics shortly...





Migration Steps...Before Migrating

- Assess Impact of JMS changes
 - WebSphere MQ classes for JMS have been restructured; new layered architectures
 - Exceptions thrown from different classes
 - RFH2 headers handling for WebSphere MQ Classes for Java changes
 - Queue attribute PROPCTL
 - *After upgrading to MQ V7, MQMessage.format inside a base Java V6 application returns incorrect value of "MQSTR" instead of "MQHRF2" when getting JMS messages*
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21472676>
 - JMS Exception listeners behave slightly differently





Migration Steps...the Mechanics

- This section will only cover the highlights and unique steps for migrating to WebSphere MQ v7.0 on each platform

- For detailed steps on migrating and installing
 - *Migrating to WebSphere MQ Version 7.0* section of *Quick Beginnings* for that platform
 - **NOTE:** PDFs are no longer current (last updated 7.0.0.1)





Migration Steps...the Mechanics

■ Get Ready

- Quiesce **all** applications, channels, queue managers
- (Save queued application messages to disk)*
- Stop all queue managers and listeners
- Backup queue manager state data (tranlogs, qmgr data)
- Uninstall obsolete SupportPacs
- Uninstall* existing version of WMQ

■ Install

- Install WMQ v7 base or refresh pack
- Install WMQ fixpack
- (Install iFixes or PTFs to address APARs)
- (*dltmqInk*)

■ Post-install

- Start queue manager
 - Queue manager on-disk upgrade takes place with *strmqm*
- (SVRCONN channel remediation)*
- Start listeners **AFTER** the queue manager





Migration Steps...the Mechanics

- Migrating clustered queue managers
 - Migrate the full repositories first
 - http://www.ibm.com/developerworks/websphere/library/techarticles/0605_vanstone/0605_vanstone.html
 - Now also available (updated) in the InfoCenter
 - *Upgrading Clustered Queue Managers to v7*
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21472526>
 - » Recommend maintenance to v6 queue managers as well
 - Staged migrations
 - Mixed clusters often persist for long periods of times
 - Mixed versions for specific application queues permit extended live testing with opportunity for selective fallback
 - Cluster member migration steps (next foil)





Migration Steps...the Mechanics

- Cluster member Migration Steps:
 1. Suspend (Remove) queue manager from cluster (Optional)
 2. Record objects known by this queue manager.
 1. DISPLAY CLUSQMGR(*), DISPLAY QC(*)
 3. Record full repositories view of the cluster objects owned by this queue manager.
 1. DISPLAY CLUSQMGR(<migrated queue manager name>)
 2. DISPLAY QC(*) WHERE(CLUSQMGR EQ <migrated queue manager name>)
 4. Stop queue manager.
 5. Take a backup of the queue manager.
 6. Install the new version of WebSphere MQ.
 7. Restart queue manager.
 8. Check for successful cluster object migration and communication with full repositories
 9. Check that full repositories still know about the migrated cluster queue manager and its cluster queues.
 10. Test
 1. applications on other queue managers can put messages to the migrated cluster queue manager's queues.
 2. applications on the migrated queue manager can put messages to the other cluster queue manager's queues.
 11. Resume (Reinstate) queue manager into cluster (Optional)
 1. RESUME CLUSTER(<cluster name>)
 12. Monitor the queue manager and applications in the cluster





Migration Steps...the Mechanics

- Windows Platform Notes
 - Uninstall not required (but recommended)
 - Default installation installs only those features previously installed
 - CUSTOM option lets you select the features
 - MQExplorer requires Eclipse (3.3) installation
 - *dcomcnfg* information must be manually restored following migration
 - Ensure that the IBM WebSphere MQ Service is stopped
 - *msiconfig* installation logging needs to be set up manually





Migration Steps...the Mechanics

■ Unix Platform Notes

- Uninstall required
 - Except on AIX, but even then... Must remove retired filesets
- Install with platform-specific installation tool:
 - AIX - SMIT, installp, geninstall or the Web-based System Manager
 - HP-UX - swinstall
 - Linux - rpm (rpm upgrade tools **not** supported)
 - Solaris - pkgadd
- There is no migration path between v7 WMQ 32-bit and 64-bit queue managers on 64-bit Linux platforms that support both versions
 - http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.amq1ac.doc/lq10180_.htm





Migration Steps...After Migration

- On-disk structures are actually migrated when you start the queue manager
- Start queue manager before you start any WebSphere MQ listener associated with that queue manager
 - Otherwise, you will not be able to start the WebSphere MQ listeners
- channel initiator (SCHINIT) and command server (SCMDSERV) can (should) be put under queue manager control (if 5.3 migration)



Migrating WebSphere WMQ V6 to V7



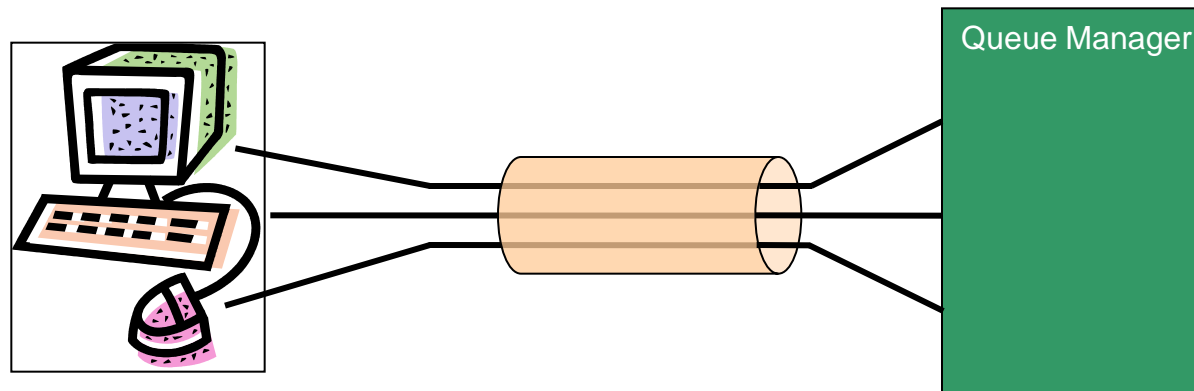
■ Agenda

- Why Migrate?
- Migration Steps
- A Deeper Dive into Selected Topics
 - MQI Channels and SHARECNV
 - 32 or 64-bit shared library considerations
 - APAR IC72897
 - Migrating to WAS v7 and WMQ v7



A Deeper Dive into Selected Topics

- MQI channels and SHARECNV
 - In WMQ v6 every MQI Connection was implemented over its own separate socket to the QM
 - These were not duplex connections – all instigated by the client
 - WMQ v7 can
 - Multiplex multiple connections down the same socket
 - Detect failures much quicker due to fully duplex communications





A Deeper Dive into Selected Topics

- MQI channels and SHARECNV
 - New attributes on SVRCONN definitions in v7
 - SHARECNV
 - MAXINST and MAXINSTC
 - **SHARECNV**
 - Default is **10**
 - Attribute set when queue manager is migrated





A Deeper Dive into Selected Topics

- MQI channels and SHARECNV
 - Set SHARECNV attribute on SVRCONN channels as appropriate
 - SHARECNV(0) gives v6 behavior & least performance impact*
 - SHARECNV(1) allows exploitation of v7 features (admin stop/quisce, heartbeat, read-ahead, asynchronous consumers)
 - See:
 - *Performance implications of sharing conversations on client-connection channels* from InfoCenter
 - http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.cs.qzao.doc/mi12240_.htm
 - Performance Evaluation SupportPacs (MPxx)





A Deeper Dive into Selected Topics

- MQI channels and SHARECNV - APARs
 - IZ94330: WEBSPPHERE MQ V7.0: 5 SECOND DELAY WHEN CLOSING A MULTIPLEX CONVERSATION
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ94330>
 - IZ94585: WebSphere MQ writes an FDC record, Probeld CO001001 when a security exit grows the buffer, and SHARECNV has value > 0
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ94585>
 - IZ68236: WEBSPPHERE APPLICATION SERVER V7.0 STARTUP HANGS DURING MESSAGE DRIVEN BEAN ACTIVATION
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ68236>



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A Deeper Dive into Selected Topics

- 32 or 64-bit shared library considerations
 - Symbolic Link Considerations for 32/64-bit
 - Background
 - /usr/lib symbolic links to 32-bit libraries (.../mqm/lib) were created as a convenience
 - Predates 64bit versions of libraries
 - Maintained for backward compatibility
 - Avoiding dependency became important with availability of 64bit libraries in MQ V6.0.
 - *dltmqlnk*
 - Must be rerun after each WMQ Refresh Pack or Fix Pack installation
 - » <https://www-304.ibm.com/support/docview.wss?uid=swg21249743>





A Deeper Dive into Selected Topics

- 32 or 64-bit shared library considerations
 - Symbolic Link Considerations for 32/64-bit
 - *Implications of a 64-bit queue manager in Quick Beginnings for ...*
 - <http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.amq1ac.doc/lq10400.htm>
 - Technotes
 - AMQ8568 RC=2495 mqjbnd was not found
 - » <http://www-01.ibm.com/support/docview.wss?uid=swg21413508>
 - IZ84448: WEBSHERE MQ V7 JAVA/JMS CLIENT FAILS TO LOAD MQJBND LIBRARY WHEN USING A JNI BINDINGS CONNECTION
 - » <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ84448>
 - Fix dependencies with recompile
 - Remove LIBPATH and LD_LIBRARY_PATH dependencies





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 - [APAR IC72897](#)
 - Migrating to WAS v7 and WMQ v7





A Deeper Dive into Selected Topics

- APAR IC72897
 - Background
 - V6
 - JMS clients received messages in the same codepage in which it was stored on the queue (in other words, the unconverted message)
 - converted message internally using the Java JVM's conversion routines to the codepage required by the application
 - V7 (without the APAR, and/or prior to 7.0.1.5)
 - the queue manager performs the conversion
 - converted message returned to the classes for JMS





A Deeper Dive into Selected Topics

- APAR IC72897
 - **Original goals of V7 change in behavior (prior to this APAR) were to:**
 - Be completely transparent to the user
 - Provide some performance gains
 - Conform to the general IBM best practice for data conversion:
 - Request queue manager to do the conversion
 - <http://www-01.ibm.com/support/docview.wss?uid=swg27005729>
 - Provide additional functionality
 - Data Conversion Exits at the queue manager
 - **APAR IC72897 restores V7 default behavior to that of v6**





A Deeper Dive into Selected Topics

- APAR IC72897
 - **WHY change default behavior mid-release?**
 - **Customer migration issues**
 - Queue manager cannot perform requested conversion
 - » e. g. AIX: 1051 -> 1208
 - Unwanted header / structure data conversion takes place
 - » Headers converted that were **un**converted using MQ v6
 - » Application issues if they did not check
 - » Messages with header conversion failures no longer delivered
 - Differences in new line characters in conversion performed by a z/OS queue manager
 - Queue managers log files filling up with warning messages
 - » On user-specified format





A Deeper Dive into Selected Topics

- APAR IC72897
 - Consequences when applied/included
 - Data Conversion Exits
 - MQMD / Format
 - Conversion exits will not run before the message is sent to the requesting client application
 - Using other queue manager known data formats
 - JMS classes do not contain conversion functionality for CICS, IMS headers
 - No longer converted by queue manager





A Deeper Dive into Selected Topics

■ APAR IC72897

- MQGMO_CONVERT switching functionality for Java Message Service applications
 - <https://www-304.ibm.com/support/docview.wss?uid=swg21459994>
 - **changes** the default behavior of the version 7.0 WebSphere MQ classes for JMS
 - message codepage conversion is performed within the WebSphere MQ classes for JMS
 - matches the behavior of the version 6.0 WebSphere MQ classes for JMS
 - targeted for inclusion in fixpack 7.0.1.5
- ADD PROPERTIES TO ENABLE V7.0 WMQ JMS APPLICATIONS TO CONFIGURE MESSAGE DATA CONVERSION TO OCCUR IN THE QUEUE MANAGER OR CLIENT
 - <http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg1IC72897>
 - Property-specified control of receive conversion and CCSID
- IZ67359: JMS APPLICATION USING WEBSHERE MQ JMS V7 CLIENT FAILS TO RECEIVE MESSAGES WITH 2119 (MQRC_NOT_CONVERTED).
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ67359>





A Deeper Dive into Selected Topics

- APAR IC72897
 - Related APARs FP 7015
 - IZ86335 WEBSphere MQ V7 JMS APPLICATION ERROR. JAVAX.JMS.JMSEXCEPTION:
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ86335>
 - IZ85702 WHEN USING MQFMT_NONE AND CCSID 1202, THE CUSTOMER RECEIVES JMSCMQ1046: THE CHARACTER SET 'CCSID:1202' IS NOT SUPPORTED
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ85702>
 - IZ87553 WEBSphere MQ JMS CLASSES ON SOLARIS OR HP-UX. AFTER UPGRADE FROM WMQ V6 TO V7 CODEPAGE ERRORS ARE RECEIVED WHILE GETTING MESSAGES
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ87553>
 - IZ86625 WEBSphere MQ V7 JAVA CLIENT THROWS UNSUPPORTEDENCODINGEXCEPTION WHEN USING A NON-DEFAULT LOCALE AND ISO CODEPAGE
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ86625>





A Deeper Dive into Selected Topics

- APAR IC72897
 - Related APARs FP 7014
 - IZ78154 MESSAGE RECEIVE FAILS WITH AN MQRC_OPTIONS_CHANGED 2457 ERROR
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ78154>
 - IC69370 MQJMS1006 (INVALID VALUE FOR CHAR SET) RETURNED FROM WAS WHEN SENT BY WMQ JMS APPLICATION USING V7 CLIENT TO V6 QUEUE MANAGER
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IC69370>
 - IZ78154 MESSAGE RECEIVE FAILS WITH AN MQRC_OPTIONS_CHANGED 2457 ERROR
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ78154>
 - IZ77087 WMQ V7 JMS APPLICATION GETS NULLPOINTEREXCEPTION WHEN USING SPECIAL CHARACTERS IN CORRELATION ID
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ77087>





A Deeper Dive into Selected Topics

■ APAR IC72897

– Related APARs FP 7013

- IZ67359 JMS APPLICATION USING WEBSPHERE MQ JMS V7 CLIENT FAILS TO RECEIVE MESSAGES WITH 2119 (MQRC_NOT_CONVERTED)
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ67359>
- IZ71306 WMQ V7 JMS AND WMQ CLASSES FOR JAVA CLIENT FAIL TO CONNECT TO A QUEUE MANAGER WITH AMQ9503 WHEN USING CCSID 943
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ71306>
- IC65949 INCORRECT VALUES SPECIFIED FOR JMS_IBM_MQMD_ENCODING AND JMS_IBM_MQMD_CODEDCHARSETID ON THE GET OPERATION (values set during put, but lost on get)
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IC65949>
- IZ64472 WHEN USING DEFAULT CCSID IN WMQ7 JAVA CLIENT MESSAGES ARE PUT AND GOT WITH CHARACTER SET OF THE QUEUE MANAGER INSTEAD OF THE CLIENT
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ64472>





A Deeper Dive into Selected Topics

■ APAR IC72897

– Related APARs FP 7011

- IZ59900 WEBSphere MQ V7 Java classes fail to connect on Solaris and HP when using Queue Manager CCSID of 943
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ59900>
- IZ60374 WEBSphere MQ Java client is unable to map the IBM-943C character set to a known CCSID value
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ60374>
- IZ60293 WEBSphere MQ V7 Java client CCSID 1051 UNSUPPORTEDCHARSETEXCEPTION THROWN - java.nio throws a different set of exceptions to java.io, and we weren't dealing with the right set.
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ60293>
- IZ60646 META-INF/services/java.nio.charset.spi.CharsetProvider FILE IN COM.IBM.MQ.JMQI.JAR IS NOT ENCODED IN UTF-8 (so can't be used on z)
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IZ60646>



Migrating WebSphere WMQ V6 to V7



■ Agenda

- Why Migrate?
- Migration Steps
- A Deeper Dive into Selected Topics
 - MQI Channels and SHARECNV
 - 32 or 64-bit shared library considerations
 - APAR IC72897
 - Migrating to WAS v7 and WMQ v7





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7
 - Very Common Integration Scenario
 - Several ways to get there
 - Lots of niceties to be cognizant of
 - End game (target) is environment with WAS at v7 and WMQ v7
 - Assumption is that you are starting with WAS v6/6.1 and WMQ v6





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7
 - Basics
 - Where we want to be: How the target environment will look
 - How to get there
 - **Option 1** : Upgrade WAS to v7 before upgrading WMQ to v7
 - **Option 2** : Upgrade WMQ to v7 before upgrading WAS to v7
 - Further considerations
 - Key enhancements in WAS v7/WMQ integration
 - Exploiting WMQ v7/7.0.1 features within WAS



A Deeper Dive into Selected Topics



■ Migrating to WAS v7 and WMQ v7– Basics

■ Architectural History

- In WAS V5, the WMQ supported code installed on WAS was a cut-down version of actual WMQ server code
- In WAS V6, the WMQ supported code installed on WAS was a subset of jar files taken from native WMQ libraries;
 - Starting with WMQ V6.0.2.1, a separate WMQ Resource Adapter (wmq.jmsra.rar) is available for installation on other J2EE compliant application servers (but **NOT SUPPORTED** in WAS)
- In WAS V7, the WMQ supported code installed on WAS is the WMQ Resource Adapter (wmq.jmsra.rar); this is the same RA as for other J2EE compliant application servers
- “Which version of MQ is shipped with WebSphere Application Server?” provides the “components” and version level matrix of WMQ/JMS code installed with WAS, going back to WAS V5:
 - <http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg21248089>





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 - Basics
 - WMQ Resource Adapter provides connectivity to WMQ
 - Implements JCA 1.5
 - WMQ RA is a component of WMQ
 - available for other Application Servers since WMQ v6.0.2.1
 - but **not** for WAS
 - Essentially, the RA is a bundled set of the discrete jars needed for JMS *client* mode connections
 - Plus JCA pieces

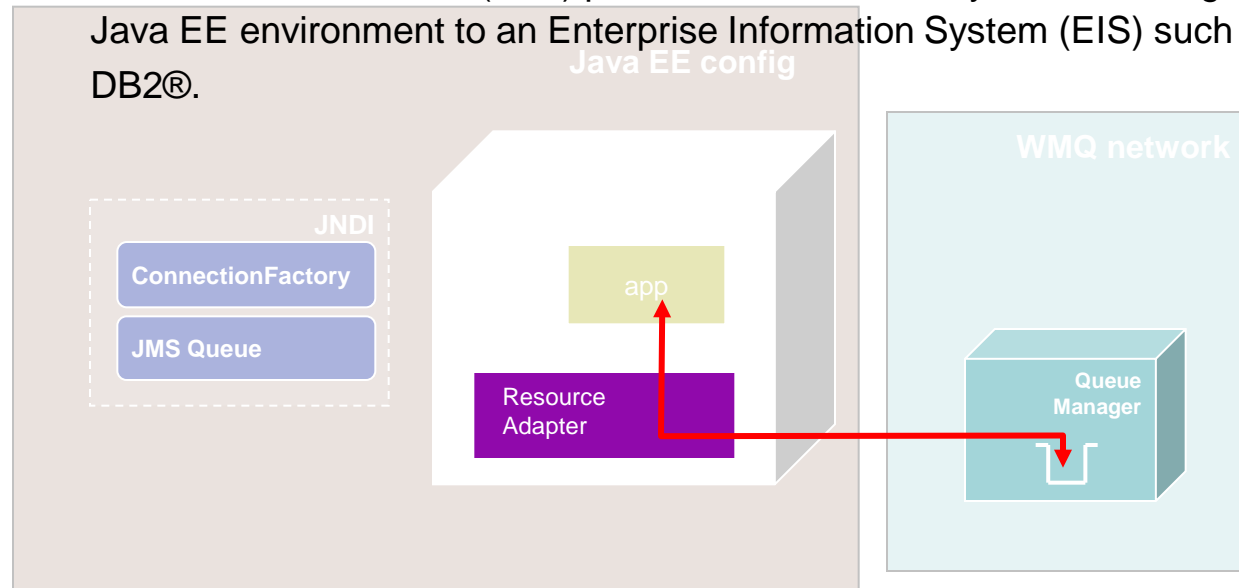


A Deeper Dive into Selected Topics

■ Migrating to WAS v7 and WMQ v7 – Basics

■ WMQ Resource Adapter

- Allows applications running in an application server to access WebSphere MQ resources. Supports inbound and outbound communication.
- Implements the JCA 1.5 interface. The Java Platform, Enterprise Edition (Java EE) Connector Architecture (JCA) provides a standard way of connecting applications running in a Java EE environment to an Enterprise Information System (EIS) such as WebSphere® MQ or DB2®.





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 – Basics
 - WMQ Resource Adapter
 - Outbound and Inbound (JCA 1.5) Communication types supported
 - Limitations
 - Does not support real-time connections to the Broker
 - Only supports channel exit programs written in Java
 - sslFipsRequired must be true for **ALL** JCA resources or false for **ALL** JCA resources
 - If you use the client channel definition table, in the event of a failure the RA might select a different channel definition (and therefore different queue manager) from the CCDT. This could cause issues for transaction recovery.
 - Activation Specifications are now the preferred method for delivering messages from an MQ Destination to an MDB running inside WAS v7.
 - The use of message listener ports has been deprecated in WAS v7
 - It is still possible to use message listener ports to deliver messages to an MDB using the MQ messaging provider.
 - Migration from a Listener Port to an Activation Specification is selective
 - Care needed around 64bit / 32 bit installation (especially if some environments are 64 bit).





A Deeper Dive into Selected Topics

■ Migrating to WAS v7 and WMQ v7 – Basics

– Version 6 Levels of WAS and WMQ as starting point

- Current fixpack levels are WSAS v6.1.0.35 and WMQ v6.0.2.10
- Default WAS configuration **only** allows WMQ/JMS client connections to WMQ
 - Default WMQ/JMS Client in WAS 6 is supplied by means of the following jar files:
 - » com.ibm.mqjms.jar
 - » com.ibm.mq.jar
 - » dhbcore.jar
 - Default location in WAS is `$WAS_install_root\lib\WMQ\java\lib`
- To establish WMQ/JMS **bindings** connections to WMQ, you need to install WMQ on the same machine and configure **MQ_INSTALL_ROOT** to point to the WMQ installation directory.





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7
 - Basics
 - Target Environment
 - How to get there
 - **Option 1** : Upgrade WAS to v7 before upgrading WMQ to v7
 - **Option 2** : Upgrade WMQ to v7 before upgrading WAS to v7
 - Further considerations
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A Deeper Dive into Selected Topics

■ Migrating to WAS v7 and WMQ v7 – Target Environment

– WAS and WMQ both at v7

- Current levels: WAS v7.0.0.15 and WMQ v7.0.1.4
- WAS V7
 - WebSphere MQ V7 JCA 1.5 RA, installed as a resource adapter, replaces separate client jars
 - MQ_INSTALL_ROOT variable is **no longer used** (except for migration purposes and the client container)
 - Native library path (RA property) is used to identify the location of the required native libraries (for **binding mode** connections)
 - Service updates to RA now solely by use of the WAS FixPacks
 - Manual update possible but only on advice from IBM Service
 - Pushes RA code outside of normal update route





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 – Target Environment
 - WAS v7 does **not require** the 3 WMQ/JMS client jars (used in WAS v6) for any migration scenario
 - All of the WMQ/JMS jar files required in WAS v7 to connect in Client mode to WMQ now come packaged in the WMQ Resource Adapter (WMQ RA).
 - There is only one way to configure the WMQ RA in WAS V7
 - So: MQ_INSTALL_ROOT is no longer required and by default it is NOT migrated over from WAS V6.
 - Bindings mode **still requires** that WMQ v7 is installed on the same machine as the application server





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7
 - Basics
 - Target environment
 - How to get there
 - **Option 1** : Upgrade WAS to v7 before upgrading WMQ to v7
 - **Option 2** : Upgrade WMQ to v7 before upgrading WAS to v7
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A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 – **Option 1** - Upgrade WAS to v7 before upgrading WMQ to v7
 - Check pre-requisite APAR levels etc. for WMQ in provided documentation
 - Specifically WMQ APAR IC64098 is required to run with WAS v7
 - <http://www-01.ibm.com/support/docview.wss?uid=swg1IC64098>
 - Details of recommended fixes and supported combinations are described via the WAS supported software pages
 - *Information about using the WebSphere MQ messaging provider for WebSphere Application Server Version 7.0*
 - <http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg21316899>





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 – **Option 1** - Upgrade WAS to v7 before upgrading WMQ to v7
 - WAS v7 connects to WMQ using the WMQ RA
 - The WMQ classes for JMS will be running in WAS in "migration mode", which has a performance and functional cost
 - Documented in SupportPac MP07 *JMS Performance Evaluation*
 - “When connected to a V6 Queue Manager a less optimised codepath is used, which facilitates migration from V6 to V7 but which should not be considered as a long term solution if performance is important.”
 - WAS v7 does not support Bindings mode connections to WMQ 6.0.2.4 or earlier (6.0.2.7 required on z/OS)
 - Is a simple but short-term expedient only if performance cost has been confirmed to be acceptable by Business.





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7
 - Basics
 - Target environment
 - How to get there
 - **Option 1** : Upgrade WAS to v7 before upgrading WMQ to v7
 - **Option 2** : Upgrade WMQ to v7 before upgrading WAS to v7
 - Further considerations
 - Key enhancements in WAS v7/WMQ integration
 - Exploiting WMQ v7/7.0.1 features within WAS





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 – **Option 2** - Upgrade WMQ to v7 before upgrading WAS to v7
 - Starting point is WAS 6.1 with WMQ 6 JMS Classes
 - Intermediate point is WAS 6.1 with WMQ v7 JMS Classes
 - This is a valid ‘end-point’ if it meets business requirements
 - It is stable and supported
 - MQ_INSTALL_ROOT will by default point to the WAS directory with the WAS installed WMQ/JMS libraries.
 - Some of WMQ v7's new functionality and improved performance levels are unobtainable with this combination
 - The WMQ Resource Adapter **CAN NOT** be installed on WAS 6.1





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 – **Option 2** - Upgrade WMQ to v7 before upgrading WAS to v7
 - Connecting WAS V6.1 applications to WMQ (1)
 - For **binding mode** connections:
 - WebSphere MQ V7 Server must be installed on the same machine as the application server
 - MQ_INSTALL_ROOT must be configured to point to the WebSphere MQ V7 installation directory
 - For client mode connections, same configuration as for the starting environment (WAS V6 & WMQ V6)
 - i.e. the cutdown version of WMQ/JMS Client in WAS 6 is supplied by means of:
 - com.ibm.mqjms.jar, com.ibm.mq.jar, dhbcore.jar
 - Which reside by default in WAS_install_root\lib\WMQ\java\lib





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7
 - Basics
 - Target environment
 - How to get there
 - **Option 1** : Upgrade WAS to v7 before upgrading WMQ to v7
 - **Option 2** : Upgrade WMQ to v7 before upgrading WAS to v7
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A Deeper Dive into Selected Topics

■ Migrating to WAS v7 and WMQ v7 **Further Considerations**

- "Target client" WAS v6 field of JMS Destinations
 - In WAS v6, was either 'MQ' or 'JMS', controls RFH2 header generation
 - In WAS v7, property was renamed and the format was changed.
 - Documentation at:
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21421492>
- PROVIDERVERSION (ConnectionFactory)
 - Possible values: **6, 7, unspecified**; usually you want ***unspecified***
 - *com.ibm.msg.client.wmq.overrideProviderVersion*
 - Documentation in InfoCenter:
 - http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/index.jsp?topic=/com.ibm.mq.csqzaw.doc/jm41140_.htm





A Deeper Dive into Selected Topics

- Migrating to WAS v7 and WMQ v7 **Further Considerations**
 - Many JMS issues resolved between release of WAS v7.0 and current release
 - Latest WAS level recommended as target at the start of the migration project (with the expectation that this will become 'current -1' by completion).
 - Connection to Multi-Instance Queue Managers is supported (WAS 7.0.0.13)
 - Includes WMQ RA 7.0.1.3
 - **BEWARE** classloader issues if you have embedded MQ jar files
 - WAS v7 migration has its own *Migration Guide* considerations





A Deeper Dive into Selected Topics

■ Migrating to WAS v7 and WMQ v7 **Further Considerations**

■ Key Enhancements

- Support for Activation Specs with WMQ
- Better integration with Application Server SSL support
- Full support for CCDT
- Support for Channel Exits
- Improved scripting support
- Automatic transport selection
- See the following DeveloperWorks article :
 - http://www.ibm.com/developerworks/websphere/techjournal/0901_leming/0901_leming.html



Migrating WebSphere WMQ V6 to V7



- Summary
 - Why Migrate?
 - Migration Steps Review
 - A Deeper Dive into Selected Topics





We value your feedback

- Please complete the survey for this session
- **AVP-2931 Migrating WebSphere WMQ V6 to V7 - Recommendations and Focus Areas**

Thank you...





Questions?

