Installing WebSphere MQ 7.5 to coexist with MQ 7.0.1 and MQ 7.1 in UNIX and Windows

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Agenda

- Introduction to MQ 7.1 Multi-version
- Previous WSTEs that provide in depth information
- Installing MQ for first time using 7.1/7.5
- Single-Stage upgrade to 7.1/7.5 - no co-existing
  - Need to explicitly setup Primary installation
- Coexisting multiple versions
  - Using setmqenv to setup environment variables
Highlights of Multi-Version

- Starting with MQ 7.1 it is possible to install multiple versions of MQ on a single system
- MQ 7.1 or 7.5 can be installed on a system which is already running MQ 7.0.1.6 or later
  - (For short, saying MQ 7.5 to mean also 7.1)
- Multiple copies of MQ 7.5 can be installed on:
  - AIX, HP-UX, Linux, Solaris and Windows
  - Multi-version is not available on IBM i or z/OS
- New commands for working with multiple installs
Previous WSTE on this topic (1)

- WebSphere MQ V7.1 Multi-Version - First Steps (PART 1)
- Discusses the benefits of multi-version installation, packaging changes, platform-specific installation details, and both new and updated commands for working with multiple versions of WebSphere MQ.
- Presenters: Barry Robbins, Justin Fries & Rich Montjoy
Previous WSTE on this topic (2)

- WebSphere MQ V7.1 Multi-Version - Environment Considerations and Management (PART 2)
- Discusses strategies for applying maintenance and patches, for migrating queue managers between versions, and for managing applications with WebSphere MQ.
- It also covers considerations for multi-instance queue managers, and diagnostics.
MQ 7.1/7.5 are not fix packs on top of 7.0

- MQ 7.1 is NOT a fix pack for 7.0:
  - 7.1 is a different version

- Similar comments apply to 7.5:
  - 7.5 is not a fix pack for 7.0 nor 7.1

- There are NO delta packages that will just add the new function added in MQ 7.1 and 7.5 to an MQ 7.0 installation.
Downloading MQ queue manager 7.1

- For the queue manager, the full code (not just a delta Fix Pack) can be downloaded from IBM Passport Advantage.

- It is faster and easier to search for Part Numbers and they are listed in the following technotes.

  - Downloading WebSphere MQ Version 7.1.0.2 from the Passport Advantage Web site
  - Base 7.1.0.2 (It is 7.1.0.0 plus 7.1.0.1 and 7.1.0.2)
Downloading MQ queue manager 7.5

- Downloading WebSphere MQ Version 7.5 from the Passport Advantage Web site
- Base 7.5.0.0
If you just want to install the MQ Client by itself (most up to date: base + fix packs), you can download from IBM Fix Central:

- MQC71: WebSphere MQ V7.1 Clients

- MQC75: WebSphere MQ V7.5 Clients
Downloading MQ Explorer 7.1 and 7.5

- You can just install the MQ Explorer by itself, on Windows or Linux Intel.

- MS0T: WebSphere MQ Explorer
- This SupportPac provides the WebSphere MQ Explorer (and the required level of the WebSphere Eclipse Platform, if necessary).
- You can select which set of files to download:
  - for MQ 7.0.1, MQ 7.1 and MQ 7.5.
Installing MQ for first time using 7.5

- This is the simplest scenario:
- The desired host does NOT have MQ installed.
- This is going to be the first installation of MQ in the host.
- Same process as installing MQ V6 and 7.0

- CAVEAT!
- You must use setmqinst to setup this installation as the PRIMARY installation
  - Even if there are no other installations
Symbolic links are no longer setup

- Starting with MQ 7.1, the installer does NOT create symbolic links in /usr/bin and other system directories for the MQ commands under /opt/mqm/bin or /usr/mqm/bin

- If you login as the MQ administrator and try to run MQ commands such as dspmq or crtmqm you will get errors like this one:
  - dspmq: command not found

- This is the expected behavior!
Notes: Common pitfall after installation (1)

- You have installed MQ 7.1 or 7.5.
- You login as an MQ Administrator and you try to run an MQ command, such as:
  - `dspmq`
- You expect the list of queue managers, but instead, you get an error message!
- If 'dspmq' is not a typo you can run the following command to lookup the package that contains the binary:
  - `command-not-found dspmq`
  - `-bash: dspmq: command not found`
- You try another command:
  - `dspmqver`
- And instead of getting the version of MQ, you get another error message:
  - AMQ8594: WebSphere MQ commands are no longer available in /usr/bin.
- In order to run MQ commands you must manage your path configuration as described in the WebSphere MQ product documentation. In particular review the topic on "Choosing a primary installation".
Use setmqinst to set Primary install (1)

- Because you may decide later on to install another version of MQ 7.1 or 7.5 in the same host, the installer code cannot make the automatic decision of making a particular installation the PRIMARY one.

- You need to manually designate an installation to be the Primary, even if there is ONLY one installation.
Use setmqinst to set Primary install (2)

- By designating a particular installation to be the primary one, then the symbolic links in /usr/bin will be created to the proper MQ executables.

- For this simplest scenario, do as user “root”:
  - UNIX: /opt/mqm/bin/setmqinst -i -p /opt/mqm
  - AIX: /usr/mqm/bin/setmqinst -i -p /usr/mqm

- Flags: -i sets this installation as primary
  - -p the path of the installation to modify.
Notes: Common pitfall after installation (2)

- Let's illustrate some symbolic links that are automatically created when installing MQ V6 or 7.0.x in a UNIX host: /opt/mqm (This is the location of the MQ code)
- There are many symbolic links in /usr/bin for most of the MQ commands, such as:
  - lrwxrwxrwx 1 root root /usr/bin/crtmqm -> /opt/mqm/bin/crtmqm
  - lrwxrwxrwx 1 root root /usr/bin/dspmq -> /opt/mqm/bin/dspmq

- If you uninstall MQ V6 or V7.0, those symbolic links are deleted.

- When installing MQ 7.1, the above symbolic links are NOT created.

- After you run as root the MQ 7.1 “setmqinst” command, then the corresponding symbolic links will be created:
  - lrwxrwxrwx 1 root root /usr/bin/crtmqm -> /opt/mqm/bin/crtmqm
  - lrwxrwxrwx 1 root root /usr/bin/dspmq -> /opt/mqm/bin/dspmq

- For illustration, if MQ 7.5 is installed in /usr/mqm75 and it is made primary, then the symbolic links would be:
  - lrwxrwxrwx 1 root root /usr/bin/crtmqm -> /opt/mqm75/bin/crtmqm
  - lrwxrwxrwx 1 root root /usr/bin/dspmq -> /opt/mqm75/bin/dspmq
MQ Admin cannot remotely connect (1)

- Due to the new feature in 7.1 called …
- **channel authentication records**
- ... the DEFAULT behavior for a new queue manager is to NOT allow the remote connection by an MQ administrator
- They will get:
  - RC 2035 MQRC_NOT_AUTHORIZED

- Queue managers created prior to 7.1 have the old behavior (MQ admin can remotely connect)
MQ Admin cannot remotely connect (2)

- For more details on how to alter the queue manager to allow the remote connections by MQ administrators, consult the technote:
  - WMQ 7.1 or 7.5 queue manager - RC 2035
    MQRC_NOT_AUTHORIZED when using client connection as an MQ Administrator
Notes: Channel Authentication Records

- From the “Answer” section of the technote mentioned in the previous slide:

- 1) If this is a production queue manager, then you could stop trying to use a userid that is an MQ Administrator and instead, use a non-admin userid.

- 2) If you really want the MQ Administrator to be able to access the queue manager via client channels, you could do one of the following actions.

  a) You can add the following two Channel Authentication Records:

     $ runmqsc QmgrName
     SET CHLAUTH(*) TYPE(BLOCKUSER) USERLIST('nobody','*MQADMIN')
     SET CHLAUTH(SYSTEM.ADMIN.*) TYPE(BLOCKUSER) USERLIST('nobody')

  b) You can disable the Channel Authentication Records feature:

     $ runmqsc QmgrName
     ALTER QMGR CHLAUTH(DISABLED)

     WARNING: Disabling this new feature is not recommended for MQ 7.1 / 7.5 production queue managers due to security implications.
Single-Stage upgrade, no co-existing

- This scenario is called “Single-Stage Upgrade” or “Single-Stage Migration”
- You have MQ 6 or 7.0 and you want to replace it with MQ 7.1 or 7.5.
  - That is, you are NOT going to exploit the multi-version capability.
- For more details, consult the techdoc:
  - Upgrading WebSphere MQ 7.0.1 to MQ 7.5 in Linux
Single-Stage upgrade prior to MQ 7.1

- Before MQ 7.1, upgrading was very linear
- 1. Stop all queue managers and their applications
- 2. Uninstall the old WebSphere MQ version
- 3. Install the new WebSphere MQ version
- 4. Start the queue managers to migrate them:
  - The first time the “strmqm” was used on a queue manager, the irreversible process to upgrade the queue manager took place.
Single-Stage upgrade after MQ 7.1

- After MQ 7.1, Single-Stage upgrades require more:
  - 1. Stop all queue managers and their applications
  - 2. Uninstall the old WebSphere MQ version
  - 3. Install the new WebSphere MQ version
  - 4. Specify new installation to be the Primary
  - 5. Start the queue managers to migrate them.
  - 6. Decide if you want MQ administrators to remotely connect to each queue manager
    - See mentioned technote 1577137 (slide 18)
Installation Paths for multiple installs

- The MQ installation path for binaries is no longer fixed on AIX, UNIX® and Linux systems.
- MQ 7.0: the only choice is:
  - /usr/mqm in AIX
  - /opt/mqm in Linux, HP-UX, Solaris
- MQ 7.1 example: /opt/mqm71
- MQ 7.5 example: /opt/mqm75

- MQ in Windows had already the ability to be installed in a user-specified location.
Data Paths

- The data path is shared between all installations

- AIX, UNIX and Linux:
  - /var/mqm

- Windows:
  - Chosen by the first installation,
  - Then fixed for all subsequent installations
Details on the installations

- Details about installations are held in a central location:
  - UNIX and Linux: /etc/opt/mqm/mqinst.ini
  - Windows: The Registry

- The command “dspmqinst” lists the details.
Installation names

- Starting with MQ 7.1, every installation has a name
- On AIX, UNIX and Linux systems, the first MQ version 7.1 installation is automatically given an installation name of **Installation1**.

- On Windows systems, you can choose the installation name during the installation process.

- The installation name **Installation0** is reserved for an installation of MQ version 7.0.1.6+
Adding another installation in Windows

- This techdoc shows all the steps.
- Installing WebSphere MQ 7.5 to coexist with MQ 7.0.1 and MQ 7.1 in Windows

- After running the test scenario, the directories are:
  - MQ 7.0.1.9 installed in:
    - C:\Program Files\IBM\WebSphere MQ
  - MQ 7.1.0.2 installed in:
    - C:\Program Files\IBM\WebSphere MQ_1
  - MQ 7.5.0.0 installed in:
    - C:\Program Files\IBM\WebSphere MQ_2
dspmqinst shows installed versions (1)

- New MQ command `dspmqinst` displays the different versions installed in the system
- In test scenario the output shows for each version:
  - InstName: Installation0
  - InstDesc: IBM WebSphere MQ Installation
  - Identifier: 0
  - InstPath: C:\Program Files\IBM\WebSphere MQ
  - Version: 7.0.1.9
  - Primary: Yes
  - State: Available
dspmqinst shows installed versions (2)

- In this test scenario, these are the values for the Installation name (InstName)
  - "Installation0" refers to MQ 7.0.1.9
  - "Installation1" refers to MQ 7.1.0.2
  - "Installation2" refers to MQ 7.5.0.0
Default is to use Primary (MQ 7.0)

- In this scenario, if you open a Windows command prompt and enter “dspmqver”, you will see:
  - Name: WebSphere MQ
  - Version: 7.0.1.9

- Notice that it is the older version (7.0.1.9), which is located in the primary installation.

- Question: what should be done to use the dspmqver from another installation?
Use setmqenv to specify installation (1)

- Answer: You need to run the new "setmqenv" command and specify the proper installation.
- In this example MQ 7.5 is in Installation2.
- Attempt 1: INCORRECT (full path not provided)
- Notice that setmqenv it is not in the PATH, because it did not exist in MQ 7.0 and the default PATH points to MQ 7.0.
- C:\> setmqenv -n Installation2
- 'setmqenv' is not recognized as an internal or external command, operable program or batch file.
Use setmqenv to specify installation (2)

- **Attempt 2: CORRECT (full path for MQ 7.5)**
  - "C:\Program Files\IBM\WebSphere MQ_2\bin\setmqenv" -n Installation2

- Now let's try again to display the version (trimming output)
- C:\> dspmqver
- Name: WebSphere MQ
- Version: 7.5.0.0
- … Platform: WebSphere MQ for Windows
- Mode: 32-bit
- O/S: Windows XP, Build 2600: SP3
- InstName: Installation2
- InstPath: C:\Program Files\IBM\WebSphere MQ_2
- …
You can create a batch file that will run the setmqenv command with the specified syntax. Ensure to have this batch file in a directory in your PATH.

For example, the batch file `set-mq-75.bat` can be created with the contents:

```bash
============= begin batch file
REM Setup the environment to run MQ 7.5
CALL "C:\Program Files\IBM\WebSphere MQ_2\bin\setmqenv" -n Installation2
REM Adding Samples to the path
SET PATH=%PATH%;%MQ_FILE_PATH%\tools\c\Samples\Bin
============= end batch file
```

Similarly for MQ 7.1: `set-mq-71.bat`

REM Setup the environment to run MQ 7.1
CALL "C:\Program Files\IBM\WebSphere MQ_2\bin\setmqenv" -n Installation1
SET PATH=%PATH%;%MQ_FILE_PATH%\tools\c\Samples\Bin

Similarly for MQ 7.0: `set-mq-70.bat`

REM Setup the environment to run MQ 7.0
CALL "C:\Program Files\IBM\WebSphere MQ_2\bin\setmqenv" -n Installation0
SET PATH=%PATH%;%MQ_FILE_PATH%\tools\c\Samples\Bin
Cannot use 7.5 admin cmds with 7.1 qmgrs

- You cannot use MQ 7.5 administrative commands to run an MQ 7.0 or 7.1 queue manager
- ... and vice versa

- For example, setting env to 7.5 and then trying to start a queue manager that runs under 7.0 will result in a runtime error:
  
  - C:> strmqm QM_MIG
  - AMQ5691: Queue manager 'QM_MIG' is associated with a different installation ('Installation0').
Upgrading a queue manager to 7.5 (a)

- Previous slide showed that we cannot use the 7.5 strmqm command to upgrade a queue manager that was created in 7.0

- Question: What is the next step to upgrade the queue manager?

- Answer: When there are multiple installations, it is necessary to explicitly associate a queue manager to the desired MQ installation by using:

  - `setmqm -m QMGR -n InstallationX`
Upgrading a queue manager to 7.5 (b)

- For example, QM_MIG was created at MQ 7.0.
- For this test scenario, to associate it with 7.5, we need to issue:
  - `setmqm -m QM_MIG -n Installation2`

- Is there a command that shows the association? Yes.
- Use `dspmq` to show the new associated installation for this queue manager:
  - `C:\> dspmq -o installation -m QM_MIG`
  - `QMNAME(QM_MIG) INSTNAME(Installation2)`
  - `INSTPATH(C:\Program Files\IBM\WebSphere MQ_2) INSTVER(7.5.0.0)`
Upgrading a queue manager to 7.5 (c)

- Start the queue manager. Because this is the first time that the `strmqm 7.5` is being issued on a queue manager that was used with an older release (7.0.1.9), then `strmqm` will do a migration:
  - `C:\> strmqm QM_MIG`
  - WebSphere MQ queue manager 'QM_MIG' starting.
  - The queue manager is associated with installation 'Installation2'.
  - 5 log records accessed on queue manager 'QM_MIG' during the log replay phase.
  - Log replay for queue manager 'QM_MIG' complete.
  - Transaction manager state recovered for queue manager 'QM_MIG'.
  - **Migrating objects for queue manager 'QM_MIG'.**
  - Default objects statistics: 9 created, 0 replaced, 0 failed.
  - WebSphere MQ queue manager 'QM_MIG' started using V7.5.0.0.
Notes: New objects, queues, attributes

- The following technotes provide specific information on what new objects, SYSTEM queues and objects were introduced in 7.1 and in 7.5:
  - New attributes for objects in WebSphere MQ 7.1 and 7.5
  - New SYSTEM queues added in WebSphere MQ 7.1 and 7.5
  - New WebSphere MQ 7.1 and 7.5 attributes in DISPLAY QMGR for new or migrated queue managers

- The following web link has a list of the MQ 7.5 processes and their names:
  - WebSphere MQ > Administering > Administering local WebSphere MQ objects > Stopping queue managers manually
Notes: MQ Windows Services

- In this test scenario there are 3 entries for the MQ Windows Service
  - Start > Control Panel > Administrative Tools > Services

- MQ (7.0.x)
  - Name: IBM MQSeries
  - Description: Provides startup and maintenance services for WebSphere MQ
  - Status: Started   Startup: Automatic   Log On As: Local System

- MQ (7.1)
  - Name: IBM WebSphere MQ (Installation1)
  - Description: Provides startup and maintenance services for WebSphere MQ installation 'Installation1'
  - Status: Started   Startup: Automatic   Log On As: .\MUSR_MQADMIN1

- MQ (7.5)
  - Name: IBM WebSphere MQ (Installation2)
  - Description: Provides startup and maintenance services for WebSphere MQ installation 'Installation2'
  - Status: Started   Startup: Automatic   Log On As: .\MUSR_MQADMIN1
Adding another install to existing one (Linux)

- Installing WebSphere MQ 7.5 to coexist with MQ 7.0.1 and MQ 7.1 in Linux

- Only Chapter 1 (actual install) is specific to Linux.
- Other chapters apply to AIX and UNIX too.
- 2: Need to run setmqenv to use MQ 7.5 commands
- 3: Creating a queue manager under 7.5
- 4: Remote access
- 5: Using MQ Explorer 7.5
- 6: Migrating an MQ 7.0 queue manager to MQ 7.5
Each platform has specific install procedure

- Due to the differences in the native installers in AIX, HP-UX, Solaris and Linux, each platform has its own procedure for installing MQ on a non-default location.
  - For Linux, see Chapter 1 of techdoc 7036779 (slide 40)
  - For the rest, see technote: 7024276 (slide 4)
  - WebSphere MQ V7.1 Multi-Version - First Steps
  - AIX: User Specified Installation Location (USIL)
    - Pages 13-15
  - HP-UX: Pages 16-18
  - Solaris: Page 20 – using **crtmqpkg**
  - NOTE: To install fix packs, use **crtmqfp** in Linux/Solaris
**dspmqinst shows installed versions**

- In this test scenario for Linux, after the installation of all the versions of MQ, these are the values for the Installation name (InstName)

  - "Installation0" refers to 7.0.1.9 = /opt/mqm
  - "Installation1" refers to 7.1.0.2 = /opt/mqm71
  - "Installation2" refers to 7.5.0.0 = /opt/mqm75
Notes: Example of dspmqinst

Output of dspmqinst in a system that has both MQ 7.0 (in /usr/mqm) and MQ 7.1 (in /usr/mqm71)
Notice that Installation0 is for the first version installed in the system, in this case it is MQ 7.0.

- $ /opt/mqm71/dspmqinst
- InstName: Installation0
- InstDesc: IBM WebSphere MQ Installation
- Identifier: 0
- InstPath: /opt/mqm
- Version: 7.0.1.9
- Primary: Yes
- State: Available

- InstName: Installation1
- InstDesc: 
- Identifier: 1
- InstPath: /opt/mqm71
- Version: 7.1.0.2
- Primary: No
- State: Available
Setting the desired MQ environment (a)

- You can add the setmqenv in your profile

- Or you can execute it from the command line.

- You will need to specify the full path of the command and you need to “source” it (to run “in-line”) by specifying a leading . (dot) and a blank:
  - . /opt/mqm75/bin/setmqenv -n Installation2
  - |   |
  - | +--- blank
  - +--- dot
Installing WebSphere MQ 7.5 to coexist with MQ 7.0.1 and MQ 7.1 in Linux
IBM Techdoc: 7036779 (slide 40)

Create a script $HOME/bin/set-mq-75.ksh:
Notice that the installation name is: installation2

============= begin script
#!/usr/bin/ksh
# Name: set-mq-75.ksh
# Purpose: to setup the environment to run MQ 7.5
. /opt/mqm75/bin/setmqenv -n Installation2
# Additional MQ 7 directories for the PATH
export PATH=$PATH:$MQ_INSTALLATION_PATH/bin:$MQ_INSTALLATION_PATH/java/bin:
$MQ_INSTALLATION_PATH/bin:$MQ_INSTALLATION_PATH/samp/bin:$MQ_INSTALLATION_PATH/samp/jms/samples:
# Add local directory for running Java/JMS programs
export CLASSPATH=$CLASSPATH:
# end
============= end of script

NOTE: You will need to invoke the script with the leading dot!
$ . set-mq-75.ksh
Common pitfalls when using setmqenv (1)

- Attempt 1: INCORRECT (the full path was not provided)
- Notice that setmqenv does not have a symbolic link in /usr/bin and at this moment it is not in our PATH.

- $ setmqenv -n Installation2
- If 'setmqenv' is not a typo you can run the following command to lookup the package that contains the binary:
  - command-not-found setmqenv
  - /bash: setmqenv: command not found
Common pitfalls when using setmqenv (2)

- Attempt 2: INCORRECT (the leading dot and space were not used)
- From the error message in Attempt 1, we specify the full path for setmqenv:
  
  $ /opt/mqm75/bin/setmqenv -n Installation2
  
  AMQ8595: The setmqenv command was not preceded by the source command.

- The above is not an error, just an info message.
- What is the “source” command? See next slides.
Common pitfalls when using setmqenv (3)

- In our scenario, 7.0.1.9 is the Primary install.
- $ dspmqver => Version: 7.0.1.9

- Then we run setmqenv without 'sourcing' it:
  - $ /opt/mqm75/bin/setmqenv -n Installation2
  - AMQ8595: The setmqenv command was ...

- If we run dspmqver again, we STILL get:
  - $ dspmqver => Version: 7.0.1.9

- It seems that nothing happened because we still see the old version! What is going on?
Common pitfalls when using setmqenv (4)

- You will need to specify the full path of the command and you need to “source” it (to run “in-line”) by specifying a leading . (dot) and a blank:
  - . /opt/mqm75/bin/setmqenv -n Installation2
  - | |
  - | +---- blank
  - +---- dot
- Note, in Linux you can also use the command “source”:
  - source /opt/mqm75/bin/setmqenv -n Installation2
- If we run dspmqver again, we will get the new version:
  - $ dspmqver => Version: 7.5.0.0
Environment is NOT set when not 'sourcing'

Initial process shell

Set-1 of env variables
Using /opt/mqm

setmqenv

No change in env.
Same Set-1 of env variables
Using /opt/mqm

Forked process

setmqenv adds and alters env variables
Set-2 of env variables
Using /opt/mqm75
Need to source (in-line) setmqenv

Initial process shell

Set-1 of env variables
Using /opt/mqm

- setmqenv

In-line execution

setmqenv adds and alters env variables

Set-2 of env variables
Using /opt/mqm75

Using Set-2 of env variables
Using /opt/mqm75
Setting the desired MQ environment (b)

- You can use “wmqprofile”:

- MQ Profile for UNIX & Linux systems: wmqprofile

- It is an optional alternative to the setmqenv command shipped with MQ V7.5 on UNIX. It provides several conveniences for users and for systems administrators over the standard setmqenv command.
You can use multiple MQ Explorers

- In Windows and in Linux Intel, you can use multiple MQ Explorers at the same time
- Showing 7.0 in foreground and 7.5 in background
Additional WebSphere Product Resources

- Learn about upcoming WebSphere Support Technical Exchange webcasts, and access previously recorded presentations at: http://www.ibm.com/software/websphere/support/supp_tech.html

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