Upgrading WebSphere MQ 7.0.1 to MQ 7.5 in Linux

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http://www.ibm.com/support/docview.wss?rs=171&uid=swg27036692

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IBM WebSphere MQ Support

+++ Objective

This techdoc shows all the steps to upgrade WebSphere MQ 7.0.1 with the GSKit to WebSphere MQ 7.5 with the GSKit in Linux.

This is a straight upgrade and does not exploit the 'multi-version' feature introduced with MQ 7.1, in which several versions of MQ can co-exist ("side-by-side").

You can upgrade from MQ 7.0 to MQ 7.5, without first going through MQ 7.1.

MQ 7.5 includes also Advanced Messaging Security (AMS) and Managed File Transfer. This document does not cover their installation. The scope is only for the MQ Server, MQ Explorer, JMS and Development toolkit.

Even though the platform used in this techdoc is Linux x86 32-bit, the overall instructions apply also to other UNIX distributions: AIX, HP-UX and Solaris.

Notes:
- The principles apply also to the upgrade to MQ 8.0 and MQ 9.0.
- Starting with MQ 8.0, the queue manager is only supported in Linux 64-bit.

The chapters are:

Chapter 1: Uninstalling MQ 7.0
Chapter 2: Installing MQ 7.5
Chapter 3: Running setmqinst to designate the Primary installation
Chapter 4: Running setmqenv to use MQ 7.5 commands
Chapter 5: Creating a queue manager under 7.5
Chapter 6: Remote access to the new MQ 7.5 queue manager
Chapter 7: Using MQ Explorer 7.5
Chapter 8: Migrating an MQ 7.0 queue manager to MQ 7.5

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+++ Chapter 1: Uninstalling MQ 7.0.1
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MQ 7.1 and MQ 7.5 are separate versions of the product. They are not fix packs that can be installed on top of MQ 7.0.1.

The straight upgrade from MQ 7.0 to MQ 7.5 is similar to an upgrade from MQ V6 to MQ 7: only one version of MQ will be available under /opt/mqm.

It is necessary uninstall MQ 7.0 from /opt/mqm, and then install 7.5, also in /opt/mqm.

These tasks do NOT alter the contents of /var/mqm (which contains the data for the queue managers). That is, when you uninstall the product from /opt/mqm, the queue managers are NOT deleted.

++ Hardware and software

Linux SLES 11, on x86-32-bit, running with WebSphere MQ 7.0.1.9.

Queue Managers: QM_701 => Created with MQ 7.0.1.9. To be migrated to 7.5.0.0
QM_MIG => Created with MQ 7.0.1.9. To be migrated to 7.5.0.0
QM_75 => Created with MQ 7.5.0.0

++ Current setup of MQ 7.0.1.9

MQ 7.0.1.9 already installed in the default location:
        /opt/mqm

The data for the queue managers is stored in:
        /var/mqm

Notice that there are many symbolic links in /usr/bin for most of the MQ commands, such as:

```
lrwxrwxrwx 1 root root  19 Nov 15 16:02 /usr/bin/crtmqm -> /opt/mqm/bin/crtmqm
lrwxrwxrwx 1 root root  18 Nov 15 16:02 /usr/bin/dspmq -> /opt/mqm/bin/dspmq
lrwxrwxrwx 1 root root  19 Nov 15 16:02 /usr/bin/endmqm -> /opt/mqm/bin/endmqm
lrwxrwxrwx 1 root root  21 Nov 15 16:02 /usr/bin/endmqtrc -> /opt/mqm/bin/endmqtrc
lrwxrwxrwx 1 root root  19 Nov 15 16:02 /usr/bin/strmqm -> /opt/mqm/bin/strmqm
lrwxrwxrwx 1 root root  21 Nov 15 16:02 /usr/bin/strmqtrc -> /opt/mqm/bin/strmqtrc
```

++ Taking a backup of the queue manager data

Take a backup of /var/mqm and any other file system that is used (such as mounted, or via symbolic links) for the storage of the MQ recovery logs and the MQ data for the queue managers.
If the queue manager is created in a non-default directory (such as Multi-Instance), ensure that all queue manager data and logs are included in the backup based on the configuration in mqs.ini and qm.ini files.

Note: when an MQ 7.0 queue manager is upgraded to MQ 7.5, it goes through some migration steps that are NOT reversible. If for some reason you want to back out later on your upgrade MQ queue manager (at 7.5) back to 7.0, you will NOT be able to use the current data in /var/mqm and you will need to restore from the backup taken when the MQ queue manager was at 7.0.

Disclaimer:
The MQ Support teams do not recommend or support the action to revert to an earlier version of the product.
If any problem were to occur after upgrading to MQ V7, the best way to address the situation is to contact MQ Support and get that fixed, rather than by reverting to version 6.

Given the above disclaimer, please review the following technotes which explain more details on the topic.
http://www.ibm.com/support/docview.wss?rs=171&uid=swg21251721
After upgrading from MQ 5.3 to V6/V7, or from MQ V6 to V7, you want to revert back to previous level

See also the related technote:
http://www.ibm.com/support/docview.wss?uid=swg21161377
What steps are required to import the MS03 saveqmgr file to a new queue manager

++ Reference:

http://publib.boulder.ibm.com/infocenter/wmqv7/v7r0/topic/com.ibm.mq.amq1ac.doc/lq10880_.htm
WebSphere MQ 7.0 > Quick Beginnings for Linux
Uninstalling WebSphere MQ

The following is an excerpt:

- End all WebSphere MQ activity:
  - Log in as a user from group mqm.
  - Use the **dspmq** command to display the state of all the queue managers on the system (only applicable on a server installation).
  - Use the **endmqm** command to stop all running queue managers.
  - Stop any listeners associated with the queue managers, using the command:
       endmqlsr -m QMgrName
  - To check that you have stopped all necessary WebSphere MQ activity, type:
     ps -ef | grep mq
  - Check that there are no processes listed that are running command lines beginning with amq or runmq. Ignore any that start with amqi.

- Log in as root.
- Before you uninstall WebSphere MQ for Linux you must find out the names of the packages (components) currently installed on your system. To list all the packages with their version information, enter the following:

   rpm -qa | grep MQSeries

   rpm -qa | grep gsk

Note: If you have applied maintenance to the install, remove these maintenance packages before removing the base install.

- Some of the installed packages are dependent on others. The rpm command will not remove a package if others are dependent on it. For this reason you must uninstall the packages in such an order that each one you uninstall has no dependencies from other packages.
   However, an easier alternative is to remove all the components at the same time by appending all the package names to the rpm command arguments. For example, to remove the runtime, Server and SDK components, enter the following:

   rpm -ev MQSeriesRuntime MQSeriesServer MQSeriesSDK

- Proceed to identify the GSKit files:

   rpm -qa | grep gsk
gsk7bas-7.0-4.41
gskcrypt32-8.0-14.22
gskssl32-8.0-14.22

- Remove the GSKit packages:
   rpm -ev gsk7bas-7.0-4.41 gskcrypt32-8.0-14.22 gskssl32-8.0-14.22

At this point, you have completely removed MQ V7.0 and the corresponding GSKit.

We have not altered in anyway the contents of /var/mqm which has the data for the queue managers

++ Some symbolic links in /usr/bin were removed but others remain

Notice that after uninstalling MQ 7.0, there are some symbolic links in /usr/bin for MQ commands that were removed (such as crtmqm), but there are still some symbolic links left behind (which is normal), such as:

ls -l /usr/bin/*mq*
lrwxrwxrwx 1 root root 21 Jul 2 10:43 /usr/bin/amqcc62a -> /opt/mqm/bin/amqcc62a
lrwxrwxrwx 1 root root 23 Jul 2 10:43 /usr/bin/amqcc62a_r -> /opt/mqm/bin/amqcc62a_r
lrwxrwxrwx 1 root root 21 Jul 2 10:43 /usr/bin/amqcctca -> /opt/mqm/bin/amqcctca

```
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+++ Chapter 2: Installing MQ 7.5
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```

++ Downloading the MQ 7.5 code

It is recommended that the "Search for Part Numbers" should be used in
IBM Passport Advantage to find the MQ components easier.
The following technote has more details on the component names and the part
numbers for the installable images for MQ V7.5 from the IBM Passport
Advantage web site:

http://www.ibm.com/support/docview.wss?uid=swg24032734
Downloading WebSphere MQ Version 7.5 from the Passport Advantage Web site

For this techdoc, the following files were downloaded:
CI79HML   WebSphere MQ V7.5 for Linux on x86 32-bit Multilingual

The downloaded file was renamed to:
MQ-V7.5-Linux-x86-32bit-CI79HML.tar.gz

++ Installing MQ 7.5 into /opt/mqm75

In order to install the code, you need to login as root.

To be installed in:
        /opt/mqm

The downloaded code from Passport Advantage into a temporary directory, such as:
        /downloads/mq/75

Change to the location of the downloaded file and uncompress it:
        # cd /downloads/mq/75
        # tar -zxvf MQ-V7.5-Linux-x86-32bit-CI79HML.tar.gz

Proceed to accept the license:
        # ./mqlicense.sh -accept
        …
        Agreement accepted: Proceed with install.

++ Clarification on what step to do next

The MQ 7.5 Information Center has a rather confusing paragraph regarding what step is next:
http://pic.dhe.ibm.com/infocenter/wmqv7/v7r5/index.jsp?topic=
%2Fcom.ibm.mq.doc%2Fig10440_.htm
WebSphere MQ > Installing > Installing components > WebSphere MQ server
Installing WebSphere MQ server on Linux

This is the paragraph that seems confusing:
"If this installation is not the first installation of WebSphere MQ on the system, you must run the crtmqpkg command to create a unique set of packages to install on the system."

The tricky part to interpret here is: "the first installation of WebSphere MQ on the system".

Well, one possible answer is: "I installed MQ 7.0.1.9 before and thus, that was the first installation of MQ in the system".
The counterpoint is that because MQ 7.0.1.9 was uninstalled, it is no longer the "first installation" in the system.

The way to interpret the paragraph is this: **do you have a version of MQ already installed in the system?**

If YES, then you need to run the crtmqpkg command in order for MQ 7.5 to coexist with the existing version of MQ already installed.

If NO, then you do NOT need to run the crtmqpkg command.

For the scenario described in this techdoc, because we uninstalled MQ 7.0 and at this moment there is no code in /opt/mqm, then we do NOT need to run the crtmqpkg command, and we can proceed to run the rpm command to install the filesets.

++ Running rpm with the filesets

Note: It is recommended that you invoke the "rpm" command with all the filesets that you want to install, instead of invoking "rpm" separately for each fileset. In that way, you avoid the need to specify the strict order to install the filesets, because some are pre-requisites for others. When you include all the filesets at once, the "rpm" command finds out which is the proper order of installation and proceeds to execute the installation in the precise order.

NOTE: In this techdoc, the AMS and Managed File Transfer components (MQSeriesFT*) will NOT be installed.

rpm -ivh MQSeriesClient-7.5.0-0.i386.rpm MQSeriesExplorer-7.5.0-0.i386.rpm MQSeriesGSKit-7.5.0-0.i386.rpm MQSeriesJRE-7.5.0-0.i386.rpm MQSeriesJava-7.5.0-0.i386.rpm MQSeriesMan-7.5.0-0.i386.rpm MQSeriesRuntime-7.5.0-0.i386.rpm MQSeriesSDK-7.5.0-0.i386.rpm MQSeriesSamples-7.5.0-0.i386.rpm MQSeriesServer-7.5.0-0.i386.rpm

```
Preparing...              ######################################### [100%]
   1:MQSeriesRuntime       ######################################### [ 10%]
   2:MQSeriesJRE           ######################################### [ 20%]
   3:MQSeriesClient        ######################################### [ 30%]
   4:MQSeriesExplorer      ######################################### [ 40%]
   5:MQSeriesGSKit         ######################################### [ 50%]
   6:MQSeriesJava          ######################################### [ 60%]
   7:MQSeriesMan           ######################################### [ 70%]
   8:MQSeriesSDK           ######################################### [ 80%]
   9:MQSeriesSamples       ######################################### [ 90%]
  10:MQSeriesServer        ######################################### [100%]
```

- Notice that in addition to the previous symbolic links in /usr/bin, after the installation of MQ 7.5, there is a new symbolic link in /usr/bin
   lrwxrwxrwx 1 root root   21 Nov 15 15:18 dspmqver -> /opt/mqm/bin/amqichlp

- Notice that a new file is created that indicates what are the installed versions of MQ 7.1 or later. In this case, we have only one installation.
   cat /etc/opt/mqm/mqinst.ini
Installation:
   Name=Installation1
   Description=
   Identifier=1
   FilePath=/opt/mqm

The installation name **Installation0** is reserved for an installation of WebSphere MQ version 7.0.1.

On UNIX and Linux systems, the first WebSphere MQ installation is automatically given an installation name of **Installation1**.

++ Downloading latest Fix Pack for MQ 7.5

This step is for completeness sake. We recommend to run MQ with the latest fix pack level. At this moment, there are no fix packs for MQ 7.5. But in case that there was one, then visit the following web page and download the corresponding fix pack:
http://www-01.ibm.com/support/docview.wss?rs=171&uid=swg27006037
Recommended Fixes for WebSphere MQ

```
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```
+++ Chapter 3: Running setmqinst to designate the Primary installation
```
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```

OK, you have installed MQ 7.5 and you proceed to issue MQ commands.

You login as an MQ Administrator and 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".
```

What is going on?

This is what happened: starting with MQ 7.1, there is a new function called "multi-version", which allows to have multiple versions and fix packs of MQ to be installed concurrently (co-existing) in the same machine. For example, you may want to have:

MQ 7.0.1.6 (the minimum version in 7.0.1 for multi-version) in /opt/mqm
MQ 7.1.0.0 in /opt/mqm71
MQ 7.1.0.1 in /opt/mqm7101
MQ 7.5.0.0 in /opt/mqm75

Assuming the above 4 installations, now you will have 4 different versions of the command "strmqm". Question: which one do you want to use?

If there is a symbolic link in /usr/lib for "strmqm", to which version should it point to? To the one in /opt/mqm? Or /opt/mqm75?

It could be very confusing to issue strmqm for a queue manager that is running under MQ 7.5 but the strmqm is the one from MQ 7.1.0.1.

To avoid that confusion, the symbolic links in /usr/bin for most of the MQ commands and links in /usr/lib for the MQ library files have been removed whenever MQ 7.1 or 7.5 is installed in the system.

At this point, you have 2 ways on how to proceed:

a) Do NOT have a Primary installation.

b) Designate one of the installations to be a Primary installation, and symbolic links will be created in /usr/bin to use the MQ files from the desired installation. This is desirable when you want to work most of the time with that particular installation. For this techdoc, because we have ONLY ONE installation of MQ, it makes perfect sense that /opt/mqm should be the Primary Installation. Thus, the rest of this chapter will describe how to accomplish that.

Wait a moment!

If I have only 1 installation of MQ in the system, why the MQ installation utilities do not assign it to be the Primary? Why do I have to be bothered to take one more step in order to manually designate it as Primary?

One reason is that the utilities do not know if your intention is to install in the same day 2 different versions of MQ in the same machine. A Primary installation is not chosen (even if it is the only installation) just in case that you want to exploit the multi-version feature later on and this early decision of not designating a Primary will save you confusion and frustration later on.

On UNIX and Linux systems, if you set an installation as the Primary installation, symbolic links to the external libraries and control commands of that installation are added into /usr/lib, and /usr/bin. If you do not have a primary installation, the symbolic links are not created.

For more information see:

http://pic.dhe.ibm.com/infocenter/wmqv7/v7r5/index.jsp?topic=%2Fcom.ibm.mq.doc%2Fzi00700_.htm
WebSphere MQ > Installing > Planning your installation
Choosing a primary installation

http://pic.dhe.ibm.com/infocenter/wmqv7/v7r5/index.jsp?topic=
%2Fcom.ibm.mq.doc%2Fzi00701_.htm

WebSphere MQ > Planning > Planning for multiple installations > Choosing a primary installation

Single installation of WebSphere MQ version 7.1, or later, configured as the primary installation

+ begin quote

On UNIX and Linux platforms, the first installation onto a system must be manually configured to be the primary installation. Set the primary installation using the setmqinst command.

Enter the following command at the command prompt:

   MQ_INSTALLATION_PATH/bin/setmqinst -i -p MQ_INSTALLATION_PATH

+ end quote

The MQ_INSTALLATION_PATH for this test is the original MQ 7.0 directory /opt/mqm. Thus, the command to run is the following.

You need to run the command as root (otherwise, the command will fail)

   /opt/mqm/bin/setmqinst -i -p /opt/mqm

87 of 87 tasks have been completed successfuly.

'Installation1' (/opt/mqm) set as the Primary Installation.

Notice that a couple of lines are appended to the mqinst.ini file: there is a new stanza "Primary":

  cat /etc/opt/mqm/mqinst.ini

Installation:
   Name=Installation1
   Description=
   Identifier=1
   FilePath=/opt/mqm
Primary:
   Name=Installation1

Notice that there are new symbolic links for MQ commands in /usr/bin, such as:

ls -l /usr/bin/*mq*

```
lrwxrwxrwx 1 root root  19 Nov 15 16:02 /usr/bin/crtmqm -> /opt/mqm/bin/crtmqm
lrwxrwxrwx 1 root root  18 Nov 15 16:02 /usr/bin/dspmq -> /opt/mqm/bin/dspmq
lrwxrwxrwx 1 root root  19 Nov 15 16:02 /usr/bin/endmqm -> /opt/mqm/bin/endmqm
lrwxrwxrwx 1 root root  21 Nov 15 16:02 /usr/bin/endmqtrc -> /opt/mqm/bin/endmqtrc
lrwxrwxrwx 1 root root  19 Nov 15 16:02 /usr/bin/strmqm -> /opt/mqm/bin/strmqm
lrwxrwxrwx 1 root root  21 Nov 15 16:02 /usr/bin/strmqtrc -> /opt/mqm/bin/strmqtrc
```

Also notice that there are symbolic links in /usr/lib, such as:

ls -l /usr/lib/*mq*
lrwxrwxrwx 1 root root 31 Nov 15 16:02 /usr/lib/libimqb23gl.so -> /opt/mqm/lib/4.1/libimqb23gl.so
lrwxrwxrwx 1 root root 33 Nov 15 16:02 /usr/lib/libimqb23gl_r.so ->
/opt/mqm/lib/4.1/libimqb23gl_r.so
lrwxrwxrwx 1 root root 31 Nov 15 16:02 /usr/lib/libimqc23gl.so -> /opt/mqm/lib/4.1/libimqc23gl.so
lrwxrwxrwx 1 root root 33 Nov 15 16:02 /usr/lib/libimqc23gl_r.so ->
/opt/mqm/lib/4.1/libimqc23gl_r.so

Now that we have a Primary installation and the symbolic links in /usr/bin, let's check
again the behavior dspmq and dspmqver commands mentioned earlier.

  dspmq
QMNAME(QM_701)   STATUS(Status not available)
QMNAME(QM_MIG)   STATUS(Status not available)

  dspmqver
Name: WebSphere MQ
Version: 7.5.0.0
Level: p000-L120604
BuildType: IKAP - (Production)
Platform: WebSphere MQ for Linux (x86 platform)
Mode: 32-bit
O/S: Linux 2.6.27.54-0.2-pae
InstName: Installation1
InstDesc:
InstPath: /opt/mqm
DataPath: /var/mqm
Primary: Yes
MaxCmdLevel: 750

```
+++++++++++++++++++++++++++++++++++++++++++++++++++++
+++ Chapter 4: Running setmqenv to use MQ 7.5 commands
+++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Now that we finished with the root activities, we can login as an MQ administrator.

There is a global file in /etc (new for MQ 7.1) which provides information on the MQ 7.1 and later installations of MQ in the machine:
        /etc/opt/mqm/mqinst.ini

Let's display the contents of the file:
        cat /etc/opt/mqm/mqinst.ini

```
Installation:
   Name=Installation1
   Description=
   Identifier=1
   FilePath=/opt/mqm
Primary:
   Name=Installation1
```

Notice that the name is "Installation1". This name is very important!

You can use the following new MQ 7.5 command to display the information on the installation.

```
  dspmqinst
InstName:      Installation1
InstDesc:
Identifier:    1
InstPath:      /opt/mqm
Version:       7.5.0.0
Primary:       Yes
State:         Available
```

Now, let's display the version of MQ:

```
  dspmqver
Name:        WebSphere MQ
Version:     7.5.0.0
Level:       p000-L120604
BuildType:   IKAP - (Production)
Platform:    WebSphere MQ for Linux (x86 platform)
```

Mode: 32-bit
O/S: Linux 2.6.27.54-0.2-pae
InstName: Installation1
InstDesc:
InstPath: /opt/mqm
DataPath: /var/mqm
Primary: Yes
MaxCmdLevel: 750

In MQ 7.0, if you wanted to run Java/JMS programs you need to issue the command:
  . setjmsenv
Or
  . setjmsenv64
... in order to setup the proper environment variables for MQ Java and JMS.

Well, these commands are still available, but a more comprehensive command was introduced:
  setmqenv

This new command is critical to setup the environment when exploiting multi-version installations. Because of its importance, it is described here, even though the scenario in this techdoc does not exploit multi-versions.

Before running "setmqenv", the following command did not return any entries for environment variables that have "MQ" or "mq" in the names:

  set | grep -i mq
(no items returned)

It is a bit tricky to invoke the setmqenv command. Let's start with the simplest (but incorrect) way to issue it:

Attempt: INCORRECT (it was not sourced in)

$ **setmqenv -n Installation1**
AMQ8595: The setmqenv command was not preceded by the source command.

What went wrong?
You need to "source" (run "inline") the utility setmqenv by specifying a leading . (dot) and a blank:
```
$ .   /opt/mqm/bin/setmqenv -n Installation1
  | |
  | +--- blank
  +--- dot
```

The following is a quote from the WebSphere MQ 7.1 Information Center

http://publib.boulder.ibm.com/infocenter/wmqv7/v7r1/index.jsp?topic=
[%2Fcom.ibm.mq.doc%2Flq10440_.htm](http://publib.boulder.ibm.com/infocenter/wmqv7/v7r1/index.jsp?topic=%2Fcom.ibm.mq.doc%2Flq10440_.htm)
WebSphere MQ > Reference > Administration reference > WebSphere MQ control commands > The control commands
setmqenv
Note: The . character used at the beginning of each command makes the setmqenv script run in the current shell. Therefore, the environment changes made by the setmqenv script are applied to the current shell. Without the . character, the environment variables are changed in another shell, and the changes are not applied to the shell from which the command is issued.

Attempt: CORRECT (it was sourced in)

. **/opt/mqm/bin/setmqenv -n Installation1**

These are the changes made in the environment by this utility:

CLASSPATH=.:/opt/mqm/java/lib/com.ibm.mq.jar:/opt/mqm/java/lib/com.ibm.mqj
ms.jar:/opt/mqm/samp/wmqjava/samples:/opt/mqm/samp/jms/samples
MANPATH=/opt/mqm/man:/usr/local/man:/usr/share/man:/usr/man:/usr/man
MQ_DATA_PATH=/var/mqm
MQ_ENV_MODE=32
MQ_INSTALLATION_NAME=Installation1
MQ_INSTALLATION_PATH=/opt/mqm
MQ_JAVA_DATA_PATH=/var/mqm
MQ_JAVA_INSTALL_PATH=/opt/mqm/java
MQ_JAVA_LIB_PATH=/opt/mqm/java/lib
MQ_JRE_PATH=/opt/mqm/java/jre
MQ_RETVAL=0
PATH=/opt/mqm/bin:..

+ Hint:
You can create a script that will run the setmqenv command with the specified syntax.
Its usage is an overkill when having only 1 installation in the system, but it becomes very useful if you decide to exploit the multi-version features later on.

For example, the script $HOME/bin/set-mq-75.ksh can be created with the contents:
        $ mkdir $HOME/bin
        $ cd $HOME/bin
        $ vi set-mq-75.ksh

Notice that the installation name is: installation1

============= begin script
#!/usr/bin/ksh
Name: set-mq-75.ksh
Purpose: to setup the environment to run MQ 7.5

. /opt/mqm/bin/setmqenv -n Installation1

Additional MQ 7.5 directories for the PATH
export PATH=$PATH:$MQ_INSTALLATION_PATH/bin:
$MQ_INSTALLATION_PATH/java/bin:$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

Notice that additional directories are included in the PATH. This is going to be explained later. The setmqenv will setup the proper directory for MQ_INSTALLATION_PATH.

You will need to specify the script as executable:
        $ chmod 755 $HOME/bin/set-mq-75.ksh

You will need to add $HOME/bin in the PATH in your .bashrc or .profile:

PATH=$PATH:$HOME/bin:.
export PATH

You will need to invoke the script with the leading dot!

```
        $ .    set-mq-75.ksh
          | |
          | +--- blank
          +--- dot
```

+++ Hint for your bashrc or profile

You can add into your bashrc or profile file the following:

. set-mq-75.ksh

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++ Chapter 5: Creating a queue manager under 7.5
++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Before we create a queue manager under 7.5, let's show the current queue managers created under MQ 7.0.

Let's create a new queue manager. Notice the new line shown in bold font that indicates that Installation1 is used:

  crtmqm -u SYSTEM.DEAD.LETTER.QUEUE QM_75
WebSphere MQ queue manager created.
Directory '/var/mqm/qmgrs/QM_75' created.
The queue manager is associated with installation '**Installation1**'.
Creating or replacing default objects for queue manager 'QM_75'.
Default objects statistics : 74 created. 0 replaced. 0 failed.
Completing setup.
Setup completed.

Start the queue manager. Notice the lines that indicate the installation and the version under which the queue manager is running:

  strmqm QM_75
WebSphere MQ queue manager 'QM_75' starting.
The queue manager is associated with installation 'Installation1'.
5 log records accessed on queue manager 'QM_75' during the log replay phase.
Log replay for queue manager 'QM_75' complete.
Transaction manager state recovered for queue manager 'QM_75'.
WebSphere MQ queue manager 'QM_75' started using V7.5.0.0.

Let's display the status
  dspmq -m QM_75
QMNAME(QM_75)   STATUS(Running)

Let's do a more advanced display of status. Notice that the new one QM_75 has 3 new pieces of information: INSTNAME, INSTPATH and INSTVER

  dspmq -o installation
QMNAME(QM_75) **INSTNAME(Installation1) INSTPATH(/opt/mqm) INSTVER(7.5.0.0)**

++
+++ Chapter 6: Remote access to the new MQ 7.5 queue manager
++

Let's customize the queue manager to allow it to be monitored remotely by the MQ Explorer and to create a local queue Q1 for initial testing:

   runmqsc QM_75
define listener(TCP.LISTENER) trptype(tcp) control(qmgr) port(1430)
start listener(TCP.LISTENER)
define channel(SYSTEM.ADMIN.SVRCONN) chltype(SVRCONN) REPLACE
define ql(Q1)
end

Now you start the MQ Explorer from a remote host, using a userid that is an MQ Administrator in the host that has the newly created queue manager.

You use the MQ Explorer to try to remotely access the 7.5 queue manager.
Right click on the folder "Queue Managers" and then select "Add Remote Queue Manager..."
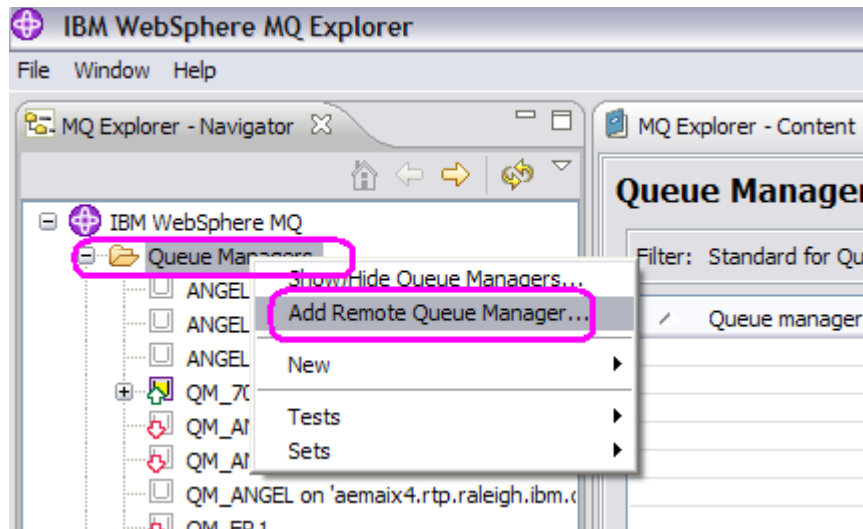
Specify the queue manager name and accept the default way of connecting.

⊕ **Add Queue Manager**

Select the queue manager and connection method

Identify the queue manager to add and choose the connection method to use

Queue manager name: QM_75

How do you want to connect to this queue manager?

⦿ Connect directly

       This option creates a new connection to the queue manager (recommended)

◯ Connect using a client channel definition table

Then specify the hostname and port:

⊕ **Add Queue Manager**

Specify new connection details

Provide details of the connection you want to set up
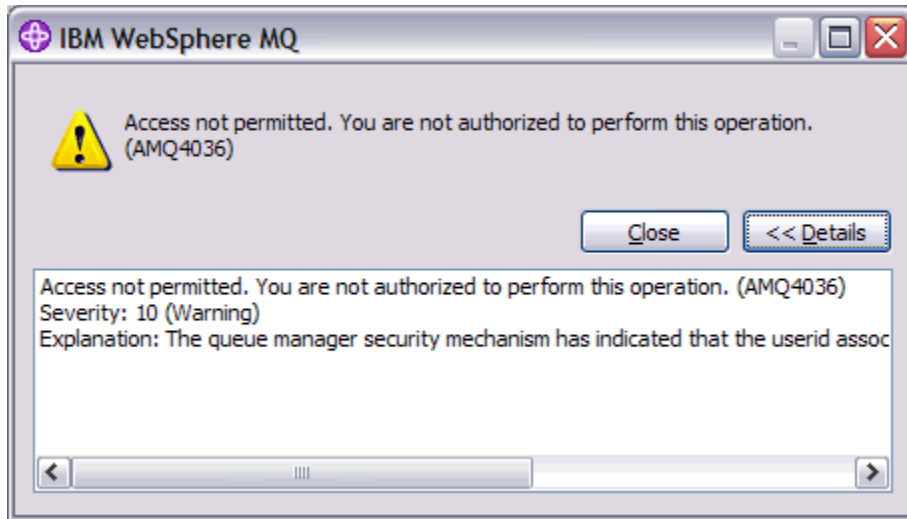
Queue manager name: QM_75

Connection details

Host name or IP address: veracruz███████om

Port number: 1430

Server-connection channel: SYSTEM.ADMIN.SVRCONN
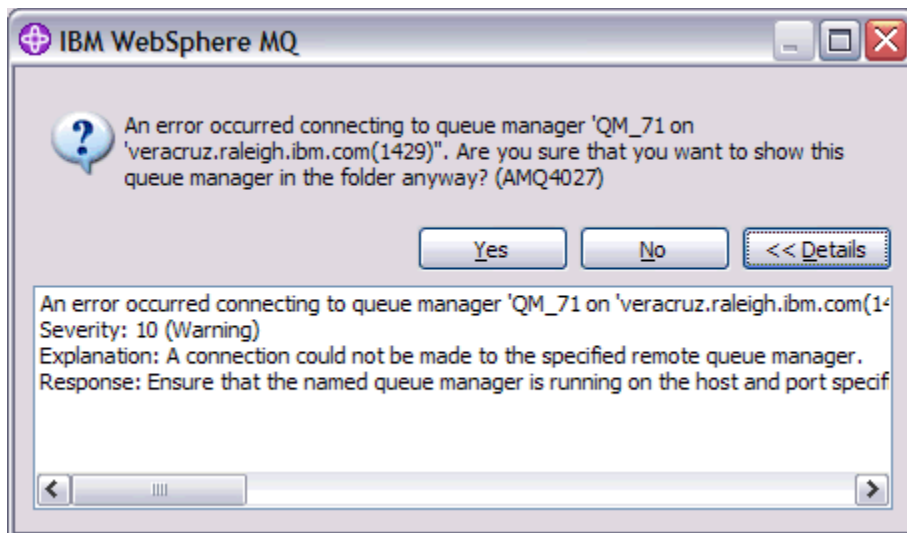
And you get the following errors:

Text inside the dialog box:
  Access not permitted. You are not authorized to perform this operation. (AMQ4036)
  Severity: 10 (Warning)
  Explanation: The queue manager security mechanism has indicated that the userid associated with this request is not authorized to access the object.

After closing the above dialog, the next one appears:

Text inside the dialog box:
  An error occurred connecting to queue manager 'QM_71 on 'host.x.com(14xx)". Are you sure that you want to show this queue manager in the folder anyway? (AMQ4027)
  Severity: 10 (Warning)
  Explanation: A connection could not be made to the specified remote queue manager.
  Response: Ensure that the named queue manager is running on the host and port specified, and has a channel corresponding to the specified name. Ensure that you have the authority to connect to the remote queue manager, and ensure that the network is running. Select Yes if you believe that the problem can be resolved later. Select No if you want to correct the problem now and try again.

In the error log for the queue manager (/var/mqm/qmgrs/QM_75/errors/AMQERR01.LOG) you see the errors AMQ9776 and AMQ9999

AMQ9776: Channel was blocked by userid
EXPLANATION:
The inbound channel 'SYSTEM.ADMIN.SVRCONN' was blocked from address '9.49.x.x' because the active values of the channel were mapped to a userid which should be blocked. The active values of the channel were 'MCAUSER(rivera) CLNTUSER(rivera)'.
ACTION:
Contact the systems administrator, who should examine the channel authentication records to ensure that the correct settings have been configured. The ALTER QMGR CHLAUTH switch is used to control whether channel authentication records are used. The command DISPLAY CHLAUTH can be used to query the channel authentication records.

AMQ9999: Channel 'SYSTEM.ADMIN.SVRCONN' to host 'x (9.49.x.x)' ended abnormally.

In MQ 7.1 and later, as part of the improved security measures, by default an MQ Administrator CANNOT use the MQ Explorer to remotely access a queue manager. The new feature of "channel authentication records" blocks the remote access via channels for any MQ Administrator. There are 3 such records in a newly created queue manager:

  runmqsc QM_75
display chlauth(*)
    5 : display chlauth(*)
AMQ8878: Display channel authentication record details.
   CHLAUTH(SYSTEM.ADMIN.SVRCONN)   TYPE(ADDRESSMAP)

```
   ADDRESS(*)                          USERSRC(CHANNEL)
AMQ8878: Display channel authentication record details.
   CHLAUTH(SYSTEM.*)                   TYPE(ADDRESSMAP)
   ADDRESS(*)                          USERSRC(NOACCESS)

AMQ8878: Display channel authentication record details.
   CHLAUTH(*)                          TYPE(BLOCKUSER)
   USERLIST(*MQADMIN)
```

If you want an MQ Administrator to be able to remotely control a queue manager via the MQ Explorer, then refer to the following technote:

http://www.ibm.com/support/docview.wss?uid=swg21577137
MQ 7.1 and 7.5 queue manager - RC 2035 MQRC_NOT_AUTHORIZED when using client connection as an MQ Administrator

This technote refers to Page 10 from the following presentation:

http://www.websphereusergroup.org/go/article/view/251913/whats_new_in_websphere_mq_v7.1_security
What's new in WebSphere MQ v7.1 Security: A deeper dive
T.Rob Wyatt

Here is the summary for the article from T.Rob:
+ begin summary
Use runmqsc to implement the following 2 rules for the Channel Access Records (new feature in MQ 7.1).
The first rule blocks administrative users and the MCAUSER "nobody" (which prevents someone from creating a user ID "nobody" and putting it into an authorized group.
The second rule provides a reduced blacklist for SYSTEM.ADMIN channels that allows administrators to use these. It is assumed here that some other CHLAUTH rule such as an SSLPEERMAP has validated the administrator's connection or than an exit has done so.

SET CHLAUTH(*) TYPE(BLOCKUSER) USERLIST('nobody','*MQADMIN')
SET CHLAUTH(SYSTEM.ADMIN.*) TYPE(BLOCKUSER) USERLIST('nobody')
+ end summary

OK, then use runmqsc to run the above 2 commands.

Now you can successfully add the newly created queue manager into the remote MQ Explorer.

++
+++ Chapter 7: Using MQ Explorer 7.5
++

Note: The MQ Explorer GUI is ONLY available for Linux Intel (32-bit and 64-bit) and Windows.
If you are using AIX, HP-UX, or Solaris, then skip this chapter.

When you install MQ 7.5 in Linux Intel (x86), you will see that under the "Application Browser" will have an entry for the MQ Explorer. To show the "Application Browser" you need to click on Computer on the bottom left corner, and then click on "More Applications" in the lower right.
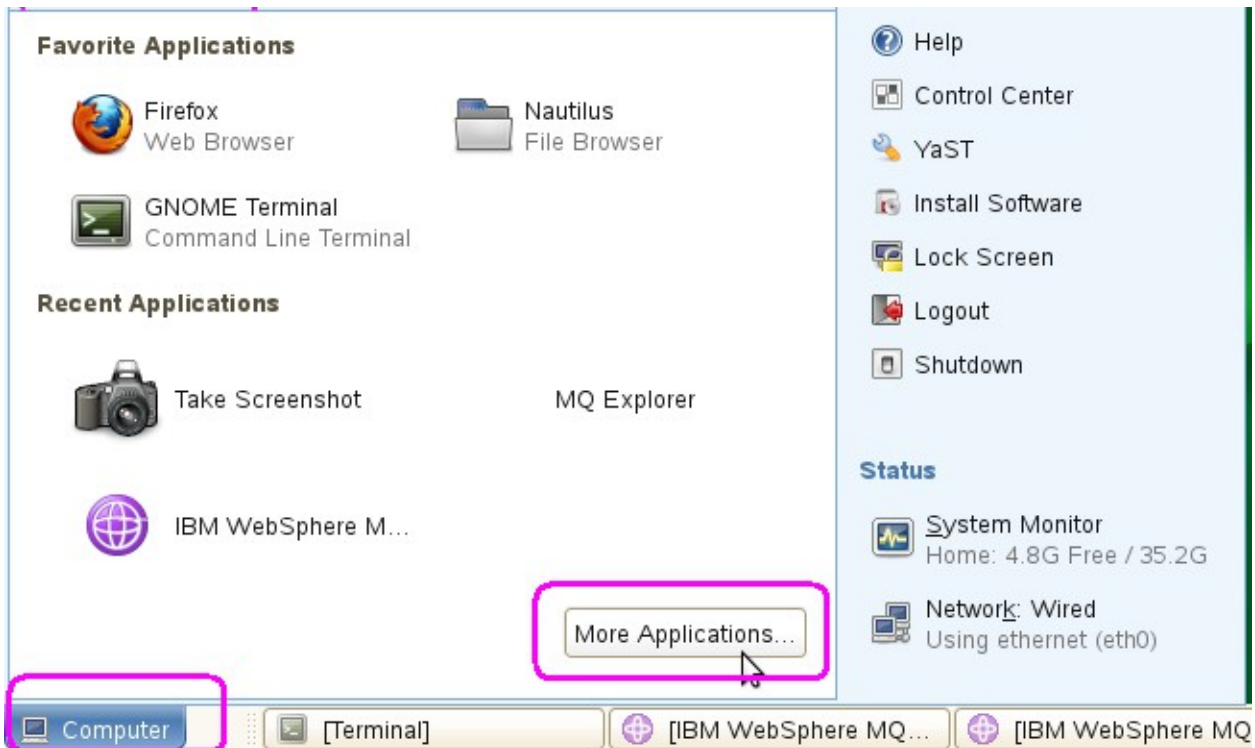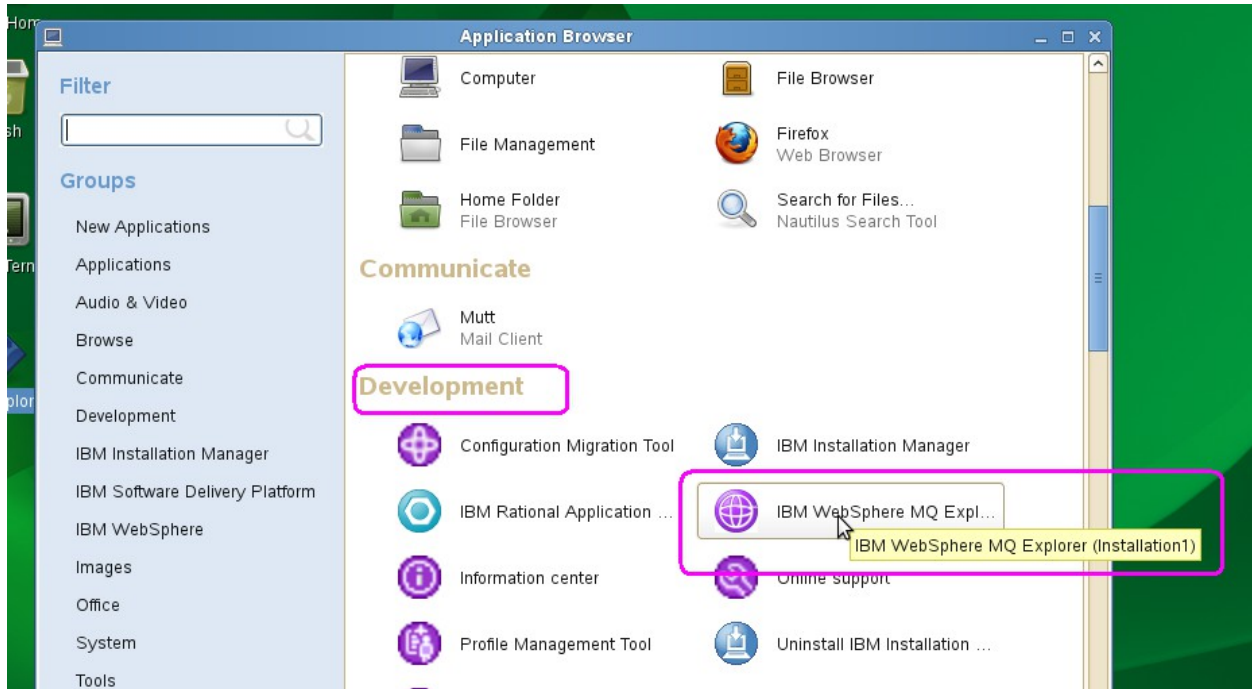
The Application Browser shows the entry for the MQ Explorer 7.5 in the
"Development" section:
  IBM WebSphere MQ Explorer (Installation1)

Notice that the title is truncated and only when you hover the cursor the full title is
shown. The truncated title is:
  IBM WebSphere MQ Expl

If you click on the icon for the MQ Explorer 7.5, you will see that the title indicates
that it is from "Installation1":

++
+++ Chapter 8: Migrating an MQ 7.0 queue manager to MQ 7.5
++

Let's display the status of the queue managers.
 dspmq
QMNAME(QM_701)   STATUS(Status not available)
QMNAME(QM_MIG)   STATUS(Status not available)
QMNAME(QM_75)   STATUS(Running)

The following invocation shows the queue managers with the following information:
- the installation name: INSTNAME(Installation0)
- the path of the MQ 7.5 code: INSTPATH(/opt/mqm)
- and the version: INSTVER(7.5.0.0)

dspmq -o installation
QMNAME(QM_701) INSTNAME(Installation0) INSTPATH(UNKNOWN) INSTVER(?.?.?.?)
QMNAME(QM_MIG) INSTNAME(Installation0) INSTPATH(UNKNOWN) INSTVER(?.?.?.?)
QMNAME(QM_75)   INSTNAME(Installation1) INSTPATH(/opt/mqm) INSTVER(7.5.0.0)

Notice that QM_701 and QM_MIG do not show proper information in the status
attributes because those queue managers have not been upgraded yet to 7.5.

+ Notice the Stanzas in the file: /var/mqm/mqs.ini

QueueManager:
   Name=QM_701
   Prefix=/var/mqm
   Directory=QM_701
QueueManager:
   Name=QM_MIG
   Prefix=/var/mqm
   Directory=QM_MIG
QueueManager:
   Name=QM_75
   Prefix=/var/mqm
   Directory=QM_75
   InstallationName=Installation1

The QM_75 queue manager has a new attribute, to indicate the InstallationName.
The other queue managers do not have that attribute, because they have not been
upgraded yet.

- Because there is only one installed version of MQ, then you can use the normal way to upgrade the queue manager to the most recent version:

 strmqm QM_MIG
WebSphere MQ queue manager 'QM_MIG' starting.
The queue manager is associated with installation 'Installation1'.
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.

Let's display the status:

 dspmq -o installation
QMNAME(QM_701)   INSTNAME(Installation0) INSTPATH(UNKNOWN) INSTVER(?.?.?.?)
QMNAME(QM_MIG)   INSTNAME(Installation1) INSTPATH(/opt/mqm) INSTVER(7.5.0.0)
QMNAME(QM_75)   INSTNAME(Installation1) INSTPATH(/opt/mqm) INSTVER(7.5.0.0)

+ Notice that in the mqs.ini file, this queue manager QM_MIG is now explicitly associated with the Installation1.

QueueManager:
  Name=QM_701
  Prefix=/var/mqm
  Directory=QM_701
QueueManager:
  Name=QM_MIG
  Prefix=/var/mqm
  Directory=QM_MIG
  InstallationName=Installation1
QueueManager:
  Name=QM_75
  Prefix=/var/mqm
  Directory=QM_75
  InstallationName=Installation1

- Now display some relevant attributes for the queue manager using runmqsc. Notice the CMDLEVEL and the new VERSION fields:

  runmqsc QM_MIG

DISPLAY QMGR CMDLEVEL VERSION
    1 : DISPLAY QMGR CMDLEVEL VERSION
AMQ8408: Display Queue Manager details.
  QMNAME(QM_MIG)   CMDLEVEL(750)
  VERSION(07050000)

- Notice also that a migrated queue manager will have the following new attributes under "DISPLAY QMGR":

ACTVCONO(DISABLED)
ACTVTRC(OFF)
CHLAUTH(DISABLED) < - - - New Channel Authority Records feature is DISABLED
CUSTOM( )
PSCLUS(ENABLED)
SUITEB(NONE)
VERSION(07050000)
XRCAP(NO)

Note that a new queue manager created under MQ 7.1 or later will have:
      CHLAUTH(ENABLED)

For more information on the new attributes, see the following technote:

http://www.ibm.com/support/docview.wss?rs=171&uid=swg21578742
New MQ 7.1 and 7.5 attributes in DISPLAY QMGR for new or migrated queue managers

+++ end +++