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Download, install and test IBM-MQ-Install-Java-All (com.ibm.mq.allclient.jar) and IBM-MQ-Java-InstallRA (wmq.jmsra.rar)

https://www.ibm.com/support/pages/node/6202719

Date last updated: 29-Mar-2023

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+++ Objective

The objective of this tutorial is to describe how to download, install and test the package "IBM MQ Install Java All" that contains the file com.ibm.mq.allclient.jar which can be used with MQ Java / MQ JMS client applications that require a smaller footprint (instead of installing all the filesets for the MQ Client.

For example, file named: 9.3.0.4-IBM-MQ-Install-Java-All.jar

The same principle applies to "MQ Resource Adapter for use with Application Servers" to install the file wmg.jmsra.rar.

For example, file named: 9.3.0.4-IBM-MQ-Java-InstallRA.jar

Please keep in mind the following:

- You do NOT need to be an "Administrator" to install these packages and you can install them anywhere you want.
- The user who installs the package will be the owner of the unpacked files: if the user is "fulano", then "fulano" will be the owner.

That is, the files do not need to be owned by user "mgm".

- The proper installation utilities are NOT used and thus, you cannot query the Operating System to ask if the MQ code has been installed or not, and where!

For illustration purposes the MQ 9.3.0.4 LTS release is used in this tutorial. Keep in mind that the principles apply to all MQ 9.x.x LTS fix packs and CD releases.

In this tutorial the user "fulano" (who is NOT a member of the group 'mqm' and therefore, not an MQ Administrator) is the one that will be using a dedicated copy of the MQ jar files which will be installed under a subdirectory from the HOME directory.

This tutorial shows also the essential changes into the file .bashrc for the user in order to use the desired jar files.

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The chapters are:

Chapter 1: General information Chapter 2: Downloading and installing 9.3.0.4-IBM-MQ-Install-Java-All.jar

Chapter 3: Installing 9.3.0.4-IBM-MQ-Java-InstallRA.jar

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+++ Chapter 1: General information
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++ Which are the MQ requirements for working with Java applications?

If you have a Linux Host (physical server, VM, ...) you will need to have 2 things to run MQ Java/JMS Client applications:

- a) MQ jar files => This is the focus of this tutorial
- b) A Java Runtime Environment (JRE) or a Java Software Development Kit (SDK)

See the following tutorial for more details:

https://www.ibm.com/support/pages/node/6202414 Download, install and setup of IBM SDK for Java 8 in Linux to run MQ Java/JMS client applications

- ++ When to use the packages "MQ-Install-Java-All" and "MQ-Java-InstallRA"?
- a) If you have a host that will have ONLY standalone MQ Client applications that use the MQ Classes for Java or the MQ Classes for JMS, then you could download and install the package:

MQ-Install-Java-All

This will save you footprint in your host because you will not need to install MQ shared libraries for C-based programs.

In addition, you do NOT need to be an "Administrator" to install the files! You can install them anywhere you want!

However, the proper installation utilities are NOT used and thus, you cannot query the Operating System to ask if the MQ code has been installed or not, and where were they installed!

Similarly, you can download the standalone MQ Resource Adapter package to be used with a J2EE application server:

MQ-Java-InstallRA

To download these packages, see NEXT CHAPTER 2 (and you may skip item 'b' below).

b) If you have a host that will have a variety of MQ Client applications (C-based, Java, JMS, .NET, XMS) then it is best to download and install the complete package from the web page shown below.

You will need to be Unix/Linux user "root" (or a Windows Administrator) to install the packages and they will be installed in a default location (which you could specify).

The installation uses the proper installation utilities from the Operating System and you can query the system to ask if the MQ code has been installed and where is located.

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=roadmap-mq-downloads

IBM MQ / 9.3 / IBM MQ downloads Any MQ version, all downloads

Scroll to section:

Resource adapter, clients and other resources

See the subsection:

Clients:

Click on:

IBM MQ C and .NET clients

https://ibm.biz/mq93clients

You will be taken to a selected list of items from IBM Fix Central.

The MQ Client package includes client related code (C-base, Java/JMS, GSKit, etc) but does not include code for the server, AMS, MFT and Telemetry.

Linux: Just for illustration, the generic name of the filesets for the Linux rpm files is shown below:

Client (MQSeriesClient...)
GSKit (MQSeriesGSKit...)
Java (MQSeriesJava...)
JRE (MQSeriesJRE...)
Manual pages (MQSeriesMan...)
Msg* (message catalogs, MQSeriesMsg...)
Runtime (MQSeriesRuntime...)
Samples (MQSeriesSamples...)
SDK (MQSeriesSDK...)
BlockChain Bridge (MQSeriesBCBridge...)
SalesForce Bridge (MQSeriesSFBridge...)

Windows: These are the 4 "components" that are installed by default in Windows:

MQI Client (incluges GSKit) Extended Messaging APIs Development Toolkit Java Runtime Environment

Example of file names:

File name for Linux x86-64 bit, MQ 9.3.0.4: 9.3.0.4-IBM-MQC-LinuxX64.tar.gz File name for Windows 64-bit, MQ 9.3.0.4: 9.3.0.4-IBM-MQC-LinuxX64.tar.gz

Note that in the file names, the "C" in MQC means "Client" and not "C-language". That is, the MQ Client includes the interfaces for C-language and Java/JMS.

By the way, the above package does NOT include the MQ Explorer. If you want the standalone MQ Explorer, then visit the following web page:

https://www.ibm.com/support/pages/node/6598657

Installing Standalone MQ Explorer 9.3 in Windows and Linux

Notes:

- For MQ 9.3: MQ Explorer is NO longer included with the download from Passport Advantage.
- Only the latest CD version is available.
- Example file name: 9.3.2.0-IBM-MQ-Explorer-Win64
- ++ Additional references

 $\frac{https://www.ibm.com/docs/en/ibm-mq/9.3?topic=messaging-what-is-installed-mq-classes-jms}{IBM\ MQ\ /\ 9.3}$

What is installed for IBM MQ classes for JMS

 $\frac{\text{https://www.ibm.com/docs/en/ibm-mq/9.3?topic=jms-mq-classes-jmsjakarta-messagingrelocatable-jar-files}{\text{IBM MQ }/\text{ 9.3}}$

IBM MQ classes for JMS/Jakarta Messaging relocatable JAR files

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=java-what-is-installed-mq-classes IBM MO / 9.3

What is installed for IBM MQ classes for Java

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=java-mq-classes-relocatable-jar-files IBM MQ / 9.3

IBM MQ classes for Java relocatable JAR files

++ Obtaining the IBM MQ classes for JMS separately.

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=umcjm-obtaining-mq-classes-jms-mq-classes-jakarta-messaging-separately

IBM MQ / 9.3 /

Obtaining the IBM MQ classes for JMS and IBM MQ classes for Jakarta Messaging separately

+ begin excerpt

The libraries and utilities necessary for running applications using IBM® MQ classes for JMS or IBM MQ classes for Jakarta Messaging are available in a self-extracting JAR file that you download from Fix Central. You do this if you want to get only these files, for example for deployment into a software management tool or for use with stand-alone client applications.

Before you start this task, make sure that you have a Java™ runtime environment (JRE) installed on your machine and that the JRE has been added to the system path.

The Java installer that is used in this installation process does not require running as root or any specific user. The only requirement is that the user it is run as has write access to the directory that you want the files to go in.

[MQ 9.3.0 Jun 2022][Jakarta Messaging 3.0]

From IBM MQ 9.3.0, Jakarta Messaging 3.0 is supported for developing new applications. IBM MQ 9.3.0 continues to support JMS 2.0 for existing applications. It is not supported to use both the Jakarta Messaging 3.0 API and the JMS 2.0 API in the same application.

. . .

A self-extracting JAR file is used to minimize the size of the download, and the time that it takes to perform the extraction. The exact contents of this JAR file, and the sub-directories into which it extracts the files, depends on the version of IBM MQ.

When you run the self-extracting JAR file, it displays the IBM MQ license agreement, which must be accepted. It also lets you change the parent directory for the extraction.

+ end excerpt

The MQ Client code that is downloaded from IBM Fix Central:

- It does not require a license.
- It is a "manufacturing refresh". For example, MQ 9.3.0.4 includes: base MQ 9.3.0.0 + fix pack 9.3.0.1 + ... + fix pack 9.3.0.4

Start your navigation by visiting:

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=roadmap-mq-downloads IBM MQ / 9.3 / IBM MQ downloads

Any MQ version, all downloads

Scroll to section: Resource adapter, clients and other resources

See the subsection: Clients:

Click on: <u>IBM MQ Java™ / JMS client</u>

https://ibm.biz/mq93javaclient

You will be taken to a selected list of items from IBM Fix Central. Some example items are:

As of 29-Mar-2023:

1 release level: 9.3.0.4-IBM-MQ-Install-Java-All Long Term Support release: 9.3.0.4 IBM MQ JMS and Java 'All Client'

You can proceed to download the desired file.

It is a good practice to have a dedicated directory for the "downloads" and in this case, it is:

/downloads

A dedicated subdirectory for the "MQ 9.3.0.4" download files is created: /downloads/mg9304

Thus, the full path name of the file in the target host is:

volterra1.fyre.ibm.com: /downloads/mq9304
ls -l *.jar

-rw-r--r-- 1 root root 113331404 Mar 29 12:48 9.3.0.4-IBM-MQ-Install-Java-All.jar

++ Setup the .bashrc file for the user to use the JRE

In this tutorial the user "fulano" (who is NOT a member of the group 'mqm' and therefore, not an MQ Administrator) is the one that will be using a dedicated copy of the MQ jar files which will be installed under a subdirectory from the HOME directory.

You need to ensure that the .bashrc or .profile does NOT invoke the setmqenv command, because the intention is specify the proper MQ environment variables that will use the dedicated subdirectory.

Thus, ensure that after the login, the following command does not show any MQ environment variables:

[fulano@volterra1 ~]\$ set | grep MQ [fulano@volterra1 ~]\$

Add the necessary environment variables in the .bashrc to allow to use the JRE or SDK that is available in the system. See the following tutorial for more details:

https://www.ibm.com/support/pages/node/6202414

Download, install and setup of IBM SDK for Java 8 in Linux to run MQ Java/JMS client applications

For this tutorial, the following environment variables were added:

Java Development Kit or Java Runtime Environment.
Basic variables for Java
export JAVA_HOME=/opt/ibm/java-x86_64-80
export JAVA_BINDIR=\$JAVA_HOME/bin
Add Java to the PATH
export PATH=\$JAVA_BINDIR:\$PATH
Add local directory for running Java/JMS programs
export CLASSPATH=\$CLASSPATH:.

Note: The CLASSPATH right now is a place holder. Later on in the tutorial, a more detailed entry will be explained.

You need to logoff and login again to refresh the environment.

Ensure that you can issue the "java" runtime command:

[fulano@volterra1 ~]\$ set | grep -i java
JAVA_BINDIR=/opt/ibm/java-x86_64-80/bin
JAVA_HOME=/opt/ibm/java-x86_64-80
PATH=/opt/ibm/java-x86_64-80/bin:/usr/lib64/qt3.3/bin:/usr/local/bin:/bin:/usr/bin:/usr/local/sbin:/home/fulano/.local/bin:/home/fulano/bin

[fulano@volterra1 ~]\$ java -version java version "1.8.0_241"

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Java(TM) SE Runtime Environment (build 8.0.6.7 - pxa6480sr6fp7-20200312_01(SR6 FP7)) IBM J9 VM (build 2.9, JRE 1.8.0 Linux amd64-64-Bit Compressed References 20200219_440062 (JIT enabled, AOT enabled)

OpenJ9 - 3088245 OMR - eb95a4d IBM - 83517b6)

JCL - 20200310_01 based on Oracle jdk8u241-b07

++ Unpack the 9.3.0.4-IBM-MQ-Install-Java-All.jar file into the desired directory

Create now a directory where you want to store the MQ jar and do a 'cd' into that directory:

[fulano@volterra1 ~]\$ pwd/home/fulano

[fulano@volterra1 ~]\$ mkdir mq9304java [fulano@volterra1 ~]\$ cd mq9304java

[fulano@volterra1 mq9304java]\$ pwd/home/fulano/mq9304java

Copy the jar file from the /downloads directory into this new subdirectory:

[fulano@volterra1 mq9304java]\$ cp /downloads/mq9304/9.3.0.4-IBM-MQ-Install-Java-All.jar.

[fulano@volterra1 mq9304java]\$ ls -l -rw-r--r-- 1 fulano mquser 50832640 Mar 29 14:47 9.3.0.4-IBM-MQ-Install-Java-All.jar

Now proceed to unpack the jar file:

[fulano@volterra1 mq9304java]\$ java -jar 9.3.0.4-IBM-MQ-Install-Java-All.jar Before you can use, extract, or install IBM MQ V9.1 - 07/2019, you must accept the terms of 1. IBM International License Agreement for Evaluation of Programs 2. IBM International Program License Agreement and additional license information. Please read the following license agreements carefully.

The license agreement is separately viewable using the --viewLicenseAgreement option.

Press Enter to display the license terms now, or "x" to skip.

By choosing the "I Agree" option below, you agree to the terms of the license agreement and non-IBM terms, if applicable. If you do not agree, select "I do not Agree".

Select [1] I Agree, or [2] I do not Agree: 1

Enter directory for product files or leave blank to accept the default value. The default target directory is /home/fulano/mq9304java

Target directory for product files? (enter)
Extracting files to /home/fulano/mg9304java/wmg

Successfully extracted all product files.

(end of the installation)

Let's list the files that were unpacked. Notice that the files are under a subdirectory tree "wmq"

[fulano@volterra1 mq9304java]\$ ls -l total 49644

-rw-r--r-- 1 fulano mquser 50832640 Mar 29 14:47 9.3.0.4-IBM-MQ-Install-Java-All.jar drwxr-xr-x 5 fulano mquser 46 Mar 29 14:59 wmq

Let's list the expanded directory tree:

[fulano@volterra1 mg9304java]\$ Is -IR wmg

wmq:

total 4

drwxr-xr-x 2 fulano mqviewer 114 Mar 29 13:14 JavaEE drwxr-xr-x 4 fulano mqviewer 28 Mar 29 13:14 JavaSE drwxr-xr-x 2 fulano mqviewer 4096 Mar 29 13:14 OSGi

wmq/JavaEE:

total 35956

-rw-r--r-- 1 fulano mqviewer 10272 Mar 29 13:14 wmq.jakarta.jmsra.ivt.ear -rw-r--r-- 1 fulano mqviewer 18390414 Mar 29 13:14 wmq.jakarta.jmsra.rar

-rw-r--r-- 1 fulano mqviewer 25642 Mar 29 13:14 wmq.jmsra.ivt.ear

-rw-r--r-- 1 fulano mqviewer 18384860 Mar 29 13:14 wmq.jmsra.rar

wmg/JavaSE:

total 4

drwxr-xr-x 2 fulano mqviewer 130 Mar 29 13:14 bin drwxr-xr-x 2 fulano mqviewer 4096 Mar 29 13:14 lib

wmq/JavaSE/bin:

total 24

-rw-r--r-- 1 fulano mqviewer 2345 Mar 29 13:14 JMS30Admin

-rw-r--r-- 1 fulano mqviewer 2193 Mar 29 13:14 JMS30Admin.bat

-rw-r--r-- 1 fulano mqviewer 3569 Mar 29 13:14 JMS30Admin.config

-rw-r--r-- 1 fulano mgviewer 2254 Mar 29 13:14 JMSAdmin

-rw-r--r-- 1 fulano mqviewer 2184 Mar 29 13:14 JMSAdmin.bat

-rw-r--r-- 1 fulano mgyiewer 3600 Mar 29 13:14 JMSAdmin.config

wmq/JavaSE/lib:

total 27468

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-rw-r--r-- 1 fulano mqviewer 1022720 Mar 29 13:14 bcpkix-jdk15to18.jar

```
-rw-r--r-- 1 fulano mqviewer 9342484 Mar 29 13:14 bcprov-jdk15to18.jar
-rw-r--r-- 1 fulano mgviewer 677620 Mar 29 13:14 bcutil-jdk15to18.jar
-rw-r--r-- 1 fulano mgviewer 8356673 Mar 29 13:14 com.ibm.mg.allclient.jar
-rw-r--r-- 1 fulano mgviewer 8373764 Mar 29 13:14 com.ibm.mg.jakarta.client.jar
-rw-r--r-- 1 fulano mqviewer 46710 Mar 29 13:14 com.ibm.mq.traceControl.jar
-rw-r--r-- 1 fulano mqviewer 22769 Mar 29 13:14 fscontext.jar
-rw-r--r-- 1 fulano mqviewer 56270 Mar 29 13:14 jakarta.jms-api.jar
-rw-r--r-- 1 fulano mqviewer 58349 Mar 29 13:14 jms.jar
-rw-r--r-- 1 fulano mqviewer 70348 Mar 29 13:14 org.json.jar
-rw-r--r-- 1 fulano mgviewer 77116 Mar 29 13:14 providerutil.jar
wmq/OSGi:
total 38284
-rw-r--r-- 1 fulano mgviewer 8316656 Mar 29 13:14 com.ibm.mg.osgi.allclient 9.3.0.4.jar
-rw-r--r-- 1 fulano mgviewer 11274081 Mar 29 13:14
com.ibm.mq.osgi.allclientpreregs 9.3.0.4.jar
-rw-r--r-- 1 fulano mgviewer 8333824 Mar 29 13:14
com.ibm.mg.osgi.jms30.client 9.3.0.4.jar
-rw-r--r-- 1 fulano mqviewer 11272043 Mar 29 13:14 com.i
```

We will be using the jar files that are under the wmq/JavaSE/lib (for Standard Edition - for standalone programs).

That is, the following full directory path will be: \$HOME/mq9304java/wmq/JavaSE/loib

[fulano@volterra1 mq9304java]\$ cd \$HOME/mq9304java/wmq/JavaSE/lib

The key jar file is: com.ibm.mq.allclient.jar

Thus, the full path name of the key jar file is: \$HOME/mq9304java/wmq/JavaSE/lib/com.ibm.mq.allclient.jar

Note: To simplify your development/runtime efforts it is suggested that you add the above full directory into your CLASSPATH inside the .bashrc and thus, for this tutorial, it will be:

export CLASSPATH=\$CLASSPATH:::\$HOME/mq9304java/wmq/JavaSE/lib/com.ibm.mq.allclient.jar

Then logoff and login again to refresh the environment.

Now let's take a look at the CLASSPATH

[fulano@volterra1 ~]\$ echo \$CLASSPATH :::/home/fulano/mg9304java/wmg/JavaSE/lib/com.ibm.mg.allclient.jar

++ Quick test

Well, we have downloaded and install the MQ jar files into a dedicate directory. What is next?

We can do a quick verification test that our environment variables are properly set.

You will need to copy the following file from another host that has the MQ Samples installed.

For this tutorial, the following files were copied from somewhere else into the \$HOME of the user "fulano"

(From another host)

\$ ls /opt/mqm/samp/jms/samples/JmsProducer* /opt/mqm/samp/jms/samples/JmsProducer.class /opt/mqm/samp/jms/samples/JmsProducer.java

Copy the files into \$HOME for the user.

After the copy, the files are now available to the user "fulano":

[fulano@volterra1 ~]\$ pwd /home/fulano

[fulano@volterra1 ~]\$ Is -I Jms*

-r--r-- 1 fulano mquser 7359 Mar 29 15:11 JmsProducer.class

-r--r-- 1 fulano mquser 8935 Mar 29 15:11 JmsProducer.java

Let's run the JmsProducer java program and we will not specify any parameters. Because of the lack of parameters, it will fail to execute.

But the point of the exercise is to verify that the "Usage" statement will be displayed. This will indicate that all the environment variable (CLASSPATH) and the jar files are properly found and no Java Exceptions at runtime should be encountered:

[fulano@volterra1 ~]\$ java JmsProducer

No arguments! Mandatory arguments must be specified.

Usage:

JmsProducer -m queueManagerName -d destinationName [-h host -p port -l channel] [-u userid -w passWord]

Even though the program did not do anything useful at this moment, the program was successful at runtime, in the sense that there were NO runtime EXCEPTIONS (such as class not found, or jar file not found or that the command "java" was not found, etc).

Yeah!!

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++ Download

To download the 9.3.0.4-IBM-MQ-Java-InstallRA.jar see the instructions in Chapter 2.

You need to download:

release level: 9.3.0.4-IBM-MQ-Java-InstallRA
Long Term Support: 9.3.0.4 MQ Resource Adapter for use with Application Servers
File: 9.3.0.4-IBM-MQ-Java-InstallRA.jar

++ Unpack the 9.3.0.4-IBM-MQ-Java-InstallRA.jar file into the desired directory

This chapter assumes that the file 9.3.0.4-IBM-MQ-Java-InstallRA.jar was downloaded into the following directory:

\$ ls /downloads/mq9304/*RA*

9.3.0.4-IBM-MQ-Java-InstallRA.jar

Create now a directory where you want to store the MQ jar and do a 'cd' into that directory:

[fulano@volterra1 ~]\$ pwd/home/fulano

[fulano@volterra1 ~]\$ mkdir mq9304RA [fulano@volterra1 ~]\$ cd mq9304RA

[fulano@volterra1 mq9304RA]\$ **pwd** /home/fulano/mq9304RA

Copy the jar file from the /downloads directory into this new subdirectory:

[fulano@volterra1 mq9304RA]\$ cp /downloads/mq9304/9.3.0.4-IBM-MQ-Java-InstallRA.jar .

Now proceed to unpack the jar file:

[fulano@volterra1 mq9304RA]\$ java -jar 9.3.0.4-IBM-MQ-Java-InstallRA.jar

9.3.0.4-IBM-MQ-Install-Java-All.jar

Before you can use, extract, or install IBM MQ V9.1 - 07/2019, you must accept the terms of 1. IBM International License Agreement for Evaluation of Programs 2. IBM International Program License Agreement

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Press Enter to display the license terms now, or "x" to skip.

By choosing the "I Agree" option below, you agree to the terms of the license agreement and non-IBM terms, if applicable. If you do not agree, select "I do not Agree".

Select [1] I Agree, or [2] I do not Agree: 1

Enter directory for product files or leave blank to accept the default value. The default target directory is /home/fulano/mq9304RA

Target directory for product files? (enter)
Extracting files to /home/fulano/mq9304RA/wmq
Successfully extracted all product files.

(end of the installation)

Let's list the files that were unpacked. Notice that the files are under a subdirectory tree "wmq"

[fulano@volterra1 mq9304RA]\$ Is -I total 22068

-rw-r--r-- 1 fulano mquser 22595911 Jun 1 11:34 9.3.0.4-IBM-MQ-Java-InstallRA.jar drwxr-xr-x 2 fulano mquser 52 Jun 1 11:36 wmq

Let's list the expanded directory tree:

[fulano@volterra1 mq9304RA]\$ Is -IR wmq

wmq:

fulano@volterra1.fyre.ibm.com: /home/fulano/mq9304RA/wmq (61) ls -l

-rw-r--r-- 1 fulano mqviewer 10272 Mar 29 13:25 wmq.jakarta.jmsra.ivt.ear

-rw-r--r-- 1 fulano mqviewer 18390414 Mar 29 13:25 wmq.jakarta.jmsra.rar

-rw-r--r-- 1 fulano mqviewer 25642 Mar 29 13:25 wmq.jmsra.ivt.ear

-rw-r--r-- 1 fulano mqviewer 18384860 Mar 29 13:25 wmq.jmsra.rar

The rar file is:

wmq.jmsra.rar

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Thus, the full path name of the rar file is: \$HOME/mq9304RA/wmq/wmq.jmsra.rar

For more details see the following web page from the online manual. Even though it says "Liberty", it applies to J2EE application servers that are NOT WebSphere.

https://www.ibm.com/docs/en/ibm-mq/9.3?topic=adapter-installing-resource-in-liberty IBM MQ 9.3 Installing the resource adapter in Liberty

+++ end +++