Quick Guide of the Administrative Console from WebSphere Application Server for WebSphere MQ users

IBM Techdoc: 7018556
http://www.ibm.com/support/docview.wss?uid=swg27018556

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IBM WebSphere MQ Support

+++ Objective +++

The objective of this techdoc is to provide a quick guide of the sections of the Administrative Console from WebSphere Application Server which are relevant to WebSphere MQ users:

- Listener Ports
- JMS resources (Connection Factories, Destinations, Activation Specifications)
- MDBs and their mapping to Listener Port or Activation Specification
- Environment variables (MQ_INSTALL_ROOT for WebSphere Application Server V6)
- Trace enablement and specification of the trace string
- Specification for the MQ Native Libraries for Bindings Transport Type
- Enablement of new MQ V7 functions: Read Ahead, Asynchronous Put
- Additions in WAS V8: connection name list, advanced properties

The screen shots are taken from a WebSphere Application Server Administrative Console at V7.
Whenever relevant, specific screen shots from WebSphere Application Server V6 and V8.x and V9 will be shown.

+++ Update on 07-Mar-2018:
New section for the MQ Resource Adapter properties, such as:
reconnectionRetryInterval

+++ Update on 10-Aug-2016:
Including WAS V9.

+++ Update on 18-Nov-2011:
Including WAS V8.

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+++ High level view of the Console, regarding functions related to MQ
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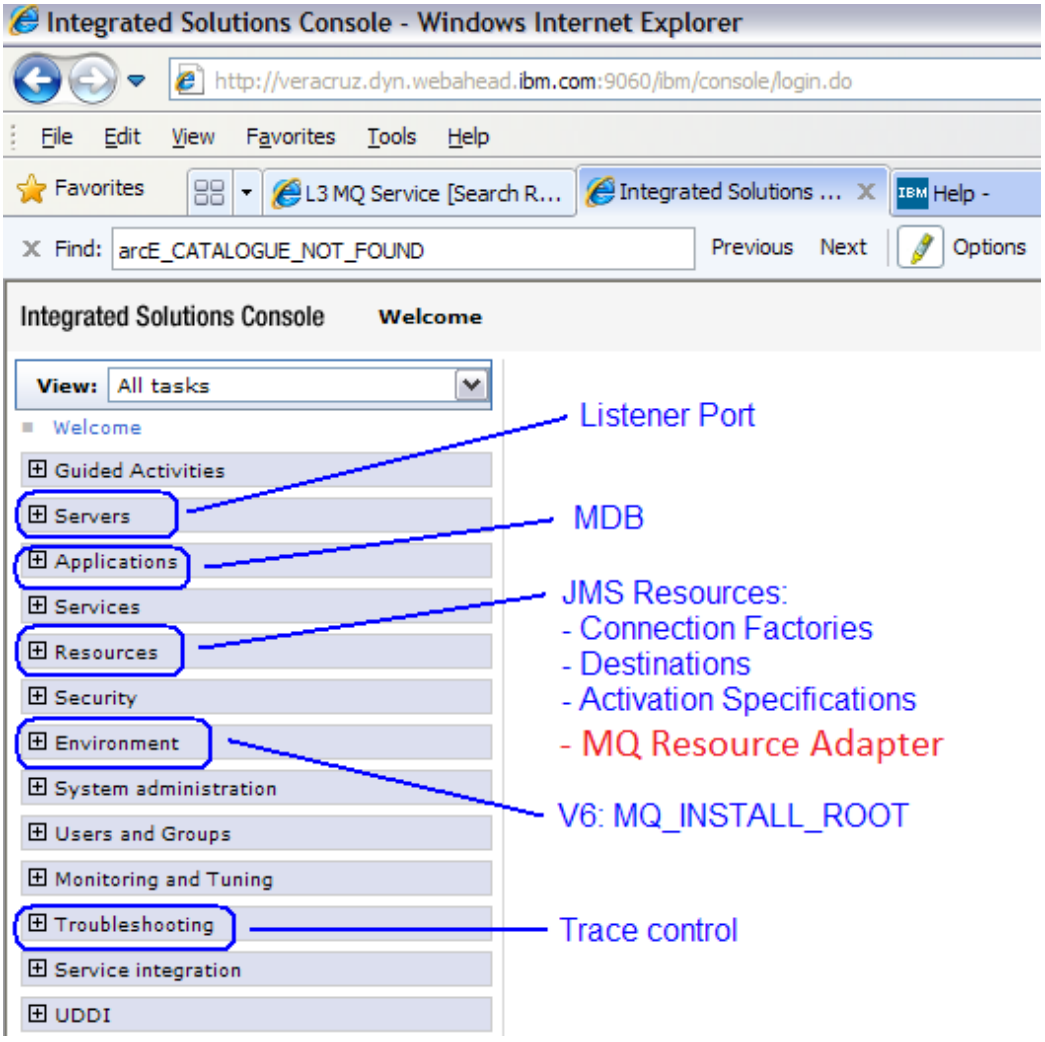
This is the high level view of the WebSphere Application Server Administrative Console showing the menus that have objects related to MQ.

The default URL for the WebSphere Application Server Administrative Console is:
http://hostname.domain.com:9060/ibm/console



Servers:
Listener Ports: start, stop, status

Applications:
- MDBs: start, stop, bindings to Listener Port or to Activation Specification

Resources:
- JMS Resources:
  - Connection Factories
  - Destinations (Queues, Topics)
  - Activation Specifications
  - MQ Resource Adapter properties (such as reconnectionRetryInterval)

Environment:
- WebSphere Application Server V6: MQ_INSTALL_ROOT

Troubleshooting:
- Tracing: trace string, enable tracing, disable tracing.

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+++ Listener Ports
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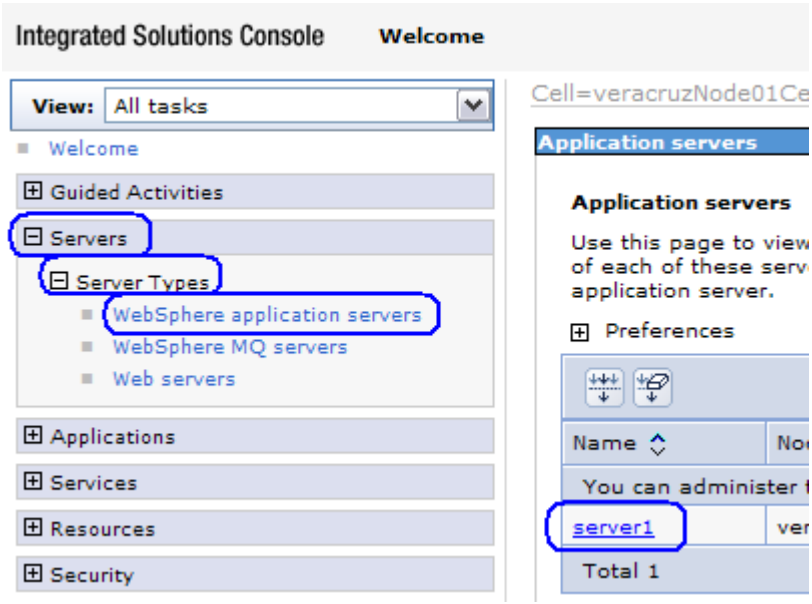
A WebSphere Application Server Listener Port is not a JMS administrative object and thus, it is not stored in the JNDI directory service.
Rather, it is an object under the "server" of WebSphere Application Server.

The short cut is:
Application servers > server1 > Message listener service > Listener Ports

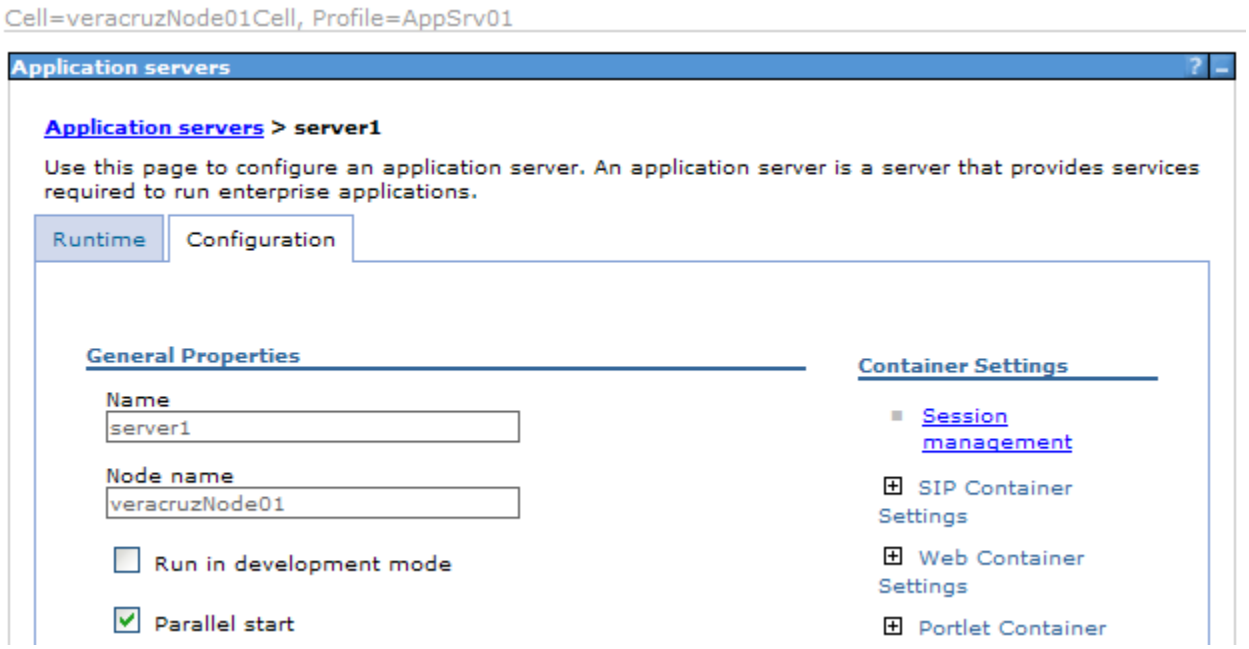
The full procedure is described below.

From the left panel, select:
Servers > Server Types > WebSphere application servers



From the right panel, click on the appropriate server, in this case, “server1”.

The Configuration tab will display the main information on the server:

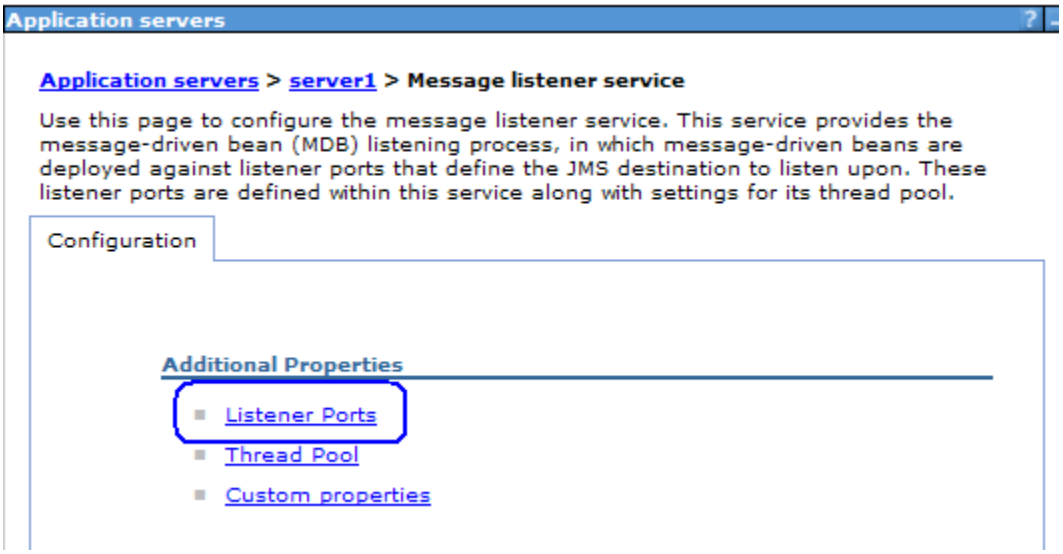


You need to scroll down to reach the section “Communications”

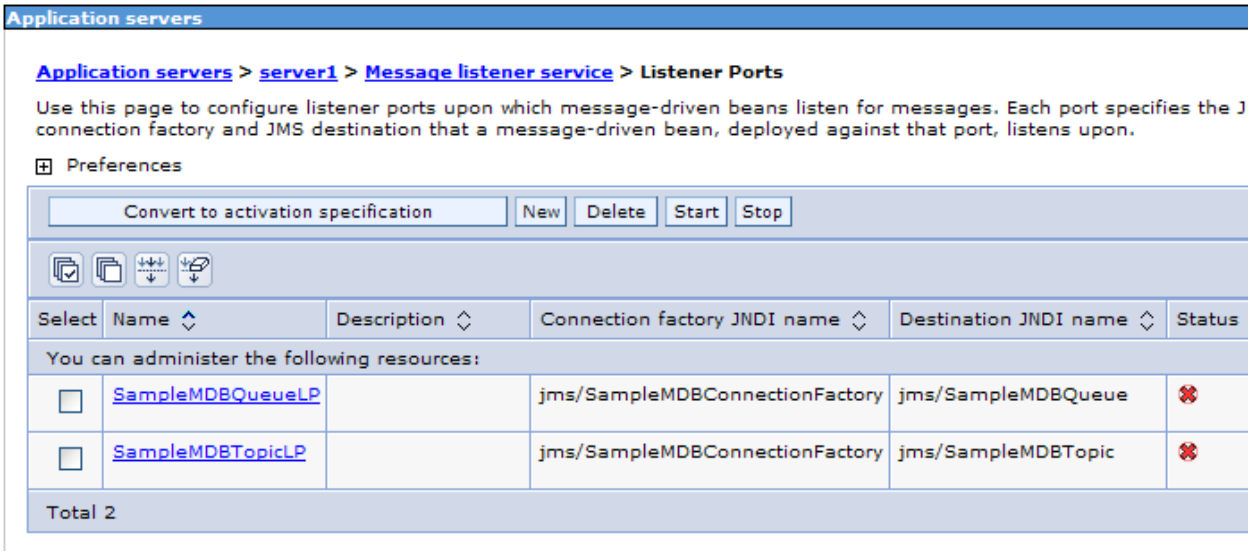
Click on “Messaging”

Click on “Message listener service”

In the “Message listener service”, click on: Listener Ports



Click on Listener Ports



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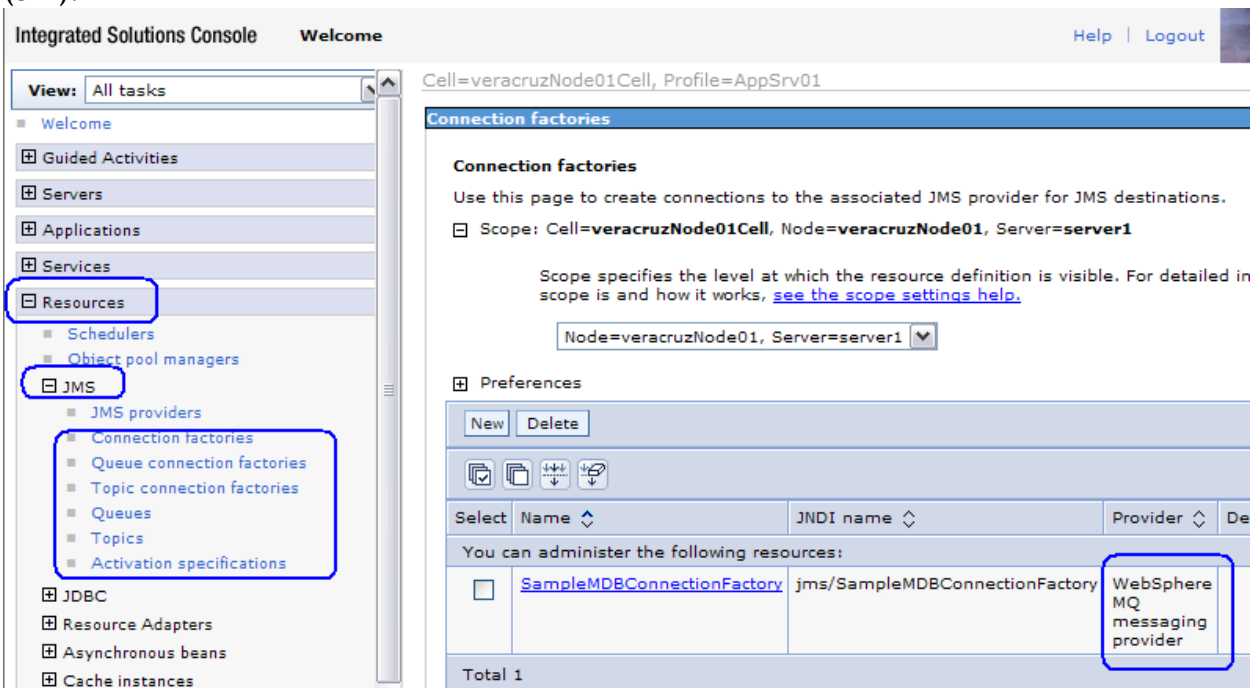
+++ JMS resources (Connection Factories, Destinations, Activation Specifications)
++

The JMS resources are:
- Connection Factories (Generic, Queue and Topic)
- Destinations (Queues, Topics)
- Activation Specifications

Notice that MQ is designated as the "WebSphere MQ messaging provider".

The "Default messaging provider" is NOT MQ, but rather, the System Integration Bus (SIB).



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+++ JMS resources (JMS providers > MQ Resource Adapter properties)
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New in WAS 8:
WebSphere Application Server V8 exposes the following WebSphere MQ connection properties that are used to configure the WebSphere MQ resource adapter that is used by the WebSphere MQ messaging provider. These properties affect the connection pool that is used by activation specifications:
- maxConnections
- connectionConcurrency
- reconnectionRetryCount
- reconnectionRetryInterval

https://www.ibm.com/support/knowledgecenter/SSEQTP_9.0.0/com.ibm.websphere.base.doc/ae/tmm_wmqra_propconfig.html
WebSphere Application Server traditional 9.0.0.x > Managing messaging with the IBM MQ messaging provider
Configuring properties for the IBM MQ resource adapter
.
+ begin excerpt
.
You can configure the IBM MQ resource adapter properties that affect the connection pool, which is used by IBM MQ messaging provider activation specifications.
About this task
There are properties that are used to configure the IBM MQ resource adapter used by the IBM MQ messaging provider:
- maxConnections: default 50
- connectionConcurrency: default 1
(Setting this property only affects WebSphere® Application Server 7 nodes. The property has no effect for WebSphere Application Server Version 8 or later nodes.)
- reconnectionRetryCount: default 5
- reconnectionRetryInterval: default 300,000 milliseconds (it is 5 minutes!!)
- startupRetryCount
- startupRetryInterval
.
These properties affect the connection pool, which is used by the IBM MQ messaging provider activation specifications. They do not affect the IBM MQ messaging provider queues, topics, or connection factories.
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Procedure

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1. In the navigation pane, click Resources > JMS-> JMS providers to display a list of JMS providers in the content pane.
2. Optional: If you want to manage JMS resources that are defined at a different scope setting, change the Scope setting to the required level.
3. In the Providers column of the displayed list of JMS providers, click the name of the IBM MQ messaging provider that you want to work with.
4. In the content pane under Additional properties, click Resource adapter properties to view the configuration page for the properties.
5. Specify the required values for the properties.

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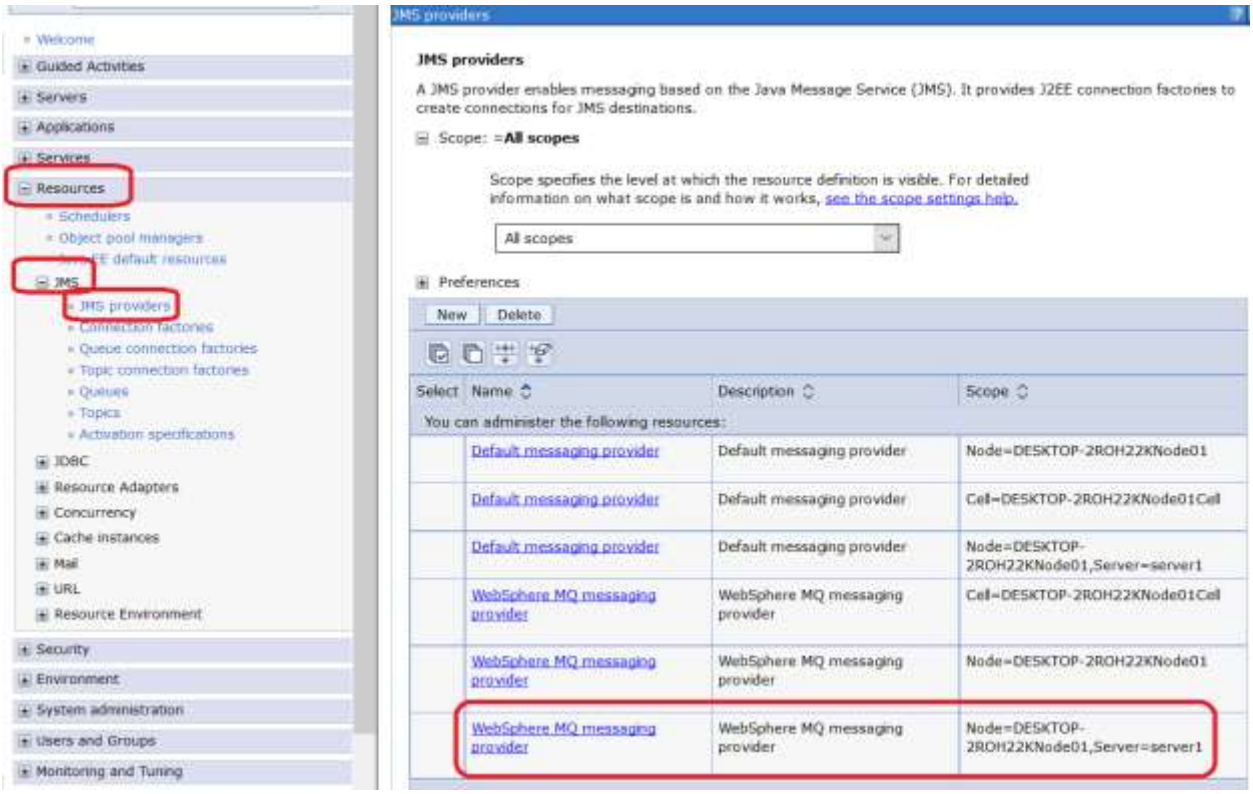
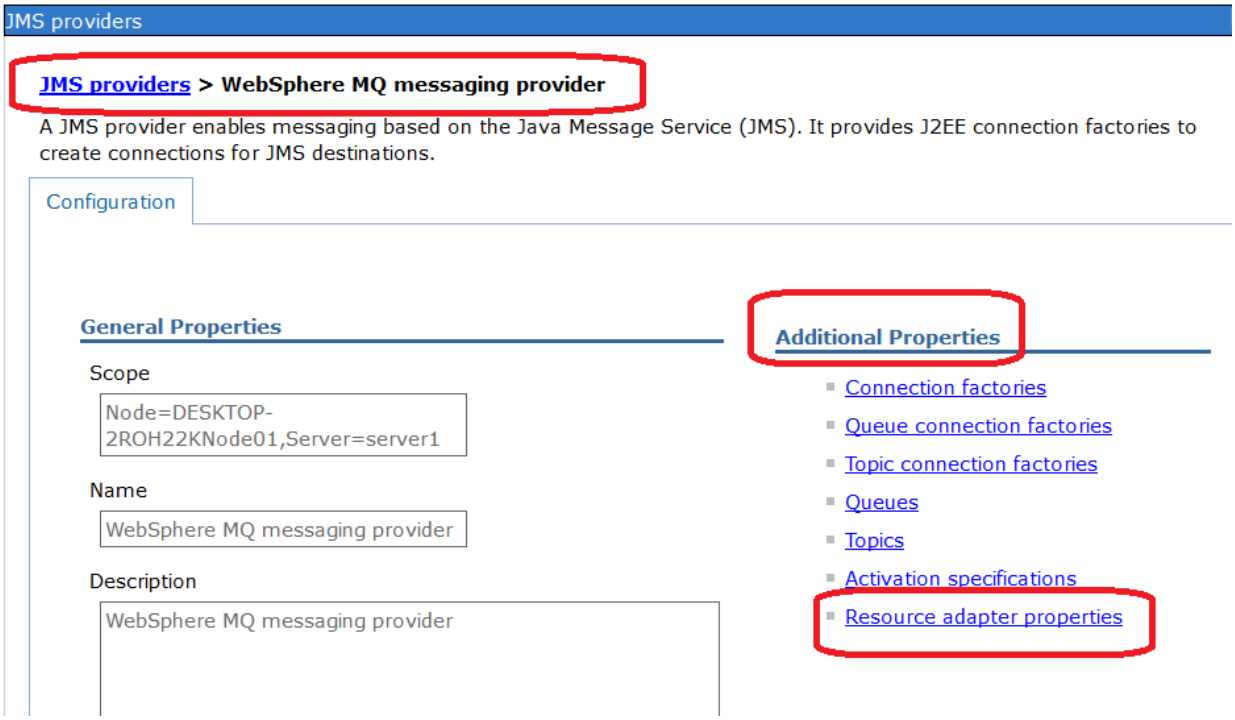
+ end excerpt

Example:

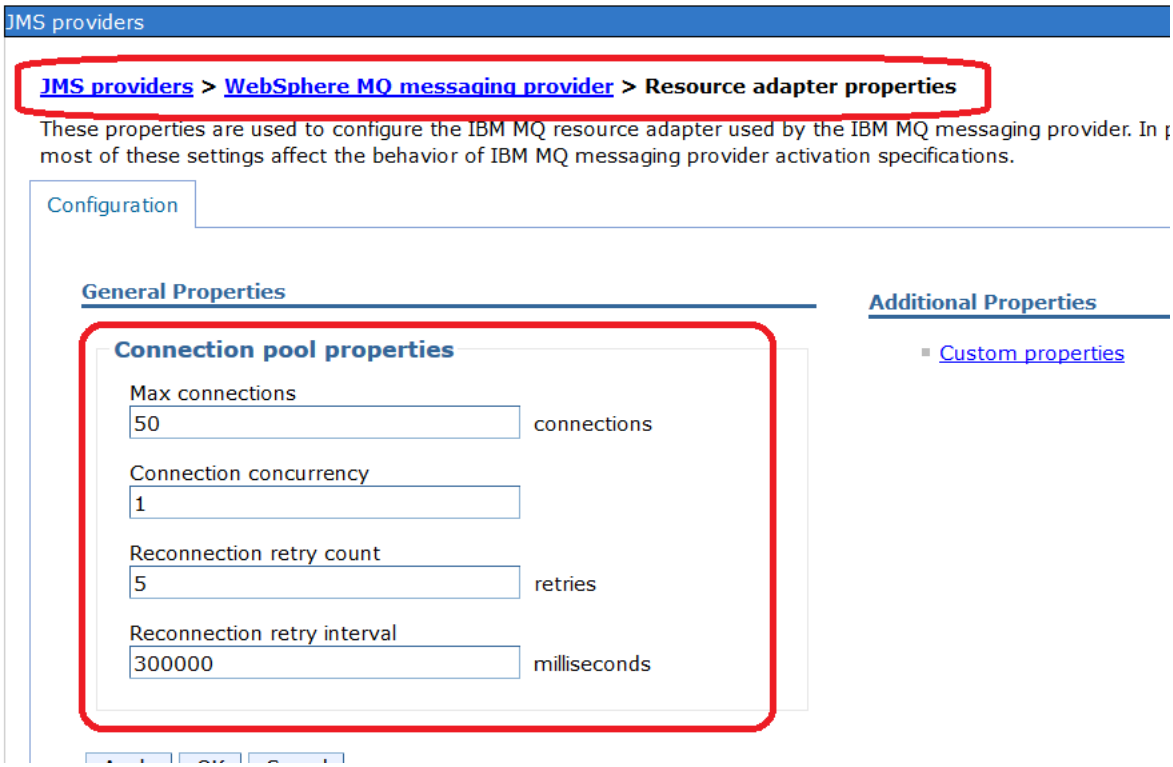
JMS Resources > JMS providers



JMS Resources > JMS providers > WebSphere MQ messaging provider



JMS Resources > JMS providers > WebSphere MQ messaging provider > Resource Adapter properties



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+++ MDBs and their mapping to Listener Port or Activation Specification
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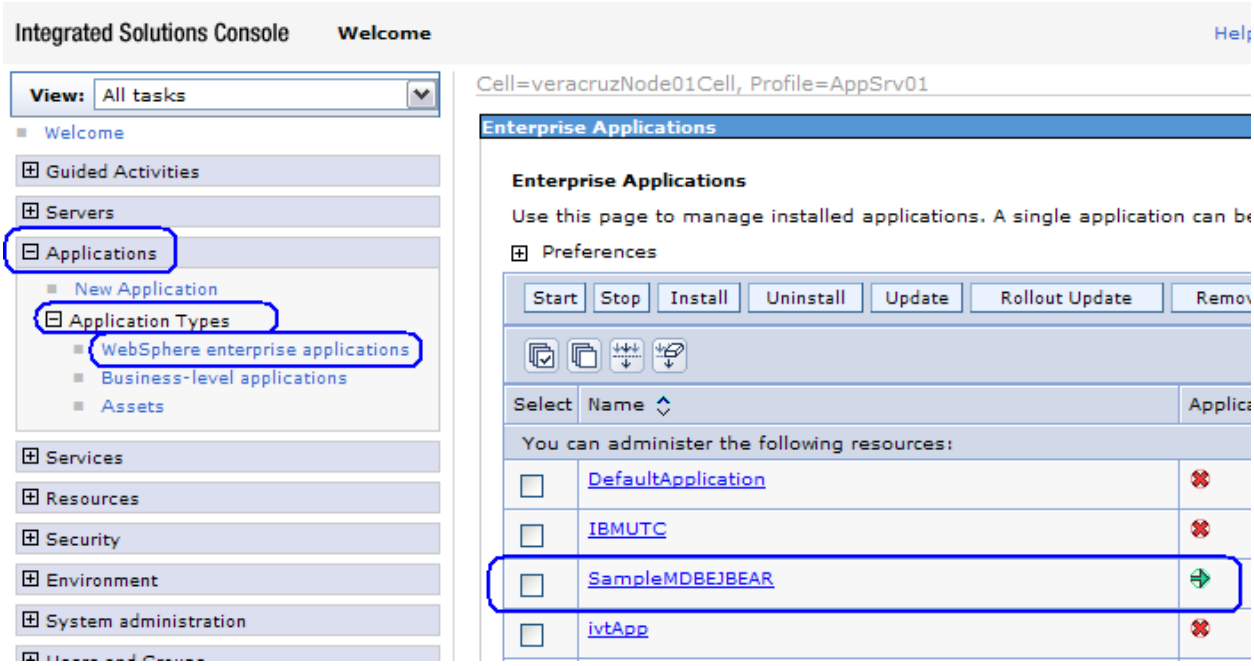
A Message Driven Bean (MDB) is part of a deployed application.
They can be found under:

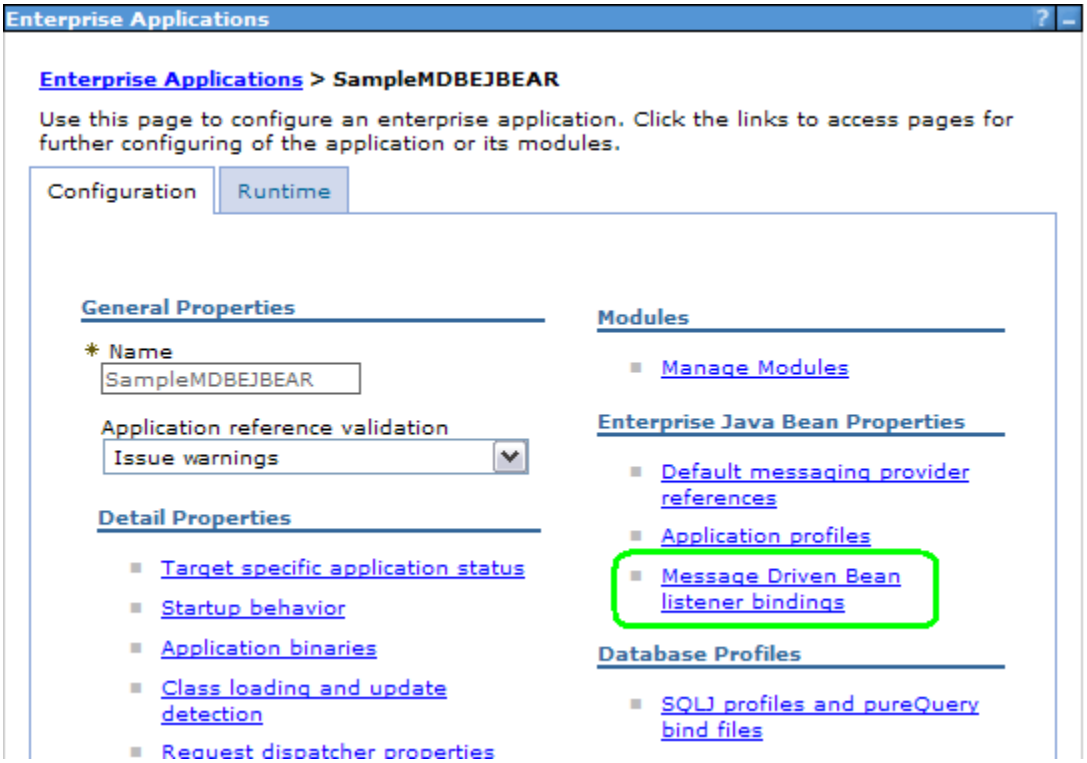
Applications > Application Types > WebSphere enterprise applications



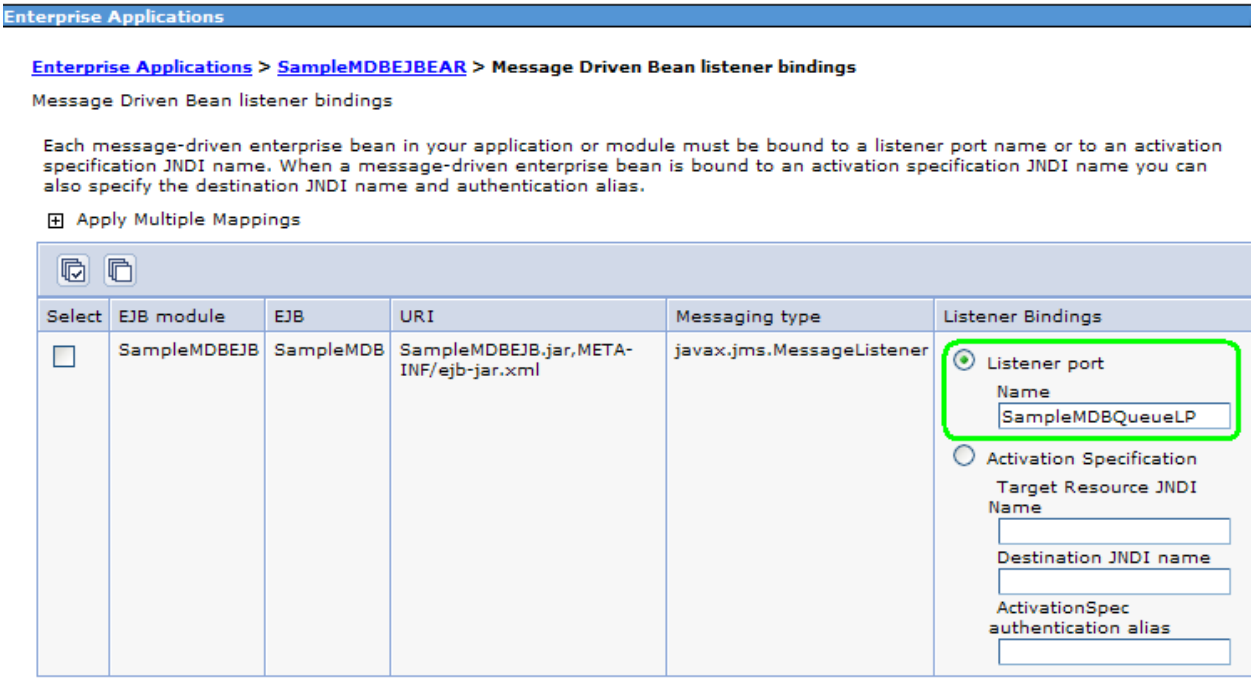
Notice that the application needs to be shown with a status of running (green arrow) in order for the corresponding MDB to be running.

The MDB can be associated with a Listener Port or an Activation Specification. From the sample above, click on the application "SampleMDBEJBEAR".

Under the section "Enterprise Java Bean Properties", select:
Message Driven Bean listener bindings



In this example, the binding is with a Listener Port



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+++ Environment variables (MQ_INSTALL_ROOT for WebSphere Application Server V6)
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In WebSphere Application Server V6, the WebSphere Application Server environment variable MQ_INSTALL_ROOT is used to indicate the location of the MQ JMS jar files.

The default value of MQ_INSTALL_ROOT is:
${WAS_INSTALL_ROOT}/lib/WMQ

Where WAS_INSTALL_ROOT is:
AIX: /usr/IBM/WebSphere/AppServer
Others: /opt/IBM/WebSphere/AppServer
Windows: C:\Program Files\IBM\WebSphere\AppServer

The jar files are located in ${MQ_INSTALL_ROOT}/java/lib
Thus, the full path for these MQ jar files is:
AIX: /usr/IBM/WebSphere/AppServer/lib/WMQ/java/lib
Others: /opt/IBM/WebSphere/AppServer/lib/WMQ/java/lib
Windows: C:\Program Files\IBM\WebSphere\AppServer\lib\WMQ\java\lib

In WebSphere Application Server V7, the variable MQ_INSTALL_ROOT is practically not used. For more details, consult the following techdoc:

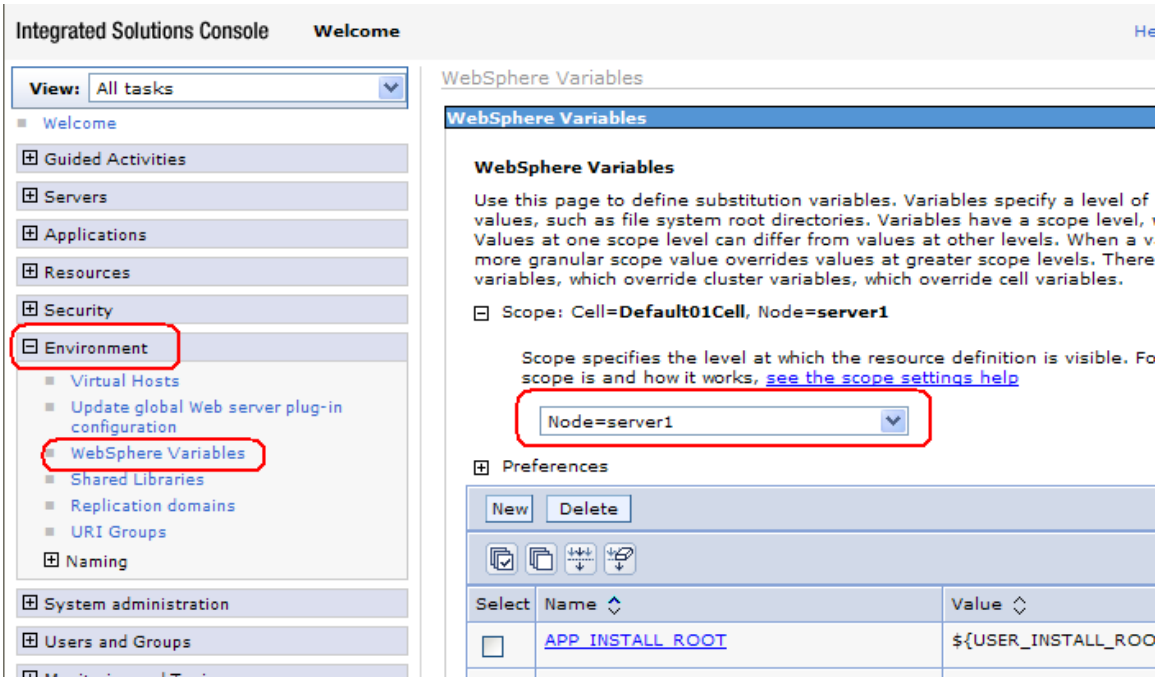
http://www.ibm.com/support/docview.wss?uid=swg27017881
WebSphere MQ V5.3, V6 and V7 as JMS Provider for WebSphere Application Server V5, V6.0, V6.1 and V7

In WebSphere Application Server 6.0, the following variable is defined in terms of MQ_INSTALL_ROOT.
Do NOT modify directly this variable:
MQJMS_LIB_ROOT = ${MQ_INSTALL_ROOT}/lib/WMQ

In WebSphere Application Server V6.1 the variable MQJMS_LIB_ROOT is NO longer used.
It is still shown in the WebSphere Application Server Administration Console, but its value is NOT used. Instead, the following is actually used:
${MQ_INSTALL_ROOT}/lib/WMQ

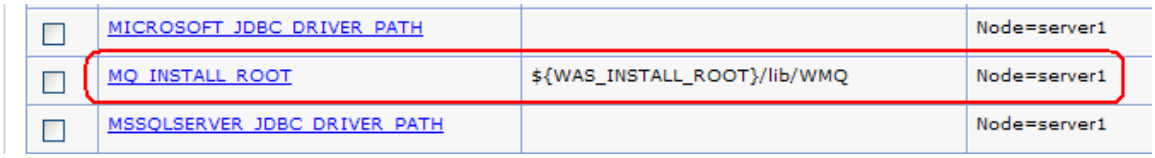
To find out the values for these variables, use the WebSphere Application Server administrative console:

Environment > WebSphere Variables
Ensure to select the scope to: Node=server1



You will need to scroll down or go to the next page in the long list of variables, until you find:

MQ_INSTALL_ROOT ${WAS_INSTALL_ROOT}/lib/WMQ



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+++ Trace enablement and specification of the trace string
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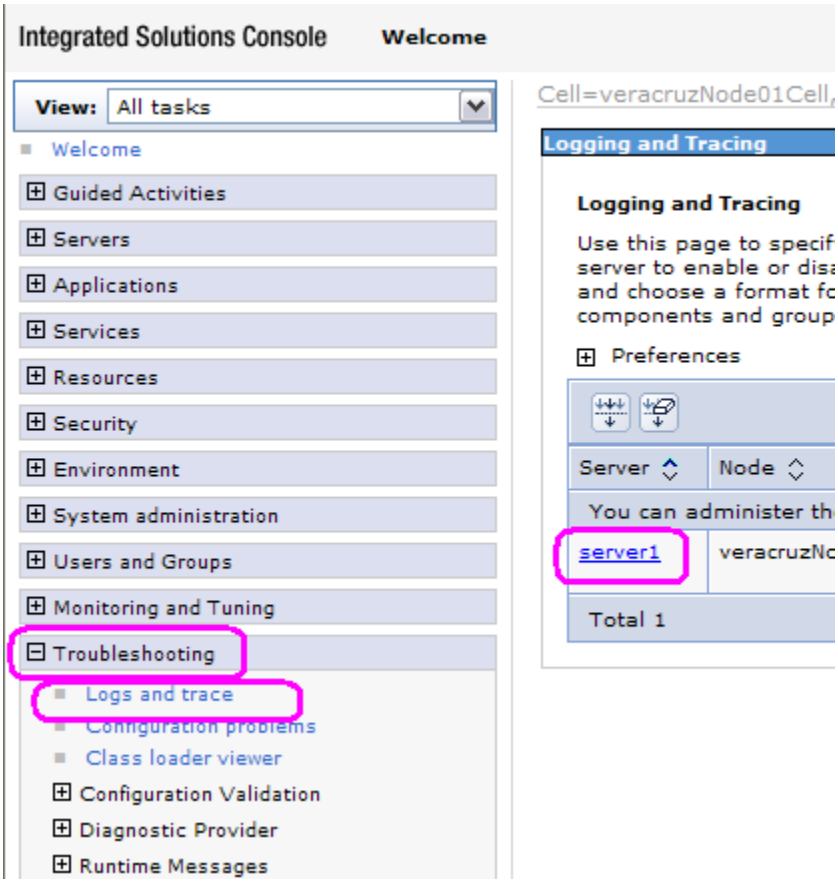
The following technote has the details on how to enable the MQ JMS trace in WAS:
http://www.ibm.com/support/docview.wss?uid=swg21199176
Technote: 1199176
Enabling Java Message Service (JMS) trace for WebSphere Application Server

WAS V9.0 (all on one line):
=info:jmsApi=all:Messaging=all:com.ibm.mq.=all:JMSApi=all:com.ibm.ws.cdi.jms*=all

WAS V8: The string should be:
=info: JMSApi=all: Messaging=all: com.ibm.mq.=all

WebSphere Application Server V6 and V7: The string should be (in one single line)
=info:JMSApi=all:JMSServer=all:Messaging=all:JMS_WASTraceAdapter=all:com.ibm.mq.=all:jmsApi=all

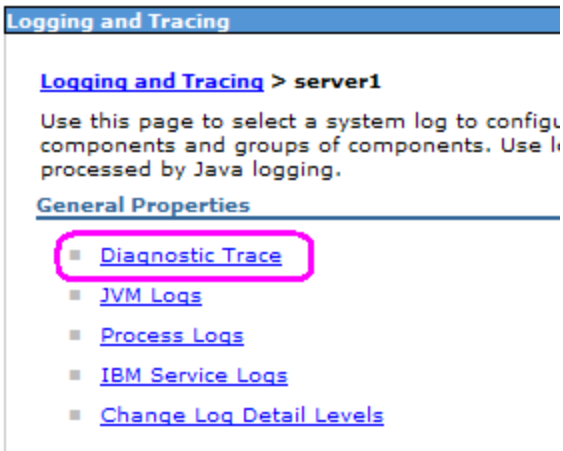
Select: Troubleshooting -> Logs and Trace.



- For WAS V6, V7, V8 and V9 (using old style and not using new HPEL) go to page 14.
- For WAS V8 (using new HPEL) to go page 17.

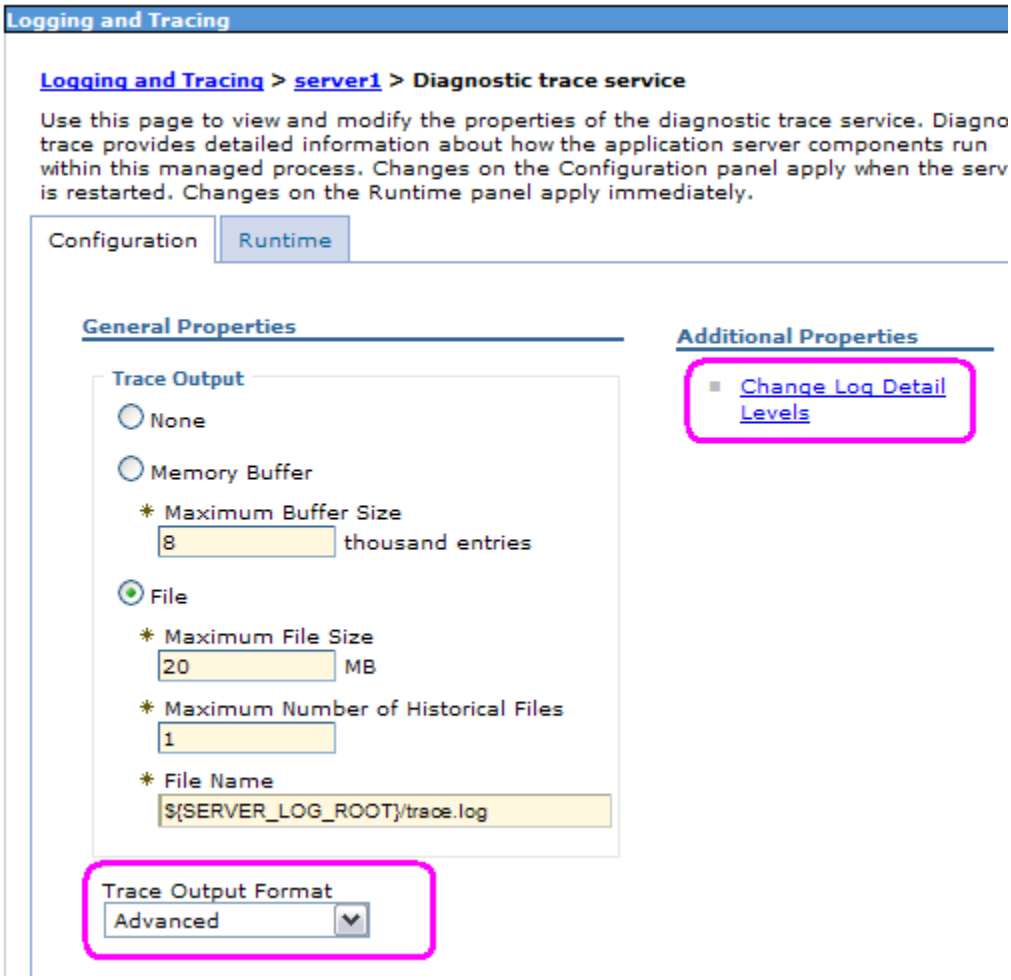
For WAS V6, V7, V8 and V9 (Legacy, NOT using HPEL):

Select: Diagnostic Trace



To ensure you capture full data flows, select:
Trace Output Format = Advanced

Then select:
Change Log Details Levels

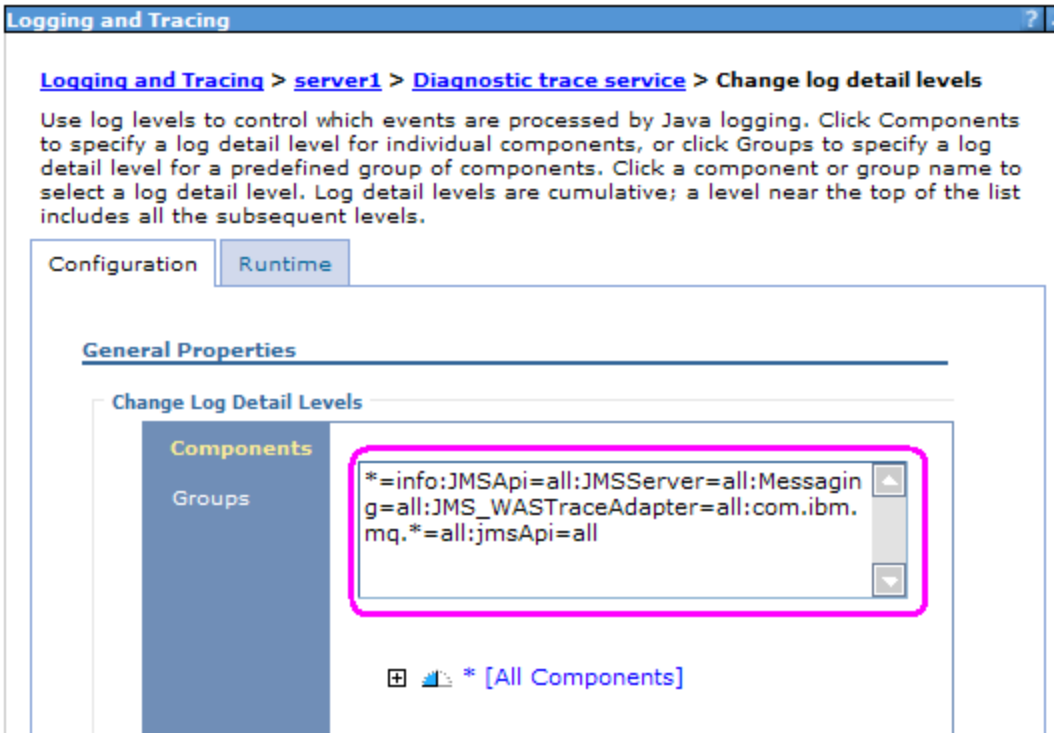


Specify the string (all in one single line):

WAS V9.0 (all on one line):
=info:jmsApi=all:Messaging=all:com.ibm.mq.=all:JMSApi=all:com.ibm.ws.cdi.jms*=all

WAS V8:
=info: JMSApi=all: Messaging=all: com.ibm.mq.=all

WAS V6 and V7:
=info:JMSApi=all:JMSServer=all:Messaging=all:JMS_WASTraceAdapter=all:com.ibm.mq.=all:jmsApi=all



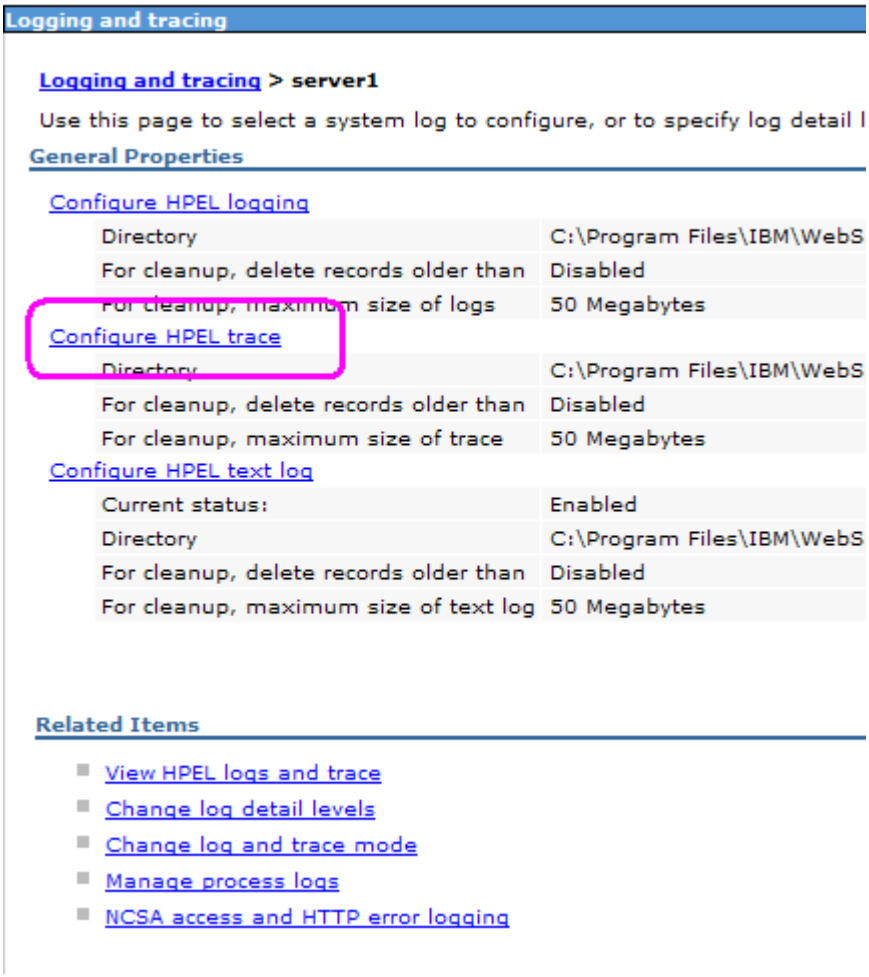
Location of trace files
<WAS_HOME>\profiles\<server_name>\logs\<server_name>\trace.log

To disable the trace in WebSphere Application Server:
After you have finished collecting the trace, please disable the tracing to avoid un-necessary consumption of system resources and disk space

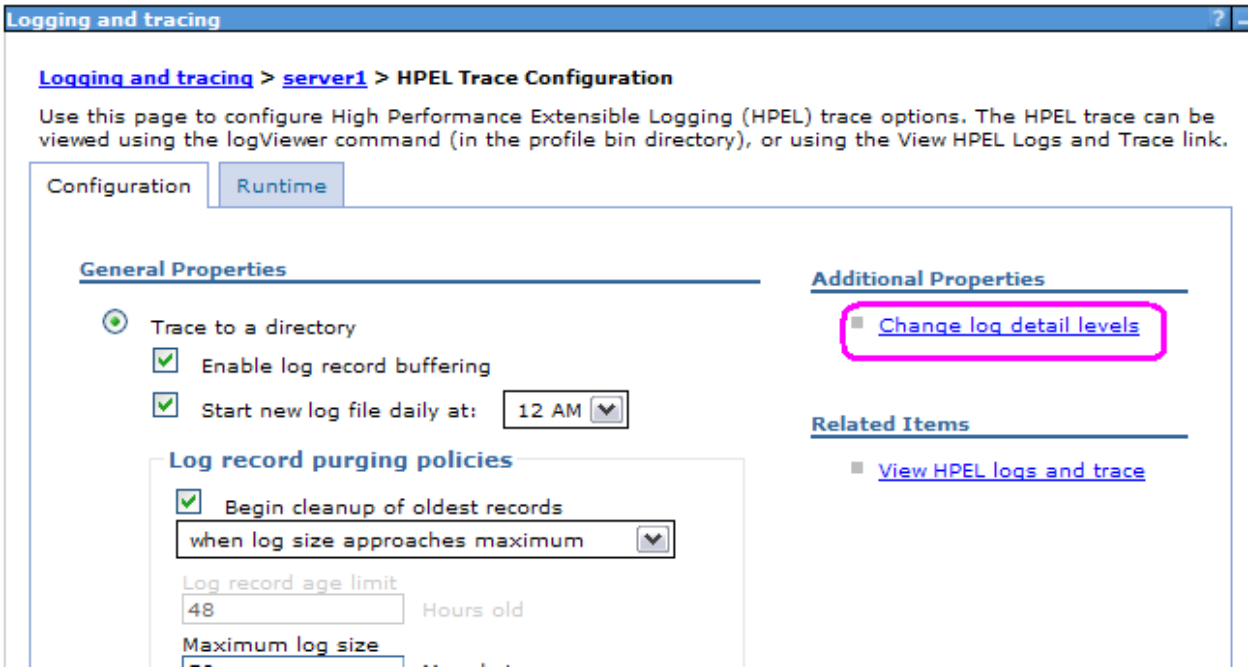
Change Log Detail Levels:
*=info

For WAS V8 and later (using the new HPEL):

Select: Configure HPEL trace



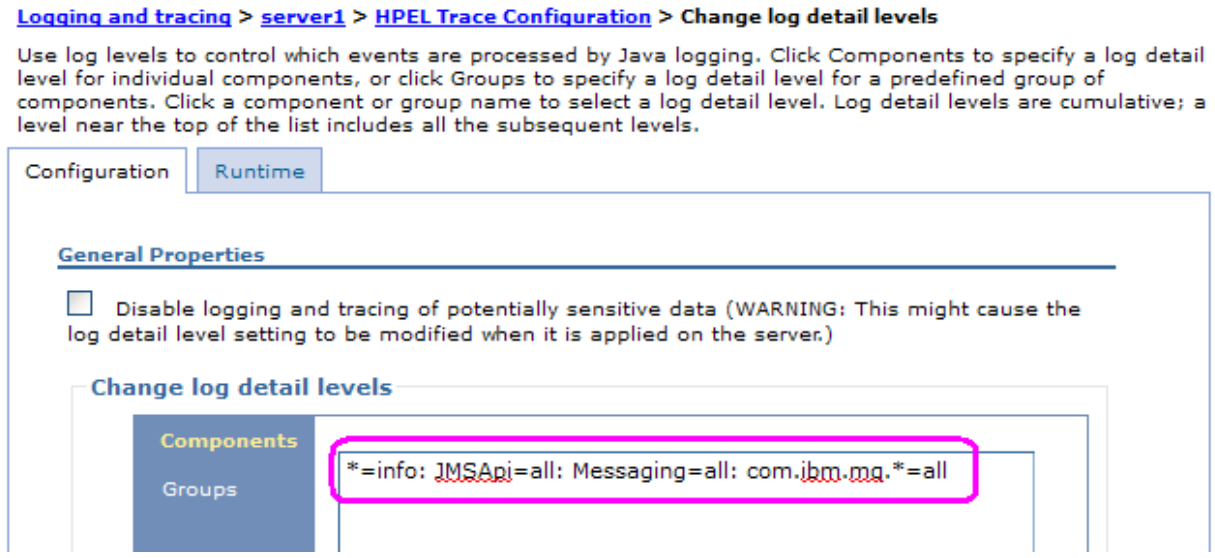
Select: Change log detail levels



Specify the string (all in one single line):

WAS V9.0 (all on one line):
=info:jmsApi=all:Messaging=all:com.ibm.mq.=all:JMSApi=all:com.ibm.ws.cdi.jms*=all

WAS V8:
=info: JMSApi=all: Messaging=all: com.ibm.mq.=all



Location of trace files:
<WAS_HOME>\profiles\<server_name>\logs\<server_name>\tracedata*

To disable the trace in WebSphere Application Server do the following:

After you have finished collecting the trace, please disable the tracing to avoid un-necessary consumption of system resources and disk space

Change Log Detail Levels:
*=info

++
+++ Specification for the MQ Native Libraries for Bindings Transport Type
++

In order to locate the WebSphere MQ V7 or later native libraries required for BINDINGS mode, the application server needs to be configured to have the generic Java Virtual Machine (JVM) argument set to the location of the libraries.

-Djava.libary.path

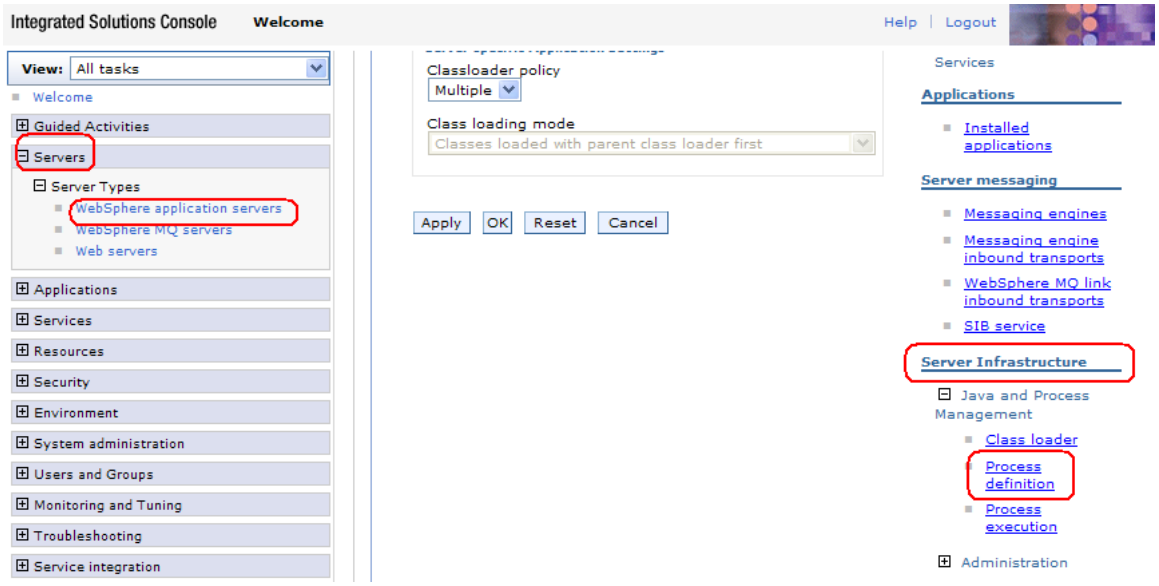
For information about where these files are installed, please see the "The Java Native Interface (JNI) libraries required by WebSphere MQ classes for JMS applications" section in the online manual for MQ

http://www.ibm.com/support/knowledgecenter/SSFKSJ_9.0.0/com.ibm.mq.dev.doc/q031570_.htm
The Java Native Interface (JNI) libraries required by IBM MQ classes for JMS applications

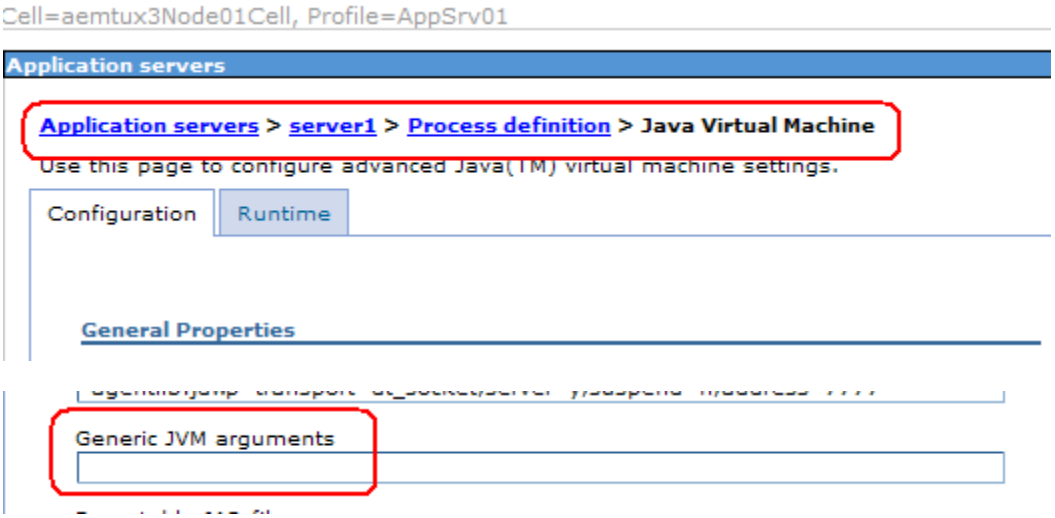
+++ WebSphere Application Server 6

From the WebSphere Application Server V6 Admin Console:

Click on Servers > Application Servers > server1.
Then, under “Server Infrastructure”,
click Java and Process Management > Process definition



Then select “Java Virtual Machine”



Under “Generic JVM arguments”, enter:
-Djava.library.path=library_path

For Linux 32-bit, it should be:
-Djava.library.path=/opt/mqm/java/lib

For Linux 64-bit, HP-UX and Solaris, the string is:
-Djava.library.path=/opt/mqm/java/lib:/opt/mqm/java/lib64

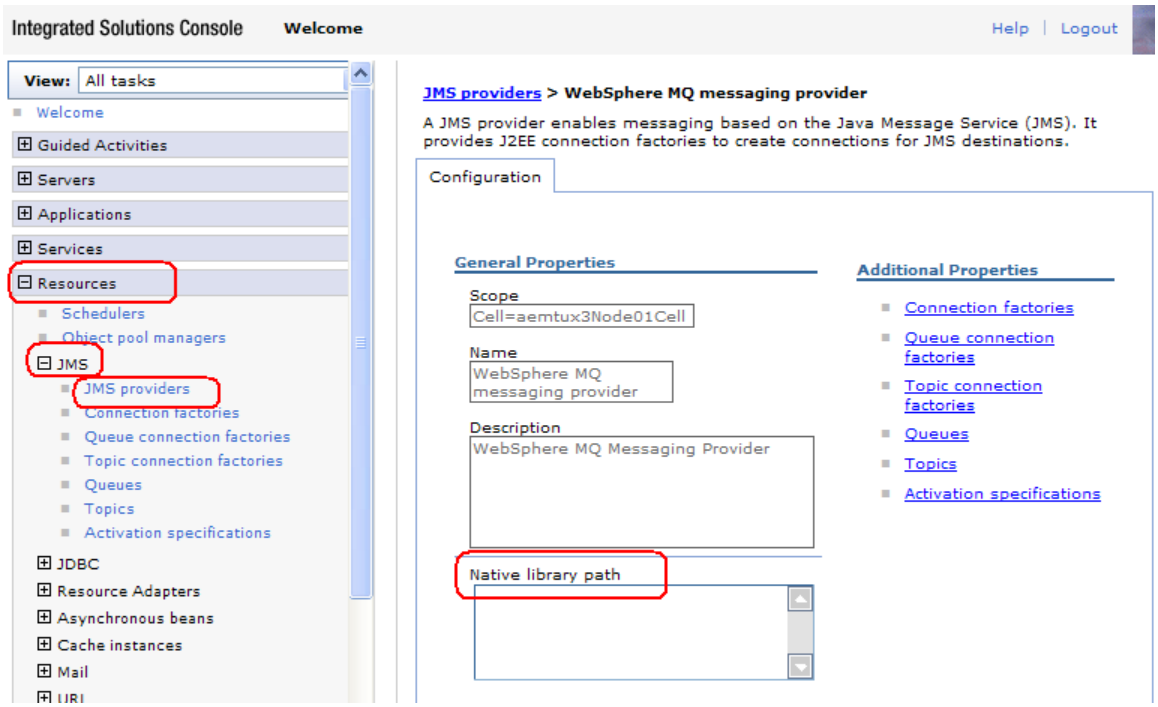
For AIX, the string is:
-Djava.library.path=/usr/mqm/java/lib:/usr/mqm/java/lib64

+++ WebSphere Application Server V7 or later

It is required for bindings mode applications that the JMS runtime must access the appropriate "bindings module" in the "native" WMQ libraries.
Thus the Resource Adapter's "native library path" must be configured to point to the WMQ directory where these libraries are located:

AIX: /usr/mqm/java/lib
Unix: /opt/mqm/java/lib
Windows: C:\Program Files\IBM\WebSphere MQ\java\lib

For more information see the following web page from the WebSphere Application Server online manual:
http://www.ibm.com/support/knowledgecenter/SSEQTP_7.0.0/com.ibm.websphere.base.doc/info/aes/ae/tmj_adm33.html
Configuring the WebSphere MQ messaging provider with native libraries information



The procedure is:

- In the navigation pane, expand Resources > JMS > JMS providers

- Select the WebSphere MQ messaging provider that is at the correct Scope for the connection factory or activation specification that will create the bindings mode connection. Note that native path information at Server scope is used in preference to native path information at higher scopes, and native path information at Node scope is used in preference to native path information at Cell scope.

- Under General Properties, in the Native library path property, enter the full name of the directory that contains the WebSphere MQ native libraries.
For example, on Linux enter /opt/mqm/java/lib. Enter only one directory name.
Click OK.

- Save any changes to the master configuration.

- If you are running in an application server environment, you must restart all affected servers twice when you have changed the native path information. Otherwise, a WMSG1623E message is produced, indicating that the WebSphere MQ messaging provider is not available.

++
+++ Enablement of new MQ V7 functions: Read Ahead, Asynchronous Put
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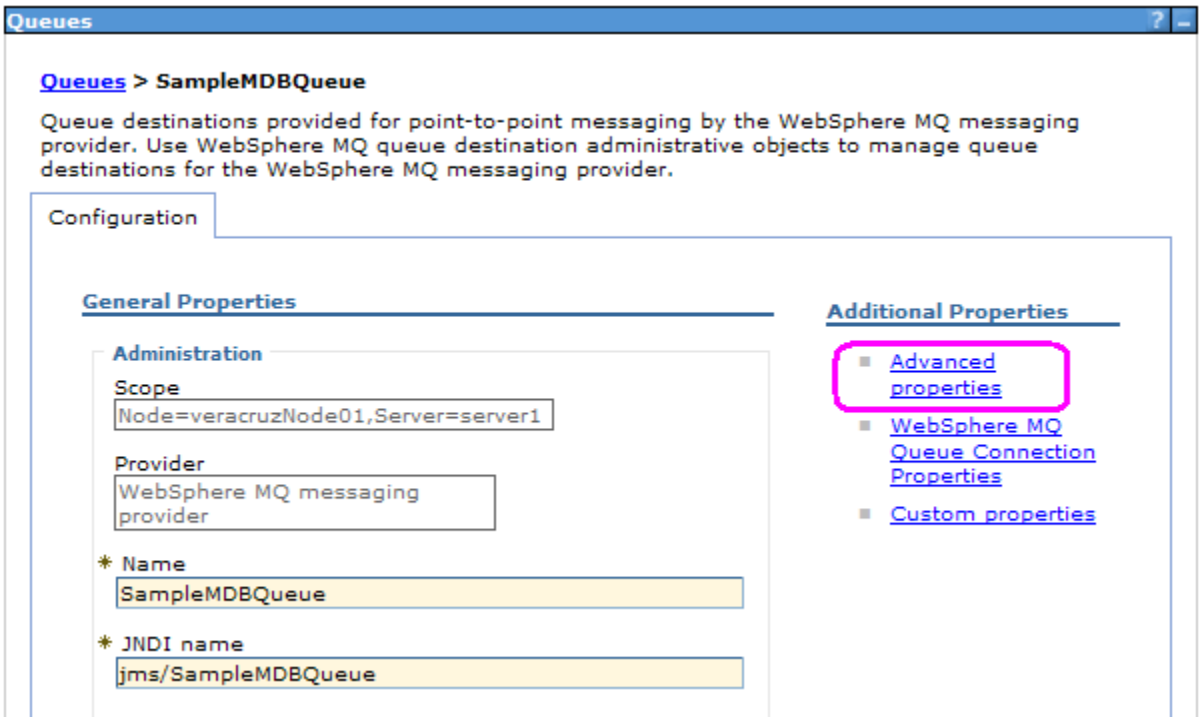
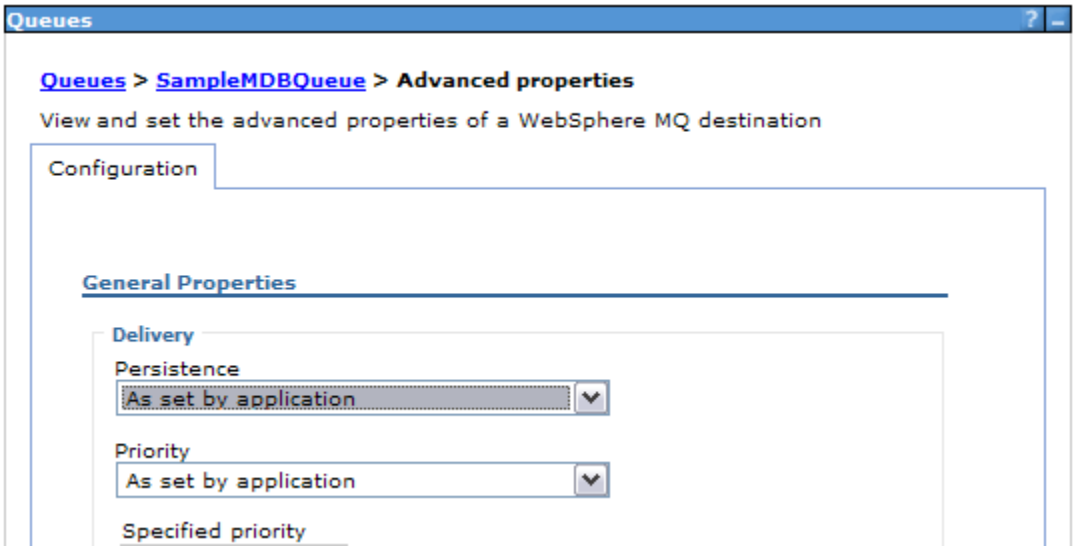
These functions are ONLY available in WebSphere Application Server V7 and later.

Read Ahead

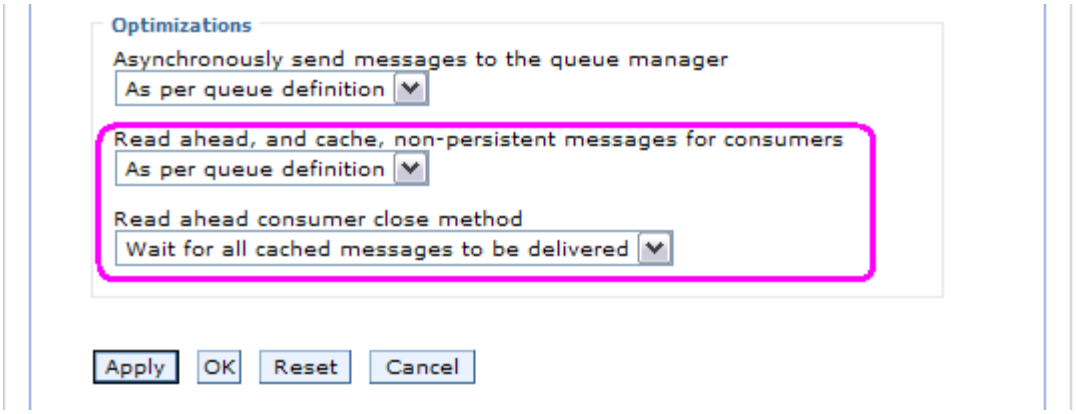
Resources > JMS > Queues > $QueueName/$TopicName > Advanced properties
Section: Optimizations



You will see the Advanced Properties:



You will need to scroll down.
Section: Optimizations



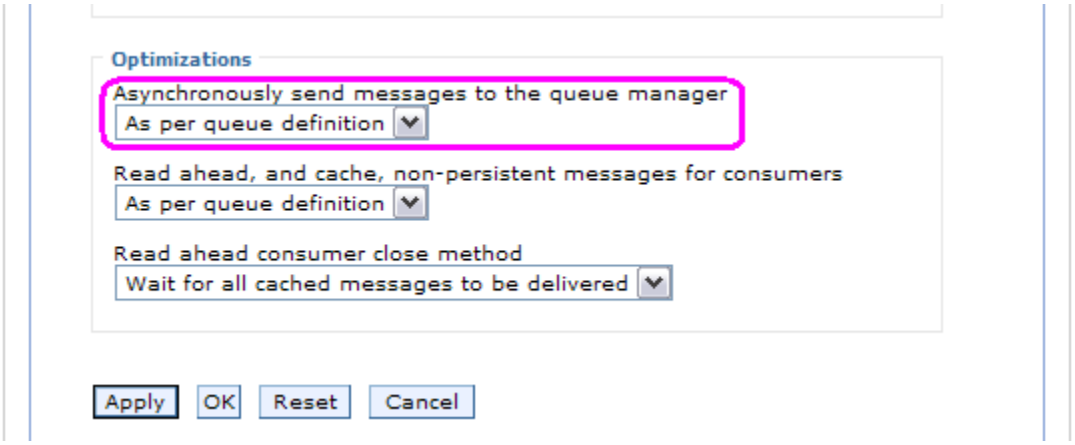
Read ahead, and cache, non-persistent messages for consumers
- As per queue definition
- Yes
- No

Read ahead consumer close method
- Wait for all cached messages to be delivered
- Wait for the current message to be delivered

Asynchronous put ("fire and forget")

Resources > JMS > Queues > $QueueName/$TopicName > Advanced properties
Section: Optimizations

See previous page for the "Advanced Properties".



Asynchronously send messages to the queue manager
- As per queue definition
- Yes
- No

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+++ Additions in WAS V8 and later: connection name list, advanced properties
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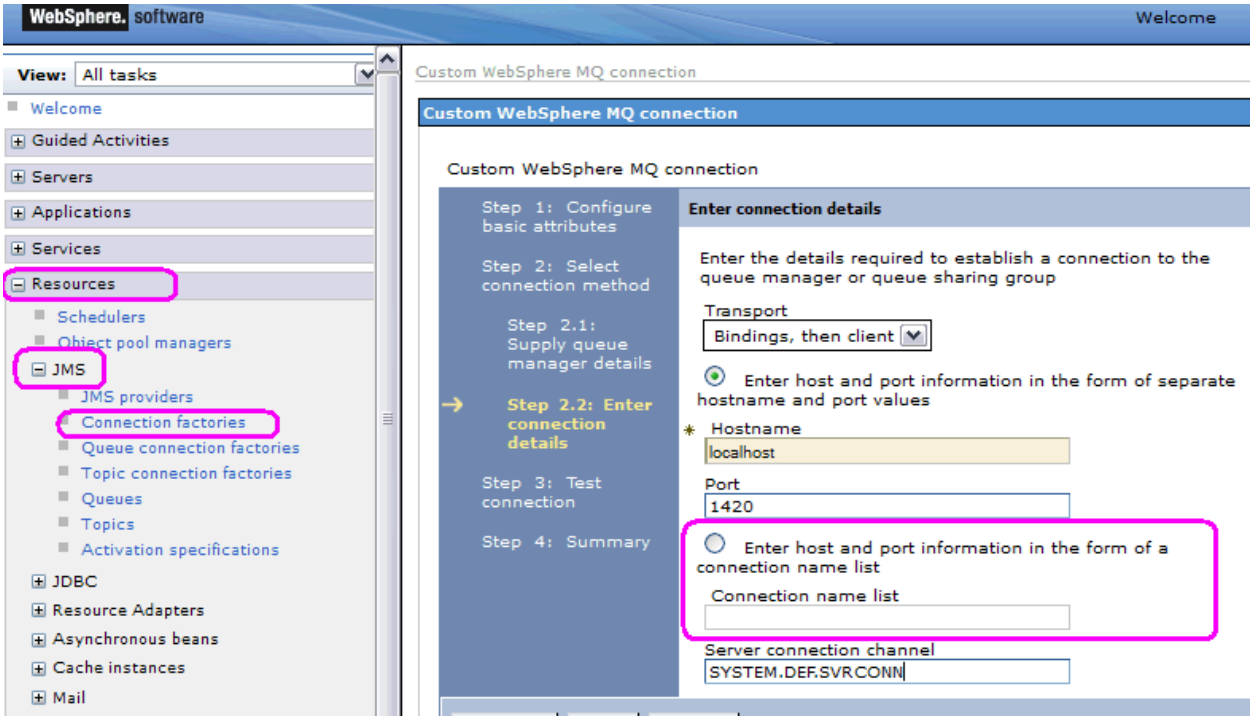
These functions are ONLY available in WebSphere Application Server V8 and later.

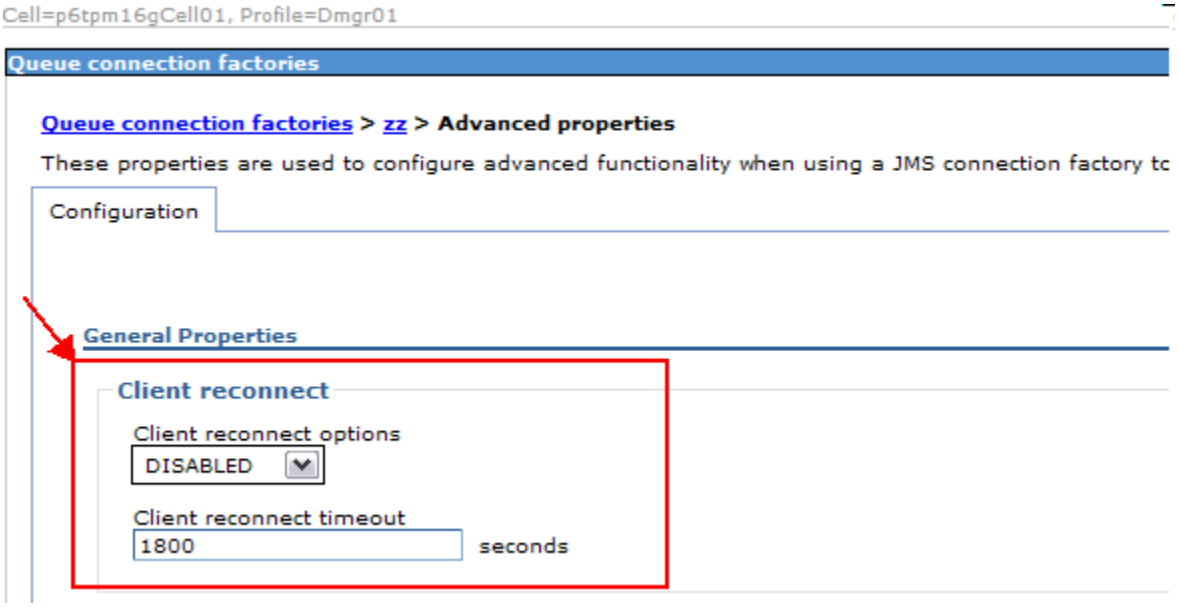
+ Support for WMQ connection name list in a Connection Factory (CF) or an Activation Specification (AS).
During the creation of any of these objects:
Notice the new radio button to choose between a single host/port or a connection name list



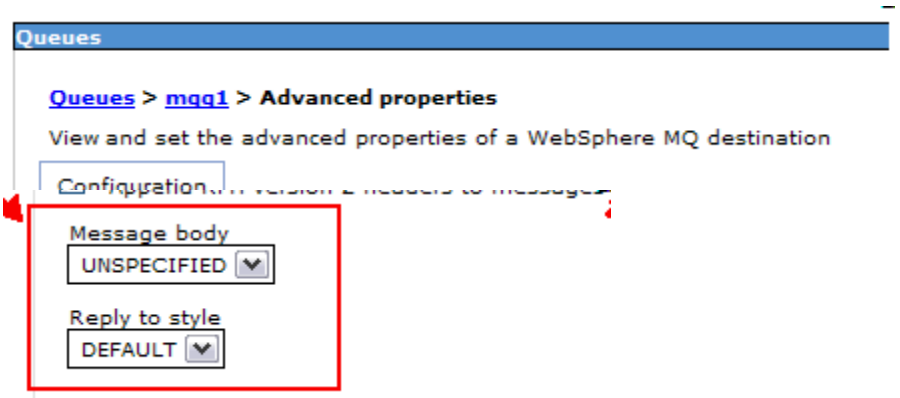
+ Exposing additional WMQ properties

Several existing WMQ properties that were previously set via custom properties are now available in the WAS Administrative Console.

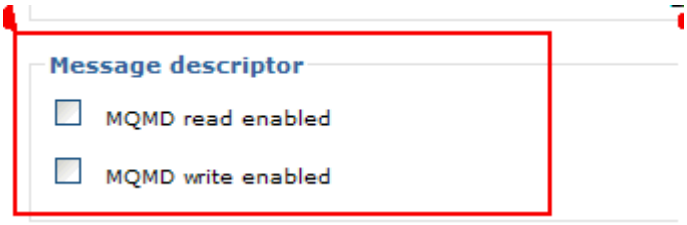
Queue connection factories: Client reconnect
Client reconnect options (Disabled)
Client reconnect timeout (1,800 seconds)



Queues, Advanced properties:
Message Body: Unspecified, JMS, MQ
Reply to style: Default, MQMD, RFH2



Queues, Advanced properties:
  Message descriptor:
    MQMD read enabled
    MQMD write enabled



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