# DATA SOURCE AND RESOURCE REFERENCE SETTINGS IN WEBSPHERE 7.0, RATIONAL APPLICATION DEVELOPER FOR WEBSPHERE VER 8 WITH JAVA 6 AND MICROSOFT SQL SERVER 2008

By Wick Gankanda | Updated: August 8, 2012

# **Table of Contents**

Table of Contents	1
Creating an Authentication Alias	1
Connecting to a SQL Server Database	3
Configuring WebSphere Application Server variables for Microsoft SQL Server JDBC Drivers	3
Obtaining the Latest Driver Files from Microsoft	3
Setting up the Driver Files for WebSphere Application Server Access	3
Setting Environment Variables in WebSphere for Microsoft JDBC Drivers	4
Setting WebSphere Environment Variables on Windows 7	4
Setting WebSphere Environment Variables on WebSphere 7.0 EXPRESS Web Application Server on Series i	5
Creating the JDBC Provider	6
Creating the Data Source	8
Configuring Connection Pooling Properties	12
Web Container Thread Connection Pool	13
Determining Web Container Thread Pool Values	13
Minimum Connection Pool Size	13
Maximum Connection Pool Size	13
Recommended starting values for the WebContainer and database connection pool sizes	14
Thread inactivity timeout	14
Using the Data Source in Java Programs	14
Data Source in a POJO (Plain Old Java Object) using the Deployment Descriptor	14
Defining a Resource Reference and WebSphere Bindings in RAD	14
Using the Data Source in a POJO	16
References	17
Copyright and Trademark Information	17

When trying to connect to a database without a data source with WebSphere 7.0, the following error is thrown by the Web Application server:

com.ibm.ws.webcontainer.servlet.ServletWrapper service SRVE0068E: Uncaught exception
created in one of the service methods of the servlet <servlet-name> in application <webservice-application> ... javax.naming.NameNotFoundException: Name comp/env/jdbc not found
in context "java:".

# **Creating an Authentication Alias**

Log onto the administrative console AKA Integrated Solutions Console > select Security > Global security > expand Java Authentication and Authorization Server > click J2C authentication data

# 

- System logins
- J2C authentication data

Click New > enter an alias name, user ID, and password for the database

Example:

Alias (name of the authentication data entry): alias\_suppl\_web\_services User ID: ? Password: ? Description: J2C for JDBC suppl\_web\_services

GIO	hal	secu	TTT V

# Global security > JAAS - J2C authentication data > New Specifies a list of user identities and passwords for Java(TM) 2 connector security to use. General Properties \* Alias alias\_suppl\_web\_services \* User ID supplierws \* Password Description J2C4JDBC\_suppl\_web\_services Apply OK Reset Cancel

Click OK > click Save directly to the master configuration >

Example of result:

### Global security > JAAS - J2C authentication data

Specifies a list of user identities and passwords for Java(TM) 2 connector security to use.

Prefix new alias names with the node name of the cell (for compatibility with earlier releases)

#### Apply

#### 

New	New Delete			
Select	Alias 🛟	User ID 🛟	Description 🗇	
You can administer the following resources:				
	WG- O980Node03/alias_suppl_web_services	supplierws	J2C4JDBC_suppl_web_services	
Total	1			

# **Connecting to a SQL Server Database**

### Configuring WebSphere Application Server variables for Microsoft SQL Server JDBC Drivers

Microsoft SQL Server JDBC Driver 4.0 files were not found in RAD 8 installation and had to be downloaded from Microsoft. Once downloaded, the compressed file is unzipped and its contents extracted to folders.

### **Obtaining the Latest Driver Files from Microsoft**

Microsoft SQL Server JDBC drivers can be downloaded from Microsoft.

```
Go to this page and download the latest drivers:
Microsoft JDBC Driver for SQL Server
http://msdn.microsoft.com/en-us/data/aa937724.aspx
```

### Setting up the Driver Files for WebSphere Application Server Access

Unzip the download and create this folder structure at a location that's accessible to WebSphere 7.0 server.



### Setting Environment Variables in WebSphere for Microsoft JDBC Drivers

W

Setting WebSphere Environment Variables on Windows 7

WebSphere Variables > MICROSOFT_JDBC_DRIVER_NATIVEPATH			
Use this page to define substitution variables. Variables specify a level of indirection for some system-defined values, such as file system root directories. Variables have a scope level, which is either server, node, cluster, or cell. Values at one scope level can differ from values at other levels. When a variable has conflicting scope values, the more granular scope value overrides values at greater scope levels. Therefore, server variables override node variables, which override cluster variables, which override cell variables.			
Configuration			
General Properties			
* Name MICROSOFT_JDBC_DRIVER_NAT			
Value [es\MSSQLServer_JDBC4\xa\x86			
Description			
The directory that contains native files needed by the Microsoft SQL Server JDBC Driver.			
Apply OK Reset Cancel			

Update global Web server plug-in configuration

In the administrative console > click Environment > WebSphere variables

Set the value of the MICROSOFT\_JDBC\_DRIVER\_PATH environment variable to the location of the sqljdbc4.jar file.

12

8

E Environment

Virtual hosts

WebSphere variables Shared libraries

Replication domains

Value: (Specifies the absolute path that the symbolic name represents)	WebSphere Variables ? -
WebSphere Variables > MICROSOFT_JDBC_DRIVER_PATH         Description: (Specifies an optional description for your administrative records)    WebSphere Variables > MICROSOFT_JDBC_DRIVER_PATH Use this page to define substitution variables. Variables specify a level of indirection for some system-define system root directories. Variables has conflicting scope values, the more granul level can differ from values at other levels. Which is either server, node, cluster, or cell value overrides values at greater scope levels. Therefore, server variables override node variables, which over which override cell variables. Configuration	
Example path: On Windows 7 C:\classes\MSSQLServer_JDBC4	General Properties  * Name MICROSOFT_JDBC_DRIVER_PAT
Click <b>OK</b> .	Value C:\classes\MSSQLServer_JDBC4 Description The directory that contains the Microsoft SQL Server JDBC Driver.
Set the value of the <b>MICROSOFT_JDBC</b>	

Value: (Specifies the absolute path that the symbolic name represents) Description: (Specifies an optional description for your administrative records) Example path on Windows 7 C:\classes\MSSQLServer\_JDBC4\xa\x86

	WebSphere Variables ? _
Click <b>OK</b> .	WebSphere Variables > MICROSOFT_JDBC_DRIVER_NATIVEPATH Use this page to define substitution variables. Variables specify a level of indirection for some system-defined values, such as file system root directories. Variables have a scope level, which is either server, node, cluster, or cell. Values at one scope level can differ from values at other levels. When a variable has conflicting scope values, the more granular scope value overrides values at greater scope levels. Therefore, server variables override node variables, which override cluster variables.
	Configuration General Properties
	* Name MICROSOFT_JDBC_DRIVER_NAT Value es/MSSQLServer_JDBC4\xa\x86
	Description The directory that contains native files needed by the Microsoft SQL Server JDBC Driver.
	Apply OK Reset Cancel

### Example of result:

WebS	WebSphere Variables ? _			
We	bSphere Variables			
Use file leve ove whi	Use this page to define substitution variables. Variables specify a level of indirection for some system-defined values, such as file system root directories. Variables have a scope level, which is either server, node, cluster, or cell. Values at one scope level can differ from values at other levels. When a variable has conflicting scope values, the more granular scope value overrides values at greater scope levels. Therefore, server variables override node variables, which override cluster variables.			
Ξ	Scope: <b>=All scopes</b>			
	Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help.			
	All scopes	-		
	MICROSOFT_JDBC_DRIVER_NATIVEPATH	C:\classes\MSSQLServer_JDBC4\xa\x86		
	MICROSOFT_JDBC_DRIVER_PATH	C:\classes\MSSQLServer_JDBC4		

# Setting WebSphere Environment Variables on WebSphere 7.0 EXPRESS Web Application Server on Series i

Create this folder structure with JDBC SQL Server files

—ms_sql	
sqljdbc4	4.jar
└──xa	
└──x86	
	<pre>sqljdbc_xa.dll</pre>

Go to **Environment** > **WebSphere variables** > lookup absolute path for WebSphere variable 'WAS\_INSTALL\_ROOT' Example: /QIBM/ProdData/WebSphere/AppServer/V7/Express

Copy the above folder structure to the 'lib' folder in the path specified above for 'WAS\_INSTALL\_ROOT' Example: /QIBM/ProdData/WebSphere/AppServer/V7/Express/lib/ms\_sql Go to Environment > WebSphere variables

- set WebSphere variable 'MICROSOFT\_JDBC\_DRIVER\_PATH' to \${WAS\_INSTALL\_ROOT}/lib/ms\_sql
- set WebSphere variable 'MICROSOFT\_JDBC\_DRIVER\_NATIVEPATH' to \${MICROSOFT\_JDBC\_DRIVER\_PATH}/xa/x86

Variables in WebSphere 7.0 EXPRESS may look like this:

F	MICROSOFT_JDBC_DRIVER_NATIVEPATH	\${MICROSOFT_JDBC_DRIVER_PATH}/xa/x86	
	MICROSOFT_JDBC_DRIVER_PATH	\${WAS_INSTALL_ROOT}/lib/ms_sql	
	MQ_INSTALL_ROOT	Contract WMQ	
	ORACLE_JDBC_DRIVER_PATH		
	OS400_NATIVE_JDBC40_DRIVER_PATH		
	OS400_NATIVE_JDBC_DRIVER_PATH		
	OS400_TOOLBOX_JDBC_DRIVER_PATH		
	SERVER_LOG_ROOT	\${LOG_ROOT}/WEBAPPSVR	
	SERVER_LOG_ROOT	\${LOG_ROOT}/IHS_WEBAPPHTTP	
E	SYBASE_JDBC_DRIVER_PATH		
	UNIVERSAL_JDBC_DRIVER_PATH	\${WAS_INSTALL_ROOT}/universalDriver/lib	Ī
	USER_INSTALL_ROOT	/QIBM/UserData/WebSphere/AppServer/V7/Express/profiles/WEBAPPSVR	
	User-defined_JDBC_DRIVER_PATH		1
	WAS_CELL_NAME	LADEV2_WEBAPPSVR	
	WAS_ETC_DIR	\${USER_INSTALL_ROOT}/etc	
	WAS_INSTALL_LIBRARY	QWAS7A	t
100	WAS_INSTALL_ROOT	/QIBM/ProdData/WebSphere/AppServer/V7/Express	T

## Creating the JDBC Provider

In the administrative console > expand **Resources** > **JDBC** from the navigation tree > Click **JDBC Providers** >

Resources	JDBC providers Use this page to edit properties of a Il implementation class for access to the activity. A guided activity provides a lis C Scope: =All scopes	DBC provider. The JDBC provider object enca specific vendor database of your environm t of task steps and more general informatio	apsulates the specific JDBC driver ent. Learn more about this task in a guided ri about the topic.
<ul><li>Schedulers</li><li>Object pool managers</li></ul>	Scope specifies the level at information on what scope All scopes	which the resource definition is visible. For is and how it works, see the scope settings •	detailed help.
⊞ JMS	New Delete		
DIDBC	0 0 # 19		
JDBC providers	Select Name 🛟 You can administer the following reso	Scope 😄	Description 🗘
Data sources	Derby JDBC Provider	Node=WG- O980Node03,Server=server1	Derby embedded non-XA JDBC Provider
Data sources (WebSphere Application Server V	Total 1		

Select the scope:

**Scope** to specify the level at which a resource is visible on the administrative console panel. By changing the value for Scope, you see only the resources that are defined at that scope.

**Recommended: Node** - limits the visibility to all the servers on the named node. The node scope is the default scope for most resource types.

### Select New > create a new JDBC provider >

Verify the Scope Database type: SQL Server Provider type: Microsoft SQL Server JDBC Driver Implementation type: XA data source (for support of two-phase commit transactions) Name: Microsoft SQL Server JDBC Driver (XA) Description: Microsoft SQL Server JDBC Driver (XA). This provider is configurable in version 6.1.0.15 and later nodes.

After creating the JDBC provider, the class path will point to older SQL JDBC driver.

### Class path

\${MICROSOFT\_JDBC\_DRIVER\_PATH}/sqljdbc.jar

Expand **Resources** > **JDBC** from the navigation tree > Click **JDBC providers** > select the provider 'Microsoft SQL Server JDBC Driver (XA)' > change and verify the directory location for the SQL Server JDBC drivers

### Change the class path \*\*\* THIS IS CRITICAL OR CONNECTION WILL FAIL \*\*\*: from \${MICROSOFT\_JDBC\_DRIVER\_PATH}/sqljdbc.jar to \${MICROSOFT\_JDBC\_DRIVER\_PATH}/sqljdbc4.jar

Directory location for "sqljdbc.jar" which is saved as WebSphere variable \${MICROSOFT\_JDBC\_DRIVER\_PATH} Native library path: Directory location which is saved as WebSphere variable \${MICROSOFT\_JDBC\_DRIVER\_NATIVEPATH}

Cre	eate a new JDBC Provider	
	Step 1: Create new JDBC provider	Enter database class path information
→	Step 2: Enter database class path information Step 3: Summary	Set the environment variables that represent the JDBC driver class files, which WebSphere(R) Application Server uses to define your JDBC provider. This wizard page displays the file names; you supply only the directory locations of the files. Use complete directory paths when you type the JDBC driver file locations. For example: C:\SQLLIB\java on Windows(R) or /home/db2inst1/sqllib/java on Linux(TM).
		If a value is specified for you, you may click Next to accept the value.
		Class path:
		\${MICROSOFT_JDBC_DRIVER_PATH}/sqljdbc.jar
		Directory location for "sqljdbc.jar" which is saved as WebSphere variable \${MICROSOFT_JDBC_DRIVER_PATH}
		C:\classes\MSSQLServer_JDBC4
		Native library path Directory location which is saved as WebSphere variable
		\${MICROSOFT_JDBC_DRIVER_NATIVEPATH} C:\classes\MSSQLServer_JDBC4\xa\x86
	Previous Next Cano	cel

### Verify this:

Class path		
\${MICROSOFT_JDBC_DRIVER_PA	TH}/sqljdbc4.jar	
Click Next > review the summary of the sett	ings > click <b>Finish</b>	
Click Save directly to the master configur	ation.	
Example of result:		
JDBC providers		2
JDBC providers		
Use this page to edit properties of a JDBC pro implementation class for access to the specific activity. A guided activity provides a list of task	vider. The JDBC provider object encapsu vendor database of your environment. < steps and more general information ab	lates the specific JDBC driver Learn more about this task in a guided out the topic.
Scope: Cell=WG-O980Node04Cell, Node=	WG-O980Node03	
Scope specifies the level at which the information on what scope is and h	ne resource definition is visible. For deta ow it works, see the scope settings help	iled 5.
Node=WG-0980Node03	•	
Preferences		
New Delete		
Select Name 💠	Scope 🛟	Description 🛟
You can administer the following resources:		
Microsoft SQL Server JDBC Driver (XA)	Node=WG-O980Node03	Microsoft SQL Server JDBC Driver (XA). This provider is configurable in version 6.1.0.15 and later nodes.
Total 1		
		E Resources
Creating the Data Source		<ul><li>Schedulers</li><li>Object pool managers</li></ul>

Expand **Resources** > **JDBC** > select **Data sources**:

Select the Scope:

**Recommended: Node** - limits the visibility to all the servers on the named node. The node scope is the default scope for most resource types.

Click New to create a new data source > enter basic data source information

Example:

Data source name (This name is used for administrative purposes): JDBC4 SQLServer DataSource 4 SupplierDB JNDI name (JNDI name that will be used to access the data source): jdbc/suppweb

**T** JMS

E JDBC

10

JDBC providers
 Data sources

Data sources (WebSphi

#### Create a data source

#### Create a data source

<b>→</b>	Step 1: Enter basic data source	Enter basic data source information
	information Step 2: Select JDBC provider	Set the basic configuration values of a datasource for association with your JDBC provider. A datasource supplies the physical connections between the application server and the database.
	Step 3: Enter database specific properties for the	Requirement: Use the Datasources (WebSphere(R) Application Server V4) console pages if your applications are based on the Enterprise JavaBeans(TM) (EJB) 1.0 specification or the Java(TM) Servlet 2.2 specification.
	data source Step 4: Setup security	Scope cells:WG-O980Node04Cell:nodes:WG- O980Node03
	Step 5: Summary	* Data source name JDBC4 SQLServer DataSource 4 SupplierDB
		* JNDI name jdbc/suppweb

#### Click Next > Select JDBC provider



Click Next > enter database specific properties for the data source

### Database name:

Port number (the database server listens on):

Server Name:

Enter database specific properties for the data source

Select Use this data source in container managed persistence (CMP)

Set these database-specific properties, which are required by the database vendor JDBC driver to support the connections that are managed through the datasource.

Click Next.

Name	Value
Database name	SUPPWEB
Port number	1433
Server name	129.129.160.3

Use this data source in container managed persistence (CMP)

Setup security aliases using the drop-down options for Authentication alias for XA recovery and Componentmanaged authentication alias.

#### Setup security aliases

Select the authentication values for this resource.

Authentication alias for XA recovery	_
WG-O980Node03/alias_suppl_web_services 🔻	•
Component-managed authentication alias	_
WG-O980Node03/alias_suppl_web_services 🔻	
Mapping-configuration alias (none)	
Container-managed authentication alias	
(none)	-

Note: You can create a new J2C authentication alias by accessing one of the following links. Clicking on a link will cancel the wizard and your current wizard selections will be lost.

Click **Next** > review the summary of the settings > click **Finish**.

### Summary

Summary of actions:

Options	Values
Scope	cells:WG-O980Node04Cell:nodes:WG-O980Node03
Data source name	JDBC4 SQLServer DataSource 4 SupplierDB
JNDI name	jdbc/suppweb
Select an existing JDBC provider	Microsoft SQL Server JDBC Driver (XA)
Implementation class name	com.microsoft.sqlserver.jdbc.SQLServerXADataSource
Database name	SUPPWEB
Port number	1433
Server name	129.129.160.3
Use this data source in container managed persistence (CMP)	true
Authentication alias for XA recovery	WG-O980Node03/alias_suppl_web_services
Component-managed authentication alias	WG-O980Node03/alias_suppl_web_services
Mapping-configuration alias	(none)
Container-managed authentication alias	(none)

Click Save directly to the master configuration.

## Example of result:

Data sources         Use this page to edit the settings of a datasource that is associated with your selected JDBC provider. The datasource ob guided activity provides a list of task steps and more general information about the topic.            Cope: Cell=WG-O980Node04Cell, Node=WG-O980Node03          Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help.             Mode=WG-O980Node03             Preferences             Vew Delete Test connection Manage state             Select Name          JNDI name             Scope 3Cell=WG-O980Node03             Select Name             JNDI name             Scope 4            JOBC4 SQLServer 5            Jdbc/suppweb             O880Node03             Server JDBC Driver 5            Source 6 or the Microsoft SQL Server 1DBC Driver 108C Dr	ta sour	ces						
Use this page to edit the settings of a datasource that is associated with your selected JDBC provider. The datasource ob supplies your application with connections for accessing the database. Learn more about this task in a guided activity. A guided activity provides a list of task steps and more general information about the topic.         □ Scope: Cell=WG-O980Node04Cell, Node=WG-O980Node03         Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help.         Node=WG-O980Node03         •         •         •         Preferences         • <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>								
Use this page to edit the settings of a datasource that is associated with your selected JDBC provider. The datasource ob supplies your application with connections for accessing the database. Learn more about this task in a guided activity. A guided activity provides a list of task steps and more general information about the topic. Scope: Cell=WG-O980Node04Cell, Node=WG-O980Node03 Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help. Node=WG-O980Node03 Preferences New Delete Test connection Manage state Scope \$\frac{1}{2}\$ Provider \$\frac{1}{2}\$ Description \$\frac{1}{2}\$ Category You can administer the following resources: DBC4 SQLServer DataSource 4 SupplierDB Jdbc/suppweb Node=WG- 0980Node03 Microsoft SQL Server JDBC Driver (XA) Microsoft SQL Server JDBC Driver (XA) Microsoft SQL Server JDBC Driver. This data source for the Microsoft SQL Server JDBC Driver. This data source Verve is in the source state is a source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC Driver This data source for the microsoft SQL Server JDBC D	Data sources							
<ul> <li>Scope: Cell=WG-O980Node04Cell, Node=WG-O980Node03</li> <li>Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help.</li> <li>Node=WG-O980Node03</li> <li>Preferences</li> <li>New Delete Test connection Manage state</li> <li>Select Name &lt; JNDI name &lt; Scope &lt;&gt; Provider &lt;&gt; Description &lt;&gt; Category</li> <li>You can administer the following resources:         <ul> <li>JDBC4 SQLServer DataSource 4 SupplierDB</li> <li>JOBC4 SQLServer SupplierDB</li> <li>Node=WG-O980Node03</li> <li>Microsoft SQL Server This data source for the Microsoft SQL Server JDBC Driver (XA)</li> </ul> </li> </ul>	Use this page to edit the settings of a datasource that is associated with your selected JDBC provider. The datasource object supplies your application with connections for accessing the database. Learn more about this task in a guided activity. A guided activity provides a list of task steps and more general information about the topic.							
Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help. Node=WG-O980Node03 Preferences New Delete Test connection Manage state New Delete Test connection Manage state Select Name Select Name NDI name Scope Provider Description Category You can administer the following resources: DBC4 SQLServer DataSource 4 SupplierDB jdbc/suppweb Node=WG- O980Node03 Server JDBC Driver (XA) Microsoft SQL Server JDBC Driver This data source for the Microsoft SQL Server JDBC Driver. This data source for the Node=WG- O980Node03 Category Node=WG- O980Node03 Diver. This data source for the Microsoft SQL Server JDBC Driver. This data source for the Microsoft SQL Server JDBC Driver. This Microsoft SQL Server JDBC Driver. This Server JDBC Driver. This Microsoft SQL Server JDBC Driver. This Microsoft SQL Server JDBC Driver. This Microsoft SQL Server JDBC Driver. This Microsoft SQL Server JDBC D	Scope: Cell=WG-O980Node04Cell, Node=WG-O980Node03							
Node=WG-O980Node03       ▼         Preferences       Manage state         Image: Select Name        JNDI name        Scope        Provider <       Description        Category         You can administer the following resources:       JDBC4 SQLServer       jdbc/suppweb       Node=WG-       Microsoft SQL       XA data         SupplierDB       JBC/suppweb       Node=WG-       O980Node03       Microsoft SQL       Server JDBC Driver       XA data         SupplierDB       SupplierDB       Node=WG-       O980Node03       Microsoft SQL       Server JDBC Driver       XA data         SupplierDB       Image: SupplierDB       Node=WG-       O980Node03       Microsoft SQL       Server JDBC Driver       Microsoft SQL         Server JDBC       Driver. This       Server JDBC       Driver. This       Microsoft SQL       Server JDBC	Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, see the scope settings help.							
Image Preferences         New       Delete       Test connection       Manage state         Image State       Manage state       Manage state         Image State       Job State       Scope $\diamondsuit$ Provider $\diamondsuit$ Description $\circlearrowright$ Category         You can administer the following resource 4 SupplierDB       jdbc/supp web       Node=WG- 0980Node03       Microsoft SQL Server JDBC Driver (XA)       XA data source for the Marsource type is	Node=WG-O980Node03							
New       Delete       Test connection       Manage state         Image: Select       Name        JNDI name        Scope        Provider        Description        Category         You can administer the following resources:       JDBC4 SQLServer       jdbc/suppweb       Node=WG-       Microsoft SQL       XA data source for the Microsoft SQL Server JDBC Driver (XA)       XA data source for the Microsoft SQL Server JDBC Driver is source for the Microsoft SQL Server JDBC Driver is source to the source is the source of the source is source to the source is the source of the source is source to the source is source is source to the source is source i	Preferences							
New       Delete       Test connection       Manage state         Image       Ima	H FIE	lei ences						
Image: Select Name Image: Select Select Name Image: Select Select Name Image: Select Sel	New	Delete Test conne	ction Manage stat	e				
Select       Name        JNDI name        Scope        Provider        Description        Category         You can administer the following resources:       JDBC4 SQLServer DataSource 4 SupplierDB       jdbc/suppweb       Node=WG- O980Node03       Microsoft SQL Server JDBC Driver (XA)       XA data source for the Microsoft SQL Server JDBC Driver Driver, This data source type is       XA data source for the Microsoft SQL Server JDBC Driver								
You can administer the following resources:         Image: DBC4 SQLServer DataSource 4 SupplierDB       jdbc/suppweb       Node=WG-O980Node03       Microsoft SQL Server JDBC Driver (XA)       XA data source for the Microsoft SQL Server JDBC Driver (XA)	Select	Name 💠	JNDI name ᅌ	Scope 🔷	Provider 🖒	Description 🛟	Category	
JDBC4 SQLServer DataSource 4 SupplierDB       jdbc/suppweb       Node=WG- O980Node03       Microsoft SQL Server JDBC Driver (XA)       XA data source for the Microsoft SQL Server JDBC Driver Driver. This data source type is	You ca	an administer the follow	wing resources:					
configurable in version 6.1.0.15 and later nodes.		JDBC4 SQLServer DataSource 4 SupplierDB	jdbc/suppweb	Node=WG- O980Node03	Microsoft SQL Server JDBC Driver (XA)	XA data source for the Microsoft SQL Server JDBC Driver. This data source type is configurable in version 6.1.0.15 and later nodes.		
Total 1	Total	1				I		

Test the new connection by selecting the new data source and clicking **Test connection**.

A successful connection will output this message:

Data sources	
	Messages
	The test connection operation for data source JDBC4 SQLServer DataSource 4 SupplierDB on server server1 at node WG-O980Node03 was successful.

# **Configuring Connection Pooling Properties**

In the administrative console > expand Resources > JDBC > Data sources > select the data source name

Select Connection pool properties in the Additional Properties section

our application. Consider the default values carefully ies.	; your application requirements might warrant changing thes
nfiguration	
General Properties	Additional Properties
Scope cells:WG- O980Node04Cell:nodes:WG- O980Node03	<ul> <li>Advanced connection pool properties</li> <li>Connection pool custom properties</li> </ul>
* Connection timeout 180 seconds	
* Maximum connections 10 connections	
* Minimum connections 1 connections	
* Reap time 180 seconds	
* Unused timeout 1800 seconds	
* Aged timeout	

Specify the following information:

180	seconds
500	connections
50	connections
60	seconds
120	seconds
120	seconds
Entire	Pool
	180 500 50 60 120 120 Entire

#### General Properties



Click on OK > Save directly to the master configuration.

# Web Container Thread Connection Pool

In the administrative console > expand Servers > Server Types > click on WebSphere application servers > click on the server name > Under Additional Properties click Thread pools > click on the WebContainer thread pool

This screen is from the localnos	his screen	s from the lo	calhost:
----------------------------------	------------	---------------	----------

lication servers	
oplication servers > server1 > Thread pools > WebContainer	
se this page to specify a thread pool for the server to use. A	thread pool enables server components to reuse thre
stead of creating new threads at run time. Creating new threa	ads is typically a time and resource intensive operatio
Configuration	
General Properties	Additional Properties
* Name	Additional Properties
WebContainer	Custom properties
Description	
* Minimum Cine	
5 threads	
* Maximum Size	
10 threads	
* Thread inactivity timeout	
60000 milliseconds	

### **Determining Web Container Thread Pool Values**

### **Minimum Connection Pool Size**

The default value of the minimum connection pool size is 5. This value is appropriate to most configurations.

### **Maximum Connection Pool Size**

When determining the maximum size of the database connection pool, consider the following issues:

The total number of connections that the WebSphere Commerce cluster can open to the database should not overwhelm your database.

In order to prevent deadlocks, there should be connections available for all the threads that might require one. It is not only the web container that uses database connections. The following equation can help you determine the maximum number of database connections you should allow:

DataSource Connection Pool Size >=

(# Of WebContainer Threads)

- + (# Of WC Scheduler Threads)
- + 1 (for WC Key Manager)
- + 1 (for WC Auditing)
- + (# of Parallel and Serial MQ listener threads)
- + (# of non-WebContainer Threads used by Custom Code)

In order to satisfy the rule that all the threads have connections available, you might need to either increase the number of database connections or reduce the number of WebContainer and other threads.

### Recommended starting values for the WebContainer and database connection pool sizes

The following table lists recommended starting values for configuring the WebContainer and database connection pool sizes. The optimal configuration in your system might be different. Finding the best configuration for your environment can only be done by completing a performance tuning exercise.

	Minimum	Maximum
WebContainer	25	25
Database Pool	0	55

The values were determined following these considerations:

- The WebContainer minimum and maximum sizes are configured to be the same to avoid the overhead of creating and destroying threads.
- A value of 25 for the WebContainer is usually enough to allow high throughput and concurrency without overloading the server.
- The database pool is configured to ensure there will be enough connections available for all the WebContainer • threads.
- The minimum value of the database pool is set to 0 to prevent firewall related problems and avoiding maintaining unused connections.

### Thread inactivity timeout

Specifies the number of milliseconds of inactivity that should elapse before a thread is reclaimed. A value of 0 indicates not to wait and a negative value (less than 0) means to wait forever.

Example:

Minimum Size: 10 threads Maximum Size: 1201 threads (2 x Connection-pools + 1) 300 milliseconds (number of milliseconds of inactivity that should elapse before a thread Thread inactivity timeout: is reclaimed)

Uncheck Allow thread allocation beyond maximum thread size

Click on OK after settings the values > Save directly to the master configuration > restart this instance of the server.

# Using the Data Source in Java Programs

These examples were created using IBM Rational Application Developer for WebSphere Software version: 8.0.4.1.

### Data Source in a POJO (Plain Old Java Object) using the Deployment Descriptor

### Defining a Resource Reference and WebSphere Bindings in RAD

Change to the Web perspective > right-click on the deployment descriptor > Open with Web Application Deployment Descriptor Editor > this opens the web.xml file

	Overview	<b>E E</b>	General Information	
	type filter text		Display Name:	expensewire
	Web Application (expensewire)	Add	Version*:	2.5
😤 Enterprise Explorer 🖾	Welcome File List	Remove	Distributable:	(Application is Distributable)
expensewire		Un	Metadata Complete:	
Diagrams		Deve	Description	
2.9 expensewire		Down		
The Mappings				
- Enters			-	
G Listener				
B Security roles			Manage Utility	Jars
Serviet Mappings			* WebSphere Dep	loyment Descriptors
S Serviets			Conen Wahanh	era Rindings Descriptor

Right-click on Web Application (<name-of-web-application>) > Add > select Resource Reference > enter the following details:

Name (resource reference name to be used in applications): jdbc/SupplierDBDEVReference Type: javax.sql.DataSource Authentication: Container Sharing scope: Shareable

### Click Finish.

Example of result:

lot	
	<u> </u>

Resource Reference Type:

Resource Authorization:

Resource Sharing Scope:

Resource Reference Name\*: jdbc/SupplierDBDEVReference javax.sql.DataSource Container Shareable

### web.xml source:

<display-name>expensewire</display-name>

٠	٠	٠	
<	r	e	source-ref>

<res-ref-name>jdbc/SupplierDBDEVReference</res-ref-name>

<res-type>javax.sql.DataSource</res-type>

<res-auth>Container</res-auth>

<res-sharing-scope>Shareable</res-sharing-scope>

</resource-ref>

Click on Web Application (<name –of-web-application>) > WebSphere Deployment Descriptors > click on WebSphere Binding Descriptor > click on Web Bindings > Add > select Resource Reference > OK > enter the following details:

Name:	jdbc/SupplierDBDEVReference	
Туре:	javax.sql.DataSource	•
Authentication:	Container	
Sharing scope:	Shareable	
Description:		4

Add Resource Reference

WebSphere Deployment Descriptors

Open WebSphere Bindings Descriptor

Name (resource reference name to be used in applications): jdbc/SupplierDBDEVReference Binding Name (JNDI name field in WebSphere server): jdbc/suppweb

Example of result:

### Web Bindings Editor - expensewire

Define the main components of the bindings in this section. Set the properties for the selected item. Required fields are denoted by the selected item.			
	his section. Set the properties for the selected item. Requir	<ul> <li>e properties for the selected item. Required fields are denoted by</li> </ul>	elected item. Required fields are denot
type filter text jdbc/SupplierDBDEVReference	Name*: jdbc/SupplierDBDEVReferen	*: jdbc/SupplierDBDEVReference	pplierDBDEVReference
Web Bindings (default_host)     Add     Binding Name*: jdbc/suppweb	Add Binding Name*: jdbc/suppweb	g Name*: jdbc/suppweb	ppweb
B Remove	Remove		

### ibm-web-bnd.xml source:

<resource-ref name="jdbc/SupplierDBDEVReference" binding-name="jdbc/suppweb" />

#### Select File > Save All.

### Using the Data Source in a POJO

A Java bean Class TestDataSource\_v1:

DataSource ds =
 (DataSource) new javax.naming.InitialContext().lookup("java:comp/env/jdbc/SupplierDBDEVReference");
connection = ds.getConnection();
System.out.println("Connect to " + connection.getCatalog() + " a success!" + CLASSNAME);

#### Screen-shot from the workspace in Rational Application Developer for WebSphere version 8

```
File Edit Source Refactor Navigate Search Project Run Window Help
😰 🕫 🛐 🔳 🔮 🐓 🗧 🕈 🗘 🔶 🗸 🗸 🕈
🚺 TestDataSource_v1.java 🖾
     import java.sql.Connection;
     import java.sql.DatabaseMetaData;
     import java.sql.ResultSet;
     import java.sql.SQLException;
     import javax.sql.DataSource;
     public class TestDataSource_v1 implements Serializable {
         Connection connection = null:
         ResultSet rs = null;
         DatabaseMetaData dbMetaData = null;
        private StringBuffer str;
   \Theta
         public TestDataSource_v1() {
             super();
             System.out.println("Called super class for Class " + CLASSNAME);
             initializer();
         } // END constructor
   0
        public void initializer() {
             String classAndMethod = " [in class " + CLASSNAME + ", method " +
             "initializer" + "]";
             String TAB1 = " ", TAB2 = " ";
             try {
                str = new StringBuffer();
                 DataSource ds = (DataSource) new javax.naming.InitialContext().lookup("java:comp/env/jdbc/SupplierDBDEVReference");
                 if (ds == null) { throw new Exception("DataSource object is null."); }
                 connection = ds.getConnection();
```

This class is called from a JSP page:

<jsp:useBean id="tsds" class="com.company.project.test.TestDataSource\_v1" scope="page" type="com.company.project.test.TestDataSource\_v1"/>

O About Rational®	Application Developer for WebSphere® Software	3
	IBM Rational® Application Developer for WebSphere® Software	
ALC:	Version: 8.0.4.1 Build ID: RADO8041-I20120502_2148	
The	(c) Copyright IBM Corp. and others 2000, 2012. All rights reserved.	
	This product is powered by Eclipse technology. ( http://www.eclipse.org )	
IBM.		

## References

# IBM Redbooks: WebSphere Application Server V7 Administration and Configuration Guide - Chapter 9. Accessing databases from WebSphere

http://www.redbooks.ibm.com/abstracts/sg247615.html

### **IBM InfoCenter: WebSphere Application Server considerations**

http://publib.boulder.ibm.com/infocenter/wchelp/v7r0m0/index.jsp?topic=%2Fcom.ibm.commerce.admin .doc%2Fconcepts%2Fcpmwas.htm

# Configuring the WebContainer and database connection pool sizes for a WebSphere Commerce server

http://www-304.ibm.com/support/docview.wss?uid=swg21358336

### IBM Redbooks: Experience Java EE! Using Rational Application Developer V7.5

http://www.redbooks.ibm.com/redpieces/pdfs/sg247827.pdf

# **Copyright and Trademark Information**

- Rational, Rational logo, Rational Developer Network, Rational Rose, Rational XDE, Rational Unified Process, Rational Project Console and Quantify are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries or both.
- WebSphere, WebSphere logo are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries or both.
- IBM and IBM logo is a registered trademark of International Business Machines Corporation in the United States and other countries.
- Java and all Java-based trademarks and logos are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.
- Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
- Red Hat, the Red Hat 'Shadow Man' logo and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries.
- All other trademarks and copyrights are the property of their respective owners.