ONESOURCE INDIRECT TAX DETERMINATION

INSTALLATION GUIDE

ORACLE DATABASE AND IBM WEBSPHERE

5.12.X.X

Document Version 4

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DOCUMENT HISTORY

VERSION NUMBER	VERSION DATE	SUMMARY
1	August 2019	Created first version of this guide for ONESOURCE Indirect Tax Determination 5.12.x.x.
		Same version: Changed Prerequisites section from Java to Amazon Corretto.
2	June 2020	• Added information on support for Amazon Coretto 11 and Oracle Database 19c. • Minor edits changing 5.12.0.0 to 5.12.x.x to reflect the usage more accurately.
3	November 2020	Updated Java and Amazon Correto entry.
4	September 9, 2022	Time Eviction Cache support.

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INTRODUCTION

The ONESOURCE Indirect Tax Determination software is a highly scalable and reliable taxing service for all business applications needing consolidated tax determination, calculation, and recording. A three-tier application built on industry standard Java technology and state-of-the-art design principles, the Determination software is designed to optimize performance, reliability, interoperability, manageability, and security.

This guide explains how to install Determination to version 5.12.x.x.

WHO SHOULD READ THIS GUIDE?

The installation requires the coordination of people in various roles. If you are responsible for overseeing the installation, make this guide available to the following contributors:

- Database administrator
- Application server administrator
- IT administrator
- Tax professional

RESOURCES

Several resources help you become familiar with ONESOURCE Indirect Tax Determination and master its features. Help is installed with the application. All documents are posted on the ONESOURCE Customer Center. To locate documents specific to your application, enter the search term "Determination documentation."

DETERMINATION RESOURCES	
Resource	**Description**
Help	This Help system gives assistance within Determination. Use Help after Determination is installed and configured.
Installation Guide	This guide is intended for technical users and contains complete details about how to install and configure Determination.
Platform Support	This describes the combinations of operating systems, databases, and application servers on which Determination operates.

DETERMINATION RESOURCES	
Resource	**Description**
Product Support Lifecycle	This lists the end-of-life dates for products in the ONESOURCE Indirect Tax Suite.
Upgrade Guide	This guide describes the procedures for upgrading an instance of Determination and refers to configuration information in the *Installation Guide*.
Customization Guide	This guide is intended for technical users. It describes types of customization and shows examples.
Data Dictionary	This resource is intended for technical users. It contains a list of all the fields in the Determination database.
Sizing Guide	This guide is intended for technical users. It contains an architectural overview and discusses components, database, and server sizing.

Still can't find what you're looking for? Try these additional resources:

ONESOURCE RESOURCES	
Resource	**Description**
ONESOURCE Customer Center https://tax.thomsonreuters.com/support/onesource/customer-center/	Search for answers in the Knowledge Base, enter product support tickets, and track support ticket history for you and your organization.
Indirect Tax Customer Center https://customercenter.sabrix.com/	Download ONESOURCE Indirect Tax software.
Other ONESOURCE Indirect Tax Products and Services https://tax.thomsonreuters.com/products/brands/onesource/indirect-tax/	Browse descriptions of other ONESOURCE Indirect Tax products and services.
Documentation Feedback onesource.indirect.tax.fb@thomsonreuters.com	Send feedback about ONESOURCE Indirect Tax documentation.

STYLE CONVENTIONS

We use the following special formatting throughout this guide:

Bold text indicates most user interface elements, such as:

- Data you are expected to enter, such as in a text field
- Pages, buttons, tabs, and field names
- Dialog boxes, drop-down lists, selections within lists, and check box titles
- Windows
- Menu items

Italic text indicates the following:

- File and folder names
- Java classes, PL/SQL objects and executable files
- Document titles

CAPITAL text indicates keyboard commands, such as ENTER, or database components.

`Courier` text indicates command-line input/output.

<brackets> indicate user entry. For example, <host> indicates you should replace the text and angle brackets with your server name.

Book titles are shown in italics and sections within a book are in quotation marks, such as “Starting the Installation” in the *ONESOURCE Indirect Tax Determination Installation Guide*.

This pencil symbol indicates suggestions or additional information.

This warning symbol indicates important text that you should review before proceeding.

↵ This carriage return symbol indicates that a single line of code is divided into multiple lines so you can read it. If you copy and paste code with these symbols, be sure to keep the code before and after the carriage return on the same line.

```
1    /* Code snippets have numbered lines with a gray background. */
2       /* Be cautious if you copy lines from the code snippets-the l
        ine numbers are included! */
```

PREREQUISITES

Complete the following tasks before you attempt to install and configure ONESOURCE Indirect Tax Determination.

Review System Requirements (page 5)

Java (page 5)

Gathering Administrative Information (page 6)

Download the Software (page 6)

REVIEW SYSTEM REQUIREMENTS

ONESOURCE Determination has detailed requirements for the following:

- Computer hardware
- Operating system
- Database
- Application server/web container

To confirm you are using supported components, review platform support and product support lifecycle information listed in the ONESOURCE Customer Center.

JAVA

Determination requires an application server to host its various components, and the application server must use Oracle Java (1.8 or 1.10) or Amazon Corretto (1.8.x or 11). Search the ONESOURCE Customer Center to find the platform support information specific to your product version. If your application server does not provide its own version of Java or Amazon Corretto, you must install it separately.

GATHERING ADMINISTRATIVE INFORMATION

To install the Determination software, you need to gather certain administrative information. Before you begin the installation, add your values to the table below:

RESOURCES		
Type	**Where to Find**	**Your Values(s)**
Customer Center credentials	Thomson Reuters Customer Support	
Oracle RDBMS server name and service name	Oracle DBA	
Administration credentials for Oracle database	Oracle DBA	
Administration console URL of the IBM WebSphere Application Server	Application Server Administrator	
Administration credentials for the IBM WebSphere Application Server	Application Server Administrator	
Name of the server hosting IBM WebSphere and the Port for the Determination software	Application Server Administrator	

DOWNLOAD THE SOFTWARE

To download and install the software, get the *ONESOURCEIDTDetermination_512xx.zip* file from the Indirect Tax Customer Center:

1. Open the Indirect Tax Customer Center at https://customercenter.sabrix.com/.
2. Log on using the username and password provided by Customer Support.
3. Find Determination in the **Available Products** list and verify that **Installed Version** is set to **None**.
4. Select **Download** for Determination.

5. Save the file.
6. Unzip the *ONESOURCEIDTDetermination_512xx.zip* file.

CONFIGURING YOUR DATABASE

This guide covers the installation of Determination in the Oracle RDBMS. Once you have confirmed that you are using the correct database version for this release of Determination, review the following:

DATABASE INITIALIZATION PARAMETERS

Set the appropriate database initialization parameters for Determination. Contact Oracle if you need assistance setting these in your environment.

Set the Oracle parameter OPEN_CURSORS to 3000 to ensure the Determination installation completes successfully.

DATABASE CHARACTER SET

Configure the database to use a UTF8-compatible database character set. If you use the AL16UTF16 character set (default), multi-byte character handling performance will be optimized. You need to either install or upgrade the database to meet this requirement.

ORACLE TABLESPACES AND USERS

Oracle tablespaces and users must be created before you install Determination. You can use the .sql scripts provided in the downloaded .zip file to perform this task.

For production environments, you should create separate tablespaces to contain tax and audit data (SBXTAX and SBXAUD). If you accept the setup script defaults, these tablespaces are created automatically. The setup script also creates the users SBXTAX and SBXAUD; these user names are referred to throughout this document.

The tablespace creation script also enables you to create a single tablespace to hold all data. While this configuration may be desirable for a test environment, we do not recommend this for a production environment.

To create the required tablespace(s) and users:

1. On the system hosting the Oracle database, open a command prompt or terminal window.
2. Go to the directory containing the downloaded .sql scripts.
3. Log into SQL*Plus as SYS or SYSDBA.

4. Execute the following setup script:

   @OracleDBSetup.sql

   This script executes both the tablespace and user creation scripts. You can also execute these scripts separately, if desired.

5. Enter the path to the Determination datafile directory (without a trailing separator). The default shown is the directory containing default Oracle tablespaces on your system. Press ENTER to accept the default, or enter a new path name.
6. Enter the path separator for your platform (" / " for Unix and Linux or " \ " for Microsoft Windows). The default should already be selected.
7. Enter values for the Tax and, optionally, the Audit schemas.
   - To accept the defaults (SBXTAX and SBXAUD are shown in this guide), press ENTER at each prompt.
   - To create a new schema, enter its name at each prompt.
   - To skip the schema creation, enter the value of **none** at each prompt.
8. Messages appear as the tablespaces are created.
9. You are prompted to verify the locations of the tablespaces created earlier. If you accepted the defaults above, the prompts will appear as the following:

   Tablespace for Sabrix tax data [SBXTAX]:

   Tablespace for Sabrix audit data [SBXAUD]:

   Temporary Tablespace for Sabrix users [TEMP]:

10. You are prompted to create the user for the Tax schema. Press ENTER to specify the default (SBXTAX is used in this guide) or enter another desired name.
11. If you chose to create a separate Audit schema, press ENTER to specify the default user name (SBXAUD is used in this guide) or enter another desired name.
12. Enter a profilename for each user when prompted. If you are unsure which profile to use, enter **default**.
13. Messages appear as the user(s) are created.

PREPARING ORACLE FOR XA TRANSACTIONS

To ensure that your Determination installation handles XA transactions, execute the following database grants for both the Tax (SBXTAX) and Audit (SBXAUD) users. Replace **SBXTAX** and **SBXAUD** with the Tax and Audit schemas from your environment:

```
1    GRANT SELECT ON sys.dba_pending_transactions TO SBXTAX;
2    GRANT SELECT ON sys.pending_trans$ TO SBXTAX;
3    GRANT SELECT ON sys.dba_2pc_pending TO SBXTAX;
4    GRANT EXECUTE ON sys.dbms_xa TO SBXTAX;
```

```
1    GRANT SELECT ON sys.dba_pending_transactions TO SBXAUD;
2    GRANT SELECT ON sys.pending_trans$ TO SBXAUD;
3    GRANT SELECT ON sys.dba_2pc_pending TO SBXAUD;
4    GRANT EXECUTE ON sys.dbms_xa TO SBXAUD;
```

CONFIGURING IBM WEBSPHERE

Before you proceed to the following tasks, ensure that you have a supported version of WebSphere by reviewing platform support information listed in the ONESOURCE Customer Center.

When WebSphere is installed and ready for Determination configuration, complete the following:

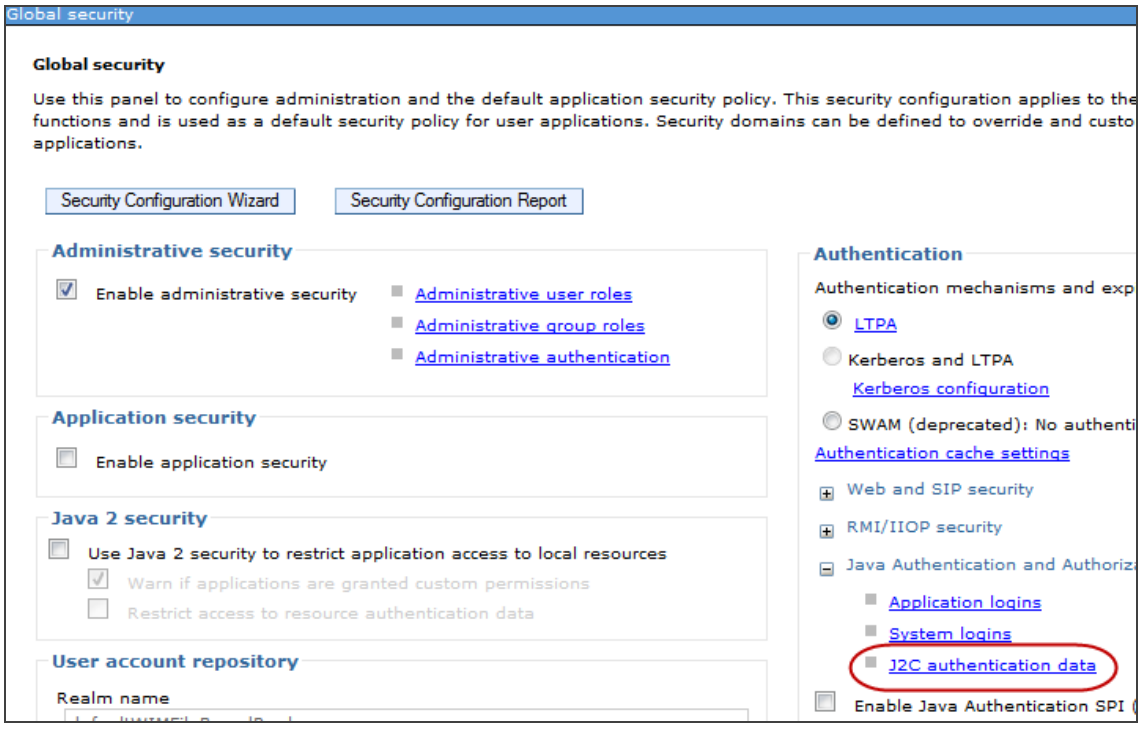
- Configuring Authentication (page 14)
- Configuring the WebSphere Environment Variable (page 17)
- Modifying the Log Level (page 19)
- Modifying Transaction Timeouts (page 21)
- Creating the Oracle JDBC Provider (page 23)
- Creating the Tax Data Source (page 26)
- Modifying the Tax Data Source (page 31)
- Creating the Audit Data Source (page 34)
- Modifying the Audit Data Source (page 39)
- Configuring the Java Virtual Machine (page 42)
- Enabling Automatic Tax Data Downloads (Optional) (page 45)
  - Exporting the Customer Center Certificate (page 45)
  - Configuring the Certificate in WebSphere (page 45)
- Configuring CSRFGuard (page 48)
- Deploying the Application (page 49)
  - Loading the Application (page 49)
  - Selecting Installation Options (page 50)
  - Configuring Class Loading (page 59)
  - Setting a Custom Property (page 61)

CONFIGURING AUTHENTICATION

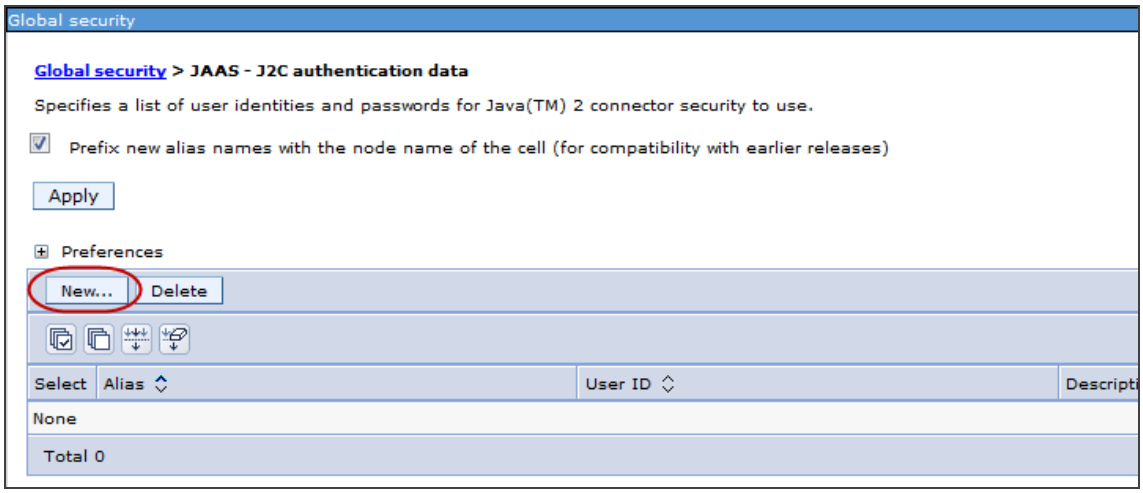
Configure user name and password combinations that will be referenced by the JDBC data sources you create. Configure both SBXTAX and SBXAUD, which are described in Oracle Tablespaces and Users (page 9).

To configure authentication:

1. Log on to the IBM WebSphere Integrated Solutions Console.
2. Using the list on the left side of the console, go to **Security > Global security**.
3. Expand the **Java Authentication and Authorization Service** in the **Authentication** section.
4. Click **J2C authentication data**.



5. Click **New**.
6. Enter data to create the Tax user as shown in the following table:



PROMPT	VALUE
Alias	SBXTAX
User ID	SBXTAX
Password	Enter the password for SBXTAX
Description	Enter this description: User associated with the Tax Data Source

7. Click OK, and then click **Save directly to the master configuration**.
8. Click **New** to create the Audit user.

9. Create the Audit user by entering the following data:

PROMPT	VALUE
Alias	SBXAUD
User ID	SBXAUD
Password	Enter the password for SBXAUD
Description	Enter this description: User associated with the Audit Data Source

10. Click OK, and then click **Save directly to the master configuration**.

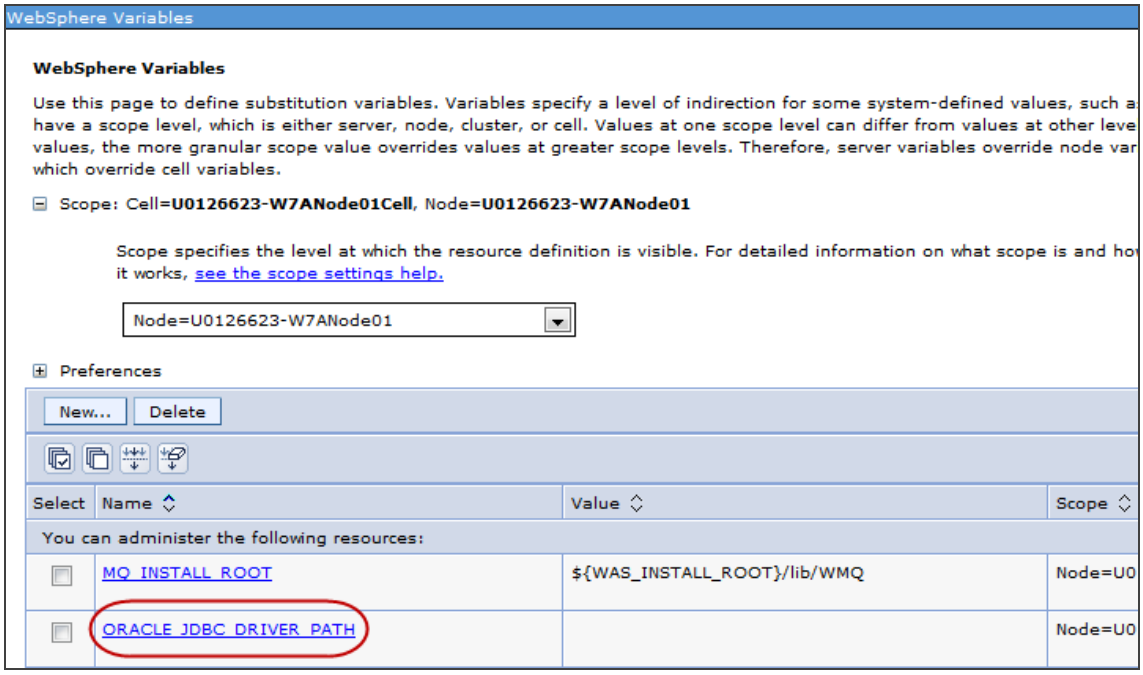
CONFIGURING THE WEBSPHERE ENVIRONMENT VARIABLE

Configure an environment variable by completing the following:

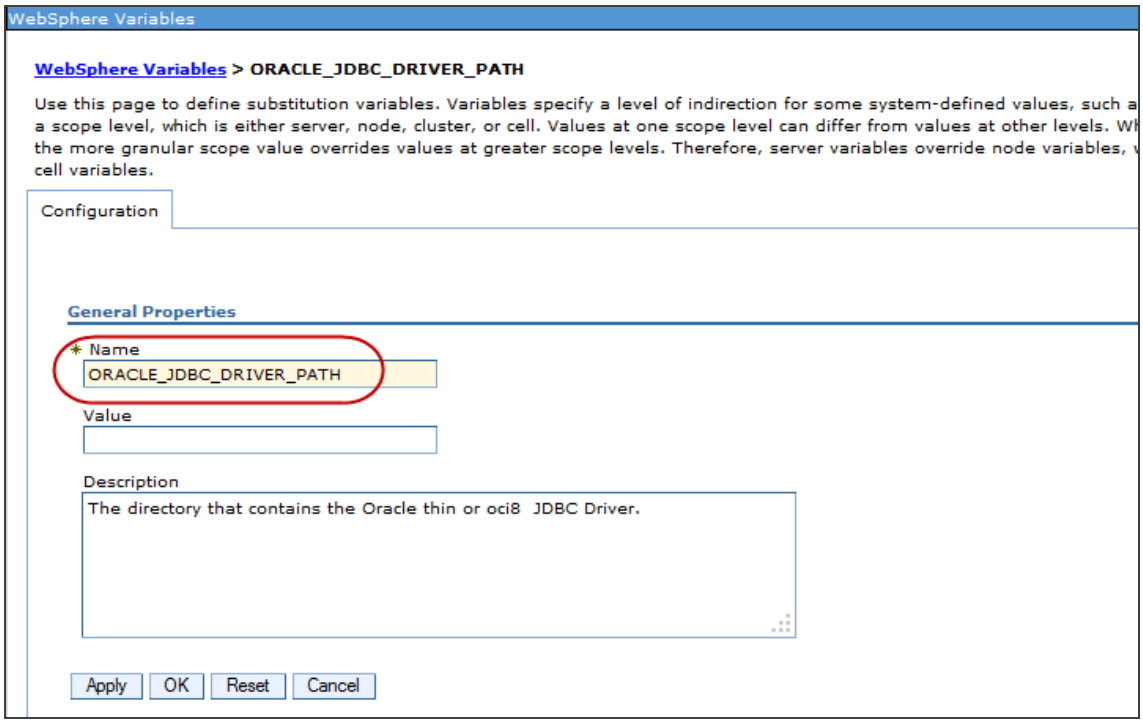
1. In the console, go to **Environment > WebSphere variables**.
2. Select the variable scope that is appropriate for your environment.

   Select the same scope throughout installation.

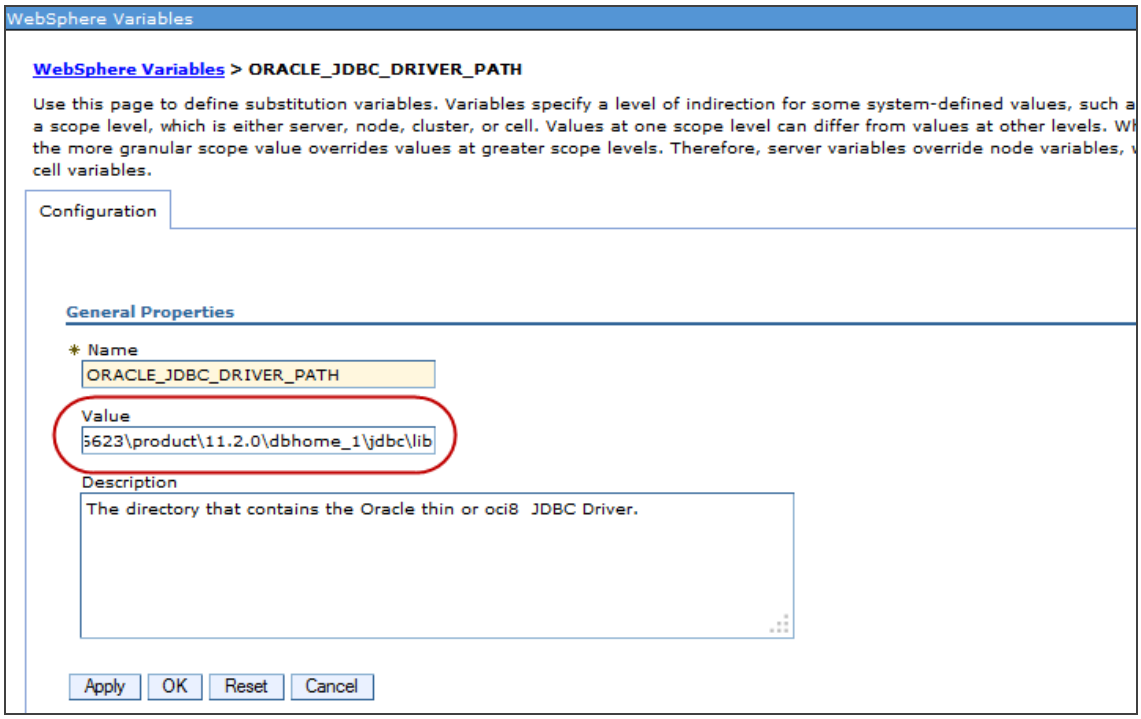
3. Click **ORACLE_JDBC_DRIVER_PATH** in the name column (it may be on the second page). If you do not see **ORACLE_JDBC_DRIVER_PATH** for your scope, click **New**.



4. Add **ORACLE_JDBC_DRIVER_PATH** if it is not already in the **Name** field.



5. Enter the path to your JDBC driver *jar* file in the **Value** field. The directory shown below is an example and would be different for your environment.

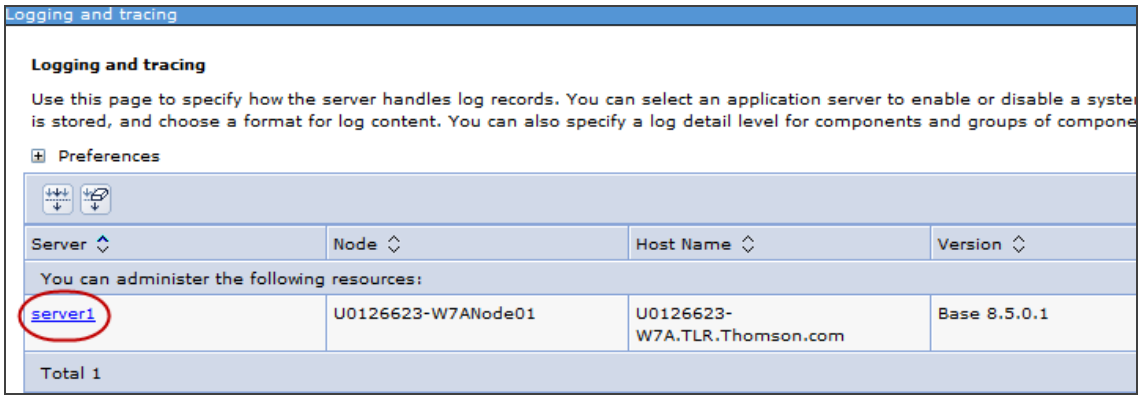


6. Click OK, and then click **Save directly to the master configuration**.

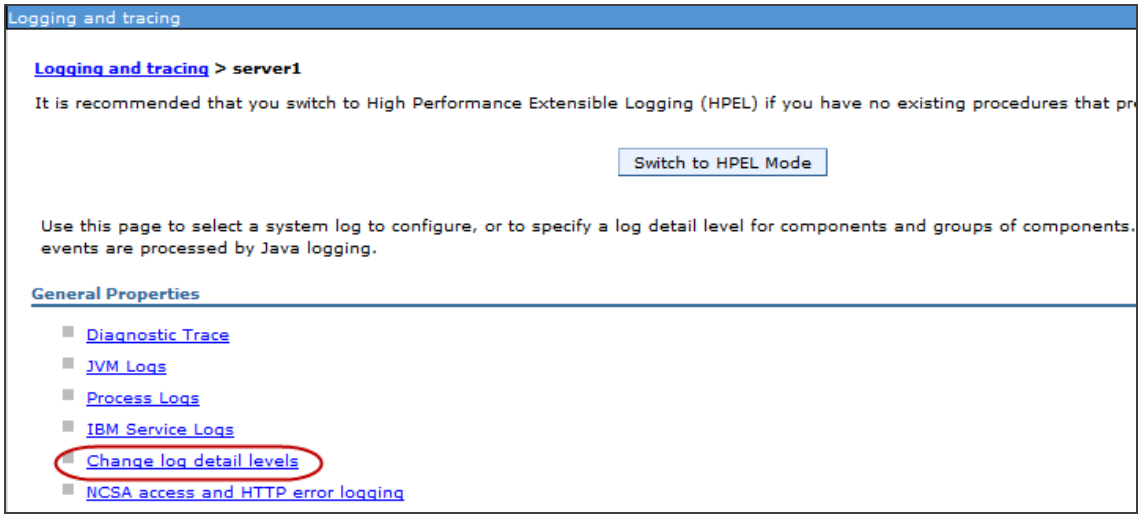
MODIFYING THE LOG LEVEL

By default, the log level for JGroups is set at a level that fills Determination log files and the console with extraneous data. You can change the level to avoid this situation:

1. In the console, go to **Troubleshooting > Logs and Trace**.
2. Click on your server.

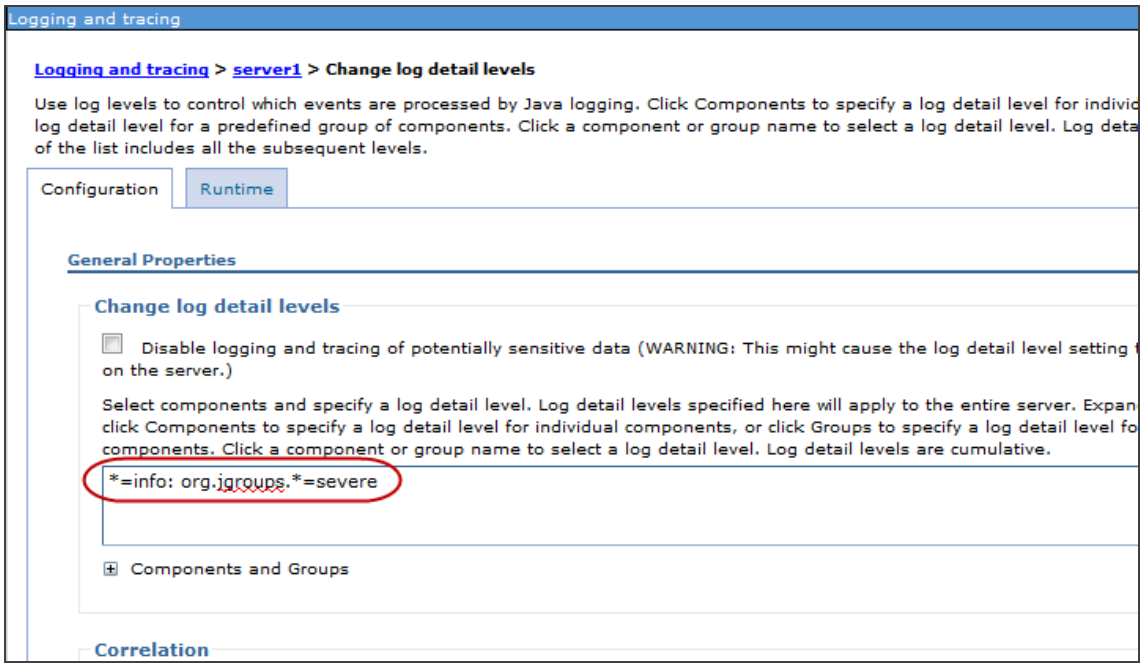


3. Click **Change Log Detail Levels**.



4. In the **Configuration** tab, add the following line in the text entry field above the listed log contexts:

   =info: org.jgroups.=severe



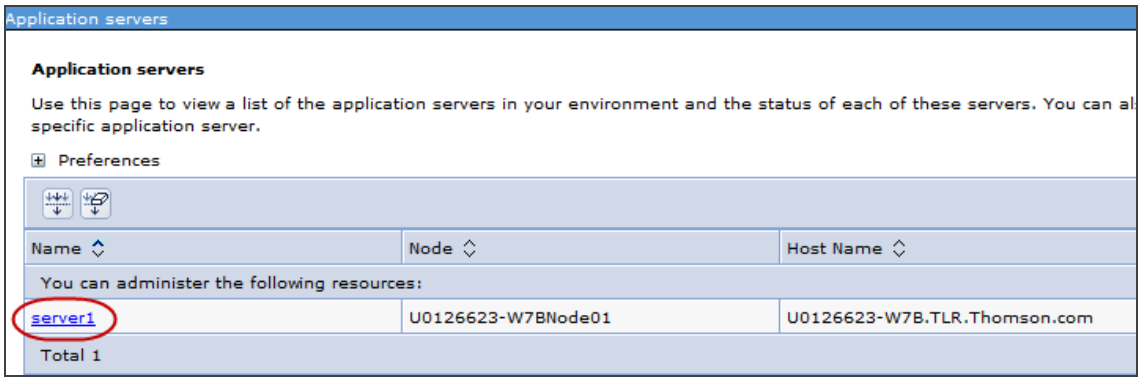
5. Click OK, and then click **Save directly to the master configuration**.

Repeat this procedure for each server in the cluster because the change will not be automatically propagated to other cluster nodes.

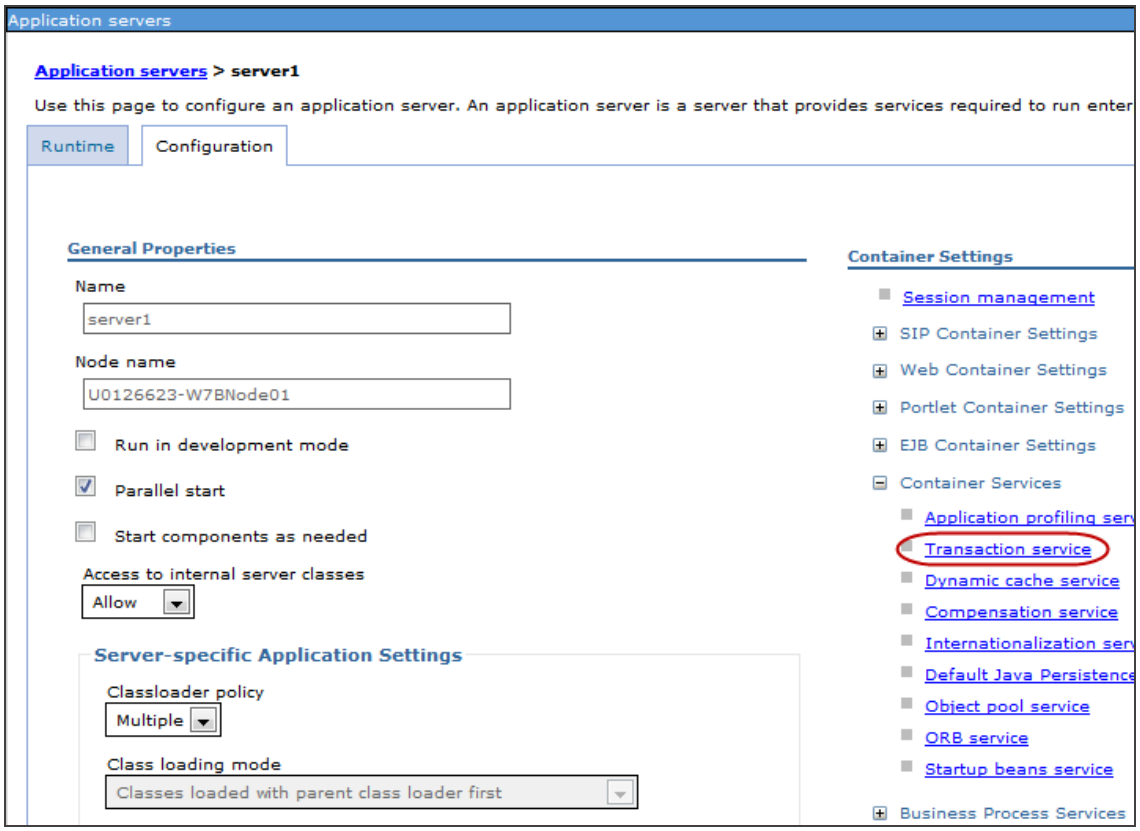
MODIFYING TRANSACTION TIMEOUTS

Increase the transaction timeouts by completing the following:

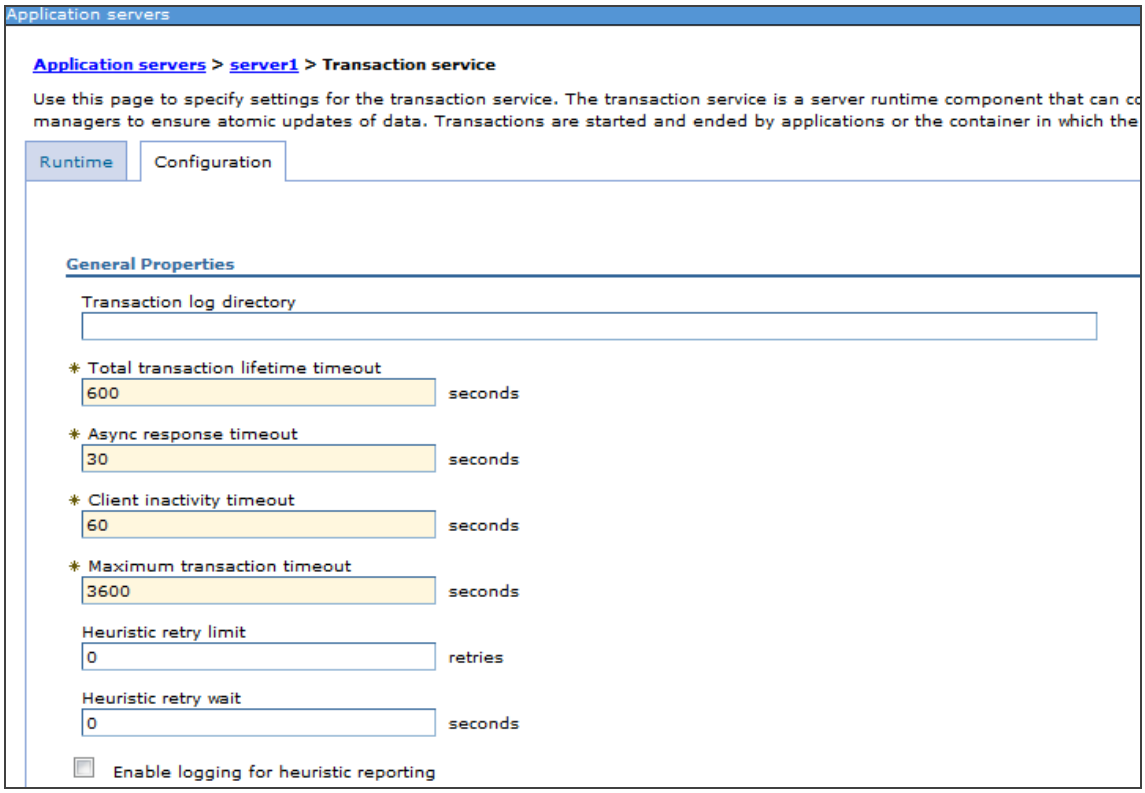
1. Go to **Servers > Server Types > WebSphere application servers**.
2. Click your server.



3. Under **Container Settings > Container Services**, click **Transaction service**.



4. Change the timeouts as shown in the following table:



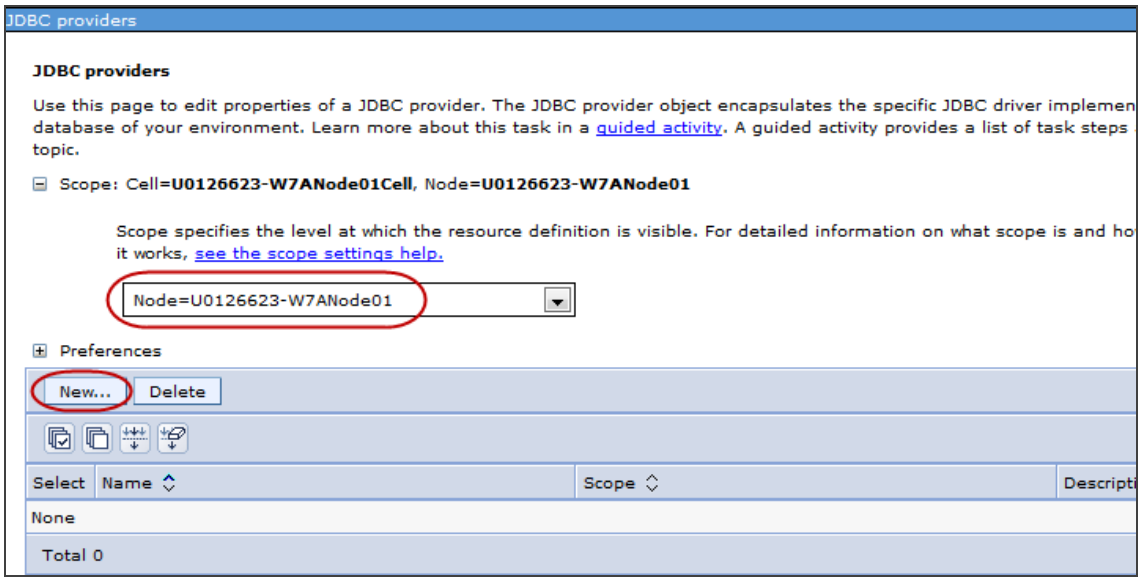
PROMPT	VALUE
Total transaction lifetime timeout	600
Maximum transaction timeout	3600

5. Click OK, and then click **Save directly to the master configuration**.

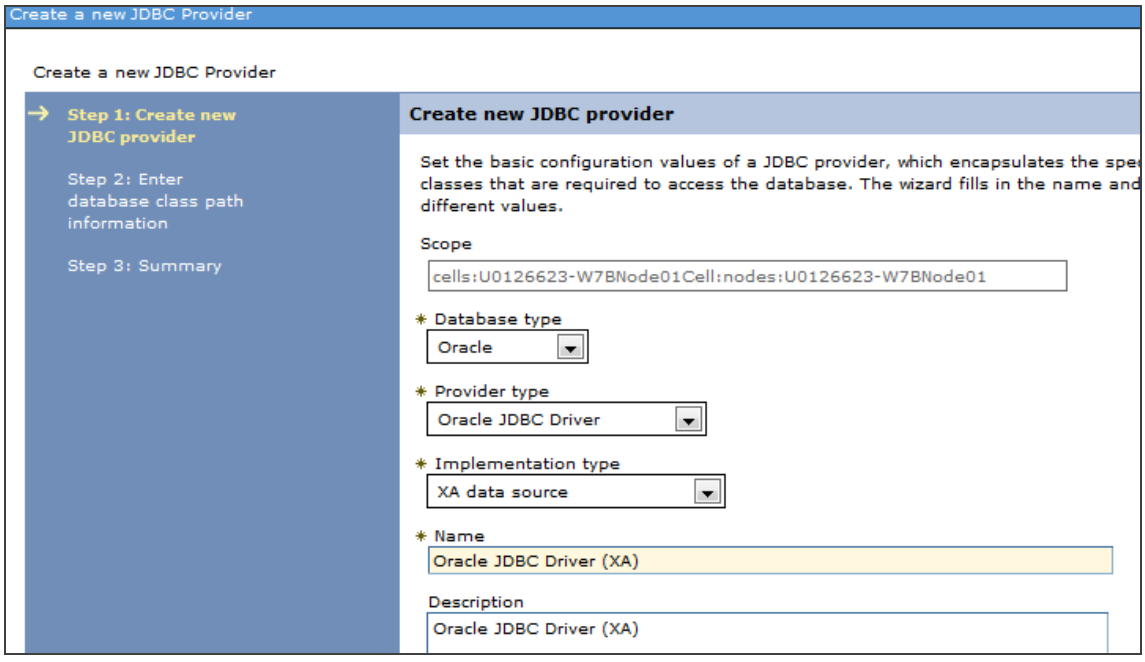
CREATING THE ORACLE JDBC PROVIDER

Create the Oracle JDBC Provider by completing the following.

1. From the console, go to **Resources > JDBC > JDBC Providers**.
2. Set the scope that is appropriate to your environment, and then click **New**.



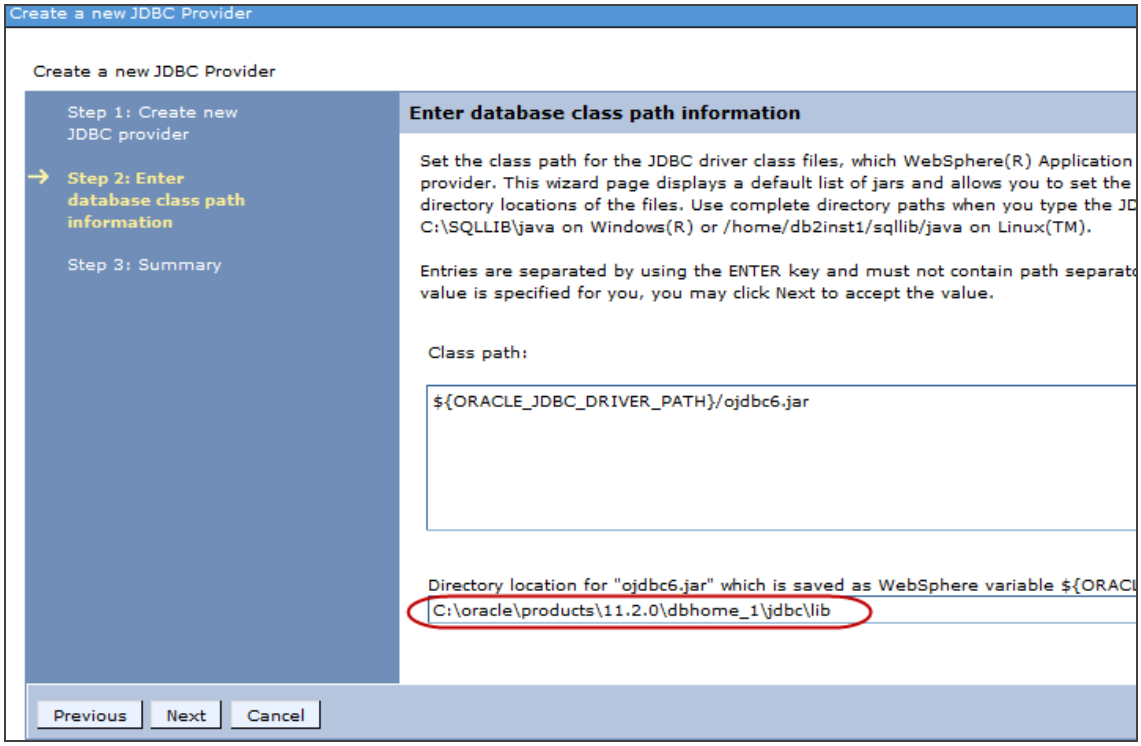
3. Update the fields in the table below, and then click **Next**.



FIELD	VALUE
Database type	Oracle
Provider type	Oracle JDBC Driver
Implementation type	XA data source
Name	Oracle JDBC Driver (XA)
Description	Oracle JDBC Driver (XA)

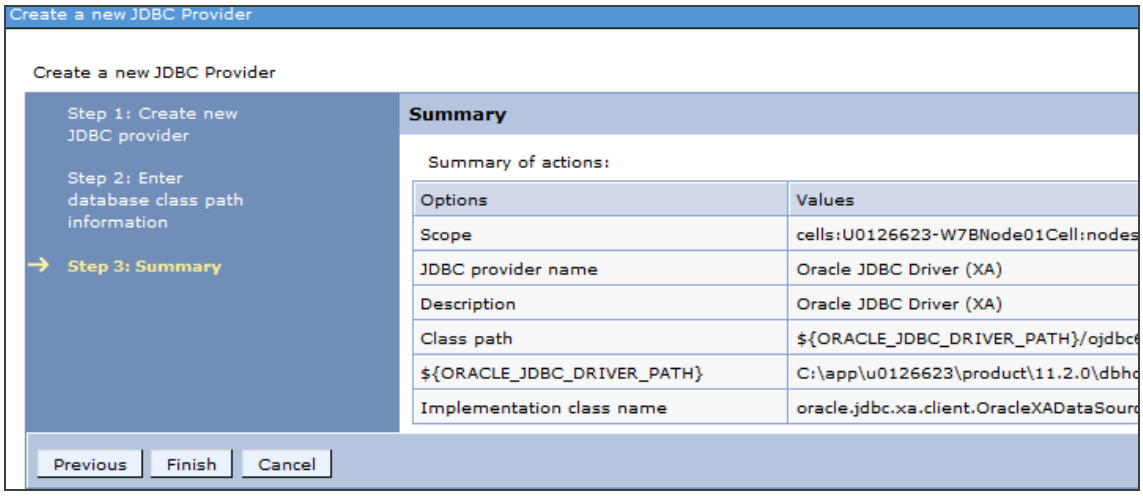
4. Specify the directory location of the JDBC driver. The directory shown below is an example and would be different in your environment.

Determination requires the latest JDBC driver version for your database. Locate *ojdbc8.jar*, the Oracle JDBC driver.



5. Click **Next**.

6. If the summary is correct, click **Finish**.

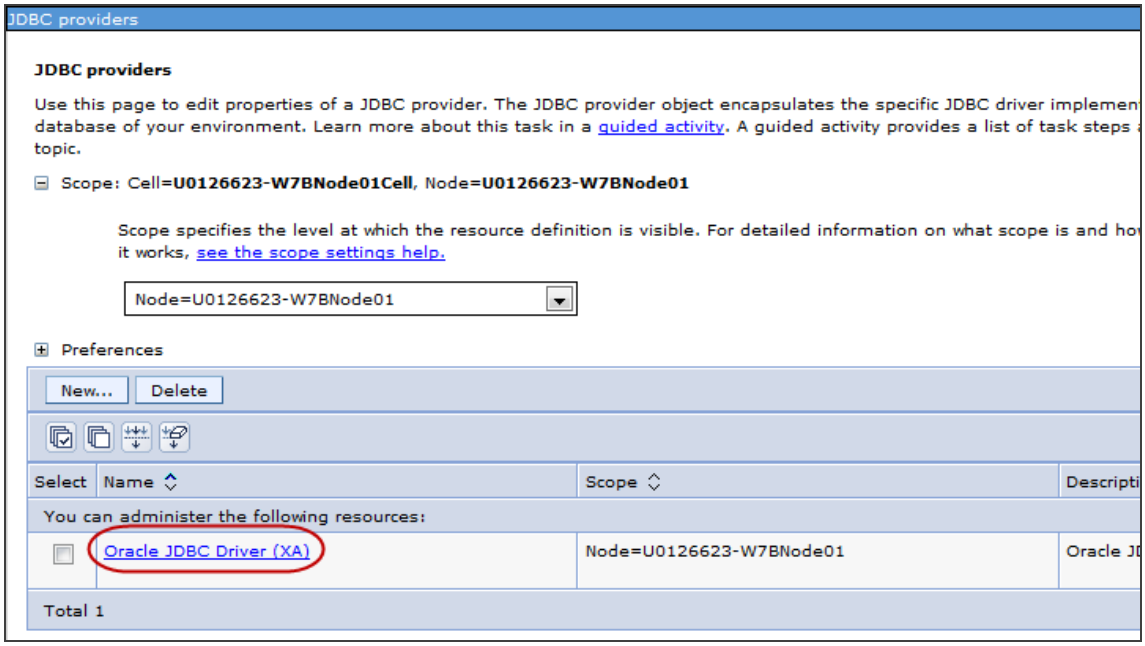


7. Click **Save directly to the master configuration**

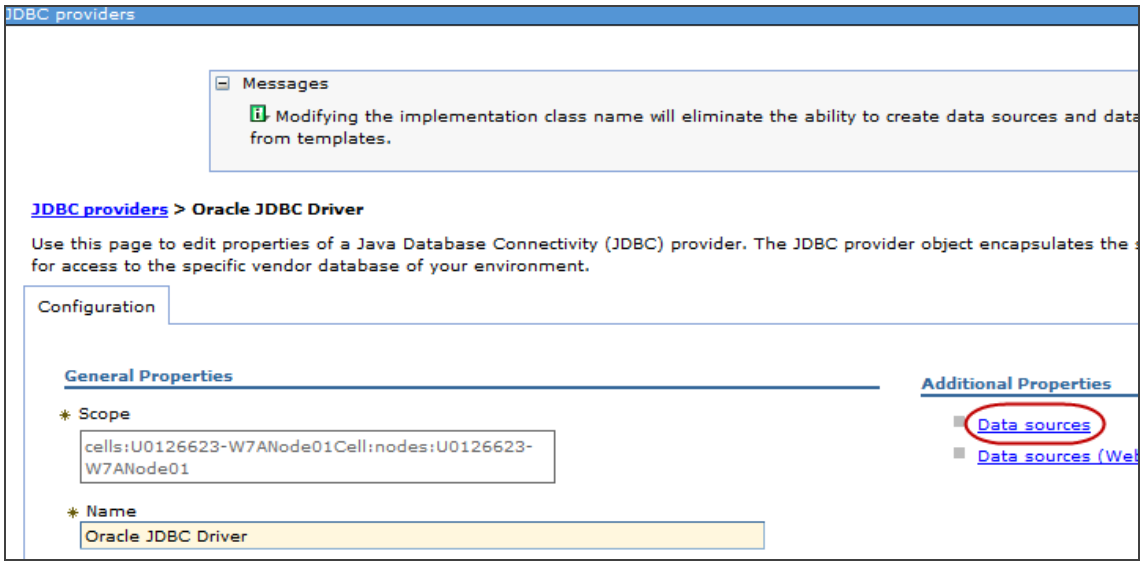
CREATING THE TAX DATA SOURCE

Create the Tax data source by completing the following.

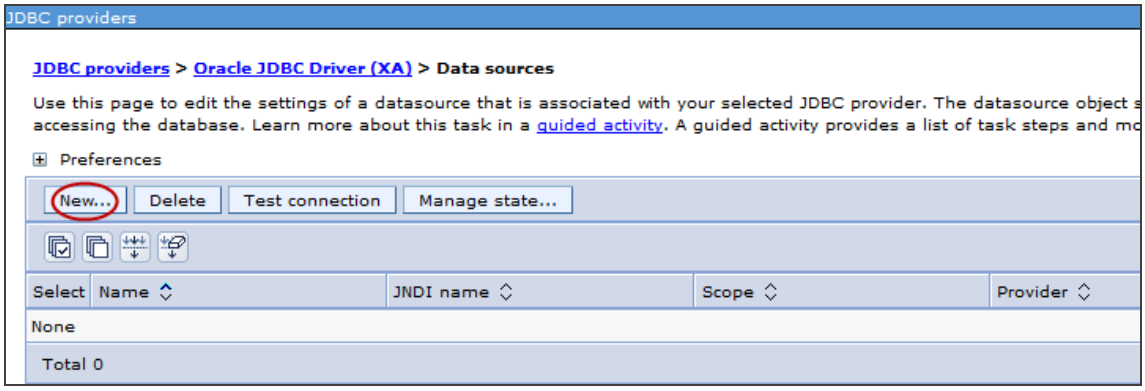
1. Go to **Resources > JDBC > JDBC providers**, and click **Oracle JDBC Driver (XA)**.



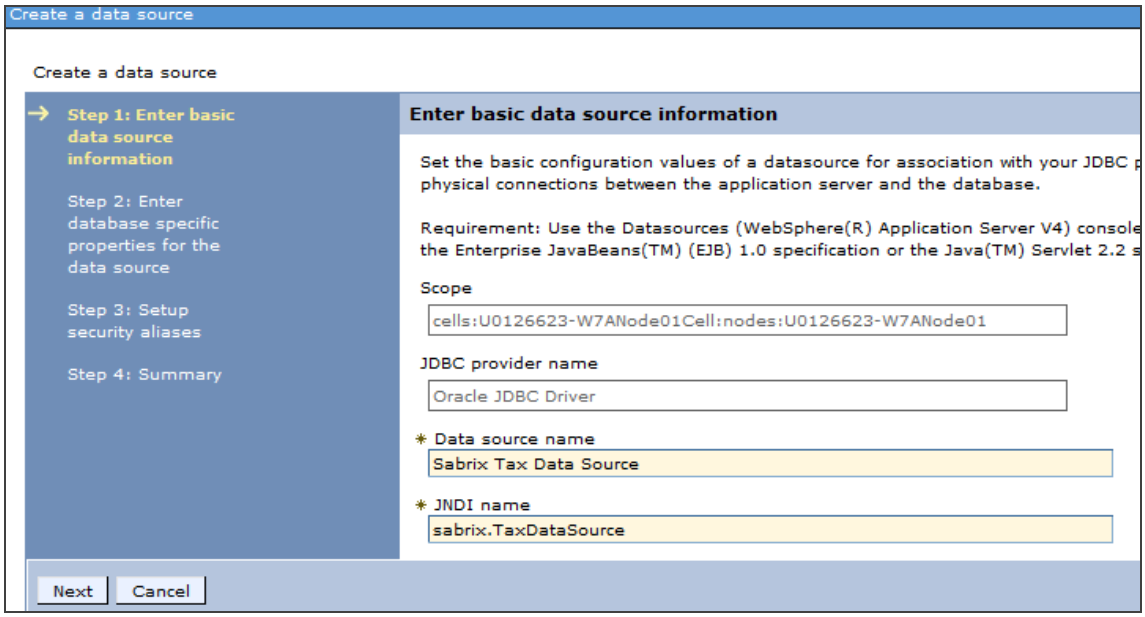
2. Click **Data Sources** in the **Additional Properties** section.



3. Click **New**.

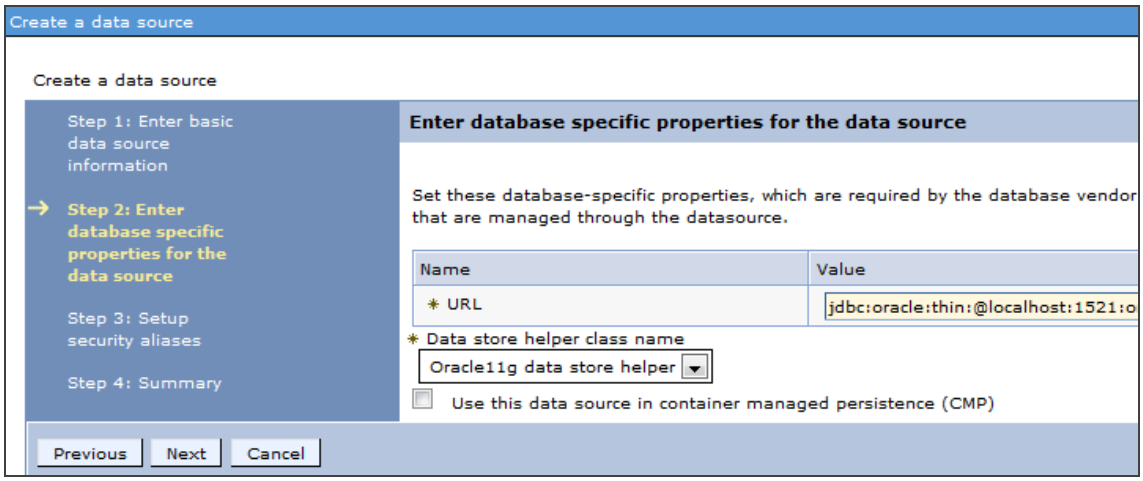


4. Enter the basic data source information, and then click **Next**.



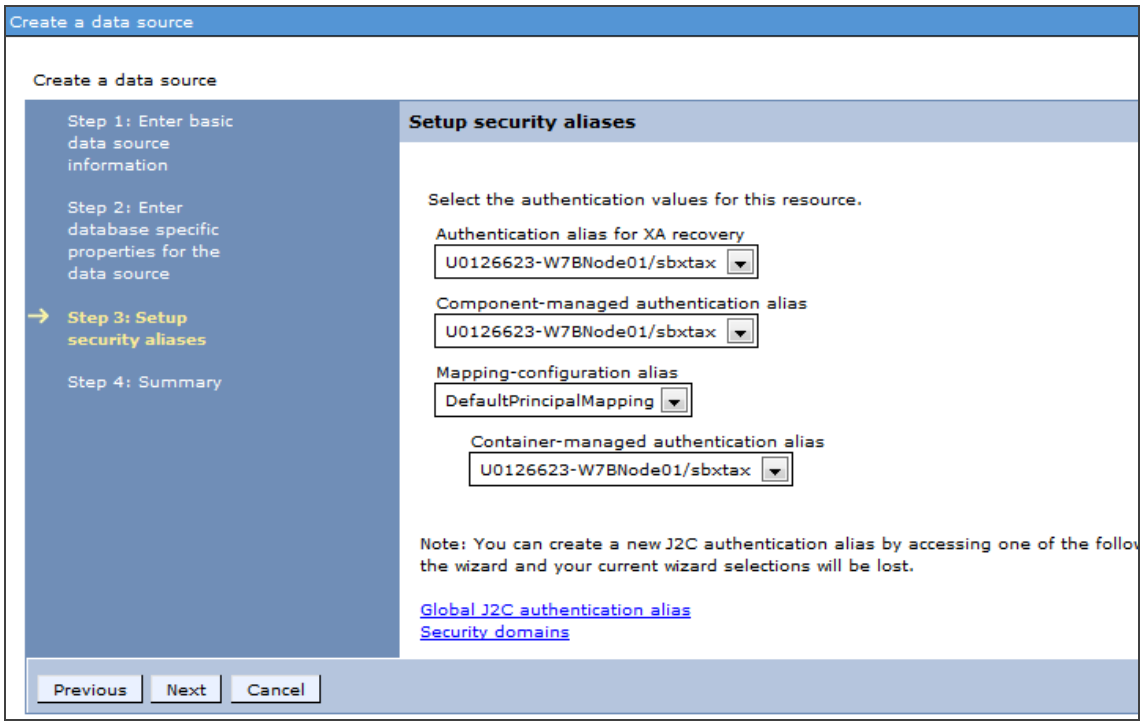
FIELD	VALUE
Data source name	Sabrix Tax Data Source
JNDI name	sabrix.TaxDataSource

5. Add the database properties, and then click **Next**.



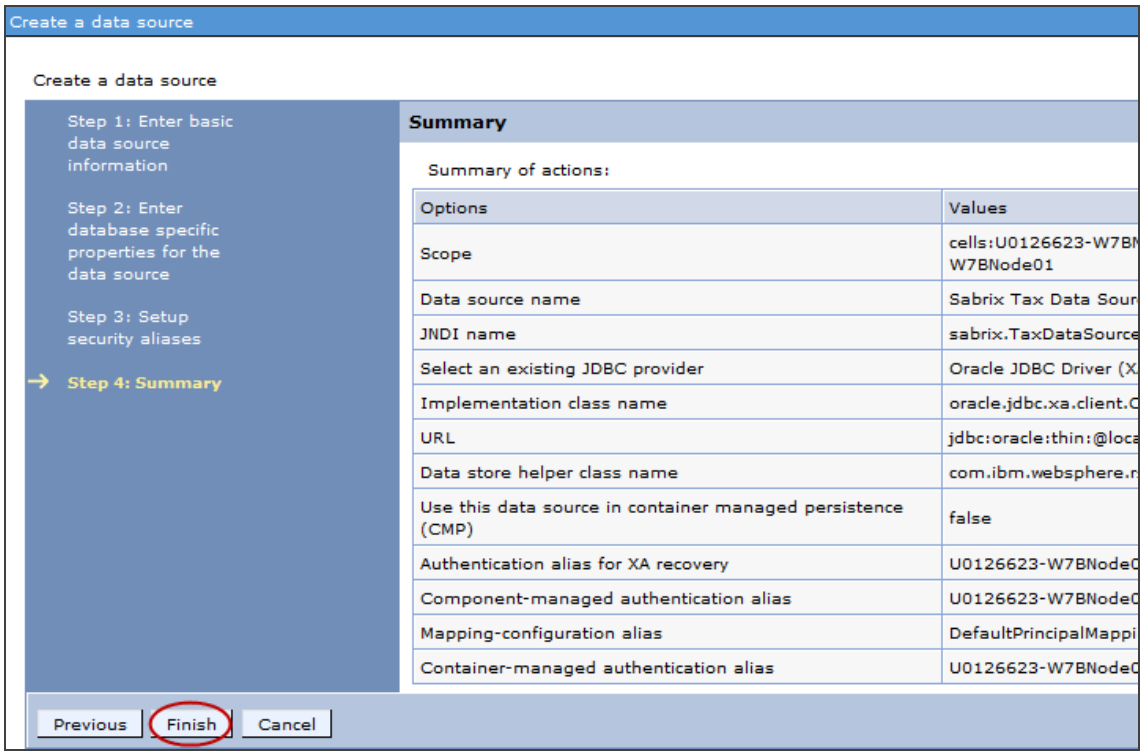
FIELD	VALUE
URL	Insert the following string into the **Value** field, and then change the bold items so they are appropriate for your environment: jdbc:oracle:thin:@**host**:**port**:**service** • Replace **host** with the name of the server running the Oracle database. • Replace **port** with the database port number (for example, 1521). • Replace **service** with the name of your database service. For Oracle Database 19c (19.6) Enterprise Edition platforms - support starting as of Determination 5.12.1.0 and above - the URL should be: jbdc:oracle:thin:@**host**:**port/service**
Data Store Helper Class Name	Oracle11g data store helper.
Container Managed Persistence	Clear this check box.

6. Set up your security aliases, and then click **Next**.



FIELD	VALUE
Authentication alias for XA recovery	Select the Tax user you created in Configuring Authentication (page 14).
Component-managed authentication alias	Select the Tax user you created in Configuring Authentication (page 14).
Mapping-configuration alias	Select **DefaultPrincipalMapping**.
Container-managed authentication alias	Select the Tax user you created in Configuring Authentication (page 14).

7. If the summary is correct, click **Finish**. Otherwise, click **Previous** to correct your previous entries.

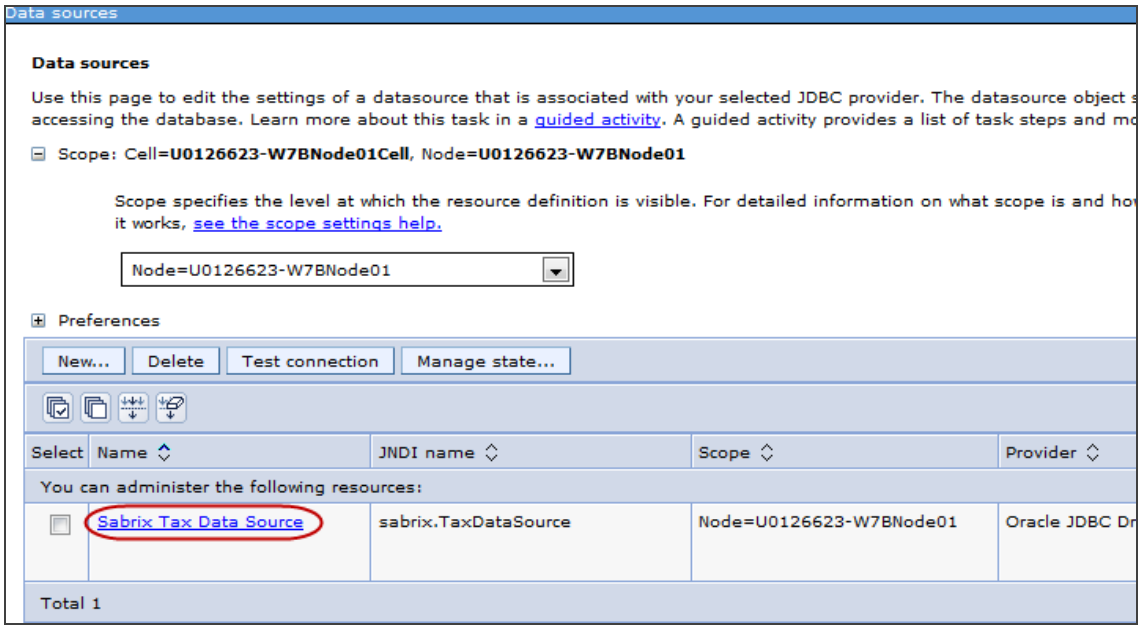


8. Click **Save directly to the master configuration**.

MODIFYING THE TAX DATA SOURCE

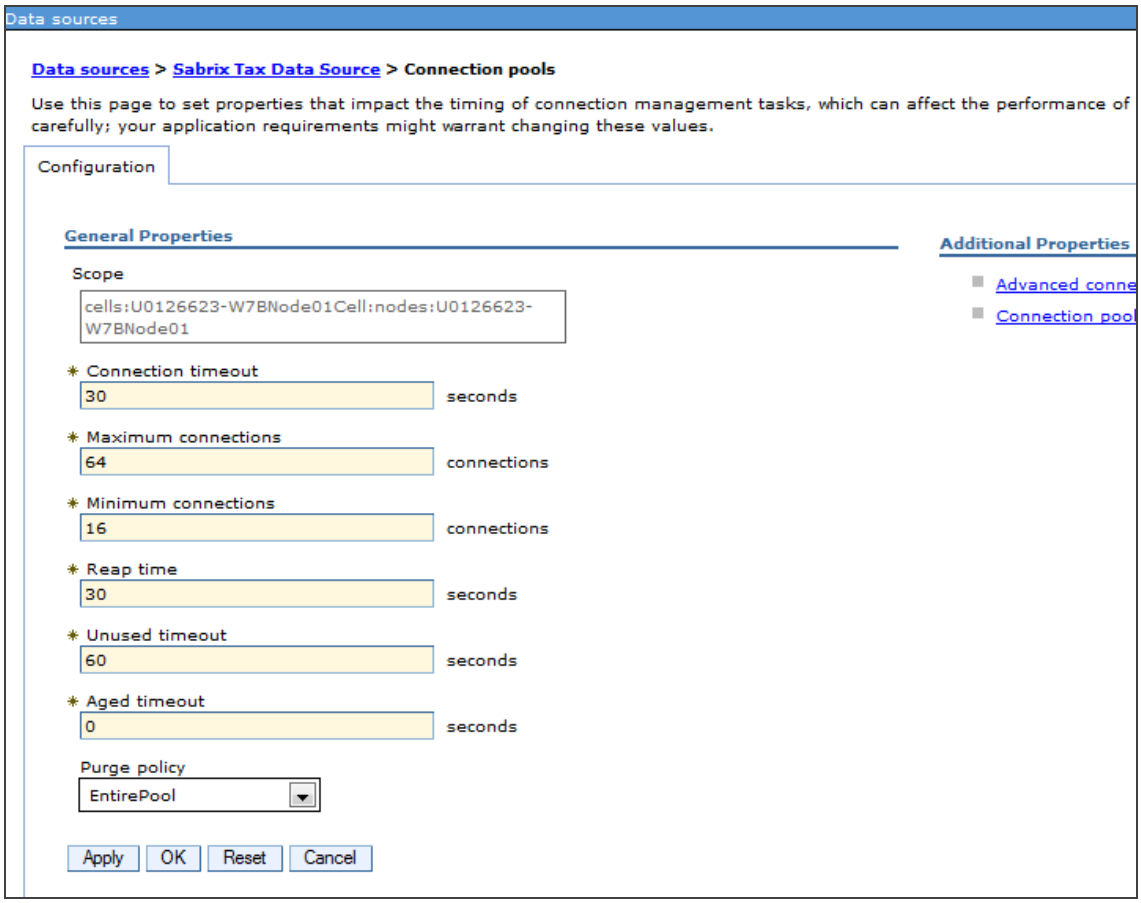
Modify the Tax data source by continuing in **Resources > JDBC > Data sources**.

1. Click **Sabrix Tax Data Source**.



2. Click **Connection pool properties** in the **Additional Properties** section.

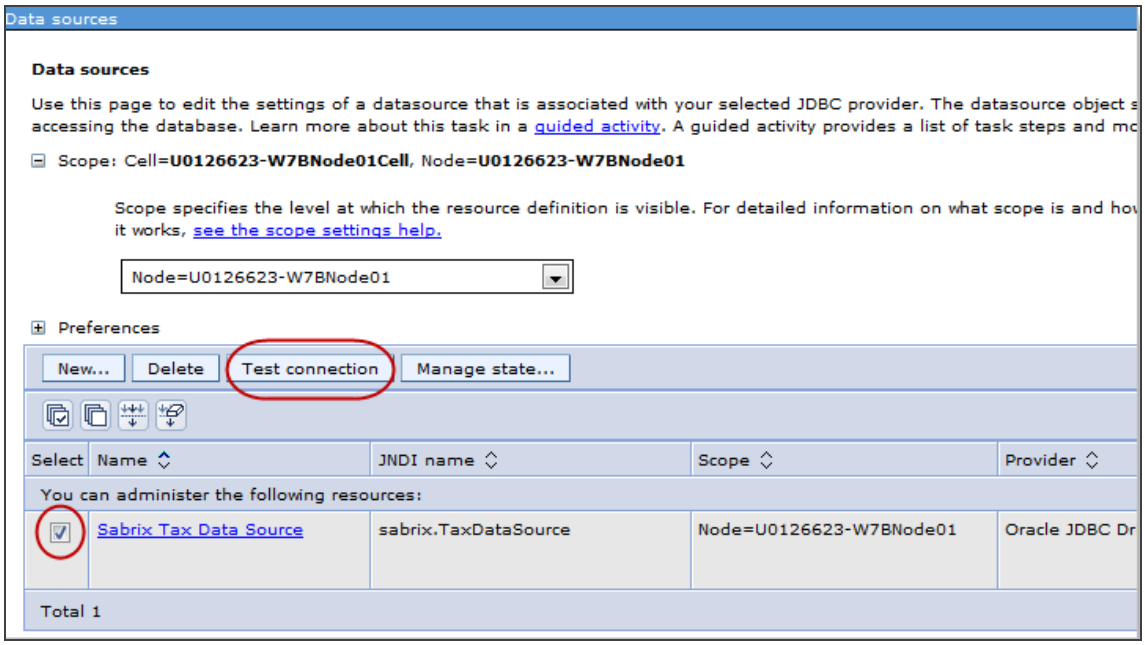
3. Add the following general properties, and then click OK.



FIELD	VALUE
Connection timeout	30
Maximum connections	64
Minimum connections	16
Reap time	30
Unused timeout	60
Aged timeout	0
Purge policy	EntirePool

4. Click **Save directly to the master configuration**.

5. Select **Sabrix Tax Data Source**, and then click **Test Connection**.

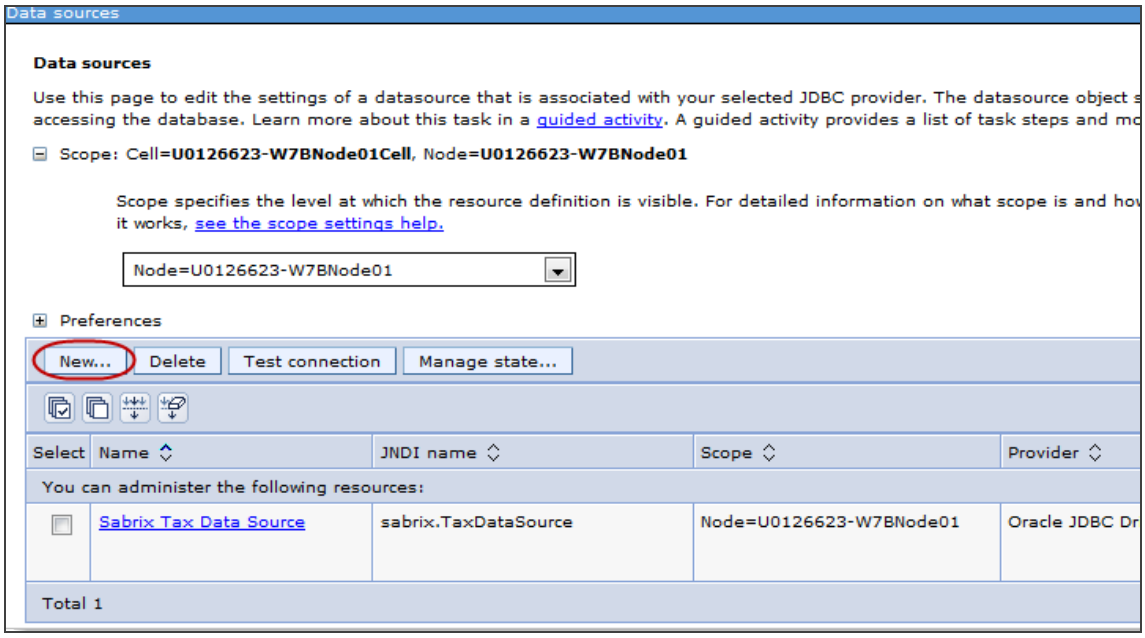


6. If your test is successful, continue to the next section; otherwise, revise your tax data source entries until you successfully complete the test.

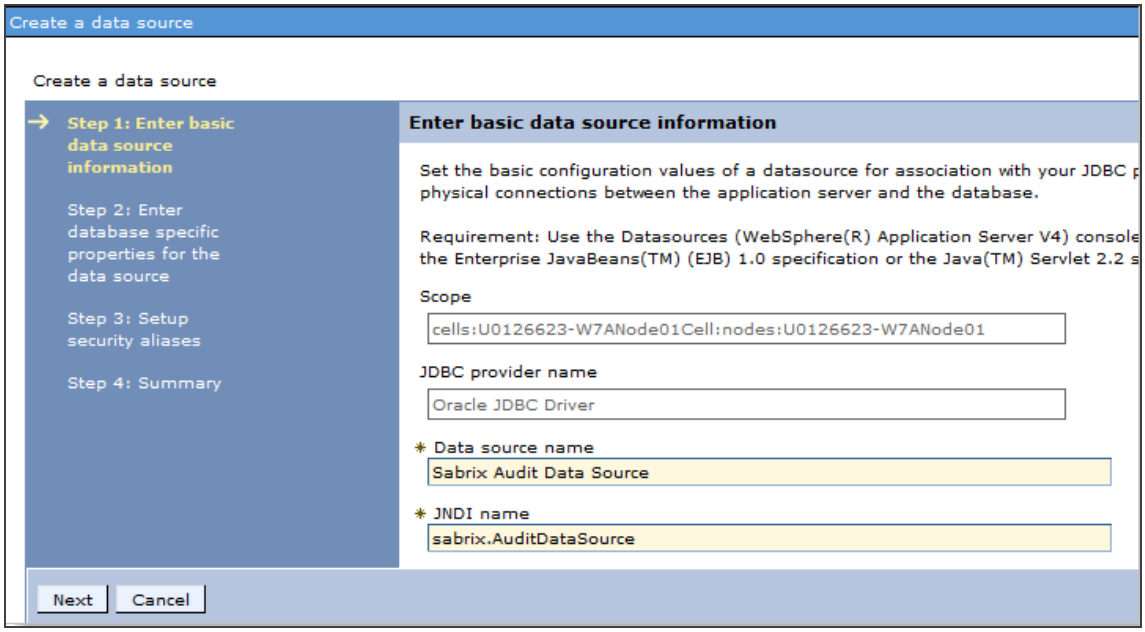
CREATING THE AUDIT DATA SOURCE

Create the Audit data source by going to **Resources > JDBC > Data Sources**.

1. Select the appropriate scope, and then click **New**.

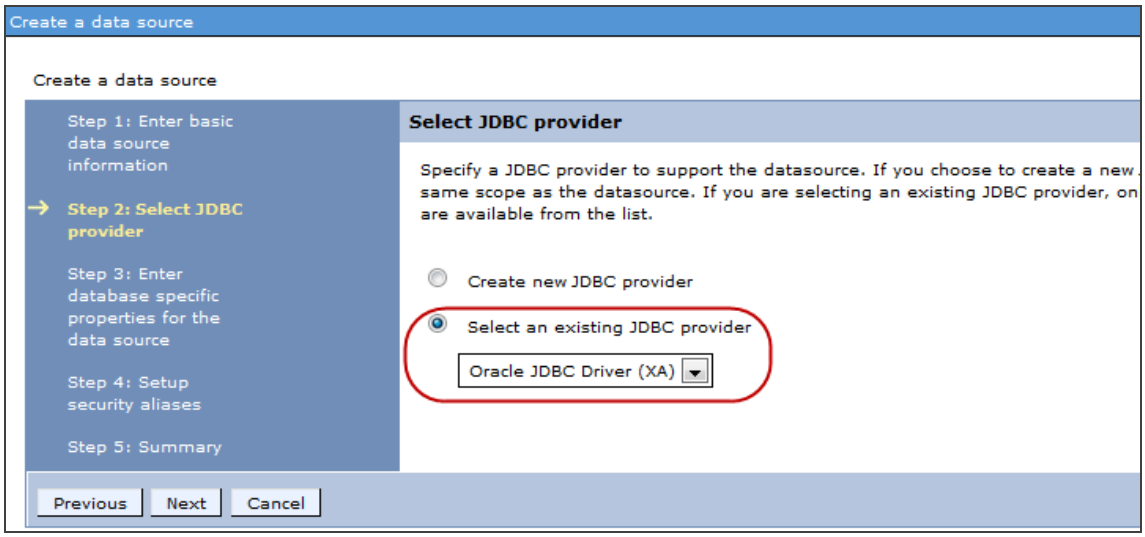


2. Enter the basic data source information, and then click **Next**.



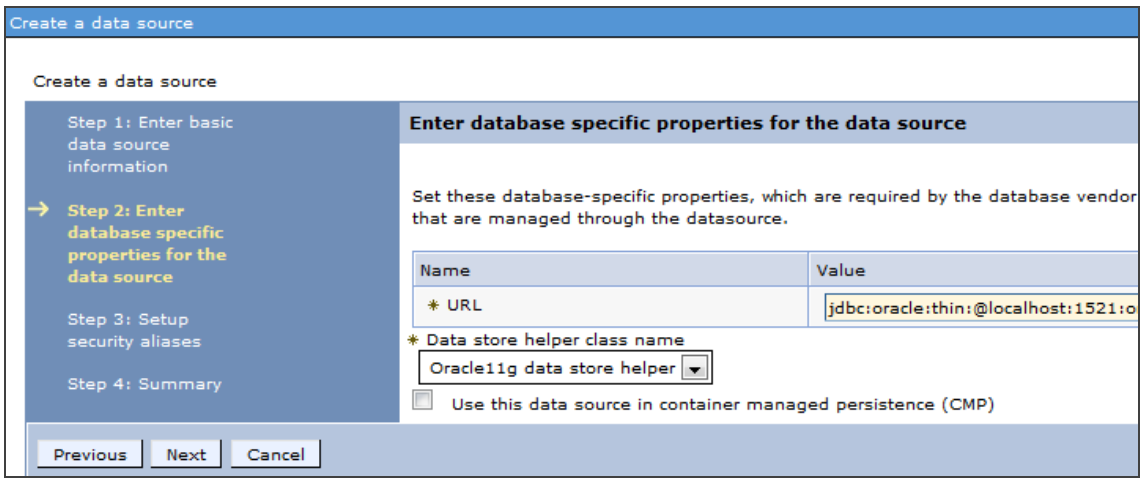
FIELD	VALUE
Data source name	Sabrix Audit Data Source
JNDI name	sabrix.AuditDataSource

3. Select the option **Select an existing JDBC provider**, and then select **Oracle JDBC Driver (XA)**.



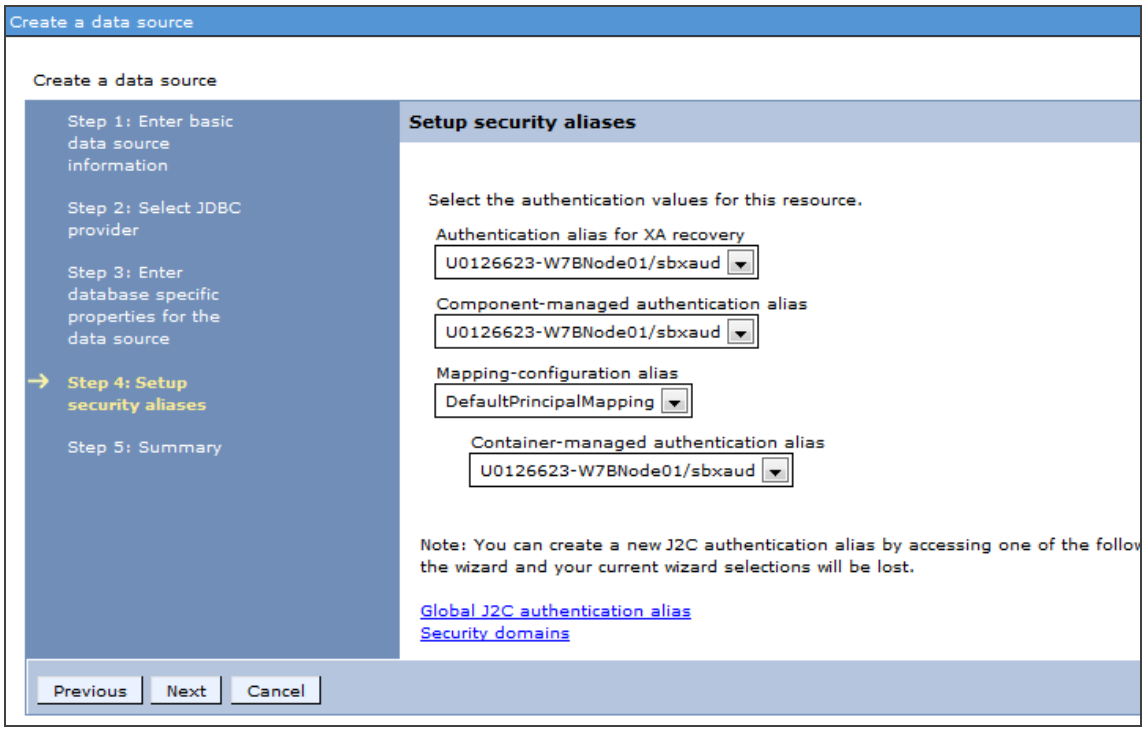
4. Click **Next**.

5. Add the database properties, and then click **Next**.



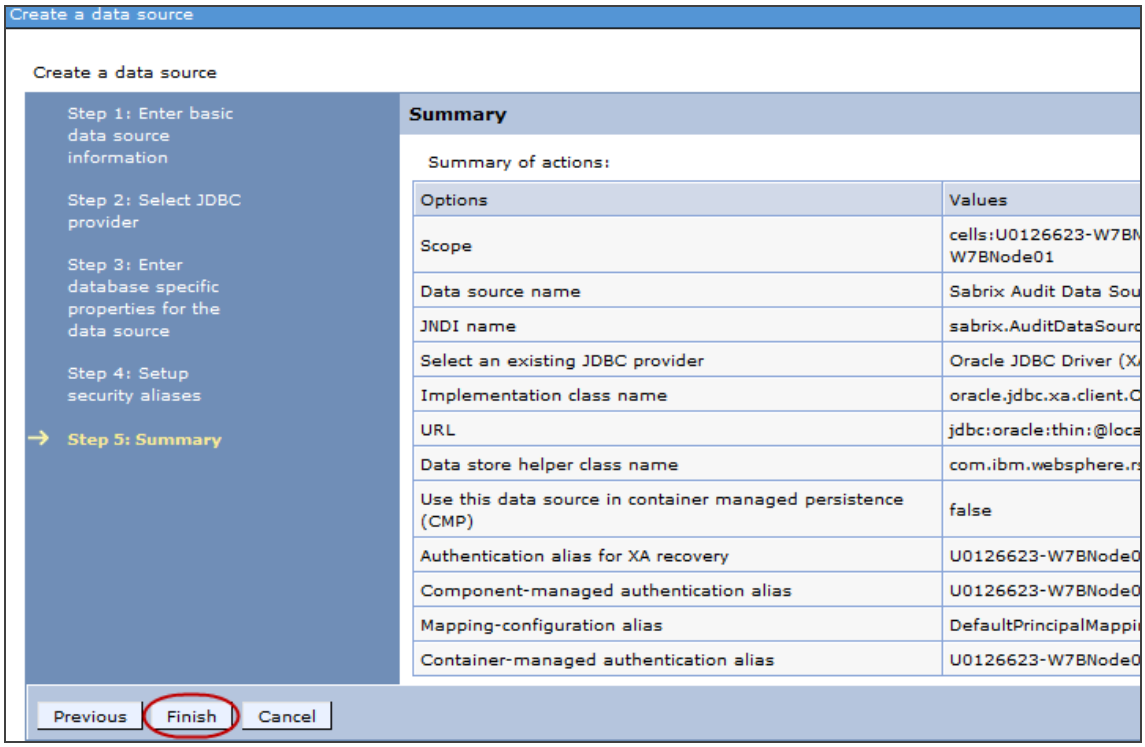
FIELD	VALUE
URL	Insert the following string into the **Value** field, and then change the bold items so they are appropriate for your environment: jdbc:oracle:thin:@**host**:**port**:**service** • Replace **host** with the name of the server running the Oracle database. • Replace **port** with the database port number (for example, 1521). • Replace **service** with the name of your database service. For Oracle Database 19c (19.6) Enterprise Edition platforms - support starting as of Determination 5.12.1.0 and above - the URL should be: jbdc:oracle:thin:@**host**:**port/service**
Data Store Helper Class Name	Oracle11g data store helper.
Container Managed Persistence	Clear this check box.

6. Set up your security aliases, and then click **Next**.



FIELD	VALUE
Authentication alias for XA recovery	Select the Audit user you created in Configuring Authentication (page 14).
Component-managed authentication alias	Select the Audit user you created in Configuring Authentication (page 14).
Mapping-configuration alias	Select **DefaultPrincipalMapping**.
Container-managed authentication alias	Select the Audit user you created in Configuring Authentication (page 14).

7. If the summary is correct, click **Finish**; otherwise, click **Previous** to correct your previous entries.

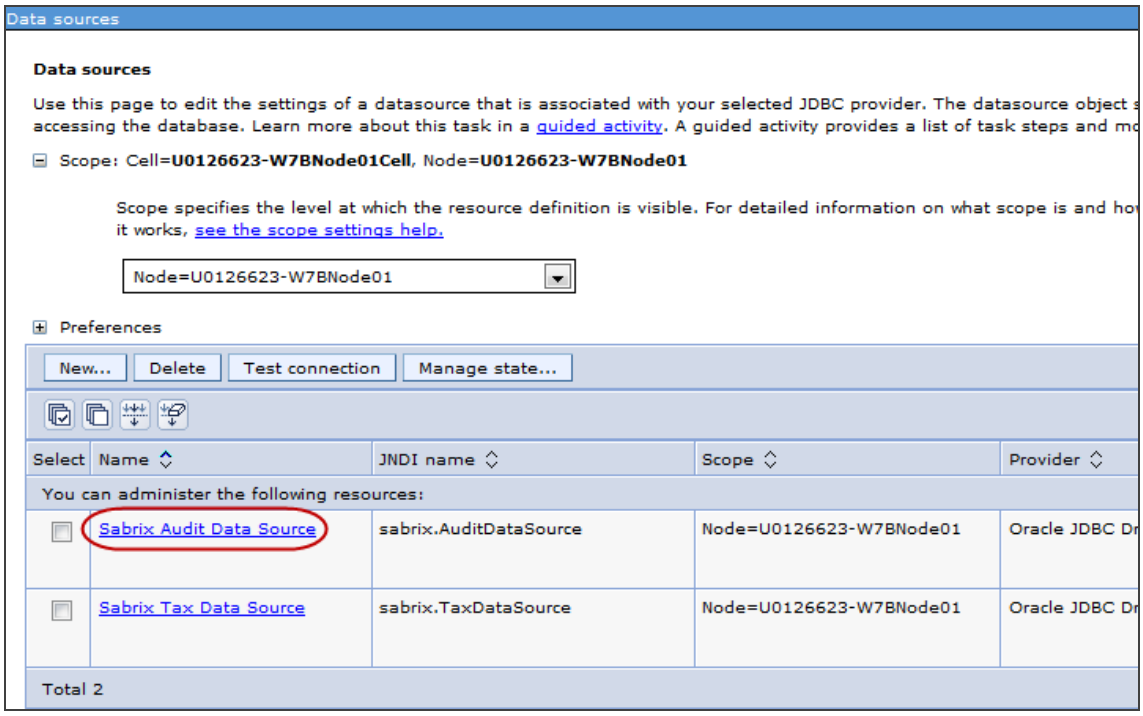


8. Click **Save directly to the master configuration**.

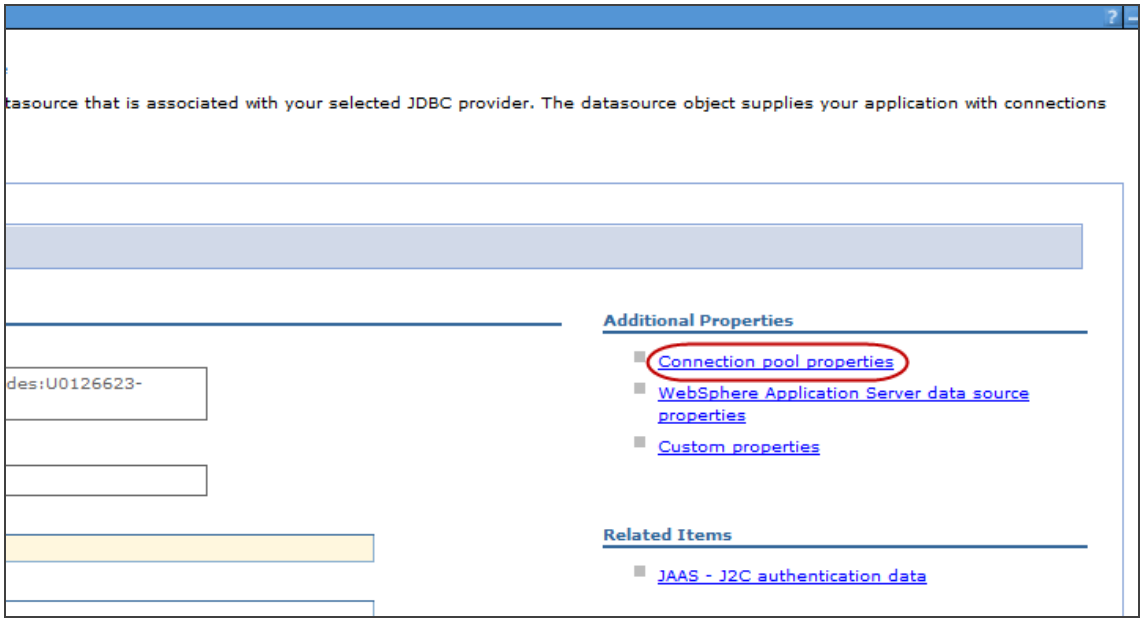
MODIFYING THE AUDIT DATA SOURCE

Modify the Audit data source by continuing in **Resources > JDBC > Data sources**.

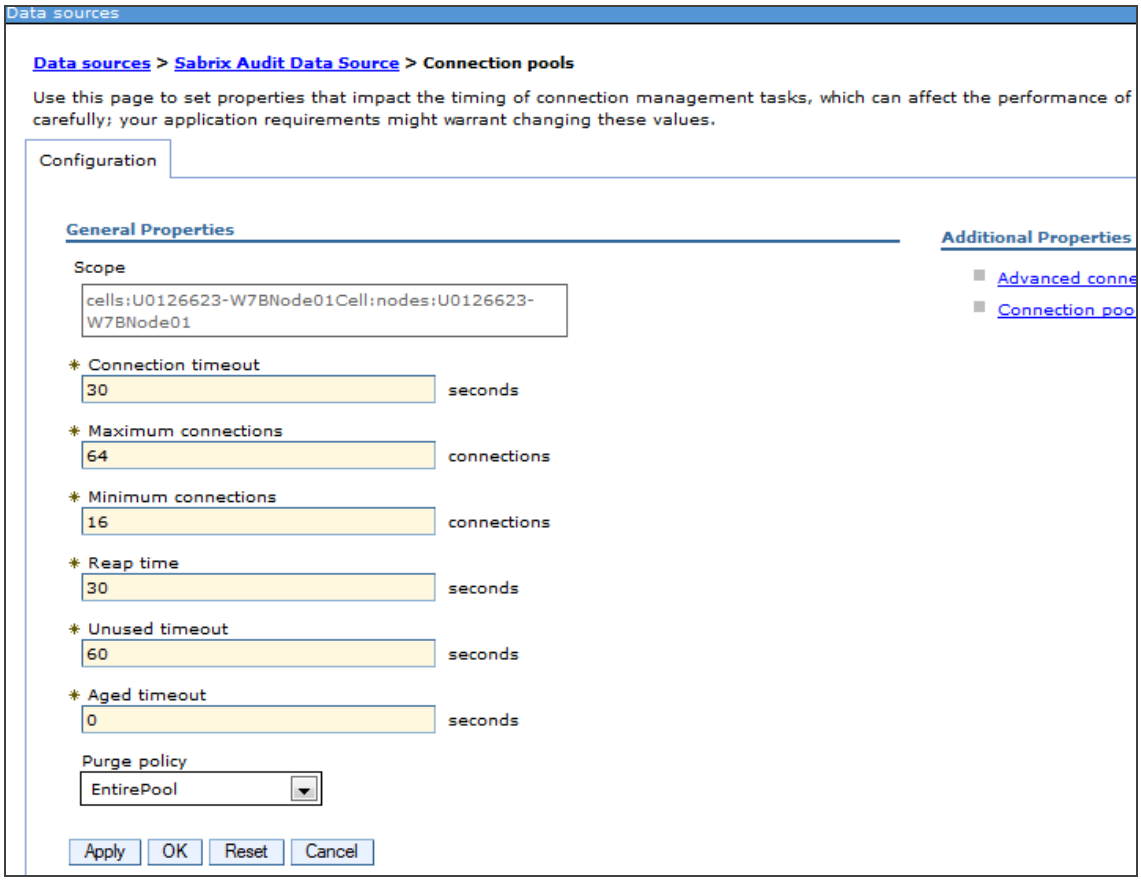
1. Click **Sabrix Audit Data Source**.



2. Click **Connection pool properties** in the **Additional Properties** section.

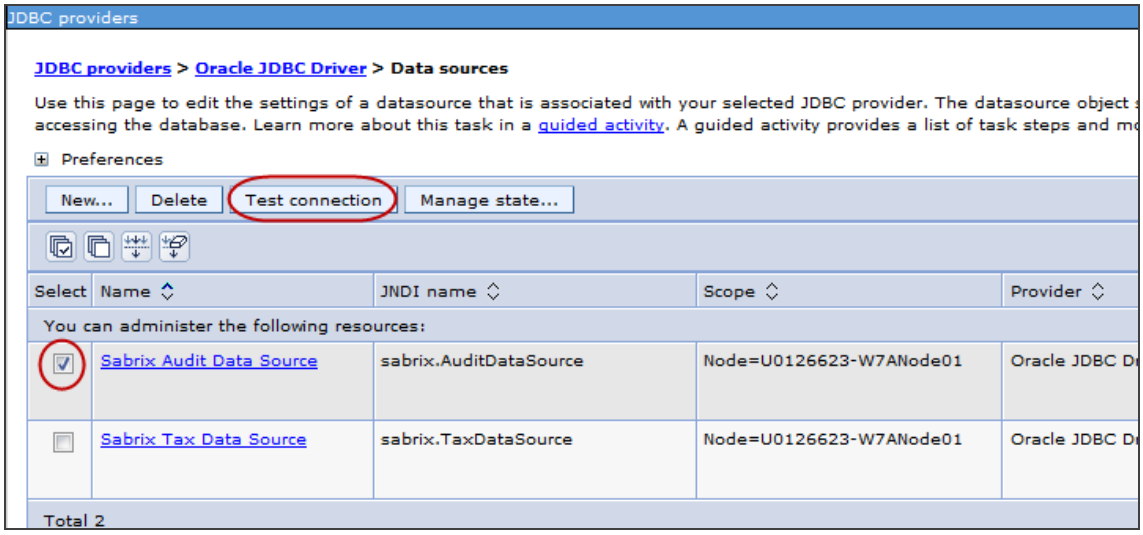


3. Add the following general properties, and then click OK.



FIELD	VALUE
Connection timeout	30
Maximum connections	64
Minimum connections	16
Reap time	30
Unused timeout	60
Aged timeout	0
Purge policy	EntirePool

4. Click **Save directly to the master configuration**.
5. Select **Sabrix Audit Data Source**, and then click **Test Connection**.

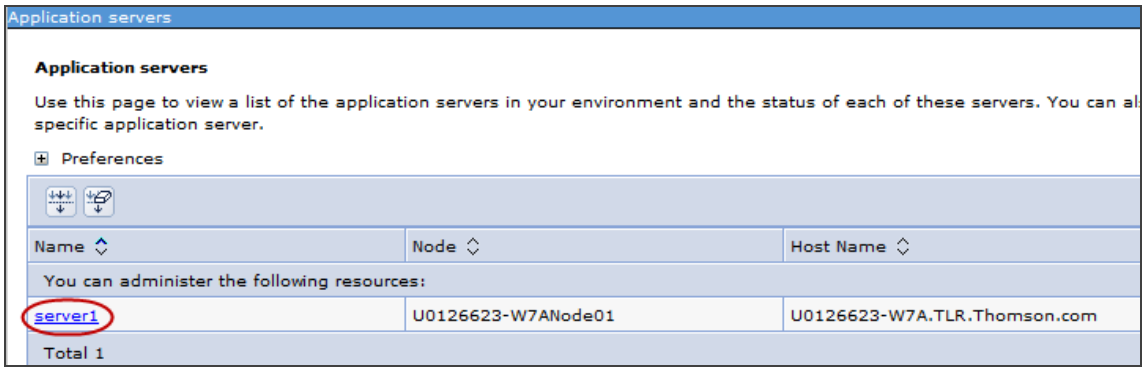


6. If your test is successful, continue to the next section; otherwise, revise your audit data source entries until you successfully complete the test.

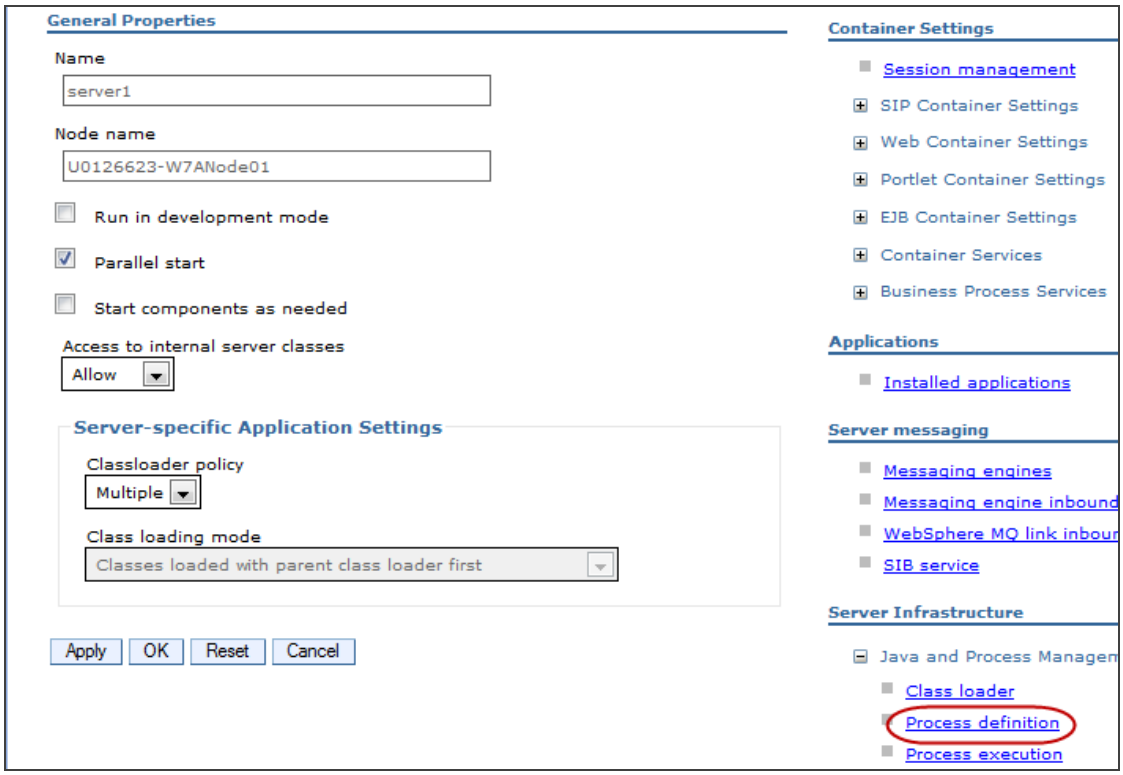
CONFIGURING THE JAVA VIRTUAL MACHINE

The default heap sizes for the Java Virtual Machine are too low to deploy the Determination software successfully. Change the sizes by completing the following.

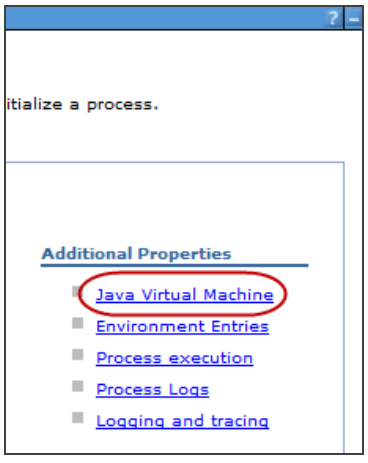
1. Go to **Servers > Server Types > WebSphere application servers**.
2. Click on your server.



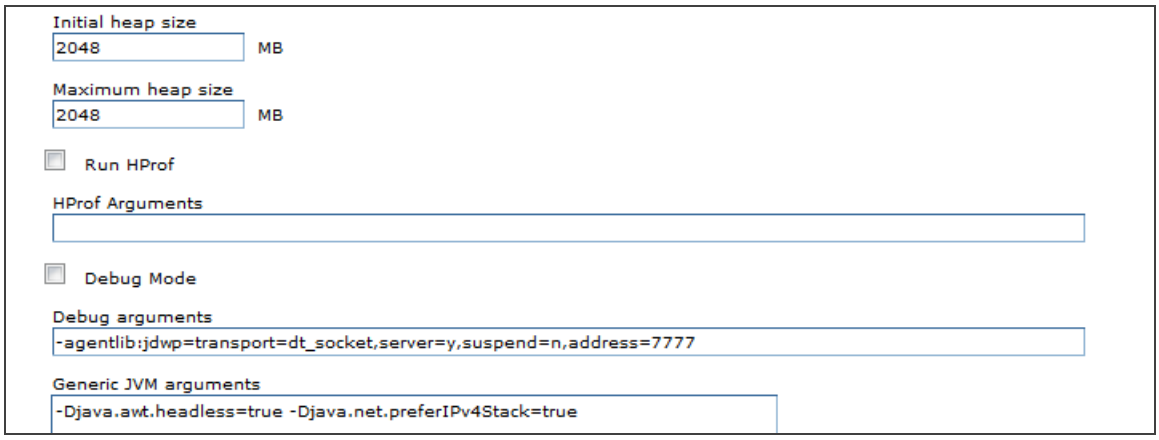
3. Expand **Java and Process Management** in the **Server Infrastructure** list, and then click **Process Definition**.



4. Click **Java Virtual Machine** in the **Additional Properties** list.



5. Complete the following fields using the table below as a guide.



FIELD	VALUE
Initial Heap Size	2048 (minimum) We recommend allocating at least 6144m.
Maximum Heap Size	2048 (minimum) We recommend allocating at least 6144m.
Generic JVM arguments	-Djava.awt.headless=true -Djava.net.preferIPv4Stack=true
Generic JVM arguments	-DBASE_SABRIX_DIRECTORY=<logging_directory> If you plan to run Determination in several instances of the application server on the same host, add this parameter to ensure that each instance logs to its own directory. Replace <logging_ directory> with your logging directory. If you are only running one instance of the application server, you can skip this step and set the parameter in Determination on the Configuration page. See the Help for further details.

6. Click OK, and then click **Save directly to the master configuration**.

ENABLING AUTOMATIC TAX DATA DOWNLOADS (OPTIONAL)

If you plan to use the tax data automatic download feature, you need to complete both a WebSphere configuration and a configuration inside Determination. The following explains the WebSphere configuration, and you should consult Help for details about Determination configuration. If you do not plan to use this feature, then skip to Deploying the Application (page 49).

There are two parts for the WebSphere configuration of this feature:

- Exporting the Customer Center certificate.
- Configuring the certificate in WebSphere.

Exporting the Customer Center Certificate

The following is an example using Internet Explorer:

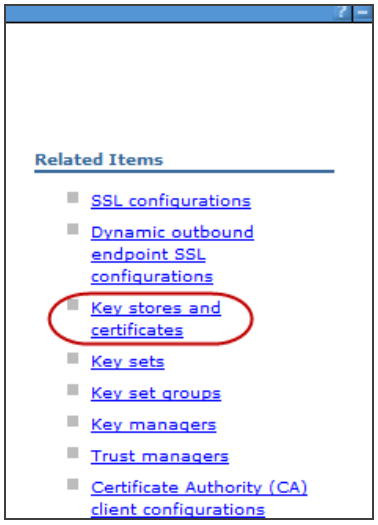
1. Go to the following: https://customercenter.sabrix.com/sabrixcc/
2. Click the lock icon, which brings up the **Website Identification** window.
3. Click **View certificates**.
4. Click the **Details** tab, and then click **Copy to File**.
5. Click **Next** in the **Certificate Export Wizard**.
6. Accept the default for the **Export File Format** (**DER encoded binary**), and then click **Next**.
7. Specify a name and directory path, and then click **Next**.
8. Click **Finish**, and then OK.
9. Upload the certificate to the server hosting WebSphere.

You will use this certificate file in the following section.

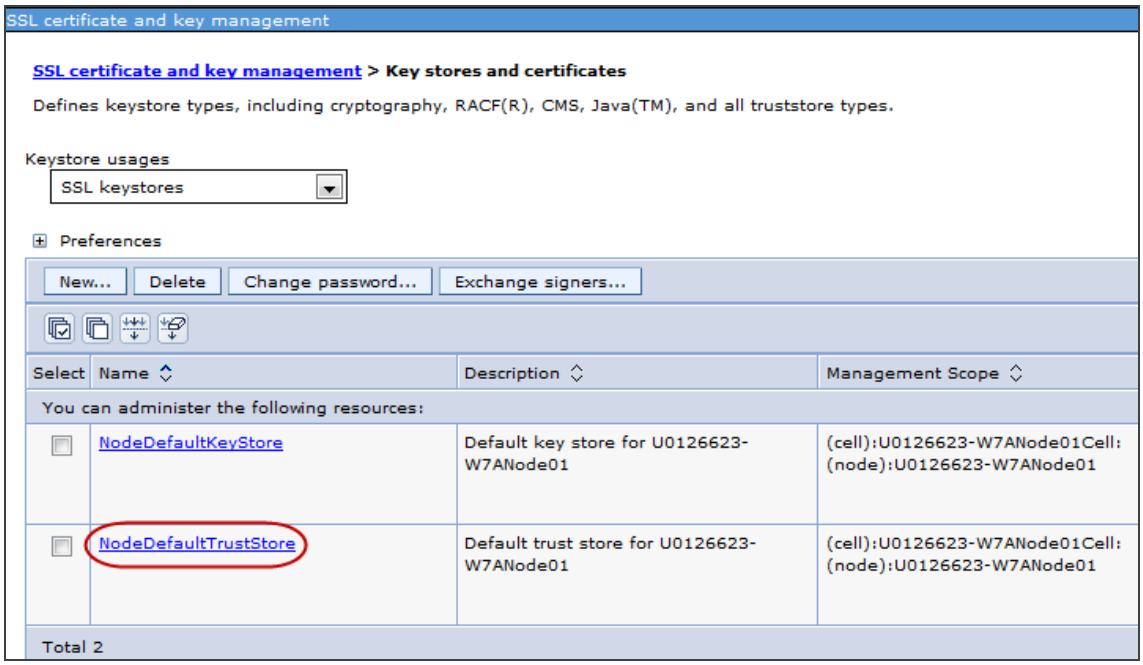
Configuring the Certificate in WebSphere

Using the Integrated Solution Console, complete the following:

1. Under **Security** in the left pane, click **SSL certificate and key management**.
2. Under **Related Items**, click **Key stores and certificates**.

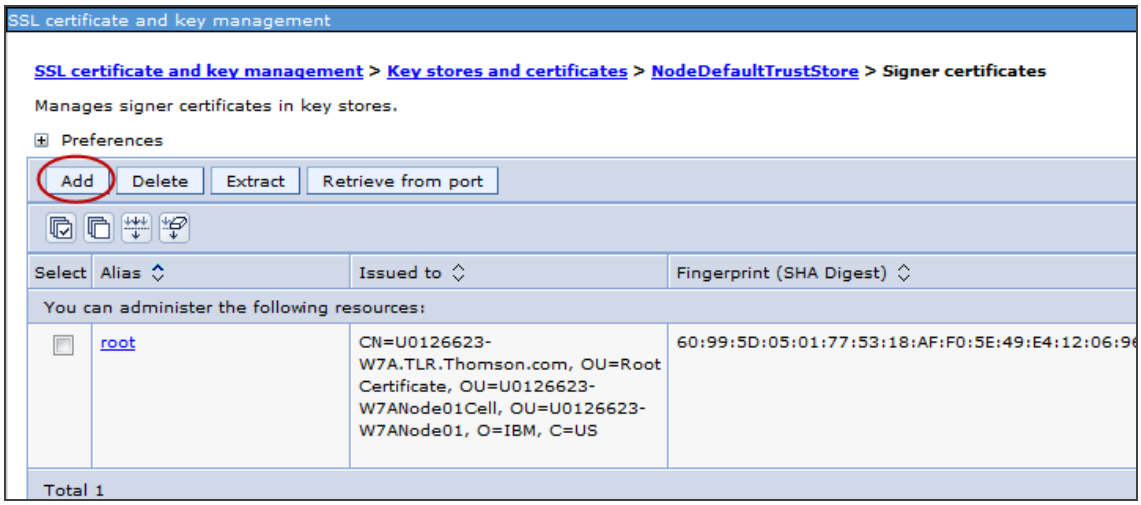


3. Click **NodeDefaultTrustStore**.

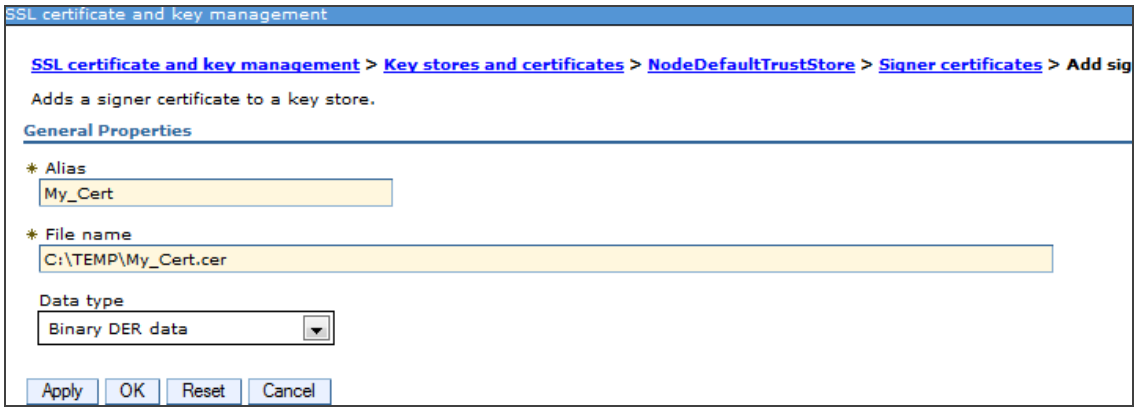


4. Under **Additional Properties**, click **Signer certificates**.

5. Click **Add**.



6. Complete the following general properties.



FIELD	VALUE
Alias	Enter a label of your choice.
File name	Insert the name and directory path where you stored your exported certificate.
Data type	Select **Binary DER data**.

7. Click OK, and then click **Save directly to the master configuration**.

After you finish your WebSphere configurations and you begin your Determination configurations, consult Help for directions about configuring the automatic download feature.

CONFIGURING CSRFGUARD

When enabled, CSRFGuard provides security against cross-site request forgery security attacks. By default, CSRFGuard is disabled. To enable this feature, contact Customer Support or visit the Knowledge Base.

Complete the following:

1. Stop WebSphere.
2. Navigate to the following directory in WebSphere:

   <WebSphereBaseDirectory>/AppServer/lib/

3. In the directory, create a file called *Owasp.CsrfGuard.overlay.properties*, and then insert the following lines:

```
1   org.owasp.csrfguard.configuration.provider.factory=org.
    owasp.csrfguard.config.overlay.ConfigurationOverlayProviderFactor
    y
2   org.owasp.csrfguard.Enabled=false
3   org.owasp.csrfguard.PRNG=IBMSecureRandom
4   org.owasp.csrfguard.PRNG.Provider=IBMJCE
```

4. Save and close *Owasp.CsrfGuard.overlay.properties*.
5. Restart WebSphere.

DEPLOYING THE APPLICATION

The Determination application is contained in the *sabrix.ear* file, which is in the root directory of the installation .zip file you downloaded and extracted earlier. Complete the following steps to deploy the application.

These deployment steps are for a default installation. If your environment requires advanced settings for deployment, choose those as you complete the steps below.

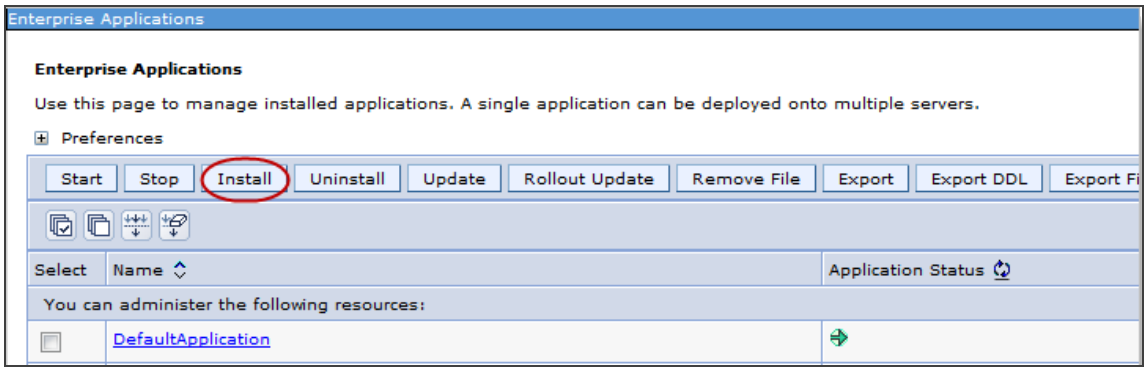
The deployment steps are grouped into four sections:

- Loading the Application
- Selecting Installation Options
- Configuring Class Loading
- Setting a Custom Property

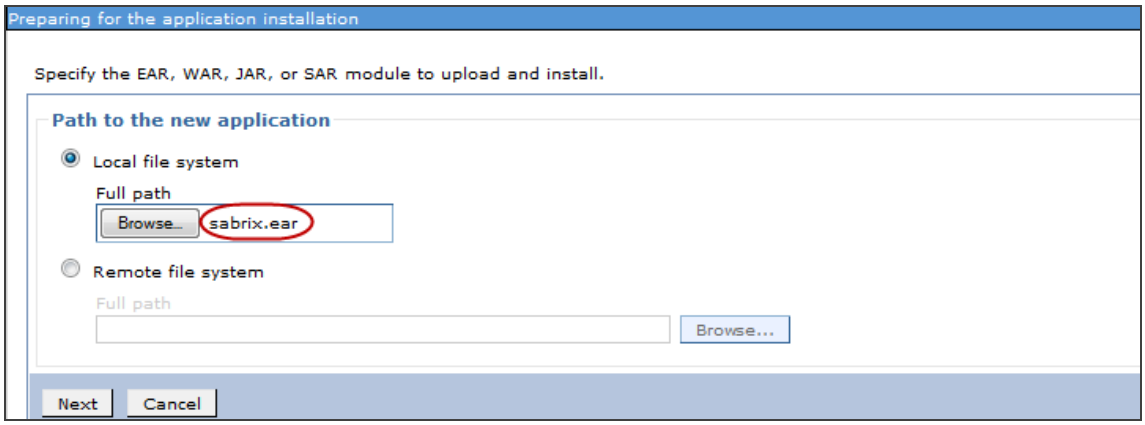
Loading the Application

The following steps guide you through the process of loading the Determination application.

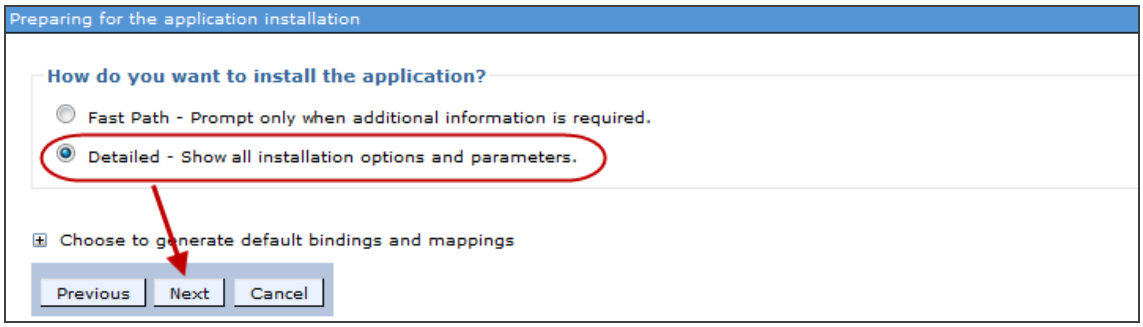
1. From the console, go to **Applications > Application Types > WebSphere enterprise applications**.
2. Click **Install**.



3. Enter or browse to the location of the *sabrix.ear* file, and then click **Next**.



4. Select **Detailed - Show all installation options and parameters**, and then click **Next**.

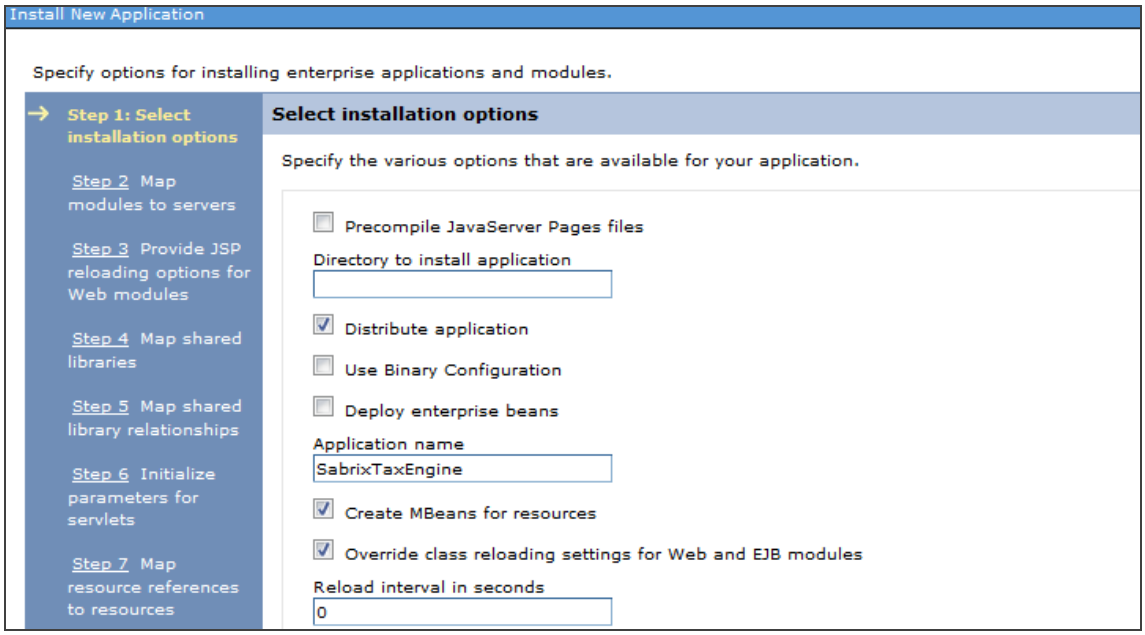


Remain on the screen, and continue with the steps in the following section.

Selecting Installation Options

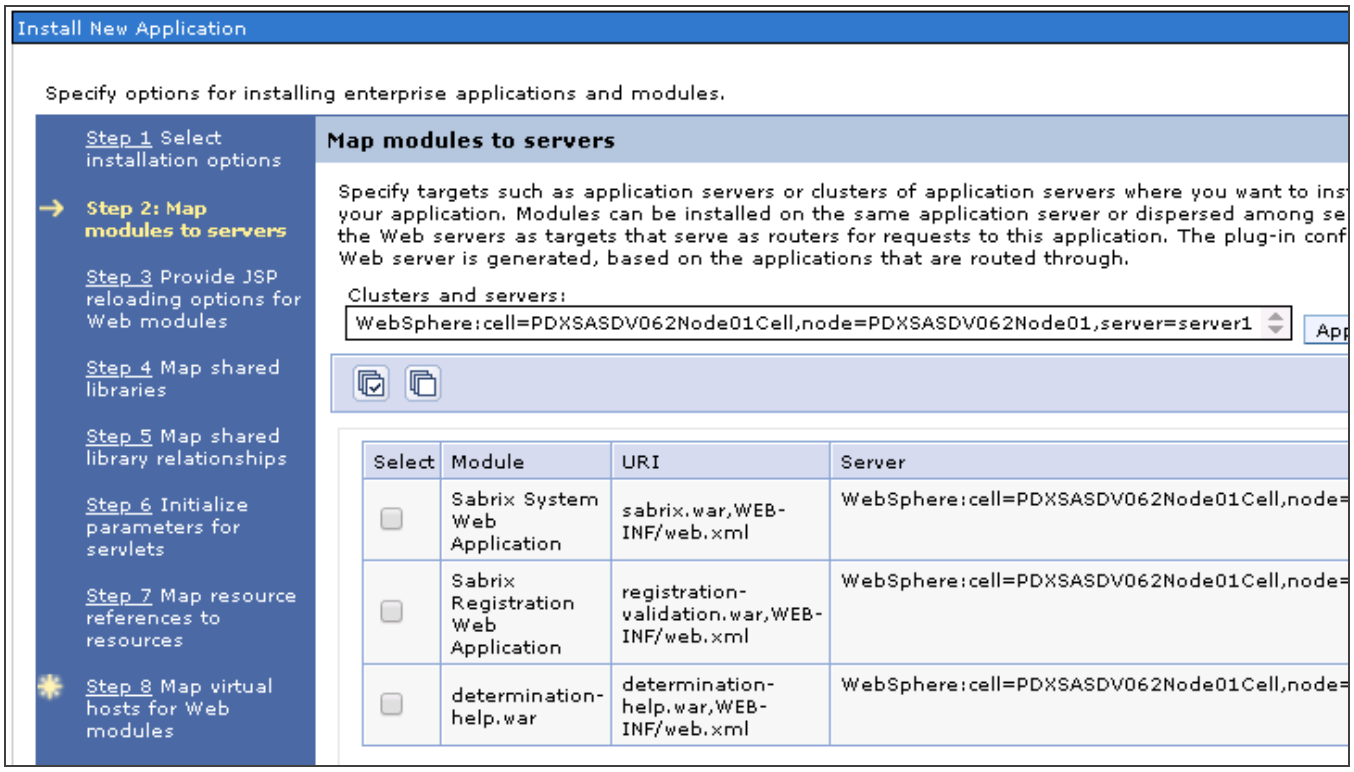
Complete each step below to select the installation options.

1. On **Step 1: Select installation options**, choose the following installation options, and then click **Next**.

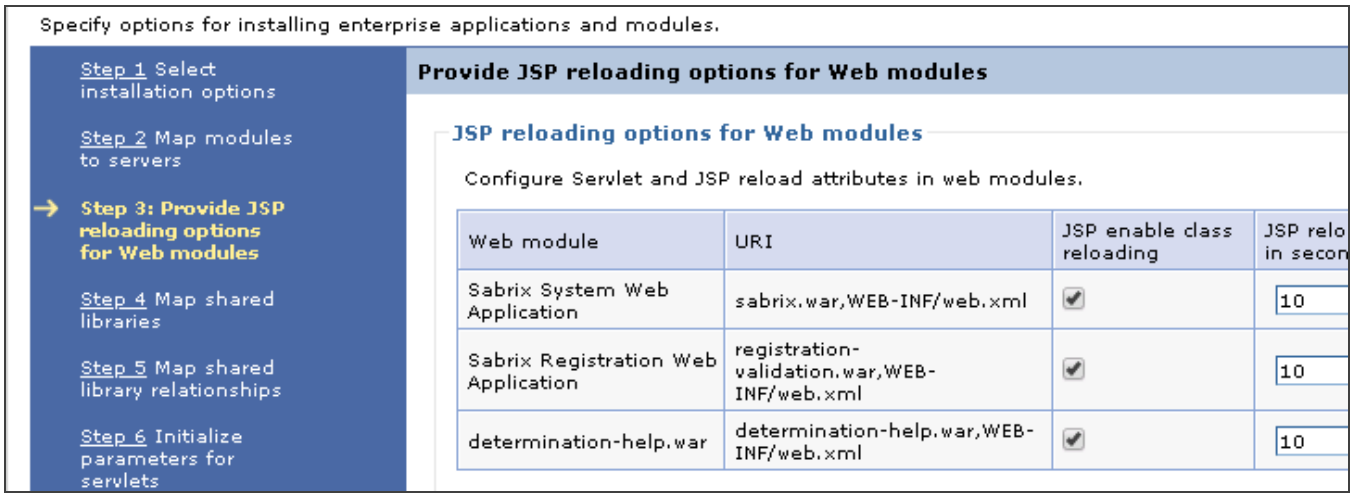


FIELD	VALUE
Distribute application	Check the box
Create MBeans for resources	Check the box
Override class reloading settings for Web and EJB modules	Check the box
Reload interval in seconds	Enter zero: **0**

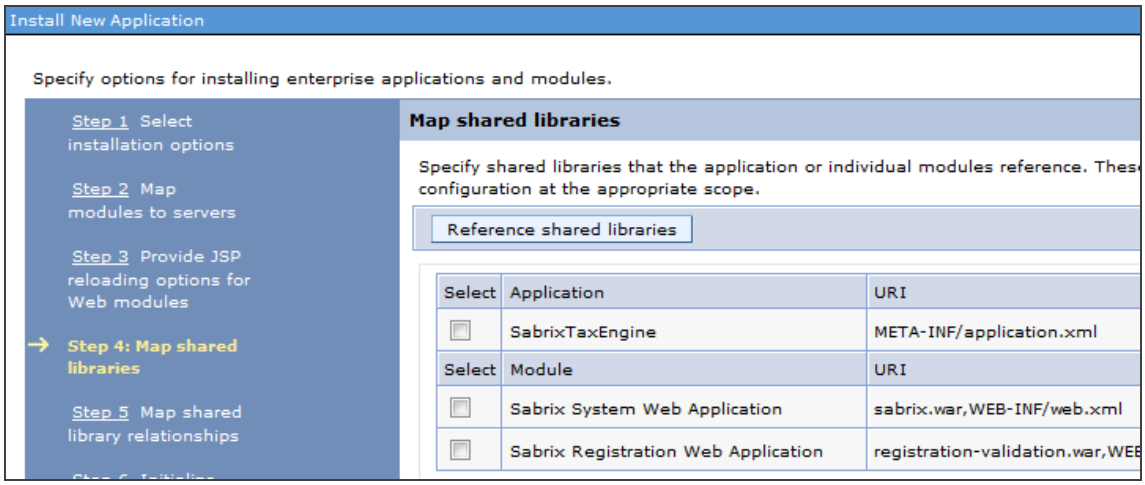
2. On **Step 2: Map modules to servers**, if there is just one entry in **Clusters and servers**, accept the defaults, and then click **Next**. If there are multiple entries in **Clusters and servers**, highlight the container (s) you want to deploy to, select the three check boxes below, and click **Apply**. When you are done, click **Next**.



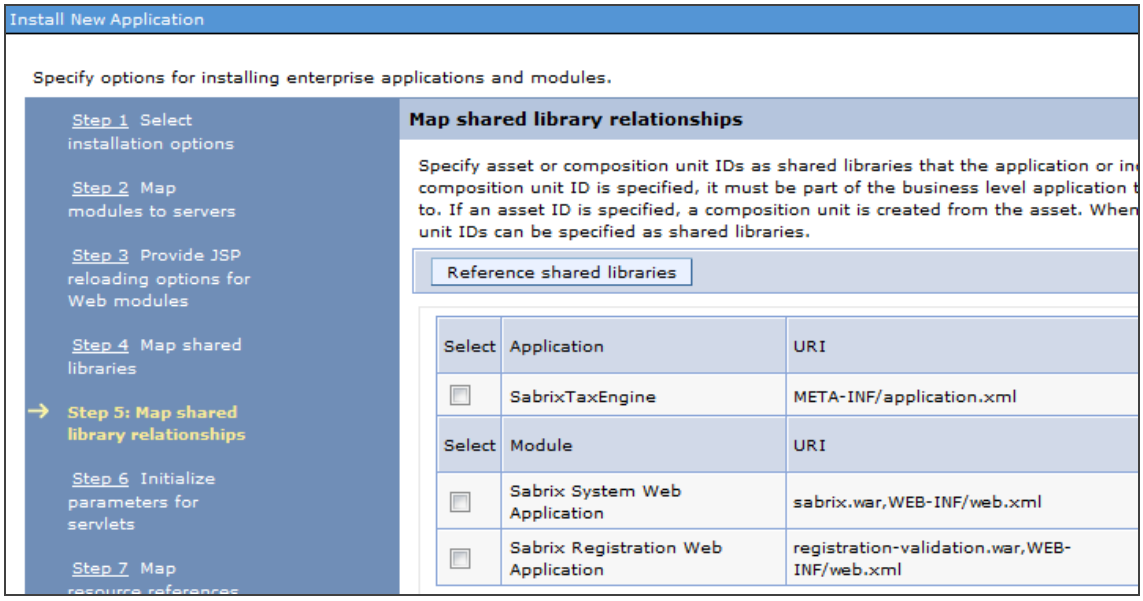
3. On **Step 3: Provide JSP reloading options for Web modules**, click **Next** to accept the defaults.



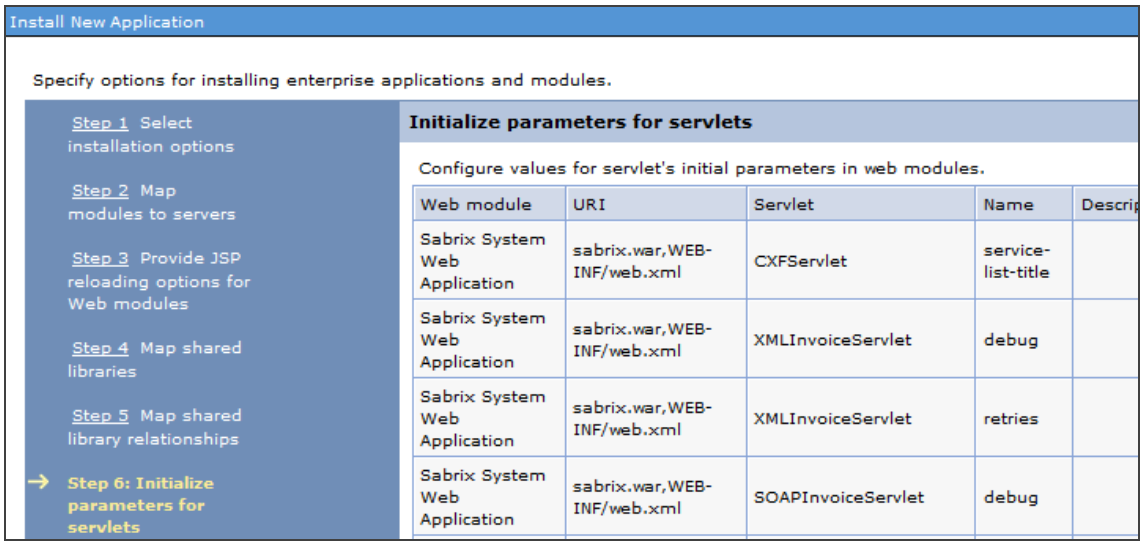
4. On **Step 4: Map shared libraries**, click **Next** to accept the defaults.



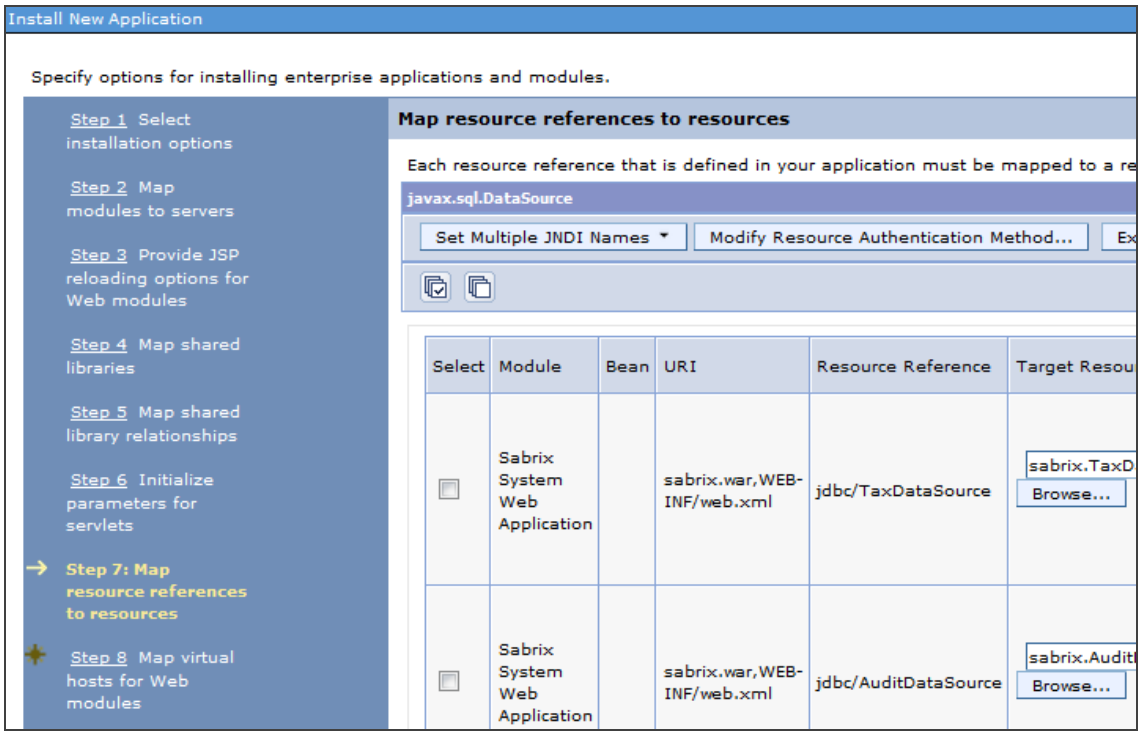
5. On **Step 5: Map shared library relationships**, click **Next** to accept the defaults.



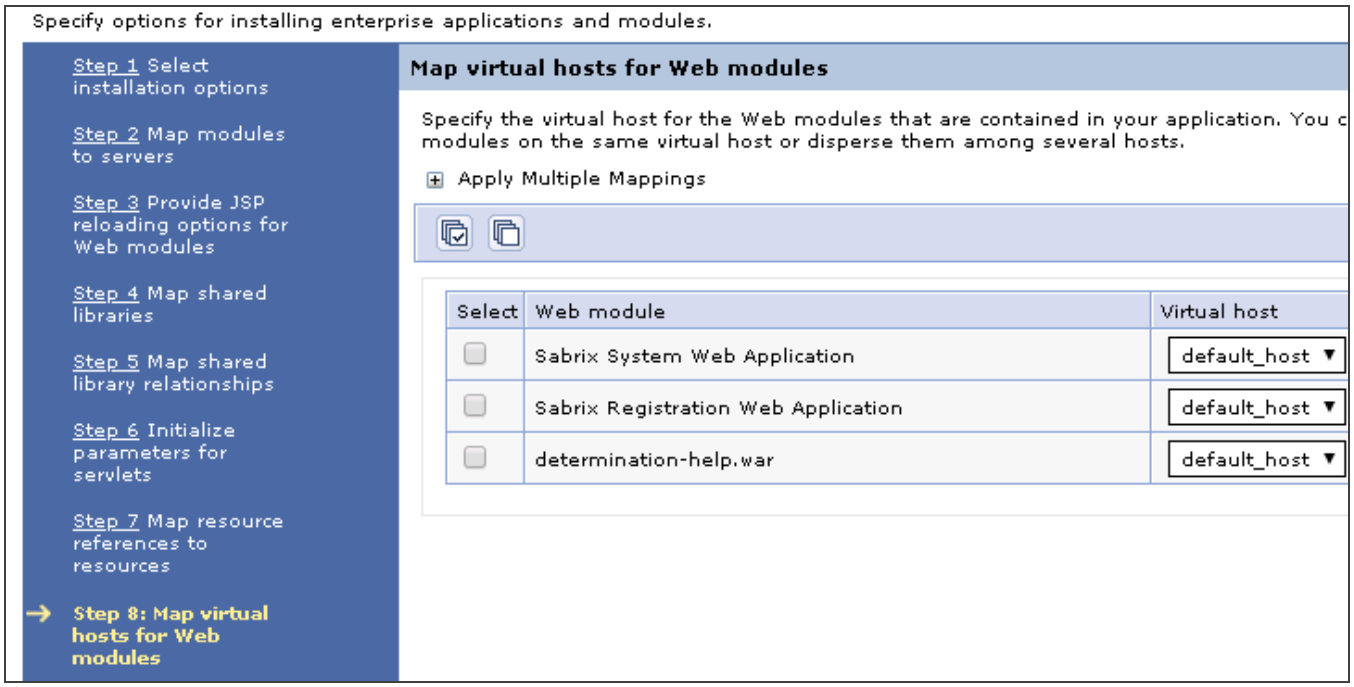
6. On **Step 6: Initialize parameters for servlets**, click **Next** to accept the defaults.



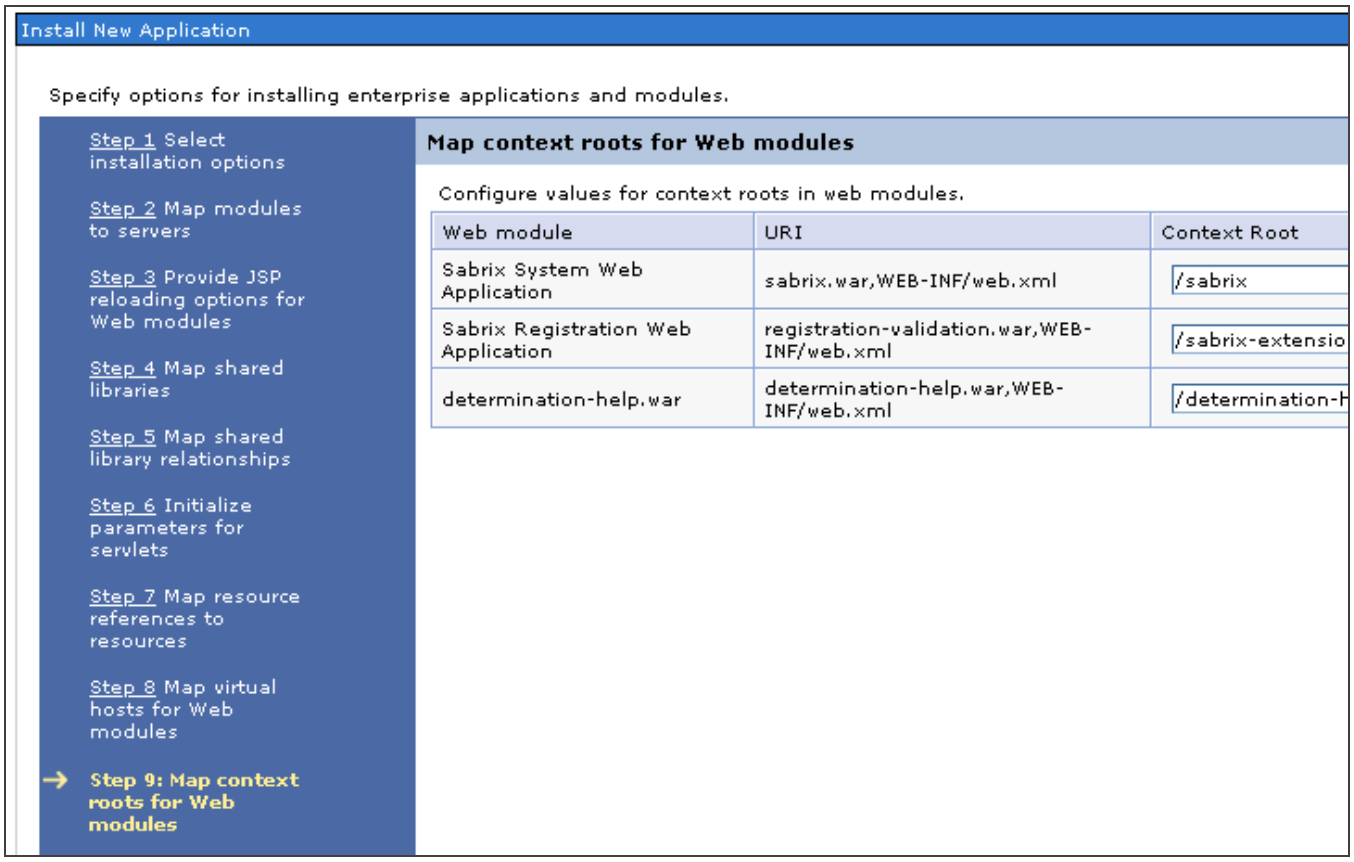
7. On **Step 7: Map resource references to resources**, click **Next** to accept the defaults.



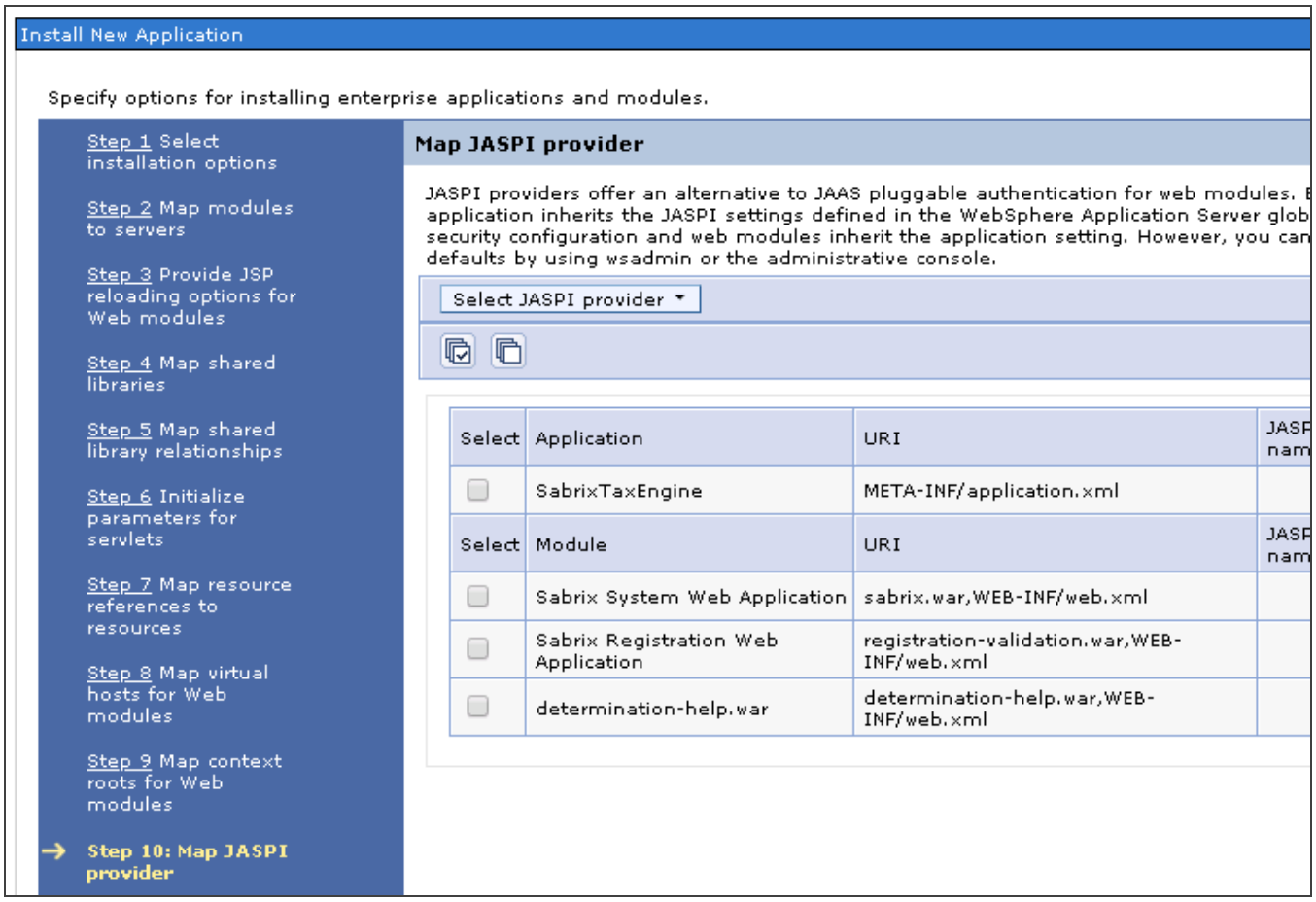
8. On **Step 8: Map virtual hosts for Web modules**, click **Next**, unless you want to specify the virtual host.



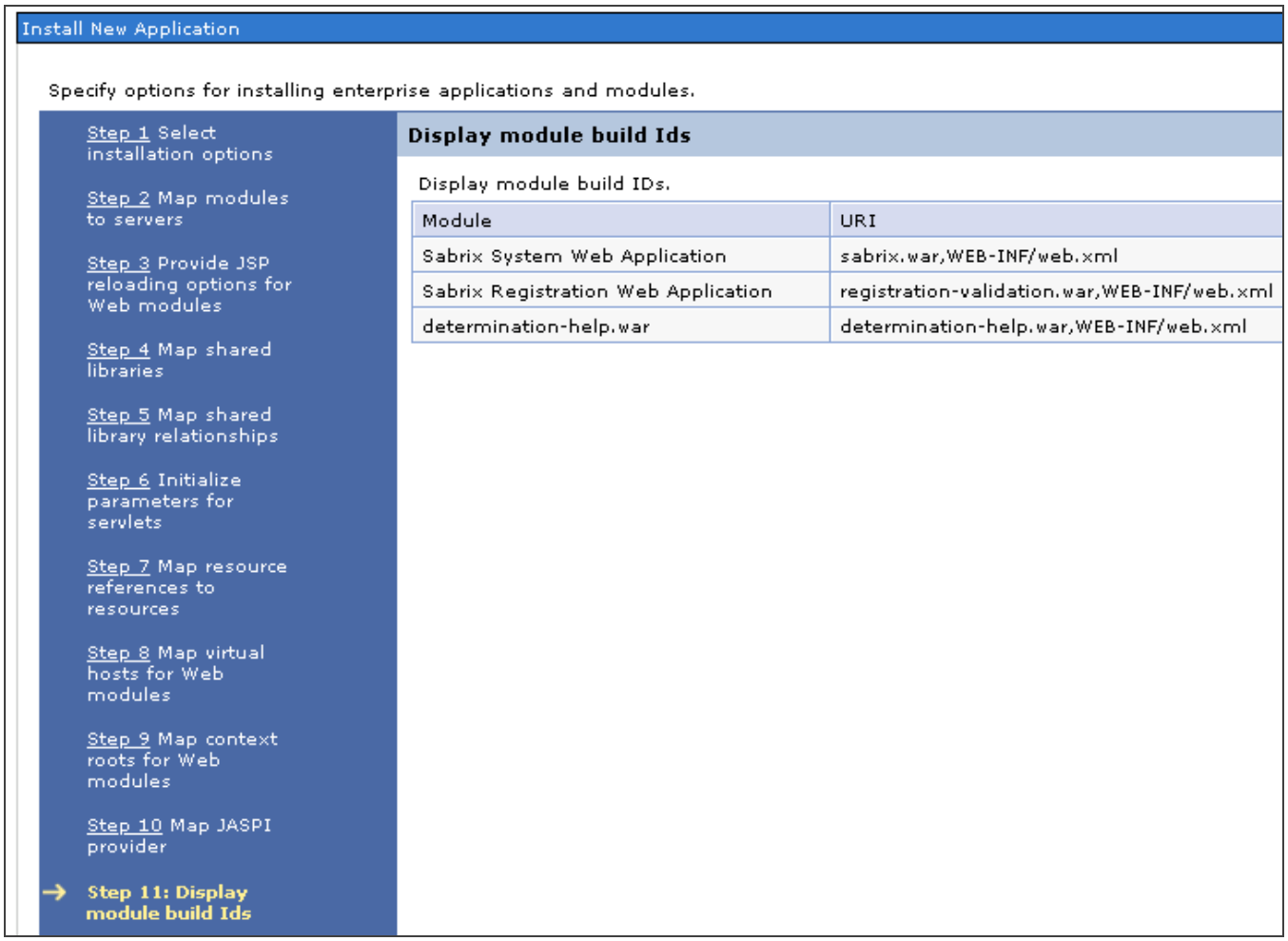
9. On **Step 9: Map context roots for Web modules**, click **Next** to accept the defaults.



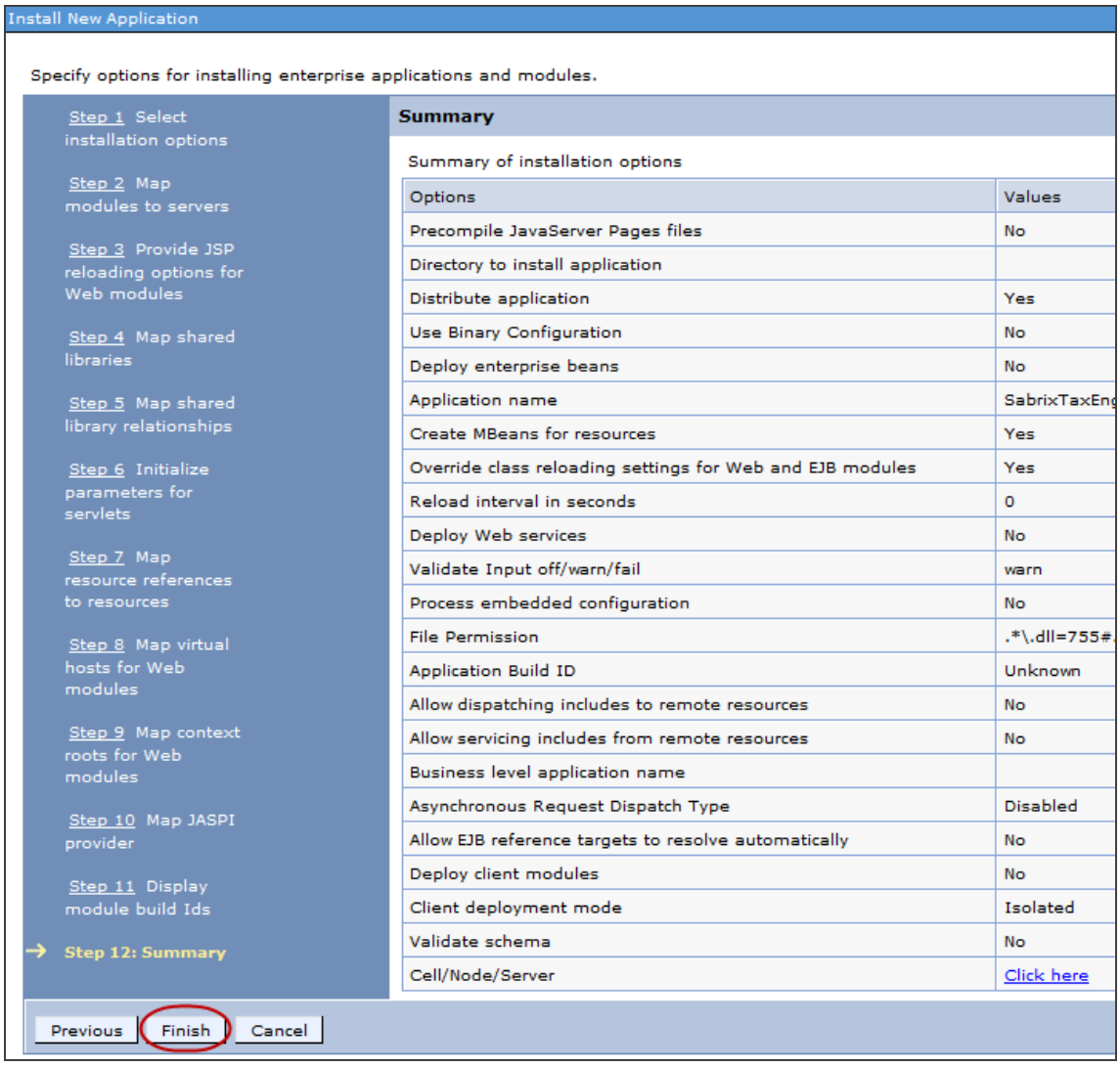
10. On **Step 10: Map JASPI provider**, click **Next** to accept the defaults.



11. On **Step 11: Display module build Ids**, click **Next**.



12. Review the summary, and if the values are not correct, return to the previous steps to make corrections; otherwise, click **Finish**.

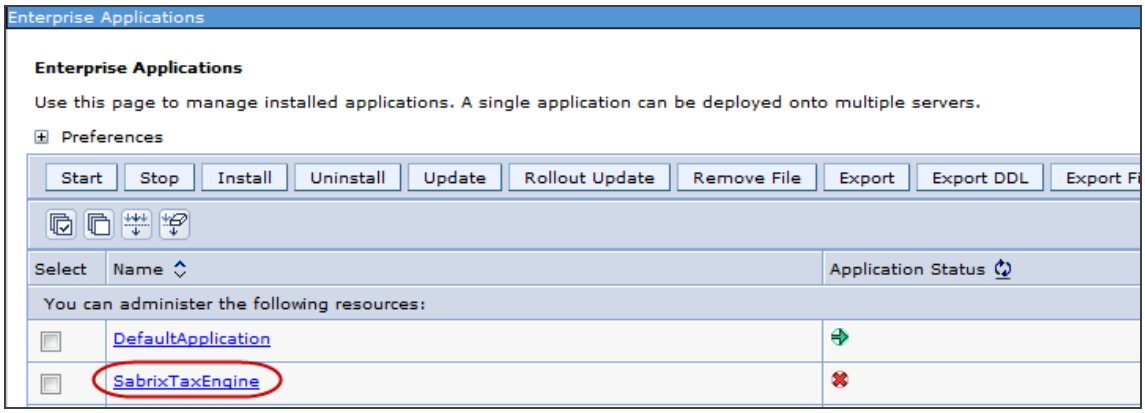


13. Once the deployment is finished, click **Save directly to the master configuration**.

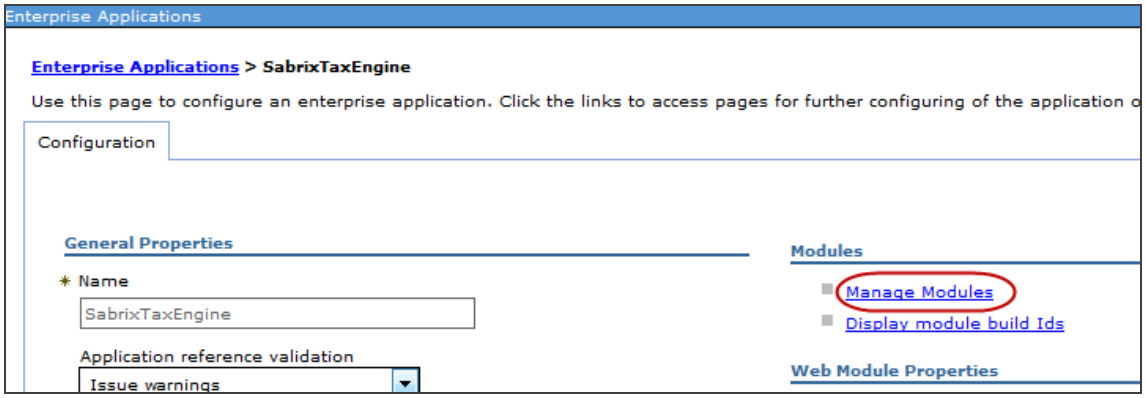
Configuring Class Loading

After the deployment, complete the following steps to set class loading.

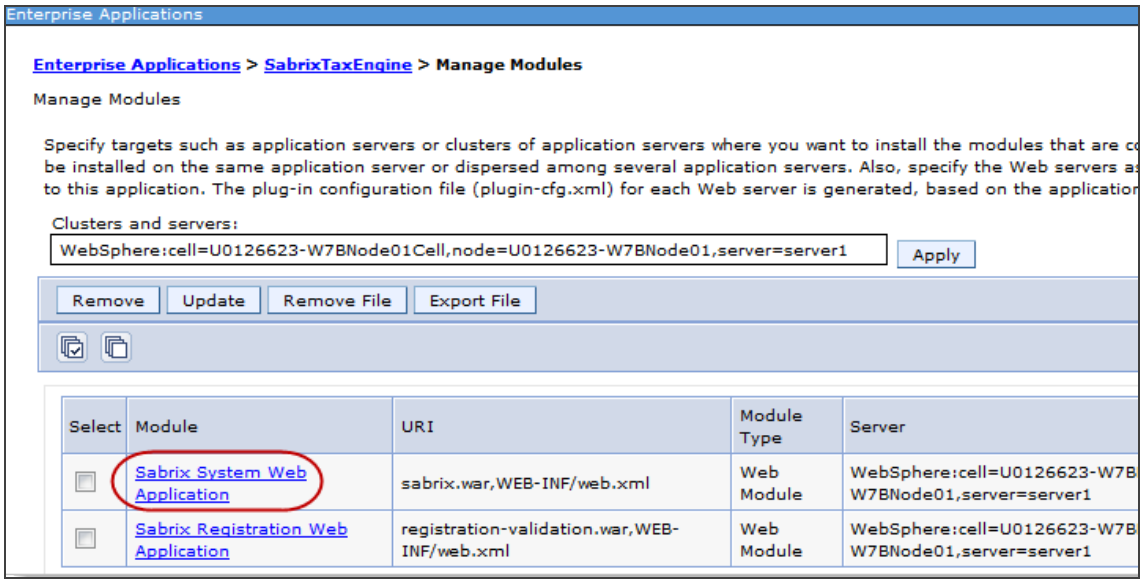
1. Go to **Applications > Application Types > WebSphere enterprise applications**.
2. Click **SabrixTaxEngine**.



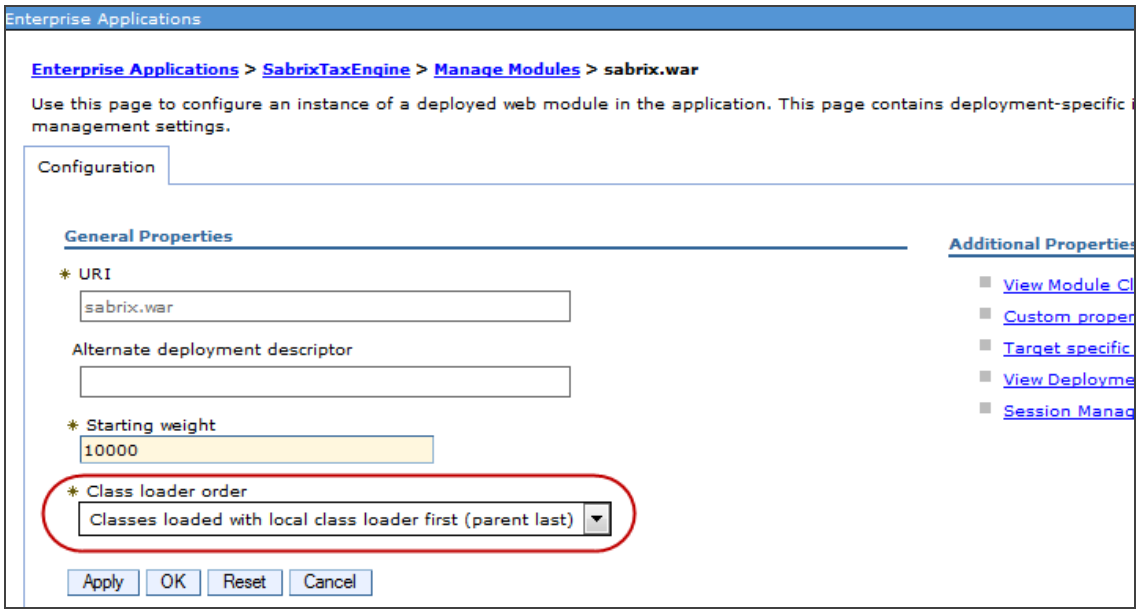
3. Click on **Manage Modules**.



4. Click **Sabrix System Web Application**.



5. Select the **Class loader order** value **Class loaded with local class loader first (parent last)**.

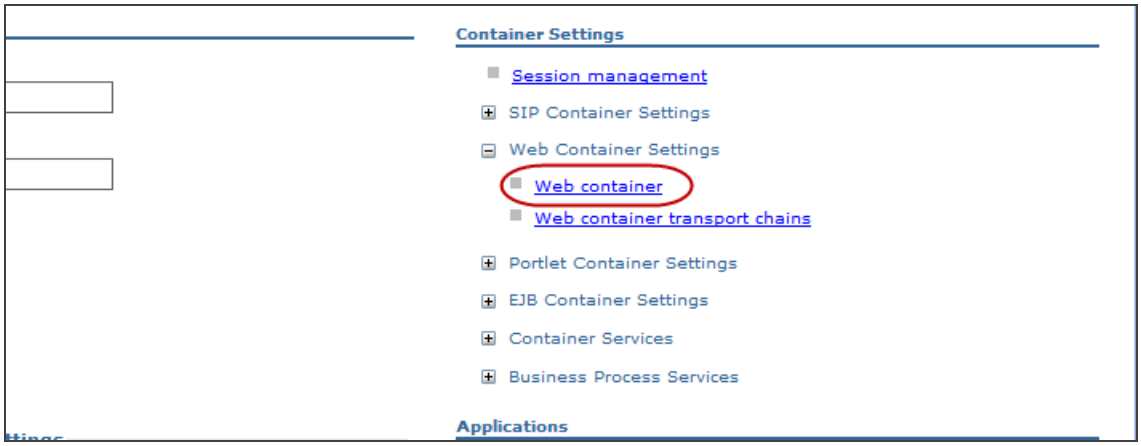


6. Click OK, and then click **Save directly to master configuration**.

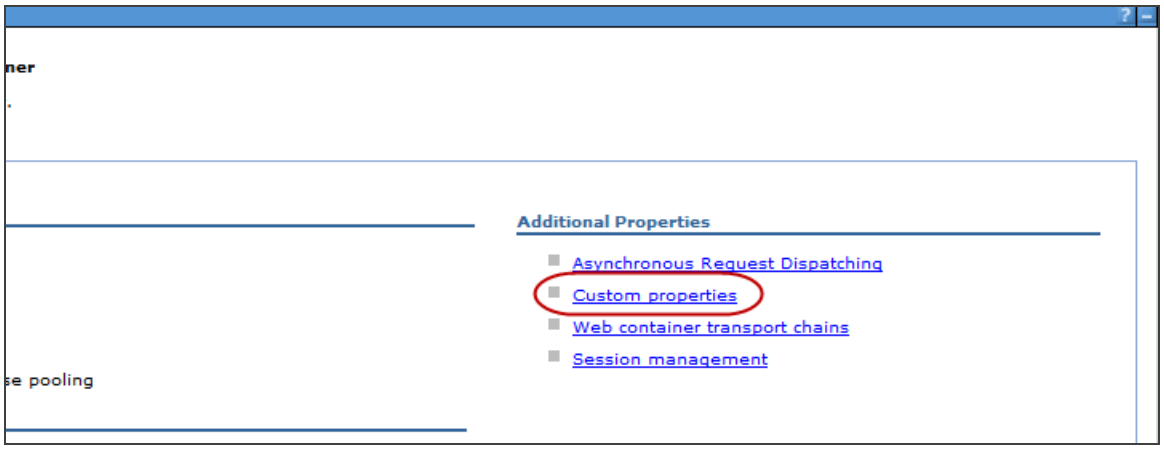
Setting a Custom Property

Complete the following to ensure the trailing forward slash is removed from your URL:

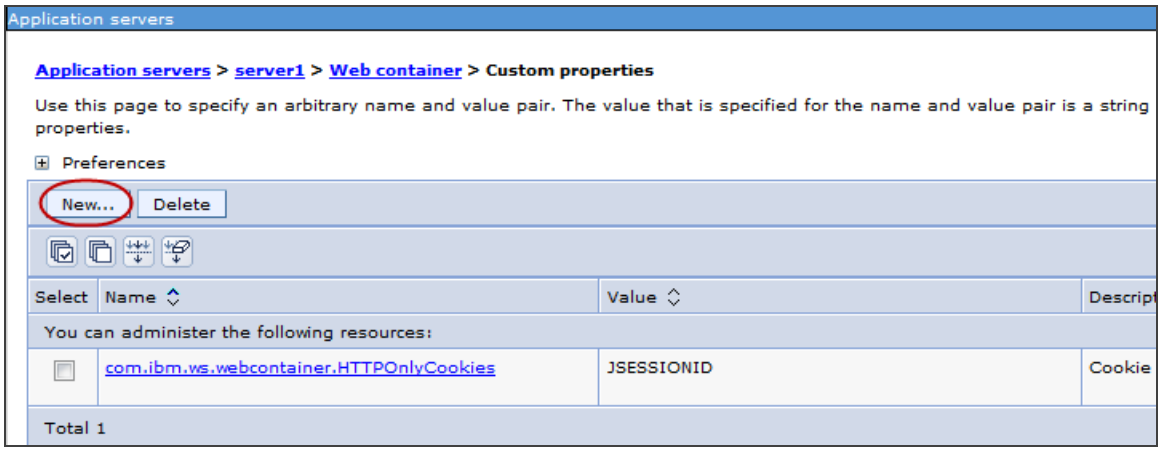
1. Go to **Servers > Server Types > WebSphere Application Servers**, and then click on the server (for example, **server1**).
2. Under **Container Settings**, expand **Web Container Settings**and then click **Web container**.



3. Select **Custom properties** under **Additional Properties**.

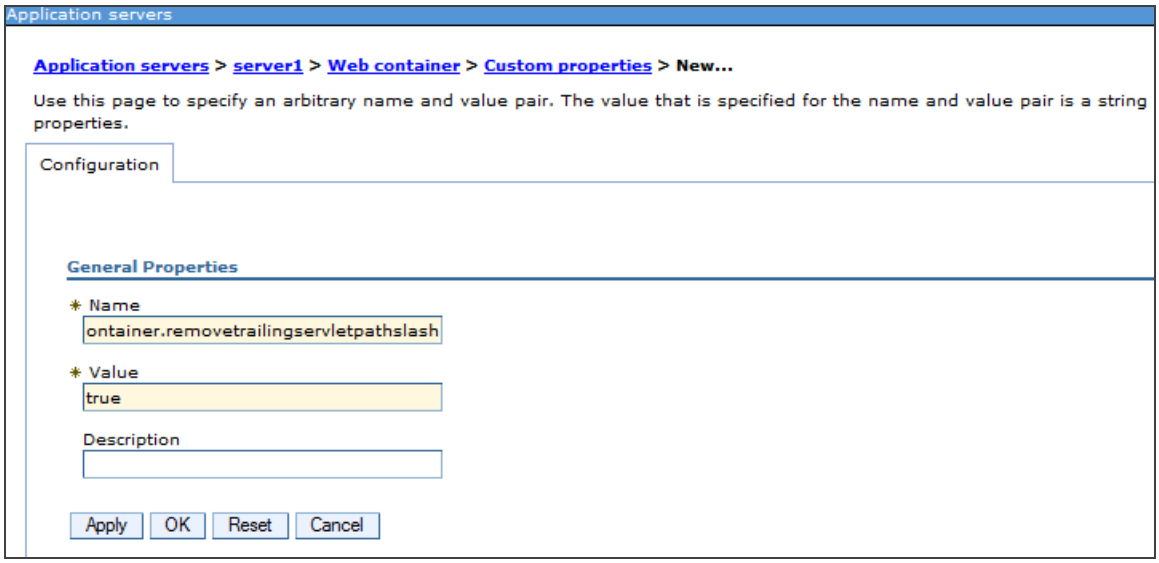


4. Click **New**.



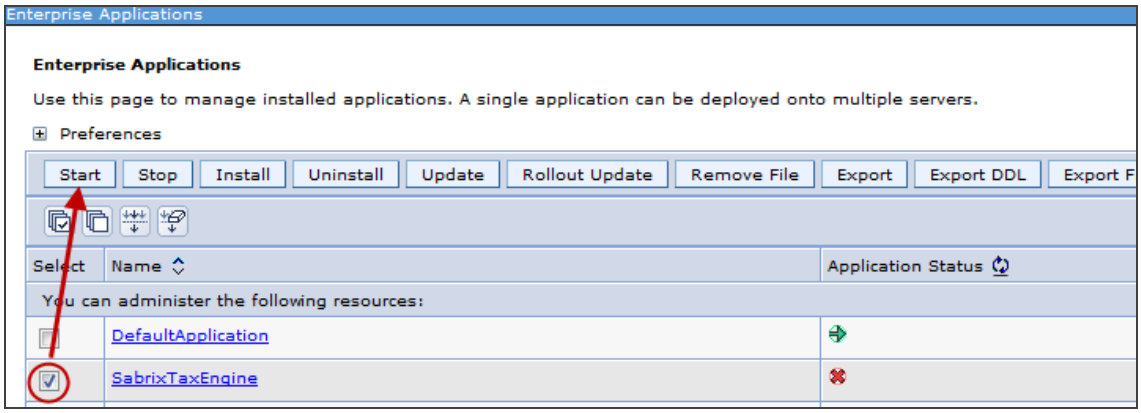
5. Enter the values listed in the table below:

NAME	VALUE
com.ibm.ws.webcontainer.removetrailingservletpathslash	true



6. Click OK, and then click **Save directly to master configuration**.

7. Return to **Applications > Application Types > WebSphere enterprise applications**, select **SabrixTaxEngine**, and then click **Start**.


Enterprise Applications
Enterprise Applications
Use this page to manage installed applications. A single application can be deployed onto multiple servers.
Preferences
Start
Stop
Install
Uninstall
Update
Rollout Update
Remove File
Export
Export DDL
Select
Name
Application Status
You can administer the following resources:
DefaultApplication
SabrixTaxEngine

DUPLICATE USERS

Determination does not support duplicate user name entries in the database. During the installation process, the installer checks for duplicate user names. When duplicate users are found, the installer appends "_DET5100x_ [Sequential Number]" to those entries. For example, two entries for SMITH become SMITH_DET5100x_1 and SMITH_DET5100x_2.

If found, the installer displays a list of duplicate user names and the new replacement names.

```
5 duplicate user names found. Renamed the inactive duplicate data. | User Name |
Renamed User Name | | BobSmith | BobSmith_DET5100x_1 | | BobSmith | BobSmith_
DET5100x_2 | | BobSmith | BobSmith_DET5100x_3 | | MaryClark | MaryClark_DET5100x_4
| | MaryClark | MaryClark_DET5100x_5|
```

If the installer cannot append a user name, the installation fails. Duplicate user names that cannot be resolved are left in the database and must be modified manually before completing the installation. A message similar to the following displays:

```
Aborting installation. 11 duplicate user names found with more than 60 characters
after appending DET5100x and maximum duplicate user count. Please remove or rename
these inactive duplicate user manually. | User Name | | MarkHam | |MarkHam |
|MarkHam | |MarkHam | |MarkHam | |MaryHart | |MaryHart | |MaryHart |
|TomSmith123456 | |TomSmith123456 | |TomSmith123456 |
```

RUNNING THE IMPLEMENTER

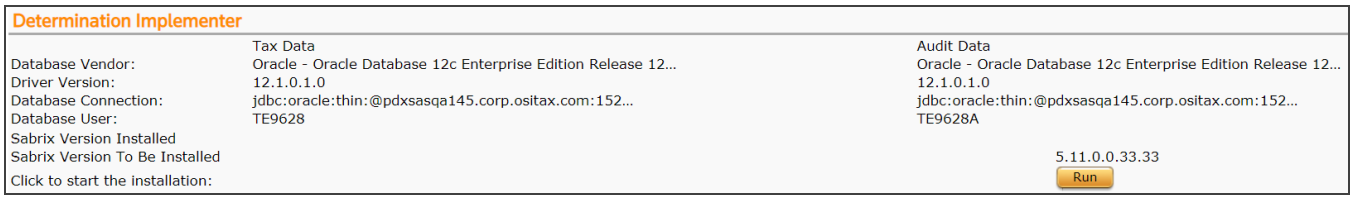
The Implementer is the installation program for Determination and is the process you run after configuring your application server.

> Set the Oracle parameter OPEN_CURSORS to 3000 to ensure the Determination installation completes successfully.

STARTING THE INSTALLATION

Open a browser and complete the following steps:

1. Go to the Determination installation URL (http://<host>:<port>/sabrix/install).
2. Enter the following user name and password: **dba/password**.
3. The Implementer page displays a summary of your environment.



4. Click **Run** to start the installation.

CHECKING THE INSTALLATION RESULTS

When the process runs, it records the results in your browser window and in a log file:

- **Browser Window**: You should see the following message at the end of the screen output: "Implementation completed successfully!" If you receive this message, you can continue with the remaining sections in this guide; however, if you see the following message, you should contact Customer Support: "Problem(s) encountered during implementation! Check the installation messages for more information."

- **Log File**: If you want more detailed information about installation messages, review the *sabrix.log* file. See "Log Files" in the *ONESOURCE Indirect Tax Determination User Guide* for instructions about finding the log.

If you review the log immediately after installing Determination, you can ignore any errors that appear from the beginning of the log until the entry that ends with "CleanUpRolesForCoreUsers." Any errors that appear after this log entry may be significant, and you should contact Customer Support.

INSTALLING TAX CONTENT

This is a two-step process that is composed of importing the content and associating that content with a Determination company.

IMPORTING CONTENT INTO DETERMINATION

You downloaded the Content file(s) at the beginning of this installation process. Now, you will import the files into Determination using the Import/Export feature.

Do not unzip your Content files. You will load these into Determination as zipped files.

1. Go to the Determination URL (http://<host>:<port>/sabrix/).
2. Enter the following user name and password: **dba/password**.

   To protect your system, be sure to change the password for the dba user once you have completed the initial installation. See Help for details about how to change the password.

3. Go to **Menu > System > Import/Export**.
4. Click the **Import** tab.
5. Browse to the directory containing the first downloaded file.
6. Enter the path and file name, or browse to it, and then click OK.
7. Click **Import**.
8. The **Import/Export Wizard** displays information about the file to be imported. Click **Next**.
9. Click **Next** on each page until the import starts.
10. Once the import has started, close this status window - even though the import is not finished. The import will continue, and you can go to the **History** tab periodically to check the status. Click **Refresh** on the **History** tab to update the display.

11. Repeat steps 3 through 9 for the other Tax Data Provider(s), as appropriate.

Once you install master Content, you will need to perform monthly Content updates to keep your data current. You can automate all or part of the update process. For more information, see the "Import/Export" topic in Help.

CREATING AND CONFIGURING A COMPANY

To use the new Content, you need to associate it with a company in the Determination software.

1. Log on to Determination as the dba user.
2. Go to **Menu > System > Companies**.
3. Select **Add** from the **Actions** menu to create a company.
4. On the **Edit** tab, enter basic company information, and then click **Submit**.
5. Click the **Tax Preferences** tab.
6. In the **Data Providers** section, select values for your **Tax Data Provider**, and then click **Submit**.

You now have a basic Determination company to use when you test the installation in the following section. Once you successfully complete the testing, you can make additional company configurations (see the Help topic "Working with Companies").

TESTING YOUR INSTALLATION

After installing Determination and creating a basic company, test the installation by creating a test transaction.

1. Log on to Determination as the **dba** user.
2. Select the company you previously created from the **Company** selector in the upper right corner of the page.
3. Select **Menu > Workbench**.
4. Enter scenario information for a test transaction on the **Main** tab of the workbench. For example, enter the following:
    - **Scenario**: 1
    - **Invoice Number**: 1
    - **Company Role**: Seller
    - **Currency**: United States Dollar
    - **Quantity**: 1
    - **Gross Amt**: 1000
5. Click the **Locations** tab.
6. Click **Ship From**, and then enter the following:
    - **Ship From Country**: US
    - **Ship From State**: WA
    - **Ship From County**: KING
    - **Ship From City**: SEATTLE
    - **Ship From Zip**: 98101
7. Click **Ship To**, and then enter the following:
    - **Ship To Country**: US
    - **Ship To State**: CA

- **Ship To County**: ALAMEDA
- **Ship To City**: OAKLAND
- **Ship To Zip**: 94601

8. Click **Submit**. You should see an effective rate and tax amount for your transaction. Click **Results** to review the processing of the invoice including tax breakdowns per jurisdiction.
9. Select **Input XML** or **Output XML** from the **Actions** menu to view the XML that was sent to and returned by the Determination software. These tools can be helpful if you need to debug the integration software that connects your financial system with Determination. See the *Programmer Guide* for more details.

CLUSTERING

Skip this section if you are not installing in a clustered environment.

Starting from Determination version 5.12.3.8, we recommend using Time Eviction Caching (Section below) instead of Clustering.

Due to upgrade of libraries in version 5.12.3.8, caching features are not supported.

- In the Running Implementer section above, when Run button is clicked installer will not complete. As a work around, remove the node from cluster and then run the installer. After installer is complete, move node back to cluster.
- In System > Diagnostics > Cache View, caching entities are not displayed, and cache cannot be reset using the Reset Cache button. In case of any cache corruption please do the rolling restart of all nodes.

Determination supports TCP and UDP cluster communication to establish initial cluster membership, as well as to keep membership information current. Review the following sections to set up clustering:

Prerequisites (page 73)

Determination Parameters (page 74)

Properties File (page 75)

Cluster XML File (page 79)

Cluster Test (page 80)

PREREQUISITES

Review the following before you begin configuring the cluster.

- **Tax Content**: Make sure your tax content is loaded into Determination before you set up the cluster.
- **JDBC URLs**: All cluster members must have identical JDBC URLs. For example, although the following two URLs point to the same host and database, clustering would not work because one JDBC URL uses the IP address and the other uses the fully qualified domain name for the host of the database:

  jdbc:oracle:thin:@pdxsasdv062.corp.acme.com:1521/service

  jdbc:oracle:thin:@10.198.221.48:1521/service

- **Internet Protocol Versions**: Some application servers default to the IPv6 stack while others use the IPv4 stack. When you enter IP addresses during the cluster configuration, be sure to adhere to the format appropriate for the internet protocol version. If your cluster involves communication between an IPv4 and an IPv6 node, set the following property in the start-up file of the application server:

```
-Djava.net.preferIPv4Stack=true
```

- **Firewalls**: Make sure firewalls are not blocking communications between Determination nodes.
- **Multicast**: If you are using multicast, confirm that the Determination nodes are on the same subnet, and that the network allows multicast packets to be transmitted.
- **Multihomed Host**: If there is a multihomed Ethernet configuration, force the use of a particular IP by setting the **jgroups.bind_address** system property to the appropriate NIC IP address. For example if the desired interface has an IP of 10.198.221.48, set the following Java system variable: -Djgroups.bind_address=10.198.221.48.

You can set **jgroups.bind_address** where the JVM parameters are set. Here is a configuration file example:

```
-Xms4096m -Xmx4096m -Djava.awt.headless=true -Djgroups.bind_address=10.198.221.48
```

DETERMINATION PARAMETERS

Clustering requires certain parameters in Determination.

1. Log on to Determination.
2. Go to **Menu > System > Configuration**.
3. Click **Actions > Add**.
4. Enter the parameters and values according to the table below.
5. Click **Submit**.

PARAMETER	VALUE	DESCRIPTION
ENABLE_SERVER_↵COMMUNICATION	Y	This parameter is required to enable all types of clustering.

PARAMETER	VALUE	DESCRIPTION
CLUSTER_CHANNEL_PROPERTIES_FILE	udp-cluster.xml or tcp-tcpping-cluster.xml	This parameter is not allowed if you are using UDP with default ports and IP addresses. If you are using UDP with non-default settings, insert the value **udp-cluster.xml**. If you are using TCP, insert the value **tcp-tcpping-cluster.xml**. This parameter must match the parameter *determination.infinispan.jgroups.configuration_file* in the *determination_application_overrides.properties* file. See Properties File (page 75).
SABRIX_MASTER_NODE		If this parameter exists, remove it to set up clustering.
MULTICAST_ADDRESS		If this parameter exists, remove it to set up clustering.
MULTICAST_PORT		If this parameter exists, remove it to set up clustering.

PROPERTIES FILE

Determination requires a properties file for clustering, and the contents of the file depends on whether you are using UDP or TCP. Based on your network environment, follow the steps in one of the next three sections:

UDP Multicast with Default Settings

This section explains how to set up UDP multicast with the following defaults:

- Multicast Address = 224.0.0.1
- Multicast Port = 5665

If you have multiple clusters of Determination on the same subnet (for example, Production, UDP .

Complete the following:

1. Stop WebSphere.
2. Create a new directory in WebSphere:

   <WebSphereBaseDirectory>/AppServer/lib/ext

3. In the new directory, create a new file called *determination_application_overrides.properties* in the new directory, and then insert the following lines:

```
determination.infinispan.cache.configuration=infinispan.xml
determination.infinispan.jgroups.cluster_name=ClusterName
```

4. Replace **ClusterName** in the second line of the snippet with a unique name for your cache cluster.

   Be sure to use the same cluster name in the *determination_application_overrides.properties* file on each node, and do not include any spaces in your cluster name.

5. Save and close the file *determination_application_overrides.properties*.
6. Restart WebSphere.
7. Repeat these steps on each WebSphere node.

   To simplify the process, you can copy the file *determination_application_overrides.properties* to each node.

8. Skip to Cluster Test (page 80)

UDP Multicast with Non-Default IP and Port Number

This configuration changes the default UDP multicast address and port in cases when default values are not appropriate.

Ensure that you created the Determination parameter CLUSTER_CHANNEL_PROPERTIES_FILE before completing these steps. See Determination Parameters (page 74).

Complete the following:

1. Stop WebSphere.
2. Create a new directory in WebSphere:

   <WebSphereBaseDirectory>/AppServer/lib/ext

3. In the new directory, create a file called *determination_application_overrides.properties* in the new directory, and then insert the following lines:

```
1   determination.infinispan.cache.configuration=infinispan.xml
2   determination.infinispan.jgroups.cluster_name=ClusterName
3   determination.infinispan.jgroups.configuration_file=udp-clus
    ter.xml
4   determination.infinispan.jgroups.udp.mcast_addr=224.1.2.3
5   determination.infinispan.jgroups.udp.mcast_port=16655
```

4. Replace **ClusterName** in the second line of the snippet with a unique name for your cache cluster.

   Be sure to use the same cluster name in the *determination_application_overrides.properties* file on each node and do not include any spaces in your cluster name.

5. Change the numbers for **mcast_addr** and **mcast_port** to match your multicast address and port. Be sure to use valid ranges (Addr: 224.0.1.0 to 238.255.255.255).
6. Save and close the file *determination_application_overrides.properties*.
7. Repeat these steps on each WebSphere node.

   To simplify the process, you can copy the file *determination_application_overrides.properties* to each node.

8. Skip to Cluster XML File (page 79).

TCP Transport with Static List of Nodes (TCPPING)

In this configuration, a static list of cluster member addresses is set on each node so each member knows where the other cluster members are located.

Ensure that you created the Determination parameter CLUSTER_CHANNEL_PROPERTIES_FILE before completing these steps. See Determination Parameters (page 74).

Complete the following:

1. Stop WebSphere.
2. Create a new directory in WebSphere:

   <WebSphereBaseDirectory>/AppServer/lib/ext

3. In the new directory, create a file called *determination_application_overrides.properties* in the new directory, and then insert the following lines:

```
1   determination.infinispan.cache.configuration=infinispan.xml
2   determination.infinispan.jgroups.cluster_name=ClusterName
3   determination.infinispan.jgroups.configuration_file=tcp-tcppi
    ng-cluster.xml
4   determination.infinispan.jgroups.tcp.address=10.198.221.48
5   determination.infinispan.jgroups.tcpping.initial_hosts=10.198
    .221.50[7800],10.198.221.48[7800]
6   determination.infinispan.jgroups.tcp.port=7800
```

4. Replace **ClusterName** in the second line of the snippet with a unique name for your cache cluster.

   Be sure to use the same cluster name in the *determination_application_overrides.properties* file on each node and do not include any spaces in your cluster name.

5. Set **tcp.address** to match the node's IP address.
6. Set **tcpping.initial_hosts** to list the addresses of all nodes in the cluster. The value of **tcpping.initial_hosts** is the same on each node, but **tcp.address** is unique for each node.

   [7800] refers to the port on which each cluster instance will start the initial membership lookup. If necessary, you can change the port ranges by editing *tcp-tcpping-cluster.xml* (see Cluster XML File (page 79)). Change the two values of 7800 specified in the file to some other valid and available port to complete this change.

7. To change the default port from 7800, set **tcp.port** to the new port value.

   If you use the default port of 7800, do not include this entry in the properties file.

   If you specify the **tcp.port** property, the port number used for this property should match the port number used in the **tcpping.initial_hosts** property.

8. Save and close the file *determination_application_overrides.properties*.

9. Repeat the process for all nodes in the cluster, making all specified values identical except **tcp.address** which should be unique per node.

In this configuration, when a new cluster member is introduced or an existing one is removed, the list must be updated on each node. An update requires cluster nodes to be restarted so new changes are picked up. You add to the list or subtract from the list by adding or removing additional IP addresses in *determination_application_overrides.properties* at this line:

```
1    determination.infinispan.jgroups.tcpping.initial_hosts=
     10.198.221.50[7800],10.198.221.48[7800]
```

CLUSTER XML FILE

This step does not apply to UDP clusters that use default ports and IP addresses.

Complete the following to set up the cluster XML file:

1. Go to the *clustering* directory where you unzipped the *ONESOURCEIDTDetermination512xx.zip* (see Download the Software (page 6)).
2. Use the table below to determine which XML file from the *clustering* directory is appropriate for your environment.

FILE NAME	CLUSTER TYPE
udp-cluster.xml	UDP This is only for UDP clusters that use custom ports and IP addresses.
tcp-tcpping-cluster.xml	TCP

3. Copy the appropriate XML file to the same directory as *determination_application_overrides.properties*.

   <WebSphereBaseDirectory>/AppServer/lib/ext

4. Restart WebSphere.
5. Repeat these steps on each WebSphere node.

CLUSTER TEST

Complete the following tests to confirm that clustering is configured correctly.

If the tests fail, please double-check your settings before contacting Customer Support.

Verify that cluster members can send and receive messages:

1. After all cluster nodes are started, log on to Determination on one node and go to **Menu > System > Diagnostics > Cluster View**. The page should list all nodes in the cluster.
2. Click **Actions > Send Test Message**.
3. Log on to each of the other cluster members and go to **Menu > System > Diagnostics > Cluster View**. Confirm that each node received the message (you may need to click **Actions > Refresh**).
4. Repeat these steps from each node to ensure each node can send and receive messages.

Skip this below section for versions starting from 5.12.3.8.

Verify that resetting the cache on one node resets all caches in the cluster:

1. Populate the Determination cache by clicking **Menu > System > Companies** on each node.
2. On each of the cluster nodes, go to **Menu > System > Diagnostics > Cache View**.
3. Enter **ALL** in the **Table Name or 'ALL'** field then click **Search**. The cache content is displayed on each node.
4. On any cluster node, click **Actions > Reset Cache**, and then perform another search for **ALL** on the other nodes. If you have not accessed any other pages, the list should be empty (no entity has been cached).

TIME EVICTION CACHE

Complete the following:

1. Stop WebSphere.
2. Create a new directory in WebSphere:

   <WebSphereBaseDirectory>/AppServer/lib/ext

3. Go to the clustering directory where you unzipped *512xx* (see Download the Software (page 6)).
4. Copy the *infinispan-timed-cache.xml* file to the directory - <WebSphereBaseDirectory>/AppServer/lib/ext

   The **expiration lifespan="600000"** value determines the cache retention time in *milliseconds*. Change this value as per appropriate time that caching needs to be retained.

5. In the new directory, create a file called *determination_application_overrides.properties*, and then insert the following lines:

   ```
   determination.infinispan.cache.configuration=infinispan-timed-cache.xml
   ```

6. Save and close the file *determination_application_overrides.properties*.
7. Restart WebSphere.
8. Repeat these steps on each WebSphere node.

PERFORMING ADDITIONAL CONFIGURATIONS

Once you verify that ONESOURCE Indirect Tax Determination is running, you may need to complete some post-installation tasks:

- Connecting your Determination instance to your business source system using integration software. Contact your implementation partner for assistance.
- Securing your Determination installation. See the Determination Help topic "Security Measures."
- Modifying Configuration parameters to reflect your hardware, network, and security environment. You can also modify those parameters that affect auditing, tax calculations, and reporting. See the Help topic "Configuration."
- Setting up users to access Determination. This might include tax professionals, tax clerks, and Determination administrators. See the Help topic "Edit Users."
- Completing the Company configuration you began in the section "Creating and Configuring a Determination Company." See the Help topic "Working With Companies."
- Installing and configuring ONESOURCE Indirect Tax Reporting. See the Help topic "Running Reports."