ONESOURCE INDIRECT TAX DETERMINATION

INSTALLATION GUIDE

MICROSOFT SQL SERVER AND JBOSS

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	July 2020	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 Corretto entry.
4	September 9, 2022	Time Eviction Cache support.

TABLE OF CONTENTS

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 line
     numbers are included! */
```

PREREQUISITES

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

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	
Name of Server hosting Microsoft SQL Server, database port number, and instance name (if applicable)	SQL Server DBA	
Administration credentials for Microsoft SQL Server (SA access)	SQL Server DBA	
Name of server hosting JBoss and the port for the Determination software (used to build the URL 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 Microsoft SQL Server. Once you have confirmed that you are using the correct database version, review the following:

DOWNLOADING THE MICROSOFT JDBC DRIVER FOR SQL SERVER

The Microsoft JDBC Driver for SQL Server is used to enable communication with the Microsoft SQL Server database. The Determination software requires *mssql-jdbc-7.0.0.jre10.jar* from Microsoft SQL Server JDBC Driver 7.0.

The driver, along with supporting XA files, is available from Microsoft:

1. Open a browser and go to the Microsoft web site.
2. Enter in the search field **Microsoft SQL Server JDBC Driver 7.0**.
3. Select the article containing the JDBC download.
4. Click **Download**.
5. Save the driver to a temporary location on your hard drive.
6. Run the installation executable you downloaded to extract a copy of *mssql-jdbc-7.0.0.jre10.jar*.
7. Make a note of the location of *mssql-jdbc-7.0.0.jre10.jar* because you will use this later during the installation.

PREPARING SQL SERVER FOR XA TRANSACTIONS

Complete the following steps to ensure that your Determination installation handles XA transactions:

Distributed Transaction Coordinator

Follow the steps below to enable XA transactions in the Distributed Transaction Coordinator:

1. In Microsoft Windows, go to **Control Panel > System and Security > Administrative Tools**.
2. Double-click **Component Services**.

3. In the left pane, expand the nodes as follows: **Component Services > Computers > My Computer > Distributed Transaction Coordinator**.
4. Right-click **Local DTC** under **Distributed Transaction Coordinator**, and then select **Properties**.
5. Click the **Security** tab on the **Local DTC Properties** window.
6. Select the **Enable XA Transactions** check box, and then click OK.
7. Click **Yes** to restart the MSDTC service, and then click OK to confirm the restart.
8. Close **Component Services**.
9. Restart SQL Server to ensure that it synchronizes with the MSDTC changes.

Library File

The file *sqljdbc_xa.dll* needs to be in your SQL Server directory structure. Before continuing to the following steps, ensure that you completed Downloading the Microsoft JDBC Driver for SQL Server (page 7).

1. Return to the extracted directory structure for the Microsoft JDBC Driver. Depending on your environment, go to one of the following:
   - **64-Bit**: *<extract_directory>\Microsoft JDBC Driver 7.0 for SQL Server\mssql-jdbc-7.0.0.jre10.jar\enu\xa\x64*
   - **32-Bit**: *<extract_directory>\Microsoft JDBC Driver 7.0 for SQL Server\mssql-jdbc-7.0.0.jre10.jar\enu\xa\x86*
2. Copy *sqljdbc_xa.dll* into the SQL Server installation location: *Microsoft SQL Server\<SQLServerInstanceBaseDirectory>\MSSQL\Binn*.

SQL Server XA Script

Go to the following directory where you extracted the JDBC driver:*<extract_directory>\Microsoft JDBC Driver 7.0 for SQL Server\mssql-jdbc-7.0.0.jre10.jar\enu\xa*.

Complete the following:

1. Execute the database script *xa_install.sql*.
2. Restart SQL Server after the script finishes.

DATABASE CREATION

The database must be configured to use Mixed Mode Authentication. The scripts described in the following section will fail if you have not set up Mixed Mode Authentication.

To create the required databases and database users as shown here:

1. Log on to the system hosting SQL Server.
2. Browse to and double-click on the *createSQLServerDatabases.bat* file you downloaded earlier.
3. Follow the prompts to enter the following information:

PROMPT	DESCRIPTION	VALUE
Enter the name or IP address of the server hosting SQL Server:	The name of the system hosting SQL Server.	
Enter the SQL Server instance name (leave blank for a default instance):	The instance name.	
Use WINDOWS authentication during database creation [N]?	If you enter **y**, Windows authentication is used during database creation, and you skip the following two prompts. If you enter **n** (default), you will need to enter a username and password of a user with database creation permissions.	
Enter the name of the user with System Administrator privileges that will create the databases [sa]:	A user with sufficient permissions to create databases (the sysadmin or dbcreate roles). The default is **sa**.	
Enter the password for that user [sa]:	The password of the user specified above.	

PROMPT	DESCRIPTION	VALUE
Enter the path to your preferred SQL Server datafile directory:	The full directory path to the datafile directory.  If the directory does not exist, an error message will appear. Either create the directory and try again, or enter a different path name and try again.	
Enter the name of the SQL Server tax database to be created [SBXTAX]:	A name for the Tax database. The default is SBXTAX.	
Enter the name of the LOGIN user to associate with this database [sbxtax]:	A name for the login user associated with the database.	
Enter the name of the user to associate with this database [sbxtax]:	The user that will be granted permissions on the Tax database.	
Enter the database password for this user in the tax database [sbxtax]:	A password for the Tax database user.	
Enter the name of the SQL Server audit database to be created [sbxaud]:	A name for the Audit database. The default is SBXAUD.  We do not recommend that you use the same name as your tax database; however, if you do, a single database to hold both Tax and Audit data is created.	
Enter the name of the LOGIN user to associate with this database [sbxaud]:	A name for the login user associated with the database.	

PROMPT	DESCRIPTION	VALUE
Enter the name of the user to associate with this database [sbxaud]:	The user that will be granted permissions on the Audit database.	
Enter the database password for this user in the audit database [sbxaud]:	A password for the Audit database user.	

4. Messages appear as the databases are created. Press ENTER when the scripts complete.

CONFIGURING JBOSS ENTERPRISE EDITION

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

Be sure you installed JBoss according to their instructions, and confirm that your JAVA_HOME operating system environment variable is pointing to the Java installation directory.

The following instructions are for a standalone installation of JBoss Enterprise. If you have a domain, please consult your JBoss documentation.

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

MODIFYING THE START-UP PARAMETERS

Locate *standalone.conf* (Unix) or *standalone.conf.bat* (Microsoft Windows) in the *bin* directory of your <*JBossHomeDirectory*>, and then open it in a text editor. The table below contains options and values in the file that you will change or add. See the examples for your operating system below.

JAVA OPTION	VALUE	DESCRIPTION
-Xms	2048m	Increase this starting value to at least this amount.  We recommend allocating at least 6144m.
-Xmx	2048m	Increase this maximum value to at least this amount.  We recommend allocating at least 6144m.
-DBASE_SABRIX_ DIRECTORY=	Directory path for logging	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. If you are only running one instance of the application server, you can skip this and set the parameter on the Configuration page of Determination (see the Help for further details). Insert this following the other options, and then replace <LoggingDirectory> with a directory path from your environment. **UNIX**: JAVA_OPTS="$JAVA_OPTS -DBASE_SABRIX _DIRECTORY=<LoggingDirectory>" **MICROSOFT WINDOWS**: set "JAVA_OPTS=%JAVA_OPTS% -DBASE_SABRIX_ DIRECTORY=<LoggingDirectory>"  If you are using Microsoft Windows, use escape characters for the directory backslashes (for example, "*c:**temp*\\").

Unix Example

Locate the section in *standalone.conf* that begins with the following:

```
1    if [ "x$JAVA_OPTS" = "x" ]; then
```

Change or add the values in bold text below. This example is for the Java HotSpot VM.

```
1    if [ "x$JAVA_OPTS" = "x" ]; then
2       JAVA_OPTS="-Xms2048m -Xmx2048m -Djava.net
        .preferIPv4Stack=true"
3       JAVA_OPTS="$JAVA_OPTS -Djboss.modules.system.pkgs=$JBOSS_MODUL
        ES_SYSTEM_PKGS -Djava.awt.headless=true"
4       JAVA_OPTS="$JAVA_OPTS -Djboss.modules.policy-permissions=true"
5    else
```

Microsoft Windows Example

Locate the section in *standalone.conf.bat* that begins with the following:

```
1    rem # JVM memory allocation pool parameters - modify as
     appropriate.
```

Using the table of Java options as a guide, insert your values into the section shown below. This example is for the Java HotSpot VM.

```
1    rem # JVM memory allocation pool parameters - modify as
     appropriate.
2    set "JAVA_OPTS=-Xms2048m -Xmx2048m"
```

CREATING DATA SOURCES

Locate the file *standalone.xml* in the *configuration* directory under standalone, and then open it in a text editor. Follow the steps below for your type of Microsoft SQL Server instance:

- Named Instance (page 15)
- Default Instance (page 18)

Named Instance

You need to insert our data source snippet into *standalone.xml*. The snippet sections appear below, but you should open a text version that is available from the Knowledge Base:

1. Go to the following: ONESOURCE Customer Center.
2. Open the file *jboss-sqlserver-named-xa-ds_example.txt*.

Insert the entire data source snippet between the <datasources> elements in *standalone.xml*. Follow the steps in the sections below for editing values in the snippet.

Tax Data Source: Change the values in the snippet that correspond to the elements in the table below. The sample snippet that follows the table has bold entries highlighting the values to change.

TAX DATA SOURCE (JDBC/TAXDATASOURCE)	
Element	**Description**
<driver>**jdbc**</driver>	Replace **jdbc** with the name of the JDBC driver (for example, *mssql-jdbc-7.0.0.jre10.jar*).
<xa-datasource-property name="InstanceName"> **instance name**</xa-datasource-property>	Replace **instance name** with the name of the SQL Server instance.
<xa-datasource-property name="User"> **user name**</xa-datasource-property>	Replace **user name** with the Tax database user name.
<xa-datasource-property name="Password"> **password**</xa-datasource-property>	Replace **password** with the password for the Tax database user.

```
1    <xa-datasource jndi-name="java:/jdbc/TaxDataSource" pool-name="Ta
     xDataSourceDS" enabled="true" use-java-context="true">
2       <driver>jdbc</driver>
3       <xa-datasource-class>
4          com.microsoft.sqlserver.jdbc.SQLServerXADataSource
5       </xa-datasource-class>
6       <xa-datasource-property name="InstanceName">
7          instance name
8       </xa-datasource-property>
9       <xa-datasource-property name="User">
10         user name
11      </xa-datasource-property>
12      <xa-datasource-property name="Password">
13         password
14      </xa-datasource-property>
15      <xa-pool>
16         <min-pool-size>16</min-pool-size>
           <max-pool-size>64</max-pool-size>
           <is-same-rm-override>false</is-same-rm-override>
           <no-tx-separate-pools>true</no-tx-separate-pools>
17      </xa-pool>
18      <validation>
19         <valid-connection-checker class-name="org.jboss.jca.adapte
           rs.jdbc.extensions.mssql.MSSQLValidConnectionChecker" />
20      </validation>
21   </xa-datasource>
```

Audit Data Source: Change the values in the snippet that correspond to the elements in the table below. The sample snippet that follows the table has bold entries highlighting the values to change.

AUDIT DATA SOURCE (JDBC/AUDITDATASOURCE)	
Element	**Description**
<driver>**jdbc**</driver>	Replace **jdbc** with the name of the JDBC driver (for example, *mssql-jdbc-7.0.0.jre10.jar*).
<xa-datasource-property name="InstanceName"> **instance name**</xa-datasource-property>	Replace **instance name** with the name of the SQL Server instance.
<xa-datasource-property name="User"> **user name**</xa-datasource-property>	Replace **user name** with the Audit database user name.
<xa-datasource-property name="Password"> **password**</xa-datasource-property>	Replace **password** with the password for the Audit database user.

```
1    <xa-datasource jndi-name="java:/jdbc/AuditDataSource" pool-name="
     AuditSourceDS" enabled="true" use-java-context="true">
2       <driver>jdbc</driver>
3       <xa-datasource-class>
4       com.microsoft.sqlserver.jdbc.SQLServerXADataSource
5       </xa-datasource-class>
6       <xa-datasource-property name="InstanceName">
7          instance name
8       </xa-datasource-property>
9       <xa-datasource-property name="User">
10         user name
11      </xa-datasource-property>
12      <xa-datasource-property name="Password">
13         password
14      </xa-datasource-property>
15      <xa-pool>
16         <min-pool-size>16</min-pool-size>
           <max-pool-size>64</max-pool-size>
           <is-same-rm-override>false</is-same-rm-override>
           <no-tx-separate-pools>true</no-tx-separate-pools>
17      </xa-pool>
18      <validation>
19         <valid-connection-checker class-name="org.jboss.jca.adapte
           rs.jdbc.extensions.mssql.MSSQLValidConnectionChecker" />
20      </validation>
21   </xa-datasource>
```

Default Instance

You need to insert our data source snippet into *standalone.xml*. The snippet sections appear below, but you should open a text version that is available from the Knowledge Base:

1. Go to the following: ONESOURCE Customer Center.
2. Open the file *jboss-sqlserver-default-xa-ds_example.txt*.

Insert the entire data source snippet between the <datasources> elements in *standalone.xml*. Follow the steps in the sections below for editing values in the snippet.

Tax Data Source: Change the values in the snippet that correspond to the elements in the table below. The sample snippet that follows the table has bold entries highlighting the values to change.

TAX DATA SOURCE (JDBC/TAXDATASOURCE)	
Element	**Description**
<driver>**jdbc**</driver>	Replace **jdbc** with the name of the JDBC driver (for example, *mssql-jdbc-7.0.0.jre10.jar*).
<xa-datasource-property name="ServerName"> **host**</xa-datasource-property>	Replace **host** with the name of the server hosting the database.
<xa-datasource-property name="PortNumber"> **port**</xa-datasource-property>	Replace **port** with the number of the database port.
<xa-datasource-property name="User"> **user name**</xa-datasource-property>	Replace **user name** with the Tax database user name.
<xa-datasource-property name="Password"> **password**</xa-datasource-property>	Replace **password** with the password for the Tax database user.

```
<xa-datasource jndi-name="java:/jdbc/TaxDataSource" pool-name="TaxDataSourceDS" enabled="true" use-java-context="true">
   <driver>jdbc</driver>
   <xa-datasource-class>
      com.microsoft.sqlserver.jdbc.SQLServerXADataSource
   </xa-datasource-class>
   <xa-datasource-property name="ServerName">
      host
   </xa-datasource-property>
   <xa-datasource-property name="PortNumber">
      port
   </xa-datasource-property>
   <xa-datasource-property name="User">
      user name
   </xa-datasource-property>
   <xa-datasource-property name="Password">
      password
   </xa-datasource-property>
   <xa-pool>
      <min-pool-size>16</min-pool-size>
      <max-pool-size>64</max-pool-size>
      <is-same-rm-override>false</is-same-rm-override>
      <no-tx-separate-pools>true</no-tx-separate-pools>
   </xa-pool>
   <validation>
      <valid-connection-checker class-name="org.jboss.jca.adapters.jdbc.extensions.mssql.MSSQLValidConnectionChecker" />
   </validation>
</xa-datasource>
```

Audit Data Source: Change the values in the snippet that correspond to the elements in the table below. The sample snippet that follows the table has bold entries highlighting the values to change.

AUDIT DATA SOURCE (JDBC/AUDITDATASOURCE)	
Element	**Description**
<driver>**jdbc**</driver>	Replace **jdbc** with the name of the JDBC driver (for example, *mssql-jdbc-7.0.0.jre10.jar*).
<xa-datasource-property name="ServerName">**host**</xa-datasource-property>	Replace **host** with the name of the server hosting the database.
<xa-datasource-property name="PortNumber">**port** </xa-datasource-property>	Replace **port** with the number of the database port.

AUDIT DATA SOURCE (JDBC/AUDITDATASOURCE)	
Element	**Description**
<xa-datasource-property name="User">**user name**</xa-datasource-property>	Replace **user name** with the Audit database user name.
<xa-datasource-property name="Password">**password**</xa-datasource-property>	Replace **password** with the password for the Audit database user.

```
<xa-datasource jndi-name="java:/jdbc/AuditDataSource" pool-name="
AuditSourceDS" enabled="true" use-java-context="true">
   <driver>jdbc</driver>
   <xa-datasource-class>
      com.microsoft.sqlserver.jdbc.SQLServerXADataSource
   </xa-datasource-class>
   <xa-datasource-property name="ServerName">
      host
   </xa-datasource-property>
   <xa-datasource-property name="PortNumber">
      port
   </xa-datasource-property>
   <xa-datasource-property name="User">
      user name
   </xa-datasource-property>
   <xa-datasource-property name="Password">
      password
   </xa-datasource-property>
   <xa-pool>
      <min-pool-size>16</min-pool-size>
      <max-pool-size>64</max-pool-size>
      <is-same-rm-override>false</is-same-rm-override>
      <no-tx-separate-pools>true</no-tx-separate-pools>
   </xa-pool>
   <validation>
      <valid-connection-checker class-name="org.jboss.jca.adapte
      rs.jdbc.extensions.mssql.MSSQLValidConnectionChecker" />
   </validation>
</xa-datasource>
```

When you finish creating the data sources, continue to the next section to make an additional change in *standalone.xml*.

CONTROLLING HTTP PARAMETERS

Continue editing *standalone.xml* by adding a configuration that controls the number of HTTP parameters:

1. Locate the </extensions> tag in *standalone.xml*.
2. Below the </extensions> tag, insert the following:

```
1    <system-properties>
2       <property name="org.apache.tomcat.util.http.Parameters.MAX_
        COUNT" value="10000"/>
3    </system-properties>
```

3. Save and close the file.

JDBC DRIVER

Determination requires the latest JDBC driver version for your database. Locate the SQL Server JDBC driver *mssql-jdbc-7.0.0.jre10.jar* (see Downloading the Microsoft JDBC Driver for SQL Server (page 7)), and copy it into the JBoss *deployments* directory under *standalone*.

DEPLOYING THE APPLICATION

The Determination application is contained in the *sabrix.ear* file, which is in the root directory of the Determination software. Copy this file to the *deployments* directory under *standalone*.

Start JBoss to deploy the application.

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

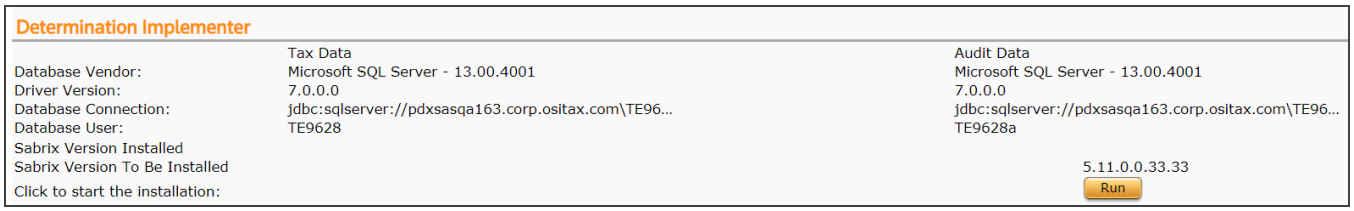
The Implementer is the installation program for Determination and is the process you run after configuring your application server.

> 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

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:

```
1    -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:

```
1    -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.
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 34).
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.

MODULE FILE

Complete the following:

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

   <JBossHomeDirectory>/modules/com/thomsonreuters/config/main

3. In this new directory, create a file called *module.xml*, and insert the following lines:

```
<module xmlns="urn:jboss:module:1.1" name="com.thomsonreuters
.config">
   <resources>
      <resource-root path="."/>
   </resources>
   <dependencies>
      <module name="javaee.api" />
   </dependencies>
</module>
```

4. Save and close *module.xml*.
5. Repeat these steps on each JBoss node.

STANDALONE FILE

Complete the following:

1. Go to the following directory:

   <JBossHomeDirectory>/standalone/configuration

2. Open *standalone.xml* in a text editor.
3. Locate the following section:

   <subsystem xmlns="urn:jboss:domain:ee:1.2">

4. Insert the following snippet as a child of the *subsystem* element above:

```
<global-modules>
   <module name="com.thomsonreuters.config" slot="main" />
</global-modules>
```

5. Save and close *standalone.xml*.
6. Repeat these steps on each JBoss node.

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, Development, and QA), skip to the next section UDP Multicast with Non-Default IP and Port Number (page 36). That approach prevents the clusters from interfering with each other.

Complete the following:

1. Go to the directory you created previously:

   <JBossHomeDirectory>/modules/com/thomsonreuters/config/main

2. Create a new file called *determination_application_overrides.properties*, and then insert the following lines:

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

3. 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.

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

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

7. Skip to Cluster Test (page 39).

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 32).

Complete the following:

1. Go to the directory you created previously:

   <JBossHomeDirectory>/modules/com/thomsonreuters/config/main

2. Create a file called *determination_application_overrides.properties*, 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-clust
    er.xml
4   determination.infinispan.jgroups.udp.mcast_addr=224.1.2.3
5   determination.infinispan.jgroups.udp.mcast_port=16655
```

3. 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.

4. 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).

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

6. Repeat these steps on each JBoss node.

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

7. Skip to Cluster XML File (page 38).

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 32).

Complete the following:

1. Go to the directory you created previously:

   <JBossHomeDirectory>/modules/com/thomsonreuters/config/main

2. Create a file called *determination_application_overrides.properties*, 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-tcpp
    ing-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
```

3. 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.

4. Set **tcp.address** to match the node's IP address.

5. 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 38)). Change the two values of 7800 specified in the file to some other valid and available port to complete this change.

6. 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.

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

8. 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 *ONESOURCEIDTDetermination_512xx.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*:

<JBossHomeDirectory>/modules/com/thomsonreuters/config/main

4. Restart JBoss.
5. Repeat these steps on each 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 JBoss.
2. Go to the *clustering* directory where you unzipped *512xx* (see Download the Software (page 6)).
3. Copy the *infinispan-timed-cache.xml* file to the directory - <JBossHomeDirectory>/modules/com/thomsonreuters/config/main

   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.

4. Go to the directory you created previously:

   <JBossHomeDirectory>/modules/com/thomsonreuters/config/main

5. Create a new 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 JBoss.
8. Repeat these steps on each JBoss 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."