HP OpenView Select Identity

Connector for Microsoft SQL Server 2000

Installation and Configuration Guide

Connector Version: 2.5
Select Identity Version: 3.3.1

August 2005

Legal Notices

Warranty

Restricted Rights Legend

Copyright Notices

- Commons-beanutils.

- Commons-collections.

- Commons-logging.

- Commons-digester.
- Commons-httpclient.
- Element Construction Set (ecs).
- Jakarta-poi.
- Jakarta-regexp.
- Logging Services (log4j).

Additional third party software used by Select Identity includes

- JasperReports developed by SourceForge.
- iText (for JasperReports) developed by SourceForge.
- BeanShell.
- Xalan from the Apache XML Project.
- Xerces from the Apache XML Project.
- Java API for XML Processing from the Apache XML Project.
- SOAP developed by the Apache Software Foundation.
- JavaMail from SUN Reference Implementation.
- Java Secure Socket Extension (JSSE) from SUN Reference Implementation.
- Java Cryptography Extension (JCE) from SUN Reference Implementation.
- JavaBeans Activation Framework (JAF) from SUN Reference Implementation.
- OpenSPML Toolkit from OpenSPML.org.
- JGraph developed by JGraph.
- Hibernate from Hibernate.org.
- BouncyCastle engine for keystore management, bouncycastle.org.
- Java Service Wrapper, Copyright © 1999, 2004 Tanuki Software.
- Copyright © 2001 Silver Egg Technology.
- This product includes software developed by Teodor Danciu (http://jasperreports.sourceforge.net). Portions Copyright © 2001-2004 Teodor Danciu (teodord@users.sourceforge.net). All rights reserved.

Support

Please visit the HP OpenView web site at:

   http://www.managementsoftware.hp.com/

This web site provides contact information and details about the products, services, and support that HP OpenView offers.

You can also go directly to the support web site at:

   http://support.openview.hp.com/

HP OpenView online software support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valuable support customer, you can benefit by using the support site to:

- Search for knowledge documents of interest

- Submit and track progress on support cases

- Manage a support contract

- Look up HP support contacts

- Review information about available services

- Enter discussions with other software customers

- Research and register for software training

Most of the support areas require that you register as an HP Passport user and log in. Many also require a support contract.

To find more information about access levels, go to:

   http://support.openview.hp.com/access_level.jsp

To register for an HP Passport ID, go to:

   https://passport2.hp.com/hpp/newuser.do

contents

1

Installing the Connector

The Microsoft SQL Server 2000 connector — hereafter referred to as the SQL Server connector — enables HP OpenView Select Identity to provision user information in database schemas hosted on SQL Server 2000 relational database systems. The connector also provides an agent that can send changes made to the data in SQL Server to Select Identity.

The following configurations are supported for this connector:

- Agent-based
  In this configuration, the connector communicates with an agent that resides on the database server; the agent uses a JDBC 2.0 compliant driver to communicate with the database. The agent can also push changes made in SQL Server to the Select Identity database (this is called **reverse synchronization** and explained later).

- Agentless using a JDBC data source
  In this configuration, the connector communicates with the database directly through JDBC calls. Be sure to create or identify a JDBC data source (and underlying connection pool) on the Select Identity server that can connect to the target SQL Server database.

- Agentless using a JDBC driver
  The connector communicates the database using a JDBC 2.0 compliant driver; no agent is installed on the database server.

The SQL Server connector is packaged in the following files and folders, which are located on the Select Identity Connector CD:

- `MS SQL Server - Generic/Gen-SQL2000-Connector.rar` — **The binaries for the connector**

- `MS SQL Server - Generic/Agent Installers/ SQL-Gen-AgentInstaller-Win.zip` — **A ZIP file that contains the installation executable for the connector agent**

- `MS SQL Server - Generic/Manual Agent/ SQL-Gen-Agent-Win.zip` — **A ZIP file that contains agent binaries and files (for manual installation)**

An Attribute Mapping Utility is also provided (deployed with the Select Identity server), which enables you to create mapping files that map database schema fields to Select Identity fields. Refer to the *HP OpenView Select Identity Attribute Mapping Utility User's Guide* for more information about the Attribute Mapping Utility.

Operations Supported by the Connector

The SQL Server connector is intended for use in a wide variety of usage scenarios. Specifically, it can perform the following operations in the database schema on the SQL Server system:

- Add, update, and remove users

- Retrieve user attributes

- Enable and disable users

- Verify a user's existence

- Change user passwords

- Reset user passwords

- Retrieve all entitlements

- Retrieve a list of supported user attributes

- Assign and unassign entitlements to and from users
- Add, update, and remove entitlements

► This connector does not provision database system users. Rather, it provisions users into a user-defined database schema in SQL Server. To provision database system users, you must install and use the Admin SQL Server connector.

In addition, the connector's agent can send user changes made in SQL Server to Select Identity. When changes are pushed from the agent to the Select Identity server, this is referred to as **reverse synchronization**. The following reverse synchronization operations are supported:

- Change passwords stored in Select Identity based on changes to the passwords in the schema in SQL Server
- Add, modify, and delete users based on user additions, modifications, and deletions in the schema in SQL Server

When a user is added, modified, or deleted in the database, triggers capture the changes. The agent's reverse synchronization component then sends the changes to Select Identity's Web Service in SPML. If an error occurs during reverse synchronization, the agent stops the operation (without affecting the connector's operations).

Additional steps are required to configure the agent for reverse synchronization. (Note that installing and configuring the agent is mandatory in order for the connector to support reverse synchronization.)

The SQL Server connector also supports custom encryption, which enables the connector to encrypt values provisioned in the schema. Refer to the *HP OpenView Select Identity Attribute Mapping Utility User's Guide* for information on how to use this feature.

System Requirements

The SQL Server connector is supported in the following environment:

Select Identity Version	Application Server	Database
3.0.2	WebLogic 8.1.2 on Windows 2000	SQL Server 2000
	WebLogic 8.1.2 on Windows 2003	SQL Server 2000
	WebLogic 8.1.2 on Solaris 9	Oracle 9i
	WebSphere 5.1.1 on Solaris 9	DB2 8.2 (or DB2 8.1 Service Pack 7)
3.3	WebLogic 8.1.4 on Windows 2003	SQL Server 2000
	WebLogic 8.1.4 on Solaris 9	Oracle 9i
	WebLogic 8.1.4 on HP-UX 11i	Oracle 9i
3.3.1	WebLogic 8.1.4 on Windows 2003	SQL Server 2000
	WebLogic 8.1.4 on Solaris 9	Oracle 9i
	WebLogic 8.1.4 on HP-UX 11i	Oracle 9i
	WebSphere 5.1.1 on HP-UX 11i	Oracle 9i
	WebSphere 5.1.1 on Windows 2003	Oracle 9i

The SQL Server connector is supported on the following Oracle platforms and operating systems:

- For Select Identity 3.0.2, the SQL Server connector is supported with Microsoft SQL Server 2000 running on Windows 2000, Windows 2003, and Windows XP.

- For 3.3, the connector is supported with Microsoft SQL Server 2000 running on Windows 2000 and Windows 2003.

- For Select Identity 3.3.1, the connector is supported with Microsoft SQL Server 2000 running on Windows 2000 and Windows 2003.

The SQL Server connector is internationalized and able to operate with languages that are supported by the Java Unicode specification. If you wish to

use the connector on non-English platforms, make sure that the following prerequisites are met:

- The Select Identity server should be configured for internationalization. Refer to the *HP OpenView Select Identity Installation and Configuration Guide* for more information.

- SQL Server can support internationalization if the Collation Name is set appropriately when the database is created. For SQL Server 2000, the Collation Name' is set by default to the Local Language type:
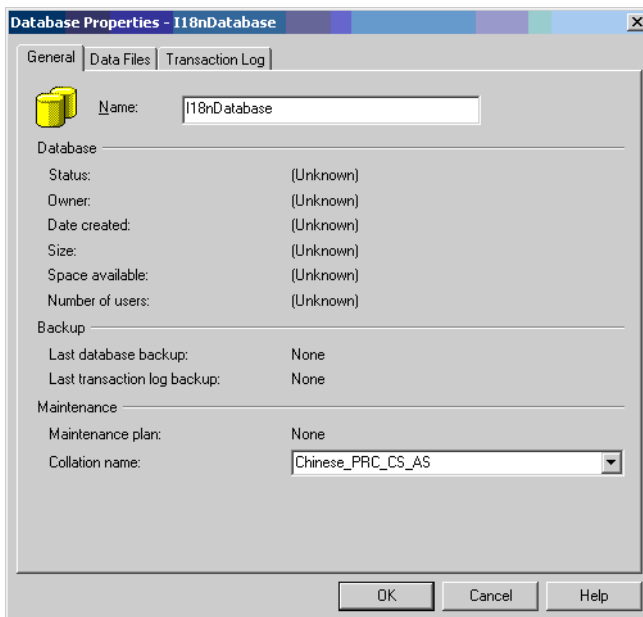
See Internationalization Support on page 24 for more information.

Deploying on the Web Application Server

To install the SQL Server connector on the Select Identity server, complete these steps:

1 Create a subdirectory in the Select Identity home directory where the connector's RAR file will reside. For example, you could create the `C:\Select_Identity\connectors` folder on Windows. (A connector subdirectory may already exist.)

2 Copy the `Gen-SQL2000-Connector.rar` file from the Select Identity Connector CD to the connector subdirectory.

3 Copy the JDBC 2.0 compliant driver to the application server. For SQL Server, you must copy the JDBC driver files (`msbase.jar`, `mssqlserver.jar`, and `msutil.jar`). Obtain the driver files from your database administrator.

4 Add the JDBC driver files to the application server's class path, such as by editing the `myStartWL.cmd` (on Windows) or `myStartWL.sh` (on UNIX) file.

5 If deploying the connector on WebLogic, complete the following steps.

  a Start the application server if it is not currently running.

  b Log on to the WebLogic Server Console.

  c Navigate to *My_domain* →**Deployments** →**Connector Modules**.

  d Click **Deploy a New Connector Module**.

  e Locate and select the `Gen-SQL2000-Connector.rar` file from the list. It is stored in the connector subdirectory.

  f Click **Target Module**.

  g Select the **My Server** (your server instance) check box.

  h Click **Continue**. Review your settings.

  i Keep all default settings and click **Deploy**. The Status of Last Action column should display Success.

6 If deploying the connector on WebSphere, complete the following steps:

  a Start the application server, if necessary.

  b Log on to the WebSphere Application Server Console.

c Navigate to **Resources →Resource Adapters**.

d Click **Install RAR**.

e In the Server path field, enter the path to the
`Gen-SQL2000-Connector.rar` file. It is stored in the subdirectory
created in Step 1.

f Click **Next**.

g In the Name field, enter a name for the connector.

h Click **OK**.

i Click the **Save** link (at the top of the page).

j On the Save to Master Configuration dialog, click the **Save** button.

k Click **Resources →Resource Adapters**.

l Click the new connector.

m Click **J2C Connection Factories** in the Additional Properties table.

n Click **New**.

o In the Name field, enter the name of the factory for the connector. For
the SQL Server connector, enter **eis/Gen-SQL2000Connector**.

p Click **OK**.

q Click the **Save** link.

r On the Save to Master Configuration dialog, click the **Save** button.

s Restart WebSphere.

7 Create a mapping file for the schema in which the connector must
provision users and entitlements. Use the Attribute Mapping Utility, as
described in the *HP OpenView Select Identity Attribute Mapping Utility
User's Guide*. See Understanding the Mapping Files on page 32 for more
information about the file format.

8 To configure reverse synchronization on the server, you must create an
XSL file based on the XML mapping file. The XSL file maps user
attributes on SQL Server to attributes in Select Identity. This file is
generated by the Attribute Mapping Utility when the XML mapping file is
created. See Understanding the Mapping Files on page 32 for more
information.

After the XSL file is created, copy it to the Select Identity home directory.

> Note that the agent must be installed and configured for the SQL Server connector to support reverse synchronization.

9 Edit the `TruAccess.properties` file, which resides in the *install_dir*/sysArchive directory on the Select Identity server, and modify the `com.hp.ovsi.connector.schema.dir` property. Set this property to the top-level directory where the mapping files reside, which is specified in the Base Directory field on the Attribute Mapping Utility interface.

> If no value was specified in the Base Directory field, the `com/trulogica/truaccess/connector/schema/spml` directory structure was created in the application server's home directory.

For example, if you entered `C:\SI_3.3\schema` in the Base Directory field, the `com/trulogica/truaccess/connector/schema/spml` directory structure was created under that directory, and the XML and XSL files were created there. In this example, the files reside in this directory:

`C:\SI3.3\schema\com\trulogica\truaccess\connector\schema\spml`

Thus, you would set the `com.hp.ovsi.connector.schema.dir` property as follows:

`com.hp.ovsi.connector.schema.dir = C:/SI3.3/schema`

After installing the connector, refer to Configuring the Connector on page 24 for information about registering and configuring this connector in Select Identity.

Installing the Agent on the Database Server

After you install the SQL Server connector on the Select Identity server, you can install the agent on the database server. This is optional; the connector can provision users in SQL Server without the agent. However, the agent enables you to send data back to Select Identity (reverse synchronization).

You can install the agent using the installation wizard or by manually copying files to the server.

⚠️ Be sure to generate the XML and XSL mapping files described in Step 7 and before installing the agent. Then, copy the mapping files from the Select Identity server to the system where you will install the agent (on the database server). The agent installation requires that the mapping files are available on the local system.

Encrypting the Select Identity Administrator's Password

The Select Identity administrative account is used to log in to Select Identity when the agent sends data from the resource to the Select Identity server (reverse synchronization). To avoid displaying of the password in clear-text in the agent configuration files, you must encrypt the password and use this encrypted password in the agent configuration. Select Identity provides an encryption utility, which is described here.

To encrypt the password that is sent to the Select Identity server, run encode.bat (on Windows) or encode.sh (on UNIX), which is provided in the weblogic/keystore subdirectory in the Select Identity home directory. This utility prompts you for the password to encrypt and will generate the encrypted password. Be sure to copy the entire encrypted password (including the curly brackets) in the field, as shown here:

Installation Using the Wizard on Windows

Complete the following steps to run the installation wizard, which installs the agent on Windows:

1   Extract the contents of the `SQL-Gen-AgentInstaller-Win.zip` file, which is located in the `Agent Installers` directory on the CD.

2   Run `install.exe`, which is located in the *`target_dir`*`\CDROM_Installers\Windows\Disk1\InstData\NoVM`. The following dialog displays:
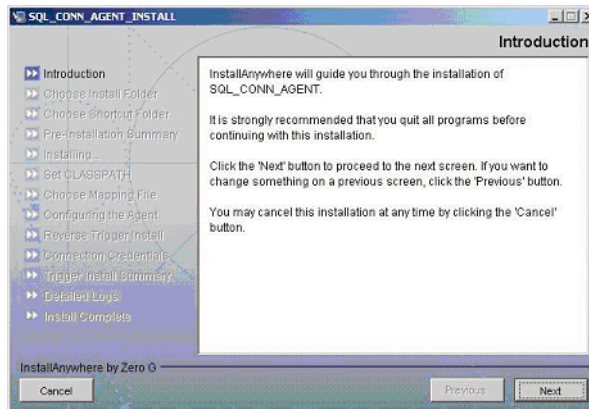
3   Click **Next** to proceed.

4   Specify an installation directory then click **Next**. By default, the agent will be installed in `C:\Program Files\SQL_CONN_AGENT`.
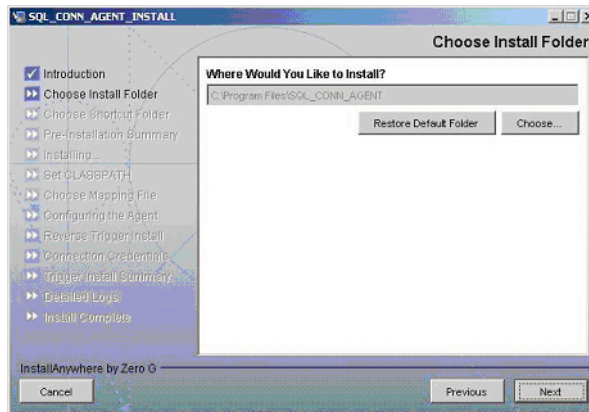
5   Select the location(s) where the product icons will be installed, then click **Next**.
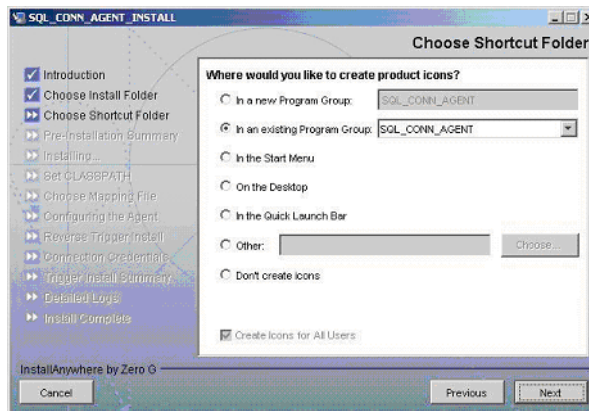
6   Verify the pre-installation summary. If you wish to make changes, click **Previous** and edit the chosen options. To install the agent, click **Install**.

7   On the Set CLASSPATH dialog, click **Next** after you verify that the database driver files (`msbase.jar`, `mssqlserver.jar`, and `msutil.jar`) are in the database server's System class path.

8 Click **Choose** to browse for and select the mapping file. This will copy the mapping file created in Step 7 on page 7 to the *install_dir*/conf/com/trulogica/truaccess/connector/schema/spml directory, where *install_dir* is the installation folder selected in Step 4 above.
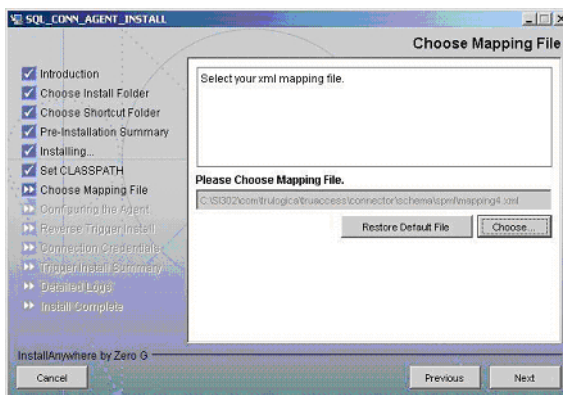
Then, click **Next**.

9 On the Configuring the Agent dialog, specify the requested information:
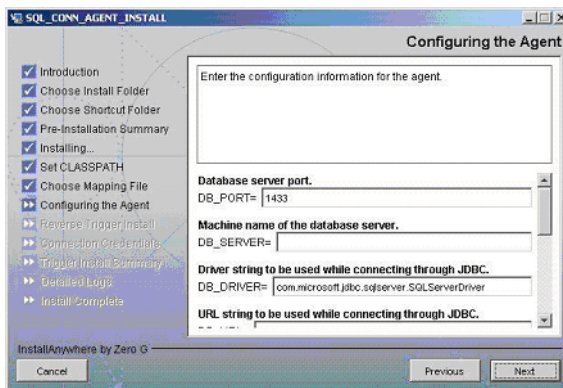
The following provides an explanation of the configuration options:

Option	Description	Example Value
DB_PORT	The port on which the database server is listening.	1433
DB_SERVER	The IP address or name of the database server.	localhost
DB_DRIVER	The JDBC driver for the database connection.	com.microsoft.jdbc. sqlserver.SQLServer Driver
DB_URL	The JDBC URL string used for the database communication.	jdbc:microsoft: sqlserver
SERVICE	The database name.	SI_DB
SERVER_ SECURE	Whether communication between the agent and Select Identity must be secure. By default, non-secure communication is used.	
CONCERO_ SERVER_URL	The URL of the Select Identity Web Service.	http://*host*:*port*/lmz/ webservice
PollDelay	The polling delay for reverse polling (in seconds).	10
AGENT_PORT	The port on which the agent listens for user provisioning requests from Select Identity.	5601
MAPPING_FILE	The XML mapping file generated by the Attribute Mapping Utility. If you have not generated the XML file yet, you can change this value later.	Mapping.xml
SPML_DELAY	The delay (in milliseconds) between successive SPML requests sent from the agent. Increase this delay if the network or Select Identity server is performing slowly.	10000

Option	Description	Example Value
NO_OF_ RETRIES	The number of times the agent will retry sending SPML requests in case of failure.	10
RETRY_DELAY	The delay (in milliseconds) between each retry.	10000

> To edit any of these values after installation, you can edit the properties.ini file, which resides in *install_dir*\conf.

After specifying these values, click **Next**.

10 Provide the operational attributes that are sent to the Select Identity server during reverse synchronization requests. Here is an explanation of the attributes:

Parameter	Sample Values	Description
urn:oasis:names:tc:SPML:1:0# UserIDAndOrDomainName	Sisa	User ID of the administrative user on Select Identity.
urn:trulogica:concero:2.0# password		Password of the administrative user. This password should be generated using the encryption utility provided with Select Identity; see Encrypting the Select Identity Administrator's Password on page 9 for details.
urn:trulogica:concero:2.0# reverseSync	true	Set to **true** if you want to enable reverse synchronization.

Parameter	Sample Values	Description
urn:trulogica:concero:2.0# resourceType	SQLSvrMap	The name of the XSL file (without the .xsl extension) that is used during reverse synchronization.
urn:trulogica:concero:2.0# resourceId	SQLSvr-Resourc e	The name of the Select Identity resource that is created for the SQL Server connector.

> To edit any of these values after installation, you can edit the
> opAttributes.properties file, which resides in *install_dir*\conf.

After specifying the values, click **Next**.

11 To enable reverse synchronization, you must install the reverse triggers.
(See Operations Supported by the Connector on page 2 for an explanation
of reverse synchronization.) Select the **Install Triggers Now** option to install
the triggers. Then, click **Next** and proceed to the next step.
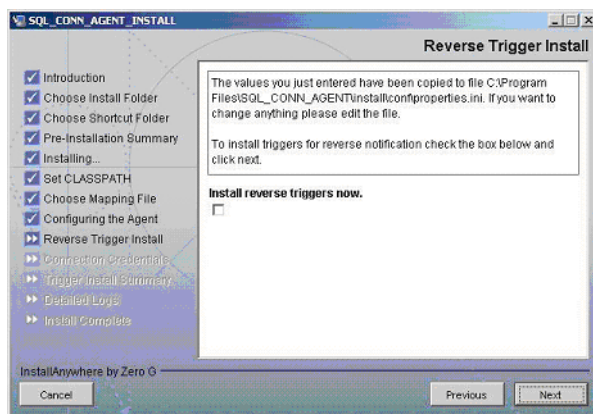
If you choose not to install the reverse triggers, skip to Step 15 on page 17.
(You can manually install the triggers later, if necessary. This is described
in Installing the Reverse Triggers on page 19.)

12 If you selected the **Install Reverse Triggers now** option on the Reverse Trigger Install dialog, specify authentication information for the database user. Then, click **Next**. The triggers are installed for the schema specified by the mapping file.
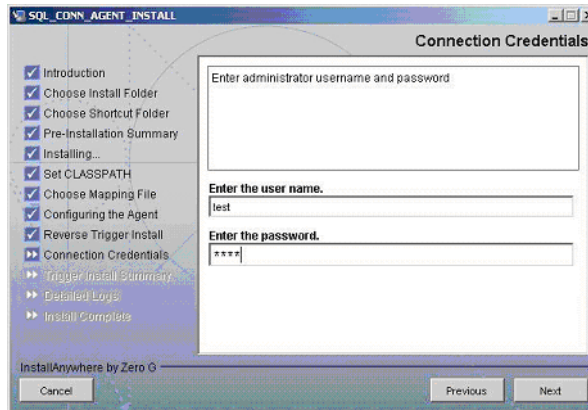
13 Review the installation summary for the triggers. If you wish to make changes, or if the trigger installation failed, click **Previous** and edit the chosen options, such as the credentials. You can also select the **Show Logs** option to review the trigger installation log files. Then, click **Next**.
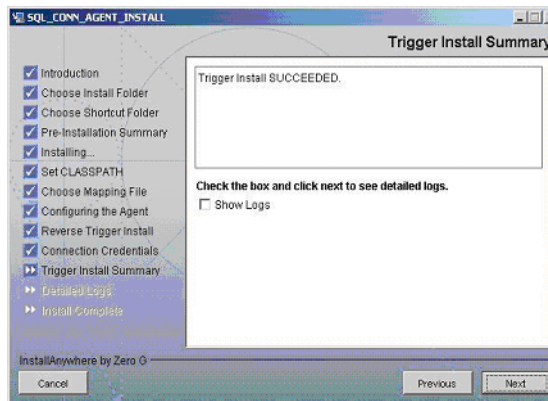
14 If you selected the **Show Logs** option, the Detailed Logs dialog is displayed. Review the log entries and click **Next**.
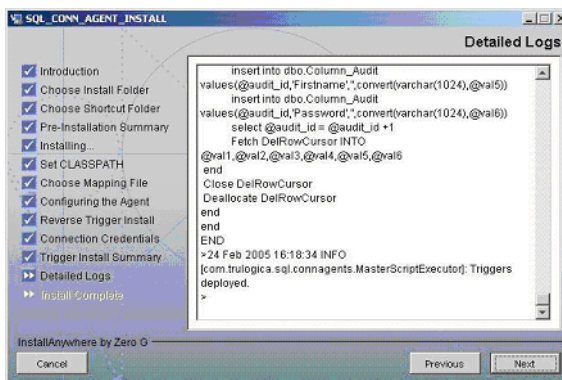
15 When the installation wizard completes, click **Done** on the Install Complete dialog to close the installation program.

Manual Installation

Instead of using the installation wizard, you can install the agent files and reverse triggers manually. The following sections describe how to do this.

Installing the Agent

Complete the following steps to manually copy the agent files to the target server:

1 *On Windows:*
Extract the contents of the `SQL-Gen-Agent-Win.zip` file, which resides in the `Manual Agent` subdirectory on the CD, to a target location for the agent on the SQL Server system. The extracted files will reside in the `SQL-Gen-Agent-Win` directory.

2 Copy the mapping file created in Step 7 on page 7 to the *agent_home*/ `conf/com/trulogica/truaccess/connector/schema/spml` directory.

3 Modify the `properties.ini` file, which resides in the *agent_home*/ `conf` subdirectory, to specify parameters for the agent. The parameters are listed in the following table.

Parameter	Sample Values	Description
DB_PORT	1433	The port on which the database server is listening.
DB_DRIVER	com.micro soft.jdbc. sqlserver. SQLServer Driver	JDBC driver for the database connection.
DB_URL	jdbc:micro soft:sqlserver	JDBC URL string used for the database communication.
SERVICE	SI_DB	Database name.
SERVER_SECURE		Whether communication between the agent and Select Identity must be secure. By default, non-secure communication is used.
CHECK_LOGIN	true	The Login Check flag.
MAX_LOGIN_RETRIES	3	The number of times the agent will attempt to log in to the database.
CONCERO_SERVER_ URL	http:// *host*:*port*/lmz/ webservice	URL of the Select Identity Web Service.
PollDelay	10	The polling delay for reverse polling (in seconds).
AGENT_PORT	5601	The port on which the agent listens for user provisioning requests from Select Identity.

Parameter	Sample Values	Description
MAPPING_FILE	Mapping.xml	The XML mapping file generated by the Attribute Mapping Utility.
SPML_Delay	10000	The delay (in milliseconds) between successive SPML requests sent from the agent. Increase this delay if the network or Select Identity server is performing slowly.
NO_OF_ RETRIES	10	The number of times the agent will retry sending SPML requests in case of failure.
RETRY_DELAY	10000	The delay (in milliseconds) between each retry.

4 Copy the SQL Server JDBC driver files (msbase.jar, msutil.jar, and mssqlserver.jar) to the system CLASSPATH. Obtain these files from the SQL Server system, the Select Identity server, or your system or database administrator.

See Installing the Reverse Triggers on page 19 for steps to configure reverse synchronization. See Starting the Agent on page 23 for information about starting the agent.

Installing the Reverse Triggers

Perform these steps if you want to synchronize changes made to users in SQL Server with Select Identify. Reverse synchronization relies on triggers configured on the database. When you start the agent, reverse synchronization is enabled.

1 Copy the XML mapping file created in Step 8 on page 7 to the *agent_home*/conf/com/trulogica/truaccess/connector/schema/ spml directory.

2 Edit the properties.ini file, which resides in the *agent_home*/conf
   subdirectory, to specify parameters for reverse synchronization. See
   Step 3 on page 18 for details on this file.

3 Run the *agent_home*/setup.cmd file (on Windows) or setup.sh file (on
   UNIX) from the command line. This installs triggers as specified by the
   mapping file and creates audit tables (SID_TAB, Table_Audit, and
   Column_Audit). If the tables exist, table creation fails, indicating the
   error.

4 Modify the opattributes.properties file, which resides in the
   agent_home/conf/ subdirectory and provides operational attributes
   that are sent to the Select Identity server during reverse synchronization
   requests. The file must contain the following:

Parameter	Sample Values	Description
urn:oasis:names:tc:SPML:1:0#UserIDAndOrDomainName	Sisa	User ID of the administrative user on Select Identity.
urn:trulogica:concero:2.0#password		Password of the administrative user. This password should be generated using the encryption utility provided with Select Identity; see Encrypting the Select Identity Administrator's Password on page 9 for details.
urn:trulogica:concero:2.0#reverseSync	true	Set to **true** if you want to enable reverse synchronization.

Parameter	Sample Values	Description
urn:trulogica:concero:2.0# resourceType	GenSQL_ Schema1	The name of the XSL file (without the .xsl extension) that is used during reverse synchronization.
urn:trulogica:concero:2.0# resourceId	SQL	The name of the Select Identity resource that is created for the SQL Server connector.

To delete the triggers, complete the steps in Manually Removing the Agent on page 43. These steps assume that properties.ini is configured as mentioned in Installing the Agent on the Database Server on page 8.

Installed Files

The following provides a listing of the directories and files installed for the agent:

Directories and Files	Description
agent_home/	Contains the following files: • AddToStartupGroup.cmd/sh — **Adds icons to startup group; this file is present only if the agent was installed using the wizard** • CopyFile.cmd/sh — **Used by agent to copy files; this file is present only if the agent was installed using the wizard** • DelFile.cmd/sh — **Used by agent to delete files; this file is present only if the agent was installed using the wizard** • setup.cmd/sh — **Installs the reverse triggers** • sqlapp.cmd/sh — **Used by agent to communicate with the database** • SQLConnectorConsole.cmd/sh — **Starts the agent** • uninstall.cmd/sh — **Uninstalls triggers**
agent_home/conf/	Contains the following files: • properties.ini — **Provides configuration settings for the agent** • opAttributes.properties — **Provides configuration settings for reverse synchronization** • log4j.properties — **Provides settings for logging.**
agent_home/conf/com/	**Contains the** trulogica/truaccess/ connectior/schema/spml **directory structure where the XML mapping file is stored**
agent_home/lib/	**Contains JAR files used by the agent.**

Directories and Files	Description
agent_home/logs	Contains log files produced by the agent.
agent_home/Uninstall_ SQL_CONN_AGENT/	Contains files for uninstalling the agent. This subdirectory is created only if the agent is installed using the installation wizard.

Starting the Agent

To start the agent, run SQLConnectorConsole.cmd (on Windows) or SQLConnectorConsole.sh (on UNIX), which resides in the agent's home directory. This program logs in to the database server using the user name and password of a user who has administrative privileges on the database.

If you wish, you can provide the following parameters to the command:

username — The user name of the user who has administrative privileges on the database.

password — The specified user's password.

Here is an example you can use on Windows:

agent_home/**SQLConnectorConsole.cmd -userName si -password abc123**

If you start the agent before or without configuring reverse synchronization (the reverse triggers), a message is displayed stating that reverse notification is disabled.

2

Configuring the Connector

After you deploy the connector on the application server, you must configure Select Identity to use the connector by deploying it in the Select Identity client. The following provides an overview of the procedures you must complete in order to deploy your connector. It also provides connector-specific information you must provide when configuring Select Identity to use the connector.

Internationalization Support

If you installed the connector on non-English platforms, familiarize yourself with the information in this section before deploying and configuring the connector. Internationalization support provided by the connector includes the following capabilities and limitations:

- When entering user attributes to provision (in the Select Identity client), you can enter local language characters except for the following attributes:

  — UserName

  — Password

  — Email

The following shows Chinese characters used in attribute values:

用户属性	
FirstName	中文
UserName	OraEvf003
Password	********* [No expiration]
GUID	E19A27C5-C66E-4F60-11DD-363488491677
Email	yilei.zhang@hp.com
Business Phone	null
Home Phone	null
Address 1	地址1
Country	中国ABC
Gen_Ora_I18N_KEY	OraEvf003

- Reverse synchronization of local language characters is supported. When provisioning users on the LDAP resource, you can enter local language characters as input data. These characters are reconciled with Select Identity through SPML communication. However, the following user attributes must contain English characters:

    — UserName

    — Password

    — Email

- The attribute names on the resource cannot contain non-English characters. Thus, you cannot include non-English characters in the mapping file. The following shows attributes contained in a mapping file; only English attribute names are shown.

Resource Name=Gen_Ora_I18N

◁◁ ◁ 页 1   / 1 ▷ ▷▷   总记录数:10

Name	Min Length	Max Length	Attribute Mapped To	Authoritative
Address	0	255	Addr1	N
Country	0	255	Country	N
EMail	0	255	Email	N
FirstName	0	255	FirstName	N
Gen_Ora_I18N_ENTITLEMENTS	1	255	Gen_Ora_I18N_ENTITLEMENTS	Y
Gen_Ora_I18N_KEY	1	255	Gen_Ora_I18N_KEY	Y
Password	0	255	Password	N
PhOffice	0	255	PhBus	N
UserName	0	255	UserName	N
phHome	0	255	PhHome	N

- Non-English entitlements are not supported by the connector.

- All configuration and property file names must be in English.

- The exception messages from the resource are in English only.

- The log messages are in English only.

- The Select Identity resource name, which is included in the reverse synchronization configuration of the agent, must be in English.

Connector Deployment

Complete the following steps to deploy and configure the connector:

1 Register the SQL Server connector with Select Identity by clicking the **Deploy New Connector** button on the Connectors home page. Complete this procedure as described in the "Connectors" chapter of the *HP OpenView Select Identity Administrator Guide*.

> Be sure to select the **Mapper Available** check box, to enable users to edit the connector's mapping file using the Attribute Mapping Utility.

After you deploy the connector, the connector properties will look similar to this:

Connector Information	
*Connector Name:	GenSQLServerConnector
*Pool Name:	eis/Gen-SQL2000Connector
Mapper Available:	☑

2 Deploy a resource that uses the newly created connector. On the Resources home page, click the **Deploy New Resource** button. The resource configuration depends on how the connector and agent were installed and configured:

— Using a JDBC data source, an agent is not installed:
In this configuration, the connector performs operations on the database directly through JDBC calls. You must specify the JDBC data source and mapping file when configuring the resource.

— Using a JDBC driver, an agent is not installed:
The connector uses the JDBC driver to communicate with the
database. You must specify all parameters except the agent port and
JDBC data source.

— Using a JDBC driver, an agent installed:
If the agent is installed and a JDBC driver is used to communicate
with the database, you must specify all parameters except the JDBC
data source.

Complete the steps in this procedure as described in the "Resources"
chapter of the *HP OpenView Select Identity Administrator Guide.*When
configuring the resource, refer to the following table for parameters
specific to this connector:

➤ Copy or move the XML and XSL files to the proper locations. For
example, if `C:\si3.3\weblogic\sysarchive` is a folder in the
WebLogic CLASSPATH, the XSL should reside in
`C:\si3.3\weblogic\sysarchive` and the XML should reside in
`C:\si3.3\weblogic\sysarchive\com\trulogica\`
`truaccess\connector\schema\spml`.

Field Name	Sample Values	Description
Resource Name	Gen-SQL2000	The name of the resource.
Resource Type	GenSQL	The connector that was deployed in Step 1 on page 26.
Authoritative Source*	No	Whether this resource is a system that is considered to be the authoritative source for user data in your environment. Specify **Yes** if the connector is enabled for reverse synchronization. If the resource is not authoritative, the resource can only modify user entitlements during reverse synchronization.
Associate to Group	Selected	Whether the system uses the concept of groups. For this connector, select this option.

Field Name	Sample Values	Description
Server Name	Ps0111	Host name or IP address of the database server. You must specify this parameter if the agent was installed.
Server Port	1433	Port on which the database server is listening. You must specify this parameter if the agent was installed.
Username	sa	The login name of the database administrative user. You must specify this parameter if the agent was installed.
Password	p4ssword	Password of the database administrative user. You must specify this parameter if the agent was installed.
Agent Port	5601	The port where the agent listens for incoming connections. You must specify this parameter if the agent was installed.
SQL URL	jdbc:microsoft: sqlserver	URL to use to communicate with the database over a JDBC connection. You must specify this parameter if the agent was installed.
Database / Service Name	testDB	The database name in which to provision users. You must specify this parameter if the agent was installed.
Database Driver String	com.microsoft.jdbc. sqlserver.SQLServer Driver	Name of the JDBC driver to connect to the database. You must specify this parameter if the agent was installed.

Field Name	Sample Values	Description
Mapping File	Mapping.xml	Mapping file containing the mappings generated by the Attribute Mapping Utility. The mapping file must reside in the `install/conf/com/ trulogica/truaccess/ connector/schema/spml` directory in order for the Select Identity server to find it.
JDBC Datasource String	Jdbc/SQLDataSource	JNDI data source name that was created or identified on the Select Identity server that can connect to the target SQL Server database. Specify a value for this property if the agent was not installed.
Encryption Specification Algo		Encryption algorithm specification string. Note that secure JDBC is not supported with this connector (do not specify these parameters).
Encryption Algorithm		Name of the encryption algorithm. Note that secure JDBC is not supported with this connector (do not specify these parameters).
Encryption Specification Level		Encryption level specification string. Note that secure JDBC is not supported with this connector (do not specify these parameters).
Encryption Level		Encryption level. Note that secure JDBC is not supported with this connector (do not specify these parameters).

* Instead of creating an authoritative resource, you can create authoritative attributes (in the next step) for the attributes that will be synchronized. Entitlements are authoritative by default in a non-authoritative resource but other attributes are not.

After you deploy the resource for the SQL Server connector, the Access Info page of the resource properties will look similar to this (this is the configuration for an agentless connector):

Home > Resources > **View Resource** : **SQLNA**

Resource Access Information	
* Resource Name:	SQLNA
Server Name:	16.73.17.66
Server Port:	1433
Username:	jtest
Password:	*****
Agent Port:	
SQL URL:	jdbc:microsoft:sqlserver
DataBase/Service Name:	jSQL66
Database Driver String:	com.microsoft.jdbc.sqlserver.SQLServerDriver
* Mapping File:	mapping.xml
JDBC Datasource String:	JDBC/DataSource
Encryption Specification Algo:	
Encryption Algorithm:	
Encryption Specification Level:	
Encryption Level:	
* ConnectorName:	Gen-SQL2000

3 Create attributes that link Select Identity to the connector. For each mapping in the connector's mapping file, create an attribute using the Attributes capability on the Select Identity client.

Refer to the "Attributes" chapter in the *HP OpenView Select Identity Administrator Guide* for more information. After you create the attributes

for the SQL Server connector, the View Attributes page for the resource will look similar to this:

(Resource Name=SQL)				
◁◁ ◁ Page 1 of 1 ▷ ▷▷				Total Records:7
Name	**Min Length**	**Max Length**	**Attribute Mapped To**	**Authoritative**
Email	0	255	Email	N
FirstName	0	255	FirstName	N
LastName	0	255	LastName	N
Password	0	255	Password	N
SQL_ENTITLEMENTS	1	255	SQL_ENTITLEMENTS	Y
SQL_KEY	1	255	SQL_KEY	Y
UserName	0	255	UserName	N

> The attributes in the snapshot are sample values based on the sample XML file given above.

4 Create a Service that will use the newly created resource. To do so, click the **Deploy New Service** button on the Services home page. Complete this procedure as described in "Services" of the *HP OpenView Select Identity Administrator Guide*. You will reference your new resource created in Step 2 while creating this service.

If you are enabling reverse synchronization, configure the Service as follows:

— When selecting the Business Relationship, choose the ReconciliationDefaultProcess workflow for the RECONCILIATION:Add Service and RECONCILIATION:Delete Service Membership request events. For RECONCILIATION:Add Service, use the user addition view.

— In the user addition view, specify mandatory attributes that are guaranteed to be passed by the reverse synchronization request when adding a user. If you specify a mandatory attribute that is not passed by the resource, the user will be created in Select Identity but reverse synchronization will not succeed.

— When specifying the context, obtain the value from the add request issued by the resource. For example, if the context is Country and the value is US, the <addRequest> element in the reverse synchroniation request should have an attribute called country and a value of US. If the context attribute is not present in the add user request, the user will be created in Select Identity but will not be assigned to a Service.

3

Understanding the Mapping Files

To enable the connector to provision users and entitlements in the schema on the SQL Server resource, you must create an XML mapping file. If you configured the agent to support reverse synchronization, you must also provide an XSL file that provides a reverse mapping of the Select Identity and resource fields mapped in the XML file.

To generate these mapping files, you must use the Attribute Mapping Utility. Only attributes that are defined in the mapping files are provisioned by Select Identity. Refer to the *HP OpenView Select Identity Attribute Mapping Utility User's Guide* for detailed information on how to generate a mapping file using that utility.

This chapter provides an explanation of the XML and XSL mapping files. The following sections are provided:

Refer to the `MS SQL Server - Generic/SampleXML` **subdirectory on the Select Identity Connector CD for sample files.**

Elements in the XML Mapping File

Here is an explanation of the format of the XML mapping file. For a sample mapping file, see the `SampleXML` subdirectory in the `MS SQL Server - Generic` directory on the Select Identity Connector CD.

➤ If the database schema changes and you need of a new set of mapping files, you can load the existing XML file in the Attribute Mapping Utility and modify it as needed. Using a text editor to edit the XML and XSL files is error-prone.

- **<Schema>**, **<providerID>**, and **<schemaID>**

   Provides standard elements for header information.

- **<objectClassDefinition>**

   Defines the actions that can be performed on the specified object as defined by that name attribute (in the <properties> element block) and the Select Identity-to-resource field mappings for the object (in the <memberAttributes> block). For example, the object class definition for users defines that users can be created, read, updated, deleted, reset, and expired in SQL Server.

   - **<properties>**
      Defines the operations that are supported on the object. This can be used to control the operations that are performed through Select Identity. The following operations can be controlled:

      — Create (CREATE)

      — Read (READ)

      — Update (UPDATE)

      — Delete (DELETE)

      — Enable (ENABLE)

      — Disable (DISABLE)

      — Reset password (RESET_PASSWORD)

      — Expire password (EXPIRE_PASSWORD)

      — Change password (CHANGE_PASSWORD)

      — Assign entitlements (LINK)

— Unassign entitlements (UNLINK)

— Retrieve entitlements (GETALL)

The operation is assigned as the name of the <attr> element and access to the operation is assigned to a corresponding <value> element. You can set the values as follows:

— true — the operation is supported by the connector

— false — the operation is not supported by the connector

— bypass — the operation is not supported by the connector

Here is an example:

```
<objectClassDefinition description="" name="User">
  <properties>
  <attr name="GETCHILDREN">
    <value>true</value>
  </attr>
  <attr name="DELETE">
    <value>true</value>
  </attr>
  <attr name="EXPIREPASSWORD">
    <value>true</value>
  </attr>
  <attr name="GETALL">
    <value>true</value>
  </attr>
...
```

- **<memberAttributes>**
  Defines the attribute mappings. This element contains
  <attributeDefinitionReference> elements that describe the mapping
  for each attribute. Each <attributeDefinitionReference> can be
  followed by an <attributeDefinition> element that specifies details
  such as minimum length, maximum length, and so on.

  Each <attributeDefinitionReference> element contains the following
  attributes:

  — Name — the name of the reference.

  — Required— if this attribute is required in the provisioning (set to
    true or false).

— Concero:tafield — the name of the Select Identity resource attribute. In general, the attribute assigned to tafield should be the same as the physical resource attribute, or at least the connector attribute. For example, it is recommended to have the following:

```
<attributeDefinitionReference name="FirstName"
required="false" concero:tafield="[givenname]"
concero:resfield="givenname" concero:init="true"
concero:isMulti="true"/>
```

instead of this:

```
<attributeDefinitionReference name="FirstName"
required="false" concero:tafield="[FirstName]"
concero:resfield="givenname" concero:init="true"
concero:isMulti="true"/>
```

— Concero:resfield — the name of the physical resource attribute from the resource schema. If the resource does not support an explicit schema (such as UNIX), this can be a tag field that indicates a resource attribute mapping.

Also, the attribute name may be case-sensitive; for example, if the attribute is defined in all uppercase letters on the resource, be sure to specify it in all uppercase letters here.

— Concero:isKey — An optional attribute that, when set to true, specifies that this is the key field to identify the object on the resource. Only one <attributeDefinitionReference> can be specified where isKey="true". This key field does not need to be the same as the key field of the identity object in Select Identity.

Note that for a key field mapping where isKey="true" and tafield is not assigned the UserName attribute, UserName should not be used in any other mapping. That is, UserName can be assigned to tafield only in cases where it is mapped to the key field in the resource. Example:

```
<attributeDefinitionReference name="UserName"
required="true" concero:tafield="[UserName]"
concero:resfield="uid" concero:isKey="true"
concero:init="true"/>
```

— Concero:init — An optional attribute that identifies that the attribute is initialized with the value of the attribute passed in from Select Identity.

Here is an example:

```
<memberAttributes>
  <attributeDefinitionReference
  concero:resfield="schema=SISQL1_ADMIN,
  table=USERINFO_1,column=ADDRESS" concero:tafield=""
  encrypt="false" encryptionAlgorithm="" fk="" iTK="false"
  isKey="false" isPassword="false"
  name="schemaSISQL1_ADMINtableUSERINFO_1columnADDRESS"
  required="false" supportedOperations="UNLINK,LINK,
  GETPARENT,GETCHILDREN,GETALL,GETAATTRIBUTES,
  RESETPASSWORD,CHANGEPASSWORD,EXPIREPASSWORD,
  CREATE,DELETE,ENABLED,UPDATE" type="string"/>
...
```

The interpretation of the mapping between the connector field (as specified by the Concero:tafield attribute) and the resource field (as specified by the Concero:resfield attribute) is determined by the connector. The SQL Server connector has code to interpret the mappings in one way, as follows:

— The connector attribute names are specified in tafield. The value of attribute xyz is taken from the UserModel during provisioning.

— Composite attributes can be specified in the SQL Server connector mapping file. To do this, specify attr1 {*xxxx*} attr2 as the connector attribute. This specifies that the value of the attr1 and attr2 attributes should be combined with the string *xxxx* to form a mapping for the specified resource field. The SQL Server connector has code to handle these composite mappings.

You must specify static text (strings) in composite attributes withn brackets (**{ }**). Also, if no string separates two connector attributes, you must add a space that is within brackets, like this: attr1{ }attr2.

- **<attributeDefinition>**

Defines the properties of each object's attribute. For example, the attribute definition for the Directory attribute defines that it must be between one and 50 characters in length and can contain the following letters, numbers, and characters: a-z, A-Z, 0-9, @, +, and a space.

Here is an example:

```
<attributeDefinition
description="schemaSISQL1_ADMINtableUSERINFO_1columnADDRESS"
```

```
name="schemaSISQL1_ADMINtableUSERINFO_1columnADDRESS"
type="xsd:string">
  <properties>
    <attr name="minLength">
      <value>0</value>
    </attr>
    <attr name="maxLength">
      <value>255</value>
    </attr>
    <attr name="defaultValue">
      <value>null</value>
    </attr>
    <attr name="pattern">
      <value><![CDATA[[a-zA-Z0-9@]+]]></value>
    </attr>
  </properties>
</attributeDefinition>
```

- **<concero:entitlementMappingDefinition>**

  Defines how entitlements are mapped to users.

- **<concero:objectStatus>**

  Defines how to assign status to a user.

- **<concero:relationshipDefinition>**

  Defines how to create relationships between users.

Refer to the SampleXML **subdirectory in the** MS SQL Server - Generic **directory on the Select Identity Connector CD for a sample XML file for this connector.**

Elements in the XSL Reverse Mapping File

If the agent is installed on the resource and you wish to enable reverse synchronization, you must create an XSL file to map all attributes that are specified in the XML mapping file. The Attribute Mapping Utility generates a corresponding XSL file when it generates the XML file. Use the examples in this section to customize the XSL files for a different schema. See the

SampleXML **subdirectory in the** MS SQL Server - Generic **directory on the Select Identity Connector CD for a full sample.**

➤ If the database schema changes and you need of a new set of mapping files, you can load the existing XML file in the Attribute Mapping Utility and modify it as needed. Using a text editor to edit the XML and XSL files is error-prone.

Also, note that the elements in the XSL file are case sensitive.

You must define the user's ID field on the resource and in Select Identity. In the following example, RES_USERID is the user ID resource attribute for the user on the resource. The RES_PASSWORD is the corresponding password attribute on the resource. The following provides an example for setting these attributes:

```
<xsl:variable name="RES_USERID"
select="'schema=dbo,table=USERINFO_1,column=USERID'"/>

<xsl:variable name="RES_PASSWORD"
select="'schema=dbo,table=USERINFO_1,column=PASSWORD'"/>
```

Note that if you generated the XSL file using the Attribute Mapping Utility, the RES_USERID and RES_PASSWORD attributes are the only ones you must edit in this file. If you are creating the XSL file using a text editor, you must edit additional attributes, as described below.

SI_USERID is the Select Identity attribute for the user ID, and SI_PASSWORD is the Select Identity attribute for the password. The following shows how to set these attributes:

```
<xsl:variable name="SI_USERID" select="'username'"/>

<xsl:variable name="SI_PASSWORD" select="'Password'"/>
```

For each resource attribute, you must define a corresponding Select Identity attribute, which defines the attribute in Select Identity to which the resource attribute is mapped. The following example defines the RES_ATTR0 resource attribute and the SI_ATTR0 attribute in Select Identity:

```
<xsl:variable name="RES_ATTR0" select="'xxxxxxxxxx'"/>

<xsl:variable name="SI_ATTR0" select="'xxxxxxxxxx'"/>
```

Then, define the resource attribute, such as in this example for RES_ATTR0:

```
<xsl:when test="$ATTRNAME = $RES_ATTR0">
  <xsl:call-template name="AttributeBuilder">
    <xsl:with-param name="DSMLELEMENT" select="$DSMLELEMENT"/>
```

```
    <xsl:with-param name="ATTRNAME" select="$SI_ATTR0"/>
    <xsl:with-param name="ATTRVALUE" select="$ATTRVALUE"/>
    <xsl:with-param name="MODIFYFLAG" select="$MODIFYFLAG"/>
  </xsl:call-template>
</xsl:when>
```

Refer to the `SampleXML` **subdirectory in the** `MS SQL Server - Generic` **directory on the Select Identity Connector CD for a sample XSL file for this connector.**

4

Uninstalling the Connector

If you need to uninstall a connector from Select Identity, make sure that the following are performed:

- All resource dependencies are removed.

- The connector is deleted through the Connectors home page on the Select Identity client.

Uninstalling the Connector from WebLogic

Perform the following to delete a connector:

1   Log on to the WebLogic Server Console.

2   Navigate to *My_Domain* →**Deployments** →**Connector Modules**.

3   Click the delete icon next to the connector that you want to uninstall.

4   Click **Yes** to confirm the deletion.

5   Click **Continue**.

Uninstalling the Connector from WebSphere

Complete the following steps to uninstall the connector on WebSphere:

1. Log on to the WebSphere Application Server Console.

2. Navigate to **Resources** →**Resource Adapters**.

3. Select the connector to uninstall.

4. Click **Delete**.

5. Click the **Save** link (at the top of the page).

6. On the Save to Master Configuraton dialog, click the **Save** button.

Uninstalling the Agent

The following sections describe how to remove the agent, which you can do using a wizard or manually.

Using the Wizard to Remove the Agent on Windows
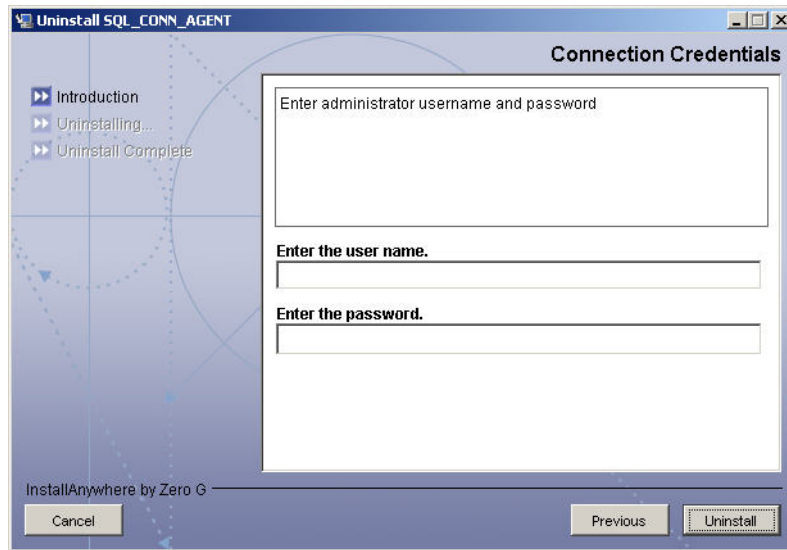
Perform the following steps to delete the agent on the Windows server:

1 Select **Programs** →**SQL_CONN_AGENT** →**Uninstall Agent** from the Start menu. The wizard displays.
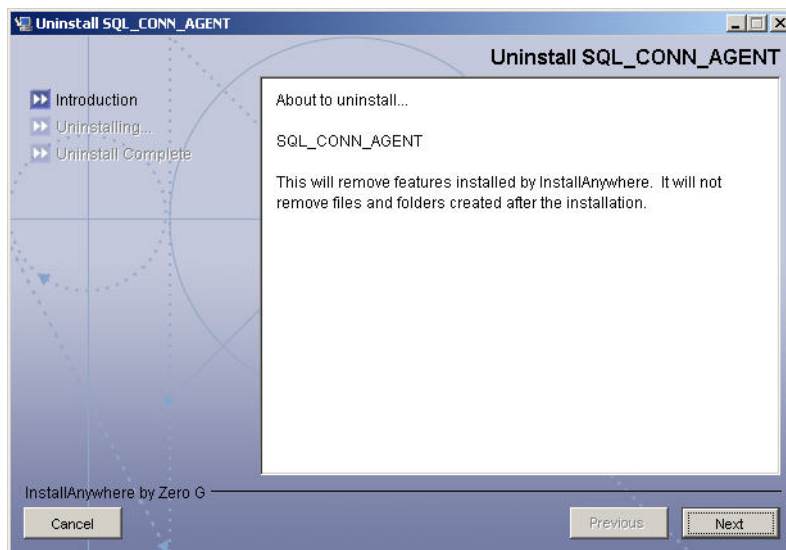
2 Click **Next** on the introductory dialog.

3 Provide the database credentials to uninstall the reverse triggers, if they were installed. Then, click **Uninstall**.

4 Click **Continue** when the pop-up dialog indicates that the triggers were successfully uninstalled.

5 Click **Done** on the Uninstall Complete dialog to close the wizard.

Manually Removing the Agent

Perform the following steps to manually remove the agent:

1 Make sure that the *agent_home*\conf\properties.ini file retains the same values used during the installation of the reverse triggers.

2 Make sure that the mapping file during the installation of the agent is available in the *agent_home*\conf\com\trulogica\truacess\ connector\schema\spml folder.

3 Run the uninstall.cmd file.

4 Provide the database login credentials when prompted.

5 Delete the agent files and directory structure, if you wish.

Troubleshooting

This appendix describes common problems encountered during the installation and use of the connector and its agent.

Connector Installation

This section lists the common problems encountered during installation and use of the connector.

- After redeploying the connector, Select Identity does not display the current connector information.

    Possible Cause: The application is using a cached connector file.

    Solution: Restart the application server.

- Select Identity does not display the most current mapping file information.

    Possible Cause: The application server is using a cached mapping file.

    Solution: Restart the application server.

- The mapping file of an existing resource is changed and, when you attempt to modify the resource to add a new mapping file, the following error displays:

    ```
    Application cannot be modified at this time
    ```

Possible Cause: Major differences may exist between the old and new mapping files.

Solutions:

— Create a new resource with the new mapping file.

— Unmap all attributes in the current resource and modify the resource to reference the new mapping file. You cannot use this second solution, however, if users were provisioned using this resource.

• Select Identity can successfully add a user but the new user is not shown in the resource's database table.

Possible Causes:

— The mapping file lacks the Create operation for the Key attribute.

— The Create operation for the User entity is not added in the XML file.

— The XML parser files may be missing from the `BEA_HOME/jdk_1.4.1/jre/lib/endorsed` folder (on WebLogic).

— A database exception occurred.

Solutions:

— Add the Create operation or add the relevant JARs to the path. Refer to the *HP OpenView Select Identity Attribute Mapping Utility User's Guide* for details on how to add create operations for an entity.

— If a database exception occurred, refer to the logs for details of the exception. Common exceptions include size mismatches for columns and foreign key constraint violations. Refer to the database documentation for more information on the database exceptions.

Agent and Trigger Installation

This section lists the common problems encountered while installing and configuring reverse synchronization.

• An error message similar to one of the following is displayed while installing the agent:

```
Object already exists

Table_Audit (or Column_Audit) already exists
```

Possible Cause: Triggers or audit tables exist, possibly from a prior attempt to install and configure the agent.

Solution: Run `uninstall.cmd` (on Windows) or `uninstall.sh` (on UNIX), which removes the triggers from the database. Verify that the Table_Audit, Column_Audit, and SID_TAB tables were removed from the database. If removal was not successful, delete the tables manually before installing the agent triggers.

- A NullPointerException occurs

  Possible Cause: The specified mapping file is not available in the class path.

  Solution: Make sure that the file is placed in the `Install/conf` directory. Ensure the name of the file specified in `properties.ini` is spelled correctly. Note that it is case sensitive. Also, check the format of the mapping file.

- The agent installation wizard fails to start and displays an error message.

  Possible Cause: The JVM is not in the System Path environment variable or Java 1.4 is not available.

  Solution: Add the Java 1.4 to the System Path.

- While deploying the reverse synchronization triggers, the installation stops and displays an exception.

  Possible Cause: A version of Java that is older than 1.4 is the default JDK in use.

  Solution: Set the JAVA_HOME_14 variable to the path of Java version 1.4.

Agent Execution

This section lists the common problems encountered while running the agent.

- An exception similar to the following is displayed:

  `java.net.BindException: Address in use: JVM_Bind`

  Possible Cause: The listening port on the agent's system is in use, possibly by another invocation of the agent.

  Solution: Stop the older invocation and run the agent again.

- An error message similar to the following is displayed:

  `Invalid Object` *`schema.tableName`*

  Possible Cause: The schema specified in the mapping file is incorrect.

  Solution: Check the mapping file. For more information on the format of mapping file, see the *HP OpenView Select Identity Attribute Mapping Utility User's Guide*.

- An error message similar to the following is displayed:

  `Invalid Object Table_Audit or Column_Audit`

  Possible Cause: Audit tables are deleted or moved, or they are inaccessible to the triggers. If a trigger fails, the operation that caused the trigger is also rolled back.

  Solution: Make sure that the audit tables (Table_Audit, Column_Audit) are available. If that does not work and the connector's operations are failing, triggers and audit tables can be uninstalled, though this will cause reverse synchronization to stop.

- The agent console shows a Log4jFactory exception when started.

  Possible Cause: The agent cannot find the `log4j-1.2.8.jar` in the classpath.

  Solution: Add the JAR to the class path.