



Informatica® PowerExchange for Microsoft
Azure SQL Data Warehouse
10.2 HotFix 1

User Guide for PowerCenter

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Publication Date: 2021-03-26

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Preface

The *Informatica PowerExchange® for Microsoft Azure SQL Data Warehouse User Guide for PowerCenter®* describes how to read data from and write data to Microsoft Azure SQL Data Warehouse. The guide is written for database administrators and developers who are responsible for moving data from a source to a Microsoft Azure SQL Data Warehouse target, and from a Microsoft Azure SQL Data Warehouse source to a target. This guide assumes that you have knowledge of database engines, Microsoft Azure SQL Data Warehouse, and PowerCenter.

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CHAPTER 1

Introduction to PowerExchange for Microsoft Azure SQL Data Warehouse

This chapter includes the following topics:

- [PowerExchange for Microsoft Azure SQL Data Warehouse Overview, 8](#)
- [PowerCenter Integration Service and Microsoft Azure SQL Data Warehouse Integration, 9](#)

PowerExchange for Microsoft Azure SQL Data Warehouse Overview

Informatica recommends that you use PowerExchange for Microsoft Azure SQL Data Warehouse V3, as it contains enhancements that are not available in PowerExchange for Microsoft Azure SQL Data Warehouse.

You can use PowerExchange for Microsoft Azure SQL Data Warehouse to connect PowerCenter and Microsoft Azure SQL Data Warehouse. Use PowerExchange for Microsoft Azure SQL Data Warehouse to read data from and write data to Microsoft Azure SQL Data Warehouse. You can use PowerExchange for Microsoft Azure SQL Data Warehouse to collate and organize the details from multiple input sources and write the data to Microsoft Azure SQL Data Warehouse. You can include a Pipeline Lookup transformation in a Microsoft Azure SQL Data Warehouse mapping.

Microsoft Azure SQL Data Warehouse is an enterprise-class, data-warehouse-as-a-service. It is a distributed database in the Azure Cloud that can process relational and non-relational data. Power Exchange for Microsoft Azure SQL Data Warehouse is optimized for large data sets and can perform better than traditional data integration methods, such as ODBC or JDBC.

When you read data from or write data to a Microsoft Azure SQL Data Warehouse target, the PowerCenter Integration Service stages data files to Microsoft Azure Storage and uses T-SQL commands with Microsoft Polybase to load relational and non-relational data in parallel.

For example, you work in sales operations and you frequently need to analyze a high volume of data to improve operational intelligence. You design a mapping to read data or write data to Salesforce and other transactional systems and aggregate the data. You create a summary table in Microsoft Azure SQL Data Warehouse that you can query against to assess your sales organization's performance.

PowerCenter Integration Service and Microsoft Azure SQL Data Warehouse Integration

The PowerCenter Integration Service uses the Microsoft Azure SQL Data Warehouse connection to connect to Microsoft Azure SQL Data Warehouse.

When you run a session with an the Microsoft Azure SQL Data Warehouse source, the PowerCenter Integration Service connects and reads data from Microsoft Azure SQL Data Warehouse through a TCP/IP network. The PowerCenter Integration Service then stores data in a staging directory on the PowerCenter Integration Service machine and writes to any target.

When you run a session with a Microsoft Azure SQL Data Warehouse the PowerCenter Integration Service reads from any source and stores data in a staging directory on the PowerCenter Integration Service machine. The PowerCenter Integration Service then connects and writes data to Microsoft Azure SQL Data Warehouse through a TCP/IP network.

CHAPTER 2

PowerExchange for Microsoft Azure SQL Data Warehouse Installation and Configuration Overview

You can install PowerExchange for Microsoft Azure SQL Data Warehouse on a Windows 64-bit, or Red Hat Enterprise Linux 64-bit machines.

When you install the PowerExchange for Microsoft Azure SQL Data Warehouse server component, you enable the PowerCenter Integration Service to read data from or write data to Microsoft Azure SQL Data Warehouse.

Prerequisites

Before you can use PowerExchange for Microsoft Azure SQL Data Warehouse, perform the following tasks:

1. Install or upgrade to PowerCenter 10.2 and apply the latest HotFix.
2. Verify that you have read, write, and execute permissions on the following directory: `<Informatica installation directory>/server/bin`.
3. Verify that either the `db_owner` privilege or the following more granular privileges are granted to the user to connect to the Microsoft Azure SQL Data Warehouse and perform read and write operations successfully:
 - `EXEC sp_addrolemember 'db_datareader', '<user>';` // Alternately assign permission to individual table
 - `EXEC sp_addrolemember 'db_datawriter', '<user>';` // Alternately assign permission to individual table
 - `GRANT ALTER ANY EXTERNAL DATA SOURCE TO <user>;`
 - `GRANT ALTER ANY EXTERNAL FILE FORMAT TO <user>;`
 - `GRANT CONTROL TO <user>;`
 - `GRANT CREATE TABLE TO <user>;`
 - Assign required privileges for tasks performed through Pre-SQL and Post-SQL commands.

Install the Server Component

The PowerExchange for Microsoft Azure SQL Data Warehouse server component installs the PowerCenter Integration Service and PowerCenter Repository Service components.

If you configure the PowerCenter Integration Service or PowerCenter Repository Service to run on primary and backup nodes, install the PowerExchange for Microsoft Azure SQL Data Warehouse server component on each node configured to run the PowerCenter Integration Service or PowerCenter Repository Service.

If you configure the PowerCenter Integration Service to run on a grid, install the PowerCenter for Microsoft Azure SQL Data Warehouse server component on each node configured to run on the grid. If you cannot install the PowerCenter for Microsoft Azure SQL Data Warehouse server component on each node on the grid, create a resource in the domain and assign it to each node where you installed the PowerCenter for Microsoft Azure SQL Data Warehouse server component. When you create a session, configure the session to use the resource.

Install the Server Component on Windows

You can install the PowerExchange for Microsoft Azure SQL Data Warehouse server component on a Windows 64-bit machine. The PowerExchange for Microsoft Azure SQL Data Warehouse server component installs the PowerCenter Integration Service and PowerCenter Repository Service components.

1. Run `install.bat` from the installation package.
2. Click **Next**.
3. Select the Informatica installation directory.

By default, the server components are installed in the following location:

```
C:\Informatica installation directory\<version folder>
```

4. Click **Next**.
5. Click **Install** to begin the installation.
6. Click **Done** when the installation is complete.

The PowerCenter Integration Service and PowerCenter Repository Service components are installed.

Install the Server Component on Linux

Install the PowerExchange for Microsoft Azure SQL Data Warehouse server component on a Red Hat Enterprise Linux 64-bit machine when the PowerCenter Integration Service or PowerCenter Repository Service runs on Linux.

1. Enter `sh install.sh` at the prompt.
2. Enter the path to the Informatica installation directory.

By default, the server components are installed in the following location:

```
<User Home Directory>/Informatica/<version folder>
```

The PowerCenter Integration Service and PowerCenter Repository Service components are installed.

Install the Client Component

Install the Client component on every PowerCenter Client machine that connects to the domain where the PowerExchange for Microsoft Azure SQL Data Warehouse server is installed.

1. Unzip the installation archive and navigate to the root directory of the extracted installer files.
2. Run the `install.bat` script file.
The Welcome page appears.
3. Click **Next**.
The Installation Directory page appears.
4. Enter the absolute path to the Informatica client installation directory. Click **Browse** to find the directory or use the default directory.
By default, the PowerCenter client is installed in the following location:
`C:\Informatica\<version folder>`
5. Click **Next**.
The Pre-Installation Summary page appears.
6. Verify that all installation requirements are met and click **Install**.
The installer shows the progress of the installation. When the installation is complete, the Post-Installation Summary page displays the status of the installation.
7. Click **Done** to close the installer.
For more information about the tasks performed by the installer, view the installation log files.

Register the Plug-in

After you install or upgrade PowerExchange for Microsoft Azure SQL Data Warehouse, you must register the plug-in with the PowerCenter repository.

A plug-in is an XML file that defines the functionality of PowerExchange for Microsoft Azure SQL Data Warehouse. To register the plug-in, the repository must be running in exclusive mode. Use the Administrator tool or the `pmrepRegisterPlugin` command to register the plug-in.

The plug-in file for PowerExchange for Microsoft Azure SQL Data Warehouse is `AzureDWPlugin.xml`. When you install PowerExchange for Microsoft Azure SQL Data Warehouse, the installer copies the `AzureDWPlugin.xml` file to the following directory: `<Informatica Installation Directory>\server\bin\Plugin`.

Note: If you do not have the correct privileges to register the plug-in, contact the user who manages the PowerCenter Repository Service.

Java Heap Memory Configuration

Perform the following action to configure the memory for the Java heap size in the node that runs the PowerCenter Integration Service.

1. In the Administrator tool, navigate to the PowerCenter Integration Service for which you want to change the Java heap size.
2. Click the **Processes** tab.
3. Edit the **General Properties** section.
4. Specify the minimum heap size in **Java SDK Minimum Memory** section and maximum heap size in **Java SDK Maximum Memory** section based on the data you want to process.
5. Click Ok.
6. Restart the PowerCenter Integration Service.

Configure Temporary Directory Location

Follow below steps to configure the temporary directory location in the node that runs the PowerCenter Integration Service.

1. In the Administrator tool, navigate to the PowerCenter Integration Service for which you want to change the temporary directory location.
2. Click the **Processes** tab.
3. Click **Custom Properties**. The **Edit Custom Properties** dialog box appears.
4. Click **New** to add a new custom property.
5. Add the JVMOption custom property for the PowerCenter Integration Service and specify the value in the following format:

```
-Djava.io.tmpdir=<required tmp directory location>
```

.

For example,

```
Property Name: JVMOption2
```

```
Value: -Djava.io.tmpdir=/opt/Informatica/tmp/ZUDAP/
```

6. Specify the property name and value. The following table lists the property names and sample values:

Property Name	Property Value
JVMOption	-Djava.io.tmpdir=<required tmp directory location>

For example, -Djava.io.tmpdir=/opt/Informatica/tmp/ZUDAP/

7. Click Ok.
8. Restart the PowerCenter Integration Service.

CHAPTER 3

Microsoft Azure SQL Data Warehouse Sources and Targets

This chapter includes the following topics:

- [Microsoft Azure SQL Data Warehouse Sources and Targets Overview, 14](#)
- [Import a Microsoft Azure SQL Data Warehouse Source or Target Definition, 14](#)
- [Pipeline Lookup, 16](#)

Microsoft Azure SQL Data Warehouse Sources and Targets Overview

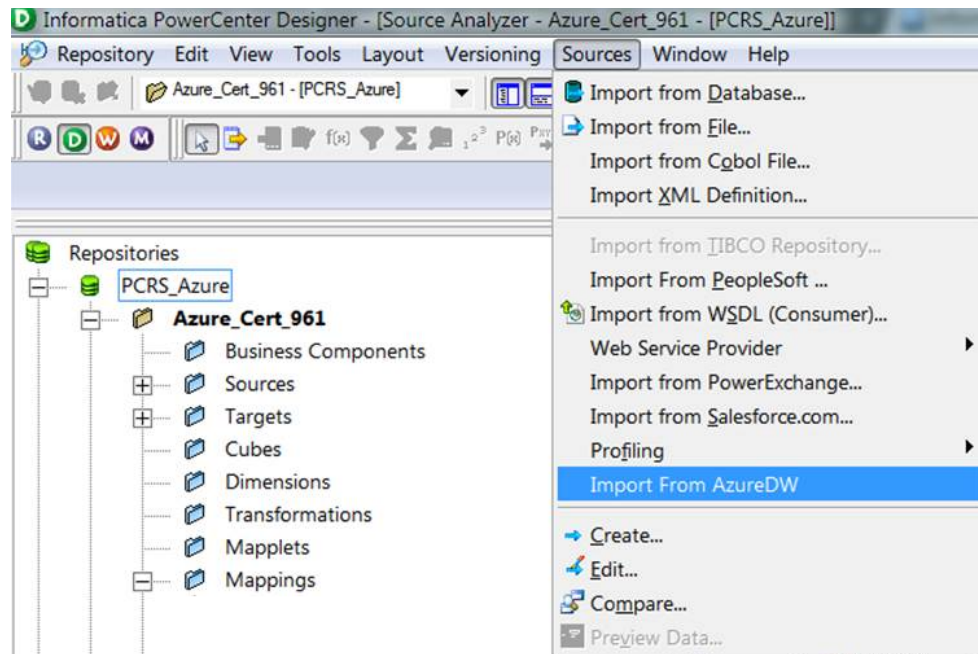
Create a mapping with a Microsoft Azure SQL Data Warehouse source to read data from Microsoft Azure SQL Data Warehouse and write to a target. Create a mapping with any source and a Microsoft Azure SQL Data Warehouse target to write data to Microsoft Azure SQL Data Warehouse.

Import a Microsoft Azure SQL Data Warehouse Source or Target Definition

You can import Microsoft Azure SQL Data Warehouse source and target objects before you create a mapping. You cannot configure a Microsoft Azure SQL Data Warehouse session to partition data.

1. Choose to import a Microsoft Azure SQL Data Warehouse source or target definition.

- In the Source Analyzer, click **Sources > Import From AzureDW**.



- In the Target Designer, click **Targets > Import From AzureDW**.

The **Import from AzureDW** dialog box appears.

2. In the **Import from AzureDW** dialog box, enter the following information:

Import Attribute	Description
DW JDBC URL Azure	Microsoft Azure SQL Data Warehouse JDBC connection string. For example, you can enter the following connection string: jdbc:sqlserver://<Server>.database.windows.net:1433;database=<Database>
Azure DW JDBC Username	User name to connect to the Microsoft Azure SQL Data Warehouse account.
Azure DW JDBC Password	Password to connect to the Microsoft Azure SQL Data Warehouse account.
Azure DW Schema Name	Name of the schema in Microsoft Azure SQL Data Warehouse.
Azure Blob Account Name	Name of the Microsoft Azure Storage account to stage the files.
Azure Blob Account Key	Microsoft Azure Storage access key to stage the files.

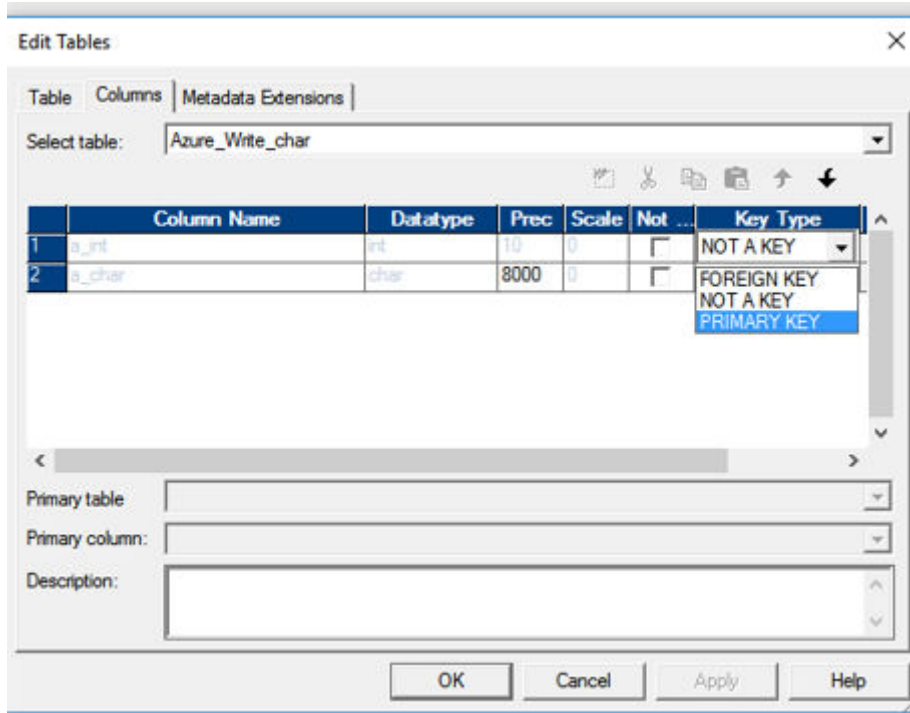
3. Click **Connect**.
4. Click **Next**.
5. Select the objects you need to load.
6. Click **Finish**.

Set a Primary Key

To upsert, update, or delete data from Microsoft Azure SQL Data Warehouse, you must define a primary key.

1. After you import the target object, double click the object to edit the target properties.
2. In the Columns tab, select primary key as the Key Type for the corresponding column. You can define multiple primary keys for a target object.

The following image shows the details of the properties page, where you can define the key type:



3. Click Ok.

Pipeline Lookup

Create a pipeline Lookup transformation to perform a lookup on a Microsoft Azure SQL data Warehouse table. A pipeline Lookup transformation has a source qualifier as the lookup source.

When you configure a pipeline Lookup transformation, the lookup source and source qualifier are in a different pipeline from the Lookup transformation. The source and source qualifier are in a partial pipeline that contains no target. The PowerCenter Integration Service reads the source data in this pipeline and passes the data to the Lookup transformation to create the cache.

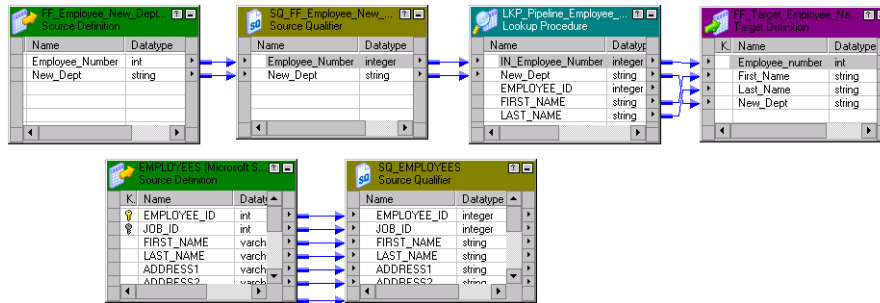
Create a connected or unconnected pipeline Lookup transformation.

Configuring a Pipeline Lookup Transformation in a Mapping

A mapping that contains a pipeline Lookup transformation includes a partial pipeline that contains the lookup source and source qualifier. The partial pipeline does not include a target. The Integration Service retrieves the lookup source data in this pipeline and passes the data to the lookup cache.

The partial pipeline is in a separate target load order group in session properties. You can create multiple partitions in the pipeline to improve performance. You can not configure the target load order with the partial pipeline.

The following mapping shows a mapping that contains a pipeline Lookup transformation and the partial pipeline that processes the lookup source:



The mapping contains the following objects:

- The lookup source definition and source qualifier are in a separate pipeline. The Integration Service creates a lookup cache after it processes the lookup source data in the pipeline.
- A flat file source contains new department names by employee number.
- The pipeline Lookup transformation receives Employee_Number and New_Dept from the source file. The pipeline Lookup performs a lookup on Employee_ID in the lookup cache. It retrieves the employee first and last name from the lookup cache.
- A flat file target receives the Employee_ID, First_Name, Last_Name, and New_Dept from the Lookup transformation.

CHAPTER 4

Microsoft Azure SQL Data Warehouse Sessions

This chapter includes the following topics:

- [Microsoft Azure SQL Data Warehouse Sessions and Connections Overview, 18](#)
- [Microsoft Azure SQL Data Warehouse Connections, 18](#)
- [Microsoft Azure SQL Data Warehouse Target Session Properties, 19](#)
- [Microsoft Azure SQL Data Warehouse Source Session Properties, 20](#)

Microsoft Azure SQL Data Warehouse Sessions and Connections Overview

After you create mappings, you can create a session to extract, transform, and load data.

Create connections to read data from and write data to Microsoft Azure SQL Data Warehouse. You can define properties in a session to determine how the PowerCenter Integration Service reads data from or writes data to a Microsoft Azure SQL Data Warehouse target.

Microsoft Azure SQL Data Warehouse Connections

A Microsoft Azure SQL Data Warehouse connection extracts data from and loads data to the Microsoft Azure SQL Data Warehouse. PowerExchange for Microsoft Azure SQL Data Warehouse uses SOAP to connect to Microsoft Azure SQL Data Warehouse.

The following table describes the Microsoft Azure SQL Data Warehouse connection properties:

Connection Properties	Description
Azure DW JDBC URL	Microsoft Azure SQL Data Warehouse JDBC connection string. For example, you can enter the following connection string: jdbc:sqlserver://<Server>.database.windows.net:1433;database=<Database>
Azure DW JDBC Username	User name to connect to the Microsoft Azure SQL Data Warehouse account.

Connection Properties	Description
Azure DW JDBC Password	Password to connect to the Microsoft Azure SQL Data Warehouse account.
Azure DW Schema Name	Name of the schema in Microsoft Azure SQL Data Warehouse.
Azure Blob Account Name	Name of the Microsoft Azure Storage account to stage the files.
Azure Blob Account Key	Microsoft Azure Storage access key to stage the files.

Configuring the Source Qualifier

After you import a source to create a mapping for Microsoft Azure SQL Data Warehouse source, you must configure the source qualifier.

1. In a mapping, double-click the Source Qualifier.
2. Select the **Configure** tab and click **Configure**.
The Establish Connection dialog box appears.
3. Specify the Microsoft Azure SQL Data Warehouse connection properties and click **Connect**.
4. Click **Finish**.
5. Save the mapping.

Microsoft Azure SQL Data Warehouse Target Session Properties

You can configure the session properties for a Microsoft Azure SQL Data Warehouse target on the Mapping tab. Define the properties for each target instance in the session.

You can use the session property Stop on Errors to indicate how many non fatal errors the PowerCenter Integration Service can encounter before it stops the session. You cannot configure the session to write records in bulk mode. You cannot configure pre-SQL and post-SQL queries for source and target objects in a mapping.

Note: Stop on Errors are calculated as per batch size. A session fails only if the error count is greater than the Stop on Errors specified after the batch succeeds. For example, if you are using normal mode and if the thread count is greater than 1, then Stop on Errors will check for errors in the batch after the entire batch is processed.

The following table describes the session property you can configure for a Microsoft Azure SQL Data Warehouse target session:

Session Property	Description
Azure Blob Container Name	Microsoft Azure Storage container name.
Field Delimiter	Character used to separate fields in the file. Default is a comma (,).

Session Property	Description
Number of Concurrent Connections to Blob Store	Number of concurrent connections to extract data from the Microsoft Azure Blob Storage. Default is 4.
Quote Character	The PowerCenter Integration Service skips the specified character when you write data to Microsoft Azure SQL Data Warehouse.
Truncate Table	Truncates the target data before inserting or upserting data to the target.
Insert	If enabled, the PowerCenter Integration Service inserts all rows flagged for insert. If disabled, the PowerCenter Integration Service rejects the rows flagged for insert.
Delete	If enabled, the PowerCenter Integration Service deletes all rows flagged for delete. If disabled, the PowerCenter Integration Service rejects all rows flagged for delete.
Update	<p>Performs update and upsert operations. To perform an update operation, you must map the primary key column and at least one column other than primary key column.</p> <p>You can select the following session target attributes:</p> <p>Update as Update</p> <p>The PowerCenter Integration Service updates all rows as updates.</p> <p>Update else Insert</p> <p>When you configure the session to update else insert rows, the PowerCenter Integration Service uses the following process to update target rows:</p> <ul style="list-style-type: none"> - If the source key value matches a target key value, the PowerCenter Integration Service updates each target row. It updates with the first or last source row matched, based on how you configure duplicate row handling. - If the source primary key value does not exist in the target, the PowerCenter Integration Service inserts the source row.
Success File Directory	This property is not applicable.
Error File Directory	This property is not applicable.

Microsoft Azure SQL Data Warehouse Source Session Properties

You can configure the session properties for a Microsoft Azure SQL Data Warehouse source on the Mapping tab. Define the properties for each source instance in the session.

You can override the source filter and sorted ports in the Application Source Qualifier at the session level. You can use the session property Stop on Errors to indicate how many non-fatal errors the PowerCenter Integration Service can encounter before it stops the session.

The following table describes the session property you can configure for a Microsoft Azure SQL Data Warehouse source session:

Session Property	Description
Quote Character	The PowerCenter Integration Service skips the specified character when you read data from Microsoft Azure SQL Data Warehouse.
Azure Blob Container Name	Name of the container in Microsoft Azure Storage to use for staging before extracting data from Microsoft Azure SQL Data Warehouse.
Field Delimiter	Character used to separate fields in the file. Default is a 0x1e.
Number of Concurrent Connections to Blob Store	Number of concurrent connections to extract data to the staging area in Microsoft Azure Blob Storage. Default is 4.
Tracing Level	Amount of detail displayed in the session log for the transformation. You can choose Normal, Verbose Initialization, or Verbose Data. Default is Normal.

APPENDIX A

Data Type Reference

This appendix includes the following topic:

- [Data Type Reference Overview, 22](#)

Data Type Reference Overview

PowerExchange for Microsoft Azure SQL Data Warehouse uses the following data types in PowerCenter sessions with Microsoft Azure SQL Data Warehouse objects.

Microsoft Azure SQL Data Warehouse native data types

Microsoft Azure SQL Data Warehouse data types appear on the Datatype tab for source qualifiers and target definitions when you edit metadata for the fields.

Transformation data types

Set of data types that appear in the remaining transformations. They are internal data types based on ANSI SQL-92 generic data types, which PowerCenter uses to move data across platforms.

Transformation data types appear in all remaining transformations in a PowerCenter sessions.

When PowerExchange for Microsoft Azure SQL Data Warehouse reads source data, it converts the native data types to the comparable transformation data types before transforming the data. When PowerExchange for Microsoft Azure SQL Data Warehouse writes to a target, it converts the transformation data types to the comparable native data types.

The following table lists the Microsoft Azure SQL Data Warehouse data types that PowerExchange for Microsoft Azure SQL Data Warehouse supports and the corresponding transformation data types:

Microsoft Azure SQL Data Warehouse Native Data Type	Transformation Data Type
bigint	bigint
binary	binary
bit	integer
char	string
date	date/time
datetime	date/time

Microsoft Azure SQL Data Warehouse Native Data Type	Transformation Data Type
datetime2	date/time
decimal	decimal
float	decimal
int	integer
money	double
nchar	string
nvarchar	string
real	decimal
smalldatetime	date/time
smallint	integer
smallmoney	double
time	date/time
tinyint	integer
varbinary	binary
varchar	string

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