

Migration from PostgreSQL database to MS SQL Server



Document Overview

AD360 comes bundled with a PostgreSQL database to store product data. The solution also supports the usage of MS SQL Server to store data and enables you to migrate product data from the built-in PostgreSQL to MS SQL database. This guide will walk you through the database migration process. Please note that AD360 supports online database migration.

Supported versions of MS SQL Server: 2005, 2008 R2, 2012, 2014, 2016, and 2017

Prerequisites for the migration process

Make sure that the following conditions are satisfied in the MS SQL Server to which you want to migrate the data:

1. The SQL Server browser must be up and running.
2. For SQL Server network configuration, TCP/IP protocol must be enabled.
3. All the client protocols must be enabled.
4. MS SQL Server access is delegated to a user with **sysadmin** and **db_owner** permissions at the server and database levels respectively.

Refer to [Appendix A](#) for configuring prerequisites 1, 2, and 3. Refer to [Appendix B](#) for configuring prerequisite 4.

Migrating from PostgreSQL to MS SQL

Migrating data from AD360' PostgreSQL database to MS SQL consists of the following two steps:

1. [Backing up the AD360 database](#)
2. [Migrating PostgreSQL data to MS SQL](#)

Step 1: Backing up the AD360 database

You can skip this step if you are migrating the database of a new AD360 installation.

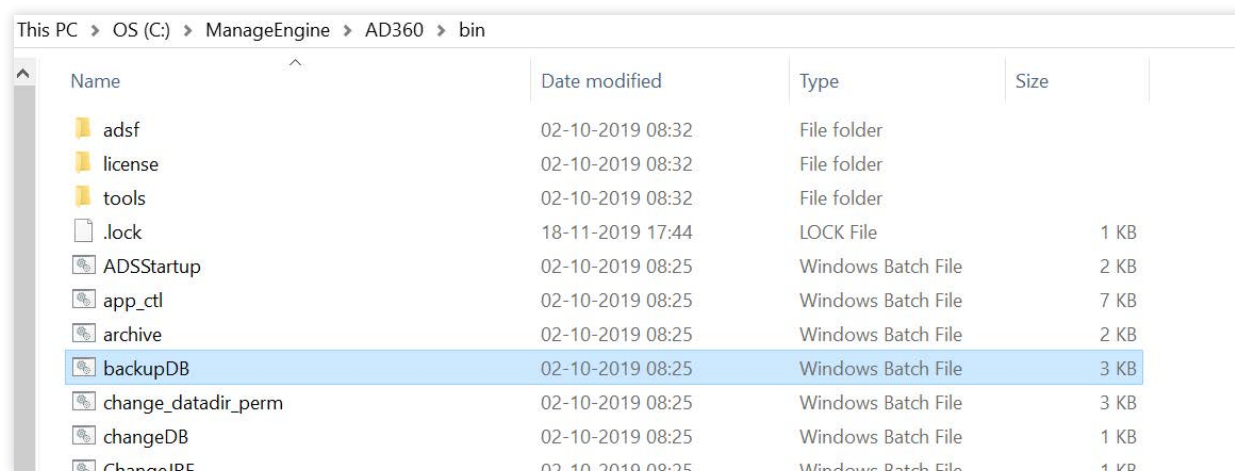
Note: It's not necessary to stop AD360 before performing the backup, as it supports online database backup and migration. AD360 makes automatic backups of the data at configured intervals. If you want to make a backup just before migration, you can follow the steps given below.

1. Navigate to **<AD360 installation directory>\bin**.

Note: By default, AD360 is installed in: C:\ManageEngine\AD360

2. Run the **backupDB** (Windows Batch) file as an administrator. Do not terminate until the process is finished.

Note: If you run the backupDB.bat in your local machine, the server needs to be stopped. But using the path – **Admin > General Settings > Database Settings > Database Backup** in AD360 product console, you can directly make online backup of database without stopping the product.



3. Data in the default database of AD360 will be backed up and stored under <AD360 installation directory>\backup\AD360_Backup_<Backup Date_ Time> if you have taken an online backup. On performing an offline backup operation, data will be stored under <AD360 installation directory>\backup\Offline Backup_<Backup Time>.

Step 2: Migrating PostgreSQL Data to MS SQL

Note: AD360 supports both online and offline migration. Refer to [section A](#) to perform offline migration and to [section B](#) to perform online migration.

A. Offline migration

1. If MS SQL Server is installed in a **remote computer**, first install the necessary command line utilities and native client, and then proceed to the next step.

Note: The links provided below will redirect you to the Microsoft SQL feature pack page command line utilities and native client formats. Download and install the corresponding SQL Native client or command line utilities (as per the MS SQL Server version and CPU type of the machine where AD360 is installed) in the machine where AD360 is running. The command line utilities contain the term **SQLCMD**, and the native client file can be found under the name **sqlncli**.

SQL Server version	Command line utilities	Native client
2005	Download	Download
2008 R2	Download	Download
2012	Download	Download
2014	Download	Download
2016	Download	Download
2017	Download	Download

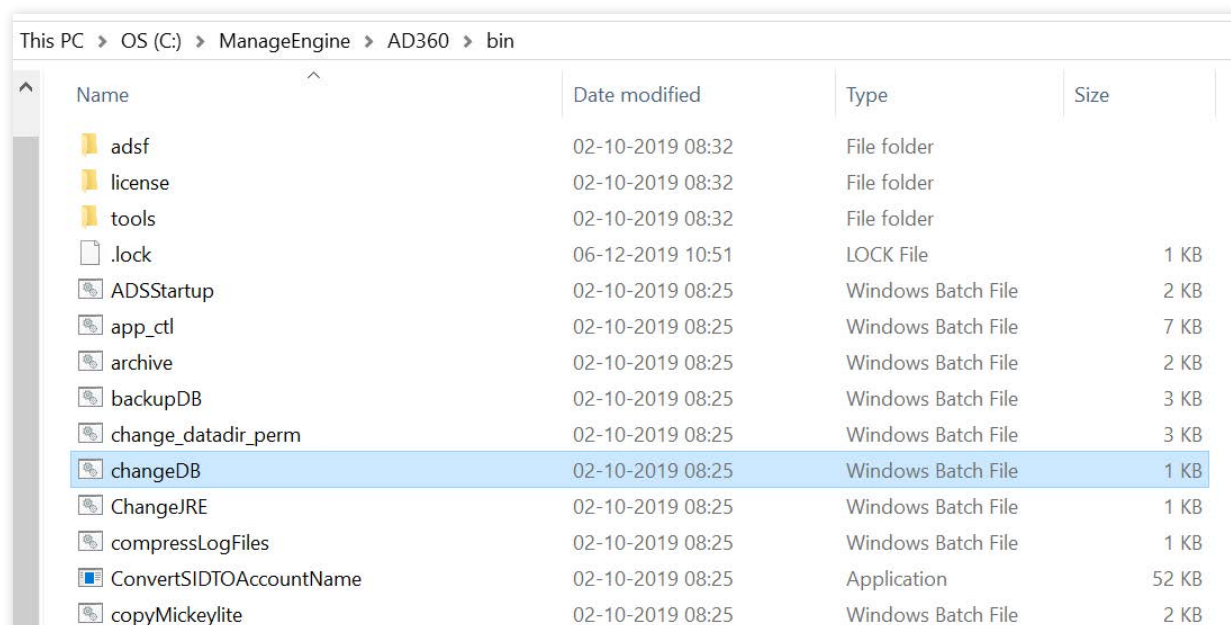
2. Copy the following files to <AD360 installation directory>\bin folder.

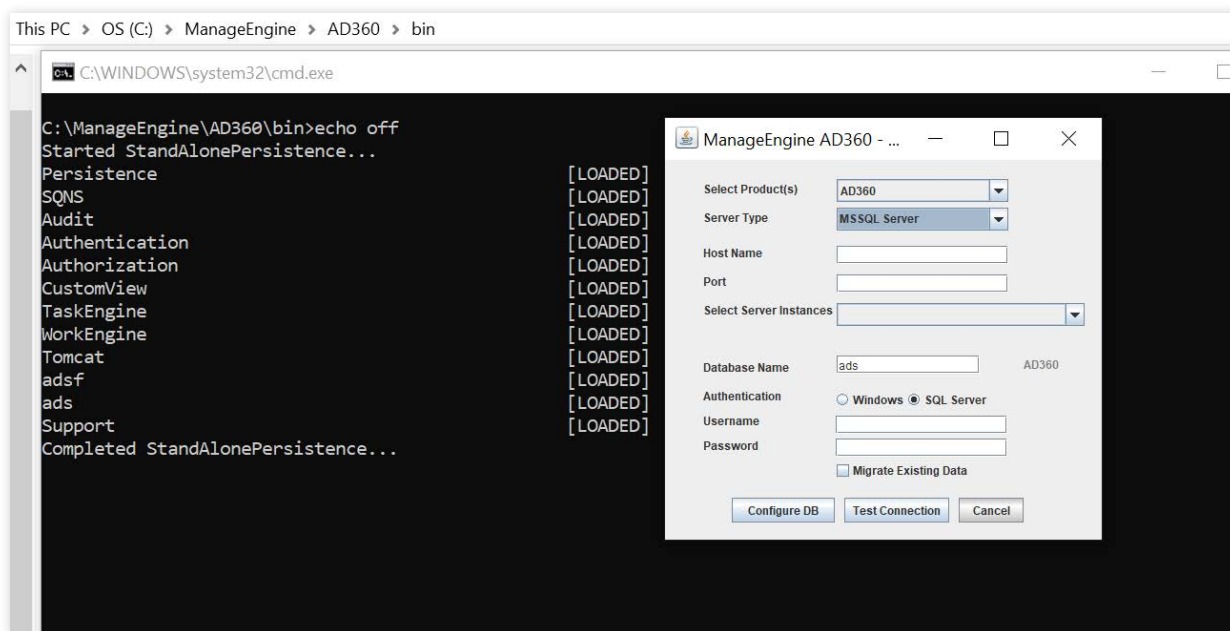
i. **bcp.exe**- <MSSQL installation directory>\Tools\Binn\bcp.exe

ii. **bcp.rll**- <MSSQL installation directory>\Tools\Binn\Resources\1033\bcp.rll

3. Navigate to <AD360 installation directory>\bin.

4. Run the **ChangeDB** (Windows batch file) as an administrator. In the **Database Setup Wizard** that appears, select **Server Type** as **MS SQL Server**.





5. Enter the **Host Name** and **Port** number of MS SQL Server.
6. Select the **SQL Server Instance** from the list of available instances.
7. If you want to migrate all the data stored in the default database, and also keep a copy of it in the newly-migrated database, check the box next to **Migrate existing data**. If you don't want to migrate the data, you can leave it unchecked.

Note: By choosing either option, data will remain in the default PostgreSQL database even after the migration. However, the MS SQL database will be active and used to store all the product data.

8. Select the **Authentication** type.
 - a. If you choose **Windows Authentication**, provide the **Domain Name**, **User Name**, and **Password** of the user account that has access to the server.
 - b. If you choose **SQL Server Authentication**, provide the **User Name** and **Password** of the user who has access to the MS SQL Server.
9. Click on **Test Connection** to check the status. If the connection fails, try reentering the correct credentials and establishing the connection again.
10. Click **Save**.
11. **Start** the **AD360Server/Service** to work with MS SQL Server as the database.

B. Online Migration

AD360 supports online migration of the product's database, so you don't need to stop the product before migration. After making a backup of the current database, follow the steps below to perform an online migration to MS SQL Server:

1. Log in to AD360 using administrator credentials.
2. Go to the **Admin** tab in the top pane.
3. Click on the **General Settings** drop-down menu on the left side.
4. Navigate to **Database Settings > Database Configuration**.
5. Under Database Configuration, select the **Database server**, and enter the **DB server name**, **port** and **instance**.
6. Browse and select the **bcp.exe** and **bcp.rll** files.
7. Select the **Authentication** type.
 - a. If you choose **Windows Authentication**, you can either use the **Default Windows Authentication option** or provide the **Username** and **Password** of the machine that has access to the server.
 - b. If you choose **SQL Server Authentication**, provide the **Username** and **Password** of the user who has access to it.

The screenshot shows the AD360 Admin console interface. The top navigation bar includes 'Dashboard', 'Reports', 'Admin', and 'Support'. The left sidebar shows a menu with 'Administration', 'General Settings', 'Personalize', 'Product Settings', 'SSL Certification Tool', 'Server Settings', 'Database Settings', and 'API Settings'. The main content area is titled 'Select Components To Migrate' and 'Database Configuration'. Under 'Select Components To Migrate', there is a table with columns 'Component Name' and 'Database Name', containing a row for 'AD360' with 'ads' in the 'Database Name' field. Under 'Database Configuration', there are several fields: 'Select Database Server' (MS SQL Server), '* DB Server Name/IP' (MS-SQLServer 1), 'DB Server Instance' (--select--), '* Select bcp.exe File' (bcp.exe), '* Select bcp.rll File' (bcp.rll), 'Authentication' (SQL Authentication and Windows Authentication), 'Use Default Windows Authentication' (checkbox), '* Username' (zohocorp\testuser), 'Password' (masked), and 'Migrate Existing Data' (checkbox). At the bottom, there are 'Configure', 'Cancel', and 'Test Connection' buttons.

The screenshot shows the AD360 Admin interface. The top navigation bar includes 'Dashboard', 'Reports', 'Admin', and 'Support'. The left sidebar has 'Administration' and 'General Settings' sections. The main content area is titled 'Database Configuration' and is split into two tabs: 'Database Backup' and 'Database Configuration'. The 'Database Configuration' tab is active and contains the following sections:

- Select Components To Migrate:** A table with two columns: 'Component Name' and 'Database Name'. There is one row with a checked checkbox, 'AD360' in the 'Component Name' column, and 'ads' in the 'Database Name' column.
- Database Configuration:**
 - 'Select Database Server': A dropdown menu set to 'MS SQL Server'.
 - '* DB Server Name/IP': A text input field containing 'MS-SQLServer 1' and a 'Port' button.
 - 'DB Server Instance': A dropdown menu set to '--select--'.
 - '* Select bcp.exe File': A text input field containing 'bcp.exe' and a 'Browse' button.
 - '* Select bcp.rtl File': A text input field containing 'bcp.rtl' and a 'Browse' button.
 - 'Authentication': Two radio buttons, 'SQL Authentication' (selected) and 'Windows Authentication'.
 - '* Username': A text input field containing 'SQL user'.
 - 'Password': A text input field with masked characters (dots).
 - 'Migrate Existing Data': A checked checkbox with a help icon.

At the bottom of the form are three buttons: 'Configure' (green), 'Cancel' (grey), and 'Test Connection' (blue link).

8. If you want to migrate with all the data stored in the default database intact and keep a copy of it in the new migrated database, check the **Migrate existing data** option. Otherwise, leave it unchecked.

Note: Data will remain in the default PostgreSQL database even after the migration. However, MS SQL database will be active and used to store all the product data.

9. Click on **Test Connection** to check the status. If the connection fails, try reentering the correct credentials and establishing the connection again.

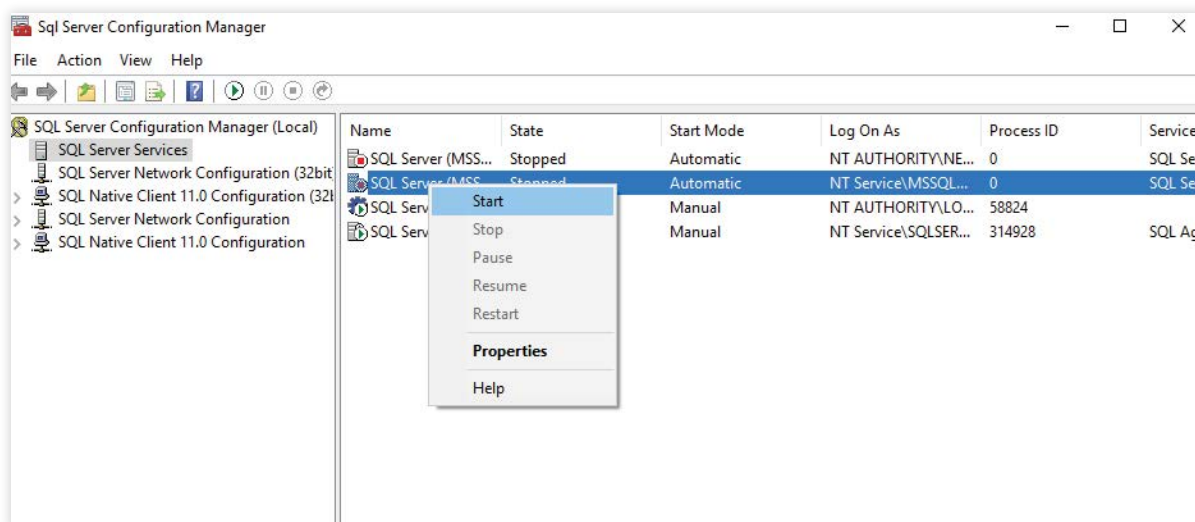
10. Click on **Configure**.

Appendix A

Configuring MS SQL Server

If you already have a functional MS SQL Server, then this step is not required. Follow the steps below to configure a new MS SQL Server installation.

1. Open SQL Server Configuration Manager, or run **compmgmt.msc** in Command Prompt.
2. Go to **SQL Server Services > SQL Server Browser**. Make sure the SQL Server Browser is running.



3. Go to **SQL Server Network Configuration > double-click Protocols for <Instance_Name>**.
4. Click on the **TCP/IP** protocol, and enable it.
5. Restart the **SQL Server Service** for the changes to take effect.

Note: **SQLEXPRESS** is the instance name provided while configuring MS SQL Server in general, however, it can be changed. This name will be used for reference.

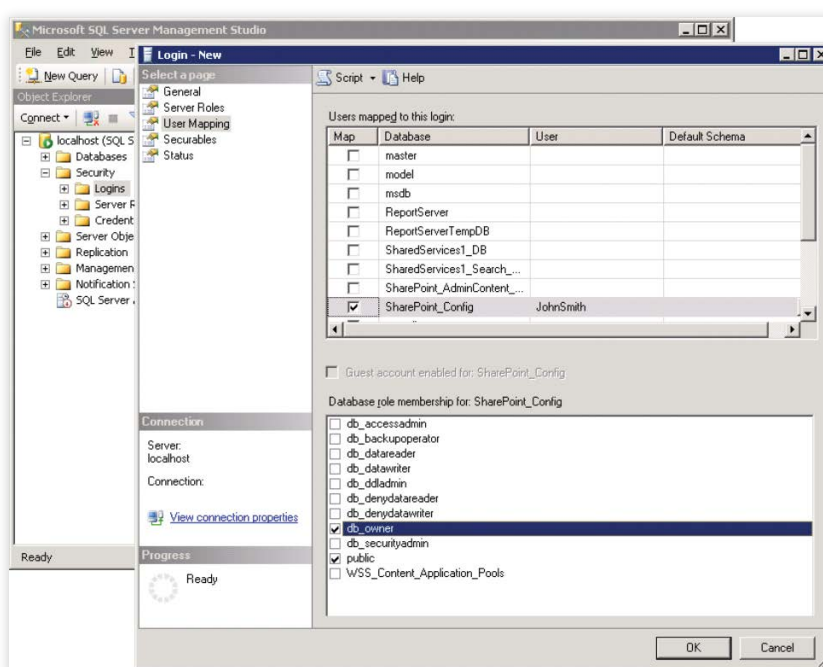
6. Go back to **SQL Server Configuration Manager**. In the left pane:
 - Navigate to **SQL Server Network Configuration > Protocols for SQLEXPRESS**, and enable all the protocols.
 - Navigate to **SQL Native Client Configuration > Client Protocols**, and enable all the protocols.

Appendix B

Delegating MS SQL Server access to users

It's necessary to add a login for users to access the configured MS SQL Server either using Windows Authentication or SQL Server Authentication. However, it's not mandatory to create a new login. You can use existing service accounts too. If there are none, then follow the steps given below to create a **New Login** and equip the user with the necessary permissions.

1. Log in to **SQL Server Management Studio**.
2. In the left pane, navigate to **Machine Name > SQLEXPRESS > Security > Logins**.
3. Right-click on **Logins**, and select **New Login**.
4. Provide a **Login Name**, and choose whether to use **Windows Authentication** or **SQL Server Authentication**.
 - If you choose **Windows Authentication**, enter the Windows NT name of the user to whom access must be granted.
 - If you choose **SQL Server Authentication**, you will be prompted to create a new **Username** and **Password**.
5. The new user must have the **sysadmin** role in the server level and **db_owner** role in the database level. Follow these steps to provide the sysadmin and db_owner role permission:
 - Navigate to **Machine Name > SQLEXPRESS > Security > Logins > Right-click the user > Properties**.
 - Go to **Server Roles**, select the **sysadmin** check box, and click **OK**.
 - Go to **User Mapping** in the left pane. In the **Users mapped to this login** list, check the database and in the **Database role membership** for list, select **db_owner**, and click **OK**.



Note: For details about user roles, refer to the following documents:

- For Server-Level Roles: <http://msdn.microsoft.com/en-us/library/ms188659.aspx>
- For Database-Level Roles: <http://msdn.microsoft.com/en-us/library/ms189121.aspx>

In general, the configured account needs one of these three sets of privileges to complete the migration process successfully:

	Required database role	Required permissions
Set 1	db_owner	Not required
Set 2	db_datareader, db_datawriter, db_ddladmin, db_backupoperator.	Not required
Set 3	db_ddladmin	ALTER ANY TABLE, ALTER ANY AGGREGATE, ALTER ANY DEFAULT, ALTER ANY FUNCTION, ALTER ANY PROCEDURE, ALTER ANY QUEUE, ALTER ANY RULE, ALTER ANY SYNONYM, ALTER ANY TYPE, ALTER ANY VIEW, ALTER ANY XML SCHEMA COLLECTION, ALTER ANY REFERENCES, CONTROL ON CERTIFICATE::[ZOHO_CERT] TO [user], CONTROL ON SYMMETRIC KEY::[##MS_DatabaseMasterKey##] TO [user], CONTROL ON SYMMETRIC KEY::[ZOHO_SYMM_KEY] TO [user]

Important:

Please note that you must have the db_owner permission while migrating PostgreSQL to MS SQL for the first time. After a successful migration, you can revoke the db_owner permission for the account, and provide the set 2 or set 3 permissions.

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