# Improving precision of numerical columns in item lists

In some WEBCON BPS content database, there may be a problem with different precisions of floating point numbers in the numerical columns of item list form fields.

Let's take a look at what causes this:

- The first 3 columns of the item list storing numbers (DET_Value – DET_Value2) can store them with a maximum precision of up to 10 decimal places,
- The next 7 columns of the item list storing the numbers ((DET_Value3 – DET_Value10) store them with a maximum precision of up to 6 decimal places,
- The remaining 20 columns (DET_Value11 – DET_Value30) can only store them with a maximum precision of up to 5 decimal places.

Migration scripts in version 2020.1.3. are designed to align the settings of the last of these three categories – the 20 columns stored between DET_Value11 – DET_Value30 – and increase them to 6 decimal places. This operation requires SQL Server to update the column type in all existing records from the item lists and their history, and also in archive databases. Columns with the greater or equal precision will not be migrated.

For small environments or environments where the updated database columns are not used, the installer will automatically perform the migration process.

For large environments, you must perform this migration manually, after providing adequate resources on the SQL server.

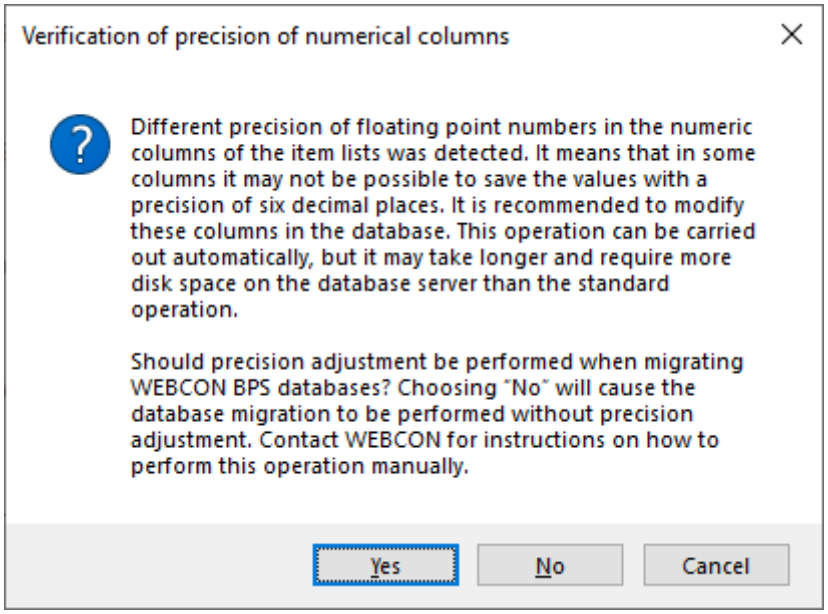
The alignment of the precision of numbers in the item list columns can be performed later, regardless of the database migration and installation to the newer WEBCON BPS version. If you do not use greater precision for numbers in item list than 5 decimal places, you will not experience any problems. However, you should do this migration before storing numbers in the WEBCON BPS databases with greater precision.

Whether the precision migration of the floating-point numbers will be performed depends on the value in the precision of floating point numbers global parameter (DecimalPrecision), which is located in the content database in the GlobalParameters table.

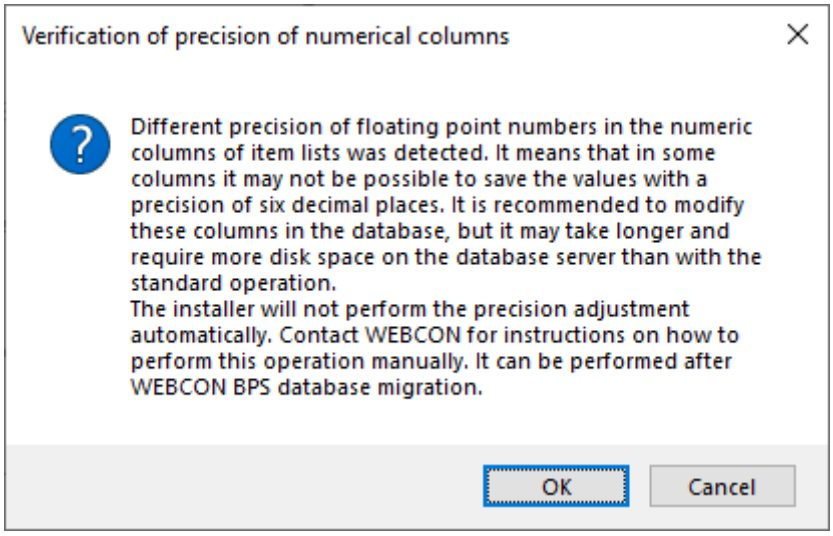
The migration will be automatically performed when the installation meets one of the following conditions:

a) Condition 1:
   - All item lists configured in the processes use only numerical fields stored in the columns that support the precision set in the precision of floating point numbers global parameter
   - No archive database has more than 100 000 rows in the WFElementDetails table
b) Condition 2:
   - The number of rows in the WFElementDetails is less than 100 000
   - The number of rows in the WFHistoryElementDetails is less than 100 000
   - The above quantitative conditions apply to all content and archive databases (quantity restrictions per database)

When it is possible to perform the migration process automatically, a user will see a message suggesting such migration. However, they have the option to skip the migration.




If the conditions for automatic precision migration are not met, a user will receive a different message – they will have to perform such migration themselves, after completing the WEBCON BPS update.




When the precision of the numerical columns (DET_Value3 – DET_Value30) is 5 and is equal to the value in the DecimalPrecision parameter, the precision migration will not be performed. However, when you want to increase the precision of floating point numbers, change the parameter value to 6 and run the migration manually.

The maximum precision can be increased to 6 decimal places – setting this parameter any higher will cause the columns to not be migrated.

## Manual migration process that aligns the precision of numerical columns in item list tables

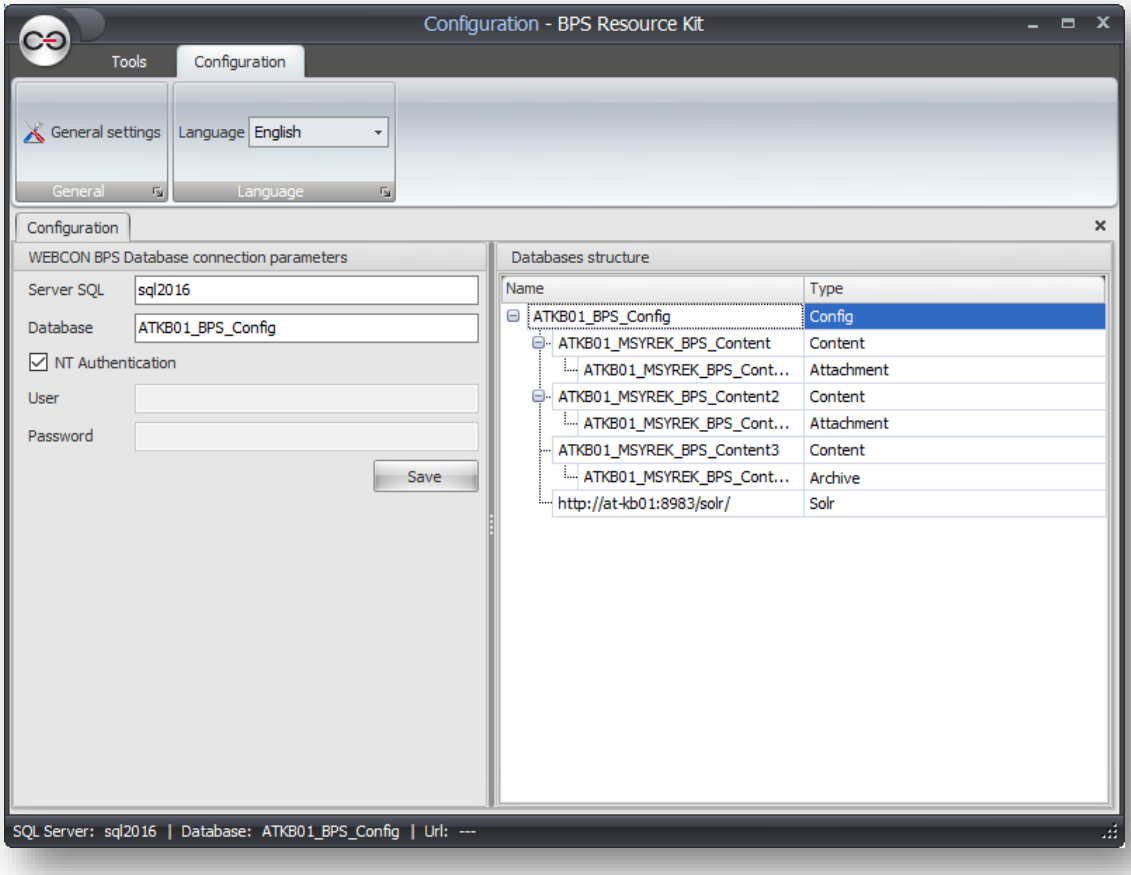
1. Prepare the appropriate resources on the server.

To prepare the appropriate resources on the server, check the size of the item list tables. For the correct precision migration of the numerical columns there should be at least 2 times more free disk space than the WFElementDetails and WFHistoryElementDetails tables take up.

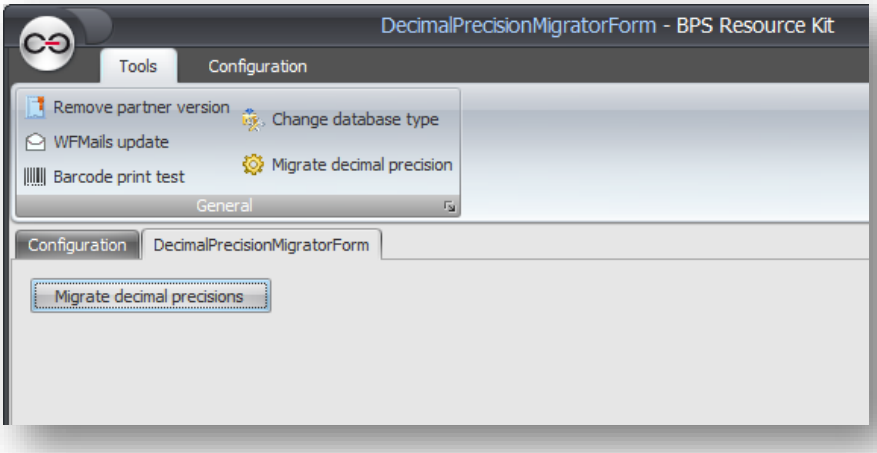
An example of returning the size of the table in SQL Server -> https://blog.sqlauthority.com/2017/05/25/sql-server-simple-query-list-size-table-row-counts/.

2. Migrate columns by using the Resource Kit tool.

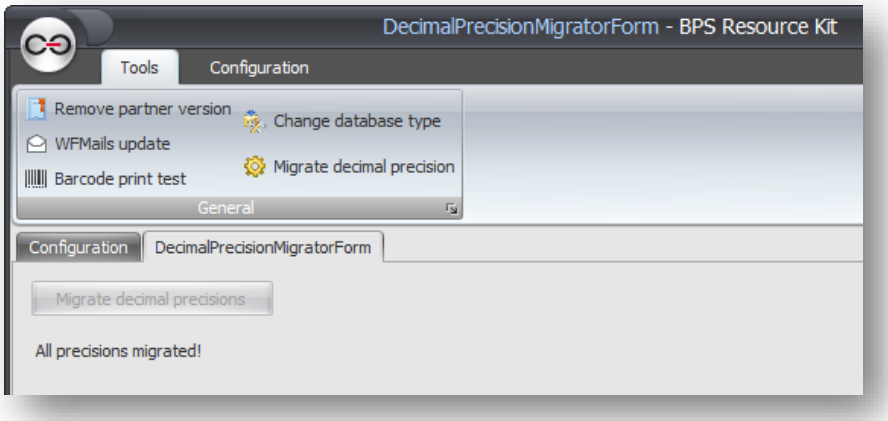
To migration the columns, open the tool which is located in the WEBCON BPS installer files in the .\Migration Tools\WebCon.BPS.ResourceKit location.




After properly configuring the database connection, run the precision of floating point numbers migration tool. If the precision is correct and there is no need to migrate, the button will be inactive.




After completing the migration, an appropriate message will be displayed.




The last step is to verify whether the precision has been properly migrated – you can use the following SQL query:

```
SELECT TABLE_NAME, COLUMN_NAME, NUMERIC_SCALE, NUMERIC_PRECISION FROM
INFORMATION_SCHEMA.COLUMNS
WHERE TABLE_NAME  in ('WFElementDetails', 'WFHistoryElementDetails') AND (COLUMN_NAME
like 'DET_Value%' or COLUMN_NAME like 'HDT_Value%')
```