2013 R2

Invantive Control

Manual

invantive

Solutions for
Real Estate and Finance

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1 Invantive Control

The manual Invantive Control is written for developers and users of a calculation model. The advantages of Invantive Control are:

- Use of frequently used Microsoft Excel;
- Use of Invantive Producer applications, like Invantive Control;
- Synergy between Microsoft Excel and Invantive Control by simply retrieve data and edit information;
- Compliance with ISO 27002 with Excel.

1.1 Description

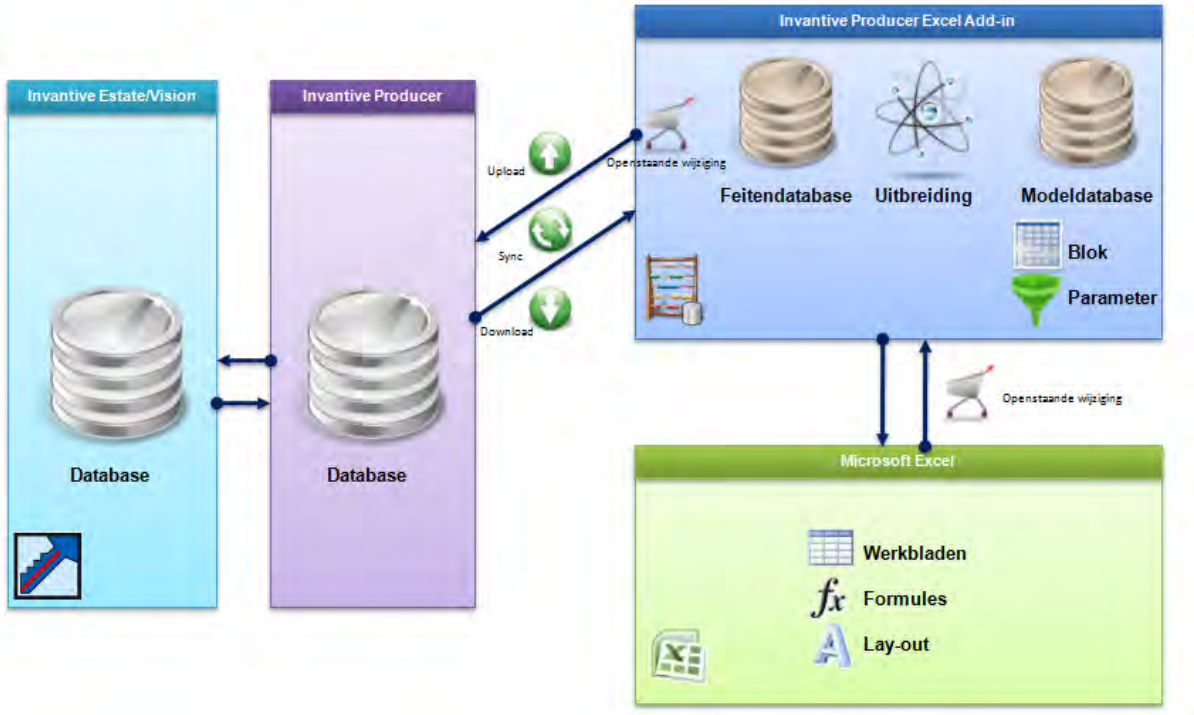
This chapter describes the concept, the functioning, and the scope of the applicationInvantive Control.

1.1.1 Concept

Invantive Control has the following concepts:

- Model;
- Block;
- Parameter;
- Extension;
- Pending Change;
- Synchronize.

The figure shows an overview of the concepts and the relationships between concepts.



Model

A model is an representation of an formula in the format of Invantive Control. The formula uses input parameters in the form of data of a database. Subsequently these input parameters are processed by Excel expressions and the result will be displayed. The input parame-

ters can be changed, added or removed. The changes will have an effect on the database. One example is that the model contains the definition of all organizations from a business object. See Model Editor 19 for more information.

Block

A block is a continuous area in an Excel worksheet. A block contains data of a database retrieved by a query at the last synchronization and contains data that needs to be saved during the next synchronization. A block uses one of the dimensions: cell, column, row or worksheet. See Blocks 21 for an example.

Parameter

A parameter is a filter that can be set to retrieve a part of the data from a block from the knowledgebase. By specifying a parameter, you ensure that only data from the database is retrieved which are set in the filter set. See Parameter Values 11 for setting parameters.

Extension

An extension is an integrated script in the output process of the model. An extension enriches a model with the functionality that is not standard available in Invantive Control. An example of an extension is to use a button that adds automatically data to the worksheet. See Extensions 26 for more information.

Pending change

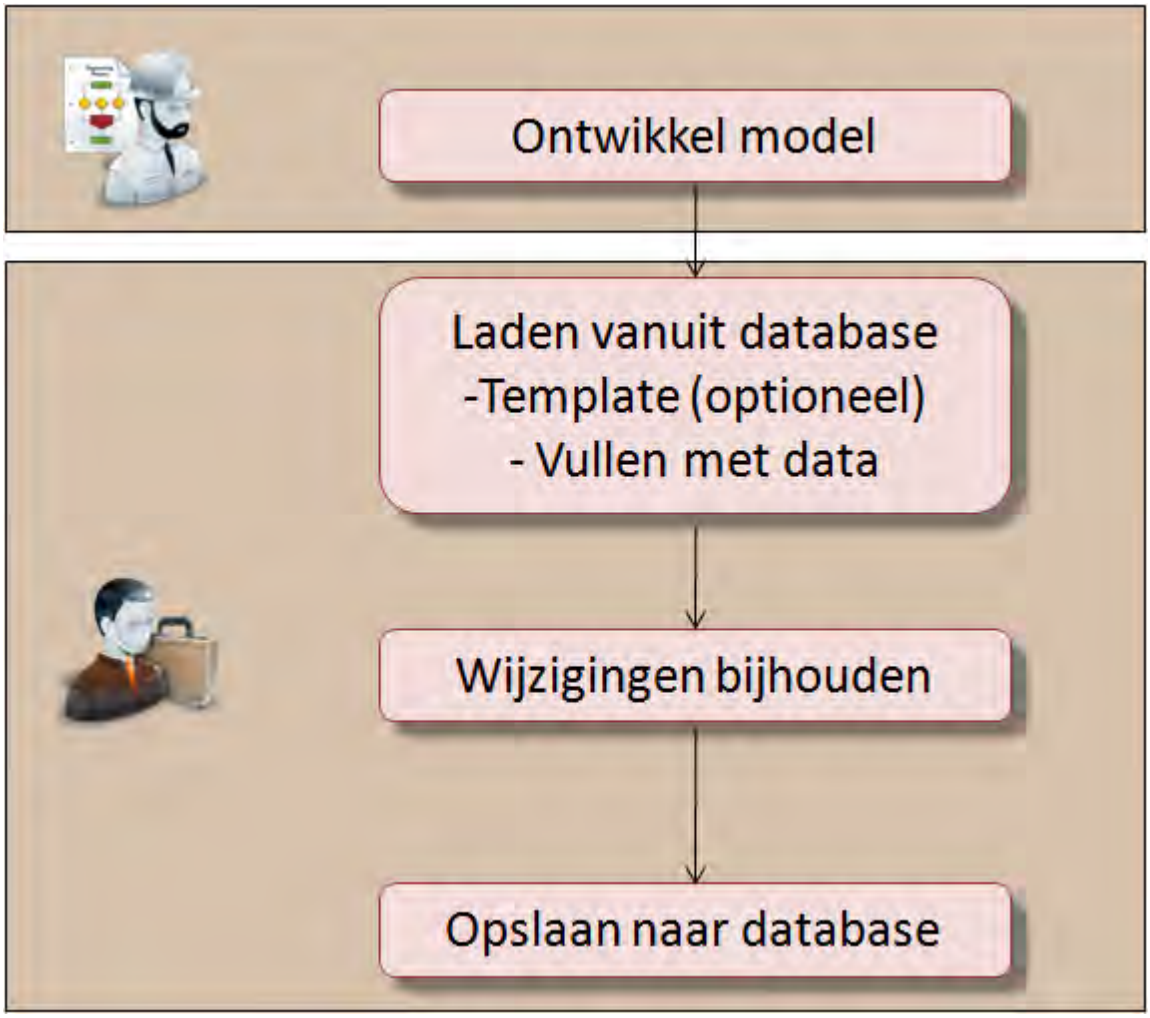
These are modifications in the local data of the model user and are ready to be sent to the knowledgebase. The knowledgebase contains the centralized storage of facts outside an Excel worksheet. An example of a pending change can be a modification of a cell value in Excel and this change still has to be sent to the knowledgebase. See Pending Changes 10 for more information.

Synchronize

You use Synchronization to send pending changes to the knowledgebase and to retrieve new data from the knowledgebase. Via the option With upload, the pending changes not yet sent are sent to the knowledgebase. Via the option With download, the last data is retrieved from the knowledgebase and processed in the data block. See User Interface Model User 7 for more information.

1.1.2 Functioning

The figure shows the global functioning of Invantive Control. The developer develops the model in Invantive Control and saves it in an Excel worksheet. The model user opens the Excel file and then loads the data from the database. The changes of the user and recorded and when synchronizing the changed data will be uploaded to the database and new data will be downloaded.



1.1.3 Scope

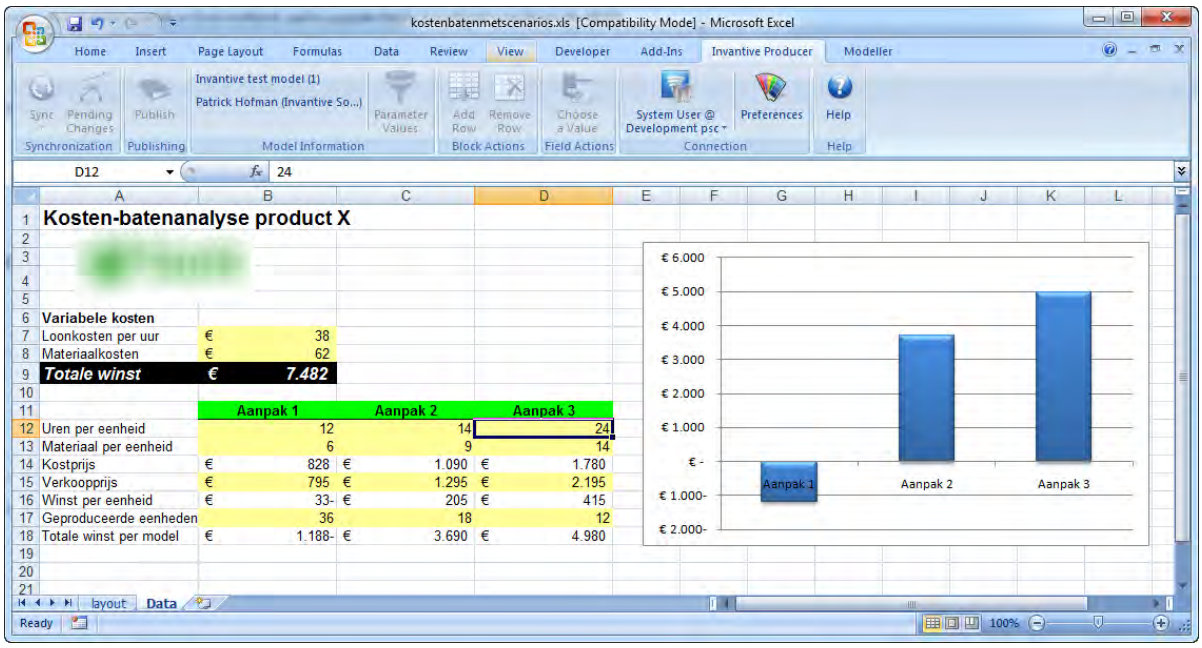
This section describes the scope of Invantive Control. The scope consists of support for calculation models, offline working and data management.

1.1.3.1 Calculation model

A mathematical model is used for calculations. An example of a mathematical model is a cost-benefit analysis which can be used to compare expected costs against expected benefits. The analysis is used to determine profitability of for example a product, project or service.

Example of a calculation model in Invantive Control

The figure shows an example of a cost-benefit analysis for developing a product which is based on three different approaches. Each approach uses different cost prices and selling prices and the bar graph shows that Approach 3 is actually the most profitable. The calculations of the model are are stored in the database which makes that the results will be displayed after synchronization throughInvantive Control in Excel. The advantage is that the user can not accidentally change the calculations and another advantage is that the computations can be managed.

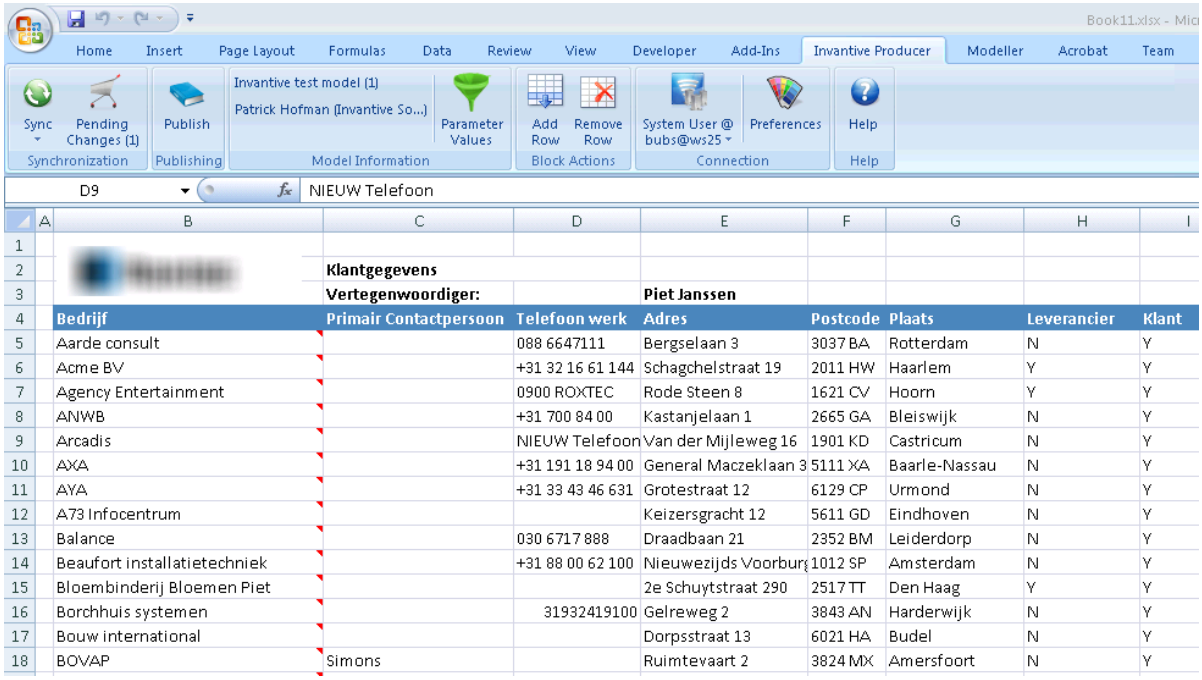


1.1.3.2 Working Offline

You can use Invantive Control for editing data in Excel offline. With working offline you can enter, change and delete data from the workbook without connecting to a database. If again there is a connection available to the database, you can upload and download changes (sync) from the database.

1.1.3.3 Data management

Another example of using <PRODUCT_ECA%> is for managing data input and updating large blocks of data. An example of this is to modify CRM data such as organizations and persons, as shown the image. It is possible to modify multiple organizations and individuals and then synchronize them with the database.



1.2 Functionality

This section describes the system requirements, de steps you have to perform for installation and an explanation of the user interface of Invantive Control.

1.2.1 System Requirements

To use Invantive Control on your PC or terminal server you will need the following software:

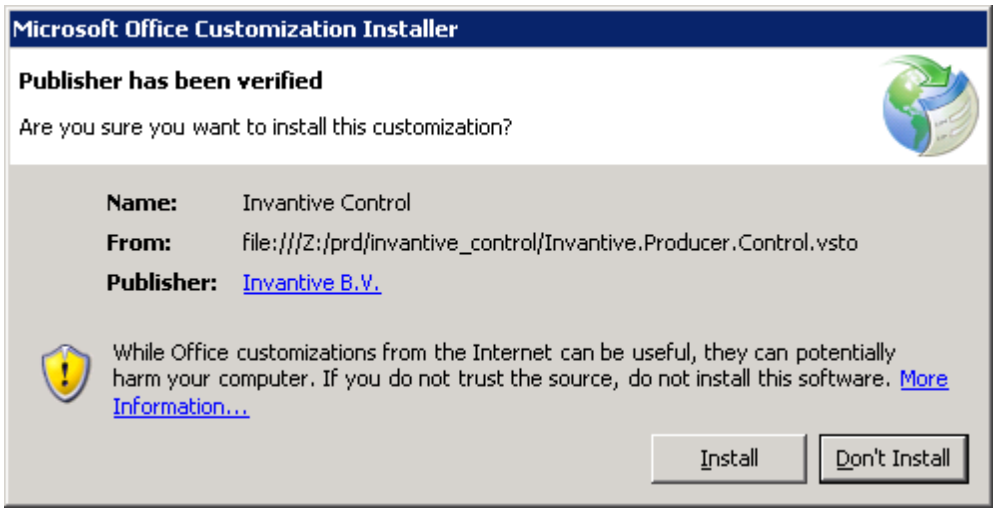
- Microsoft Office 2010 or Microsoft Office 2013 (only on Microsoft Windows).
- Microsoft .NET 4.5.
- Minimum 2 GB of internal memory.
- Screen resolution of 1280 x 1024 or higher.
- User license for used databases and/or business applications.
- Invantive Webservice or local drivers.

Use on Mac, tablet or smartphone is not possible.

1.2.2 Installation of Excel Add-in

Invantive Control will be installed on the Windows computer by performing the following steps:

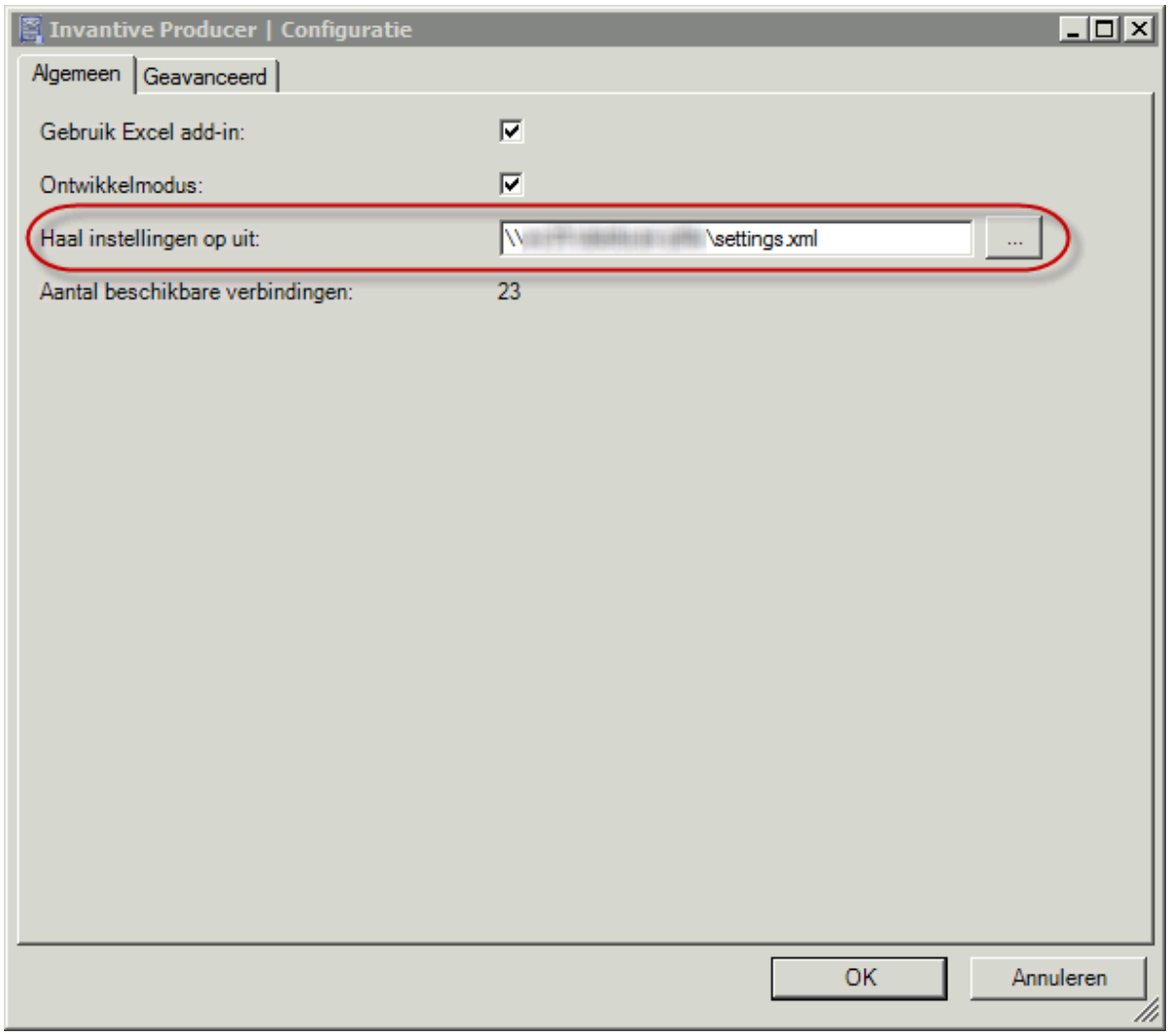
- Run the installation file 'setup.exe' then click on the 'Install' button. The file is located in the folder of Invantive Control. This installation directory is supplied by Invantive.



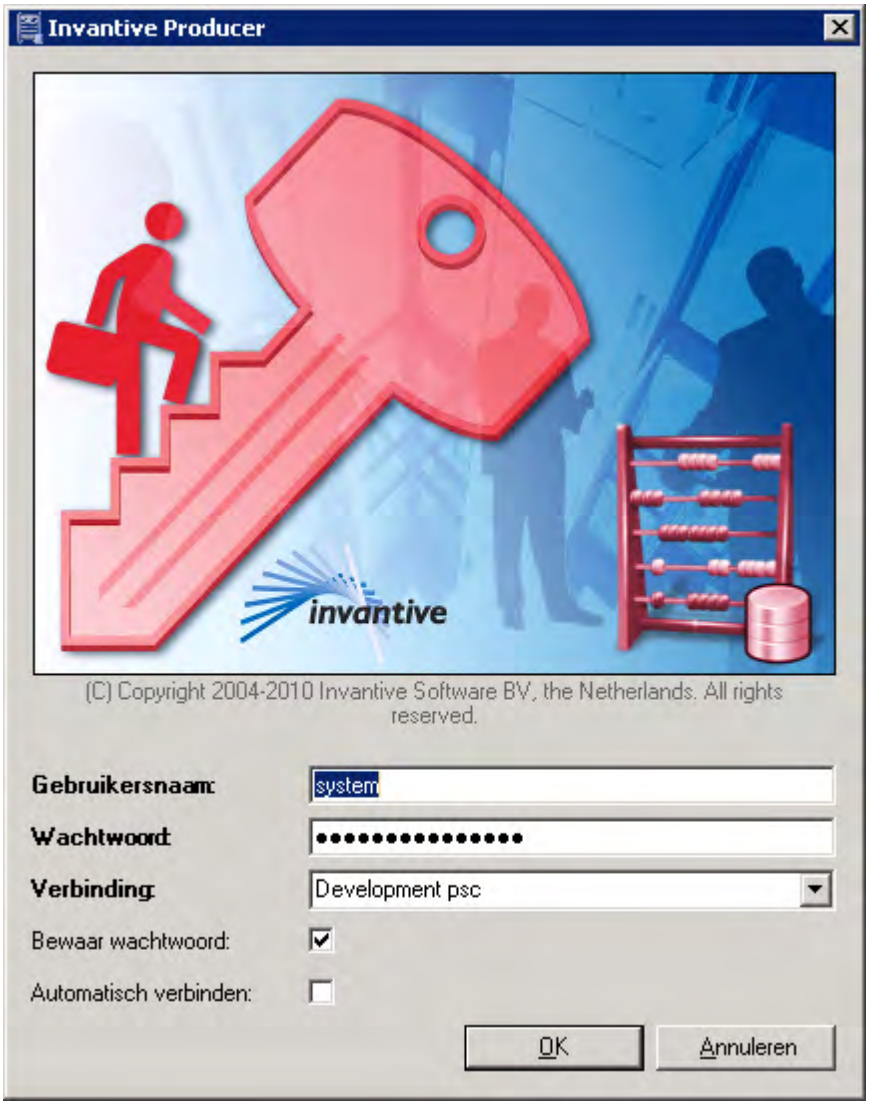
- When the installation is finished, the screen below is displayed.

- Next start Microsoft Excel to useInvantive Control. After starting Excel this window will be displayed. In this screen, you need to enter the location of the connection file. See Connection Configuration 54 for an explanation of the connection file. Next, click 'OK' to save the

changes.



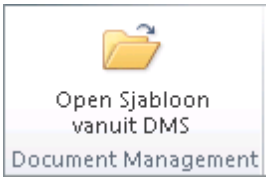
- Click on the tab 'Invantive Control' in the banner, then click on the button 'Connect' to make a connection to the server. Enter user name, password and connection then click 'OK', see Connection 12 for detailed explanation.



1.2.3 User Interface Model User

This paragraph gives an explanation of the tab Invantive Control in the banner in Microsoft Excel. The model user can enter and delete data, and set parameter values. The tab 'Invantive Control' The following image shows that the tab 'Invantive Control' is split into the groups, Document Management, Synchronizing, Publishing, Model Information, Block Actions, Field Actions, Connection and Help. Following each button there is an explanation.

Document Management



The group 'Document Management' contains the following button:

- Open the Template from DMS: Open a pop-up to open documents from DMS of Invantive Producer , see Open Template from DMS 10.

Synchronize

The group 'Synchronize' contains the following buttons:

- Sync: Synchronize the model workbook with the knowledgebase. Download alle nieuwe feiten en upload de wijzigingen naar de feitendatabase. The button 'Sync' contains the following functions:
  - Alleen Uploaden: Upload de wijzigingen van het huidige modelwerkblad naar de feitendatabase.
  - Download Only: Download all new articles from the knowledgebase in the current model.
  - Publish to New Model: Publish the model without articles to a new file.
- Pending Changes: Show the pending changes that have not yet been synchronized with the knowledgebase. The number between brackets shows the number of changes that have not yet been synchronized, seePending Changes 10.

Publish

The group 'Publish' contains the following button:

- Publish: Publishes the contents of the Exce workbook to a new workbook. You can exclude confidential parts of the original workbook from the new workbook, see Publish 10.

Model Information

The group ‘Model Information’ contains the following buttons:

- Model Information: The first line shows the name and version of the model and the second line the author and the company.
- Parameter Values: Open the parameters screen to configure a filter for retrieving data in the workbookParameter Values 11.

Blok Actions

The group ‘Block Actions’ contains the following buttons:

- Add Row: Add a new row after the current row in the selected block.
- Delete Row: Delete the selected row from the current block.

Field Actions

The group 'Field Actions' contains the following button:

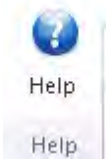
- Choose a Value: Open a pop-up which, seeChoose a Value 11.

Connection

The group ‘Connection’ contains the following buttons:

- Connect: Connect to a knowledgebase. The button shows the username and server If there is a connection to the database, see Connection 12.
  The button ‘Connect’ contains the following function:
  - Settings: Set de configuration of Invantive Control, see Settings 13.
- Preferences: Set your personal preferences for Invantive Control, see Preferences 14.

Help



The group ‘Help’ contains the following button:

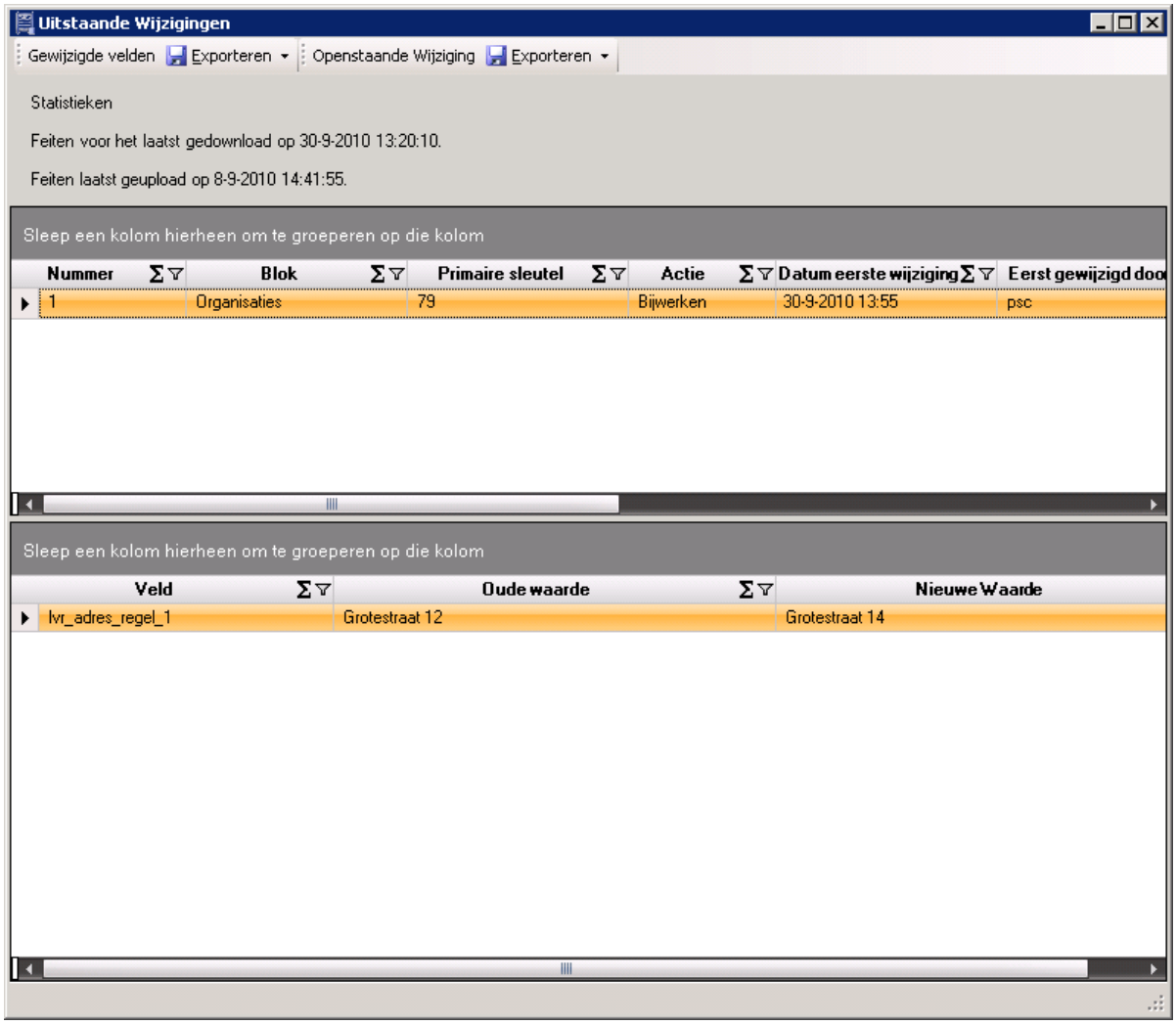
- Help: Get support for the use of Invantive Control, see Help 16.

1.2.3.1 Open Template from within DMS

Enter text here.

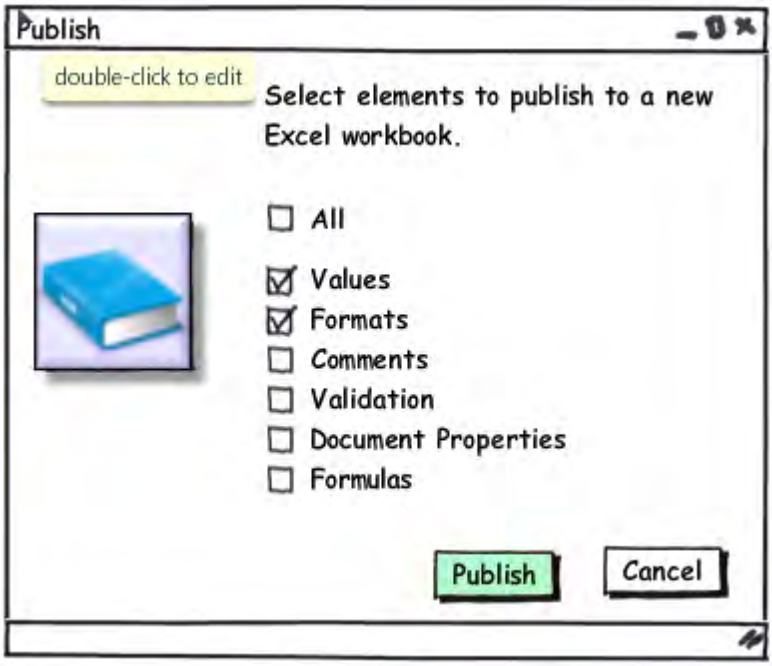
1.2.3.2 Pending Changes

The button 'Pending Changes' shows all modifications that have been made in Excel and not yet synchronized with the knowledgebase.



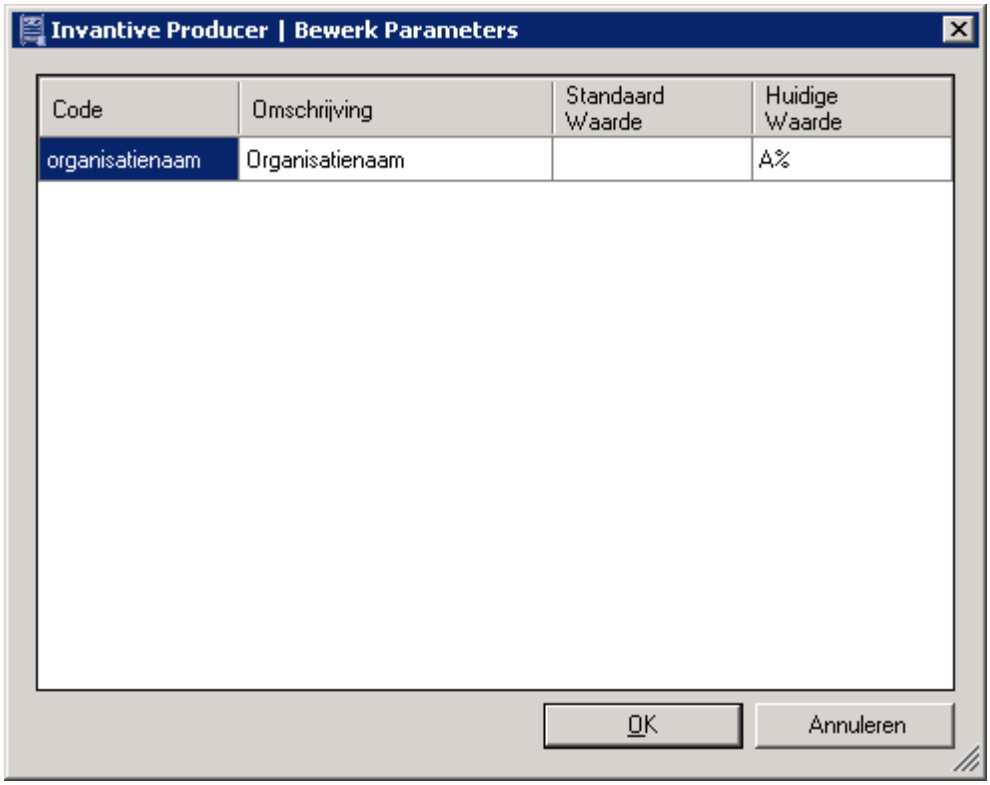
1.2.3.3 Publish

The function 'Publish' makes a new Excel Worksheet with a copy of the data from the original Excel file. In the window, you select the elements that are to be carried over to a new worksheet.

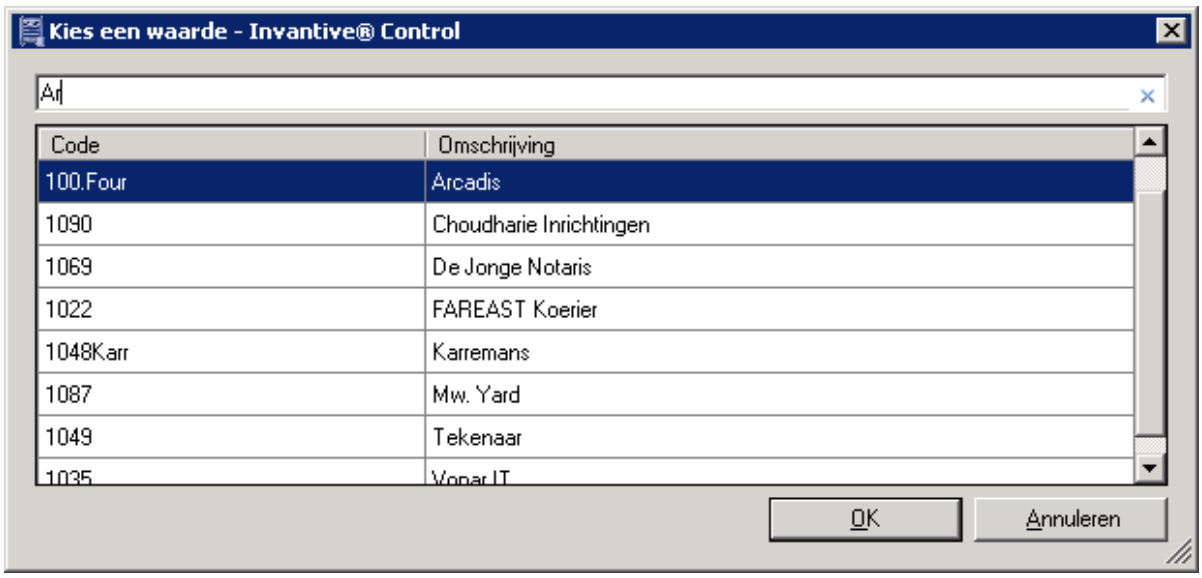


1.2.3.4 Parameter Values

The button 'Parameter Values' show the parameters that have been configured in the Model Editor 19. The current value can be edited to show another part of the data in the model. The image shows all of the organizations beginning with the letter 'A'.

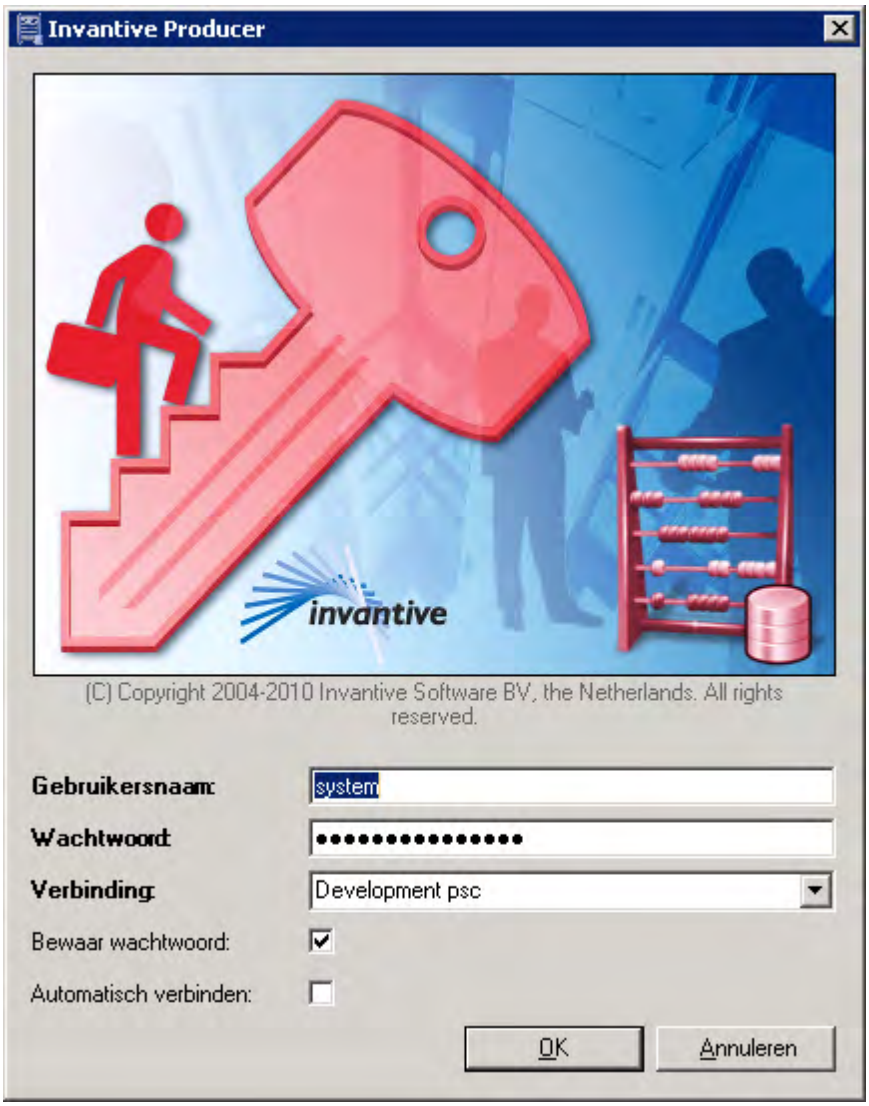


1.2.3.5 Choose a Value



1.2.3.6 Connection

The image shows the window where the connection to the database is specified.

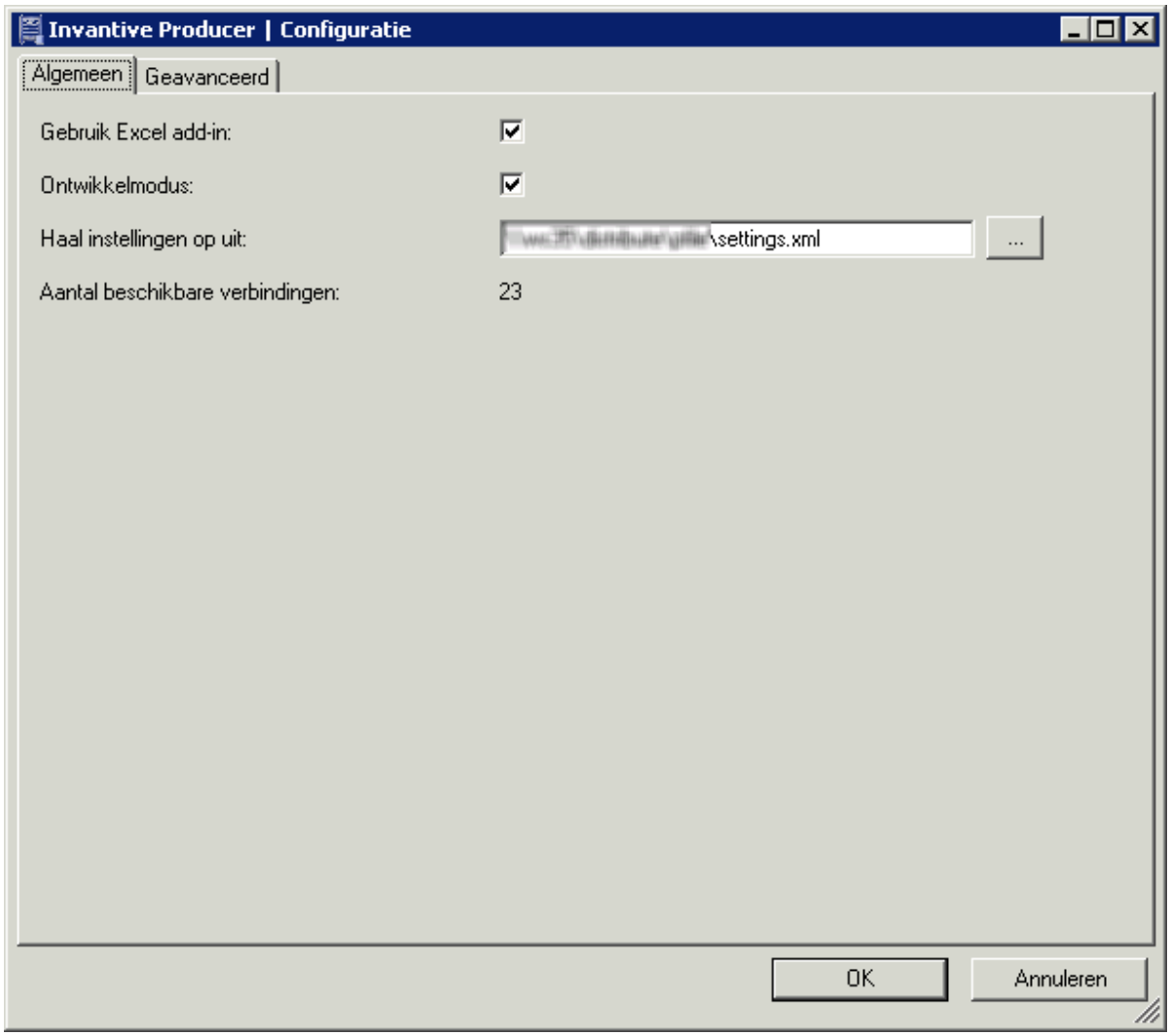


The meaning of the entry fields is:

Username	The username used for connecting to the server.
Passw ord	The passw ord of the user.
Connection	Here you enter the server w ith w hich you w ant to connect.
Store passw ord	The passw ord w ill be stored encrypted, w hen checked.
Connect Automatically	The application automatically connects to the server and the connection screen does not appear, w hen checked.

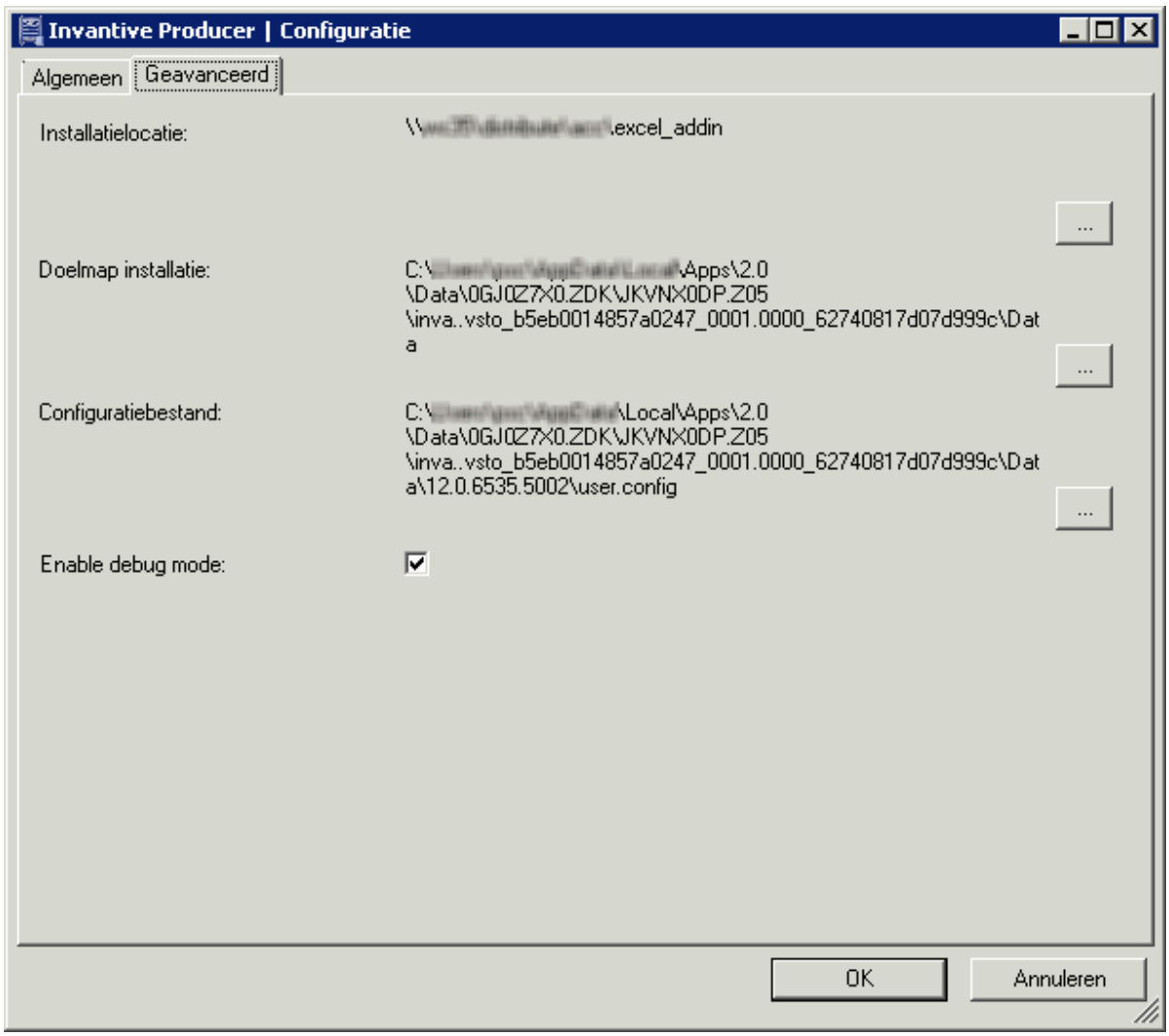
1.2.3.7 Configuration

In this window you set the configuration in from Invantive Control.



The meaning of the fields in the 'General' tab is:

Use Invantive Control	When checked, it is possible to activate Invantive Control.
Development Mode	When checked, the tab Modeller w ill be visible in the ribbon. This function is specifically for model developers.
Get settings from	This is the file location of the XML file w ith the connection settings.
Number of available connecti-ons	This field indicates the number of available connections to databases.

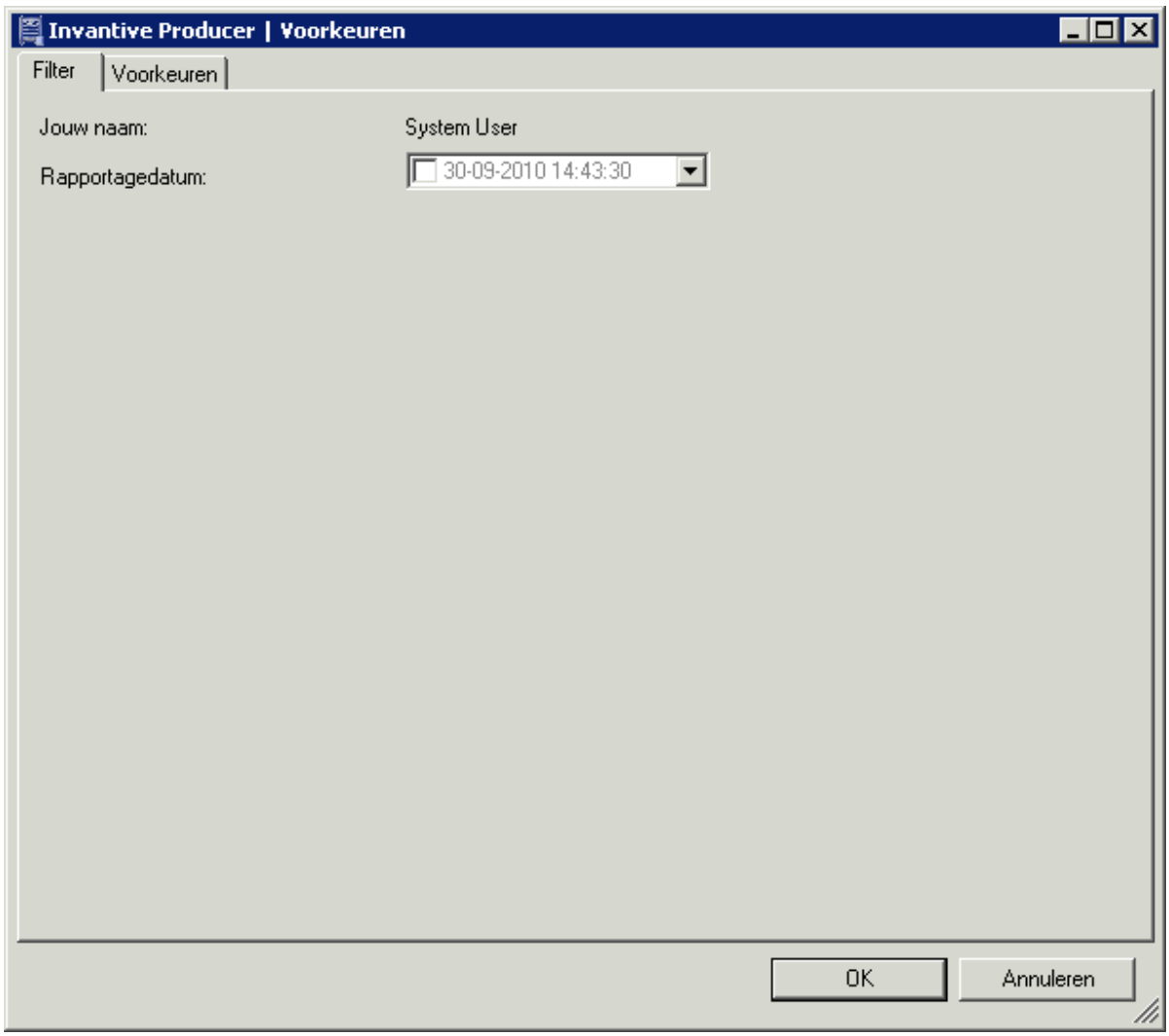


The meaning of the fields in the 'Advanced' tab is:

Installation location	This is the location of the installation file of Invantive Control. When you start Excel on this location it will be checked if a new version of Invantive Controlis available. If a newer version is available, the program will ask you if you would like to install it.
Target directory	The target directory shows the local file location of Invantive Control where the porgramm is stored.
Configuration File	This is the file location of the local configuration file containing the settings.
Enable debug mode	When checked, the tabs Modeller will be available, seeUser Interface Model Developer 171. This option should only be checked at the request of Invantive.

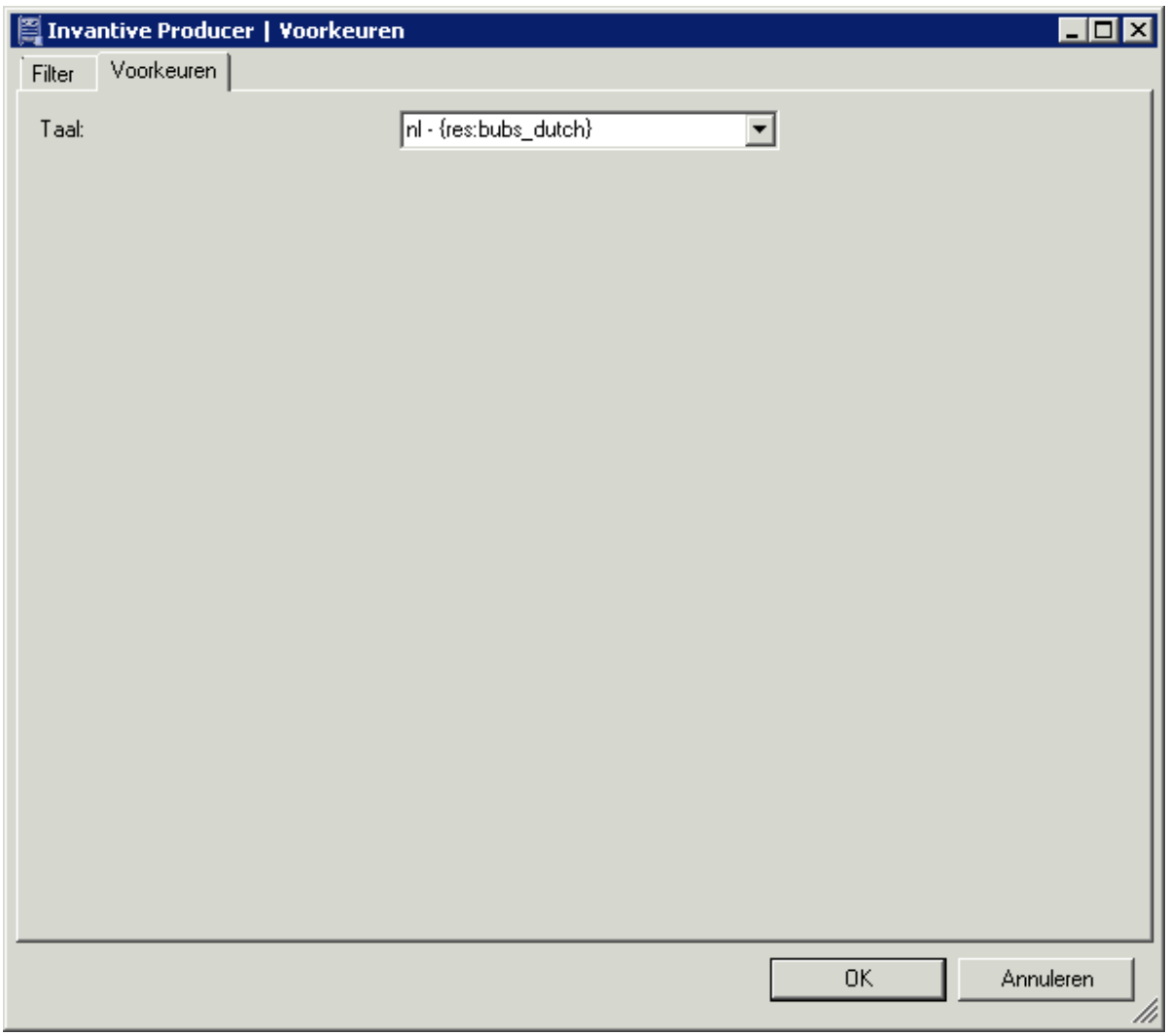
1.2.3.8 Preferences

In this window you set the preferences ofInvantive Control in.



The meaning of the fields in the tab Filter is:

Your name	The name of the user within Invantive Producer.
Report date	Here you can enter the reporting date for which the information on the reports should be shown. This data is activated when checked

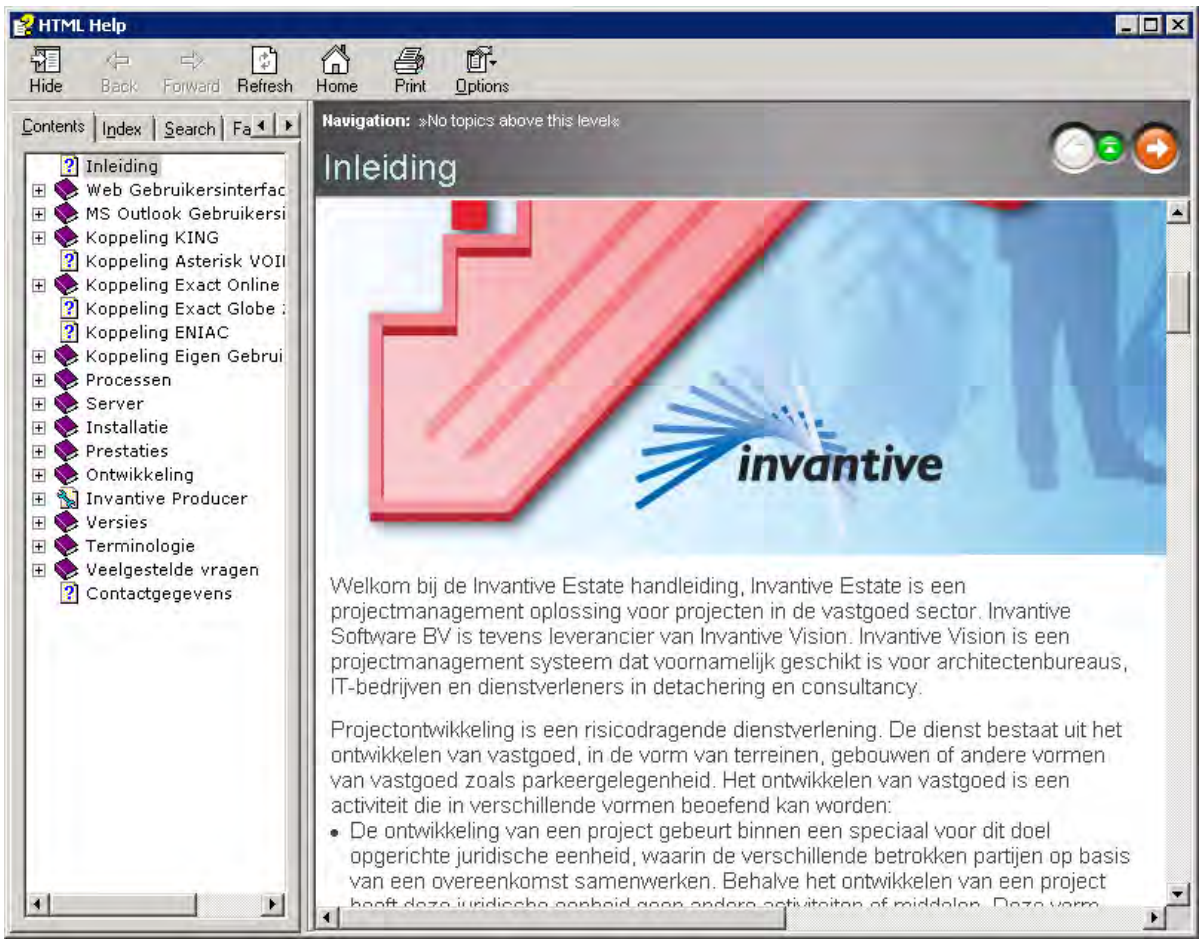


The significance of the field in the Preferences tab:

Language	Here you will find the languages which are available for Invantive Control. The language will change immediately after you close the window.

1.2.3.9 Help

The button 'Help' show the help function from Invantive Control including those from Invantive Control.

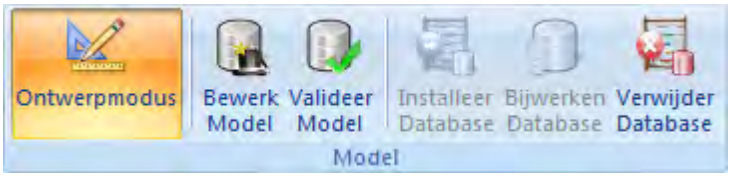


1.2.4 User Interface Model Developer

This section explains how a model developer can use Invantive Control via the ribbon buttons in Microsoft Excel. The model developer can use the same functions as the model user, only the developer can also customize the model. The following figure shows the tab 'Modeller' with the buttons that the model developer can use. This section gives the function for each button.

The tab 'Modeller' is divided into the groups 'Synchronize', 'Publish', 'Model Information', 'Blok Actions', 'Connections' and 'Help'. This tab is only visible if the development mode is enabled in Settings 13.

Model



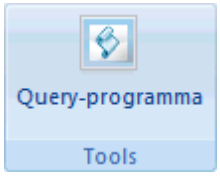
The group 'Model' contains the following buttons:

- Design Mode: Enables or disables the design mode of the worksheet. The model can

be changed in the design mode. When enabling the program will ask for a password if set.

- Edit Model: change the model of this workbook. The screen shows the parameters, blocks, extensions and pending changes. See Model Editor 19.
- Validate Model: validates the designed model. If validation fails an error message will be shown.
- Install Database: installs the model database in this worksbook.
- Database Upgrade: upgrades the model database of this workbook to the latest version supported by Invantive Control. The button works only if an update is available.
- Clear Database: removes the database model from this workbook. This action cannot be undone and synchronizing changes is not possible anymore.

Tools



The group 'Tools' contains the following button:

- Query Tool: opens the Query Tool to run a SQL query on the database, see Invantive Producer Query tool 34.

Block Information

The group 'Block Information' contains the following button:

- Block Information: here you can find information about the selected block like its source code or if it is allowed to edit the block.

Row Information

The group 'Row Information' contains the following button:

- Row Information: here you can find information about the selected row like its unique ID, status and field from the knowledgebase.

Debug and Analysis

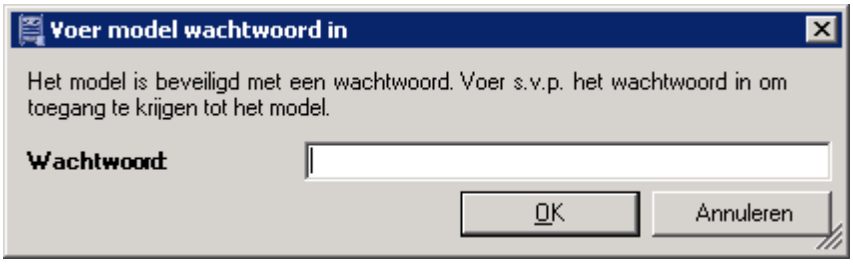
The group 'Debug and Analysis' is only visible when the debug mode is turned on and it con-

tains the following buttons:

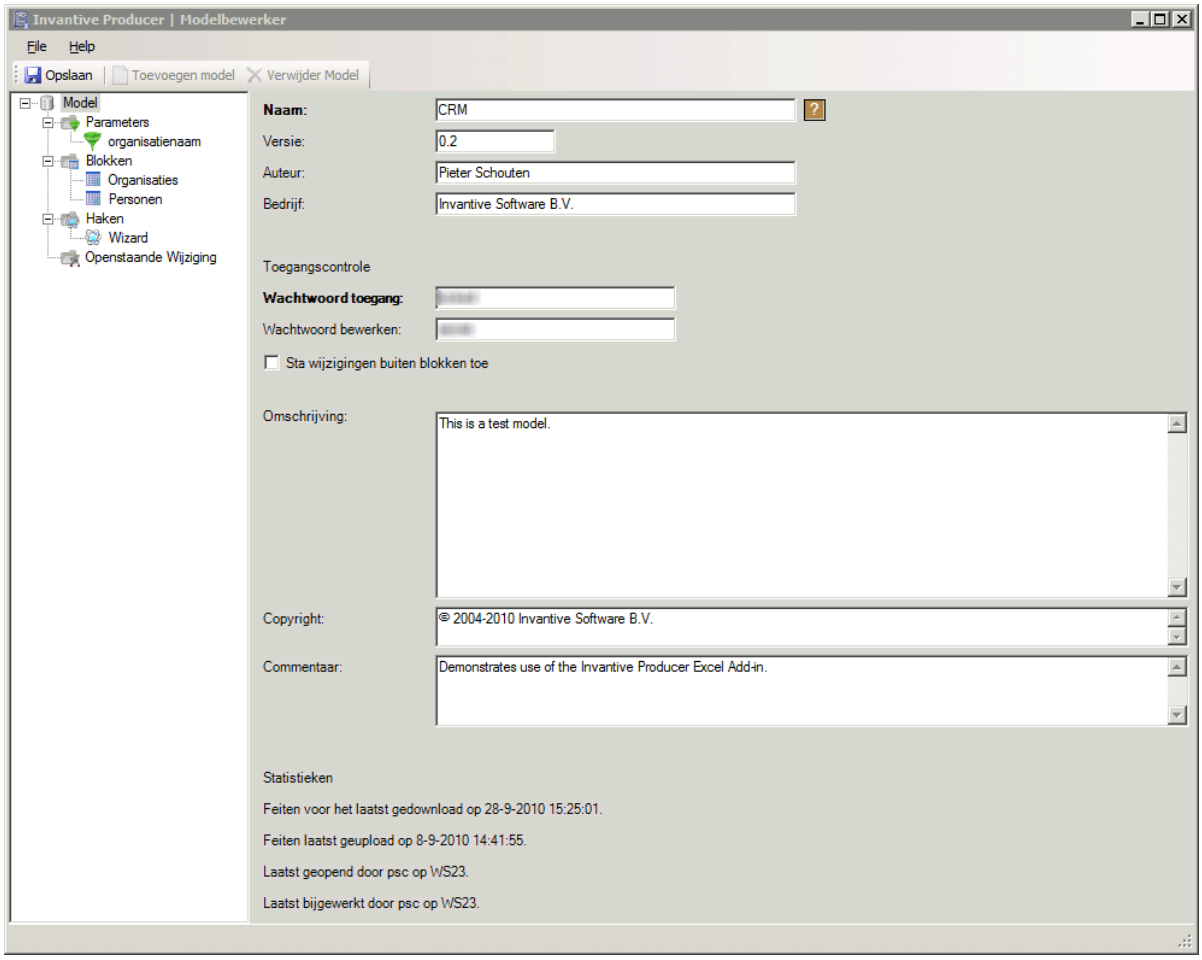
- Repository Worksheets: shows the hidden worksheets. The repository contains a workbook with the model database and a blank worksheet. see Repository Worksheets 30.
- Show Trace: opens a window with debug and analysis. This screen can be used to analyse any possible malfunctions of < Invantive Control, see Show Trace 31.
- Mark Row as New: mark this row as new so it will be inserted in the knowledgebase at the next synchronization. This function can be used when copying data between two knowledgebase.

1.2.4.1 Model Editor

The settings of the model, such as the name, version, author, password, etc., are stored In the model editor. Here you can also enter, modify and delete parameters, blocks and extensions. There is also an overview of pending changes. If a password is set for editing the model you will be prompted when selecting the button ''Edit Model', see figure.



The picture shows the screen of the model editor.



The meaning of the entry fields is:

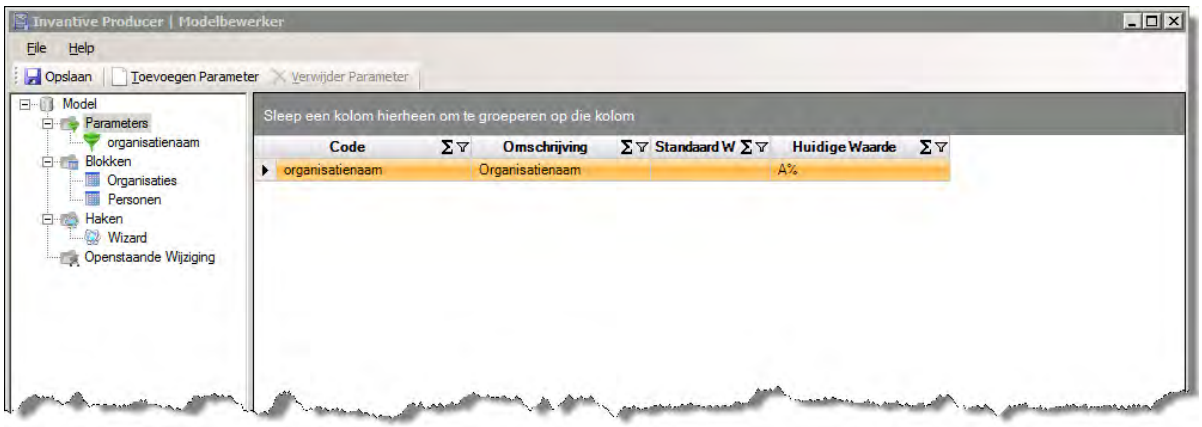
Name	The name of this model.
Version	The version number.
Author	The author(s) of the model.
Password access	The password for the security of the Excel workbook..
Edit password	The password to edit the model editor or to see the model editor.
Allow changes outside blocks	When checked it is allowed to make changes outside of the blocks.
Description	The description of the model.
Copyright	The copyright of the model.
Comments	Explanation of the model.

The meaning of the other fields:

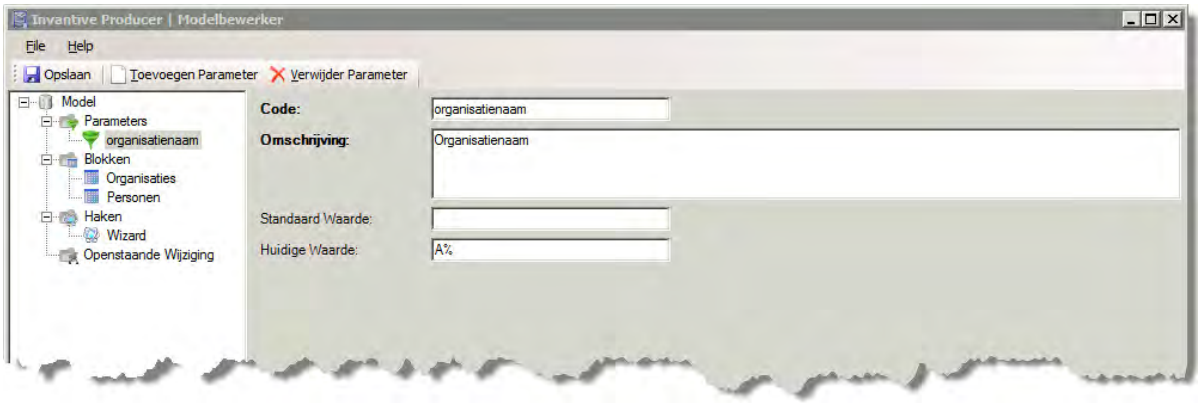
Statistics	This field shows the following statistics: • Date at which the facts were last downloaded • Date at which the facts were last uploaded • Server and username with which the model was opened the last time • Server and username with which the model was edited the last time

Parameters

In the you can specify a filter for the model with parameters. By specifying and using a filter, you ensure that only data from the database is retrieved which comply with the settings of the filter. You can use a parameter for filtering a block, seeBlocks 21. The figure show that the parameter is set to ‘A%’. This means that only organizations that begin with the letter 'A' are retrieved withInvantive Control.



In this part of model editor you can add, modify and delete parameters.

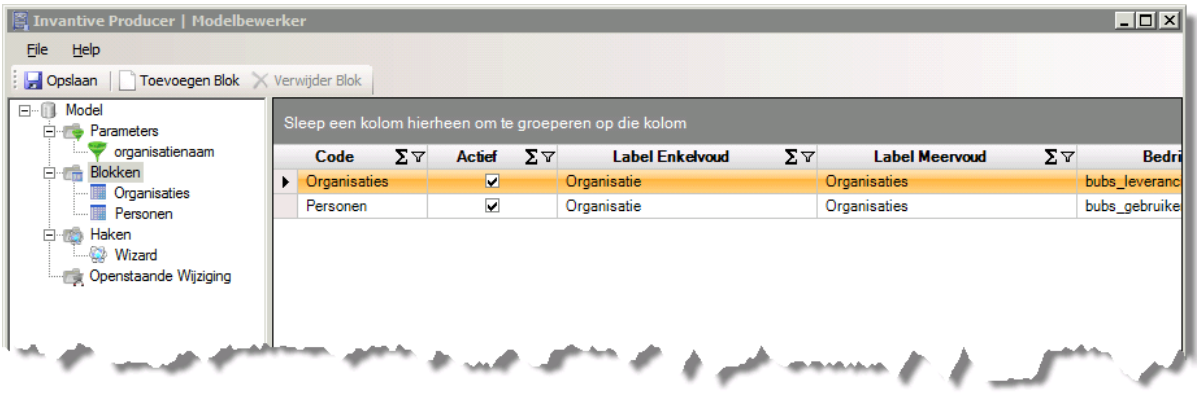


The meaning of the entry fields is:

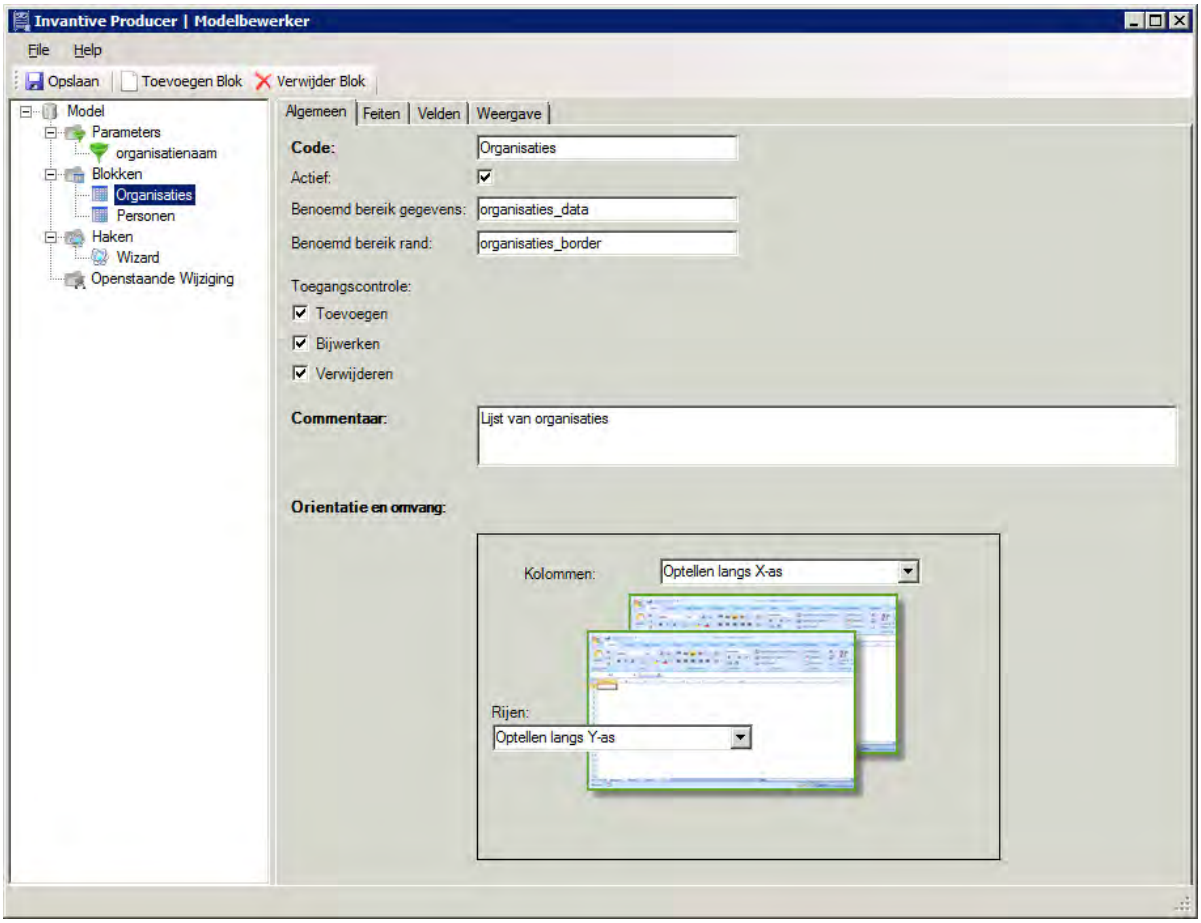
Code	The unique name of the parameter.
Description	The description of the parameter.
Default Value	The default value of the parameter.
Current Value	The current value of the parameter.

Block

A(n) block is a contiguous area in an Excel workbook. A block contains data of a database retrieved by a query at the last synchronization and contains data that needs to be saved during the next synchronization. A block uses one of the dimensions: cell, column, row or worksheet. The figure shows the current blocks, in this example are the blocks 'Organisations' and 'People'.



In this window you can add, modify or delete a block.



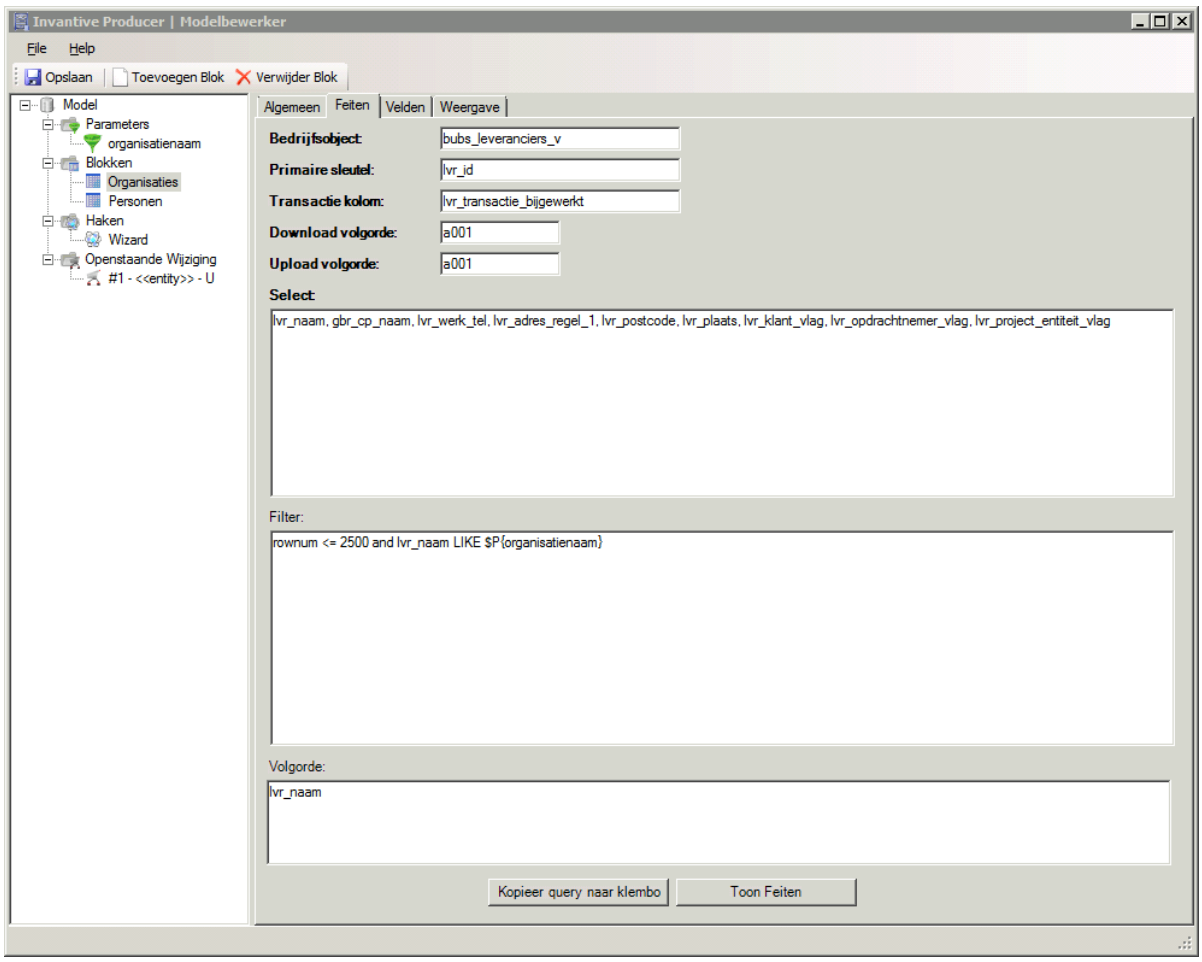
The meaning of the entry fields is:

Code	The unique name of this block.
Active	If checked, this block is active and it is possible to synchronize it w ith the know ledgebase.
Name data range	The data range as a unique name. This name is used as a name range in Excel to identify the data of the entire block, including borders. It is possible to use this name in an Excel formula.
Name border range	The border of the named data range as a unique name. This name is used as a name range in Excel to identify the data of the entire block, including the borders. It is possible to use this name in an Excel formula.
Access Control	Add: it is possible to add data and subsequently synchronize w ith the know ledgebase w hen checked > Edit: it is possible to edit data and subsequently synchronize w ith the know ledgebase w hen checked > Delete: it is possible to delete data and subsequently synchronize w ith the know ledgebase w hen checked
Comments	Give a description of the block.

Orientation and size

- Columns
- Rows

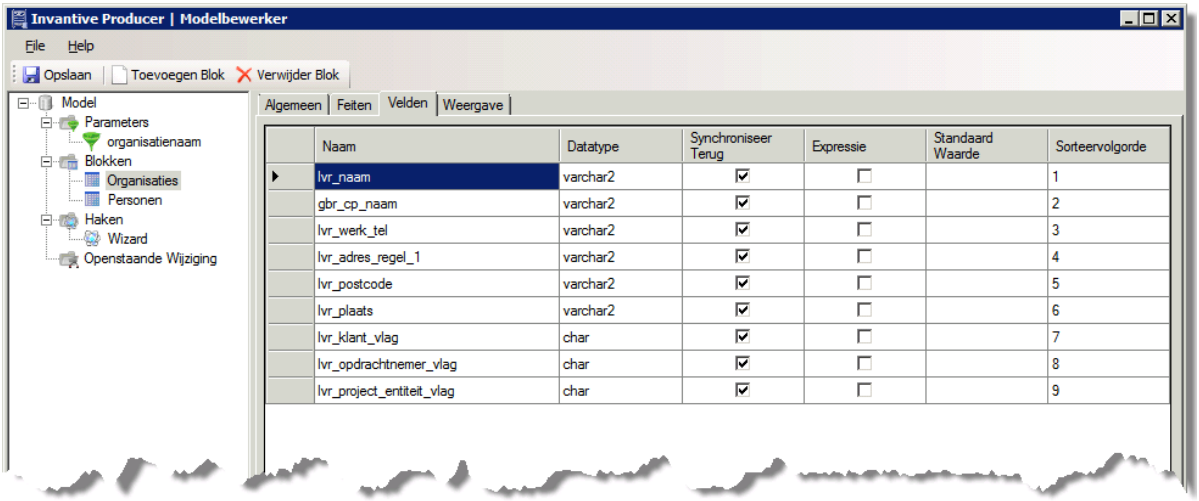
In this window you can enter the source material of the block.



The meaning of the entry fields is:

Business Object	The name of the business object, as registered in the know ledgebase. This is often the name a database view .
Primary key	The column used as the primary key for the business object. Optional w hen this block is read-only.
Transaction column	The transaction column of the business object. This field is optional if the access controls add, edit, and delete are turned off.
Dow nload Order	The dow nload sequence of the company object, this can be one or more numbers and/or letters. It provides the dow nload order of the blocks to the database. An example is that A001 comes before B001.
Upload Order	Gives the upload sequence the business object, this can be a combination of one or more numbers and/or letters. This provides the upload sequence of blocks to the database. An example is that A001 comes before B001.
Select	The columns of the business object. The columns have to be separated by a comma.
Filter	Definieer een filter om een gedeelte van een blok te selecteren in SQL-syntax.
Volgorde	The list of columns to determine the order of data in SQL syntax.

This window shows the columns of the business object and is automatically filled.

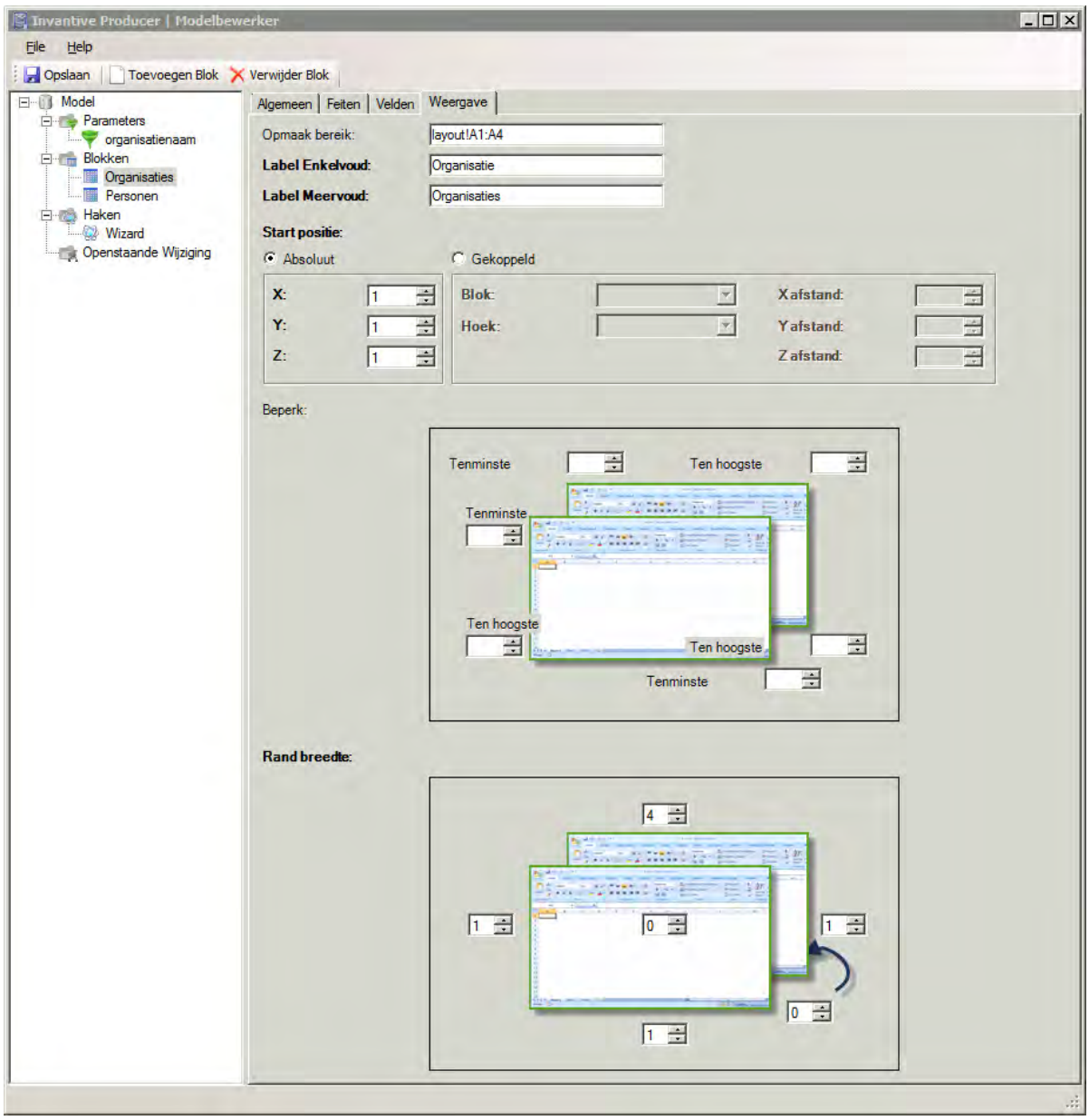


The meaning of the fields are is:

Name	The name of the column.
Data Type	The column data type.
Sync Back	If checked, changes in the column w ill be registered in the pending changes. When you synchronize only the changes are send to the know ledgebase.
Formula	When checked, you can use an Excel formula in this column. Only the result of the formula w ill be send back to the know ledgebase w ith synchronization. When checked, you can use an Excel formula in this column.
Read-only	When checked, the model user can not edit the values of the column. How ever, the column value can be edited by <PRODUCT_ECA>.
Default Value	The value w ill only be entered after synchronization w ith the know ledgebase. • Constant value. • Parameter $P{name of the parameter} • Excel formula, for example: $E{formule}
Position	This indicates the position of the column in the block in Excel.
List Source	The list w hich includes the pick list for the list.
List code field	DB Value
List Description	Label

This window shows the columns of the business object

In this window it is possible specify how the block will be displayed.



The meaning of the entry fields is:

Style range	Specify the range of the style sheet, the formatting of these cells are applied to the block. The convention of the range is 'w orksheet!cellrange', for example, 'layout! A1: A4'.
Label singu-lar	Provide a name in singular for the layout.
Label Plural	Provide a name in plural for the label.

Start position

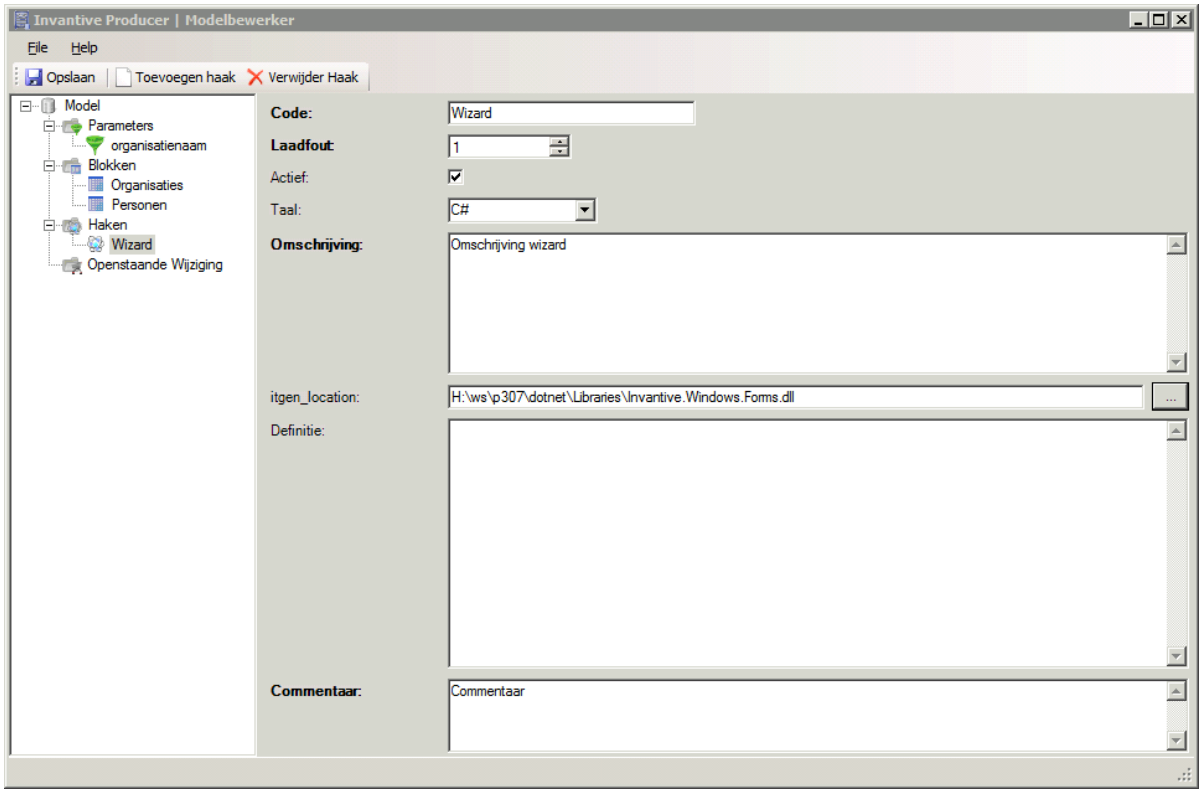
- Absolute
- Linked:

Beperk

Border width

Extensions

A(n) extensions is an embedded script in the execution flow of the Model. An extension enriches a Model with functionality that is not by default specified inInvantive Control. An example of an extension, by means of a button to automatically add data in the worksheet.

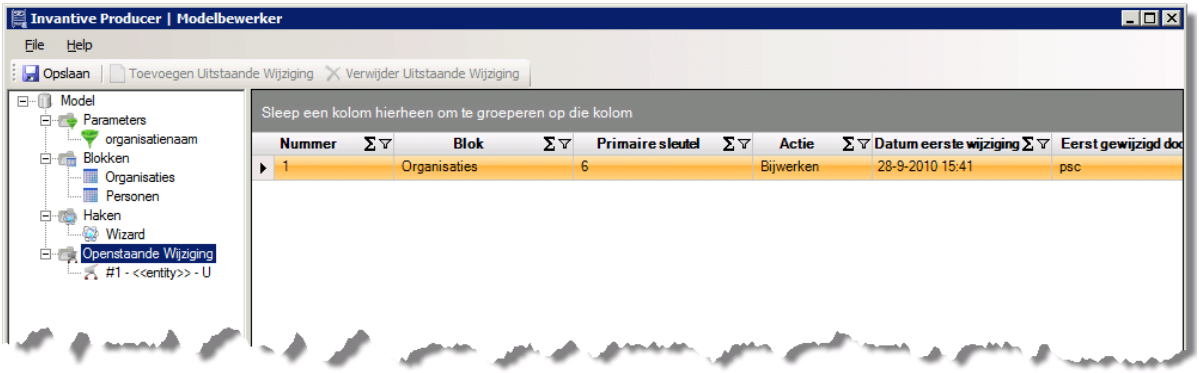


The meaning of the entry fields is:

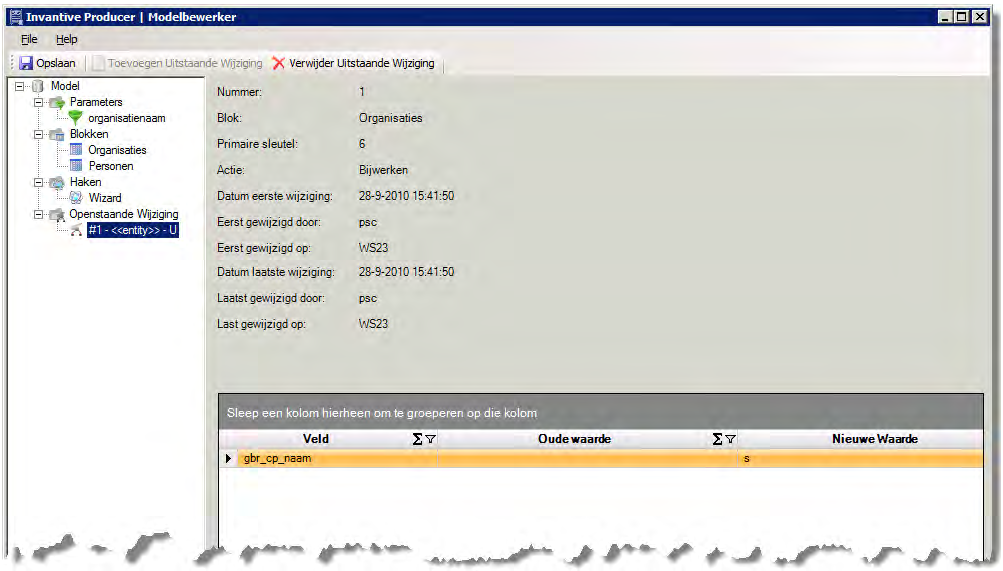
Code	Provide a unique name of the extension.
Load Order	Provide a number for the order of loading extensions in Invantive Control.
Active	This field indicates if this extension is active or not.
Language	Provide the programming language of the extension.
Description	Provide a description of the extension.
File Location	Provide a the location of the extension. The field 'File Location' or 'Definition' must contain respectively an extension location or code.
Definition	Provide the programming code of the extension. The field 'File Location' or 'Definition' must contain respectively an extension location or code.
Comments	Provide comments of the extension.

Pending Changes

Pending changes are changes in the local data of the model user and are ready to be send to the knowledgebase. The knowledgebase contains the centralized storage of facts outside an Excel worksheet. An example of a pending change can be a modification of a cell value in Excel and this change still has to be sent to the knowledgebase. This screen shows the changes that are not yet synchronized with the database.



In this screen you can delete pending changes. Select a pending change and then delete it by selecting the button 'Delete Pending Change'.



1.2.4.2 Cel reference Expression

The goal of the function cell reference expression is to be able to save normal cell references dynamically in the model in Microsoft Office Excel. A cell reference refers to a cell or cell range on a worksheet and can be used in a formula, so values or data that you want to calculate can be sought for in Microsoft Office Excel. Invantive Control Excel automatically converts the predefined cell reference expression to the cell reference that Excel works with. The block allows you to specify in a column a cell reference expression to another column. After synchronizing a reference to the location in the cells of the column (with a cell reference expression) in Excel where the expression refers.

Microsoft Office Excel cell reference

A cell reference refers to a cell or cell range on a worksheet and can be used in a formula, so values or data that you want to calculate can be sought for in Microsoft Office Excel.

You can use a cell reference in one or more formulas to refer to the following:

- Data from a cell on the worksheet
- Data located in other area's of the worksheet
- Data in cells of other worksheets in the same workbook

Example:

This formula	Refers to:	And shows as a result:
=C2	Cell C2	The value in dell C2
=Assets-Liabilities	The cells called Assets and Liabilities	The value in the cell liabilities subtracted from the value in the cell Assets
{=Week1+Week2}	The range of cells named Week1 and Week2	The sum of the values of the cell range with the name and Week1 Week 2 as an array formula
=Blad2!B2	Cell B2 on Sheet2	The value in cell B2 on Sheet2

Source: *Microsoft Office* (2011). Recalled on July 28, 2011, Create or change a cell reference: http://office.microsoft.com/nl-be/excel-help/een-celverwijzing-maken-of-wijzigen-HP010342370.aspx

Target

The purpose of a cell reference expression is to easily make cross-references in a model. It does not matter whether the link between two cells are in the same block, between multiple blocks or even beyond.

Advantages of cell reference expression in relation to Excel formulas that dynamically decide which other cells should use it:

- High processing speed with larger amounts of cell references in Excel.
- Increased integrity of data due to simpler formulas.
- Develop advanced models fast and easier.

Functioning

The syntax of a cell reference is: $C{Pivot method, Block, Worksheet, Column 1, Row 1, Column 2, Row *2*}.

Component	Required	Description
Pivot method	Yes	It starts where de range begins
Block	Yes	The block where the values are copied from and those are configured in Blocks 21
Sheet	Yes	The sheet where the reference refers to
Column 1	Yes	The column where the expression refers to
Row 1	Yes	The row where the expression refers to
Column 2	No	The range of the column can be indicated with the second column
Row 2	No	The range of the row can be indicated with the second row

Where the following possibilities are available:

Component	Options	Additional Option	Explanation
Pivot method	D E		First cell and first row As in the block indicated
Block	. "Block Name"		The current block Name of the block
Sheet	. "sheet Name" ^ $	+/-n	Current sheet Name of the sheet First sheet Last sheet
Column 1	. "Column Name 1" ^ $	+/-n	Current Column Name of the column as shown in the block First column of the block Last column of the block
Row 1	.	+/-n	Current row
Column 2	. "Column Name 2" ^	+/-n	Current Column Name of the column First column

	$		Last column
Row 2	.	+/-n	Current row

Example of the use of cell reference expression:

Component	Example	Explanation example
Pivot method	D E	The first cell and the first row As indicated in the current block
Block	. "Projects"	The current block The projects block
Sheet	. "Sheet 1" ^+1 $-1	The current sheet The sheet "Sheet 1" The second sheet The penultimate sheet
Column 1	.-1 "Project Code" ^+2 $	The current column minus one The column "Project Code" The third column of the block The last column of the block
Row 1	.+1	The current row plus one
Column 2	. "Project code"+2 ^+3 $-2	Current Column Two further than the column "Project code" The fourth column The second from the last column
Row 2	.+2	The current row plus two

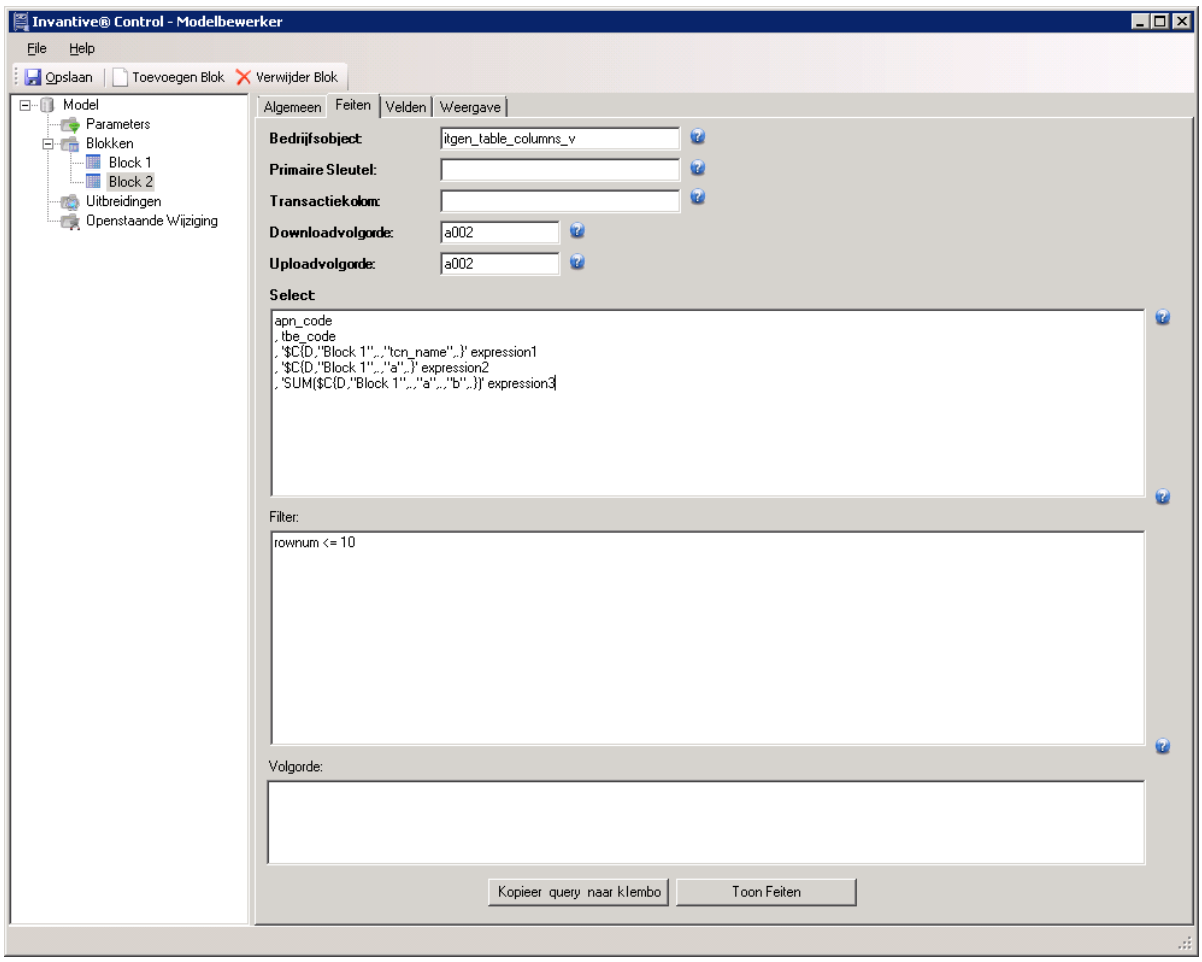
In the sections Worksheet, Column 1/2 and Row 1/2 it is also possible in the extra options to give a natural number using - or +. The extra option allows you to subtract or add a number to the option.

Properties cell reference expression:

- Case sensitive;
- Also works with SQL-functies, such as SUM, COUNT, AVG, etc.

In Invantive Control

A cell reference expression is defined in the select of one Block 21 in the Model Editor 17. The picture below shows some examples of the use of cell reference in the select expression.



$C{Starting point, Block, Worksheet, Column, Row, Column1, Column2}

With target cell reference

Excel control image

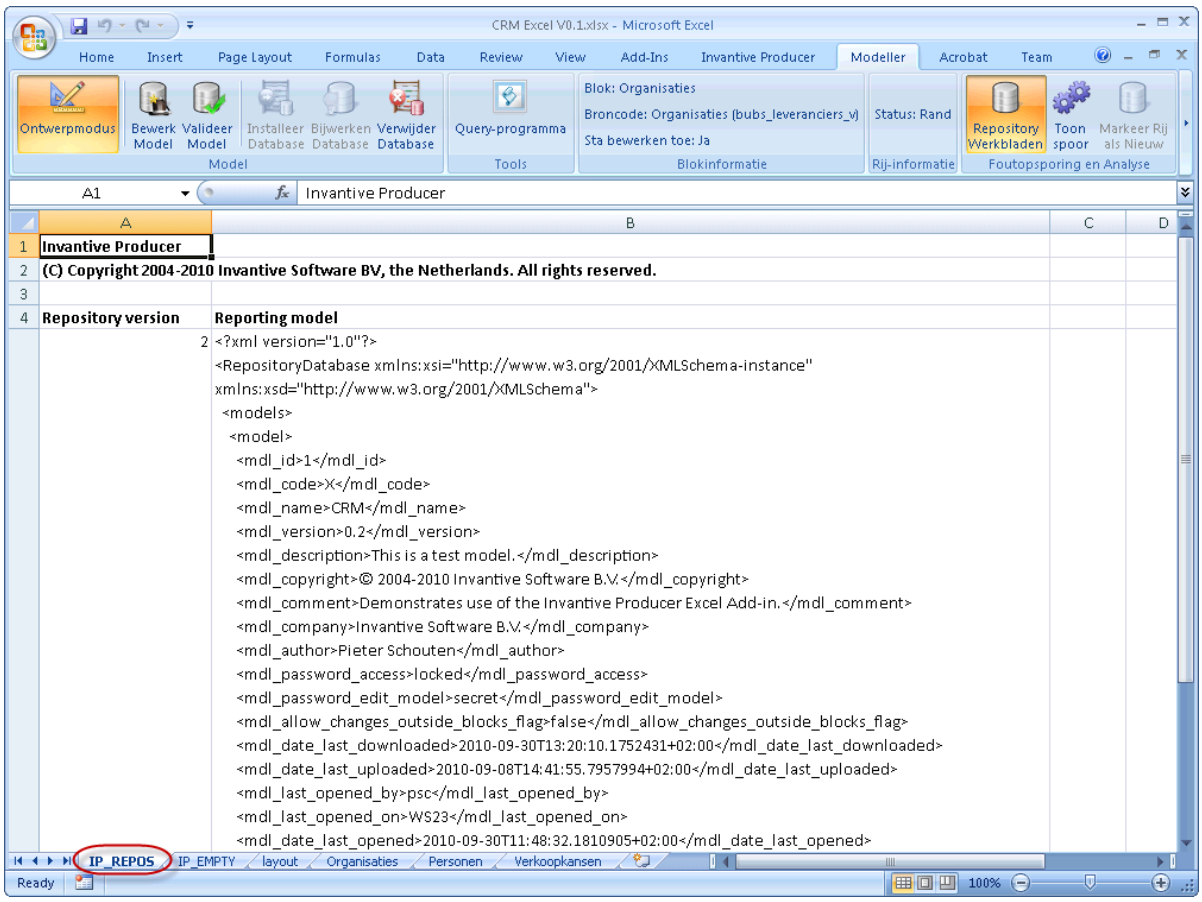
Formula, Expression on in the field. and sync back off.

An example of cell reference expression is in a column is: '$C{D,"Block 1",.,"tcn_name",.}' expression1. This example ...
[] -> []

This formula	Refers to:	And shows as a result:
=C2	Cell C2	The value in dell C2
=Assets-Liabilities	The cells called Assets and Liabilities	The value in the cell liabilities subtracted from the value in the cell Assets

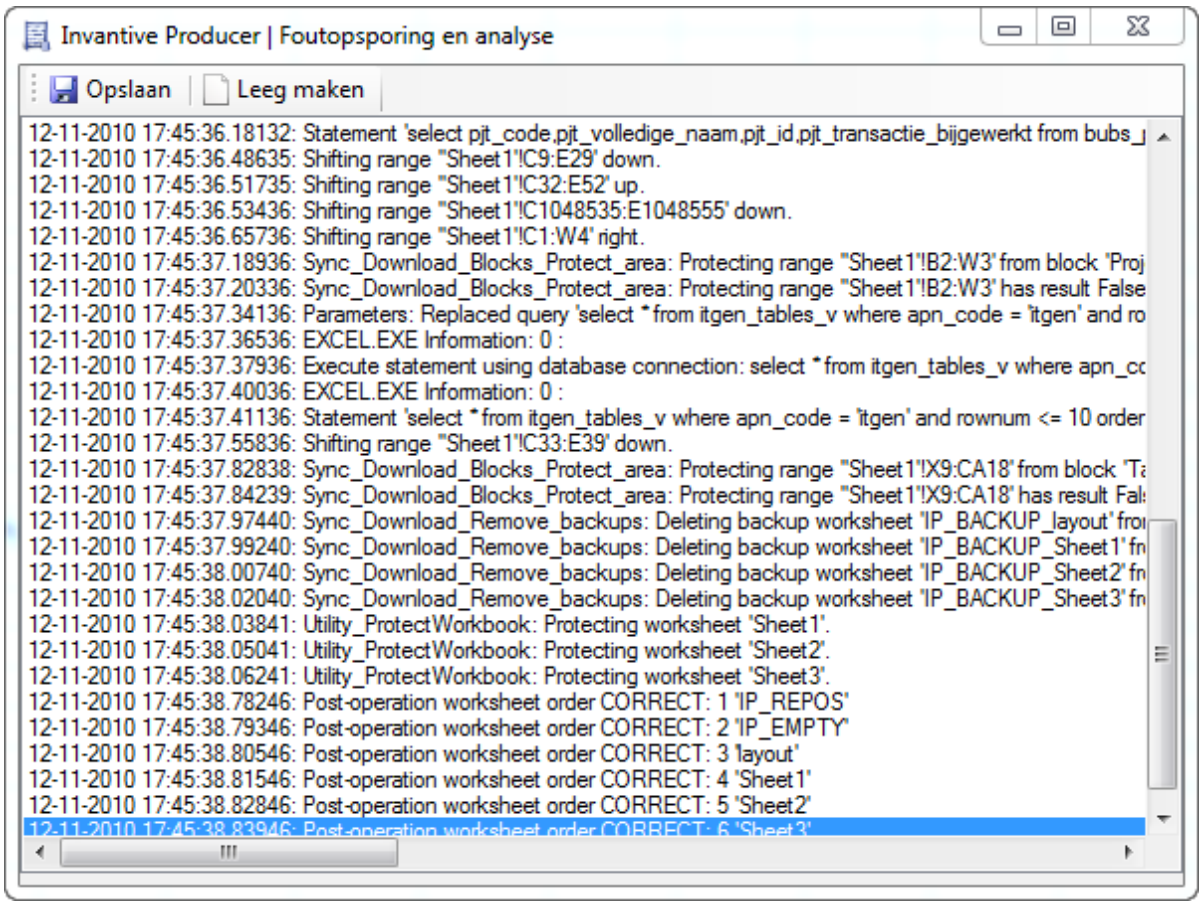
1.2.4.3 Repository Worksheets

The repository worksheets contain an empty worksheet and a worksheet with the XML-code that describes the model. This tab is only visible if you click on the 'Repository Worksheet' button, seeUser Interface Model Designer 17.



1.2.4.4 Show Trace

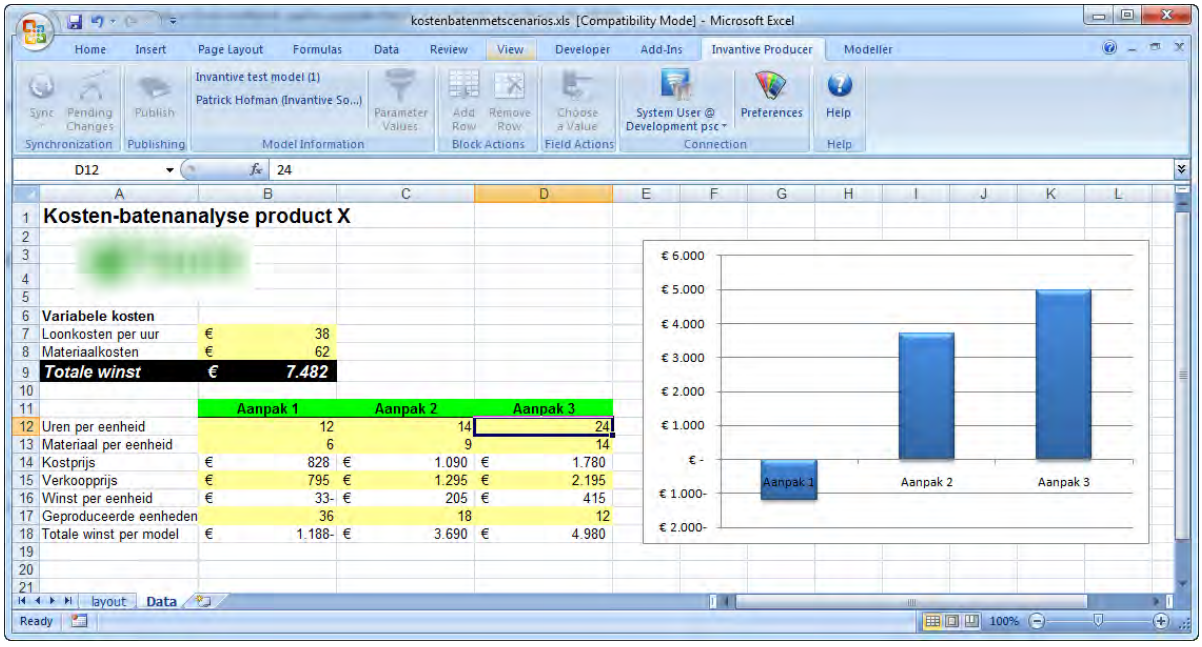
The function You can use 'Show Trace' to analyze errors in Invantive Control. The window is only displayed if the 'Show Trace' button is on, see User Interface Model Designer 17. Invantive can request that 'Show Trace" be enabled and the log file sent, in order to determine why there is a problem with synchronizing the model.



1.3 Examples

1.3.1 Calculation model

Development of a model



Add an ERD diagram

1.3.2 Working Offline

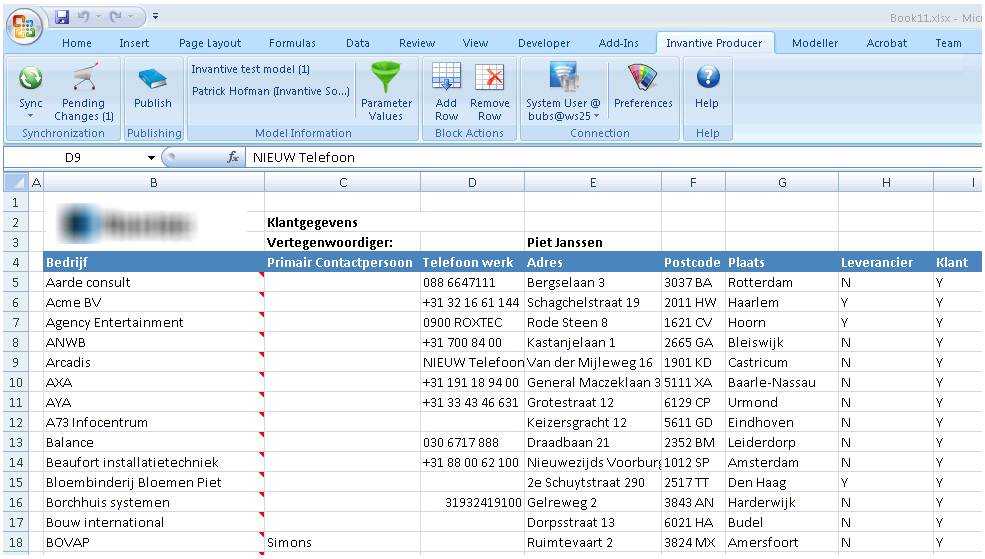
1.3.3 Data management

Another example to useInvantive Control for managing data.

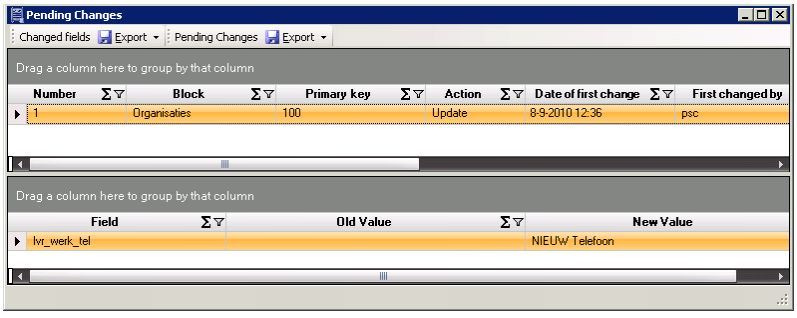
CRM data

- Organizations
- Persons

Data entry and updating large blocks of data.



Bedrijf	Primair Contactpersoon	Telefoon werk	Adres	Postcode	Plaats	Leverancier	Klant
Aarde consult		088 6647111	Bergselaan 3	3037 BA	Rotterdam	N	Y
Acme BV		+31 32 16 61 144	Schagchelstraat 19	2011 HW	Haarlem	Y	Y
Agency Entertainment		0900 ROXTEC	Rode Steen 8	1621 CV	Hoorn	Y	Y
ANWB		+31 700 84 00	Kastanjelaan 1	2665 GA	Bleiswijk	N	Y
Arcadis		NIEUW Telefoon	Van der Mijleweg 16	1901 KD	Castricum	N	Y
AXA		+31 191 18 94 00	General Maczeklaan 3	5111 XA	Baarle-Nassau	N	Y
AYA		+31 33 43 46 631	Grotestraat 12	6129 CP	Urmond	N	Y
A73 Infocentrum			Keizersgracht 12	5611 GD	Eindhoven	N	Y
Balance		030 6717 888	Draadbaan 21	2352 BM	Leiderdorp	N	Y
Beaufort installatietechniek		+31 88 00 62 100	Nieuwezijds Voorburg	1012 SP	Amsterdam	N	Y
Bloembinderij Bloemen Piet			2e Schuytstraat 290	2517 TT	Den Haag	Y	Y
Borchhuis systemen		31932419100	Gelreweg 2	3843 AN	Harderwijk	N	Y
Bouw international			Dorpsstraat 13	6021 HA	Budel	N	Y
BOVAP	Simons		Ruimtevaart 2	3824 MX	Amersfoort	N	Y



1.4 Versions

This chapter describes the changes in the application per version.

1.4.1 Release 2014 R1

Released: XX-XX-2014.

Invantive Producer: bXX.

Changes and bug fixes:

Number	Type	Product	Description
20965	PR	Invantive Control	Kan Waarderingsmodel niet publiceren naar nieuw model ivm resizen blokken en Excel tabellen.
21848	PR	Invantive Control	Verbergen repository sheets geeft error.
21538	ER	Invantive Control	Nieuw plaatje in Invantive Control voor weergave x/y/z.

Installation

- No specialties.

Implementation

- No specialties.

2 Invantive Query Tool

With the Invantive Query Tool working with your data via SQL becomes easy. Invantive Producer makes it possible to edit a real-time data warehouse using SQL. Maintaining integrity and maintaining information security according to ISO 27002. The Invantive Query Tool is an addition to Invantive Producer and derived products such as ${products.iv}, ${products.ie}, Invantive Control and Invantive Composition.

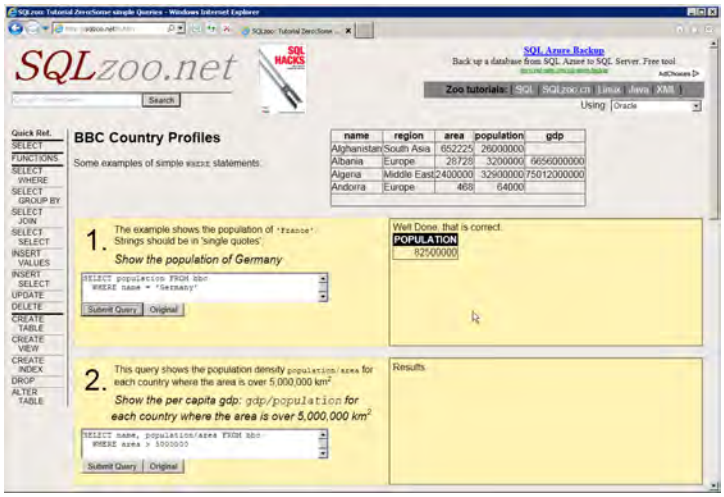
With the Invantive Query Tool you can:

- Execute SQL-queries and request the results in a table.
- Immediately group, filter and sort the results in the table on the screen.
- Print the results or export them to Adobe PDF, Microsoft Excel or Microsoft XPS.
- Automate processes with assistance from Oracle PL/SQL (only in combination with Oracle RDBMS).
- Retrieve old queries from a file or from the list in the tab "History".
- Connect directly through a native connection for the concerned type database (for example Oracle SQL*Net for Oracle) or connect through the Invantive Webservice so that you do not have to install database-specific software on a work location.
- Supply the database user with a connection or connect to an already installed Invantive product with associated user codes.
- Retrieve the structure of a table or view.
- Request the output of dbms_output, itgen_output and itgen_log of an Oracle PL/SQL block (only in combination with Oracle RDBMS).
- Retrieve an execution plan ("query plan" or "explain plan") of an Oracle SQL query. (only in combination with Oracle RDBMS)
- Request the trajectory ("Oracle Trace") of a SQL statement (only in combination with Oracle RDBMS).

2.1 Learn SQL

More information on what SQL is and how it can be used can be found at: http://en.wikipedia.org/wiki/SQL.

The manual at http://sqlzoo.net also provides a good insight and in addition allows for interactive learning of how you can use SQL to retrieve, edit and create data.



2.2 Functioning

This paragraph describes the functioning of the Query Tool.

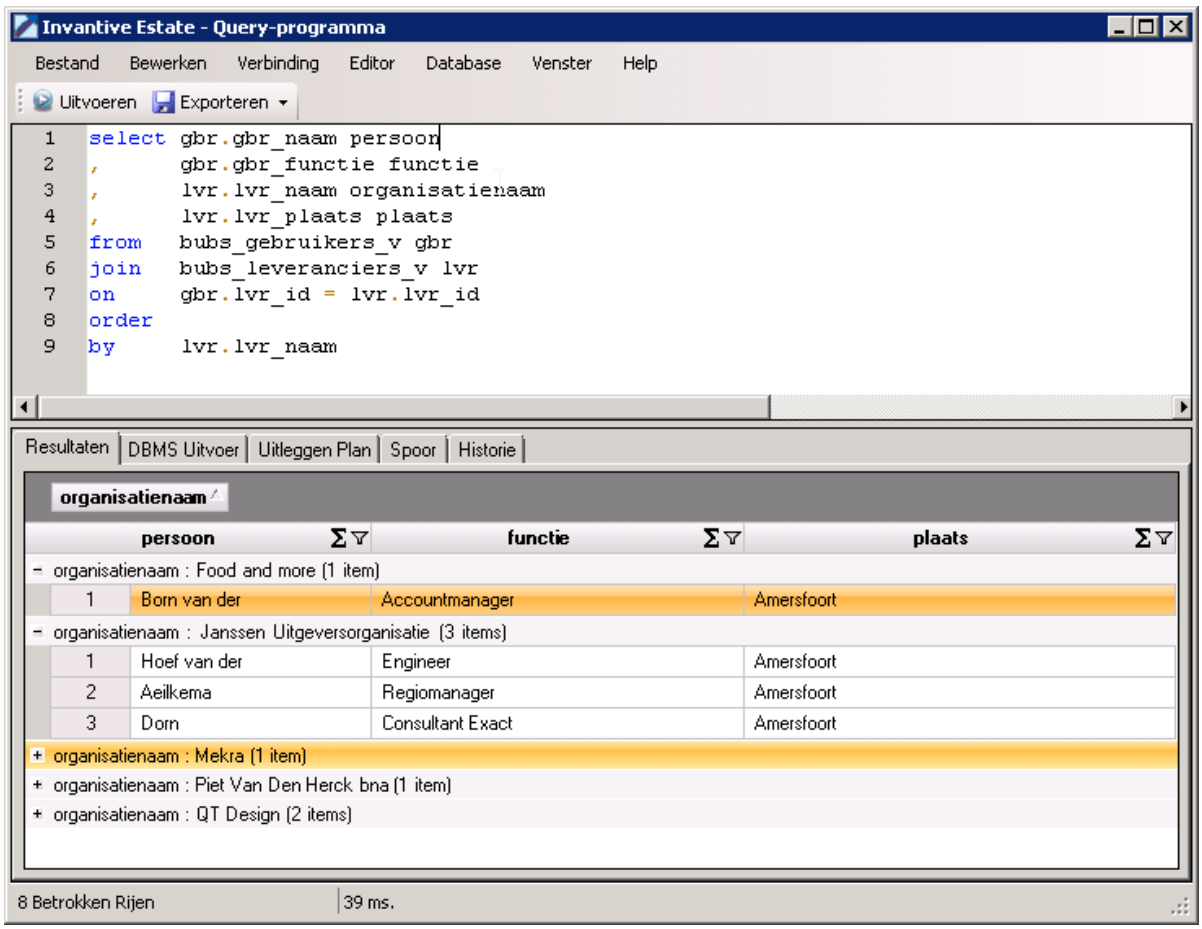
The Query Tool consists of two parts:

- The editor section.
- The output section.

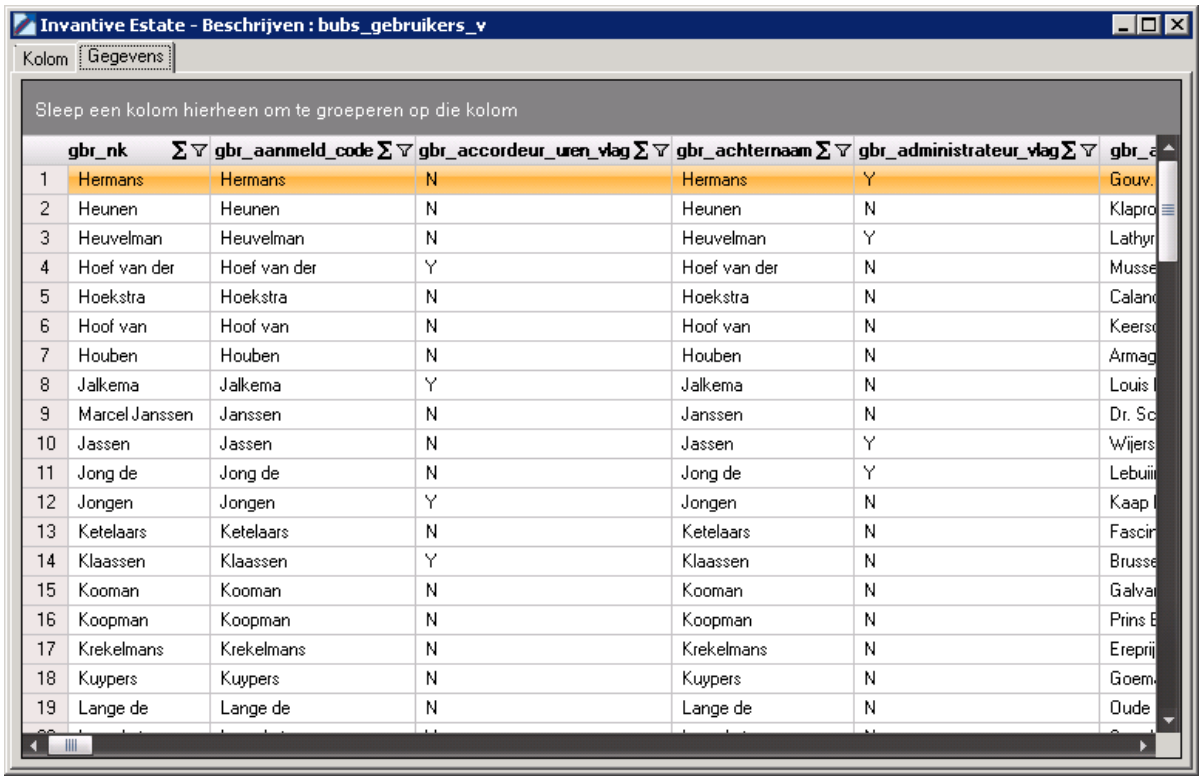
In the following paragraph there are several examples of what you can do with the Invantive Query Tool:

2.2.1 Query Tool Examples

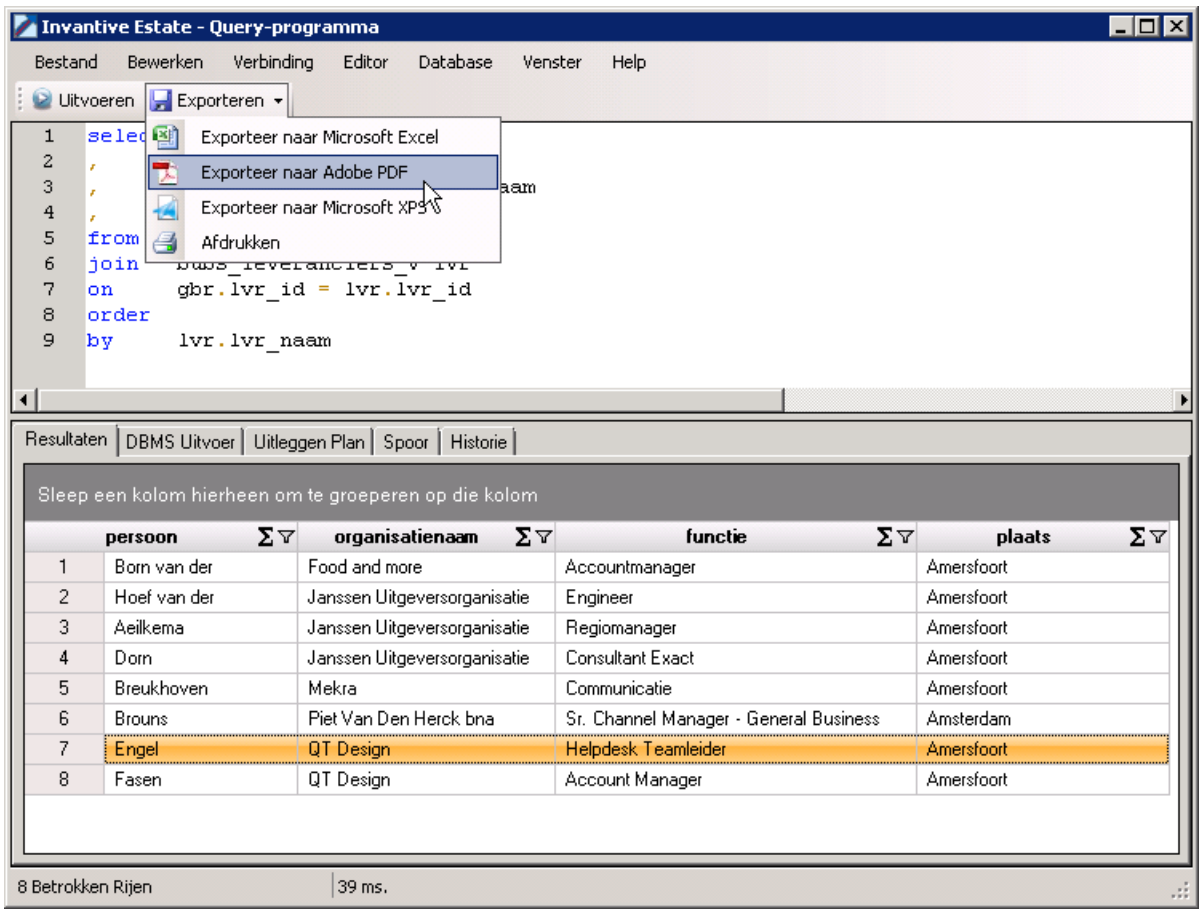
- The figure below shows the request by means of a SQL query, of persons grouped by organization.



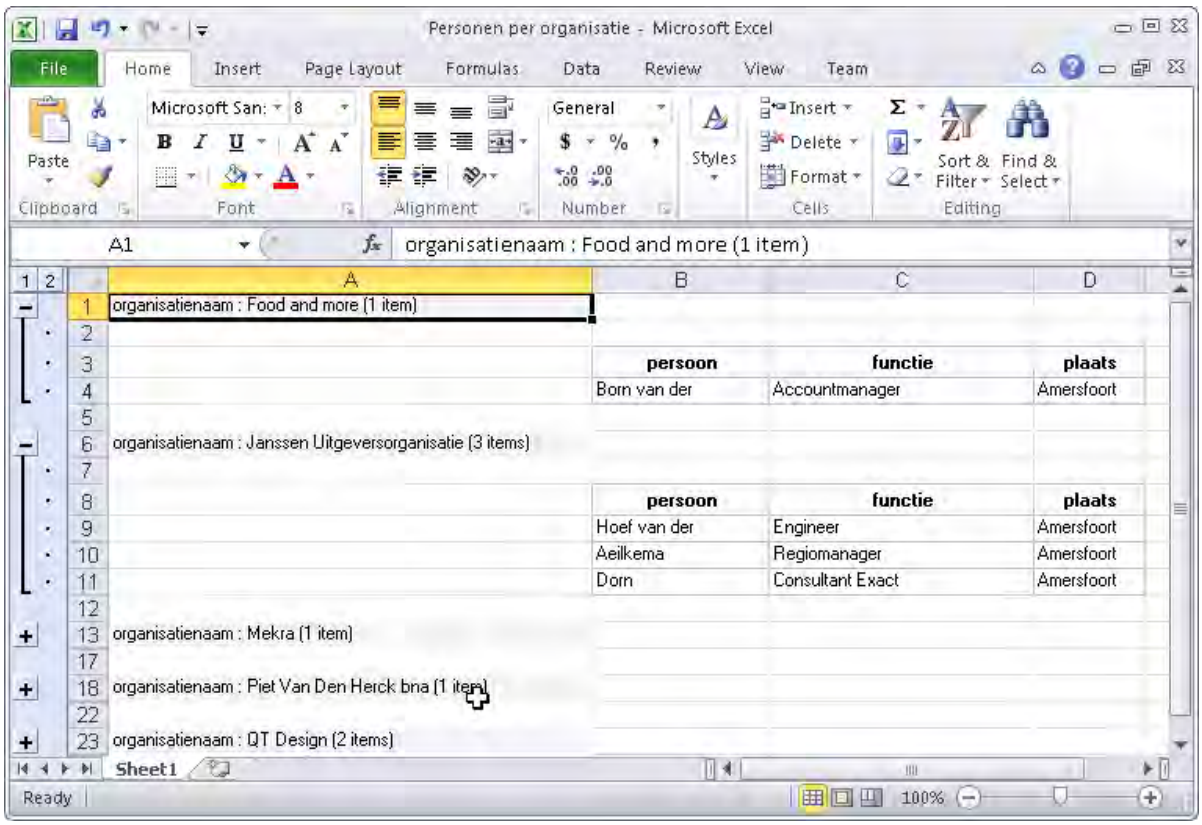
- Displaying the description of an object (using the F4 key). This corresponds to the Oracle function 'Describe'. The figure below shows the data in the business object persons (bubs_gebruikers_v).



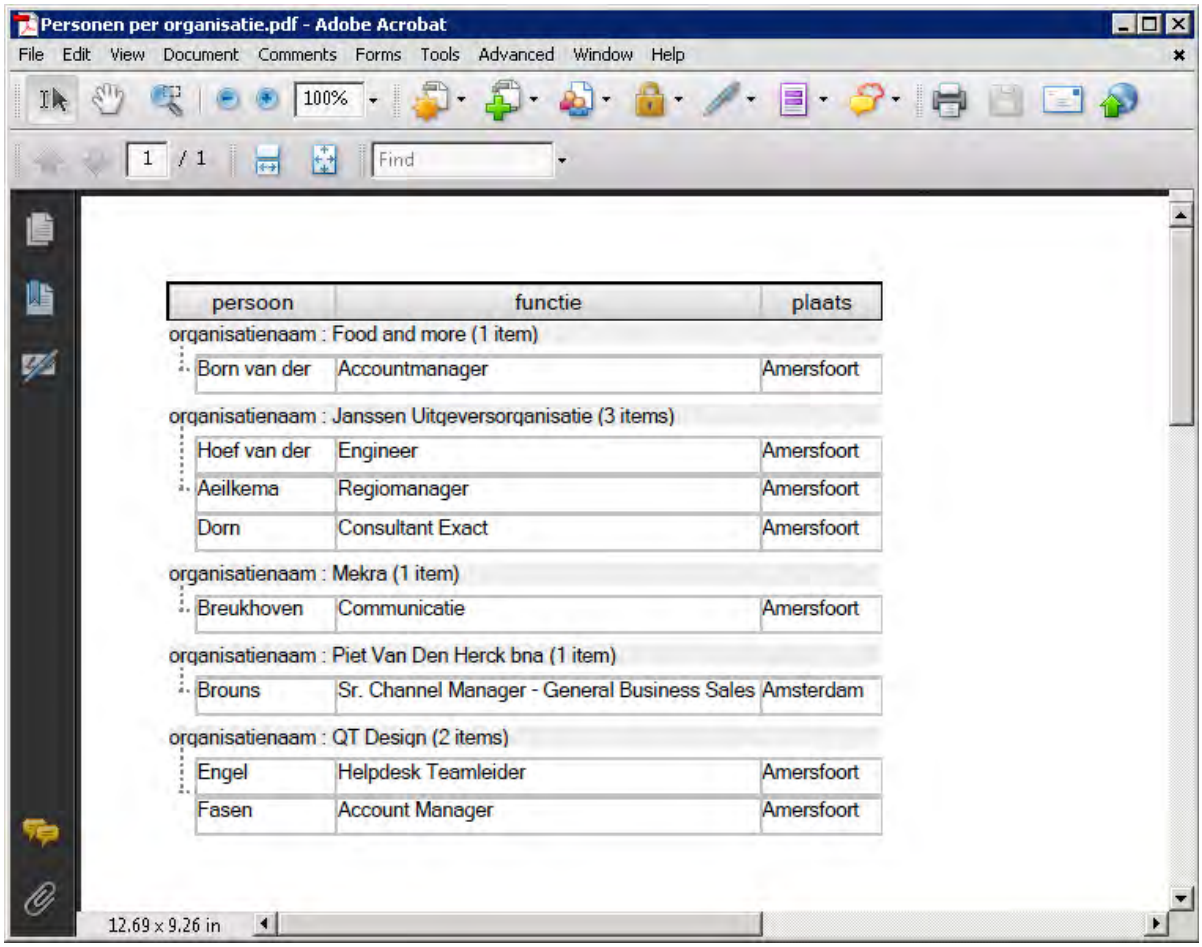
- The result of the SQL query can be exported to Microsoft Excel, Adobe PDF, Microsoft XPS and can be printed on a printer.



- The image shows the result of the SQL query in Microsoft Excel.



- The image shows the result of the SQL query in Adobe Acrobat.



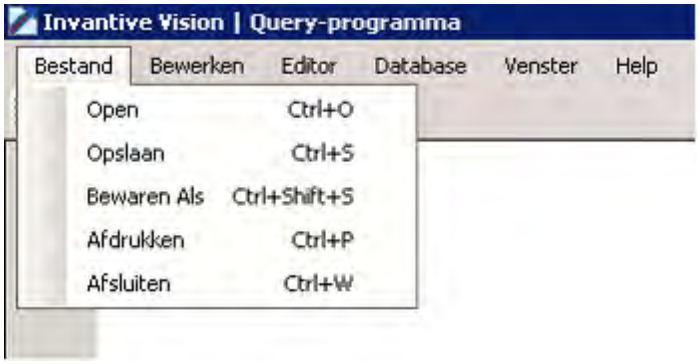
2.2.2 Editor

In the editor you can execute queries. There are five types of SQL statements possible:

- Select.
- Insert.
- Update.
- Delete
- PL/SQL (Begin ... End, without line breaks and blank lines)

A possible transaction is immediately recorded at the end of the execution of the statement.

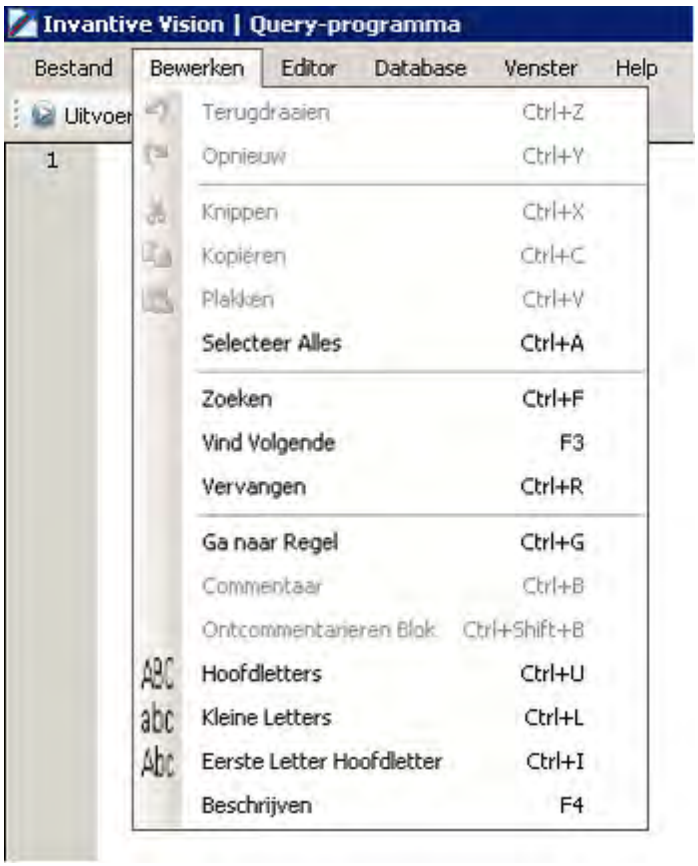
Menu File



Here queries can be opened, saved, saved under a different name and printed.

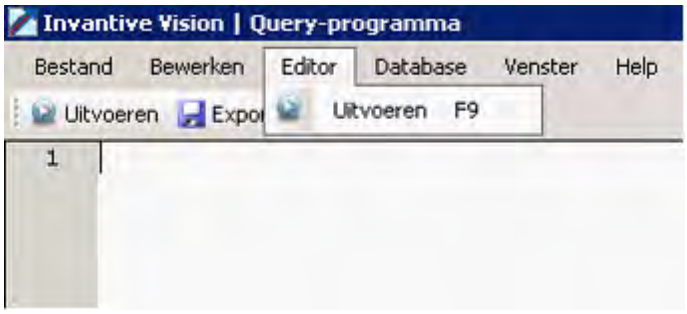
In addition, via 'Exit' the Query Tool can be closed.

Menu Editor



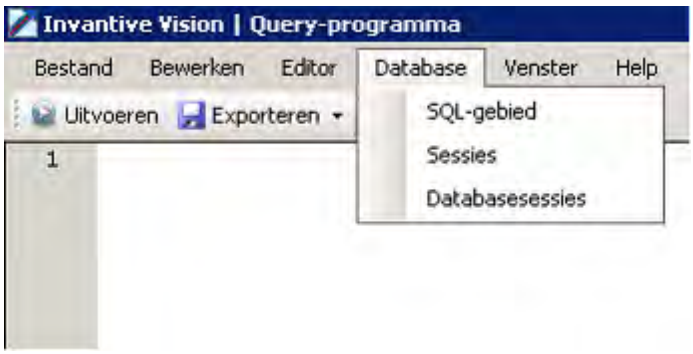
The ‘Editor’ menu contains all items with which you can edit the query text.

Menu Editor



Via ‘Run’ you can run the query. The results of the query are displayed in the Query Results tab in Query Output.

Menu Database



This menu consists of three specific database menu items:

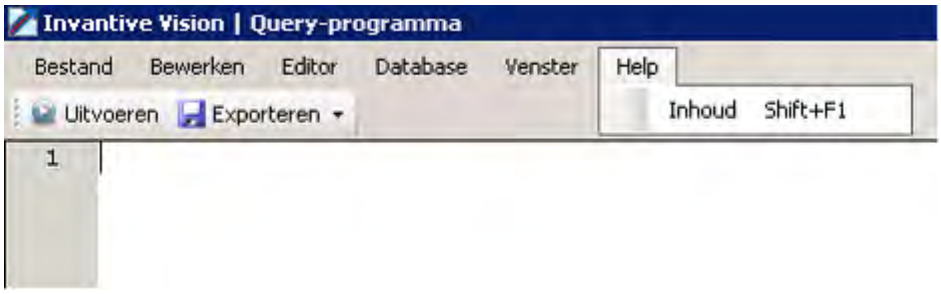
SQL area: This menu item places the following query in the editor:

```
select *
from itgen_db_sqlarea_r
where 1=1
order
by elapsed_time desc
```

Sessions: ?

Database session: ?

Menu Help



Using this menu the Help for the Query Tool can be requested as part of the Invantive Vision Help.

Export Menu

Using the Export tab, you can print the output of queries or export it to different formats.

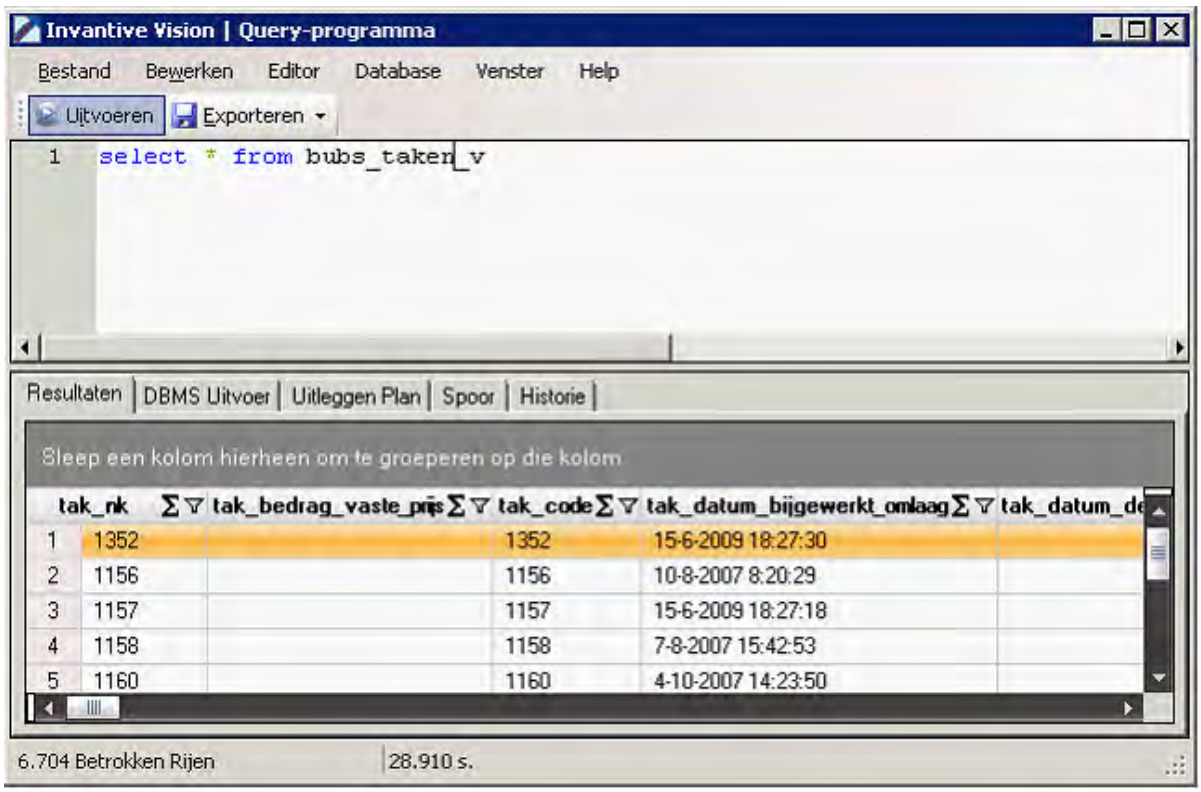
2.2.3 Query-output

The query output can be started with the function key 'F9'.

If the editor contains a valid query this will lead to output in different tabs under the tab 'Output'.

2.2.3.1 Query-results

Executing a query results in filling the tab Output with the records delivered by the query.



Also the number of rows and the execution time will be displayed.

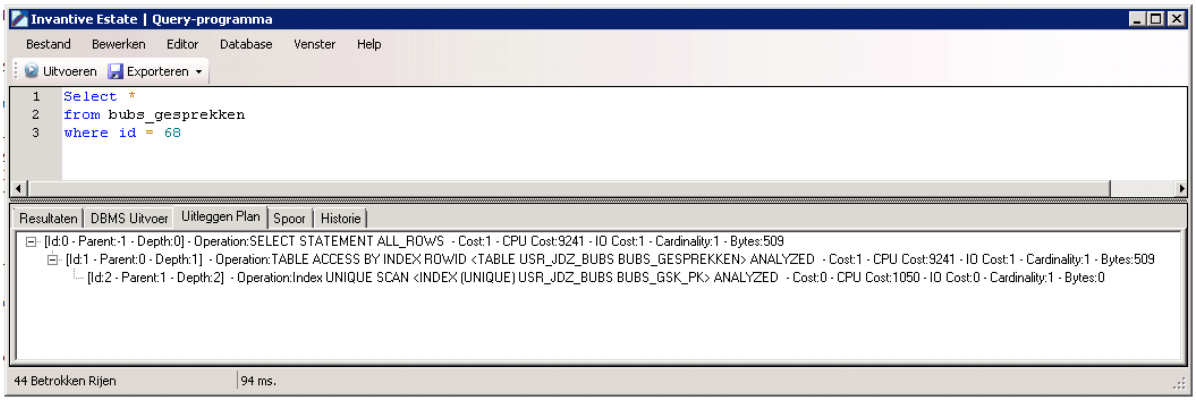
2.2.3.2 DBMS-output

This tab includes the output of dbms_output.put_line statements (only in combination with Oracle RDBMS)

2.2.3.3 Explain Plan

The Explain Plan can be executed using the menu item 'Explain Plan' or using the key combination Ctrl+E:

The executing of 'Explain Plan' ensures the filling of the tab 'Explain Plan' with the rows which are completed by the 'Explain Plan' of Oracle:



In the tab, the way the query will be executed by Oracle is shown in tree form.

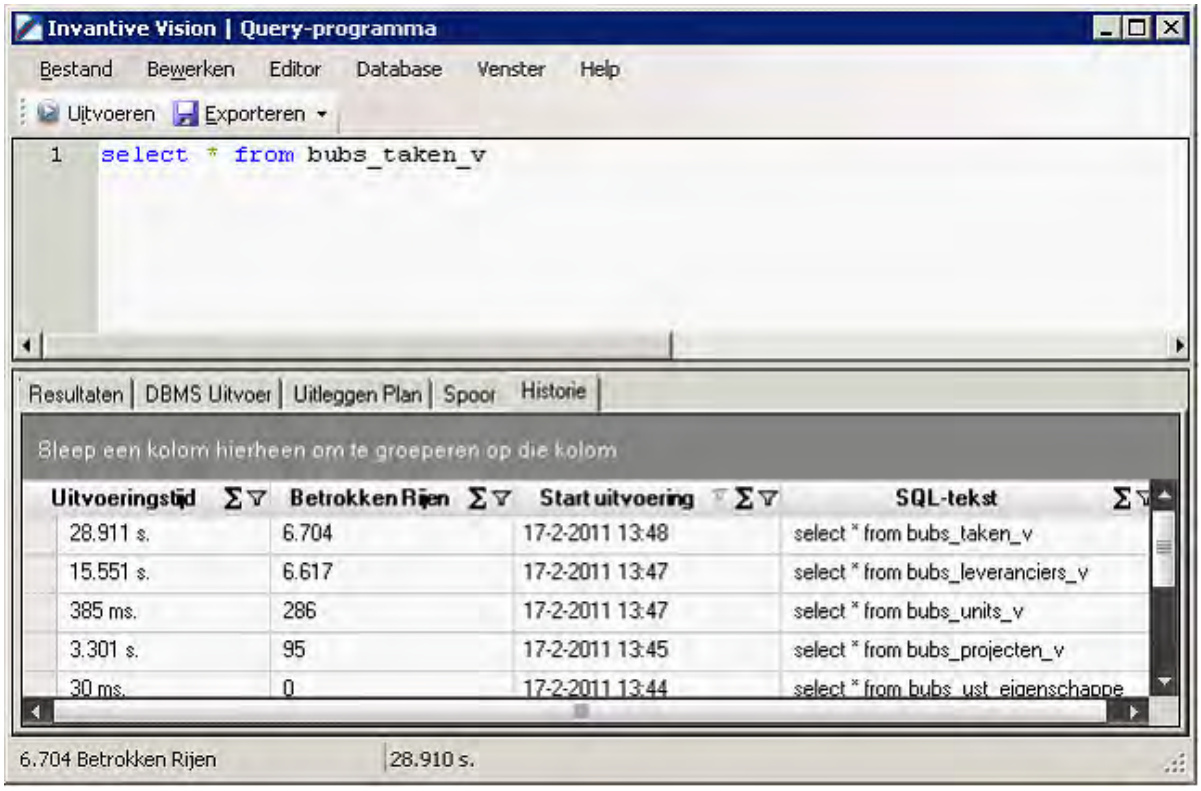
With this the to be executed actions are in order of the ID, so from a branch with the deepest level back to the parent level and back to a related level; this is called 'Processing in Order'.

2.2.3.4 Trace

This tab contains the result of an Oracle trace (only in combination with Oracle RDBMS)

2.2.3.5 History executed queries

Executing a query ensures the filling of the tab history because the data of the last executed query is added.



As long as the Query Tool is open a record is added after each output.

2.3 Availability

The following Invantive products provide a user license of Invantive Query Tool:

- ${products.iv} ${products.ola};

- Invantive Control;
- Invantive Composition.

The Invantive Query Tool is also separately available and can be downloaded via the link:http://webservice.invantive.com/qt/publish.htm

2.4 System Requirements

To use Invantive Query Tool on your PC or terminal server you will need the following software including licenses:

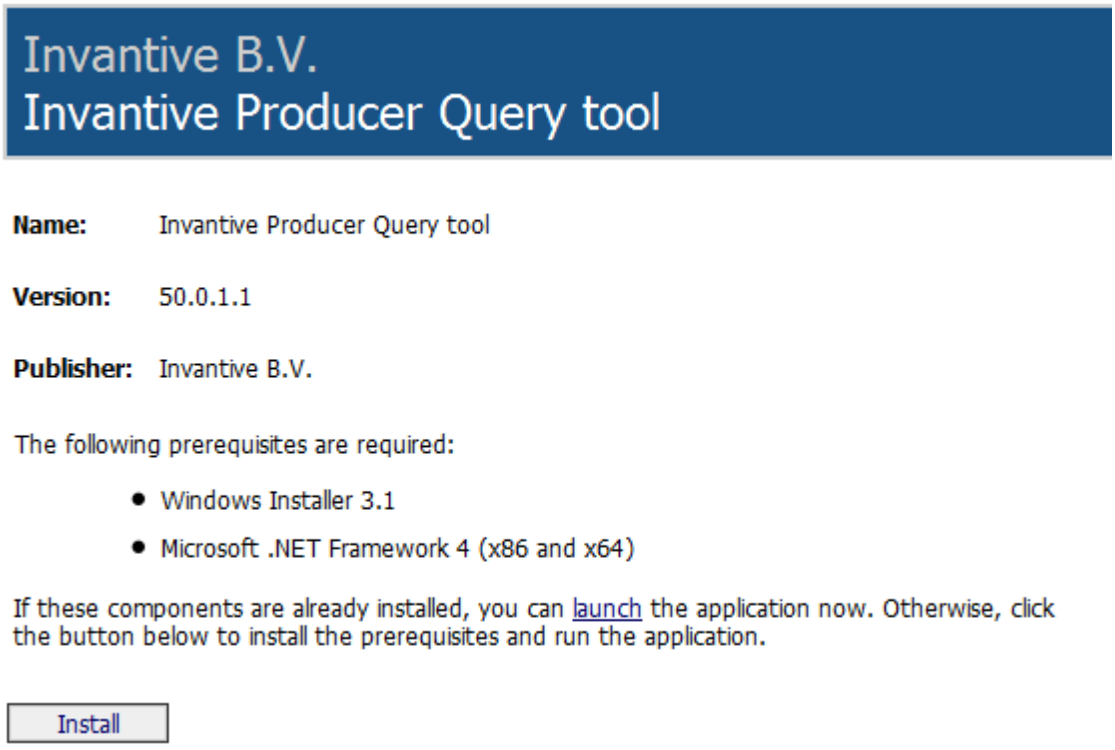
- Microsoft .NET 4.5.
- Minimum 2 GB of internal memory.
- Screen resolution of 1280 x 1024 or higher.
- Invantive Webservice or local drivers.

Use on Mac, tablet or smartphone is not possible.

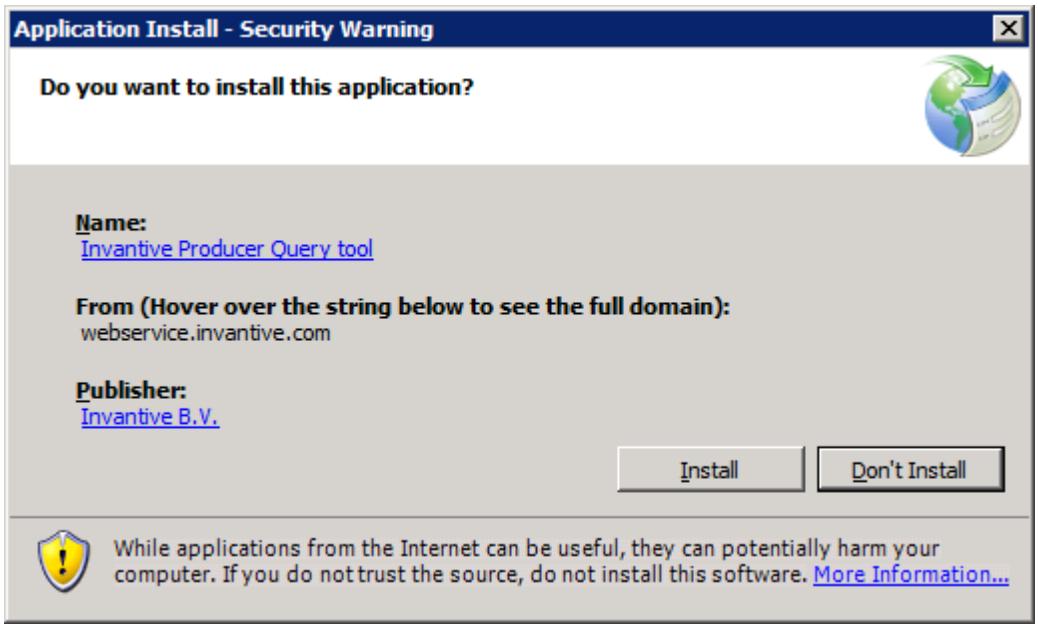
2.5 Installation

Perform the next steps to install Invantive Query Tool:

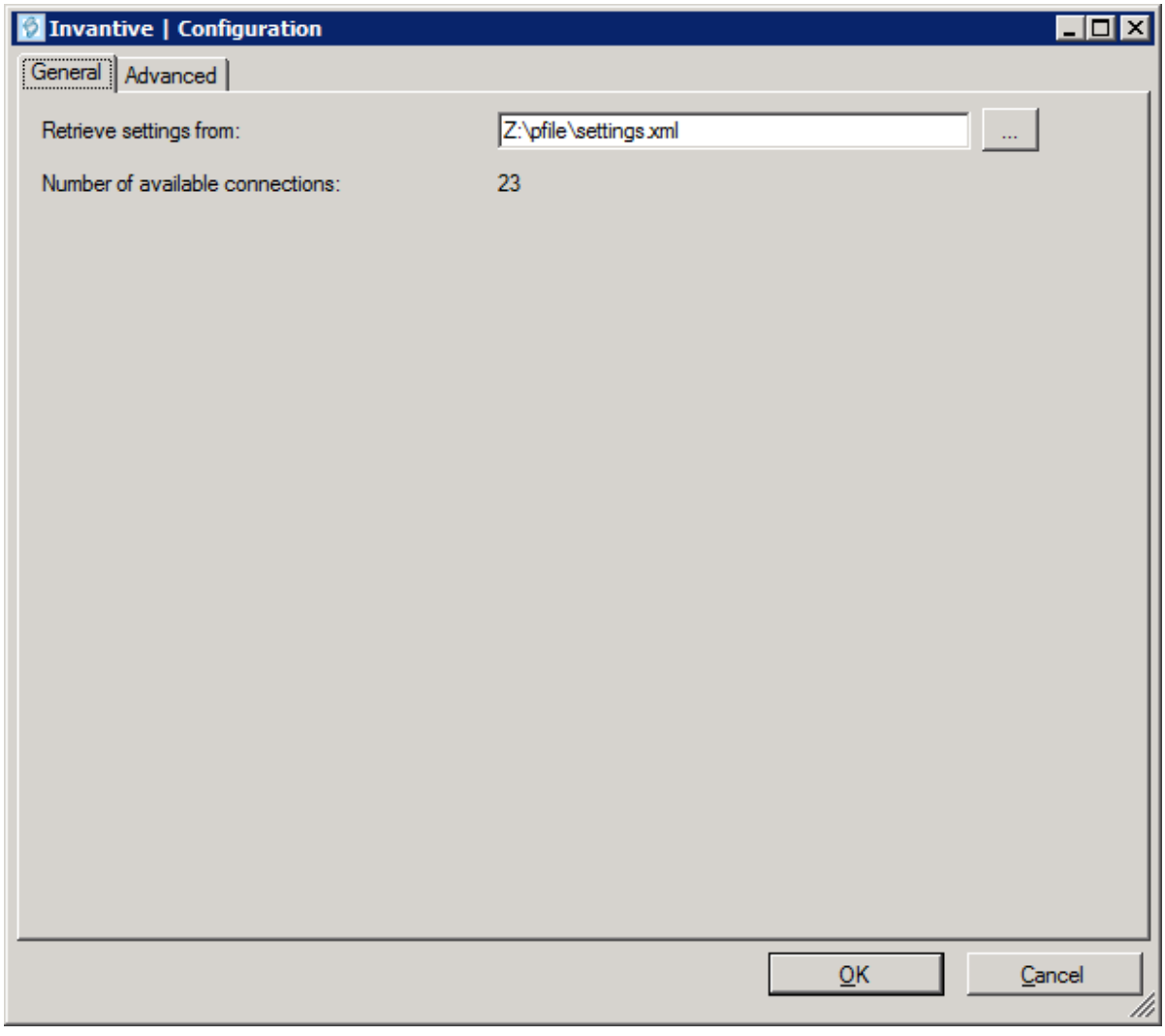
- Use an Internet browser to go to the link: http://webservice.invantive.com/qt/publish.htm. Then click 'Install', next save the file and execute it.



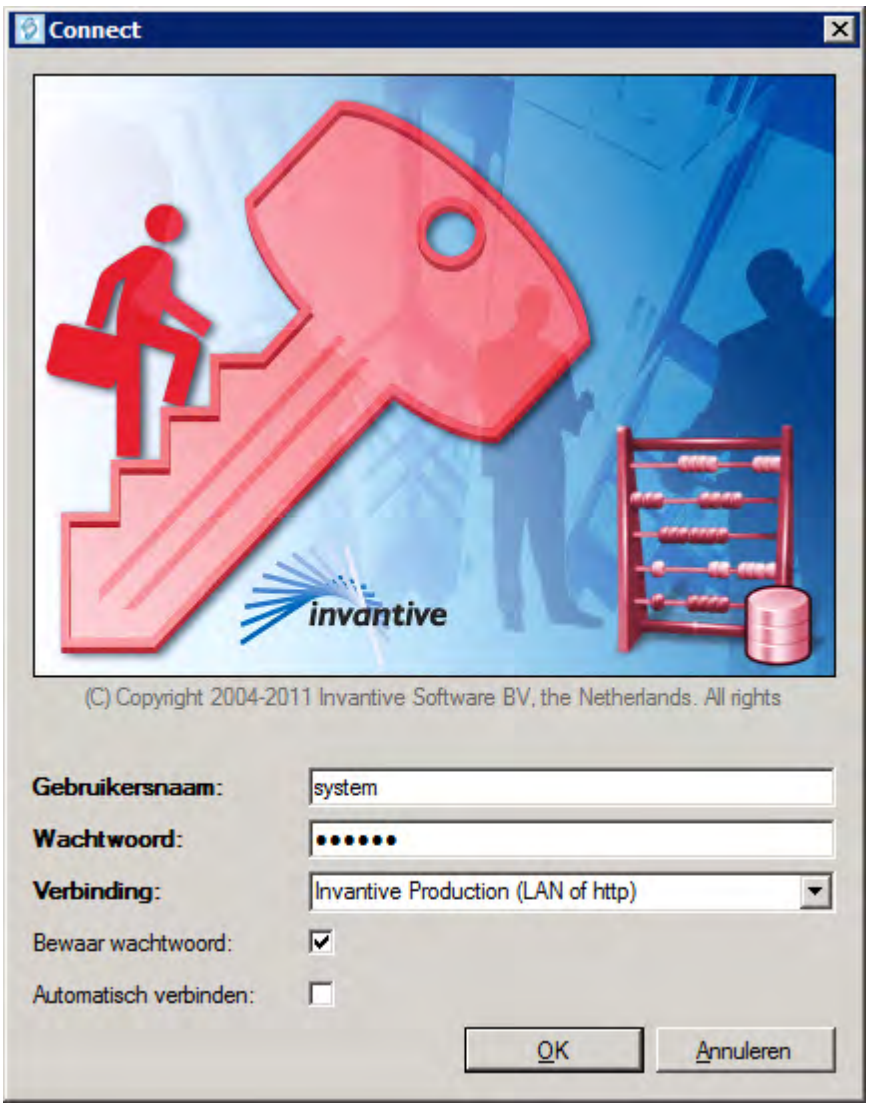
- Click on the button 'Install' to install the Invantive Query Tool on the computer.



- After installation, the following window will be shown. In this screen, you need to enter the location of the connection file. See Connections Settings 54 for an explanation of the connection file. Select 'OK' to save your changes.



- Next comes the login screen. Next enter the username, password and connection and select ‘OK’.



- In order to change the settings of Invantive Query Tool after installation, press 'Crtl' when starting up Invantive Query Tool.

2.6 Versions

This chapter describes the changes in the application per version.

2.6.1 Release 2014 R1

Released: XX-XX-2014.

Invantive Producer: bXX.

Changes and bug fixes:

Number	Type	Product	Description
12935	ER	Invantive Query Tool	dbms_output en explain plan in Query Tool
21718	PR	Invantive Query Tool	Describe w erkt niet in Query Tool ondanks rechten op de functie itgen_querytool_describe.
1994	ER	Invantive Qu-	Lijst meest recente documenten (stuk of 10) tonen in Bestandsmenu.

Num-ber	Type	Product	Description
3		ery Tool	

Installation

- No specialties.

Implementation

- No specialties.

3 Invantive Webservice

This chapter describes the possibilities of the Invantive Webservice.

3.1 Web services

Because of the technological changes and the mobility of employees more and more traditional work spaces are disappearing. Employees work at home more often or make use of travel time work time. Work processes like the making of financial reports or the start-up of a new project take place more and more outside of the office. For companies this means that work processes are assigned differently and should be optimized. To allow for the work processes to run as efficient and effective as possible it is required to have quick and safe access to the company network through the Internet.

Webservices make it possible for companies to organize work processes through the Internet even smarter. By providing access to the company network and applications using webservices, it is possible to coordinate and optimize processes from each location.

3.2 Advantages

The Invantive Webservice offers various advantages:

- The Invantive Webservice makes it easy to quickly and safely exchange data through the internet between various databases and services. For companies this means that the execution of financial calculations and the manufacturing and recording of contracts is available from every location. the Invantive Webservice allows different companies to work together more effective and more efficient within a project.
- That is because the Invantive Webservice simplifies the exchange of information between different parties within a project. The Invantive Webserive makes it possible to give partners - through http(s) - authorized access to applications and databases. The advantage of this is that existing applications and applications based on Invantive Producer can easily exchange data. This means that partners can use óne application for the planning of projects, execution of complex calculation models and the registration of work hours. Using the Invantive Webservices the data can - depending on the security model - be retrieved and processed in the own administration. This makes it possible to provide multiple clients and/or relations quick and safe access to the company network with the Invantive Webservice.
- With the Invantive Webservice work processes can be organized even smarter and be optimized. The result is the more effective and efficient work on a project.

3.3 System Requirements

Client

To use Invantive Webservice on your PC or terminal server you will need the following software including licenses:

- Microsoft .NET 4.5.
- Minimum 2 GB of internal memory.
- Screen resolution of 1280 x 1024 or higher.

On-Premises

For the use of Invantive Webservice as server within the private network you will need (so-called "on-premises" use):

- Operating system: Windows 2008 R1 Service Pack 2, Windows 2008 R2 or Windows 2012.
- Minimum of 4 Gb internal memory.
- Screen resolution of 1280 x 1024 or higher.
- Minimal 1 central processing unit for server use not older than 2 years.
- Drivers for the supported databases or own specific drivers for business applications.

3.4 Concept

With the Invantive Webservice Invantive applications and applications based on Invantive Producer can exchange data with databases and other services using the internet or the company network.

It is also possible to use these applications without Invantive Webservice, but for installations with more than one user this is strongly discouraged. With the Invantive Webservice it will take no time outside of the client installation to allow an extra user or PC to make use of a database; without the Invantive Webservice this will take considerably more time for each PC and/or user.

The exchange of data happens through webservices that use the so-called http and/or https protocol. Depending on the chosen security model you can exchange data with databases in the company network using the Invantive webservice both within the company network as well as on the internet from Invantive applications and applications based on Invantive Producer.

You can also - if authorized - exchange data with databases at various companies. With this you can easily collaborate with multiple clients and/or relations in an efficient manner, wherever you are and whenever you feel the need to. Every client and/or relation also has an own installation of the Invantive Webservice.

The Invantive Webservice works as follows:

- A user starts an application based on Invantive technology.
- The application will know automatically or hear from the user which connection is to be used with which user name and password.
- The connection are is retrieved in a list with available connections and the related (possible redundant) channels.
- On the basis of the retrieved preferences and availability a channel is chosen for communication.
- Through this channel a connection is established with the service provided by the webservice.

- Data and requests are exchanged.

If the connection drops, then the connection is automatically established again. A possible alternative channel for the connection is used if the desired channel is not available.

3.5 Database platforms

An installation of the Invantive Webservice consists of one or multiple installations of the Invantive Webservice programming. In addition to the programming you also need to indicate the connections to databases that can be used through this installation. These can at least be the following database platforms:

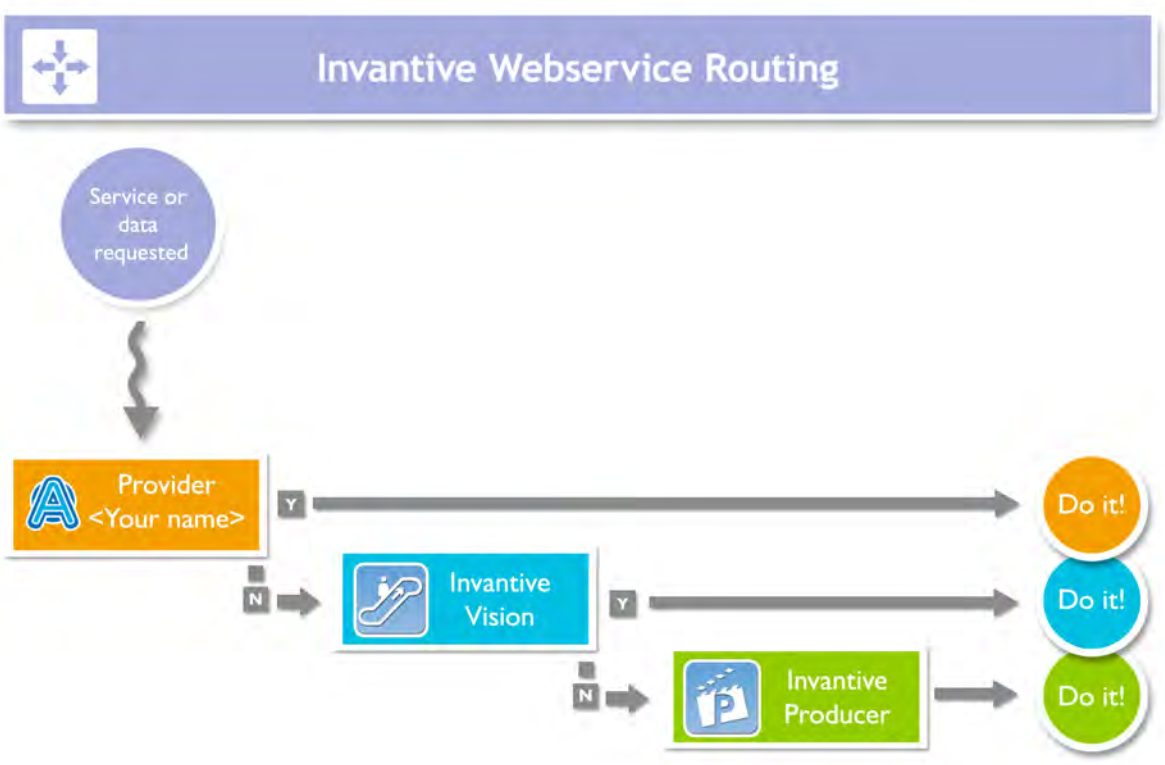
- Microsoft SQL Server
- Oracle RDBMS
- MySQL
- IBM DB2 UDB (Linux, Unix, Windows)

The actual choice of the database platform depends on which application you will be using. Some (company) applications only work on a portion of the database platforms.

The support of extra database platforms can be added by a system developer or ordered with Invantive.

Requests are routed to providers as soon as requests for data or actions arrive to the webserver. In the configuration file you can adjust in which order this happens (see image).

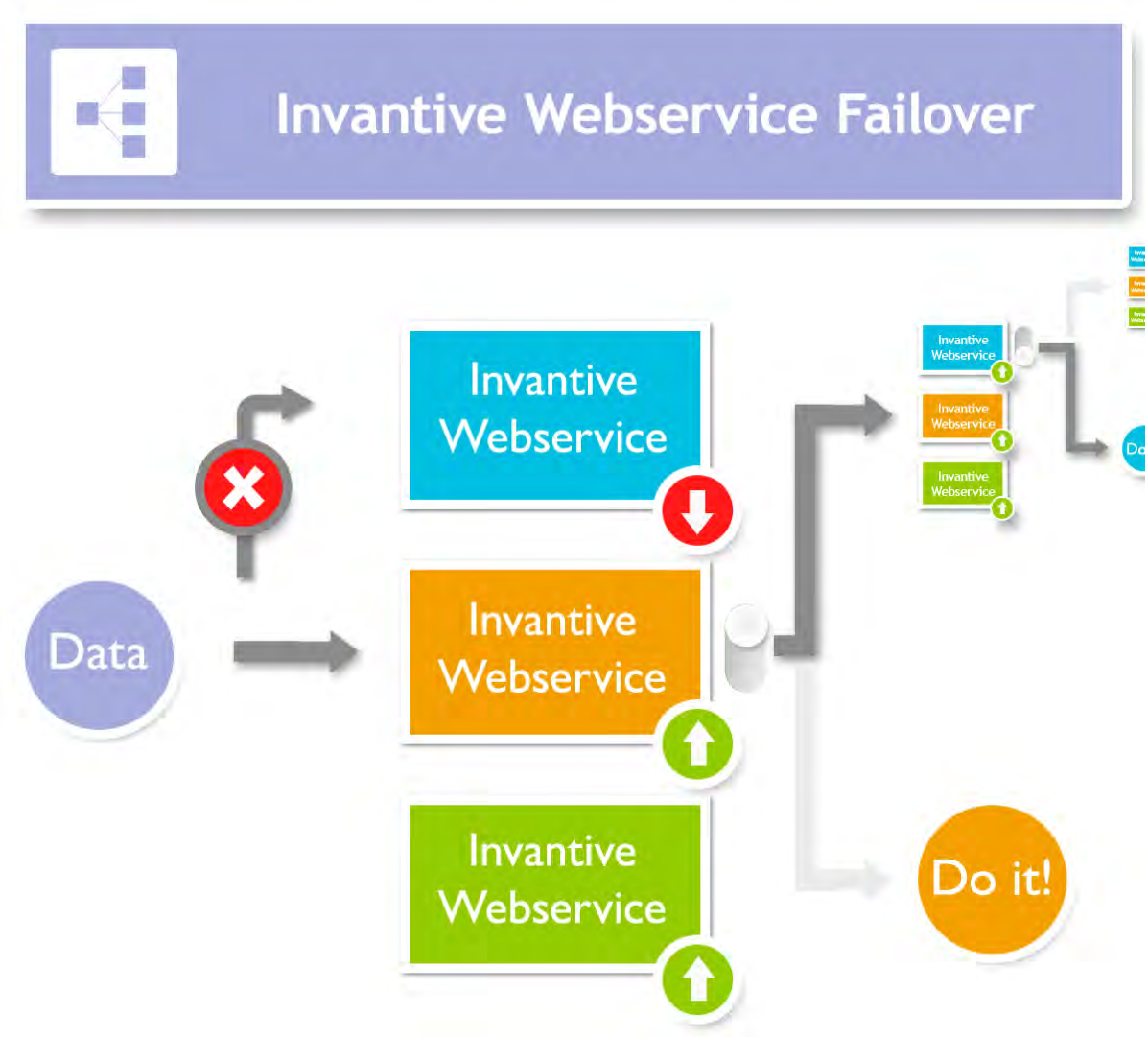
See also Providers Configuration 57.



3.6 Redundance

For a higher availablity you can install multiple installations of the Invantive Webservice programming. These installations can be located on óne server or on multiple servers. With

multiple servers you ensure a better availability: even if a server breaks then the users can still keep on working (see image).



The redundance can be set in the settings.xml file. See also Connection configuration 54. As soon as a connection is no longer available the programming of your user will try to use a different available connection.

3.7 Installation

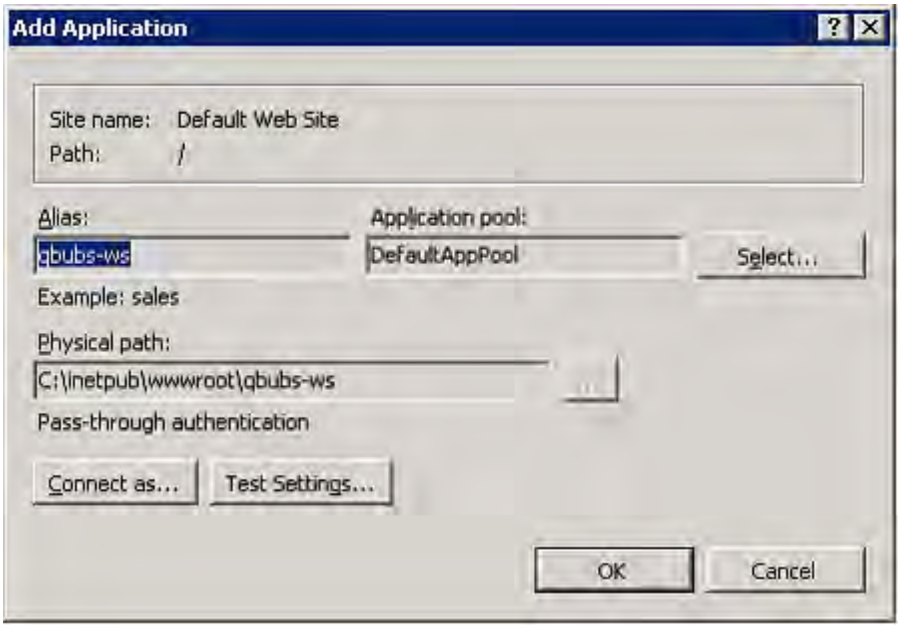
This element describes the installation of the Invantive Webservice and its components.

3.7.1 Invantive Webservice Programming

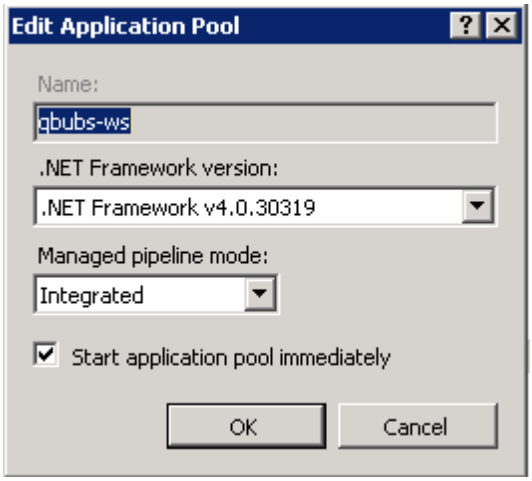
Execute following steps to make the Invantive Webservice available to the users.

- Install Microsoft IIS 7 or 8 including ASP.NET support.
- Install Microsoft .NET Framework version 4.5 or newer. In the Control Panel among the installed programs there will then be listed 'Microsoft .NET Framework 4.5'.
- Copy invantive-webservice in the distribution to the folder that is known within Microsoft IIS, preferably 'webservice' within the folder of the application or alternatively c:\inetpub\wwwroot\invantive-webservice, c:\inetpub\wwwroot\<OMGEVING>-ws or (preferably) ENVIRONMENTDIR\webservice.
- Adjust settings.xml in this folder as described in settings.xml.sample.

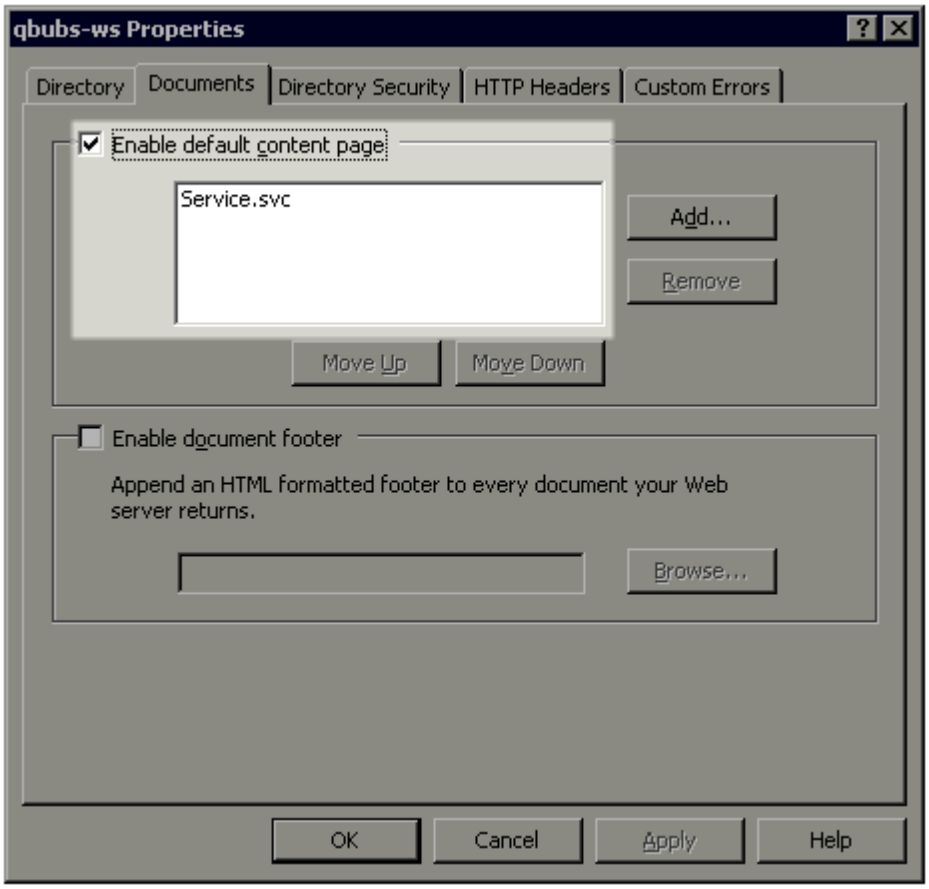
- Start Microsoft IIS with ‘inetmgr’ or through Control Panel.
- Select ‘Properties’ from the folder.
- Convert the folder to application with an own application pool:



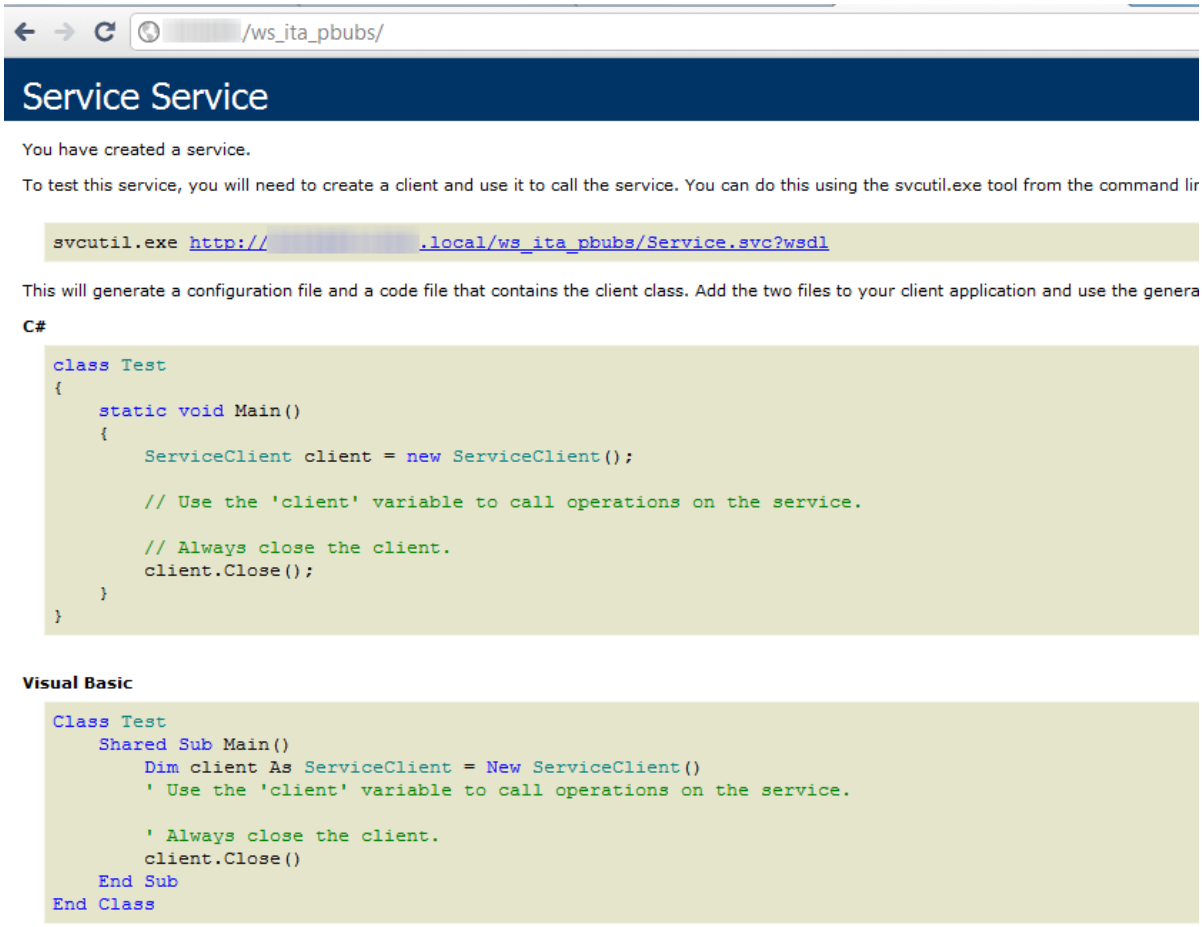
- Set the application in for use of the application pool 'ASP.NET v4.0':



- Set the standard page Service.ashx:



- You can now test the web service by opening the page. You will receive output such as (t23522):



3.7.2 Certificate

If you make use of https, then you need to submit a certificate (see also http://www.iis.net/learn/manage/configuring-security):

- Start MMC with 'Run'.
- Go to the File menu and select 'Add/Remove Snap-in'.
- Click on Certifcates and click on 'Add'.
- Select 'Computer Account' and click on 'Next'.
- Select 'Local Computer' and click on 'Finish'.
- Select 'OK'.
- Click on 'Certificates (Local Computer)' in the middle part of the window.
- Click on the right on 'Personal'.
- Select 'All tasks' and then 'Import'.
- Set up the filter for 'Personal Information Exchange (*.pfx)'.
- Select the .pfx bestand as Personal Certificate.
- Enter the password.
- If desired you select the check box 'Mark this key as exportable.'.
- Allow automatic placement in the storage for the certificate based on the type.
- Select 'Finish'.
- Close the MMC.
- It is not necessary to save the settings of MMC.

- Start Microsoft IIS through 'inetmgr'.
- Click right on the website (usually 'Default Website').
- Go to 'Edit bindings'.
- Add a 'https' binding and choose the Friendly Name of the certificate that you have just imported.

3.7.3 Connection Configuration

To make a connection with an Invantive application or an application based on Invantive Producer there needs to be a file settings.xml with included within the configuration of the connection settings. This has to be an XML file with the same design as the example. The file can contain the configuration to connect with one or more servers.

If you start an Invantive-based application product for the first time the settings.xml file is searched for at multiple locations in succession:

- the installation folder containing setup.exe;
- from the installation folder a folder upwards;
- from the installation folder a folder up and the file folder in it;
- from the installation folder two folders up;
- from the installation folder two folders up and the file folder under it;
- from the installation folder three folders up;
- from the installation folder three folders up and the file folder under it;
- in the folder c:\ws.

If the settings.xml file can not be found, the user will be asked where the settings.xml file is located. The chosen location of the settings.xml file is remembered and used from that moment.

In the text below it is described how it works:

```
<?xml version="1.0" encoding="utf-8"?>
<!--
  (C) 2004-2013 Invantive BV, the Netherlands (www.invantive.com).

  $Header: http://svn.invantive.com/repos/p104/trunk/help/nl/manual/Topics/verbin-
dingsconfiguratie.xml 23549 2013-11-01 14:21:27Z smoke $

  Purpose:
  Configuration of the Invantive Webservice and direct database connections
  available to client and the Invantive Webservice acting as a database client.

  Explanation:
  Connections are used to retrieve data from a database and to update the contents
of databases.
  This settings file can accommodate all settings for database and web service
connections
  that are used by Invantive products.
  This file contains a number of structured elements, explained further on.

  Top level: the connection groups.
  This is the root level of the settings file. It only contains connections
groups.
```

```
  Attributes:
  * "default": The default connection. The format is 'group\connection'.
    the first connection with the given name will be used when the group element
is omitted.
  * "forceDefault": If true, only the default connection can be used. No other
connection is
    eligible for selection based upon this settings.xml file. You can use for in-
stance when you
    add a new default connection and you want to make sure everyone switches to
the new connection,
    irrespective of what connection is currently used as default.

  The group level:
  This level defines a set of connections, logically grouped together. You are
  free to choose the way of grouping.
  Examples of logical manner of grouping: by customer, by environment (production,
test).

  Attributes:
  * "name": The name of the group.

  The connection level:
  This level defines an actual logical connection.
  For example: Production environment Acme site.
  Under this level, the actual transport mechanism and its settings can be defi-
ned.
  The connection and associated failovers are tried when initially establishing
the connection and when reconnecting
  after the provider detected a connection loss.
  The elements of this level can consist of two types:
  * physical connection (either an Invantive Webservice or direct database connec-
tion);
  * failovers.
  All physical connections listed will be brought online during application use.

  Attributes:
  * "name": The name of the logical connection.

  The webservice element:
  This element defines a connection using the Invantive.Providers.Webservice pro-
vider.
  This provider is capable of proxying database connections over HTTP/HTTPS. A
client
  can connect to a database directly through a webservice, but a webservice can
route
  this request also to another Invantive Webservice and so on.

  Attributes:
  * "url": the url of the Invantive Webservice.
  * "encoding": the encoding to use.
    This will be passed as header on the request.
    Allowed values are: "binary" or "text". Default: binary. Use text for debug-
ging purposes or with poor CPU.
  * "compression": the compression method to use.
    This will be passed as header on the request. Allowed values are: "auto",
"true" or "false". Default: "auto" (will set compression enabled)
    Within a fast LAN network and/or with slow servers, we recommend no compressi-
on. In all other situations, we recommend
    compression to be enabled.

  The database element:
  This element defines a connection to a database using a provider
  specific for that type of database.
```

```
  Attributes:
  * "connectionString": the ADO.NET connection string for the specified provider.
    You can specify Data Source, User Id and other settings.
  * "provider": the name of the ADO.NET connection provider.
    For example: "Oracle.DataAccess.Client"

  The failover level:
  The failover level can define a list of database or webservice settings.
  It supplements the webservice/database element.
  Connection settings defined in a failover can be used to
  have a failover connection when one connection cannot be established.
  This can be useful when relying on a internet connection or presence of a VPN
tunnel.
  Settings defined in this section will be evaluated one after another, starting
top down.
  When any of the failovers can be established, no other failovers will be tried.

  Attributes:
  * (none)

  Examples:

  This example illustrates a single connection. The software will sequentially try
to:
  * Connect to the 'authenticationServer' Active Directory server;
  * Connect to one of the connections in the failover:
    - First the database connection (when connection from the internal network or
VPN);
    - The first webservice connection;
    - The second (or 'failover') webservice connection.

  <connections default="Customer A\Production" forceDefault="false">
    <group name="Customer A">
      <connection name="Production">
        <database connectionString="Data Source=authenticationServer;User Id=user-
name;Password=thepublicpassword;Pooling=false" provider="Invantive.CustomerA.Acti-
veDirectory" />
        <failover>
          <database connectionString="Data Source=localhost;User Id=username;Pass-
word=thepublicpassword;Pooling=false" provider="Oracle.DataAccess.Client" />
          <webservice url="http://www.customer-a.com/ws/"      encoding="binary"
compression="true" />
          <webservice url="http://failover.customer-a.com/ws/" encoding="binary"
compression="true" />
        </failover>
      </connection>
    </group>
  </connections>

  This example illustrates connections to different database platforms. The soft-
ware will try to:
  * Connect to the IBM DB2 UDB database when connection 'DB2' is selected;
  * Connect to the Microsoft SQL Server database when connection 'SQLServer' is
selected;
  * Connect to the Oracle MySQL server when connection 'MySQL' is selected;
  * Connect to the Oracle RDBMS server when connection 'Oracle' is selected;

  <connections default="Customer A\Production" forceDefault="false">
    <group name="Customer A">
      <connection name="DB2">
        <database connectionString="Server=localhost;Database=THE_DATABASE;UID=us-
ername;PWD=password;CurrentSchema=schema" provider="IBM.Data.DB2" />
      </connection>
      <connection name="SQLServer">
```

```
        <database connectionString="Server=localhost;Database=database;User Id=us-
ername;Password=password;" provider="System.Data.SqlClient" />
      </connection>
      <connection name="MySQL">
        <database connectionString="Server=localhost;Database=database;Uid=userna-
me;Pwd=password" provider="MySql.Data.MySqlClient" />
      </connection>
      <connection name="Oracle">
        <database connectionString="Data Source=localhost;User Id=username;Pass-
word=password" provider="Oracle.DataAccess.Client" />
      </connection>
    </group>
  </connections>

-->
  <connections default="Customer A\Production" forceDefault="false">
    <group name="Customer A">
      <connection name="Production">
        <database connectionString="Data Source=authenticationServer;User Id=user-
name;Password=thepublicpassword;Pooling=false" provider="Invantive.CustomerA.Acti-
veDirectory" />
        <failover>
          <database connectionString="Data Source=localhost;User Id=username;Pass-
word=thepublicpassword;Pooling=false" provider="Oracle.DataAccess.Client" />
          <webservice url="http://www.customer-a.com/ws/"      encoding="binary"
compression="true" />
          <webservice url="http://failover.customer-a.com/ws/" encoding="binary"
compression="true" />
        </failover>
      </connection>
    </group>
  </connections>
```

3.7.4 Providers Configuration

In the providers configuration file providers.xml you configure which requests are processed by which providers and how the requests are routed within the Invantive Webservice. The possibilities are described in the sample file providers.xml.sample:

```
<?xml version="1.0" encoding="utf-8"?>
<!--
  (C) 2004-2013 Invantive BV, the Netherlands (www.invantive.com).

  $Header: http://svn.invantive.com/repos/p104/trunk/help/nl/manual/Topics/bubs-
Providers_Configuratie.xml 23549 2013-11-01 14:21:27Z smoke $

  Configuration of providers for Invantive Webservice

  Purpose:
  You can configure providers here, sorted by order.
  Providers are tried to handle a request in decreasing order. So the provider
with order 500 is offered
  the request before the provider with order 400 is offered the request.
  Providers with order 70, 80, 90, 100 and 200 are reserved for Invantive internal
use (see the table below).

  Explanation:
  Providers are used to provide functionality that is not part of the webservice.
  A provider knows how to handle a specific action on a specific platform.
  Some providers are included in the installation, such as providers for database
or webservice connectivity or a file logging provider.
  The default providers are included in the software, so they are not listed here
between the <providers> tag.

  A provider does in general NOT define WHERE the action will be executed. That is
normally specified by the settings.xml.
```

```
  But specific providers may contain the location WHERE the action will be execu-
ted as default value or specified as attributes
  with the provider's configuration.

  Default providers:
  The default providers are always available.
  A list of the default providers and there order (which cannot be used again):

  Order   Name                    Comments
  ------------------------------------------------------------------------------
------------------------------------------------------------------------------
--------
   70     Oracle MySQL            Provider supporting the execution of actions on
Oracle MySQL.
                                  Built and tested with Connector/Net 6.7.4. See
http://dev.mysql.com/doc/refman/5.6/en/connector-net.html.
                                  File: Invantive.Data.Providers.MySql.dll
   80     Microsoft SQL Server    Provider supporting the execution of actions
onMicrosoft SQL server 7.0 and later.
                                  See http://msdn.microsoft.com/en-us/library/
kb9s9ks0.aspx.
                                  File: Invantive.Data.Providers.SqlServer.dll
   90     IBM DB2 UDB             Provider supporting the execution of actions
onIBM DB2 UDB  9.7 for Windows.
                                  Not tested on any other version.
                                  File: Invantive.Data.Providers.IbmDb2.dll
  100     Oracle RDBMS            Provider supporting the execution of actions
onOracle RDBMS 9i - 12c.
                                  Needs ODP.NET and OCI to be installed.
                                  File: Invantive.Data.Providers.Oracle.dll
  200     Invantive Webservice    Provider that is executing action by forwarding
it to another Invantive Webservice over HTTP/HTTPS.
                                  File: Invantive.Data.Providers.Webservice.dll
                                  Order 200 ensures that forwaring is preferred
instead of a database connection by default.

  The providers tag contains a list of providers available, each one consisting of
the provider-tag.

  Attributes of the <provider> tag:
  * "order": Sorting order of the provider. The higher the value, the sooner it is
called.
  * "file": The file name of the provider. This can be a path relative to the Pro-
viders directory, or an absolute path.
    Fully specify the path or use a path relative to the Invantive Webservice in-
stallation folder.
    Do not use the ASP.NET/IIS ~/-prefix to indicate the current folder.
  * "class": Optional. Full class name of the provider. You can specify the class
name to increase startup performance since
    it reduces the time needed querying the file.
    You need to specify the class if you want to load a single provider in a file
that contains multiple providers.

  The elements of the <provider> tag:
  * All: you can specify elements within the provider tag. See for instance the
<templatesfolder> element
    in the example below.
    Their names and values will be passed as attributes to the provider during in-
stantiation.

  Example:

  <providers>
    <provider
     order="998"
```

```
      file="C:\ws\distribute\invantive-sdk\Invantive.XXX.Provider.dll"
      class="Invantive.XXX.Provider.Provider"
     >
       <templatesfolder>C:\temp\templates\</templatesfolder>
       <serviceurl>http://localhost/ThisIsAnExmaple/Service.svc</serviceurl>
     </provider>
   <providers>

-->
<providers>
  <!-- Custom logging. -->
  <!--
  <provider
   order="999"
   file="C:\ws\distribute\invantive-sdk\Invantive.Data.Providers.Logging.dll"
   class="Invantive.Data.LoggingProvider"
  >
    <log>C:\temp\invantive_logging.log</log>
  </provider>
  -->
  <!-- Most preferred provider due to order 400.
       Data access provider for Invantive Estate and/or Invantive Vision.
       Generates an Oracle SQL execute request. Invantive Estate and
       Invantive Vision currently only support the Oracle RDBMS.
  -->
  <!--
  <provider
   order="400"
   file="Invantive.Estate.Data.Provider.dll"
   class="Invantive.Estate.Data.InvantiveEstateDataProvider"
  />
  -->
  <!-- Less preferred provider due to order 300.
       Data access provider for Invantive Producer products.
       The following Invantive Producer products require the use of Oracle RDBMS:
       * Invantive Studio
       * Invantive Query Tool
       The following Invantive Producer products run with all supported database
platforms
       although this specific provider does not yet support it. Use a database
specific
       provider instead:
       * Invantive Composition
       * Invantive Control
  -->
  <!--
  <provider
   order="300"
   file="Invantive.Producer.Data.Provider.dll"
   class="Invantive.Producer.Data.InvantiveProducerDataProvider"
  />
  -->
</providers>
```

3.7.5 Providers

The Invantive Webservice can make use of various providers that record and retrieve data, but also offer other services. Here are the standard available providers.

3.7.5.1 Oracle Provider for Invantive Webservice

In this chapter the configuration of the provider is described.

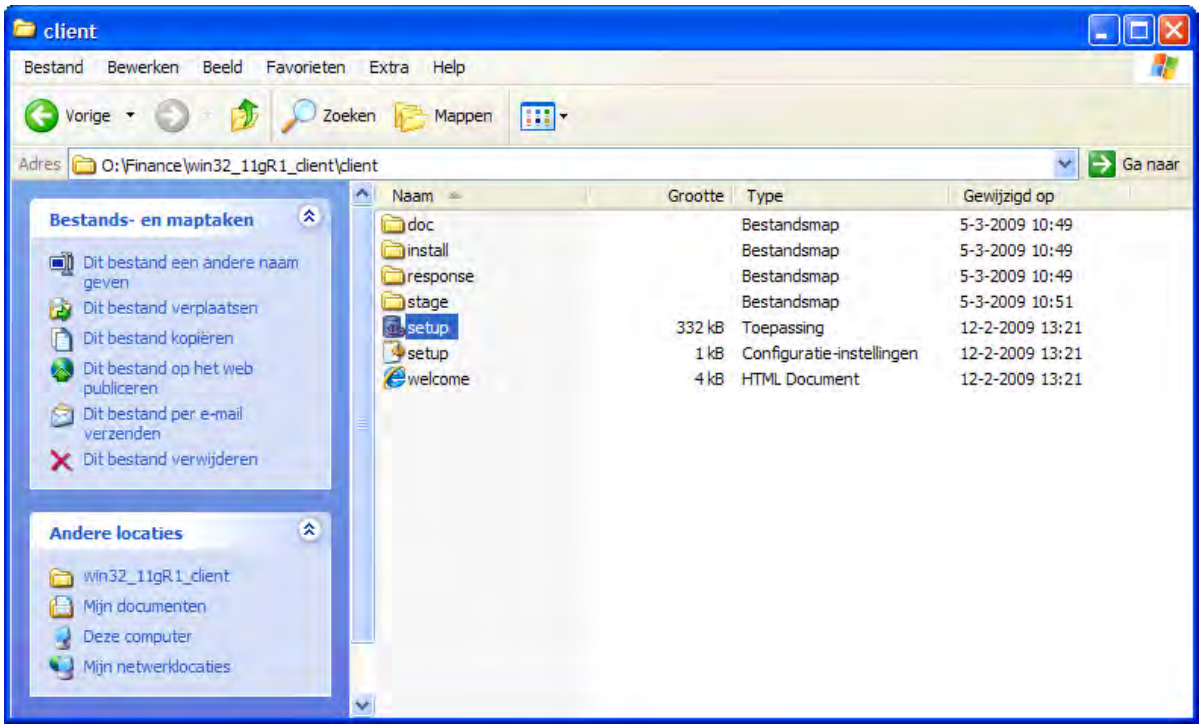
In addition, some suggestions are provided to execute the installation of the Oracle programming. However, this is no replacement of the knowledge and experience with the local situation and trainings that an administrator or DBA has from his role and the results of the instal-

lation are therefore not guaranteed.

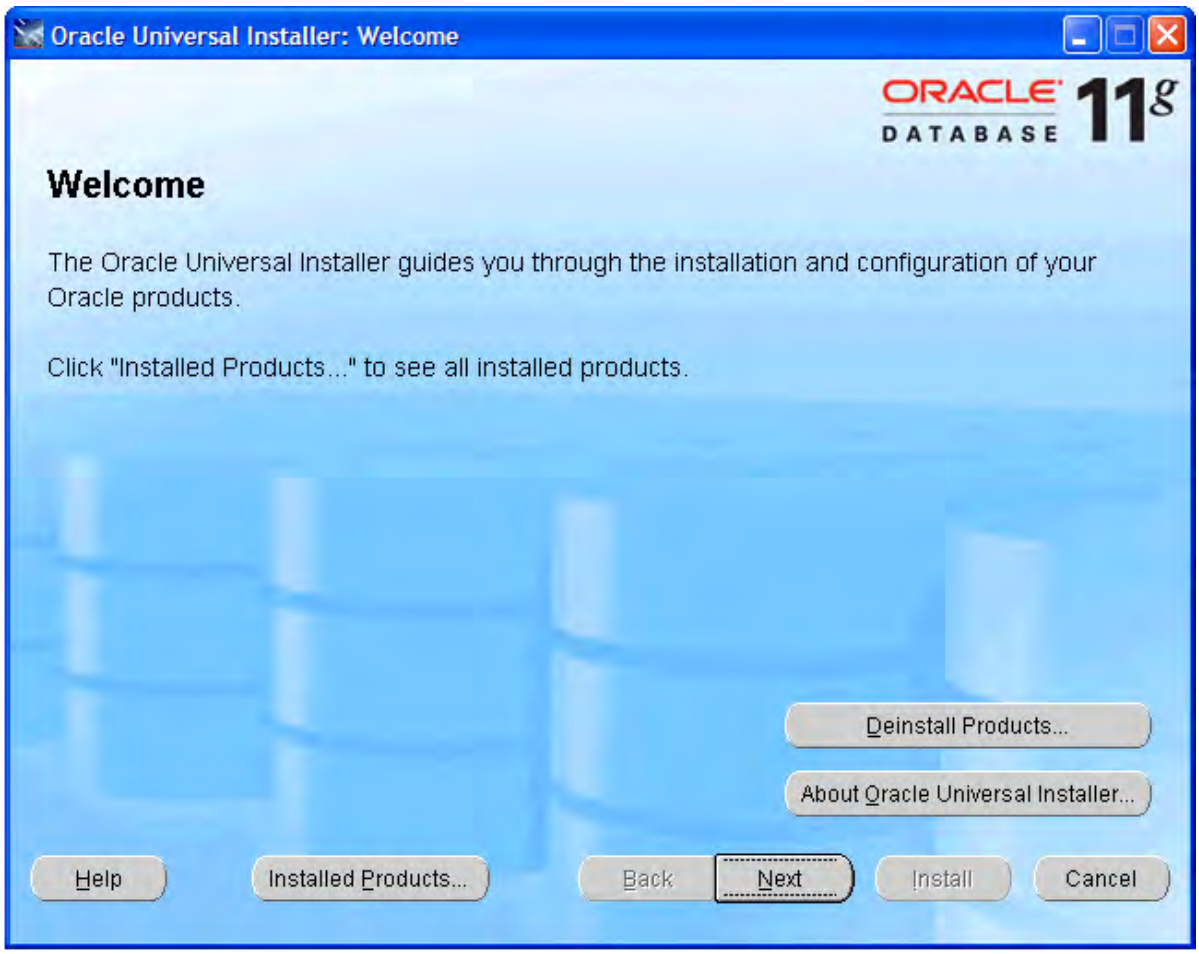
Oracle Client Installation

The installation of the Oracle client can be done following the next steps:

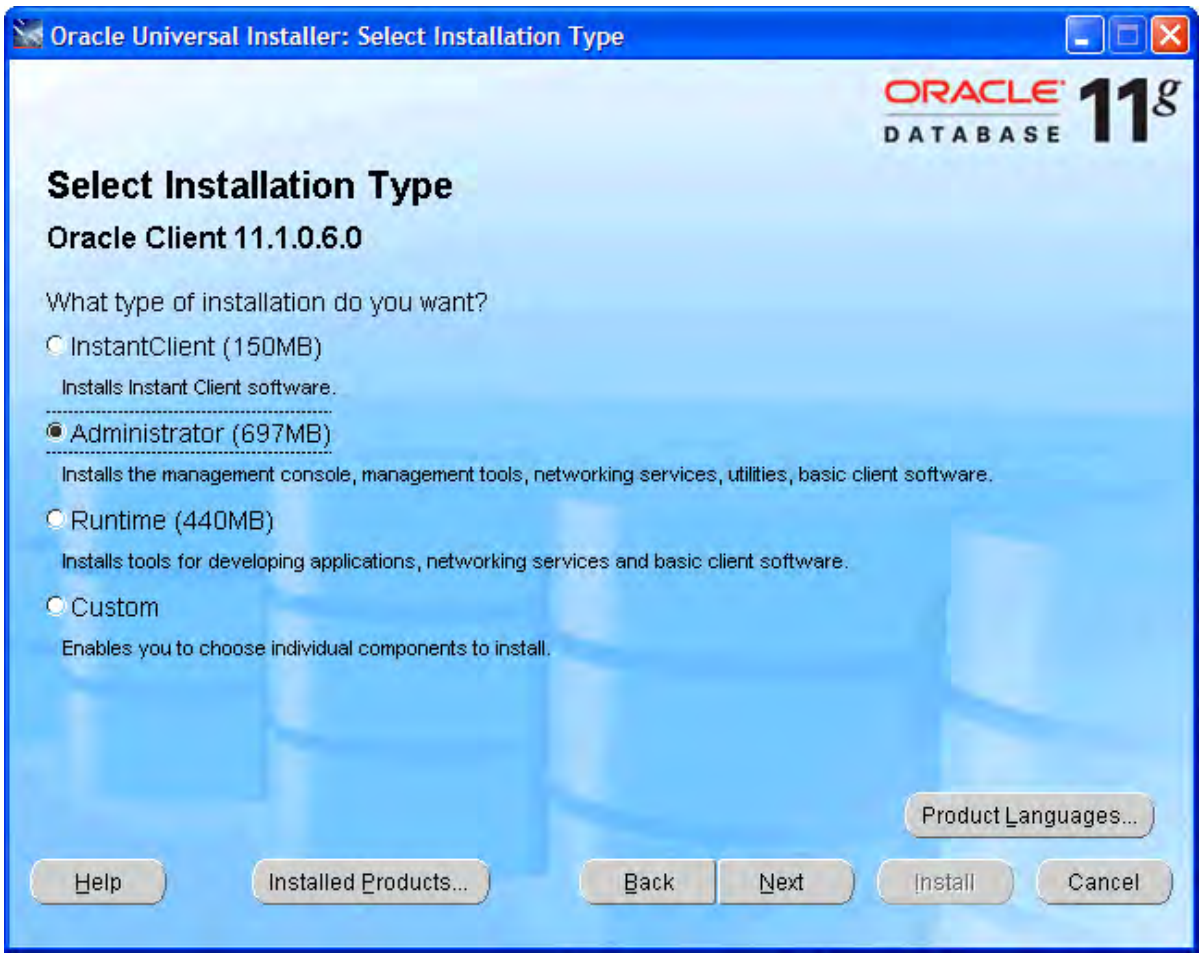
- Navigate to the folder containing the 'setup' program, for example:



- The Oracle installation program appears:

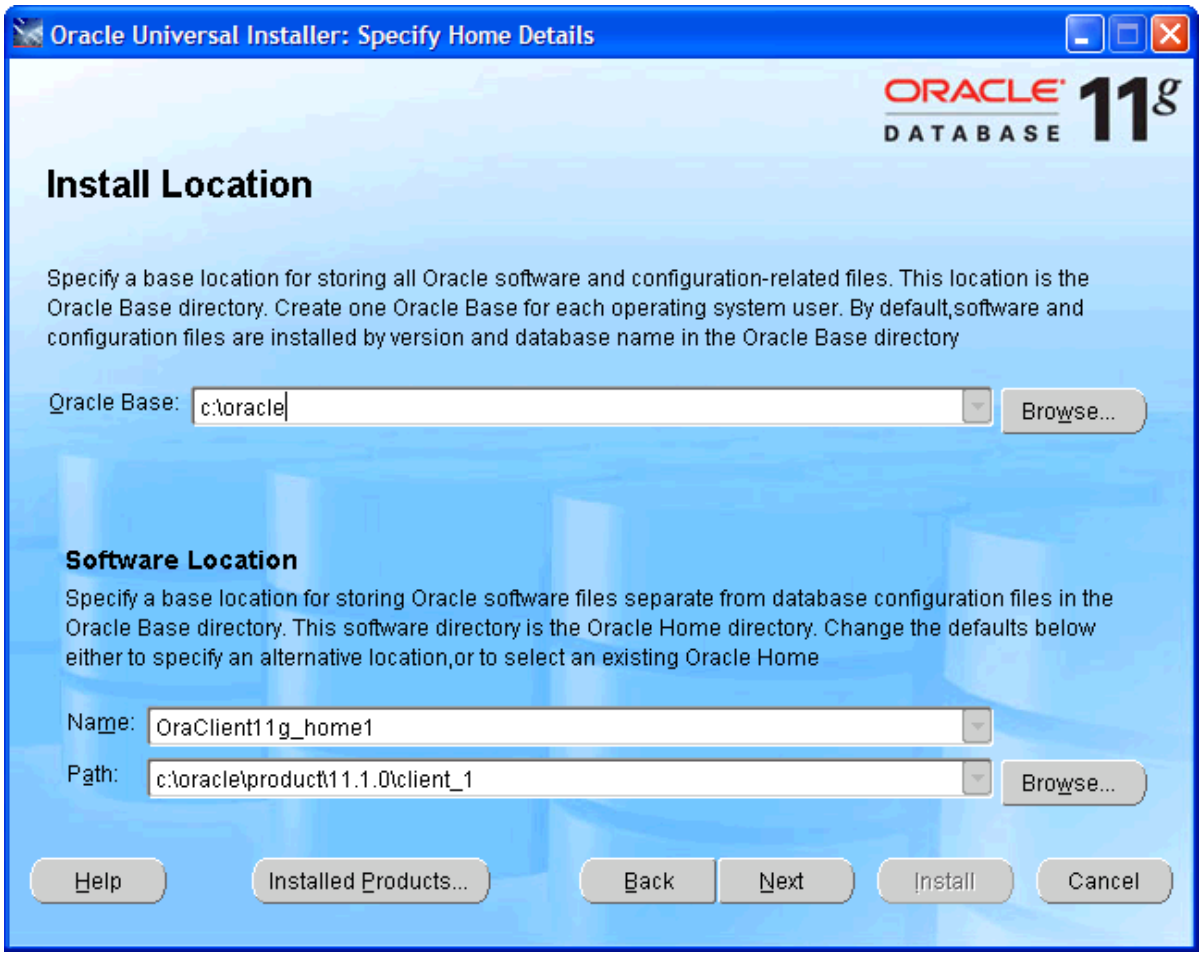


- We recommend to install the most comprehensive version within the license agreement, so that all devices are readily available if they should be needed later:

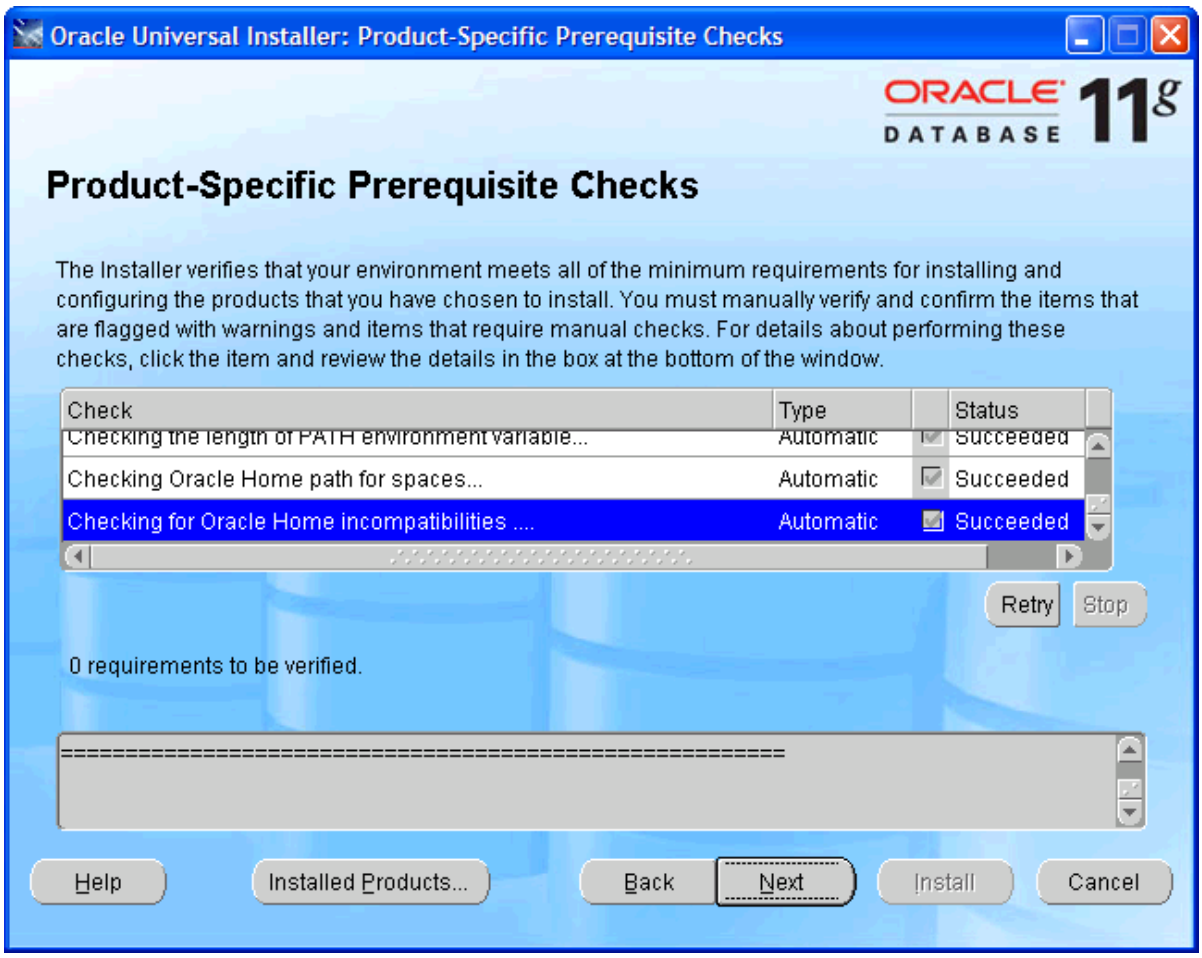


- Select the required languages via ‘Product Languages’. Here we recommend to choose all languages:

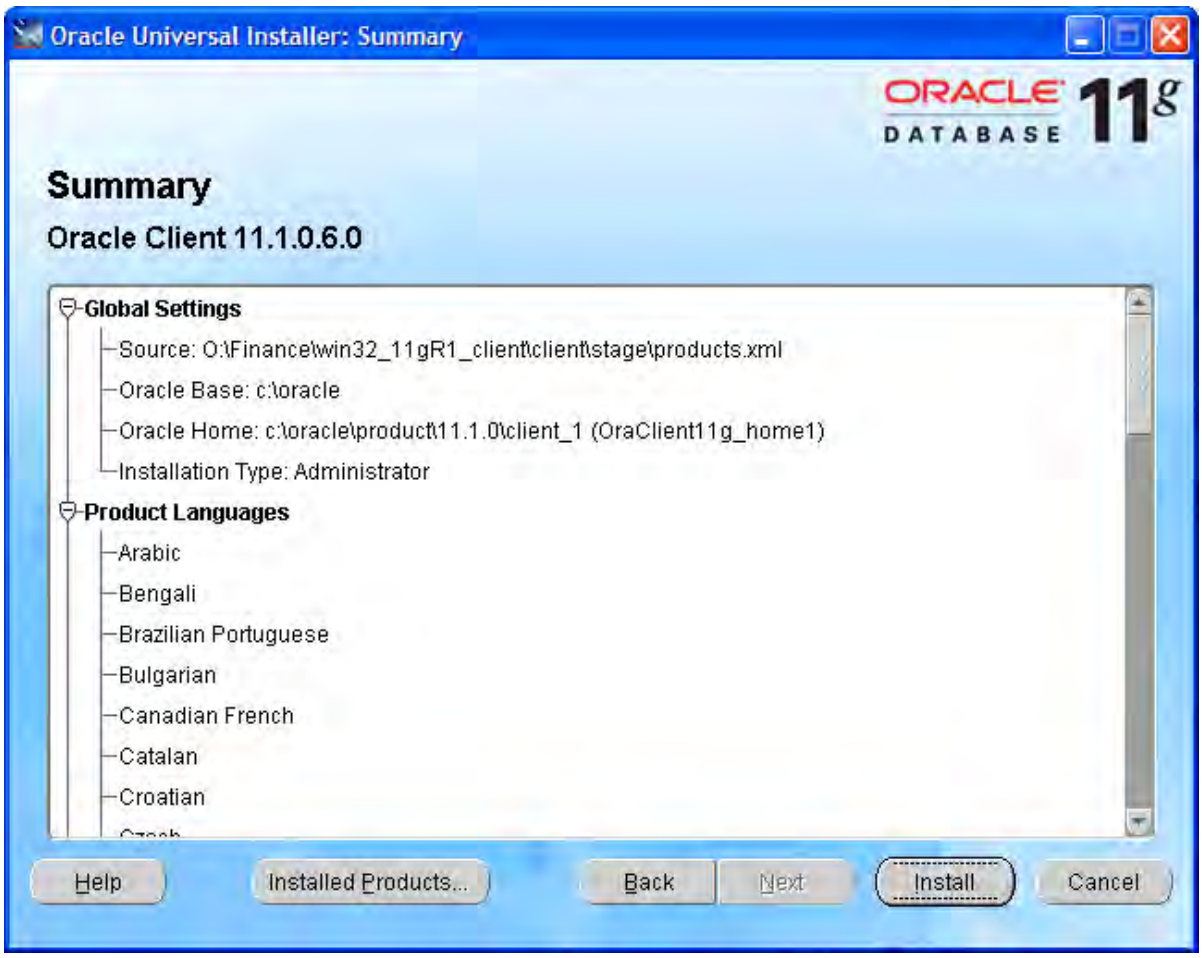
- Select 'OK' and then 'Next'. We recommend to install the software under 'c:\oracle':



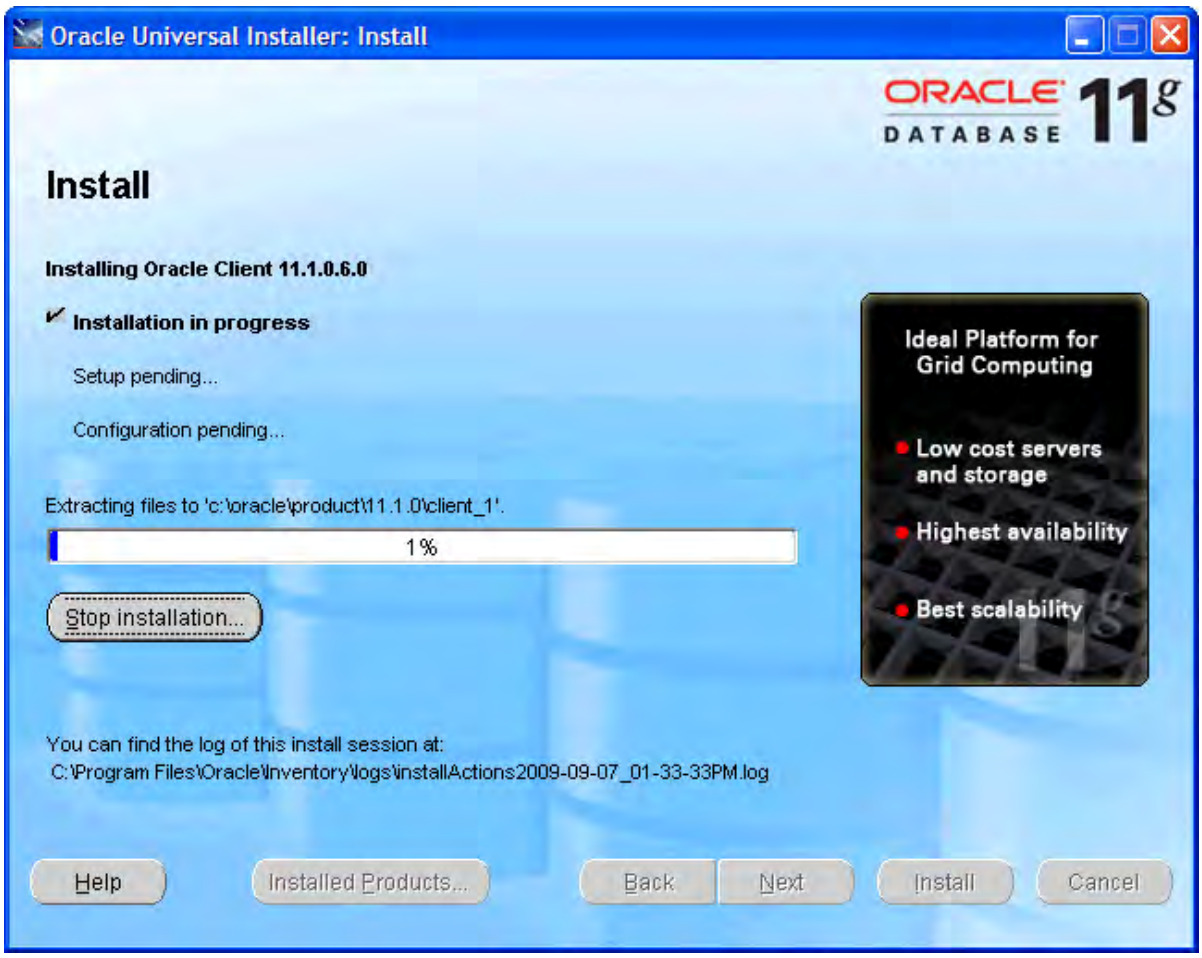
- Subsequently a number of checks will be performed. If problems are found, solve them first:



- Check the settings.
- Check if ODP.Net is listed between the products to be installed.
- Execute the installation by choosing 'Install':

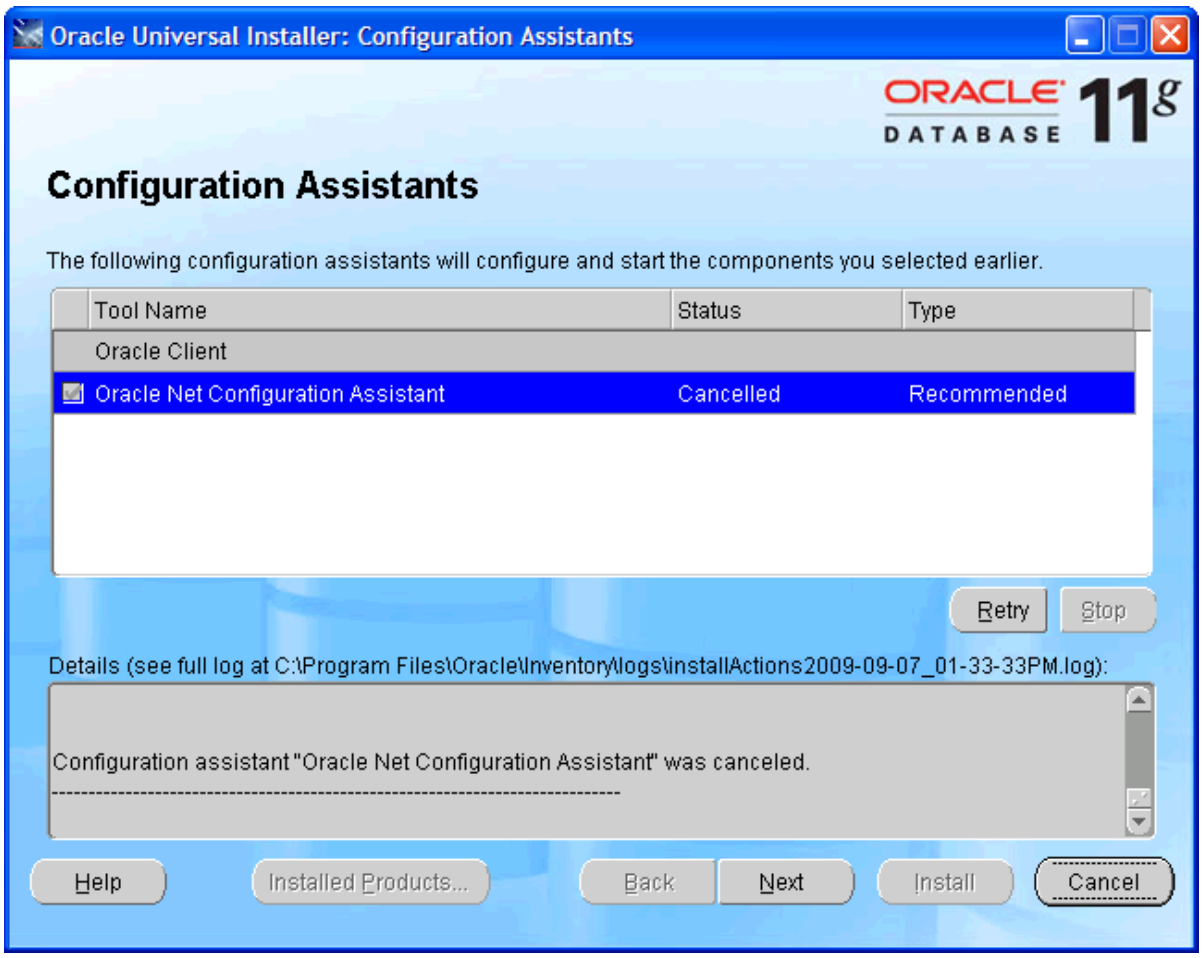


- The progress is displayed:

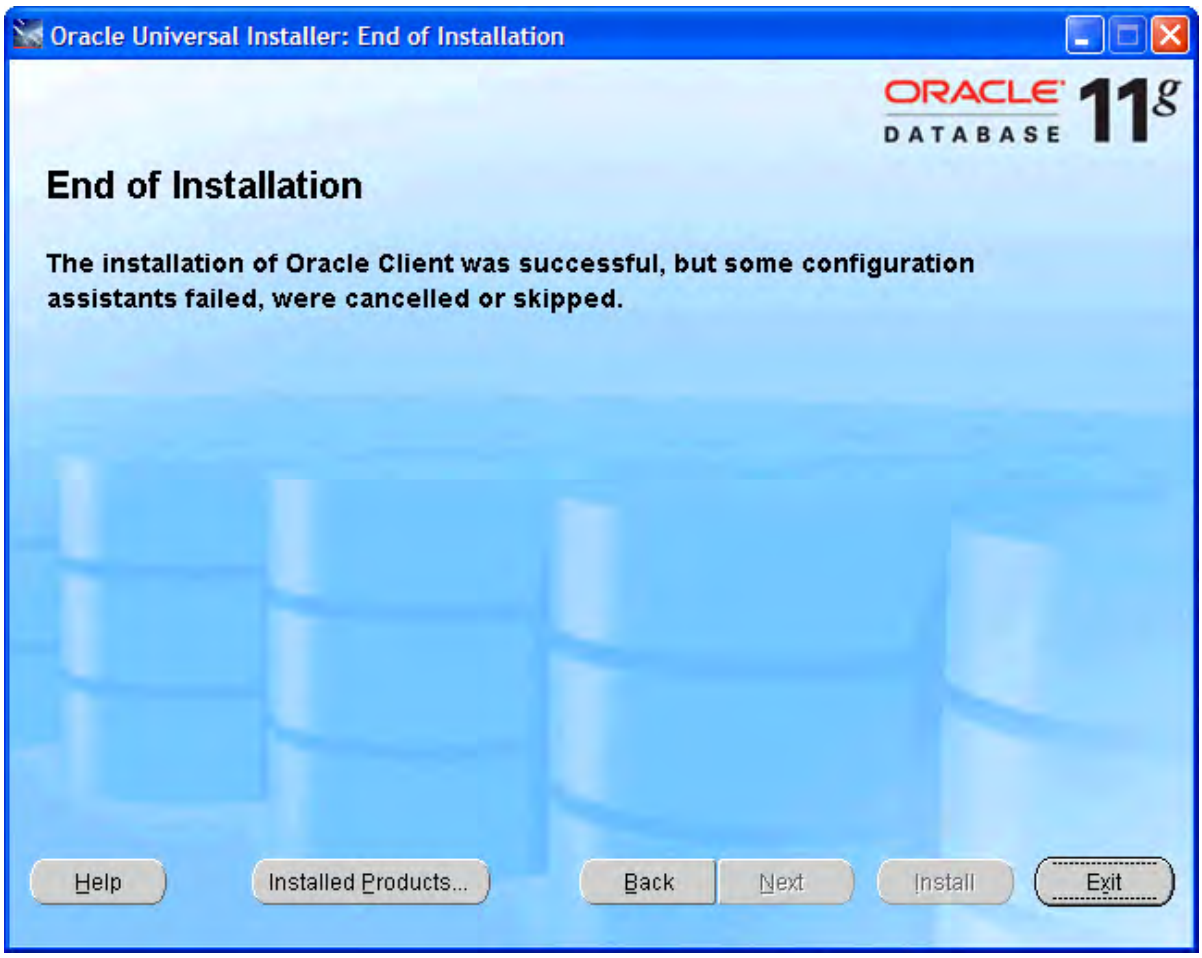


- Afterwards a configuration program for the network configuration is started. Choose ‘Cancel’, we advise you to use the configuration file ‘tnsnames.ora’ as described in the next part of the instructions:

- Select 'Next':



- Close the error message about the failure of the Oracle Net Configuration Assistant.
- Select 'Exit':



Oracle Client Configuration

Follow these steps to configure the Oracle client:

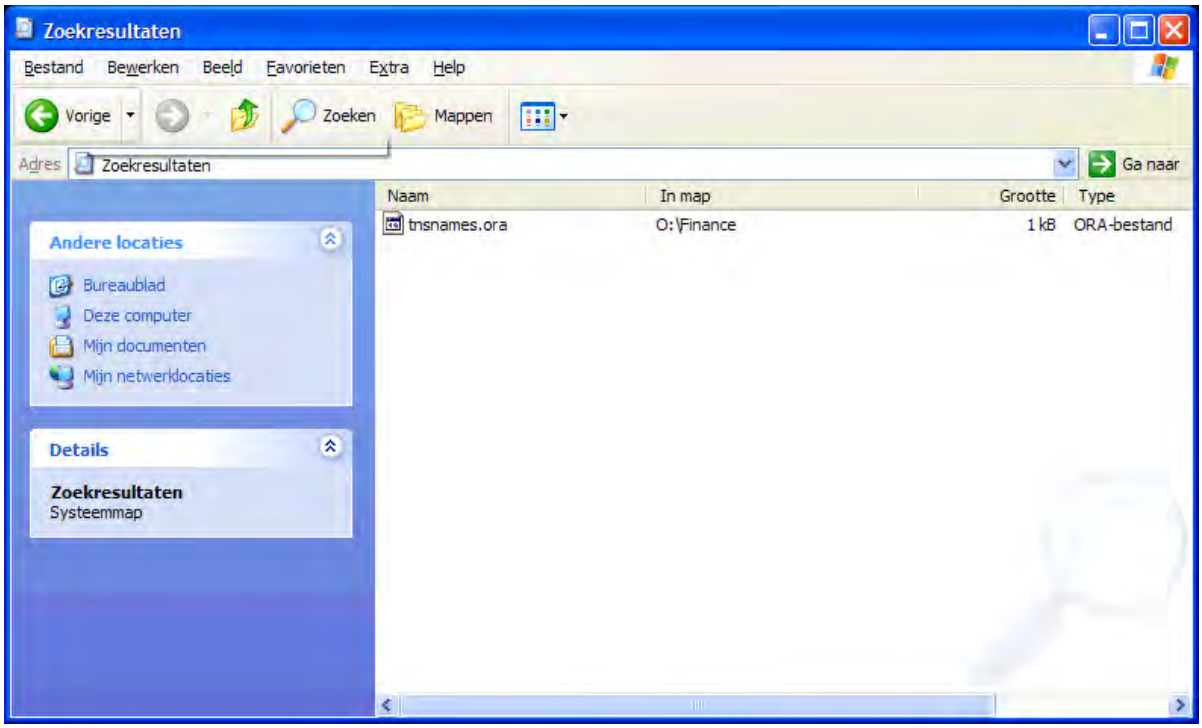
- Construct (if not available yet) a tnsnames.ora configuration file.
- In a tnsnames.ora file ('tns' is the abbreviation for 'Transparant Network Substrate') all Oracle based databases ('services') and the route via the network to get there, are described.
- An example of a description of the service:

```
81  dvt11r2.invantive.local=
82  ( description =
83    ( address_list =
84      ( address = (protocol = tcp)(host = 192.168.172.16)(port = 1521)
85      )
86    )
87    ( connect_data =
88      (sid=dvt11r2)
89      (global_name = dvt11r2.invantive.local)
90    )
91  )
```

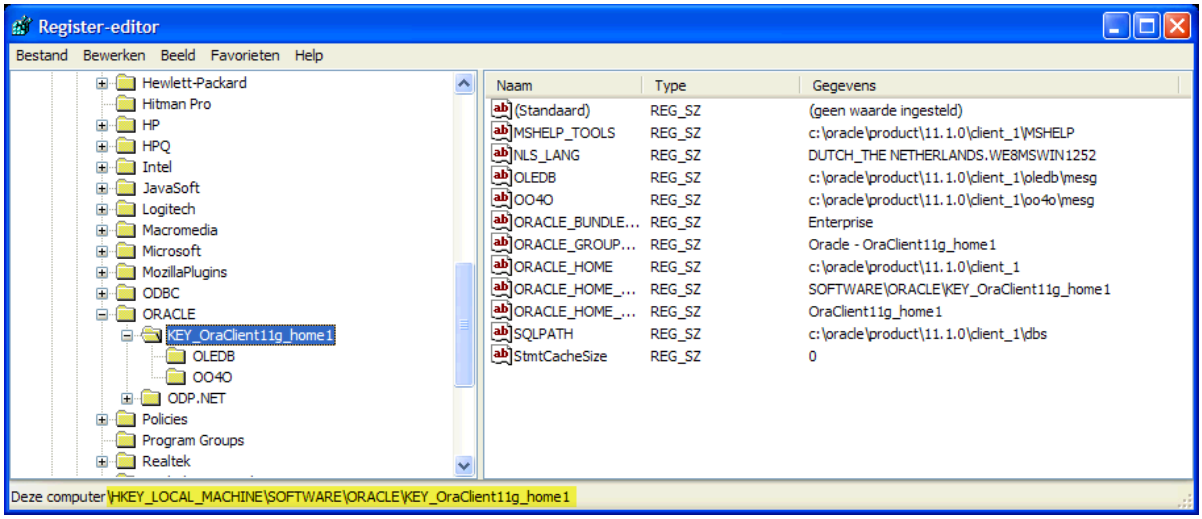
- This one describes that on the server with IP address 192.168.172.16 on port 1521 a program runs that knows how to make a connection with an Oracle database with the SID dv-

t11r2 and the global name dvt11r2.invantive.com.

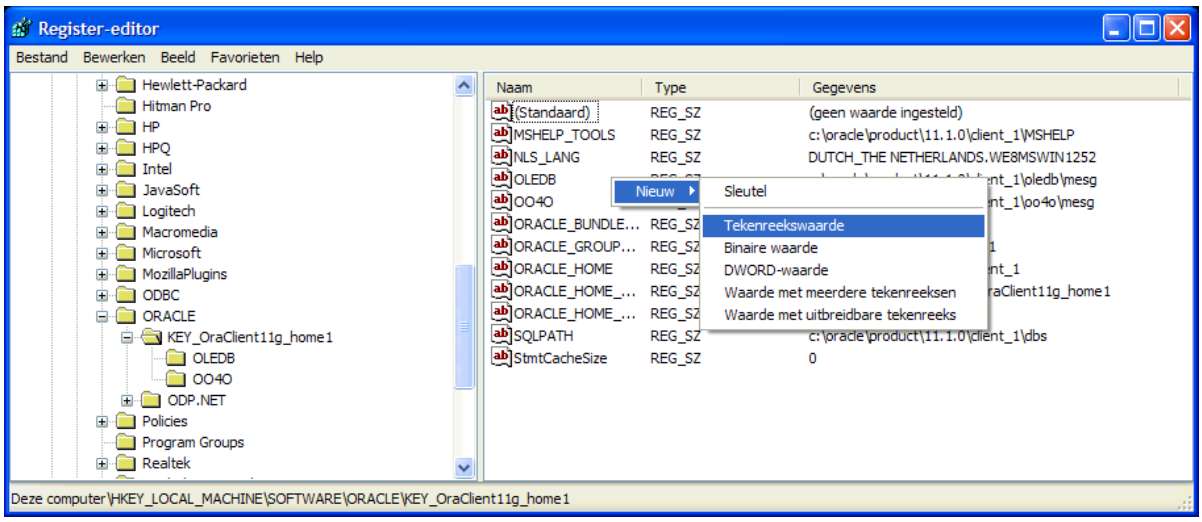
- Full instructions on creating tnsnames.ora can be found in the Oracle documentation.
- Make sure that the tnsnames.ora file is located on the same place on all PC's, preferably in way to make it easy to add services from a central location. For fixed workplaces often a network drive is used, for example, as follows:



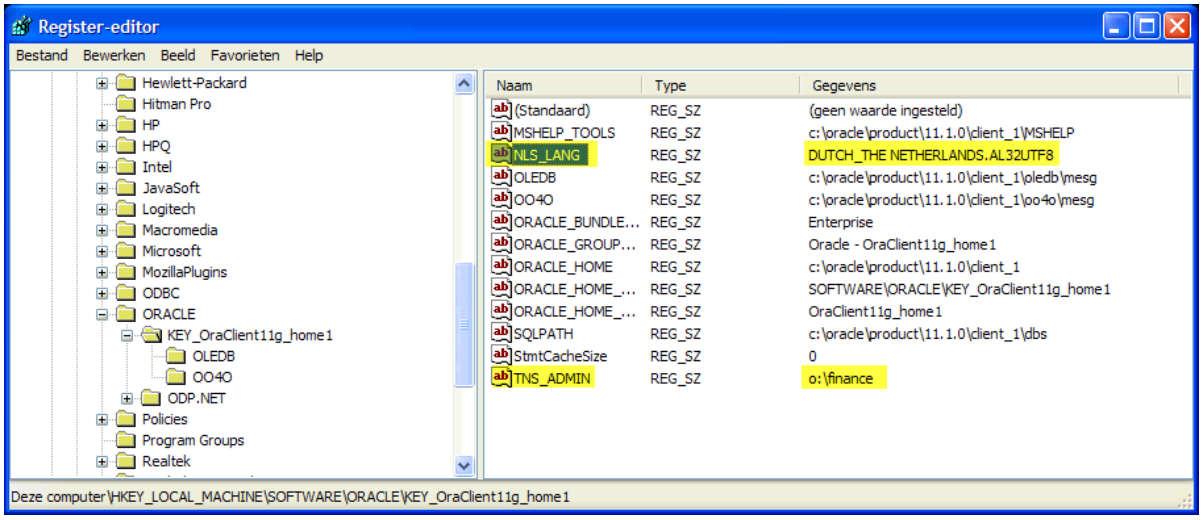
- Open the register with 'regedit' and go to the key HKLM\SOFTWARE\Oracle\KEY_OraClient11g_home1:



- Add a string with the name 'TNS_ADMIN' and make it point to the network location:

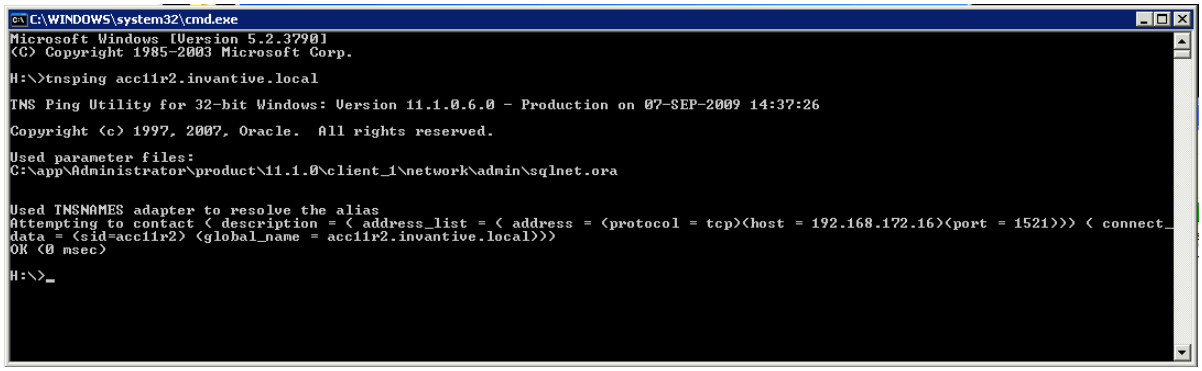


- Change also the NLS_LANG to 'DUTCH_THE NETHERLANDS.AL32UTF8' to make sure that messages appear in dutch and the Unicode character set is used. If you use Oracle Instant Client, then there is no NLS_LANG in the Windows registry; that's why you need to define the NLS_LANG environment variable in Windows.



- If you use Oracle Instant Client, then there is no NLS_LANG in the Windows registry; that's why you need to define the NLS_LANG environment variable in Windows.

- Test the connection from a command prompt with 'tnsping':



- It is still not certain if the user/password are correct, but it is certain that a network connection to the Oracle service can be built.

- Finally, check the connection by logging in with SQL*Plus.

3.7.5.2 Microsoft SQL Server Provider for Invantive Webservice

In this chapter the configuration of the provider is described.

In addition some suggestions are provided to execute the installation of the Microsoft programming. However, this is no replacement of the knowledge and experience with the local situation and trainings that an administrator or DBA has from his role and the results of the installation are therefore not guaranteed.

Installation Microsoft SQL Server Client

There are no installation steps for the Microsoft SQL Server Client. The Microsoft SQL Server Client is supplied with every .NET installation.

Configuration Microsoft SQL Server Client

There are no configuration settings for the Microsoft SQL Server Client.

3.7.5.3 MySQL Provider for Invantive Webservice

In this chapter the configuration of the provider is described.

In addition, some suggestions are provided to execute the installation of the MySQL programming. However, this is no replacement of the knowledge and experience with the local situation and trainings that an administrator or DBA has from his role and the results of the installation are therefore not guaranteed.

Installation MySQL Client

The MySQL Connector/Net client is available at http://dev.mysql.com/downloads/connector/net/. The installation of the MySQL client MySQL Connector/Net proceeds as follows:

- Double click the MSI installation file from the zip at above mentioned website.
- Choose the button 'Next'.
- Choose the button 'Typical'.
- Choose the button 'Install'.
- Choose the button 'Finish'.

Configuration MySQL Client

Specific settings for the MySQL Connector/Net client can be found at http://dev.mysql.com/doc/refman/5.6/en/connector-net-connection-options.html.

3.7.5.4 IBM DB2 Provider for Invantive Webservice

In this chapter the configuration of the provider is described.

Furthermore, some suggestions are given to execute the installation of the IBM DB2 programming. However, this is no replacement of the knowledge and experience with the local situation and trainings that an administrator or DBA has from his role and the results of the installation are therefore not guaranteed.

Installation IBM DB2 Client

Install the IBM DB2 Data Server Driver as described on http://pic.dhe.ibm.com/infocenter/db2luw/v9r7/index.jsp?topic=%2Fcom.ibm.swg.im.dbclient.install.doc%2Fdoc%2Ft0007315.html.

Configuration IBM DB2 Client

There are no configuration settings for the IBM DB2 Client.

3.8 Terminology

Hieronder beschreven we de gebruikte termen.

3.8.1 Channel

A channel is the medium on which data and requests are exchanged between an Invantive Producer client application and an Invantive Webservice server.

3.8.2 Connection

A connection is the definition of possibilities to establish a channel 72 between an Invantive Producer client application and an Invantive Webservice server.

3.9 Versions

This chapter describes the changes in the application per version.

3.9.1 Release 2014 R1

Released: XX-XX-2014.

Invantive Producer: bXX.

Changes and bug fixes:

Num-ber	Type	Description
22414	ER	IBM DB2 data provider support.
23456	ER	IBM DB2 ook via ODBC mogelijk maken.
22594	ER	Ondersteuning voor redundante verbindingen (failover).
23279	PR	Onder specifieke condities treedt een Byte[] error op bij gebruik van de w ebservice.

Installation

- No specialties.

Implementation

- No specialties.

4 Contact Information

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Route

Follow the instructions of your navigation system. The offices are located above Carglass. Parking spots are on the right side. Parking spots are indicated with a sign with 'Invantive'.

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