Magic xpi 4.x with SugarCRM Seminar

Self-Paced Tutorial

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Magic xpi 4.x with SugarCRM Seminar

June 2015

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Table of Contents

Introduction

Welcome to Magic Software University's **Magic xpi 4.x with SugarCRM Seminar** self-paced tutorial. We, at Magic Software University, hope that you will find this tutorial informative and that it will assist you in getting started with this exciting product.

About the Seminar

The seminar is intended for people with a knowledge of SugarCRM who want to know how to successfully use Magic Software Enterprises' Magic xpi product, and how to integrate Magic xpi with SugarCRM.

During the seminar you will learn about the Magic xpi SugarCRM connector and how Magic xpi integrates with SugarCRM.

Topics that will be covered include:

- Queries, including advanced queries
- Referencing objects by IDs
- Creating a SugarCRM Quote scenario
- Relationships between objects using the Link method
- Capturing events

Course Prerequisites

Before you start with the course there is basic knowledge that you need to have:

Development knowledge	Familiar with Magic xpi 4.1 or iBOLT/Magic xpi 3.x
SugarCRM	Knowledge of SugarCRM

Your computer must also meet some basic requirements:

Hardware	• Windows XP Pro and later. The course was tested on Windows 7 • Pentium processor 1.8GHz and upwards • 4Gb RAM or greater • At least 1Gb of free space • Screen resolution of at least 1024x768 pixels
Magic xpi	You will need to install the following: • Magic xpi V4.1 • SugarCRM V10 connector V1.1from the Downloads area
License	For deployment purposes, you need the SUGCRM license from your Magic Software Enterprises representative. This is not required for development purposes.
SugarCRM	This seminar has been designed using the SugarCRM installation in Magic Software headquarters. The demonstration data is based on Version 7.5.0.1 of SugarCRM (which uses their v10 API). If you use a different version you will need to provide your own sample data files.
Email Server	You need access to an email server so that you can send emails. You can use your Gmail or Yahoo accounts as well. Check the internet for instructions on how to configure those mail servers for POP3, IMAP and SMTP.

How to Use This Guide

The self-paced guide provides detailed step-by-step instructions. If you are learning using this self-pace tutorial, feel free to contact your Magic Software Enterprises representative or the Support department for further assistance.

Lesson 1

SugarCRM Connector

The Magic xpi SugarCRM connector enables a work flow between Magic xpi and SugarCRM.

Using the SugarCRM connector, you can add, modify, and delete objects in SugarCRM.

You can also trigger a Magic xpi flow when actions such as add, update, or delete are performed in SugarCRM.

As was mentioned in the Prerequisites section, for deployment purposes, to work with the SugarCRM connector, you need a special Magic xpi license: SUGCRM.

This lesson covers various topics including:

- An introduction to the SugarCRM connector
- Installing the newest version of the SugarCRM connector
- Creating a SugarCRM resource
- Connecting Magic xpi to SugarCRM

Magic xpi Architecture with SugarCRM Connector

The Magic xpi SugarCRM connector works with SugarCRM's REST API. The XML interface enables flexibility when working with SugarCRM, since you do not need to frequently update the SugarCRM connector.

The SugarCRM connector can create, query, update, and delete data objects in SugarCRM using the REST API.

The Magic xpi SugarCRM connector supports both the XML interface and Method interface.

The SugarCRM connector has the following methods:

- Create Product Bundles
- Document Add Revision
- Get Server Info
- Get User ID
- Link
- Note Add Attachment

Connecting to SugarCRM

The SugarCRM connector needs to be connected to a specific user in SugarCRM.

Therefore, before working with the Magic xpi SugarCRM connector, you need:

- A valid SugarCRM user name
- A valid SugarCRM password

Installation

Until Magic xpi 4.0a, support was provided for SugarCRM version 6.4x, which works with the v4_1 REST API.

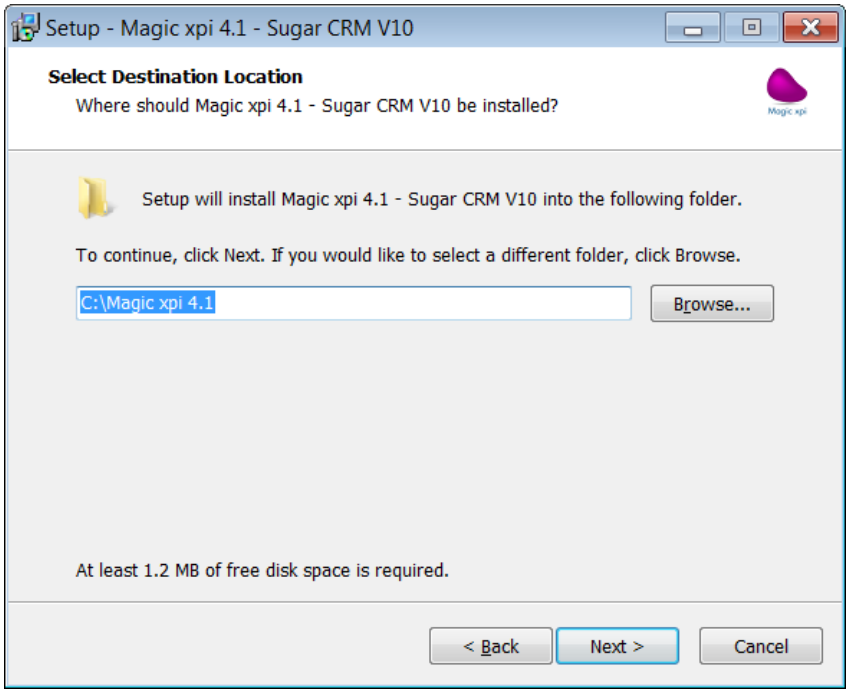
From Magic xpi 4.1, support is still provided for SugarCRM version 6.4x as well as SugarCRM version 7.x, which works with the v10 API.

This course uses SugarCRM Enterprise, Version 7.5.0.1.
The Sugar Community Edition works with 6.4x, which will not be demonstrated in this course. However, most of the functionality is similar.

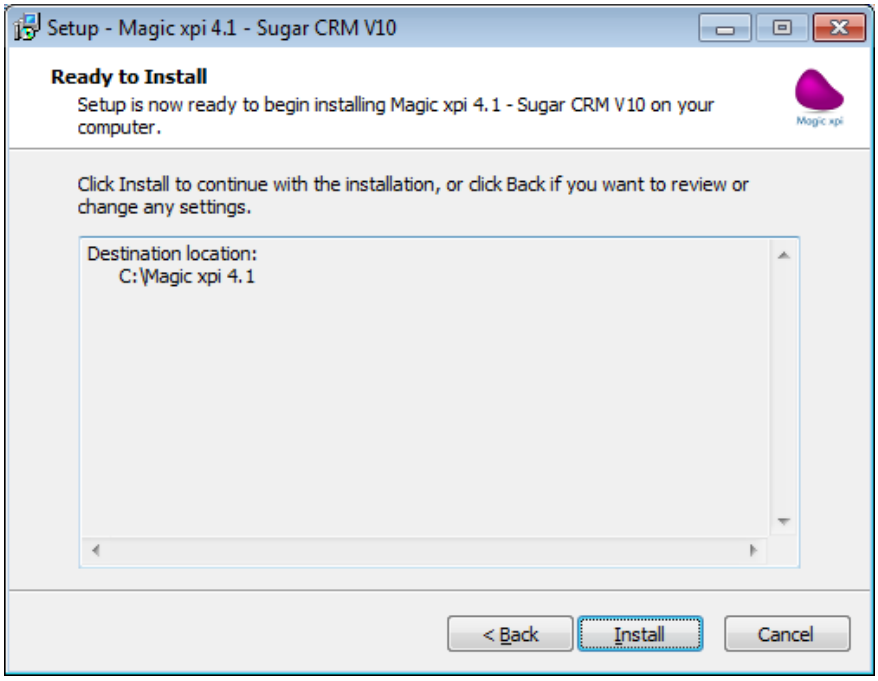
You should already have Magic xpi 4.1 installed on your computer. Now, you'll run the Magic xpi 4.1 SugarCRM V10 Setup.

1. Go the Magic Downloads area (http://downloads.magicsoftware.com/) and log in.
2. Download and run the **Magicxpi4.1.0_sugarcrmV10_InstallerV1.1.exe** file. The following screen will open.

3. Click **Next**.
4. Enter the path where Magic xpi 4.1 is installed and click **Next**.



5. Click **Install**.



6. Click **Finish**.

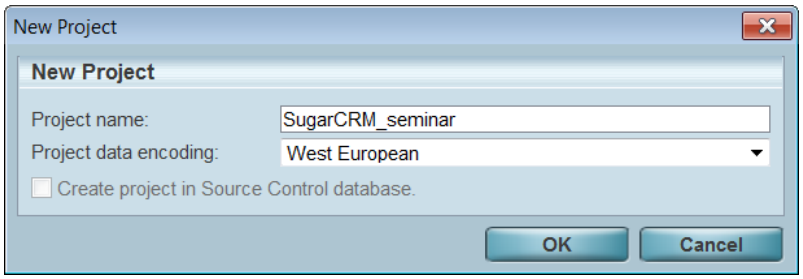
You're now ready to start developing.

Creating a Project

As with any development project, the first step is to create a new Magic xpi project.

To create a new Magic xpi project:

1. Open Magic xpi.
2. Click on the **File** menu, and select **New**. The **New Project** dialog box will open.
3. Create a new project called **SugarCRM_seminar**.



For the purpose of this course, data has been prepared for you.

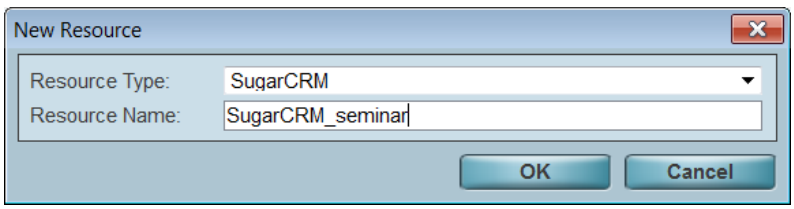
4. Copy the **course_data** folder into the project's directory. In the **<Magic xpi installation>\projects** folder, you'll see the **SugarCRM_seminar** folder. This is where you should copy the **course_data** folder.

A final version of the project is provided in the **Final_SugarCRM_Project** folder, which you can copy to the **projects** folder and refer to if needed.

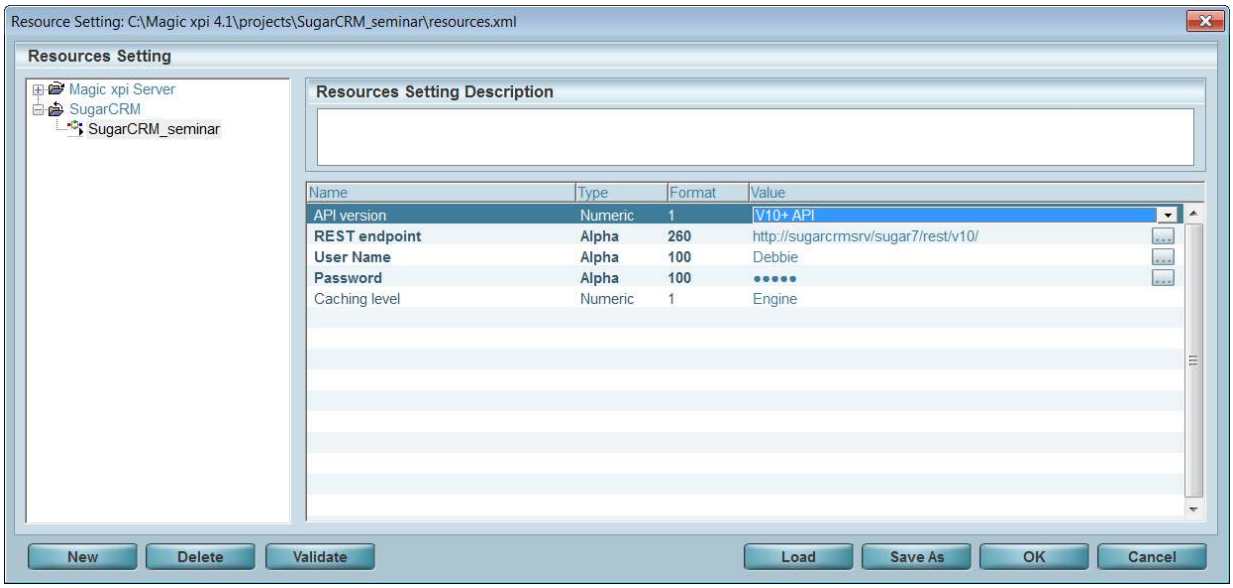
Defining a Resource

Before using the SugarCRM connector in a step, you need to define the **SugarCRM** resource.

1. From the **Project** menu, select **Resources**.
2. Click **New** to add a resource.
3. In the **Resource Type** field, select **SugarCRM**.
4. Name the resource: **SugarCRM_seminar**.



There are four mandatory settings to be defined in the SugarCRM resource. These are the settings that appear in bold.



5. From the **API version** setting, select **V10+ API**. If you are using the free version, you'll use the **Legacy API** option.
6. In the REST endpoint setting, enter the URL for the V10 API, which is: **http://{site url}/rest/v10/**. In the image above, you can see that the site url that was used was: **sugarcrmsrv/sugar**. Therefore, the full URL entered was: **http://sugarcrmsrv/sugar7/rest/v10/**.

For SugarCRM v4.1, including the Sugar Community Edition, the syntax is: **http://{site url}/service/v4_1/rest.php**.

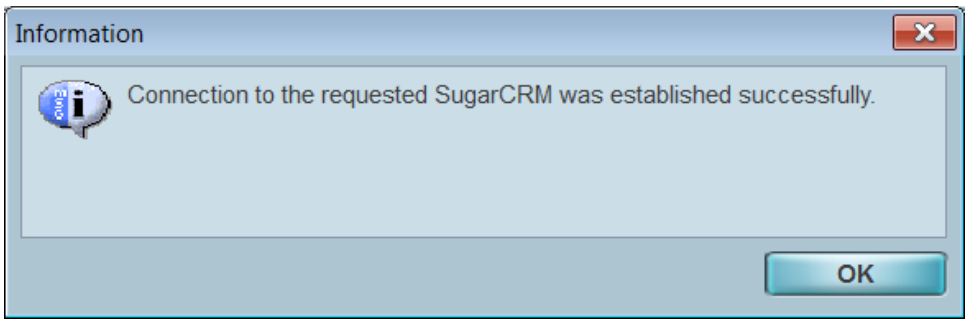
7. Enter your **User Name** and **Password** for the SugarCRM server.

You can leave the **Caching level** as is.

The basic assumption behind the need for caching is that the same data will be needed more than once. Therefore, if data can be re-fetched without performing disk I/O operations, overall performance will be enhanced. This optional setting has two options:

- **Context**: Login and module metadata is cached throughout the context. The login context is created by the first SugarCRM step in the flow and used by all other SugarCRM steps in the context configured with the same resource.
- **Engine** (default): Login and module metadata is cached for all contexts running under a Magic xpi engine. Login occurs only once for all contexts, until the login is no longer valid. This option enhances performance and lowers the use of SugarCRM API calls.

8. Click the **Validate** button to check your connection. If all of the settings were entered correctly, you should see the following message:



You have now successfully created a connection from Magic xpi to SugarCRM.

Summary

In this lesson:

- You were introduced to the Magic xpi SugarCRM connector.
- You installed the newest version of the SugarCRM connector.
- You created a project for the seminar.
- You created a SugarCRM resource and connected Magic xpi to SugarCRM.

Lesson 2

Querying SugarCRM via Magic xpi

A SugarCRM Query operation is used to retrieve data from an object according to specific search criteria.

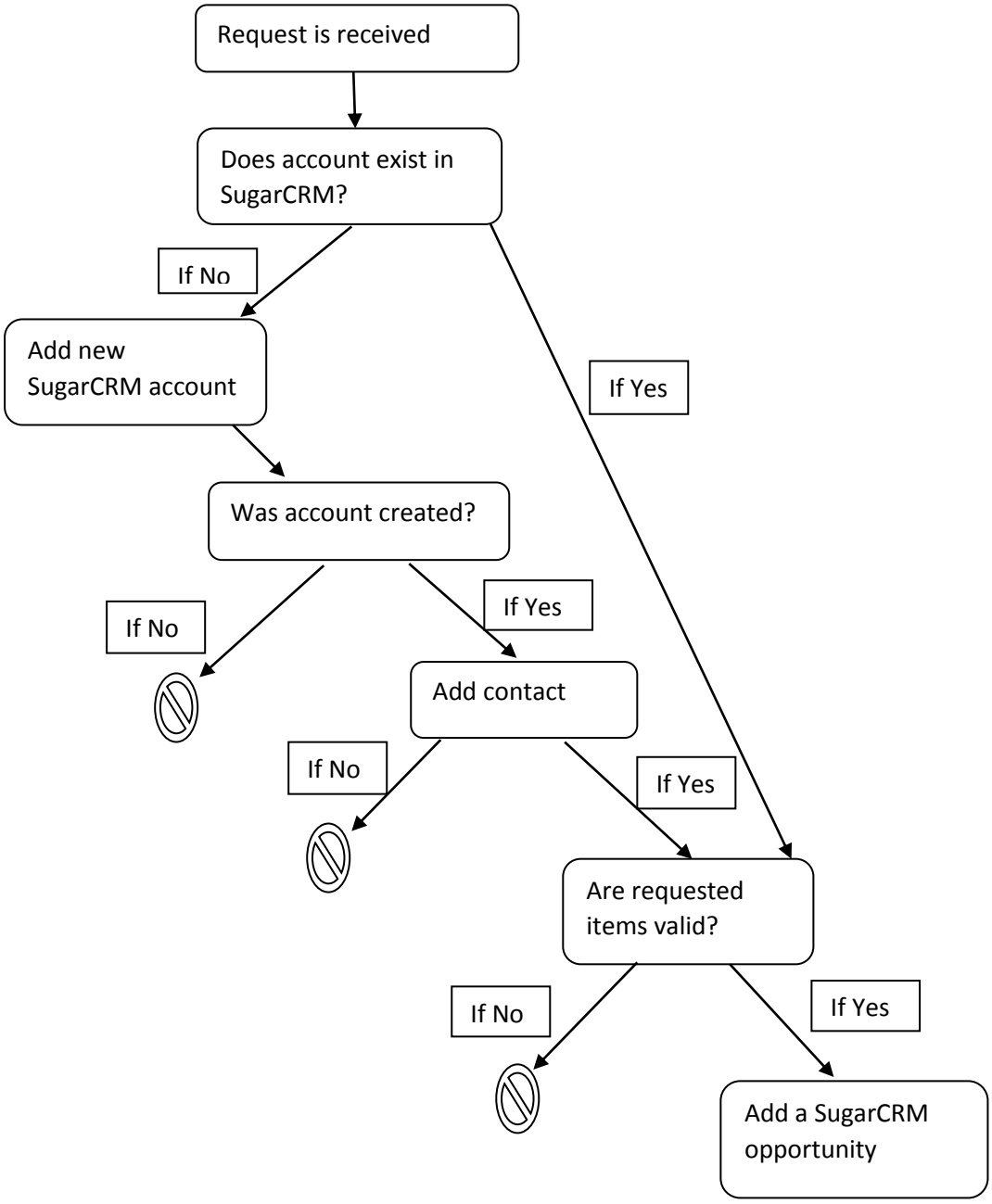
You can also define advanced WHERE clauses using the Data Mapper.

This lesson covers various topics including:

- Query operation
- WHERE clauses
- Filters

Preview of the Flow

The business process logic of the Magic xpi flow that you will create is as follows:



Triggering the Flow

You'll use a trigger to activate the flow.

1. Create a flow called **Scan for New Requests**.
2. From the **Project** menu or from the flow's context menu, select **Variables** and add the following context variable:
   - **C.RequestXML**, a BLOB variable
3. Add the flow variables listed below. When you are asked to use these variables, an explanation about them will be provided
   - **F.Account**, a BLOB variable
   - **F.RequestFileName**, an Alpha variable of size 255
   - **F.ContactXML**, a BLOB variable
   - **F.AccountExists**, a Logical variable with a default value of **'FALSE'LOG**. The **F.AccountExists** variable will be used if a query returned a user record from SugarCRM.
   - **F.AccountId**, an Alpha variable of size 100

IDs in SugarCRM are long. For example:

c570b261-42da-3240-fe8e-557e48e862df

Therefore, the ID variables used in this course are set to 100.

You will receive the request using the Directory Scanner component. There are two ways of using the Directory Scanner component: Trigger or Step. In this example you will use the Trigger mode.

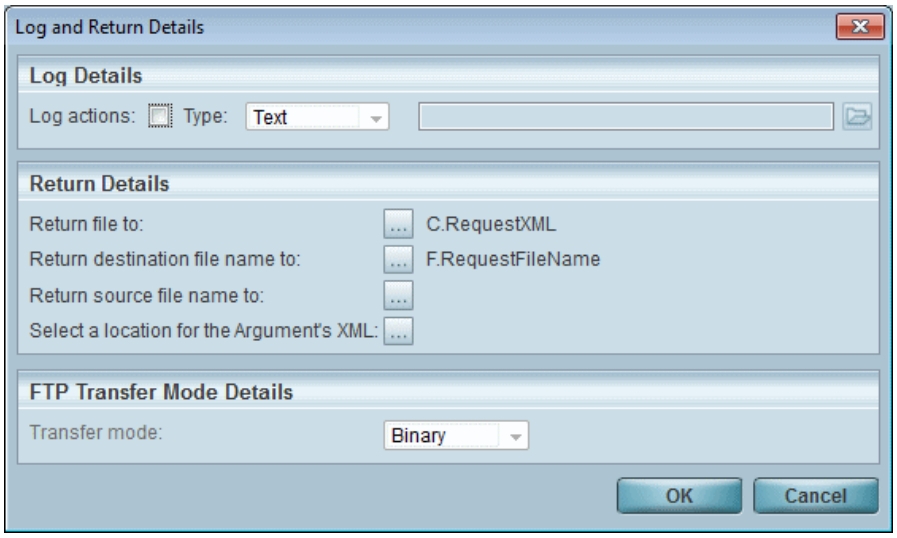
4. Drag a **Directory Scanner** component to the Trigger area and name the component: **Wait for File**.
5. Click **Configuration**. The **Component Configuration: Directory Scanner** dialog box opens.
6. Click **New** to define the trigger.
7. Define the following:
   a. Leave the **Source** as **LAN**.
   b. Set the **Directory** to: **EnvVal ('currentprojectdir')&'course_data\in\'**. The **currentprojectdir** environment variable contains the path to the directory where the current project resides.
   c. In the **Filter** property, type: **request???.xml**. This is the name of the file that will be scanned for. The **???** represents wildcard characters such as: request1.xml or

request999.xml. You could also leave the **Filter** property with its default of ***.*** for this example as the only files that will be in the **in** folder will be relevant files.

d. Leave the **Action** as **Move**.
e. Set the destination **Directory** to **EnvVal ('currentprojectdir')&'course_data\out\'**.

8. Click **Advanced**.

a. Set the **Return file to** property to **C.RequestXML**. This is the variable that the Directory Scanner will return the content of the file to.
b. Set the **Return destination file name to** property to **F.RequestFileName**. This is the name of the variable that the Directory Scanner will return the name of the file to.

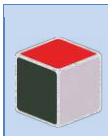


You have finished defining the Trigger.

Query Operation

You will use the XML interface to check whether the customer exists in SugarCRM.

You will use the SugarCRM connector to check whether the customer exists as an account in SugarCRM.

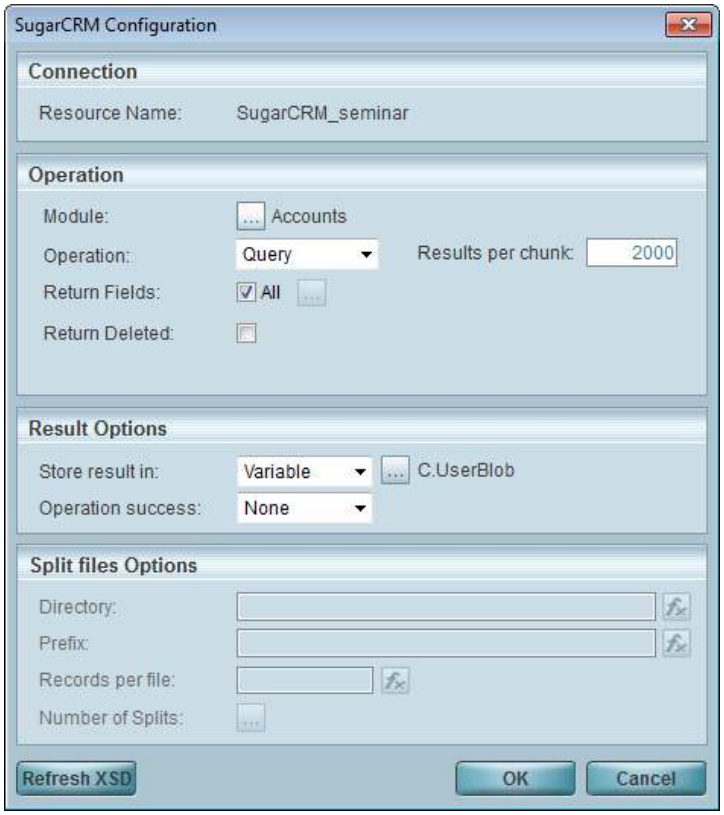


An account in SugarCRM represents a single company.

1. Drag a SugarCRM connector  as the first step in the **Scan for New Requests** flow.
2. Set the step name to **Check for Account**.
3. Leave the **Interface** as **XML**.

4. Select the **Settings** tab, and set the **Resource Name** to the **SugarCRM_seminar** resource. Since this is, currently, the only SugarCRM resource, it was probably selected automatically by Magic xpi.
5. Click **Configuration**.

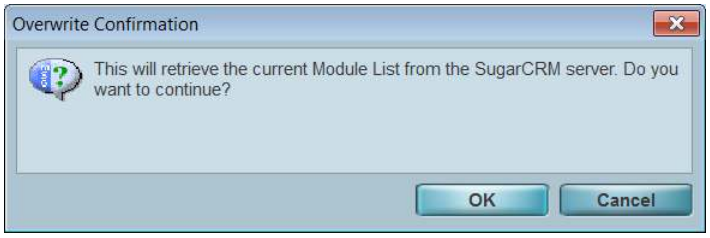
The **SugarCRM Configuration** dialog box enables you to perform operations on a SugarCRM object.



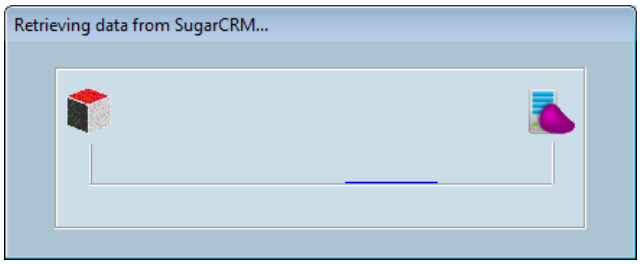
6. From the **Module** field, click the selection button  .

Magic xpi needs to fetch the objects exposed by the SugarCRM API before accessing them. Magic xpi connects directly to the SugarCRM server, retrieves the available modules, and displays them in a list. The **Modules List** contains all of the modules from the SugarCRM server.

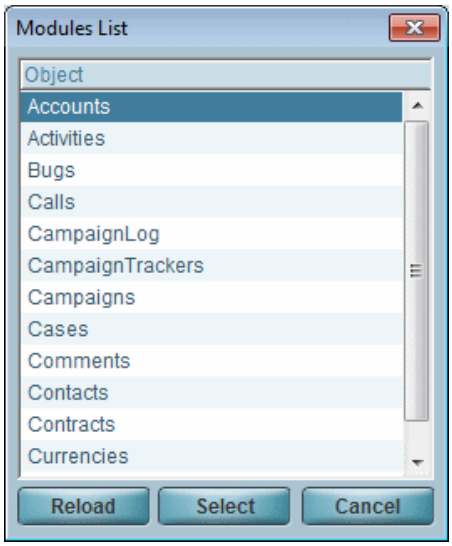
7. To retrieve the latest Module List from the SugarCRM server, click the **Reload** button. The following message will appear.



8. Click **OK.** The following image will appear, showing that Magic xpi is retrieving data from the SugarCRM server.



9. From the **Modules List**, select **Accounts**.



The SugarCRM connector supports CRUD operations: Create, Query, Update and Delete. Now since you're simply just browsing to see if an account exists in SugarCRM, you'll perform a Query.

10. From the **Operation** field, select **Query**.
11. The **Results Per Chunk** field is the maximum number of results that you want to fetch in each call to SugarCRM. Leave it set to **2000**.
12. The **Return Fields** option enables you to define which fields will be returned in the result XML. Leave it with the **All** check box selected.
13. The **Store result in** field will hold the XML retrieved from SugarCRM. You can select either a file or a variable. Select **Variable**, and then select the **F.Account** variable that you defined earlier.
14. It's a good idea to click the **Refresh XSD** button to make sure that you're using the latest module metadata. Changes that are made in the SugarCRM environment – customizations and so forth – are all pulled into the integration environment so that when you do the data mapping, it's all there and available to you.

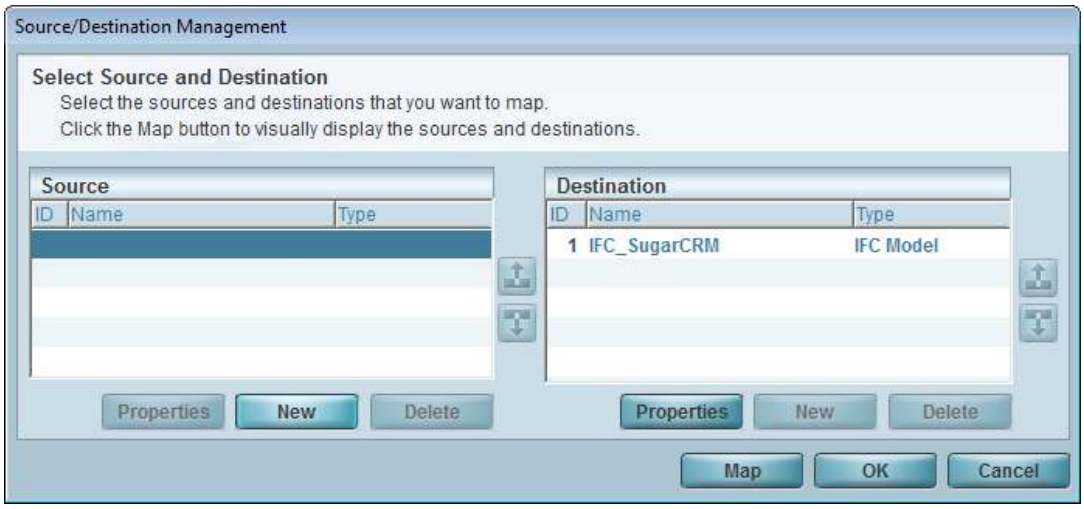
15. Click **OK**.

The Magic xpi SugarCRM connector saves the XML Schema, the XSD, in the following directory:

[project dir]\[project name]\SugarCRM\XSD\[resource name]

As you are currently using the SugarCRM connector with the XML interface, you will use the Data Mapper to configure it.

After defining the properties for the SugarCRM connector, a new **IFC Model** entry was created in the **Destination** section: **IFC_SugarCRM**.



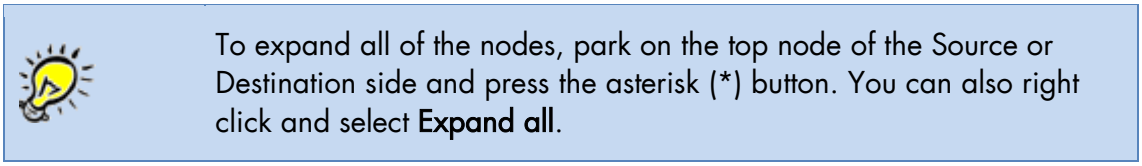
You need to use the request XML that was retrieved by the Directory Scanner to check whether the account exists in SugarCRM. Therefore, you need to have XML as the source.

1. Add an entry to the **Source** pane of the Data Mapper.
2. Set the name to **RequestXML** and the type to **XML**.
3. Click Properties.
    a. In the **XSD File** property, select the following schema: **course_data\schemas\request.xsd**
    b. Set the **Data Source** to **Variable** and select the **C.RequestXML** variable.
4. Click **OK**.

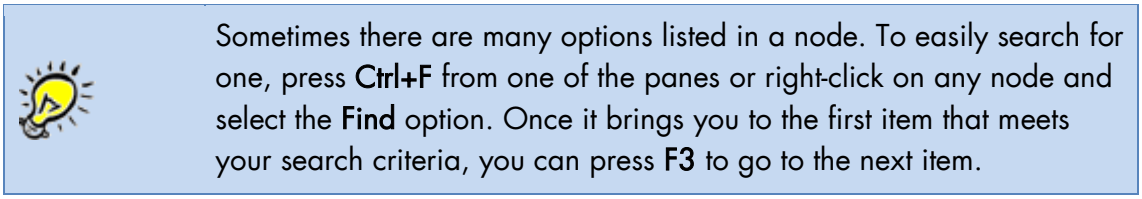
The next stage is to map.

5. In the **Source/Destination Management** dialog box, click **Map**.

You need to send the customer name to SugarCRM to query its existence. Therefore, in the destination, you should use the **name** node in the SugarCRM **Accounts** module that you previously configured.



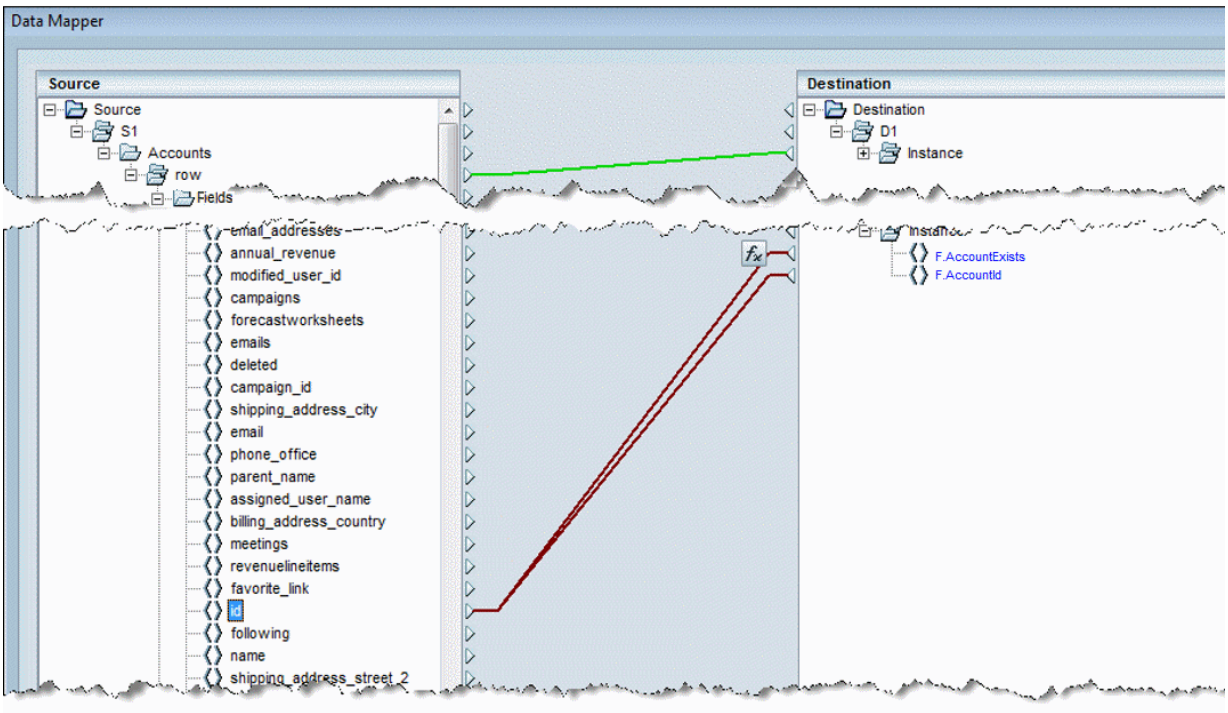
6. In the **Source** pane, expand the **Request > CustomerDetail** node.
7. In the **Destination** pane, expand the **Accounts > row > Fields** node.
8. Connect **AccountName** to **name**.
9. Click **OK** (three times) until you return to the Flow area.



Check If Account Exists

1. Drag a Data Mapper component as a child of the **Check for Account** step.
2. Name it **Check If Account Exists**.
3. Click the **Configuration** button.
4. Add an entry to the **Source** pane of the Data Mapper.
5. Set the **Type** to **XML**.
6. Click **Properties**.
   a. In the **XSD File** property, select the following schema: **SugarCRM\XSD\SugarCRM_seminar\Accounts.xsd**
   b. Set the **Data Source** to **Variable** and select the **F.Account** variable.
7. From the **Destination** pane, add an entry and set the **Type** to **Variables**.
8. Click **Properties**.
9. Scroll down to the end of the list and select both the **F.AcountExists** and **F.AccountId** variables.
10. Click the **Map** button.
11. On the **Source** pane, open the following node: **Accounts > row > Fields**.
12. On the **Destination** pane, open the **Instance** node.

13. Connect **id** to **F.AccountExists**.



14. Right click on the **F.AccountExists** node and select **Properties**.
15. In the **Calculated value** field, enter the following expression:
    NOT (Source/S3/Accounts/row/Fields/id ='' OR ISNULL (Source/S3/Accounts/row/Fields/id))

This expression returns True if there is a value. This means that if the **id** field is not empty or null, then the account exists.

16. Also connect **id** to **F.AccountId**. This will update the **F.AccountId** variable with the value of the SugarCRM **id** fields. This connection will be used in a later step when an opportunity is created.
17. Click **OK** until you return to the Flow area.

Testing Your Project

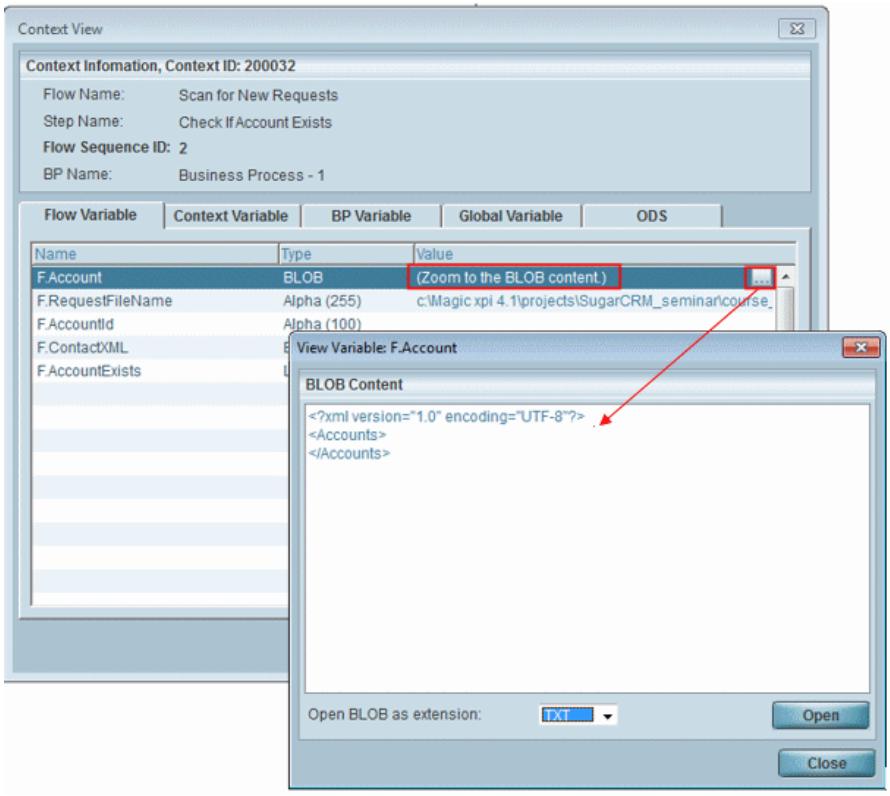
You will want to test your flow to make sure it works.

1. From the toolbar, click the Debugger  icon (or from the **Debugger** menu, select **Open**). Magic xpi checks the project for any syntax errors. If there are syntax errors, you will not be able to continue. There are various types of syntax errors, such as a mandatory property that was not defined or was incorrectly defined.
2. When the Debugger is opened, right click on the **Check for Account** step.
3. From the context menu, select **Breakpoint**. A red dot will appear next to the step. A breakpoint means that processing will halt at that point.

4. Copy the **request004**.xml file from the **out** folder to the **in** folder. This XML file includes a non-existing account.
5. From the toolbar, click the Run/Continue Project  icon (or from the **Debugger** menu, select **Run**). When the breakpoint is reached (which can sometimes take a few seconds), the Components pane will become the Context Tree.
6. From the Context Tree, click the **Check for Account** option. From the **Debugger** menu, select **Step**. This will run the second step.

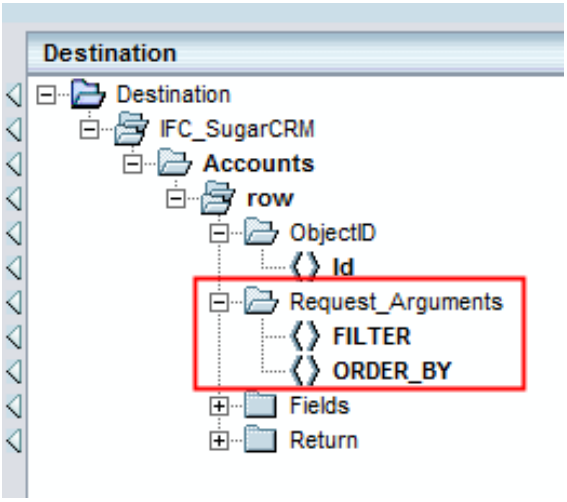
You now want to look at the **F.Account** variable, which is the variable that you selected in the **Store result in** field.

7. From the toolbar, click the Context View  icon (or select it from the **Debugger** menu).
8. Find the **F.Account** variable and notice that it says **(Zoom to the BLOB content)** in the **Value** column. If it says, **Empty BLOB type Variable**, then the flow did not successfully execute.
9. Click the zoom button and you'll see that the variable was filled in. However, you can also see that the account does not exist. Later on in the seminar, you'll see how to handle this.



10. **Close** to go back to development mode.

WHERE Clauses



In the v10 API, you can also use a more advanced query.

If you open the **Check for Account** step's Data Mapper, you'll see the **Request_Arguments** compound and its **FILTER** and **ORDER_BY** elements. These are what you use for the advanced queries. Unlike the Legacy API, the query is not a direct SQL statement that goes as-is to the database.

For example, to query for data where the last_name='Smith' and the first_name='John', you would use this FILTER clause:

filter[0][first_name][$starts]=John&filter[0][last_name]=Smith

The **[first_name]** element is a field name but **[$starts]** is a reserved keyword, which is part of SugarCRM filter syntax.

In the legacy version, the WHERE clause is sent directly to the database. In the **Accounts > SQL > WHERE** node, you use the following syntax:
<DB_TableName>.<FieldName>

For example, if you want to query the data with last_name='Smith' and first_name='John', you would use the following syntax:

Contacts.last_name='Smith'AND
Contacts.first_name='John'

Magic xpi passes the filters as is to SugarCRM, so you can use any of their supported filter operations, which are as follows.

Filter	Description
$equals	Performs an exact match on that field.
$not_equals	Matches on non-matching values.
$starts	Matches on anything that starts with the value.
$in	Finds anything where field matches one of the values as specified as an array.
$not_in	Finds anything where field does not matches any of the values as specified as an array.
$is_null	Checks if the field is null. This operation does not need a value specified.
$not_null	Checks if the field is not null. This operation does not need a value specified.
$lt	Matches when the field is less than the value.
$lte	Matches when the field is less than or equal to the value.
$gt	Matches when the field is greater than the value.
$gte	Matches when the field is greater than or equal to the value.

This table was replicated from: http://developer.sugarcrm.com/2014/02/28/sugarcrm-cookbook1/.

Exercise

During this lesson, you created a flow named **Scan for New Requests**. The purpose of this flow is to scan the **in** folder to see if a new XML request is there. If Magic xpi found a request in the folder, then you were asked to check whether the customer exists in SugarCRM.

If the customer exists, then:

- Check whether the items requested in the XML file are valid SugarCRM products.

Hints:

- Refer back to the **Preview of the Flow** section on page 16.
- Use the **ProductTemplates** module.

Once you have tried this on your own, please make sure to look at the solution for this exercise on page 63. The following lessons build on the exercise.

Summary

In this lesson:

- You learned about the Query operation.
- You also learned about WHERE clauses and filters.
- You used the SugarCRM connector to query the **Accounts** module to check the existence of an account.

Lesson 3

Adding an Object

In the previous lessons you learned how to fetch information from SugarCRM.

Querying a database is not the only operation needed in a project. It is often necessary to add an object to the database.

In this lesson, you'll see how Magic xpi enables you to add an entry to the SugarCRM database.

You'll also learn about using entries in SugarCRM selection lists.

Adding an Object to SugarCRM

The steps needed to add an object are very similar to the steps required to query an object.

Now, you'll add a customer if the customer does not exist. In other words, if the **Check If Account Exists** step returns false, you'll add the customer to SugarCRM.

1. Park on the **Scan for new requests** flow.
2. Add a SugarCRM connector as a child of the **Check If Account Exists step**, name it **Add Account**.
3. Click **Configuration**.
4. From the **Module** property, select the **Accounts** module.
5. Set the **Operation** field to **Create**.
6. From the **New Object Id** property, select **F.AccountId**. When an object is added, SugarCRM returns the object ID of the newly created object into this variable.

SugarCRM returns the ID of the last object created. If your step is adding or updating multiple records or objects, make sure to take the IDs from the result XML.

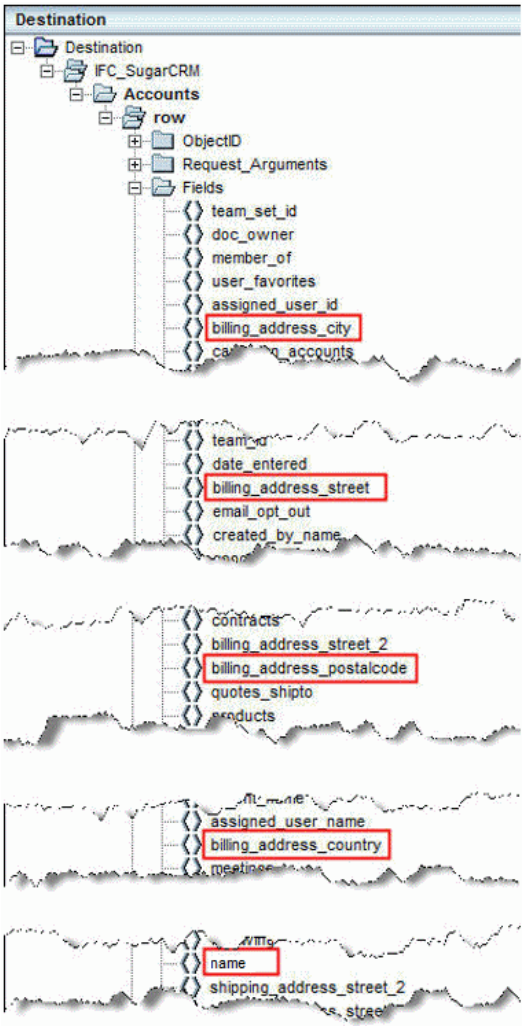
7. In the **Store result in** field, select the **F.Account** variable.
8. Click **OK**.

You need to use the request XML that was retrieved by the Directory Scanner. This contains the customer information. Therefore, you need to have an XML as the source.

1. Add an **XML** source and name it **RequestXML**.
2. Click **Properties**.
   - In the **XSD File** property, select the following schema: **course_data\schemas\request.xsd**
   - Set the **Data Source** to **Variable** and select the **C.RequestXML** variable.

You are now ready to map.

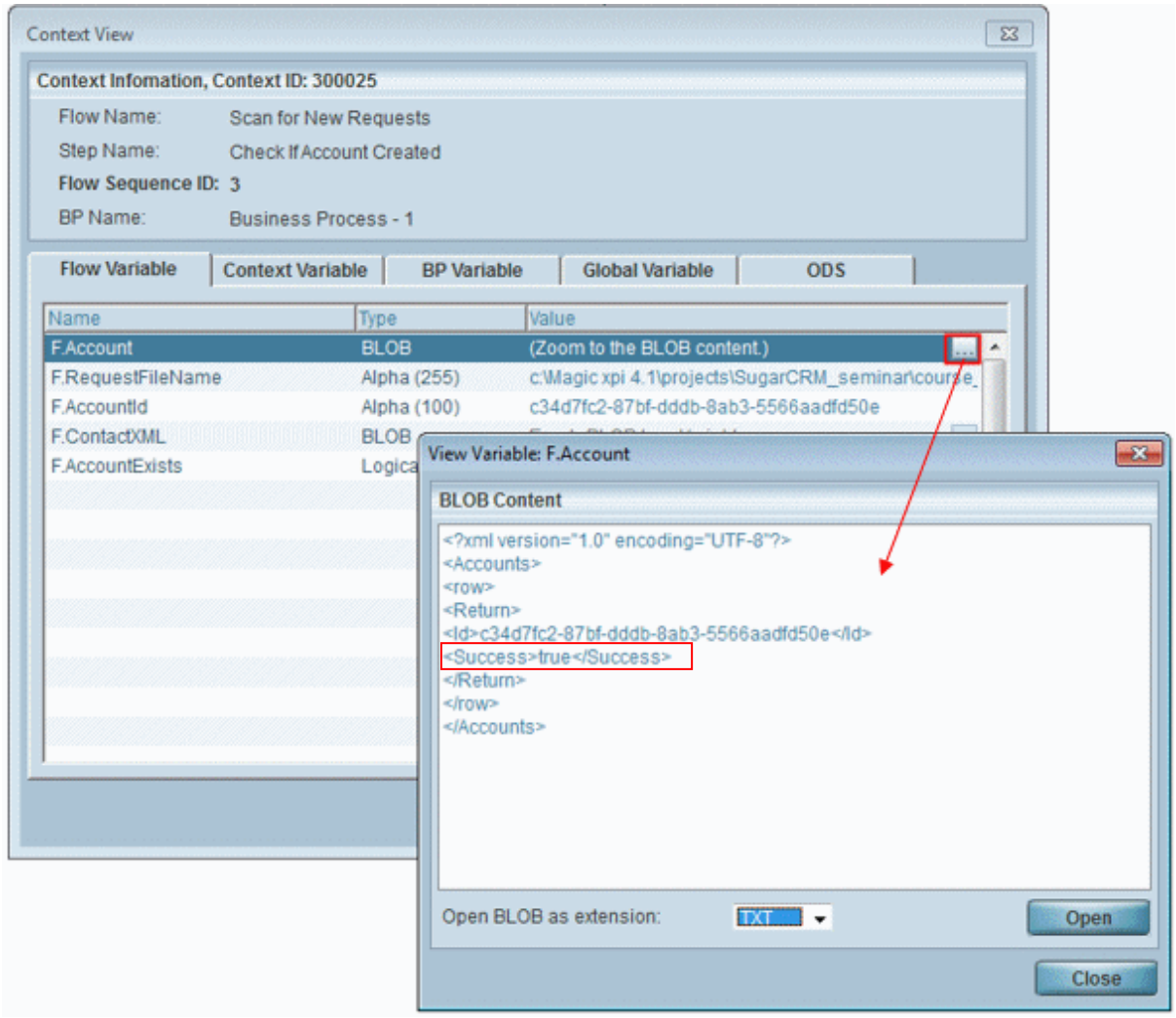
1. Click **Map**.
2. On the **Source** pane, open the following node: **Request > CustomerDetail**.
3. On the **Destination** pane, open **Accounts > row > Fields**.
4. Connect **AccountName** to **name**.
5. Connect **Street** to **billing_address_street**.
6. Connect **City** to **billing_address_city**.
7. Connect **ZipCode** to **billing_address_postalcode**.
8. Connect **Country** to **billing_address_country**.



You only want this step to be executed if the customer does not exist; in other words, the **Check If Account Exists** step's result was unsuccessful.

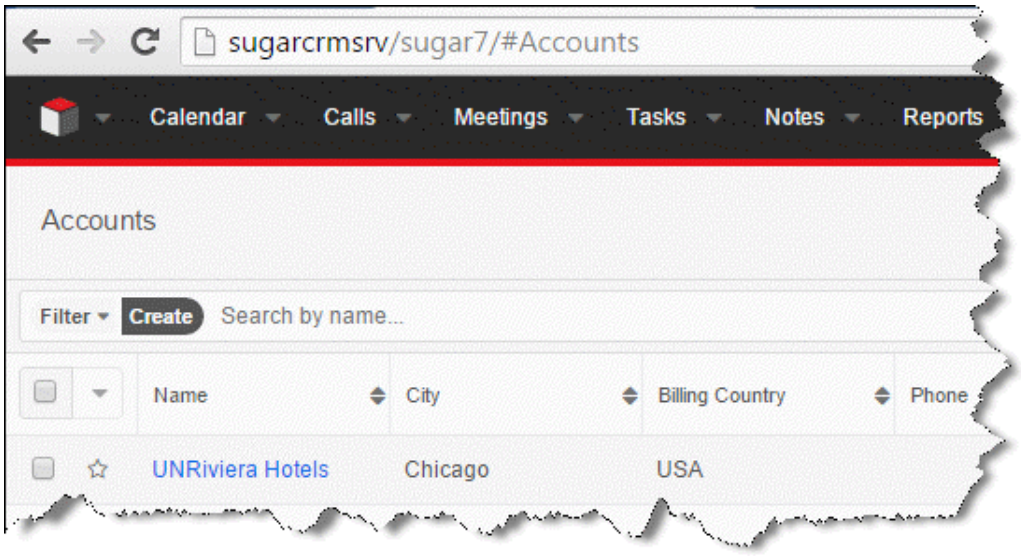
1. Park on the **Add Account** step.
2. Right-click and set the following condition: **NOT (F.AccountExists)**.
3. Copy the **Result004.xml** file from the **out** folder to the **in** folder. This file includes a non-existing account.
4. Run the Debugger for this flow with a breakpoint on the **Add Account** step. The result for the **Create** operation is stored in the **Store result in** variable, which in the **Add Account** step is the **F.Account** variable.
5. When the Debugger reaches the **Add Account** step, open the **Context View** .

6. Zoom from the **F.Account** variable and you can see the content of the variable. For every **Create** operation, the returned XML contains a success or failure indication. In the image below, you can see that the step was successful.



If there is an error, you will see the error in the returned XML.

7. In addition, open SugarCRM and if the process worked correctly, you should see the new account in SugarCRM.



Now you'll want, as part of the flow, to check if the account was created successfully.

1. Drop a Data Mapper component under the **Add Account** step and name it **Check If Account Created**.
2. Create a source and set the type to **XML**.
3. Click **Properties** and from the **XSD File** property, select **SugarCRM_seminar\Accounts.xsd**.
4. From the **Data Source** property, select the **F.Account** variable.
5. Create a destination and set the type to **Variables**.
6. Click **Properties** and select the **F.AccountExists** variable.
7. Click **Map**.
8. On the **Source** side, this time you'll open the **return** folder (**Accounts > row > return**).
9. Connect the **Success** node to **F.AccountExists**.

Although the account has been added, the contact has not yet been added:

1. Drop a **SugarCRM** connector as a child step of the **Check If Account Created** step. Name the step **Add Contact**.
2. Click **Configuration**.
3. From the **Module** property, select the **Contacts** module.
4. Set the **Operation** field to **Create**.
5. Store the result in the **F.ContactXML** variable.
6. Click **OK**.

7. Create a new **XML** source and name it **FetchContactFromRequest**.
8. Click the **Properties** button.
9. From the **XSD File** property, select: **course_data\schemas\request.xsd**.
10. From the **Data Source** property, select the **C.RequestXML** variable.

You are now ready to map.

1. Click **Map**.
2. On the **Source** pane, open the following node: **Request > CustomerDetail**.
3. On the **Destination** pane, open **Contacts > row > Fields**.
4. Connect **Customer_Name** to the **first_name** and the **last_name**.

In order to have the first name and last name appear together as the customer name, you'll use expressions.

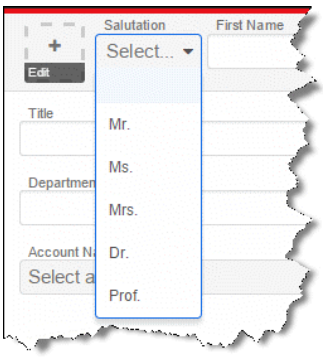
5. Right click on the **first_name** node, click **Properties** and in the **Calculated value** field, enter the following expression: **StrToken (RepStr (Trim (Source/S4/Request/CustomerDetail/Customer_Name),' ', '_') , 1 , '_')**

In the expression above, the path **Source/S4/Request/CustomerDetail/Customer_Name** is entered by clicking the **Source Nodes**  icon at the top of the Expression Editor.

The expression first replaces the separating space with an underscore and then fetches the first token. This is because a space cannot be a token delimiter. Now you'll do the same for the last name.

6. Right click on the **last_name** node, click **Properties** and in the **Calculated value** field, enter the following expression: **StrToken (RepStr (Trim (Source/S4/Request/CustomerDetail/Customer_Name),' ', '_') , 2 , '_')**
7. Connect **E-mail_Address** to **email1**. Make sure that you select **email1** and not just **email**.
8. In the **Destination** pane, park on **account_id** and enter a **Calculated value** for **F. AccountId**, the ID returned by the **Add Account** step.

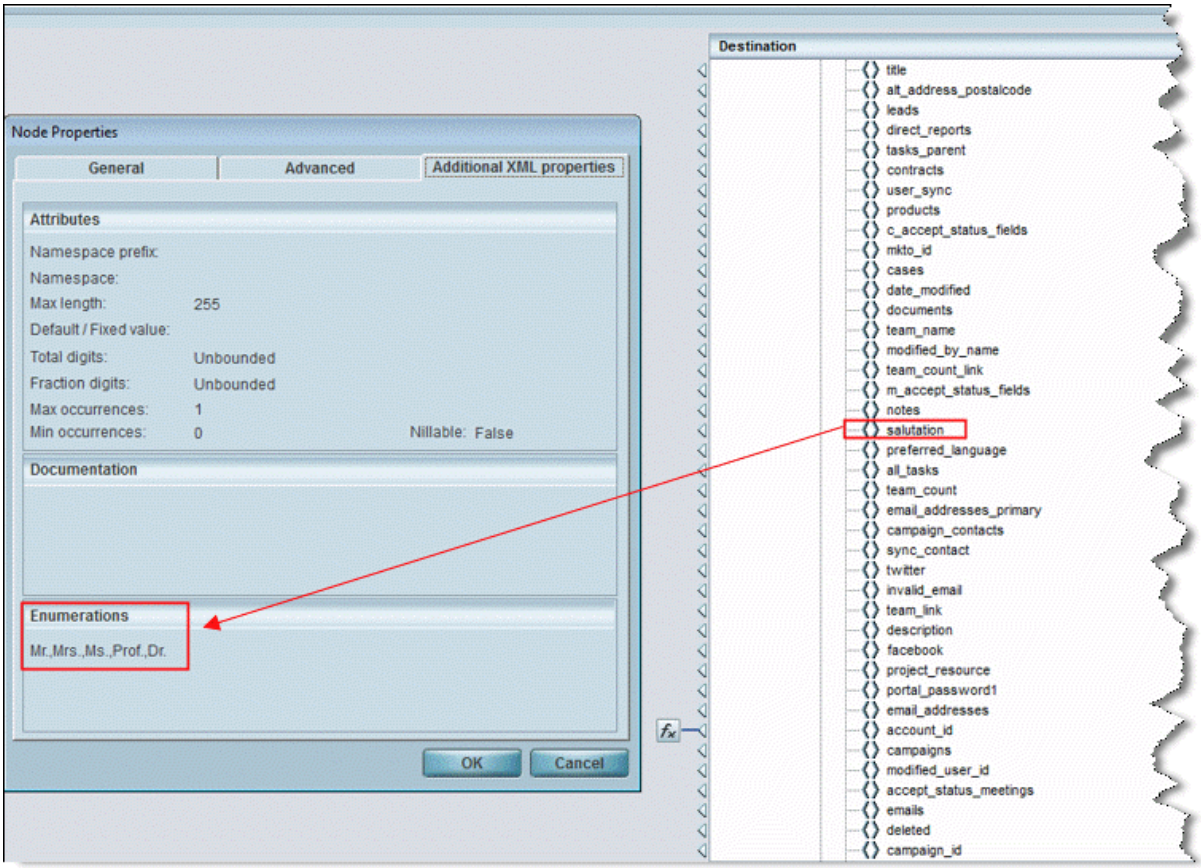
When adding a new object to SugarCRM from your Internet browser, a dropdown list provides a predefined list of available values.



For example, in the **Contacts** module, a dropdown list enables you to select whether the contact is Mr., Ms., Mrs., Dr., or Prof.

These values are provided internally by SugarCRM.

1. In the **Destination** pane, park on the **salutation** node and select **Properties**.
2. Select the **Additional XML Properties** tab and you will see the available options as defined by SugarCRM. You can also see these read-only options in the bottom left of the Data Mapper screen.
3. Manually enter **'Mr.'** as the value in the **Calculated value** property.



You have now finished adding the contact.

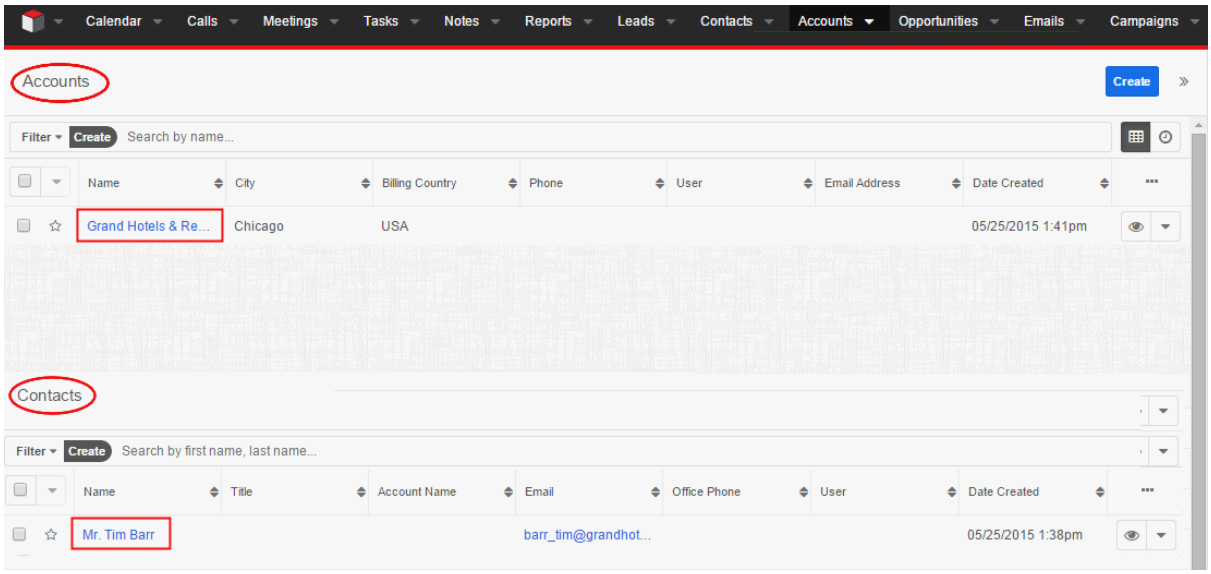
You can add a validation step like you did above when you added an account. However, the steps won't be presented here.

If the flow succeeds, you want to carry out the same steps that you did when the account existed.

4. Right click on the **Add Contact** step, select **GoTo** and click on the **Initialize variable** step.
5. Add the following condition to the GoTo step: **F.AccountExists**.

Now you'll check the flow.

6. Run the Debugger and then look in SugarCRM to make sure that a new account and contact were added.



As with the **Query** operation, the Magic xpi SugarCRM connector saves the XML Schema, the XSD, in the following directory:

[project dir]\[project name]\SugarCRM\XSD\[resource name]

Exercise

Check to see if the items in the request are valid, meaning that they exist and the requested prices is acceptable. If the items are valid, add the request as a SugarCRM **opportunity**.

The opportunity should meet the following criteria:

- Close this opportunity in two months' time.
- In the **Next Step** field, enter **Send email to customer**.
- For the **Stage Name** field, enter a value from the selection list.

Once you have tried this on your own, please make sure to look at the solution for this exercise on page 68.

Summary

In this lesson, you:

- Learned how to add an object to the SugarCRM database.
- Added an account and a contact for that account.
- Added a new opportunity.

Lesson 4

SugarCRM Object ID

In the previous lessons, you learned about the Magic xpi SugarCRM connector, and you were able to fetch objects from SugarCRM objects using criteria sent from Magic xpi. You were then able to use Magic xpi to perform other flow activities.

Any SugarCRM object can be queried in the manner that was discussed in the previous lesson.

In SugarCRM, every object has a unique identifier, an object ID. Some objects in SugarCRM require a query based on an ID from a parent object. Magic xpi enables you to query objects by the object ID.

This lesson covers various topics including:

- Creating an object by ID
- SugarCRM Object ID
  Magic xpi's getObjectIDbyField internal function

Creating Objects by ID

When you create or delete a SugarCRM object, which is dependent on a parent object, you need to retrieve the parent object's ID. To simplify this process, you can use the internal **getObjectIDbyField** function in the **Node Properties** dialog box's **Calculated value** field.

The function can only be used within a SugarCRM connector step, and is not seen in the function list.

Syntax	'getObjectIDbyField (ModuleName, FieldName, FieldValue, ErrorIfEmpty)'
Parameters	**ModuleName** is the name of the SugarCRM module exactly as it appears in the API.
	FieldName is the name of the module field that is used in the operation.
	FieldValue is the value to create.

	ErrorIfEmpty, when set to true, determines that:
	• If the method does not find an ID, the operation will not be performed.
	• If the getObjectIDbyField function returns an empty value, then:
	  ◦ The Create operation will not create an object, and an error will be returned in the result XML.
	  ◦ The Update operation will not update an object, and an error will be returned in the result XML.

Return	The ID of the linked object.
Example	**'getObjectIDbyField (Accounts, account_id, Nelson Inc, true)'** returns the ID of the account whose name is **Nelson Inc**.
Note	• It is important to make sure that the whole expression is enclosed by single straight quotation marks (' '). It is a string, and the whole string is passed to the SugarCRM connector for parsing. This is why the whole string is encompassed by single apostrophes. • Currently, this function is not supported for the Query operation. • When you use this function, you can only search for a single value. You cannot find the ID based on more than one node, for example the Name and the City. If the search discovers more than one entry, only the first ID that was found is returned.

Fetching the ID of the SugarCRM Account

In the section above, the example looked for a SugarCRM account named **Nelson Inc**. This is the name of an account in a demo provided by SugarCRM. If you do not have this account in SugarCRM, use one from your SugarCRM database.

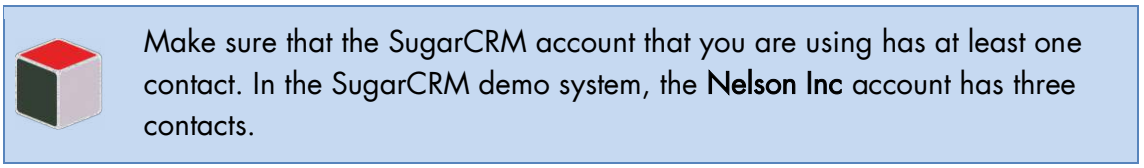
Now you will add a contact that belongs to that account.

For the purpose of this example, you will add a new flow.

1. Create a flow called **Scan for Contacts**.
2. Add one flow variable:
   - **F.Contact**, a BLOB variable. This variable will hold the result from the **Create** operation.
3. Drag a SugarCRM connector as the first step in the **Scan for Contacts** flow.
4. Set the step name to **Check for Contact**.
5. Select the **Settings** tab and set the **Resource Name** to the **SugarCRM_seminar** resource. As this is the only SugarCRM resource, it was probably selected automatically by Magic xpi.
6. Click **Configuration**.

Checking the contact's existence

You will use the SugarCRM connector to check whether a contact exists in an account in SugarCRM.



Make sure that the SugarCRM account that you are using has at least one contact. In the SugarCRM demo system, the **Nelson Inc** account has three contacts.

1. In the **Module** field, click the selection button  and select the **Contacts** module from the selection list.
2. In the **Operation** field, make sure that **Create** is selected.
3. In the **Store result in** field, select **Variable**, and then select the **F.Contact** variable that you defined earlier.
4. Click **OK**.

This is very similar to the previous lesson. As with the previous lesson, you are currently using the SugarCRM connector with the XML interface. Therefore, you use the Data Mapper to

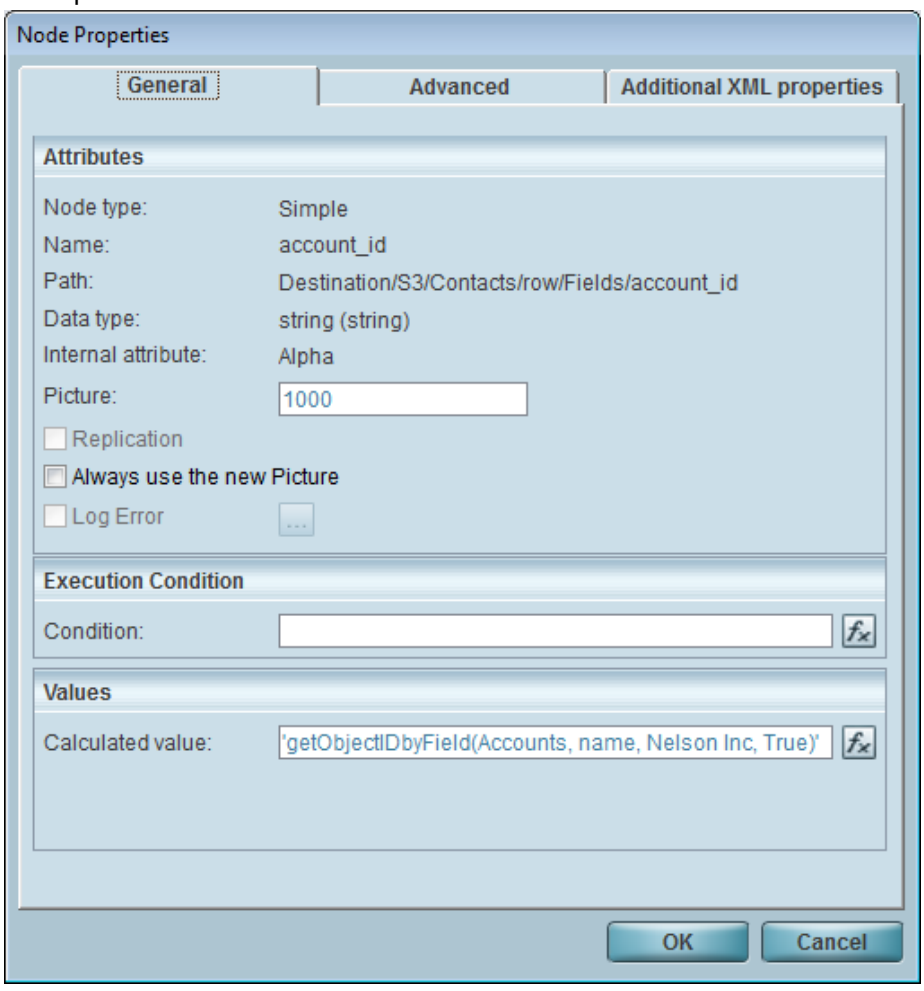
configure it.

After defining the properties for the SugarCRM connector, a new **IFC Model** entry was created in the **Destination** section.

5. Click **Map**.

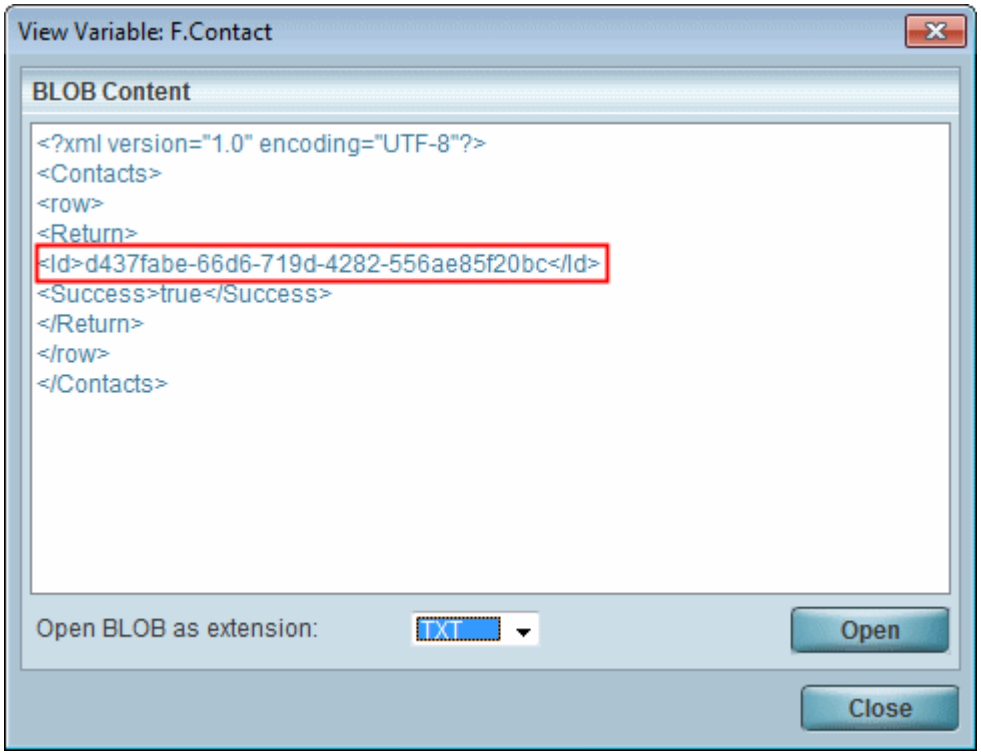
The **Contacts** module requires the **account_id** entry of the account that the contact belongs to. For this, you need the ID.

6. Park on the **account_id** node in the **Destination** pane, right-click, and select the **Properties** option.
7. Park on the **Calculated value** property and open the Expression Editor.
8. In the Expression Editor, enter **'getObjectIDbyField (Accounts, name, Nelson Inc, true)'**. Do not forget the apostrophes. If you do not have the **Nelson Inc** account, then add the account name of any of your own accounts. The **Nelson Inc** account is provided as an example.



In this example, the **getObjectIDbyField** searches for the **ID** of the **Nelson Inc** account.

9. In the **first_name** node, enter: **'David'**.
10. In the **last_name** node, enter: **'Martin'**.
11. Check the functionality by using the Debugger on the flow.
12. If everything was configured correctly, you will find the contact ID in the Context view for the **F.Contact** variable.



13. You will also see a new contact in SugarCRM named **David Martin** that is part of the **Nelson Inc** account.

Summary

In this lesson:

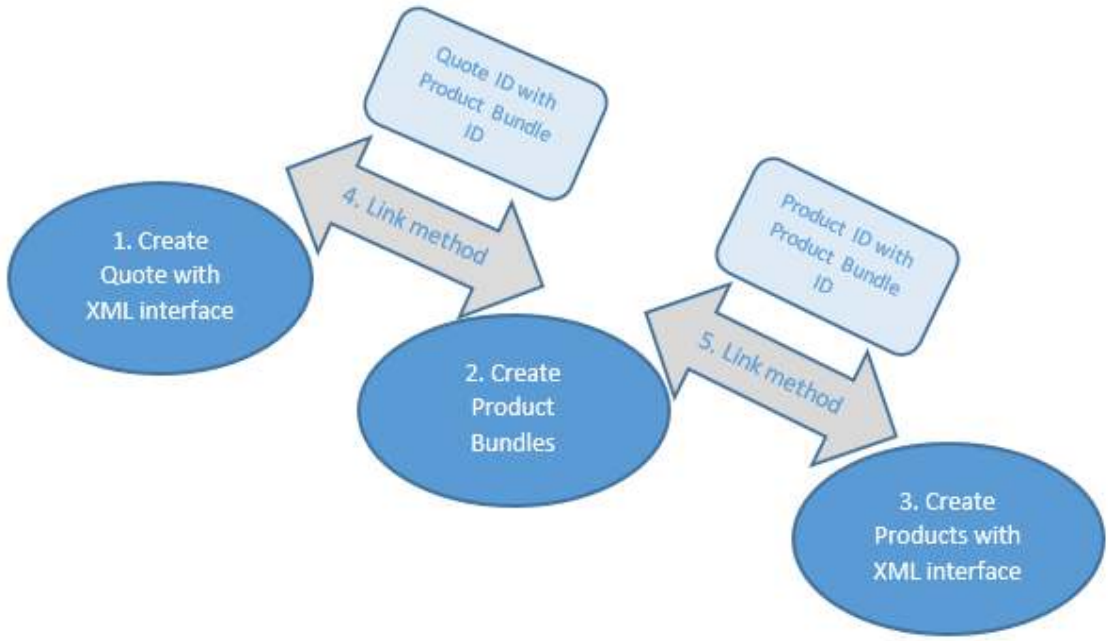
- You learned that each SugarCRM object has a unique ID that uniquely identifies it.
- You learned that by using the **getObjectIDbyField** SugarCRM connector function, you can retrieve the ID of a specific object by querying the value of a field.

Lesson 5

Creating a SugarCRM Quote Scenario

There are five steps for creating a SugarCRM quote:

1. Use the SugarCRM XML interface to create a quote.
2. Use the **Create Product Bundles** method to create a SugarCRM group.
3. Create the products that you want to have in your quote, making sure that you define values such as quantity, price, and relevant discounts.
4. Use the **Link** method to link the product bundle and the products.
5. Use the **Link** method to link the quote and the product bundle.



Using the XML Interface to Create a Quote

The quote scenario is not supported in the Legacy API implementation of the connector.

1. Create a flow and name it **SugarCRM_Quote**.
2. Right click on the flow and set the **Auto start** property to **Yes**.

Creating the Variables

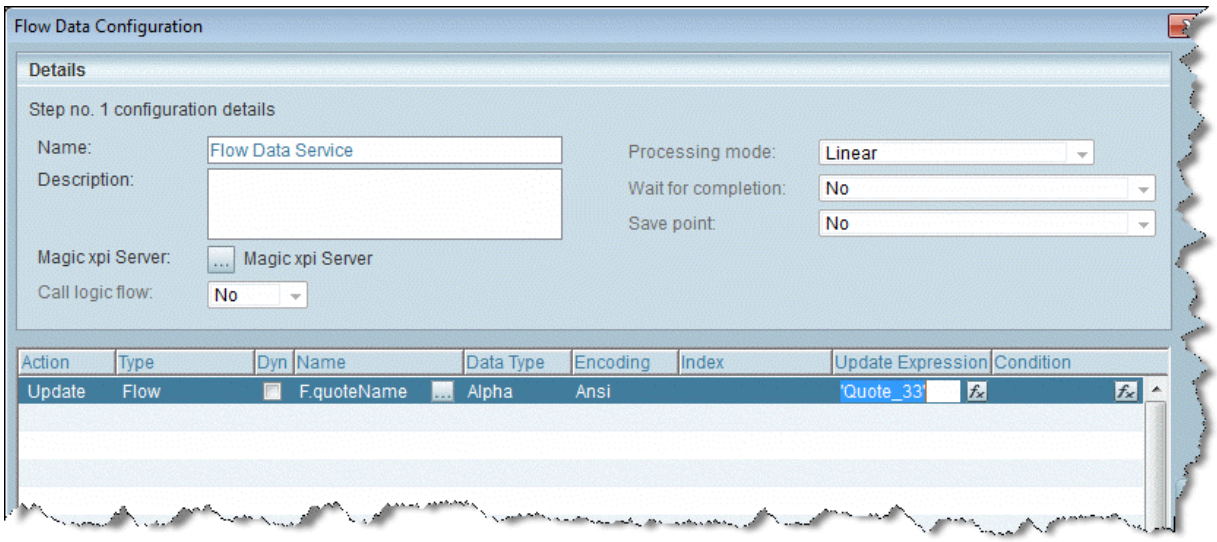
You'll define now the variables that you'll need in this flow. As you go, you'll see what each one is used for.

3. Create the following context variables:
   - **C.Timepart**, Alpha 6
   - **C.QuoteID**, Alpha 100
   - **C.ProductBundleID**, Alpha 100
   - **C.Products**, Blob
   - **C.ProductID**, Alpha 100
   - **C.LinkBundlewithProduct**, Alpha 100
   - **C.LinkQuotewithProduct**, Alpha 100
   - **C.ContactID**, Alpha 100
4. Create the following flow variables:
   - **F.C_QuoteXML**, Blob
   - **F.quoteName**, Alpha 30

In SugarCRM 7, the products are listed in the **Quoted Line Items** module and the Product Catalog is accessed via the **Admin** menu.

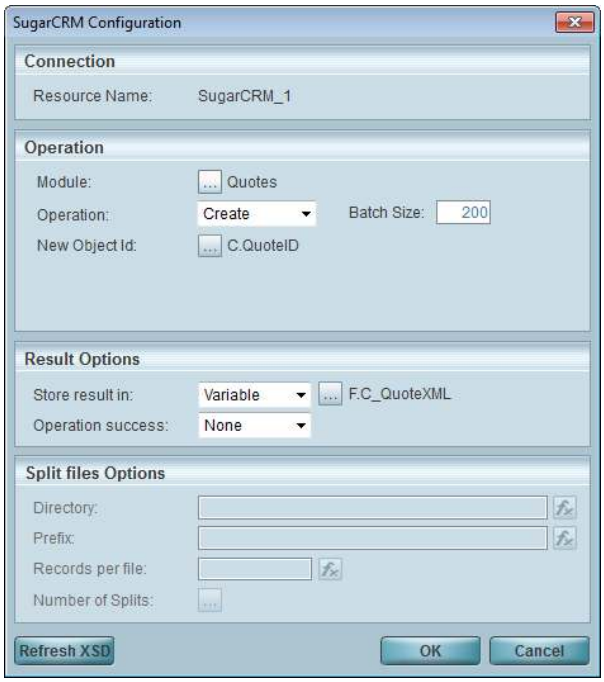
Defining a Flow Data Service

1. Add a Flow Data Service to the flow.
2. Create a new entry with the following values:
   - Action = Update
   - Type = Flow
   - Name = F.quoteName
   - Data Type = Alpha
   - Encoding = Ansi
   - Update Expression = 'Quote_33' This will serve as the name of the quote.



Creating a Quote

1. Add a SugarCRM step under the Flow Data step.
2. Name it **Create a Quote**.
3. Leave the **Interface** as **XML**.
4. Set the **Module** to **Quotes**.
5. Set the **Operation** to **Create**.
6. From the **New Object Id** field, select **C.QuoteID**.
7. From the **Store result in** field, select the **F.C_QuoteXML** variable.



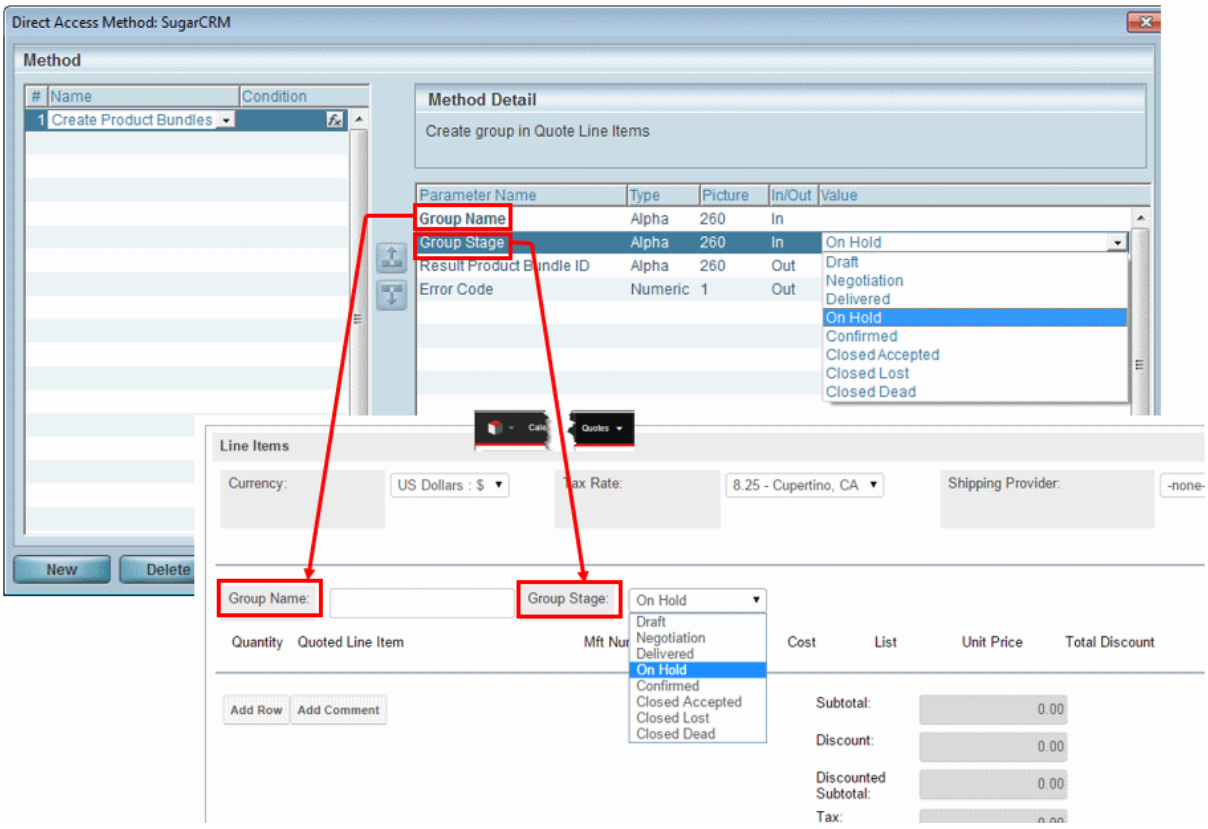
8. In the Data Mapper, right click on the following nodes and set their **Calculated value** properties:
   - **name = F.quoteName**
   - **date_quote_expected_closed = '06/11/2016'DATE**
     This will be entered in the **Valid Until** column in SugarCRM. This is a quick way of creating a date object for specific data.
   - **quote_stage = 'Draft'**
     This will be entered in the **Quote** column in SugarCRM.

Creating a Product Bundle

1. Drag a SugarCRM connector under the **Create a Quote** step and name it **Create Product Bundle**.
2. Create a new **Create Product Bundles** method.

The Magic xpi **Create Product Bundles** method lets you bundle products into a group. This creates a Group in SugarCRM's **Quote Line Items**.

As you can see in the image below, the **Group Name** and **Group Stage** parameters in Magic xpi populates the **Group Name** and **Group Stage** fields in SugarCRM.



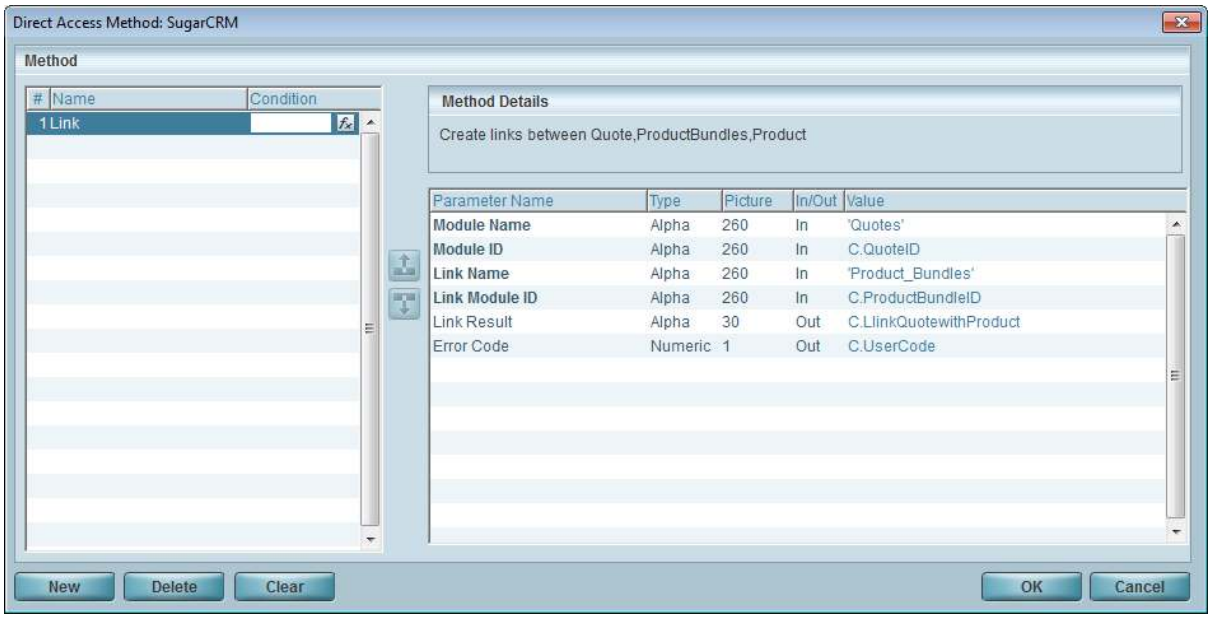
3. In the **Group Name** parameter, enter **'Priority Customer'**.
4. In the **Group Stage** parameter, select **Draft**.
5. In the **Result Product Bundle ID** parameter, select the **C.ProductBundleID** variable. You'll use this to Link the module to the quote.
6. In the **Error Code** parameter, select **C.UserCode**.

Link the Quotes with the Product Bundle

Now go back to the **SugarCRM_Quote** flow where you'll link the Quote ID with the Product Bundle. You'll use the Link method, which creates links between quotes, product bundles, and products.

Note: You can link multiple products to one product bundle and this product bundle will be linked to the quote object.

1. Drag another SugarCRM connector onto the flow and name it **Link Quote with Product**.
2. Create a **Link** method.



3. In the **Module Name** parameter, enter **'Quotes'**.
4. In the **Module ID** parameter, select **C.QuoteID**.
5. In the **Link Name** parameter, enter **'Product_Bundles'**.
6. In the **Link Module ID** parameter, select **C.ProductBundleID**.
7. In the **Link Result** parameter, select **C.LinkQuotewithProduct**.
8. In the **Error Code** parameter, select **C.UserCode**.

Creating Products

You will now create multiple products.

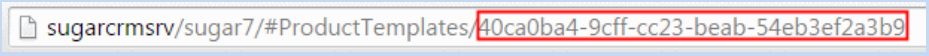
1. Drag a SugarCRM connector onto the flow and name it **Create Products**.
2. Set the **Interface** to **XML**.
3. Set the **Module** to **Products**.
4. Set the **Operation** to **Create**.
5. From the **New Object Id** field, select the **C.ProductID** variable.
6. From the **Store result in** field, select the **C.Products** variable.
7. Click **OK**.

Now you'll use the **products.csv** file that is in the **course_data** folder. Two products have been defined here and you'll set up Magic xpi so that it creates these products in SugarCRM.

	A	B	C
1	Santo Gadget	11c7d71d-3928-c758-2fef-54eb3e0fc589	900
2	Angelica Gadget	8e0b984c-4f7f-5f89-6140-54eb3ec1e36f	856

You can see that the file includes two products with three columns.

The second column is the Product ID. In SugarCRM, you can find the Product ID in the URL. For example, you can see a Product ID at the end of the following URL:



8. On the **Source** side, create a new **Flat File** entry.
9. From the **Data Source** property, select **File** and enter the following expression: **EnvVal ('currentprojectdir')&'course_data\Products.csv'**
10. Define the following three entries in the table at the bottom of the **Flat File Properties** dialog box:

Name	Data Type	Format	Length
Name	Alpha	30	30
ID	Alpha	100	100
Price	Numeric	12.4	17

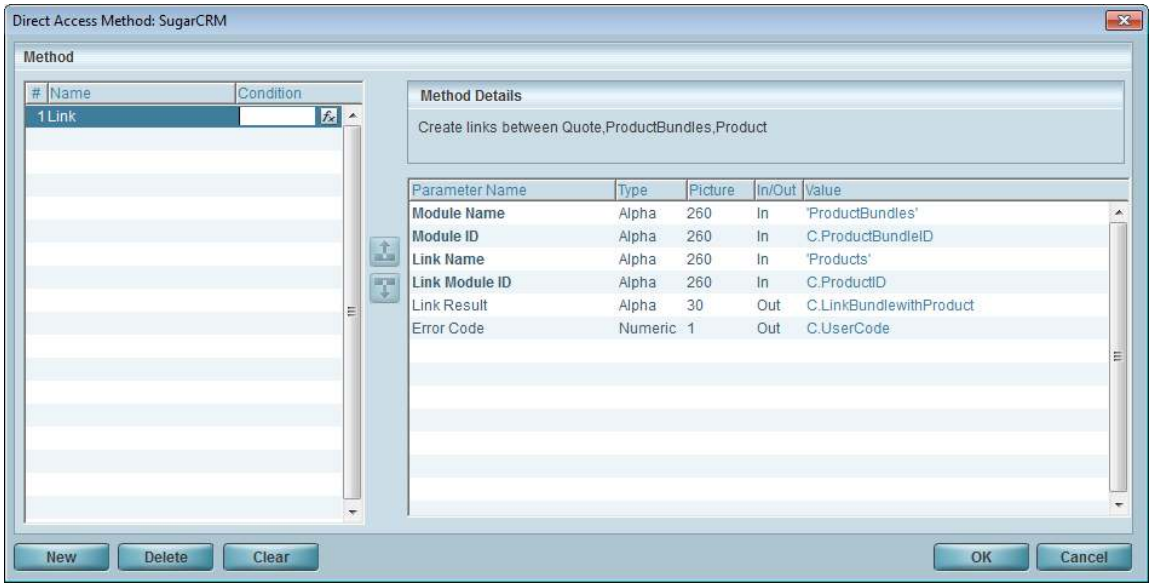
11. Click **Map**.
12. On the **Source** side, open the **Record** node.
13. On the **Destination** side, open the **Products > row > Fields** node.

14. Map the following nodes:
    - **Name** to **name**
    - **ID** to **product_template_id**
      The product ID will be generated automatically by SugarCRM once the product is created.
    - **Price** to **list_price**

Link the Product Bundle and the Products

You will now link all of the products to the Product Bundle.

1. Create a new flow and name it **Link Product to Product Bundle**.
2. Drag a SugarCRM connector onto the flow and name it **Link Bundle with Products**.
3. Create a new **Link** method.



4. In the **Module Name** parameter, enter **'ProductBundles'**.
5. In the **Module ID** parameter, select **C.ProductBundleID**.
6. In the **Link Name** parameter, enter **'Products'**.
7. In the **Link Module ID** parameter, select **C.ProductID**.
8. In the **Link Result** parameter, select **C.LinkBundlewithProduct**.
9. In the **Error Code** parameter, select **C.UserCode**.

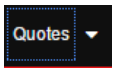
Now you'll define a Data Mapper that will call the **Link Product to Product Bundle** flow that you just created.

10. Drag a Data Mapper component below the **Create Products** step.
11. Create an **XML** source.
12. In the **XSD File** property, select **SugarCRM\XSD\SugarCRM_seminar\Products.xsd**.
13. In the **Data Source** property, select **C.Products** variable.

14. Create a **Call Flow** destination.
15. From the **Flow Name** property, select the **Link Product to Product Bundle** flow.
16. Double click the **Link Product to Product Bundle** node and set the **Condition** property with the following: **Source/S3/Products/row/Return/Success**.
17. Map the **Products > row > Return > Id** to **C.ProductId**.
18. Add a NOP step and name it **End**.

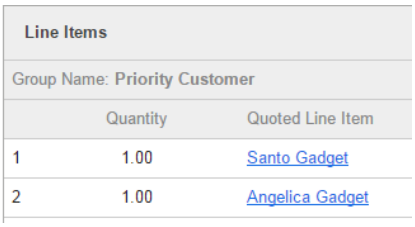
That's it. You've finished creating this flow.

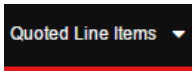
Running the Flow

1. Run the Debugger by clicking the Open Debugger icon  .
2. Log into SugarCRM.
3. Go to **Quotes**: 

4. Open the quote that was just created.

5. You should see two items created: **Angelica Gadget** and **Santo Gadget**. This is the product bundle.



6. Go to Quoted Line Items: 

7. Click on the first new product and modify it.
8. You can then see the changes in the Quote (click again on **Quotes**).

Note that in this scenario, you did not carry out validation steps since this is just an example of how to implement the steps of the quote scenario.

Summary

In this lesson, you learned about a specific scenario in Magic xpi – how to create a SugarCRM Quote.

You learned that this is a five step process:

1. Using the SugarCRM XML interface to create a quote.
2. Using the **Create Product Bundles** method to create a SugarCRM group.
3. Creating the products that you want to have in your quote.
4. Using the **Link** method to link the product bundle and the products.
5. Using the **Link** method to link the quote and the product bundle.

Lesson 6

Capturing Events

In an integration project, you need to be able to handle actions that are invoked by the so-called other side, the entity that you want to integrate with.

Capturing events in SugarCRM enables the triggering of workflows, based on actions carried out in SugarCRM.

For example, if you need to add the customer details to a local database when an Account is created in SugarCRM, the workflow will be initiated by an action carried out in SugarCRM.

The Magic xpi SugarCRM connector trigger polls SugarCRM for necessary modifications and invokes the flow.

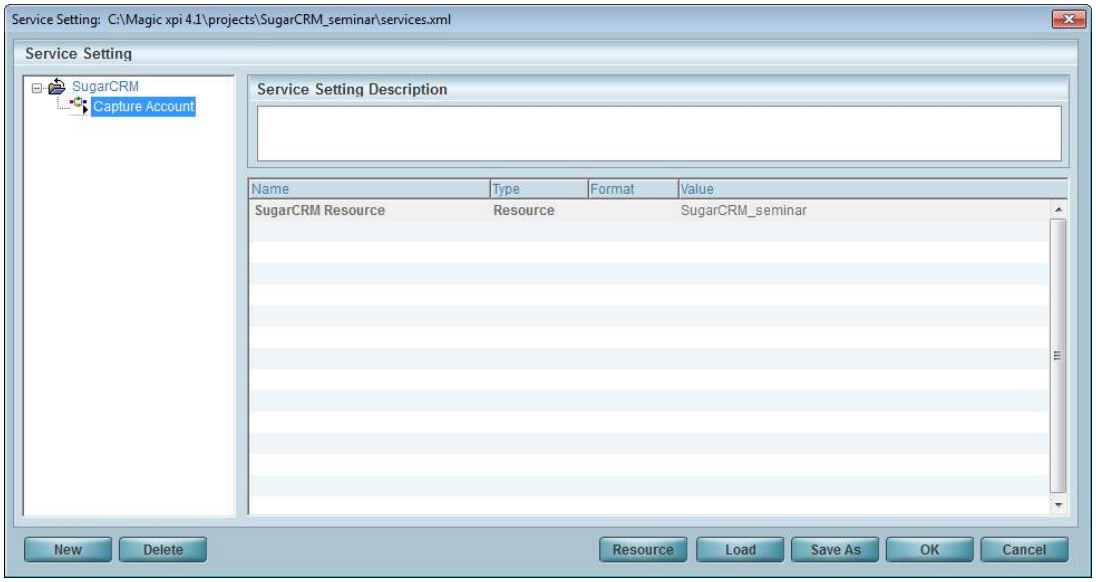
This lesson covers various topics including:

- SugarCRM service
- SugarCRM trigger
- DateTime fields

SugarCRM Connector Service

Before defining a SugarCRM connector trigger, you need to define a SugarCRM service as follows:

1. From the **Project** menu, select **Service Repository**.
2. Create a new **SugarCRM** service and name it **Capture Account**.
3. From the **Value** field, select the resource that you defined earlier: **SugarCRM_seminar**.



SugarCRM Trigger

You are going to define a Magic xpi trigger that will invoke a flow whenever a new account is added in SugarCRM. The Magic xpi flow will send a welcome email to a salesperson.

Sending an email to the administrator is provided as an example of a process.

Once the flow is invoked you can add any Magic xpi component. For example, you might want to add the account as a customer in a local database or you might want to create a file of all customers added.

You are going to use a new flow for the purpose of this lesson:

1. Create a new flow and name it: **New Account Added**.
2. Before continuing, you need to add the following flow variables:
   - **F.AccountResult** – BLOB
   - **F.RowLabel** – Alpha 30
   - **F.Emailbody** – BLOB
3. Define the following **global** variable. This will be explained later on:
   - **G.TriggerStartDate** – Alpha 30
4. Initialize the **G.TriggerStartDate** global variable with the start date of the course by clicking the expression  button and using the **DateTimeFormat** function in the following format: **DateTimeFormat (Date ()-1,'10:45:30'TIME,'+03:00',1).** This will be explained later on in this lesson.

Now you will define a trigger for the flow:

1. Drag a SugarCRM connector to the Trigger area and name it **Scan for Accounts**. The SugarCRM service that you created is automatically selected.
2. Click **Configuration** and then **New**.
3. In the **Row Label** column, you can enter your own text to identify this row, for example **AccountAdded**. The **Row Label** is useful if you have multiple lines. This property is not mandatory. The use of the label will be explained later.
4. Select the SugarCRM object that you want to poll. In this example, you will select **Accounts**.
5. Determine if you want an indication of whether the object was updated or deleted. In this example you will select **Created**. Note that there is no indication as to whether this is a new account or an updated account.
6. In the **Start Date** property, select the **G.TriggerStartDate** variable that you previously created. The trigger will retrieve accounts that were added or updated from the date that you defined in the variable.

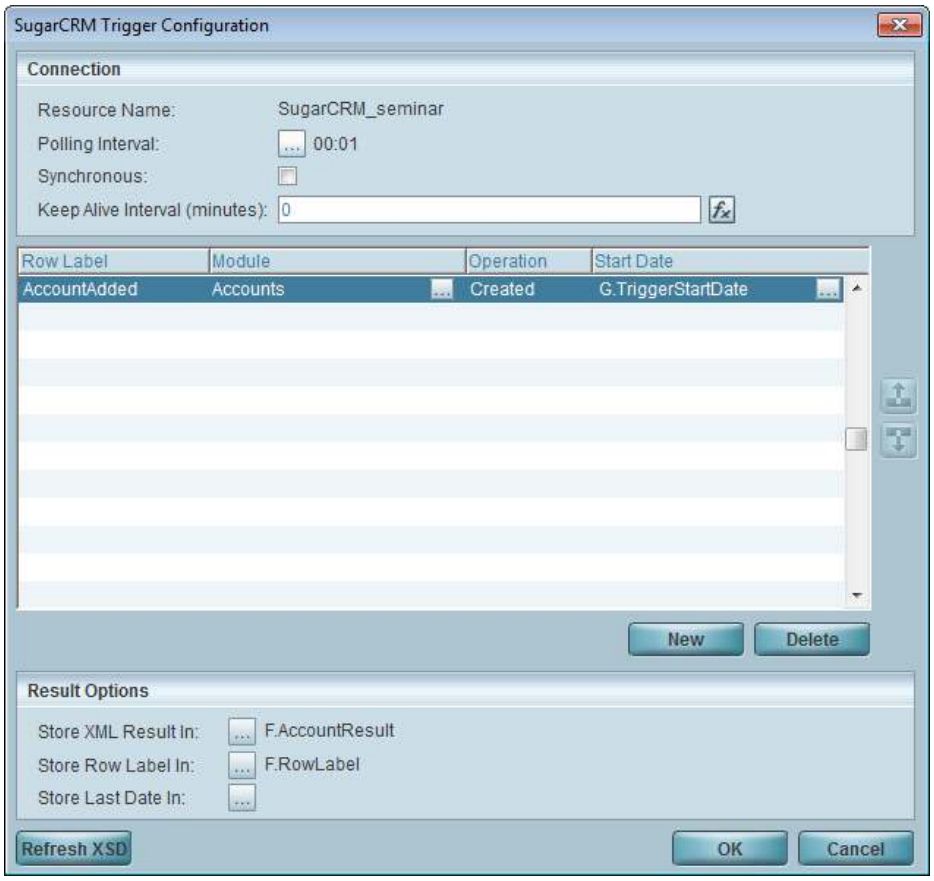
In the **Start Date** property, if the variable is empty or if you do not use a variable, Magic xpi starts polling from the next time you run the project. Magic xpi saves an indication of the last time that SugarCRM was polled for each resource, object and operation combination. The last timestamp is saved in the **Trigger.xml** file under **%currentprojectdir%SugarCRM**.

The required format for this property and SugarCRM is the XML DateTime format. This will be discussed in the next section.

Enter as many rows as needed. This is the same as adding different SugarCRM triggers. Then, by using the **Row Label** column *within the flow*, you can identify which trigger was actually invoked.

The SugarCRM connector trigger is a polling trigger. This means that Magic xpi will check the SugarCRM server at predefined intervals. By default, the interval is set to five minutes.

7. Set the **Polling interval** option to **00:01**; otherwise, SugarCRM will use the default and wait five minutes.
8. In the **Store XML Result In** option, select the **F.AccountResult** variable, which returns the object details.



9. In the **Store Row Label In** options, select the **F.RowLabel** variable, which holds the value of the trigger that was invoked.

Data can be retrieved only for objects to which the logged-in user has access.

10. Click **OK**.

The trigger has now been defined.

You'll now create a Data Mapper step to extract specific information from the result variable, **F.AccountResult**. In this case, you'll use a template to display this field in a certain structure.

1. Drag a Data Mapper component as the first step in the flow.
2. Create an **XML** source.
3. In the **XSD File** property, select **SugarCRM\XSD\SugarCRM_seminar\Accounts.xsd**.
4. In the **Data Source** property, select the **F.AccountResult** variable.
5. Create a **Template** destination.
6. From the **Template File** property, select **course_data\Templates\AccountAdded.tpl**. This is an HTML template that you will use to send a personalized email to the administrator.
7. In the **Data Destination** property, select the **F.Emailbody** variable. This will be used as the email's HTML body.
8. Map the **Accounts > row > Fields > name** node to the **CustomerName** node.

You'll now send the email to the administrator.

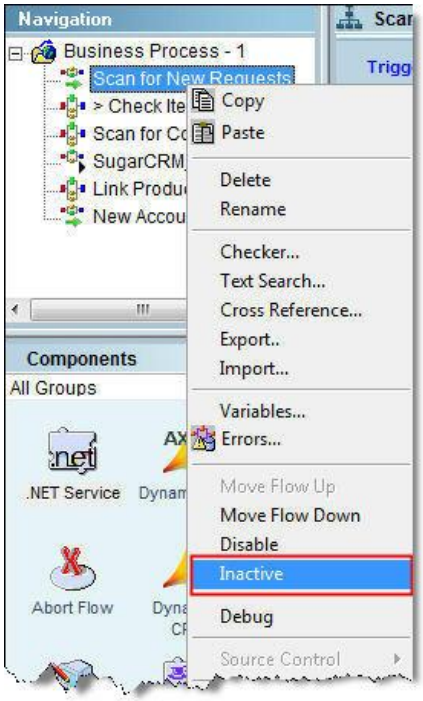
1. Add an environment variable named **Admin_email** and set the email for your administrator.
2. Define an **Email** resource with the settings relevant for your email server.

If you do not have the parameters of an email or are not able to define or connect to one, you can skip the email step, save the email body to the file system, and check the HTML page that was created.

3. Click the **Validate** button to check the accuracy of the information you entered.
4. Drag an Email component as the first step and name it **Send email to administrator**.
5. Click **Configuration**.
6. Select the **Quick Send** method.
7. From the **To** parameter, select the **Admin_email** environment variable.
8. In the **Subject** parameter, enter **A new account was added**.
9. In the **BodyType** parameter, select **HTML**.
10. In the **Body** parameter, select the **F.Emailbody** variable.

You'll now run the Debugger and see if you receive an email. However, since we don't want to run all of the flows, we'll make the other flows inactive in order to run the Debugger.

1. Right-click on each of the flows, except the last one, and select **Inactive**. In the Navigation pane, the inactive steps will appear in red.



2. Run the Debugger from the toolbar with a breakpoint on the Data Mapper step.
3. Since the trigger's polling interval was set to 1 minute, you might have to wait 1 minute until the process starts working.
4. Check to see if you receive an email.
5. When you finish working with the Debugger, remove the **Inactive** status from the flows.

DateTime Fields

SugarCRM stores **DateTime** field values as Greenwich Mean Time (GMT). When one of these values is returned in SugarCRM, it is automatically adjusted for the time zone specified in your organization's preferences.

The Magic xpi Date and Time formats do not conform to the SugarCRM convention. You need to handle this conversion in your Magic xpi project.

Syntax	**DateTimeFormat(date, time, timezone, format)**
Parameters	**date** is any date variable (or a hard-coded date, such as '05/06/2008'DATE, or an expression that evaluates to a date).
	time is any time variable (or a hard-coded time, such as '16:10:14'TIME, or an expression that evaluates to a time).
	timezone is the time zone that you want to use relative to GMT.
	format is one of the following: 1 – XML DateTime format, which is YYYY-MM-DDThh:mm:ssTZD. Make sure you add the first **T** as part of the string. 2 – JDE Julian day format, which is CYYDDD, where C is the century (0=1900 and 1=2000), YY is the year and DDD the day of the year.
Return	DateTime string in required format.
Example	If you have: DateTimeFormat('29/04/2008'DATE, '10:45:30'TIME, '+03:00',1), it returns 2008-04-29T10:45:30+3:00.
Note	The DATE that you see in the string above, '29/04/2008'DATE, is a Magic xpi literal. If you use this literal, the string is interpreted as a date. You can use it in arithmetic operations because it's internally represented as a Numeric value. So, for example, '01/01/97'DATE+14 is a valid expression that yields the date 15/01/97.

Exercise

For your own exercise (a solution is not provided with this seminar):

- If the customer exists but the contact is a new one, add the contact to the account and add this contact to the opportunity.
- Check that the contact was added to the account successfully.
- Check that the contact was added to the opportunity successfully.

Summary

In this lesson, you learned how to:

- Capture SugarCRM events.
- Trigger a flow when an event occurs in SugarCRM.
- Define SugarCRM dates in Magic xpi.

Solutions

Lesson 2 – Querying SugarCRM via Magic xpi

In this exercise, you are asked to check whether the products are valid SugarCRM products. You are asked to do this if the account exists.

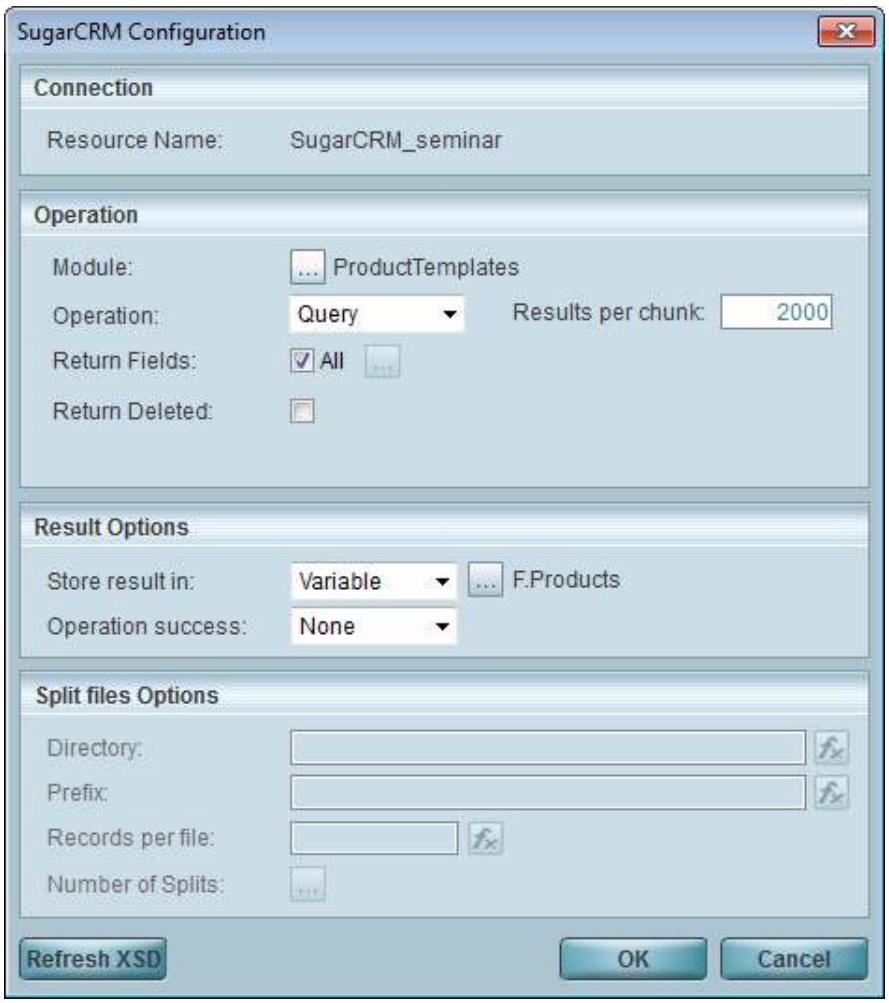
To perform this you will need a separate flow that will check each product.

1. Create a flow named **> Check Items**.
2. Add the following context variable:
   - **C.All_Items_Exist**, a Logical variable with the default value set to **'FALSE'LOG**.
3. Add the following flow variables:
   - **F.ItemCode**, an Alpha variable with a size of 100.
   - **F.Products**, a BLOB variable. This will hold the returned data from the SugarCRM query.
   - **F.PriceTooLow**, a Logical variable. This will indicate whether the customer's requested price was the same or higher than the price in the SugarCRM Product Catalog.
   - **F.ProductAvailable**, a Logical variable with a condition set to **'FALSE'LOG**.
   - **F.RequestedPrice**, a Numeric variable with a size of 6.2.

The **ProductTemplates** module is the SugarCRM Product Catalog.

Now you will query the **ProductTemplates** module.

1. Drop a SugarCRM connector as the first step of the **> Check Items** flow. Name it **Query Product Template**.
2. Click **Configuration**.
3. In the **Module** property, select the **ProductTemplates** module.
4. Set the **Operation** to **Query**.
5. Set the **Store result in** property to **F.Products**.



The next stage is to map.

1. In the **Source/Destination Management** dialog box, click **Map**.
2. In the **Destination** pane, expand **Products > row > Fields**.
3. Park on the **id** node and in the **Calculated value** property, select the **F.ItemCode** variable.

Now you'll add a Data Mapper to check that the products exist and that the price is a relevant price.

1. Drop a Data Mapper component under the **Query Product Template** step.
2. Name it **Check Exists and Price**.
3. Create a new **XML** source.
4. In the **XSD File** property, select the following schema: **SugarCRM\XSD\SugarCRM_seminar\ProductTemplates.xsd**.
5. From the **Data Source** property, select the **F.Products** variable.
6. Create a **Variables** destination and select the **F.ProductAvailable** and **F.PriceTooLow** variables.

The next stage is to map.

1. In the **Source** pane, expand **ProductTemplates > row > Fields**.
2. In the **Destination** pane, expand the **Instance** node.
3. Connect the **list_price** node with the **F.PriceTooLow** variable.
4. Set the **Calculated value** property of the **F.PriceTooLow** variable to: **Source/S3/ProductTemplates/row/Fields/list_price > F.RequestedPrice**. At a later stage, you will pass this variable in a Data Mapper's Call Flow in the **Scan for New Requests** flow.
5. Connect the **status** node with the **F.ProductAvailable** variable.
6. Set the **Calculated value** of the **F.ProductAvailable** variable to: **Lower (Source/S3/ProductTemplates/row/Fields/status) = 'available'**.

At this stage the **F.RequestedPrice** and **F.ProductAvailable** variables should have a value based on the logic that you defined in your mapping. In the next step you'll update the **C.All_Items_Exist** context variable based on the value of the two flow variables.

1. Drop a **Flow Data** step as a child step of the **Check Product** step and name it **Update variable**.
2. Click **New**.
3. Set the **Action** property to **Update**.
4. Set the **Type** to **Context**.
5. Select the **C.All_Items_Exist** variable.
6. Set the **Update Expression** to **'FALSE'LOG**.
7. Set the following condition for this step: **NOT F.ProductAvailable OR F.PriceTooLow**. This expression means that if the product is not available or if the requested price is lower than the catalog price, the order cannot be filled and we must set the **C.All_Items_Exist** variable to **False**.

If any of the previous runs of the **> Check items** flow found a product that either doesn't exist or its requested price is too low, no further check should be performed. You can prevent the **> Check Items** flow from running by conditioning the first step as follows:

8. Right click on the **Query Product Template** step and set the following condition: **C.All_Items_Exist**.

Now you need to call this flow for each item; but first you need to initialize the context variable.

1. Park on the **Scan for New Requests** flow.
2. Drop a **Flow Data** service as a child step of the **Check for Account** step. Name it **Initialize variable**.
3. Click **New**.
4. Set the **Action** property to **Update**.
5. Set the **Type** to **Context**.
6. Select the **C.All_Items_Exist** variable.
7. Set the **Update Expression** to **'TRUE'LOG**.

Now you are ready to call the new flow.

1. Drop a **Data Mapper** component as a child step of the **Initialize variable** step.
2. Name it **Check Items**.
3. Click **Configuration**.

You need to use the request XML that was retrieved by the Directory Scanner to retrieve the request items. Therefore, you need to have an XML as the source.

1. Add an entry to the **Source** pane of the Data Mapper.
2. Set the name to **RequestXML** and the type to **XML**.
3. Click **Properties**.
    a. In the **XSD File** property, select the following schema: **course_data\schemas\request.xsd**
    b. Set the **Data Source** to **Variable** and select the **C.RequestXML** variable.

You now need to call the new flow.

1. Add an entry to the **Destination** pane of the Data Mapper.
2. Set the name to **CheckItemFlow** and the type to **Call Flow**.
3. Click **Properties**.
4. In the **Flow Name** property, select the **> Check Items** flow.

The next stage is to map.

1. Click **Map** to open the Data Mapper screen.
2. Connect **ProductId** to **F.ItemCode**.
3. Connect **Request_Price** to **F.RequestedPrice**.

You are ready to test.

In the **course_data/out** folder, you'll find XML requests, including:

- **request001.xml** – This includes a valid account and two items that exist and their price is high enough.
- **request002.xml** – This includes a valid account, but one of the items does not exist.
- **request003.xml** – This includes a valid account, but one of the items has a price that is too low.
- **request004.xml** – This includes a non-existing account.

There is also a fourth XML file, but you won't use it in this exercise.

You'll run the project three times using the first three XML files.

1. Place one of the XML files in the **in** folder before running the project.
2. When the process is finished, for the **Request001.xml** file, check that the **F.AccountExists** variable is set to **True**.
3. For the other two files, check that it's set to **False**.

If you get these results, the project is working as expected.

Lesson 3 – Adding an Object

In the exercise, you were asked to add an opportunity if all the items are valid.

1. Add a **SugarCRM** connector as a child step of the **Check Items** step.
2. Name the step: **Write New Opportunity**.
3. Click the **Configuration** button.
4. From the **Module** property, select **Opportunities**.
5. Set the **Operation** column to **Create**.
6. Click **OK**.

You need to connect the opportunity to a specific account. The **AccountId** is part of the XML returned by the **Account** Query operation. Therefore you can use this as the source.

1. Create an **XML** source and name it **AccountInfo**.
2. Click **Properties**.
3. From the **XSD File** property, select: **SugarCRM\XSD\SugarCRM_seminar\Accounts.xsd**.
4. From the **Data Source** property, select **F.Account**.

You are now ready to map. In the **Data Mapper** screen:

1. In the **Source** pane, open the node **Accounts > row > Fields**.
2. In the Destination pane, open the node **Opportunities > row > Fields**.
3. Connect **id** to **account_id**.
4. Connect **name** to **account_name**.
5. In the **Destination** pane, park on the **sales_stage** node and enter a calculated value for one of the entries for the drop-down list, such as **'Value Proposition'**. You can view these in the **Additional XML Properties** tab.
6. In the name node, enter: **'Seminar opportunity'**.
7. In the **date_closed** node, enter the following calculated value: **AddDate (Date (),0,2,0)**. This means that it will be closed in two months.
8. In the **next_step** node, enter the following calculated value: **'Send email'**.

The opportunity can only be added if the request is valid.

1. Park on the **Write New Opportunity** step.
2. Set the following condition: **C.All_Items_Exist**.

You can now test the flow using the **request001.xml** file. If the process worked, you should be able to find an opportunity in SugarCRM called **Seminar opportunity**.