PNMsoft Knowledge Base

Sequence User Guides

PNMsoft SCE

July 2016
Product Version 7.5 and above

PNMsoft UK 38 Clarendon Road Watford Hertfordshire WD17 1JJ

Tel: +44(0)192 381 3420 • Email: info@pnmsoft.com • Website: www.pnmsoft.com

TABLE OF CONTENTS

General Document Information

Purpose

The purpose of this document is to describe how to design intelligent workflow solutions for Dynamics CRM using PNMsoft SCE.

This guide is appropriate for Dynamics CRM 2011/2013/2015/2016.

Note: Sequence 8.x supports CRM 2015/2016 and above.

Prerequisites

- Basic knowledge of developing Dynamics CRM workflows.
- Basic knowledge of developing workflows using PNMsoft Sequence.

Overview

PNMsoft Sequence CRM Edition (SCE) enables businesses to design and manage intelligent workflows for their Microsoft Dynamics CRM environment. PNMsoft SCE is an Intelligent BPM suite that includes the following Dynamics CRM integration components:

- A solution that can be imported into Dynamics CRM: including built-in entities and a plugin.
- An App Studio including pre-built activities and functions for Dynamics CRM.

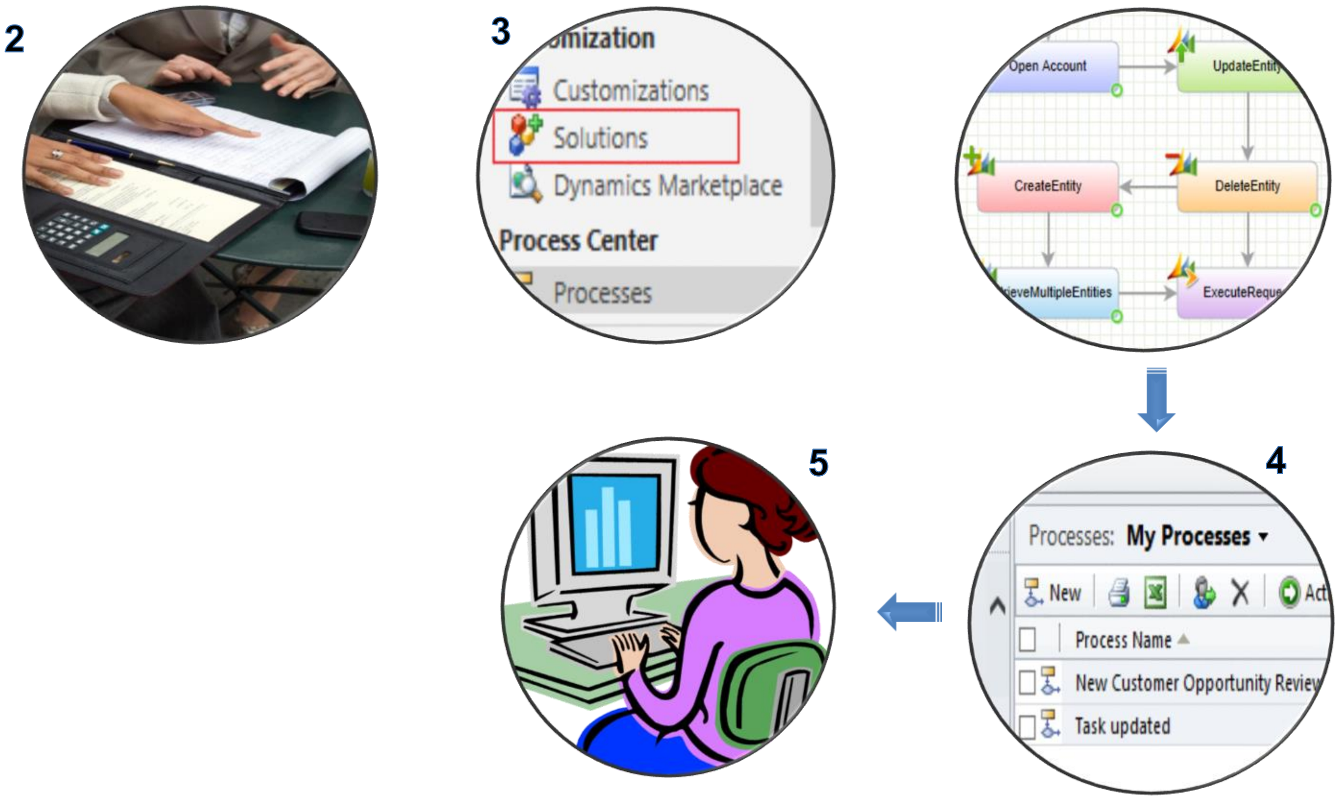
The basic steps for using PNMsoft SCE are as follows:

1. Plan: decide how an intelligent workflow will solve a real business problem.
2. Install PNMsoft SCE.
3. Design the workflow application in Sequence App Studio.
4. Create a basic Dynamics CRM workflow that invokes the Sequence workflow.

   OR

   Invoke the Sequence workflow using an external trigger (e.g. a customer completing an online form).

   Note: Sequence Workflows can also kick off native Dynamics CRM workflows.
5. Users view and monitor the Sequence Workflow instances in your Dynamics CRM.



PNMsoft SCE - Basic Steps

Key Terms

The following terms are used in association with PNMsoft SCE:

- **PNMsoft SCE Solution**

  The PNMsoft Sequence solution that can be imported into Dynamics CRM.

- **App Studio**

  The visual workflow application design interface where you create intelligent workflows which interact with your Dynamics CRM.

- **Process**

  A native CRM workflow.

- **Workflow**

  An instance of a native CRM workflow.

- **Sequence Process**

  An intelligent workflow designed using the Sequence App Studio.

- **Sequence Workflow**

  An instance of a Sequence Process within Dynamics CRM.

- **Activity**

  A single step in a Sequence Process.

- **Sub Workflow**

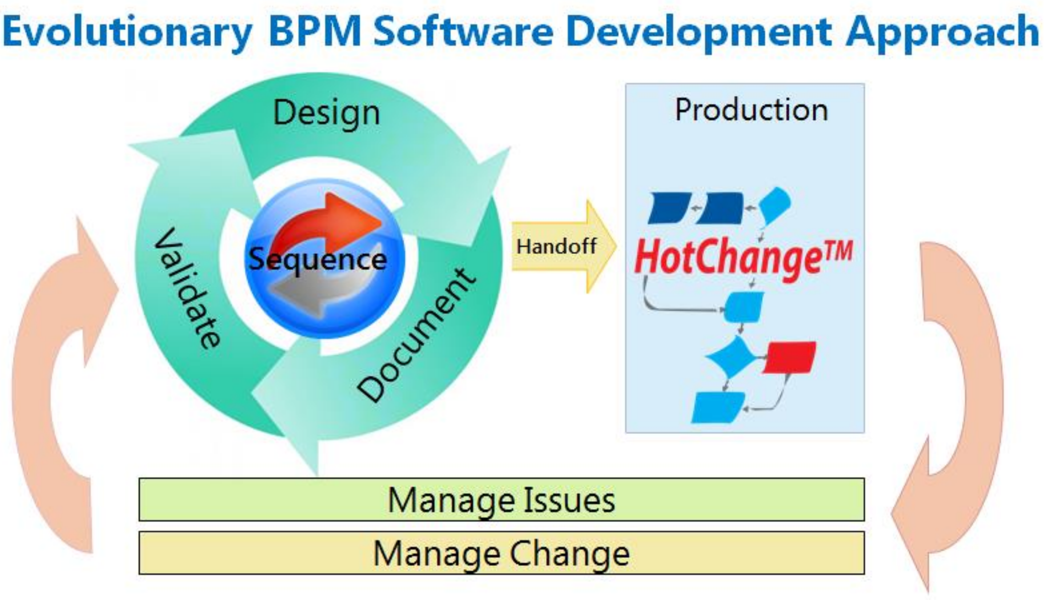
  An activity which is a Sequence Process in itself.

Plan Your Intelligent Workflow Solution

During this step you should conduct meetings within your organization to understand how an intelligent workflow application will help you solve a real business problem related to your use of Dynamics CRM.

PNMsoft SCE gives you the capability to design and manage complex CRM-related workflows. For example, a workflow which performs a sequence of activities within your organization when a new customer comes on board.

Using PNMsoft's Evolutionary BPM methodology, you can actually model the design of the workflow application in Sequence's App Studio during such meetings, without having to complete each activity. Once you have done this, you will already have a model of the workflow you are going to create.



Evolutionary BPM Methodology

Installing PNMsoft SCE

This section describes how to install the PNMsoft SCE.

To install PNMsoft SCE, you must perform the following steps:

1. Install PNMsoft Sequence with the Dynamics CRM connector.
2. Run the *Setup.exe* file on your Sequence Server.
3. Import the PNMsoft SCE Solution into your CRM.

The following sections describe each step in detail.

Install PNMsoft Sequence

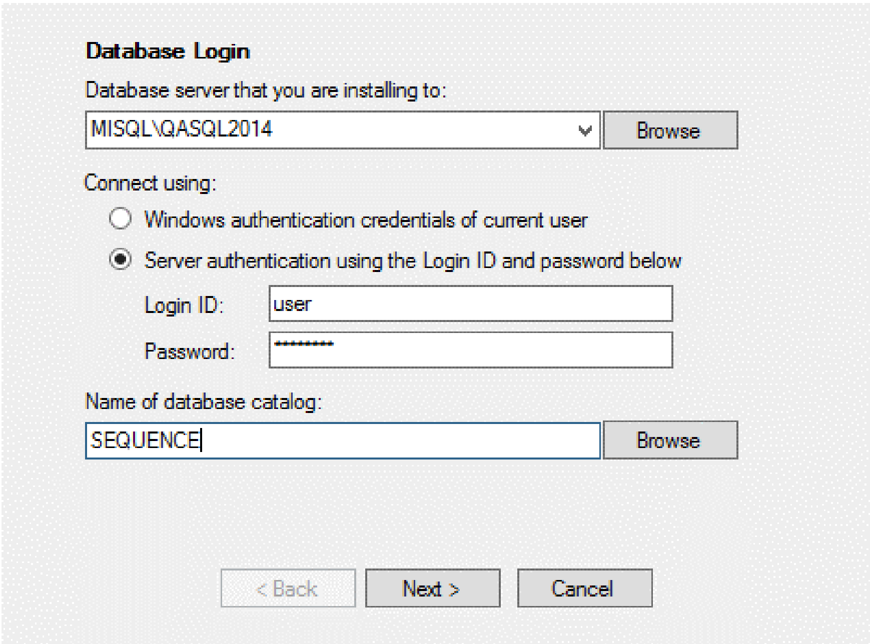
Please refer to the Sequence Installation Guide for detailed instructions. Ensure that you have selected the Dynamics CRM Connector option in the Installation Wizard.

Note: You must install Sequence v7.5 and above to work with PNMsoft SCE.

Run the SCE_Setup.exe file on your Sequence Server

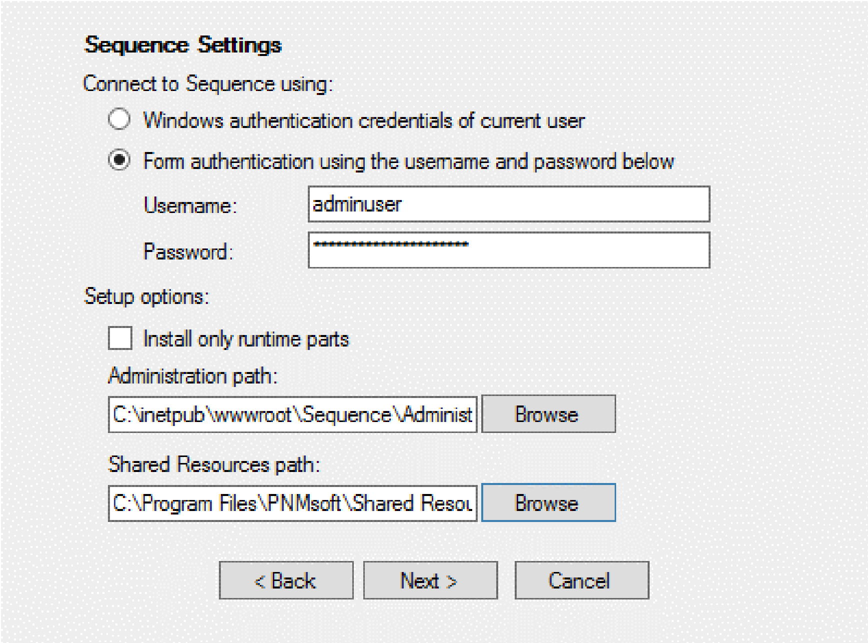
A *PNMsoft.Sequence.Crm.Setup.exe* file will be provided with your purchase of PNMsoft SCE. Copy this file to your Sequence Server, and run it.

Complete the installation screens as follows:



PNMsoft SCE Setup – Screen 1

- Database server: Enter the name of the Sequence Database server.
- Connect using: Enter your Sequence Database login details.
- Name of database catalog: Enter the name of the Sequence Database.



PNMsoft SCE Setup – Screen 2

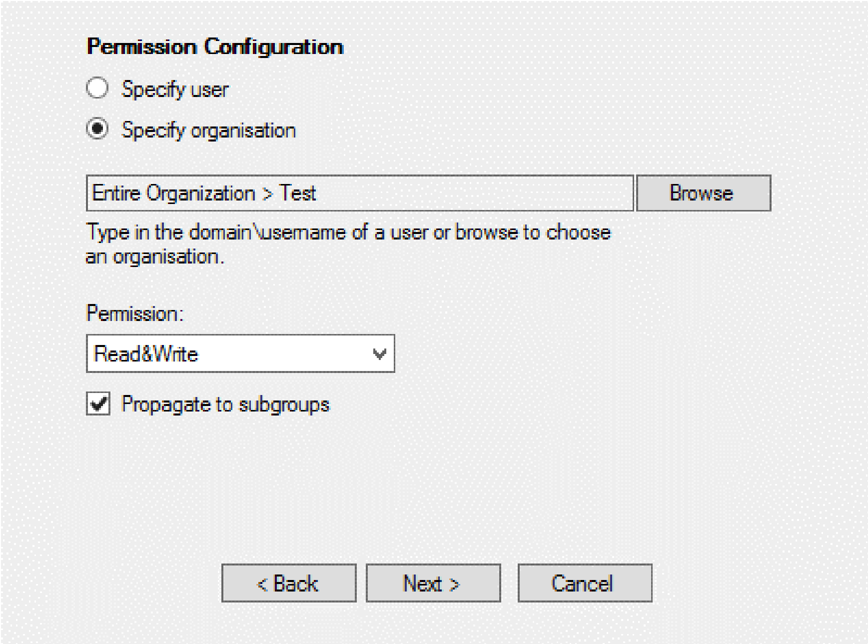
- Connect to Sequence using: select Form Authentication, and enter the Username and Password for your Sequence Administration environment.

Setup options:

Install only runtime parts (select this option when installing this Setup file on your Runtime server if your Sequence Runtime and Administration are installed on separate servers.)

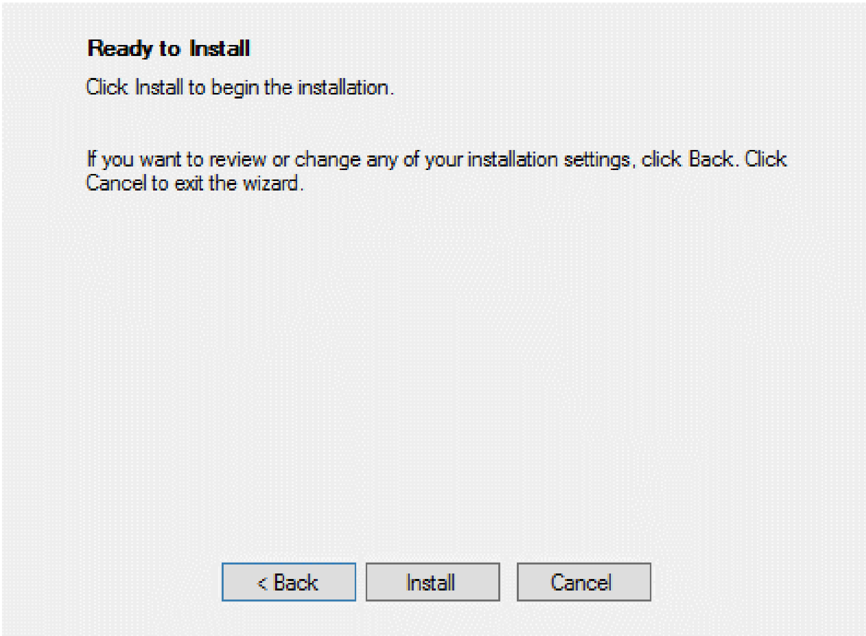
Administration path: for example, *C:\inetpub\wwwroot\Admin\Administration*

Shared Resources path: C:\Program Files\PNMsoft\Shared Resources



Permissions Configuration

- Select **Specify organization**. Browse to select your organization or the organizational group to which you want to provide permissions to SCE workflows. (Alternatively you can provide permissions to these workflows using the Administration environment).
- Select the appropriate **Permission** level. The recommended setting is Read&Write. See the Sequence Permissions guide for more details.
- To propagate permissions to subgroups, select **Propagate to subgroups**. This will ensure all the sub groups of the selected group are granted permissions as well.



PNMsoft SCE Setup – Screen 3

Click **Install**. The installation completes.

Define CRM Connection Details in Sequence Administration

After PNMsoft Sequence is installed, you must define a Connection to your Dynamics CRM organization within Sequence.

You can connect to the following types of CRM deployment:

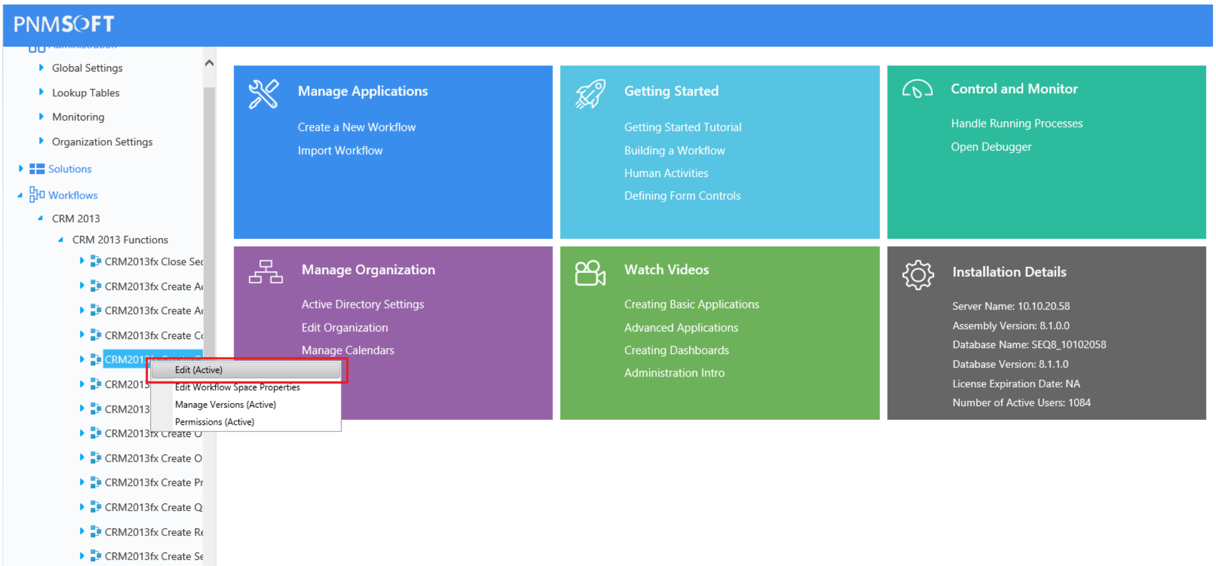
- On-premise
- Online
- Partner Hosted

You can use the following types of authentication (not every type is appropriate for all deployment types):

- Active Directory
- Federated
- Online Federated
- Live ID

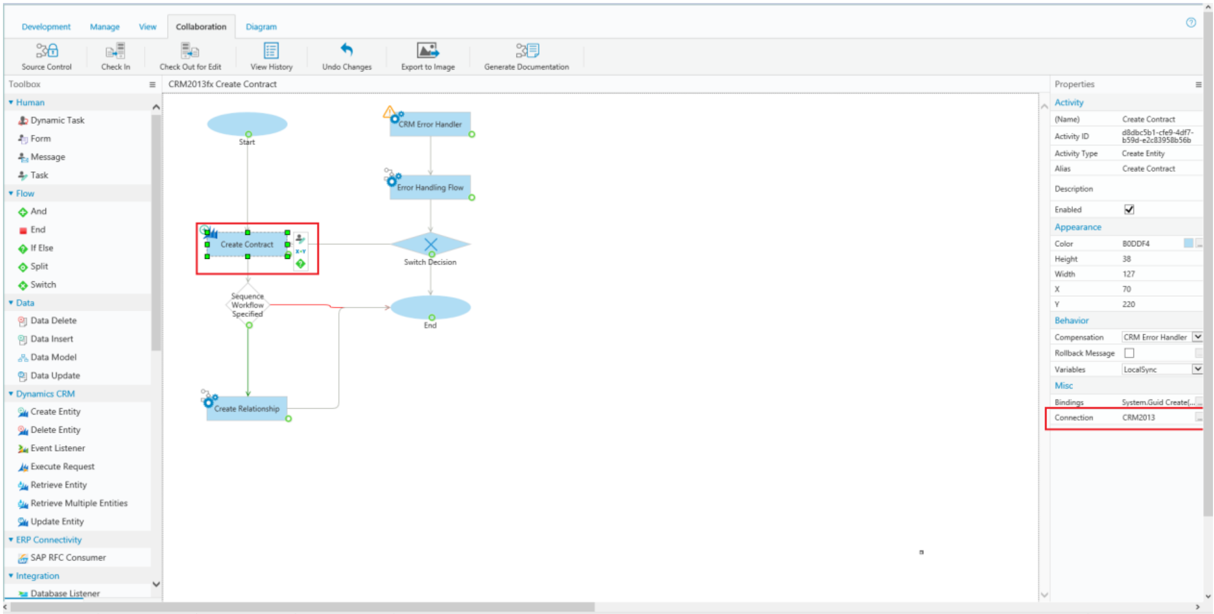
To define a CRM connection:

1. From the Workflow tree, open any CRM Function, right click and select **Edit**.



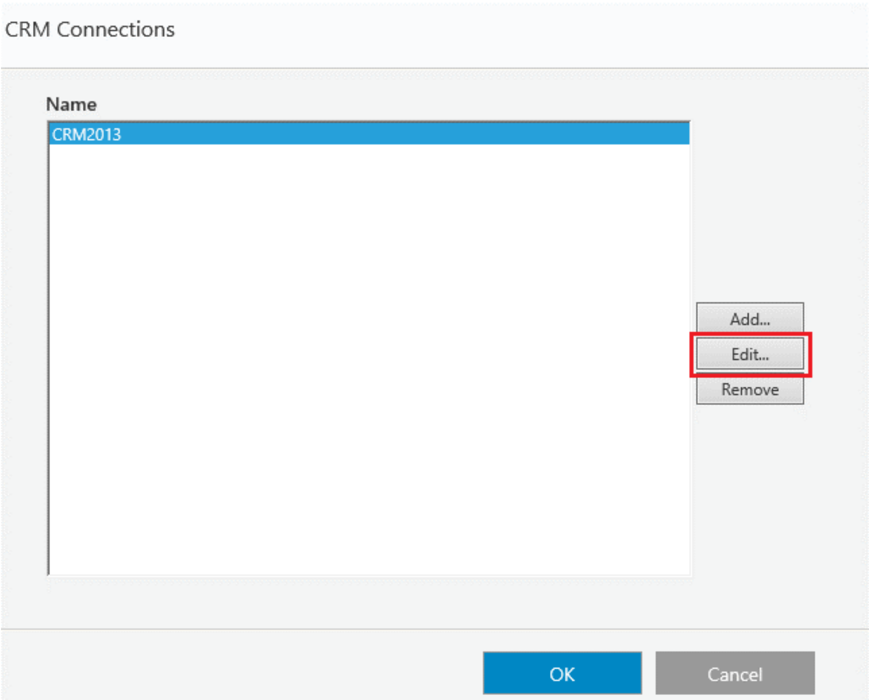
Edit CRM Function

2. Select any CRM Activity in that function.
3. In the Properties area, select ... beside **Connections**.



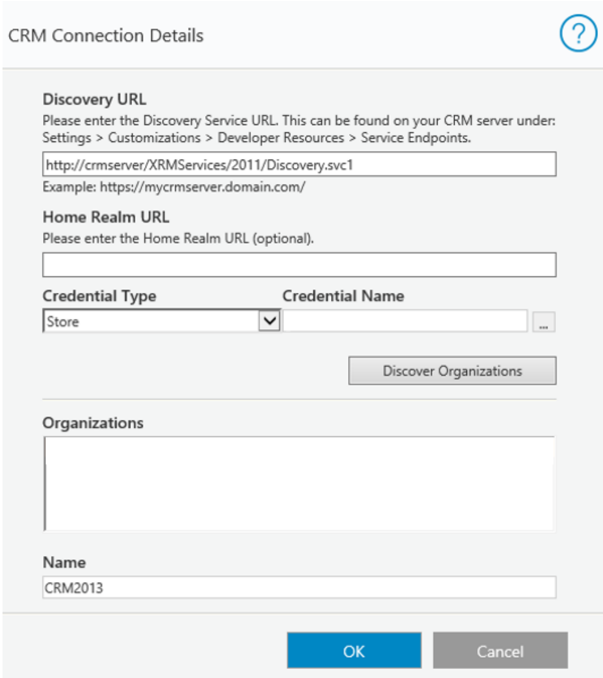
CRM Connection

4. The *CRM Connections* screen appears. Select the **CRM2013** Connection and click **Add** to add a new connection, or **Edit** to edit an existing connection.



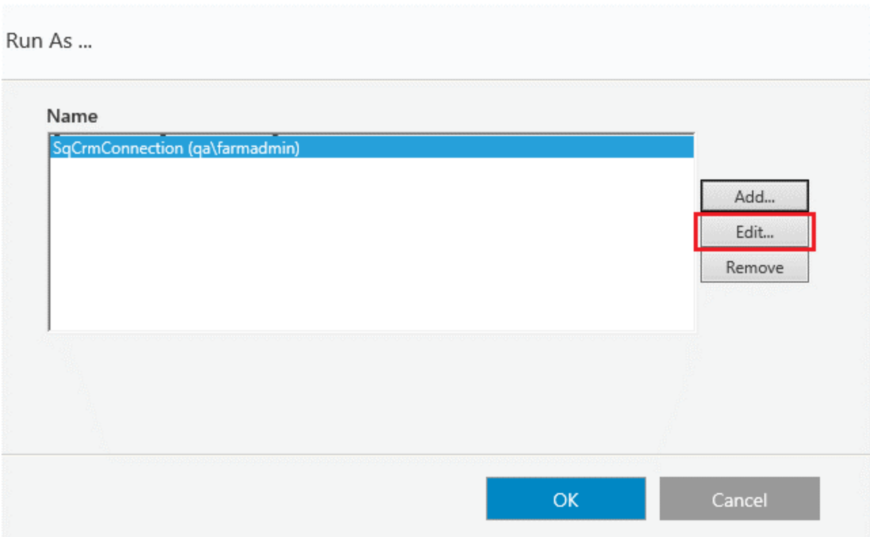
CRM Connections

The CRM Connection Details screen appears.



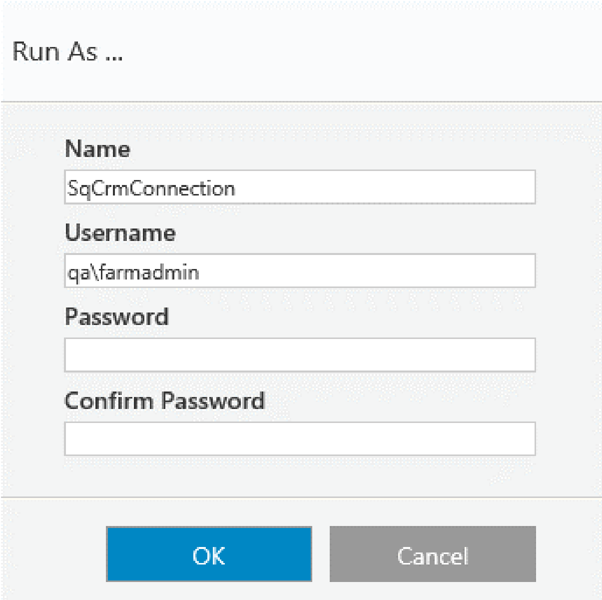
CRM Connection Details

5. **Discovery URL:** Enter the Discovery URL. You can find this on your server in: Settings > Customizations > Developer Resources > Service Endpoints.
6. **Home Realm URL:** (Optional) Set the URL of the cross realm STS metadata endpoint. If you have several STSs, you need to specify to which you want to connect. Ask your CRM administrator for help to identify this.
7. Select the **Credential Type** (e.g. Store) and click ... under **Credential Name**.
8. Select the SqCrmConnection and click **Edit**.



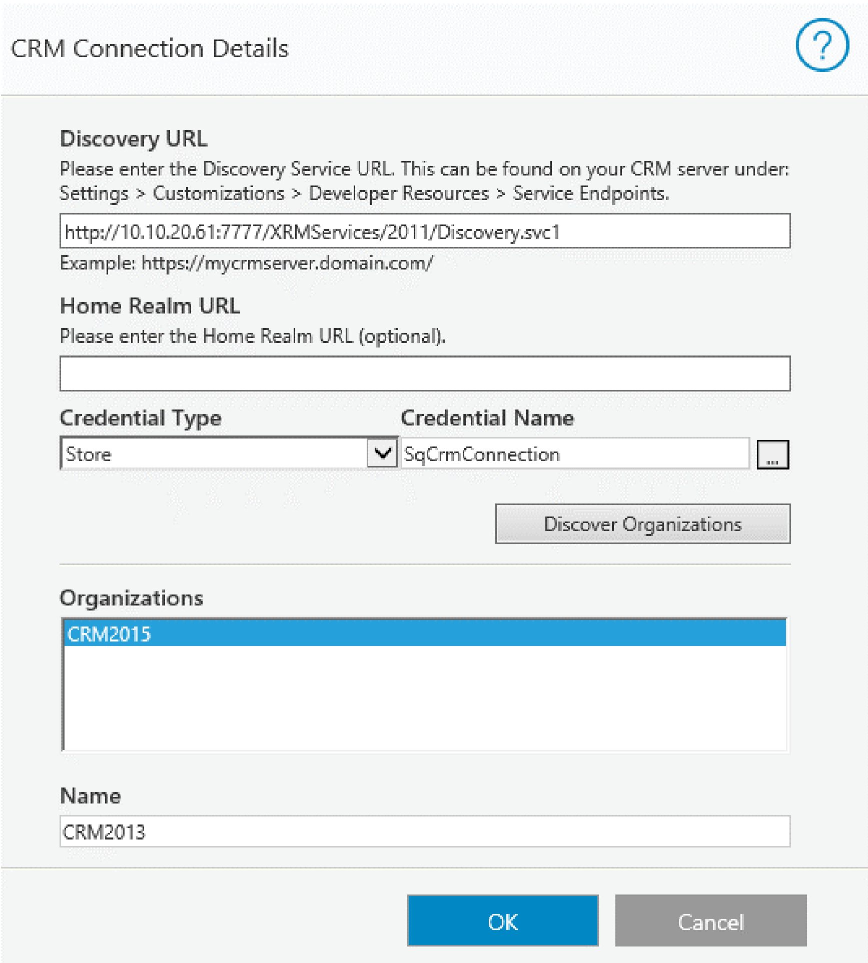
Credential Name

9. Enter the Domain\UserName and Password of your Dynamics CRM user and click **OK**. The CRM user needs to be able to access the CRM with at least the "System Customizer" role. (The stronger role - "System Administrator" - will work too.)



Credentials

10. In the *CRM Connection Details* screen, click **Discover Organizations**. Your organization(s) should appear.



Discover Organizations

11. Select your Organization and click **OK**. Your CRM connection is now defined.

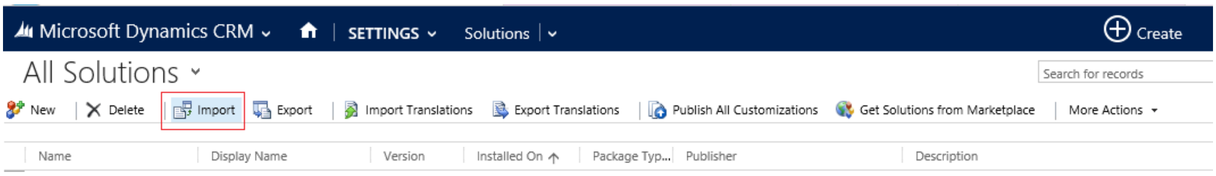
    Note: Please do not change the Name field (keep the default 'CRM2011'), since the demo workflows depend on it. Alternatively, you may add new connections with any name you prefer.

Import the PNMsoft SCE Solution into your CRM

Note: Dynamics CRM 2011 needs to be fully patched to update 15 before installing the SCE Solution.

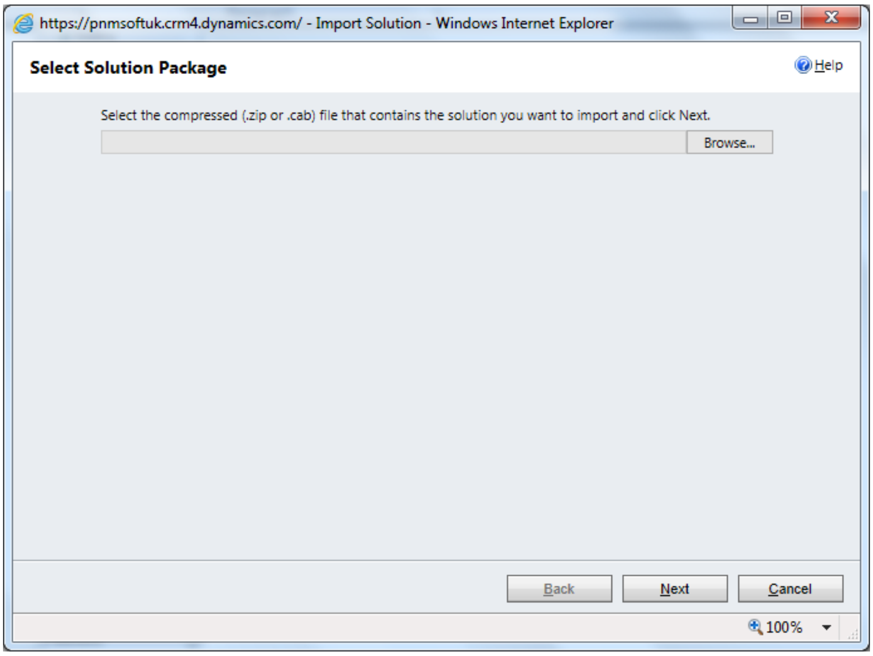
To import the PNMsoft SCE Solution into your CRM:

1. In Settings > Solutions, click **Import**.



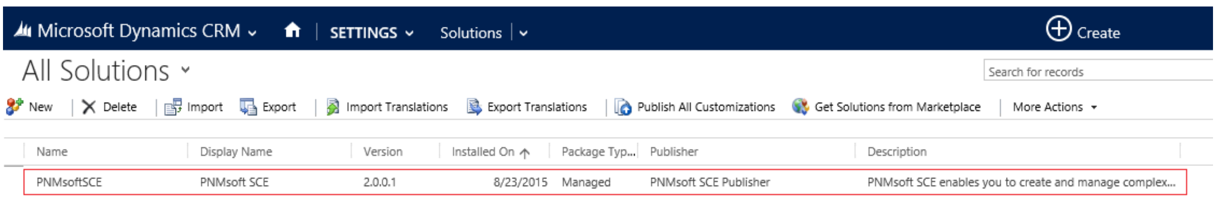
Import PNMsoft SCE

2. Browse for the zip file of the PNMsoft SCE solution package and select import.



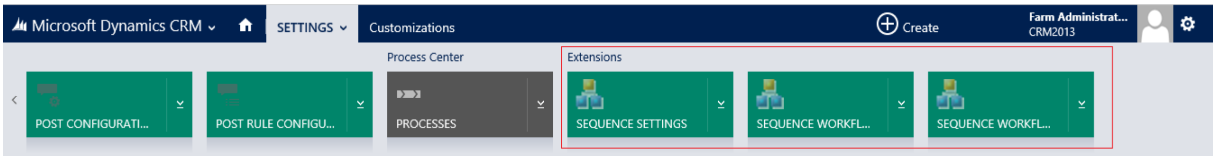
Import PNMsoft SCE

3. Complete the import wizard steps (accept the default settings). The PNMsoft SCE Solution is now imported into your CRM.



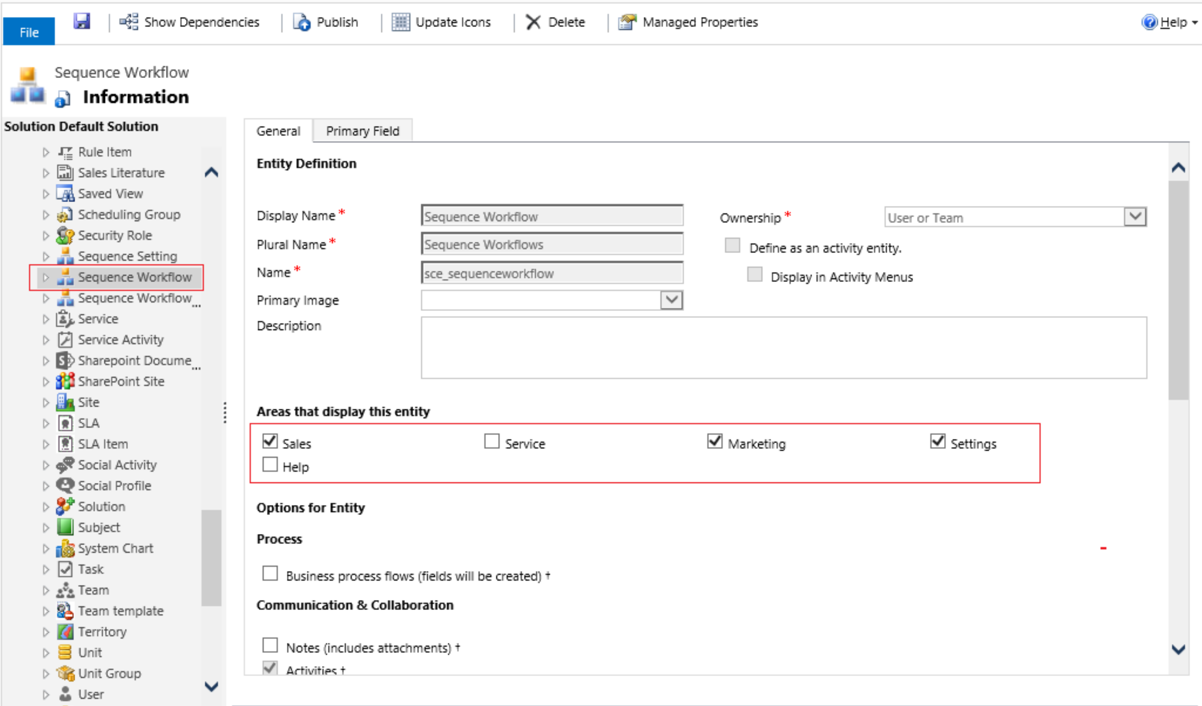
PNMsoft SCE Solution after Import

4. Refresh the CRM browser. Now, in the Settings menu, if you navigate to the far right, you see the following new Sequence entities under Extensions:
   - Sequence Settings
   - Sequence Workflows
   - Sequence Workflow Correlations



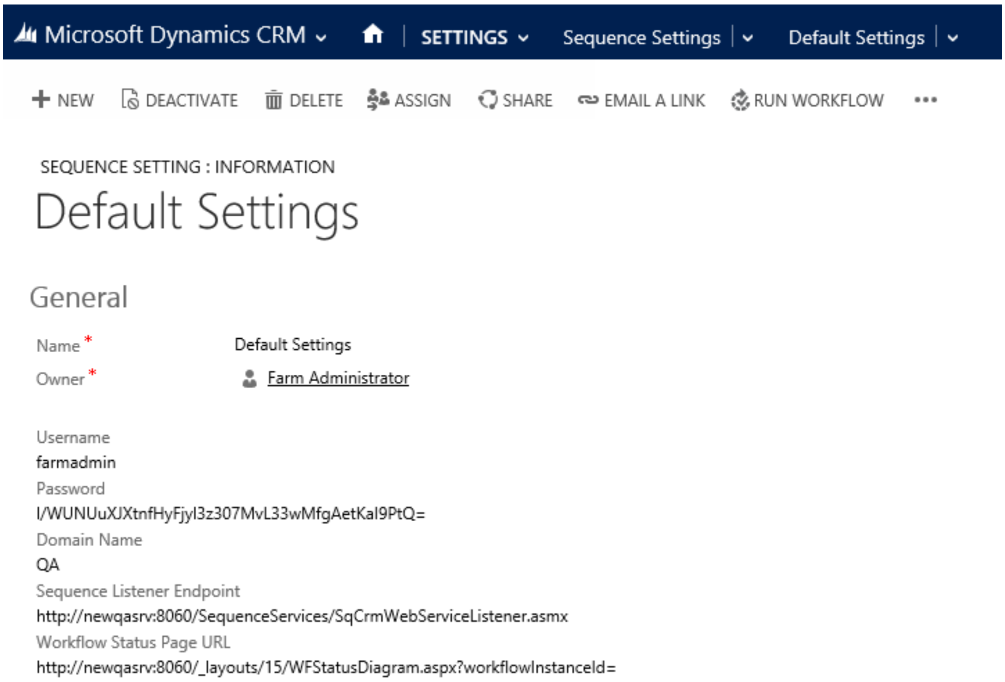
Sequence Entities

Note: You can configure which of these entities appear on which CRM tabs (e.g. Sales, Marketing, etc.), using the Settings > Customizations > Customize the System settings.



Where to Display Sequence Entities

5. Click **Sequence Settings** and from the top ribbon click **New**. A Sequence Settings window appears (called “Default Settings” by default).



Sequence Settings

6. Enter the connection details to your Sequence Administration environment as follows:
   - **Name:** The name of the connection to the Sequence environment. It is recommended to use the default name: Sequence Kinetics. (If you add additional connections, you must provide a unique name for each connection.)
   - **Username:** Enter the Sequence user who will have permissions to edit and run Sequence processes.
   - **Password:** Enter the above user's password in Sequence in encrypted format. To encrypt your password, please download the Encryption tool from our Sequence Toolkit.
     Note: Please use this encryption tool and not a different one.
   - **Domain Name:** the Domain of the Sequence server.
   - **Sequence Listener End Point:** Enter the URL of the Sequence Listener End Point as follows:
     <your Runtime Server URL>/SequenceServices/SqCrmWebServiceListener.asmx
   - **Workflow Status Page URL (for Dynamics CRM 2013, 2015 only):** In order to be able to view the Sequence workflow status, enter the following URL:

     http://SERVERNAME:PORT/_layouts/15/WFStatusDiagram.aspx?workflowInstanceId=

     If Sequence Flowtime is not on SharePoint 2013, do not insert '15' after '_layouts'.

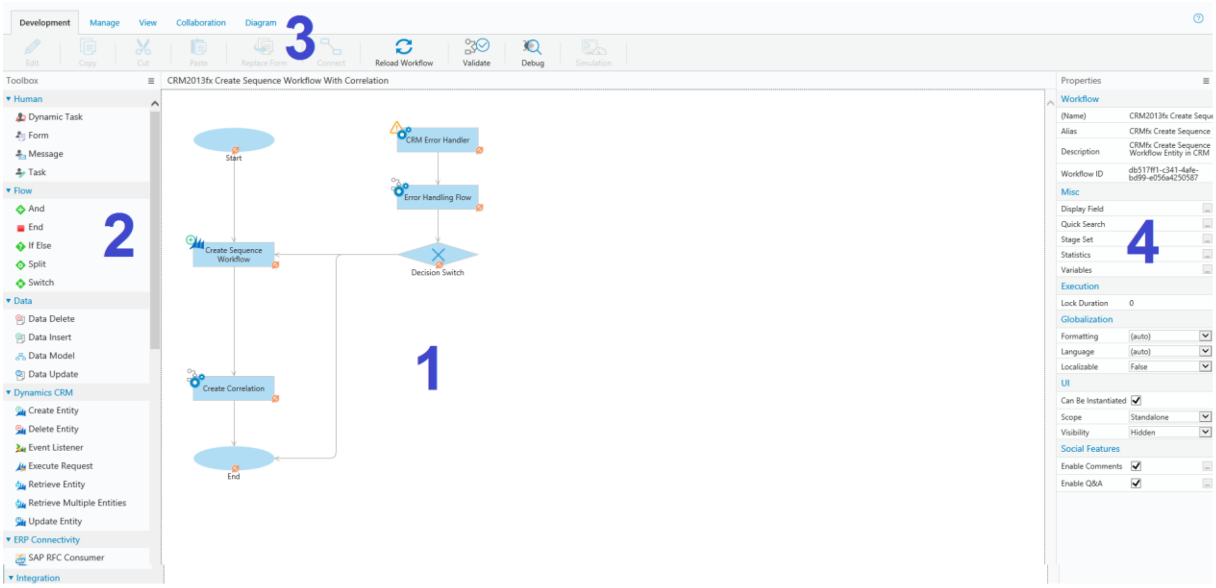
     The easiest way to obtain the correct URL is to open the Workflow status window in Flowtime and copy-paste the URL (delete all unnecessary parts).
     Note: When the 'Workflow Status' option is selected in CRM, the Sequence workflow instance ID will be concatenated to the URL.

Designing a Workflow Application in Sequence App Studio

Sequence's App Studio enables you to design complex, intelligent workflow applications.

The App Studio includes (numbered below):

1. A visual canvas where you can drag-and-drop activities.
2. A toolbox of activities (Human, Flow, CRM-related, and additional Integration) you can add to your workflow.
3. A top ribbon which helps you manage and organize your workflow.
4. A properties area to view and edit workflow/activity properties.



App Studio

The workflow above is an example of an intelligent workflow which executes a series of actions within an organization for a customer on-boarding process. Click here to watch a demo of this process.

For instructions on how to use the App Studio to create workflows, see the following resources:

Creating Business Processes in Sequence

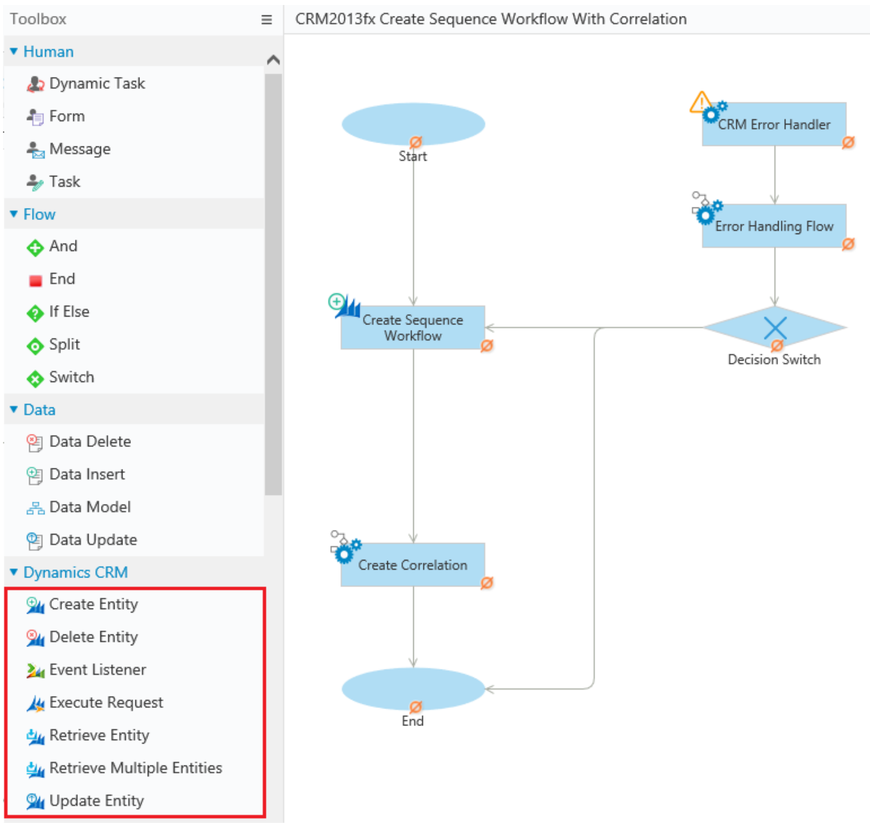
Getting Started Developing Workflows

CRM Activities

The App Studio includes a set of out-of-the-box activities for integration with Microsoft Dynamics CRM. These activities enable you to create, retrieve and edit CRM entities, and execute CRM actions. This functionality makes it easy to create complex business processes for Dynamics CRM, and business processes which leverage CRM data.

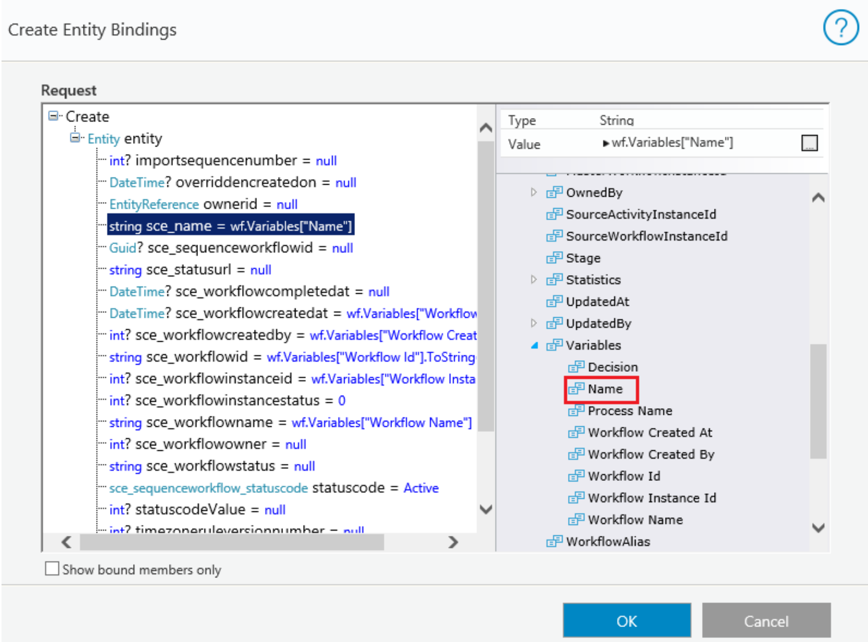
The following activities are available from the App Studio toolbox (click each activity for more details on how to use it:

- Create Entity: create a new CRM entity (e.g. lead, account, contact)
- Delete Entity: delete a CRM entity
- Execute Request: execute any CRM action (e.g. assign owner)
- Retrieve Entity: fetch a CRM entity as an object
- Retrieve Multiple Entities: fetch multiple CRM entities as objects
- Update Entity: edit a CRM entity
- Event Listener : listen to a native CRM workflow to start or resume a Sequence workflow



Dynamics CRM Activities

Each activity includes a step-by-step wizard which enables you to define how the process interacts with the CRM entity(ies) or action.



Creating a CRM Entity Using Data from the Workflow

Pre-built CRM Functions

PNMsoft SCE includes a set of pre-built CRM Functions, which are short workflows that perform common CRM tasks. This both saves you time and encapsulates functionality, helping you get started in building Sequence workflows for CRM, with ready-made building blocks. In many cases, you will want to incorporate these workflows as sub workflows from within your main workflow application.

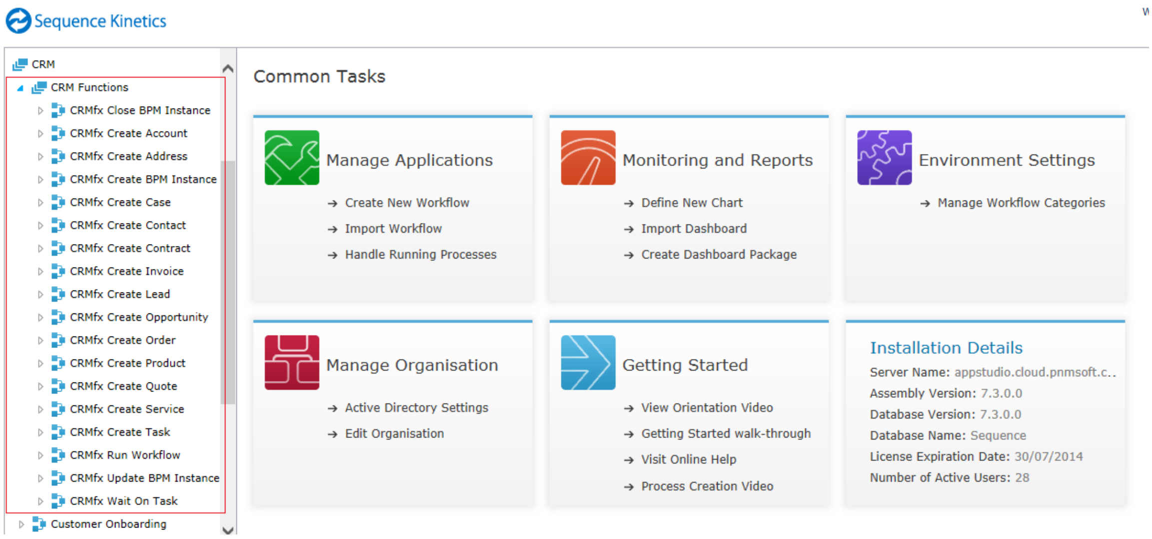
The following functions are available:

- CRMfx Create Account
- CRMfx Create Address
- CRMfx Create Contact
- CRMfx Create Contract
- CRMfx Create Invoice
- CRMfx Create Lead
- CRMfx Create Opportunity
- CRMfx Create Order
- CRMfx Create Product
- CRMfx Create Quote
- CRMfx Create Sequence Workflow
- CRMfx Create Sequence Workflow Correlation
- CRMfx Create Sequence Workflow Relationship
- CRMfx Create Service
- CRMfx Create Task
- CRMfx Error Handling
- CRMfx Run Workflow
- CRMfx Update Sequence Workflow

- CRMfx Close Sequence Workflow

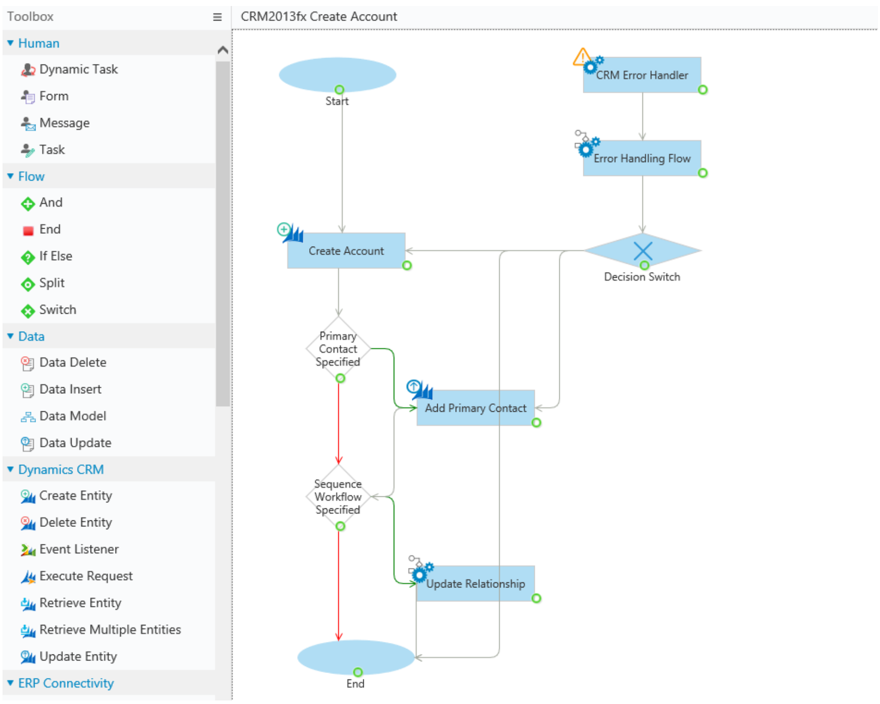
Note: It is recommended not to edit the CRM Functions. If necessary, you can create copies (new versions) of these functions and customize them.

You can access and browse the pre-built CRM workflows from the **Administration > Workflows > CRM > CRM Functions** menu:



CRM Functions Menu

Here is an example of a CRM Function which creates an Account record:



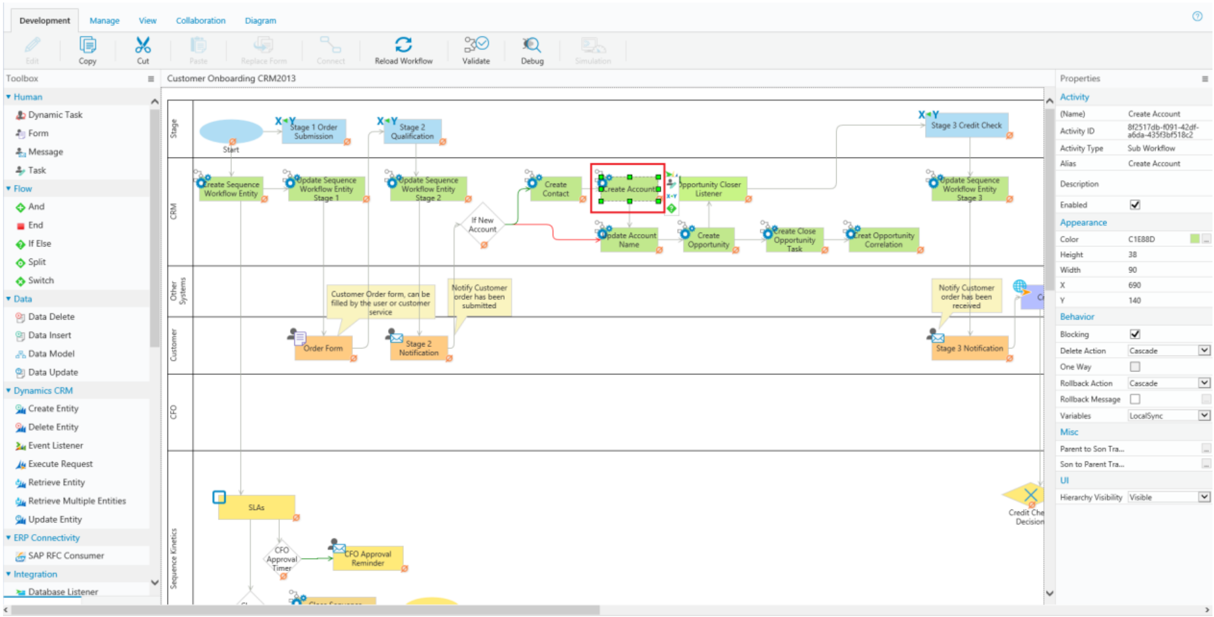
CRMfx Create Account

Notice that this CRM Function is comprised of several CRM activities (e.g. Create Account, Update Entity), in addition to several other Sequence activities. That is because this workflow does more than just create an Account record, it also performs the following useful activities:

- Adds a Primary Contact if specified.
- Conducts Error Handling, including sending a message to the user if an error occurs.
- Updates the Sequence Workflow instance within the CRM.

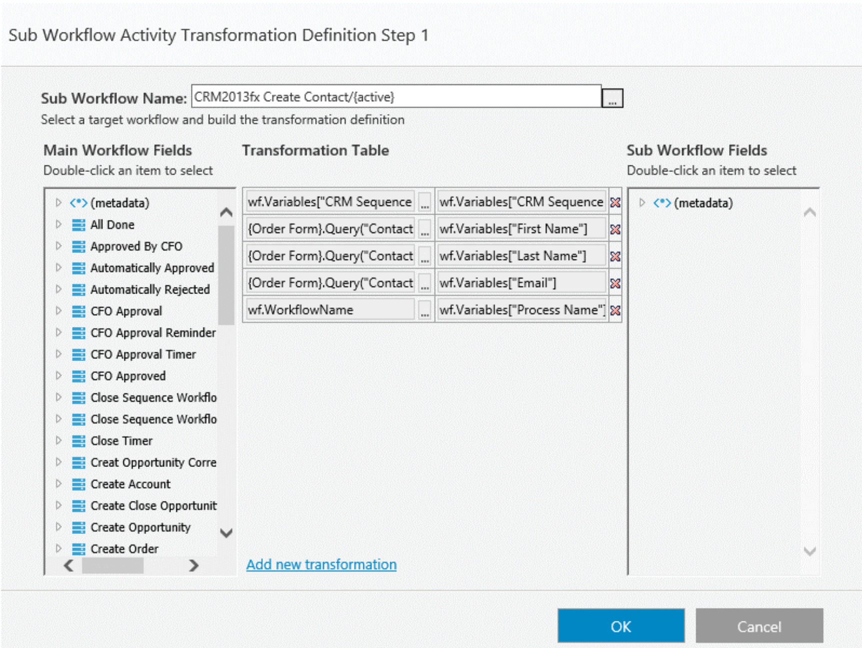
To add a CRM Function to your main workflow application:

1. From your main workflow application Toolbox, click **Sub Workflow**.



Add a Sub Workflow

2. Complete the Sub Workflow wizard, which enables you to select the CRM Function and define its connections with the main workflow. [Click here](#) for more detailed instructions on how to define Sub Workflows.



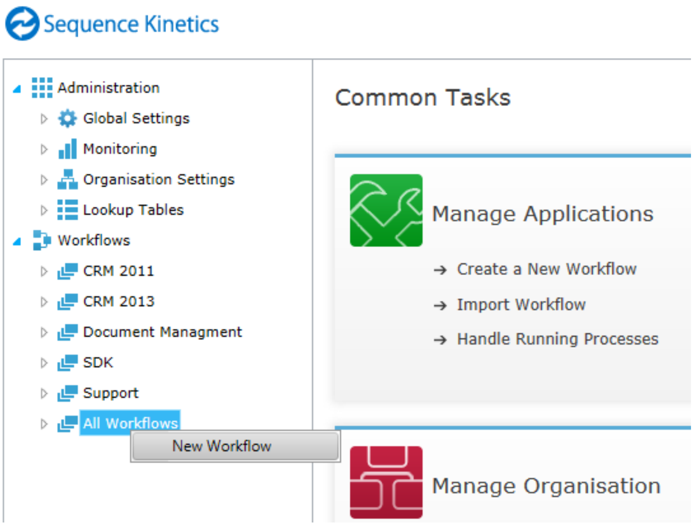
Example Exercise #1: Web Lead-to-CRM

In this basic example, you will create a Sequence Workflow for the following CRM scenario:

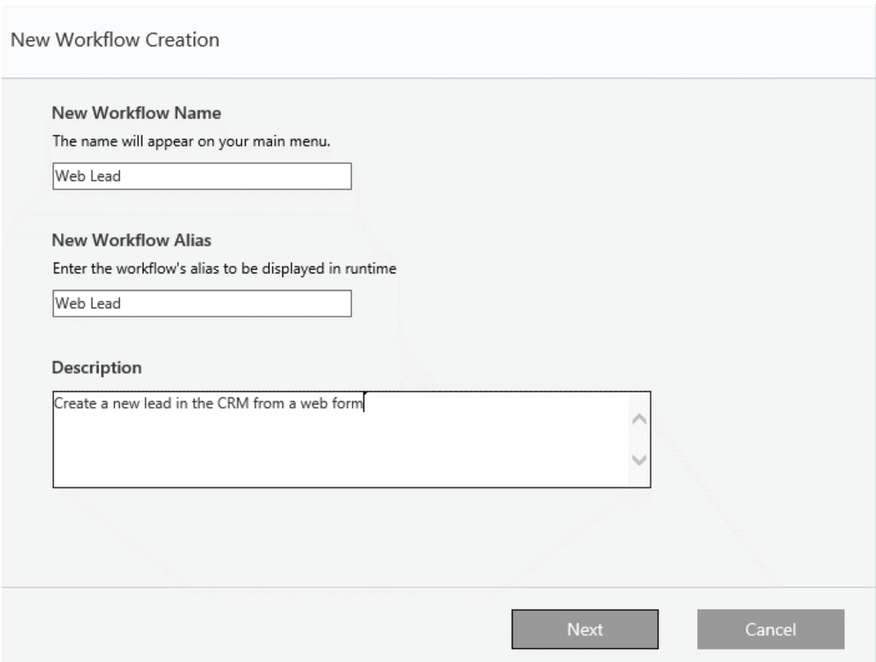
A potential customer completes a web form. This kicks off a Sequence workflow which creates a new Lead Entity in the CRM, and notifies a salesperson that a new lead exists.

Complete the following steps:

1. In Sequence Administration, create a new workflow called: Web Lead.

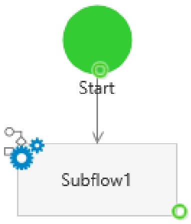


Sequence Administration > New Workflow

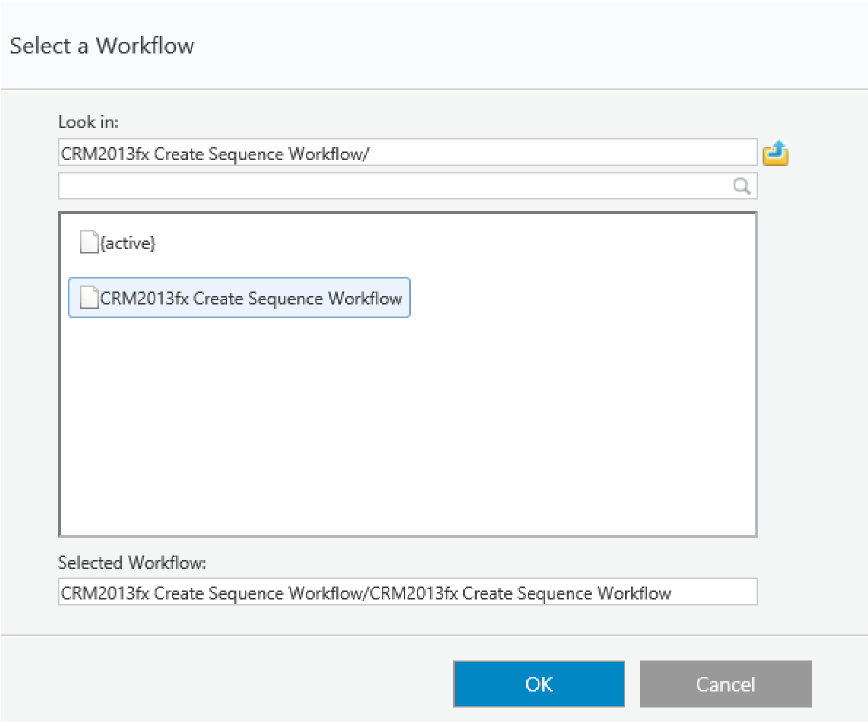


New Workflow "Web Lead"

2. Add a Sub Workflow to this workflow, and select the CRMfx Sequence Workflow as its source. (While not mandatory, this step is a best practice and will enable you to view the Sequence workflow status within CRM).

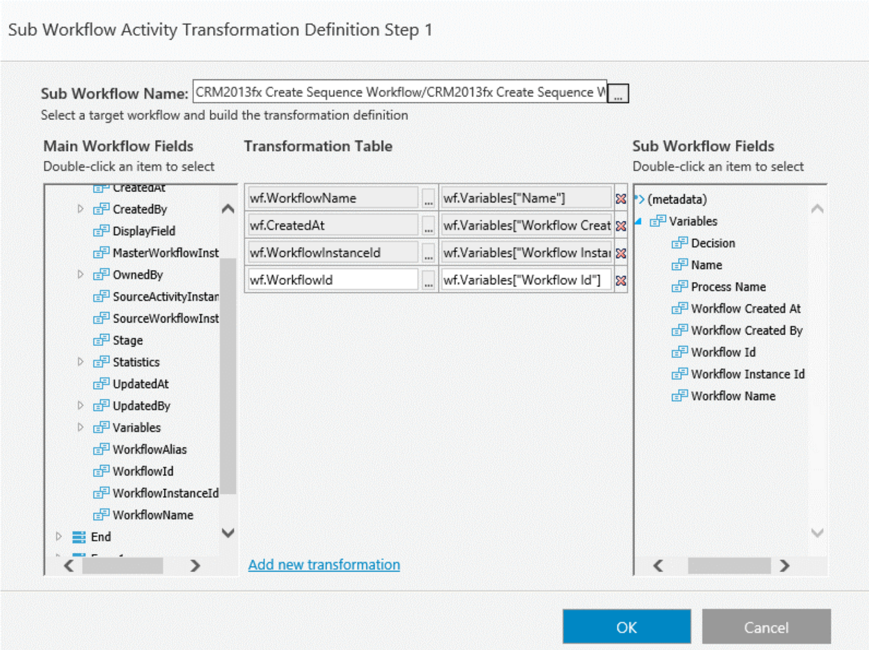


Add Sub Workflow



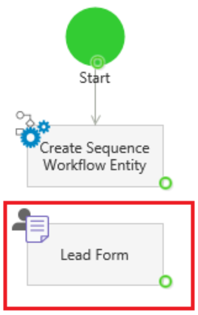
Select a Workflow "CRMfx Create Sequence Workflow"

Map relevant status fields from the Sequence Workflow to the Sequence Workflow Entity in the CRM:

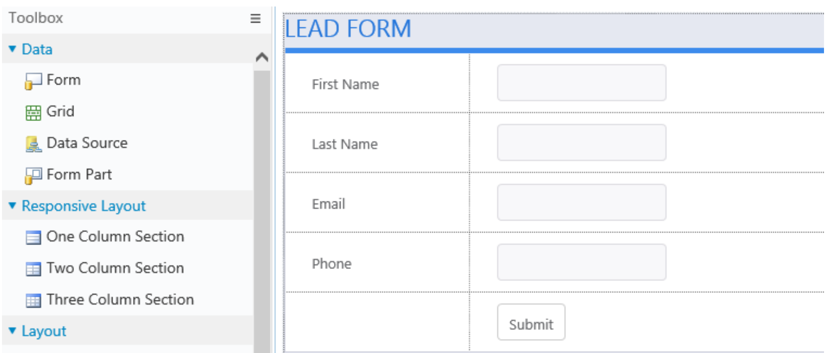


Mapping Sequence Workflow Entity Fields

3. Add a Form to this workflow, with the fields:
   - First name
   - Last name
   - Email
   - Phone



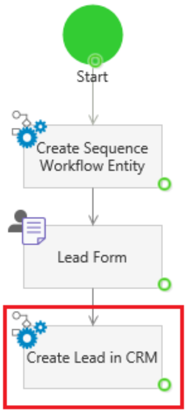
Add Lead Form to Workflow



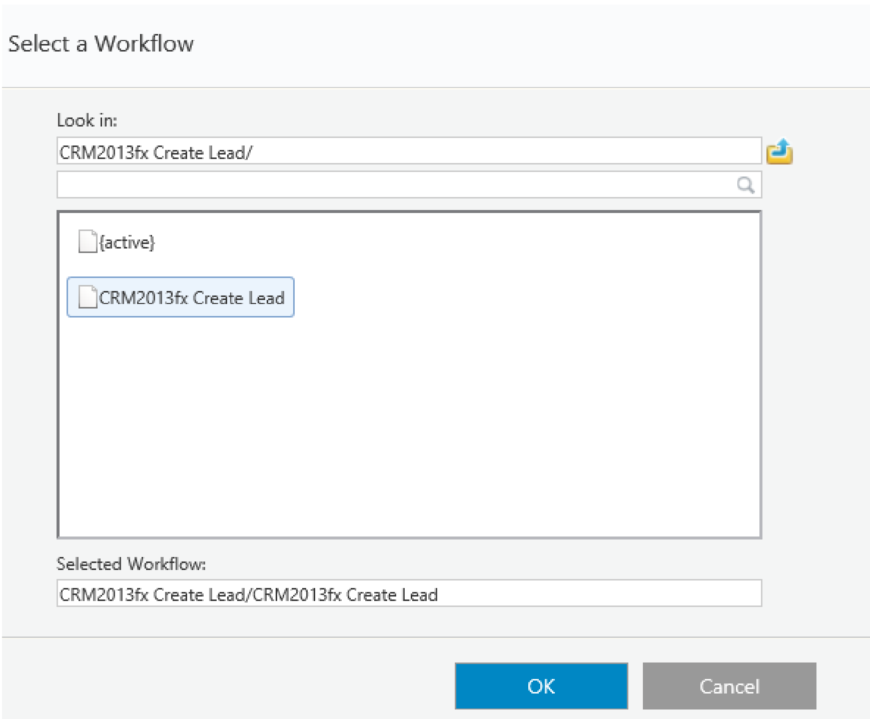
Lead Form – Add Fields

4. Add a Sub Workflow activity to the workflow. Edit the Sub Workflow and select the CRMfx Create Lead workflow.

   Note: This function creates a lead entity in the CRM and also performs Error Handling if necessary. Alternatively, you could have added the CRM Create Entity activity instead, but then you won't have the additional error handing. Also, using the CRMfx functions, the connection to the CRM is pre-defined automatically.

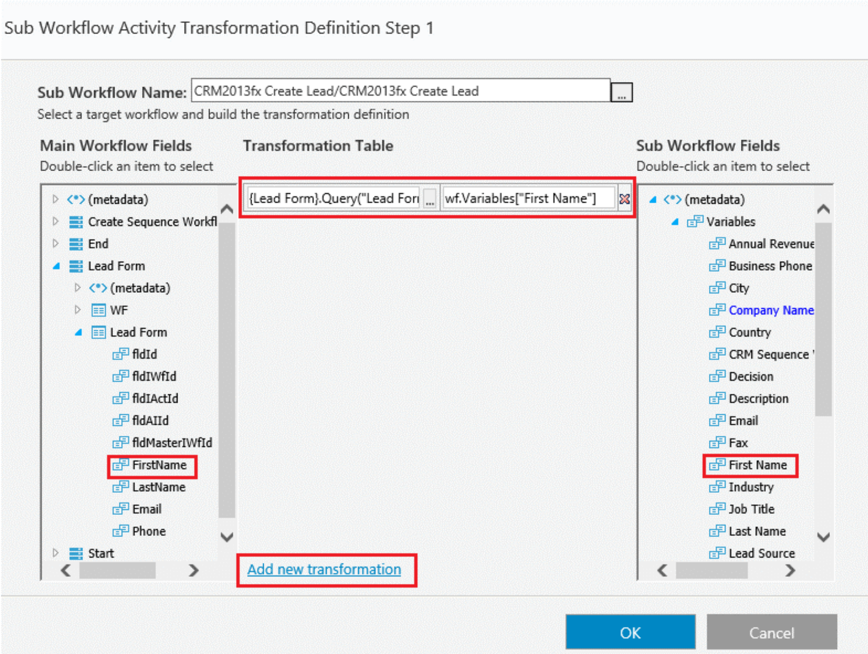


Add Sub Workflow

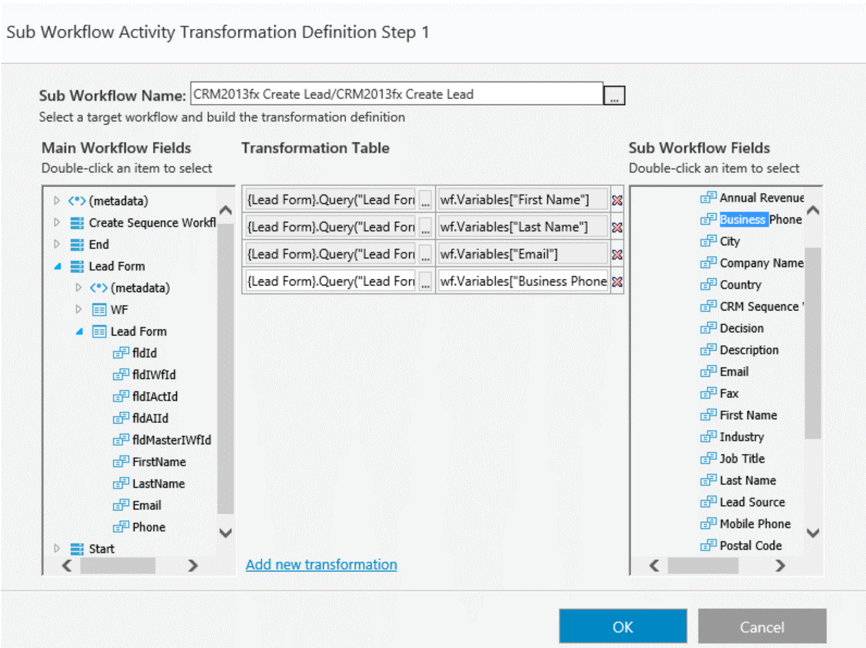


Select the Workflow "CRMfx Create Lead"

5. Click **Add new transformation** to define the bindings between the main workflow and the sub workflow. Map First Name to First Name, Last Name to Last Name, etc. In this way, map the web form fields to the CRM Lead entity fields.

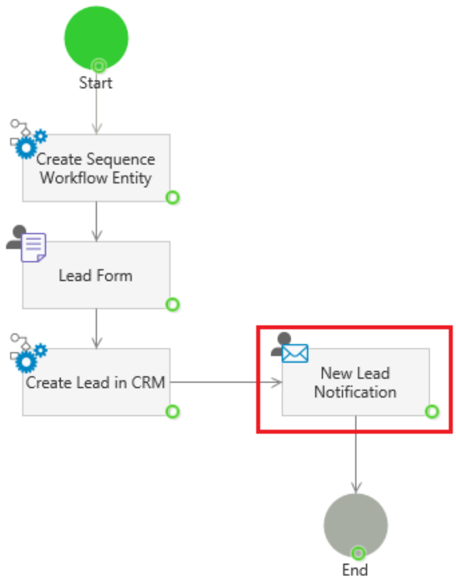


Sub Workflow Activity Transformation Mappings

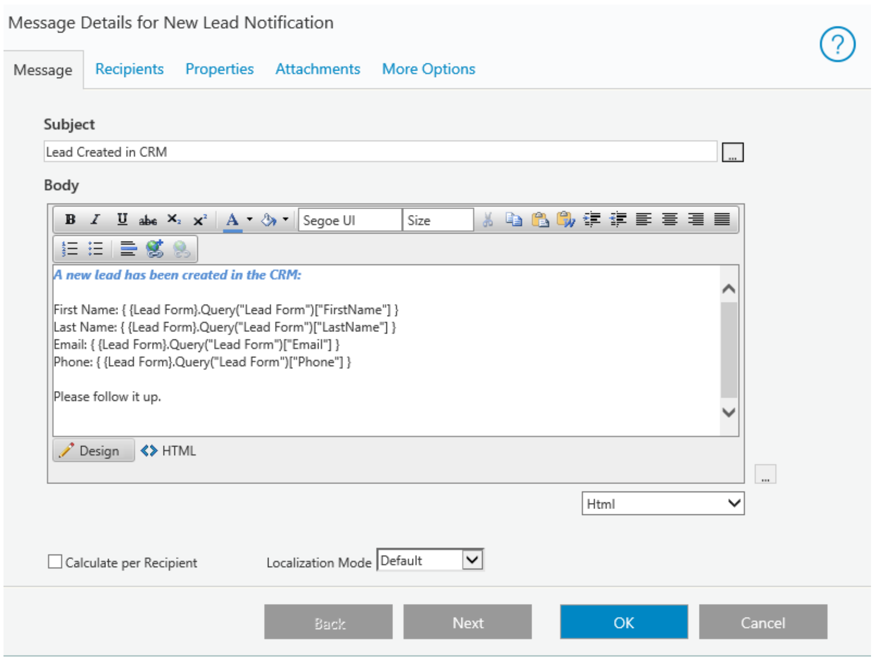


Sub Workflow Activity Transformation Mappings Complete

6. Add a new Message activity to the workflow, notifying a salesperson that a new lead has been created in the CRM. Edit the Body of the message to include the Lead fields.



Add Message Notification

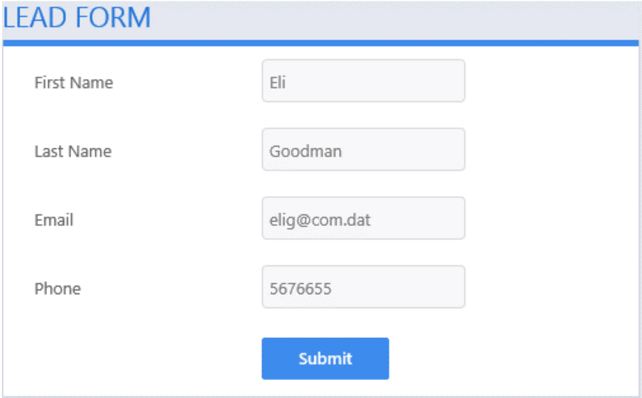


Message Details

Your Web Lead-to-CRM workflow is complete.

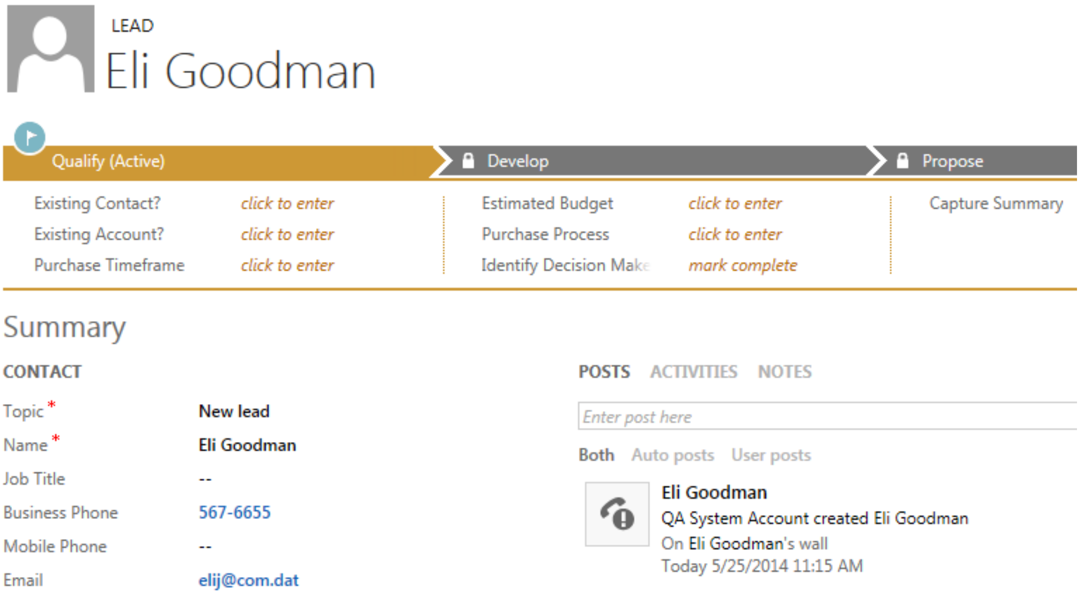
Now add permissions and run the workflow in Sequence Flowtime.

Complete a lead form:



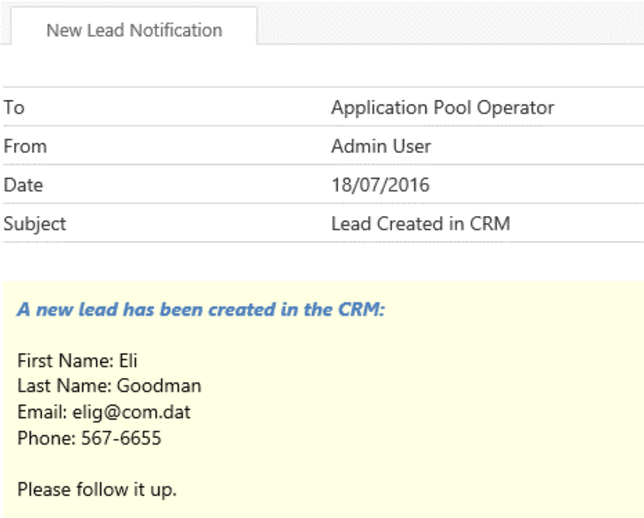
Web Lead Form – Enter Lead Details

Verify that a new Lead record is created in your CRM:



New Lead Created in CRM

Verify that a message has been sent to the salesperson:


New Lead Notification

To	Application Pool Operator
From	Admin User
Date	18/07/2016
Subject	Lead Created in CRM

A new lead has been created in the CRM:

First Name: Eli
Last Name: Goodman
Email: elig@com.dat
Phone: 567-6655

Please follow it up.

Message to Salesperson

Note: We have kept things simple for this example by running the Form within Sequence, but you can easily embed this form inside any web application, and use a Web Service Listener activity to kick off the Sequence workflow when the form is completed.

Example Exercise #2: Assign Lead Owner

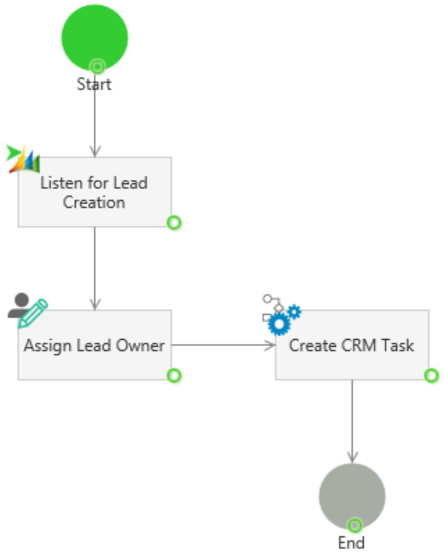
In this more advanced example, you will create a workflow for the following scenario:

A lead is created in the CRM. Sequence listens to this event. When it occurs, Sequence sends a task to a manager to assign a new owner (e.g. a salesperson) to the lead. Sequence creates a CRM task activity for this salesperson to follow up on the lead.

Since the scenario begins with a CRM event (a new lead), you need to create a CRM native process which is imitated by this event. This native process will then call the Sequence workflow.

Complete the following steps:

1. Create a new Sequence Workflow called ‘CRM Leads Management’. Add the following activities to it:
   - CRM Event Listener (there is no need to define this activity, it has no configuration options. It just waits for the native CRM process to call it).
   - A Task activity: “Assign CRM Owner” (see definition below).
   - A Sub Workflow which calls the function CRMfx Create Task (see definition below).

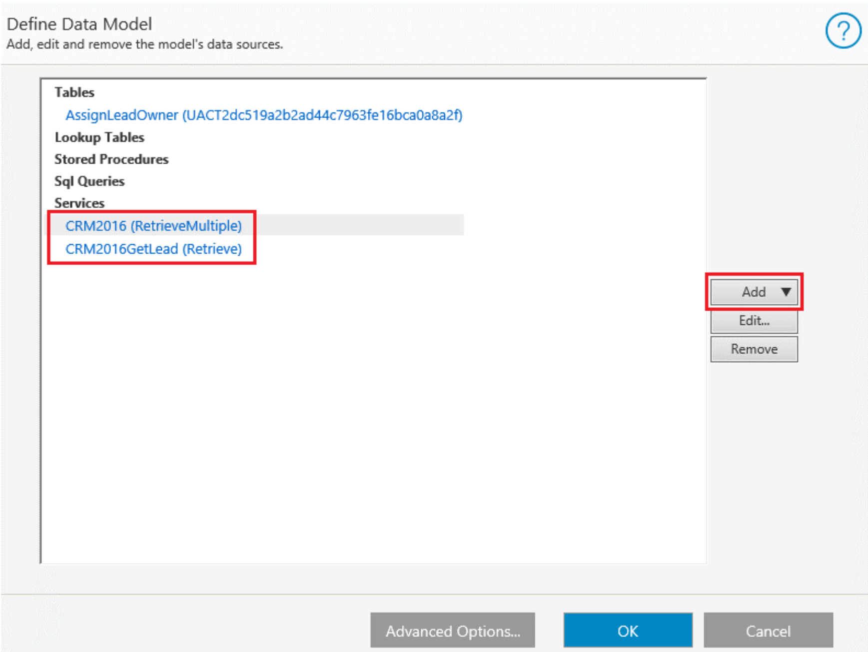


Sequence Workflow “CRM Leads Management”

2. Define the Assign Lead Owner task as follows:

   In the Task’s Data Model, add two Service Queries:

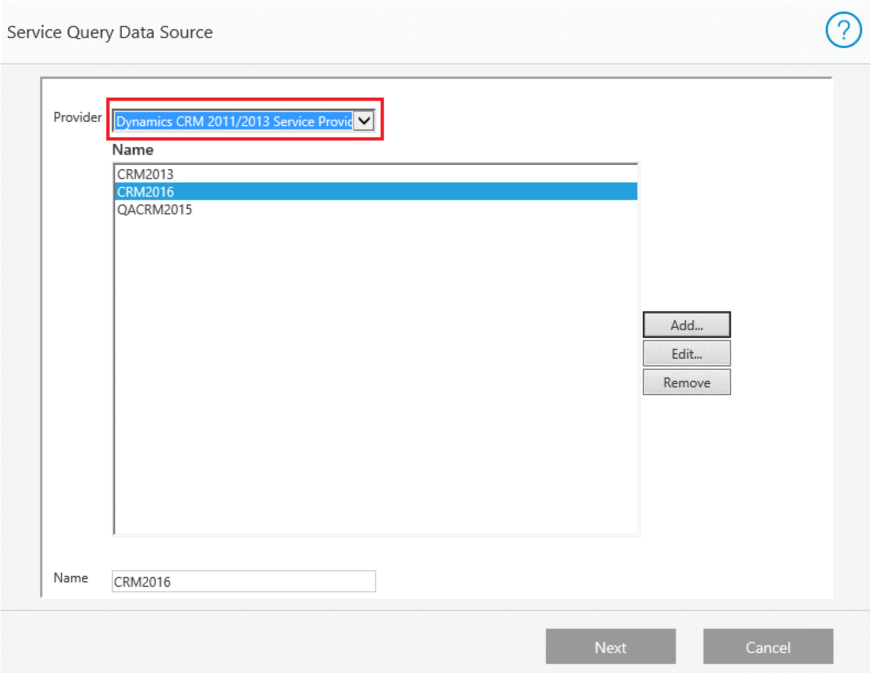
   - CRM2013GetLead: this query retrieves the lead entity fields.
   - CRM2013Retrieve Multiple: this query retrieves a list of CRM users (to which the lead can be assigned).



CRM Service Queries

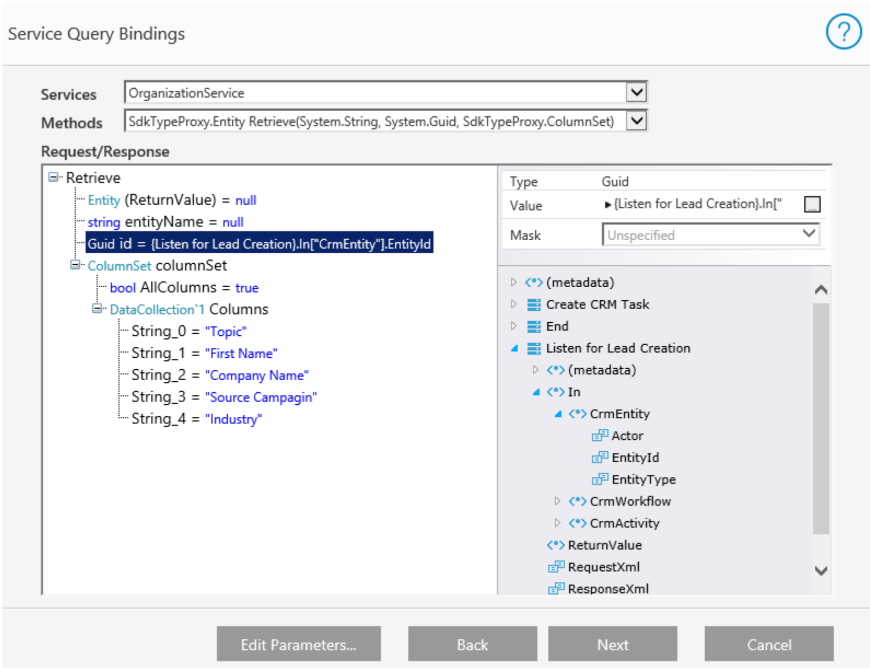
3. Define the query CRM2011GetLead as follows:

   Select the Provider: CRM2011.



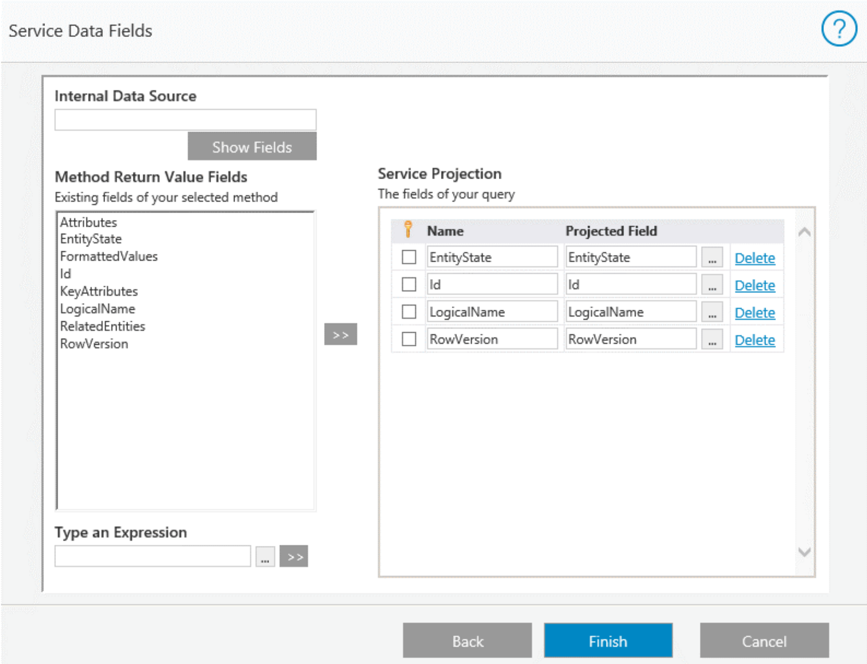
Define Query: Select Data Source

Select the Method: SdkTypeProxy.Entity.Retrieve, and define the bindings as follows:



Define Query: Service Query Bindings

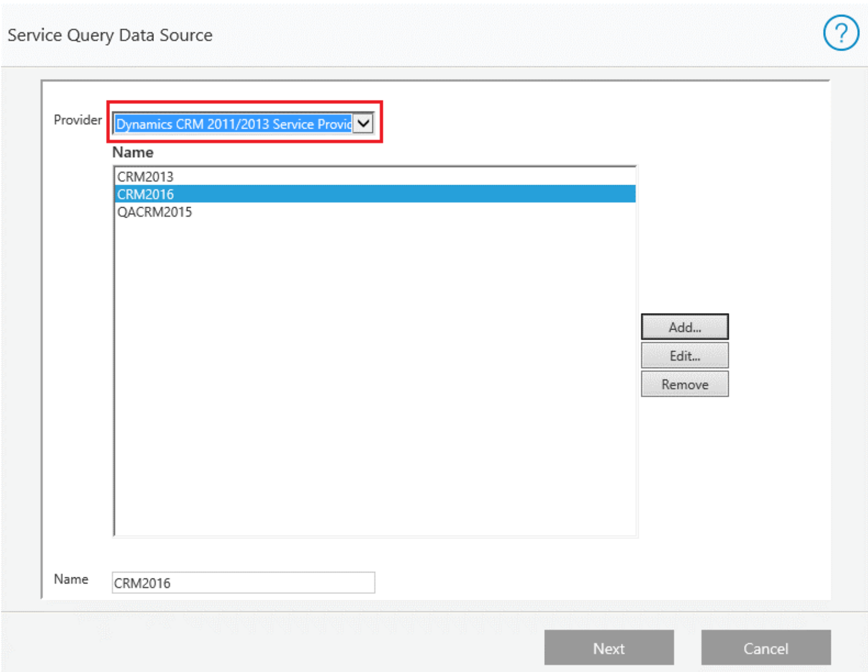
Define the Service Projections as follows:



Define Query: Map Service Projections

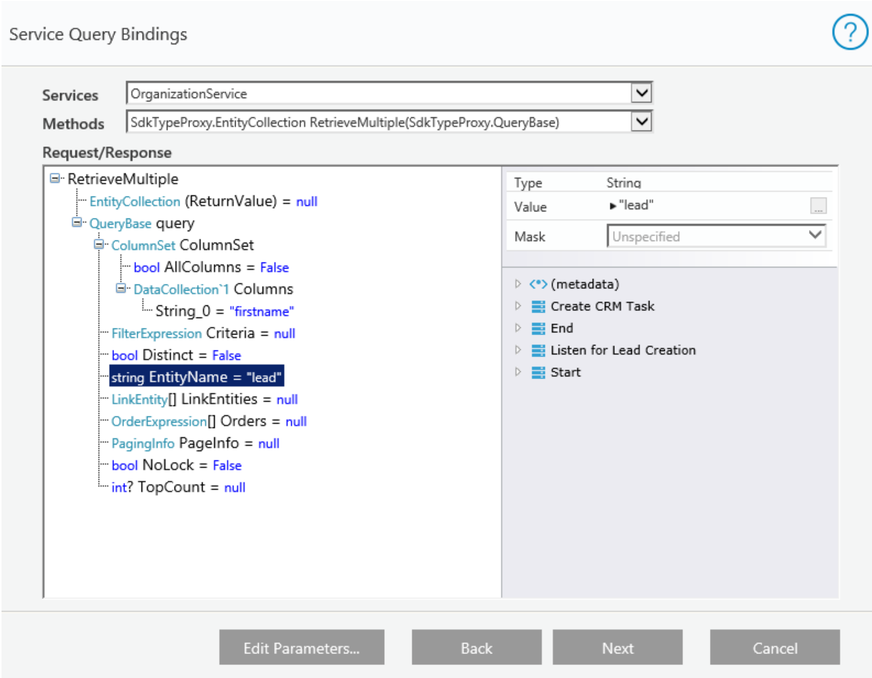
4. Define the query CRM2011 Retrieve Multiple as follows:

   Select the Provider: CRM2011.



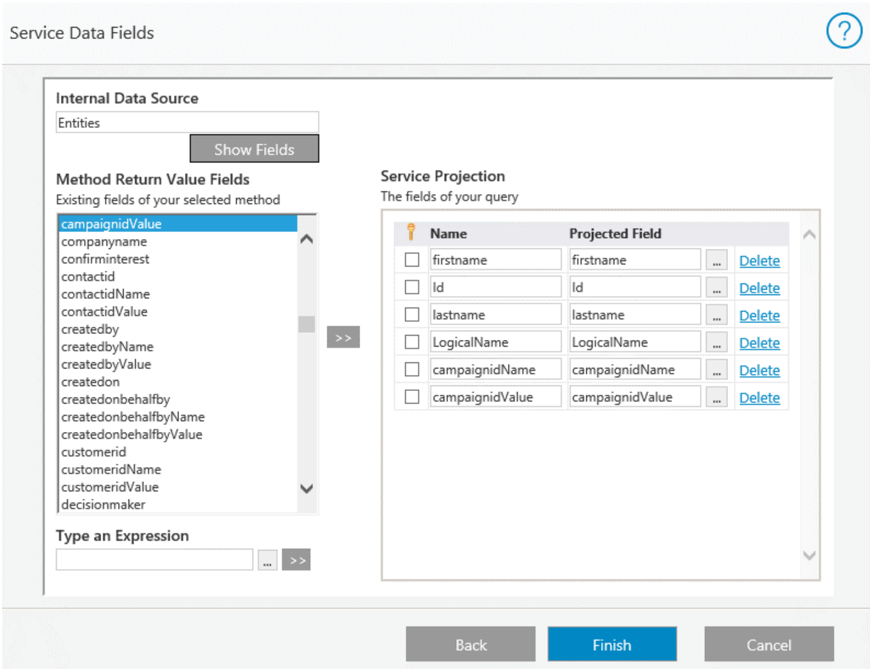
Define Query: Select Data Source

Select the Method: SdkTypeProxy.EntityCollection.RetrieveMultiple, and define the relevant bindings:



Define Query: Service Query Bindings

Define the Service Projections.
In the Internal Data Source, type: Entities and click **Show Fields**.
The entity's fields are displayed.

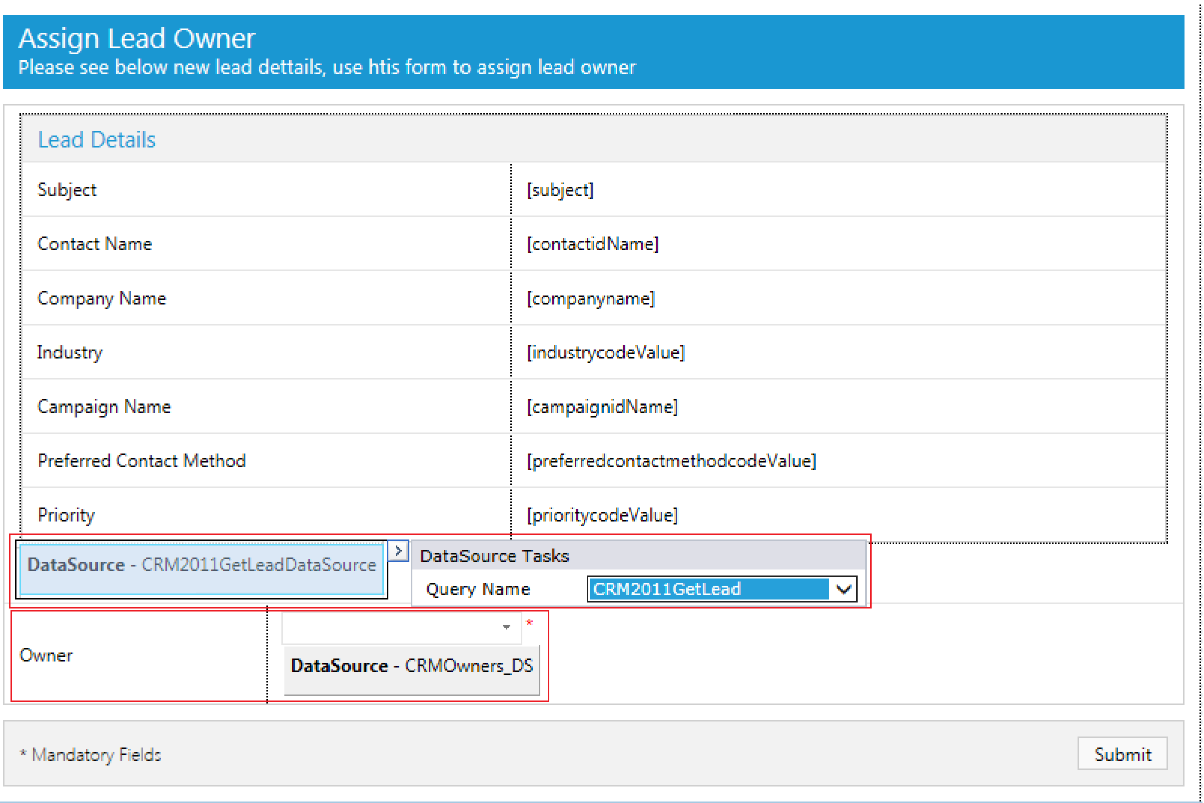


Define Query: Map Service Projections

5. Create the Assign Lead Owner Form. To the Data Model of the form, add a field called "Owner", of type list. In the list picker, select the Retrieve Multiple query.
6. Use UI Generation on the Get Lead query to create a read-only form which displays the lead.

7. Use UI Generation to build the Assign Lead Owner form.

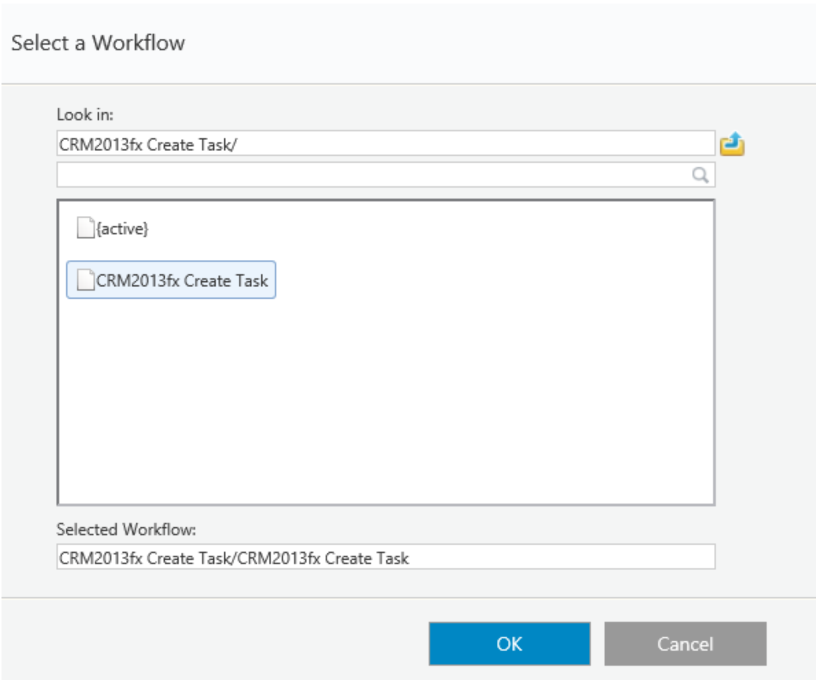
   The result should appear as follows:



Assign Lead Owner Form

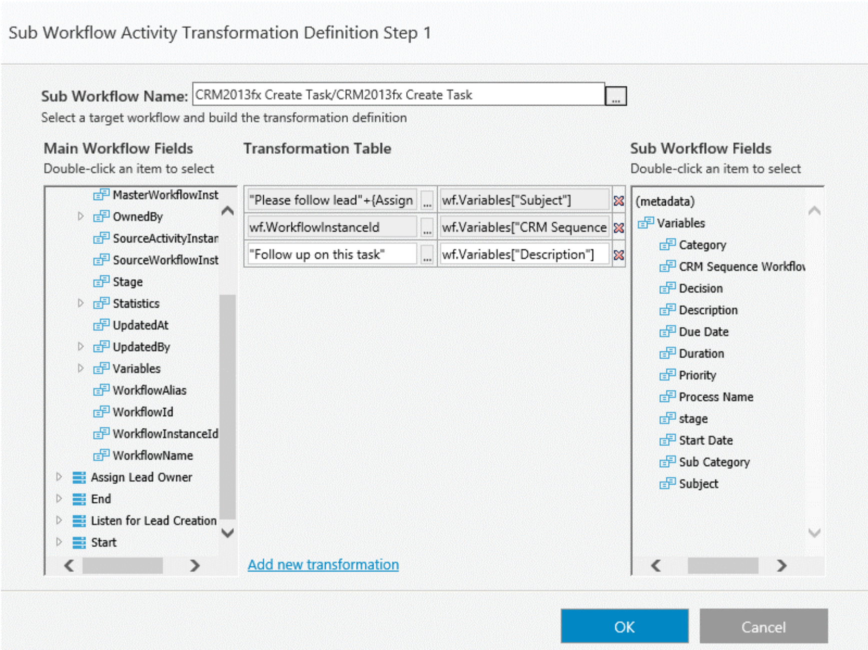
8. Define the Sub Workflow activity as follows:

   Set the source of the Sub Workflow as the CRMfx Create Task function:



CRMfx Create Task

9. Define the Transformation mapping:

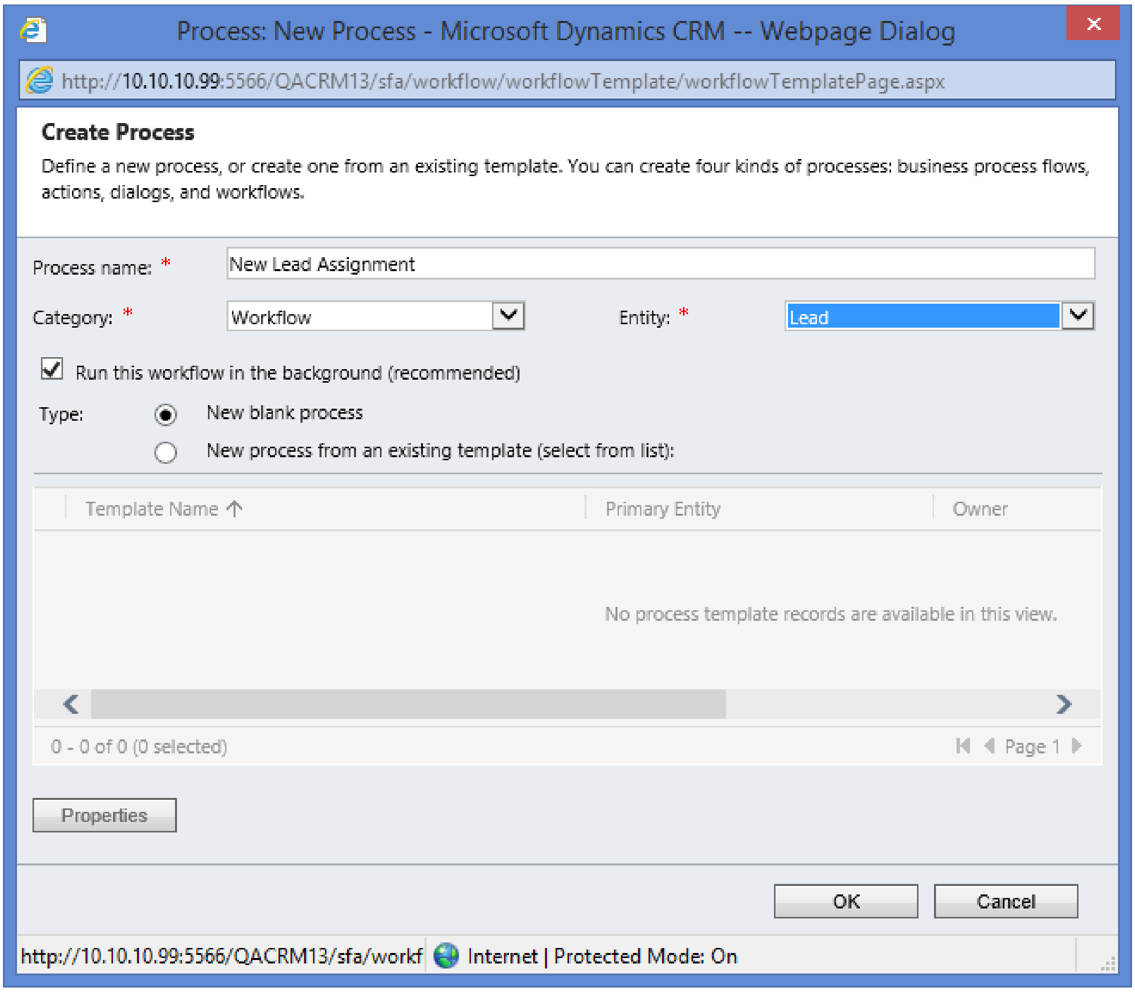


Transformation Mapping

Your Sequence Workflow is defined.

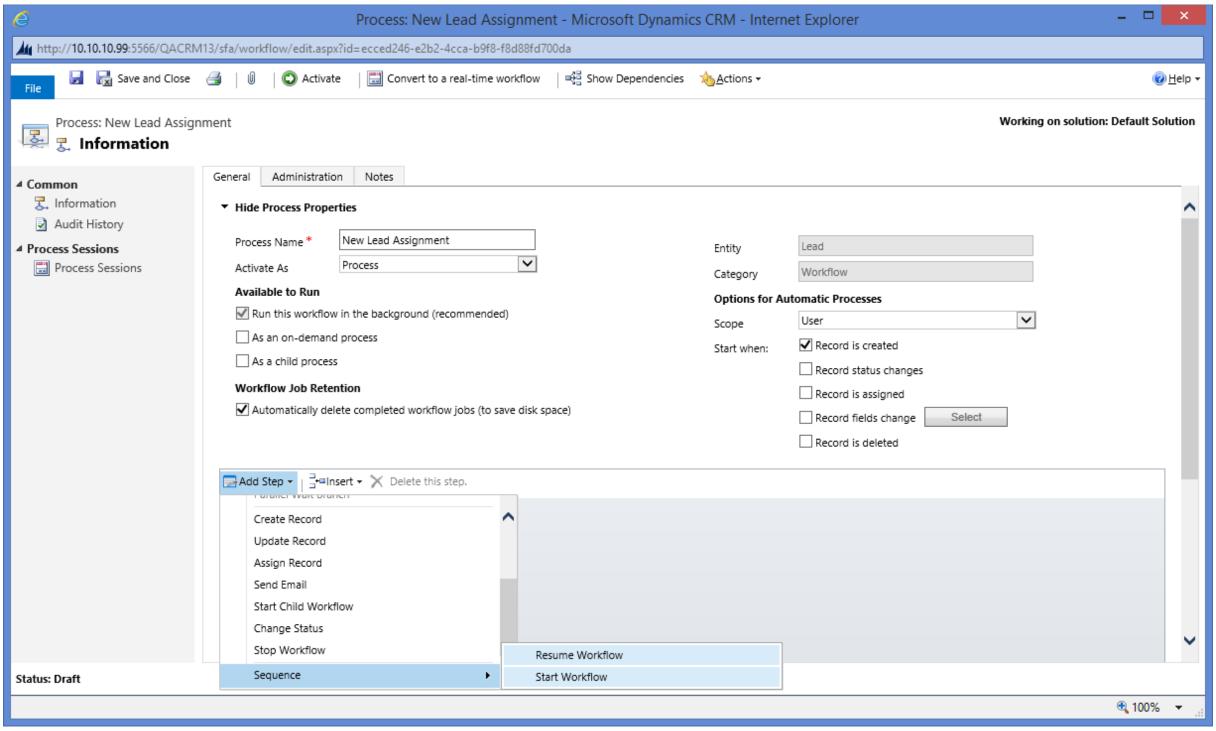
Now you must define the native CRM process which kicks off the Sequence Workflow when a new lead is created:

10. Create a CRM native process called New Lead, as follows:



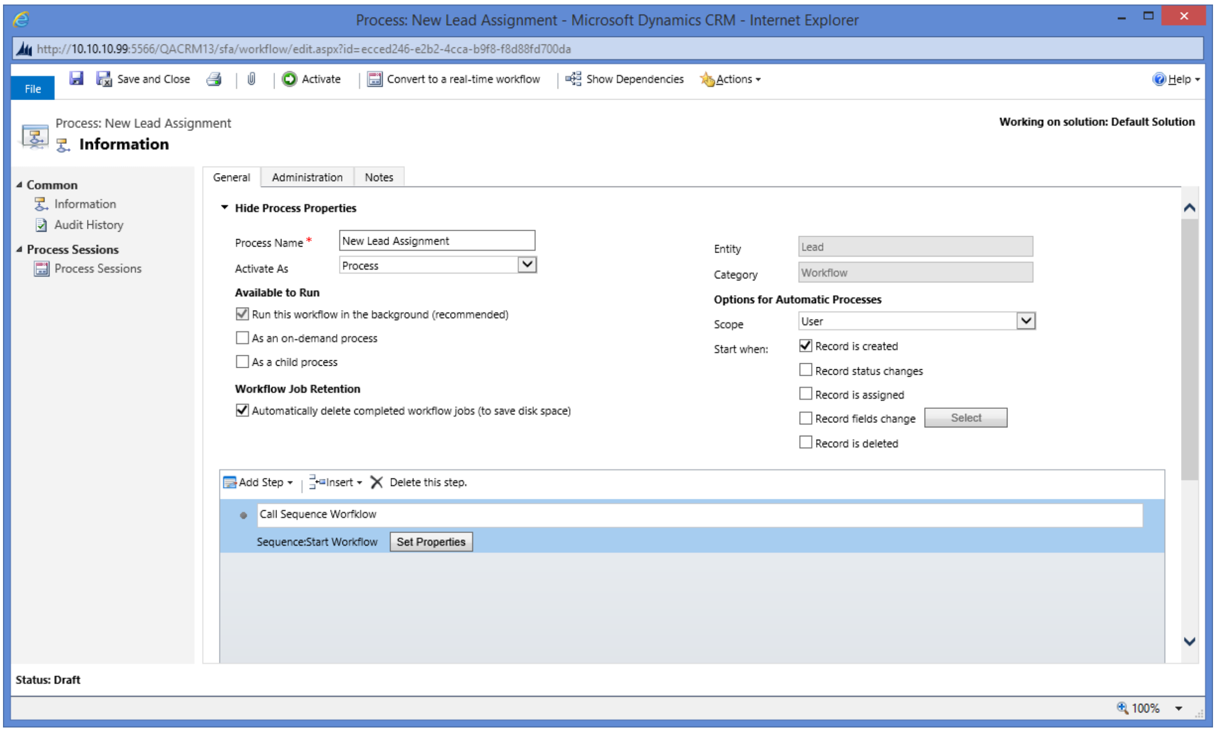
Native CRM Process "New Lead"

11. Set that the process is started when a new lead record is created, and set that the process calls and starts the Sequence Workflow:



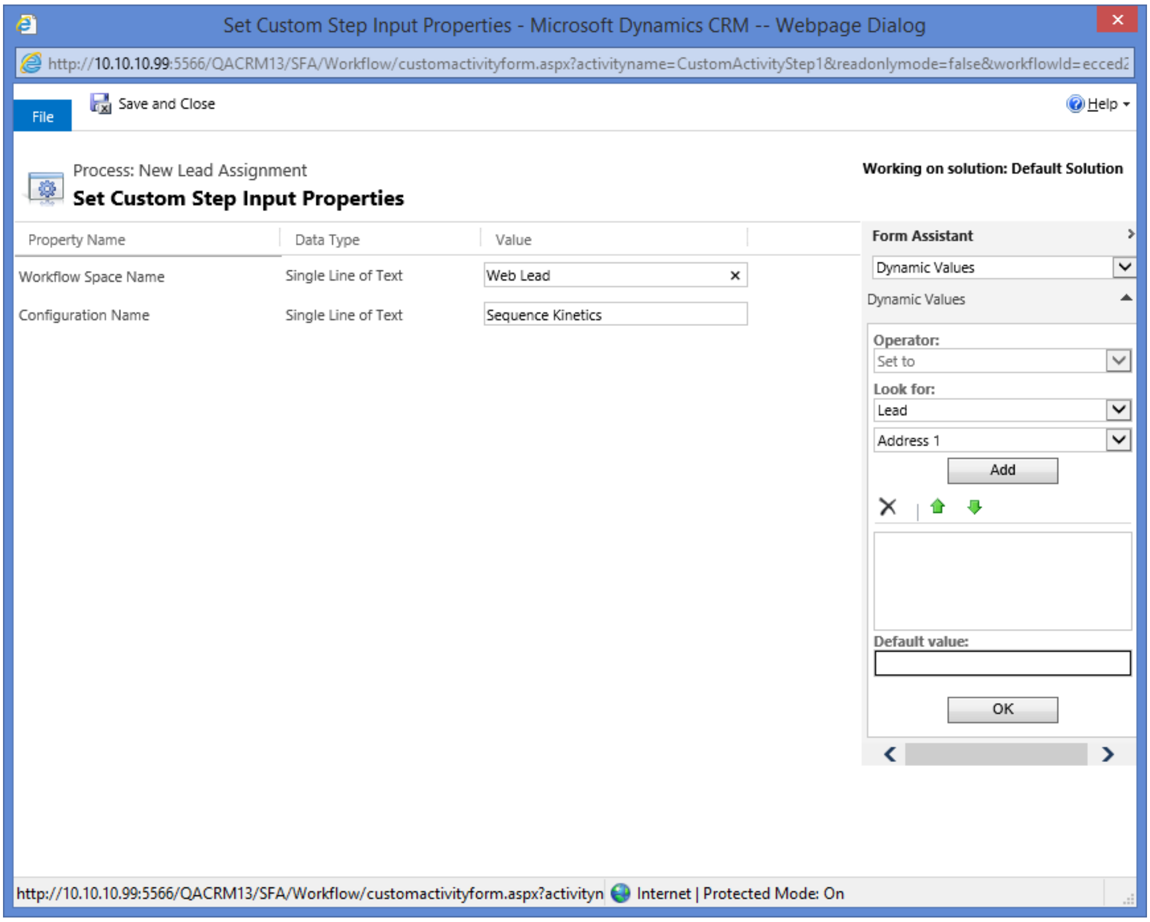
New Lead Process Properties

Click Set Properties:



Set Properties

In the Workflow Space field, enter the Workflow Space name (e.g. Web Lead):

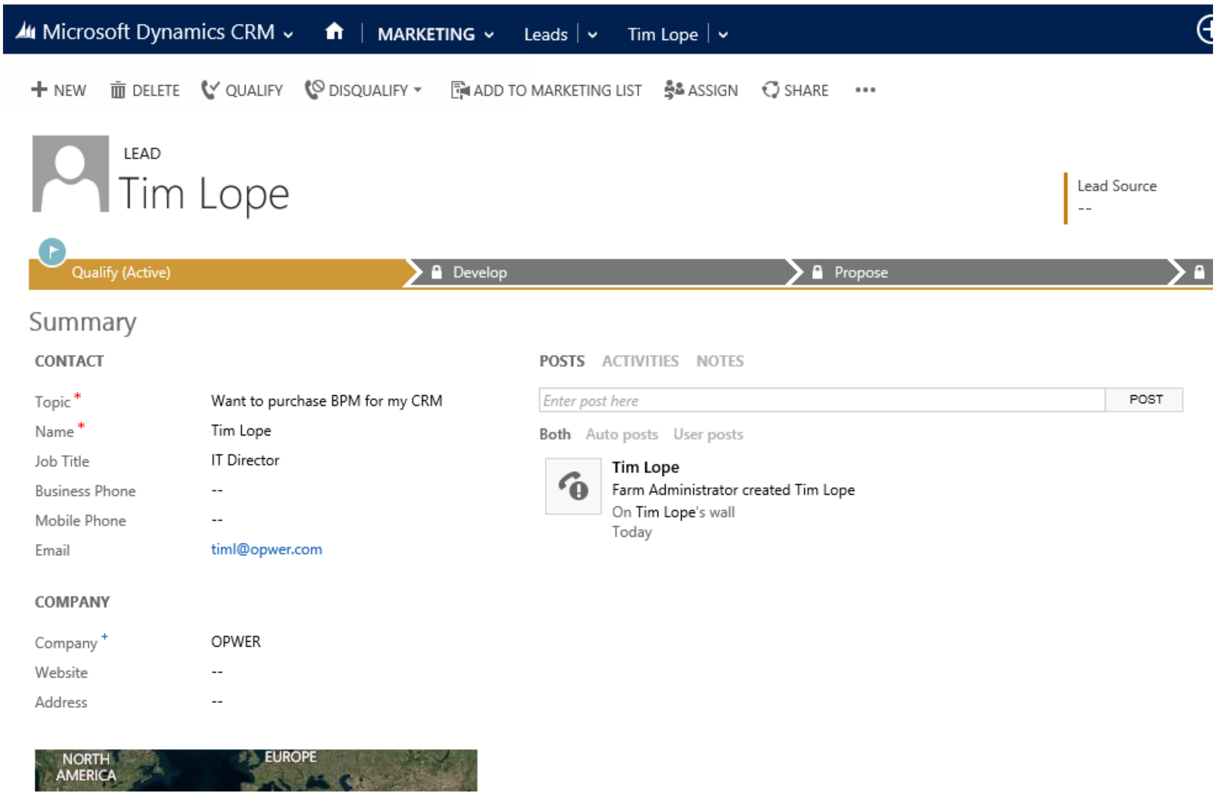


Set Properties > Workflow Space Name

Activate the CRM process.

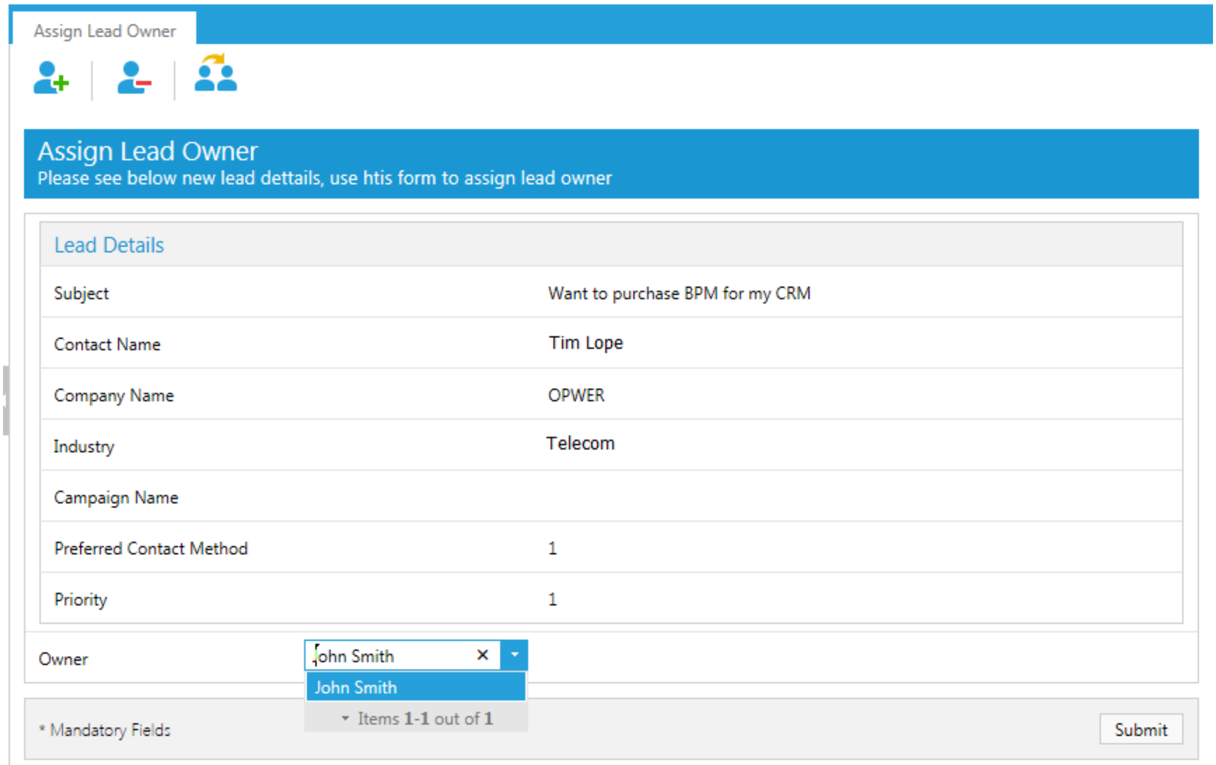
You’re done. Now, check your work:

Create a lead within CRM:



Create Lead in CRM

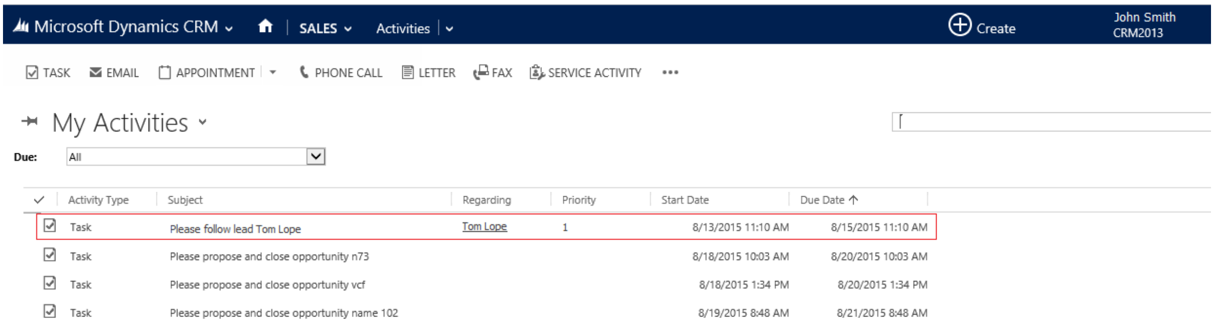
Check that the Sequence Workflow sends an Assign Lead Owner task to the manager.



Task: Assign Lead Owner

Have the manager select a new Owner to the lead and submit the form.

Verify that the owner of the lead has changed in the CRM, and that a CRM task activity is created for the new owner (within CRM):

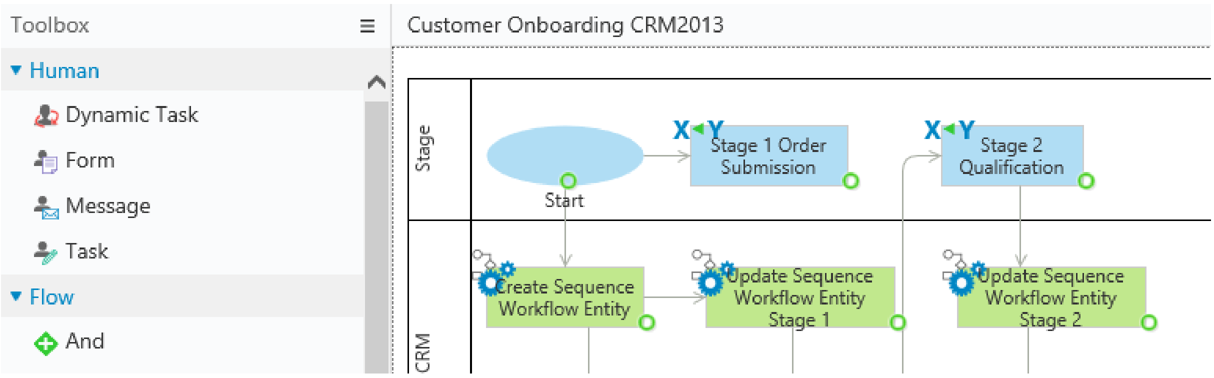


Task Activity Created within CRM

Best Practises for Designing Workflows in Sequence

It is recommended to use the following best practices when designing workflows in Sequence:

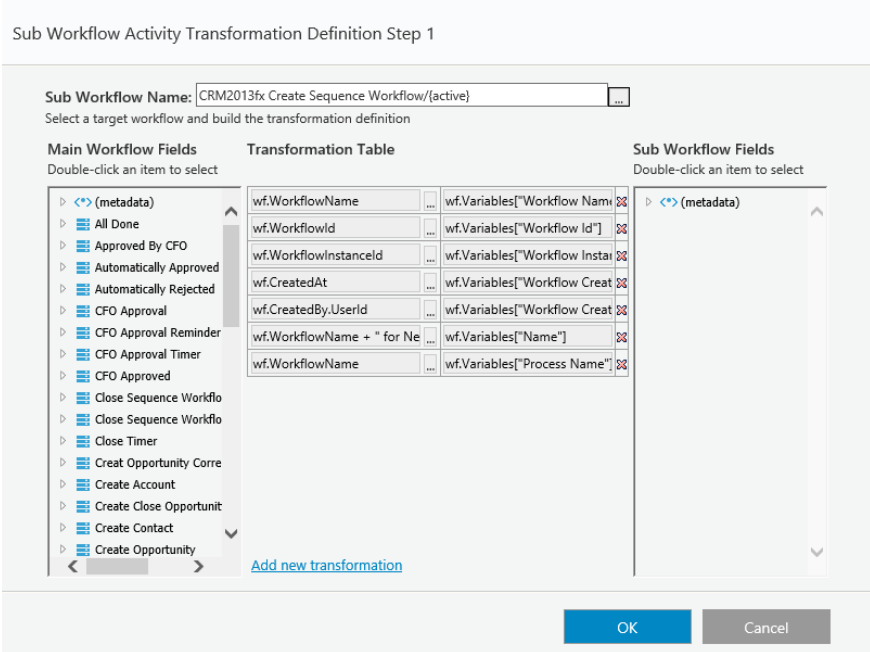
1. At the start of your main workflow, always add a CRM Function which creates a Sequence Workflow entity in the CRM. Without this, you cannot manage your Sequence Workflow within the CRM. You can use the following functions to accomplish this:
   - CRMfx Create Sequence Workflow
   - CRMfx Create Sequence Workflow with Correlation (use this when you have a CRM Event Listener in the workflow - see Appendix A for more details).



Create Sequence Workflow Function

2. Whenever you add a single CRM Activity to the main workflow, you must add Error Handling and Compensation for this activity. (Try to use the CRM Functions instead where possible, as they include built-in Error Handling and Compensation.)

3. When you create a Sequence Workflow Entity, transfer a meaningful name into the metadata variable 'Name' (in the *Sub Workflow Transformation* screen > Sub Workflow Fields), because this will be the display name of the Sequence Workflow in the CRM.



Workflow Name

4. In the main workflow, use CRMfx Update Sequence Workflow to update the Sequence Workflow Status with the current status of the workflow (use meaningful values for the status – e.g. 'Initiated', 'In Progress'). This status will be displayed in the CRM. If you have several Workflows, try to use a convention for Status values.
5. At end of the main workflow, update the Status to 'completed', and add CRMfx Close Sequence Workflow (it sets the Sequence Workflow as inactive in the CRM and gives it a completion date).
6. For each workflow, use only one Create Sequence Workflow activity, since you only need one instance of the Sequence Workflow entity in the CRM per main workflow.
7. Before you create a new workflow, decide where you want the tasks to be managed by the end users – in Sequence or in Dynamics CRM. If in Sequence, you will add Sequence Task activities to the workflow. If in CRM, you will add CRMfx Create Task activities. Decide on your Task Management strategy before building the workflow.
8. If you have sub processes that repeat themselves, encapsulate them as dedicated Sub Workflows that you can reuse.
9. If your main workflow has one CRM Event Listener, use CRMfx Create Sequence Workflow with Correlation at the beginning of the workflow.
10. If your main workflow has more than one CRM Event Listener, add a CRMfx Create Correlation for each one. If the CRM Event Listener is in a Loop, add CRMfx Create Correlation inside the Loop.
11. If your main workflow needs to be kicked off by Dynamics CRM, place a CRM Event Listener as the first activity of the workflow, connected to the Start activity.
12. If you want to edit a CRM Function, create a new version of it (a copy) and customize it as needed. Do not edit the original function.

Initiating Sequence Workflows

You can initiate and resume Sequence Workflows in several ways, including:

- Creating a native CRM Process which initiates/resumes the Sequence Workflow
- Using an external trigger to initiate/resume the workflow

This section will describe each of these methods.

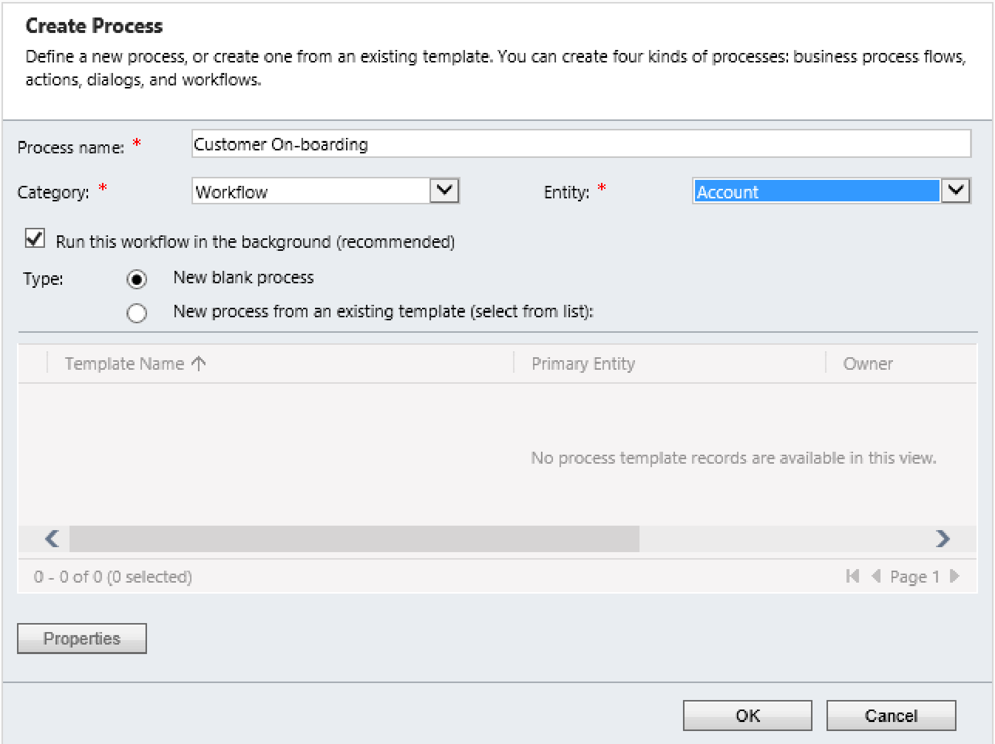
Initiating/Resuming via a CRM Process

CRM Processes are useful in that they can listen to events within the CRM and perform a set of actions when these events occur. Therefore, if your Sequence Workflow should be initiated/resumed when such an event occurs, you must create a short CRM Process to kick it off.

Note: The solution comes with a few basic CRM Processes which resume Sequence Workflows.

To initiate a Sequence Process via a CRM Process:

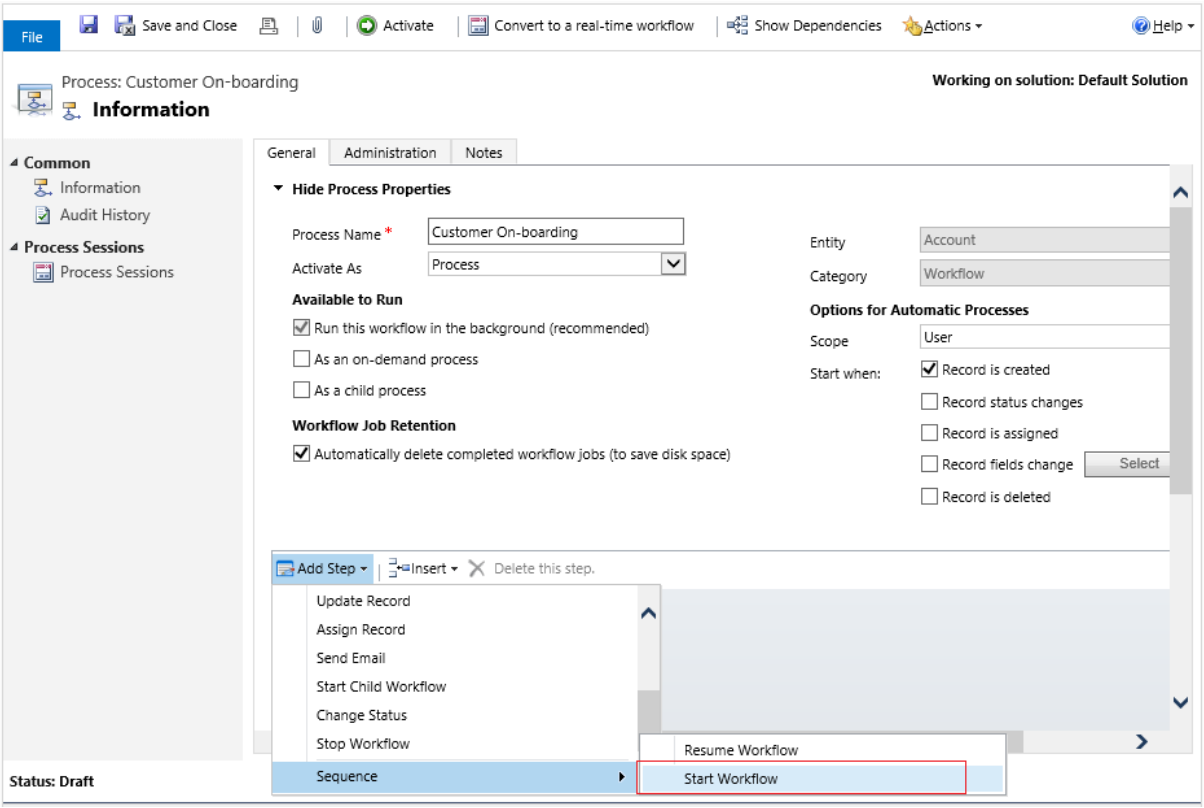
1. Create the CRM Process. Define this process as a workflow which will run upon a specific event (e.g. when an account is created).



Create CRM Process

2. In the CRM Process definition window, **Add a Step** and select:
   - **Sequence > StartNewWorkflow**: to start a new Sequence Workflow.
   - **Sequence > ResumeWorkflow**: to resume an existing Sequence Workflow.

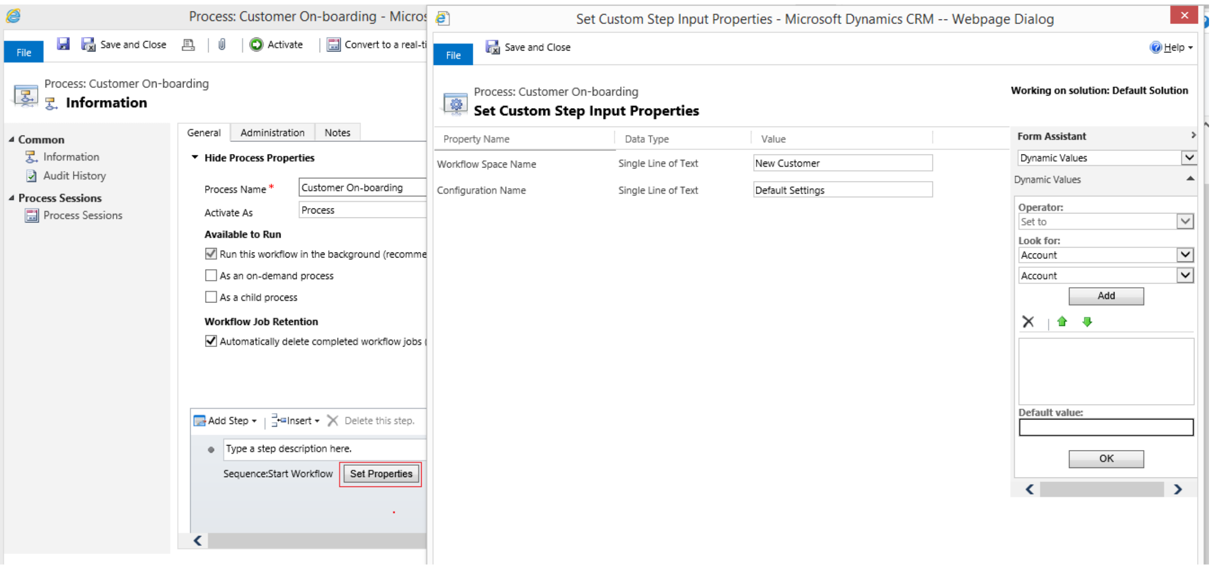
   Note: the Resume option is an advanced option. See Appendix A for more details.



CRM Process Definition

3. Click **Properties**, and enter the Workflow Space name, to specify which Sequence Workflow should be called.

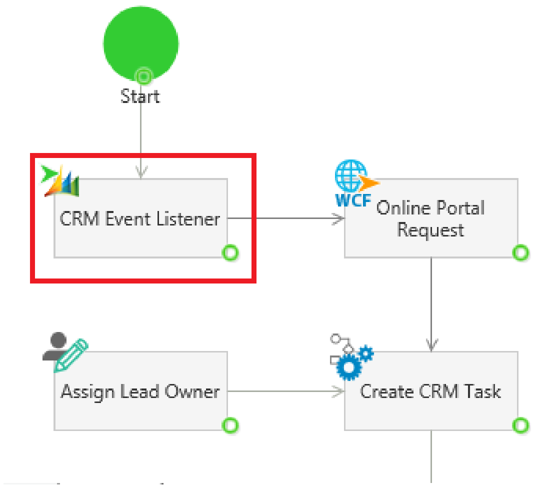
   Note: The Sequence Settings Name by default should be set to "Default Settings". If you have additional connections to Sequence environments, you must edit the Sequence Settings Name to match the name of the connection you wish to use.



Set Workflow Space Name

4. In your Sequence Workflow, add a CRM Event Listener activity. To start the workflow, add this activity after the Start activity. To resume the workflow, at this activity at the point at which you want to resume the workflow (see Appendix A for more details).

   Note: The CRM Event Listener activity requires no configuration.



CRM Event Listener

Now, when the CRM Workflow is initiated, it will start/resume the specified Sequence Workflow.

Initiating/Resuming via an External Trigger

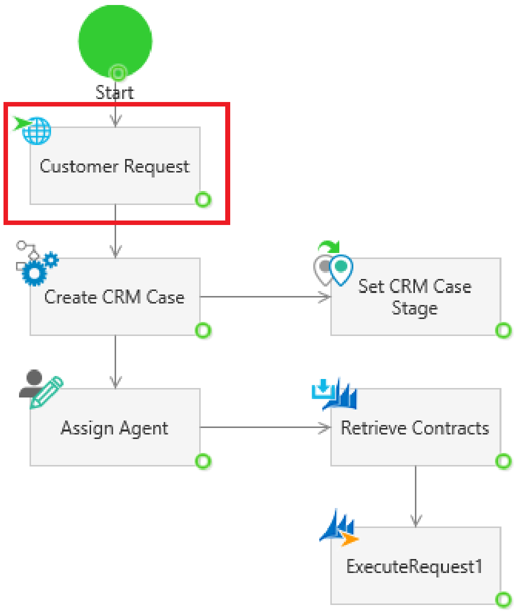
Sequence Workflows can be initiated/resumed in a variety of ways using external triggers. Sequence includes several types of Listener activities which can initiate/resume workflows:

- SharePoint Listener
- Web Service Listener
- Database Listener

…and more

For example, you may require a workflow application which presents customers with a web support interface which enables them to request a service. The flow could be as follows:

1. The customer completes a web form on an external site.
2. When submitted, it invokes a Sequence Web Service Listener. This initiates a workflow that handles the customer service request.
3. This Sequence workflow updates the CRM with a new Case record, assigns the case to an appropriate agent, ensures the agent completes the request, and notifies the customer that the case has been handled.

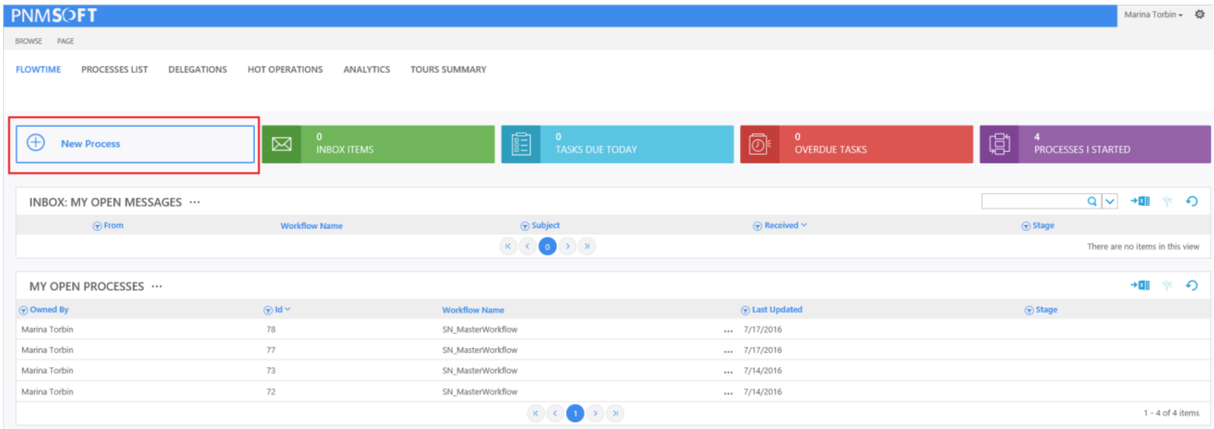


Initiate via Web Service Listener

In this case, no CRM Process is necessary to initiate the Sequence Workflow, since the trigger is external. Click here for more information on how to define Sequence Listener activities.

Initiation via SharePoint Flowtime

An additional external trigger which can be used to initiate a Sequence Workflow is when end users operate Sequence BPM within a SharePoint interface. In this case, users can kick off Sequence workflows on-demand, within Flowtime, Sequence's SharePoint-based end user environment.



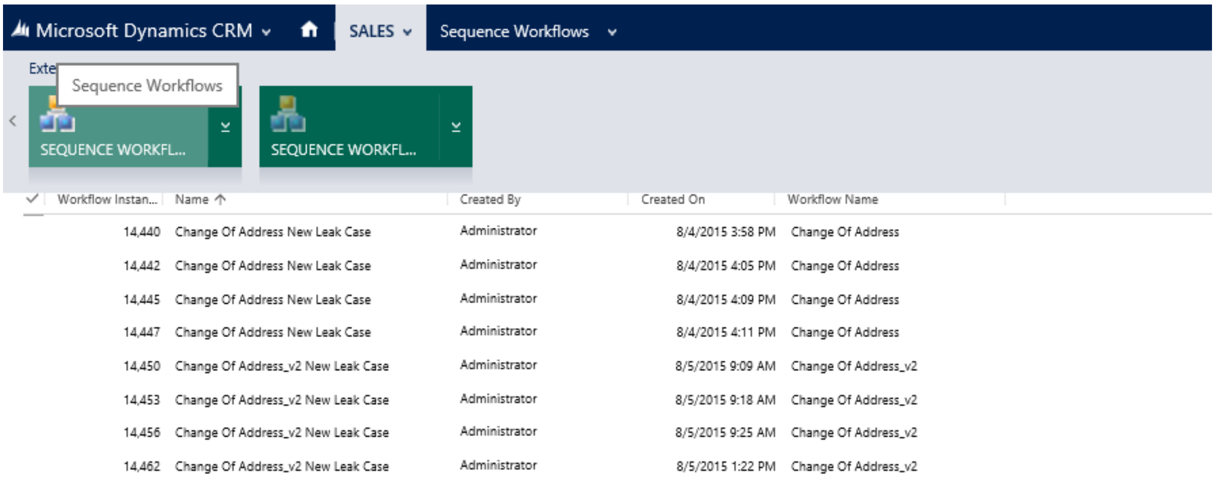
SharePoint FlowtimeOperating and Monitoring Sequence Workflows in CRM

End users can operate and monitor Sequence Workflows within Dynamics CRM. Users can perform the following actions:

- View/Edit Sequence Workflows (process instances)
- View/Edit Sequence Workflows per CRM record
- View Visual Workflow Status
- Monitor Workflow Performance

Viewing/Editing Sequence Workflows

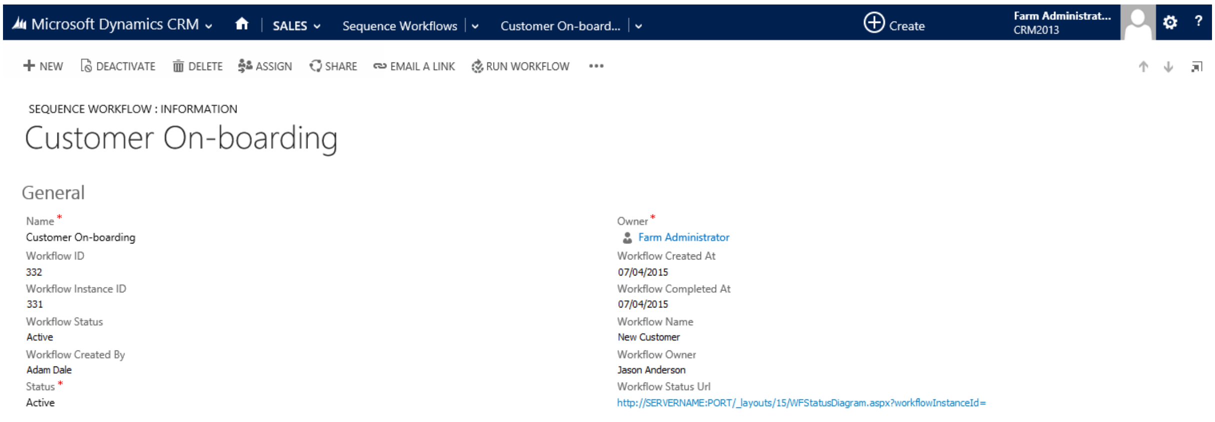
In Dynamics CRM, you can view all Sequence Workflows by clicking Sequence Workflows from Settings (or Sales) > Sequence Workflows:



Sequence Workflows

You can filter the view, by selecting the type of Sequence workflow from the drop-down list (marked in red, above).

To open a specific Sequence workflow instance, click it. The specific instance opens:



Sequence Workflow Instance

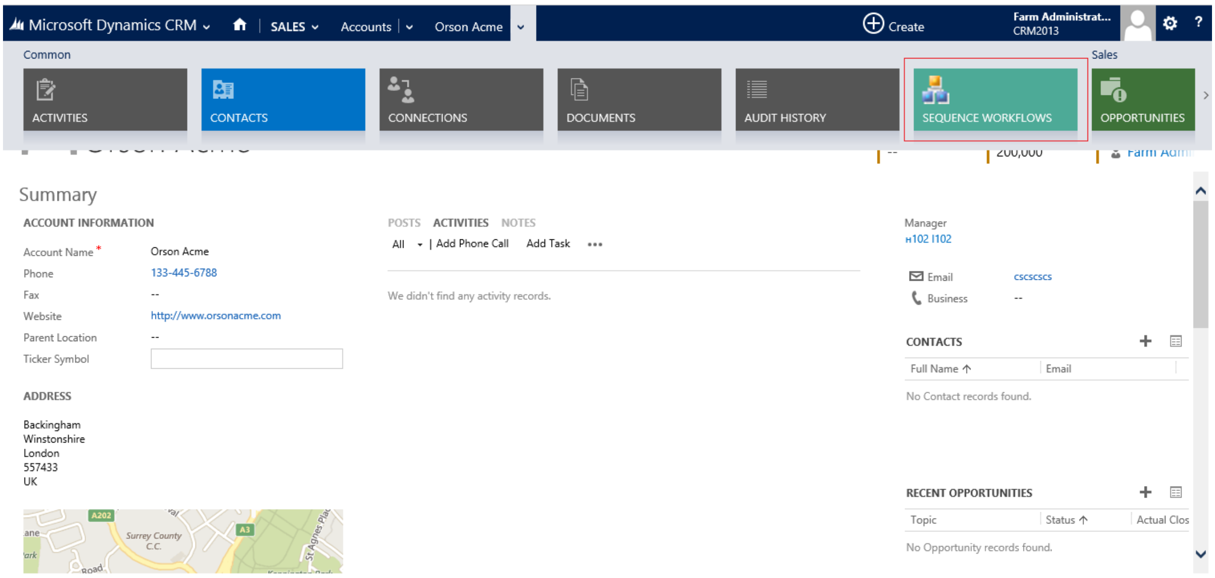
Here, you can edit the workflow instance fields as necessary (e.g. assign a different owner).

Notice that you can click Related entities and processes on the left navigation area, to view CRM entities that are related to this workflow (e.g. Accounts).

> ***Note: Sequence Workflows can have an N:N relationship with CRM workflows and entities, meaning that one Sequence Workflow can be related to multiple CRM records or processes, and a single CRM record or process can be related to multiple Sequence workflows.***

Viewing/Editing Sequence Workflows Per Record

You can access the Sequence Workflows that are related to specific CRM records (e.g. a specific Account). To do so, open the Account record, and click **Sequence Workflow**.

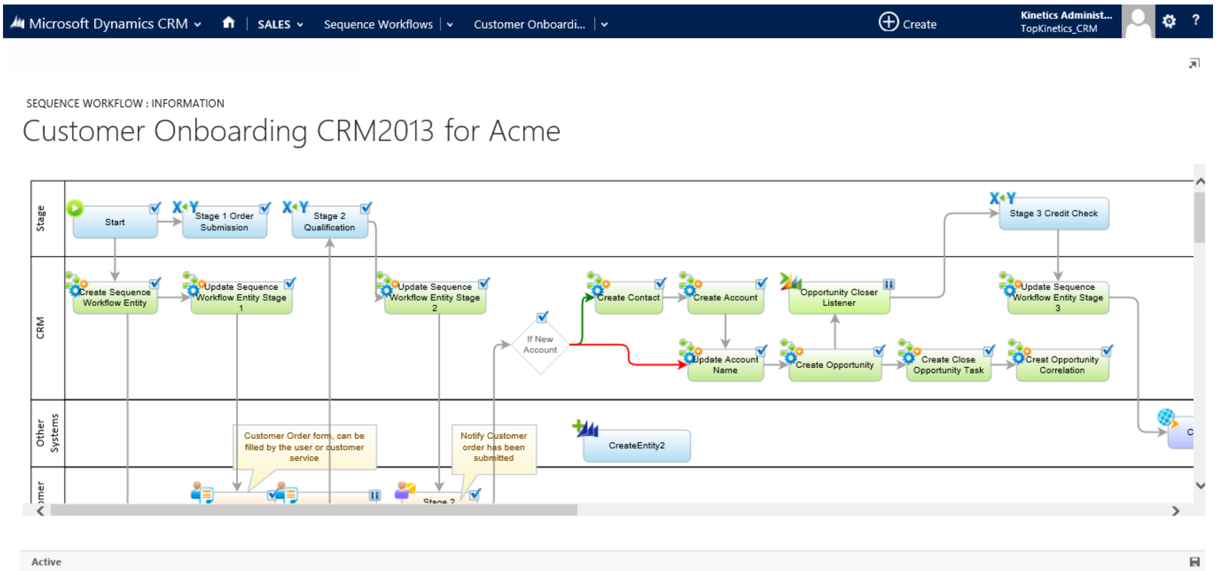


Account > Sequence Workflows

View Visual Workflow Status

For each Sequence Workflow, you can view the workflow's current status in a visual display window. To do so, click open the Sequence Workflow record, and click the **Workflow Status URL**. The Workflow Status window is displayed.

> ***Note: You must have permissions to access Sequence in order to view this window.***



Workflow Status

In the visual status window, icons indicate which activity status, as follows:

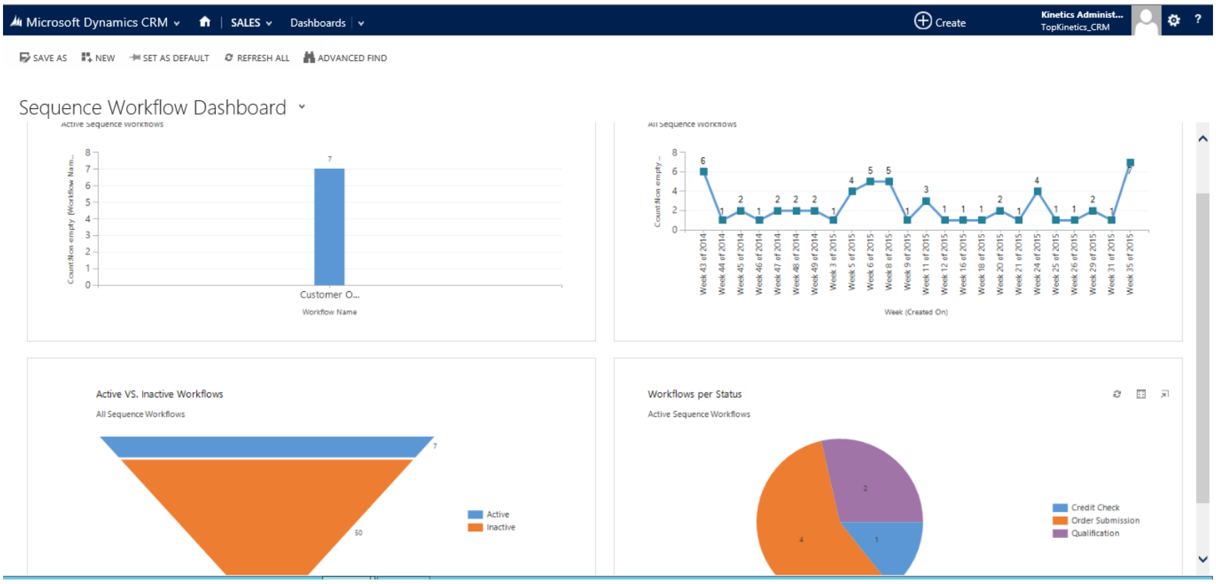
 - indicates an activity has been completed

 - indicates an activity is paused (waiting to resume)

No icon – indicates an activity has not been reached yet.

Monitoring Workflow Performance

You can monitor Sequence Workflow performance from Dynamics CRM's **Dashboards** screen. From the View dropdown, select **Sequence Workflow Dashboard**:



Sequence Workflow Dashboard

Helpful charts indicate KPI such as:

- Number of Workflows per Type
- Active vs. Inactive Workflows
- New Workflows
- Workflows per Status

These indicators can help you isolate bottlenecks and optimize process performance.

For more information on using PNMsoft Sequence, visit our Knowledge Centre at http://members.pnmsoft.com.

Appendix A: Sequence Workflow Correlations

This section describes the advanced feature: Sequence Workflow Correlations.

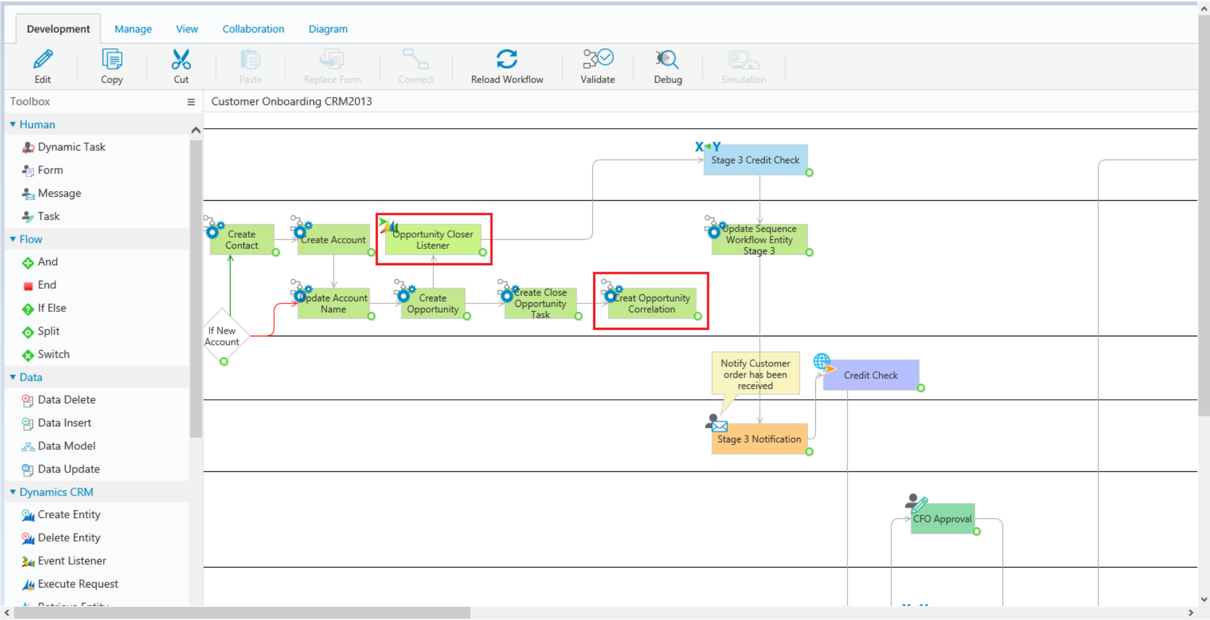
If your Sequence workflow needs to be resumed via a CRM Event Listener, you must create a Sequence Workflow Correlation record, which defines the connection between CRM Events and each CRM Listener.

To resume a Sequence Workflow using a Sequence Workflow Correction:

1. Add a Sequence Workflow Correlation Function (as a Sub Workflow) to the main workflow in parallel to the CRM Event Listener.

   OR

   Add a Sequence Workflow with Correlation Function (as a Sub Workflow) to the main workflow, as the first activity of the workflow. This creates both a Sequence Workflow Entity and a Correlation record in Dynamics CRM and may be more convenient to use.

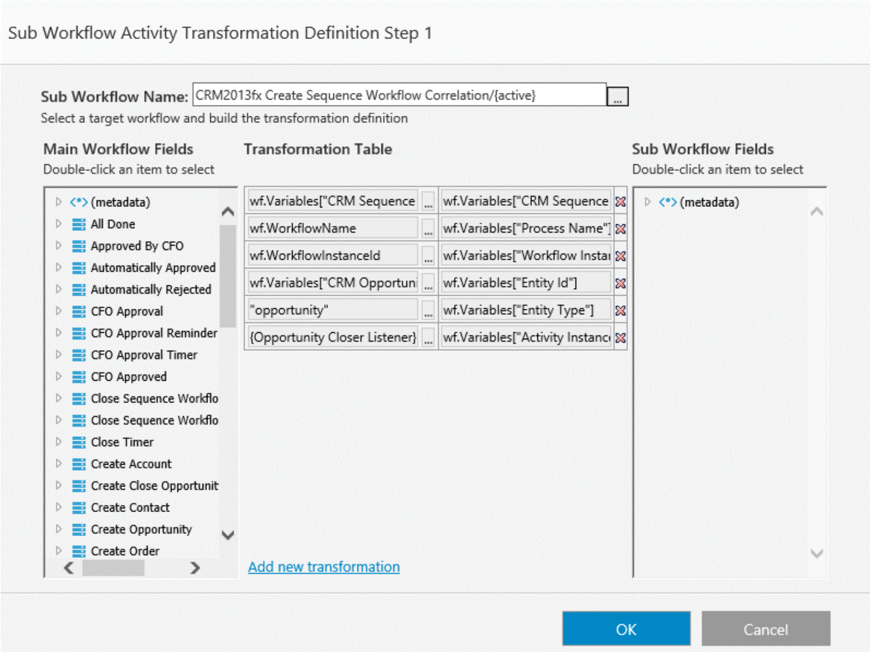


Add Sequence Workflow Correlation Activity

2. Define the input and output parameters of this Function, according to the requirements of your solution.

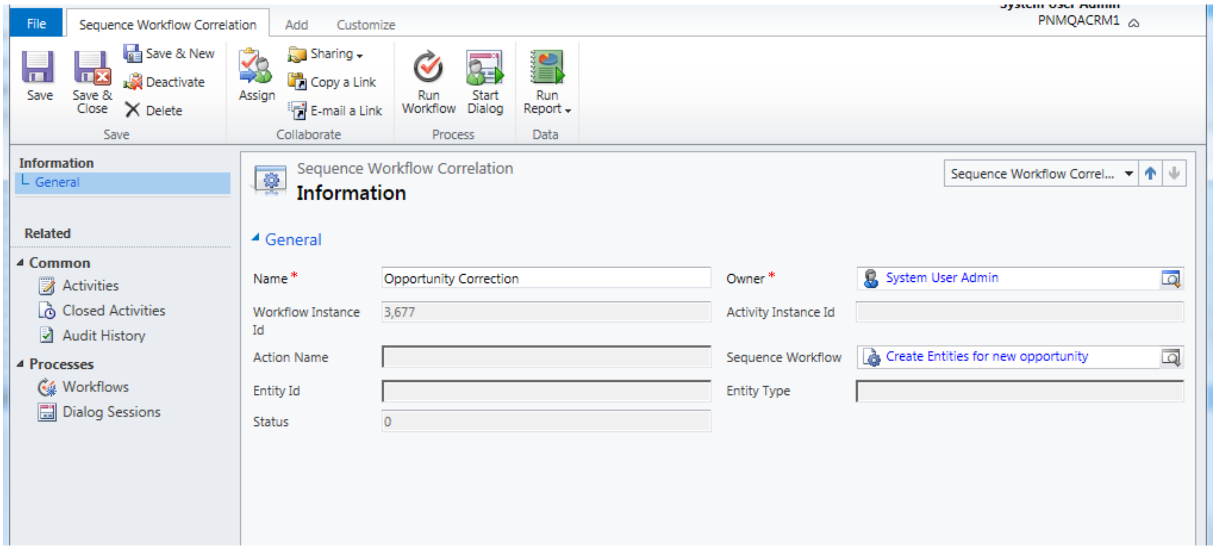
   Note: Some input parameters are required by the create correlation process: sequence wf id , workflow instance id , entity id or Action name.

   Click here for more information about defining Sub Workflows.



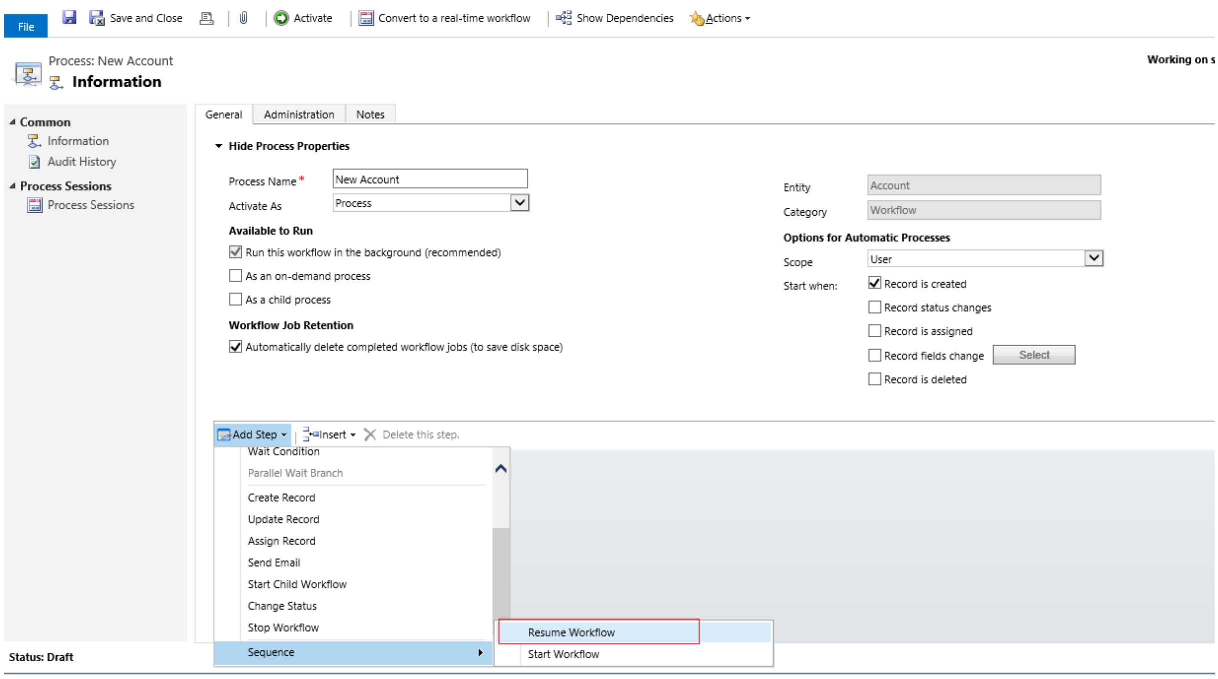
Sequence Workflow Correlation Transformation Definition

Now, this function automatically creates a Sequence Workflow Correlation record in Dynamics CRM, which defines the connection between CRM events and the CRM Listener:



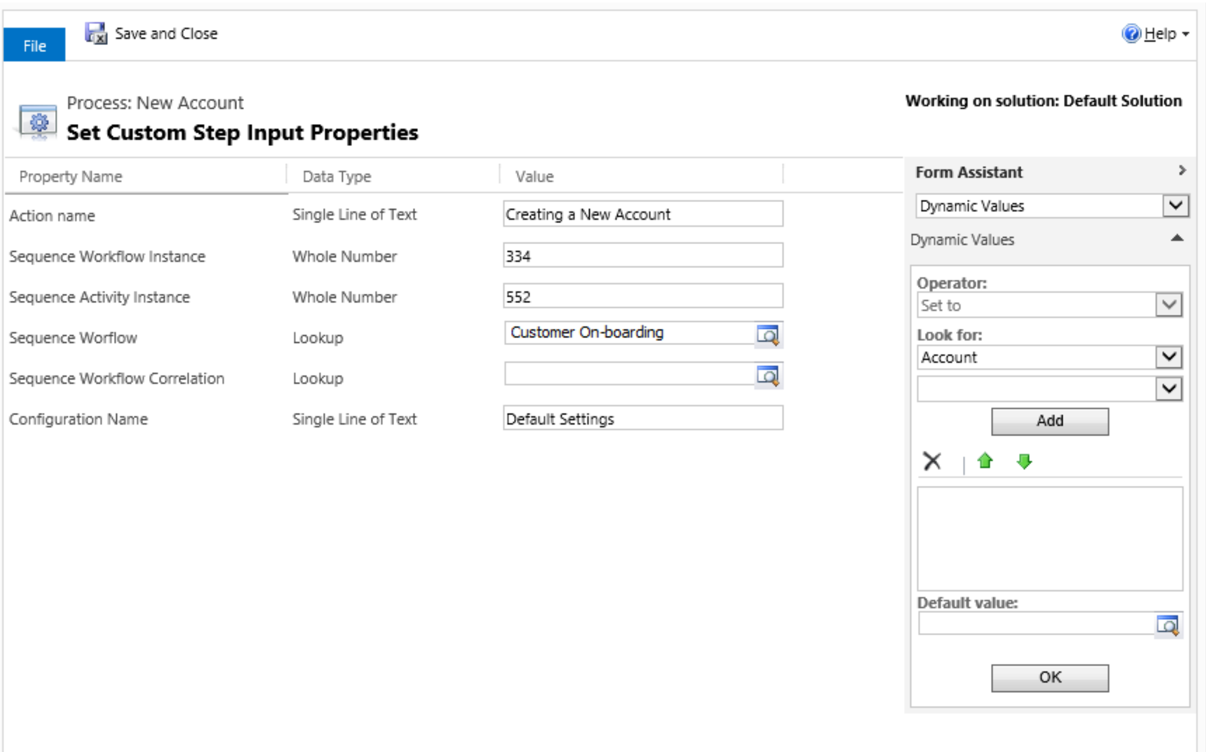
Sequence Workflow Correlation Record

3. Create a CRM Process which resumes the Sequence Workflow (see the section: Initiating/Resuming via a CRM Process, above).
4. Select Add Step > Sequence > ResumeWorkflow.



Resume Workflow Step

5. (Optional) Click **Properties** to edit fields of the Resume step properties:



Define Resume Properties

For the listener to work properly, you need to clearly identify which listener the step should execute.

If you kick off a workflow, in the **Start Workflow** step > Properties window, enter the workflow space id or the workflow space name of the workflow you wish to start.

To resume a workflow you have two options:

1. Make sure there is a Sequence workflow entity attached to the entity that triggered the workflow, and a matching correlation entity attached to the Sequence workflow entity.

   Sequence will identify the correct listener from the correlation entity values.

   If you want to tell Sequence to use a specific workflow, use the workflow lookup field. If you want to limit it to a specific correlation entity, use the action name (a matching action name must exist in the correlation entity).

   If you enter the workflow instance id or activity instance id in the Properties form, you override the correlation entity values.

OR

2. You can use any combination of the fields in the Properties form as long as you have unique identification of the listener (just like when running a Web Service Listener from code or a Web Service Consumer). For example, you can use workflow instance id if you have only one listener instance in the workflow, or use instance activity id if your listener is in a loop or you have more than one listener. You can use workflow id from the entity you are triggering by using the Dynamic CRM values option.

The Action field can be left blank. It should be used if you have two or more correlation entities attached to the Sequence workflow entity and you would like to trigger only one of them. To implement such a scenario, give the correlation entity a name and use this name when defining the resume activity. Sequence will then use this name to fetch the right correlation entity for the resume operation.