



Simplifying development with XrmToolBox

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Jonas Rapp

```
var jonas = (WhoAmIResponse)service.Execute(new WhoAmIRequest());
```

- Head of Development, Innofactor Sweden
 - Cinteros
- Software Developer
 - Since 1994
- 100% MS Dynamics CRM/365
 - Since 2009
- XrmToolBox contributor
 - Since 2014
- Speaker
 - CRM Saturday 2017

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XrmToolBox – MVP Tanguy Touzard

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- Web: www.xrmtoolbox.com

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If you are not working with
XrmToolBox...

...you are just working too hard.

authentic quote – Jonas Rapp 2016

Why XrmToolBox?


User perspective


- I *really* don't like working too hard
- CRM admin UI is limited
- Bulk actions
- Data investigation
- Advanced editors
- Expose SDK-only features
- Stunware Tools – R.I.P.
- 50+ tools


Developer perspective


- Internal tools and gadgets
 - Specialized one-off apps
- The toolbox is there to be filled
 - Common interface, connectivity
 - Common “marketing”
- Open Source
 - Learn from each other
- Community collaboration
 - Contribute where you can


My favorite XTB tools



Web Resources Manager by MscrmTools - 1.2016.12.6



Solution History by RajYRaman - 2.2.0.0



SiteMap Editor by MscrmTools - 1.2016.12.3



Plugin Registration by Microsoft Corporation and contributors - 3.1.1.



View Layout Replicator by MscrmTools - 1.2016.9.2



FetchXML Builder by Jonas Rapp, Innofactor AB - 1.2016.12.115



Plugin Trace Viewer by Jonas Rapp, Innofactor AB - 1.2016.12.20



XrmToolBox for Microsoft Dynamics CRM 2011 to 2016 (v1.2016.11.4)



Connect to CRM



Manage connections


Home


View Layout Replicator (Rappen 365)


Load Entities



Save views



Publish


Entities


Search:


Display name	Logical name
Account	account
Account Project Price List	msdyn_account...
Activity	activitypointer
Actual	msdyn_actual
Actual Data Export (Dep...	msdyn_dataexp...
Address	customeraddress
Advanced Similarity Rule	advancedsimila...
Agreement	msdyn_agreem...
Agreement Booking Date	msdyn_agreem...
Agreement Booking Inc...	msdyn_agreem...
Agreement Booking Pro...	msdyn_agreem...
Agreement Booking Ser...	msdyn_agreem...
Agreement Booking Ser...	msdyn_agreem...
Agreement Booking Set...	msdyn_agreem...
Agreement Business Pr...	msdyn_bpf_ba...
Agreement Invoice Date	msdyn_agreem...
Agreement Invoice Prod...	msdyn_agreem...
Agreement Invoice Setup	msdyn_agreem...
Agreement Sub-Status	msdyn_agreem...
Appointment	appointment
Approval	msdyn_approval
Article	kbarticle
Article Template	kbarticletempla...
Attachment	activitymimeatt...
Batch Job	msdyn_batchjob
Bookable Resource	bookableresou...
Bookable Resource Boo...	bookableresou...



Connected to 'rappen.crm4.dynamics.com (Inno...'



Easy Translator by MscrmTools - 1.2016.8.23



FetchXML Builder by Jonas Rapp, Innofactor AB - 1.2016.12.115



Metadata Browser by MsCrmTools - 1.2016.6.1



Plugin Registration by Microsoft Corporation and contributors - 3.1.1.



Plugin Trace Viewer by Jonas Rapp, Innofactor AB - 1.2016.12.20



Ribbon Workbench 2016 by Scott Durow - 3.0.24.0



SiteMap Editor by MscrmTools - 1.2016.12.3



Solution History by RajYRaman - 2.2.0.0



Web Resources Manager by MscrmTools - 1.2016.12.6



View Designer by Innofactor AB - 1.2016.8.7



View Layout Replicator by MscrmTools - 1.2016.9.2


Connect to CRM



Manage connections



Tabs



Plugins store



Search


Home



Easy Translator by MscrmTools - 1.2016.8.23



FetchXML Builder by Jonas Rapp, Innofactor AB - 1.2016.12.115



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

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View Layout Replicator by MscrmTools - 1.2016.9.2


Connected to 'crm-2016-dev.cintutv.se (CEM)'

<http://tiny.cc/XTBstat>

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FetchXML Builder

- Why?
 - FetchXML is the query language for Dynamics CRM
 - Advanced Find is the only “editor”
- How?
 - Represent query in hierarchical UI
 - Generate corresponding FetchXML
- Dynamics 365 UI Limitations
 - Not-in queries
 - Aggregate queries
 - System/internal entities
 - Attributes from linked entities
 - ...and so on...



- FXB Features
 - Solution for OOB limitations
 - Join on other fields than relationships
 - Generate C# QueryExpression code
 - Generate OData query string
 - Easy to use UI to compose queries for reports in CRM
 - Easy integration with other tools
- <http://fxb.xrmtoolbox.com>

Plugin Trace Viewer

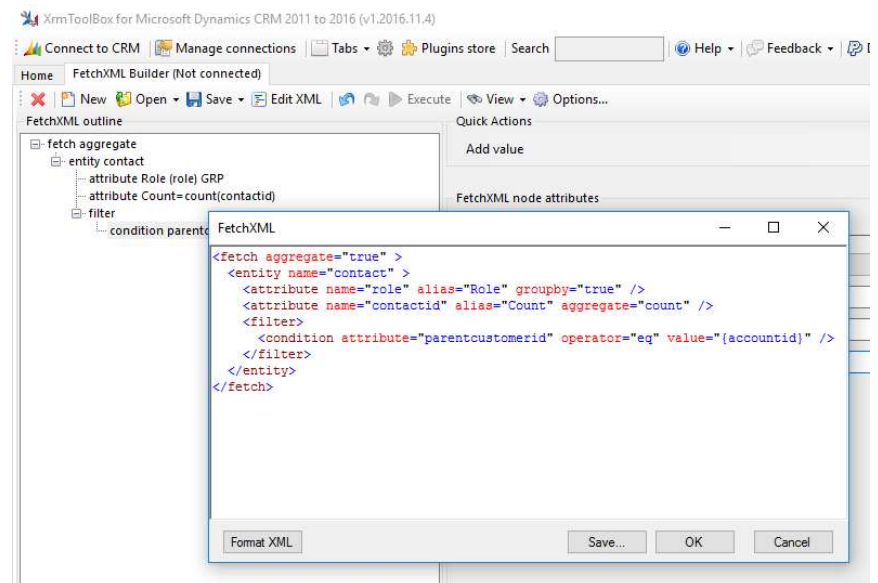
- Why?
 - Monitor plugin behavior
 - Development “debugging”
- How?
 - Initialize Tracing Service
 - Write to trace
 - Throw exceptions
- Dynamics 365 UI Limitations
 - Filtering
 - Columnset
 - Form design



- PTV Features
 - Filter by almost anything
 - Retrieve 250+ records
 - Quick view message/exception
 - Group/filter by correlation id
 - Show related Plugin Statistics
 - Update log setting
- <http://ptv.xrmtoolbox.com>

FetchXML Builder - Demo

1. Create a view in CRM showing accounts without decision makers
2. Create aggregate query showing number of contacts by role



FetchXML Builder - Demo

Account view with “not-in” query

1. CRM: Create new personal Account view “*Accounts without decision makers*”.
2. XTB: Use **View Layout Replicator** to copy column layout from “Active Accounts”.
3. XTB: Use **FetchXML Builder** to open the view from CRM and edit the query according to tree to the right ([download xml](#)). Test and save the view.
4. CRM: Refresh CRM and verify results now showing accounts with contacts but none of them is married.
5. CRM: Open an account, open a contact from the account, happily marry the contact. Verify account is no longer visible in the view.
6. XTB: Use **View Designer** to change name of the view to “*Accounts without married people*”. Uncheck “Snap to grid” and drag columns to desired widths. Save view.
7. CRM: Refresh browser to verify view changes.
8. CRM: Open **Advanced Find** with the new view. Notice it is not possible to even select it, as CRM cannot render the query.

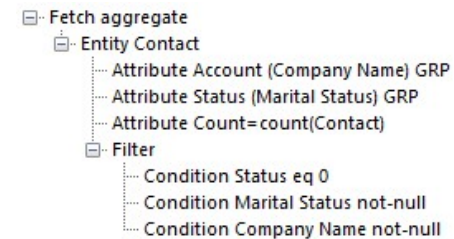


```
fetch distinct
  entity account
    attribute name
    attribute primarycontactid
    attribute telephone1
    attribute accountid
    attribute address1_city
    attribute description
    filter
      condition outercontact.contactid null
    order name
    link-entity contact (accountprimarycontactidcontactcontactid)
      attribute emailaddress1
    link-entity contact (outercontact)
      filter
        condition familystatuscode eq 2
      link-entity contact (innercontact)
```

FetchXML Builder - Demo

Aggregate query

1. Use **FetchXML Builder** to create a new query
2. Design the query according to query tree to the right ([download xml](#)).
3. Test the query. Notice “unfriendly” results where the marital status is displayed as a number.
4. Update Options to select Result view *Raw fetch result*. Test the query and notice that “friendly” status information is available.

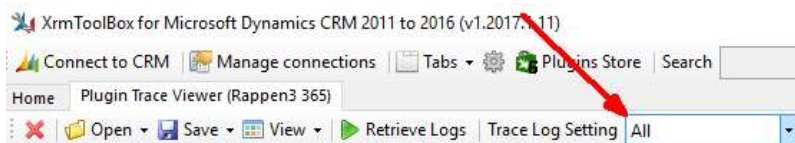




Plugin Trace Viewer - Demo

1. Plugin verifying that fax is not used on account
2. Plugin updating account description field with contacts by role

Before starting the demo, open the **Plugin Trace Viewer** in XrmToolBox and verify that the logging is set to **All**.



- Custom PluginBase class
 - Initialize Tracing Service
 - Custom IOrganizationService
 - Log all service requests to trace
 - Other dev assisting features

<https://github.com/rappen/JonasPluginBase>



Plugin Trace Viewer - Demo

Verify Fax is not used

1. VS: Clone repository from <https://github.com/rappen/JonasPluginBase.git>
2. VS: Check the code in **AccountVerification.cs** in project SamplePlugin. Compile the solution.
3. XTB: Use Plugin Registration to register the resulting assembly **SamplePlugin.Merged.dll**.
 1. (PlugReg may crash when [registering an assembly first time](#). If so, use SDK version of PlugReg for first registration.)
 2. Add steps for Create and Update of account, triggering Pre-validation for all attributes.
4. CRM: Open an account and enter fax number, save the account.
 1. An error like the one top right should be displayed.
 2. Try changing some other field.
 3. Open an account that has fax number and remove it and save.
5. XTB: Use Plugin Trace Viewer to investigate the logs for the different save actions.
 1. Notice timing...
 2. Exception call stack...
 3. Context information... etc.



Business Process Error

Fax?? Get outta here! If you contact support, please provide the technical details.

[Show technical details](#)

Download Log File

OK

```
Trace Log
11:38:08.987    *** Enter
Step: SamplePlugin.AccountVerification: Update of account
Msg: Update
Stage: 10
Mode: 0
Depth: 1
Type: account
Id: ac2e6d3f-5de0-e611-80ed-5065f38b56e1
User: 618b0a9b-1f6a-4f13-8d4a-c1074d6dfff16

11:38:08.987    Incoming account:
accountid = ac2e6d3f-5de0-e611-80ed-5065f38b56e1 (Guid)
fax       = 0123456 (String)

11:38:08.987    *** Exception ***
Microsoft.Xrm.Sdk.InvalidPluginExecutionException: Fax?? Get outta here!
    at SamplePlugin.AccountVerification.VerifyFaxNotUsed(JonasPluginBag bag)
    at SamplePlugin.AccountVerification.Execute(JonasPluginBag bag)
    at JonasPluginBase.JonasPluginBase.Execute(IServiceProvider serviceProvider)
11:38:08.987    Internal execution time: 0 ms
11:38:08.987    *** Exit
```



Plugin Trace Viewer - Demo

Aggregate marital status to account

1. VS: Check the code in **AggregateContactStatusToAccount.cs** in project SamplePlugin. Compile the solution.
2. XTB: Add steps for Create and Update of contact, triggering Post-operation for attributes *familystatuscode* and *parentcustomerid*.
3. CRM: Open a contact. Verify or set Company Name, and set a Marital Status. Save the contact.
4. XTB: Use Plugin Trace Viewer to investigate the logs for the save action.
 1. Notice logged information, both from the service calls and explicitly logged information from the plugin.
 2. Select to *View - Correlation Grouping* and retrieve the logs again. Notice the grouping of trace logs related to the same save action gets the same correlation id. This is very valuable when investigating plugin chains and nested triggering.
 3. Double click a record to show it in CRM. Notice the poor UI, if you need any more arguments to use PTV instead of CRM ;)

```
Trace Log
11:51:17.997 *** Enter
Step: SamplePlugin.AggregateContactStatusToAccount: Update of contact
Msg: Update
Stage: 40
Mode: 0
Depth: 1
Type: contact
Id: Sda2e5b9-88df-e311-b8e5-6c3be5a8b200
User: 618b0a9b-1f6a-4f13-8d4a-c1074d6dff16

11:51:17.997 Incoming contact:
contactid = Sda2e5b9-88df-e311-b8e5-6c3be5a8b200 (Guid)
familystatuscode = 3 (OptionSetValue)

11:51:17.997 Accountid from target: 00000000-0000-0000-0000-000000000000
11:51:17.997 Accountid from postimage: 00000000-0000-0000-0000-000000000000
11:51:17.997 Accountid from preimage: b6a19cdd-88df-e311-b8e5-6c3be5a8b200
11:51:17.997 RetrieveMultiple(fetchxml)
11:51:18.012 Retrieved 2 records in: 8 ms
11:51:18.012 Getting metadata for contact.familystatuscode
11:51:18.012 Execute(RetrieveAttribute)
11:51:18.028 Executed in: 17 ms
11:51:18.028 Returning label for value 1: Ogift
11:51:18.028 Getting metadata for contact.familystatuscode
11:51:18.028 Execute(RetrieveAttribute)
11:51:18.044 Executed in: 16 ms
11:51:18.044 Returning label for value 3: Skild
11:51:18.044 Description:
2 Ogift
1 Skild
11:51:18.044 Update(account) b6a19cdd-88df-e311-b8e5-6c3be5a8b200 (1 attributes)
11:51:18.262 Updated in: 216 ms
11:51:18.262 Internal execution time: 259 ms
11:51:18.262 *** Exit
```

Corr	Start Time	Duration	Plugin	Depth	Message	Entity
A	2017-01-30 11:51:18	15	SamplePlugin.AccountVerification	2	Update	account
A	2017-01-30 11:51:18	281	SamplePlugin.AggregateContactStatusToAccount	1	Update	contact
B	2017-01-30 11:51:01	31	SamplePlugin.AccountVerification	2	Update	account
B	2017-01-30 11:51:01	31	SamplePlugin.AccountVerification	2	Update	contact
C	2017-01-30 11:51:01	31	SamplePlugin.AccountVerification	2	Update	account
C	2017-01-30 11:51:01	31	SamplePlugin.AccountVerification	2	Update	contact



Bulk Data Updater – Demo

Bulk touch contacts to trigger plugin

1. XTB: Use **Bulk Data Updater** to get relevant contacts and then touch the marital status of these to trigger the plugin updating accounts using plugin from previous demo.
 1. Select **Use FetchXML Builder** to get records to update.
2. Compose query to select all contacts with Company Name and Marital Status ([download xml](#)).
3. Click **Return FetchXML** to load the contacts in Bulk Data Updater.
4. Select options in Bulk Data Updater
 1. Attribute to update: **Marital Status**.
 2. Update Method: **Touch**. This will “set the same value again” on marital status for all returned contacts.
5. Click **Update records** to start touching all returned contacts.
6. CRM: Verify that all accounts with contacts with marital status now have Description with number of contacts by marital status.
7. XTB: Use **Plugin Trace Viewer** to investigate the trace log records from the bulk touch action.

The screenshot shows the Bulk Data Updater application interface. The top window is titled 'Bulk Data Updater (Rappen3 365)' and shows the '1. Select records to update' step. It has a dropdown menu set to 'Use FetchXML Builder' and a 'Get records' button. Below this, it says 'Records not loaded'. To the right, a tree view shows the 'Fetch' process with 'Entity Contact' and a 'Filter (and)' condition. The filter conditions are: 'Condition Status eq 0', 'Condition Marital Status not-null', and 'Condition Company Name not-null'.

The bottom window is titled 'FetchXML Builder (Rappen3 365)' and shows the 'Return FetchXML' button. Below this, there is a 'Quick Actions' section with a button 'Return FetchXML to Bulk Data Updater'.

The main window is titled 'XrmToolBox for Microsoft Dynamics CRM 2011 to 2016 (v1.2017.1.11)' and shows the 'Bulk Data Updater (Rappen3 365)' tab. It has a '1. Select records to update' section with a dropdown menu set to 'Use FetchXML Builder' and a 'Get records' button. Below this, it says '21 records of entity contact'. The '2. Select attribute to update' section has a dropdown menu set to 'Attribute Marital Status (familystatuscode)'. The '3. Choose update method' section has three radio buttons: 'Value', 'Touch' (selected), and 'Set null'. There are checkboxes for 'Only when change is needed' and 'Ignore errors'. The '4. Execute update' section has an 'Update records' button and says 'Nothing updated'.

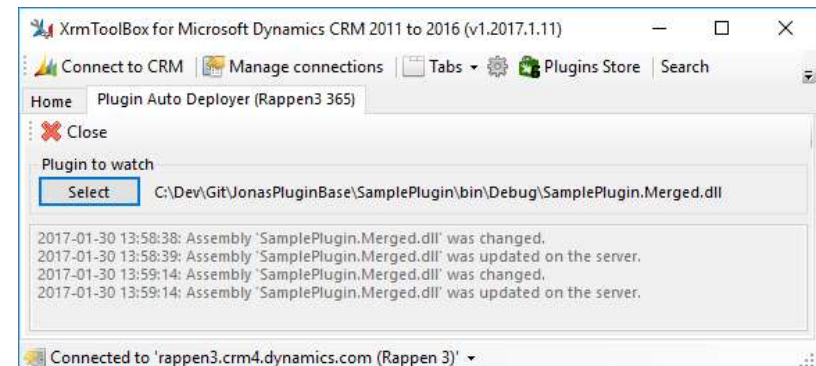
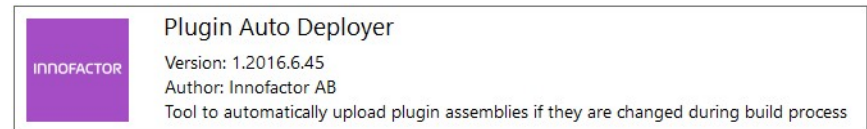
On the right side of the main window, there is a 'Records' table with the following data:

	Full Name	Company Name	Marital Status
1	Carl-Johan Larsson (exempel)	Contoso Pharmaceuticals (exempel)	Divorced
2	Carl-Johan Olofsson	Fourth Coffee	Single
3	Erna Mattsson (exempel)	Fabrikam, Inc. (exempel)	Married
4	Greta Johansson (exempel)	A. Datum Corporation (exempel)	Single
5	Gunnar Jonsson (exempel)	Coho Winery (exempel)	Married
6	Gunnar Svensson	Fourth Coffee	Single
7	Harald Eriksson (exempel)	Alpine Ski House (exempel)	Divorced
8	Ian Göransson	Alpine Ski House	Single
9	Ingmar Svensson	City Power & Light	Married
10	Isak Hedlund (exempel)	Coho Winery (exempel)	Single
11	Jonathan Larsson	Alpine Ski House	Married
12	Kalle Jansson	Coho Winery	Single
13	Lana Bengtsson (exempel)	A. Datum Corporation (exempel)	Married
14	Lars Henriksson	Coho Winery	Married
15	Lars Henriksson (exempel)	City Power & Light (exempel)	Single
16	Lena Svensson (exempel)	Fourth Coffee (exempel)	Married
17	Martina Carlsson (exempel)	Adventure Works (exempel)	Married
18	Nelly Persson (exempel)	Litware, Inc. (exempel)	Married
19	Sara Mårtensson (exempel)	Alpine Ski House (exempel)	Single
20	Wilmer Bengtsson (exempel)	Blue Yonder Airlines (exempel)	Married
21	Yusef Bergqvist	Fourth Coffee	Divorced

Plugin Auto Deployer – Demo

Automatically update plugin in CRM

1. XTB: Open tool **Plugin Auto Deployer** to have XTB automatically update the plugin assembly in CRM when recompiled.
 1. Select the resulting merged assembly with the plugin.
 2. Change something in the plugins from previous demos.
 3. Compile the project and verify that the Plugin Auto Deployer has updated the assembly.
2. CRM: Change some information that will trigger the updated plugin
3. XTB: Use **Plugin Trace Viewer** to verify that the changed plugin is now triggering.



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