

Master Data Management System (MDMS)

User Guide

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Chapter 1 Introduction

Master Data Management System (abbrev. MDMS) is a module that ensures data consistency when replicating data between multiple Microsoft Dynamics 365 Business Central databases. For this purpose, MDMS offers functions that enable the user to set up any set of data within Dynamics 365 Business Central database and replicate it to another Dynamics 365 Business Central database.

With its features for replication, master data management and data consistency, the MDMS application supports companies that use Business Central in multiple subsidiaries.

In MDMS, target companies with databases, to which data will be replicated are set up as receivers. It is possible to set up multiple receivers

The structure of data replicated is set up as data sets.

Users can use any number of created data sets and set them up to be replicated to a particular receiver, by using the replication card. Replication can be set up as either Full or Incremental. While processing incremental replication only data changed or added within the last replication will be exported.

The module is particularly useful when a company wants to create and maintain standardized Dynamics 365 Business Central cards (e.g. items, BOMs, vendor cards) in one main company/headquarters – called “master” company, and afterwards synchronize the cards and data with its subsidiaries (“receiver” companies).

The MDMS application uses SOAP Web Services as a data transport layer.

Chapter 2 Glossary

MDMS: Master Data Management System.

Master Company: A company where all data considered global is stored

Receiver Company: A company to which data is sent.

Chapter 3 Master Company Processing

3.1. Data Set

Data sets contain information about the structure of data to be replicated.

Data sets can be displayed in the **MDMS / Data Sets** window:

← DATA SET
 ✎ + 🗑

ITEMS · Items Data Set

New Process | More options

General

No. ITEMS ...

Last Date Modified 02.07.2019

Description Items Data Set

Status Open

Lines | Manage Line Functions Fewer options 🔗

CODE	NAME	TABLE NO.	TABLE NAME	ON RECORD EXISTS	RE... LE... RE...	DIS... LO... INS...	DIS... LO... DE...	BLOCK EXCLUDE FILTER	RUN TRI... ON INS...	RUN TRI... ON MO...
ITEM	Item	27	Item	Update	☐	☐	☐		☐	☐
ITEM VARIA...	Item Variant	5401	Item Variant	Update	☐	☐	☐		☐	☐
					☐	☐	☐		☐	☐

The following fields are available in the Data Set header:

- No.**
Specifies a data set unique identifier.
- Description**
Specifies a description of the data set
- Last Date Modified**
This is a read only field. It contains a date of the last modification
- Status**
This is a read-only field that specifies the data set status. The status can be either Open or Released and can be adjusted using the Release and Reopen actions.

The following fields are available in data set lines:

- Code**
Specifies a unique identifier of the data set line.
- Name**
Specifies a description of the data set line.
- Table No.**
Specifies a number of the table to be replicated.

4. Table Name

Specifies a name of the table to be replicated; the field is filled in automatically when the Table No. field is filled in.

5. On Record Exists

Specifies the action which will be taken when it is found that a replicated record already exists in the target database. The following action options are available: Update and Skip.

6. Record Level Replication

Specifies if all the table data should be replicated or the user (with the MDMS Receiver role assigned) should manually mark the records to be replicated to the user's local database (see more under the Record-Level Replication chapter.)

7. Disable Local Insert

If this field is selected, users will not be able to insert new records in their local database.

8. Disable Local Delete

If this field is selected, users will not be able to delete records in their local database.

9. Block Exclude Filter

Specifies a filter (using C/AL SETVIEW syntax) to exclude certain records from the blocking rules. Sample filters:

- Cross-Reference Type=Filter(<>Bar Code)
- Code=FILTER('FA CIP')
- Dimension Code=FILTER('FA CIP')
- No."=FILTER(11111.11198|11211..11297)

10. Run Trigger on Insert

If a new record is inserted into a local database, INSERT(TRUE) will be used during the operation. By default, it is INSERT(FALSE).

11. Run Trigger on Modify

If a record is updated in a local database, MODIFY(TRUE) will be used during the operation. By default, it is MODIFY(FALSE).

The user can set up which fields should be included in the data set using the Line / Show Details function

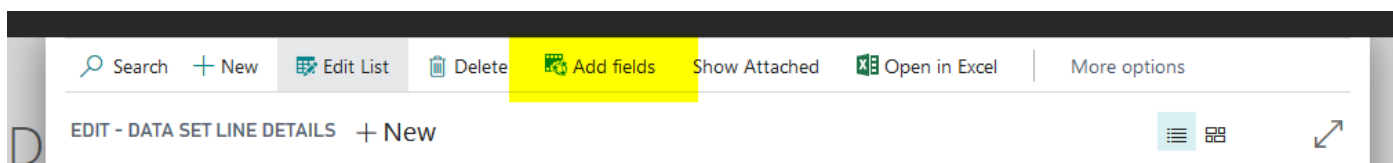
EDIT - DATA SET LINE DETAILS + New

CODE	FIELD NO.	FIELD NAME	VA... FIE...	DIS... LO... MO...	FIELD TYPE	PROCES... ORDER ↑
NO	1	No.	☐	☒	Code	1
NO2	2	No. 2	☐	☐	Code	2
DESCRIPTIO...	3	Description	☐	☐	Text	3
SEARCHDES...	4	Search Description	☐	☐	Code	4
DESCRIPTIO...	5	Description 2	☐	☐	Text	5
BASEUNITO...	8	Base Unit of Measure	☐	☐	Code	6
*	0		☐	☐	Integer	0
			☐	☐		

The following fields are available on the Data Set Line Details page:

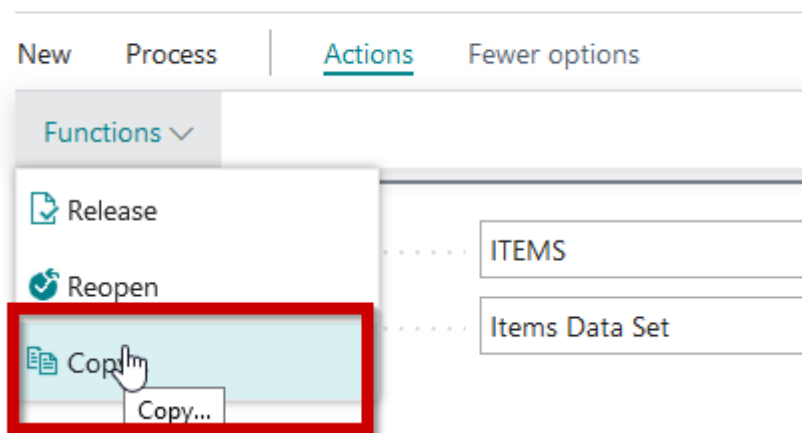
- 1. Code**
Specifies a unique identifier of a data set field.
- 2. Field No.**
Specifies a field number.
- 3. Field Name**
Specifies a name of the field.
- 4. Validate Field**
Specifies whether the field should be validated upon importing on the receiver side.
- 5. Disable Local Modify**
Specifies whether it should be allowed to edit fields at the local level, on the receiver's side.
- 6. Field Type**
Specifies a type of the field.
- 7. Processing Order**
Specifies an order in which record fields will be processed. This is particularly important for the data validation flow.
- 8. Table No.**
Specifies a number of the table
- 9. Keep Local Value**
Specifies if a selected field value should be transferred from the global/master company to a local company, however the value is not overwritten afterwards. It will be possible to adjust the field's value locally and this value will be kept.
- 10. Skip Export**
If this field is selected, the selected field will be excluded from the export.

Note: The **Add Fields** function:



The Copy function enables the user to copy data sets.

ITEMS · Items Data Set



3.1.1. Releasing / Reopening

After all the setup has been defined, it is necessary to mark the data set card as completed by using the **Functions / Release** action which will change its status to **Released**. The data set has to be released before it is included in any replication process. If the user wants to make any further adjustments to a previously released data set, it is necessary to reopen it first by using the **Functions / Reopen** action.

3.1.2. Data Set filters

Using the **Line / Show Filters** action, it is possible to specify additional filters that will be applied to data set records when the replication process is run.

NOTE: If filters have been defined both for a data set and replication for the same table, filters on the data set level will be overwritten.

3.1.3. Data Set Line Relation

The **Line / Show Relation** action is used to specify the relation between indented record and its parent.

3.2. Replication

Replication links data sets to a particular receiver and specifies the type of data to be replicated. It is also possible to set up additional filters which will be applied when replication is processed.

Replication entries can be displayed under MDMS / Replications:

ITEMS > REC · Items to rec

Run (Full)
 Run (Incremental)
 Release
 Reopen
 | More options

General

No.	ITEMS > REC ...	Status	Open
Description	Items to rec	SYNCHRONIZATION	
Receiver No.	REC v	No. of Pending Sync. Entries	0
Last Run Date and Time		Has Error	No

Lines | Manage | More options

DATA SET NO.	DESCRIPTION
ITEMS	Items Data Set

The following fields are available in the replication header:

- No.**
Specifies a unique identifier of the replication.
- Description**
Specifies a description of the replication.
- Receiver No.**
Specifies a number of the receiver.
- Last Run Date and Time**
Specifies a date and time of the last successful replication.
- Status**
This is a read-only field and it specifies the replication status. The status can be either Open or Released and can be adjusted by using the **Functions / Release** and the **Functions/Reopen** actions.

The following fields are available in replication lines:

- Data Set No.**
Specifies a number of the replicated data sets.
- Description**
Specifies a description of the replicated data set.

3.2.1. Replication filters

The Line / Show Filters action is used to specify additional filters that will be applied to data set records while processing the replication:

Search New Edit List Delete Open in Excel					
EDIT - REPLICATION LINE FILTERS New					
DATA SET LINE NO.	DATA SET LINE CODE	FIELD NO.	FIELD CAPTION	VALUE	
0		0			

The following fields are available:

1. Data Set Line No.

Specifies a line number of the data set to be replicated.

2. Data Set Line Code

Specifies a line code of the data set to be replicated. It is filled in automatically as soon as a number in the Data Set Line No. field is entered.

3. Field No.

Specifies a number of the field for which the filter will be applied.

4. Field Caption

The field is filled in automatically as soon as a field number is entered.

5. Value

Specifies a value that is a required filter value.

NOTE: Please remember that **Value** is a text-based field. If you want to set up a filter for an option-type field, you should ensure that the filter value is correct.

3.2.2. Releasing/Reopening

After required setup has been completed, it is necessary to mark replication cards as completed by using the **Functions / Release** action which will change its status to **Released**. Each replication has to be released before it is run. If the user wants to make any further adjustments to a previously released replication, it is necessary to reopen it first using the **Functions / Reopen** action.

3.3. Running Replication

While running a replication process, the system first checks whether all data sets included in the current replication are released and displays an error message if otherwise. Moreover, each replication has to be released as well.

After the replication process is completed successfully, the system creates record synchronization entries and updates the **Last Run Date and Time** field on the **Replication** card page.

3.3.1. Manual

The user can run the replication process manually, from a relevant replication card or replication list, using the **Run (Full)** or **Run (Incremental)** functions:

ITEMS > REC · Items to rec

Run (Full)

Run (Incremental)

Release

Reopen

Actions

Navigate

Fewer options

NOTE: It is possible to select multiple replications on the list and run them altogether.

3.3.2. Automatic (using Job Queue)

It is possible to set up replication to be run automatically using the **Job Queue** module (in Dynamics 365 Business Central).

← JOB QUEUE ENTRY CARD  +  ✓ SAVED 

Codeunit · 20020699 · Run Replication (MDMS)

Process Report | More options

General Show less

Object Type to Run	Codeunit	Expiration Date/Time	
Object ID to Run	20020699	Status	On Hold
Object Caption to Run	Run Replication (MDMS)	Parameter String	ITEMS > REC;FULL
Description	Run Replication (MDMS)	Job Queue Category	
Last Ready State	02.07.2019 15:05	User ID	ADMIN
Earliest Start Date/Time		Maximum No. of Attempts	0

It is necessary to set up a codeunit no. 20020699 by selecting the type and number in the **Object Type to Run** and **Object ID to Run** fields and then, selecting **Run Replication (MDMS)** in the **Object ID to Run** field.

In the **Parameter String** field, the following structure has to be applied:

<Replication No.>;<Replication Type>

Where:

- Replication No. – Specifies a number of the replication to be run;
- Replication Type – Specifies a replication type with any of two possible values: "FULL" and "INCREMENTAL".

Example *Parameter String* values are:

- R0001;INCREMENTAL
- R0025;FULL

If the value in the **Parameter String** field is invalid, the job queue fails, and an appropriate error message is displayed. To enable the user to read incoming confirmations, it is necessary to set up Codeunit 20020701 with **Read Confirmations**.

3.3.3. Full vs Incremental

Each replication can be run in one of the two modes: Full or Incremental.

Full replication loops through all the records from a data set, including filters set up on the replication line (if any). If no filters have been set up, all the records will be exported each time the replication process is run.

Incremental replication includes only data that has recently been modified (since the **Last Run Date and Time** field as specified on the Replication card). For each record that would normally be included in full replication, it performs additional check (using the internal change log functionality) to verify if the record should be exported.

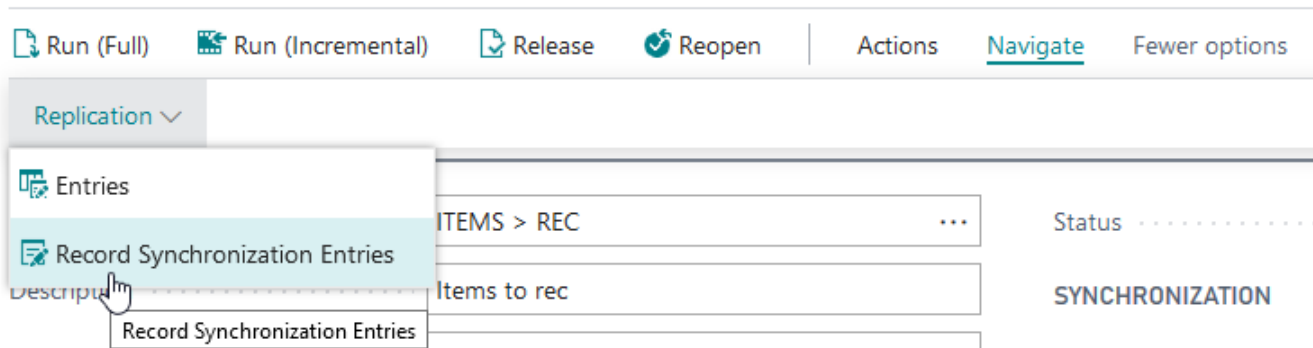
NOTE: Only top-level changes are recognized.

Each successful replication process updates the **Last Run Date and Time** field on **Replication** card page.

3.3.4. Record Synchronization Entries

Each time the replication process is run, it creates record synchronization entries for each processed record. The entries can be viewed from the replication card by choosing **Navigate / Replication/ Record Synchronization Entries**:

ITEMS > REC · Items to rec



← RECORD SYNCHRONIZATION ENTRIES ↗

Search Open in Excel More options

ENTRY NO.	ENTRY TYPE	RECORD ID	DATE AND TIME	STATUS	PROCESSED DATE & TIME	PROCES... BY	NO. OF DETAILS
1	Update	Item: 1000	02.07.2019 15:01	New			
2	Update	Item: 1001	02.07.2019 15:01	New			
3	Update	Item: 1100	02.07.2019 15:01	New			
4	Update	Item: 1110	02.07.2019 15:01	New			
5	Update	Item: 1120	02.07.2019 15:01	New			
6	Update	Item: 1150	02.07.2019 15:01	New			

The following fields are available:

- 1. Entry No.**
Specifies a sequential number.
- 2. Date and Time**
Specifies a date and time of the replication to be run.
- 3. Status**
Specifies if the entry has been processed successfully.
- 4. Processed Date & Time and Processed By**
Specifies if the entry has been processed and the user who ran the process.
- 5. Error Text**
Specifies a text of the message displayed after a processing error occurs.
- 6. Old Record ID**
Specifies an old record ID to be used in case of record renaming. It points to the record that was renamed to be included in the receiver company.
- 7. Receiver No.**
Specifies a number of the receiver which is important when the group receiver feature is used.

3.4. Synchronizing records

After the replication process is run, no data is sent to the receiver company. Under Process Record Synchronization Entries, there are 2 action options available. The Synchronize on Replication Card action processes all entries pending for replication.

ITEMS > REC · Items to rec

Run (Full) Run (Incremental) Release Reopen Actions Navigate Fewer options

Functions ▾

- Release
- Reopen
- Run (Full)
- Run (Incremental)
- Synchronize**

MS > REC ... Status Released

Items to rec

SYNCHRONIZATION

No. of Pending Syn... 1

Has Error No

02.07.2019 16:08

The **Process** on **Record Synchronization Entries** action processes all selected entries.

← RECORD SYNCHRONIZATION ENTRIES ↗

Search Open in Excel Actions Fewer options

Process

ENTRY	ENTRY TYPE	RECORD ID	DATE AND TIME	STATUS	PROCESSED DATE & TIME	PROCESSED BY	NO. OF DETAILS
152	Update	Item: 1972-...	02.07.2019 16:08	New			1

Chapter 4 ADVANCED FEATURES

4.1. Record-Level Replication

4.1.1. General information

By default, replication processes all records from given table, and while processing incremental replication, only recently modified records are exported.

It may be however necessary to specify a certain subset of records that should be replicated to certain receivers.

Using Record-level Replication, every receiver has to manually mark which records they want to receive.

4.1.2. Setup

To enable Record-level Replication feature it is necessary to put a checkmark in Record-level Replication field in Data Set line:

ITEMS · Items Data Set

New		Process	Actions	Fewer options
General				
No.	ITEMS ...		Last Date Modified --	02.07.2019
Description	Items Data Set		Status	Released

Lines		Manage	Line	Functions	Fewer options
CODE	NAME	TABLE NO.	TABLE NAME	ON RECORD EXISTS	RE... LE... RE...
ITEM	Item	27	Item	Update	☒

4.1.3. Processing

When Record-level Replication option is enabled for a data set, all replications that use this data set will consider only records that receiver has manually marked to replication.

DATA SET CODE	DATA SET NAME
ITEM	Item

To see a list of records, following page needs to be opened:

Note: Please remember that data set will appear on the list only when it is included in released replication. List is rebuilt while releasing a replication.

To see a list of database records user needs to run Records function. Following window will appear:

EDIT - DATA RECORDS

RECORD ID	RF	STATUS	BASEUNITOFMEASURE	DESCRIPTION	DESCRIPTION2	NO
Item: 8924-W			PCS	Server - Enterprise Package		8924
Item: C-100	☒	Replicated		Cabling for LS-100		C-1
Item: FF-100	☒	Press Ctrl+F1 to learn more		Frequency filter for LS-100		FF-
Item: HS-100	☐		PCS	Housing LS-100,Oakwood 120 Its		HS-
Item: LS-100	☐		PCS	Loudspeaker 100W OakwoodD...		LS-
Item: LS-10...	☐		BOX	Loudspeakers, White for PC		LS-
Item: LS-120	☐		PCS	Loudspeaker, Black, 120W		LS-
Item: LS-150	☐		PCS	Loudspeaker, Cherry, 150W		LS-
Item: LS-2	☐		BOX	Cables for Loudspeakers		LS-
Item: LS-75	☐		PCS	Loudspeaker, Cherry, 75W		LS-
Item: LS-81	☐		PCS	Loudspeaker, Walnut, 80W		LS-t
Item: LS-M...	☐		PCS	Manual for Loudspeakers		LS-l
Item: LS-S15	☐		PCS	Stand for Loudspeakers LS-150		LS-!
Item: LSU-15	☐		PCS	Base speaker unit 15" 100W		LSU
Item: LSU-4	☐		PCS	Tweeter speaker unit 4" 100W		LSU
Item: LSU-8	☐		PCS	Middletone speaker unit 8"100W		LSU
Item: SPK-1...	☐		PCS	Spike for LS-100		SPK

Close

Data Records window contains following columns:

1. Record ID

Contains unique record ID of each record,

2. Replicated

Specifies whether record is being replicated,

3. Status

Record replication status,

4. <data set columns>

List of first 10 data columns from particular data set.

Status field may have one of two values:

- Under Revision,
- Released.

Only Released records are replicated. Under Revision status has been introduced to allow user to mark some of replicated records to further investigation. They will not be replicated until their status is switched back to Released.

Following functions are available in **Data Records** window allowing users to easily change status for many records at once:

- Set Replicated,
- Unset Replicated,
- Replicate All,
- Replicate None,
- Set Released,
- Set Under Revision.

NOTE: Above functionality may cover any table from the database, therefore it is built in very general way. It may be however necessary to implement it more user-friendly way on certain

application areas. For instance, if it is required to replicate customers data, customer card can be adjusted to allow users to set certain records as replicated directly on customer cards.

4.1.4. Group Receivers

When using the Group Receivers feature, it is possible to process one replication simultaneously for multiple receivers.

Receiver Card

Show Attached | Actions | Fewer options

General

No. GROUP

Description

Group Receiver ☒

Web Services >

Group Receiver Lines | Manage

GROUP RECEIVER NO. ↑		RECEIVER NO. ↑
GROUP		RECEIVER1
GROUP		

NO. ↑	DESCRIPTION
RECEIVER1	

+ New Select from full list

On the Receiver card, select **Group Receiver** to display the **Group Receiver Lines** subpage. It is possible to set up a list of linked receivers.

When the replication process is run for a group receiver, record synchronization entries are created for each of the receiver lines.

← RECORD SYNCHRONIZATION ENTRIES

Search | Open in Excel | Actions | Fewer options

ENTRY NO.	PROCES... BY	NO. OF DETAILS	ERROR TEXT	OLD RECORD ID	RECEIVER NO.
153	:	1			REC
154		1			REC2

4.2. Deleting Records

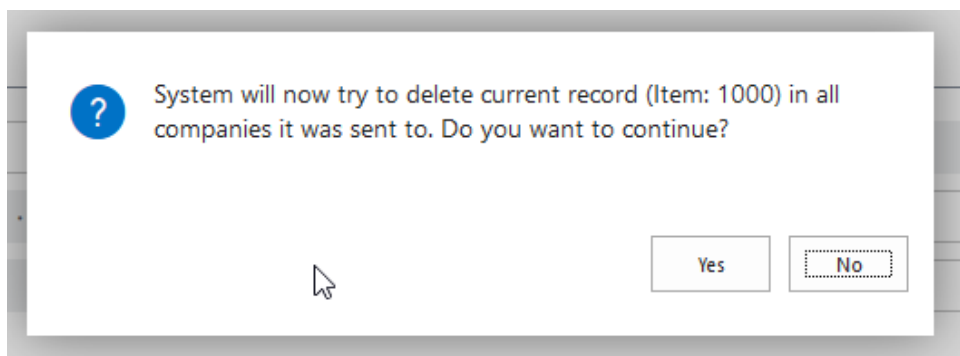
Records can be deleted in the master company.

Records that have never been replicated yet, can be deleted when the **Allow Deleting Before Replicated** checkbox is selected on the **MDMS Setup** page.

For records that have been replicated, the system will automatically issue a webservice call for all receiving companies that have ever received this particular record and will try to delete the record from the companies' databases. If the process is completed successfully, records will be deleted from the master company database as well.

NOTE: The Block Record Delete setup parameters should be disabled on the **MDMS Setup** page first.

The following dialog window will be displayed:



When the message is confirmed, the system will attempt to delete the record from all receiver companies.

If there are any errors (e.g. when the item being deleted is on stock), they will be listed in this summary:

DELETE ENQUIRIES				
RECORD ID	DATE AND TIME	RECEIVER NO.	STATUS	ERROR TEXT
Item: 70061	02.07.2019 17:14	REC	Success	

Only after deleting is completed successfully in all the companies, the record will be deleted in the master company.

4.3. MDMS Events

In order to efficiently incorporate advanced business logic, MDMS now publishes the following Events:

1. Codeunit **Replication Mgt.**
 - 1.1 OnBeforeExportRecord

Allows the user to specify if given record should be exported (e.g. when exporting a list of currencies – to avoid publishing a local currency. This can also be set up by using filters on the Replication card).

Parameters:

- ReplicationNo [Code20]
- ReceiverNo [Code20]
- ExportedRecord [RecordID] = Specifies a record to be exported.
- IncludeRecord [Boolean] = Specifies if the record will be exported.
- VAR OverrideIncludeRecord [Boolean] = The parameter should be set to TRUE in order to override a default value.
- VAR NewIncludeRecord [Boolean] = The parameter should be set to TRUE/FALSE in order to include or skip the record. This setup only works when combined with OverrideIncludeRecord set to TRUE.

Example: (Currency CAD to be skipped from export):

```
LOCAL [EventSubscriber] BeforeRecordExported(ReplicationNo : C
IF ExportedRecord.NUMBER = DATABASE::Currency THEN BEGIN
    ExportedRecord.SETTABLE(MyCurrency);
    IF MyCurrency.Code = 'CAD' THEN BEGIN
        OverrideIncludeRecord := TRUE;
        NewIncludeRecord := FALSE;
    END;
END;
```

1.2 OnAfterExportRecord

Allows you to perform actions on exported records.

Parameters:

- ReplicationNo [Code20]
- ReceiverNo [Code20]
- TableNo [Integer]
- RecordID [RecordID] = Specifies the record to be exported (RecordID)
- ExportedRecord [RecordRef] = Specifies the record to be exported (RecordRef)

Example usage (Fill in "Replication Comment" = new field on Customer card):

```
LOCAL [EventSubscriber] AfterRecordExported(ReplicationNo : Code[20];ReceiverNo
IF ExportedRecord.NUMBER = DATABASE::Customer THEN BEGIN
    ExportedRecord.SETTABLE(MyCustomer);
    MyCustomer."Replication Comment" := 'Published ' + FORMAT(CURRENTDATETIME);
    MyCustomer.MODIFY;
END;
```

2. Codeunit **Record Synchronization Mgt.**

2.1 OnAfterImportedRecordModify

Allows the user to perform actions on imported records.

Parameters:

- VAR ModifiedRecord [RecordRef] = Specifies the record to be updated.
- IsNewRecord [Boolean] = Specifies if the record was new or it existed before.

Example: (Updating the Currency Code field on the Customer card, this time on the receiving company side):

```
LOCAL [EventSubscriber] AfterRecordImported()  
IF ModifiedRecord.NUMBER = 18 THEN BEGIN  
    ModifiedRecord.SETTABLE(MyCustomer);  
    IF MyCustomer."Currency Code" = 'CAD' THEN  
        MyCustomer."Currency Code" := '';  
    MyCustomer.MODIFY;  
END;  
END;
```

3. OnBeforeExportField:

Allows you to override a default field value with your own function.

Parameters:

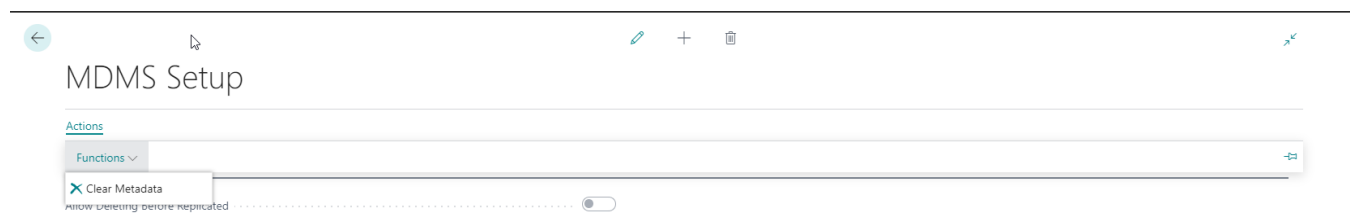
- ReplicationNo [Code20]
- ReceiverNo [Code20]
- TableNo [Integer]
- FieldNo [Integer]
- RecordID [RecordID] = Specifies the record to be exported.
- FieldValue [Text] = Specifies the currently exported field value
- VAR OverrideFieldValue [Boolean] = This parameter should be set to TRUE in order to override default value
- VAR NewFieldValue [Text] = This parameter should be to a new field value.

Example: (Currency Code CAD on Customer Card to be changed to <Blank> when exporting to Canada Receiver):

```
LOCAL [EventSubscriber] AfterFieldExported(Replication  
IF ReceiverNo <> 'CA' THEN  
    EXIT;  
IF TableNo = DATABASE::Customer THEN BEGIN  
    IF FieldNo = 22 THEN BEGIN  
        IF FieldValue = 'CAD' THEN BEGIN  
            NewFieldValue := '';  
            OverrideFieldValue := TRUE;  
        END;  
    END;  
END;  
END;
```

4.4. Metadata cleaning

Clear Metadata action delete all records from Local Table Block Entry table. It means that all information about blocking records and fields will be removed.





www.IT.integro.pl