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# Master Data Management System

Master Data Management System (abbrev. MDMS) is an application 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 Dynamics 365 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 a replication card. Replication can be set up as either **Full** or **Incremental**. While processing incremental replication, only the data changed or added since the last replication is exported.

The application 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.

## Frequently Asked Questions

[FAQ](#)

## 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.

### NOTE

Master Data Management System for Microsoft Dynamics 365 Business Central® is an application available in both license models: cloud (online, SaaS) and on-premises (perpetual license and subscription). Since the release of wave 2 of Business Central 2019, the `[!include[master-data-management-system-md](master-data-management-system-md.md)]` application is offered as a single solution for both the online and on-premises versions of Microsoft Dynamics 365 Business Central.

## Business Processes

- [New and Planned](#)
  - [Application Roadmap](#)
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## Master Company

- [Business Functionality](#)
  - [MDMS Setup](#)
  - [Replication Management](#)
  - [Records Management](#)
  - [Extensibility](#)

## Receiver Company

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## Basic Process Walkthrough

- [Basic Process Walkthrough](#)

## Administration and Installation

- [System Requirements](#)
- [Installation and Registration](#)
- [Sandbox Environment](#)

## Product Lifecycle Policy

- [Product Lifecycle Policy](#)

## Business Central - Base Application

MDMS has been designed based on the technology and functionality of Microsoft Dynamics 365 Business Central. Business Central, as a popular ERP system, supports the management of small and medium-sized companies worldwide, enabling them to automate and streamline their business processes in many business areas.



### TIP

Documentation for Business Central, the base application, has been published on [Microsoft Docs](#).

## Get Started with MDMS

To get started with Dynamics 365 Business Central and MDMS, contact IT.integro at [mdvapp@it.integro.pl](mailto:mdvapp@it.integro.pl).

## See Also

[Master Data Management System on the AppSource marketplace](#)

[IT.integro applications for companies in Poland and global companies](#)

[Other applications in the IT.integro's offer](#)

[Business Central Base Application documentation](#)

[Policies for Product Documentation and Related Online Documents](#)

# New and Planned

Master Data Management System is developed according to a set schedule that represents technological changes, latest legal requirements and the requirement submitted by IT.integro customers and partners. The following table contains links to the articles that describe the application development roadmap and versions released according to the roadmap.

TO	SEE
Get insight into Master Data Management System roadmap and learn the rules for planning development works]	<a href="#">Application Roadmap</a>
Learn what is new in the application versions that were released	<a href="#">Releases</a>

## See Also

[Product Lifecycle Policy](#)

The roadmap for the standard Business Central application has been described in [New and Planned](#)

Contact IT.integro at [mdvapp@it.integro.pl](mailto:mdvapp@it.integro.pl)

# Master Data Management System Roadmap

This article presents the development plans for the Master Data Management System application.

The list below includes:

- functionalities made available within Master Data Management System, starting from the first release of the application which was developed for Microsoft Dynamics 365 Business Central 15 and
- functionalities, the provision of which has been or will be planned for subsequent releases as part of the product roadmap.

In the case of planned functionalities, the dates declared may be changed; it is also possible that development tasks and functionality release may be cancelled.

## IMPORTANT

Deadlines for the completion of tasks that have been specified in the table are subject to change depending on the current priorities. Primarily, the priorities for development tasks related to individual functionalities depend on:

- legal requirements, taking into account the applicable deadlines for providing end users with functionalities that support these requirements,
- unforeseen changes in the scope of legal requirements,
- technological changes and changes in the base application introduced by Microsoft, which have an impact on ensuring the compatibility of Master Data Management System,
- demand reported by project teams and IT.integro partners,
- importance for the operation of the application in the context of related functionalities.

## IMPORTANT

The rules for maintaining the compatibility of Master Data Management System with Dynamics 365 Business Central have been described in [Product Lifecycle Policy](#).


## Completed and Planned Development Tasks

The table in this section shows the development plans and roadmap for Master Data Management System.

The functionalities included in the application roadmaps are developed:

- due to legal requirements,
- as improvements in the functionality of the application,
- as application performance improvements resulting from technological changes.

The table also specifies the status of development tasks for individual functionalities:

- the  symbol means that development of a given functionality has been completed and the functionality has been made available as part of the published version, the number of which is specified in the **Availability from version** column ;
- the **In progress** status means that the development team is working on a given functionality to be released, and the release date has been specified in the **Planned Date** column in a respective row;
- the **To be planned** status means that development has not started yet and no release date has been scheduled. The release date will be determined depending on the priorities set.

FUNCTIONALITY	IMPLEMENTATION STATUS	PLANNED RELEASE DATE	AVAILABLE FROM VERSION
External receiver integration patterns support	□□	-	5.0.3
Field values transformation/mappings when running replication	□□	November 2022	5.3.0
Incremental replication: possibility to choose the replication type for multi-level data sets	□□	December 2022	5.4.0
Performance improvements using partial records (SetLoadFields() for RecRefs )	□□	December 2022	5.4.0
Support for FlowFields	□□	March 2023	5.5.0
Binary data (BLOB, Media, MediaSet) synchronization support	□□	March 2023	5.5.0
SOAP will be deprecated in the future. Change the way of publishing web services to OData	□□	March 2023	5.6.0
Applying local templates on the top of the newly synchronized records	□□	May 2023	5.7.0
A full replication for records from newly added data set lines or data set fields	□□	July 2023	5.9.0
Accelerating data synchronization time by processing synchronization tasks in parallel	□□	October 2023	5.10.0
New function to suggest data set fields based on the master company data	In progress	Q1 2024	-
Database communication for the receivers in the same environment.	In process	Q1 2024	-
Advanced error handling for the http errors.	In process	Q1 2024	-
Default data set templates for the most common master data.	Not started	Q2 2024	-
Transformations for the translations tables. F.e.: Sending the item translation to the item description.	Not started	Q2 2024	-
Function to convert the standard Business Central settings of master data management into MDMS settings	Not started	Q3 2024	-
<b>Include Child Lines</b> feature: Support for the rename of the child lines records	Not Started	Q4 2024	-

## See Also

Contact IT.integro at [mdvapp@it.integro.pl](mailto:mdvapp@it.integro.pl)

[Policies for Product Documentation and Related Online Documents](#)



# Releases

This article lists the released versions of Master Data Management System for Microsoft Dynamics 365 Business Central.

## Versions

- [5.11.0](#)
- [5.10.3](#)
- [5.10.2](#)
- [5.10.1](#)
- [5.10.0](#)
- [5.9.0](#)
- [5.8.1](#)
- [5.8.0](#)
- [5.7.0](#)
- [5.6.0](#)
- [5.5.1](#)
- [5.5.0](#)
- [5.4.1](#)
- [5.4.0](#)
- [5.3.0](#)
- [5.2.0](#)
- [5.1.1](#)
- [5.1.0](#)
- [5.0.3](#)
- [5.0.1](#)
- [5.0.0](#)
- [4.0.6](#)
- [4.0.5](#)
- [4.0.4](#)
- [4.0.3](#)
- [4.0.2](#)
- [4.0.1](#)
- [4.0.0](#)
- [3.6.0](#)
- [3.5.6](#)
- [3.5.5](#)
- [3.5.4](#)
- [3.5.3](#)
- [3.5.2](#)
- [3.5.1](#)
- [3.5.0](#)
- [3.4.2](#)
- [3.4.1](#)
- [3.4.0](#)
- [3.3.0](#)
- [3.2.7](#)
- [3.1.0](#)
- [3.0.0](#)

## See Also

[Installation and Registration](#)

[Contact IT.integro for support at installation](#)

[MDMS on the AppSource marketplace](#)

# Business Functionality

The following articles present how to work with the Master Data Management System application.

## Master Company

TO	SEE
Create data sets and receivers and manage application features	<a href="#">MDMS Setup</a>
Replicate the data by preparing synchronization entries and to synchronize the data by processing synchronization entries	<a href="#">Replication Management</a>
Delete and compare replicated records	<a href="#">Records Management</a>
Perform periodic maintenance activities in a master company	<a href="#">Maintenance</a>
Learn about published application events and external systems integration patterns	<a href="#">Extensibility</a>

## Receiver Company

TO	SEE
Assign user permissions, set up web service authentication	<a href="#">Receiver Company Setup</a>
Display local data creation, modification and deletion constraints	<a href="#">Local Data Set Rules</a>
Delete metadata	<a href="#">Deleting Metadata</a>

## Basic Process Walkthrough

TO	SEE
Go through the basic process of data replication to a receiver company	<a href="#">Basic Process</a>

## See Also

[Installation and Registration](#)

[Contact IT.integro for support](#)

[MDMS on the IT.integro.pl website](#)

[MDMS on App Source](#)

# Setting up MDMS

These articles provide guidelines on the master company configuration.

TO	SEE
Learn about the onboarding experience	<a href="#">Onboarding Experience</a>
Set up the master company	<a href="#">Master Company Setup</a>
Set up receivers	<a href="#">Receivers Setup</a>
Verify receiver's web services	<a href="#">Web Services Setup</a>
Define replicated data structure	<a href="#">Data Set Setup</a>
Connect a data set with a receiver using a replication card	<a href="#">Replication Setup</a>
Set up job queues to automate the processes	<a href="#">Job Queue Setup</a>

# MDMS Onboarding Experience

The following articles provide information about the onboarding experience components that have been incorporated into MDMS to assist users in starting their journey with the application.

TO	SEE
Go through the MDMS checklist	<a href="#">MDMS Checklist</a>
Create MDMS basic setup with demo data	<a href="#">Basic Assisted Setup</a>
Update receiver company details to establish a web service connection	<a href="#">Receiver Connection Assisted Setup</a>

# MDMS Checklist

Master Data Management System contains an onboarding checklist designed to provide users a comprehensive overview of the onboarding process. This checklist enables users to configure and navigate through the application at their own pace, following predefined configuration steps and teaching tips.


To get started with the checklist:

1. Choose the **Settings** icon, select the **My Settings** action and select the **MDMS Manager** as a value in the **Role** field.
2. On the **MDMS Manager** role center page, select the **Get Started** action on the welcome banner to open the onboarding checklist.
3. Explore the application by using the checklist steps and teaching tips that will be displayed after you open consecutive pages.

# MDMS Basic Assisted Setup

As part of the onboarding experience, Master Data Management System provides assisted setups with step-by-step guidance throughout the setup process. The basic assisted setup is designed to help new users get started with using the application quickly. With the basic assisted setup, the user can quickly create demo data sets, a receiver card with basic information and demo replication.


To get started with the basic assisted setup:

1. Choose the  icon, enter **Assisted Setup**, and then select a related link.
2. On the **Assisted Setup** page, find the **Master Data Management System Setup** group and use the **Set up a master company** wizard.

# MDMS Receiver Connection Assisted Setup

The receiver connection assisted setup is specifically designed to assist MDMS administrators in configuring web service communication with receiver companies. By using the receiver connection assisted setup, MDMS administrators can easily update the receiver card with all the essential information such as the data needed for creating the OData URL.

To get started with the receiver connection assisted setup:

1. Choose the  icon, enter **Assisted Setup**, and then select a related link.
2. On the **Assisted Setup** page, find the **Master Data Management System Setup** group and use the **Set up a receiver's connection** wizard.



# Master Company Setup

The following articles will guide you through master company setup.


TO	SEE
Switch on and off general features	<a href="#">MDMS Setup</a>
Assign user permissions	<a href="#">User Permissions</a>
Grant additional user permissions	<a href="#">MDMS User Setup</a>

# MDMS Setup

MDMS allows creating settings that have impact on the master company.

## Setting up a Master Company

To set up a master company:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. Mark the following fields as true:
  - **Master Company** - Specifies, if the current company is a master company. This setting enables a number of functionalities, including blocking certain actions for records in the tables that are part of active data sets.

### NOTE

Set up the **Master Company** field in the master company.

3. On the **General** FastTab, review the following options:
  - **Block Record Renaming** - Prevents renaming records in replicated tables.

### NOTE

The **Block Record Renaming** field affects tracked tables only. For more information, see [Replication Setup](#).

- **Block Record Deletion** - Prevents deleting records from replicated tables.

### NOTE

The **Block Record Deletion** field affects tracked tables only. For more information, see [Replication Setup](#).

- **Use API Setup Templates** - If the field is selected in the receiver company, the configuration template defined on the **API Setup** page will be applied to the newly created records. For more information, see [MDMS Local Template Setup \(API Setup\)](#)
- **Advanced Attributes Handling** - Helps managing item attributes and attributes related tables. The default value is false. This setting should be done in the master company.

### IMPORTANT

Added logic:

- Adding text type item attributes gets detected by incremental replication (master company).
- Preventing a confirmation page being displayed when last value of a particular attribute is deleted (receiver).

### IMPORTANT

Recommendations:

- Replicate attributes and their values first (with synchronization) before replicating item attributes mappings.
- Do not manage attributes locally, because their primary keys are auto-incremented.

1. On the **Data Set** FastTab, review the following options:

- **Prevent Identical Table on Data Sets** - Disallows using the same table in different data sets.
- **Auto Assign Primary Key Relations** - Assigns data set relations automatically based on primary keys.
- **Track Data Set Changes** - If the field is selected, the changes in the data set are tracked and selected data set lines can be replicated to align the data.

5. On the **Replication** FastTab, review the following options:

- **Enable One-Time Replication** - For more information, read [Running One-Time Replication](#).

6. On the **Synchronization** FastTab, review the following options:

- **No of Records per Synchronization Message** - Specifies the number of records sent per one message. The smaller a data set is, the larger the number is. If Http 413 error occurs, the number should be decreased.
- **Auto Synchronize** - Specifies whether synchronization entries are processed automatically (synchronized with receivers) after the replication process.

7. In the **Records Deletion** FastTab, review the following options:

- **Allow Deleting Before Replication** - Allows deleting records that have not been replicated yet.
- **Clear Record Receivers** - If the field is selected, the non-existent record receivers are deleted after source record is deleted. This setting applies to record-level replications. For more information, see [Running Record-Level Replication](#).

8. On the **History** FastTab, review the following options:

- **Generate Record Sync. Details** - Specifies whether record synchronization entry details are created.

#### NOTE

The **Generate Record Sync. Details** action may slow down the synchronization process, therefore it is not recommended to use it with large volumes of replicated data.

- **Record Sync. Entries Period** - Specifies a date formula used to determine record synchronization entries that should be deleted with the **Clear Record Sync. Entries** batch job execution.
- **Create Performance Log** - Logs replication performance details.

9. On the **Numbering** FastTab, review the following options:

- **Data Set Nos.** - Specifies the number series to be used for new data sets.
- **Replication Nos.** - Specifies the number series to be used for new replications.

10. On the **Job Queue Monitoring** FastTab, review the following options:

- **Skip Open Replications** - Allows job queues to skip open replications limiting the number of errors.
- **Maximum Number of Attempts to Restart JQ** - Specifies the maximum number of restarting attempts for the job queue monitor to restart a single job queue entry.
- **Send Notification** - Specifies whether the system sends an e-mail notification to e-mail recipients to notify about the fact that a job queue entry has not been restarted successfully after reaching the maximum number of restart attempts.
- **Email Recipients** - Specifies e-mail notifications recipients.
- **Email Sender Name** - Specifies the name of an e-mail notifications sender.
- **Email Sender Address** - Specifies the address of an e-mail notifications sender.

# User permissions

As part of the MDMS, the following permission sets have been created:

- **ITI01 MDMS FULL** - Specifies an administration permission set that provides access to all MDMS functionalities. This role must be assigned to the user dedicated to web service communication.
- **ITI01 MDMS USER** - Specifies a user's permission set. It is suitable for users working in a master data company. Access to setup tables, including **Data Sets** and **Receivers**, is blocked.
- **ITI01 MDMS LOCAL** - Specifies a local user permission set. It is suitable for users working in a receiver company.

## NOTE


The **MDMS** permission set needs to be assigned to the receiver company user or the Azure Active Directory application whose credentials are used on the **Receiver Card**.

# MDMS User Setup

Creating MDMS user setup is required to enable users to take advantage of some advanced features like accessing filtered views or performing actions that require extra privileges.

## Creating MDMS User Setup

To create a MDMS user setup:

1. Choose the  icon, enter **MDMS User Setup**, and then select a related link.
2. Select the **New** action and Fill in the following fields:
  - **User ID** - Specifies the user ID.
  - **MDMS Super User** - Specifies whether a user is a super user. If selected, the user can perform special activities.
  - **Deletion Confirmation** - Specifies if the confirmation dialog should be displayed to the user when deleting records from the master company.

## Understanding MDMS Super User Privileges

### Master Company

In a master company, a MDMS super user can:

- delete records
- edit one-time replication setup
- view tracking log entries
- run the **Clear Replication Tracking Log** and **Delete Record Sync. Entries** batch jobs
- manage MDMS users' receiver permissions used in record-level replications
- Define *Clear Table on Full Replication* field value

### Receiver Company

In a receiver company, a MDMS super user can:


- create, modify and delete records ignoring the limitations enforced by the following data sets: **Disable Local Insertion**, **Disable Local Deletion** and **Disable Local Modification**,
- delete the limitations enforced by data sets (metadata).

# Receivers Setup

A receiver is a company that receives data sets from a master company. It exposes a web service which its master company connects to. Therefore, each receiver card must provide the necessary connection parameters.

## Setting up Receivers

To set up a receiver:

1. Choose the  icon, enter **Receivers**, and then select a related link.
2. On the **Receivers** page select **New**, and then fill in the following fields:
  - **No.** – Specifies a unique code to identify the receiver.
  - **Description** – Specifies a text to identify the receiver.
  - **Group Receiver** – Specifies if the receiver is a group receiver.
  - **External** – Specifies if external systems integration patterns are used.
  - **Web Service Protocol** – Specifies the web service protocol. Possible options are: SOAP, ODataV4.
  - **Web Service Address** – Specifies the web service address. The ReceiverWS web service is published automatically. Its details can be found on the Web Services list in the receiver company. The SOAP URL should be copied, and the ODataV4 URL can be created with the AssisEdit button.

### NOTE

The SOAP web service address must match the following pattern for Microsoft Dynamics 365 Business Central on-prem receivers:

```
http(s)://<SERVER>:<NUMERIC_PORT>/<INSTANCE>/WS/<COMPANY_NAME>/Codeunit/ReceiverWS
```

### NOTE

The SOAP web service address must match the following pattern for Microsoft Dynamics 365 Business Central cloud (SaaS) receivers:

```
https://api.businesscentral.dynamics.com/<API VERSION>/<TENANT ID>/<ENVIRONMENT NAME>/WS/<COMPANY_NAME>/Codeunit/ReceiverWS
```

### NOTE

The ODataV4 web service address must match the following pattern for Microsoft Dynamics 365 Business Central on-prem receivers:

```
http(s)://<SERVER>:<NUMERIC_PORT>/<INSTANCE>/ODataV4?company=<COMPANY_NAME>
```

### NOTE

The ODataV4 web service address must match the following pattern for Microsoft Dynamics 365 Business Central cloud (SaaS) receivers:

```
https://api.businesscentral.dynamics.com/<API VERSION>/<TENANT ID>/<ENVIRONMENT NAME>/ODataV4?company=<COMPANY_NAME>
```

## IMPORTANT

<ENVIRONMENT NAME> and <COMPANY NAME> should be URL encoded.

- **Authentication Method** – Specifies the web service authentication method. The following options are available:
  - **Basic**
  - **AAD**
- **Web Service Username** – Specifies a web service username (if basic authentication is selected).
- **Web Service Password** – Specifies a web service password (if basic authentication is selected).
- **Client ID** – Specifies a client ID (if AAD authentication is selected).
- **Client Secret** – Specifies a client secret (if AAD authentication is selected).
- **Tenant ID** – Specifies an AAD tenant ID (if AAD authentication is selected).

3. Select the **Test Connection** action on the ribbon.

## Authentication Methods

Authentication methods: **Basic** and **Azure Active Directory** are available.

### Basic Authentication

To authenticate web service using basic authentication, WebServices username and WebServices Password need to be specified.

For on-premises installation, **User Name** and **Business Central Password** settings should be used. For more information, see [On-premises Installation](#)

For online installation, the **User Name** setting should be use as **WebServices Username**.

The web service access key that is generated on the **User Card** page (in a receiver company) should be used as a WebServices password.

### NOTE

Basic authentication is obsolete since Business Central 2022 wave 1. Azure Active Directory authentication must be used to connect to a receiver in Microsoft Dynamics 365 Business Central online.

## Azure Active Directory Authentication

For more information, read [How to set up AAD authentication](#).

## Testing Connection

The connection to a receiver company can be verified by using the **Test Connection** action on a **Receiver Card** page.

## Receiver MDMS Version

The **MDMS Version** field on the **Receiver Card** indicates the version of the MDMS that the receiver is running. This field is retrieved during the **Test Connection**, **Release**, and **Synchronize** in the replication process. The value of this field is used to maintain compatibility between different versions of the MDMS software.

**NOTE**

If the connection is not established, or if the receiver's version is lower than 5.5.0.0, the value of the MDMS Version field will be N/A.

**NOTE**

The **MDMS Version** field value is not retrieved for external receivers.

## Setting up Group Receivers

A group receiver allows creating a single replication that sends the same data to all the receivers it groups. That option can be used when a group of companies always receives the same data. It aims at saving the replication setup and maintenance time.

To convert an existing receiver to a group receiver:

1. Open a Receiver Card of the already created receiver.
2. On the **Receivers** page go to the **General** FastTab and set the following field to **True: Group Receiver**.
3. On the **Receivers** page, go to the **Group Receiver Lines** FastTab and add other receivers to the group.

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

## Setting up External Receivers


For more information see, [External Systems Integration Patterns](#).



# Verifying the Web Service Address

The ReceiverWS SOAP web service is exposed automatically during the application installation.

To verify the web service address:


1. Choose the  icon, enter **Web Services**, and then select a related link.
2. On the **Web Services** page, set up a filter for the **Object ID** field and use **20020709** as a filter value.
3. Copy the **SOAP URL** field value.

## IMPORTANT

The MS Dynamics 365 Business Central server instance name is part of the web service URL for an on-premises installation. Make sure the SOAP web service is enabled for the instance or use a different one.

The ReceiverWS ODataV4 web service is not exposed automatically during the application installation and it has to be created manually.

To create the ODataV4 web service address:

1. Choose the  icon, enter **Receivers**, and then select a related link.
2. On the **Receivers** page, select **New**, and then fill in necessary fields.
3. Choose the AssistEdit button on the **Web Service Address** field.
4. On the page that opens, fill in the following fields:
  - **Environment Type** - Specifies the type of environment that the receiver uses.
  - **Company Name** - Specifies the company name of the receiver.
  - **Tenant ID** - Specifies the tenant ID of the receiver, if the **Online** environment type is selected.
  - **Environment Name** - Specifies the environment name of the receiver, if the **Online** environment type is selected.
  - **Connection Protocol** - Specifies the connection protocol, if the **On-Premises** environment type is selected.
  - **Server** - Specifies the server where the web service is hosted, if the **On-Premises** environment type is selected.
  - **Port** - Specifies the port number that is used to identify the network port to which your application or service should connect, if the **On-Premises** environment type is selected.
  - **Web Service Instance** - Specifies the web server instance of the receiver, if the **On-Premises** environment type is selected.
5. Select **OK** to create the web service address.

# Data Sets

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

## Setting up Data Sets


A data set consists of a header and at least one line. Lines can be linked using data set line relations and filtered with data set line filters. A subset of table fields is assigned to each data set line.

### NOTE

When the *ObsoleteState* table property is set to *Pending* for a data set line or a field in a data set line, it is colored yellow. When the *ObsoleteState* property is set to *Removed*, either a relevant table or field are colored in red.

## Data Set Header

To set up a data set header:

1. Choose the  icon, enter **Data Sets**, and then select a related link.
2. On the **Data Sets** page select **New**, and then fill in the following fields:
  - **No.** - Specifies a data set unique identifier.
  - **Description** - Specifies a description of the data set.
  - **Status** - Specifies the data set status. The status can be either **Open** or **Released**. It can be changed using the **Release** and **Reopen** actions.

### IMPORTANT

Only a data set with the **Released** status can be replicated.

## Data Set Line

To set up a data set line:

1. Go to the **Lines** subpage and fill in the following fields:
  - **Table No.** - Specifies a number of the table to be replicated.
  - **Code** - Specifies a unique identifier of the data set line.

### NOTE

This field is filled in automatically.

- **Name** - Specifies a description of the data set line.

### NOTE

This field is filled in automatically.

- **Table Name** - Specifies a name of the table to be replicated.

#### NOTE

This field is filled in automatically.

2. Optionally, fill in or review the following fields:

- **No. of Data Set Fields** - Specifies the number of selected data set fields.
- **No. of Table Records** - Specifies the number of selected table records in current company.

#### NOTE

Data set filters do not affect the displayed number of records.

- **Target Table No.** - Specifies the number of the target table. it is possible to set up some other table.
- **Always Include Child** - When selected, the **Incremental Replication** process always includes child lines with **Full Replication**.
- **Full-Incremental Replication** - When selected, the **Incremental Replication** process takes all fields included in the data set.
- **Clear Table On Full Replication** - When selected, the table in the receiver company is fully deleted, before new data is uploaded. It works only if the **Full Replication** option is set and users have the **MDMS Super User** permissions. If you encounter a connection error while working with large amounts of data, you may consider adjusting the **Max Session Timeout** field on the **MDMS Setup** page. This setting determines the amount of time in milliseconds that the system will wait for establishing a connection with the remote service before timing out. The default value in **MDMS** software is 1 minute. Please note that the value you set for the **Max Session Timeout** field cannot exceed the **NavHttpClientMaxTimeout** parameter value, which is the maximum amount of time that a connection attempt can take before timing out. If the **Max Session Timeout** value is bigger than the **NavHttpClientMaxTimeout** parameter value, the **NavNclHttpClientTimeoutTooLargeException** error is displayed.

#### NOTE

Only users with the **MDMS Super User** permission can define the field value.

- **On Record Exists** - Specifies the action which is taken when it turns out that a replicated record already exists in the target database. The following action options are available: **Update** and **Skip**.

#### NOTE

MDMS always compares primary keys.

- **Disable Local Insert** - If this field is selected, users will not be able to insert new records in their local database.
- **Disable Local Delete** - If this field is selected, users will not be able to delete records in their local database.
- **Block Exception Filter** - Specifies a filter that allows excluding certain records from the blocking rules.
- **Run Trigger on Insert** - If a new record is inserted into a local database, **Insert (true)** is used during the operation. By default, it is **Insert (false)**.

#### NOTE

When the **Run Trigger on Insert** field is selected, business logic behind this trigger is executed. Event subscriptions are executed with

**RunTrigger=true.**

- **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)**.

#### **NOTE**

When the **Run Trigger on Modify** field is selected, business logic behind this trigger is executed. Event subscriptions are executed with **RunTrigger=true**.

## Data Set Field

To set up a data set field (primary key fields are added automatically):

1. Go to the **Lines** subpage and fill in the following fields:

- **Field No.** - Specifies a field number.
- **Code** - Specifies a unique identifier of a data set field.

#### **NOTE**

This field is filled automatically when **Field No.** is validated.

- **Field Name** - Specifies a name of the field.

#### **NOTE**

This field is filled automatically when the **Field No.** value is validated.

- **Target Field No.** - Allows exporting the value to another field.

#### **IMPORTANT**

**Target Field No.** must be changed for fields of class FlowField. The exceptions are when **Table No.** and **Target Table No.** are different.

- **Validate Field** - Specifies whether the field value should be validated upon importing in receiver companies.

#### **NOTE**

When the field is selected, the table relation is checked and the field validation logic is executed. Event subscriptions are executed with **RunTrigger=true**.

- **Disable Local Modify** - Specifies whether edition of the field value in the receiver companies is allowed.
- **Field Type** - Specifies the type of the field.

#### **NOTE**

This field is filled automatically when **Field No.** is validated.

- **Processing Order** - Specifies the order in which record fields are processed. This is particularly important for the data validation flow.

#### **NOTE**

This field is filled automatically when the **Field No.** is validated.

- **Table No.** - Specifies the number of the table.

#### **NOTE**

This field is filled automatically when **Field No.** is validated.

- **Exclude Record Status Compare** - If selected, the field is excluded from **Record Status Comparison**.
- **Keep Local Value** - Allows an initial export of the field value while no later changes of the field value are synchronized with receivers.
- **Skip Export** - Allows skipping the field during the export.

#### **NOTE**

It can be useful to skip a Data Set field when synchronization returns error. Next synchronization will not send that field again.

#### **NOTE**

The **Add Fields** function allows selecting multiple fields.

#### **NOTE**

If the **Blob**, **Media** or **MediaSet** fields are included in the data set with other, non-primary key fields, an error will be displayed. These types of fields should have a dedicated data set. For more information, see [Binary data replication](#)

## Data Set Line Filter

It is possible to specify additional filters that are applied to data set records when a replication process is run. To set up a data set line filter:

1. Go to the **Lines** subpage and select the **Filters** action from the **Line** tab in the ribbon.

#### **NOTE**

If a filter is defined for a data set line and a replication line for the same field, then the data set filter is overridden.

2. Fill in the following fields:
  - **Field No.** - Specifies a field number from current data set line.
  - **Value** - Specifies a text value expression the field is filtered with.

## Data Set Line Relation

It is possible to specify a relation between an indented record and its parent record.

**Increase Indent** and **Decrease Indent** actions are used to manage relations between lines.

Relations can be set up automatically when **Auto Assign PK relations** is selected in the **MDMS Setup**. That option works for relations based on the primary key.

To set up a data set line relation:

1. Go to the **Lines** subpage and select the **Relations** action from the **Line** tab in the ribbon.
2. Fill in the following fields:
  - **Field No.** - Specifies a field number from current data set line.
  - **Parent Field No.** - Specifies a field number from a related, parent data set line.

The Item table example describes additional considerations of the relations:

1. If incremental replication is run for for a certain item unit of measure then a parent record (item) is also included.
2. If **Always Include Child** is marked on a data set line then **Record Synchronization Entries** are created for all related child lines.
3. If **Include Child** is marked on the One-Time Replication Setup then **related** child line (Item Unit of Measure is included in the replication.

## Retargeting Tables and Fields

Retargeting tables and fields is possible (see: **Data Set Line** and **Data Set Field** above). The following table presents the supported processes.

PROCESS	RETARGETED TABLE	RETARGETED FIELD
Record Replication	Supported	Supported
Record Deletion	Supported if the table exists in the master company	Supported
Record Status Check	Supported if the table exists in the master company	Supported

### IMPORTANT

**Target Field No.** must be changed for fields of class *FlowField*. The exceptions are when data set line's **Target Table No.** is different from data set line's **Table No.**.

### IMPORTANT

The fields of class *FlowField* cannot be tracked by MDMS (they will not appear in Tracking Log Entries), therefore it is recommended to mark the **Full-Incremental Replication** on data set line as true.

## Copying Data Sets

The **Copy** function enables the user to copy data sets.

## Managing Replications with Where-Used

The **Where-Used** function enables the user to see the page with all the replications the data set is assigned to. Reopening and

releasing those replications is possible on that page.

## Releasing Data Sets

When a data set is prepared, it is necessary to change its status to **Released** using the **Release** action. Open data sets cannot be replicated. Making adjustments to a released data set requires reopening it first by using the **Reopen** action.

## Displaying Record Synchronization Entries

The **Show Record Sync. Entries** action is available on the ribbon in the **Navigate** section. It navigates to the **Record Sync. Entries** related to the Data Set.

## FactBoxes

There are: **Fields**, **Relations** and **Filters** FactBoxes available on a data set.

## Binary Data Data Sets

Binary data refers to fields of the **Blob**, **Media**, and **MediaSet** type that store files such as images or other types of media. To make it possible to send this type of field with MDMS, you have to create a dedicated data set for it. The release of a data set that contains binary fields and other non-primary key fields causes an error. For more details see: [Binary data replication](#)

# Replication Setup


A replication connects data sets and a receiver. It offers a possibility of applying receiver-oriented filters to limit the number of replicated records.

## Setting up Replications

A replication consists of a header and at least one line representing a linked data set. Lines can be filtered with replication line filters.

### Replication Header

To set up a replication header:

1. Choose the  icon, enter **Replications**, and then select a related link.
2. On the **Replications** page select **New**, and then fill in the following fields:
  - **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.
  - **Job Queue Entry Exists** - Specifies, if any job queue entry exists for a replication.
  - **Status** - Specifies the replication status. The status can be either **Open** or **Released** and can be changed using the **Functions / Release** and the **Functions / Reopen** actions.
  - **One-Time Replication** - Specifies, whether the replication is used as one-time replication only.
  - **Locked** - Specifies whether the replication is being processed at the moment. It prevents processing it again at the same time.
  - **Allow Incremental Replication** - Specifies whether the replication can be processed using the **Run (Incremental)** action. The option is enabled by default. If it is disabled, tracking log entries\*\* are not created.
  - **No. of Pending Synchronization Entries** - Specifies the number of pending record synchronization entries to be processed.
  - **Has Error** - Specifies if the replication has any synchronization errors.
  - **No. of Records per Synchronization Message** - Specifies the number of records sent per one message. The smaller a data set is, the larger the number is. If Http 413 error occurs, the number should be decreased. It appears on the replication card when replicating binary data. It overrides a field that has the same field name on the MDMS Setup page. For more details see: [Binary data replication](#)

### Replication Lines

To set up a replication line:

1. Go to the **Lines** subpage and fill in the following fields:
  - **Data Set No.** - Specifies a number of the replicated data sets.
  - **Description** - Specifies a description of the replicated data set.
2. Optionally, fill in or review the following fields:
  - **Filtered** - Specifies whether replication filters are applied.

### Replication Filters



It is possible to specify additional filters that are applied to data set records when a replication process is run. To set up a replication line filter:

The following fields are available:

- **Data Set Line No.** - Specifies a line number of the data set to be replicated.
- **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.
- **Field No.** - Specifies a number of the field for which the filter will be applied.
- **Field Caption** - The field is filled in automatically as soon as a field number is entered.
- **Value** - Specifies a value that is a required filter value.

#### NOTE

**Value** is a text-based field. Make sure the values are correct, especially for options and enums.

#### NOTE

If a filter is defined for a data set line and a replication line for the same field, then the data set filter is overridden.

## FactBoxes

The **Filters** factbox is available on the **Replication Card** page. The following fields are available:

- **Filter Type** - Specifies whether filters are applied on the data set or on a replication.
- **Field Caption** - Specifies a filtered field caption.
- **Value** - Specifies a filtered field value.

## Releasing Replications

When a replication card is prepared, it is necessary to change its status to **Released** by using the **Release** action. Making adjustments to a released replication requires reopening it first by using the **Reopen** action. Each replication has to be released before it is run. Actions: **Release All** and **Reopen All** are available on the **Replication List** page.

## Binary data replication

Binary data refers to fields of type Blob, Media, and MediaSet, which store files such as images or other types of media. To make it possible to send this type of field with MDMS you have to create a separate replication for it. For more details see: [Binary data replication](#)

#### IMPORTANT

MDMS tracks tables added to released replications only. If a replication is open and a record is created or modified then an incremental replication processing does not include this. If a replication is open and user tries deleting/renaming a record, the record is deleted/renamed regardless of **Block Record Delete** and **Block Record Rename** settings on **MDMS Setup** page.


# Job Queue Setup

Replications can be automated using job queues. A monitoring job queue can be created to send e-mail notifications on failures.

## Setting up a Replication Job Queue Entry


It is possible to set up a replication to be run automatically using the a job queue entry.

To set up a job queue entry for a replication:

1. Choose the  icon, enter **Replications**, and then select a related link.
2. Select the **Create Job Queue Entry** action.
3. In a confirmation dialog window, select **Yes**, if incremental replication is to be run or **No**, if full replication is to be used.
4. Provide the recurrence parameters and set the status to **Ready**.

## Viewing Job Queue Entries for a Replication

To see job queue entries related to a replication:

1. Choose the  icon, enter **Replications**, and then select a related link.
2. Select the **Show Job Queue Entries** action.

### IMPORTANT


Grouping job queue entries into categories reduces the risk of locking, because job queue entries that belong to the same category cannot be run simultaneously.

## Monitoring Job Queue Entries

It is possible to set up a job queue entry to monitor all the job queue entries which are set up for replications. A monitoring job queue entry puts replication jobs on hold if they constantly fail and notifies the e-mail recipients.

## Setting Up a Job Queue Entry Monitor

To set up a monitoring job queue entry:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. Set up the following fields on the **Job Queue Monitoring** FastTab of the **MDMS Setup**:
  - **Maximum Number of Attempts to Restart JQ** - Specifies the maximum number of attempts to restart a job queue entry. When this value is exceeded, the job queue status is set to **On Hold**.
  - **Codeunit ID to Restart** - Specifies the Codeunit Id used by the job queue monitor function. Codeunit Id 20020699 is suggested automatically.
  - **Send Notification** - Specifies whether the system sends notifications after the **Maximum Number of Attempts to Restart JQ** value is exceeded.
  - **Email Recipients** - Specifies notification e-mails recipients.

1. Select the **Test Email** action on a **MDMS Setup** and send a test e-mail.

2. Select the **Create Job Queue Entry Monitor** action, provide the recurrence parameters and set status **Ready**.

# Configuration Tools

To streamline the demonstration of the application functionality and onboarding process, MDMS provides the configuration package that enables you to easily create data sets for items, vendors, customers or G/L accounts with predefined setup.

## Creating MDMS Configuration Package from the MDMS Setup

The **Create MDMS Configuration Package** action, available on the **MDMS Setup** page, allows you to create a configuration package that contains MDMS configuration tables. This action can be useful when configuration packages are used for migrating the MDMS configuration or setting up a new company.

To create an MDMS configuration package:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. On the **MDMS Setup** page, choose the **Create MDMS Configuration Package** action.
3. Verify and adjust the created configuration package.
4. Export the configuration package in a preferred format.

### IMPORTANT


The MDMS configuration package will not contain receivers web service address and credentials. This data should be updated in the configured company after importing the configuration package.

## Creating Demo Data Sets

If you need to test the application or quickly configure data sets for demo purposes, you can use the **Create Demo Data Sets** action on the **MDMS Setup** page. This action allows you to create demo data sets for items, vendors, customers or G/L accounts.


### IMPORTANT

The demo data sets will be created with some pre-defined fields and local blocking, which will prevent users from changing the data in the local company.

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. On the **MDMS Setup** page, choose the **Create Demo Data Sets** action.
3. Choose the tables for which the data set should be created. You can choose from the following tables: **Item**, **Vendor**, **Customer** and **G/L Account**. By default, all the options are marked.
4. Choose the **OK** button to create demo data sets.

## Creating Data Set Lines from the Configuration Package

The **Create Data Set Lines from the Config. Package** action, available on the **Data Set** page, allows you to create data set lines and data set fields based on the selected configuration package lines. This action can be useful when the configuration packages are used for data migration or setting up a company.

1. Choose the  icon, enter **Data Sets**, and then select a related link.
2. On the **Data Sets** page, choose the **Create Data Set Lines from the Config. Package** action.

3. On the **Get Configuration Package Lines** page, select the configuration package lines you want to convert into the data set lines and choose the **OK** button.
4. Choose **Yes** to confirm the dialog.
5. Verify the settings of the created data set lines. By default, the **Disable Local Insertion/Deletion/Modification** fields are set to **Yes**.

#### **IMPORTANT**

Only the configuration package field records with the **Include Field** field set to **Yes** will be converted. Moreover, this functionality does not support the following field types: **GUID, Binary, RecordID, BLOB, Media** and **MediaSet**.

# Replication Management


Replication is a process of moving records from a master company to receiver companies. The articles below describe replication types and functionalities that help users run them.

TO	SEE
Run a basic replication	<a href="#">Running Replication</a>
Run a record-level replication	<a href="#">Running Record-Level Replication</a>
Run a replication of a selected record	<a href="#">Running One-Time Replication</a>
Run a replication for a selected data set line	<a href="#">Running Replication for Selected Data Set Line</a>
Cancel one or more record synchronization entries	<a href="#">Canceling Synchronization Entries</a>
Synchronize metadata with receivers	<a href="#">Synchronizing Metadata</a>
Create a transformation for a field value	<a href="#">Transformations</a>
Replicate media	<a href="#">Binary data replication</a>

# 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.

## Running a Replication Manually

1. Choose the  icon, enter **Replications**, and then select a related link.
2. Select the **Run (Full)** or **Run (Incremental)** action.

### NOTE

It is possible to select multiple replications on the list and run them one after another.

## Running a Replication using Job Queue

Replication can be set up using a job queue entry. It is recommended to use one job queue entry per replication with the incremental parameter. See [Job Queue Setup](#).

## Understanding Full and Incremental Replications

Each replication can be run in one of the two modes: **Full** or **Incremental**. Both replication methods include filters that are applied to a replication line or data set line and filters related to record-level setup. Each successful replication process updates the **Last Run Date and Time** field on its **Replication Card** page.

The **Full** replication loops through all the records in a data set. If no filters have been set up, all the records are exported each time the replication process is run. A record synchronization entry is created for each replicated record.

The **Incremental** replication includes only data that has been modified since the last replication. Tracking log entries are used to track the changes of the records (creation, modification, renaming and deletion). The replication creates record synchronization entries and deletes tracking log entries, which it used as a reference. See [Tracking Log Entries](#).

If the **Use Incremental** field is not selected on the replication card, it is possible to run the **Full** processing (**Tracking Log Entries** are not created).

### NOTE

If there is a parent record on the **Tracking Log Entries** (on top of a data set line) for which **Always Include child** is marked on a data set line then **Record Synchronization Entries** are created for all related tables defined in that data set.

## Understanding Record Synchronization Entries

Record Synchronization Entries document the replication.

To see record synchronization entries of a particular replication:

1. Choose the  icon, enter **Replications**, and then select a related link.

2. Select the **Record Synchronization Entries** action.

3. Review the following fields:

- **Entry No.** - Specifies a sequential number.
- **Entry Type** - Specifies a type of an entry. It can be: "Update" when data is replicated for the first time or updated, "Delete" when record was deleted from current or receiver company or "Rename" if rename operation was detected.
- **Action Type** - Specifies what action was performed.
  - **Full** - Full Replication.
  - **Incremental** - Incremental Replication.
  - **Metadata** - Metadata was sent (**Disable Local Insertion, Disable Local Deletion, Disable Local Modify, Block Exception Filter**).
  - **Records Management** - Tool handling the deletion process from master.
  - **One-Time** - One-time replication feature.
- **Source Type** - Specifies if related to full/incremental replication or results from a **Records Management** operation.
- **Record ID** - Specifies an ID of a record that was sent or deleted.
- **Target Table No.** - Specifies a destination table number.
- **Target Table Name** - Specifies a destination table name.
- **Date and Time** - Specifies the date and time of a replication.
- **Status** - Specifies record status.
  - **New** - Newly created entries.
  - **Processed** - Entries that processed successfully.
  - **Error** - Entries for which a web service returned an error message.
  - **Cancel** - Entries of status **New** that were canceled.
- **Processed Date & Time** - Specifies the processing date and time.
- **Processed By** - Specifies the ID of a user who processed the entry.
- **Error Text** - Specifies the text of the message displayed after a processing error occurred.
- **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.
- **Data Set No.** - Specifies the data set number which was used for the replication.
- **Receiver No.** - Specifies a number of the receiver. Important when the group receiver feature is used.

## Synchronizing records

Synchronization is one of the tasks of the replication process. However, it can be run separately if **Auto Synchronize** is switched off in the **MDMS Setup**.

The **Synchronize** action on a **Replication Card** processes all entries pending for replication.

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

## Record Synchronization Entry Details



**Update** and **Rename** operations can have **Record Synchronization Entry Details** created. The details show which fields and values were replicated.

To see record synchronization entry details:

1. Go to the **Record Synchronization Entries** page.
2. Select the **Show Details** action.
3. Review the following fields:
  - **Field No.** - Specifies a replicated field number.
  - **Field Name** - Specifies a replicated field name.
  - **Field Value** - Specifies a replicated field value.
  - **Target Field No.** - Specifies a destination field number.
  - **Target Field Name** - Specifies a destination field name.

#### NOTE

Details are generated only if **Generate Record Sync. Details** is marked in the **MDMS Setup**.

## Group Receivers

With the group receivers feature, it is possible to process one replication simultaneously for multiple receivers. See [Receiver Setup](#).

A group receiver can be used when a group of receivers always receives the same data.

#### NOTE

Replication with a group receiver can generate performance problems when processing a large volume of data.


## Locked Replication

When the replication is being run or synchronized, it is set as **Locked** to avoid opening or double processing. Each replication can be unlocked manually by using the **Unlock** action available on the **Replication Card** and **Replications** pages.

## Performance Log Entries

**Performance Log Entries** can be created during replication running and synchronization. **Performance Log Entries** are used to monitor and support performance issues. To use this feature, you must mark the **Create Performance Log** field in **MDMS Setup**.

### Opening Performance Log Entries View

1. Choose the  icon, enter **Replications**, and then select a related link.
2. Select the **Performance Log Entries** action.

3. Review the following fields:

- **Entry No.** - Specifies a sequential number.
- **Entry Type** - Specifies a type of entry. It defines the monitored part of the process.
- **Replication No.** - Specifies the number of the replication that it relates to.
- **Receiver No.** - Specifies the number of the receiver that it relates to.
- **Data Set No.** - Specifies the number of the data set that it relates to.
- **Data Set Line Code** - Specifies the data set line code.
- **Starting Date & Time** - Specifies the starting date & time of the processing.
- **Measured Time** - Specifies the process length.
- **No. Of Records** - Specifies the number of records that were processed.
- **No. Of Fields** - Specifies the number of fields that were processed.

# Enabling Record-Level Replication

Sometimes it is necessary to specify a certain subset of records to be replicated to certain receivers. A record-level replication is the one that takes into account the setup of record subscriber. Any table can be replicated at the record level. However, to make managing records subscriptions easier for users, it is recommended to add **Record Receivers Matrix** action or the **Receivers** action to selected lists **as an AL application extension**.

## Extending the MDMS by Adding Actions to Selected Lists

Within the record-level replication two options are available. The **Record Receivers Matrix** which offers possibility to replicate selected records or the **Receivers** to replicate a single record.

### Record Receivers Matrix

To add the **Record Receivers Matrix** action to a selected list:

1. Ask a developer to prepare the the following page extension for each selected list (Item List, Vendors, some custom list, etc):

```
pageextension 50100 "ITI MDMS Item List" extends "Item List"
{
  actions
  {
    addlast(processing)
    {
      action(ITIRecordReceiversMatrix)
      {
        ApplicationArea = All;
        Caption = 'Record Receivers Matrix';
        ToolTip = 'Specify receivers for the selected records.';
        Image = Company;

        trigger OnAction()
        var
          Item: Record "Item";
          RecordLevelMgt: Codeunit "ITI MDMS Record-Level Mgt.";
          RecRef: RecordRef;
        begin
          CurrPage.SetSelectionFilter(Item);
          RecRef.GetTable(Item);
          RecordLevelMgt.ShowRecordReceiversMatrix(RecRef);
        end;
      }
    }
  }
}
```

2. Add a selected list name after the **extends** keyword in the first line of the code. For example **Payment Terms**.

#### **NOTE**

Any table can be used in the record-level replication functionality.

### Receivers

To add the **Receivers** action to a selected list:

1. Ask a developer to prepare the the following page extension for each selected list (Item List, Vendors, some custom list, etc):

```
pageextension 50100 "ITI MDMS Item List" extends "Item List"
{
  actions
  {
    addlast(processing)
    {
      action(Receivers)
      {
        ApplicationArea = All;
        Caption = 'Receivers';
        ToolTip = 'Specify the receiver for the selected record.';
        Image = Company;

        trigger OnAction()
        var
          RecordLevelMgt: Codeunit "ITI MDMS Record-Level Mgt.";
        begin
          Clear(RecordLevelMgt);
          RecordLevelMgt.OpenRecordReceivers(Rec.RecordId());
        end;
      }
    }
  }
}
```


2. Add a selected list name after the **extends** keyword in the first line of code. For example **Payment Terms**.

#### NOTE

Any table can be used in the record-level replication functionality.

## Setting up a Record-Level Replication

To set up the record-level replication functionality for a table:

1. Choose the  icon, enter **Record-Level Active Tables**, and then select a related link.
2. Add a new record. The following fields can be set up:
  - **Table No.** - Specifies a table number used.
  - **Record-Level Filtering** - Specifies whether record-level is the only way of filtering. Other filters will not be applied which reduces a full replication processing time.
  - **Include Children on Subscribe** - Specifies whether to include all data set children with a subscribed record.
  - **Check Receiver Permissions** - Specifies whether records displayed on the **Record Receivers** page are filtered based on receiver permissions. For more information, please read [Receiver Permissions](#).

## Making Exceptions in Record-Level Replications

MDMS offers a possibility of excluding a record from record-level replication. The **OnBeforeExportRecord** event publisher procedure contains information whether record-level is used. The parameter value can be changed to exclude a record from record-level replication.

To exclude a record from record-level replication:

1. Ask a developer to prepare a following event subscriber procedure:

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI Replication Mgt.", 'OnBeforeExportRecord', "", false, false)]
local procedure OnBeforeExportRecord(ReplicationNo: Code[20]; ReceiverNo: Code[20]; ExportedRecord: RecordRef; IncludeRecord:
Boolean; var OverrideIncludeRecord: Boolean; var NewIncludeRecord: Boolean; var UseRecordLevel: Boolean)
begin
    if ExportedRecord.Number() in [Database::Customer, Database::Item] then
        UseRecordLevel := false;
end;
```

2. Write the procedure code based on the above template to handle the event using your business logic.

## Setting Up Record Receivers with Record Receivers Matrix

Record-level replication allows setting up the receivers of selected records.

To set up record receivers with the record receivers matrix for the records:

1. Navigate to a selected list page and select the records.
2. Select the **Record Receivers Matrix** action.

### NOTE

Please remember that the **Record Receivers Matrix** action appears on the list only if it is developed as an extension.

3. Select the field for each receiver that should get the record.
4. Optionally, use the **Batch Subscribe** action.

## Batch Subscribe

The **Batch Subscribe** action allows selecting records from the **Record Receivers Matrix** list and making subscription of these records at once.

To execute **Batch Subscribe**:

1. Select records from **Record Receiver Matrix**.
2. Select the **Batch Subscribe** action.
3. Review the following fields:
  - **Receiver** - Specifies which receivers should batch subscribe selected records.
  - **Subscribe** - Specifies whether the selected records will be subscribed or unsubscribed.

## Setting up Record Receivers

Record-level replication allows setting up receivers of each record.

To set up record receivers for a record:

1. Navigate to a selected list page and choose a record.
2. Select the **Receivers** action.

## NOTE


Please remember that the **Receivers** action appears on the list only if it is developed as an extension.

3. Select the **Is Replicated** field for each receiver that should get the record.
4. Optionally, use the following functions that are available on the **Record Receivers** page:
  - **Subscribe All** - Selects all receivers at once.
  - **Unsubscribe All** - Deselects all receivers at once.

## Clearing Record Receivers

When the **Clear Record Receivers** field is selected on the **MDMS Setup** page, record receivers are deleted automatically after a record is deleted from a master company.

To clear record receivers of non-existent records manually:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. Select the **Clear Record Receivers** action.

## For Developers

There are two additional functions which allow you to select/deselect record receivers in the **ITI MDMS Record-Level Mgt.** codeunit.

### SetRecordForAllReceivers

The function enables you to select/deselect all record receivers for a given record ID.

```
[EventSubscriber(ObjectType::Table, Database::Item, 'OnAfterInsertEvent', '', false, false)]
local procedure OnAfterInsertItemEvent(var Rec: Record Item; RunTrigger: Boolean)
var
    MDMSRecordLevelMgt: Codeunit "ITI MDMS Record-Level Mgt.";
begin
    MDMSRecordLevelMgt.SetRecordForAllReceivers(Rec.RecordId(), true);
end;
```

### SetRecordReceiver

The function enables you to select/deselect record receivers for a given record ID and receiver code.

```
[EventSubscriber(ObjectType::Table, Database::Item, 'OnAfterInsertEvent', '', false, false)]
local procedure OnAfterInsertItemEvent(var Rec: Record Item; RunTrigger: Boolean)
var
    MDMSRecordLevelMgt: Codeunit "ITI MDMS Record-Level Mgt.";
begin
    MDMSRecordLevelMgt.SetRecordReceiver(Rec.RecordId(), 'DK', true);
end;
```

## OnAfterSetRecordReceiver

The event publisher procedure that is invoked after a record receiver is selected/deselected.

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI MDMS Record-Level Mgt.", 'OnAfterSetRecordReceiver', "", false, false)]  
local procedure OnAfterSetRecordReceiver(var RecordReceiver: Record "ITI Record Receiver"; IsReplicated: Boolean)  
begin  
end;
```

# One-Time Replication

One-time replication is replication of records selected on a list page. It can be added to selected lists **as an AL application extension**.

## Extending the MDMS by Adding Actions to Selected Lists

To add the **One-Time Replication** action to the selected lists:

1. Ask a developer to prepare the following page extension for each selected list (Item List, Vendors, a custom list, .etc):

```
pageextension 50500 "Item Extension" extends "Item List"
{
  actions
  {
    addlast(processing)
    {
      action("One-Time Replication")
      {
        ApplicationArea = All;
        Caption = 'One-Time Replication';
        ToolTip = 'Run a one-time replication for the records selected on a list page.';
        Image = Company;
        trigger OnAction()
        var
          Item: Record Item;
          OneTimeReplicationMgt: Codeunit "ITI One-Time Replication Mgt.";
        begin
          CurrPage.SetSelectionFilter(Item);
          if Item.FindSet() then
            repeat
              OneTimeReplicationMgt.RunOneTimeReplication(Item.RecordId());
            until Item.Next() = 0;
          end;
        end;
      }
    }
  }
}
```

2. Add the selected list name after the `extends` keyword in the first line of code. For example **Payment Terms**.

## Setting up One-Time Replication

To set up one-time replication functionality:

1. Select **Enable One-Time Replication** on the **MDMS Setup** page.
2. Open the **One-Time Replication Setup** page from: **MDMS / MDMS Setup**.
3. Fill in the following fields:
  - **Table No.** - Specifies a table number for which one-time replication is used.
  - **Receiver No.** - Specifies the receiver number for which one-time replication is used.
  - **Replication No.** - Specifies a default replication (Only one-time replications can be used).
  - **Replication Line No.** - Specifies a default replication line.
  - **Data Set No.** - Specifies a default data set.
  - **Data Set Line No** - Specifies a default data set line.
  - **Include Child** - Specifies whether child lines from data sets are replicated.



#### NOTE

To use the One-Time Replication feature, a separate replication with the **One-Time Replication** field selected, should be created.

## Processing One-Time Replication

To run one-time replication:

1. Select the **One-Time Replication** action on the list page.
2. Verify record synchronization entries for each receiver.

#### NOTE

To automatically synchronize records, check if **Auto Synchronize** is selected on the **MDMS Setup** page.

# Replication for Selected Data Set Line

Sometimes it is necessary to change the data set by adding a new table to it or by changing the fields scope. After making such a change, we do not want to run a full replication for the entire data set because it is time-consuming, but we want to replicate only the newly added or changed data set lines.

## IMPORTANT

To run a full replication for the selected data set lines, there must be data set change log entries that will be created only if there are synchronization entries from previous replications for the selected data set.

## IMPORTANT

The data set change log entry will be created if a new table is added to the data set or if the table field scope is changed by adding or removing a field.


## Setting up tracking data set changes

To enable tracking data set changes:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. Select the **Track Data Set Changes** action.

## Updating a Data Set

To update a data set:

1. Choose the  icon, enter **Data Sets**, and then select a related link.
2. Select the data set that should be updated and use the **Where-Used** action.
3. On the **Replication Lines** page, select the **Reopen All** action to reopen the related replications.
4. On the **Data Sets** page, select the **Reopen** action to reopen the data set.
5. Make the necessary changes to the data set.

## Running a Replication


To run a full replication for selected data set lines:

1. Select the **Release** action after making changes to the data set.
2. Confirm the dialog box that will be displayed to review the changed data set lines.
3. On the **Data Set Change Log** page, review the changes and unselect the **Replicate** field for data set lines that should not be replicated.
4. In the **Action Type** field, select whether the replication should be run immediately or scheduled with a job queue.
5. Select the **OK** button to proceed.

# Canceling Record Synchronization Entries

All record synchronization entries with the **New** status can be canceled by MDMS super users. Canceled entries will not be processed.

To cancel all pending record synchronization entries of a replication:

1. Choose the  icon, enter **Replications**, and then select a related link.
2. Select the **Cancel Record Sync. Entries** action.
3. Verify, if the entry's status has changed into **Canceled**.

## NOTE

The action is also available on the **Record Synchronization Entries** page, where selected entries can be canceled.

# Synchronizing Metadata

The following fields on the data set are considered metadata:

- **Block Local Insertion**
- **Block Local Deletion**
- **Block Local Modification**
- **Block Exception Filter**

MDMS sends metadata every time a replication runs. However, there are situations when updating metadata is required instantly.

The **Send Metadata** action is available on the **Replication Card** and **Replication List** pages.

When this action is used, MDMS sends the data listed above to a receiver or a group receiver specified on the replication header.

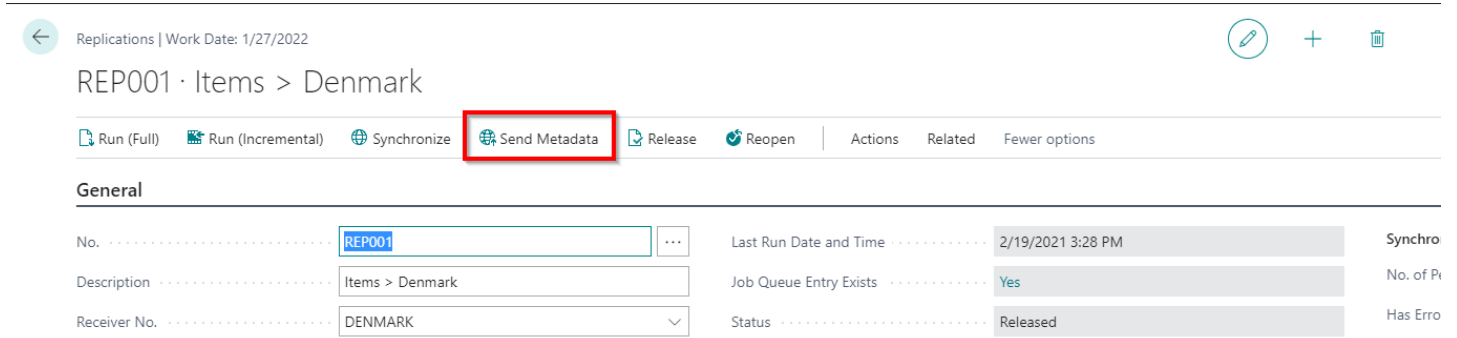


Figure: The **Send Metadata** action on a **Replication Card** page

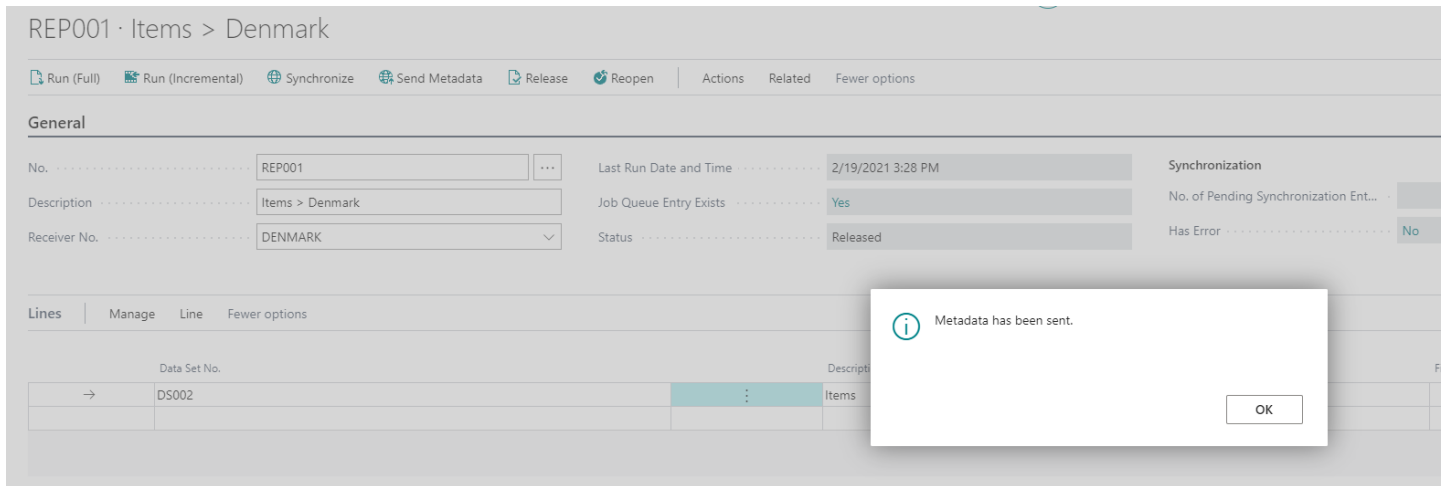


Figure: The message on successful metadata sending

After sending metadata, record synchronization entries for all tables included in the replication are created.

Entry No. ↓	Entry Type	Action Type	Record ID	Target Table No.	Target Table Name	Date and Time	Status
12770	Update	Metadata		5404	Item Unit of Measure	2/22/2021 1:27 PM	Processed
12769	Update	Metadata		27	Item	2/22/2021 1:27 PM	Processed

Figure: Record synchronization entries created for metadata

## Deleting Metadata

The **Delete Metadata** action on the **Replication Card** or **Replication List** pages can be used to delete metadata remotely.

The screenshot shows the 'Replication Card' for 'REP001 · items'. At the top, there is a navigation bar with a back arrow, the text 'Replications | Work Date: 1/26/2023', and the title 'REP001 · items'. Below this is a toolbar with several action buttons: 'Run (Full)', 'Run (Incremental)', 'Synchronize', 'Send Metadata', 'Release', 'Reopen', 'Actions', 'Related', and 'Fewer options'. A 'Functions' dropdown menu is open, listing various actions: 'Release', 'Reopen', 'Run (Full)', 'Run (Incremental)', 'Synchronize', 'Send Metadata', 'Delete Metadata' (highlighted with a red box), 'Cancel Record Sync. Entries', 'Create Job Queue Entry', and 'Unlock'. The main content area displays details for the replication job, including 'REP001', 'items', and 'REC1'. On the right, there are status indicators: 'Last Run Date and Time' (5/12/2021 12:20 AM), 'Job Queue Entry Exists' (No), 'Status' (Released), and 'Locked' (toggle off). Below this is a table with columns for 'Description' and 'items'.

Figure: The **Delete Metadata** action on a **Replication Card** page.

# Transformations

Transformation is a functionality which allow you to replicate data from the master company and keeping the whole configuration despite different field values in a receiver company.


## Setting up Transformations

To be able to create a new transformation:

1. Set up a data set. For more information, please read [Setting up Data Set](#).
2. Set up a replication. For more information, please read [Setting up Replication](#).

## Creating Transformations

To create a new transformation:

1. Choose the  icon, enter **Replications**, and then select a related link.
2. Choose a data set and go to **Line/Transformations** action.
3. On the **Replication Line Transformations** page select **New**, and then fill in the following fields:
  - **Data Set Line No.** - Specifies a data set line no.
  - **Data Set Line Code** - Specifies a data set line code.

### NOTE

This field is filled in automatically.

- **Data Set Field Code** - Specifies a data set field code.
- **Fixed Target Value** - Specifies whether any source value should be transformed into the target value.
- **Source Value** - Specifies a value in master's company database.
- **Target Value** - Specifies a value to be send to a receiver company.

### IMPORTANT

Transformations cannot be created for **Primary Key** fields and fields of class FlowField.

### IMPORTANT

Transformations are not supported for group receivers.

### IMPORTANT

If two transformations exist for the same field – one with a specified source value and the other with the **Fixed Target Value** field selected, the transformation with the specified source value will not be overwritten.

### NOTE

In fields of the *Boolean* type enter **Yes/No** value or select a value from the dialog menu.

**NOTE**

In fields of the *Option* type select a value from the dialog menu.

# Binary Data Replication

## Binary Data Replication

Binary data refers to the content of the **Blob**, **Media**, and **MediaSet** fields that store files such as images or other types of media. To make it possible to send these types of fields with MDMS, you have to create a separate data set and replication for it.

### NOTE

The release of a replication that contains binary fields for receivers of versions lower than 5.5.0.0 causes an error.

### NOTE

The release of a data set that contains binary fields and other non-primary key fields causes an error.

## Constraints of Binary Data Replication

- To replicate binary data using MDMS, a separate data set and replication must be created. Additionally, the receiver must be of version 5.5.0.0 or higher.
- The maximum allowed content length in IIS defaults to 30 MB, which may cause an HTTP error 413 (Request Entity Too Large) or HTTP error 500 (The request's Content-Length - is larger than the request body size limit 67108864) when attempting to replicate binary data. In this case, it is advised to decrease the **No. of Records per Synchronization Message** value to reduce the size of individual messages.
- It is not advised to send large files using MDMS. Files over 15 MB may cause performance issues and be more susceptible to errors. Therefore, it is recommended to keep file sizes as small as possible.



# Records Management

Replicated records management (i.e. record deletion or field values comparison) is time consuming and error-prone when performed in each receiver company manually. The MDMS application offers a number of solutions that support master company based records management. Their capabilities have been described in the following articles.

TO	SEE
Delete records	<a href="#">Record Deletion</a>
Check record field values accross receivers	<a href="#">Record Status Check</a>

# Deleting Records

Deleting records is an important operation from the data consistency point of view. It has to be done with caution. In order to delete a record from a master company, the record has to be deleted from all the receiver companies. Even though the deletion is complex, it can be carried out solely in the master company.

## Deleting a Record

Records can be deleted directly from a page in the master company. For instance, deleting a vendor from the **Vendors** list page. For records that have been replicated, MDMS issues a series of web service calls to all the companies that have received the record and tries to delete the record remotely. If the process is completed successfully, the record is deleted in the master company as well.

### NOTE

Only **MDMS Super Users** are authorized to delete replicated records. Records that are not replicated can be deleted when the **Allow Deleting Before Replication** option is set up on the **MDMS Setup** page.

To delete an already replicated record:

1. Go to the record's page.
2. Select the **Delete** action.
3. Confirm a message in the dialog window saying: "The system will now try to delete current record in all companies it was sent to. Do you want to continue?"
4. Review the list of receiver deletion attempts and their statuses and then press **Close**.


### IMPORTANT

Direct deletion of a record executes the OnDelete trigger in the receiver companies.

## Deleting Records with MDMS Records Management

The **MDMS Records Management** page allows deleting multiple records at once.

To delete already replicated records with MDMS Records Management:

1. Choose the  icon, enter **MDMS Records Management**, and then select a related link.
2. Fill in the **Replicated Table Name** field.
3. Select the **Calculate Records** action to calculate the worksheet lines.
4. Selected records manually or using the **Select All** action.
5. Select the **Delete Records** to delete the selected records.
6. Review the list of receiver deletion attempts and their statuses and then press **Close**:
  - **Record ID** - Specifies a Record ID of a managed record.
  - **Receiver No.** - Specifies the receiver of a managed record. Empty values indicate master company records.
  - **Status** - Specifies the record management operation status. The field contains **Success**, if a record has been deleted from a

receiver or **Error**, if something has gone wrong.

- **Error Text** - Specifies the error message received from a receiver company or current master.
- **Selected** - Specifies that a line or multiple lines are selected in order to perform actions on them (deleting, checking record status).

#### **IMPORTANT**

Executing the OnDelete trigger in the receiver companies is optional and can be set on the **MDMS Records Management** page. The trigger is never run for the master company records, if the operation is performed on the **MDMS Records Management** page.

#### **NOTE**


Record synchronization entries of the **Delete** type are created after the deletion process.

# Checking Records Status


Checking records status on the **Records Management** page allows comparing data between a master and receiver companies.

## Setting up Records Status Checks

To set up records status checks:

1. Choose the  icon, enter **Records Status Setup**, and then select a related link.
2. Fill in the following fields:
  - **Table No.** - Specifies a table number for which records status checks are enabled.
  - **Receiver No.** - Specifies a number of the receiver for which records status checks are enabled.
  - **Data Set No.** - Specifies a data set definition records checks are performed against.
  - **Data Set Line No** - Specifies a data set line definition records checks are performed against.

## Performing Records Status Checks with MDMS Records Management

1. Choose the  icon, enter **MDMS Records Management**, and then select a related link.
2. Fill in the **Replicated Table Name**.
3. Optionally, provide the table filters.
4. Select the **Calculate** action.
5. Select the lines to be compared by marking the **Selected** field.
6. Select the **Get Record Status** action.
7. Review the **Record Status** page that appeared. The following fields are available on **Record Status** page:
  - **Record ID** - Specifies the compared record ID.
  - **Receiver No.** - Specifies the receiver number.
  - **Record Status** - Specifies the record status. If all the included fields in the data set are equal between a master and receivers, the status is **Up-to-Date**. In other cases, it is **Out-of-Date**.

The list of the data set fields with their values is presented on the **Record Status** page.

### NOTE

If receivers have different data sets set up in the **Records Management Setup**, the the list of presented fields is merged (only for presentation).

### NOTE

Fields can be excluded from a record status check, if the **Exclude Record Status Compare** field is selected on the data set field.

### NOTE

Fields of the **Blob**, **Media**, and **MediaSet** types cannot be compared with a record status check. Fields of these types have the **Exclude Record Status Compare** field selected for the **DataSet** field by default.

Records can be updated quickly with **One-Time Replication** feature of the **Record Status** view.

#### **NOTE**

To synchronize records **One-Time Replication Setup** is required.

## Extension

The functionality can be added on, for instance, Item or Vendor Lists by an external extension.

```
pageextension 50501 "Item Extension" extends "Item List"
{
  actions
  {
    addlast(processing)
    {
      action("Check Status")
      {
        ApplicationArea = All;
        Caption = 'Check Record Status';
        ToolTip = 'Check the record's status. Compare the values of the fields in the data set between the master company and the receiver companies.';
        Image = Status;
        trigger OnAction()
        var
          CheckRecordStatus: Codeunit "ITI Record Status Mgt.";
        begin
          CheckRecordStatus.GetRecordsStatus(Rec.RecordId());
        end;
      }
    }
  }
}
```

# Master Company Maintenance

The articles listed below describe the periodic activities recommended in order to keep master company performance on a high level.

TO	SEE
Run the report that compresses record synchronization entries	<a href="#">Compressing Record Synchronization Entries</a>

# Compressing Record Synchronization Entries


To limit the space taken by the **Record Synchronization Entry** table, you can use the **Compress Record Sync. Entries** report that enables you to delete obsolete records.

## NOTE

The **Compress Record Sync. Entries** report has replaced the **Clear Record Sync. Entries** report. If you still see the old report, ask your partner to update your Business Central license.

## Running the Compress Record Sync. Entries Batch Job

To run the **Compress Record Sync. Entries** batch job:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. Select the **Compress Record Sync. Entries** action.
3. In the initial report window that opens, fill in the fields on the **Options** FastTab:
  - **Replication No.** – Specifies the replication number if the compression is to be limited to a specific replication. Otherwise, leave the field empty.
  - **Archive Deleted Entries** – Specifies if deleted record synchronization entries should be moved to the data archive list.

## NOTE

The archived data is stored in the **Tenant Media** table which is not included when the database size is calculated and it counts as a file storage.

## Scheduling the Compress Record Sync. Entries Batch Job with a Job Queue Entry

It is recommended to schedule the **Compress Record Sync. Entries** report by using a job queue entry.

# Extensibility

The MDMS application can be extended by subscribing to the published events. It allows adding custom business logic, and, when combined with receivers marked as external, even exporting records to external systems. The following articles describe the application extensibility.

TO	SEE
See a list of published events and available procedures	<a href="#">Events and Procedures</a>
Learn about external systems integration patterns	<a href="#">External Systems Integration</a>



# MDMS Events and Procedures

## Events

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

### Codeunit ITI Replication Mgt.

#### OnBeforeExportRecord

The event allows the user to specify, if a 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.
- var UseRecordLevel [Boolean] - The parameter should be set to True/False in order to use Record-Level functionality.

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

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI Replication Mgt.", 'OnBeforeExportRecord', '', false, false)]
local procedure OnBeforeExportRecord(ReplicationNo: Code[20]; ReceiverNo: Code[20]; ExportedRecord: RecordRef; IncludeRecord:
Boolean; var OverrideIncludeRecord: Boolean; var NewIncludeRecord: Boolean; var UseRecordLevel: Boolean)
var
    MyCurrency: Record Currency;
begin
    if ExportedRecord.Number() = Database::Currency then begin
        ExportedRecord.SetTable(MyCurrency);
        if MyCurrency.Code = 'CAD' then begin
            OverrideIncludeRecord := true;
            NewIncludeRecord := false;
        end;
    end;
end;
```

#### OnAfterExportRecord

The event allows performing 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)

## Codeunit ITI Record Synchronization Mgt.

### OnAfterImportedRecordModify

The event 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** page, this time on the receiving company side):

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI Record Synchronization Mgt", 'OnAfterImportedRecordModify', "", false, false)]
local procedure OnAfterImportedRecordModify(var ModifiedRecord: RecordRef; IsNewRecord: Boolean)
var
    MyCustomer: Record Customer;
begin
    if ModifiedRecord.Number() = Database::Customer then begin
        ModifiedRecord.SetTable(MyCustomer);
        if MyCustomer."Currency Code" = 'CAD' then begin
            MyCustomer."Currency Code" := "";
            MyCustomer.Modify();
        end;
    end;
end;
```

### OnAfterImportedRecordRename

The event allows the user to perform actions on imported records, when imported records keys are renamed.

Parameters:

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

*Example:* The same example as in *OnAfterImportedRecordModify*.

### OnBeforeExportRecordField

The event allows the user to override a default field value with your own function.

Parameters:

- ITIRecordSyncEntry [Record "ITI Record Sync Entry"]
- ITIDataSetField [Record "ITI Data Set Field"]
- FieldValue [Text] - Specifies the currently exported field value.
- var OverrideFieldValue [Boolean] - This parameter should be set to True in order to override the default value.
- var NewFieldValue [Text] - This parameter should set be to a new field value.

### OnBeforeSynchronizeData

The event that is published before the data is imported to the receiving company (**for each package**).

Parameters:

- LastPackage: Boolean - Specify whether the last package is being imported.

### **OnAfterSynchronizeData**

The event published after the data is imported to the receiving company (**for each package**).

Parameters:

- LastPackage: Boolean - Specify whether the last package was imported.
- IsError: Boolean - Specify whether the error message has been displayed.

## Codeunit ITI Record Delete Mgt.

### **OnBeforeRecordDeleted**

The event published before the record is deleted in the receiving company.

Parameters:

- DeletedRecordRef: RecordRef

### **OnAfterRecordDeleted**

The event published after the record is deleted in the receiving company.

Parameters:

- DeletedRecordRef: RecordRef
- RecordExists: Boolean - Specify whether record exists.
- RecordDeleted: Boolean - Specify whether record was deleted.

## Codeunit "ITI MDMS Record-Level Mgt."

### **OnAfterSetRecordReceiver**

The event allows you to run an action after the record receive is selected/deselected (using for the record-Level functionality).

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI MDMS Record-Level Mgt.", 'OnAfterSetRecordReceiver', '', false, false)]  
local procedure OnAfterSetRecordReceiver(var RecordReceiver: Record "ITI Record Receiver"; IsReplicated: Boolean)  
begin  
end;
```

## External Functions

MDMS exposes the following functions:

## Codeunit ITI Log Mgt.

### **CreateTrackingLogEntries**

The function allows to create tracking log entries on which an incremental replication is based.

Parameters:

- RecRef: RecordRef - Triggered RecordRef.
- xRecRef: RecordRef - Triggered xRecordRef. Parameter can be blank if it's no rename.
- IsIns: Boolean - true if insert
- IsMod: Boolean - true if modify
- IsRen: Boolean - true if rename

### **SetMDMSRun**

The function sets the value of the global variable: MDMSRun. If true, the **Local Block Insert, Local Block Modify, Local Block Delete** and **Local Block Rename** values are not checked (in the receiver company).

Parameters:

- NewMDMSRun: Boolean

### **IsMDMSRun**

The function returns the value of the global variable: MDMSRun.

## Codeunit ITI Record Synchronization Mgt.

### **IsRecordSent**

The function returns true if a given record ID has been sent to the receiver. The checking is based on the record synchronization entries history.

The function recognizes cases in which a record had been sent and then deleted. In such cases, it returns 'False'.

Parameters:

- RecID: RecordId
- ReceiverNo: [Code20]

## Codeunit ITI One-Time Replication Mgt.

### **RunOneTimeReplication**

The function allows running one-time replication for a given record ID.

Parameters:

- RecID: RecordId

# External Systems Integration Patterns

MDMS allows handling the synchronization part of the replication process in a custom way. This article guides you through the receiver setup, integration events and possible scenarios.

## Common Scenarios

The temporary tables containing replication data (**Replication Input Record** and **Replication Input Line**) are exposed by the **OnBeforeSendPackage** event (published in the **ITI Record Synchronization Mgt** codeunit). All the values are exposed as XML formatted text. The commonly used scenarios are described below.

### NOTE

Status is set to processed for each synchronization entry handled by an external receiver.

## Exporting Records to a File

**Replication Input Record** and **Replication Input Line** table data is serialized (XML, JSON) and sent to the storage (Azure Blob Storage, sFTP...). An external system reads the files.

### IMPORTANT

Custom development using AL code is required to implement this synchronization scenario.

## Exporting Records to a HTTP Triggered Azure Logic App


The **Replication Input Record** and **Replication Input Line** table data is serialized (XML, JSON) and sent to a HTTP triggered Azure Logic App as a request body. Azure Logic App delivers the message to an external system.

### IMPORTANT

Custom development using AL code and dedicated Azure resources are required to implement this synchronization scenario.

## Setting up a Receiver for External Integration

To set up the receiver:

1. Choose the  icon, enter **Receivers**, and then select a related link.
2. On the **Receivers** page select **New**, and then fill in the following fields:
  - o **No.** – Specify a unique code to identify the receiver.
  - o **Description** – Specify a text to identify the receiver.
  - o **External** – Select **True** in the field.
3. Ignore the **Web Services** and **Authentication** FastTabs.

## NOTE

Working with external receivers requires a custom AL code that handles the synchronization part of the replication.

## Subscribing to the Published Events

Subscribing to the published events listed below is mandatory for the replication process to work.

EVENT NAME	CODEUNIT NAME	PURPOSE
OnBeforeSendPackage	ITI Record Synchronization Mgt	Replicated records retrieval
OnBeforeProcessMetadata	ITI Record Synchronization Mgt	Metadata information retrieval
OnBeforePurgeTables	ITI Record Synchronization Mgt	Purging tables information retrieval

### Example: OnBeforeSendPackage

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI Record Synchronization Mgt", 'OnBeforeSendPackage', '', false, false)]
local procedure CustomSynchronization(ReceiverNo: Code[20]; var IsHandled: Boolean; LastPackage: Boolean; ReplicationNo: Code[20];
var TempITIReplicationInputRecord: Record "ITI Replication Input Record"; var TempITIReplicationInputLine: Record "ITI Replication
Input Line")
var
    ITIReceiver: Record "ITI Receiver";
begin
    ITIReceiver.Get(ReceiverNo);
    IsHandled := ITIReceiver.External;

    // Take TempITIReplicationInputRecord and TempITIReplicationInputLine data and handle it in a custom way
end;
```

### Example: OnBeforeProcessMetadata

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI Record Synchronization Mgt", 'OnBeforeProcessMetadata', '', false, false)]
local procedure ProcessMetadata(ReceiverNo: Code[20]; ReplicationNo: Code[20]; var IsHandled: Boolean)
var
    ITIReceiver: Record "ITI Receiver";
begin
    ITIReceiver.Get(ReceiverNo);
    IsHandled := ITIReceiver.External;

    // Custom logic is optional
    // Metadata contains information about local record edition limitations
end;
```

### Example: OnBeforePurgeTables

```
[EventSubscriber(ObjectType::Codeunit, Codeunit::"ITI Record Synchronization Mgt", 'OnBeforePurgeTables', "", false, false)]
local procedure PurgeTables(ReceiverNo: Code[20]; ReplicationNo: Code[20]; var IsHandled: Boolean)
var
    ITIReceiver: Record "ITI Receiver";
begin
    ITIReceiver.Get(ReceiverNo);
    IsHandled := ITIReceiver.External;

    // Custom logic is optional
    // Purging information is available on a data set line.
end;
```

## Record Deletion

Deletion requests for records synchronized with external receivers are skipped. Despite the fact, synchronization entries of the **Delete** type are created.

## Record Status Check

The request for checking record statuses for records synchronized with external receivers are not possible.

# Setting up a Receiver Company

The following articles provide guidelines on receiver company setup.


TO	SEE
Assign user permissions	<a href="#">User Permissions</a>
Check the web service address	<a href="#">Web Services</a>
Set up AAD authentication	<a href="#">AAD Authentication</a>




# MDMS Local Template Setup (API Setup)

MDMS local template setup is used to apply the configuration template automatically after record synchronization is run. The configuration template will be applied only once when the new record is created in a receiver company. You can also define the conditions under which the configuration template will be applied to the record.

## Activating the API Setup Template

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. Mark the **Use API Setup Templates** field.

## Defining a New API Setup

1. Choose the  icon, enter **API Setup**, and then select a related link.
2. Select the **New** action and fill in the following fields:
  - **Table ID** - Specifies the table that contains a record for which the template should be applied.
  - **Template Code** - Specifies the configuration template which will be applied after the record is created.
  - **Conditions** - Specifies the set of conditions which must be met to apply the local template.

### **IMPORTANT**

You must set the page ID to 0 for the templates which should be used by the MDMS. Alternatively, you can use the **Order** field to set up the order in which the templates should be applied.

# Show Data Set Rules (metadata)

The following fields on the data set are considered metadata:


- **Block Local Insertion**
- **Block Local Deletion**
- **Block Local Modification**
- **Block Exception Filter**

The **Show Data Set Rules** action can be visible on the **MDMS Setup** page. The page can be opened by a MDMS Super User only.

# Deleting the Metadata

The metadata (the records containing information about what operations on records are blocked) can be deleted in the receiver company by MDMS super users. The metadata is sent to receivers every time data sets are replicated.


To delete the metadata:

1. Choose the  icon, enter **MDMS Setup**, and then select a related link.
2. On the **MDMS Setup** page select the **Clear Metadata** action.

# Basic Process Walkthrough


## Creating a Receiver Company

To create a receiver company:

1. Choose the  icon, enter **Companies**, and then select a related link.
2. On the **Companies** page choose a company and select **Copy**.
3. Enter the new company name and select OK.

## Enabling IT Manager Profile

To enable the IT Manager profile:

1. Choose the  icon, enter **Profiles (Roles)**, and then select a related link.
2. Find the **IT Manager** profile and select **Edit**.
3. Set the **Enabled** field to yes.

## Setting up a Receiver

Setting up a receiver is required in the master company. To set up a receiver:

1. Set up a receiver according to the steps described in [Setting up Receivers](#)
2. For demo purposes, use basic authentication if you use on-premises installation, and AAD authentication if you use the on-cloud installation.
3. Make sure the web service user or application has the right permissions granted.

## Setting up a Data Set

A data set containing two fields from the **Salesperson/Purchaser** table can be defined. To set up a demo data set:

1. Set up a data set according to the steps described in [Setting up Data Sets](#)
2. Fill in **13** in the **Table No.** field in a data set line to add the **Salesperson/Purchaser** table to the data set.
3. Select the **Fields** action in the **Line** ribbon tab and fill **2** in the **Field No.** field.
4. Select the **Release** action to release the data set.


## Setting up a Replication

To set up a demo replication:

1. Set up a replication according to the steps described in [Setting up Replications](#)
2. Fill in the **No.**, **Receiver** and **Data Set No.** fields in the replication.
3. Select the **Release** action to release the replication.

## Running Full Replication

Full replication allows sending all master company records defined in the data set to the receiver company. To run full replication:

1. Run a replication according to the steps described in [Running Replications](#)
2. Choose the  icon, enter **Salespeople/Purchasers**, and then select a related link.
3. Change the values in the **Name** field as required.
4. Open the replication card and select the **Run (Full)** action.
5. Go to **My Settings** and change company to **Receiver**.
6. Go to the **Salespeople/Purchasers** page and verify that the records have been changed.
7. Change the company back to **Cronus International Inc.**

## Run Incremental Replication

Incremental replication allows sending the records created or changed since the last replication.

1. On the **Salespeople/Purchasers** page, change a name and add a new record.
2. Open the replication card and select the **Run (Incremental)** action.
3. Go to **My Settings** and change company to **Receiver**.
4. Go to the **Salespeople/Purchasers** page and verify that the records have been changed.
5. Change the company back to **Cronus International Inc.**

# Administration and Installation

In this article, you will find information about MDMS administration and installation.

TO	SEE
Learn more about system requirements	<a href="#">System Requirements</a>
Get to know how to install the application	<a href="#">Installation and Registration</a>
Carry out AAD app registrations	<a href="#">AAD Authentication Setup</a>
Find out how to create a sandbox environment	<a href="#">Sandbox Environment</a>

## See Also

Contact IT.integro for support at installation [sd.mdms@it.integro.pl](mailto:sd.mdms@it.integro.pl)

[Product Lifecycle Policy](#)

[Releases](#)

# System Requirements

System requirements for MDMS are the same as for Microsoft Dynamics 365 Business Central on-premises and online. The requirements for Microsoft Dynamics 365 Business Central online have been described in [System Requirements for Dynamics 365 Business Central](#).

## See Also

[Installation and Registration](#)

# Installation and Registration

This article describes the prerequisites and installation and registration steps for MDMS in Business Central online and on-premises.

## Installing the Application for Business Central Online

To install MDMS for Business Central online perform the following steps:

1. On the [AppSource offer page](#), select **Free Trial**.
2. Choose the environment on which you would like to install the app (sandbox or production).
3. Press install.

## Installing the Application for Business Central On-Premises

To install MDMS for Business Central on-premises perform the following steps:

1. Download the installation file from the [IT.integro Product Portal](#). Add the MDMS Functionality for NAV and D365BC application for the client license.

### IMPORTANT

The IT.integro Product Portal can be accessed only by authorized IT.integro partners.

### CAUTION

When installing the application, you have to be assisted by an authorized IT.integro partner.

2. Run Dynamics NAV Administration Shell as an administrator.
3. To publish MDMS run the command:

```
Publish-NAVApp -ServerInstance YourDynamicsNAVServer -Path ".\IT.integro sp. z o.o._Master Data Management System.app"
```

3. To synchronize MDMS run the command:

```
Sync-NAVApp -ServerInstance YourDynamicsNAVServer -Name "App Name" -Version VersionNo. -Tenant [Tenant1, Tenant 2, default]`
```

### TIP

The **Tenant** parameter can be skipped for a single-tenant instance or set as *default*. For multi-tenant instances, each tenant to be synchronized has to be listed.

4. To install MDMS run the command:

```
Install-NAVApp -ServerInstance YourDynamicsNAVServer -Name "App Name" -Tenant [Tenant1, Tenant2, default]
```

### TIP



It is recommended to install the latest application version available.

**NOTE**

**Following note refers to receiver companies working in Business Central OnPrem environments only.** If Credential Type in the service configuration equals Windows then setting up a separate instance **Credential Type = NavUserPassword** (or AAD based, **Credential Type = AccessControlService**) is required. Then a new user (or Azure Active Directory Application) should be created with NAV/BC User Password authentication setup. That user must have permission sets assigned to be able to open the receiver company and the MDMS permission set to authorize the web service.

MASTER	RECEIVER	ADDITIONAL INSTANCE AT THE RECEIVER
Business Central OnPrem - NavUserPassword	Business Central OnPrem - NavUserPassword	No
Business Central OnPrem - NavUserPassword	Business Central OnPrem - Windows	Yes
Business Central OnPrem - NavUserPassword	Business Central Online	No
Business Central OnPrem - NavUserPassword	Navision - NavUserPassword	No
Business Central OnPrem - NavUserPassword	Navision - Windows	Yes
Business Central OnPrem - Windows	Business Central OnPrem - NavUserPassword	no
Business Central OnPrem - Windows	Business Central OnPrem - Windows	Yes
Business Central OnPrem - Windows	Business Central Online	No
Business Central OnPrem - Windows	Navision - NavUserPassword	No
Business Central OnPrem - Windows	Navision - Windows	Yes
Business Central Online	Business Central Online	No
Business Central Online	Business Central OnPrem - NavUserPassword	No
Business Central Online	Business Central OnPrem - Windows	No
Business Central Online	Business Central OnPrem - Navision - NavUserPassword	No
Business Central Online	Business Central OnPrem - Navision - Windows	No
Navision - NavUserPassword	Business Central OnPrem - NavUserPassword	No
Navision - NavUserPassword	Business Central OnPrem - Windows	No
Navision - NavUserPassword	Business Central Online	No

<b>MASTER</b>	<b>RECEIVER</b>	<b>ADDITIONAL INSTANCE AT THE RECEIVER</b>
Navision - Windows	Business Central OnPrem - NavUserPassword	No
Navision - Windows	Business Central OnPrem - Windows	No
Navision - Windows	Business Central Online	No

## See Also

[System Requirements](#)

[Support for the Application](#)

[Publishing and Installing an Extension](#)

[Sync-NAVApp](#)

# Sandbox Environment

This article describes how you can create the sandbox based on production environment and provides guidelines and precautions for copying the environment.

## Creating a Sandbox Environment

### IMPORTANT

To create a sandbox environment an MDMS Super User should be selected on the **MDMS User Setup** page as the **Admin** user in all companies.

1. Choose the **Settings**, then select the **Admin Center**.
2. In the Business Central administration center, select **Environments**, then select the environment that you want to copy.
3. On the **Environment Details** page, choose the **Copy** action.
4. In the **Copy Environment** pane, specify the type of environment that you want to create based on the current environment.
5. Specify a name for the new environment.
6. Choose the **Create** action.

## Copying the Environment

When a sandbox environment is created as a copy of a production environment, a number of precautions are taken for that copy:

- The job queue is stopped.
- Any base application integration settings are cleared.
- Outbound HTTP calls from extensions are blocked by default and must be approved for each extension.
- The **WebServices Address** field is cleared from the **Receiver Card** page for all copied companies.

## See Also

[Copy a Production or Sandbox Environment in the Admin Center](#)

# IT.integro's Product Lifecycle Policy for solutions (modules) created for Microsoft Dynamics NAV/Dynamics 365 Business Central

Due to the fact that all IT.integro solutions work only as add-on modules/extensions of the base system, i.e. Microsoft Dynamics NAV/ Dynamics 365 Business Central, they are subject to the same product lifecycle policy as the base system, i.e. Microsoft Dynamics NAV/ Dynamics 365 Business Central.

## Classification of Changes in Product Versions

As part of product development and maintenance, IT.integro introduces the following changes to the offered modules:

- **New versions (change of the MAJOR type - when changes to the application elements are introduced as a result of breaking API compatibility)**
  - Application releases that adapt IT.integro products to the respective versions of the main system. The versions can be released for new "Cumulative Updates" (CU), fixes or full system versions, i.e. NAV 2018, Business Central 13 and 14. New versions may also add new functionalities to the modules, such as those listed hereinafter.
- **Functional extensions (change of the MINOR type - when a new functionality is introduced that is compatible with previous versions)**
  - New legally required functionalities - functions implemented within the system in order to adapt the system to legal requirements or to change the requirements. By definition, they should include functionalities explicitly required by law as applicable to ERP systems, but the definition may be extended to functionalities that support processes, the implementation of which, apart from the ERP system used, would be technically difficult.
  - New development functionalities - functions that improve work in the system, but are not required obligatorily by law. Their introduction is a result of feedback submitted by customers and project teams during implementation works at customers' and the result of technology development.
- **Fixes (change of the PATCH type - when the bug is fixed and the compatibility with previous versions is not broken)**
  - Application releases containing fixes to the existing functions of add-on modules or adaptation to the fixes implemented within the standard system version.

## Support Cycles

For each product created by IT.integro (as an ISV partner - Independent Software Vendor) to the appropriate versions of the Microsoft Dynamics NAV/ Dynamics 365 Business Central system, fixes and new versions and functionalities are prepared during the standard product support period – in accordance with the definitions presented above. The support periods for individual full system versions are listed in the table.

VERSION NAME	RELEASE DATE	END-OF SUPPORT DATE FOR THE STANDARD SYSTEM VERSION
NAV 2016	3 January, 2016	13 April, 2021
NAV 2017	27 October, 2016	11 January, 2022

VERSION NAME	RELEASE DATE	END-OF SUPPORT DATE FOR THE STANDARD SYSTEM VERSION
NAV 2018	1 December, 2017	10 January, 2023
Dynamics 365 Business Central (BC 13)	1 October, 2018	14 April, 2020
Dynamics 365 Business Central on-premises Spring 2019 Update (BC 14)	01 April, 2019	10 October, 2023
Dynamics 365 Business Central on-premises 2019 Release Wave 2 (BC 15)	01 October, 2019	13 April, 2021
Dynamics 365 Business Central on-premises 2020 Release Wave 1 (BC 16)	01 April, 2020	12 October, 2022
Dynamics 365 Business Central on-premises 2020 Release Wave 2 (BC 17)	01 October, 2020	12 April, 2022
Dynamics 365 Business Central on-premises 2021 Release Wave 1 (BC 18)	01 April, 2021	11 October, 2022
Dynamics 365 Business Central on-premises 2021 Release Wave 2 (BC 19)	01 October, 2021	12 April, 2023
Dynamics 365 Business Central on-premises 2022 Release Wave 1 (BC 20)	01 April, 2022	10 October, 2023
Dynamics 365 Business Central on-premises 2022 Release Wave 2 (BC 21)	03 October, 2022	14 April, 2024

## Product Support Rules

1. Customers paying for the Enhancement Plan and partners are entitled to get a free download of new versions of individual products, legally required functionalities and fix packages during the periods listed in the table. Additional functionality extensions are also added to the new full versions of products. Such functionality extensions facilitate the use of solutions, but are not obligatory from a legal point of view. They are not prepared for lower versions that already operate on the market. For each perspective implementation of a new version within older versions, the project team will provide a cost estimate.
2. Customers who do not pay for the Enhancement Plan, will be charged for each modification or new version in accordance with the price list for the respective version.
3. After the expiry of the standard support period for individual versions of the produced solutions, no new legally required functionalities or fix packages will be added to them. The technical feasibility of preparing and installing such fixes or new versions will be valued and assessed each time individually by the project team or partner.
4. Downgrade to earlier solution versions (not supported) for customers requesting for the downgrade is considered and evaluated on an individual basis and performed by project teams. Project teams take responsibility for preparing the "lower" version, checking its compatibility with the customer's system and installing it in the customer's system.
5. In accordance with the product life cycle policy developed by Microsoft and adopted by IT.integro for their ISV solutions, paying the Enhancement Plan fees after the expiry of the standard support period does not entitle customers to obtain new

releases and fixes free of charge. On the other hand, the Enhancement Plan fee entitles the customer to download a newer version (compatible with the appropriate version of the main system) of a given product free of charge and install it within the Microsoft Dynamics NAV/ Dynamics 365 Business Central system in use. It is recommended for Customers to upgrade their software to the latest system versions.

6. Installation of new releases and fixes will be delivered as a paid service in compliance with the terms and conditions for the provision of services by IT.integro.

## See Also

Contact IT.integro at [mdvapp@it.integro.pl](mailto:mdvapp@it.integro.pl)

[MDMS on App Source](#)

[IT.integro applications for companies in Poland and global companies](#)

[IT.integro offer](#)

[Software Lifecycle Policy and Dynamics 365 Business Central On-Premises Updates](#)

[Dynamics 365 Business Central on-premises \(Modern Policy\)](#)