PUBLIC

How-To: Using Data Replication Framework for Material

Applicable Releases:

From EHP6 for SAP ERP 6.0 and from S/4HANA 1511

Version 4.0

September 2024

Document History

Document Version	Description
1.0	First official release of this guide
1.1	Additional SAP notes and hints
1.2	Background information for using DRF for Materials
1.3	Update for RBWF
1.4	Updates to chapter 3.5 Key Mapping (including ALE Audit), new chapter 3.6
1.5	Updates to chapter 3.3 IDoc Reduction
1.6	Small corrections
1.7	Updates to 3.1 and new chapter 3.9
1.8	Updates for MDG 9.0
1.9	Validity update
2.0	SAP Note 2268203
3.0	Deletion of chapter 5
3.1	Small updates, new chapter 3.4 Change Pointer (September 2022)
4.0	Layout update (September 2024)

Table of contents

1. Introduction

SAP Master Data Governance (MDG) provides business processes to find, create, change, and mark master data for deletion. It supports the governance of master data in a central hub and the distribution to connected operational and business intelligence systems.
The processes are workflow-driven and can include several approval and revision phases, and the collaboration of all users participating in the master data maintenance.
MDG offers change request (CR)-based processing of master data with integrated workflow, staging, approval, activation, and distribution.

You can replicate master data changes carried out centrally either manually or automatically in the background using the data replication framework (DRF). Filters allow you to configure replication settings. You can replicate data between the Master Data Governance hub and operational systems by means of SOAP services, IDoc's, or file download functions.

This How-To Guide provides background information about the data replication framework (DRF) valid for the domain material.

The How-To Guide also describes how to set up the system to enable immediate distribution of changes in the material master during activation of the material. With MDG 9.0 and SAP S/4HANA 1610 it is configurable, if you would like to distribute immediately or using change pointer.

2. Background Information/Troubleshooting on DRF for Material

2.1. Restrictions

This guide is valid for an MDG-M system. This means that in Customizing under MDGIMG > Central Governance for Material > Activate Business Transaction Events, the Application Active checkbox is selected for the MDGM application. Without MDG the application LO-MD is set and DRF outbound implementations 194_2 (MATMAS IDocs) or 194_3 (Product SOAP Services) are used. For more information, see SAP Note 2700769. All information in this guide refers to an MDG-M system.

The DRF material outbound implementation I_MAT supports only ALE message types MATMAS (with PRODVERSION) and CLFMAS.

With MDG 9.0 and outbound implementation I_MAT_V2 also ALE message types for quality inspection setup (MATQM), change number and revision level (ECMREV) and documents (DOLMAS) are supported.

If you want to replicate change states/revision levels using IDoc ECMREV, you must also activate the ALE change pointers using SALE -> IDoc Interface / Application Link Enabling (ALE) -> Modeling and Implementing Business Processes-> Master Data Distribution-> Activate Change Pointers for Message Types (transaction BD50).

The DRF material outbound implementations do not support ALE message DOCMAS. For distribution of DOCMAS you can use the standard ALE distribution.

ALE and DRF distribution for MRP Areas is not possible as no IDoc exists for distribution of MRP Areas (MDMA). See also SAP Note 2268203: Not possible to Update / Transfer MRP Area when using Message Type MATMAS.

Only in S/4HANA it is also possible to use outbound implementation 194_3 for replication via services. https://help.sap.com/viewer/bc6b9325fedd4344a84412b2195064fa/latest/en-US/f758dc3b2f444f3fb6c6cabc8ebd1689.html

Flex entities are not supported by the DRF material outbound implementation.

2.2. DRF Set Up, Customizing, Online Help, SAP Best Practices Explorer

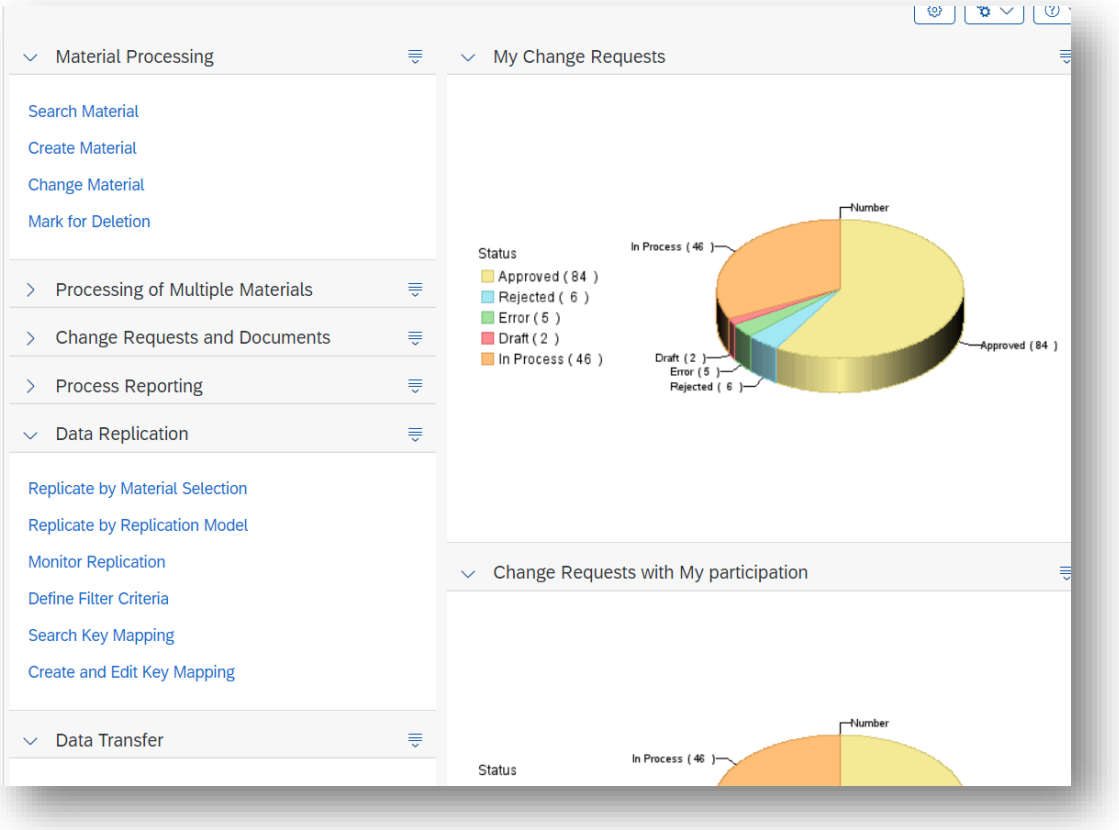
For more information, see the section *Set Up Data Replication Using ALE with DRF* in *Configuring Master Data Governance for Material* topic *Set Up Data Replication* https://help.sap.com/viewer/6d52de87aa0d4fb6a90924720a5b0549/latest/en-US/64a5cb5285135721e10000000a423f68.html as well as the *Data Replication* topic in Working with MDG, Central Governance https://help.sap.com/viewer/6d52de87aa0d4fb6a90924720a5b0549/latest/en-US/104bf4bff9c54d7796d266605a4111fd.html.

Note: Don't forget to run transaction MDGIMG and navigate to Central Governance for Material Activate Business Transaction Events and select the Application Active checkbox for the MDGM Application Indicator to enable MDG Material with DRF. For more information, see SAP Note 2700769.

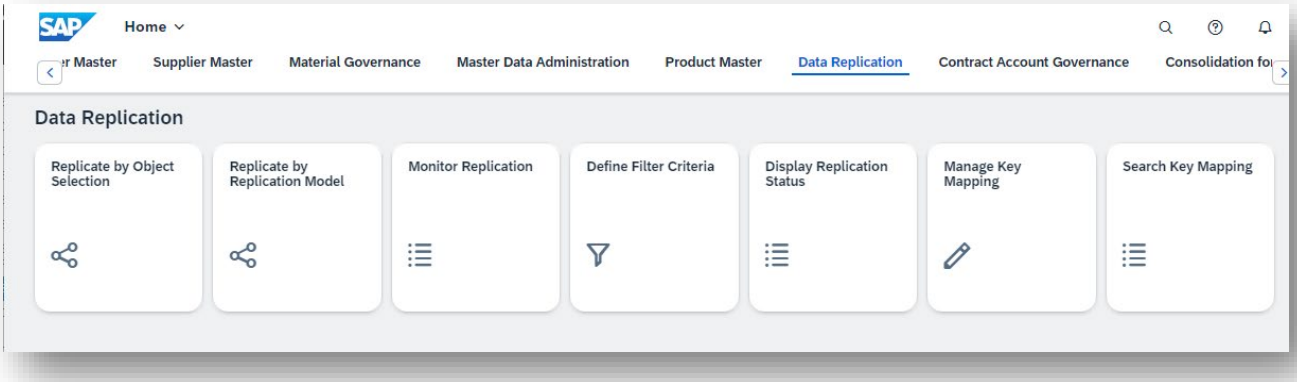
For more information about the data replication framework in SAP S/4HANA, see the *Data Replication Framework* topic https://help.sap.com/viewer/8308e6d301d54584a33cd04a9861bc52/latest/en-US/88e3f5577c84bc12e10000000a4450e5.html.

2.3. Web Dynpro Applications and Fiori Launchpad

Web Dynpro applications can be found here on the material governance homepage:



Fiori Launchpad:



Or you can use transaction DRFOUT. For scheduled distribution with a background job, you should use a variant of transaction DRFOUT.

2.4. Change Pointer

DRF change pointer are written because of the entries in table TBE11 (Application Active checkbox is selected for the MDGM application) and TBE31 (function modules MDG_BS_MAT_DRF_CP and MDG_BS_CLF_DRF_CP for MDGM application).

You can check the change pointer with transaction SE16N and table MDGD_CP to get the change pointer ID. Then check table MDGD_CP_REP_STAT, that the status is now CR. There you can see that change pointer is written for the business systems ID's.

2.5. IDoc Reduction

Scenario:

You have defined a reduced IDoc type, which creates a new message type. You have also registered it for a target system, but DRF does not create an IDoc.

Solution:

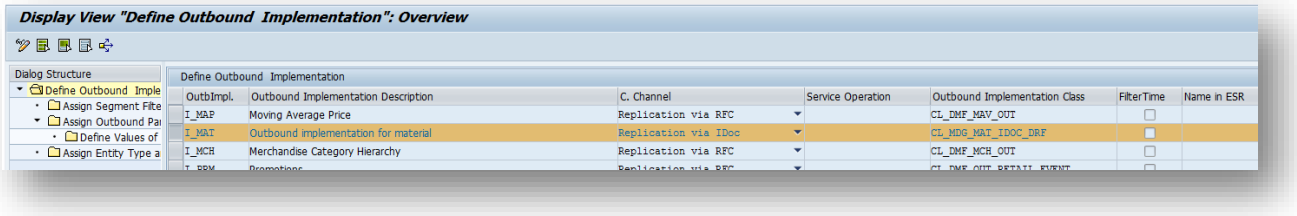
Implement the following SAP Notes:

- SAP Note 2080421: DRF: Reduced IDoc message types cannot be sent
- SAP Note 2084728: Reduced IDoc message types for MDG implementations
- SAP Note 2093396: Reduced Message Type

Workaround:

If you can't implement these SAP Notes, you can use this as a workaround.

The message type MATMAS is hard coded in method SEND_MATMAS_IDOC of class CL_MDG_MAT_IDOC_DRF. This class is used in the outbound implementation I_MAT for DRF.



Search for the usage IF_MDG_MAT_DRF_CONSTANTS=>GC_MATMAS. You must replace the hard-coded message type using an overwrite exit on this method, or by creating your own outbound implementation (inheriting from class CL_MDG_MAT_IDOC_DRF).

2.6. Replication of Deletion

Scenario:

You have replicated a material with several descriptions and long texts. You then delete some descriptions/long texts (or any other segment where deletion is possible) and replicate the material again using IDoc and DRF. The deletions do not reach the target system.

Root cause:

DRF for material does not support message function '003' (deletion). DRF for material always sends the full material. ALE/DRF filters are of course considered.

Solution options:

- Using only ALE:
  Sending a segment deletion is supported in standard ALE (transaction BD21). This option doesn't need additional coding.

- Using DRF or ALE:
  This option needs additional coding in the target systems. If it is possible to determine which data gets deleted in the target system, you can also implement the IDoc inbound BAdI IDOC_DATA_MAPPER in the target system. In this BAdI, set the segment's message function (MSGFN) to '003' (deletion). This enables the IDoc inbound (usually function module IDOC_INPUT_MATMAS01) to delete the data.

This above case works for segments that are solely maintained on the hub (no data added in the target system).

If one such segment exists in the target system's database but not in the IDoc, then this could be considered an indication that this segment must be deleted. These rules and the implementation are project specific so no example coding is provided.

2.7. Key Mapping (Including ALE Audit)

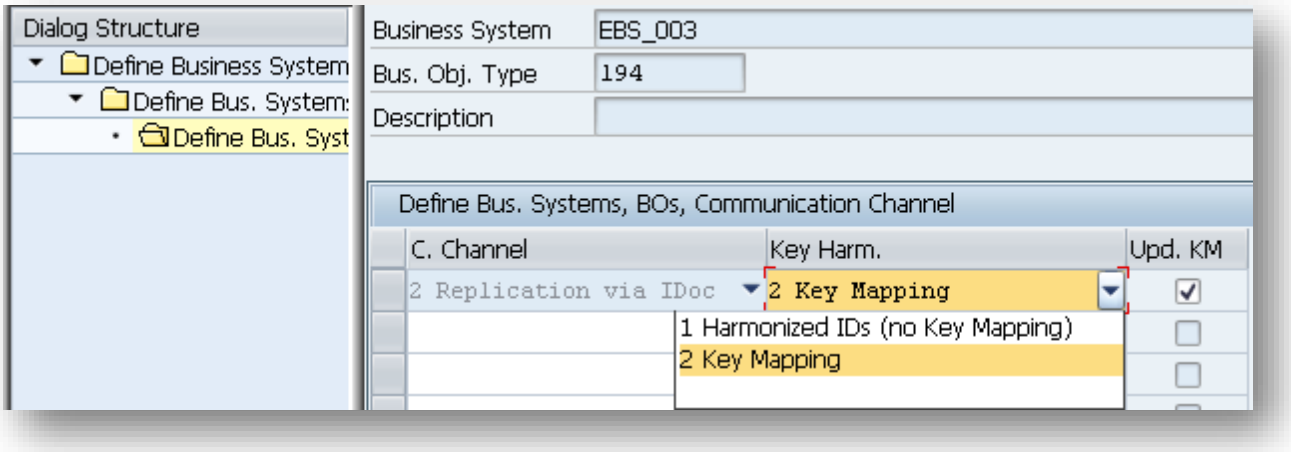
If possible, harmonized material numbers in your landscape are considered best practice. This would avoid key mapping completely, but is not always possible (legacy systems with non-harmonized material numbers ...). In this case, MDGM also supports key mapping.

2.7.1. Key Mapping

For key mapping of material numbers, IDoc types MATMAS01..5 and CLFMAS01..2 use the 'Object Identifier Type Code' number 20 "Material ID (internal format) (ERP)". MDG-M supports the following three options, based on the settings in "Define Technical Settings for Business Systems"

1. "Harmonized IDs": Key mapping not considered
2. "Key Mapping" and ("Update KM via ALE audit" unchecked or BD10 outbound):
   - Key mapping needed for material
   - DRF/ALE outbound fails if key mapping is missing
3. DRF only: "Key Mapping" and "Update KM" (via ALE audit) checked:
   - Key mapping considered if available
   - Otherwise, the hub sends its material number; client can
     - Either accept it or confirm via ALE audit
     - Or provide new, internally assigned material number;
       this material number gets returned via ALE Audit and the key mapping gets updated

on Hub;
for IDoc inbound with internal numbering, check http://scn.sap.com/thread/1954090



2.7.2. How to Customize ALE Audit

You can configure your client and hub systems so that your client systems send confirmation of replicated materials back to the MDG hub. The technology that is used for this is called ALE auditing. The customizing for ALE audit is described in the section *Customizing for ALE Audit (Optional)* in *Adapting Master Data Governance for Material → Key Mapping*
https://help.sap.com/viewer/db97296fe85d45f9b846e8cd2a580fbd/MDG92.latest/en-US

2.7.3. ALE Audit and Classification IDoc's

Scenario:

Option 3 (ALE audit) is used to replicate material with classification, key mapping required, update via ALE Audit active (key created in target system)

Challenge:

The CLFMAS IDoc's must not be sent until ALE audit has returned the material number of the target system and updated the key mapping. To ensure this, the classification outbound will fail with an error message in the ALE replication log (BD87) if no key mapping was found. Thus, the DRF change pointers will be set to processed but the CLFMAS IDoc will not be sent but instead get an error status.

Note that no message is written into the DRF log, only the ALE log (as it was there where the replication failed).

After the ALE audit has updated the key mapping, the CLFMAS IDoc's need to be replicated again. Unfortunately, this replication can't be automated from the ALE audit.

Solution:

Prerequisite is SAP Note 2030807.

Type	Solution
Initial Load	Retrigger replication for materials whose CLFMAS IDoc's have failed – check BD87. No work list available.
Delta	Delta is driven by change pointers → new change pointers created for failed classification IDoc's → for next periodic replication, material including CLFMAS will be sent again
Manual	Restart replication for materials whose CLFMAS IDoc's have failed – check BD87. No work list available.
CR Activation	Custom coding: WAIT task until DRF replication status indicates that the ALE Audit was finished, then restart replication

Note that the restart sends CLFMAS IDoc as well as the corresponding MATMAS IDoc, which is somewhat redundant.

2.8. Value Mapping

For value mapping see How To Guide Using Data Import Framework (DIF), chapter *Value Mapping*.

The customizing is valid for inbound and outbound.

2.9. Filter Criteria

Filter Object - Defines the selection criteria used to determine the data objects which should be replicated. It combines one or more filters. Maintenance of the selection criteria is done by the master data steward.

Filter - Carries out the comparison of a given set of objects against the maintained filter criteria. It *returns the list of objects that match the filter criteria*. To apply filters sequentially on the same object list, they can be combined in Filter Objects. Filter types available: *Explicit (simple and complex) and implicit*. *Segment Filters* are special filters that generally do not limit the number of objects but the amount of data in the object itself.

Explicit filters are configured explicitly by the customer

- **Simple filters** are defined per attributes on a single ERP or S/4HANA entity root table - e.g. fields MATNR, MATKL and MTART of table MARA. The evaluation of simple filters is generic in the way that it can be easily enhanced just by adding another attribute to the filter using append technology (no code change necessary).
- **Complex filters** are not directly related to the ERP or S/4HANA entity root table but need to get evaluated by certain function modules or methods like selected nodes of the article hierarchy or merchandise category hierarchy. The semantically interpretation of complex filters is coded using the corresponding APIs. To enhance complex filters code changes are necessary.

Implicit filters are offered by the system

- In addition to simple and complex filter the system offers implicit filters (reusable APIs). They are executed by the system and can only be switched on or off using the configuration on the Replication Model/Outbound Implementation level.
- Examples are checks of certain material/store combinations due to listing conditions or selling periods

Segment filters are used to exclude parts ("segments") of the Business Object from replication.

The delivered outbound implementation I_MAT has the following filter criteria's, which you can find in the MDG customizing: General Settings->Data Replication->Enhance Default Settings for Outbound Implementations->Define Outbound Implementations.

- Main filter in outbound implementation with Filter Object MDG_BS_MAT
- Segment filters F_MAT1 bis F_MAT6

If these filters are not sufficient you can create your own outbound implementation with own filters. Filters are defined in the MDG customizing: General Settings->Data Replication->Enhance Default Settings for Outbound Implementations-> Define Filter Objects.

2.10. Change of DRF Change Pointer Generation

Scenario:

You want to influence the DRF change pointers.

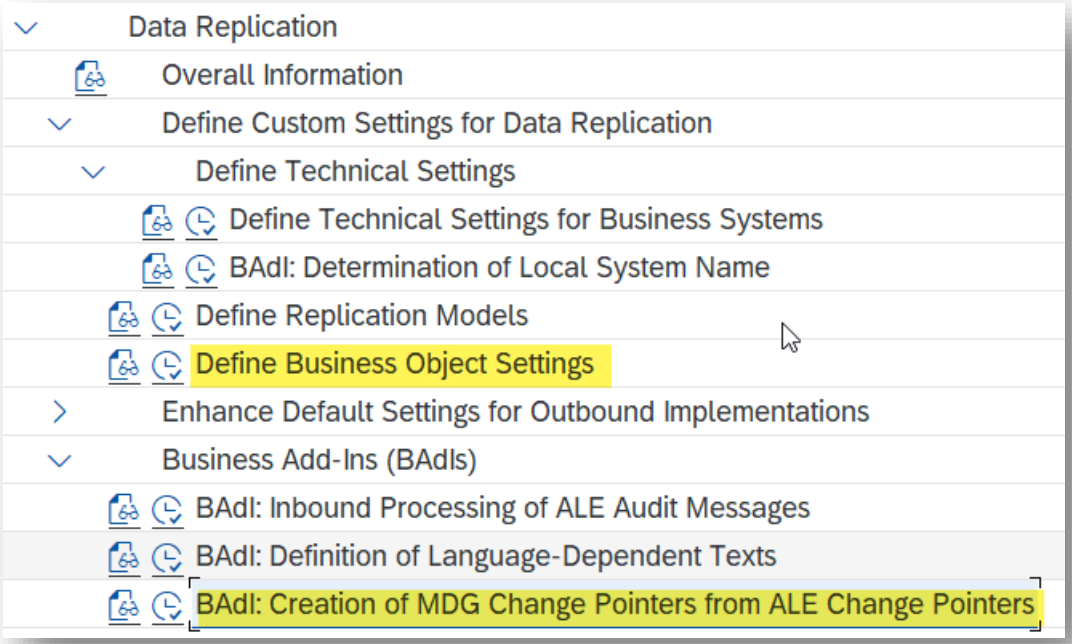
Solution:
The DRF change pointer creation is triggered by a BTE (Business Transaction Event) as stored in table TBE31. To prevent this creation, you should exchange/remove the two entries for MDG_BS_MAT_DRF_CP for BTE 00001250 and MDG_BS_CLF_DRF_CP for BTE 00004002. This is a modification.

In addition, different change pointer should be written. This could be achieved by:

- Alternative 1: Copy function module MDG_BS_MAT_DRF_CP and change the coding according to your requirements. Then exchange the function module in table TBE31.

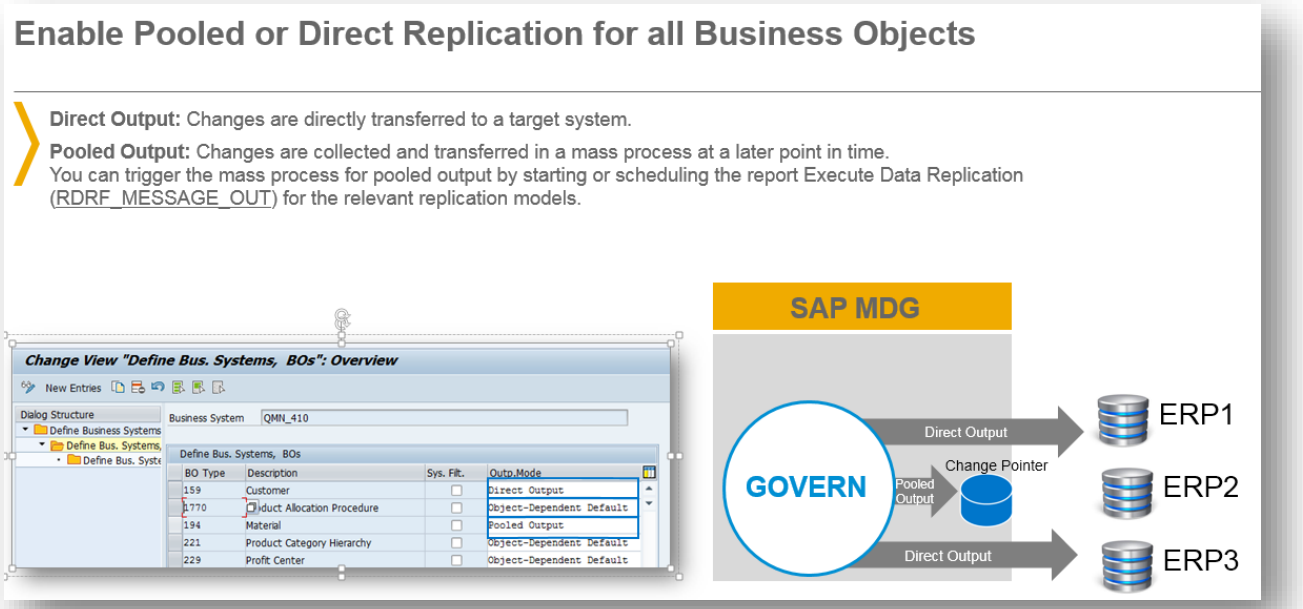
- Alternative 2: Use ALE-BAdI BDCP_BEFORE_WRITE. There you can create DRF change pointers if ALE change pointers are created for the ALE-Message type. Prerequisite is the assignment of ALE-

Message Type to the Business Object.



3. Step-by-Step Explanation for Immediate Replication with MDG 9.0 and SAP S/4HANA 1610

From MDG 9.0 and SAP S/4HANA 1610 it is possible to configure pooled or direct replication.



See configuration Guide MDG-M Set Up Data Replication
https://help.sap.com/viewer/6d52de87aa0d4fb6a90924720a5b0549/latest/en-US/64a5cb5285135721e10000000a423f68.html

4. Additional Information

4.1. Further Reading

4.1.1. Information on SAP MDG on SAP S/4HANA

- Exchange knowledge: SAP Community | Q&A | Blog
- Try SAP Master Data Governance on S/4HANA for free: Trial Version
- Try SAP Master Data Governance on S/4HANA on the SAP Cloud Appliance Library: S/4HANA 2022 FPS1
- Learn more: Latest Release | Help Portal | How-to Information | Key Presentations

4.1.2. SAP Roadmap Explorer

- Please see the roadmap for SAP Master Data Governance

4.1.3. Related Information

- Learn more: Floorplan Manager for Web Dynpro ABAP | How to Adapt FPM | FPM Blog | How-to Information | Service Mapping Tool | SAP S/4HANA Cookbook CVI

4.2. SAP Notes

In addition to the detailed explanations written in this document, please see the following SAP Notes for further important information.

Note	Description
3372801	Upgrade or Conversion for Master Data Governance, Central Governance
3043582	MDG Customer Connection 2020
3194967	MDG Customer Connection 2021 for S/4HANA 2022
3311039	MDG Customer Connection 2023
3428179	Master Data Governance: Continuous Influence
3134600	MDG-M: Supported fields in Data Model MM
1806108	Functional restrictions in MDG-M in MDG7 (incl. SP02)
2129261	Functional restrictions in MDG-M in MDG8
2284745	Functional Restrictions in MDG for Material with SAP Master Data Governance 9.0

2461516	Functional Restrictions in MDG for Material with SAP Master Data Governance 9.1
2656693	Functional Restrictions in MDG for Material in SAP Master Data Governance 9.2 and on SAP S/4HANA 1809
2816571	Functional Restrictions in MDG for Material on SAP S/4HANA 1909
2948873	Functional Restrictions in MDG for Material on SAP S/4HANA 2020
3070012	Functional Restrictions in MDG for Material on SAP S/4HANA 2021
3219945	Functional Restrictions in MDG for Material on SAP S/4HANA 2022
3374998	Functional Restrictions in MDG for Material on SAP S/4HANA 2023
2479869	Usage of Lean Classification with SAP Master Data Governance
1619534	How to Create, Enhance and Adapt FPM Applications
1637249	MDG: Information for efficient message processing
2105467	MDG Performance
2561461	Scope of support for SAP Master Data Governance (MDG)
1637249	MDG: Information for efficient message processing