
Number	2206980
Version	12
Processor	
Processing Status	new
Implement. Status	Undefined Implementation State
Language	EN
Short Text	Material Inventory Managment: change of data model in S/4HAN
Component	MM-IM-GF Basic Functions

Long Text

Symptom

You want to install SAP S/4HANA and need additional information how to adjust your customer enhancements, modifications or own functionalities to the new, simplified data model of SAP S/4HANA Supply Chain (MM - Inventory Management).

You want to have informations about what is different in SAP S/4HANA Supply Chain (MM - Inventory Management) compared to Suite on HANA A MM-IM.

Reason and Prerequisites

You have customer enhancements, modifications or own functionalities in the area of inventory management (component MM-IM) which were built for SAP ERP 6.0.

You are using functionalities which behave different in SAP S/4HANA Supply Chain (MM - Inventory Management) compared to Suite on HANA

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The SAP ERP 6.0 stock inventory management data model consists of the two document tables MKPF for document header information and MSEG for document item data. Additionally there were aggregated actual stock quantity data stored in several tables. Some of these tables do also store material master data attributes like the tables MARC, MARD and MCHB. Such tables with material master data attributes as well as actual stock quantities will be named as hybrid tables in the following. In contrast there are also tables like MSSA containing only aggregated actual stock quantities for sales order stock. Such tables will be called in the following as replaced aggregation tables.

With S/4HANA this data model has been changed significantly. The new de-normalized table MATDOC has been introduced which contains the former header and item data of a material document as well as a lot of further attributes. Material document data will be stored in MATDOC only and not anymore in MKPF and MSEG. Additionally the aggregated actual stock quantities will not be persisted anymore in the hybrid or replaced aggregation tables. Instead, actual stock quantity data will be calculated on-the-fly from the new material document table MATDOC for which some of those additional special fields are used. Hence, with the new MM-IM data model the system will work on database level in an INSERT only mode without DB locks. Nevertheless,

for stock decreasing processes there will be still ABAP locks to ensure stock consistency. A further advantage of the new MM-IM data model is the capability of simple and fast reporting because the most information is all in one place: MATDOC.

All below mentioned tables of the SAP ERP 6.0 product do still exist in S/4HANA as DDIC definition as well as database object and the hybrid tables will still be used to store the material master data attributes. For compatibility reasons there are Core Data Service (CDS) Views assigned as proxy objects to all those tables ensuring that each read access to one of the mentioned tables below still returns the data as before in SAP ERP 6.0. The CDS Views do the on-the-fly aggregation of actual stock quantities from the new MM-IM data model and join the master data attributes from the material master data table. Hence all customer coding reading data from those tables will work as before because each read access to one of the tables will get redirected in the database interface layer of NetWeaver to the assigned CDS view. Write accesses to those tables have to be adjusted.

The affected tables are:

Table	Table description	DDL	Source of CDS View for redirect View to read the content of the database table (w/o redirect to compatibility view)	View to read the master data attributes only	
MKPF	Material document header	NSDM_DDL_MKPF	NSDM_MIG_MKPF	-	
MSEG	Material document item	NSDM_DDL_MSEG	NSDM_MIG_MSEG	-	
MARC	Plant Data for Material	NSDM_DDL_MARC	NSDM_MIG_MARC		
V_MARC_MD					
MARD	Storage Location Data for Material	NSDM_DDL_MARD	NSDM_MIG_MARD		
V_MARD_MD					
MCHB	Batch stocks	NSDM_DDL_MCHB	NSDM_MIG_MCHB	V_MCHB_MD	
MKOL	Special Stocks from Vendor	NSDM_DDL_MKOL	NSDM_MIG_MKOL		
V_MKOL_MD					
MSLB	Special Stocks with Vendor	NSDM_DDL_MSLB	NSDM_MIG_MSLB		
V_MSLB_MD					
MSKA	Sales Order Stock	NSDM_DDL_MSKA	NSDM_MIG_MSKA	V_MSKA_MD	
MSSA	Total Customer Orders on Hand	NSDM_DDL_MSSA	NSDM_MIG_MSSA	-	
MSPR	Project Stock	NSDM_DDL_MSPR	NSDM_MIG_MSPR	V_MSPR_MD	
MSSL	Total Special Stocks with Vendor	NSDM_DDL_MSSL	NSDM_MIG_MSSL		
MSSQ	Project Stock Total	NSDM_DDL_MSSQ	NSDM_MIG_MSSQ	-	
MSKU	Special Stocks with Customer	NSDM_DDL_MSKA	NSDM_MIG_MSKU		
V_MSKU_MD					
MSTB	Stock in Transit	NSDM_DDL_MSTB	NSDM_MIG_MSTB	-	
MSTE	Stock in Transit to Sales and Distribution Document	NSDM_DDL_MSTE	NSDM_MIG_MSTE	-	
MSTQ	Stock in Transit for Project	NSDM_DDL_MSTQ	NSDM_MIG_MSTQ	-	
MCSD	DIMP: Customer Stock	NSDM_DDL_MCSD	NSDM_MIG_MCSD	MCSD_MD	
MCSS	DIMP: Total Customer Stock	NSDM_DDL_MCSS	NSDM_MIG_MCSS		
MCSS_MD					
MSCD	DIMP: Customer stock with vendor	NSDM_DDL_MSCD	NSDM_MIG_MSCD		
MSCD_MD					
MSCS	DIMP: Customer stock with vendor - Total	NSDM_DDL_MSCS			
NSDM_MIG_MSCS					
MSCS_MD					
MSFD	DIMP: Sales Order Stock with Vendor	NSDM_DDL_MSFD			
NSDM_MIG_MSFD					
MSFD_MD					
MSFS	DIMP: Sales Order Stock with Vendor - Total	NSDM_DDL_MFS			
NSDM_MIG_MSFS					
MSFS_MD					
MSID	DIMP: Vendor Stock with Vendor	NSDM_DDL_MSID	NSDM_MIG_MSID		

MSID_MD

MSIS DIMP: Vendor Stock with Vendor - Total NSDM_DDL_MSIS

NSDM_MIG_MSIS MSIS_MD

MSRD DIMP: Project Stock with Vendor NSDM_DDL_MSRD NSDM_MIG_MSRD

MSRD_MD

MSRS DIMP: Project Stock with Vendor - Total NSDM_DDL_MSRS

NSDM_MIG_MSRS MSRS_MD

MARCH	History	NSDM_DDL_MARCH	NSDM_MIG_MARCH	-
MARDH	History	NSDM_DDL_MARDH	NSDM_MIG_MARDH	-
MCHBH	History	NSDM_DDL_MCHBH	NSDM_MIG_MCHBH	-
MKOLH	History	NSDM_DDL_MKOLH	NSDM_MIG_MKOLH	-
MSLBH	History	NSDM_DDL_MSLBH	NSDM_MIG_MSLBH	-
MSKAH	History	NSDM_DDL_MSKAH	NSDM_MIG_MSKAH	-
MSSAH	History	NSDM_DDL_MSSAH	NSDM_MIG_MSSAH	-
MSPRH	History	NSDM_DDL_MSPRH	NSDM_MIG_MSPRH	-
MSSQH	History	NSDM_DDL_MSSQH	NSDM_MIG_MSSQH	-
MSKUH	History	NSDM_DDL_MSKAH	NSDM_MIG_MSKAH	-
MSTBH	History	NSDM_DDL_MSTBH	NSDM_MIG_MSTBH	-
MSTEH	History	NSDM_DDL_MSTEH	NSDM_MIG_MSTEH	-
MSTQH	History	NSDM_DDL_MSTQH	NSDM_MIG_MSTQH	-
MCSDH	History	NSDM_DDL_MCSDH	NSDM_MIG_MCSDH	-
MCSSH	History	NSDM_DDL_MCSSH	NSDM_MIG_MCSSH	-
MSCDH	History	NSDM_DDL_MSCDH	NSDM_MIG_MSCDH	-
MSFDH	History	NSDM_DDL_MSFDH	NSDM_MIG_MSFDH	-
MSIDH	History	NSDM_DDL_MSIDH	NSDM_MIG_MSIDH	-
MSRDH	History	NSDM_DDL_MSRDH	NSDM_MIG_MSRDH	-

The hybrid tables of the former Industry Solution DIMP have now new tables containing the material master data only. The name of the new tables is presented in the right column of above table.

According to the fact that data will not persisted anymore in the header and item tables MKPF and MSEG the transaction DB15 behaves differently in the environment of archiving.

Transaction DB15, which allows the retrieval of statistical data for DB tables grouped by the archiving objects that refer to these tables, does not provide correct information for tables MKPF and MSEG. When selecting tables from which data is archived for archiving object MM_MATBEL, and navigating to #Online Space# or #Space Statistics# for tables MKPF or MSEG, the statistics #No. Records# and #Table Space# are shown in the result screen. These numbers are taken from the original tables MKPF and MSEG, and not calculated by redirecting the request to table MATDOC. Consequently, when executing archiving for archiving object MM_MATBEL, this will have no effect on the numbers shown for tables MKPF and MSEG in transaction DB15.

Solution

One impact of the simplified MM-IM data model does exist if there are customer APPENDs or INCLUDEs with customer fields on the mentioned tables. The NetWeaver redirect capability requires that DB table and assigned proxy view is compatible in the structure: number of fields, their sequence and their type. Thus if there is an APPEND or INCLUDE on one of the above mentioned tables then the assigned DD L source of the CDS view must be made compatible. In some cases for S/4HANA on-premise 1511 this does not require customer interaction especially in those cases where the append has been put at the end of a table which is strongly recommended (not somewhere in between

which may happen if a table is composed by include structures like for MARC). For other cases and in general for S/4HANA on-premise 1610 the structure of the proxy view can be made compatible to the table by extension view. This extension view is always an extension to the above mentioned view in the DDL source of the CDS view used for redirect. In the extension view the fields have to be listed in exactly the same order as in the append. For more information about view extension see e.g. SAP NetWeaver 7.4 documentation.

Another impact of the simplified MM-IM data model is a performance decrease of DB read operations on the above mentioned tables just because a data fetch on one of the mentioned tables is in S/4HANA slower than in SAP ERP 6.0 due to the on-the-fly aggregation and the JOIN operation. Hence performance critical customer coding may be adjusted to improve performance. Furthermore customer coding writing data to aggregated actual stock quantity or to the former document header or item table shall be adjusted!

1. Customer Appends

With SAP Note 2194618 and 2197392 SAP offers a check to be executed on the start release to identify APPEND issues described in the following sub chapters. Hence customer is not forced to scan all above listed tables manually.

1.1 Customer Appends on the former document tables MKPF and MSEG

If there are APPENDs on MKPF and MSEG where fields with the same fieldname do exist then there is a name conflict in case that the content of field MKPF-A is different from field MSEG-A (fields with same name and identical content do exist on MKPF and MSEG also in SAP Standard for performance reasons e.g. BUDAT). In this case it is required to add a further field A_NEW to the append, copy the data from A to A_NEW with a special customer program and then all coding sections, Dynpros, etc. need to be adjusted to use A_NEW and then field A needs to be dropped from the append. This must be done before migration from ERP 6.0 to S/4HANA.

If the attributes in the APPENDs or INCLUDEs (e.g. CI_M* INCLUDEs as introduced with consulting note 906314) on table MKPF and MSEG do have a master data or process controlling character then the fields from the APPENDs/INCLUDEs need to be appended to the table MATDOC and the assigned proxy views can be made compatible via extension views.

In case of a system conversion all these customer fields in such APPENDs or INCLUDEs need to be appended to table MATDOC during the ACT_UPG phase (SPDD). It has to be done in any case before the MM-IM conversion program will be executed which move the data from MKPF and MSEG to MATDOC otherwise data in customer fields gets lost. The structure compatibility between table MKPF/MSEG and their assigned proxy view shall be created directly after system conversion by creating extend views, see note 2242679.

Fields from APPENDs/INCLUDEs to table MKPF should be appended to sub structure NSDM_S_HEADER of table MATDOC.

Fields from APPENDs/INCLUDEs to table MSEG should be appended to sub structure NSDM_S_ITEM of table MATDOC.

1.1.1 Customer include CI_COBL in table MSEG

Table MSEG contains the customer include CI_COBL where customers can insert own fields. The CI_COBL include has been made available also in the new MM-IM data model with note 2240878. This note must be applied before the data migration starts in the ACT_UPG phase (SPDD); otherwise you may lose data. With the implemented CI_COBL the table MSEG and its assigned proxy view is not compatible in their structure anymore. The structural compatibility can be re-created by applying note 2242679. This must be done directly after system co

conversion has been finished.

1.2 Customer Appends on the hybrid and replaced aggregation tables

1.2.1 Fields containing material master data attributes If the append is not at the end of the hybrid table then the append should be moved to the end if possible and then no further action is required because the delivered DDL sources for the proxy views provide the \$EXTENSION feature within S/4HANA on-premise 1511. Due to too many side effects like unpredictable sequence of fields from APPENDS, this has been changed with S/4HANA On-Premise 1610 where always an EXTEND VIEW for a CDS proxy view has to be created for an APPEND on a material master data table. For the DIMP tables the append has to be appended also to the new pure DIMP material master data tables. The structural compatibility between table and CDS proxy view can be re-created by applying note 2242679. This must be done directly after system conversion has been finished (e.g. creating just an EXTEND VIEW with the customer fields using ABAP Development Tools for S/4HANA On Premise 1610 and higher). For replaced aggregation tables appends with master data attributes are not supported. If such appends are really required in the customer processes then the approach described in the next chapter maybe feasible. In the core functionality of material document processing there will be no write process on these tables. Thus update of the fields in the appends requires maybe some additional customer coding.

1.2.2 Fields representing a customer defined stock type or quantity/value to be aggregated

If own stock types or a dimension which needs to be aggregated have been introduced by the customer then the view stack of the CDS view assigned to the table with the additional stock type needs to be modified. Right now, there is no technology support for modification free enhancement. If the stock type has not been introduced by new entries or enhancements in the tables T156x (T156, T156SY, T156M, T156F) - which controls in the core functionality the mapping between a posting and a stock type - then the process logic needs to be adapted.

1.3 Customer Appends on views

There are several views in SAP Standard which also do have an assigned proxy view because the view provide actual stock quantity data.

View and assigned proxy view must be compatible in structure too. If there are customer appends on such view the same rules as for tables apply. Views with assigned proxy compatibility view can be determined by searching via transaction SE16N in table DD02L with TABCLASS = VIEW and VIEWREF <> '' or you may use above mentioned check functionality in your start release.

1.3.1 Customer views on MKPF/MSEG

Views are database objects and thus a view is executed on the database. Because the table MKPF and MSEG will not contain data anymore (except legacy data from migration) such a customer view will never return any record. Such views have to be either adjusted by fetching data from table MATDOC or to be created new as DDL source with a different name. In the last case all usages of the old DDIC SQL view must be replaced by the new CDS view.

1.3.2 Customer views on material master attributes

Such views using only material master data attributes from the hybrid tables do not need to be changed.

1.3.3 Customer views using aggregated stock quantity data Customer views having at least one actual stock quantity aggregate cannot be used anymore because

the field representing this aggregate on the database will be empty

forever

the quantity must be aggregated from table MATDOC which is not possible with DDIC SQL views. Such views must be defined new as a DDL source with a new name. Each of the above mentioned DDL sources can be used as template. All usages of the old DDIC SQL view must be replaced by the new CDS view.

2 Code adjustments and optimizations

Technically it is still possible to do DB write operations (INSERT, UPDATE, DELETE, MODIFY) on the tables MKPF, MSEG as well as the fields representing actual stock quantities in the hybrid and replaced aggregation tables. But such write operations are without any effect! Therefore write operations on MKPF, MSEG as well as the fields representing actual stock quantities in the hybrid and replaced aggregation tables shall be removed from customer coding. Write operations on the material master data attributes in the hybrid tables are still possible. Write operations on table MATDOC and your moved customer append fields are done by class CL_NSDM_STOCK.

DB read operations on the hybrid and replaced aggregation tables have a performance decrease. In general, it shall be avoided to read any stock quantities when only master data is required. Therefore it is recommended to adjust the customer coding in the following way

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If material master data as well as actual stock quantity data are required then the SELECT....<table> should be replaced by using a data access method from class CL_NSDM_SELECT_<table>. These classes provide access methods for single as well as array read operations.

If material master data are required then the SELECT....<table> should be replaced by SELECT....V_<table>_MD where V_<table>_MD is one of the above mentioned views for master data access. Alternatively corresponding material master data read methods in the class CL_NSDM_SELECT_<table> can be used. Also the data type declarations should be adjusted from TYPE...<table> to TYPE...V_<table>_MD.

If actual stock quantity data are required then the SELECT....<table> should be replaced by SELECT....NSDM_V_<table>_DIFF where NSDM_V_<table>_DIFF is one of the views in the view stack of the above mentioned proxy view. Also the data type declarations should be adjusted from TYPE...<table> to TYPE...NSDM_V_<table>_DIFF.

For table MARC and field STAWN valid from S/4HANA On Premise 1610 please read note #mce_temp_url#

For performance critical coding parts these adjustments are strongly recommended. For non critical parts it is optional short term but recommended on long term.

To identify such locations, it is required to make use of the where-used functionality of transaction SE11 and considering other techniques like transaction CODE_SCANNER to find locations which SE11 cannot handle # like dynamic programming or native SQL statements.

Consider SAP Note 28022 if there are issues with the where-used functionality in the customer system. In the where-used dialog it is possible via the button "Search Range" to search specific for key words like SELECT, INSERT and so on.

Other terms

S4TC, S/4 transition, MM-IM, Material Management

Valid Releases

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Links to Support Packages

Software Component	Release	Package Name
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