

Industry Models

Physical Model Guidelines



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Introduction

This document describes the Logical to Physical Transformation of Industry Models and generation of DDL script for deployment of the physical model objects in a relational database. The document covers the key aspects of this transformation and the generation of DDL scripts which include:

- Logical to Physical Transformation
 - Models suitable for the deployment in a relational database
 - Logical to Physical transformation options
 - $\circ~$ Database type specific customization of database object in the physical model
- Generation of DDL file used to create the database objects and set their attributes
- Customization and Execution of DDL
- Importing of released "ready-to-use" physical models into existing Industry Models IDA project

This document covers only the transformation from logical to physical model with the use of IBM InfoSphere Data Architect (IDA) tool. The transformation of logical model to physical models with use of any other modeling tools (e.g. Erwin) is not in scope of this document.



1. Logical to physical model transformation

Logical to physical model transformation is expected to produce a model which can be used to deploy the model objects (tables, columns, relationships) in a particular database system. The Industry Models usually consist of three models

- Business Data Model (BDM)
- Atomic Data Model (AWM)
- Dimensional Data Mode (DWM)

Only the AWM and DWM are designed for the purpose of deployment in a database system.

1.1 Transformation scope and naming standard

The transformation of logical model to physical model can be based on one of the following options:

- Full logical model transformation
- Transformation of all model elements from a particular logical model package
- Transformation using a model scope defined by a logical model diagram
- Transformation using a selection of model elements in the Data Project Explorer

Glossary Model as Naming Standard file

Glossary Model set as the Naming Standard of the project is used for the transformation. Glossary model provides pre-defined support to transform entity and attribute names from logical (business friendly) names, that could be up to 80 characters, to abbreviated physical names. This includes removal of punctuation. These changes are necessary to create a DDL file for use by a database.

Verify that a Glossary Model is defined in the project and is set as the Naming Standard file associated with the project.

1. In the Data Project Explorer view, click on the main project title, e.g. HCPDM88-Project



2. In the Properties View click on the Naming Standard tab



🗁 <data design="" project=""> HCPDM88-Project</data>					
General	Glossary model files:				
Domain References	🔢 /HCPDM88-Project/Standards - Naming.ndm	Add			
Naming Standard		Remove			
		Remove			

Note: All Industry Model IDA projects are released with a Glossary Model named "Logical to Physical Glossary Model" or "Standards – Naming" and set as Naming Standard for the project.

As an alternative a new Glossary Model can be created and populated with translation of business terms into abbreviated physical names. Such file can be used instead or in addition to the existing Glossary Model file assigned to the project.

1.2 Logical to Physical transformation options

In the Data Project Explorer view, based on the desired scope, select the model, a package or a diagram which will be transformed into a physical model. The steps below describe transformation of the full AWM or DWM into a physical model.

- 1. Click on the root model package in the Data project explorer to select it. The name of the root package normally matches the name of the model.
- 2. In the menu, select Data > Transform > Physical Data Model.
- 3. On the "Target Physical Data Model" screen of the transformation wizard choose Create New Model and click Next.



4. On the "Physical Data Model File" screen of the transformation wizard specify the file name, the database in which the physical model will be deployed and the version of the database Model and click Next.

💿 Transform To Physical Data Model				
Physical Data Model File Specify the database, version, and location of the new model file.				
<u>D</u> estination folder: <u>F</u> ile name: D <u>a</u> tabase: <u>V</u> ersion:	Destination folder: HCPDM88-Project Browse File name: Atomic Warehouse Model Database: DB2 for Linux, UNIX, and Windows ▼ Version: V10.5			
A Cancel A Cancel				

The HCPDM 8.8 physical models were created for the following database types and versions:

- DB2 for Linux, UNIX, and Windows, V10.5
- Netezza, 7.x
- Oracle, 11



- 5. On the "Options" screen of the transformation wizard configure the details of the model transformation and click Next.
 - "Name Case" option set to "Use upper case"
 - "Label Source" option set to "Use name" This can provide additional traceability to the original model elements. Untransformed attribute names will be placed in the label of physical model columns.
 - "Transform diagrams" option enabled
 - "Generate Traceability" option enabled Refer to Chapter 4 which describes the model import steps to make sure the dependencies created by enabling this option are preserved when importing the physical model with dependencies to a project with the logical model.

💿 Transform To Physical Data Model 📃 📃 🗮 🗶					
Options Choose opt	Options Choose options for the transformation.				
Physical N	ame				
Name Ca	ise			Name Source	Label Source
Use tit	le case 🔘 U	lse existing case		Use label	Use label
Constant	the second Tanadara Ma	·····		0.000	0
O Use na	it and index iva	mes			
Use na	ming standard	s			
Data type o	defaults				
Data type:	CHAR	Length:	10		
Precision:	5	Scale:	2		
Physical O	ptions				
Surrogate	e key			I <u>n</u> dex	
© Genera	ate <u>i</u> dentity col	umn 💿 Genera	ate se <u>q</u> ueno	e 📃 Generate <u>i</u> ndex f	or primary key/unique constraint
Miscellane	ous				
Сору				✓ Transform diagrams	
Docum	nentation	Annotation	s	☑ Generate traceability	
URLs		🔽 Dependenc	ies	Column ordering (key	y columns first)
				Append new columns	s
lain table					
2011 (2016	separator.	-		Schema name: Schema	Br <u>o</u> wse
<u>R</u> oll Up ty	/pe table suffix:	Туре			
?			<	Back Next >	Einish Cancel



6. When the transformation completes the "Output" screen appears in the wizard with the result of the transformation. Click Finish to save the generated model and close the wizard.

🕞 Transform To Physical Data Model 📃 💷	x
Output Message output	
Transformation to physical model is complete. Click Finish to save the generated physical data model to a resource, or click Cancel to quit.	*
(?) < <u>Back</u> <u>Next</u> > <u>Finish</u> Canc	el

7. You should now see a new physical model under the Data Models folder in the Project Explorer view.





1.3 Database type specific customization of physical model

The technical attributes of the Physical Model objects are usually updated with the specifics of a particular database type before there is a DDL file generated from the Physical Model.

This might include definition of the following objects:

- Table spaces
- Indexes
- Partitioning/Distribution keys
- Materialized query tables (MQTs)
- Temporal tables

When deploying the DB2 physical data model on DB2 BLU the "table organization" property of the database in physical model needs to be set to "COLUMN" before the DDL is generated. Refer to HCPDM documentation for detailed instructions:

• HCPDM User Guide > Appendixes > Transforming the Logical Data Models to Physical Data Models

Additionally the used data type can be refined based on the target database.

Refer to the best practices document for a particular database type to learn more about the design of the physical model in relation to Industry Models:

- DB2 Best Practices Transforming IBM Industry Models https://www.ibm.com/developerworks/mydeveloperworks/wikis/form/anonymous/api/library/0fc2f498-7b3e-4285-8881-2b6c0490ceb9/document/91a0986b-0de4-4181-aec5-d672f229c1ce/attachment/b2d409c1-396d-4d83-a9e2-0d4a561c3477/media/DB2BP_Transforming_IBM_Industry_Models_1012.pdf
- Deploying an IBM Industry Data Model on an IBM Netezza DW appliance http://www-01.ibm.com/support/docview.wss?uid=swg27020938&aid=1



2. Generation of DDL file

The Physical Model will be used to generate the Data Definition Language (DDL) file to create the objects in the database. The steps below describe generation of DDL file for all objects included in a schema. It is also possible to generate DDL for individual database or schema elements (e.g. table, view and sequence).

To generate the DDL file for a Physical Model:

- 1. In the Data Project Explorer view expand the contents of the Physical Model by clicking on the twistie.
- 2. Right-click on the Schema and from the context menu and choose Generate DDL.
- 3. On the "Options" screen of the transformation wizard enable the "CREATE statements" option and configure other options as required.
 - CREATE statement
 - Fully qualified names

Generate DDL	
Options Select the model elements that you script.	want to include in the DDL
Generate: Check <u>m</u> odel Guoted identifiers DROP statements CREATE statements Select All Deselect All	COMMENT ON statements Update statistics catalog IN TABLESPACE clause Use domain if exists OR REPLACE clause Restore Defaults
< <u>B</u> ack <u>N</u> ext >	<u>Einish</u> Cancel

Note: The options displayed in this screen of the DDL generation wizard depend on the Physical Model database type.



- 4. On the "Objects" screen of the transformation wizard choose the object to be generated.
 - Foreign key constraint
 - Indexes
 - Primary key constraint
 - Sequences
 - Tables

🕞 Generate DDL				
Objects Select the model objects that you want to include in the DDL				
script.				
Generate:				
Conditions	Primary key constraint			
🕅 Global Variables	Privileges			
Modu <u>l</u> es	Remote servers			
Alia <u>s</u> es	Row p <u>e</u> rmissions			
Check constraint	Sc <u>h</u> emas			
🔲 Col <u>u</u> mn masks	Seguences			
Foreign key constraint	Stored procedures			
E Functions	✓ <u>T</u> ables			
<u>H</u> istory table	Tablespaces			
✓ Indexes	Triggers Triggers			
MQTs	User mappings			
Nic <u>k</u> names	User_defined types			
Pac <u>k</u> age	<u>Views</u>			
Package <u>B</u> ody	Wrappers			
Select All Deselect All Restore Defaults				
	<u>F</u> inish Cancel			

Note: The options displayed in this screen of the DDL generation wizard depend on the Physical Model database type.



5. On the "Save and Run DDL" screen of the transformation wizard set the name of the DDL file such as "AWM DDL.sql" and adjust the folder into which the DDL file is saved if necessary and click Next. Other configurable options on this screen allow setting of the DDL statement terminator, direct execution of the DDL script on a database server and option to open the generated DDL file in SQL editor after it is saved. This screen also includes the preview of the DDL file.

Generate DDL				
Save and Run DDL Specify a path to save the generated DDL script. You can run the DDL script by providing your database connection information.				
F <u>o</u> lder:	/HCPDM88-Project	Brow	wse	
F <u>i</u> le name:	Script.sql			
Preview D	DL			
<scriptoptions statementterminator=";"></scriptoptions> CREATE SCHEMA Schema; CREATE SEQUENCE Schema.ACCT_ENTR_SK_SEQ1 AS BIGINT_START WITH 1 CREATE SEQUENCE Schema.ACCT_SK_SEQ1 AS BIGINT_START WITH 1 INCRE CREATE SEQUENCE Schema.ACCT_STC_LVL_SK_SEQ1 AS BIGINT_START WITH			E F Ppply	
 Run DDL on server Edit and run DDL in the SQL editor 				
?	< <u>B</u> ack <u>Next</u> <u>Finish</u>	Cance	el	



6. On the "Summary" screen of the transformation wizard review all configured DDL generation properties and click Finish to save the DDL file.

Setting	Value
file location	/HCPDM88-Project/Atomic Warehouse Model - Physical - DB210.5.sql
Open DDL for editing	false
Run DDL on server	false
Model validation	false
Senerate fully qualified names	true
Generate quoted identifiers	false
Senerate DROP statements	false
Senerate CREATE statements	true
Generate comments	false
Generate update statistics values	false
Generate IN TABLESPACE clause	false
Jse domain if exists	false
OR REPLACE clause	false

You will find the generated DDL file, in the SQL Scripts folder in Data Project Explorer view.

3. Customization and Execution of DDL

The statements in the generated DDL file can be updated in a text editor if needed for example to replace the default DB schema name by the name of an existing DB schema in which the object will be created. This can be done by a global search and replace to set the schema name in the DDL statements before deploying of the DDL in the database.



Importing of physical models into IDA project 4.

If there are Physical Models provided for an industry (e.g. HCPDM 8.8) these can be loaded to the existing IDA project. The following steps describe the import of the physical models:

- 1. In the Data Project Explorer view click on the project (e.g. HCPDM88-Project) with right mouse button and select Import from the context menu.
- 2. Expand General item, Choose "File System" and click on Next button.

Import			
Select Import resources from the local file system into an existing project.			
Select an import source: type filter text General Archive File Existing Projects into Workspace File System Preferences			
(?) < <u>Back</u> <u>Next</u> > <u>Finish</u> Can			

3. Use the "From Directory" field to point the import wizard to a location into which you saved DBM. The selected directory should include all files without any subfolders. This is to make sure that the transformation traceability dependencies link correctly to the logical model.



4. Select the files which you want to import and click on Next button.

lmport		
File system Import resources	from the local file system.	
From directory:	C:\Users\IBM_ADMIN\IBM\rationalsdp\Workspace\im-h	cpdw-models\IDA Models\Physical Models 8.8
Filter Types Filter Types Into folder: HCI Options Qverwrite exi Create top-le Advanced >>	cal Models 8.8 Select All Deselect All PDM88-Project sting resources without warning vel folder	Image: Contract C
?		< <u>Back</u> <u>Mext</u> <u>Finish</u> Cancel

- 5. You should now see all loaded physical models under the Data Models folder in the Project Explorer view.
 - ▲ 11 HCPDM88-Project
 - Mappings
 - XML Schemas
 - Data Diagrams
 - a 🛅 Data Models
 - atomic Warehouse Model Physical DB210.5.dbm
 - iii Atomic Warehouse Model Physical Netezza7.x.dbm
 - 📷 Atomic Warehouse Model Physical Oracle11.dbm
 - Atomic Warehouse Model.ldm
 - 💼 Business Data Model.ldm
 - iii Dimensional Warehouse Model Physical DB210.5.dbm
 - 💼 Dimensional Warehouse Model Physical Netezza7.x.dbm
 - 🌆 Dimensional Warehouse Model Physical Oracle11.dbm
 - Dimensional Warehouse Model.ldm
 - 🔟 Standards Data Domains.ddm
 - 😥 Standards Naming.ndm
 - D Other Files
 - SQL Scripts