HP IT Executive Scorecard

Software Version: 9.50
Windows ® operating system

Content Extension Guide for XS IDE Version 9.50

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Contents

Getting Started with Content Extension

The Integrated Development Environment (IDE) allows you to develop content and DWH models, as well as develop new entities and extend existing content using the Designers. Once the entities are defined and mapped, they are run through the ETL Generator to produce the metadata and workflows. You can then package the data into Content Packs for use in the Data Warehouse.

> **Note:** The IDE only supports the usage of UTF-8 (Latin) characters.

IDE Set up

1. **Prerequisite:** When creating or extending content make sure that you have set up IT Executive Scorecard. For IT Executive Scorecard installation and administration details, see the *IT Executive Scorecard Administrator Guide*.

2. Install the contents of the IDE DVD. The IDE can be downloaded from HP Live Network (https://hpln.hp.com/group/executive-scorecard) and contains:

   - **IDE:** Unzip the file and double-click **eclipse.exe** to run the IDE Eclipse application.

   - **IDE Content:** Contains the OOTB Content Packs.

Content Extension Process

The development of new content comprises the following steps:

1. Understand IDE. For details, see "IDE Terms" on the next page, "IDE Audience" on page 11, "IDE Main Page" on page 26, and "Content Packs and Data Modeling" on page 21.

2. Design and analyze the purposes of the extension. For details, see "Design and Analysis Phase" on page 13.

3. Data Evidence: Understanding and analyzing what data needs to be included, based on your information needs and objectives. For details, see "Discover Data Evidence" on page 17.

4. Import existing content for extension or new Content Pack directories if required. For details, see "Import Existing Content" on page 58.

5. If needed, define new Content Pack projects. For details, see "Define New Content Pack Project" on page 59.

6. Modeling: The architect creates the Target model. For details, see "Define the Target Model" on page 64 and "Architect Target Designer Tasks" on page 34.

7. Data Source Integration: The engineer maps the data from the Source to Target. For details, see "Engineer Stream Designer Tasks" on page 46, "Delete an Entity Permanently" on page 66, and "Manage Validation" on page 68.

8. ETL development and generation. For details, see "Generate Content" on page 80.

9. ETL orchestration and management. For details, see "Package and Deploy Content" on page 82.

10. Activate new content. For details, see "Activate New Content " on page 84

11. Consolidation

12. Context (universe) building and adjustments.

13. KPIs additions and modifications.

14. Advanced development. For details, see "Advanced Development" on page 90.

15. Next steps. For details, see "Next Steps" on page 114.

The IDE End-to-End Flowchart

The following illustrates the typical flow, tasks, and procedures in the IDE process. The tasks correspond to the relevant tasks in the Designers.
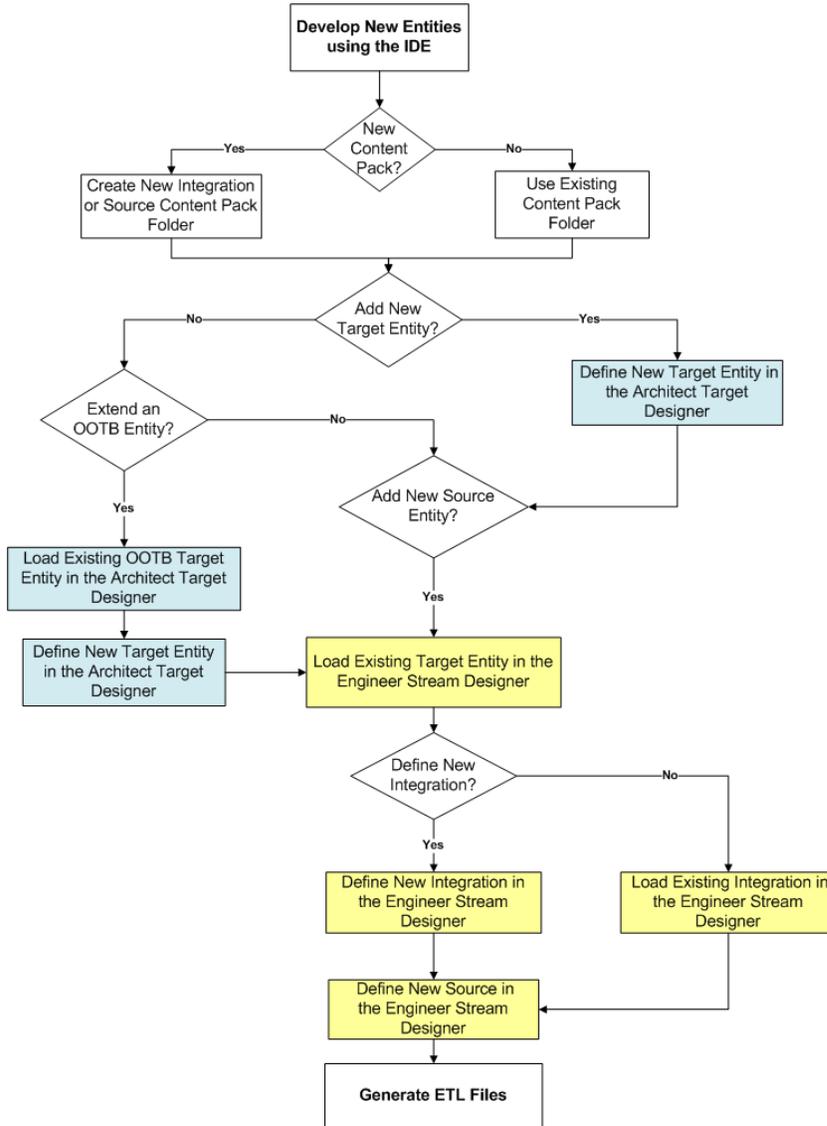
IDE Terms

- **IDE: Integrated Development Environment.** The Eclipse workspace where you can create or extend content using modeling tools in the relevant designers.

> **Note:** The path to the workspace should not contain blank spaces. For example: **C:/workspaces/ide_workspace/**.

- **KPI: Key Performance Indicator.** KPIs reflect how well the organization is doing in areas that most impact financial measures valued by shareholders, such as profitability and revenues.

- **API: Application Programming Interface.** A specification intended to be used as an interface by software components to communicate with each other.

- **ETL: Extract, Transform, Load.** An end-to-end transfer of external source data through several staging layers and into the target layer of the data warehouse. The data warehouse uses the ETL process to extract, consolidate, and transform the source data into a meaningful target model that populates relevant business analytics.

- **UDM: Unified Data Model.** Provides a bridge between the user and the data sources.

- **DWH: Data Warehouse.** The data warehouse is an end-to-end solution for extracting source data and consolidating disparate source data models into a consolidated data model. The data organized to reflect this model resides in target tables that become the source for XS.

- **XS: [[[Undefined variable Project_Variables.BA]]].** An application that enables executives to continuously improve their business by measuring what happened and what is happening, analyzing that information, and planning new strategies using the gathered information.

- **File Based Integration (FBI) Extractor.**

  FBI enables you to extract data from a specific data source according to a set of instructions. It consists of a plug-able extractor framework for each data source. The extractor gathers data according to the specific instructions it receives, placing it into a relevant .txt flat file. If you want to develop your own extractor for use with extended content, see the *FBI Extractor SDK Guide*.

  The following extractors are available for each source product:

Product	Extractor
ALM	ALM11, ALM11.5/12
AM	MSSQL, Oracle
AWS	aws_s3
AWSCW	AWSCW
BSM	BSM, GDE, UCMDB
CSA	CSA
DP	DP
FPA	FPA
IC	MSSQL, Oracle, PostgreSQL
NA	MSSQL, Oracle, MySQL
NNM	NNM

Product	Extractor
OO	MSSQL, Oracle, MySQL
PPM	Oracle
SA	SA
SE	Oracle
SM	MSSQL, Oracle
UCMDB	UCMDB
VCM	script(groovy)

- **Entity.** An entity is an object of interest included in the data model.

- **Designer.** A designer in the IDE is the model you create in order to perform content extension and definition. It is a collection of certain entities that may share some relevancy in common. The IDE contains the Architect Target Designer and the Engineer Stream Designer.

- **Content Packs.** A content pack is a set of entities from a certain type. There are three types of content packs:

  - **Source.** Contains all of the artifacts needed to connect to the relevant data source and pull data from that data source.

  - **Integration.** Integrates the information from the source, using the DWH schema and loading process in order for the data to be brought to the Target tables. Takes the schema and entities of the source data and transforms it into usable data.

  - **Target.** Defines the content of the Data Warehouse as well as the look of the target tables according to the Unified Data Model (UDM).

IDE Audience

This document assumes basic data warehouse modeling knowledge, understanding of the ETL concepts, good familiarity with databases including the SAP Business Objects Data Services (BODS).

Requirements for DWH Architects

- Understanding of Business Intelligence tools, data warehouse modeling and database design principles.
- XS DWH Target schema.

Requirements for DWH ETL Engineers

- Understanding ETL principles.
- Familiarity with the source schema.

Requirements for DWH Integration Engineers

- Java programming skills

Prerequisite Knowledge for Performing Content Development Tasks

- HP Unified Data Model (UDM).
- Target Model: The existing supported model of the DWH
- Basic architecture of the data warehouse and the advantages of the templates.
- Basic familiarity with the Integrated Development Environment (IDE).
- Verticaand data modeling.

Content Development Process

The content development process includes several stages:
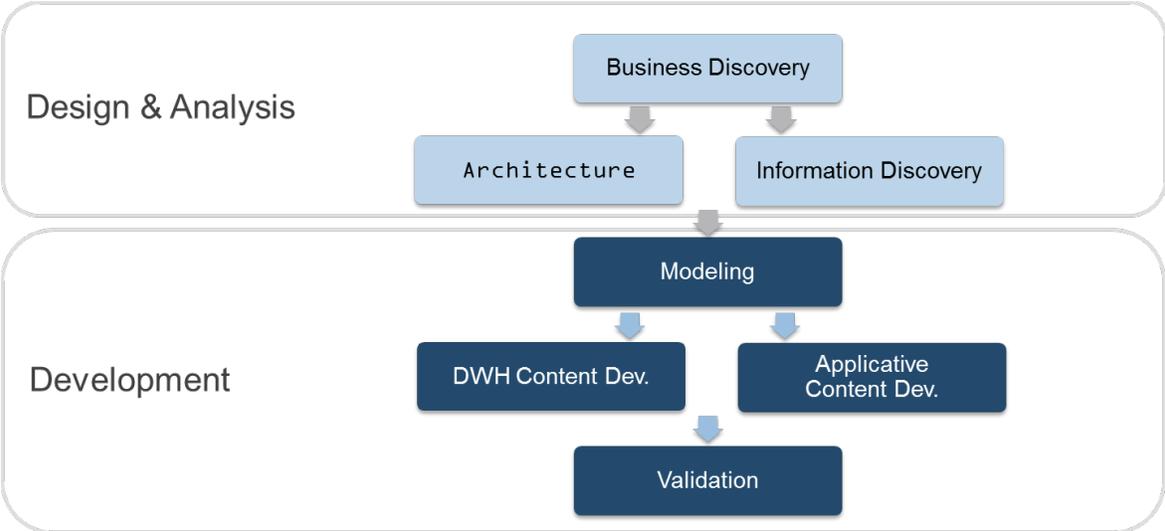
Design and Analysis Phase

The information design and analysis phase help you determine your organization's objectives and information needs and discover the data in the organization that supports the business requirements.

Learn More

● Learn More

Design and Analysis

This phase is the preparation for the actual implementation but usually consumes more time and resources as the outcome of it should be exact design of the end user solution.

This phase has the following stages:
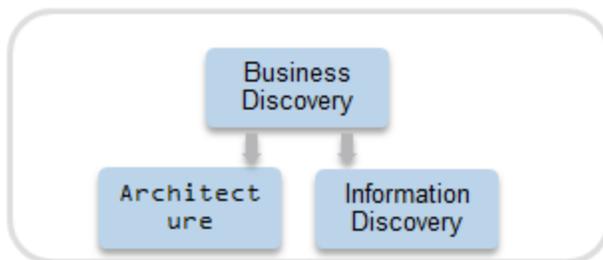
Business Discovery

A structured methodology for understanding the company's objectives and Information needs.

This methodology includes the following steps:

1. **User Analysis.**
   - Define the personas
   - Define the personas business requirements

2. **Decision Based Analysis.**
   - KPIs
   - Reports
   - Metrics
   - Dashboards

3. **Information Availability.**

- Identify the Source systems that support business requirements

4. **Assign Priorities.**

The output of this stage is the design document that describes the solution from business perspective.

Information Discovery

This stage implies discovering the data in the Organization that supports the Business requirements synchronizing between the available information, means of extracting it and information required by the business. It's also known as "Data Evidence" process

Discover the data in the organization that supports the business requirements. Synchronize the available information and the means of extracting it with information required. This is the Data Evidence process. Information discovery includes the following steps.

1. **Select the Source Contact Point.**

   - Select a source expert to accompany the information discovery process

2. **Define the Source Extraction Method.**

   - Common extraction methods are DB query, API, Web Services

   - The new extractors can be developed based on the FBI API.

3. **Identify the Source Table.**

   - Identify configuration tables to populate Dimensions

   - Identify transactional tables to populate Facts

4. **Define the Source to Target Mapping.**

   - Identify Source Columns Mapping to Target Columns

   - Define data-processing requirements

Architecture

During this stage the Target data model is visualized using the Star-Scheme Model approach. Star Schema is a design method of dimensional modeling, in which data is organized in:

- **Facts:** An event that is counted or measured, such as a sale or logon. Table Structure contains business measurements (numeric or time based) and Dimensional Intersection Point.
- **Dimensions:** Reference information about the fact, such as period, product, or customer. Common Table Structure contains descriptive attributes.

A star schema is diagrammed by surrounding each fact with its associated dimensions. The resulting diagram resembles a star. Star schemas are optimized for querying large data sets and performing analytical queries that are used in data warehouses and Business intelligence systems.

Sample Star Schema
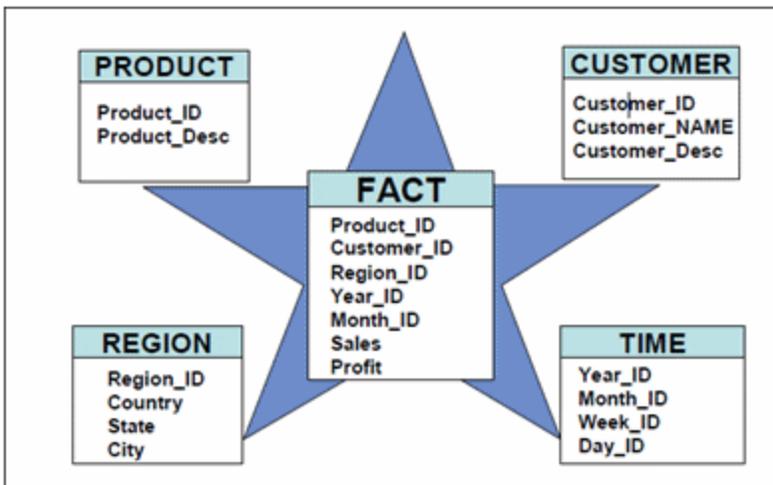
The Star-Scheme architecture creation process includes:

- Review the XS UDM catalog.
  - Review the XS UDM Catalog, by the business context defined in Business Discovery phase.

- Gap Analysis
  - Identify the OOB Target entities matches.

  - Identify the OOB Target entities to be extended.

  - Identify the New Target entities.

- Design Dimension Tables
  - Define the Attributes.

  - Mark Slowly Changing Dimension columns

  > **Note:** DWH supports 2 types of Slowly Changing Dimensions:
  > - **SCD1**: no history preserving an update on one or more attributes will override the old value
  >
  > - **SCD2**: history preserving an update on one or more attributes that were marked as SCD2 will be added as new record and previous record will be marked as not active.

- Design Fact tables
  - Define measures

  - Define granularity

- Define Dimensional Intersection Points
  - Identify Fact to Dimension Links

> **Note:** The IDE tool is used only for designing Fact and Dimension tables and their intersection points.

This section includes the following topics:

UI Description

Discover Data Evidence

It is necessary to understand and be familiar with the new data you want to develop. When there is a new source system involved, you must first understand how the data from the source appears and operates.

Tasks

Discover data evidence

Data Evidence can be discovered as follows:

1. Understand how to extract the data.
2. Take sample files extracted from the source.
3. Examine the different fields that this source provides: It is important to recognize the fields and data that come from the source and to define the names of the fields as the source tables.
4. Define and plan in advance which extractors provide data for specific entities.
5. Understand variety, different lists of values, and end-cases.
6. Observe data behavior over time:
   a. Understand what happens with data across time – is it the same file, only different dates?
   b. Sizes of rows and volumes by types of customers.
   c. Identify how this data correlates with existing data in the Data Warehouse.

      At the end you should have a good sense of what this data looks like and how to develop extraction code for it.
7. Identify:
   a. What is the required data to be available in the Target schema to support required KPIs.
   b. What is the data that can come from the source (depending on technology).
   c. Where do they meet in the middle, so eventually we have the outcomes of the extracted data and the DWH Target model.
   d. For which columns do you want to preserve history.

After mapping between the Source and the Target, the design process is complete.

Development
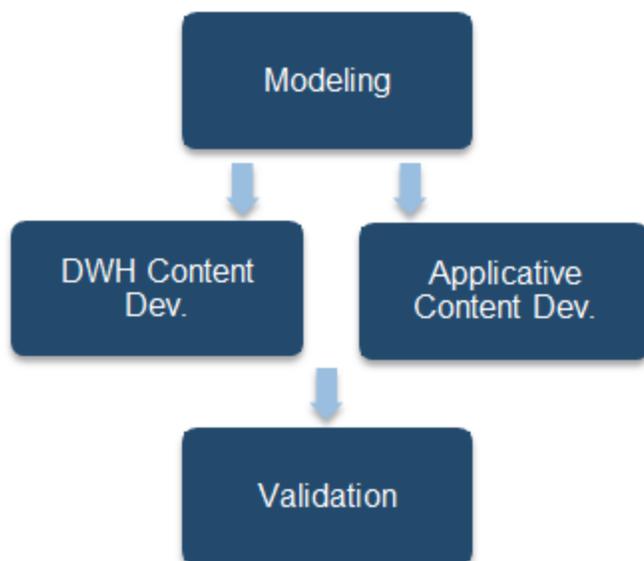
Modeling

This stage is done completely in the IDE tool.

The IDE tool has the following XS DWH definition:

- **Target Entity** is a Fact or Dimension.

  Entity name along with column names is defined according to the Star-Schema Architecture.

- **Integration Entity** is the source table representation.

  Entity name along with column names and data types is defined according to source table design.

- **Source Entity** is the actual and accurate representation of an entity to be extracted from the source.

  It describes how and what data is extracted from the source. It is generated automatically according to integration entity design however depending on the extractor being used it may require some changes as the automatic generation is targeted for the DB extractor only.

- **Transformation Entity** is the logical representation of all the transformations that are performed by the DWH during the data processing. It's the accurate representation of the Target Entity.

- **Column Mapping** - Source to target column mapping

The modeling approach:
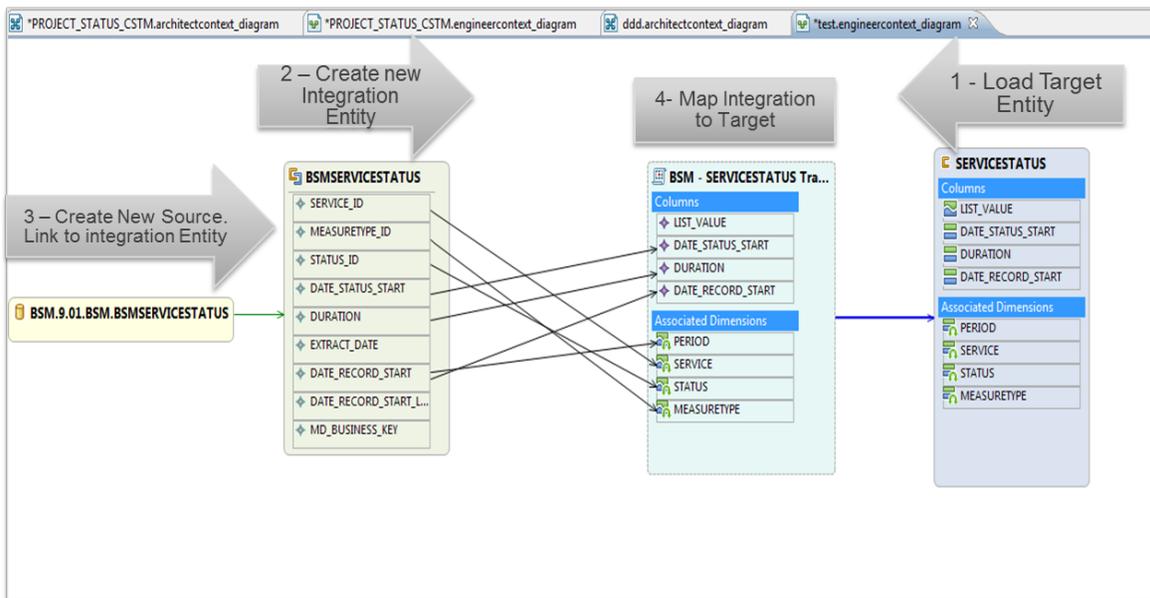
The Solution Modeling Highlights:

- Different functions are collaborating on same models simultaneously until reaching a final version.
- Actually serves as a high-level DB Studio + ETL tool. No need to touch the DB directly.
- 95% of the solution is defined by this high-level modeling.

DWH Content Development

This stage is the final stage of the content development on DataWarehouse side. The outcome of this step is the ready-to-be-distributed Product Content Pack (iCP) and the delta artifacts for the Core content pack.

The **Product Content Pack (iCP)** is the set of the artifacts that describe the data flows and data transformations for the logical entities. The iCP belongs to one source product only (e.g. AM, PPM, SM) and contains the metadata of:

- **Source Content Packs**
  - The content packs that contain all source entities metadata

  - The separate source content pack exists for each product version and the type of extractor used

- **Integration Content Pack**
  - Contains the Integration Entities metadata

  - Unlike Source entities, the integration entity is not dependent on the product version and extractor type therefore multiple source entities are mapped to the one integration entity.

- **Column Mapping**
  - Contains the metadata of the column mappings between the Integration entity and the Target

entity.
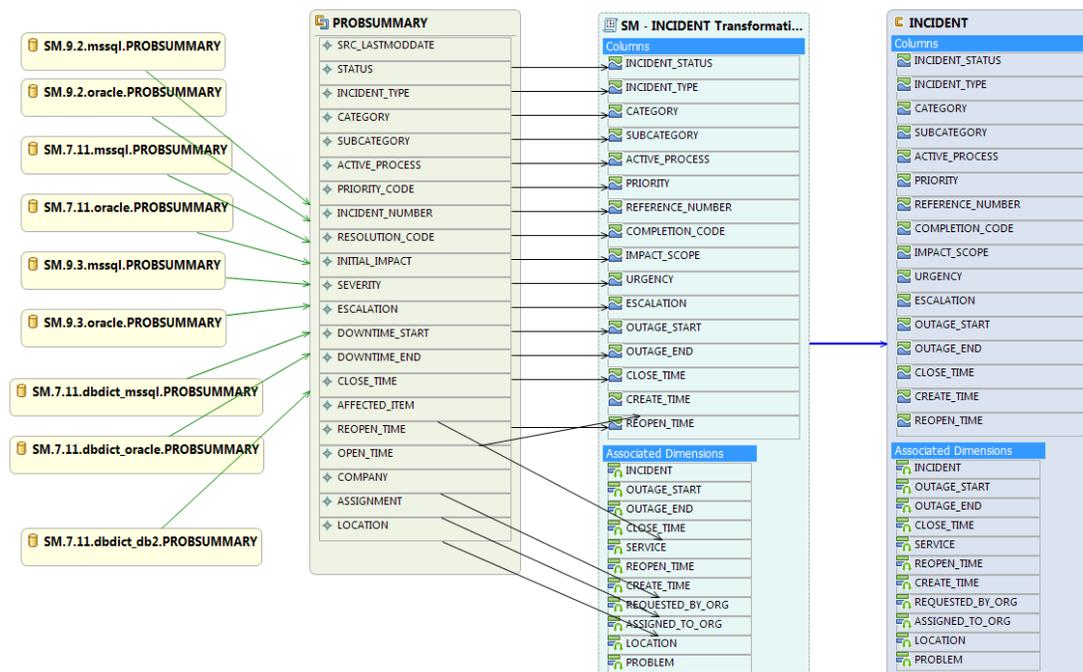
The **Core Content pack** contains the metadata for all the target entities and the intersections between them and is the basic content pack for the DataWarehouse. It is deployed automatically during the XS configuration.

DWH Content Development includes the following steps:

- Generate & Load DWH Artifacts
  - Generate ETL codes from Models

  - Create New Content Pack

  - Generate Physical Models

  - Load BODS Artifacts

- Enrich ETL (BODS)
  - Modify Delta-load Criteria

  - Apply Specific Data-Processing & transformation Logic

  - Set Consolidation Definitions

- Packaging and testing
  - Export Artifacts to create Deployable Content Pack

  - Running the ETL and verifying operation and correctness

Content Packs and Data Modeling

Content packs contain all the artifacts needed to connect to the relevant data source and gather data from that data source. The mapping between the raw data from the data source and the target database in the Data Warehouse is included in the ETL.

Learn More

Content Pack contents

Content Packs include:

- The definition of the data model used for the connection.
- The type of data gathered from the data source.
- The ETL definitions.
- The definition files.
- The configuration files.
- The scripts that help build and define the Data Warehouse.

Content Pack Types

- **Target Content Pack.** Responsible for the transfer of data from consolidation to the target database. The Target CP defines the content of the Data Warehouse as well as the look of the target tables.
- **Integrated Content Pack (i-CP).** The i-CPs are responsible for bringing the data from the specific data sources and transforming it into the consolidation level. From there, the Target CP transfers the data to the target. The i-CPs integrate the information from the source, using the DWH schema and loading process in order for the data to be brought to the target tables.

Content Pack directories

Content Packs contain the following directories:

- **ABC**: Contains files that define the ETL stream, and the general flow of steps of SAP BusinessObjects Data Services jobs. The files list the order of the steps as well as the link between the parent and child steps. These files are necessary if you have to add a step to the ETL process.
- **Custom**: Contains SQL scripts that are not part of the standard ETL processes. For example, if you want to include a staging table that will help the ETL, the script is placed in the Custom directory.
- **Data Model**: Contains the xml files that define the target schema.
- **ETL**: Contains the jobs and workflows of the ETL and defines how data goes through the processes.
- **cp_manifest.properties**: The manifest file provides additional information to the Content Pack to allow the system to perform sets of validations.
- **dw_app.properties**
- **dw_app.xml**: Files that are created automatically when you add a new CP.

Data Model Types

Data models describe the source, extraction, consolidation, and target components for a single entity:

- **Target Entity. Fact** or **Dimension**: Entity name and column names defined according to the Star-Schema architecture.
- **Source Entity.** The actual representation of an entity extracted from the source. Generated automatically according to the integration entity design.
- **Integration Entity.** Entity name, column names, and data types defined according to source table design.
- **Column Mapping.** Source to Target column mapping.

Logical Data Models

DWH supports the following types of logical data models:

- **Target Data Models:**

  - **Target Model – Dimension or Fact.** The target data models describe the format of the data that produces business intelligence analytics. The instantiated data models are dimension, fact, and hierarchy tables.

- **i-CP Data Models:**

  - **Extraction Model.** ETL processes obtain the data in native format and stages it in intermediate tables that conform to the extraction data model for that entity. Extraction also validates the data to ensure that it is usable.

  - **Source Model.** The source entity models represent the design of DII (Data Integration Interface).

Physical Data Models

DWH logical Data Models generate multiple physical tables that support the ETL processing logic.

- **Source entity models.** The source entity models are the data produced by an external application. Used for a specific version of the product, for example ALM 10/MSSQL, ALM 11 Oracle.
- **Extraction models.** ETL processes obtain the data in native format and stage it in intermediate tables that conform to the extraction data model for that entity. Extraction also validates the data to ensure that it is usable.
- **Consolidation models.** Consolidation models transform the data further by merging extracted data from diverse sources into meaningful data required by applications.
- **Target models.** The target models describe the final version of the data that adheres to the design required by applications.

Data models describe the source and extraction format so that the data warehouse can consume this data and integrate it into a common view that you can use to populate comprehensive business intelligence reports and dashboards.

Each table contains both designed columns and static columns, also known as metadata columns, so that the administrator can have the visibility of ETL processing over the entity's data.

Data Warehouse Internal Fields

The following are the internal Data Warehouse fields, in addition to those in the IDE, that are added to the model.

Field Name Prefixes	Description
MD_BATCH_ID	ETL stream ID displayed on all Physical Models.
MD_PROCESS_ID	ETL Process ID running the specific job.
MD_DURABLE_KEY	Entity's unique identifier populated with MD_QUALIFIER which should be considered as the identifier to consolidate records. Displayed only in Consolidation Physical Models
MD_ENTERPRISE_KEY	Entity's unique identifier in the DWH system. Displayed only in Target Physical Models
MD_BUSINESS_KEY	Entity's unique key as it comes from the source systems. Displayed only in Target and Extraction Physical Models
MD_TRANSLASTIND	Indicator whether the line is the last transaction of a specific MD_ENTERPRISE_KEY. Displayed only in Target Physical Models
MD_ACTIVESTATUSIND	Indicator whether the line is active (simulates delete operation). Displayed only in Target Physical Models
MD_TRANSENDDATE	Transaction end date. Displayed only in Target Physical Models
MD_DELETEDDATE	Delete date (date record was marked as inactive). Displayed only in Target Physical Models
MD_CREATEDDATE	Date record was created. Displayed only in Target Physical Models
MD_LASTMODDATE	Date record was last modified and updated. Displayed only in Target Physical Models
MD_FLAG	Flag that indicates whether row is new, updated, or requires a delete. Displayed only in Consolidations and Extractions Physical Models
MD_PF_FLAG	Flag that indicates whether row is pre-filled or not. Displayed only in Extractions Physical Models
MD_QUALIFIER	Unique identifier of an Entity across all Sources, that allows consolidations (like "Consolidation Rule"). **Example** "NODE" entity qualifier is FQDN Node name.

Field Name Prefixes	Description
MD_CP_ID	Source instance ID

Application Content Development

This stage implies creating the end-user artifacts based on the target data model that was developed above.

It has the following steps:

- Generate Interface
  - Create XS views (If Needed)
  - Serves for normalizing the data for the KPI modeling purposes and filtering the unnecessary DWH metadata fields.

- -Create Business Contexts
  - Based on XS Views or Target Tables
  - Similar to the Star-Scheme usually includes one fact entity which context is based on and the multiple dimension entities linked to the fact.

- Create Artifacts
  - KPIs
  - Metrics
  - Webi Reports
  - Xcelsius Reports

- Calculate and Verify
  - Run Calculation Engine
  - Check validity

- Packaging
  - Export Artifacts to create distributable Content Acceleration Pack

Content Extension Best Practices

There is set of best-practices and guidelines for creating customization tracks

- Do not modify the OOTB entities
  - This includes avoiding linking the custom dimensions to the OOTB entities
  - Use the Target Extension link from the custom entity to the OOTB entity instead.

- Use the _CSTM suffix when naming the custom entities.
- Generate the ETL artifacts using the Custom container.
- Do not modify OOTB XS views, Business Contexts, BO Universes and Webi Reports

Enforcing those guidelines will guarantee that the solution will never be overridden in the future and be upgradable

Content Extension Rules

This section includes a set of best-practices and guidelines for creating customization tracks.

- Do not modify the OOTB entities:
  - Avoid modifying:
    - Any existing files in any OOTB Content Pack directories.
    - Any existing OOTB BODS workflows.
    - Any existing OOTB engineercontext diagram and architectcontext diagram in the IDE.
  - Avoid linking the custom dimensions to the OOTB entities.

    > **Note:** Instead of linking the custom dimensions to the OOTB entities, use the Target Extension link from the custom entity to the OOTB entity.

- Use the _CSTM suffix when naming the custom entities.
- Generate the ETL artifacts using the Custom container.
- Do not modify OOTB XS views, Business Contexts, BO Universes, CAPs, and Webi Reports.

Enforcing those guidelines will guarantee that the solution will never be overridden in the future and be upgradable.

XS IDE User Interface Overview

The XS IDE is the Eclipse based plug-in that offers the visual tools for modeling the DWH entities and creating the distributable XS content packs.

The IDE UI consists of three parts:

1) Package Explorer

2) Data Source Browser

3) Diagram Editor

IDE Main Page

The IDE main page enables you to create Designers for the purpose of extending content to entities. The following describes the IDE main page and icons.

The IDE Eclipse Main Page

The IDE requires basic knowledge of Eclipse and its capabilities. The following describes the IDE layout and icons. Select **Window** > **Show View** to add to and change the view of the various tabs and areas.

> **Note:** It is recommended to select the IDE Perspective by clicking [icon].
>
> The IDE perspective [XS IDE] contains all of the relevant buttons, areas, and functionality for working in the IDE.

IDE Workspace: Main area where all IDE functions are located.

User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Package Explorer	A list of all of the available loaded Content Packs and Designer diagrams.
Canvas	Displays model diagram.
Problems	Displays validation errors and warnings.
Properties	Displays property tabs according to the selected entity in the Designer.
Error Log	Reports system errors.
Data Source Explorer	Enables you to connect to a specific data source and browse the database.
ETL	**ETL Generation.** Appears when a designer is open in the canvas. Click to perform the ETL process and generate the artifacts and create a new Content Pack. For details, see "Generate Content" on page 80.
🖫	**Save.** Click to validate and save your mappings and configurations.
🐞	**Report a Bug.** Click to gather information for a bug report packaged in a ZIP file.
✅	**Validate.** Click to manually perform validations on the Designer.
🗗	**Perspective**. Select to switch to recommended IDE perspective. 　田 XS IDE 　This perspective contains all of the relevant buttons, areas, and functionality for working in the IDE.
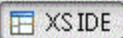
IDE Icons

Icon	Description
🗀	Indicates a Target entity.
🗀	Indicates an Integration entity.
🛢	Indicates a Source entity.
◫	Indicates a Target extension entity.
◆	Indicates a Integration entity column.

Icon	Description
	Indicates a Fact entity column.
	Indicates a Dimension entity column.
	Indicates an association between Fact and Dimension entities.
	Indicates an association between Dimension entities.
	Indicates a column which exists both as a Fact and as a Dimension.
	Indicates a consolidation column.
	Warning that appears when you save a problematic change to a model that might cause an error at a later stage in the process. You can view the details by hovering over the icon on the model or in the Problems tab.
	Error that appears when there is a design problem with your model in a designer. For example, the length of a column is too long. You can view the details by hovering over the icon on the model or in the Problems tab. Right-click an error to check if Quick Fix has been enabled for the problem. For details, see "Manage Validation" on page 68.

Package Explorer

The Package Explorer shows and allows importing\creating the content pack directories.

All the pieces of the DWH entities modeled in the IDE – target, integration and source entities - are stored as the metadata in the core, integration and source content packs directories correspondingly as the xml files.

There is one directory for the Core CP (**cp-core**), one integration content pack directory per product (**cp-<Product_Name>**) and multiple directories for the source content packs per product per version per extractor type (**cp_<Product_Name>_<Product_Version>_<Extractor_Type>**).

There are also directories where the data flow and data model diagrams are stored (**cp_<Product_Name>_<engineer\architect>**).
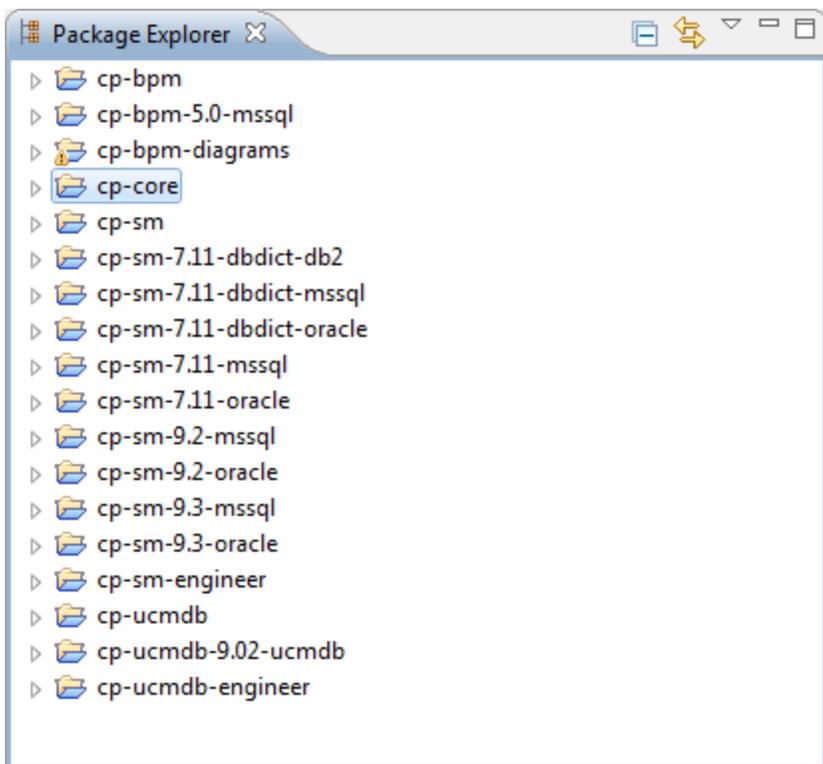
All the OOTB content packs source directories are shipped with the IDE package and can be imported into the Package Explorer for extension or reference.

Data Source Browser

The Data Source Browser allows connecting to the data sources or multiple kinds to be able to browse the source structure and data for reference purposes as well as to create the DWH entity and the entity diagram automatically based on the data source metadata.

The currently supported data source types are:

- Databases
- Flat file sources (text files with the specific separators)

Diagram Editor

There are two types of diagrams in the IDE:

- Architect Target Designer
- Engineer Stream Designer

The **Architect Target Designer** is used for modeling the Target data model: the target entities and the links between them.

The Designer refers to the Core CP directory – all the entities modeled in it are created as the xml files in the Core CP directory once the Designer is saved.

The entity is visualized as the table with the fields, it has the properties with entity type selections (fact and\or dimension) and the set of fields attributes based on the entity type.

The designer has the Palette with the available actions:

- Entities
    - New Target Entity – create a new target entity placeholder on the canvas
    - Load Target Entity – load the existing target entity from the Core CP directory (cp-core)
    - Target Column – add the column to the target entity
- Target Entities Relation
    - Dimension to Dimension – create the intersection point between the dimensions.
    - Fact to Dimension – create the intersection point between fact and dimension.
    - Target Extension – create the reference between the OOTB and the custom entity that is created as the extension.

Physically the link between the entities is presented as a FK column in the entity table that refers to the record in the linked dimension table.

The **Engineer Scream Designer** allows creating the data path from the source to the target entity.

The Designer works with the selected Source, Integration and Core CP so that the new\existing entities are created\loaded in\from the specific source, integration or core CP directories.

The usual approach is to load the Target Entity that was previously created in the Architect Target Designer and create the new Source\Integration entities and map the fields to the Target entity.

In rare cases when the Target Entity is not supposed to be linked to any other dimension entities, it can be created directly in the Engineer Stream Designer.

The Integration Entity has the Properties where the columns data types and lengths of the fields should be set as well as the Business Key, Last Modified and nullable columns should be selected.

The Source Entity has the Properties that are based on the DB query concept and where the extraction attributes like Table\Join Condition, Where clause and the columns names\aliases and rules can be defined.

Properties

Source

General
Columns
Appearance

Columns

ID	Type	Not Applicable	Table Name	Column Name	Fixed Value	Calculation Rule
SRC_LASTMODDATE	Direct	N	P1	SYSMODTIME		
STATUS	Direct	N	P1	PROBLEM_STATUS		
INCIDENT_TYPE	Rule	N				CASE WHEN P1.CATEGO...
CATEGORY	Direct	N	P1	CATEGORY		
SUBCATEGORY	Direct	N	P1	SUBCATEGORY		
ACTIVE_PROCESS	Rule	N				CASE WHEN P1.FLAG = '...
PRIORITY_CODE	Direct	N	P1	PRIORITY_CODE		
INCIDENT_NUMBER	Direct	N	P1	NUMBER		
RESOLUTION_CODE	Direct	N	P1	RESOLUTION_CODE		
INITIAL_IMPACT	Direct	N	P2	INITIAL_IMPACT		
SEVERITY	Direct	N	P1	SEVERITY		
ESCALATION	Rule	N				CASE WHEN P1.STATUS ...
DOWNTIME_START	Direct	N	P1	DOWNTIME_START		
DOWNTIME_END	Direct	N	P1	DOWNTIME_END		
CLOSE_TIME	Direct	N	P1	CLOSE_TIME		
AFFECTED_ITEM	Direct	N	P2	AFFECTED_ITEM		
REOPEN_TIME	Direct	N	P2	REOPEN_TIME		
OPEN_TIME	Direct	N	P1	OPEN_TIME		
COMPANY	Direct	N	P1	COMPANY		
ASSIGNMENT	Direct	N	P1	ASSIGNMENT		
LOCATION	Direct	Y	PROBSUMMARYM1 P1 I...	location		

Upon the linkage of the Source Entity to the Integration entity the attributed are populated automatically:

- The Integration Entity name is populated into Table Name field
- The Integration Entity columns are populated into the Columns fields.

Physically the Source Entity is saved as the source entity xml based on which the queries\calls to the data source are built.

The Palette has the set of available actions:

- Target Entity
  - New Target Entity
  - Load Target Entity
  - Target Column
- Integration Entity
  - New Integration Entity
  - Load Source Entity
  - Integration Column
- Source Entity
  - New Source Entity
  - Load Source Entity
  - Source to Integration Relation (the source entity columns are not modeled by inherited from the Integration entity which the Source entity linked to)
- Transformation

- Column Mapping – create a direct mapping from the Integration Entity fields to the Target\Transformation Entity fields.
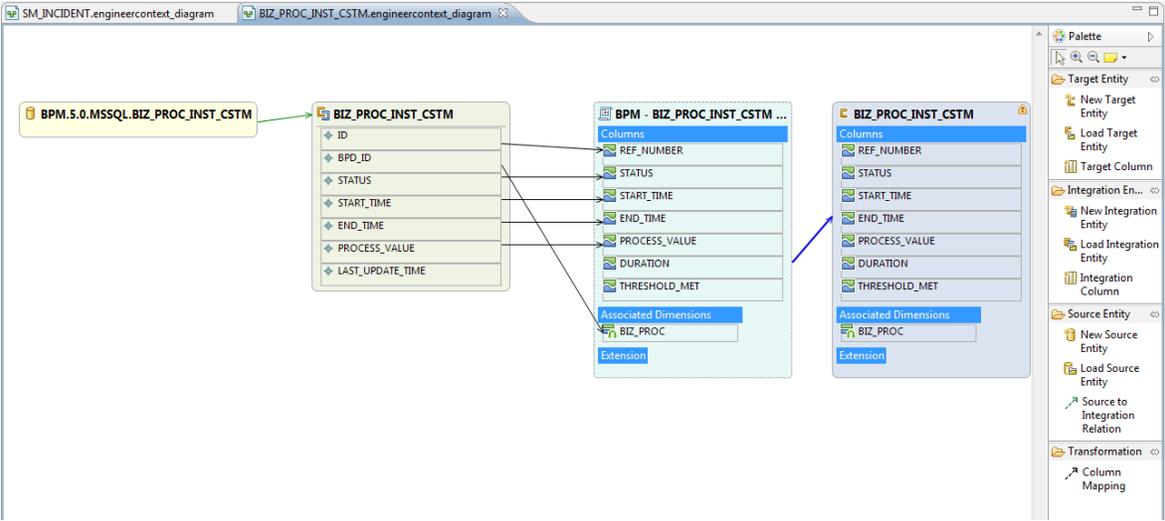
Architect Target Designer Tasks

The Architect Target Designer enables you to define a Target entity as well as link associations, or extend an existing entity. Each Target entity in the Architect Target Designer contains columns of fact, or dimension (or both) and associations to other Target entities.

Architect Target Designers can contain one or more Target entities. Usually each Architect Target Designer includes several entities that are related to the same subject (Designer). Target entities can be included in several Architect Target Designers.

The IDE supports the extension of a target entity by creating an association called Target Extension. This enables you to extend an entity by adding to the new entity columns. Adding an extension enables Fact extension and the ability to link a group of Dimensions specifically to the same group. You then use the extension entity to make all associations and links.

> **Note:** Make sure you have selected the IDE perspective before beginning to work on your designer diagram.

> **Note:** It is recommended to create a separate general project in the Package Explorer for the Architect Target Designer files.

To access:

In the IDE main page,select **File > New >Other > DWH IDE Wizards > Architect Target Designer**.

Learn More	Tasks	UI Description

Learn More

The Architect Target Designer enables the following:

- Create a new entity metadata which is translated into the Target model.
- Load an existing Target entity.
- Add columns which affect entity generation.
- Add associations between entities.
  - Link a Fact to Dimension
  - Link a Dimension to Dimension
  - Link an entity to an extension

Tasks

This section includes:

Create a new Architect Target Designer in the IDE

1. In the IDE main page, select **File > New > Other > DWH IDE Wizards > Architect Target Designer** and click **Next**.

2. Select the parent directory and enter the file name for the Stream Designer diagram - make sure you do not change the suffix of the file name - and click **Next**.

3. Select the relevant Target Content Pack directory and click **Finish**.

Define a new Target entity

1. In the Architect Target Designer, in the palette area, select **New Target Entity** and click on the canvas.

2. Name the entity.

3. Add relevant columns to the entity.

4. Click 🖫 **Save**.

Load an existing Target entity

1. In the Architect Target Designer, in the palette area, select **Load Target Entity** and click on the canvas. The Resource Selector dialog box opens.

2. Expand the target directory and select an entity. The entity is displayed with all of the previously added columns and dimensions.

3. Add relevant columns to the entity. You can then edit and configure columns in the Properties view.

4. Click 🖫 **Save**.

Extend a Target Entity:

1. In the Architect Target Designer, in the palette area, select **Load Target Entity** and click on the canvas to load the target entity that you want to extend. The Resource Selector dialog box opens.

2. Expand the target directory and select an entity. The entity is displayed with all of the previously added columns and dimensions.

3. Select **New Target Entity** and click on the canvas to add the entity which will be the target extension.

4. Name the entity. If you are extending the Person entity, for example, you can enter PERSON_CSTM.

5. In the Properties tab of the new entity, configure the entity Type (**Fact** or **Dimension**). Must be the same entity type as the base entity.

6. In the palette area, click **Target Extension**.

7. Drag the arrow from the new extending entity to the original loaded entity.

8. This relation creates an extension to the new entity. The new entity name is displayed as an

extension in the original entity. You can add relevant columns and configure the extended entity as necessary. Mapping is then done from the Integration to the Target extension.

> **Note:**
>
> - The extending and base targets are referred to as a single entity. Therefore, you can not add a column with the same Column ID of one in the original base entity.
>
> - When you add an extension, make sure that the Source and Target are from the same type.
>
> - Target Extensions can also be extended.
>
> - The name of the extension is derived from the name of the extended entity and cannot be changed.

Add a column

1. In the Architect Target Designer, in the palette area, select **Target Column**.
2. Click in the Column area of your entity and enter the Column ID in the text box.

   The column is added to the entity. You can then edit and configure columns in the Properties view.

3. Click 💾 **Save**.

Link a Dimension to a Dimension

1. In the Architect Target Designer, in the palette area, click **Dimension to Dimension**.
2. Drag the arrow from a Dimension to the Dimension you want it linked to.
3. The New Dimension to Dimension dialog box opens. The default name is displayed and can be edited. This relation links a Dimension entity to another Dimension.

   > **Note:** If you link to an entity from an existing association, you can connect using the arrow without naming the Associated Dimension.
   >
   > The default Associated Dimension name is the Target entity.

4. Click 💾 **Save**.

Link a Fact to a Dimension

1. In the Architect Target Designer, in the palette area, click **Fact to Dimension**.
2. Drag the arrow from the Fact entity to the Dimension you want it linked to.
3. The New Fact to Dimension dialog box opens. The default name is displayed and can be edited. This relation links a Fact entity to another Dimension.

   > **Note:** If you link to an entity from an existing association, you can connect using the arrow without naming the associated Dimension.

> The default associated dimension name is the Target entity.

4. Click ⊞ **Save**.

Extend custom ITFM Entities

1. In the Architect Target Designer, in the palette area, select **Load Target Entity** and click on the canvas to load the target entity that you want to extend. The Resource Selector dialog box opens.

2. Expand the target directory and select either ACTUALCOST_CSTM or PLANNEDCOST_CSTM (custom extended) entities. These two ITFM entities come OOTB with custom extension entities that can be further extended through the ACTUALCOST_CSTM or PLANNEDCOST_CSTM entities.

UI Description

Create Architect Target Designer
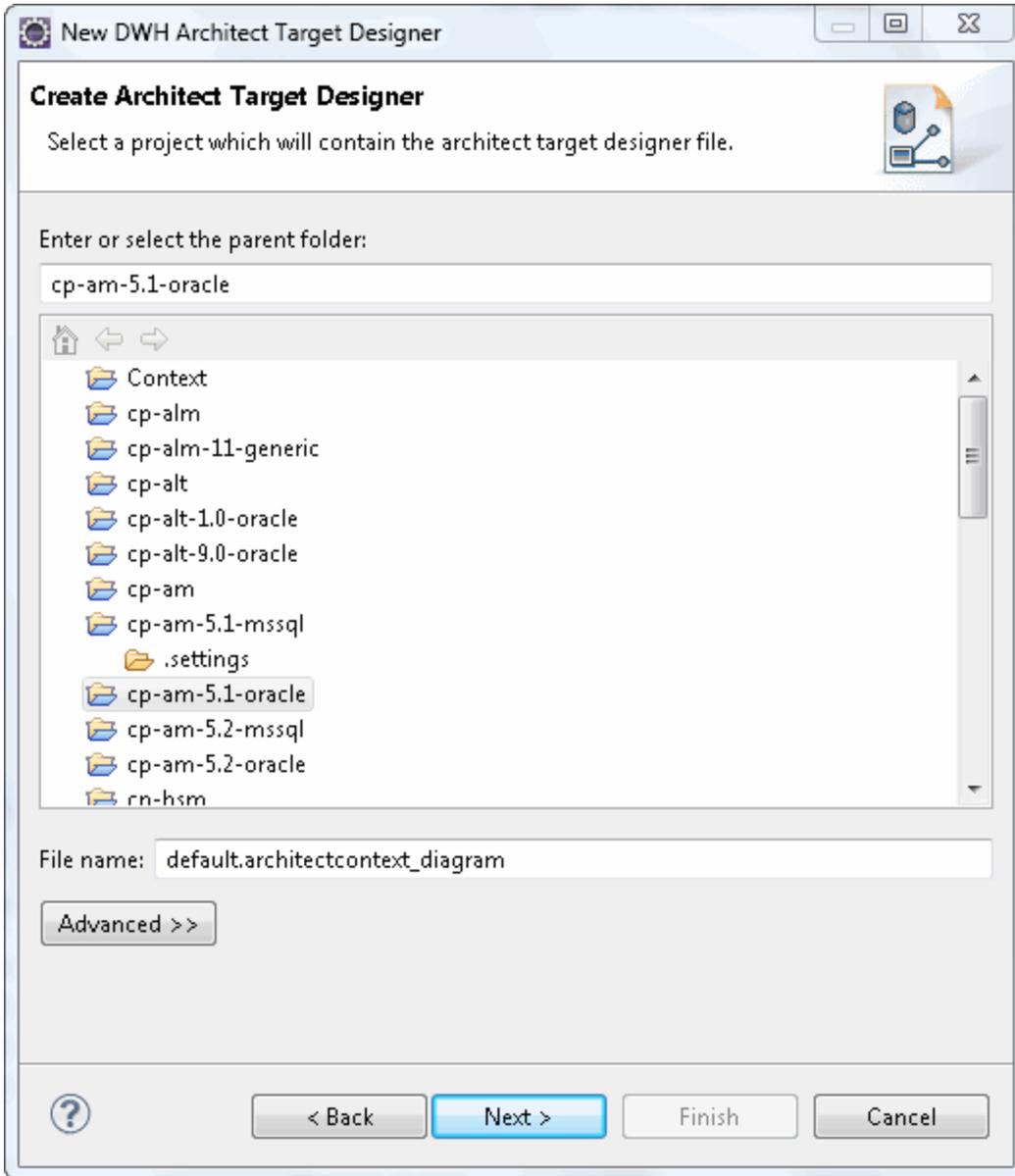
User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Enter or select the parent directory	Select the directory in which this Designer will be contained, from the directory list.
File Name	Enter a file name for your Designer diagram.

Target Content Pack
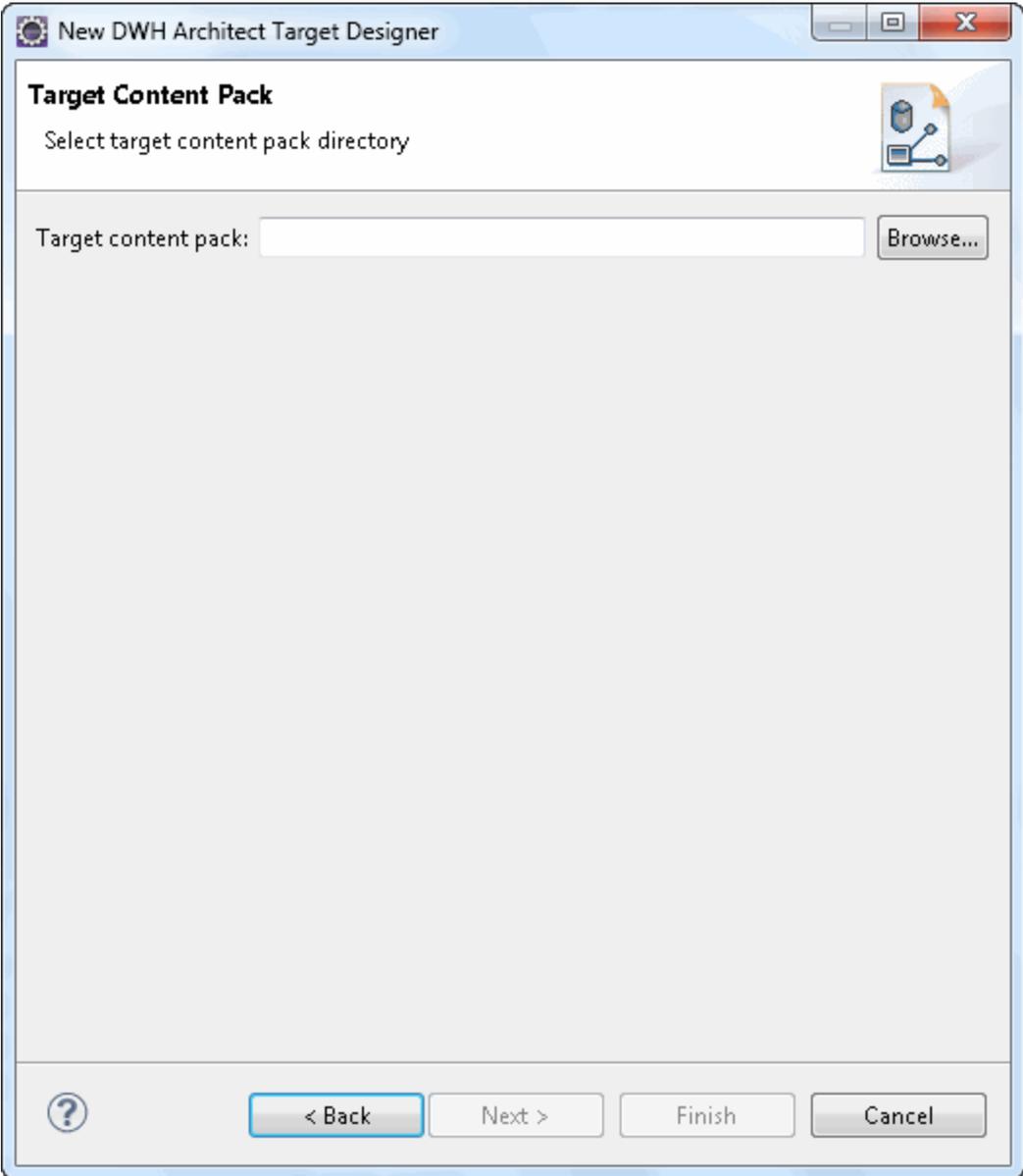
User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Target Content Pack	Select or browse for the Target Content Pack directory.

Architect Target Designer View
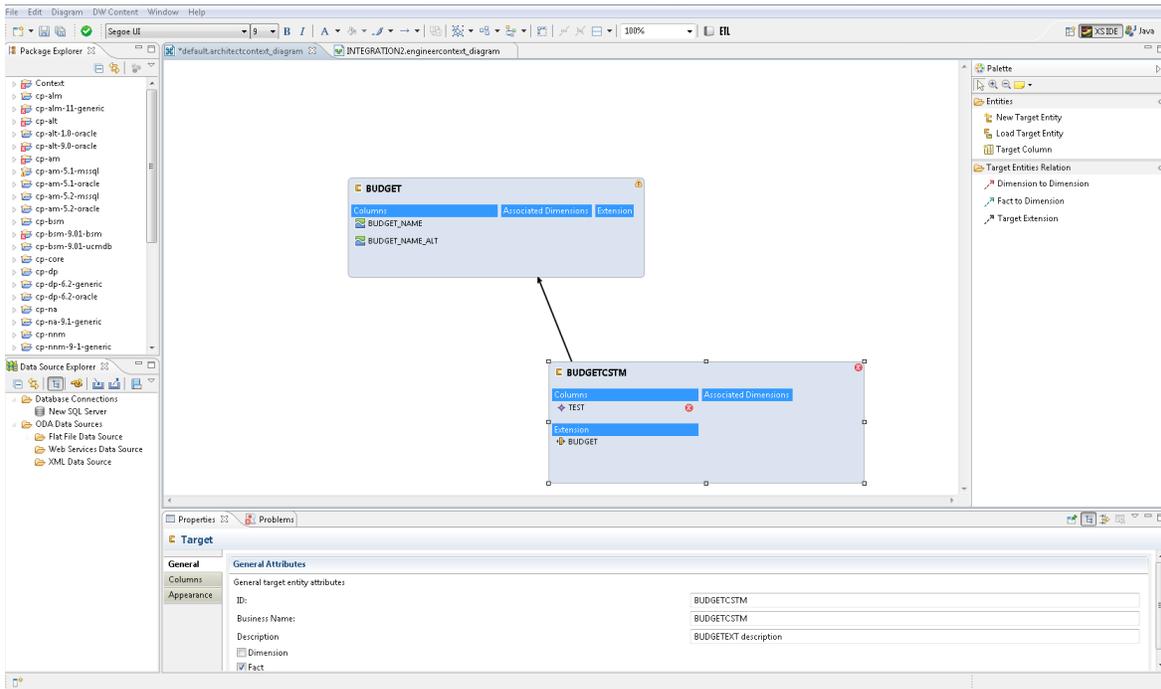
Palette Area

User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Entities	Contains the following Target entity options: • **New Target Entity.** Creates a new Target entity. Entity type can be defined in the Properties tab. To view the Properties tab, right-click on the specific entity and click **Show Properties View.** • **Load Target Entity.** Opens the Resource Selector dialog box. Select the relevant entity for your model.

UI Element	Description
	Resource Selector dialog showing a CORE tree with entries: ABC / ABC, ACTUALCOST / Actual Cost Lines, APPLICATION / Applications, BACKUP_POLICY / Backup Policys, BACKUP_SESSION / Backup Session, BUDGET / Budgets, BUDGETLINE / Budget Lines, BUSINESS_APP_STATUS / Business Application Status, BUSPROCESS / Business Process. With OK and Cancel buttons. • **Target Column.** Adds columns to entities. Column properties, for example column type, can be edited in the Properties tab. Each added attribute impacts the relevant entity generations.
Target Entities Relation	Click a link to create connections for building the model. • **Dimension to Dimension.** Link from one Dimension to another Dimension. A red arrow is displayed between the entities. • **Fact to Dimension.** Link from a Fact to a Dimension. This type of relation requires that the fact type was defined in the entity properties. A blue arrow is displayed between the entities. • **Target Extension.** Link from a new target entity to the base/original target entity. A black arrow is displayed between the entities.

Properties tab for Target entity and specific fields

To view the Properties tab, right-click on the specific entity and click **Show Properties View.**

You first configure the Target entity properties, and then the properties for each specific column.

UI Element	Description
General tab	Displays the **Entity**, **Dimension** and **Fact** attributes for the target entity. **General Target entity attributes:** ● **ID:** The ID of the entity. ● **Business Name:** The complete business name. ● **Description:** Enter a description of the entity. ● **Dimension/Fact Checkbox:** Select one or both for the entity. If you change the selection, a dialog opens, warning that you may lose information previously entered in the Columns tab. **Note:** Make sure to select the required option connected to the relevant Fact or Dimension column properties.
Columns tab	Displays information for each column in the Target entity. Column property options are displayed according to the entity selection of Fact or Dimension in the General tab. ● **ID.** The ID of the entity. ● **Business name.** The complete business name. ● **Description.** Enter a description of the entity. ● **Data Type.** Varchar, Int 16, Int 32, Float, Localized Date Time ● **Length.** Only for Varchar data type. The length of a Varchar column must be more than 0 and less than 4000. ● **Null Allowed.** Select if the field can have the value NULL. ● **SCD Type.** Slowly Changing Dimension type can be either 1 or 2. Only for Dimension. SCD1: For update. SCD2: For preserving history. ● **Measure.** Select only for Fact. ● **Calculation Formula.** The calculation of the measure. (Optional) ● **Summary.** Select **SUM**, **MIN**, **MAX**, or **AVG**. (Optional)
Appearance tab	Displays font and appearance information.

New Associated Dimension Dialog Box

When you link to an unlinked Dimension, the following dialog box opens.
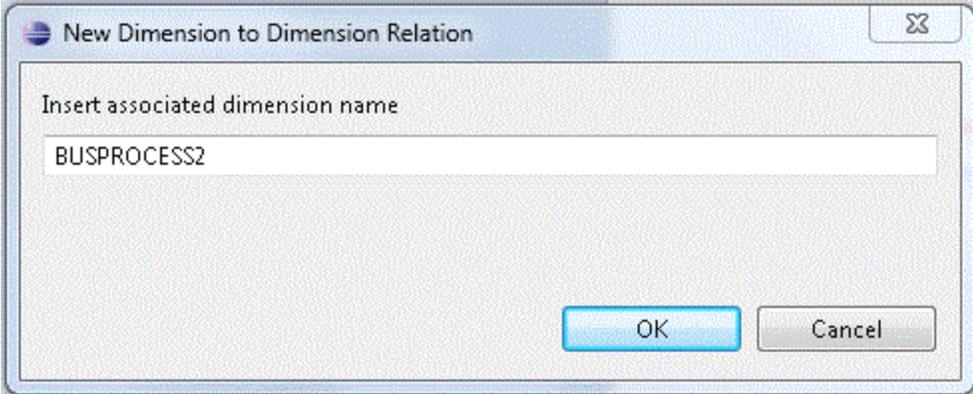
Edit an Associated Dimension name. The default is the Target entity name.

Target Extension Entity
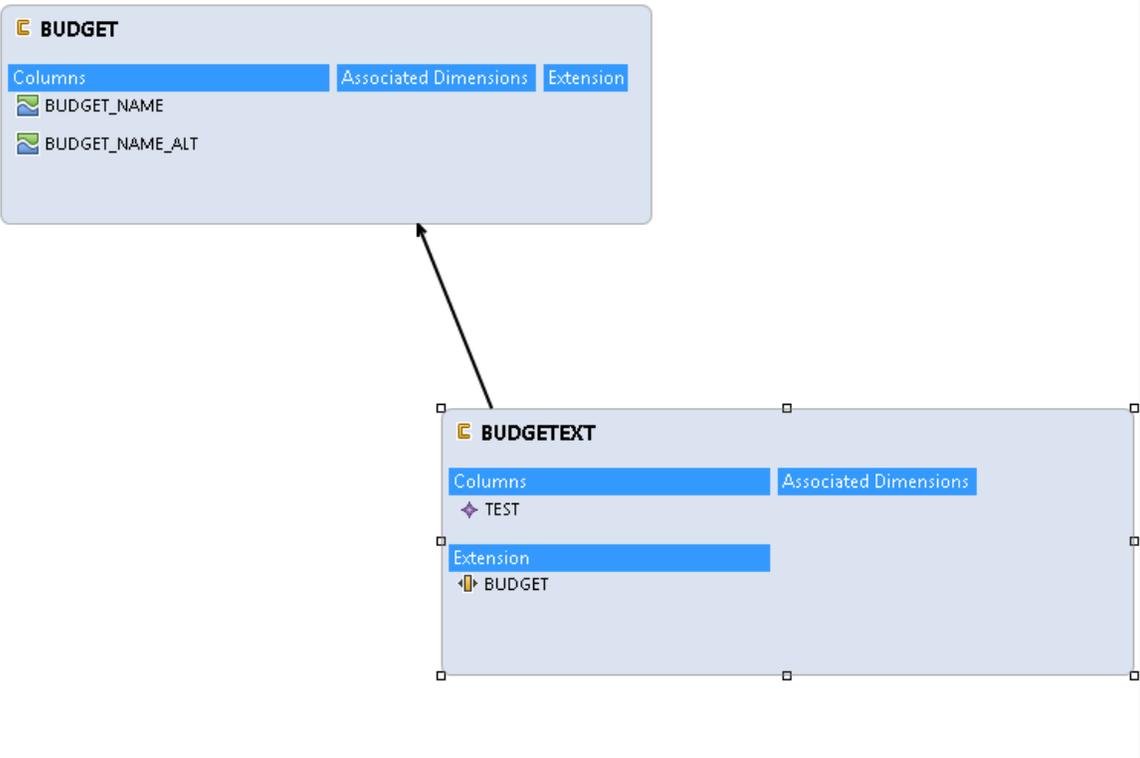
OOTB ITFM Custom Target Extension Entity
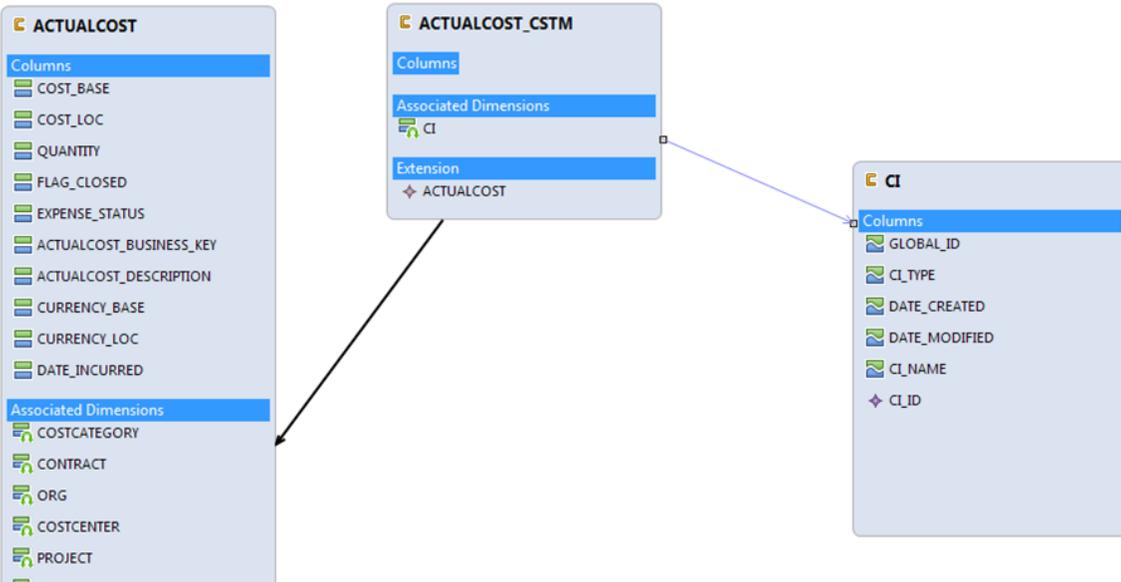
Properties tab for Associated Dimensions

To view the Properties tab, right-click on the specific entity and click **Show Properties View.**

UI Element	Description
Associations tab	Displays Dimension association information: • **ID.** The ID of the entity. • **Business Name.** The complete business name. • **Description.** Enter a description of the entity. • **Type.** Select **Dimension**, **Fact**, or **Both**. • **SCD Type.** For Dimension only. • **From Target.** The Target entity. • **To Target.** The Associated Dimension
Appearance tab	Displays font and appearance information.

Engineer Stream Designer Tasks

The Engineer Stream Designer enables you to define the integrations and how they are transformed and connected. This view defines the mapping relations for the entity from the source to the target. You can create new integrations based on graphical diagrams, using the Engineer Stream Designer in the IDE tool.

> **Note:** Make sure you have selected the IDE perspective before beginning to work on your designer diagram.

To access:

In the IDE main page, select **File > New > Other > DWH IDE Wizards > Engineer Stream Designer**.

Learn More   Tasks   UI Description

Learn More

The Engineer Stream Designer enables you to extend and add content from the Integration and Source Content Packs into the target model. Using a new or existing Target entity, you can add new or existing content from the Integration and Source entities. You then perform transformation and Source Integration mapping for new and pre-loaded entities. The Source, Integration and Target entities are mapped using the Transformation Mapping connector, which creates a new mapping entity. All further mapping is done to the new entity in order to complete the Target model.

> **Note:** All Source entities must be connected to an Integration entity.

Entities in the Engineer Stream Designer are mapped as follows:

- **Source Entity:** Mapping to the correct source, meaning the version the data is extracted from.
- **Integration Entity:** Contains the mapping of all fields.
- **Target Entity:** Several consolidation entities can be consolidated into one entity.

It is recommended to map from the Source to the Target.

Source Extractors

OOTB set of existing supported extractors are:

- **Generic Extractors**
  - **DB Extractor:** Supports MSSQL, Oracle and MySQL databases.
  - **File Extractor:** Supports general CSV file.

- **Source Specific Extractor**
  - **BSM API Extractor:** Supporting both GDE and REST calls.
  - **DP CLI Extractor**

- **SA SDK Extractor**

- **NNM Optimized file Extractor:** Holds mass volumes of NNM files.

Connecting to the integration:

ETL Gen templates in the back-end generate integration templates which utilize File Based Integration (FBI). Load the Source metadata to the IDE and then map it to the correct consolidation entity in the relevant fields. To create a custom FBI extractor, see the *FBI Extractor SDK Guide.*

Important Information

> **Note:** Creating new Target entities with Associated Dimensions can only be done in the Architect Target Designer.

Tasks

This section includes:

Create a new Engineer Stream Designer in the IDE

1. In the IDE main page, select **File > New > Other > DWH IDE Wizards > Engineer Stream Designer** and click **Next**.
2. Enter or select the parent directory and enter the file name for the Engineer Stream Designer diagram - make sure you do not change the suffix of the file name - and click **Next**.
3. Select the Target, Integration, and Source Content Pack directories and click **Finish**.

Define a new Target entity

1. In the Engineer Stream Designer, in the palette area, select **New Target Entity** and click on the canvas.
2. Name the entity.
3. Add relevant columns to the entity.
4. Click Save.

Load an existing Target entity

1. In the Engineer Stream Designer, in the palette area, select **Load Target Entity** and click on the canvas. The Resource Selector dialog box opens.
2. Select an entity. The entity is displayed with all of the previously added columns and dimensions.
3. Click Save.

Define a new integration entity

1. In the Stream Designer, in the palette area, select **New Integration Entity** in the Integration section and click on the canvas. An integration entity is displayed.

2. Enter a name. The name can be up to 44 characters. An Integration entity is created.

3. Click **Integration Column** to add a column to the entity.

4. Perform mapping if required.

5. Click 💾 **Save**.

Load an existing integration entity

1. In the Stream Designer, in the palette area, select **Load Integration Entity** in the Integration section and click on the canvas. The Resource Selector dialog box opens.

2. Select an entity. The entity is displayed with all of the previously added mappings.

Define a new source entity

1. In the Engineer Stream Designer, in the palette area, select **New Source Entity** in the Source section and click on the canvas. A Source entity is displayed.

2. Click **Source-Integration Relation** and drag the display arrow from the Source entity to an Integration entity. All columns from the Integration entity are copied to the Source entity with default values.

3. Click 💾 **Save**.

> **Note:** The Source-Integration Relation tool only enables you to link Source entities to Integration entities of the same product (content pack). For example, a Source entity from cp-bsm-9.01-bsm can only be linked to Integration entities from cp-bsm and not cp-ppm.

Load an existing source entity

1. In the Engineer Stream Designer , in the palette area, select **Load Source Entity** in the Source section and click on the canvas. The Resource Selector dialog box opens.

2. Select an entity. The entity is displayed with its mapped integration entity.

Add a column

1. In the Engineer Stream Designer, in the palette area, select **Target Column** or **Integration Column**.

2. Click in the Column area of your entity and enter the Column ID in the text box.

   The column is added to the entity.

3. Click 💾 **Save**.

> **Note:** Source data is replicated from the integration entity. If you add or delete columns from the Integration, however, it is not automatically done in the Source.
>
> To add: Once you have added the column, delete the mapping link and re-map from the Source to Integration.
>
> To delete: Right-click the deleted column, delete the mapping link and re-map from the Source to Integration.
>
> Alternatively, you can use the Quick Fix mechanism on the error that appears in the Problems tab. For details, see "Manage Validation" on page 68.

Map from the Integration to Target

Once you have added columns to the Integration entity you can perform SSI mapping.

1. In the Engineer Stream Designer, in the palette area, click **Column Mapping** in the Relations section to map the Integration to the Target entity.

2. Drag the arrow from the Integration column to the Target column.

3. After you have performed the first SSI mapping, a transformation SSI entity is created to which you can perform further mapping. Any integration entity from the same CP that should be mapped to this Target, must be mapped to the transformation entity.

4. Click **Save**.

> **Note:** If an Integration column is already mapped to a Target column, you cannot perform further mapping from the same Content Pack.
>
> Two Integration entity columns from the same Content Pack cannot be mapped to the same Target entity column.

⬤ UI Description

Engineer Stream Designer View
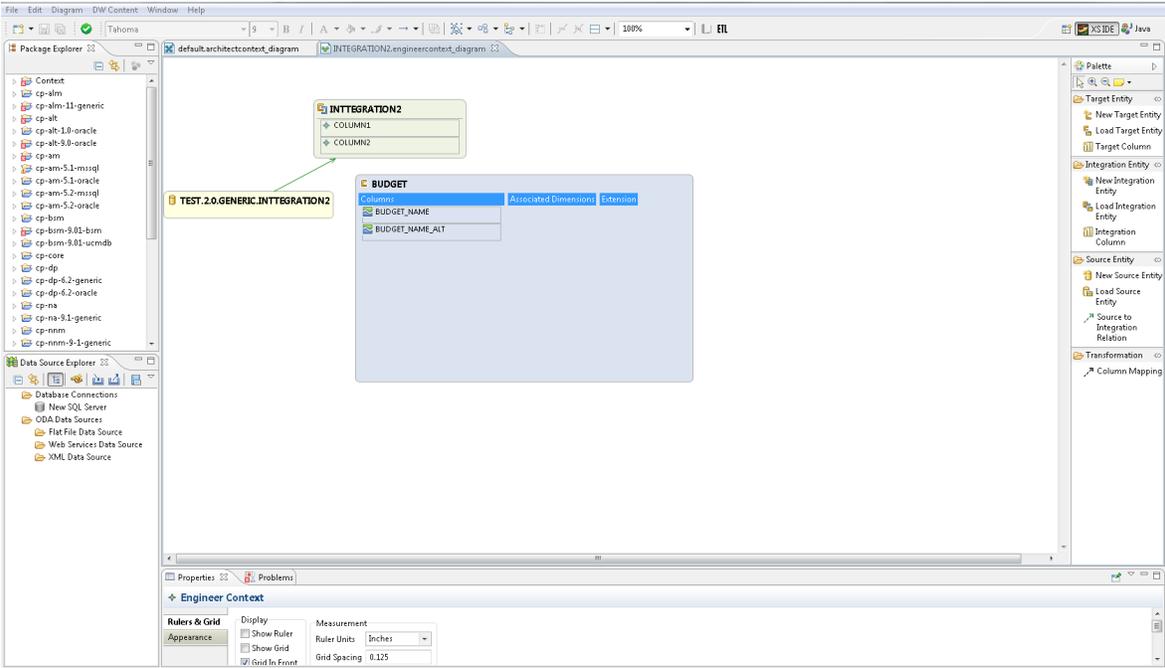
Palette Area

UI Element	Description
Target Entity	• 🔸 **New Target Entity.** Select to display a new Target entity.
	• 🔸 **Load Target Entity.** Opens the Resource Selector dialog box. Select the relevant entity for your model.

UI Element	Description
	   • **Target Column.** Adds columns to entities. Column properties, for example column type, can be edited in the Properties tab. Each added attribute impacts the relevant entity generations.
Integration Entity	Contains the following Integration entity options: • **New Integration Entity.** Select to display a new Integration entity. • **Load Integration Entity.** Opens the Resource Selector dialog box. Select the relevant entity for your model.

UI Element	Description
	• **Integration Column.** Adds columns to entities. Column properties, for example column type, can be edited in the Properties tab. Each added attribute impacts the relevant entity generations.
Source Entity	Contains the following Source entity options: • **New Source Entity.** Select to display a new Source entity. • **Load Source Entity.** Opens the Resource Selector dialog box.Select the relevant entity for your model. **Resouce Selector** ▷ AM.5.1.mssql ▷ AM.5.1.oracle ▷ AM.5.2.mssql ▷ AM.5.2.oracle ▷ BSM.9.01.BSM ▷ BSM.9.01.UCMDB ◢ DP.6.2.GENERIC 　　T_MEDIA 　　T_SESSION ▷ DP.6.2.oracle OK　　Cancel • **Source to Integration Relation.** The Source must be mapped to the Integration in order to map to the Target. A green arrow is displayed between the entities.
Transformation	Click to map the displayed entities. • **Column Mapping.** Mapping between the Integration and Target columns. First time mapping is done from the Integration column to the Target column. A black arrow is displayed between the entities. First-time mapping creates a new entity for Transformation. Subsequent mappings are done to the new Transformation entity.

Properties tab for Integration

To view the Properties tab, right-click on the specific entity and click **Show Properties View.**

> **Note:** Properties data is replicated in the Integration and Source columns. If you add or delete columns from the Integration, however, it is not automatically done in the Source.
>
> To add: Once you have added the column in the properties tab, delete the mapping link and re-map from the Source to Integration.
>
> To delete: Right-click the deleted column, delete the mapping link and re-map from the Source to Integration.

UI Element	Description
General tab	Displays the **General** entity attributes.
Columns tab	Displays column information: ● **ID.** The ID of the column. It is taken fro the mapped integration column and is read-only. ● **Business name.** The complete business name. ● **Description.** Enter a description of the entity. ● **Data Type.** Varchar, Int 16, Int 32, Float, Localized Date Time ● **Length.** Only for Varchar data type. The length of a Varchar column must be more than 0 and less than 4000. ● **Null Allowed.** Select if the field can have the value NULL. If you specify a Business Key, at least one of the columns must not **Null Allowed**. ● **Business Key.** Primary key of the Integration field order. Select a number for the order of columns for placement. When no number has been assigned, you can only select 1. Subsequently you can assign any number to a column. If you change a number, all other assigned columns are automatically shifted down a spot in the order. > **Example** If you change the Business Key of a column to **1**, the one that was specified previously as **1** becomes **2**. ● **Last Modified.** The last date that the source has been changed. Select the button if you want a query from a certain date and not all possible data.

Properties tab for Source

To view the Properties tab, right-click on the specific entity and click **Show Properties View.**

UI Element	Description
General tab	**General attributes:**

UI Element	Description
	• **ID.** The entity ID. • **Content Pack.** The Source Content Pack information. **Data Source SQL Clauses:** • **Group by.** The section in the SQL Query for the aggregation. • **Table Name/Join Condition.** Default is Integration entity name. If you change the table name, you must also change it in the columns. Enter the Join Condition for an SQL query with join. • **Where.** Where to extract for the SQL query for filtering data from the source.
Columns tab	Displays column information. The Source entity receives all of the Integration entity properties. • **ID.** The ID of the column. It is taken fro the mapped integration column and is read-only. • **Type.** Select **Fixed**, **Direct**, or **Rule**. If you select Fixed, you must enter a Fixed Value. if you select Rule, you must enter the Calculation Rule. • **Not Applicable.** • **Table Name.** Based on table name entered in the General tab. Relevant only if **Direct** type is selected. • **Column Name.** The field name. Must be what appears in the Source entity. • **Fixed Value.** The fixed value of the column. Relevant only if **Fixed** type is selected. • **Calculation Rule.** The calculation rule of the column. Relevant only if **Rule** type is selected. The IDE does not support non UTF-8 characters in the **Calculation Rule** field.

For details on the Properties for Target entities, see

For details on the Properties tab for Associated Dimensions, see .

The DW Content menu

The DW Content menu has several actions (that are also duplicated on the Toolbar):

- Report a Bug (the workspace is exported to the zip archive and can be sent to Support for investigation)
- Upgrade (applicable in case the entity was created in the previous IDE versions)
- Validate (check the opened diagrams for errors)
- ETL Gen (The generation of the ETL based on the opened diagram)
- BODS Export (the advanced ETL transformations that are done in BODS can be exported into the deployable content pack)

Obviously the most usable action is the ETL Gen.

By clicking this menu item\tool bar button the ETL Generator dialog is opened.
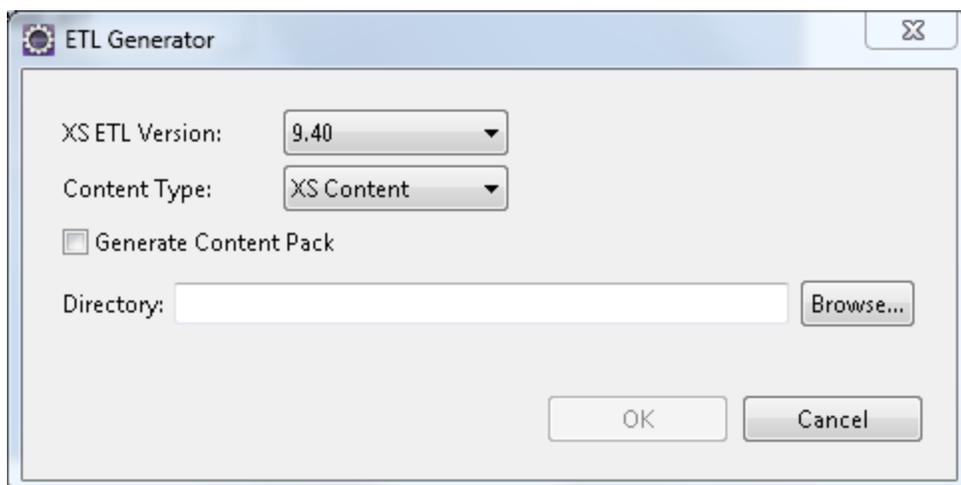
Since the ETL artifacts are different in different XS versions, it is important to select the correct XS version.

The Content Type can be either **XS Content** or **Custom Content**. Only the OOTB content is generated using the **XS Content** type, so whenever the OOTB content is extended or the new content is created using the Custom Content type should be selected. Physically depending on this setting the BODS entities workflows are placed to either Generic or Custom container.

Selecting the Generate Content Pack check-box allows generating the full content pack directory structure. It is applicable whenever the new content pack is selected. In case of the extension of the existing content packs, the generation of the CP directory structure is not required because only the delta artifacts are generated and merged to the existing content pack directory in the **\<HP-XS>\agora\ContentPacks** directory.

After specifying the settings above the location for the generated ETL artifacts should be selected.

The ETL artifacts are generated only for the Designer in context of which the ETL Generator dialog in opened.

The two directories are generated: Core – the target entity artifacts, and <Product_Name> - the source entity, integration entity and mappings artifacts. These two directories should be then copied into the **\<HP-XS>\agora\ContentPacks** directory. If the new content pack is created, it should be registered in DWH using the **dw_cp_register.bat** utility in order to become available on the Data Source Management UI.

Common Extension Scenarios

There are several most common extension scenarios:

1. Extension of the existing entity in the existing content pack
2. Extraction of the new entity in the existing content pack

3. Populating the existing entity from the new source

4. Extraction of the new entity from the new source

Extension of the existing entity in the existing Content Pack

In this scenario the main goal is to add more fields of the existing entity.

The approach is the following:

1. Use the existing Integration and Source (the required product version) content packs.

2. Model the new target entity and link it to the OOTB target entities using the Target Extension link.

> **Note:** Make sure the name of the new entity includes the suffix _CSTM.

3. Model the new Integration and Source entity

4. Generate the ETL without creating the new content pack (just the delta is generated).

> **Note:** Make sure the content type is "custom" when generating the ETL.

   a. Only new entity artifacts are used (not the whole content pack) for both Core and Product content packs and merged with existing CP directories in the XS content packs directory.

Extraction of a new entity in an existing Content Pack

The purpose is to bring the new entity from the data source which already has the OOTB integration with XS.

The approach is similar to the previous scenario; the only difference is that instead of the Target Extension link the Fact to Dimension or Dimension to Dimension link is used for linking the new entity with the OOTB entities.

> **Note:**
> - Make sure the name of the new entity includes the suffix _CSTM.
> - Make sure the content type is "custom" when generating the ETL.

Populating an existing entity from a new data source

In case when the customer does has the source systems that XS does not have the OOTB integration with, but does have the necessary target entities with all the necessary fields, the approach for developing the integration is as follows:

1. Create new Integration and Source content packs.

2. Use the existing Target entity

3. Create new Integration and Source entities.

> **Note:** Make sure the name of the new entity includes the suffix _CSTM.

4. Generate the ETL with the Generate Content Pack feature in order to create the new CP.

   a. Only the Product Content Pack artifacts are used (the Core CP has the entity already) and are copied to the XS content packs directory as a new directory.

   > **Note:** Make sure the content type is "custom" when generating the ETL.

5. Register the new CP in XS.

Extracting a new entity from a new source

There are cases when XS does not provide either the OOTB CPs or the suitable target entities that could fulfill the integration requirements. In this case the modeling of the all pieces is required.

1. Model the target entities and the references between them
2. Create new Source and Integration Content Packs

   > **Note:** Make sure the name of the new entity includes the suffix _CSTM.

3. Model new Integration and Source entities.
4. Generate the ETL with the Generate Content Pack feature in order to create the new CP.

   a. The product CP directory is copied to XS content packs directory as a new directory

   b. The Core CP directory (delta) is merged with the existing Core directory in the XS content packs directory.

   > **Note:** Make sure the content type is "custom" when generating the ETL.

5. Register the new CP in XS.

Import Existing Content

When you extend your existing content using the IDE, you must import the relevant content packs you want to work with.

> **Note:** You must import the Target Content Pack (cp-core) in order to extend or create content in the IDE.

Tasks

Import existing content

1. Navigate to **File** > **Import** > **General** > **Existing Projects into workspace** and click **Next.**
2. Browse for the cp-core directory and click **OK**, click **Finish** to import the project.
3. Import all of the relevant content packs you need to work with.
4. Proceed to creating the Designers.

Define New Content Pack Project

The IDE comes with out of the box Content Packs which you can import to add and extend content. You can also create projects based on data from new content directories, which you must manually add and define.

> **Note:** You must import the Target Content Pack (cp-core) in order to extend or create content in the IDE.

To access:

In the IDE main page, select **File > New > Other > DWH IDE Wizards > Content Pack**.

Tasks   **UI Description**

Tasks

Create new projects from content directories

To create new projects from content directories:

1. Select **File** > **New** > **Other > DWH IDE > Content Pack**.
2. Select the type of project: **Source** or **Integration**.
3. Enter the relevant details for the project and click **Next**.
4. Select the relevant Content Pack reference for the project:
   - For new Integration CP select the Target Content Pack for the project.

   - For new Source CP select the Integration Content Pack for the project.

5. Click **Finish**.
6. Proceed with defining the Architect Target and Engineer Stream Designer projects. For details, see "Architect Target Designer Tasks" on page 34 and "Engineer Stream Designer Tasks" on page 46.

⬤ UI Description

Integration Project
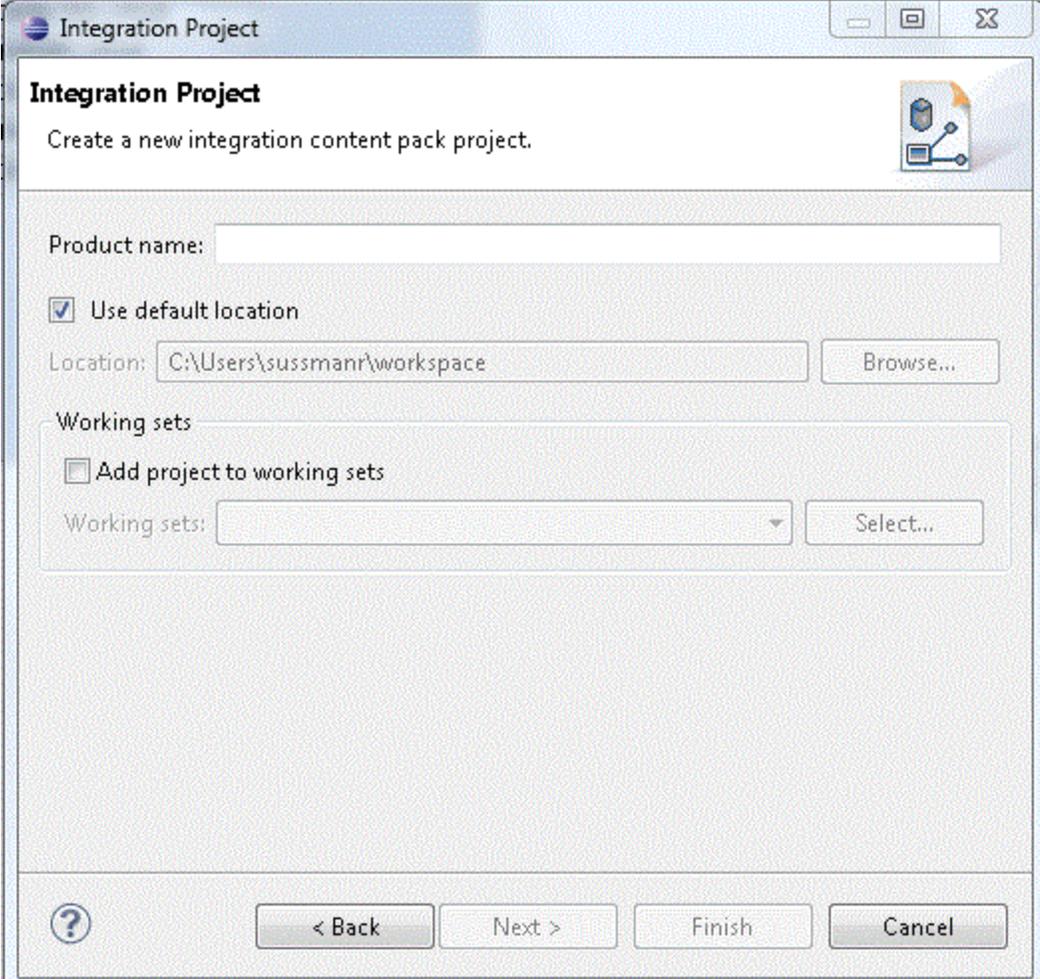
User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Product Name	Name of the source product. Make sure that after you define the product name, you can view the file under the Integration project **icp.dwmodelappintegration** file.
Use Default Location	Select to use the displayed location for your new project.
Location	Browse to the location of the content directory.

UI Element	Description
Add project to working sets	Select to add this project to the current set of projects.
Working Sets	Select new working sets.

Target Content Pack Reference

User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Referenced projects	Select the Target Content pack for the new Integration project.

Source Project
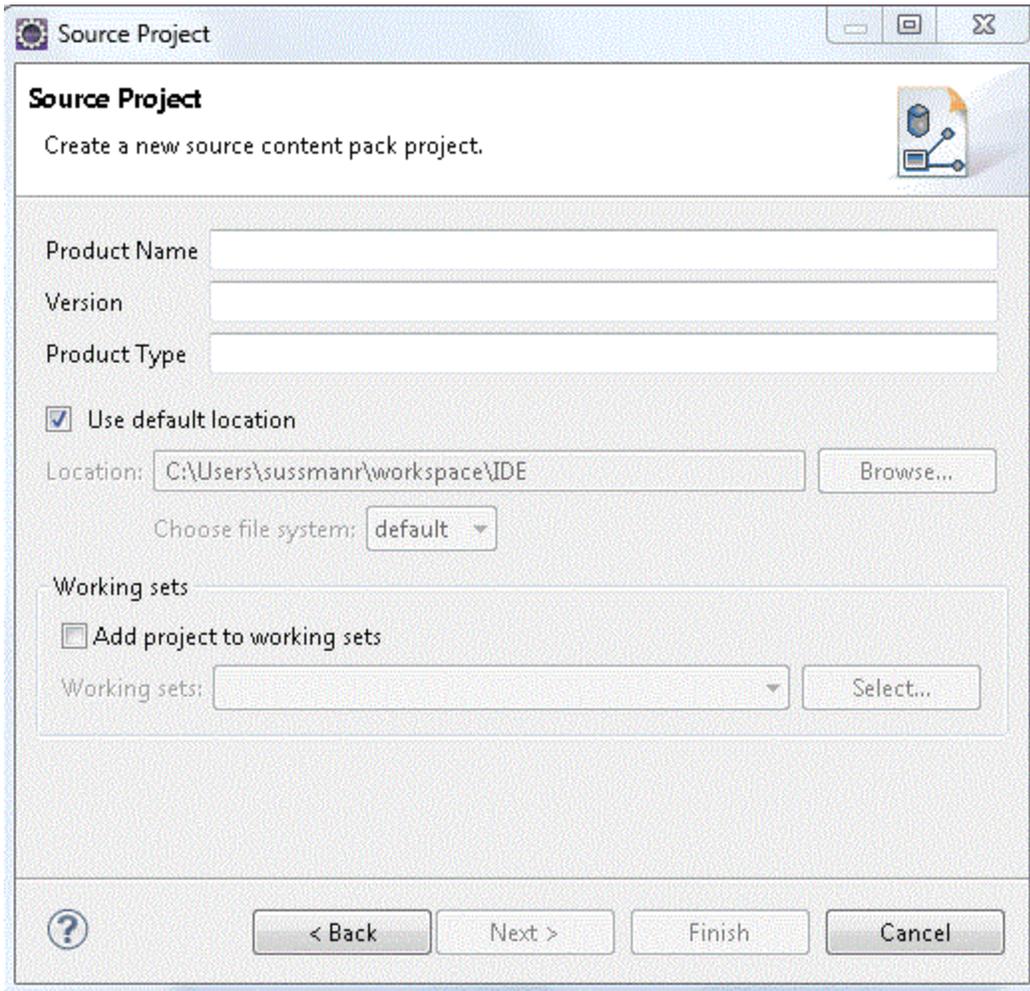
User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Product Name	Name of the source product. Make sure that after you define the product name, you can view the file under the Source project **scp.dwmodelappsource** file.
Version	Enter the data source version.
Product Type	Enter the data source type.
Use Default Location	Select to use the displayed location for your new project.
Location	Browse to the location of the content directory.
Add project to	Select to add this project to the current set of projects.

UI Element	Description
working sets	
Working Sets	Select new working sets.

Integration Content Pack Reference
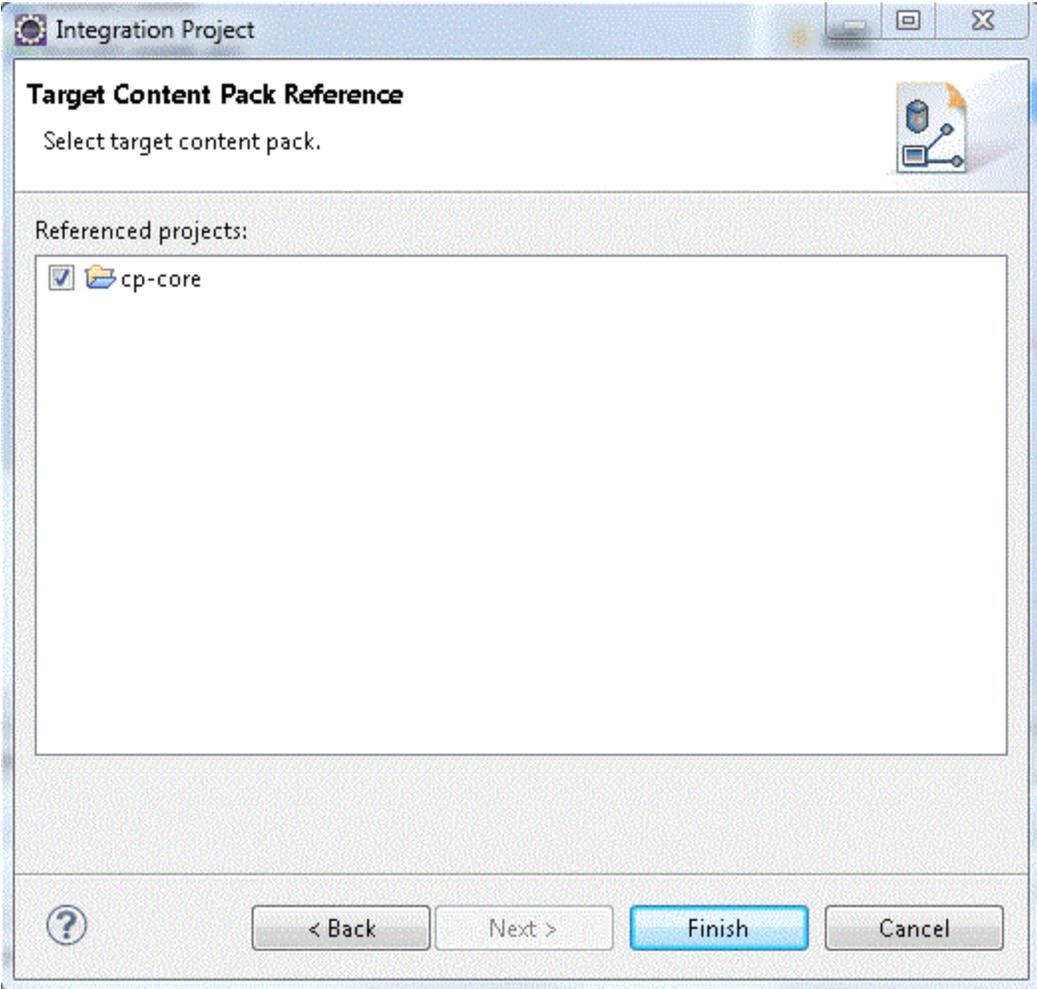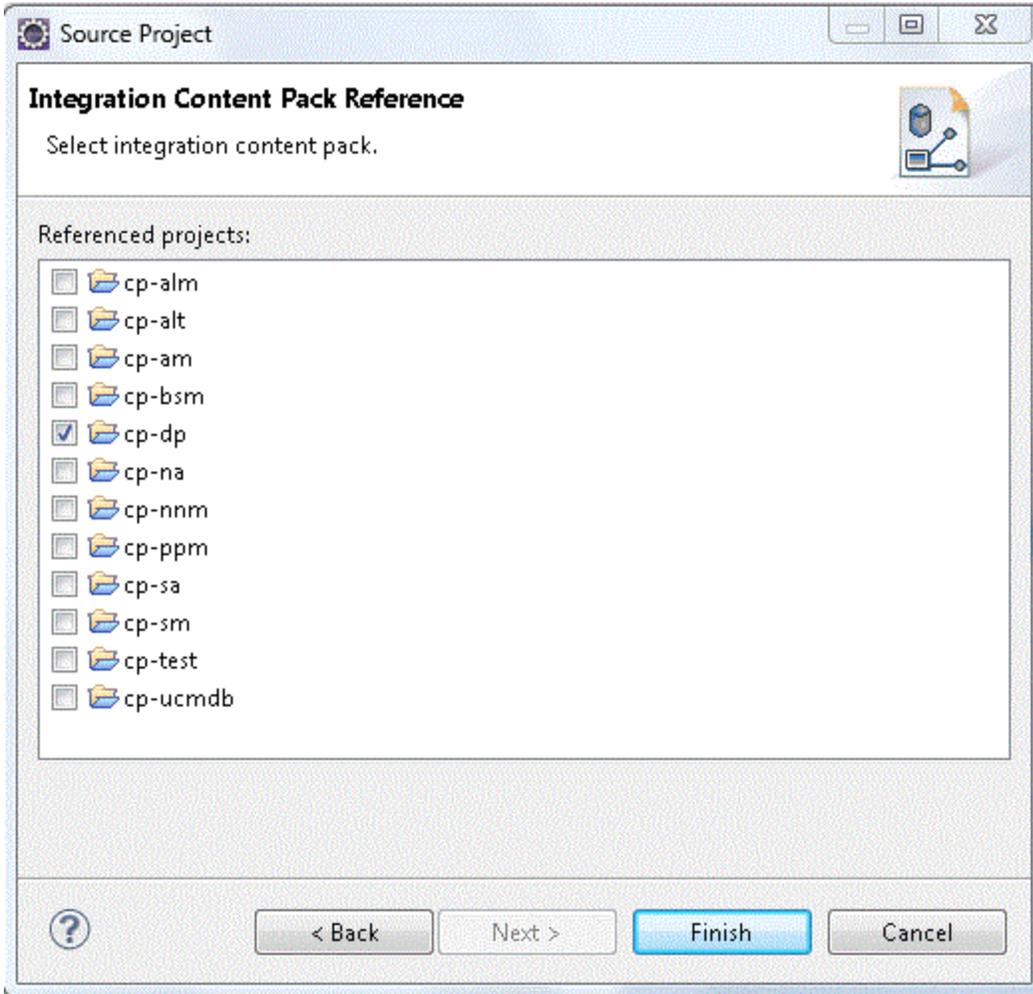

User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Referenced projects	Select the Integration Content pack for the new Source project.

Define the Target Model

Before working with a specific designer, you should define the Target model and the related associations and mappings. The Target model describes the final version of the data that adheres to the design required by applications. Each table in the model contains both designed columns and static columns, which comprises the metadata, so that the administrator can have the visibility of ETL processing over the entity's data.

Target Model – Dimension or Fact: The target data models describe the format of the data that produces business intelligence analytics. The instantiated data models are dimension, fact, and hierarchy tables.

In the Architect Target Designer you define the target model containing the entities and links between them.

Extend the Period Entity

The Period target entity requires special mapping requirements in the IDE. The entity contains time and date related mapping and can only connect to date related sources and dimensions, for example START_TIME.

When you connect to a data source that has a Period entity, the data source consistently changes depending on configurations. Therefore you can only map to date-related entities and dimensions.
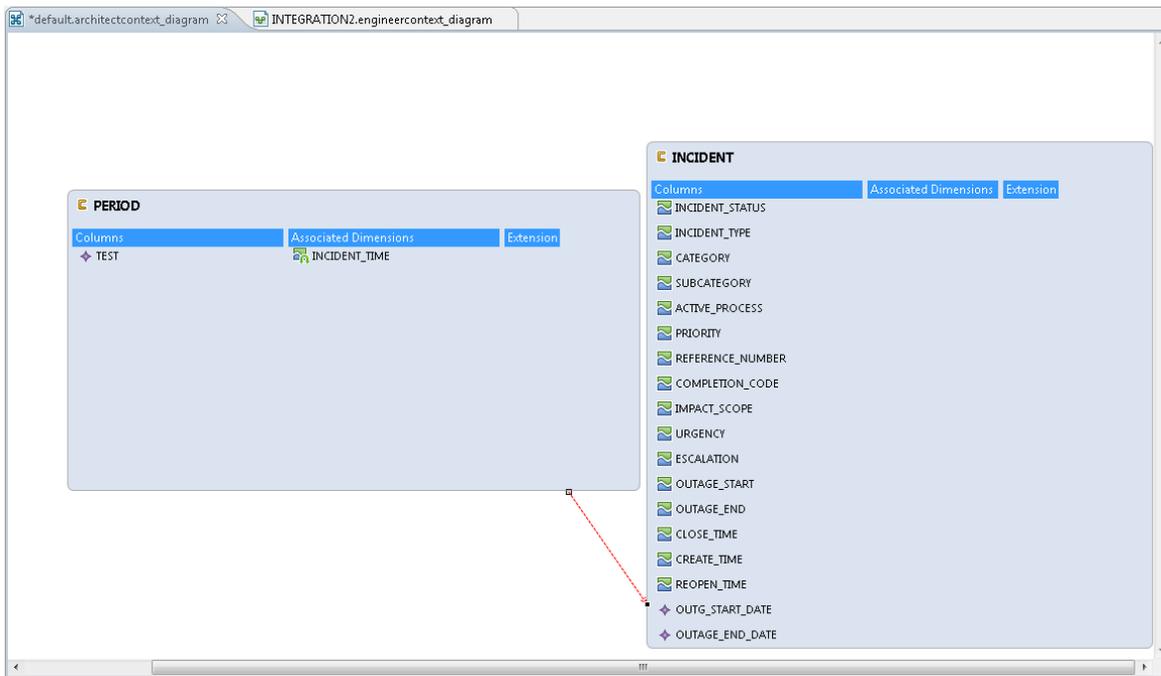
Delete an Entity Permanently

The IDE enables you to permanently delete an entity that is not needed or supported, from the file system. Make sure that no other entity contains any reference to the deleted entity.

> **Note:** When you right-click a selected entity and click **Delete From Model**, the entity is only removed from the current designer and not from the file system.

Tasks

Permanently delete an entity

To permanently delete an entity:

1. Delete the relevant entity from the canvas.
2. In the Package Explorer, expand the content pack that contains the entity you want to delete, for example **cp-sa**.

3. Delete the actual entity, for example **POLICY**, from the Package Explorer.
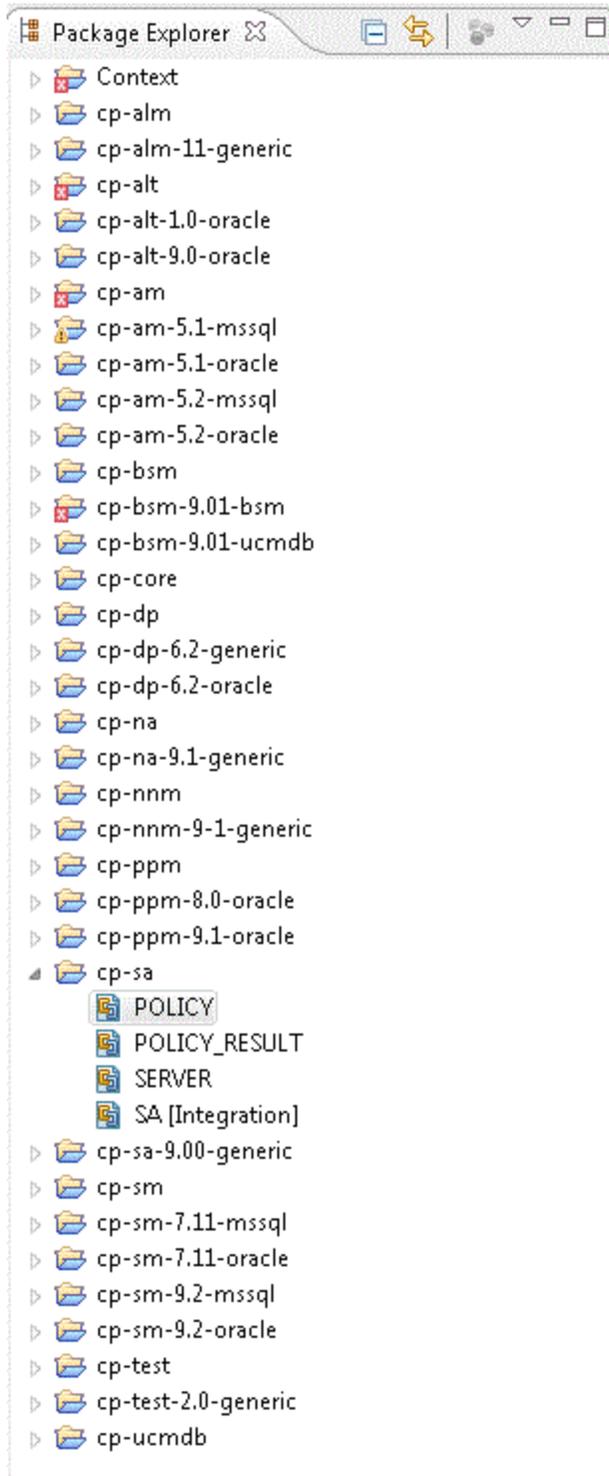
Manage Validation

The IDE performs validations on all Designers and entities created in the Designers. After you save your changes, you can view the errors and warnings that occurred during content development. You can perform a manual validation or use the Quick Fix solution to make the required fixes for validation.

Note: All validations are performed only after you have saved your changes to the Designers.

To access:

Click the **Problems** tab.

Tasks

This section includes the following topics:

View the errors and warnings that occurred during content development

After you save your changes, click the **Problems** tab, below, to view the errors and warnings that occurred during content development.

Manually perform validation

Additionally, you can manually perform validations on all Designers and fix relevant errors and warnings.

1. To activate, click ✅ in the toolbar, or select **DW Content** > **Validate**.

2. During the validation process, a Progress Information dialog box appears specifying the current validated designer and its progress.
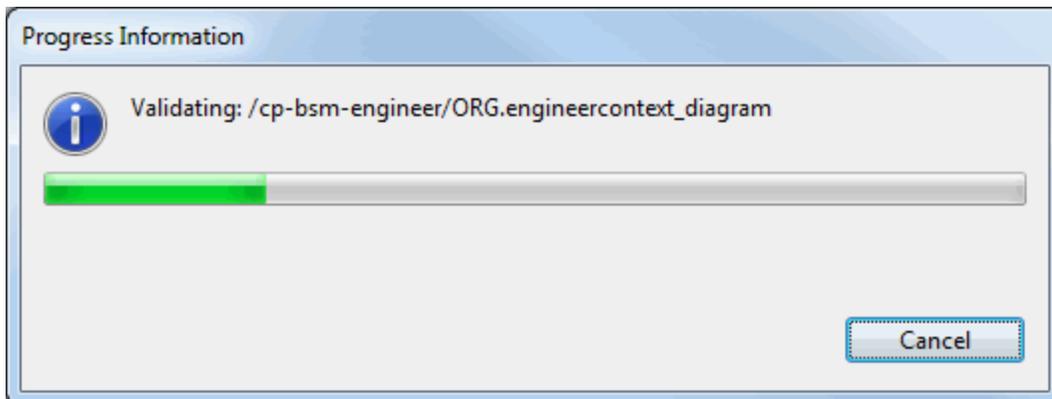
In case of an unreadable designer, an error dialog appears, listing the problem designer diagrams.
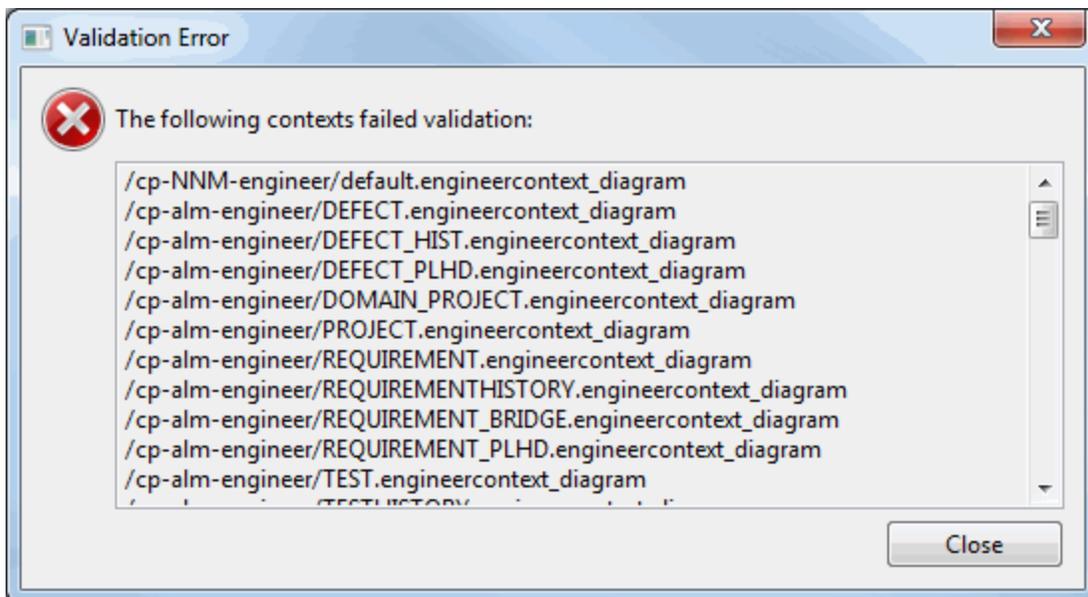
3. Click **Cancel** to cancel the validation process.

   All validations are performed only after you have saved your changes to the Designers.

Quick Fix

The validation process also includes a Quick Fix validation which provides recommendations for

solutions for validation problems displayed in the Problems tab.

To use the Quick Fix option:

1. In the **Problems** tab, under the **Warnings** or **Errors** list, right-click a warning or error and select **Quick Fix** to open the Quick Fix dialog box.
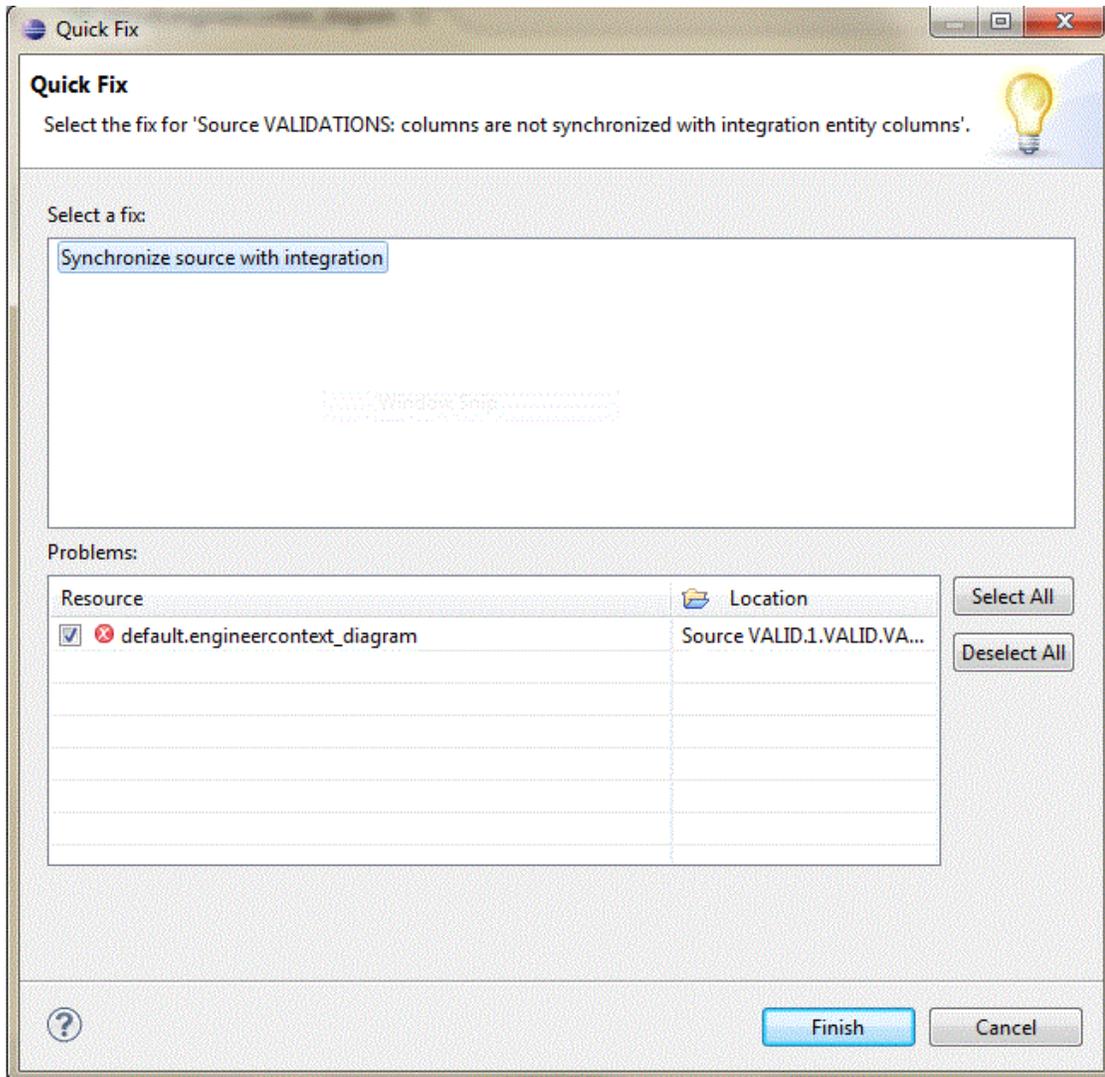
2. Select the fix for the specific warning and click **Finish**.

3. Click ⊟ **Save** and the error is removed.

Reference

Validation Table

Make sure all entities have been configured properly according to the following validations. An error or

warning appears in the Problems tab once you have made the problematic change, and saved it. Note the validations that have the Quick Fix option available.

Error Text	Validation	Source	Integration	Target	Quick Fix
Target <Target ID> column <Column ID> - id length is greater than allowed Integration <Integration ID> column <Column ID>:- id length is greater than allowed	Length of column names (including system suffix)	Up to 60 characters	Up to 60 characters	Up to 60 characters	
Target <Target ID>: id length is greater than 50 characters Integration <Integration ID> id length is greater than 44 characters	Length of entity names (including system suffix)	Up to 60 characters	Up to 44 characters	Up to 50 characters	
Sample errors: Target <Target ID>: 'Business Name' field contains backslash (\) character Integration <Integration ID> 'Description' field contains backslash (\) character Source <Source ID>: 'Group By' field contains backslash (\) character	Backslash (\ ) is not permitted in any field text.	✓	✓	✓	✓
Target <Target	Entity names and column	✓	✓	✓	✓

Error Text	Validation	Source	Integration	Target	Quick Fix
ID> column <Column ID> id attribute violates DW Platform reserved prefixes: starts with non alphabetic character Integration <Integration ID> column <Column ID>: id attribute violates DW Platform reserved prefixes: starts with non alphabetic character	names must start with alphabetic characters.				
Target entity is invalid. File containing the metadata was deleted Integration entity is invalid. File containing the metadata was deleted Source entity is invalid. File containing the metadata was deleted	Make sure an entity deleted from the file system is also deleted from the designer diagram.	✓	✓	✓	
Target <Target ID> column <Column ID> DataType is not defined	Make sure Data Type is defined for all Target columns.			✓	
Target <Target ID>: no column is defined as SCD for dimension entity	Make sure when a Target entity is defined as a **Dimension** that **SCD Type** is defined for at least one column.			✓	✓

Error Text	Validation	Source	Integration	Target	Quick Fix
Target <Target ID>: no column is defined as measure for fact entity	Make sure when a Target entity is defined as a **Fact** that **Measure** is selected for at least one column.			✓	✓
Target <Target ID>: not defined as FACT or DIMENSION	Make sure a Target entity is defined as a Fact, or Dimension, or both. The entity type cannot be left unselected.			✓	
Target <Target ID>: no column is defined as SCD for dimension entity Target <Target ID>: no column is defined as measure for fact entity	Make sure that when a Target entity is defined as a Dimension and a Fact, that at least one column in the entity is defined accordingly for each type. **Note:** If the Target entity contains only associated Dimensions, this validation is not performed.			✓	✓
Target <Target ID>: Invalid target extension. Target type doesn't match	Make sure that the data type in the extended entity equals the type of the base entity.			✓	
Target <Target ID> column <Column ID> - id is not unique in target extension	Make sure column or Associated Dimension ID is unique in the Target extension			✓	
Target <Target ID>: Target extension contains loop	Make sure Target extension does not contain a loop, meaning the extension of a base entity can not also have the base entity as an extension. That would place the entities in a loop with each other.			✓	
Target <Target ID> column	Integration names and in the columns first character must be a letter:	✓	✓	✓	✓

Error Text	Validation	Source	Integration	Target	Quick Fix
<Column ID> id attribute violates DW Platform reserved prefixes: starts with non alphabetic character	[a-z][A-Z].				
Target <Target ID>: id attribute violates DB character constraints (a-z A-Z 0-9 $ # _)	Integration names and in the columns next characters should be a letter, a digit, or '_' , '$', or '#'.	✓	✓	✓	✓
Target <Target ID> Associated Dimension <Associated Dimension ID> id attribute violates DB character constraints (a-z A-Z 0-9 $ # _)					
Target <Target ID> column <Column ID> id attribute violates DB character constraints (a-z A-Z 0-9 $ # _)					
Integration <Integration ID> id attribute violates DB character constraints (a-z A-Z 0-9 $ # _)					
Integration <Integration ID> column <Column ID>: id attribute violates DB character constraints (a-z A-Z 0-9 $ # _)					

Error Text	Validation	Source	Integration	Target	Quick Fix
Source <Source ID> <Column ID>: 'Column Name' field violates DB character constraints (a-z A-Z 0-9 $ # _)					
Target <Target ID>: id attribute violates DW Platform reserved prefixes: MD_ or DI_ Target <Target ID> Associated Dimension <Associated Dimension ID> id attribute violates DW Platform reserved prefixes: MD_ or DI_" Target <Target ID> column <Column ID> id attribute violates DW Platform reserved prefixes: MD_ or DI_ Integration <Integration ID>id attribute violates DW Platform reserved prefixes: MD_ or DI_ Integration <Integration ID> column <Column ID>: id attribute violates DW Platform reserved prefixes: MD_ or DI_	Integration names and in the columns must not start with one of the DW Platform reserved prefixes: MD_ or DI_.	✓	✓	✓	✓

Error Text	Validation	Source	Integration	Target	Quick Fix
Integration <Integration ID> no business key is defined Integration <Integration ID> Business key sequence is not defined properly (Doesn't start at 1 or numbers are not sequential)	Make sure that the Business Key is specified. In case of more than one Business Key, they must be in order (1, 2, 3) without spaces in the numbering.		✓		
Integration <Integration ID> Business key sequence must contain at least one column which is not Nullable	Make sure Null Allowed is not selected for at least one of the Business Keys.		✓		✓
Target <Target ID> : No id is defined for column Target <Target ID> column <Column ID> - id is not unique Integration <Integration ID> column <Column ID>:- id is not unique	Make sure that the column has an ID and it is unique.		✓	✓	
Source <Source ID> <Column ID>: no value at table name field Source <Source ID> <Column ID>: no value at db column name field	If a Source column has Type set as Direct, then make sure Table Name and Column Name are not empty.	✓			

Error Text	Validation	Source	Integration	Target	Quick Fix
Source <Source ID> <Column ID>: no value at fixed value field	If a Source column has Type set as Fixed, then make sure Fixed Value is not empty.	✓			
Source <Source ID> <Column ID>: no value at calculation rule field	If a Source column has Type set as Rule, then make sure Calculation Rule is not empty.	✓			
Source <Source ID> <Column ID>: 'Column Name' field contains backslash (\) character Source <Source ID> <Column ID>: 'Column Name' field violates DB character constraints (a-z A-Z 0-9 $ # _)	If a Source column has Type set as Direct, then make sure Column Name does not contain special characters. This validation runs only if the Product Type in the source Content Pack is the database type of either MSSQL, Oracle or MySQL.	✓			✓
Source <Source ID> doesn't include join condition	Make sure that the Source entity has a Join Condition and Table Name specified.	✓			
Source <Source ID> contained in <cp Name> is not referencing to any integration entity	Make sure that a Source entity is mapped to an Integration entity.	✓	✓		
Source <Source ID>: columns are not synchronized with integration entity columns	Make sure that the Source and Integration entities are synchronized.	✓	✓		
Integration <Integration ID> column <Column	Make sure all mapped Integration columns are mapped accordingly to the		✓		

Error Text	Validation	Source	Integration	Target	Quick Fix
ID>: is not mapped to target column and data type is undefined Integration <Integration ID> column <Column ID>: contains invalid mapping	Target or have been assigned a data type.				
Target <Target ID> column <Column ID> is defined as VARCHAR but has no length Integration <Integration ID> column <Column ID>: is defined as VARCHAR but has no length	Make sure that the length of a Varchar column is more than 0.		✓	✓	
Target <Target ID> column <Column ID> is defined as VARCHAR but length is greater than allowed (4000) Integration <Integration ID> column <Column ID>: is defined as VARCHAR but length is greater than allowed (4000)	Make sure that the length of a Varchar column is less than or equal to 4000.	✓	✓	✓	✓
No id is defined for target entity No id is defined for integration entity	Make sure each entity has an ID defined.	✓	✓	✓	

Error Text	Validation	Source	Integration	Target	Quick Fix
Target <Target ID> column <Column ID> the id is a DB reserved word Integration <Integration ID> column <Column ID>: the id is a DB reserved word	Make sure the defined column name does not contain a reserved word. For details, see MSDN Microsoft SQL Server reserved keywords list.	✓	✓	✓	

Generate Content

The IDE can generate the relevant schemas and ETLs that are required for the integration.

The ETL Generator generates the required artifacts based on the modeling in the previous steps. The artifacts contain BODS workflows that are imported into the BODS repository as well as the data models and XML files that are imported into the Data Warehouse metadata repository. Once the metadata has been loaded, the schema generation mechanism performs the schema changes in the target and the staging databases.

To access:

When a designer is open, the ETL button is displayed in the top right toolbar in the IDE workspace. If it is not displayed, navigate to **Window** > **Customize Perspective** and make sure **XS IDE** is selected.

Click **ETL** to begin the ETL Generator.

Learn More   **Tasks**

Learn More

Content Pack Creation Tool

The Content Pack Creation Tool enables you to create a new Content Pack structure using existing source content packs. This allows you to use the IDE to extend content as well as develop entirely new Content Packs for use in the Data Warehouse and IT Executive Scorecard.

The ETL Generator action is relevant to the selected designer. The ETL button is only displayed when a designer is open.

Tasks

Create a new entity and a new Content Pack with the ETL Generator

To create a new entity and a new Content Pack with the ETL Generator:

1. Click **ETL** in the toolbar on the top right of the IDE workspace to begin the ETL Generator. The ETL Generator dialog box opens.
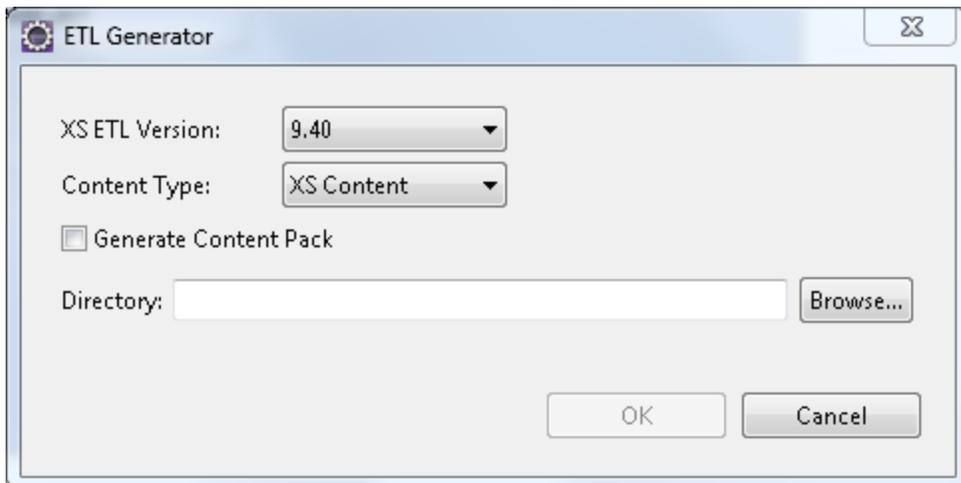
2. In the dialog box:

- In **XS ETL Version**, select **10.00**.

- In **Content Type:** select **XS Content** or **Custom Content**.

- Select the **Generate Content Pack** check box if you are creating a new Content Pack (not extending content). This creates a new content pack structure along with the generated ETL files. This capability is only available when generating the ETL files in the Designer.

    > **Note:** The Generate Content Pack check box is not available when generating the ETL files from the Architect Target Designer.
    >
    > When you generate the ETL files from the Engineer Stream Designer, the **Generate Content Pack** check box is disabled if there are no source entities in the Engineer Stream Designer.

- In **Directory**, browse to the directory where you want the generated Content Pack to be placed.

3. Click **OK**. The process may take some time.
4. Proceed to package and deploy your content.

Package and Deploy Content

After you have run the ETL Generator and saved the Content Pack, you must package your new or extended content solution.

⬤ Tasks

This section includes the following topics:

Package and deploy content

Copy the generated files to the Content Packs directory on the DWH server. Use the automation tool to deploy the changes in content.

- **For Content Packs with added or extended entities:**
  - The Target CP is deployed when changes are added to the target schema:
    i. Launch the command line window in administrator mode.
    ii. Re-deploy the Target CP by running the command: **dw_ds_automation.bat -task Redeploy -cp Core**.

  - The Integration CP is deployed when changes made to an Integration or Source entity:
    i. In the XS user interface, activate the i-CP.
    ii. Launch the command line window in administrator mode.
    iii. Re-deploy the i-CP by running the command **dw_ds_automation.bat -task Redeploy -cp <CP_NAME>**.

  - The Integration CP is not deployed when changes made to an Integration or Source entity:
    ○ i activate the i-CP at XS UI

- **For new Integrated Content Packs:** Make sure your new CP is packaged in the correct directory structure by selecting the **Generate Content Pack** checkbox in the ETL Generator, and then copying it to the ContentPacks directory in your DWH installation.
  a. Launch the command line window in administrator mode.
  b. Register the new Content Pack: **dw_cp_register.bat -name <CP_NAME> -type integration**.
  c. Activate the new Content pack in the XS user interface or activate the new Content Pack with the following steps:
    i. Configure the **datasource.xml** file and run: **dw_ds_automation.bat -task ConfigureInitial -cp <CP_NAME>**.

ii. Deploy the task: **dw_ds_automation.bat –cp <CP_NAME> –task Deploy**.

iii. Activate the task: **dw_ds_automation.bat –cp <CP_NAME> –task Activate**.

Compact the BODS repository after each redeployment

Tip: For versions prior to 9.40, with each additional CP redeployment, mainly performed during the content development process, the SAP BusinessObjects Data Services repository database gets heavier because the records in the Data Services are not deleted from the tables but only marked accordingly. This leads to large local repositories, corruption, bad response times, and more.

It is recommended to compact the SAP BusinessObjects Data Services repository from time-to-time (ideally after each CP redeployment) as follows:

1. Open the SAP BusinessObjects Data ServicesDesigner.

2. Specify the SAP BusinessObjects Data Services repository database connection details.

3. Select **Open File > Compact Repository**.

4. Select **Local Repository** and click **OK**.

Activate New Content

After you package and deploy new Content Packs, you activate the content in the XS Data Source Management UI. Content that is created from databases, delimited files, as well as Excel files can be activated in the customized Data Source Management activation.

Select the Data Source Type according to your specific Content Pack source, as follows:

- **MSSQL**
- **Oracle**
- **MySQL**
- **Delimited File**
- **Excel File**

To access:

In the XS application, select **Admin** > **Data Source Management.** Click **Add Data Source** and select the relevant Content Pack you have created.

Tasks	UI Description

🔘 Tasks

Activate a new Content Pack

1. In the XS application, select **Admin** > **Data Source Management**.
2. Click the **Add data source** to open the Data source wizard. The Add Data Source page opens.
3. Select the CP you created and click **Next**.

   The relevant data source page opens.
4. Enter and select the configuration parameters.
5. Complete the wizard.

   The data source instance is activated.

For details on all XS Data Source Management capabilities, see Data Source Management in the *IT Executive Scorecard Administrator Guide*.

🔘 UI Description

CP Activation Page Options

Activation parameters are based on the Data Source Type of your Content Pack.

MSSQL Database Source CP

UI Element	Description
Instance name	Enter a name for the data source instance you are activating.
<CP name> Version	1
Time Zone	Select the time zone for the data source.
Data Source Type	Select **MSSQL**.
Username	Enter your username used to log on to the database.
Password	Enter your password used to log on to the database.
Hostname/IP Address	Enter the SQL server database hostname or IP address.
Port	Enter the server port number.
Database Name	Enter the database name used by the CP.
Initial Load Period (months)	Select the number of months from which you want the initial data loaded.

MySQL Database Source CP

UI Element	Description
Instance name	Enter a name for the data source instance you are activating.
<CP name> Version	1
Time Zone	Select the time zone for the data source.
Data Source Type	Select **MySQL**.
Username	Enter your username used to log on to the database.
Password	Enter your password used to log on to the database.
Hostname/IP Address	Enter the MySQL server hostname or IP address.
Port	Port for database connections.
Initial Load Period (months)	Select the number of months from which you want the initial data loaded.

Oracle Database Source CP

Note: The Oracle database can have both Server ID (SID) and Service Name properties, but the user should specify only one. If you define the SID, then the SID is used, and if you define Service Name, then Service Name is used. If you define both in the UI, only SID is used.

UI Element	Description
Instance name	Enter a name for the data source instance you are activating.
<CP name> Version	1
Time Zone	Select the time zone for the data source.
Data Source Type	Select **Oracle**.
Username	Enter your username used to log on to the database.
Password	Enter your password used to log on to the database.
Hostname/IP Address	Enter the Oracle server hostname or IP address.
SID	Enter the unique name of the database.
Service Name	Enter the alias used when connecting.
Initial Load Period (months)	Select the number of months from which you want the initial data loaded.

Delimited File Source CP

UI Element	Description
Instance name	Enter a name for the data source instance you are activating.
<CP name> Version	1
Time Zone	Select the time zone for the data source.
Data Source Type	Select **Delimited File**.
directory Path	Enter the path where the data source file is located.
Encoding	Enter the text encoding of the file. The default is UTF-8.
Field Delimiter	Enter the field delimeter for the file, such as '**,**'.
Row Delimiter	Enter the row delimeter for the file, such as '**\r\n**'.
Initial Load Period (months)	Select the number of months from which you want the initial data loaded.

Excel File Source CP

UI Element	Description
Instance name	Enter a name for the data source instance you are activating.
<CP name> Version	1
Time Zone	Enter the time zone for the data source.

UI Element	Description
Data Source Type	Select **Excel File**.
directory Path	Enter the path to excel data source file.
Initial Load Period (months)	Select the number of months from which you want the initial data loaded.

Upgrade Tool

If you intend to develop content from a previous version, you must perform the upgrade process. This is done to allow file and content compatibility and simplifies the merging and entity deletion processes.

Learn More   **Tasks**

Learn More

When to perform an upgrade

An additional upgrade must be performed in the following cases:

- When you are using models from before the IDE was upgraded.

  Possible issues include:

  - ETL Gen, BODS Export failures.

  - Validation errors for all designers when using the **Validate** button.

  - Content pack files cannot be viewed in the default editor.

  - Content pack name starts with "null".

  - Entity problems.

- When you have upgraded models in a non-upgraded IDE version.

  Possible issues include:

  - ETL Gen, BODS Export failures.

  - Validation errors for all designers when using the **Validate** button.

  - In Package Explorer, entity files cannot be viewed by the default editor or entity files appears with UUID instead of entity name.

  - The Upgrade option does not appear in the DW Content menu.

> **Note:** The following content changes require that you perform an additional upgrade on your IDE version.
>
> - Reverting to older content (https://hpln.hp.com/group/executive-scorecard).
>
> - Merge of content from another developer's environment using a previous IDE version.

 Tasks

Upgrade the IDE

To perform an upgrade, select **DW Content** > **Upgrade**.

Advanced Development

Following the ETL Generator process, you can optionally access the following features and processes for advanced content development.

Data Source Explorer

The IDE provides a Data Tool Platform plug-in which enables you to connect to a specific data source and browse the database.The Data Source Explorer enables connection to the data sources through the SQL, Oracle and MySQL drivers. You can then browse the database tables, make queries, and view the data source information.

You can also connect to file based data sources with the Open Data Access (ODA). It enables you to interface with an external data provider.

For details on the ODA, see the Eclipse DTP tutorials.

For details on 816381 extractors for each product, see "File Based Integration (FBI) Extractor. " on page 10

To access:

- To create a new data source connection profile, in the IDE main page, select **Window > Show View > Other > Data Management > Data Source Explorer,** right click **Database Connections** and right-click **New**.

- To create a flat file data source, select **Window > Show View > Other > Data Management > Data Source Explorer,** right click **Flat File data Source** and right-click **New**.

Tasks   **UI Description**

Tasks

This section includes the following tasks:

Create a new database connection in the Data Source Explorer

1. Navigate to **Window** > **Show View** > **Other** > **Data Management** > **Data Source Explorer**. The Data Source EXPLORER tab is displayed.
2. Right-click **Database Connections** and then right-click **New.**
3. Select **Oracle**, **SQL Server**, or **MySQL** and click **Next**.
4. Enter the **Database**, **Host**, **Port number**, **Username** and **Password**.
5. Click **Test Connection** to check for errors with the connection to the database.
6. Click **Finish** to enable the connection to the database.

You can change the driver definitions or create another driver.

Modify driver definitions

Note: IDE provides out-of-the-box drivers for MSSQL, Oracle, and MySQL.

1. Navigate to **Window** > **Preferences** > **Data Management** > **Connectivity** > **Driver Definitions**.
2. Select the driver you want to change, or click **Add** to add an additional driver.

   For details on the Data Tool Platform, see the Eclipse DTP tutorials.

Connect to flat file data sources

The IDE can connect to a flat file which contains data. The supported file types are: csv, ssv and psv. The flat file may contain:

- A file where the first row includes the headers and the rest of the file contains the data.
- A file where the first row includes the headers and the second row contains the data types of each header. The rest of the file contains the data.
- A file where there is only data and does not contain headers or data types.

1. Navigate to **Window** > **Show View** > **Other** > **Data Management** > **Data Source Explorer**. The Data Source EXPLORER tab is displayed.
2. Navigate to **ODA Data Sources** > **Flat File Data Source**, right-click and select **New**.
3. Enter the relevant details in the New Flat File Data Source Profile wizard.

   For details, see the Eclipse DTP tutorials.

UI Description

Data Source Explorer

> **Note:** IDE provides out-of-the-box drivers for MSSQL, Oracle, and MySQL.
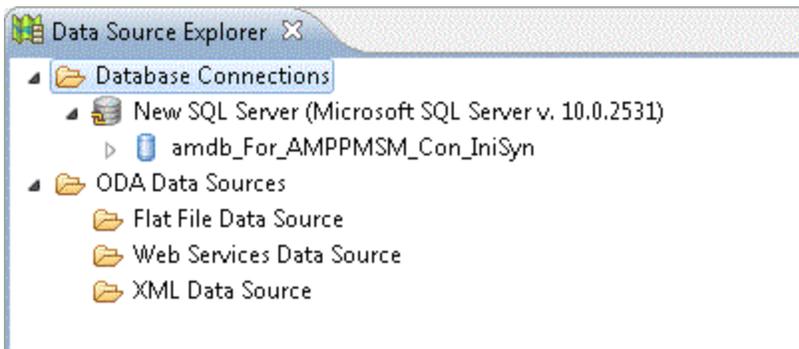
- Right-click **Database Connections** and select **New** to create a new database connection. For details, see "Data Source Connection Profile" below
- Right-click **Flat File data Source** and right-click **New** to create a flat file data source. For details, see "Create Connection Profile" on page 99

Data Source Connection Profile
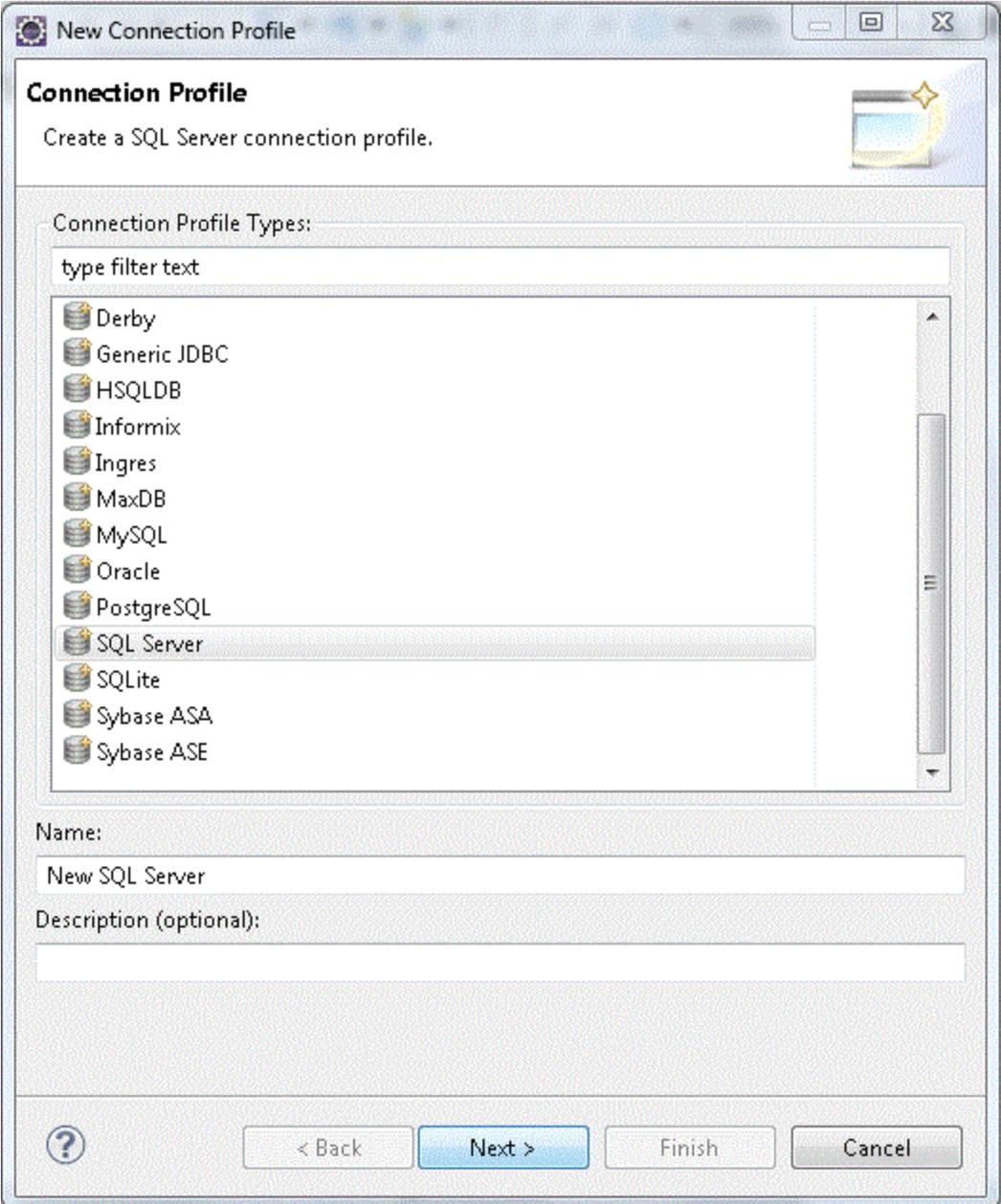
User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
<Driver List>	Select **SQL**, **Oracle**, or **MySQL Server**.

Specify a Driver and Connection Details

- **MSSQL Server**
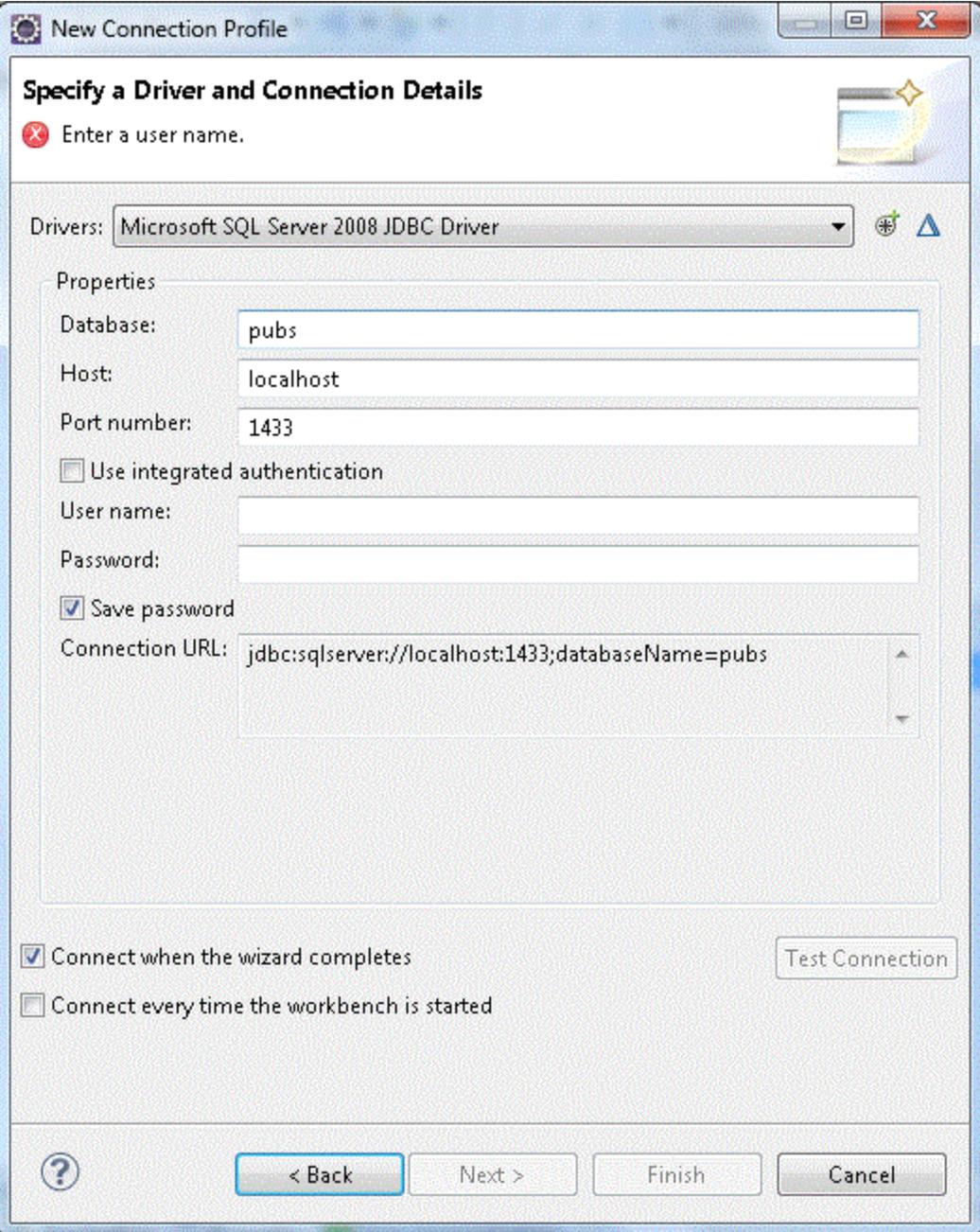
UI Element	Description
Database	Enter the specific database name.
Host	Enter the host server.

UI Element	Description
Port number	Enter the database port.
User name	Enter the database username.
Password	Enter the database password.
	New Driver Definition. Click to configure new driver definitions. For details, see the Eclipse DTP tutorials.
	Edit Driver Definition. Click to edit the current driver definitions. If you receive an error for the driver, check that the correct path is displayed in the driver files of the JAR list.

- **Oracle Server**
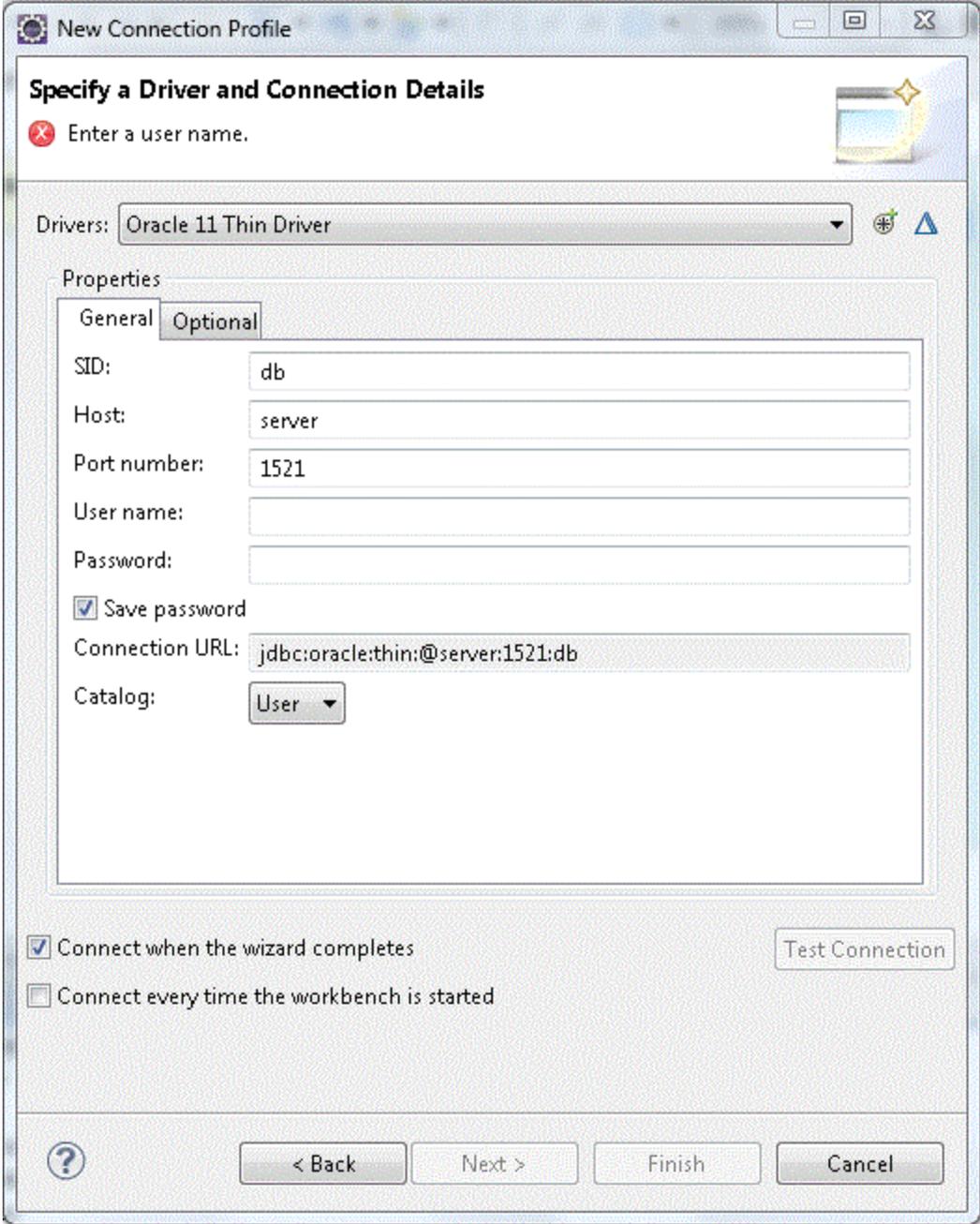
UI Element	Description
SID	Enter the Server ID, the unique name of the database.
Host	Enter the host server.
Port	Enter the database port.

UI Element	Description
number	
User name	Enter the database username.
Password	Enter the database password.
	New Driver Definition. Click to configure new driver definitions. For details, see the Eclipse DTP tutorials.
	Edit Driver Definition. Click to edit the current driver definitions. If you receive an error for the driver, check that the correct path is displayed in the driver files of the JAR list.

- **MySQL Server**

User interface elements are described below (when relevant, unlabeled elements are shown in angle brackets):

UI Element	Description
Database	Enter the specific database name.
URL	Enter the database URL.

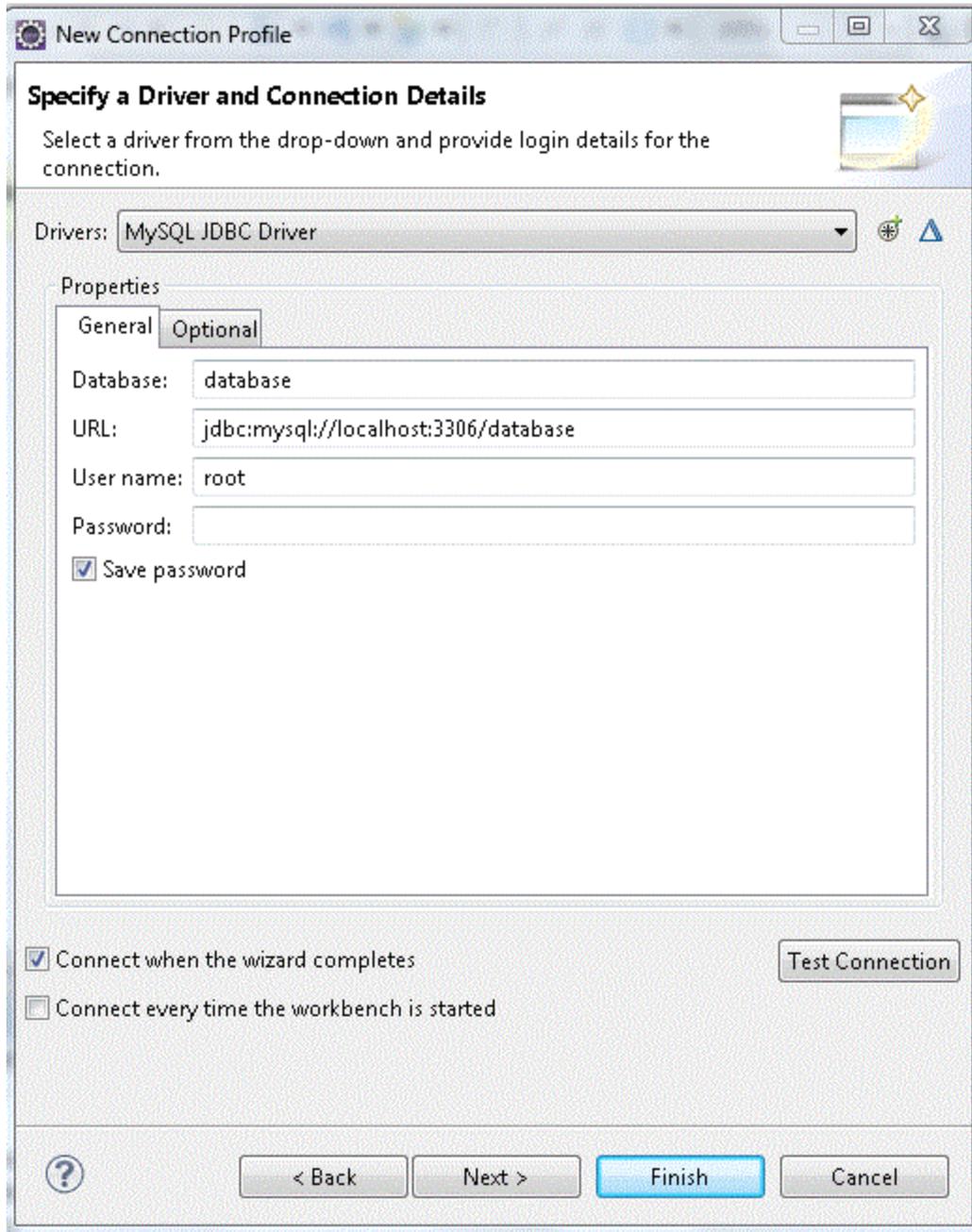| UI Element	Description
User name	Enter the database username.
Password	Enter the database password.
⊛	**New Driver Definition.** Click to configure new driver definitions. For details, see the Eclipse DTP tutorials.
△	**Edit Driver Definition.** Click to edit the current driver definitions. If you receive an error for the driver, check that the correct path is displayed in the driver files of the JAR list.

Create Connection Profile
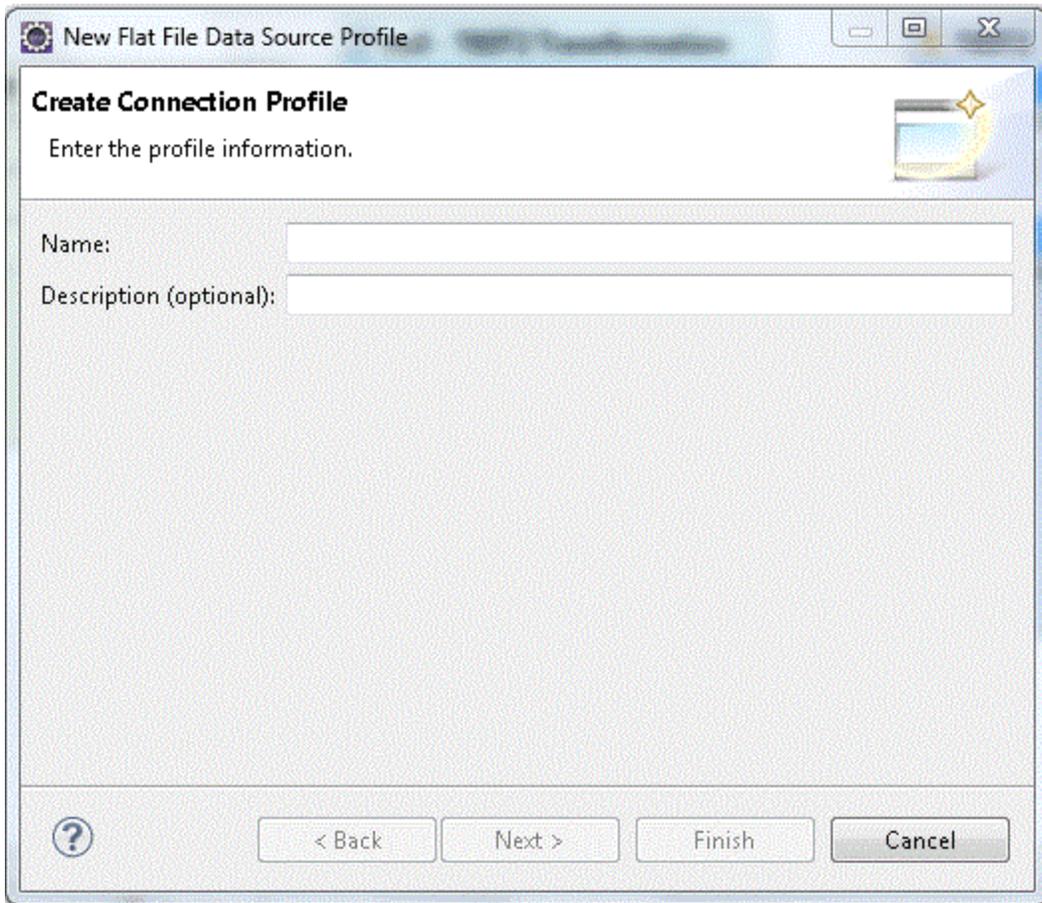

User interface elements are described below:

UI Element	Description
Name	Enter any name for the flat file.
Description (optional)	Enter a description of the data source. This field is optional.

Define directory or a File URI
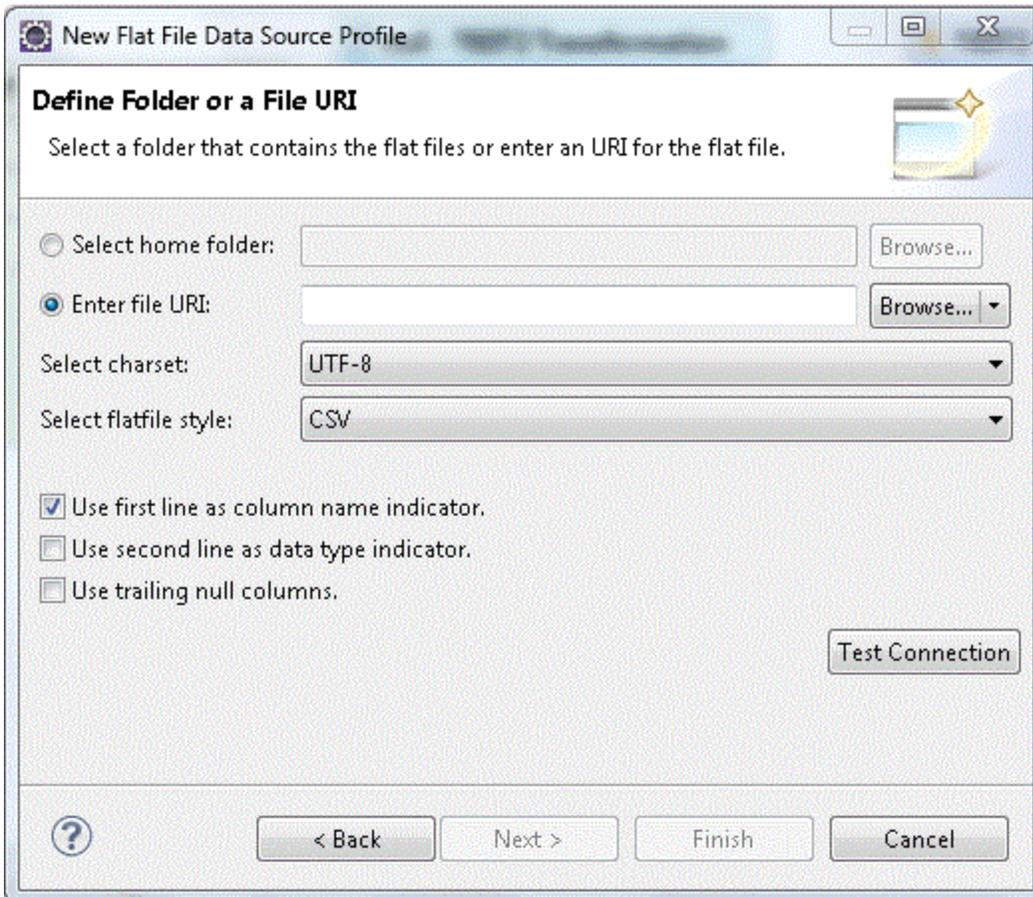
UI Element	Description
Select home directory	This option is not supported
Enter file URI	Browse to the relevant flat file.
Select charset	Select the relevant character set.
Select flatfile style	Select the flat file type: **CSV**, **PSV**, **SSV**. The IDE does not support the .tsv style.
Use first line as column name indicator.	Select when using a flat file that has headers and data (no data types). Select when using a flat file that contains both headers and data types.
Use second line as data type indicator.	Select when using a flat file that contains both headers and data types.
Use trailing null columns.	Not relevant to the IDE.

UI Element	Description
Test Connection	Click to check the connection to your flat file.

Note: When activating a flat file as a source, remove the data types row from the file.

For details, see the Eclipse DTP tutorials.

Generate Entities Automatically

You can generate entities from the source database tables or views, as well as flat files based on .csv format. This enables you to automatically create Source, Integration or Target entities. Using the Data Source Explorer, you can connect to the source database and navigate to the source table or view. The entities are created based on the specific source metadata. MSSQL, Oracle, and MySQL source databases are supported. You can then load the entity to a new designer located in an existing project. The entity is then displayed in the new Engineer Stream Designer.

> **Note:**
>
> - The following file formats are supported: .csv, .psv, and .ssv.
> - The following file models are supported:
>   - Column name in first row.
>   - Column name in first row and data type in second row. Flat files can only be extracted using this model.
>   - No column name or data type.

Tasks	UI Description

Tasks

This section includes the following tasks:

Automatically generate entities from database tables or views

> **Note:** You can generate Source, Integration or Target entities using the Entity Generator wizard.

1. Navigate to **Window** > **Show View** > **Other** > **Data Management** > **Data Source Explorer**. The Data Source EXPLORER tab is displayed.
2. Select either an SQL, Oracle, or MySQL Database and connect to the database.
3. Navigate to **Tables** or **Views** and right-click the relevant table or view from which you want to generate the entity and select **Generate DWH Entity**.
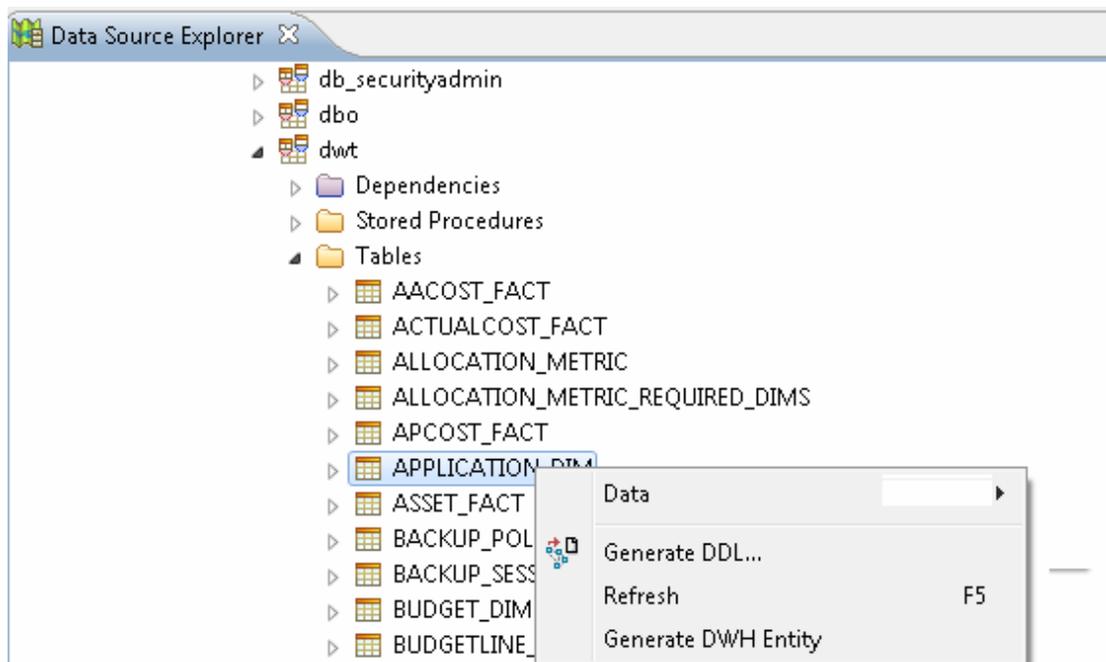
4. In the Scenario page:

    a. Select the type of content pack: **Source Content Pack**, **Integration Content Pack**, or **Target**.

    b. If you have selected **Source Content Pack**, **Integration Content Pack**, select the relevant content pack.
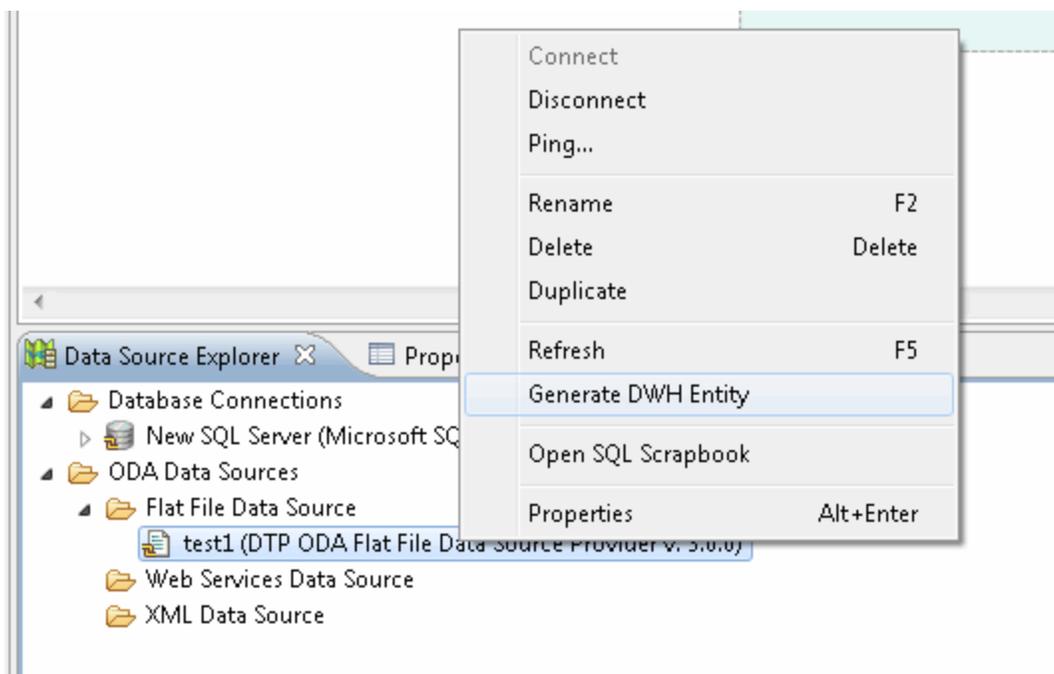
        When you select the Source Content Pack, the Integration Content Pack is automatically displayed.

        If you have selected **Target**, select whether the entity is defined as a **Fact** or **Dimension**.

    > **Note:** When you generate an entity from an Oracle database, make sure that if you use reserved words, they are placed in quotation marks, for example, "NUMBER".

5. Click **Next**.

6. In the Load to Designer page, select to either load the entity to a **New Designer**, or **No Designer** .

7. If you selected **New Designer**, select from the drop down list, the project where you want the specific Designer to be located.

8. Click **Finish** to complete the wizard and create the entity. The new entity is now displayed in the IDE Package Explorer, and if relevant, loaded in the assigned designer canvas.

Automatically generate entities from flat files

1. Navigate to **Window** > **Show View** > **Other** > **Data Management** > **Data Source Explorer**. The Data Source EXPLORER tab is displayed.

2. Navigate to **ODA Data Sources** > **Flat File Data Source** and right-click the file from which you want to generate the entity and select **Generate DWH Entity**.

3. In the Scenario page:

   a. Select the type of content pack: **Source Content Pack**, **Integration Content Pack**, or **Target**.

   b. If you have selected **Source Content Pack**, **Integration Content Pack**, select the relevant content pack.
When you select the Source Content Pack, the Integration Content Pack is automatically displayed.

     If you have selected **Target**, select whether the entity is defined as a **Fact** or **Dimension**.

4. Click **Next**.

5. In the Load to Designer page, select to either load the entity to a **New Designer**, or **No Designer**.

6. If you selected **New Designer**, select from the drop down list the project where you want the specific designer to be located.

7. Click **Finish** to complete the wizard and create the entity. The new entity is now displayed in the IDE Package Explorer, and if relevant, loaded in the assigned designer canvas.

UI Description

**Entity Generator Wizard**

Scenario page
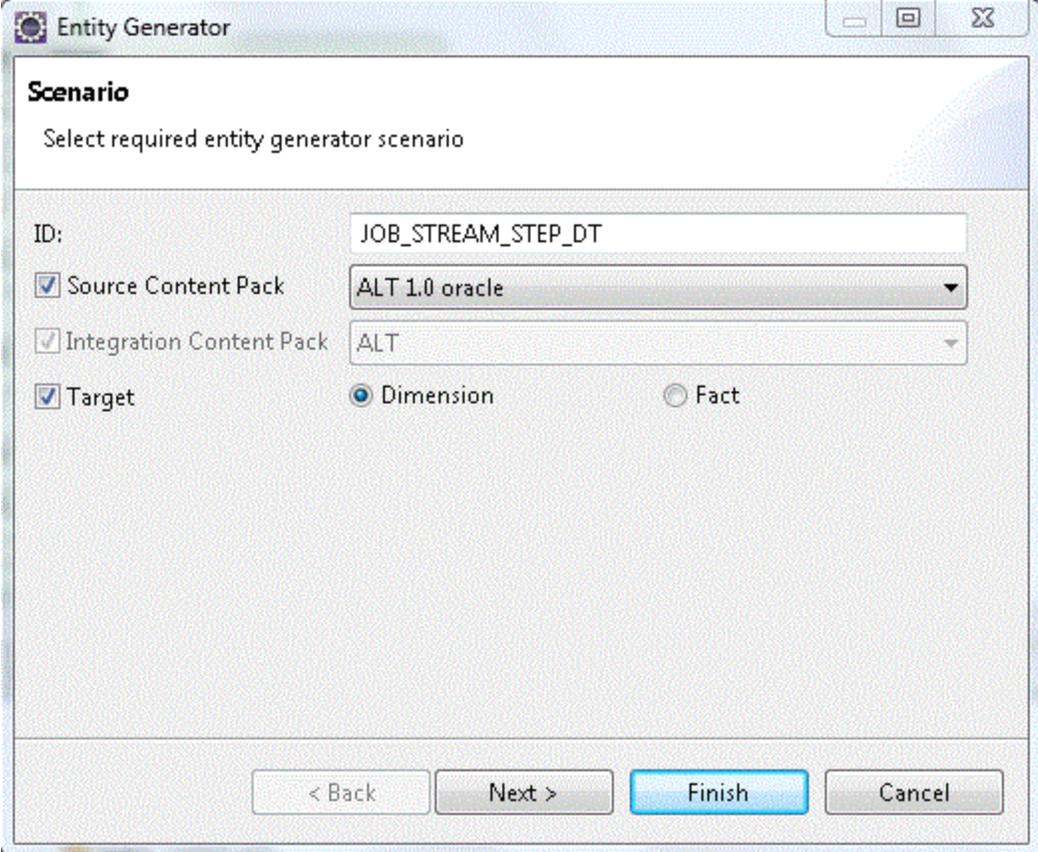
Note: If you select to generate Integration and Target entities, **SSI Column Mapping** is automatically performed and displayed in the relevant designer .

UI Element	Description
ID	Enter entity name. The current table or view name is the default.
Source Content Pack	Select the checkbox and the Source content pack for the specific entity. This generates a Source entity and automatically selects the relevant Integration content pack. **Notes:** • If there is only one Source content pack in the workspace it is entered automatically and cannot be changed. • This checkbox is disabled if there is no Source content pack in the workspace.
Integration Content Pack	Select the checkbox and the Integration content pack for the specific entity. The Integration content pack is automatically populated when the Source CP is selected. **Notes:** • If there is only one Integration content pack in the workspace it is entered automatically and cannot be changed.

UI Element	Description
	• If only **Integration Content Pack** is selected, the **Next** button is disabled, and the entity cannot be loaded to a designer. • This checkbox is disabled if there is no Integration content pack in the workspace.
Target	Select the checkbox and whether the Target entity is defined as a **Dimension** or **Fact**. The entity is placed in the core-cp. If only **Target** is selected, the entity is loaded to the Architect Target Designer.

Load to Designer page
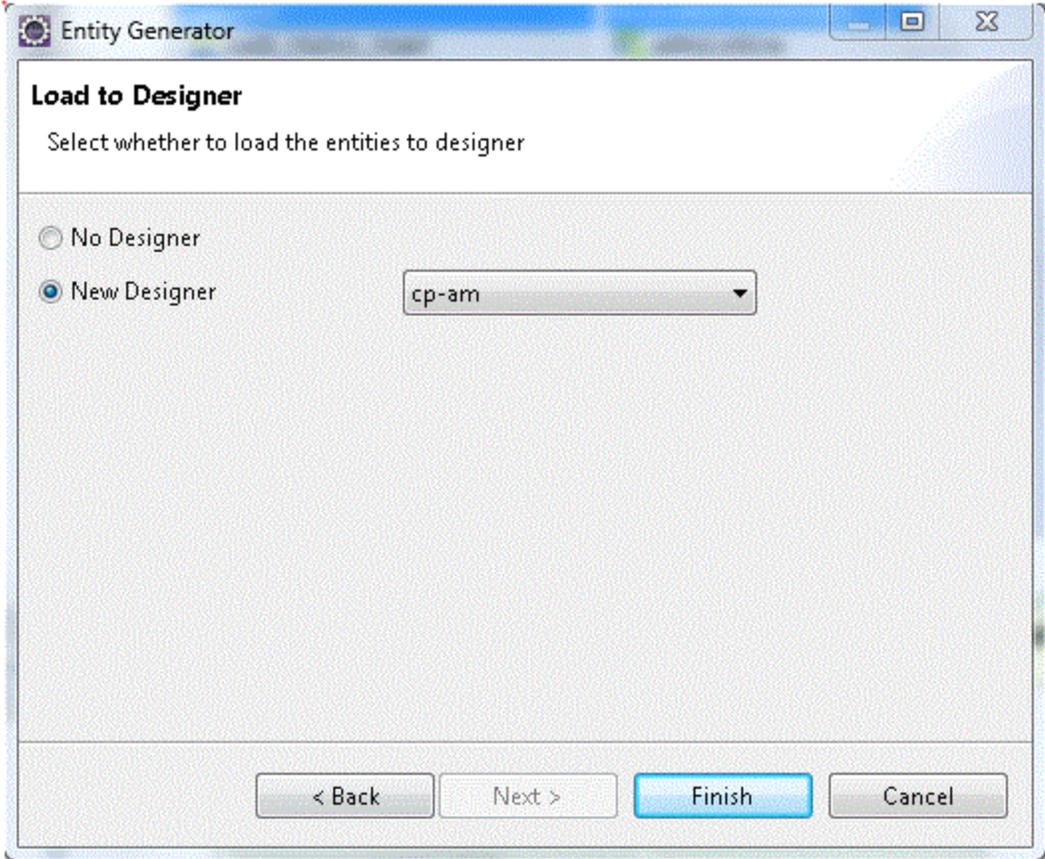
UI Element	Description
No Designer	Select the checkbox and the generated entity is not displayed in a designer canvas.
New Designer	Select the checkbox for the generated entity to be displayed in a designer canvas. Select an existing project from the drop down list where the designer will be located.

UI Element	Description
	Note: If a Target entity was generated then the entity is loaded into an Architect Target Designer only. For Source and Integration entities, they are loaded into an Engineer Stream Designer.

Complete Entity Generation with SSI mapping displayed in Stream Designer
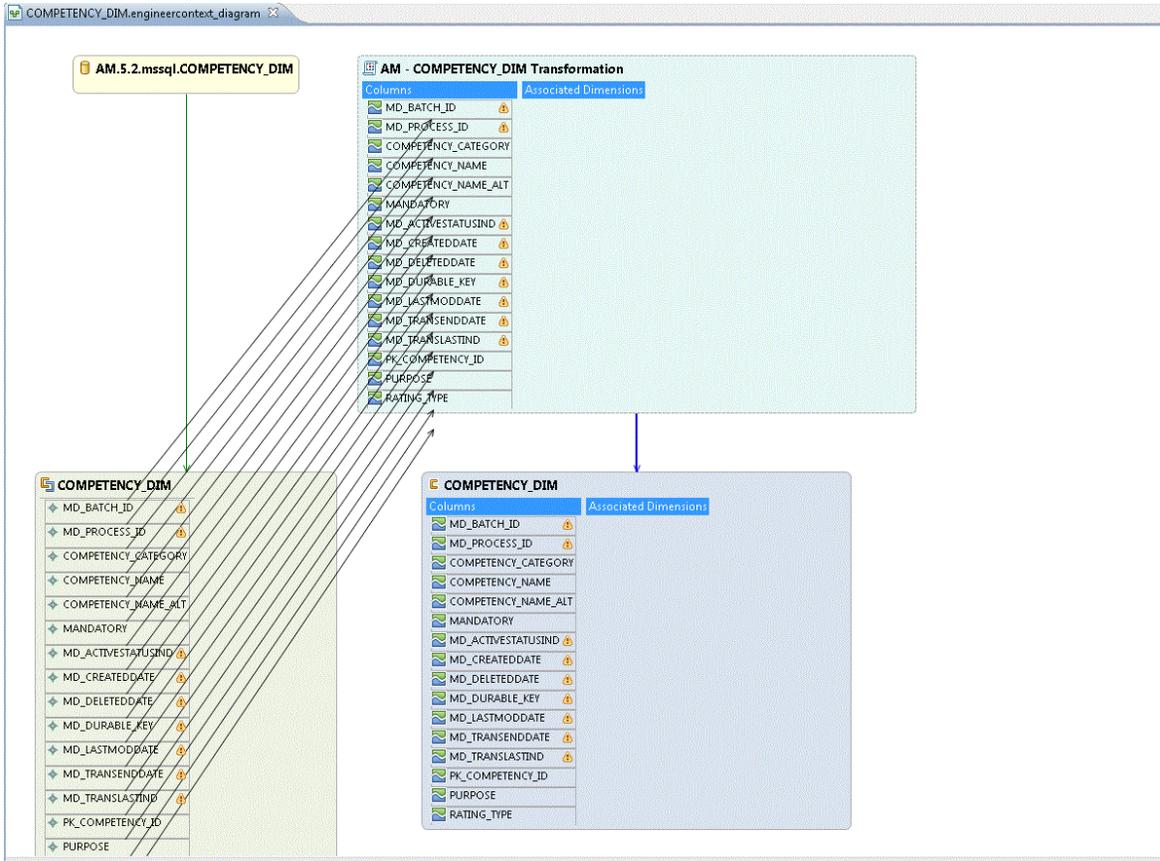
IDE Data Types

The follows shows Database Data Types and the conventions used for them in the IDE entity columns.

Database Data Type	IDE Data Type
BIGINT	Int32
INTEGER(INT), SMALLINT, NUMERIC, NUMBER	Int16
FLOAT, DOUBLE_PRECISION	Float
CHARACTER, NVARCHAR, VARCHAR, VARCHAR(2), CHARACTER_VARYING, CHARACTER_VARYING	VarChar (size)

Database Data Type	IDE Data Type
CHARACTER_LARGE_OBJECT, CLOB, TEXT	VarChar (4000)
DATE, TIMESTAMP, TIME, DATETIME,	Integration: Date Time Target: Localized Date Time
RAW16	No IDE Data Type. User must select a data type or delete the column.
IMAGE	No IDE Data Type. User must select a data type or delete the column.
BLOB	No IDE Data Type. User must select a data type or delete the column.

Data Source Extraction Customization

Integration with data sources is performed using File Based Integration (FBI). In order to generate the query executed for the data source, the ETL indicates to the FBI module which source entity to extract. The FBI then extracts the correlating metadata definitions, and uses them in order to formulate a query.

Tasks

This section includes the following tasks:

Customize the Source Model

You can customize the generated query by modifying the source entity xml file. This updates the source metadata in the Data Warehouse and matches it to the customized source.

1. Modify the xml and load it into the Data Warehouse metadata repository, use dw_import_defs.bat.
2. Change the SQL query from the FBI log and run the query on the source database make sure the query is correct and can run without errors.
3. Identify all of the changes.

There are various types of customizations to the source models supported by the DWH. This document emphasizes cases where the data source that you extract information from is based on RDBMS, and entities which are already modeled in the DWH have had field names or table names changed in the data source's structure.

The Data Source's source model metadata xml files are located under:

**<HP-XS>\agora\ContentPacks\<CPname>\dataModel\dataIntegration\source\
<CPName>\<product_version>\<DB_type>\<entity_name>.xml**

> **Example** C:\<HP-
> XS>\agora\ContentPacks\SM\dataModel\dataIntegration\source\SM\9.2\oracle\SM_
> INCIDENTSM1_SRC.xml

Make changes in a field name

- Open the entity xml source model file and update the source field names in the **datasourcecolumnname** property in the **ColumnMapping** tag:

> **Example**
>
> <ns1:ColumnMapping extractioncolumnidentifier="<identifier>" notapplicable="N" >
>
> <ns1:DataSourceMapping datasourcetablenameoraliasname=" <name>"
> datasourcecolumnname=" source field name" datasourcecolumntype="XXXXX"/>

</ns1:ColumnMapping>

Make changes in a table name

1. Open the entity xml source model file and update the **DataSourceJoin** and **DataSourceWhere** tags with the changes.

Examples

<ns1:DataSourceJoin>table name</ns1:DataSourceJoin>

<ns1:DataSourceWhere>field name=1</ns1:DataSourceWhere>

<ns1:DataSourceJoin>table1 A LEFT JOIN table2 B ON A.AAAAA = B.BBBBB</ns1:DataSourceJoin>

<ns1:DataSourceWhere>A.AAAAAAAA IS NOT NULL</ns1:DataSourceWhere>

2. Change the **datasourcetablenameoraliasname** property in the **ColumnMapping** tag to the new value.

Example

<ns1:ColumnMapping extractioncolumnidentifier="XXXX" notapplicable="N" >

<ns1:DataSourceMapping datasourcetablenameoraliasname=" A" datasourcecolumnname=" XXXX" datasourcecolumntype="XXXXX"/>

</ns1:ColumnMapping>

Update the data warehouse metadata

1. Run the command on the source model xml update file: **C:\<Installation Directory>\agora\DataWarehouse\bin>\dw_importdefs.bat –topdir <SOURCE MODEL XML FILE DIR>**
2. Start the ETL again using the DW ABC Streams Management UI. For details, see Content Flow Management in the *IT Executive Scorecard Administrator Guide*.

Create an Entity from an Excel File

You can generate an entity from an Excel file using the IDE Engineer Stream Designer. In the source entity Properties, you must specify the Table Name/Join Condition field as the Excel file and the Where field as the Excel worksheet. After you generate your content, make sure to activate the new Content Pack in the Data Source Management UI as an **Excel file** in the **Data Source Type** field. For details see "Activate New Content " on page 84
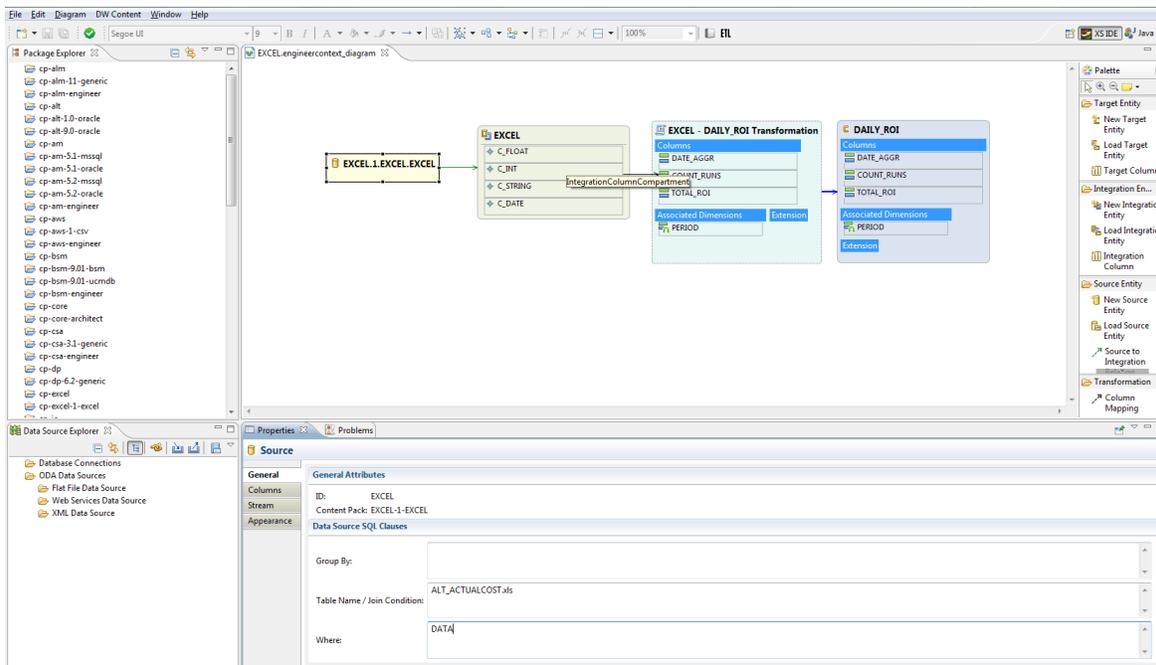
| Tasks | UI Description |

Tasks

Generate an entity from an Excel file

1. Define a new Content Pack project. For details see "Define New Content Pack Project" on page 59.
2. Define the Architect Target Designer project and create the Target entity. For details see "Architect Target Designer Tasks" on page 34.
3. Define the Engineer Stream Designer project. For details see "Engineer Stream Designer Tasks" on page 46.
4. Proceed with the Engineer Stream Designer tasks by loading the relevant entities.
5. Select **New Source Entity** in the Source section and click the canvas. A Source entity is displayed.
6. Click **Source to Integration Relation** and drag the display arrow from the Source entity to an Integration entity. All columns from the Integration entity are copied to the Source entity with default values.
7. Click the Source entity.
8. In the Properties tab of the Source entity, enter the excel file name in the **Table Name/Join Condition** field, for example ALT_ACTUALCOST.xls
9. In the Properties tab of the Source entity, enter the excel worksheet name in the **Where** field, for example DATA.
10. Add columns and perform mapping as necessary. The column names have to match the actual excel file columns.

UI Description

Excel

Properties tab for Source

To view the Properties tab, right-click on the specific entity and click **Show Properties View.**

UI Element	Description
General tab	**General attributes:** ● **ID.** The entity ID. ● **Content Pack.** The Source Content Pack information. **Data Source SQL Clauses:** ● **Group by.** This field is not applicable. ● **Table Name/Join Condition.** Enter the Excel file name including the extension. It can have the .xls, or .xlsx extension. ● **Where.** Enter the specific excel worksheet name.
Columns tab	Displays column information. The Source entity receives all of the Integration entity properties. ● **ID.** The ID of the column. It is taken fro the mapped integration column and is read-only. ● **Type.** Select **Fixed**, **Direct**, or **Rule**. If you select **Fixed**, you must enter a Fixed Value. if you select Rule, you must enter the Calculation Rule. ● **Not Applicable.** ● **Table Name.** Based on table name entered in the General tab. Relevant only if **Direct** type is selected. ● **Column Name.** The field name. Must be what appears in the excel file columns.

UI Element	Description
	• **Fixed Value.** The fixed value of the column. Relevant only if **Fixed** type is selected. • **Calculation Rule.** The calculation rule of the column. Relevant only if **Rule** type is selected. The IDE does not support non UTF-8 characters in the **Calculation Rule** field.

Next Steps

Following the IDE content development and extension process, you have created additional Content Packs for use in the Data Warehouse. This provides data to IT Executive Scorecard. Using the tools of IT Executive Scorecard, you can customize and modify your data, in order to access and display it according to specific formulas and parameters. The process includes:

- **Create a custom FBI Extractor:** Enables you to develop and modify an extractor for use with new content. For details, see the *FBI Extractor SDK Guide*.

- **Manage the Data Sources:** Enables you to manage the integration of extended or new data into the data warehouse through the activation of data sources.

  To access: In IT Executive Scorecard, select **Admin** > **Data Source Management.** For details, see Data Source Management in the *IT Executive Scorecard Administrator Guide*.

- **Manage the ETL:** Enables you to perform the essential tasks related to ETL and stream functionality. It displays the state of active streams, and enables you to schedule and control stream activity. It also allows you to view the historical data and the archived stream definitions. All ETL management and functionality is accessed and performed through the Content Flow Management men in the ADMIN tab.

  To access: In IT Executive Scorecard select **Admin** > **Content Flow Management**. For details, see Content Flow Management in the *IT Executive Scorecard Administrator Guide*.

- **Create your Context in the Context Designer:** Enables you to create and manage Contexts (universes). The universes can be based on your target schema tables or on .CSV files that can be uploaded to the target schema using the Context Designer.

  To access: In IT Executive Scorecard, select **Admin** >**Semantic Layer > Semantic Layer**. The Context Management page opens. For details, see Semantic Layer - Context Designerin the *IT Executive Scorecard Content Reference Guide*.

- **Create KPIs in the Studio:** Enables you to create and manage all of the displayed KPI elements (based on your content), as well as their interactions with each other: wiring, drill downs, and other features.

  To access: In IT Executive Scorecard, select **Studio**. For details, see Create the Executive Dashboard Contents in the Studio in the *IT Executive Scorecard Business Analyst Guide*.

- **Create Executive Pages in the XS Dashboard:** Enables you to set up pages that include components that are of interest to specific users or groups of users. For each page, the administrator defines the layout of components on the page, and the interaction of the page components with one another.

  To access: In IT Executive Scorecard, select **Studio**. For details, see Dashboard Display in the *IT Executive Scorecard Business Analyst Guide*.

- **Create CAPs:** Enables you to create Content Acceleration Packs that include Scorecards, KPIs, Dashboard pages that display the Scorecards and KPI components, Contexts (universes), and .CSV files.

  To access: In IT Executive Scorecard, select **Admin > Context Management > CAP Management**. For details, see Create Content Acceleration Packs in the *Content Acceleration Packs Guide*.

Release Notes

Compatibility

The IDE version 10.00 is not compatible with all previous XS versions.

What's New in this Version

IDE version 10.00 is compatible with HP IT Executive Scorecard 10.00.

There are no new features in IDE 10.00

Send Documentation Feedback

If you have comments about this document, you can contact the documentation team by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on Content Extension Guide for XS IDE Version 9.50 (IT Executive Scorecard 9.50)

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to SW-Doc@hp.com.

We appreciate your feedback!