# Infor Business Vault Analytic Modeling User Guide Cloud Edition

Release 11.3.x

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# About this guide

With Infor Business Vault Enterprise Edition analytic modeling, you can design hierarchies, dimensions, and cubes. You can organize and structure business data for analysis. The Enterprise Edition includes data warehouse and analytic modeling functions for the Business Vault.

This guide describes how to use the Business Vault analytic modeling functionality.

### Intended audience

This document is intended for:

- System Administrators
- Business Process Administrators
- Business Analysts
- Database Administrators
- Application Administrators

## Related documents

You can find these documents in the product documentation section of the Infor Xtreme Support portal:

- *Infor Business Vault Administration Guide Cloud Edition*
- *Infor Business Vault Release Notes*
- *Infor Data Warehouse Management Guide*

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If you have comments about Infor documentation, contact documentation@infor.com.

# Chapter 1: Infor Business Vault Product Overview

The Business Vault Standard and Enterprise Editions include these key features:

### Data Store Management

You can use the Business Vault to route Business Object Document (BOD) messages to the Raw Data Vault (RDV). The RDV is a repository that contains all versions of new and modified documents. The documents are routed through Infor ION into the RDV. To process BODs into the repository, you must setup a Business Vault connection point with ION document flows in Infor ION. The Raw Data Vault contains all variations of BOD messages.

You can use the Business Vault to extract and map content from the BODs in the Raw Data Vault to fill purpose-built relational databases, or data stores.

You can use the document trace and monitoring functions to track and troubleshoot BOD processing into the Raw Data Vault. You can use replays to load historic BOD data into a data store. Additionally, you can use replays to populate a new data store or to re-run specific BODs to update a data store. Because the BODs are stored in the Raw Data Vault, no additional processing is required from the source systems that sent the BODs.

You can configure and activate data stores and BOD mappings. Data stores are the relational databases that contain data mapped from the BODs. You can configure custom BOD mappings and import BOD mappings for the Infor Business Vault Base Data Store database. Active data stores process the information from the BODs into the relational databases in real-time, making the data available for operational reports and analysis. Use the document trace and monitoring functions to track and troubleshoot BOD processing into the data stores.

### Analytic Modeling

With Infor Business Vault Enterprise Edition, you can use analytic modeling to design cubes, dimensions, and hierarchies. This information is published to an analytics application such as Infor BI OLAP Server for business intelligence use. The analytic modeling features allow you to design level-based hierarchies, manual hierarchies, range-based hierarchies, and rule-based hierarchies. You can design standard dimensions, time dimensions, and preconfigured dimensions. You can incorporate dimensions into multi-dimensional analysis cubes, where you combine dimensions, measures, and facts. You can publish dimensions and cubes to target applications on-demand or on a scheduled basis.

# Analytic Modeling Overview

Infor Business Vault Enterprise Edition supports multi-dimensional modeling of dimensions, hierarchies, and cubes for analysis purposes. You can use Analytic Modeling to define the structure and properties of hierarchies, dimensions, and cubes without coding. The data is published to a target application such as Infor BI OLAP Server.

Analytic modeling includes several features to model information for analysis. These features are:

- Hierarchies
- Dimensions
- Cubes
- Applications
- Publishing
- Models
- Import and Export
- Localization

### Hierarchies

You can build hierarchies to organize and structure your data so that it is easily accessible to cubes, reporting, and business intelligence solutions.

These are the hierarchy types:

- Level-based hierarchy: An organizational structure to group and aggregate dimensional data into levels. This type of hierarchy is used for large customer and product hierarchies in which the levels are data-driven. Attribute values are defined at each level. You can preview a sample of the data when you define the hierarchy. New and updated data in the data source is incorporated into the hierarchy when the hierarchy is published.
- Manual Hierarchy: An organizational structure in which the hierarchy branches and leaves are defined manually. This type of hierarchy is used for smaller, fixed hierarchies like currency types and measure hierarchies with few branches and leaves.
- Rule-based Hierarchy: An organizational structure in which the hierarchy structure is defined manually, and dimension members or leaves are assigned to the hierarchy either through direct assignment or assignment rules. This type of hierarchy is used for balance sheet and income statement account hierarchies.

### Dimensions

Hierarchies are consolidated into dimensions. Dimensions are used to form the structure and context of a cube. Common dimensions are customers, products and time. The dimension has information about the customers or products, and the hierarchies structure the members by categories such as customer geography or product classifications. Dimensions contain attributes, which are additional properties to describe the dimension members.

These are the dimension types:

- Standard Dimensions: You can use standard dimensions to define the dimension’s properties including name, description, and type. Define the attributes in a dimension, and select the hierarchies

to publish in the dimension. Optionally, specify a top level node to aggregate multiple hierarchies into a dimension, and specify subsets of dimension members for analysis purposes.

- Preconfigured Dimensions: You can use preconfigured dimensions to define a more advanced dimension structure. The dimension utilizes a configuration, which is a custom configuration defined in the source database and in the Business Vault database. The preconfigured dimension shows parameters for a user to specify before saving and publishing the dimension. Preconfigured dimensions provide a method for a content provider (for example, Infor consultant or representative) to tailor dimensions for specific analysis requirements.
- Time Dimensions: You can use time dimensions for calendar dimensions and define months or days as the lowest level. You can start in any month and include any number of past and future years. Optionally, you can include additional hierarchies for year-to-date, quarter-to-date, and month-to-date. Month-to-date hierarchies are available for calendars with day defined as the lowest level. Attributes can be selected from a predefined list. Date formats and related text strings are customizable. Language localization is available for both text strings and date formats

### Cubes

Cubes are the structures for multi-dimensional analysis. Cubes combine the dimensions such as customers and products along with quantitative values, called measures. Use the cube feature to select dimensions for the cube. Specify the facts, or the transaction sources, to associate dimension and measure values. Cubes are modeled in the Business Vault and published to a target.

### Applications

Applications are used to group, or categorize hierarchy, dimension, and cube definitions. Applications are used to organize definitions and personalize your user experience. Each definition is associated with an application. When you log-on to the Business Vault to use analytic modeling, you must specify the application with which to work.

### Publishing

You can publish dimensions and cube information to a target analysis application such as Infor BI OLAP Server. The Business Vault sends the dimension and cube fact data, and provides the setup instructions to the target system. You can specify the source and target databases, cubes, facts, and dimensions to publish in a publication definition.

You can validate the publication to ensure that the definitions and data are valid for the target application. You can publish the dimensions and cubes with current definitions or with saved versions. You can run publications on-demand or on a schedule. You can monitor the publication results and access audit details for publishing results.

### Models

Models make it easier for an analytic modeling user to define hierarchies, dimensions and cubes. Models are containers for user-friendly aliases for properties and entities, table relationships or joins, custom properties or expressions, custom entities, and preconfigured dimension configurations. Models are used to provide metadata for users defining hierarchies, dimensions and cubes.

Models are associated with database connections, because the objects in a model can be associated with one or more source databases. Objects in a model are maintained directly in the hierarchy,

dimension and cube definitions. The objects are available for other definitions and database connections that share the same model.

### Import and Export

You can import and export hierarchy, dimension, and cube definitions from one Business Vault installation to another. You can export definitions to translate default locales into localized strings and import the localized values back into the definitions. You can export definitions from a Business Vault test environment and import them into a Business Vault production environment.

### Localization

You can export definitions to add localized values and import the values back into definitions. You can publish dimensions and cubes with localized values to analysis targets such as Infor BI OLAP Server.

## Analytic modeling components

These components are used for the analytic modeling functions:

- A standard database connection is used as the data source for most hierarchy, dimension, and cube definitions.
- A model or models are associated with the standard database. The models store property aliases, entity aliases, custom properties, custom entities, and relationships that you use and maintain in definitions. Additionally, models store configurations used in preconfigured dimensions.
- A target database connection is required to publish cubes and dimensions to Infor BI OLAP Server.
- A publication target definition is associated with a target database connection. A publication target definition allows you to specify the locales in which to publish data and to activate and deactivate the target.
- An application is provided by default. An application is used to group and organize hierarchy, dimension, cube, and publication definitions, and publication monitor results. An application with hierarchy, dimension, and cube definitions may be provided for you. Additionally, you can define new applications.
- Data stores and BOD mappings are provided for you if they are used to populate a data store database. The data store database may be the source of data for dimension and cube fact data.

# Chapter 2: Prerequisites

Before you use the analytic modeling features, you must:

- Have a standard database connection. A standard database connection is used as the data source for most hierarchy, dimension, and cube definitions.
- Optionally, select models to associate with the standard database. The models may be created, imported, and selected for the database connection.
- Have a target database connection. A target database connection is required to publish cubes and dimensions to Infor BI OLAP Server.
- Have a publication target definition. A publication target definition is associated with a target database connection. A publication target definition allows you to specify the locales in which to publish data and to activate and deactivate the target.
- Have an application. An application is provided by default. An application is used to group and organize hierarchy, dimension, cube, and publication definitions, and publication monitor results.
- Optionally, import analytics content with a model, hierarchy, dimension, and cube definitions. By importing content, it is associated with the application that you are using.
- Optionally, setup a data store and BOD mappings if the source of dimension and cube fact data is a data store database with models, hierarchy, dimension, cube, and publication definitions.
- Most or all of these steps may be completed if the Infor Business Vault is configured with an Infor Analytics application.

## Standard database connection

A standard database connection identifies the source of dimension, hierarchy, and cube fact data for analytic modeling.

Additionally, a standard database connection is used to define the database for data stores. A data store is a Business Vault definition used for database tables, columns, and BOD mappings. Data stores define the relational database tables and columns into which BOD data is structured and loaded. BOD Mappings provide the instructions to extract the BOD data and load the data into tables.

# Models

Models contain user-friendly entity and database column names, called aliases, custom properties, relationships between entities and configurations. Models are optional. They provide a user-friendly method of using, managing, and enhancing the metadata associated with a source database.

Models are not required for analytic modeling, but they are helpful. You can create a new model or import a model. If you are using Infor-delivered content, a model is provided for you. An Infor provided model is locked. This indicates that you can use it with a standard database connection, but it is not editable.

# Target database connection

A target database is used to publish dimensions, cubes, and data to Infor BI OLAP Server. The target database indicates the Infor BI OLAP Server *Load from Source* database. The *Load from Source* database is the interface database between the publishing processes of the Business Vault and Infor BI OLAP Server. The Business Vault sends instructions to build dimensions, cubes, and load facts to the target database when dimensions and cubes are published. Infor BI OLAP Server reads instructions and processes jobs from the *Load from Source* database.

# Publication target

A publication target definition is associated with the ttarget database connection. The publication target definition allows you to specify the locales in which to publish dimension and cube data.

You must have at least one publication target to publish dimensions and cubes. If you publish dimensions and cubes to multiple Infor BI OLAP Server databases, then you can have multiple publication targets.

To define a publication target, see Publishing dimensions and cubes on page 131.

# Applications

An application is used to group and organize hierarchy, dimension, and cube definitions. The definitions are associated with an application. When you log-on to the Business Vault, you are working within an application. The application is listed in the top right of the menu.

When you use Analytic Modeling, new definitions are associated with the application that you are working within. If you import hierarchy, dimension, and cube definitions, then they are associated with the application in which you are working. Publications are also associated with an application.

You select the application to use when you log-on to the Business Vault. If you are authorized to the BVAdmin role, then you can change the name of the default application, and you can create new applications.

See Applications on page 38.

## Analytics content

If you are using an Infor analytics application, then the application installation can include hierarchy, dimension, cube, and publication definitions.. The definitions are delivered in an export `.zip` file and are imported into the Business Vault.

# Chapter 3: Database connections

A database connection contains the database information and connection details for a source database and a target database.

Standard or source database connections define the database to use as a data store. Additionally, a standard database connection is used to define the source database for dimensions and cube fact data. A standard database connection can have models associated with it.

Target database connections are used in analytic modeling to identify the database into which dimension, cubes, and facts are published. The target database in Infor BI OLAP Server is the Load from Source database.

The BVAdmin security role is required to access the Database Connections to create, edit, delete, import, or export analytic modeling models. Additionally, the BVAdmin role can also remove analytic modeling database views. The BVAdmin role can view the database connection definition name, description, and database type.

**Note:** If you make a change to a database connection while a BOD mapping is active for data stores and BOD mappings, then the BOD mapping will continue to process with the previous database connection definition. For the changes to take effect, you must stop and restart the Business Vault User Interface (UI), Raw Data Vault, and BOD Mapping services. You can deactivate and reactivate the data store.

## Viewing standard database connections

1. Log in to Infor Business Vault as BVAdmin.
2. 2 Select **Administration > Database Connections**.
3. Click **drill-down** to update an existing standard connection. The database connection usage type is Standard.

   Standard database connections are used for data stores and BOD mappings. Additionally, standard database connections identify the source of data to use when building hierarchies, dimensions, and cubes.
4. View this information:

   **Name**
   The unique name for the database connection

**Description**
The description for the database connection

5 Click **Back**.

For analytic modeling, click the **Models** tab to add, update, import, and select models to associate with a standard database connection.

See Models on page 31.

# Target database connections

Target database connections are used in analytic modeling and identify the target database for publishing dimensions, cubes, and facts to Infor BI OLAP Server. The target database is the *Load From Source* database that is set up and configured for Infor BI OLAP Server.

A target database connection is associated with a publication target definition. The publication target definition specifies the locales in which to publish dimensions and cubes.

## Viewing target database connections

1 Log in to Infor Business Vault as BVAdmin.
2 2 Select **Administration > Database Connections**.
3 Click **drill-down** to update an existing target connection. The database connection usage type is Target.

A target database connection identifies the database into which dimension and cube definitions and data are published.

4 View this information:

**Name**
The unique name for the database connection

**Description**
The description for the database connection

5 Click **Back**.

A Publication Target definition must be associated with a target database connection.

# Removing analytic modeling views

Analytic modeling database views are created when you validate and publish dimension and cube facts. These views are not used after validation and publication processes end. You can remove these views for source database connections.

Before you remove views, ensure that no validation and publication processes are running. Additionally, you must deactivate the publication schedules.

1. Log in to Infor Business Vault as BVAdmin.
2. Select **Administration > Database Connections**.
3. Select a standard database connection and click **Remove Views** at the top of the page.
4. Click **OK** on the warning dialog. The **Remove Views Results** dialog is displayed.

   The **Removed** field displays the number of views that were successfully removed from the source database. If there are no views to remove, the value of zero is displayed. The **Unable to be removed** field shows the number of views that could not be removed. If views are not removed, confirm these conditions and rerun the process:

   - A valid standard database connection is selected.
   - The database server where the Business Vault is installed, is running.
   - The validation and publication processes are not running.
   - Publication schedules have been deactivated.
5. Click **OK** to close the dialog.

# Chapter 4: Properties and custom model objects

You can use the **Properties** pane and the **Entity** prompt in the definition functions to use entities and properties. You can maintain and use custom model objects such as:

- Custom entities
- Custom properties
- Property aliases
- Entity aliases
- Entity Relationships

The Infor Federated Services security role of **`BVAdmin`** role is required to add, update, and delete aliases, custom properties, and relationships in editable models. The Infor Federated Services security role of **`BVUser`** role has access to use the model objects in the **Properties** pane and **Entity** field.

## Properties and custom model objects overview

The **Properties** area is used in many Analytic Modeling functions, such as, the Level-Based Hierarchy definition, Rule-Based Hierarchy definition, Standard Dimension definition, and Cube definition.

The **Properties** area shows the fields, or items, that are available to use in the definitions. Additionally, it shows the properties associated with the database connection's entity that you select for the definition. For example, if you select a database connection for the Infor Business Vault Base Data Store database and select the Customer entity, then the properties or fields in the Customer entity are displayed in the Properties pane. You can use the properties in the Properties pane for captions, unique IDs, sort by values, and attribute value, depending on the type of definition.

Properties can be dragged from the **Properties** pane into fields for Caption, Unique ID and Attribute values. You can also select a property from a definition field, like Caption and Unique ID fields, that have drop-down fields.

The properties in the **Properties** pane include regular, standard, and custom properties. Regular properties are physical database table or view columns in the entity selected for the definition. Custom properties are custom expressions or calculations, added into the entity to provide additional properties for definitions. You can add, maintain, or delete custom properties in the Properties pane.

When you use the **Properties** pane, the properties may have user-friendly names, called aliases. Aliases make it easier to understand the property when you build a definition. For example, instead of

viewing a physical column name such as PID_ID, the alias Customer ID is displayed. You can optionally change the aliases to make them more recognizable to your organization.

The **Properties** pane is not limited to the definition in which you are creating or maintaining at the time. The properties are available for any definitions that use the same or related database connection. In this example, a related database connection is a database that shares the models associated with the database connection that you are using in the definition. For example, if the Customer entity is renamed to Client, then all definitions that reference the Customer entity show Client instead. Any new definitions that have an Entity selection list the Client entity instead of the Customer entity.

Relationships are joins, or associations, between two entities. Related entities provide a method to create definitions with properties from multiple entities. Relationships between entities are maintained in the Properties pane. The related entity and its properties are available to use in a definition, and the related entities and properties are used in the publishing process.

Relationships can be used to extend the tables. If you have custom tables or views in the data store database, then you can create relationships to the custom tables to add the properties from the custom tables into your definitions.

A relationship between two entities is based on a condition where values in the first entity equal values in the second entity. When you setup relationships, you can add filters to specify these conditions.

Custom entities provide a duplicate entity for a database table or view. You can use a custom entity in a definition the same way you use a regular entity. The custom entity can have different properties and different aliases associated with it. Each entity can have separate names, for example, item number versus product number. A custom entity can also have a filter to select only records applicable for the entity. For example, the products entity can have a flag or indicator to filter for sellable products only. When the custom entities with filters are used in definitions or are published, the entity data that matches the filter criteria is selected.

# Assigning or editing an alias for a regular property

An alias is a user-friendly, substitute name for a property or field, associated with an entity. An alias can be assigned to a regular property. When you assign an alias, the new alias is displayed in the definition in which it is assigned. The new alias also appears in other definitions that reference the same property.

1. Select a property in the **Properties** pane.
2. Right-click the property and select **Assign Alias**. The Alias dialog is displayed.
3. Specify an **Alias** for the property or change the **Alias**. The Alias box shows the alternate aliases supplied in the models and the physical name of the property.
4. Click **Save**. The property's alias is displayed in the **Properties** area. The new alias is displayed everywhere in the definition that the property is used. All users referencing this property can view the new alias.

# Deleting an alias for a regular property

After an alias is assigned to a property, it can be deleted. When you delete an alias, the alias or physical column name is displayed in the definition in which you are assigning it. The current alias or physical column name will also appear in any other definitions that reference the same property. You can only remove the aliases that you have access to update. You cannot remove the alias in a locked model.

1. Select a property in the **Properties** pane.
2. Right-click the property and select **Assign Alias**.
3. Clear the **Alias** value for the property.

   The original property name or top-level alias is displayed in the **Properties** pane. The current alias or physical column name appears anywhere in the definition in which the property is used. The new alias is displayed for all users when the definition that they are editing is refreshed.
4. Click **Save**.

# Viewing technical details for a regular property

You can view additional technical details, such as data type, for a regular property.

1. Select a regular property in the **Properties** pane.
2. Right-click the property and select **Technical Details**. The **Technical Details** dialog is displayed with this information as read-only:

   **Original Column**
   The physical column name of the property is displayed.

   **Table Name**
   The physical table name of the entity in which the regular property is stored. The table is a physical table in the database associated with the database connection used in the definition or joined by a relationship to the entity in the database.

   **Data Type**
   The data type that is specified in the database for the property is displayed. The data types are: integer, nvarchar, decimal, boolean, or datetime.

   **Allows NULLs**
   This indicates if the column allows null values. In an analysis cube null values are not allowed.

   **Length**
   This is the column length of the property in the physical database.

   **Decimal Places**
   The number of decimal places are displayed for a numeric property.

   **Default Value**
   This is the default value for a property used for the initial creation of a record in the entity.

**3** Click **Close**.

# Creating custom properties

To add new properties to an entity, you can create a custom property. Custom properties contain an expression to calculate the value of the property. Custom properties are associated with an entity, and are available for any definition that uses the same entity.

To create a custom property, specify an expression for the custom property in valid Microsoft SQL Server syntax. You can specify an expression or a constant value. The field names that are used in the expression editor, must be the physical database table and column names. Property aliases are not accepted.

In the expression syntax, you can use fields that are associated with the base table in a data store or locale. Additionally, you can use a translation table that is associated with a base table. The base and locale tables are defined in the Business Vault Data Store BOD Mapping function. The expression editor is limited to fields from the base and the locale tables. You cannot create an expression to include fields from additional tables or views.

For example, the Infor Business Vault Base Data Store database has BOD mappings for the `Item Master` noun. The main table is `ITEM`, and the locale table is `ITEM_LC`. In the **Properties** pane, fields from the `ITEM` and `ITEM_LC` table are displayed in the Properties list. You can use the **Technical Details** option to determine if the fields are in the base or locale tables.

- To specify a base table field in an expression, use the `$Base$` keyword and use the syntax **`$Base$.TableColumnName`**. The `$Base$` keyword is case-sensitive. Use a period, no spaces, between the `$Base$` keyword and the table column name. The table column name must be the physical column name. Aliases cannot be used. For example, to use the Item ID from the Item Master table, specify **`$Base$.IMH_IID_ID`**.
- To specify a locale table field in an expression, use the `$Locale$` keyword and the syntax **`$Locale$.TableColumnName`**. The `$Locale$` keyword is case-sensitive. Use a period, no spaces, between the `$Locale$` keyword and the table column name. The table column name must be the physical column name. Aliases cannot be used. For example, to use the Item Description from the Item Master locale table, specify: **`$Locale$.IMH_DSC`**.
- You can a base table field and a locale table field in an expression to create a custom property. For example, to create a custom property for Item ID-Item Description, specify: **`$Base$.IMH_IID_ID + '-' + $Locale$.IMH_DSC`**.

**Note:** Ensure that you use values that result in `SELECT` syntax as opposed to `DELETE`, `UPDATE`, or `INSERT` statements or calling stored procedures that affect the integrity of the source database. For example, do not call a stored procedure or add a `DELETE` table expression.

The expression syntax is not validated by the Business Vault. If an expression is entered incorrectly and the syntax is not valid, then the dimension or cube will fail during the publication process.

To create a custom property:

**1** Click **Add Custom Property** in the **Properties** pane.

**2** Specify a **Name** for the custom property.

3 Specify the **Expression** for the custom property in valid Microsoft SQL Server syntax. You can specify an expression or a constant value.
4 Click **Save**. The custom property is displayed in the **Properties** area. Properties are listed in alphabetical order. You can use the custom property in the definition. Select the appropriate data type for the property when you specify the custom property in a definition.

# Editing custom properties

Custom properties are associated with an entity, and are available when you are editing a definition. You can use a custom property in any definition that uses the same entity.

1 Select a custom property from the **Properties** pane.
2 Right-click the property and select **Edit**.
3 Edit the custom property **Name** or **Expression**.
4 Click **Save**. The custom property is displayed in the **Property Browser**. If a new name was specified, the references in the browser are changed on any definition that references the custom property. The updated expression is used when a definition is published.

# Deleting custom properties

You can delete a custom property if it is no longer needed. Custom properties that are used in a definition cannot be deleted. You must remove the references to the custom property before it can be deleted. You cannot delete regular properties or custom properties in an Infor model.

1 Select a custom property in the **Properties** pane.
2 Click **Delete Custom Property**. Click **OK** to confirm the delete.

**Note:** If the custom property is currently in use, click **Details** to list all locations where the custom property is used, such as a dimension definition. You must remove the references to the custom property in each definition before you can delete the custom property.

# Refreshing custom properties and custom objects

You can refresh regular and custom properties in the **Properties** pane while you are editing a definition. If you are adding, updating, or deleting custom properties or adding or updating aliases, then the changes are displayed immediately. However, if the custom properties or aliases on the same entity in a definition are being edited by another user, you must refresh your definition to view the changes.

To refresh the Properties pane:

Click **Refresh** in the **Properties** pane. Both custom properties and regular properties are refreshed. Any new aliases for entities and properties, new custom entities, new custom aliases and new relationships are displayed.

# Creating relationships

You can use the **Properties** pane to add entity relationships. You can join a source and a target entity and you can use filters to specify the join relationship between the entity properties. The relationship is defined as a many-to-one relationship between the source and the target entity.

When you create relationships, you can add conditions to associate the source entity with the target entity. You can use the filters dialog to add the conditions. Although the filters are optional, you should define the relationship properly to achieve the correct results. You can create relationships for a source and target entity that is a regular entity reference for tables and views in the data source. You also can create relationships between a regular entity and a custom entity.

The **Properties** dialog does not distinguish between a property that has a relationship and a property that does not have a relationship. A gray triangle appears next to each property whether the property has an associated relationship or not. Because there is no visual indicator to identify where a relationship can be found, you should add relationships in a general property or add relationships under the entity's key values, to make them easier to find.

To create a relationship:

1. Select a property within the **Properties** pane.
2. Click **Relationship**. The relationship icon is a right-facing triangle in the second column of the **Properties** pane. Next to every property, a relationship icon is displayed. The title of the **Properties** pane is changed to Relationships.
3. To add a new relationship, click **Add Relationship**.
4. Specify this information.:

   **Name**
   Specify a name for the relationship.

   **Source Table**
   The entity in which you are creating the relationship, is defaulted into the Source Table. The entity can be a database table or a view.

   **Property**
   This is the property that was selected for the relationship.

   **Target Table**
   Select a target table from the drop-down list. The target table options are the tables and views in the Database Connection database.

5. Click **Add Filter** to create the relationship between one property or constant in the source table.
6. Select **Constant** or **Property** for the source entity. If you select a **Constant**, specify the value for the constant. If you select a **Property**, select a property from the source entity.

7 Specify the **Comparison operator** to define the relationship.

8 Select **Constant** or **Property** for the target entity. If you select a **Constant**, specify the value for the constant. If you select a **Property**, select a property from the target entity.

9 Click **Add Advanced Filter** to create multiple filter relationships. You can build multiple simple and advanced filter conditions and nest the filter conditions for more complex logic. You can select logic for:

- All of the following are true
- Any of the following are true
- None of the following are true

10 To save the relationship, click **Save**.

11 To navigate to the **Properties** pane for the target table, click the **Relationship** icon next to the relationship name.

The **Properties** pane shows the name of the target entity and the properties in the target entity appear in the Properties list. You can use the properties from the related entity in your definitions. You can also add custom entities in the related entity. You can add another relationship from the related table to another entity.

# Editing relationships

1 Click the **Relationship** icon next to the property with the relationship to edit. The title of the **Properties** pane is changed to Relationships. Relationships that are associated with the property are displayed.

2 Right-click the relationship and select **Edit**.

3 You can edit the relationship **Name** or **Selection Criteria** filters.

4 To save your edits, click **Save**.

# Deleting relationships

You can delete a relationship that is no longer needed.

1 Click the **Relationship** icon next to the property that contains the relationship. The title of the **Properties** pane is changed to Relationships and the relationships are displayed.

2 Select the relationship to delete and click **Delete Relationships**.

3 Click **OK** to confirm the delete.

**Note:** If the relationship is currently in use, then click **Details** to show all locations where the relationship is used. You must remove the references to the definitions to continue with the delete.

# Syncing a property

When you select a property in a definition, such as a level-based hierarchy caption or an attribute value, the property can be associated with the entity displayed in the **Properties** pane. Alternately, it can be associated with a related entity that is not currently displayed in the **Properties** pane.

You can use the **Sync Property Browser** option to display the entity from which the property is associated. This option is available for regular and custom properties.

1. In a definition that has a **Properties** pane, right-click the property, such as a **Caption** or **Attribute Value**.
2. Select **Sync Property Browser**. The **Properties** pane shows the entity associated with the selected property. The property that you have selected is listed in the Properties list.

# Viewing property history

When you select a property in a definition, such as a level-based hierarchy caption or an attribute value, the property can be associated with the entity displayed in the **Properties** pane. It can be associated with a related entity that is not currently displayed in the **Properties** pane.

If a property is associated with an entity that is not currently displayed, then you can use the navigation features to navigate through the related tables. The Back option has two functions:

- Navigate through the related entities to the property's entity.
- Right-click the **Back** option to view the navigation history through properties and related entities.

You can view the property history for regular and custom entities.

1. Select a property from within a definition, such as a level-based hierarchy caption or attribute value. Alternatively, select a property from a related entity or a relationship in the **Properties** pane.
2. If the property is associated with a related entity, the **Back** option for the property is enabled.
3. Right-click the **Back** option. A **Navigation History** context menu is displayed.
4. The navigation history shows the related properties or relationships associated with the property. For example, if you drilled down a property, then the entity and the property name show in the history menu. If you drill-down on a relationship, then the property used to obtain the association is displayed as read-only in the history menu.
5. Click any of the entries in the menu to navigate to that area. For example, if you select a property, then you are directed to the property selected.

# Creating custom entities

You can create a custom entity to create a duplicate entity for a database table or view. You can use a custom entity the same way you can use a regular entity.

When you create a custom entity, aliases that are associated with the original entity are not applied. The new entity shows the physical names for each property. You can assign aliases to the properties to make them recognizable.

Optionally, you can add filters to a custom entity to select specific records from the source. For example, if you have a codes table with all code types in the data source, then you can create a custom entity for countries and only include codes with a code type of Country. You can add a filter to the Countries custom entity to select only records with a code type of Country. When the Countries custom entity is used in a definition or published, only records that have a Country code are selected.

1. Within a definition that contains an **Entity** field and a **Properties** pane, select a **Database Connection**.
2. Select an **Entity** to duplicate for your new custom entity.
3. Right-click the entity and select **Add Custom Entity**.
4. Specify a **Name** for the new entity. The **Original Entity** value is displayed.
5. Select **Add Filter** to specify a single selection condition.
6. Select a **Property** on which to base the custom entity.
7. Specify the **Comparison operator** to define the criteria.
8. Specify a **Constant** on which to base the selection.
9. Select **Add Advanced Filter** to define multiple selection criteria. You can build multiple simple and advanced filter conditions and nest the filter conditions for more complex logic. You can select logic for:
   - All of the following are true
   - Any of the following are true
   - None of the following are true
10. Click **Save**. The new entity name is displayed in the drop-down list on the Entity field.
11. Select the custom entity from the drop-down list. The **Properties** pane shows the properties associated with the custom entity.
12. To assign aliases to the properties, right-click the property and select **Assign Alias**.

# Deleting custom entities

You can delete an entity that is no longer required.

1. Within a definition that contains an **Entity** field and a **Properties** pane, select a **Database Connection**.
2. In the **Entity** field, select the custom entity to delete.
3. Right-click the custom entity and select **Delete Custom Entity**.
4. Click **Yes** to confirm the delete.

   **Note:** If a custom entity is currently in use, click **Details** to show all locations where the custom entity is used. You must remove the references to the definitions in order to continue with the delete.

# Viewing physical entity and property names

When you edit definitions and view entity and property names, the aliases are displayed. The alias is a user friendly name for a database table, view, or database column. You can change your setting to show the physical table, view, and property name. The setting is active while you use the Business Vault.

You can select the **Show Aliases** option to view the aliases. Unselect the option to show physical entity and property names in the definitions.

To change the **Show Aliases** option:

1. Select **Administration > Settings**. The **Settings** dialog is displayed.
2. To show physical entity and property names, uncheck the **Show aliases** option. The default value is **Show aliases** so entity and property aliases are displayed when you edit definitions.
3. Click **Close**. The physical entity and property names are displayed when you edit a definition.

   **Note:** The setting is reset to the default value of **Show Aliases** when you close the session or refresh the browser.

# Chapter 5: Models

A model is a collection of objects that represent and enhance the physical database tables and columns of a source database. When you define hierarchies, dimensions, and cubes, you select the database connection and entity to associate with the definitions. For example, when you define a Customer hierarchy, you select the source database and the Customer entity. The model provides the user-friendly names of Customer, Customer ID, and Customer Name. The names for the entity and properties are easier to identify than viewing the physical database table and field names.

Models are associated with source database connections. You can access models through the Database Connections function. You can associate multiple models with a database connection, and stack them in priority order. You can create a model for your organization to override and enhance Infor-provided content or to build definitions for a source database.

Models that are delivered as part of your Infor application are locked. These models cannot be edited. To customize and enhance the content, you can setup and use your own models. If your organization uses Client and Vendor, you can store these user-friendly names in a model for your organization. If your organization adds objects to a source database, you can define relationships to these objects in your model and they are available for definitions.

You can import and export models in the Database Connection function. You can add and rename a custom model that is not an Infor-delivered model. You must be assigned the BVAdmin role to access this function.

The model provides entity aliases, field aliases, custom properties, custom entities, and relationships. These are maintained directly in the hierarchy, dimension, and cube definitions. Field aliases, custom properties, and relationships are maintained in the Properties pane. They are available in the level-based hierarchy, rule-based hierarchy, standard dimension, and cube definition functions. In addition, an editable model must be associated with the database connection that is selected in the definition.

See Properties and custom model objects on page 21.

Configurations are maintained outside of the Business Vault application's user interface.

For more information on defining configurations, contact your Infor ICS representative.

## Understanding object types in a model

These are the object types stored in a model:

- Entity aliases

User-friendly names for the physical database tables and views.

- Field aliases

  User-friendly names for the physical database table columns.

- Relationships

  Joins between two database tables, views, or custom entities.

- Custom properties

  User-defined expressions using constants or calculations to add new properties.

- Custom entities

  Duplicate copies of physical tables or views in a source database. Custom entities may have different aliases and filter conditions. For example, an `ITEM_MASTER` table is used to store both purchased items and products for sale. For Sales content, you can use the Products entity to show names such as Product ID, Product Code, and Product Name. For Purchasing content, you can use the Item entity to show names such as Item ID, Item Description, and Item Class. The underlying source database table is the same, but the table is represented differently for ease of use.

- Configurations

  Predefined procedures used to build hierarchies and complex dimensions, such as time dimensions. Configurations must be defined outside of the Business Vault user interface before they are available for use. You can use them through the Preconfigured Dimension function.

  In Analytic Modeling, the model objects are automatically displayed and accessible within the definitions. When you publish dimensions and cubes to a target, the relationships, custom properties, and configurations are used to build the data sent to the target.

# Understanding model benefits

Models provide these benefits:

- Re-use
  - You can use the same models for different source databases. For example, you can use the same model for a test environment database and a production environment database.
  - You can use models for consistency. You can use common objects throughout modeling. For example, if you rename Customer to Client, then the new alias is available immediately to all users. It is applied to all definitions that reference the model.
- Flexibility
  - You can maintain your own model and override the Infor models. For example, if an Infor model references a Customer table, then you can change the name to Client. In addition, you can add custom tables. You can add user-friendly names, relationships, custom properties, and virtual tables to the tables in definitions and cubes.
  - Models can evolve as new content is added and updated. When new tables and fields are introduced, the models can incorporate the changes.
- Portability
  - You can export and import models into different Business Vault installations. If you have multiple Business Vault installations, then you can move the models from one installation to another.

- You can install Infor models to use with Infor data sources. When Infor delivers a database that is used as a source for analytical purposes, Infor can prepare and install models into the Business Vault application.

# Using models

Use the Standard Database Connection definition to create new models, edit model names and descriptions, delete empty models, and import and export models. A model is selected for use with a standard database connection. It serves as the metadata representation of the standard database. If you have multiple models associated with a standard database connection, then the models should be placed in priority order. If you have models provided with analytics content, then the model may be locked by Infor. Therefore, you cannot add, modify, or delete objects in the model.

You can use the **Model** tab in the Standard Database Connection definition to:

- Delete models
- Import and export models
- Select models to use for a standard database connection
- Prioritize selected models for a database connection

Infor models are provided as part of Infor analytics content. These models are provided with metadata, such as aliases, relationships, configurations, and custom properties and entities. Infor-delivered models cannot be modified. The models are locked, meaning that they cannot be updated. Only custom models can be updated.

The Infor Federated Services security role of BVAdmin is required to maintain Models in the Database Connections definition.

# Available and selected models

Available and Selected models are displayed on the **Models** tab. The available models are displayed on the left and the selected models on the right. To move an available model to the selected grid, and make it available for use, select the available model. Click the right arrow between the two grids. When models are moved from available to selected, the model is removed from the available grid.

These columns are read-only in the Available grid:

- Name

  This is the model name that is available. You can right-click a model name to display and update the model properties.

- Editable Content

  Infor-Delivered Content indicates that you cannot change the model. Infor-Delivered Content is used for the BOD mappings delivered by the Infor Business Vault Base Data Store. For Infor-Delivered Content, you cannot modify the table and column mappings except the user areas and classification code areas in the BOD mapping.

- Grid Filter

  You can use the filter to find specific models.

### Order of selected models

The order of the selected models determines the order that the models are accessed. The top model is the first model that is used when accessing the content in definitions. The models are accessed in order from top to bottom. The first model that is encountered, that contains the content to display in the definition, is used. To change the order of the models, select a model and use the up and down arrows.

See Selecting and prioritizing models on page 36.

## Creating new models

1. Select **Administration > Database Connections**. The **Database Connections** page is displayed with a list of database connections.
2. Click **drill-down** to update an existing standard database connection.
3. Select the **Models** tab.
4. Click **New** above the Available grid to open the **New Model** dialog.
5. Specify this information:

   **Name**
   Specify a unique model name.

   **Description**
   Optionally, specify a model description.

6. Click **OK** to create the new model. Click **Cancel** to exit without creating a new model.

## Editing models

In the Available and Selected grids, you can edit the model name and description of a model that is not Infor-delivered.

To edit a model:

1. Select **Administration > Database Connections**.
2. Click **drill-down** to update an existing standard database connection.
3. Select the **Models** tab.
4. Right-click and select **Edit** to display the **Edit Model** dialog.
5. Specify this information:

   **Name**
   Specify a unique name for the model.

**Description**
Optionally, specify a description for the model.

6 Click **OK** to save the changes.

## Importing models

You can import models to use with one or more standard database connections. You can use the import function to import new or updated models into a Business Vault environment. For example, you can export a model from a test environment and import the model into your production environment.

To import a model, use the **Database Connections** function. **Database Connections** is secured to users with the BVAdmin role.

To import a model:

1 Select **Administration > Database Connections**. The **Database Connections** page is displayed with a list of database connections.
2 Select a standard database connection and click **drill-down**.
3 Select the **Models** tab.
4 Click **Import**. The **Import Wizard** is displayed.
5 Browse to and select the `.zip` file to import. The file must contain at least one exported `object.zip` file and an associated `ReadMe.txt` file. Comments that are specified in the uploaded `ReadMe.txt` file are displayed as read-only in the **Comments** field. Additionally, the file includes a list of models imported from the `.zip` file. A list of model components, configurations, relationships, properties, and entities is displayed.
6 Select an option for: **If the import file contains entities that already exist, the system should:** The options are:

| Option | Description |
|---|---|
| Overwrite existing definitions with the imported versions | This option adds new model components and replaces any existing model components with matching model components contained in the import file. |
| Only add definitions that do not already exist and skip the rest | This option adds new model components, but does not replace or update existing model components. |
| Abort the entire import operation | This option aborts the import if existing model components match model components contained in the import file. |

7 Click **Import** to import the model components. A message dialog is displayed to indicate the import is successful. The imported model is now available in the Available data grid. You do not have to save the database connection after the model is imported.
8 If you import an Infor-delivered model, then the Infor-Delivered Content flag is checked. You can select and use an Infor-delivered model with a database connection, but you cannot edit or delete the model or the objects in the model.

9 To associate a model with a database connection, select the models and click **Add**. The models are displayed in the Selected grid.

See Selecting and prioritizing models on page 36.

## Selecting and prioritizing models

When you create new models or import models, the models are displayed in the Models Available grid. Available models are models in the Business Vault that can be selected with the standard database connection. Selected models are the models selected to use with the standard database connection.

**Note:** The Business Vault does not validate selected models to ensure that the standard database is represented in the metadata of the model.

You can associate the same models with multiple standard database connections. When objects, such as custom entities or relationships, are added to the model through the definitions, the objects are available to use with any database connection that uses the model.

To select models for a standard database connection:

1 Select **Administration > Database Connections**.
2 Select a standard database connection and click **drill-down**.
3 Select the **Models** tab.
4 Select one or more models from the Available grid.
5 Click **Add** to move the models to the Selected grid.
6 To change the priority order, select a model and use the **Up** and **Down** buttons or use the row position icon in the grid.

   The order of the selected models determines the order that the models are accessed. The top model is the first model that is used when accessing the content in definitions. The models are accessed in order from top to bottom. The first model encountered that contains the content to display in the definition is used.

7 Click **Save**.

   The top-priority editable (non Infor-delivered) model is the model in which new model objects are added when using the definition functions.

## Exporting models

When you work with definitions, the definitions can have references to custom properties, custom entities, relationships, and configurations. If you are exporting definitions, then export the models associated with the database connection. This ensures that the definitions can be imported successfully. You can import and export models from one Business Vault installation to another. For example, you can export a model from a test environment and import the model into your production environment.

To export a model:

1. Select **Administration > Database Connections**. The **Database Connections** page is displayed with a list of configured database connections.
2. Click **drill-down** to edit an existing standard database connection.
3. Select the **Models** tab.
4. Select one or more models to export.
5. Click **Export**. The **Export Wizard** is displayed.
6. Select the **Options** tab. Specify comments for the export. The comments are included in the export file `readme.txt`.
7. Click **Next** or click the **Export** wizard tab. A list of model components, configurations, relationships, properties, entities, and models selected for export are displayed.
8. Click **Finish** to continue with the export or click **x** to cancel.
9. Select a location to save the `Export.zip` file to a local file directory in the file directory window. The `Export.zip` file contains a `ReadMe.txt` file and all model components in separate zip files.

   The export zip file may contain these files:

   - `Models.zip`: Contains all the models that you exported. Each model contains an `.xml` within the `Models.zip` file.
   - `Entities.zip`: Contains all entities, alias entities and custom entities, for the models that you exported. Each entity is in a separate `.xml` file within the `Entities.zip` file.
   - `Properties.zip`: Contains all properties, alias and custom properties, for the models that you exported. Each property that is part of the model has its own `.xml` file within the `Properties.zip` file.
   - `Relationships.zip`: Contains all relationships for the models that you exported. Each relationship is in its own `.xml` file within the `Relationships.zip` file.
   - `Configuration.zip`: Contains all configurations and preconfigured dimensions, for the models that you exported. Each configuration is in its own `.xml` file.
   - `ReadMe.txt`: Contains comments specified for the export. It also contains a list of models, entities, properties, relationships, and configurations in the export file.

## Deleting models

You can delete models that have no aliases, entities, relationships, configurations, or custom properties in them. You cannot delete a model if it has any objects in it or if it is selected for a database connection. If you do not want to use the model but cannot delete it, then you can de-select the model for all standard database connections.

To delete a model:

1. Select **Administration > Database Connections**.
2. Click **drill-down** to select an existing standard database connection.
3. Select the **Models** tab.
4. Select the model to delete in the Available grid and click **Delete**.
5. Click **OK** to confirm.

# Chapter 6: Applications

An application is a way to organize data warehouse and analytic modeling content. Applications are associated with hierarchy, dimension, cube definitions, and publications.

You can setup and use applications for specific analytic content, such as sales content and finance content. You can also define your own applications for custom analytics definitions. The application that you are working within is displayed in the upper right corner of the Business Vault.

In the Business Vault, the definitions that you see on the hierarchies, dimensions, cubes, publications, publication schedules, and publications monitor are associated with the application that you are using.

You can change the application to see the content associated with a different application. A user with BVAdmin authority has the ability to create new applications and update existing applications. The BVAdmin role also has the authority to specify one default application, which becomes the default application for everyone using the Business Vault.

Using the export and import functions, you can copy definitions from one application to another. You export definitions from one application, switch the application, and then import the definitions. You have two independent sets of definitions; changes made in one application do not affect definitions in another application.

## Selecting an application

When you log-on to the Business Vault, you are within an application. The analytic modeling functions and the data warehouse functions show the content associated with the application. The selected application is displayed in the top right of the Business Vault menu.

To select a different application or to display available applications:

1. Select **Application** in the top right of the **Business Vault** page. The available applications are displayed in the **Applications** drop-down list.
2. Select an application from the list. The application label is changed and the Business Vault menu is displayed.

# Accessing applications

You can use the **Applications** menu option to create and maintain applications and to set a default application. The applications menu option is available to users with the BVAdmin role.

1. Select **Administration > Applications**.
2. The Applications list is displayed:
   - **Name**: The name of the application.
   - **Default**: The option to select the default application for all Business Vault users.
   - **Last Updated By**: The user ID of the person who last updated the application.
   - **Last Updated On**: The date and time in which the application was last updated.
3. To show more columns or remove columns on the Applications list, click **Grid Settings** and select **Column Personalization**. Select the columns to show in the list, for example, Description.
4. To refresh the application list, click **Refresh**.
5. To set an application as the default application, select the application and click **Set as Default**. The default application is the initial application for all users in the Business Vault environment.

# Adding or editing an application

1. Select **Administration > Applications**.
2. To create a new application, click **New**. To update an existing application, click **drill-down**.
3. Specify this information:

   **Name**
   Specify a unique application name. The name is displayed in the Application selection list.

   **Description**
   Specify a description. The description is displayed on the application details page.

4. Click **Save**.

# Chapter 7: Hierarchies

A hierarchy is a structure to organize data for reporting and analysis purposes. Hierarchies structure dimension data in a top-to-bottom or parent to child type structure. The hierarchy structure contains more than one parent-child level and may be several levels deep. The hierarchy members, also called nodes, are the individual items in the hierarchy.

Hierarchies provide a logical organization of dimension members. For example, you can organize customers by countries, subdivisions, and cities. Products can be organized by product type and line. The structure provides a path to view dimension information from a top-down, bottom-up or level comparisons. A common example is a customer hierarchy with levels for countries, subdivisions, cities, and customers. When you view customers in an analysis application, you can compare country statistics. You can drill-down from countries to subdivisions, from subdivisions to cities, and from cities to individual customers. Analysis statistics, like total sales or quantity sold, are aggregated to the higher-level members for countries, subdivisions, and cities.

Hierarchies are used to structure data for dimensions. Hierarchies are selected for a dimension, and are published in a dimension. Each dimension can have one hierarchy, multiple hierarchies, or no hierarchies. All hierarchies selected for a dimension must share common characteristics.

The measure dimension in a cube contains a hierarchy. Each cube has one measure dimension. This hierarchy has the quantitative values for amounts, quantities, and counts.

### Types of Hierarchies

- Level Based Hierarchy

  An organizational structure used to group and aggregate dimensional data into levels. You can use this type of hierarchy for large customer and product hierarchies in which the levels are data-driven. You can define attribute values at each level and you can preview a sample of the data in a hierarchy. When you publish the hierarchy, new and updated data in the data source is automatically incorporated into the hierarchy.

- Manual Hierarchy

  An organizational structure in which the hierarchy members are defined manually. You can use this type of hierarchy for smaller, relatively static hierarchies like currency type, company, and measure hierarchies. Manual hierarchies are also used to define range-based hierarchies. A range-based hierarchy is a hierarchy in which the analysis data is categorized into value-based classifications.

- Rule-Based Hierarchy

  An organizational structure in which the hierarchy structure is defined manually. The lowest level members are assigned to the hierarchy either through direct assignment or assignment rules. You can use this type of hierarchy for balance sheet and income statement account hierarchies. This

type of hierarchy is useful for large hierarchies in which the hierarchy branches vary in depth. For example, one hierarchy path may have four levels and another hierarchy path has seven levels.

In a rule-based hierarchy, you can assign rules to classify the lowest-level members. Rule-based assignments classify the hierarchy members according to the rules setup for a member. For example, if accounts follow a numbering scheme, then you can establish a range of account numbers to classify accounts into Travel Expenses or Product Revenue members. When new accounts are added or updated, they are assigned when the hierarchy is published in a dimension.

You can create a dimension directly from a hierarchy, or you can create a hierarchy from a dimension. All hierarchy types are accessed through the **Hierarchies** menu option. On the **Hierarchies** page, you can create any type of hierarchy definition. You can also duplicate, validate, import, export, and delete hierarchies from the **Hierarchies** page.

# Accessing hierarchies

Use the **Hierarchies** menu option to create and maintain all hierarchy types.

1. Select **Analytic Modeling > Hierarchies**. All existing hierarchies are displayed. This includes Manual, Level-based, and Rule-based hierarchies.
2. The Hierarchies list displays these read-only columns:
   - **Name**: The name of the hierarchy.
   - **Type**: The type of the hierarchy. The type is: Manual, Level-based, or Rule-based.
   - **Database Connection**: The source of the data to use for the hierarchy while building a hierarchy definition. The database connection is applicable for rule-based and level-based hierarchies. The database connection is not relevant for Manual hierarchies.
   - **Entity**: The primary entity on which the definition is based. The entity is associated with the database connection. The entity is the primary source of information for the properties used in the definition.
   - **Last Updated By**: The user ID of the person who last updated the hierarchy.
   - **Last Updated On**: The date and time in which the hierarchy was last updated.
3. To show more columns or remove columns on the Hierarchies list, click the **Grid Settings** option and select **Column Personalization**. Select the check-box next to any of the columns that you would like to show in the list, for example, Unique ID.
4. To create a new hierarchy, click **New** or click the drop down list and select:
   - **New Level-based**: Opens the Level-based Hierarchy page for you to create a new level-based hierarchy.

     See Level-based hierarchy on page 45.
   - **New Manual**: Opens the Manual Hierarchy page for you to create a new manual hierarchy.

     See Manual hierarchy on page 73.
   - **New Rule-based**: Opens the **Rule-based Hierarchy** page for you to create a new rule-based hierarchy.

     See Rule-based hierarchy on page 62.

5 To refresh the hierarchy list, click the **Refresh** icon. All hierarchies are updated.
6 To duplicate a hierarchy definition, see Duplicating a hierarchy on page 43.
7 To validate a hierarchy definition, see Validating a hierarchy on page 42.
8 To export a hierarchy definition, see Exporting definitions on page 129
9 To import a hierarchy definition, see Importing definitions on page 129.
10 To import hierarchy translations, see Importing definition translations on page 157.
11 To export hierarchy translations, see Exporting definition translations on page 155.
12 To delete a hierarchy definition, see Deleting hierarchies on page 42.

# Validating a hierarchy

When you validate a hierarchy, the hierarchy definition is checked. Validation is a batch process and the results are available in the **Publications Monitor**.

See Process report codes and messages on page 158.

You can validate a hierarchy definition to:

- Validate internal consistency within the hierarchy definition.
- Validate the hierarchy definition against the source database connection entities and properties.

1 Select **Analytic Modeling > Hierarchies**.
2 Select the hierarchy to validate. You can only validate one hierarchy at a time.
3 Click **Validate**.
4 Select one or both validation options and click **OK**.

| Option | Description |
|---|---|
| Validate the selected definition to ensure internal consistency | This option validates conditions for codes: 101, 102, 103, 104, 105, 106 and 107. |
| Validate the selected definition against the source database connection | This option validates condition for codes: 108 and 109. |

See Process report codes and messages on page 158.

5 Click **OK**.
6 Select **Analytic Modeling > Publication Monitor** to view the results.
See Accessing the publications monitor on page 142.

# Deleting hierarchies

1 Select **Analytic Modeling > Hierarchies**. All hierarchies are displayed.
2 Select the hierarchy to delete. You can select multiple hierarchies to delete.

3 Click **Delete**.

4 Click **OK** to confirm the deletion.

**Note:** If the hierarchy is currently in use, click **Details** to display a list all definitions that reference the hierarchy. You will need to de-select the hierarchy from each dimension before you can delete the hierarchy definition.

# Duplicating a hierarchy

You can duplicate a hierarchy definition to create a new hierarchy. The hierarchy name must be unique.

1 Select **Analytic Modeling > Hierarchies**. All hierarchies are displayed. This includes Manual, Level-based, and Rule-based hierarchies.

2 Select the hierarchy to duplicate and click **Duplicate**. Depending on the type of hierarchy, the information that is to be copied, is displayed.

This is the information copied:

- For a level-based hierarchy:
  - Description
  - Database Connection
  - Entity
  - Caption
  - Unique ID
  - Top Level
  - Levels and level details
  - Filters
  - Missing and unknown details
  - Attributes and attribute values for each level
- For a manual hierarchy:
  - Description
  - Hierarchy members
  - Attributes and attribute values
- For a rule based hierarchy:
  - Description
  - Database Connection
  - Entity
  - Caption
  - Unique ID
  - Sort By
  - Weight
  - Filters
  - Attributes and attribute values
  - Hierarchy structure members
  - Direct assignments and rules

3 Specify a new **Name** for the hierarchy.
4 Specify the required information.
5 Click **Save**. The new hierarchy is created.

## Importing and exporting hierarchies

To import or export hierarchy definitions, see Import and export definitions on page 128.

To import or export hierarchy translations, see Localization on page 153.

# Chapter 8: Level-based hierarchy

This section describes how to configure a level-based hierarchy.

## Level-based hierarchy overview

The level-based hierarchy is an organizational structure to group and aggregate dimensional data into levels. You can use this type of hierarchy for large customer and product hierarchies in which the levels are data-driven. Each branch in a level-based hierarchy has the same depth. If you define 3 levels, then each lowest level member, has two parent members above it in the hierarchy.

For example, a customer hierarchy can have levels for country, subdivision, city, and customer. Each customer is automatically grouped into their country, subdivision, and city levels. Each country, or branch, in the hierarchy has the same number of levels. As new customers are added or updated in the data source, the levels and customers are added and grouped in the hierarchy. Every time the hierarchy is published through a dimension, the customer information is updated to reflect the current information in the data source.

You can identify the hierarchy as a named hierarchy within the dimension. A named hierarchy is a separate, distinct, hierarchy in a dimension. Named hierarchies are incorporated in the dimension and share attributes. Each named hierarchy may have its own top-level member, hierarchy branches, number of levels, and level names. To incorporate the hierarchy as a named hierarchy, use the dimension option to use named hierarchies. Named hierarchies are available for standard dimensions that have one or more named hierarchies.

Alternatively, you can incorporate one or more unnamed hierarchies in a dimension. Unnamed hierarchies are consolidated into a single, default hierarchy in a dimension. The default hierarchy's name is the dimension display name. Unnamed hierarchies use default level numbers as level names.

You can use attributes for additional information about each level member and each lowest-level member. The attributes are shared by all hierarchy members and must be incorporated into the dimension to be published. For example, you can setup attributes for an abbreviation and a long name. The attribute values for each level member can be different. An abbreviation for a country level member can be US with a long name of United States. The same attribute values for a city level member can be an abbreviation of BOS and a long name of Boston.

Optionally, you can create a top level member for the hierarchy, for example, All Customers by Region or All Products. If a top level is added, the name does not have to be unique. If the dimension contains

multiple hierarchies, then you should make the name unique within the dimension. When the hierarchy is published in a dimension, the top level is displayed as a single member above the other levels.

You can filter the members in a hierarchy to include or exclude specific members based on member properties. For example, you can exclude deleted customers or prospects from a customer hierarchy. Filters apply to the entire hierarchy and are not level-specific.

You can also incorporate logic for missing members and unknown members. A missing member is a substitute, or replacement value, to use when the data source does not provide information for a level or a member. For example, if a customer address does not include a city, but the hierarchy has a city level, then you can specify a Missing City member as the parent level. Missing values can be assigned at each level and at the lowest level. A missing leaf member is used when a fact transaction in a cube has no dimension reference. For example, if a sales order is posted without a customer identified, then the Missing Customer is used as a substitute value. This ensures that the sales orders are included in the cube.

An unknown value is a substitute or replacement leaf member when the facts contain a dimension reference that is not in the dimension. For example, if sales orders in an analysis cube have customers that are not in the dimension, then the Unknown Member can be used as a substitute member so the sales orders are included in the cube. Unknown members may be in the data source due to a timing issue of loading customer dimension data and sales order facts. Unknown members may also be caused by incomplete source system data. When an unknown member is specified, all measure values for unknown customer references are aggregated into this single unknown value. The unknown leaf value is positioned under the missing value level parents defined at each level. The unknown leaf member is under the missing value leaf member.

You can preview a sample of the data in a hierarchy. You publish hierarchies by including them in a dimension. When you publish a hierarchy, new and updated data in the data source is incorporated into the hierarchy.

# Hierarchy level types

These are the three types of levels in a level-based hierarchy:

- The top level is the single parent member positioned at the top of the hierarchy. The top level has a caption, unique ID, and can have attribute values. A top level is optional. If you type a value into the **Top Level** field, then it is displayed in the **Levels** section in the middle of the page.
- The leaf level is the lowest level and contains the members at the bottom of a hierarchy. The leaf members have a caption and unique ID specified at the top of the page. Each leaf level includes a sort by value, that determines the sort order of the members under the parent. Each leaf level includes a weight value, that determines the aggregation value for the members as they roll-up into the parent. When you specify a caption and unique ID, the caption is displayed in the **Levels** pane in the middle of the page. The **Level Details** area shows the unique ID, sort by and weight. A leaf level may have attribute values. A leaf level may have substitute values for missing values and unknown values.
- The intermediate levels are all levels added above the leaf level. You can add intermediate levels by dragging properties from the **Properties** pane into the **Levels** pane in the middle of the page.

Each intermediate level must have a caption, unique ID, sort by value, and weight. In addition, intermediate levels have options to construct a unique ID. An intermediate level can have attribute values and can have a substitute value for missing levels.

# Level-based hierarchy page

There are many ways to setup a level-based hierarchy. The edit mode page is the primary page and has multiple areas, or panes. The areas change based on the level of the hierarchy that you are defining.

The main areas of the page are:

- The top pane contains general information such as the hierarchy name, description, database connection and entity. The top pane also includes the caption and unique ID for the lowest, or leaf, level in the hierarchy.
- The **Properties** pane contains the properties which are the fields available to use for caption, unique ID, sort by and attribute values. The **Properties** pane is available on the left side of the page.
- The **Levels** pane contains the caption for each level and is located in the center of the page. When you add a top level, the value appears at the top of the **Levels** pane. When you specify a caption in the top pane, the caption for the leaf-level appears. When you add intermediate levels by dragging them into the **Levels** pane, you drag the caption for the level. The levels are displayed in an indented tree structure. When you select a level caption, the caption turns blue, indicating that the level is selected. When a level is selected, the other areas of the page are also selected. The **Level Details** pane corresponds to the selected level, and the **Attributes** pane at the bottom of the page, corresponds to the selected level.
- The **Level Details** tab is on the right side of the page. The level details are required to define each level. The options change based on the level selected in the **Levels** pane.
- The **Missing Value** and the **Unknown Value** tabs are next to the **Level Details** tab. The **Missing Value** applies to intermediate levels and the leaf level. The options change based on the level selected in the **Levels** pane. The **Unknown Value** tab is only available for the leaf level.
- The **Attributes** pane contains the attribute name, description, type, and size for all attributes in the hierarchy. The **Attributes** pane is available at the bottom of the page. The attribute values are the values that you want to use for each attribute. Attribute values are defined separately for each leaf member, intermediate level, top level, missing value, and unknown value. When a level is selected in the **Levels** pane, you can see the caption displayed in the **Attribute** pane header. When you have a missing value or unknown value selected, you can see the caption for the missing or unknown value displayed in the Attribute pane header.
- The **Filters** pane is available in the center of the page. Filters apply to the entire hierarchy and are not level-specific.
- The **Preview** page switches the definition between the Edit mode and the Preview mode. When you edit a definition, switch to the Preview to view a sample of the results.

# Checklist for creating a level-based hierarchy

To create a level-based hierarchy, follow these steps:

1. Create a new level-based hierarchy definition.
2. Add information for the lowest level, also called the leaf level, of the hierarchy.
3. Add level details for the lowest level. Setup attributes and leaf-level attribute values.
4. Optionally add a missing value and unknown value for the lowest level in a hierarchy.
5. Add an intermediate level. Setup level details and specify attribute values for intermediate level members.
6. Optionally add a top level. Setup attribute values for the top level member.
7. Optionally add a missing value for intermediate levels.
8. Optionally filter the hierarchy.
9. Optionally preview the hierarchy.
10. Optionally create a new dimension from the hierarchy.

As you define the levels, the **Levels** page shows the level captions in a hierarchical tree format:

- All Customers (top level)
  - Country (intermediate level)
    - Subdivision (intermediate level)
      - City (intermediate level)
        - Customer Name (leaf level)

# Creating or updating level-based hierarchies

1. Select **Analytic Modeling > Hierarchies**. All existing hierarchies are displayed.
2. To create a new level-based hierarchy, click **New > New Level-based**. The **Level-Based Hierarchy details** page is launched. To update an existing hierarchy, click **Drill-down**.
3. Specify this information:

   **Name**
   Specify a unique name for the hierarchy.

   **Description**
   Optionally, specify a description for the hierarchy.

   **Hierarchy Display Name**
   Specify a display name for the hierarchy. The hierarchy display name is required for a named hierarchy. The hierarchy display name should be a unique hierarchy name in a dimension. The display name is not used for unnamed hierarchies.

   **Hierarchy Description**
   Specify a description for the hierarchy. The hierarchy description is required for a named hierarchy. The description is not used for unnamed hierarchies.

**Database Connection**
Select an existing database connection from the list. The database connection is the source of the data to use for the hierarchy.

See the *Infor Business Vault Administration Guide*.

**Entity**
Select an entity. All of the entities in the default schema of the database specified in the database connection are displayed. After the entity is selected, the **Properties** page shows the properties associated with the entity.

- Optionally, you can assign an alias for the entity. Right-click the **Entity** and select **Assign Alias**. Specify an alias name in the **Alias** dialog.
- Optionally, you add a custom entity. Right-click the **Entity** and select **Add Custom Entity**.

**Note:** If the database connection or entity is changed, then the entire page is refreshed to use the properties associated with the new database connection or entity. A **Change Properties** dialog is displayed with the details of the impact on the current definition. You will be prompted to confirm the change because it may result in losing values entered in the definition.

**Caption**
Specify a caption for the hierarchy. This is a user-friendly name displayed for the lowest level members in the hierarchy, also called the leaf level of the hierarchy. The caption may be selected from the drop-down list of properties in the entity. You may drag a property from the Properties pane into the caption field.

**Unique ID**
Select a unique ID. The unique ID is the key value for the lowest level members in the hierarchy. It should be a unique value to distinguish the members, such as a noun ID (NID) in a base data store table. The unique ID may be selected from the drop-down list of properties in the entity. You may drag a property from the Properties area into the unique ID field.

See Properties and custom model objects on page 21.

**Top Level**
Optionally, specify a top level for the hierarchy. This is a free-form text field for you to enter a caption for a top-level member for the hierarchy, such as `All Customers by Region` or `All Products`. If you specify a top level, then the name does not have to be unique. It should be unique within a dimension if the dimension contains multiple hierarchies.

4 To create or update the level-based hierarchy header information, click **Save**.

**Note:** You must still define the level-based definition details.

# Specifying levels

Levels are defined to form the structure of the hierarchy. This section explains how to specify a leaf level, or the lowest level in the hierarchy, intermediate levels and a single top-level member. Different options are available for each level type.

As you create levels, the intermediate levels of the hierarchy can be moved higher or lower. Select the level in the **Levels** pane and drag the level into another position. You cannot drag the top level or the lowest level into another position.

Level names are applicable for named hierarchies only. Levels without names, and levels incorporated in an unnamed hierarchy in a dimension, use level number names.

## Adding or updating the lowest level of a hierarchy

The lowest level of a hierarchy, also called the leaf level, is created when you specify the caption and unique ID in the top pane of the definition. You can see the **Caption** in the **Levels** pane in the center of the page. The level details for the lowest level are displayed on the right side of the page when the **Caption** is selected in the **Levels** pane.

See Creating or updating level-based hierarchies on page 48.

For usability, you can add the attributes and attribute values for the lowest level first, but it is not a requirement. Most of the attributes that you create have attribute values applicable to the leaf level members. If you add the attributes at the leaf level, then the attribute values default into the attribute values for the leaf members. For example, if you have a Customer level and select attributes for Description, Status and Status Update Date, the attribute values are sourced from the lowest level of the Customer entity, which are the individual customer values.

To update the lowest level:

1. Specify the **Caption** and **Unique ID** in the top pane of the definition.

   See Creating or updating level-based hierarchies on page 48.
2. In the **Levels** pane, specify the **Level Name**. The **Level Name** is used for a named hierarchy.

   Each level name in a single named hierarchy should be unique. If a level name for a named hierarchy is not specified, the level name defaults to a level number.
3. In the Levels pane, select the **Caption** for the lowest level. The Caption is displayed in blue to indicate that it is selected. The **Level Details** pane for the lowest level shows the Unique ID that was specified in the top pane.
4. Specify this information:

   **Sort By**
   Specify a sort by value. You can drag and drop a Sort By value from the Properties pane into the Sort By value. The Sort By is the order that the members are displayed under the parent. The default Sort By value is the caption in ascending order, but you may change it to another property.

   **Ascending or Descending**
   Specify the Sort By order of **`Ascending`** or **`Descending`**. An ascending sort shows the results lowest to highest, for example, A-Z, 1-9, or 2005-2008. A descending sort shows the results highest to lowest, for example, Z-A, 9-1, or 2008-2006.

   **Weight**
   Specify a weight. Weight is a multiplier used by the target analysis application to aggregate measure values for members to the parent. The default weight is 1. A value of 1 indicates that values are

aggregated into the parent using the actual value. You can specify another numeric value, or you may use a numeric value property. Properties are helpful if you have a numeric value, such as a rate, associated with the level members that you want to use for aggregation purposes.

5 Optionally, specify attributes and specify attribute values for the top level member and intermediate level members.

See Attributes and attribute values on page 53.

6 Optionally, specify a missing value or an unknown value for the leaf level.

See Specifying a missing value for the lowest level in the hierarchy on page 55 and Specifying an unknown value for the lowest level in the hierarchy on page 56.

## Adding or updating an intermediate level of a hierarchy

The levels above the leaf level are called intermediate levels. To add an intermediate level, select the level caption and complete the level details, level attribute values, and an optional level missing value. The **Caption** is displayed in the **Levels** pane. The **Level Details** for the intermediate level are displayed on the right side of the page when the caption is selected in the **Levels** pane.

The attribute values for an intermediate level are added in the **Attributes** pane. Select appropriate attribute values for the level for the proper results. For example, if the hierarchy has a country level and a city level, do not specify values for the city name at the country level. If you do, then the country hierarchy members will be repeated for each city.

To add an intermediate level:

1 Select a property from the **Properties** pane. Drag and drop it into the **Levels** pane. The **Caption** for the level is displayed above the leaf caption. The level is selected and displayed in blue.

2 To complete the level setup, select the **Level Details** pane. The caption for the level selected is displayed in the **Attributes** data grid next to the **Attributes** label.

3 Specify this information:

**Unique ID**
Specify a unique ID. The unique ID is the key value for the level members in the hierarchy. It should be a unique value to distinguish the members. The unique ID defaults to the Caption. To change the unique ID, drag and drop a property from the **Properties** pane into the unique ID field.

**Concatenate**
Optionally, specify the concatenate value for intermediate level members. The concatenate value determines the number of levels to concatenate above to form the Unique ID for the level members. This is visible when you preview the level-based hierarchy. Specify a numeric positive integer, for example, 1, 2, or 3. The Concatenate field is available for intermediate levels only. If it is left blank, there is no concatenation.

When the unique ID of the level members are not unique within the hierarchy or if the members are not unique within the hierarchies selected in the dimension, you can use the concatenate value. For example, the customer hierarchy has levels for country and subdivision, a unique ID key of CA may denote Canada or California. To uniquely identify Canada and California, concatenate the country unique ID with the subdivision ID to form the unique ID of US-CA for California. When you

preview a level-based hierarchy, the system validates that the concatenation value is valid. The level number must be between 0, which indicates do not concatenate the unique ID of this level with upper levels' unique ID, to a maximum value of the level's number - 1. For example, if the intermediate level is the third row in the level details pane, the level is 3. The max concatenation value is 2. If the concatenation value is not valid, a message is displayed that states the allowable values.

**Separator**
If you specify a concatenation value, you must specify a separator. The separator is a character used to separate the unique ID segments. For example, specify a hyphen to show the unique ID as US-CA.

**Sort By**
Specify a sort by value. You can drag and drop a sort by value from the **Properties** pane into the **Sort By** field. This field determines the order that the members are displayed under the parent. The default value is the caption in ascending order, but you can change it to another property.

**Ascending or Descending**
Specify the **Sort By** order of **`Ascending`** or **`Descending`**. An ascending sort shows the results lowest to highest, for example, A-Z, 1-9, or 2005-2008. A descending sort shows the results highest to lowest, for example, Z-A, 9-1, or 2008-2006.

**Weight**
Specify a weight. Weight is a multiplier used by the target analysis application to aggregate measure values for members to the parent. The default weight is 1. A value of 1 indicates that values are aggregated into the parent using the actual value. You can specify another numeric value, or you may use a numeric value property. Properties are helpful if you have a numeric value, such as a rate, associated with the level members that you want to use for aggregation purposes.

4. Optionally, specify attributes and specify attribute values for the top level member and intermediate level members.
   See Attributes and attribute values on page 53.
5. Optionally, specify a missing value for the intermediate level members.
   See Specifying missing values for an intermediate level in a hierarchy on page 57.

## Deleting an intermediate level

You can delete a level from the hierarchy if the level is not needed.

1. Select the **Caption** of the level in the Levels pane.
2. Click **Delete** in the Levels pane.

## Adding or updating the top level of a hierarchy

The top level of a hierarchy is a single hierarchy member above all hierarchy members. A top level is added by entering a top level caption in the hierarchy header pane. Specify a unique ID value for the top level in the level details, and specify attribute values. You can see the **Caption** in the **Levels** pane. The **Level Details** for the top level member are displayed when the caption is selected in the **Levels** pane.

The attribute values for a top level are added in the **Attributes** pane.

1. Specify the **Caption** first. Specify a value into the **Top Level** field at the top of the hierarchy definition. The top level caption appears above all levels in the **Levels** pane. The level is selected and displayed in blue. The **Level Details** pane for the top level has a **Unique ID** field. The caption for the top level is displayed in the Attributes data grid next to the Attributes label to indicate the level selected.
2. Specify a **Unique ID**. The unique ID is the key value for the top level member in the hierarchy. It should be a unique value to distinguish the members. The caption value is the default value, but you can change it.
3. Setup attributes and specify attribute values for the top level member.

   See Attributes and attribute values on page 53.

## Deleting the top level of a hierarchy

You can delete a top level from the hierarchy if the level is not needed.

Clear the **Top Level** field from the top pane of the hierarchy definition. The **Levels** pane clears the top level caption.

# Attributes and attribute values

Attributes are published with a level-based hierarchy when the hierarchy is included in a dimension and published to a target.

When you define attributes, the attributes are common to the entire hierarchy. Attribute values are specific to each level members, each missing value and unknown value, and each top-level member. When you select a level **Caption**, a **Missing Value**, an **Unknown Member** or a top-level member in the **Levels** pane, the caption is displayed in the **Attributes** grid. The caption displayed indicates the hierarchy members to which the attribute values pertain.

You can optionally use attributes. Attributes are not required to publish a hierarchy in a dimension. Additionally, attribute values are optional. They are not required for each level member, missing value, unknown value or top-level member.

You must verify that the attribute values pertain to the specific level or member. For example, if you setup attributes for abbreviation and long name, then verify that the attribute values for the country level use country-specific properties. Country-specific abbreviations and descriptions can have attribute values sourced from the Countries entity. Customer-specific abbreviations and descriptions are properties

in the main Customer entity. Unexpected results can occur if the attribute values are not specific to the level or member. You can preview a sample of the hierarchy in the Preview feature. You can publish the hierarchy in a dimension to view the entire hierarchy in the target.

## Defining attributes and attribute values for a level-based hierarchy

1. Select a **Caption** for the hierarchy level, leaf member, or top level in the **Levels** pane. You can also select a **Missing Value** tab or the **Unknown Value** tab to setup attributes and attribute values for a missing or unknown value. When you select a hierarchy member, you can see the member caption.

   **Note:** Specify the leaf-level of the hierarchy first. The attribute values are defaulted into the attribute value column in the attribute grid. In most cases, the leaf-level members will contain the most attribute values.
2. Click **New** for the attribute option. A new row is added to the **Attributes** grid. You can drag and drop one or more properties into the **Attributes** data grid. The name of the property is displayed in the Attribute Name column.
3. Select the text field and specify an **Attribute Name**. The attribute name must be unique for the hierarchy.
4. To specify an attribute **Value**, select a level in the **Levels** panel. The **Value** field becomes an editable text field. For intermediate and leaf-levels, you can drag and drop a property from the Properties pane to select an attribute value.
5. To specify attribute values for missing and unknown values, select the **Missing Value** or **Unknown Value** tab. Specify the attribute values.
6. Specify this information for the Attribute:

   **Description**
   Specify a description for the attribute. If you drag a property from the Properties area, then the property description is the default value for the attribute description.

   **Type**
   Select the type for the attribute. If you drag a property from the Properties area, then the property type is the default value for the attribute type. If you drag a custom property, then String is the default. You can change the type. The **Type** options are:
   - **`String`**: This type is for character values such as text values. This is the default data type.
   - **`Numeric`**: This type is for decimal and integer values.
   - **`Date`**: This type is for date values. Specify date attribute values in a YYYYMMDD format or convert to a date type.
   - **`Logical`**: This type is used for blank, true, or false values.

   **Size**
   Specify a size for string and numeric attributes. The size is the field width of the attribute value. When you add an attribute by dragging a property from the Property pane, the size of the field in the source database is the default value. If you change the size, then the string value is truncated if it is bigger than the attribute size.

**Decimals**
Specify the decimal precision of a numeric attribute. The decimal precision of the database type is the default.

**Translate**
Select the Translate flag for the string attributes. The Business Vault does not translate any of the attribute values. If the Translate flag is selected, then the localized values of the attribute values are published. The translated values are sourced from the source database. This option works in conjunction with the publication target. If the translated values are available in German and English, then you must select German and English locales for the publication target.

7 Optionally, select **Re-Order** to change the order of the attributes in the grid.
8 To delete attributes that are no longer needed, see Deleting attributes on page 55.

## Deleting attributes

You can delete attributes from a hierarchy if they are no longer needed. When you delete an attribute, the attribute is deleted from the entire hierarchy. The attribute is not specific to each level.

**Note:** To remove the attributes from the dimension when it is published, you must delete the attributes from the dimension directly.

1 Select the **Attribute** tab.
2 Select one or more attributes to delete. To select all attributes, click the **Select All** option.
3 Click **Delete** in the **Attributes** grid. Click **OK** in the **Confirmation** dialog.

# Missing values and unknown values

This section describes how to specify **Missing Values** and **Unknown Values** for the lowest level and the intermediate levels in the hierarchy.

## Specifying a missing value for the lowest level in the hierarchy

A missing value is a substitute, or replacement value, to use when the data source does not provide information for a level or a member. For example, if a customer address does not include a city, but the hierarchy has a city level, then you can specify **`Missing City`**. Missing City is the parent level for the member. Missing values can be specified at each intermediate level and at the lowest level.

1 Select the lowest level **Caption** in the **Levels** panel. The **Level Details** is displayed for the selected level.

2 Select the **Missing Value** tab. The text `Specify a substitute value to use for missing dimension references on facts` is displayed.

3 Specify this information:

**Caption**
Specify a caption for the missing value. Only constant values can be entered into the **Caption** field. Dragging and dropping is not allowed.

**Unique ID**
Specify a unique ID for the level or the leaf missing value member. The unique ID is the key for the missing member. The unique ID defaults in from the caption but can be overridden. The unique ID is required if the caption is defined.
**Note:** You should specify the same unique ID on the cube definition that you specified for the leaf member.

4 Specify attribute values for the missing value members.

See Defining attributes and attribute values for a level-based hierarchy on page 54.

## Specifying an unknown value for the lowest level in the hierarchy

The **Unknown Value** page lets you specify a substitute value to use for unknown dimension references on facts. The unknown value is applicable to the leaf level only.

You can use the same value for the leaf level missing and unknown values. Complete the steps to specify an unknown missing value for the leaf level in the level-based hierarchy definition. In the Cube Definition, specify the same unique ID for the dimension's missing and unknown values.

1 Select the lowest level **Caption** in the **Levels** panel. The **Level Details** is displayed for the selected level.

2 Select the **Unknown Value** tab. This tab is only active when a leaf level is selected. The text `Specify a substitute value to use for unknown dimension references on facts.` is displayed. Leave the fields blank to use the same value for the missing value and unknown value.

3 Specify this information:

**Caption**
Specify a caption for the unknown value. Only constant values can be entered into the **Caption** field. Dragging and dropping is not allowed.

**Unique ID**
Specify a unique ID for the leaf unknown value member. The unique ID is the key for the unknown member. The unique ID defaults in from the caption but can be overridden. The unique ID is required when Caption is populated. The unique ID should be a unique member of the hierarchy to ensure that it is positioned correctly in the hierarchy.
**Note:** The unique ID for the leaf member specified should also be entered as the unique ID on the cube definition for the dimension reference on fact loads.

4 Specify attribute values for the unknown value member.

See Defining attributes and attribute values for a level-based hierarchy on page 54.

## Specifying missing values for an intermediate level in a hierarchy

You can add missing values as substitute members in a hierarchy. Missing values can be specified at each intermediate level and at the lowest level. If you have missing and unknown leaf-level values, you must specify a missing value for each intermediate level in the hierarchy.

1 Select the intermediate level in the **Levels** panel. The **Level Details** is displayed for the selected level.

2 Select the **Missing Value** tab. The text `Specify a substitute value to use for missing dimension references on facts` is displayed.

3 Specify this information:

**Caption**
Specify a caption for the intermediate levels. Only constant values can be entered into the **Caption** field. Dragging and dropping is not allowed.

**Unique ID**
Specify a unique ID for the intermediate level. The unique ID is the key for the missing member. The unique ID defaults in from the caption but can be overridden. The unique ID is required when caption is populated.
**Note:** The unique ID for the leaf member specified should also be entered as the unique ID on the cube definition for the dimension reference on fact loads.

**Concatenate**
Set the **Concatenate** field. This determines how many levels to concatenate above to form the Unique ID for the intermediate level missing value. This is visible when you preview the level-based hierarchy. To set this field, specify a numeric positive integer, such as 1, 2, or 3. The **Concatenate** field is available for all intermediate levels only. If the field is left blank, then there is no concatenation.

When you preview a level-based hierarchy, the system validates that the concatenation level number is valid. The level number must be between 0 and a maximum value of the level's number - 1. For example, if the intermediate level is the third row in the level details pane, then the level is 3. The max concatenation value is 2. If this is not the case, then the system displays an error with a valid range for the concatenation value. A value of zero indicates no concatenation of the unique ID of this level with upper levels' unique IDs.

**Separator**
If you specify a concatenation value, then specify a separator. The separator is a character used to separate the unique ID segments for missing value members. For example, specify a hyphen to show the value as Missing Country-Missing Subdivision.

4 To define the display of the missing values, select an option in the **Position** field:

- **`Bottom of the List`**: the missing value is positioned after all other members under the parent.

- **`Top of the List`**: the missing value is positioned above all other members under the parent.
- **`Alphabetical Order`**: the missing value is positioned in alphabetical order by caption.

5 Specify attribute values for the missing value members.
See Defining attributes and attribute values for a level-based hierarchy on page 54.

# Creating a filter for a level-based hierarchy

You can use the **Filter** pane to filter the level- based hierarchy based on specific criteria. For example, you can filter the hierarchy to include only active customers or exclude prospects from a customer hierarchy. Filters are applied to the entire hierarchy and are not level-specific.

Filters are optional. You can use **Add Filter** to create one or more filters. You can use the **Add Advanced Filter** to create combination filters. Filters are applied when the hierarchy members are viewed in the hierarchy preview. Filters are applied when the hierarchy is published in a dimension.

To exclude records that have a field value of NULL or blank, two separate filters must be defined. The first filter should use the **`Is Empty`** operand. In this case, the value is disabled. The second filter should use the **`Does Not Equal`** operand. In this case, the value field should be left blank.

For a Microsoft SQL Server data source, filter expressions that use reserved characters have to be accommodated in the filter expression. For example, since brackets are special characters in Microsoft SQL Server, to use a filter expression of City contains Brugge [Brugge]. The expression is specified as **`Brugge [[]Brugge]`**.

1 Select the **Filter** tab to display the filter pane.
2 Click **New** and select **Add Filter**.
3 Specify a value (operand 1) on the left side of the filter line. Select a property from the **Properties** pane. Drag and drop the property into the left side of the filter line. You can also specify a value.
4 Specify a comparison operator for the filter.
The list of supported operators are:
- Greater Than
- Greater Than or Equals
- Less Than
- Less Than Or Equals
- Equals
- Does Not Equal
- Contains (default)
- Does Not Contain
- Is Empty
- Is Not Empty
- Starts With
- Does Not Start With
- Ends With
- Does Not End With

5 Specify a value (operand 2) on the right side of the filter line. Select a property from the **Properties** pane. Drag and drop the property into the right side of the filter line. You may also type a value.

**Note:** The left and right operand values accept wildcards, but you may receive unexpected results. Refer to the Microsoft SQL Server database query documentation.

6 To add additional filters, click **Add Filter** or click **Add Advanced Filter**. An advanced filter combines multiple filter conditions. The options are combined based on the advanced filter selection.

The advanced filter options are:

- All of the following are true
- Any of the following are true
- None of the following are true

7 Continue to add and update filters until the filter conditions are complete.

## Deleting a filter

You can delete filters that are no longer needed.

1 Select the **Filter** tab.
2 Select the filter rows to delete. Click **Delete**.
3 Click **OK** on the confirmation dialog. The selected filters are deleted.

# Previewing a level-based hierarchy

You can preview the results of a level-based hierarchy while you are creating or editing the hierarchy definition. You can view the hierarchy members for the top level, intermediate levels, and leaf level. You can view the captions, unique ID, weight, and attribute values for each member.

If you specified a filter for the hierarchy, then the preview results show hierarchy members with the filters applied. If you specified missing and unknown values, then the missing and unknown members are displayed in the preview. The preview shows a subset of the hierarchy members, using a limit of 1500 members. Expand and collapse the hierarchy nodes to show and hide members.

The preview results are based on the current definition, and the data is retrieved from the source database specified in the database connection.

1 On the **Level-based Hierarchy Details** pane, click **Preview**. You can change between edit mode and preview mode.
2 The **Preview** pane is displayed and includes:
   - Caption
   - Unique ID
   - Weight
   - Attributes

3 To expand the hierarchy and view the children members under a parent, click the **Expand** arrow to the left of the parent member.
4 To collapse the hierarchy and hide the children members under a parent member, click the **Collapse** arrow to the left of the parent member.
5 To refresh the hierarchy, click **Refresh**.
6 To save the hierarchy, click **Save** or click **Back** to return to the Hierarchies list.

# Viewing and selecting definition versions

Definition versions are created each time a definition is imported or saved. Versions apply to hierarchy, dimension, cube, and publication definitions. Version details include a version number, updated by, and updated on date and time. To view the version details, you can select the **Version** tag at the top of each definition detail page. Version numbers are system-assigned based on the number of definition versions in the Business Vault. Version numbers are not assigned sequentially per definition.

When you create a new definition, the version tag is **`Unsaved Version`**. When you save a definition, the version tag changes to **`Current Version`**. When you select a definition to edit, the most current version of the definition is selected.

**Note:** Definitions can be edited by more than one user at a time. When each user saves the definition, a new version is saved.

1 Select a hierarchy, dimension, or cube. Click **drill-down**. The detail page is displayed.
2 Click **Version** at the top right of the page. If you drill down from a list page, then click **Current Version**. The **Version** dialog shows the **Version Number**.
3 Click the magnifying glass to view previous versions. A grid is displayed to list all versions of the definition.
4 To revert to a previous version of the manual hierarchy definition, select a version row from the grid. The selected version of the manual hierarchy is loaded into the dialog.

# Creating dimensions from a level-based hierarchy

After you save a level-based hierarchy, you can create a dimension from the hierarchy. The database connection, entity, attributes, and leaf-level properties for caption, unique ID, attributes, and attribute values from the hierarchy are used to create the dimension definition. The hierarchy is selected for the dimension.

1 Click **New Dimension** on the **Level-based Hierarchy Details** pane.
2 If the level-based hierarchy has unsaved changes, you are prompted to save the hierarchy changes before creating a new dimension. Click **Yes** to save the changes.

   This hierarchy information is copied to create the dimension definition:

   - Database connection

- Leaf-level unique ID, caption, and sort by
- Attributes and leaf-level attribute values

On the **Hierarchies** tab, the hierarchy from which you created the dimension is the default value for the Selected hierarchy in the new dimension. Selected hierarchies are published when the dimension is published.

**3** Define the new dimension.

See Dimensions on page 84 and Standard dimensions on page 89.

# Chapter 9: Rule-based hierarchy

A rule-based hierarchy is an organizational structure that you can manually define. The lowest level members of the hierarchy are called the leaf members or leaf nodes. The leaf members are assigned to the hierarchy either through direct assignment or assignment rules. To directly assign members, you can select each leaf member and assign it to a hierarchy structure member. For rule-based assignments, you can define criteria or conditions that are used to assign leaf members. Each leaf member is assigned to one parent member. If the member meets multiple assignment criteria, then a direct assignment takes precedence.

A hierarchy member has a caption, a unique ID, and an aggregation weight. A hierarchy can have the same members located in different branches of the tree. These are called duplicate members. Each duplicate member shares the same caption, unique ID, and attribute values. If the duplicate members are children of different parent members, then the weight that is applied to each member can be different.

There are two options to add new members to a rule-based hierarchy:

- Use the **Browser** to add members manually.
- Select members from entities in a data source.

The **Browser** saves time because you do not have to type member captions and unique IDs manually. If you add hierarchy members using the **Browser**, then the captions and unique IDs are not updated if the data in the source entity is changed. You must maintain the members in the hierarchy definition.

A rule-based hierarchy is used for balance sheet and income statement account hierarchies. For example, a balance sheet hierarchy can have hierarchy nodes for Total Assets, Current Assets, Cash, and Cash Equivalents. The hierarchy nodes are defined in the structure. You can use direct assignments to select individual accounts or you can use rule assignments to define conditions to assign the accounts.

If bank accounts are classified as asset accounts and have account numbers ranging from 11000-11999, then you can establish rules. Any accounts that meet the condition are grouped under the Cash and Cash Equivalents node. Rule-based assignments do not have to be updated each time new accounts are added or accounts are updated. You can republish the dimension for the changes to take effect.

When you create a rule-based hierarchy, the rules are applied to the hierarchy from the top members down, and from left-to-right. The rules defined for a parent member apply to each child member. For example, if the Total Assets node has a rule to include all accounts with an account type of Asset, then the same account type rule does not have to be specified for the Current Asset, Cash, and Cash Equivalents members under Total Assets.

If leaf members are not directly assigned or match any rule-conditions, then they can be included or excluded from the hierarchy. To include the members, specify an unassigned member. The unassigned

member is used as the parent member for all unassigned leaf members. To exclude the leaf members from the hierarchy, do not specify an unassigned member.

# Creating or updating a rule-based hierarchy

To create or update a rule-based hierarchy, you can use a wizard. Optionally, you can create a new dimension directly from the hierarchy. To create a rule-based hierarchy, perform these tasks:

- Define the general details of the hierarchy
- Specify filters that apply to the entire hierarchy
- Select attributes
- Setup the hierarchy structure
- Assign attribute values to the members of the hierarchy structure
- Assign the leaf members through direct or rule-based assignments

1. Select **Analytic Modeling > Hierarchies**. All existing hierarchies are displayed. This includes Manual, Level-Based and Rule-based hierarchies.
2. To create a new rule-based hierarchy, select the **New** drop-down list and select **New Rule-based**. To update an existing rule-based hierarchy, click **drill-down** for the hierarchy definition. The **Rule-based Hierarchy Details** page is displayed.
3. Specify this information:

   **Name**
   Specify a unique name for the hierarchy.

   **Description**
   Optionally, specify a description for the hierarchy. The description provides additional information about the hierarchy.

   **Database Connection**
   Select a database connection. The database connection specifies the source database in which the data for the hierarchy resides.

   **Entity**
   Select an entity. The entity is the database table or view on which the hierarchy is based.

   **Caption**
   Select a caption. The caption is the user-friendly value for the leaf members of the hierarchy. You can select the caption using the drop-down list or drag a property from the Properties pane.

   **Unique ID**
   Select a unique ID. The unique ID is the key value for the leaf members of the hierarchy. You can select the unique ID using the drop-down list or drag a property from the Properties pane.

   **Sort By and sort order**
   Select a sort by value and a sort order for the hierarchy. Sort by is the value on which to sort the leaf members of the hierarchy under the parent node. You can sort the leaf members in ascending

order or descending order. You can select the Sort by using the drop-down list or drag a property from the Properties pane.

**Weight**
Specify a weight. The weight is the aggregation value applied to leaf member measures aggregated to the parent node. The default value is one. One denotes that a measure value is aggregated to its parent by a multiplier of one.

4 To define additional hierarchy details, select the **Filters**, **Attributes**, **Structure**, **Details**, or **Assignments** tabs.

5 Click **Save**. A new definition version is created.

# Creating a filter for a rule-based hierarchy

Filters are used to limit the leaf members included in the hierarchy. In a balance sheet account hierarchy, you can limit the accounts available by selecting a specific accounting chart structure and excluding deleted accounts. Filters are not required. To setup one or more filters and combination filters, select the **Add Filter** and **Add Advanced Filter** options.

Filters defined in this step affect the leaf members displayed on the Assignments step. For example, a filter used to exclude deleted accounts is applied when viewing accounts in the Assignments step. Filters are applied when the hierarchy is published in a dimension.

**Note:** To filter out all records that have a field value of NULL or blank, two separate filters must be defined. To create the first filter, select the **`Is Empty`** operand. The value field is disabled. To create the second filter, select the **`Is Not Equal`** to operand and specify a value of blank. For a Microsoft SQL Server data source, filter expressions that use reserved characters have to be accommodated in the filter expression.

To delete a filter, see Deleting a filter on page 59

1 Select the **Filters** tab to display the filter pane.

2 Click **New** and select **Add Filter**.

3 Specify a value (operand 1) on the left side of the filter line. Select a property from the Properties pane. Drag and drop the property into the left side of the filter line. You may also type a value.

4 Specify a comparison operator for the filter.

This is a list of supported operators:

- Greater Than
- Greater Than or Equals
- Less Than
- Less Than Or Equals
- Equals
- Does Not Equal
- Contains (default)
- Does Not Contain

- Is Empty
- Is Not Empty
- Starts With
- Does Not Start With
- Ends With
- Does Not End With

5 Specify a value (operand 2) on the right side of the filter line. Select a property from the Properties pane. Drag and drop the property into the left side of the filter line or type a value.

**Note:** The left and right operand values accept wildcards, but you can receive unexpected results. Refer to the Microsoft SQL Server database query documentation.

6 To add additional filters, click **Add Filter** or click **Add Advanced Filter**. An advanced filter combines multiple filter conditions. The options are combined based on the advanced filter selection.

These are advanced filter options:

- All of the following are true
- Any of the following are true
- None of the following are true

7 Continue to add and update filters until the filter conditions are complete.

# Defining attributes and attribute values for a rule-based hierarchy

Attributes are included with the rule-based hierarchy when the hierarchy is included in a dimension and published to a target. Attributes provide additional details for the leaf members and hierarchy structure nodes in the hierarchy. The attributes are available for all nodes in the hierarchy. The attribute values that are defined in the **Attributes** tab, apply to the hierarchy leaves, the lowest members of the hierarchy.

Attribute are not required to publish a hierarchy in a dimension. Attribute values are optional.

1 Select the **Attribute** tab.

2 Click the **New** attribute option. A new row is added to the **Attributes** pane. You can drag and drop one or more properties into the Attributes data grid. The name of the property is displayed in the **Attribute Name** column.

3 Specify an **Attribute Name**. The name must be unique for the hierarchy. If you drag and drop the property, the you can override the Attribute Name.

4 Specify an attribute **Value**. If you drag and drop a property, you can override the attribute value. Click the **x** option to clear the value and specify a new value.

5 Specify this additional information for the attribute:

**Description**
Specify a description for the attribute. If you drag a property from the Properties area, then the property description is the default for the attribute description.

**Type**
Select the type for the attribute. If you drag a property from the Properties area, then the property type is the default for the attribute type. If you drag a custom property, String is the default. You can change the type. The **Type** options are:

- **`String`**: This type is for character values such as text values. This is the default data type.
- **`Numeric`**: This type is for decimal and integer values.
- **`Date`**: This type is for date values. Specify date attribute values in a YYYYMMDD format or convert to a date type.
- **`Logical`**: This type is used for blank, true or false values.

**Size**
Specify a size for string and numeric attributes. The size is the field width of the attribute value. If you add an attribute by dragging a property from the Property pane, then the size of the field in the source database is the default. If you change the size, then the string value is truncated if it is bigger than the attribute size.

**Decimals**
Specify the decimal precision of a numeric attribute. The decimal precision of the database type is the default.

**Translate**
Select the Translate flag for the string attributes. The Business Vault does not translate any of the attribute values. If the Translate flag is checked, then the localized values of the attribute values are published. The translated values are sourced from the source database. This option works in conjunction with the publication target. If the translated values are available in German and English, then you must select German and English locales for the publication target.

6 Optionally, select **Re-Order** to change the order of the attributes in the grid.
7 To delete attributes that are no longer needed, see Deleting attributes on page 55.

# Building a rule-based hierarchy structure

You use the **Structure** tab to build the hierarchy member tree structure. To maintain all hierarchy members, you can organize them into branches of parent and child members. You can order the hierarchy members and branches. The Structure is used to maintain all hierarchy members except the hierarchy leaf members, or the members located at the lowest level of each hierarchy branch. The leaf members are assigned in the **Assignments** tab.

You can add members, update members, and delete members in the structure. You can move members to reposition them in the structure. You can use the copy and paste options to duplicate members into different parts, or branches, of the hierarchy tree.

You can add new members manually. Use the **Browser** to select an entity that contains a list of values that can be added into the hierarchy. When you use the **Browser**, you specify the caption and unique ID values for the members instead of entering them manually.

When you add members into the hierarchy structure, the same member can be used in multiple places in the hierarchy tree. For example, if a member for Current Assets appears in the Balance Sheet portion of the hierarchy and a Ratios portion of the hierarchy, then you can add the same member in both places. The system recognizes a duplicate member by the unique ID. For consistency, use the same caption and attribute values for the duplicate members. If the captions and attribute values on the duplicate members are different, the last member in the hierarchy takes precedence. The same member cannot be used as a top-level member and a child member.

The **Structure** tab has two areas:

- **Browser** - You can select members from the browser instead of adding each hierarchy member manually. You can use the **Browser** to select a source database connection, entity, caption, and unique ID. The **Browser** shows a list of values from the source entity. You can add the values from the **Browser** by dragging and dropping them into the hierarchy tree. The caption and unique ID for the values default into the hierarchy. Using the **Browser** is optional.
- **Structure** - You can use the structure area to add, update, copy, move, and delete hierarchy members. You can use the structure to construct the hierarchy members into a hierarchy tree of parent and child members, and position hierarchy members. The tree is also used to specify the member weight.

To define the tree structure:

1. To manually add a member to the structure, click **New**. To create a new member under a parent member, select the parent member and click **New**. The active member is highlighted in blue.
2. In the **New Member** dialog, specify this information:

   **Caption**
   Specify a caption. The caption is the name for a hierarchy member. You can use the same caption for multiple members in a hierarchy, however, this can cause confusion.

   **Unique ID**
   Specify a unique ID. The unique ID is the key value for a hierarchy member. It is a unique value to distinguish the members, such as noun ID (NID) in a base data store table. You cannot enter the unique ID for an existing hierarchy member when creating a new member. To duplicate a member in the hierarchy, use the copy and paste function.

   **Weight**
   Specify a weight. Weight is a multiplier used by the target analysis application to aggregate measure values for members to a parent. The default weight is 1. A value of 1 indicates that measure values aggregate to the parent using the actual value.

3. To add members from a source entity, use the **Browser** on the left to display a list of items. Drag and drop properties from the **Browser** panel into the tree area on the right side of the page. The new member is added to the hierarchy, the caption and unique ID values are defaulted from the item selected, and the item weight default value is 1.

   **Database Connection**
   Select a database connection. The database connection is the source of the data to use for the hierarchy.

**Entity**
Select an entity. An entity is a source database. The entity contains the items that you can use to add hierarchy members. For example, if you a build a hierarchy of sales order statuses, the entity may be the Sales Order Status entity in a source database.

**Caption**

Select a caption property. The caption is the entity field to use as the caption for hierarchy members added in the browser. For example, if you build a hierarchy of sales order statuses, select the Entity *Sales Order Status* and select the Caption *Name* to show the statuses of Open, Closed, and Shipped. Optionally, you can add the values to the hierarchy directly.

**Unique ID**

Select a unique ID. The unique ID values from the data source are displayed and can be used as the member unique IDs. These are displayed on the Details tab. The unique ID is used as the key value that identifies each hierarchy member.

4 To select multiple items to drag and drop from the Browser panel to the hierarchy tree area, press **Ctrl** or **Shift** and click the items to select.
- If you drag and drop a property from the **Browser** panel into the white space, then a new member is created at the bottom of the hierarchy tree.
- If you drag and drop a property from the **Browser** panel into the white space to the side of an existing member, then a new node is created at the top of the hierarchy.
- If you drag and drop a property from the **Browser** panel into the white strip at the top of the tree structure, the member is added to the top of the hierarchy at the top level.

5 Continue to add members from the **Browser** pane by dragging and dropping them into the tree. Alternately, you can change the Browser's database connection, entity, caption, and unique ID to select values from another source or entity.

6 You can use the tree structure to perform these tasks:
- To expand the hierarchy to view all hierarchy members, click **Expand All**.
- To collapse the hierarchy to hide all members except the first-level members, click **Collapse All**.
- To display only captions in the tree, click **Show Caption**.
- To display only member unique IDs in the tree, click **Show Unique ID**.
- To display the caption and the unique ID for each member in the tree, click **Show Caption & Unique ID**.
- To display the weight of each member, click **Show Weight**.
- To search the tree for specific members, specify all or part of the Caption or Unique ID in the **Search Tree** field and click **Search**.
  **Note:** To search by member captions, you must display captions. To search by Unique ID, you must display unique ID. To clear search results, click **X** in the **Search Tree**.
- To edit a member, double-click the member. The **Edit Member** dialog is launched. For duplicate hierarchy members, the caption and unique ID of all duplicates are updated. The weight is updated automatically for all duplicate members under the same parent.
- To move a member, select the member or members and drag and drop the member to another location in the hierarchy. All children of the selected member are moved with the parent. You cannot move a member to a lower level in its current branch.
- To copy a member and duplicate it in a different branch of the hierarchy, select a member and click **Copy**. Select a member to use as the parent of the copied member and click **Paste**. The

copied member is added to the hierarchy as the first child under the parent. When a member is copied and pasted, all children of the parent member are copied into the new position. A member cannot be pasted under its own child or as a duplicate member directly under the same parent.

- To delete a member, select the member and click **Delete**. A confirmation dialog is displayed. Click **OK** to continue. If you delete a parent member with children, the parent and all children are deleted. If you delete a duplicate member, a **Delete Hierarchy Members** dialog is displayed that lists the location of the selected member and all locations of the member in the hierarchy. To delete the hierarchy member in a single location, click **Delete**. To delete the member in all locations, click **Delete All**.

## Defining details for a rule-based hierarchy

You can use the **Details** tab to specify the attribute values and select an **Unassigned Member** for the hierarchy structure members. These properties are not applicable to the hierarchy leaf members. The caption, unique ID, and weight values are defaulted from the structure and cannot be changed in the **Details** tab.

If the structure contains duplicate members, as defined by the member unique ID, then you can use the same caption and attribute values. If you use different values, then the caption and attribute values associated with the last duplicate member are used.

You can select one member in the structure to use as the parent for leaf members in the hierarchy that are not assigned by direct assignment or a rule. This is the **Unassigned Member**. You can use the unassigned member as the parent for these members so the members are included in the hierarchy. If you do not specify an unassigned member, then leaf members that are not assigned directly or by a rule are excluded from the hierarchy when it is published.

1. Select the **Details** tab.
2. This information is displayed:

   **Caption**
   The **Caption** is displayed for each member. To change the **Caption**, return to the **Structure** tab.

   **Unique ID**
   The **Unique ID** is the key for each member. To change the **Unique ID**, return to the **Structure** tab.

   **Weight**

   **Weight** is a multiplier used by the analysis cube when measure values are aggregated to the parents in a hierarchy. To change the **Weight**, return to the **Structure** tab.

3. Optionally, select the **Unassigned Member** check box for a structure member. An unassigned member is used as the parent member for all leaf members that are not assigned directly or by a rule. If no **Unassigned Member** is specified, then leaf members that are not directly assigned by a rule or direct assignment will be excluded from the hierarchy.
4. Specify attribute values for each member. The attributes that you created in the **Attributes** tab for the manual hierarchy are displayed as columns in the grid. Attribute values are optional and are not required for each member in the hierarchy. Attribute values are not validated in the definition. Select attribute values are validated during validation and publishing.

- Specify a date value for date type attributes
- Specify a numeric value for numeric type attributes
- Specify **`true`**, **`false`**, or blank for logical type attributes

**5** After you specify the details, click the **Assignments** tab to continue to the Assignments step or click the **Structure** tab to return to the Structure step.

# Assignments

You can use the **Assignments** tab to assign the lowest members to the hierarchy structure. The hierarchy structure members become the parent members of the leaf members assigned. The leaf members are the lowest level members in the hierarchy. The **Assignments** grid displays the members that are in the source database and entity that you specified in the **Properties** tab.

To assign members, select the hierarchy structure member. You can use direct assignment or rule-based assignment. Each structure member can have direct assignments, rule-based assignments, or both.

You can assign members to the **Unassigned Member** that is defined in the hierarchy. When the hierarchy is published, the assigned members appear under the unassigned node along with the leaf members that are unassigned.

## Directly assigning a member

Direct assignments are made by manually selecting the leaf members to classify under a structure member. You can use direct assignments, rule assignments, or a combination of both to assign leaves to the structure nodes. Direct assignments take precedence.

**Note:** The assignments grid contains the first 500 members only. Use the grid paging options to display additional members.

**1** In the **Structure** pane, select the hierarchy member. The structure member is displayed in blue.

**2** Ensure the **Direct Assignments** option is selected in the Assignments pane.

**3** Drag and drop the leaf member to the Assignments column of the leaf member. The member name is displayed in the Assignments column.

**4** To assign multiple leaf members, select the leaf rows to assign.

**5** Drag and drop the hierarchy structure member into the area above the grid into the **Drop node here to assign to selected members** area. The member name is displayed in the Assignments columns for the selected leaf members.

## Clearing direct assignments

If you have direct assignments that are no longer needed, then you can unassign selected members or all members in the hierarchy.

**1** Select the leaf member rows to unassign. Click **Clear Assignments**.

2 Click **OK** to confirm. The Assignments column is cleared for the selected members.
3 To unassign all leaf assignments, do not select any leaf rows. Click **Clear Assignments**.
4 Click **OK** to confirm. The Assignments column is cleared for all members.

## Assigning rules

Rules are used to define selection criteria that includes or excludes members in an assignment. Rules specify the characteristics of the leaf members to include or exclude from a hierarchy structure. As the data in the source changes, new and updated members are incorporated into the hierarchy based on the rule assignments.

A leaf member is only assigned to one parent in a hierarchy. Direct assignments take precedence, followed by the order in which the hierarchy structure is built. If a member meets the rules criteria for multiple members in the structure, then the first rule-based assignment that is published includes the member.

**Note:** To filter out all records that have a field value of NULL or blank, two separate filters must be defined. To create the first filter, select the **`Is Empty`** operand. The value field is disabled. To create the second filter, select the **`Is Not Equal`** to operand and specify a value of blank. For a Microsoft SQL Server data source, filter expressions that use reserved characters have to be accommodated in the filter expression.

To setup a rule for a hierarchy structure node:

1 Select the hierarchy member in the **Structure** panel. The structure member is displayed in blue.
2 Click **Rules** in the **Assignments** page. The **Assignments** page is changed to a Rules assignments area. The **Rules** page title changes to **Rules for: the hierarchy member**. The label **Specify the selection criteria for the node** is displayed.
3 Click the drop-down and select **Add Filter**.
4 Select a property from the **Properties** panel. Drag and drop the property into the left side of the filter line (operand 1).
5 Specify a comparison operator for the filter.

   The list of supported operators are:

   - Greater Than
   - Greater Than or Equals
   - Less Than
   - Less Than Or Equals
   - Equals
   - Does Not Equal
   - Contains (default)
   - Does Not Contain
   - Is Empty
   - Is Not Empty
   - Starts With
   - Does Not Start With
   - Ends With

- Does Not End With

6 Specify a value (operand 2) on the right side of the filter line. Select a property from the **Properties** pane. Drag and drop the property into the left side of the filter line. Alternatively, specify a value on the left side of the filter line.

7 To add additional filters, click **Add Filter** or click **Add Advanced Filter**. An advanced filter combines multiple filter conditions. The options are combined based on the advanced filter selection.

The advanced filter options are:

- **All of the following are true**
- **Any of the following are true**
- **None of the following are true**

8 Continue to add and update filters until the filter conditions are complete.

9 To delete a filter, see Deleting a filter on page 59.

## Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

# Creating a dimension from a rule-based hierarchy

You can create a dimension directly from a rule-based hierarchy. Add a dimension directly from a hierarchy to copy many of the hierarchy properties into a dimension. The hierarchy is automatically selected for the dimension.

1 Select **New Dimension** at the top of the hierarchy page.

2 If the hierarchy has unsaved changes, a dialog is displayed: `There are unsaved changes. Do you want to save your changes and continue building a dimension from this hierarchy definition?` Specify **Yes** to continue.

3 The **Dimension Definition** page is displayed with default values from the hierarchy. Specify the required fields to create the dimension. The hierarchy from which you created the dimension is selected for the dimension on the Hierarchies tab. The selected hierarchies are published when the dimension is published.

See Dimensions on page 84 for more information.

4 Click **Save**.

# Chapter 10: Manual hierarchy

The manual hierarchy is an organizational structure in which the hierarchy branches and leaves are defined manually. You can use this type of hierarchy for smaller, relatively static hierarchies such as currency types and measures.

You can build the hierarchy tree structure by defining parent and child members, or nodes, in a hierarchy tree. You can define a hierarchy structure with more than one top-level hierarchy member. You can setup hierarchy branches that have varying levels of depth. For example, one branch is four levels deep while another branch is two levels deep. A hierarchy member has a caption, a unique ID, data type, and an aggregation weight. You can also define attributes for the hierarchy and specify attribute values for each member.

A hierarchy can have the same members located in different branches of the tree. These are called duplicate members. Each duplicate member shares the same caption, unique ID, data type, and attribute values. If the duplicate members are children of different parent members, the weight applied to each member can be different. For example, if a manual sales measure hierarchy has a Discounts member, the member weight may be 1 for a Discounts top-level member and -1 for Discounts that are subtracted from a Net Sales parent measure. This is calculated as Net Sales = Gross Sales - Discounts.

There are two options to add new members to a hierarchy. You can add members manually or you can select members from entities in a data source using the **Browser**. You do not have to specify member captions and unique IDs manually in the **Browser**. If you add hierarchy members using the **Browser**, the captions and unique IDs are not updated when the data in the source entity changes. You must maintain the members in the hierarchy definition.

Manual hierarchies must be used for two specific types of dimensions: measure dimensions and dimensions with a range-based hierarchy. Measure dimensions are used to define the numeric, quantitative measures in a cube. For example, a measure dimension can be used for total amount and quantity. The measure values are mapped in the cube definition, and the measure members are defined in a manual hierarchy.

A range-based hierarchy is one in which dimension data is classified by numeric value ranges. This type of hierarchy is commonly used for cash flow analysis by categorizing invoices into current, 1-30, 31-60, and 61-90 day aging buckets. You can define the hierarchy and ranges in the manual hierarchy definition, and mark the dimension as a range-based dimension.

See Range-based hierarchies on page 79 for additional information.

# Creating or updating manual hierarchies

All hierarchies are accessed through the **Hierarchies** menu option.

1. Select **Analytic Modeling > Hierarchies**. All existing hierarchies are displayed. This includes Manual, Level-based, and Rule-based hierarchies.
2. To create a manual hierarchy, click the **New** drop down list and select **New Manual**. To edit an existing hierarchy definition, click **drill-down** on the hierarchy definition. The **Manual Hierarchy Details** page is displayed.
3. Specify this information:

   **Hierarchy Name**
   Specify a name for the manual hierarchy.

   **Description**
   Optionally, specify a hierarchy description.

   **Measure Hierarchy**
   Optionally, specify if the hierarchy is used in a measure dimension. If you select this value, then you can also select if a measure is a numeric or string value when you add or edit members. .

4. To specify the required information, select the **Tree**, **Attributes**, and **Details** tabs.
5. Click **Save** to save the manual hierarchy. A new definition version is created each time you save a definition.

# Defining the manual hierarchy tree structure

You can use the **Tree** tab to define parent and child members in the hierarchy tree structure. The **Tree** tab has two areas:

- **Browser**: You can use the **Browser** to select a source database connection, entity, caption, and unique ID. You can add members to the hierarchy tree from the list of values displayed. Using the **Browser** is optional. You can select items from the browser instead of adding each hierarchy member manually.
- **Tree Structure**: The tree structure area is used to add, update, copy, move, and delete hierarchy members. You can use the structure to construct the entire manual hierarchy structure.

1. Create a new manual hierarchy or select a hierarchy and click **drill-down** to edit an existing manual hierarchy.
2. Select the **Tree** tab. The **Browser** page is displayed.
3. To manually add new members, click **New**. To create a new member under a parent member, select the parent member. Click the **New** option. The new member is added as a child under the parent. The active parent is always highlighted in blue.

   Specify this information:

**Caption**

Specify a caption. The caption is the user-friendly name for a hierarchy member. You can use the same caption for multiple members in a hierarchy. This can cause confusion because the same caption is used for distinct hierarchy members.

**Unique ID**

Specify a unique ID. The unique ID is the key value for a hierarchy member. It is a unique value to distinguish the members, such as a noun ID (NID) in a base data store table. You cannot specify the unique ID for an existing hierarchy member when you are creating a new member. To duplicate a member in the hierarchy, use the copy and paste functions.

**Type**

Specify **`Numeric`** or **`String`** as the data type. The default value is **`Numeric`**. The String option is only available if **Measure Hierarchy** is selected for the manual hierarchy.
**Note:** A Type of **`Consolidated`** is displayed for parent nodes.

**Weight**

Specify a weight. Weight is a multiplier used by the target analysis application to aggregate measure values for members to the parent. If you specify a **Type** of **`Numeric`**, then the default value is **`1`**. The **Weight** is not applicable if the **Type** specified is **`String`**.

4 To add members from a source entity, use the **Browser** on the left to display a list of items. These items can be used as the captions and unique IDs for new members.

**Database Connection**

Select a database connection. The database connection is the source of data to use while building the hierarchy definition.

**Entity**

Select an entity. An entity is a source database entity that contains the items that you can use to add hierarchy members. For example, if you build a manual currency hierarchy, then the entity can be the Currencies entity in a source database.

**Caption**

Specify a caption property. The caption is the entity field to use as the caption for hierarchy members added from the browser. For example, if you build a hierarchy of currencies, then specify the caption as **`Name`**. Hierarchy member captions are **`United States Dollar`** or **`Canadian Dollar`**.

**Unique ID**

Select a Unique ID property. The unique ID is the key value that identifies each hierarchy member. For example, the unique ID for a currency manual hierarchy can be the Currency ID such as **`USD`** or **`CAD`**.

5 To build the tree structure from items in the **Browser**, drag and drop items from the **Browser** page into the tree area on the right side. The new member is added to the hierarchy, the caption and unique ID default from the item selected, and the member weight defaults to 1. To select multiple items to drag and drop from the **Browser** page to the hierarchy tree area, press **Ctrl** or **Shift** and click.

- If you drag and drop a property from the **Browser** page into the white space, then a new node is created at the bottom of the hierarchy tree.

- If you drag and drop a property from the **Browser** page into the white space to the side of an existing member, then a new member is created at the top of the hierarchy.
- If you drag and drop a property from the **Browser** page into the white strip at the top of the tree structure, then the member is added to the top of the hierarchy.

**6** Continue to add members from the **Browser** by dragging and dropping them into the tree. Alternately, you can change the **Browser** database connection, entity, caption, and unique ID to select values from another source.

**7** You can use the tree structure to perform these tasks:

- To expand the hierarchy to view all hierarchy members, click **Expand All**.
- To collapse the hierarchy to hide all members except the first-level members, click **Collapse All**.
- To display only member captions in the tree, click **Show Caption**.
- To display only member unique ID's in the tree, click **Show Unique ID**.
- To display the caption and unique ID for each member in the tree, click **Show Caption & Unique ID**.
- To display the data type for each member in the tree, click **Show Type**.
- To display the weight of each member, click **Show Weight**. The Weight is not applicable for String measures.
- To search the tree for specific members, specify all or part of the Caption or Unique ID in the **Search Tree** field and click **Search**.
  **Note:** To search by member captions, you must display captions. To search by unique ID, you must display unique ID. To clear search results, click **X** in the Search tree.
- To edit a member, double-click the member. The **Edit Member** dialog is launched. For duplicate hierarchy members, the caption and unique ID of all duplicates are updated. The weight is updated automatically for all duplicate members under the same parent.
- To move a member, select the member or members and drag and drop the member to another location in the hierarchy. All children of the selected node are automatically moved with the parent. You cannot move a member to a lower level in its current branch.
- To copy a member and duplicate it in a different branch of the hierarchy, select a member and click **Copy**. Select a member to use as the parent of the copied member and click **Paste**. The copied member is added to the hierarchy as the first child under the parent. When a member is copied and pasted, all children of the parent member are copied into the new position. A member cannot be pasted under its own child or as a duplicate member directly under the same parent.
- To delete a member, select the member and click **Delete**. A confirmation dialog is displayed. Click **OK** to continue. If you delete a parent member with children, the parent and all children are deleted. If you delete a duplicate member, then a **Delete Hierarchy Members** dialog is displayed. The dialog lists the location of the selected member and all locations of the member in the hierarchy. To delete the hierarchy member in a single location, click **Delete**. To delete the member in all locations, click **Delete All**.

**Note:** If you make changes to manual hierarchies that are used for measures in a measure dimension, the cube definitions are affected. Ensure that changes to the measure hierarchy are incorporated into the cube definition by updating the cube definition after you save the hierarchy. Publish the measure dimension and the cube and facts to ensure that the changes are published to the target.

## Creating attributes for a manual hierarchy

You can use the **Attributes** tab to define attributes for the hierarchy. Attributes are properties that provide additional information for each hierarchy member. Attributes are optional. When you publish a dimension, the attributes and attribute values are published to the target application such as Infor BI OLAP Server.

1. Click the **New** attribute option. A new row is added to the **Attributes** grid.
2. Click the text field and specify an **Attribute Name**. The attribute name must be unique for the hierarchy.
3. Specify this information for the Attribute:

   **Description**
   Specify an attribute description.

   **Type**
   Select the attribute's value type. The **Type** options are:
   - **`String`**: Select this type for character values such as text values. This is the default data type.
   - **`Numeric`**: Select this type for decimal and integer values.
   - **`Date`**: Select this type for date values.
   - **`Logical`**: Select this type for blank, true, or false values.

   **Size**
   Specify a size for **`String`** and **`Numeric`** attribute types. The **Size** is the field width of the attribute value. The string value is truncated if it is bigger than the attribute size.

   **Decimals**
   Specify the decimal precision of a numeric attribute.

   **Translate**
   Select the translate flag for the string attribute values. The Business Vault does not translate any of the attribute values. If the Translate flag is checked, then the localized values of the attribute values are published. This option works in conjunction with the publication target. If the translated values are available in German and English, then the publication target must have German and English locales selected. Localized attribute values for manual hierarchy members must be added by using the export and import functions of hierarchy translation.

4. Optionally, select **Re-Order** to change the order of the attributes in the grid.

## Deleting attributes from a manual hierarchy

You can delete attributes from a hierarchy if they are no longer required.

**Note:** To remove the attributes from the dimension when it is published, you must delete the attributes from the dimension directly.

1. Select the **Attribute** tab.
2. Select one or more attributes to delete. To select all attributes, click the **Select All** option.
3. Click **Delete** on the **Attributes** grid. Click **OK** on the confirmation dialog.

## Defining manual hierarchy details

The **Details** tab allows you to view the unique ID, weight, data type, and assign attribute values for each member in the hierarchy.

To assign attribute values:

1. Select the **Details** tab to display the hierarchy tree. The caption, unique ID, data type, and weight of each hierarchy member cannot be changed. To change a caption, unique ID data type, or weight, return to the Tree tab.
2. To specify or select attribute values, click the attribute value space for the member row on the grid. All of the attributes on the **Attributes** tab are displayed as columns in the grid. Attribute values are not required for each member in the hierarchy, and they are not validated in the definition. Select attribute values are validated during validation and publishing.
   - Specify a string value for text type attributes.
   - Specify a date value for date type attributes.
   - Specify a numeric value for numeric type attributes.
   - Specify **`true`**, **`false`**, or blank for logical type attributes.
3. To expand the hierarchy to see the children under a parent member, click **Expand** to the left of the parent member.
4. To collapse the hierarchy to hide the children under a parent member, click **Collapse** to the left of the parent member.

## Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

## Creating a dimension from a manual hierarchy

You can create a dimension directly from a hierarchy. Add a dimension directly from a hierarchy to copy many of the hierarchy's properties into a dimension. The hierarchy is automatically selected for the dimension.

1. Select **New Dimension** at the top of the hierarchy page.
2. If the hierarchy has unsaved changes, then a dialog is generated. Specify **Yes** to continue.
3. The **Dimension Definition** page is displayed with default values from the hierarchy. Specify the required fields to create the dimension. The hierarchy from which you created the dimension, is selected for the dimension on the **Hierarchies** tab. The selected hierarchies are published when the dimension is published.

   See Dimensions on page 84 for more information.
4. To save the dimension definition, click **Save**.

# Chapter 11: Range-based hierarchies

You can use the Business Vault to define range-based hierarchies. You can add the hierarchy to a dimension and classify transactions into categories in an analysis cube. This section:

- Describes using the manual hierarchy, dimension, and cube definitions to incorporate a range-based dimension in an analysis cube.
- Provides information on the specific settings for range-based hierarchies, dimensions, and facts.

In a range-based hierarchy, you define categories or classifications, that are based on a value or range of values. The hierarchy has categorization buckets or groups that are used to form the structure of the hierarchy. Each transaction is categorized into one hierarchy bucket based on a value.

For example, to group cube fact transactions into early, on-time, and late categories, you can define categories based on values. Your values can be the number of days or hours between a target date and an actual date. The categories allow you to analyze cubes using quantitative comparison ranges. In this example, orders are categorized into buckets for early, on-time, and late. Each order is categorized by the days between an actual end date and a forecast end date. Each range is based on the days difference to illustrate more on-time, late, or early categories.

These steps are to define a range based hierarchy, include the hierarchy in a dimension, and specify the transaction value to use in an analysis cube:

1. Create a manual hierarchy to define the hierarchy structure and define the ranges. In this example, the Order Performance hierarchy has categories for Early, On-time, and Late. Each category provides a range for the days.
2. Create a dimension and select the attribute to use for the range value. In this example, an Order Performance dimension is created from the hierarchy.
3. Create a cube definition and select the fact property to use to classify orders into a range-based hierarchy. In this example, orders are classified into the early, late, and on-time buckets based on the difference between the order's actual finish date and forecast finish date.

## Creating a manual hierarchy with ranges example

For a range-based hierarchy, add the structure and establish one numeric attribute to use for the time range. Use the **Details** to specify the range values for each category bucket.

See Manual hierarchy on page 73 for full instructions on creating a manual hierarchy.

1. Create a manual hierarchy. For this example, the hierarchy name is *Order Performance*.

See Creating or updating manual hierarchies on page 74.

2 Establish a hierarchy structure. The structure can be a multi-level structure. The ranges must be defined for the lowest level members of each hierarchy branch. Use the instructions to create a manual hierarchy with these members.
   - All orders
     - Early
       - Over 1 week early
       - Between 3-7 days early
       - Between 1-3 days early
     - On-time
       - Less than 1 day early or late
     - Late
       - Between 1-3 days late
       - Between 3-7 days late
       - Over 1 week late

3 Select the **Attributes** tab.

4 Click **New** to add an attribute. Establish one numeric attribute for the range values. In this example, the attribute name is **`Range`**. You can establish additional attributes for other values.

   See Attributes and attribute values on page 53.

5 Specify this information:

   **Description**
   Specify a description. For this example, specify **`Range between the actual and forecast end dates`**.

   **Type**
   Select the attribute type **`Numeric`**. Range values must be numeric.

6 Click **Details**. Specify the numeric ranges for the lowest-level hierarchy members. The range only pertains to the leaf, or lowest, members in the hierarchy.

7 Select the Range attribute value to specify the upper limit for each lowest-level member in the hierarchy.

   Specify this information:

   - **`Over 1 week early`** member: Specify a Range attribute value of **`-7`**. Negative 7 is the upper limit. It denotes that all orders finished over 7 days before their forecast date are grouped into the Over 1 week early bucket.
   - **`Between 3-7 days early`** member: Specify a Range attribute value of **`-3`**. All orders that finished in less than 7 days early and up to 3 days early are included.
   - **`Between 1-3 days early`** member: Specify a Range attribute value of **`-1`**. All orders that finished in less than 3 days and up to 1 day early are included
   - **`Less than 1 day early or late`** member: Specify a Range attribute value of **`1`**. All orders that finished less than 1 day early and up to 1 day late are included.
   - **`Between 1-3 days late`** member: Specify a Range attribute value of **`3`**. All orders that finished over 1 day late and up to 3 days late are included.

- **`Between 3-7 days late`** member: Specify a Range attribute value of **`7`**. All orders that finished over 3 days late and up to 7 days late are included.
- **`Over 1 week late`** member: Do not specify a Range attribute value. Leave the attribute value blank. This denotes that all orders that finished over 7 days late and up to an unlimited number of days late will be grouped into this category.

**8** The Details grid is displayed. No ranges are setup for the parent members, and the last category, Over 1 week late, does not have a range value. A blank range value indicates that there is no upper limit for the range.

| Caption | | | Unique ID | Weight | Range |
|---|---|---|---|---|---|
| All orders | | | All orders | 1 | |
| | Early | | Early | 1 | |
| | | Over 1 week early | Over 1 week early | 1 | -7 |
| | | Between 3-7 days early | Between 3-7 days early | 1 | -3 |
| | | Between 1-3 days early | Between 1-3 days early | 1 | -1 |
| | On-time | | On-time | 1 | |
| | | Less than 1 day early or late | Less than 1 day early or late | 1 | 1 |
| | Late | | Late | 1 | |
| | | Between 1-3 days late | Between 1-3 days late | 1 | 3 |
| | | Between 3-7 days late | Between 3-7 days late | | 7 |
| | | Over 1 week late | Over 1 week late | | |

**9** To create a new dimension from the hierarchy, click **New Dimension**. You are prompted to save your changes. Click **Yes**.

# Creating a dimension from a range-based hierarchy

You can create a dimension directly from a hierarchy. Add a dimension directly from a hierarchy to copy many of the properties from the hierarchy into a dimension. The **Range** attribute is displayed in the **Attribute** area on the Dimension Definition. The Order Performance Hierarchy is selected for the dimension.

1. In the **New Dimension** page, select **New Dimension**.
2. Specify this information:

   **Name**
   Specify **`Order Performance`** for the dimension name.

   **Display Name**
   Specify **`Order Performance`** for the Display Name.

   **Set Range**
   Select **Set Range** for the Range attribute in the attribute area. This indicates that the attribute is used to set the range of values.

3. To save the dimension, click **Save**.

# Adding a range dimension to a cube

This example shows the specific settings required to classify orders into the Order Performance hierarchy categories. This is not a complete example of designing an order analysis cube.

When the cube is published, the Business Vault calculates the days between Actual and Forecast End Dates values for each order. Each order is classified into the early, on-time, and late categories.

To add the Order Performance dimension to a cube and classify the orders:

1. Select **Analytic Modeling > Cubes**.
2. To create a new cube, click **New**.
3. Specify **`Order Analysis`** for the cube **Name**.
4. Select a **Database Connection** for the cube. The database contains an Order table with forecast and actual end dates.
5. Select the *Order Performance* dimension for the cube.
6. Select the **Facts** tab and select the *Orders* fact entity.
7. Click **drill-down** on the Order entity to navigate to the mapping page. This page is used to map the fact properties to dimension and measure values. In this example, use the dimension mapping to map the date different value to the range-based, order performance dimension.
8. Select a numeric property defined as the date difference between an actual finish date and a forecast finish date. If this property is not available, then you can create a custom property to calculate the value.
9. In the Properties pane, click **New** to create a custom property to calculate the difference between the Actual Finish Date and the Forecast Finish Date.
10. Specify **`Days between Actual and Forecast End Dates`** for the expression name.
11. Specify an expression such as: **`DATEDIFF(DAYS, $Base$.ActualOrderEndDate-$Base$.ForecastEndDate)`**.
12. Click **OK** to save the custom property.
13. Click to select the *Days between Actual and Forecast End Dates* property in the **Properties** pane.

14 Drag the *Days between Actual and Forecast End Dates* property in the Dimension Mapping as the **Property Mapping** for the Order Performance dimension.

When the cube and dimensions are published, the value for the days between actual and forecast end dates is used to categorize transactions into the early, on time and late members in the Order Performance dimension.

# Chapter 12: Dimensions

Dimensions provide the structure and context of an analysis cube. In the Dimension definitions you can define common dimensions such as customers, products, vendors, and time. Dimensions provide the context for the analysis measures or key performance indicators in a cube. If you analyze sales statistics, then you can have dimensions for customers, products, and time. Then you can analyze sales measures such as net revenue, gross profit, and units sold.

In the dimension definitions, you can define the measure dimension of an analysis cube. A cube is comprised of multiple dimensions. The dimensions are put together to associate the dimensions with the facts, or transactions, on which the analysis is based.

To define a dimension definition, you must specify a definition name, an external display name, optional description, and dimension type. The dimension type identifies the type of information in a dimension such as Accounts, Time, Measures or Customer.

A dimension can have attributes that are associated with each dimension member. For example, a customer dimension can have attributes for customer ID, name, address, and credit limit. A dimension can have one hierarchy, multiple hierarchies, or no hierarchies.

Hierarchies are used to structure the dimension members into a hierarchical structure. Dimensions can include one top level member that is positioned above all other hierarchy top levels. For example, you can a top level member for All Customers or All Products. A dimension can also include subsets, or logic to group dimension members into specific groups. For example, a dimension can include a subset group of products that are manufactured products and another subset group for resale products.

## Understanding dimension types

These are the types of dimensions:

- Standard dimensions

  Standard dimensions are also called regular dimensions or dimensions. Standard dimensions include dimension properties such as name, description, and type. You define the attributes in a dimension, and select the hierarchies to publish in the dimension. Optionally, you can specify a top level node to aggregate multiple hierarchies into a dimension. You can use subsets to create subgroups of dimension members for analysis purposes.
- Preconfigured dimensions

Preconfigured dimensions define a more advanced dimension structure. The dimension utilizes a custom configuration that is defined in the source database and in the Business Vault database. The preconfigured dimension displays parameters for you to specify before saving and publishing the dimension. Preconfigured dimensions provide a method for Infor to tailor dimensions for specific analysis requirements.

- Time dimensions

  Time dimensions define date dimensions for monthly calendars with months as the lowest level or days as the lowest level. Your monthly calendar can start in any month and include any number of past and future years. Optionally, you can include additional hierarchies for year-to-date, quarter-to-date, and month-to-date (only available for calendars with day as the lowest level). Attributes can be selected from a predefined list. Date formats and related text strings are completely customizable. Language localizations are available for both text strings and date formats

# Accessing dimensions

Dimensions are accessed via the Dimensions menu option. You can create dimensions using the standard dimension or the preconfigured dimension options.

To access dimensions:

1. Select **Analytic Modeling > Dimensions**. The Dimension page is displayed with a list of standard and preconfigured dimensions. The Dimensions list displays read-only columns for:
   - Name
   - Display Name
   - Definition Type
   - Database Connection
   - Entity
   - Last Updated By
   - Last Updated On
2. To show more columns on the list, click **Grid Settings** and then select **Column Personalization**.
3. Check the columns to include or clear the checkbox to hide the column.
4. To create a new standard dimension definition, click **New** and select **New Dimension**.
5. To create a new preconfigured dimension definition, click **New** and select **New Preconfigured Dimension**.
6. To create a new time dimension definition, click **New** and select **New Time Dimension**.
7. To update an existing definition, select the definition and click **Drill-down**. Based on the dimension type, the standard Dimension Definition page, the Preconfigured Dimension Definition page, or the Time Dimension Definition page is displayed.

   See Standard dimensions on page 89, Preconfigured dimensions on page 111, or Time dimensions on page 101.
8. To refresh the dimension definition list, click **Refresh**. The list is updated.
9. To duplicate a dimension definition, see Duplicating a dimension on page 87.

10 To validate a dimension definition, see Validating a dimension on page 86.

11 To import or a dimension definition or a set of hierarchy, dimension and cube definitions, see Importing definitions on page 129.

12 To export a dimension or a set of dimensions with or without the associated hierarchy definitions, see Exporting definitions on page 129.

13 To import translations for a dimension or a set of dimensions with or without the associated hierarchy definitions, see Importing definition translations on page 157.

14 To export translations for a dimension or a set of dimensions with or without the associated hierarchy definitions, see Exporting definition translations on page 155.

15 To delete a dimension definition, see Deleting a dimension on page 88.

# Validating a dimension

Validation is a batch process.

You can validate a dimension to:

- Ensure internal consistency within the dimension definition, and within all subordinate hierarchies.
- Validate the dimension definition, and all subordinate hierarchies against the source database connection entities and properties.
- Validate all subordinate definitional objects. Optionally, validate the hierarchies contained in the dimension.
- Validate the dimension data.
  **Note:** Data validation for a preconfigured dimension does not execute the stored procedure for the configuration. Additionally, the dimension data is not validated.

1 Select **Analytic Modeling > Dimensions**. The **Dimensions** page is displayed with a list of standard, preconfigured, and time dimension definition types.

2 Select one dimension to validate and click **Validate**.

3 Select one or more validation options and click **OK**.

| Option | Description |
|---|---|
| Validate the selected definition to ensure internal consistency | This option validates conditions for codes: 101, 102, 103, 104, 105, 106, and 107. |
| Validate the selected definition against the source database connection | This option validates condition for codes: 108 and 109. |
| Validate all subordinate definitional objects | This option validates the dimensions and hierarchies selected for the dimension. This option validates conditions for code: 112. |
| Validate the data in the source database | This option validates conditions for codes: 110, 111, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, and 1008. |

See Process report codes and messages on page 158.

4 To start the validation, click **OK**.

5 Select **Analytic Modeling > Publications Monitor** to view the results.

See Accessing the publications monitor on page 142.

# Duplicating a dimension

You can duplicate or copy a dimension definition to create a new dimension.

1 Select **Analytic Modeling > Dimensions**. The **Dimension** page is displayed with a list of standard and preconfigured dimensions.

2 Select the dimension to duplicate and click **Duplicate**. The dimension type determines the details that are copied.

This information is copied into a new standard dimension definition:

- Display Name
- Description
- Dimension Type
- All of the More Options settings
- Database connection
- Entity
- Unique ID
- Caption
- Sort By
- All attributes and attribute values
- All selected hierarchies and the named hierarchies option
- Top level information including caption, unique ID and attribute values
- All subsets

This information is copied into a new preconfigured dimension definition:

- Display Name
- Description
- Dimension Type
- All of the More Options settings
- Database connection
- Configuration
- Parameter values

This information is copied into a new time dimension definition:

- Display Name
- Description
- Lowest Level selection
- Year Designation selection
- Dimension Type
- All of the More Options settings

- Start Month selection
- Start year
- End year
- Include these hierarchy selections
- Display formats
- Attribute selections

3 Specify a **Name** for the new dimension.

4 Specify the required information and click **Save**. The new dimension is created from the dimension.

## Deleting a dimension

A dimension definition can be deleted if it is not included in a cube definition or a publication.

1 Select **Analytic Modeling > Dimensions**. The **Dimension** page is displayed with a list of standard and preconfigured dimensions.

2 Select one or more dimensions to delete and click **Delete**. A confirmation dialog is displayed to confirm the deletion.

3 If the dimension is defined in a cube definition, then you cannot delete the dimension. Click **Details** to list all locations where the definition is in use. To delete the dimension definition, you must de-select the dimension from the cube and delete the publication.

## Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

## Importing and exporting dimensions

To import or export dimension definitions, see Import and export definitions on page 128.

To import or export dimension translations, see Localization on page 153.

# Chapter 13: Standard dimensions

This section describes how to configure a standard dimension definition, also called a regular dimension definition. A standard dimension definition allows you to setup and design a dimension and its characteristics.

## Standard dimension overview

The standard dimension definition is a range-based dimension. The dimension members are based on a quantitative category, such as aging days.

See Range-based hierarchies on page 79.

Dimension definitions include the definition name and description. The **Display Name** is the external name that is displayed on a published dimension. The definition includes a database connection, entity, caption, and sort by values. Sort by values are required for dimensions that contain rule-based and level-based hierarchies. Dimension definitions with only manual hierarchies do not need a database connection and entity. The hierarchy members are defined in the manual hierarchies exclusively.

You can setup attributes for dimensions to provide additional details for each dimension member. Optionally, you can create a top level member, which can be used as the top level member for all hierarchies selected for the dimension. You may also create subsets, or groups, of dimension members. You can use attribute sorting to override member sorting. You can use attribute sorting to order child members under parent members. Attribute sorting overrides the sort orders that are specified in hierarchy definitions.

You can create a dimension directly from a hierarchy definition. If you create a new dimension from a hierarchy, then the hierarchy properties are defaulted into the dimension. The hierarchy is selected for the dimension. The properties include database connection, entity, sort by value, and unique ID. The type of hierarchy from which you create a new dimension, determines the hierarchy properties added to the new dimension. If you create a dimension definition first, then you can also create a new hierarchy from the dimension. If you create the dimension first and add a new hierarchy from it, then the hierarchy is not selected for the dimension. You must update the dimension definition afterwards to select the new hierarchy.

Hierarchies selected for a dimension are published with the dimension. Each dimension can contain one hierarchy, multiple hierarchies, or no hierarchies. The hierarchies available for a dimension are listed in the available hierarchy list. These are all manual hierarchies, and rule-based and level-based hierarchies that share the same entity, caption, and unique ID properties.

You can validate a dimension to check the dimension definition, verify the associated hierarchies, and validate that the dimension data is valid.

Standard dimensions are commonly incorporated into cubes to form the structure of analysis areas for cubes. You use dimensions by adding them to cubes, but they may also be used individually. You may publish dimensions individually or publish them with a cube.

# Defining standard dimensions

Use the **Dimensions** menu option to access standard dimensions. You can create both standard dimensions and preconfigured dimensions.

1. Select **Analytic Modeling > Dimensions**.
2. To launch the **New Dimension** page and define a standard dimension, click **New** and select **New Dimension**. To edit an existing dimension, select the dimension and click **Drill-down**.
3. Specify this information:

   **Name**
   Specify a unique name for the dimension. The definition name is only displayed in the Business Vault. It is not published as the dimension name.

   **Display Name**
   Specify a name for the dimension. The default is the Name of the dimension, but it can be changed. The **Display Name** is not required to be unique. The **Display Name** is the dimension name when it is published to a target.

   **Description**
   Specify a description for the dimension.

   **Dimension Type**
   Specify a dimension type to identify the type of information in the dimension. The types are:
   - Accounts
   - Bill of Materials
   - Channel
   - Currency
   - Customers
   - Geography
   - Measure
   - Organization
   - Other
   - Products
   - Promotion
   - Quantitative
   - Rates
   - Scenario
   - Time

- Unknown
- Utility

**Database Connection**
Select an existing database connection from the list. The database connection is the source of the data to use for the dimension.

A database connection is required for dimensions that contain level-based hierarchies, rule-based hierarchies, or no hierarchies. The data originates in the source database. A database connection is not required if the dimension contains only manual hierarchies, because all of the data is added directly in the Business Vault definitions. Entities and properties that are displayed with an asterisk symbol are no longer valid selections for the dimension definition.

**Entity**
Select an entity. All of the entities in the default schema of the database that is specified in the database connection, are displayed. After the entity is selected, the **Properties** pane shows the properties that are associated with the entity. An entity is not required if the dimension contains only manual hierarchies.

- Optionally, you can assign an alias for the entity. Right-click the entity and select **Assign Alias**. Specify an alias name in the **Alias** dialog.
- Optionally, you can add a custom entity. Right-click the entity and select **Add Custom Entity**.

**Unique ID**
Select a unique ID. The unique ID is the key value for the lowest level members in the dimension. It should be a unique value to distinguish the members, such as a noun ID (NID) in a base data store table. The unique ID can be selected from the drop-down list of properties in the entity. You can drag a property from the **Properties** area into the **Unique I**D field. A unique ID is not required if the dimension contains only manual hierarchies.

**Caption**
Specify a caption for the dimension. This is a name that is displayed for the lowest level members in the dimension. The caption can be selected from the drop-down list of properties in the entity. You can drag a property from the **Properties** pane into the caption field. A caption is not required if the dimension contains only manual hierarchies.

**Sort By**
Select a **Sort By** value. The sort by determines the order for the leaf members under the parent. The **Sort By** field can be selected from the drop-down list of properties in the entity. You can drag a property from the Properties pane into the **Sort By** field.

**4** Optionally, expand the More Options section to set OLAP server options:

- **`Primary Attribute Table`**: Specify **`1`** (default), **`2`**, or **`3`**.

  Infor BI OLAP Server has 3 attribute tables per dimension. Each table can have up to 49 attributes. The primary attribute table is assigned for dimension member captions and localized caption values. Additionally, the primary attribute table is used to store locale-specific attribute values for translated attributes.

- **`Access Cube`**: The access cube identifies an OLAP Server security cube that provides dimension level security. This field is a free-form text field for you to specify the name of the access cube for the dimension. An access cube is created or associated with the dimension when the dimension

is published. Leave the field blank if the dimension should not be associated with an access cube.

- **`Default Element`**: The default element is the dimension member that is the default member in the OLAP Server. If no default element is specified, then NULL is used. If the specified default element is not present in the dimension, then no default element property is created and a warning is issued in the log file.
- **`Invert the hierarchy`**: Select this option if the hierarchy members are displayed as inverted in Infor BI OLAP Server. The default is not inverted (unchecked). An inverted hierarchy is a hierarchy in which the parent member is listed below the children members. The dimension is only inverted in the Infor BI OLAP Server. The Business Vault does not show hierarchy or dimension members in an inverted order.
- **`Flatten the view`**: Specify this option if the hierarchy members are displayed in a flat structure in the Infor OLAP BI Server. The default value is to not flatten the view (unchecked).

5 To complete the definition, specify the attributes, select the hierarchies, and add a top level and subsets to the dimension definition.

See Attributes and attribute values on page 92.

6 Click **Save**.

7 Click **Back** to return to the Dimension list.

# Attributes and attribute values

Attributes provide additional information for the dimension members. The attributes defined in the dimension are published to the target. Attributes are optional and are not required to publish a dimension. The dimension and hierarchy definitions have attribute and attribute value selections. The attributes specified in the dimension are published to the target.

When you define attributes, the attributes are common to the entire dimension and available for every dimension member. For example, if the dimension has twenty attributes, then twenty attributes are published with the dimension. The number of attributes increases with translated attribute values. An additional attribute is used for each locale that is published to the target. If an attribute, such as **Description**, is a translated value, and the dimension is published to a target in English, German, Spanish, and a default locale, then the dimension contains four description attributes, one for each locale.

The attribute values that are specified in the hierarchy definitions, take precedence over the attribute values that are specified in the dimension definition. The attribute values defined in the dimension definition are used for the lowest-level dimension members. The attribute values are only used when the dimension has no selected hierarchies.

If the **Description** attribute is set in the hierarchy, then each level or member in the hierarchy can have different attribute values for **Description**. For a customer by region hierarchy, the description value may be used at each level for a country, subdivision, city, and customer description. For a customer by type hierarchy, the description value may be used for each customer type description.

If the same dimension members are in multiple hierarchies selected for a dimension, then the attribute values from the last member loaded to the target application are used. If two customer hierarchies share the same lowest-level customer members, then the attribute values from the last hierarchy selected in the dimension are used.

If the dimension members are not the lowest-level members, and the attribute values must be unique for duplicate members, then you can specify a hierarchy prefix for the selected hierarchies. The hierarchy prefix adds prefix characters to the unique IDs of the intermediate level members. If you have two customer hierarchies that share the same city level, then specify a hierarchy prefix for one or both hierarchies to make each city's unique ID distinct.

When you create a hierarchy from a dimension or a dimension from a hierarchy, attributes are copied from one definition into another. When you create a rule-based or level-based hierarchy from a dimension, the attribute values in the dimension are copied into the hierarchy definition. The attribute values are copied into the leaf members of the hierarchy.

## Defining attributes and attribute values for a standard dimension

1. Select the **Attributes** tab.
2. Click **Add Attribute** in the **Attributes** grid or drag and drop one or more properties into the Attributes grid.
3. Specify this information:

   **Attribute Name**
   Click the text field and specify an Attribute Name. If you drag a property from the Properties area, then the default for the attribute name is the property name. It can be changed. Attribute name must be unique for the dimension.

   **Value**
   Specify a value for the attribute. If you drag a property from the Properties area, then the default for the attribute value is the property value. It can be changed. You can specify a constant.

   **Description**
   Specify a description for the attribute. If you drag a property from the Properties area, then the default for the attribute description is the property description. It can be changed.

   **Type**
   Select the type for the attribute. If you drag a property from the Properties area, then the default for the attribute type is the property type. If you drag a custom property, then the default type is String. You can change the type. The **Type** options are:
   - **`String`**: This type is for character values such as text values. This is the default data type.
   - **`Numeric`**: This type is for decimal and integer values.
   - **`Date`**: This type is for date values. Specify date attribute values in a YYYYMMDD format or convert to a date type.
   - **`Logical`**: This type is used for blank, true, or false values.

**Size**
Specify a size for string and numeric attributes. The size is the field width of the attribute value. If you add an attribute by dragging a property from the Property pane, then the default is the size of the field in the source database. If you change the size, then the string value is truncated if it is bigger than the attribute size.

**Set Range**
Specify one attribute for the Set Range if the attribute is used to set the range values for a range-based dimension. The Set Range is only used for a numeric attribute, and it is only applicable if the range is specified in a manual hierarchy selected for the dimension.

See Range-based hierarchies on page 79.

**Translate**
Select the Translate flag for the string attributes. The Business Vault does not translate any of the attribute values. If the Translate flag is checked, then the localized values of the attribute values are published. The translated values are sourced from the source database. This option works in conjunction with the publication target. If the translated values are available in German and English, then the publication target must have German and English locales selected.

**Attribute Table**
Select an attribute table. When a dimension is published to the Infor BI OLAP Server, the attribute values are placed in one of three tables. Select the table to store the attributes and values. The default value is the table selected in the **More Options' Primary Attribute Table** setting.

4 Optionally, select **Re-Order** to change the order of the attributes in the grid.

## Deleting attributes for a standard dimension

You can delete attributes from a dimension that are no longer needed. When you delete attributes from a dimension, the attributes are not deleted from the selected hierarchies. Only the attributes defined in the dimension are published to the target. When you delete attributes from a dimension, the attributes in the selected hierarchies are not published.

To delete attributes, see Deleting attributes on page 55.

# Adding hierarchies to a dimension

Optionally, you can add hierarchies to a dimension. A dimension can have one hierarchy, multiple hierarchies, or no hierarchies.

A dimension with one or more level-based hierarchies is eligible to incorporate as named hierarchies. Named hierarchies in a dimension are separate hierarchies in a dimension. The named hierarchies have unique hierarchy display names and descriptions. The properties of the named hierarchy, including

the hierarchy display name, description and level names, are defined in the level-based hierarchy definition.

A dimension definition that does not have a hierarchy selected is referred to as a flat dimension. The dimension members are displayed at the top level, or they can be positioned under the top level member of the dimension.

1. Click the **Hierarchies** tab. All hierarchies that are available for the dimension are displayed.

   The **Available** page shows the hierarchies that you can add to the dimension. The available list contains level-based and rule-based hierarchies that share the same characteristics as the dimension. These include the same entity, common models associated with a database connection, caption, and unique ID. All manual hierarchies are available to add to a dimension.

2. To add one or more hierarchies to the dimension, select the hierarchies and click **Add**. The hierarchies are moved to the **Selected** pane.

   All selected hierarchies are published in a dimension. The order of the hierarchies determines the order in which the hierarchies are incorporated in the dimension.

3. To change the order of the selected hierarchies, select the re-order column in the grid. Select the check box to the left of the selected hierarchies. Click **Move up** and **Move down** to reposition the selected hierarchies.
4. Specify a **Weight** for the selected hierarchy.

   The weight is the aggregation value of the hierarchy. This is the top level dimension member, if the dimension has a top level member. The weight controls the aggregation of measure values to roll-up the hierarchy totals into the dimension top level. For example, if three hierarchies are selected for a dimension, and all hierarchies have the same members, then set the weight of 1 on one of the hierarchies. If set for more than one hierarchy, then the measure totals for the top level member will be tripled. If the hierarchies contain distinct members that should be aggregated to the top level member, then set the weight of 1 on each hierarchy. If you have other aggregation requirements, the weight may be set to another numeric value. Weight is not applicable if the dimension contains named hierarchies.

5. To add prefix characters to the Unique ID of intermediate-level members, specify a **Hierarchy Prefix**. The prefix is not relevant for a parent or leaf level members. A prefix is used if the intermediate level unique IDs of a hierarchy are duplicated in hierarchies selected for a dimension. If you do not specify a hierarchy prefix, then the caption and attribute values for the last duplicate entry will be used. For example, if multiple hierarchies selected for a dimension share the same intermediate values, such as a city, then use the hierarchy prefix to distinguish the values in each hierarchy as unique members.
6. To remove a selected hierarchy from a dimension, select the hierarchies in the **Selected** pane and click **Remove**.
7. To use named hierarchies, select **Use Named Hierarchies**.

   This option is available for a dimension that has one or more level-based hierarchies selected. Each hierarchy is published as a separate hierarchy in the dimension. By selecting this option, the members of each hierarchy are independent. The options for the hierarchy weight and top level dimension member do not apply.

8. To navigate to an available or selected hierarchy definition, right-click the hierarchy and select **Go to Hierarchy**.

   If you are navigating the current version of a dimension definition, then the current version of the hierarchy definition is displayed. If you are navigating a historic version of a dimension definition,

then the hierarchy definition active for the dimensions *Version Effective On: date and time* is displayed. Click **Back** to navigate back to the Dimension Definition.

# Adding a top level to a dimension

The **Top Level** tab allows you to setup a top level member above all hierarchies and members in a dimension. Defining a top level for a dimension is optional. If a top level is specified, it is the parent member above all selected hierarchy top level members published in a dimension. If the dimension has no top level member, then the top level members of each selected hierarchy are positioned at the top of the dimension.

The top level is not applicable if the dimension contains named hierarchies.

1 Select the **Top Level** tab. Specify this information:

**Caption**
Specify a caption for the top level. The caption label is displayed next to the Attributes label.

**Unique ID**
Specify a Unique ID. The unique ID for the caption is the default but can be changed.

2 Optionally, specify attribute values for the top level dimension member. The values must be specified manually. You can add, update, and delete the dimension attributes.

See Defining attributes and attribute values for a standard dimension on page 93 for more information.

## Deleting a top level from a dimension

1 Select the **Top Level** tab.
2 Clear the **Caption** value.
3 Clear the **Unique ID** value.

# Creating subsets

Subsets provide a method to group dimension members for analysis purposes. Defining subsets for a dimension is optional.

To define subsets for dimension members:

1 Select the **Subsets** tab.
2 Select **Click to add a subset**. A new subset row is added to the grid.
3 Specify this information:

**Name**
Specify a name for the subset.

**Sort By**
Select the value to sort the subset of dimension members. Subsets may be sorted by any of the attributes that are defined in the Attributes tab.

**Order**
Select the order by clicking the **Sort Ascending** or **Sort Descending** option.

## Creating a filter for a subset

After you create a subset, you can add the selection criteria for the subset. The selection criteria determines the dimension members to include or exclude from the subset. The selection criteria are added using filter and advanced filter options. You can build an unlimited number of filters for a subset. If no subset filters are defined, then the subset will include every dimension member when it is published

To exclude records that have a field value of NULL or blank, two separate filters must be defined. The first filter should use the **`Is Empty`** operand. In this case, the value is disabled. The second filter should use the **`Does Not Equal`** operand. In this case, the value field should be left blank.

1. Select the check box for the subset row and click **Add Filter**.
2. Select **Add Filter**.
3. Select the attribute on which to base the subset. This is operand 1.
4. Specify a comparison operator for the filter.

   The list of supported operators are:

   - Greater Than
   - Greater Than or Equals
   - Less Than
   - Less Than Or Equals
   - Equals
   - Does Not Equal
   - Contains (default)
   - Does Not Contain
   - Is Empty
   - Is Not Empty
   - Starts With
   - Does Not Start With
   - Ends With
   - Does Not End With
5. Specify a value (operand 2) on the right side of the filter line.
6. To add additional filters, click **Add Filter** or **Add Advanced Filter**. An advanced filter combines multiple filter conditions. The options are combined based on the advanced filter selection.

The advanced filter options are:

- All of the following are true
- Any of the following are true
- None of the following are true

7 Continue to add and update filters until the filter conditions are complete.

## Deleting a filter for a subset

1 Select the **Subsets** tab.
2 Select the subset to edit.
3 Select the filter row to delete and click **Delete Selected Filter Rows**.
4 Click **OK** to confirm the delete.

# Sorting by attribute values

You can sort a dimension based on the attribute values of the dimension members. You can use attribute sorting to order the child members under parent members in a dimension. The attribute sorting in a dimension definition overrides all sort orders specified in the hierarchies selected for the dimension.

You can use attribute sorting for a dimension definition that has no hierarchies, one hierarchy, or multiple hierarchies. You can select the attributes of the dimension to sort by, and sort in ascending or descending order. You can select one or more attributes.

You can use attribute sorting when the dimension has multiple hierarchies with duplicate members in more than one hierarchy. By defining an attribute sort order, the children rolling into a duplicate hierarchy member are sorted by their attribute values instead of the individual sort orders in the hierarchy definitions. This sorting is useful when a parent member has children that are added manually in a hierarchy definition and members sourced from a source database. You can define or specify attribute values to sort the manual members and the source members together in a single order.

Attribute sorting is based on the attribute values for individual members. It applies to all levels of dimension members. Using the override sort order function may require adding or defining attribute values for members that were automatically sorted when using the standard sort by functions.

Attribute sorting can be used for string, date, numeric, and logical attribute types. Members with no attribute values (NULL attribute values) are sorted at the top of an ascending sort order or at the bottom of a descending order.

- String attribute values are based on the attribute value's default locale value.
- Numeric attribute values can be negative, zero, and positive values.
- Logical attribute values set to False have an attribute value of 0. Logical attribute values set to False have an attribute value of 1. Therefore, False attribute values are lower than True attribute values.

The Business Vault does not convert attribute values to the attribute types. The attribute values for each member must be defined in the definition or in the source system that is supplying the attribute values.

## Using attribute sorting for dimension members

1 Click **Attribute Sorting**.

The Available pane shows the attributes that you can use for sorting dimension members. Each attribute is listed by name and type. The attribute types are string, numeric, date, and logical.

2 Select the attributes and click **Add**.

All selected attributes are used for sorting. The order of the attributes determines the order in which the attributes are used for sorting.

3 Click **Ascending** or **Descending** to determine sort order.

4 To change the order of the selected attributes, hover over the re-order column in the Selected pane to see a reposition cursor. Additionally, you can select the attributes and click **Move up** or **Move down**.

5 To remove a selected attribute, select the attributes in the Selected pane and click **Remove**.

# Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

# Creating a hierarchy from a dimension

You can create a new hierarchy directly from a dimension definition. Adding a hierarchy definition directly from a dimension adds the dimension properties into the new hierarchy. The dimension properties are the database connection, entity and leaf-level caption, unique ID, sort by, attributes, and attribute values. The specific dimension properties copied into a new hierarchy depend on the type of new hierarchy created from the dimension.

A hierarchy created from a dimension is not automatically selected for the dimension. After you save the new hierarchy, you must edit the dimension definition and select the hierarchy.

1 Select the **Hierarchies** tab from the **Dimension Definition Details**.

2 Click **New** and select a hierarchy option. The definition detail page for the hierarchy type is displayed.

The hierarchy options are:

- **New Level-based hierarchy** - The **New Level-based Hierarchy Definition Details** page is displayed and dimension properties are copied into the hierarchy.

See Creating or updating level-based hierarchies on page 48.

- **New Manual hierarchy** - The **New Manual Hierarchy Definition Details** page is displayed and dimension properties are copied into the hierarchy.

  See Creating or updating manual hierarchies on page 74.

- **New Rule-based hierarchy** - The **New Rule-based Hierarchy Definition Details** page is displayed and dimension properties are copied into the hierarchy.

  See Creating or updating a rule-based hierarchy on page 63.

# Chapter 14: Time dimensions

A time dimension definition consists of a monthly calendar hierarchy, and optionally, year to date, month to date, and quarter to date calendar hierarchies.

## Time dimension overview

The time dimension is used to create monthly calendars with days or months defined as the lowest level. Your monthly calendar can begin in any month and include any number of past and future years. Each calendar year consists of 12 months.

You can define a time dimension definition and specify the definition name, display name, and a description. The display name is the external user-friendly name that is displayed on the published time dimension.

You can select the time dimension parameters to define your calendar hierarchies. These parameters are:

- lowest level
- year designation
- dimension type
- start month
- start year
- end year

The lowest level is specified as day or month. You can specify the year designation as the year of the first month of a calendar year or the year of the last month of the calendar year. For any calendars that begin in a month other than January, the calendar will begin in one year and end in another year. You can choose whether the calendar year should be designated by the year of the first month or the year of the last month. The dimension type is chosen from a list of dimension types available in Infor OLAP server. Time is the default dimension type.

Optionally, you can include additional hierarchies for year-to-date, quarter-to-date, and month-to-date. The month-to-date hierarchy is only available for calendars with day as the lowest level. If you select all additional hierarchies, then your time dimension will include four hierarchies. The four hierarchies are the base calendar hierarchy and one additional hierarchy for the month-to-date, quarter-to-date and year-to-date. A time dimension built to the day level can have a maximum of four hierarchies. A time dimension built to the month, can have a maximum of three hierarchies. All time dimensions

include at least one hierarchy by default. You can build multiple time dimensions encompassing the same time span with a different numbers of hierarchies.

You can customize your time dimension definitions. Default values are provided for top level captions and unique IDs. You can modify these default values. Additionally, you can change any default values for date formats.

Language localization is defaulted for the node and leaf level captions, short forms, and long forms. The localizations can be viewed and modified using the translations export and import feature.

You can preview your time dimension results on the preview panel. The hierarchies included in your time dimension are expandable and collapsible. Localized results cannot be previewed. The localized results are only available when the time dimension is published.

You can publish your time dimensions individually, in a publication grouping, and as part of a cube. Usually, time dimensions are published when they change, for example, once a year. Therefore, time dimensions are usually published individually and not published as part of a cube.

To improve performance, publish time dimensions with the option **Skip all data validations**. If Unique ID formats have been customized, ensure that the Unique IDs are unique within a parent. When publishing time dimensions with Month-to-Date hierarchy, the number of years is limited to a maximum of 4 years.

# Defining a time dimension

1. Select **Analytic Modeling > Dimensions**.
2. Click **New** and select **New Time Dimension**. The **Time Dimension Definition** page is displayed. To edit a time dimension, select the dimension.
3. Specify this information:

   **Name**
   Specify a unique name for the dimension.

   **Display Name**

   Specify a name to display for the dimension. The default is the **Name** of the dimension, but it can be changed. The **Display Name** does not need to be unique. The **Display Name** is the dimension name when it is published to a target.

   **Description**
   Specify a description for the dimension.

   **Lowest Level**
   Select **`Day`** or **`Month`** as the lowest level of the dimension.

   **Year Designation**
   Select **`Year of Last Month`** or **`Year of First Month`** as the Year Designation. For example, if your year begins in May of 2014, then the Year of the First Month is 2014 and the Year of the Last Month is 2015.

**Dimension Type**
Specify **`Time`** as the dimension type.

**Start Month**
Select a starting month for your time dimension from the month selector drop down list.

**Start Year**
Select a starting year for your time dimension. The default value is the current year, but you can change the year by clicking the up and down arrows.

**End Year**
Select an ending year for your time dimension. The default value is the current year, but you can change the year by clicking the up and down arrows. If your start and end year are not the same, then a year is created for each year in the range. For example, if your start month is May, your start year is 2012, and your end year is 2014, then 3 years are created.

**Include the following Hierarchies**
Select the additional hierarchies that you want to include in your time dimension. Select one or more hierarchies to include.

**Month to Date**
This hierarchy option is only valid for time dimensions built to the Day level, not the Month level. The Month to Date option includes these levels:
- All Years MTD
- Year MTD
- Quarter, Year MTD
- Month, day, year MTD
- Month, day, year (leaf level)

**Quarter to Date**
This hierarchy option is valid for Day level and Month level time dimensions. The quarter to date option creates a hierarchy, that includes these levels:
- All Years QTD
- Year QTD
- Quarter, Year QTD
- Month, year QTD
- Month, year (leaf level for month level dimensions)
- Month, day, year (leaf level for day level time dimensions)

**Year to Date**
The year to date hierarchy option is valid for Day level and Month level time dimensions. The year to date option creates a hierarchy, that includes these levels:
- All Years YTD
- Year YTD
- Quarter, Year YTD
- Month, year YTD
- Month, year (leaf level for month level dimensions)
- Month, day, year (leaf level for day level time dimensions)

4 Optionally, expand **More Options** to set the Infor BI OLAP server options for the dimension. These options include:

**Primary Attribute Table**
Specify **1**, **2**, or **3**.

Infor BI OLAP Server has three attribute tables per dimension. Each table can have up to 49 attributes. The primary attribute table is assigned for dimension member captions and localized caption values. Additionally, the primary attribute table is used to store locale-specific attribute values for translated attributes.

Primary attribute table is set to **1** by default. Attribute table values for the four preselected time dimension attributes are always set to **2**. The primary attribute table value is used for any additional attributes that are moved to the selected list on the attribute panel.

If the primary attribute table is changed after attributes have been moved to the selected list, the attribute table for the selected attributed does not change, unless it is individually changed on the selected list. Any additional attributes that are moved to the selected list use the primary attribute table value as it exists at the time the attribute is moved to the selected list.

**Access Cube**
Specify the name of the access cube for the dimension. The access cube identifies an OLAP Server security cube that provides dimension level security. This field is a free-form text field. An access cube is created or associated with the dimension when the dimension is published. Leave the field blank if the dimension should not be associated with an access cube.

**Default Element**
Specify the default element. The default element is the dimension member that is the default member in the OLAP Server. If no default element is specified, then NULL is used. If the specified default element is not present in the dimension, then no default element property is created and a warning is issued in the log file.

**Invert the Hierarchy**
Select this option if the hierarchy members are displayed as inverted in the Infor BI OLAP Server. The default is not inverted. In an inverted hierarchy, the parent member is listed below the children members. The dimension is only inverted in the Infor BI OLAP Server. The Business Vault does not display hierarchy or dimension members in inverted order.

**Flatten the view**
Select this option if the hierarchy members are displayed in a flat structure in the Infor OLAP BI Server. The default value is to not flatten the view.

5 Click **Save.**

You can save your time dimension on any of the four dimension pages, **Definition**, **Formats**, **Attributes**, or **Preview**.

# Defining time dimension date formats

You can define date formats on the **Formats** panel. The **Formats** panel shows the default language text, top levels captions, unique IDs, and the default language date formats. You can change the top levels and the date formats.

See Customizing time dimension date formats on page 108 for additional information.

### Top Level captions and unique IDs

You can change these values for the top level captions or unique ids provided for each type of hierarchy. These are text fields. The default top level captions and unique ids are set to:

- *All Years* for the Calendar Hierarchy
- *All Years MTD* for the Month to Date Hierarchy
- *All Years QTD* for the Quarter to Date Hierarchy
- *All Years YTD* for the Year to Date Hierarchy

### Date Formats

Date formats are displayed in a grid. The date formats available are displayed in the first column. The Caption, Unique ID, Short Form, and Long Form are displayed in the second through fifth columns. Date format masks are composed of Java Simple Date Format values, plus Q for defining date format masks for quarters. Date format masks can include leading, trailing, and embedded text strings enclosed in single quotes. Any number of embedded text strings can be included in a single data format.

There are 14 types for date format masks. These are the 14 date format masks types:

- Year Month Day
- Year Month
- Year
- Year Quarter
- Year Month Day MTD
- Year Month MTD
- Year MTD
- Year Quarter MTD
- Year Month QTD
- Year QTD
- Year Quarter QTD
- Year Month YTD
- Year YTD
- Year Quarter YTD

Before you update any of these date masks, you can execute and save a Translation export of your time dimension.

See Localization on page 153 for additional information.

Default values are included for date mask localizations for 12 languages. If you change any of the default date masks, then the default localizations are no longer available. You can review the default

date mask localizations in the translation export Excel spreadsheet file, prior to making any modifications. You can use them as a reference, if you plan on localizing your date format masks.

# Selecting time dimension attributes

You can select attributes for time dimensions on the **Attributes** page. The attributes page shows the Available and Selected attributes. All attribute values are calculated for all levels of your time dimension hierarchies. The Short Form and Long From attributes can be customized and localized. All other attributes have standardized presentation values and cannot be customized or localized.

There are four attributes preselected. These preselected attributes are associated with all time dimensions and cannot be unselected:

- Long Form: these values are calculated based upon the format date masks provided in the Long Form column in the grid on the formats panel.
- Short Form: the values are calculated based upon the format date masks provided in the Short Form column in the grid on the formats panel.
- Period Start: the values are in the format of yyyy-mm-dd hh:mm:ss and represent the start date and time for each level in the hierarchy.
- Period End: the values are in the format of yyyy-mm-dd hh:mm:ss and represent the end date and time for each level in the hierarchy

There are 14 additional attributes available for selection. These attribute values are calculated based upon each level of the hierarchies. The attributes and their standard presentations are:

- Month: two digit month (01 through 12)
- Quarter: single digit quarter (1 through 4)
- Year: four digit year (e.g., 2012)
- Previous Month: two digit month (01 through 12) representing the month prior
- 2 Previous Months: two digit month (01 through 12) representing the two month prior
- Future Month: two digit month (01 through 12) representing one month in the future
- 2 Future Months: two digit month (01 through 12) representing two months in the future
- Previous Period: the universal date format associated with the level for the previous period, for example, 2011 for a year level, 2012-2 for a quarter level, 2012-02 for a year month level, 2012-02-01 for a year month day level.
- 2 Periods Previous: the universal date format associated with the level for 2 periods previous, for example, 2010 for a year level, 2011-1 for a quarter level, 2011-01 for a year month level, 2011-01-01 for a year month day level.
- Previous Year Period: the universal date format associated with the level for 2 periods previous, for example, 2011 for a year level, 2011-1 for a quarter level, 2012-03 for a year month level, 2011-03-01 for a year month day level.
- Future Period: the universal date format associated with the level for one period in the future, for example, 2013 for a year level, 2012-2 for a quarter level, 2012-04 for a year month level, 2012-04-01 for a year month day level.
- 2 Periods Future: the universal date format associated with the level for one period in the future, for example, 2014 for a year level, 2012-3 for a quarter level, 2012-05 for a year month level, 2012-05-01 for a year month day level.

- Future Year Period: the universal date format associated with the level for one period in the future, for example, 2013 for a year level, 2013-1 for a quarter level, 2013-03 for a year month level, 2013-03-01 for a year month day level.
- YTD Cross Reference: provides the corresponding YTD Unique ID at all levels within each of the 4 hierarchies, for example, 2013 YTD for a year level, 2013-1 YTD for a quarter level, 2013-03 YTD for a year month level, 2013-03-01 for a year month day level. If the YTD Unique ID formats are changed on the Formats panel, then YTD Cross Reference values will reflect these format changes.

To select one or more attributes:

1 Select **Analytic Modeling > Dimensions > Attributes**.
2 Select the **Attribute** checkbox.
3 Click the arrow to move the attribute to the selected list.
4 To deselect the attribute, click the arrow to move the attribute from the selected list.

# Previewing time dimension hierarchies

You can preview the results of the time dimension hierarchies. You can view the hierarchy members for the top level, intermediate levels, and leaf level. You can view the captions, unique ID, weight, and any selected attribute values for each member.

The preview shows a subset of the hierarchy members, using a limit of 1500 members. Expand and collapse the hierarchy nodes to show and hide members. The preview results are based on the current definition.

To view time dimension versions, see Viewing and selecting definition versions on page 60.

1 Select **Preview**.

  The **Preview** panel is displayed and includes these elements and their associated values:

  - Caption
  - Unique ID
  - Weight
  - Short Form
  - Long Form
  - Period Start
  - Period End
  - Other selected attributes

2 To expand the hierarchy and view the children members under a parent, click **Expand** to the left of the parent member.
3 To collapse the hierarchy and hide the children members under a parent member, click **Collapse** to the left of the parent member.
4 To refresh the time dimension, click **Refresh**.
5 To save the time dimension, click **Save** or click **Back** to return to the Dimension list.

Save your time dimension after you preview the results. To make additional changes, you can navigate back to any the of the previous time dimension panels by selecting the panel title. After you make your changes, you can preview the results before saving your dimension.

# Customizing time dimension date formats

Date formats can be customized using Java 8 Simple Date Format components. Quarter designation, QQ, has been added to the list of available date format components. Text can be embedded, including leading and trailing text components in the date formats by enclosing the text in single quotes. Multiple text components can be included in a single date format.

The list of Java 8 Simple Date Format components plus the quarter date formats component are:

| Letter | Date or Time Component | Presentation | Examples |
|---|---|---|---|
| G | Era designator | Text | AD |
| y | Year | Year | 1996; 96 |
| Y | Week year | Year | 2009; 09 |
| M | Month in year (context sensitive) | Month | July; Jul; 07 |
| L | Month in year (stand-alone form) | Month | July; Jul; 07 |
| w | Week in year | Number | 27 |
| W | Week in month | Number | 2 |
| D | Day in year | Number | 189 |
| d | Day in month | Number | 10 |
| F | Day of week in month | Number | 2 |
| E | Day name in week | Text | Tuesday; Tue |
| u | Day number of week (1 = Monday, 7 = Sunday) | Number | 1 |
| a | Am/pm marker | Text | PM |
| H | Hour in day (0-23) | Number | 0 |
| k | Hour in day (1-24) | Number | 24 |
| K | Hour in am/pm (0-11) | Number | 0 |
| h | Hour in am/pm (1-12) | Number | 12 |
| m | Minute in hour | Number | 30 |
| s | Second in minute | Number | 55 |
| S | Millisecond | Number | 978 |

| Letter | Date or Time Component | Presentation | Examples |
|---|---|---|---|
| z | Time zone | General time zone | Pacific Standard Time; PST; GMT-08:00 |
| Z | Time zone | RFC 822 time zone | -800 |
| X | Time zone | ISO 8601 time zone | -08; -0800; -08:00 |
| QQ | Quarter | Number | 1; 2; 3; 4 |

# Localizing time dimensions

You can localize time dimensions by exporting the definition, updating the Excel workbook, and importing the definition.

See Import and export definitions on page 128.

In a time dimension translation spreadsheet, columns A, B, C, and O contain identifying information, such as defaults values in column C and metadata values in column O. These identifying columns should not be changed.

Columns D through N contain the localized date formats for specific languages that are based upon the column header. You can specify or update the cells in these columns with your localized date formats. Not all languages are required. If a date format localization is entered for a caption, then the short and long forms in the data format grouping must also contain date formats. All three date formats, caption, short form, and long from, can be the same or different, but all three must be specified or an error will occur on import.

Localized date format default values are provided for all 12 languages. If you modify any of the date formats on the Formats panel, then all the localized date formats are blank in your translation export spreadsheet. Before you make any date format modifications on the Formats panel, we recommend that you export the translations to provide a basis of the standard the date format localizations.

These time dimension elements can be localized:

- Display name
- Top level caption
- Tope level caption for month to date hierarchies
- Top level caption for quarter to date hierarchies
- Top level caption for year to date hierarchies
- Caption date formats
- Short form date formats
- Long form date formats

There 14 date format groupings that can be localized. A caption, short form, and long form are considered a single date format grouping. The 14 date format groupings are numbered in the spreadsheet from 0 to 13. These numbers are associated with the data formats displayed on the Formats panel in the first column of the grid. The 14 date format groupings are:

- 0 = Year Month Day
- 1 = Year Month
- 2 = Year
- 3 = Year Quarter
- 4 = Year Month Day MTD
- 5 = Year Month MTD
- 6 = Year MTD
- 7 = Year Quarter MTD
- 8 = Year Month QTD
- 9 = Year QTD
- 10 = Year Quarter QTD
- 11 = Year Month YTD
- 12 = Year YTD
- 13 = Year Quarter YTD

## Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

# Chapter 15: Preconfigured dimensions

To create a preconfigured dimension, you select a configuration on which the dimension is based. The configuration contains many dimension properties such as the attributes, attribute values, subsets, and hierarchies.

In the dimension definition, you specify the dimension properties for the definition name, display name, description, dimension type, and the Infor BI OLAP Server options. When you select a configuration, you specify the parameters for the configuration. The parameter values are used to specify the characteristics or members that will be published in the dimension. Preconfigured dimension definitions may be selected for a cube.

In most cases, the configurations are setup by a content provider. They may be installed with Infor content or setup by an Infor representative. Configurations are associated with a model.

## Creating and editing a preconfigured dimension

1. Select **Analytic Modeling > Dimensions**.
2. Click **New** and select **New Preconfigured Dimension**. Click **drill-down** to edit an existing definition. The **Preconfigured Dimension** page is displayed.
3. Specify this information:

   **Name**
   Specify a unique name for the dimension.

   **Display Name**
   Specify a name to display for the dimension. The default is the Name of the dimension, but it can be changed. The **Display Name** does not need to be unique. The **Display Name** is the dimension name when it is published to a target.

   **Description**
   Specify a description for the dimension.

   **Dimension Type**
   Specify a dimension type to identify the type of information in the dimension. The types are:
   - Accounts
   - Bill of Materials
   - Channel
   - Currency

- Customers
- Geography
- Measure
- Organization
- Other
- Products
- Promotion
- Quantitative
- Rates
- Scenario
- Time
- Unknown
- Utility

**Database Connection**
Select an existing database connection from the list. The database connection is the source of the data to use for the dimension.

See the *Infor Business Vault Administration Guide*.

**Configuration**
Select a configuration. The drop-down list shows the configurations available in a model associated with the database connection. You cannot change the actual configuration in the definition. When you select a configuration, the **Details** tab is displayed for all parameters for the configuration. If you change the configuration while editing the definition, then the definition is updated to use the parameters, attributes, and subsets associated with the selected configuration.

**4** Expand the **More Options** section to set the Infor BI OLAP server options for the dimension:

- **`Access Cube`**: The access cube identifies an OLAP Server security cube that provides dimension level security. This field is a free-form text field for you to specify the name of the access cube for the dimension. An access cube is created or associated with the dimension when the dimension is published. Leave the field blank if the dimension should not be associated with an access cube.
- **`Default Element`**: The default element is the dimension member that is the default member in the OLAP Server. If no default element is specified, then NULL is used. If the specified default element is not present in dimension, then no default element property is created and a warning is issued in the log file.
- **`Invert the hierarchy`**: Select this option if the hierarchy members are displayed as inverted in the Infor BI OLAP Server. The default is not inverted (unchecked). An inverted hierarchy is a hierarchy in which the parent member is listed below the children members. The dimension is only inverted in the Infor BI OLAP Server. The Business Vault does not display hierarchy or dimension members in inverted order.
- **`Flatten the view`**: Specify this option if the hierarchy members are displayed in a flat structure in the Infor OLAP BI Server. The default value is to not flatten the view (unchecked).

# Setting configuration parameters

When you select a configuration, the **Details** tab shows parameters for the configuration. If you have a configuration for a Fiscal Time dimension, then the configuration parameter prompts you for a start date or year. You can specify the parameter values. The value that you specify can be a string or an integer value. If you change the configuration while you are editing the definition, the parameters change to show the parameters associated with the selected configuration.

Additional help text is displayed above the parameters. Additionally, you can hover over the **Question Mark** icon to show help for a parameter.

1. Select a configuration and click the **Details** tab.
2. Specify the value for each parameter.
3. View the attributes and subsets for the dimension.

   See Viewing attributes on page 113 and Viewing subsets on page 113.
4. Click **Save**.
5. Click **Back** to return to the dimension list.

# Viewing attributes

The **Attributes** tab shows the attributes for the dimension based on the selected configuration. The attributes are not editable. You can define the attributes in the configuration.

Select the **Attributes** tab. The attributes are displayed:

- **Name**: Shows the name of the attribute.
- **Description**: Shows the description of the attribute.
- **Type**: Shows the attribute type of string, number, date, or logical.
- **Size**: Shows the size of the attribute value.
- **Decimals**: Shows the decimal places associated with a numeric attribute value.
- **Attribute Table**: Shows the attribute table in which the attribute is stored.

# Viewing subsets

The **Subsets** tab shows the subsets for the dimension based on the selected configuration. The subsets are not editable. You can define the subset in the configuration.

Select the **Subsets** tab. The subset Name is displayed.

# Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

# Chapter 16: Cubes

Cubes are structures for multi-dimensional analysis. Cubes combine dimensions such as customers, products, and dates with quantitative values, called measures. This combination forms the structure of information and data. Measures are the quantitative values such as units, amounts, or percentages. Measures are also called the key performance indicators.

Cube definitions include dimensions and the facts. The facts are the transaction source or sources of data for the cube. You can design cubes in Analytic Modeling. Select the dimensions, select the fact transaction sources, and map the fact transaction sources to the dimensions and measures of the cube.

A cube can contain one or more fact sources. A fact source references the entity that contains the fact transactions. Additionally, each cube fact can be loaded as a full fact load or a partial fact load. A full fact load clears all areas of the cube defined by the cube fact mapping. A partial fact load clears and replaces only selected areas of the cube defined by the fact mapping and the partial load parameter values.

You can define cube rules to specify additional logic for measure and dimension values. Cube definitions are published to an analysis target where the cube is built. Before you can define a cube, you must define the dimensions for the cube, including the measure dimension of the cube.

## Accessing cube definitions

1 Select **Analytic Modeling > Cubes**. The **Cubes** page is displayed with a list of all cube definitions. These are the columns displayed:

**Name**
The name of the cube definition.

**Display name**
A display name for the cube definition.

**Database Connection**
The database connection specified for this cube definition.

**Last Updated By**
The user ID for the user who last updated the cube definition.

**Last Updated On**
The date and time in which the cube was last updated.

2. To show more columns or remove columns on the Cubes list, click the **Grid Settings** option and select **Column Personalization**. Select the check box next to any of the columns that you would like to show in the list, for example, Description.
3. To create a new cube definition, click **New**.

   See Creating or editing a cube definition on page 116.
4. To update an existing cube definition, click **Drill-down** on the cube definition row.
5. To validate a cube definition, see Validating a cube on page 126.
6. To duplicate a cube definition, click **Duplicate**. See Duplicating a cube on page 127.
7. To refresh the cube definition list, click **Refresh**.
8. To import or export a cube definition, see Importing and exporting cubes on page 127.
9. To import cube definition translations, see Importing definition translations on page 157.
10. To export cube definition translations with or without the associated dimension and hierarchy translations, see Exporting definition translations on page 155.
11. To delete a cube definition, click **Delete**. See Deleting a cube on page 127.

# Creating or editing a cube definition

1. Select **Analytic Modeling > Cubes**.
2. Click **New**. To update an existing definition, click **drill-down**.
3. Specify this information:

   **Name**
   Specify the name for the cube definition. The name must be unique.

   **Display Name**
   Specify the display name for the cube definition. The display name is published to the target.

   **Description**
   Specify a description for cube.

   **Database Connection**
   Select a database connection. The database connection specifies the source database in which the data for the facts and dimensions resides.

   **Access Control**
   Check the **Access Control** option to indicate that the cube contains security information to be sent to the Infor BI OLAP Server. See the Infor BI OLAP documentation for more information on the Access Control feature.
4. Select the dimensions to add to the cube.

   See Adding dimensions to a cube on page 117.

5 Select the facts to add to the cube.

See Adding facts to a cube on page 119.

6 Optionally, add cube rules.

See Adding cube rules on page 125.

7 Click **Save**.

# Adding dimensions to a cube

The **Dimensions** tab shows the available dimensions to be selected for the cube. The **Selected** panel shows a list of the selected dimensions for the cube.

1 Select the **Dimensions** tab.

2 To add available dimensions to the cube, select the dimensions in the Available list and click **Add**. The dimensions available are the dimensions that use the same database connection as the cube. All dimensions without a database connection specified, such as dimensions with manual hierarchies, are available.

3 After all dimensions are selected, specify one dimension as the **Measure Dimension**.

Any dimension can be designated as the **Measure Dimension**. Usually this is the dimension that has measure members associated with it. The selected dimension is designated as the measure dimension of the cube in Infor BI OLAP Server.

If the measure dimension is a string measure, then the measure dimension must be the last measure in the list of dimensions for the cube.

4 To remove a selected dimension, select the dimension in the Selected panel and click **Remove**. Removing dimensions from a cube removes the fact mappings to the dimension.

5 To change the order of the dimensions, click the order option or drag and drop a dimension to a different order in the Selected list. The order of the dimensions determines how the dimensions are displayed in the cube when published to the Infor BI OLAP Server.

6 To navigate to an available or selected definition, right-click the dimension and select **Go to Dimension**. If you are navigating the current version of a cube definition, the current version of the dimension definition is displayed. If you are navigating a historic version of a cube definition, the *Version Effective On: date and time* for the dimension definition active for the cube is displayed. Click **Back** to navigate back to the Cube Definition.

# Facts

Fact tables and views are the transaction sources for the measure values such as orders, invoices, and balances. The fact sources include quantitative values, such as amounts and quantities, associated with the measure values such as net revenue amount and units sold. You can specify the fact tables or views to incorporate into the cube definition on the Facts tab.

You can associate one or many facts with a cube. The facts are processed in priority order. For example, a sales analysis cube can have facts associated with orders, invoices, and canceled orders. You must load the facts in order to process the orders before the canceled orders. This ensures that the measure values are adjusted accordingly. The priority order is set in the Facts tab by repositioning the facts in the order of first to last. The order cannot be changed when you publish a cube.

You can specify which facts to publish each time a cube is published to a target. For example, a finance cube can have facts for actual amounts and budget amounts. Budget amounts do not change daily but your actual amounts do change daily. You can publish the actual amounts on a daily basis and publish the budgets less frequently. The cube load will be shorter because all of the facts are not loaded each time the cube is updated.

You can specify if the fact is loaded as a full load or a partial load. A full load clears areas of the cube based on the fact's dimension and measure mappings. A partial load clears areas of the cube based on the fact dimension and measure mappings that are based on the partial load parameters defined. For example, a sales cube includes a date dimension that represents the order date of sales transactions. To reduce the time to load the facts, a partial load is setup to replace and load only dates in the current year, such as 2017. When the cube is published, only facts with order dates in 2017 are cleared and replaced. Partial loads are setup on a per fact basis. The publication definition includes the option to publish the fact as a full or partial load. Therefore, you can have one cube definition that can be used for either a full or a partial load.

**Note:** The cube fact dimension and measure mappings, and the cube fact filter, are the same, regardless of the option for a full or partial load.

Each fact is a transaction source, and each fact must be mapped to dimensions. The fact source used in the mapping contains dimension and measure value references. The dimension values must map to the lowest-level members in the dimension and in the measure values. For example, a sales order is associated with a single customer, order date, and company. Each sales order line or schedule is associated with a product, quantity, and unit price. On the **Mapping** pane, you can associate the dimension value property of the fact with the dimension mapping. Each fact must be associated with each dimension through its fact property mapping to a dimension. Each fact must be associated with at least one measure mapping, such as order quantity and unit price, which are mapped to the measure values.

The fact source table or view properties help to determine how to map facts to the dimensions and measures of the cube. The two main scenarios are:

- A fact source entity that includes properties for one or more measure quantitative values on each record. For example, a sales order line fact source has properties for unit price, quantity, and total amount. In this case, specify the Measure Dimension on the Fact source line. The Measure Dimension has a manual hierarchy that has members for unit price, quantity and total amount. You can map each of the quantitative values to the Fact's measure mapping.
- A fact source entity that includes one property for the measure value description and one property for the measure numeric value. For example, a sales order line fact source that has three records, and each record has one column for a measure description value and one column for a measure numeric value. In this case, one record has a column with Unit Price text and one column with value 100.00 for the measure numeric value. A second record has a column with the measure value Quantity text and one column with value 2 for the measure numeric value. A third record has a column with the measure value Total Amount text and one column with value 200.00 for the measure numeric value. In this case, do not specify a Measure Dimension for the fact source. Instead, leave

the Measure Dimension blank. On the **Mappings** page, map the measure value text property to the dimension mapping for the measure dimension in the top of the page. Map the measure value numeric property to the **Value** field on the bottom of the page.

The measure dimensions available to associate with a fact are the standard dimensions that have one manual hierarchy associated with them. When you map the values from the fact to the measure dimension, you can map the lowest, leaf-level members of the hierarchy to the fact, such as amounts and quantities.

Two load options determine the method in which OLAP Server loads the cube fact transactions. The options are set on each fact. The options do not apply to measures mapped with a constant value.

- The first option is to aggregate cube facts to the dimension members with a single value for the numeric measure values during the publishing process. The option to aggregate measure values means that OLAP Server will sum the values and group by each dimension value. This may or may not be necessary, depending on the fact data. Aggregating measure values may increase cube fact load time because of the extra processing.
- The second option is to load zero values into the cube. Measure values are calculated at the lowest level of each dimension. For example, if the measure value for Quantity Returned is zero, then this options will load the quantity returned as 0. If load zero values into the cube is set to no, then OLAP Server will not load the quantity returned value. Loading zero values into the cube may increase fact load time and fact load volume since zero values are loaded into the cube. This may impact the results in cubes and reports when zero values are handled differently than null values.

Cube facts can have partial load parameters associated with them. The partial load parameters specify the area of a cube that is deleted and replaced by the new fact load values. Partial load parameters are used when the cube is published to Infor BI OLAP Server.

Optionally, you can clear partial load parameters after a cube publishes successfully. This process clears partial load parameters sourced from the source database; it does not clear partial load parameters specified, or typed into, the partial load values in the cube definition.

Partial load values are retrieved from the source database when the cube fact is published. If the cube and the publication end successfully, the partial load values are cleared from the partial load source table. If one or more of the facts in a cube or the publication ends in error, the partial load parameters are not cleared.

# Adding facts to a cube

To add facts to a cube definition:

1. Select the **Facts** tab.
2. Click **New**.
3. Specify this information:

   **Source**
   Select the source of the fact data from the drop down list. The fact must be a table or view associated with the Database Connection selected for the cube. If the fact Source is changed when the definition is updated, the mappings are reset.

**Name**
Specify a name. The name is displayed on the publications definition when the cubes and facts are selected.

**Measure Dimension**
Select a Measure Dimension. The measure dimension contains the measure members for the quantitative values in the cube such as revenue, cost, and quantity. The measure dimension list includes any dimension that only contains one manual hierarchy.

If the fact source has separate properties for a measure descriptive value and a measure amount, leave the measure dimension blank. When you add the mappings, a single **Value** field is used to map the measure value from the fact. If the Measure Dimension is changed when the definition is updated, the mappings are reset.

If the measure dimension is a string measure, then the measure dimension must be the last measure in the list of dimensions for the cube.

**Aggregate Measure Values**
Select this field for OLAP Server to aggregate measure values during cube fact publishing. Clear this field if you do not want OLAP Server to aggregate measure values during cube fact publishing.

Do not select this option if the data type of the measure dimension is string. To use this aggregate measure values feature with string measures, separate fact loads are required.

**Load Zero Values into the Cube**
Select this field to publish zero values into the cube. Clear this field if you do not want to publish measure values of zero into the cube. Zero values are omitted from the cube.

**Clear Partial Load param after publishing**
Select this field to clear partial load parameters, defined in a source database, after the cube publishes successfully to Infor BI OLAP Server.

4. Map the facts to the dimensions and measures.
   See Mapping facts to dimensions and measures on page 120.
5. Continue to add facts and mappings until all facts are added to the cube definition.
6. Use the grid reorder function to change the fact load order of multiple facts in a cube. The facts are published in the specified order from first to last. If the facts have overlapping values, one fact may be overwritten or updated by a subsequent fact load.

# Mapping facts to dimensions and measures

Each fact must be mapped to the selected dimensions and measures of the cube.

The mapping page has a **Properties** pane, **Dimension Mapping** area, a **Measure Mapping** area, and a **Filter** tab. The **Properties** panel shows the properties for the facts source entity. Use the **Properties** panel to map the dimension values to dimensions and the measure properties to measures.

See the Properties and custom model objects on page 21.

The **Dimension Mappings** area at the top shows each dimension selected for the cube except the measure dimension selected for the fact. Each fact must have a dimension property value mapping. The property mapping may be selected from the **Properties** pane of the fact source or can be a constant value. The **Dimension Mapping** pane contains:

- **Name**: The name of the dimension that was previously selected on the Selected Dimensions grid for the cube.
- **Property Mapping**: Use the Property Mapping to create a mapping reference between the fact and the dimension. Each dimension must have a property mapping. You can drag and drop a property from the fact into the Property Mapping or you can type a constant value.
- **Missing Value**: You can specify substitute a dimension member to use when facts are missing dimension values. The missing value is a substitute on the facts. The missing value aggregates all facts into a single member. The missing value must be a dimension unique ID. The unique ID must be associated with a lowest, leaf-level member in a hierarchy or dimension. For example, if a sales order line is missing a product dimension reference, then the missing value is used to substitute a value so the sales order fact is loaded into the cube. A missing value is optional for each dimension's fact mapping. If no missing value is mapped, then the fact load can fail during publishing
- **Unknown Value**: You can specify a substitute dimension member to use when facts have dimension values that are unknown or not in the dimension. The unknown value is a substitute on the facts. The unknown value aggregates all facts into a single member. The unknown value must be a dimension unique ID. For example, if a sales order line has a product that is not in the product dimension, then the unknown value is used as a substitute value to load the sales order fact into the cube. An unknown value is optional for each dimension fact mapping. If no unknown value is mapped, then the fact load may fail during publishing.

The **Measure Mappings** area shows each lowest-level member in the selected measure dimension. The Measure Mapping area title has the measure dimension name followed by the word Mapping. The measure mapping area contains:

- **Name**: The name of the Measure Dimension previously selected on the measure dimension reference of the fact. If no measure dimension was selected for the fact, then the only measure mapping available is **Value**.
- **Property Mapping**: Use the Property Mapping to create a mapping reference between the fact property and the measure value. Use the Property pane to drag-and-drop a property from the fact into the Property Mapping for the measure. You can also type a constant value to use as the measure value for all measure values loaded from the fact. You do not have to specify a mapping for each measure value. You must specify the measure mappings for the measure values in the selected fact or to enter constant values for a fact.
- **Type**: Shows the data type for the measure dimension. The data types are Consolidated, Numeric or String.

1. Select a property from the fact source's Properties pane and drag it into the Property Mapping of the dimension row. This associates the dimension value of the fact with the dimension reference. For example, associate the Customer property of the fact with a Customer dimension property value. You can also type a constant value directly in the Property Mapping. A constant value must match the unique ID of a dimension member.
2. To specify a **Missing Value** for the dimension mapping, specify the unique ID of a dimension member to substitute for a fact missing dimension reference. The unique ID must be the unique ID of a lowest-level member in a dimension. In some hierarchies, missing values are separate members added into a hierarchy and published in a dimension.

   For more information, see Hierarchies on page 40.

3 To specify an **Unknown Value** for the dimension mapping, specify the unique ID of a dimension member to substitute for an unknown dimension reference of the fact. The unique ID must be the unique ID of a lowest-level member in a dimension. In some hierarchies, unknown values are separate members added into a hierarchy and published in a dimension.

   See Hierarchies on page 40.

4 Repeat steps 1 to 3 for each dimension in the cube definition. Every dimension in a fact mapping must have dimension Property Mappings.

5 To use the mapping page to map measures, select a property from the fact source Properties panel and drag it into the **Property Mapping** for the Measures mapping. This associates the measure of the fact value with the measure reference. For example, associate order quantity of the fact with the Units Sold measure. You may also type a constant value directly in the Property Mapping.

   Every measure in a fact mapping does not require a measure Property Mapping, but there should be at least one measure mapping per fact. Use the measure mapping only if the fact has a measure property or if the measure value should be a constant.

6 If you did not select a Measure Dimension for the fact source, then the Value field appears in the Mappings area. Map that property that contains the measure numeric value to the Value's mapping. This indicates that the fact has a single numeric measure value property.

   **Note:** If the fact source has one measure value description property and one measure value numeric property, then ensure that the measure value description property is mapped in the Dimension property mapping.

7 After the mapping for a fact are complete, click **Back** to display the **Facts** tab.

# Creating fact filters

You can filter the transactions in a fact load by adding fact filters. Filters define the selection criteria to limit the fact transactions published in a fact load. The selection criteria determines the facts to include or exclude from the fact source. The selection criteria are added using filter and advanced filter options. You can build an unlimited number of filters. If no filters are defined, then the fact load will include all fact transactions from the source when it is published.

**Note:** Each fact source in a cube can have fact filters. For example, if you have three fact loads in a cube, then you can specify different fact filters for each fact source.

1 Select the **Filter** tab on the **Mappings** page.

2 Select **Add Filter**.

3 On the left side of the filter line in **Operand 1**, specify a value by selecting a property from the Properties pane. Alternately, specify a constant value.

4 Specify a comparison operator for the filter.

   These are the supported operators:

   - Greater Than
   - Greater Than or Equals
   - Less Than
   - Less Than Or Equals

- Equals
- Does Not Equal
- Contains (default)
- Does not Contain
- Is Empty
- Is Not Empty
- Starts With
- Does Not Start With
- Ends With
- Does Not End With

5 On the right side of the filter line in **Operand 2**, specify a value by selecting a property from the **Properties** pane. Alternately, specify a constant value.

6 To add additional filters, click **Add Filter** or **Add Advanced Filter**. An advanced filter combines multiple filter conditions. The options are combined based on the advanced filter selection.

These are the advanced filter options:

- All of the following are true
- Any of the following are true
- None of the following are true

7 Continue to add and update filters until the filter conditions are complete.

8 Click the **Mappings** tab to return to the dimension and measure mappings or click **Back** to return to the definition details.

# Deleting fact filters

You can delete fact filters that are no longer needed.

1 Select the **Filter** tab.

2 Select the filter row to delete and click **Delete Selected Filter Rows**.

3 Click **OK**.

# Partial load parameters

You can create partial load parameters for the fact load by specifying the dimensions on which to base a partial load and specifying the partial load dimension values. The dimension values can be sourced from the source database or specified directly in the cube definition.

A dimension value entered into the cube definition directly takes precedence if the parameter values are also available in the source. The dimension and dimension values specify the area of the cube to clear, and the dimension values can be either leaf-level dimension members or parent-level members. For example, to clear the facts for the year 2017, select the Date dimension in the cube and specify

the parameter value of 2017. All facts posted for dates in the year 2017 are cleared, and only facts for 2017 are loaded.

Dimension values sourced from the source database must be stored in a specific table referenced by the Business Vault.

By sourcing parameter values from the source, typed in or both, you have flexibility when publishing partial facts.

Partial load values derived from the source can be calculated while the cube facts are loaded, and therefore can be different each time the publication is run. You have the option to automatically clear the partial load parameters, sourced from a source database, after the cube publishes successfully to Infor BI OLAP Server. The option is defined in the cube definition.

Partial load values specified in the definition directly must be updated if the parameter values change. Partial load parameters, sourced in the cube definition, are not automatically cleared when the cube publishes successfully.

The filters applied to the fact load are used for either full or partial loads. If a separate filter is required for partial loads, create another fact in the cube definition and publish only the fact for partial loads in a publication that is specifically for partial loads.

Partial load parameters are referenced when the publication is set up to publish cube facts using the partial load parameters. Partial loads are optional.

## Creating partial load parameters

1. On the **Mappings** page, select the **Partial Load Parameters** tab. .
2. Select **New**. A new dimension row is added to the partial load dimension list.
3. Select the dimension on which to base the partial load.
4. Use the source parameter values. If the source values are populated in the source database, the source values appear in the **Source Parameter Values** field.

   The values displayed are the current values in the source; they are not necessarily the values used when the publication is run. If no source values are available, the source values appear as **`Not Available`**.
5. Alternatively, specify the parameter values. The specified parameter values are the dimension unique ID or unique ID values for parent or child dimension members.
   - The dimension parameter value is a dimension unique ID value.
   - The dimension unique ID may be for a parent or a child dimension member.
   - To specify multiple dimension unique ID values, use commas to separate values, for example, **`2016,2017`** to include all dates in the date dimension for 2016 and 2017.
   - Spaces between the commas are ignored.
   - Unique ID values must not begin with B: or C. These values are reserved for OLAP Server.
   - Unique ID values cannot contain commas, single quotes, or double quotes
   - Unique ID values cannot include the characters [ ] <CR> <LF> <TAB >

**Note:** If the dimension contains named hierarchies, the dimension members must be in the default hierarchy. The default hierarchy is the first hierarchy selected on the standard dimension definition. If there are dimension members that are not in the default hierarchy, the partial fact load will fail.

6 Continue to add dimension rows and select parameter values until the partial load conditions are complete. A dimension can only be selected once.

7 Click the **Mappings** tab to return to the dimension and measure mappings or click **Back** to return to the definition details.

# Removing facts from a cube

Facts can be removed from a cube if they are not necessary. Removing a fact also removes the fact transactions and mappings from the cube definition.

1 Select the **Facts** tab. The facts are listed in the fact grid along with the fact name and measure dimension selection.

2 Select the fact to remove from the cube.

3 Click **Delete**.

4 Click **OK** to confirm the delete. The facts and any associated mappings are deleted.

# Adding cube rules

You can specify the cube rules for the OLAP Server cubes in the cube rules area. The cube rules are additional logic for OLAP Server values and calculations. Cube rules can be used to define measure calculations. For example, you can define average order size by dividing sales order amount by order quantity. Cube rules must be entered in XML syntax.

1 Select the **Cube Rules** tab.

2 Specify the cube rule in XML syntax. To remove the cube rules, clear the **Cube Rules** text area.

**Note:** If the cube has been published to Infor BI OLAP Server, then the cube must be deleted in OLAP Administration before it can be published again without the cube rules. See the Infor BI OLAP Server documentation for information to delete a cube.

# Removing cube rules

You can remove cube rules by clearing the XML text from the Rules area.

1 Select the **Cube Rules** tab.

2 Clear the cube rule XML.

# Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

# Validating a cube

You can validate a cube to check for warnings and errors. Validation is an optional batch process step. You should investigate warnings and resolve errors before you publish a cube and dimensions. You can validate a cube definition to:

- Ensure internal consistency within the cube definition, within all subordinate dimensions and hierarchies.
- Validate the cube definition, and subordinate dimensions and hierarchies, against the source database connection entities and properties.
- Validate all subordinate definition objects. This includes all dimensions contained in the cube and all hierarchies contained in the dimensions.
- Validate the cube fact data.
  **Note:** Data validation for a cube containing preconfigured dimensions will execute the stored procedure associated with the configuration of the dimension.

The validation process does not fix errors. The reasons for a failed cube publishing are provided. Resolve the errors before you run the publication. You can start the validation process on the Cubes page and view the results in the Publication Process Monitor.

1 Select **Analytic Modeling > Cubes**.
2 Select a cube and click **Validate**.
3 Select one or more validation options and click **OK**.

| Option | Description |
|---|---|
| Validate the selected definition to ensure internal consistency | This option validates conditions for codes: 101, 102, 103, 104, 105, 106, and 107. |
| Validate the selected definition against the source database connection | This option validates condition for codes: 108 and 109. |
| Validate all subordinate definitional objects | This option validates the cubes, dimensions, and hierarchies selected for the cube. This option validates conditions for code: 112 |
| Validate the data in the source database | This option validates conditions for codes: 110, 111, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, and 1009. |

See Process report codes and messages on page 158.

4 To start the validation process, click **OK**.
5 Select **Analytic Modeling > Publications Monitor**. The validation process is displayed in the list.
See Accessing the publications monitor on page 142.

# Duplicating a cube

You can duplicate an existing cube definition to create a new cube.

1. Select **Analytic Modeling > Cubes**.
2. Select the cube to duplicate and click **Duplicate**. This information is copied to the new cube definition:
   - Display Name
   - Description
   - Database Connection
   - Dimensions
   - Facts
   - Fact Dimension and Measure Mappings
   - Cube Rules
3. Specify a **Name** for the new cube definition.
4. Click **Save**.

# Importing and exporting cubes

To import or export cubes, see Import and export definitions on page 128.

To import or export cube translations, see Localization on page 153.

# Deleting a cube

A cube definition can be deleted if it is not included in a publication or an active publishing schedule. You must remove the references to the cube before it can be deleted. Deleting a cube does not delete the associated dimensions.

1. Select **Analytic Modeling > Cubes**.
2. Select one or more cube definitions to delete. Click **Delete**.
3. Click **OK** to confirm the delete.
4. A dialog is displayed if the cube cannot be deleted. Click **Details** to list all locations where the definition is in use.

# Chapter 17: Import and export definitions

You can import and export hierarchy, dimension, cube, and publication definitions from one Business Vault installation or one analytic modeling application to another. For example, you can export definitions from a test environment and import them into a production environment.

Analytic modeling export and import features are available for hierarchy, dimension, cube, and publication definitions, and hierarchy, dimension, and cube definition translations. Export and import features are useful for these tasks:

- Installing new content into your environment
- Copying content from one environment to another
- Copying content from one analytic modeling application to another
- Saving content as backups

You can export definitions from one application and import them into another application in the same environment. For example, if you have an Accounts Receivable and an Accounts Payable application that have currency, accounting entity, and aging range dimensions, then you can create the definitions in Accounts Receivable and import them into the Accounts Payable application. The definitions are maintained separately in each application.

The export and import translation features provides a method to export definition text strings into a spreadsheet. You can use the spreadsheet to add localized text strings. Then you can import the definitions back into your environment. Localized values are not displayed in the definition user interface. Localized values are published to the target that is based on the locale settings for the target.

See Localization on page 153 for information on translations.

The Definition import has these options:

- Import and overwrite existing versions
- Only add definitions if they do not exist
- Abort the entire operation if any of the definitions already exist.

When you import definitions, all imported definitions are assigned to the application that you are currently using. All definitions that require a database connection, are associated with the database connection that you specify for the import.

Definitions can include references to model objects, such as relationships and custom entities. An import will fail if the referenced objects are not in a model that is associated with the selected database connection. Ensure that models associated with the definitions are exported, imported, and associated with the standard database connection that is used when importing the definitions.

# Exporting definitions

Definition exports save the latest version of each definition only. Additionally, definition exports are not associated with any database connection. If you are using multiple database connections, and the definitions are distinct, then you can export definitions that share the same database connection. Importing the definitions associates the definitions with the database connection that you specify on the import function.

Similarly, definition exports are not associated with any application. You can export definitions from one application and import them into another to create a second set of definitions.

You can export definitions from the **Hierarchies**, **Dimensions**, **Cubes**, or **Publications** menu options. When you export definitions from the **Dimensions**, **Cubes**, or **Publications** menu options, you can export subordinate definitions.

For dimensions, subordinate definitions are the hierarchy definitions that are selected for the dimension.

For cubes, subordinate definitions are the dimension definitions that are selected for the cube and all hierarchy definitions selected for each dimension.

For publications, subordinate definitions are the selected cubes in the publication, selected dimensions in the publication, and any associated dimension and hierarchy definitions. For exports that include subordinate definitions, a cube definition is exported along with the publication if you select the cube and all of its facts in the publication definition. However, if the publication includes the cube but not all facts are selected, then the cube definition is not included in the publication export.

1. Select **Analytic Modeling > Hierarchies**, **Dimensions**, **Cubes**, or **Publications**.
2. Select one or more hierarchies, dimensions, cubes, or publications to export.
3. Click **Export**. The **Export Wizard** is displayed.
4. To include associated definitions, such as dimensions and hierarchies that are associated with a cube or hierarchies associated with a dimension, select **Include subordinate definitions**.
5. Optionally, specify **Comments**. Comments are included in the export `readme.txt` file
6. Click **Next**. A list of definitions selected for export are displayed on the **Export** panel.
7. To start the export, click **Finish**. Click **X** to cancel.
8. Select a location to save the `export.zip` file.

   The `Export.zip` file contains all the definitions exported in XML file format, and a `ReadMe.txt` file that contains the comments.

# Importing definitions

You can import a hierarchy, dimension, cube, and publication definitions using the Hierarchies, Dimensions, Cubes, or Publications main pages. The objects in the import file are imported in their entirety. You cannot select individual definitions in the import file.

When you import definitions, the definitions that require database connections are associated with the database connection that you specify. The definitions are also automatically associated with the application that you are currently using.

1 Select **Analytic Modeling > Hierarchies**, **Dimensions**, **Cubes**, or **Publications**.

2 Click **Import**. The **Import Wizard** is displayed.

3 Click **Browse** to browse to and select the `.zip` file to import. The Comments that are associated with the `.zip` file and a list of the definitions in the import file are displayed

4 Select an option for: **If the import file contains entities that already exist, the system should:**

| Option | Description |
|---|---|
| Overwrite existing definitions with the imported versions | This option adds new publications, cube, dimension, and hierarchy definitions and replaces any existing publications, cube, dimension, and hierarchy definitions with matching publications, cubes, dimensions, and hierarchies contained in the import file. |
| Only add definitions that do not already exist and skip the rest | This option adds new publication, cube, dimension, and hierarchy definitions, but does not replace or update existing publication, cube, dimension, or hierarchy definitions. |
| Abort the entire import operation | This option aborts the import if existing publication, cube, dimension, and hierarchy definitions match publication, cube, dimensions, and hierarchies contained in the import file. |

5 Select a database connection.

6 Click **Import** to import the definitions.

When the import process completes successfully, the imported hierarchies are displayed in the Hierarchies page, imported dimensions appear in the Dimensions page, imported cubes appear in the Cubes page, and imported publications appear on the Publications page. The Last Updated By and Last Updated On columns are updated. If you have imported definitions that overwrite existing definitions, then a new definition version is added.

For imported publications, you can edit the publication definition to select a target. The target is the publication target definition used for publishing. A publication target is required to publish dimensions and cubes to a target application.

See Publishing dimensions and cubes on page 131.

# Chapter 18: Publishing dimensions and cubes

You can define, validate, and publish dimension and cube information to a target analysis application or a target OLAP server database. You can use the publication processes to publish dimensions, facts, and cubes on-demand or on a schedule. You can also validate dimension and cube definitions against the source data sources and targets. You can view the status and results of a validation or publication process using the publication monitor.

You can use the definition pages to validate a definition. Validations are run as part of a dimension or cube publishing process. The publication process validates:

- Internal consistency
- Definitions are valid for the source database connection
- Definitions can be used together in the same process
- Data in the source database. Data values are checked for invalid characters and non-numeric measure values.

The data validation options perform extensive checks, which may cause delays in dimension and cube publishing. Optionally, you can skip all or select data validations during the publishing process. Use these options with caution.

Dimensions or cubes that fail publishing due to data problems can result in data loss in the dimension or cube of the target. Skip all data validations or skip selected data validations only when the source data is known to be valid

**Note:** If you skip data validations when publishing dimensions or cubes, the publication may fail. The result can be the loss of dimension and cube data in the target database.

Infor BI OLAP Server dimension and cube fact publishing options can be used in conjunction and to supplement Business Vault validation options. The Business Vault validations are performed before any dimension or cube is published to OLAP Server. If an error occurs during the validation process, the publication ends and no dimension or cube facts are published to OLAP Server. The OLAP Server options are performed during the dimension, cube, and fact load process.

Publication definitions can be used to run configurations, either with or without dimension and cube publishing. The pre-process is used to specify a configuration, which runs as a process step prior to publishing cubes and dimensions. You can run a configuration that processes an extract, transform, and load (ETL) process associated with a data warehouse database. You can specify an Infor Business Vault Data Warehouse Designer (DWD) process to run as a pre-process configuration. The configuration is run as a pre-process before dimensions and cubes are published.

See KB 1964742 on Infor Xtreme Support at http://www.infor.com/inforxtreme for more information.

Additionally, a publication can be used to start additional publications. The next publications option allows you to specify next publications without using additional schedules, when the goal is to run additional publications after the main publication ends successfully. The successful completion of a main publication will submit publications to run for the next publications selected. The next publications are submitted to the publication monitor queue as individual publications and are processed independently.

# Overview of publishing dimensions and cubes

The Business Vault publishes dimension and cube definitions, and dimension and fact data to target analysis applications and target databases. The Business Vault sends the data to the target and provides the instructions to the target to build dimensions and cubes. The Business Vault does not build analysis cubes.

The publication process includes these steps:

1. Define a publication target: Specify the target database connection to the Infor BI OLAP Server target database and specify the locales in which to publish dimensions and cubes.
2. Define a publication: A publication definition contains setup instructions regarding what to publish. You can select to publish cubes, dimensions or both cubes and dimensions. You can publish one or more cubes at a time. You can publish all of the dimensions in each cube or select specific dimensions to publish. When you publish a cube, you can specify whether all of the facts in the cube are loaded or if specific facts are loaded. For example, if you are publishing a finance cube with budget and actual data, and the budget data has not changed, then you can publish the cube and load only the actual data.
3. Validate the publication: Validates the cube and dimension definitions against the source databases and target applications. Validations are target-specific, so the validation process checks to ensure that the definition content and dimension and fact data are valid for the target system.
4. Publish: The publication process constructs database views for dimensions and fact data. The instructions for cube and dimension definitions are sent to the target.
5. Schedule: Scheduling allows you to setup recurring patterns to publish cubes, facts and dimensions on an intraday, daily, weekly or monthly basis.
6. Monitor: You can monitor the activity and results of the validation and publication processes. Use the monitoring feature to view the details dialog messages. You can also put processes on hold, cancel a process, or rerun a publication.

# Accessing publication targets

Before you can publish dimensions and cubes, you must setup a publication target. You can specify a target database connection, and the locales to publish dimension and cubes. The target is the application to which the information is sent for publication.

A publication target is associated with a database connection. It is recommended to setup a single target for each target database connection to avoid contention during publishing.

From the publication targets list, you can refresh the list, filter the list, personalize the display, and export the list.

1. Select **Analytic Modeling > Publication Targets**. The **Publication Targets** page is displayed with a list of all publication targets. The **Publication Targets** list displays read-only columns for:

   **Name**
   The name of the publication target.

   **Database Connection**
   The target application where the dimension, cube and fact information is published.

   **Status**
   The status of the target. Active indicates that the target is available to process publications that are run on-demand or on a schedule. Inactive denotes that the target is not available for publishing.

   **Last Updated By**
   The user ID of the person who last updated the publication.

   **Last Updated On**
   The date and time on which the publication was last updated. The date and time are in the Coordinated Universal Time (UTC) time zone.

2. The columns displayed are shown by default. To show more columns on the list, such as target description, click **Grid Settings** and then select **Column Personalization**.
3. Check the columns to display or clear the check box to hide the column.
4. To edit a publication target, click **Drill-down** on a target in the list.
5. To create a new publication target, click **New**.
6. To refresh the target list, click **Refresh**. The list is updated with new and updated publication target details.
7. To activate a publication target, click **Activate**.
8. To deactivate a publication target, click **Deactivate**.
9. To duplicate a publication target, click **Duplicate**.
10. To delete a publication target, click **Delete**.

## Editing a publication target

1. Select **Analytic Modeling > Publication Targets**. The **Publication Targets** page is displayed with a list of all publication targets.
2. Click **Drill-down** to edit a publication target.
3. Update the target values.
4. Click **Save** to save the new values for the publication target.
5. Click **Back** to return to the Publication Targets list.

## Activating a publication target

To make the target available for dimensions and cube publishing, you must activate a publication target. When you create a new target, the default value is **`Inactive`**. This indicates that the target is not available.

1. Select **Analytic Modeling > Publication Targets**. The **Publication Targets** page is displayed with a list of all publication targets.
2. Select one or more publication targets with an inactive status.
3. Click **Activate**. The target status changes from **`Inactive`** to **`Active`**.

## Deactivating a publication target

To stop publishing dimensions and cubes to the target application, you must deactivate a publication target. Deactivating a target does not affect processes that are currently running.

1. Select **Analytic Modeling > Publication Targets**. The **Publication Targets** page is displayed with a list of all publication targets.
2. Select one or more publication targets with an active status.
3. Click **Deactivate**. The target status changes from **`Active`** to **`Inactive`**.

## Duplicating a publication target

To create a new target by copying another target's information, you can duplicate a publication target. Duplicating a publication target copies all options and settings except the publication target name.

1. Select **Analytic Modeling > Publication Targets**. The **Publication Targets** page is displayed with a list of all publication targets.
2. Select one publication and click **Duplicate**.
3. Specify a publication target **`Name`**. The name must be a unique publication target name.
4. You can optionally change the target values.
5. Click **Save** to save the new values for the publication target.
6. Click **Back** to return to the Publication Targets list.

## Deleting a publication target

You can delete publication targets that have never been used for publications and are not used in publication definitions or schedules. You must remove the target references in publication definitions and schedules before you can delete a target.

1. Select **Analytic Modeling > Publication Targets**. The **Publication Targets** page is displayed with a list of all publication targets.

2 Select one or more publication targets to delete.
3 Click **Delete**. A confirmation dialog is displayed to confirm the deletion.
4 Click **OK** to delete the publication targets. Alternatively, click **Cancel** to cancel the deletion.

# Accessing publication definitions

A publication contains instructions for what to publish and where to publish. A publication allows you to specify the database connection to the data source, the publication target, the cubes, facts, and dimensions to publish. You can use **Publications** to set up publication definitions and to run validation and publication processes.

From the publication list, you can refresh the list, filter the list, and use the grid selections to personalize the display and export the list.

To access publications

1 Select **Analytic Modeling > Publications**. The **Publications** page is displayed with a list of all publication definitions. The list shows read-only columns for:

**Name**
The name of the publication.

**Source Database Connection**
The source of the data to use for dimensions and cube data.

**Target**
The target database or application where the dimension, cube and fact data is published.

**Last Updated By**
The user ID of the person who last updated the publication.

**Last Updated On**
The date and time on which the publication was last updated. The date and time are in the Coordinated Universal Time (UTC) timezone.

2 The columns displayed are shown by default. To show more columns on the list, such as Description, click **Grid Settings** and then select **Column Personalization**.
3 Check the columns to display or clear the check box to hide the column.
4 To edit a publication definition, select a target in the list and click **Drill-down**.
See Editing a publication on page 140.
5 To create a new publication definition, click **New**.
See Creating a new publication on page 136.
6 To refresh the publication list, click **Refresh**. The list is updated with new and updated publication definition details.
7 To duplicate a publication definition, click **Duplicate**.
See Duplicating a publication on page 140.

8 To import a publication definition, click **Import**.
See Importing definitions on page 129

9 To export a publication definition, click **Export**.
See Exporting definitions on page 129

10 To publish a definition, click **Publish**.
See Publishing a definition on page 141.

11 To validate a publication definition, click **Validate**.
See Validating a publication on page 140.

12 To delete a publication definition, click **Delete**.
See Deleting a publication on page 142.

## Creating a new publication

A publication allows you to specify the dimensions, cubes and cube facts to publish to a target. You specify the source database connection where the data for the dimension and facts data resides. You specify the target to publish the dimensions and cubes information and the dimension and fact data.

The publication wizard is a step-by-step progression to select the cubes, facts and dimensions to publish. The publication is saved as a definition so it can be reused. Publications may be set to run on a schedule or run on-demand.

1 Select **Analytic Modeling > Publications**. The **Publications** page is displayed with a list of all publication definitions.
2 Click **New**.
3 On the Details pane, specify this information:

**Name**
Specify a publication name. The name must be a unique publication name.

**Description**
Specify a publication description. The description provides additional information regarding the publication.

**Database Connection**
Select the source database connection. The source database connection is the data store or source database in which the data for the dimension and fact data resides.

**Target**
Select the publication target that you previously setup. The target is the location to which the dimension and fact data and the dimension and cube fact definitions are published.

4 Select the items to publish.
You can select a configuration to publish individually in a publication or a configuration can be published with cubes and dimensions. You can publish cubes and dimensions together or independently.

**Cubes**
Select the cubes and facts to include in the publication. The cubes available are the cubes associated with the source database connection.

**Process partial fact loads**
Select the **Process partial fact load** option to process the cube facts as a partial load. This option is available if the **Cubes** option is selected. The partial load option uses the partial load parameters defined on each cube fact. If the cube fact does not have partial load settings, the cube fact is processed as a full load. This setting is applied to each cube fact selected in the publication definition

You can set the partial load clearing option for the cube definition, to clear the partial load parameters in the source database, after the cube and the publication ends successfully.

**Dimensions**
Select the dimensions to include in the publication.

- If you select to publish cubes and dimensions together, then the dimensions for the cubes are available for the publication.
- If you select to publish dimensions only, then the dimensions associated with the source database connection, or dimensions that share the same models as the source database connection are available for the publication.
- Dimensions not associated with any database connection, for example dimensions that contain only manual hierarchies, are also available for selection.

**5** Optionally, select data validation options.

**Caution:** Use these options with caution. Data validation is a crucial part of validating dimension and fact data before it is published to the target. Dimension or cubes that fail publishing due to data problems may result in incomplete or incorrect dimension and cube data in the target.

| Option | Description |
|---|---|
| Skip all data validation | This option skips all validations against the source database and against the dimension and cube data. This option skips the validations for warnings, skips cube validation to check facts for valid dimension values, and skips validation for numeric measure values. This option skips code validations: 110, 111, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008 and 1009. |
| Skip validations for warnings | This option skips the data validations for duplicate members in a dimension, resulting in informational or warning messages. This option skips code validations: 1004, 1005 and 107. |
| Skip cube validation to check facts for valid dimension values | This option applies to cube fact publishing. This option skips the data validations to check the cube facts for valid dimension member references. Each fact record must have valid dimension member references or the fact's dimension mapping must have valid missing value and unknown value replacements. This option skips code validation 1009. |
| Skip cube validation to check for numeric measure values | This option applies to cube fact publishing. The validation checks the source fact data for numeric measure values. This option skips code validation 111. |

See Process report codes and messages on page 158.

6 5 Select the Infor BI OLAP Server cube fact publishing options. These options apply to the cube facts as they are loaded into Infor BI OLAP Server. Select all that apply:

**Log cube fact errors**
Select this option to log general cube errors and data exception errors. Clear the option if you do not want to log errors or data exceptions.

**Continue a fact load on the first data exception error**
Select this option to continue validating the cube facts after the first data exception error is found. Clear this option to stop the cube fact validation when the first data error is found. No additional cube facts are loaded.

**Load valid cube facts if data exception errors occur**
Select this option to load valid cube facts into the cube. Invalid cube facts are omitted.

**Log cube fact missing and unknown value replacements**
Select this option to log data exceptions for cube facts with missing and unknown value replacements. This option logs facts that have missing dimension values. Additionally, this option logs facts in which the dimension value on the fact is unknown to the dimension.

This option works in conjunction with the missing and unknown values mapped in the definition fact mapping for the cube. Using missing and unknown value replacements ensures that the cube fact is loaded into the cube. This option logs data exceptions, not data errors, because the cube data is loaded into the cube. The missing and unknown values are used as substitute, or replacement values.

7 Select the Infor BI OLAP Server dimension publishing options. These options apply to the dimensions as they are loaded into Infor BI OLAP Server. Select all that apply:

**Log dimension errors**
Select this option to log dimension errors for general cube errors and data exception errors. Clear the option if you do not want to log errors or data exceptions.

**Continue dimension publishing on the first data exception error**
Select this option to continue validating the dimension data after the first data exception error is found. Clear this option to stop the dimension validation when the first data error is found.

8 To navigate to the **Pre-Processing** pane, select the **Pre-Processing** tab.

9 Select the configuration to publish.

The configuration is optional. Select a configuration to display the help text and the parameters of the configuration. You can select a configuration to run alone, or you can run a configuration before dimensions and cubes are published. If the configuration is run as a pre-process to publishing dimensions and cubes, the configuration must end successfully before dimensions and cubes are published.

10 To select a pre-process configuration for a data warehouse designer (DWD) process, select the configuration and specify the processing parameters. These instructions are based on the default configuration instructions. Your environment may be set up differently.

Specify this information:

**Configuration**
Select **`Process ETL Job`**.

**Job**
Specify the DWD ETL job to run.

**Always execute the ETL job from the beginning?**
Specify **`1`** to start the job at the first step. Specify **`0`** to restart the job at the point of failure (if applicable).

11 To navigate to the Cubes pane, select the **Cubes** tab.

12 Select the cubes and facts to publish.

The cubes listed are either associated with the source database connection or cubes associated with database connections that share the same database models. The cube Name is the definition name. The Display Name is in parenthesis. The Display Name is the name of the cube when it is published to the target.

Cubes have facts associated with them. The facts are the transaction details to support the measures of the cube. You can select one or more facts to publish with each cube. For example, if you have a Finance cube with a budget fact load and an actual fact load, and the actuals change on a regular basis, then you can publish just the actual fact load. The cube is published, by default, for each fact load.

**Note:** Facts are published in the order specified on the **Facts** tab, and the order cannot be changed on the **Publication Definition**. If facts need to be published sequentially, then ensure that the fact sources are listed in processing order.

13 If you did not select any cubes to publish, a message is displayed that cubes were not selected to publish.

14 To navigate to the **Dimensions** pane, select the **Dimensions** tab.

15 Select the dimensions to publish by checking dimensions in the Available grid. Click **Add** to move the dimensions into the Selected grid.

The dimensions listed in the Available grid are the dimensions used in the selected cubes. If you did not select any cubes, then the grid contains all dimensions associated with the source database connection. The grid also contains dimensions that are not associated with any database connection, such as the dimensions that contain manual hierarchies.

16 To navigate to the Next Publications pane, select the **Next publications** tab.

17 Select the publications to publish in the Available grid. Click **Add** to move the publications into the Selected grid.

The publications listed in the Available grid are the publications that use the same source database connection. If a target is specified on the publication, the next publications also use the same target.

18 To save the publication definition, click **Save**. To update the definition, click the **Details**, **Cubes**, or **Dimensions** wizard steps to update the definition. Using the wizard is an iterative process. If you change selections on previous wizard steps, then you must validate or re-select cubes, facts and dimensions on subsequent wizard steps.

19 To return to the Publications list, click **Back**.

## Editing a publication

You can update a publication after it is saved.

1. Select **Analytic Modeling > Publications**.
2. Click **Drill-down** to edit a publication definition.
3. Change the publication definition by navigating through the wizard tabs from left to right.

   **Note:** Because the wizard is a step-by-step progression, changing values on the **Details** or **Cubes** tab, can remove selections made on subsequent wizard steps.
4. Click **Save** to save the new values for the publication.

## Viewing and selecting definition versions

To view the definition versions, see Viewing and selecting definition versions on page 60.

## Duplicating a publication

You can duplicate a publication to create a new definition. The original definition is copied into the new definition. Duplicating a publication copies all options and settings except the publication name.

1. Select **Analytic Modeling > Publications**. The **Publications** page is displayed with a list of all publication definitions.
2. Select one publication and click **Duplicate**.
3. Specify a publication **`Name`**. The name must be a unique publication name.
4. You can optionally change the publication definition by navigating through the wizard tabs from left to right.

   **Note:** Because the wizard is a step-by-step progression, changing values on the **Details** tab can remove selections made on subsequent wizard steps.
5. Click **Save** to save the new values for the publication definition.
6. Click **Back** to return to the Publications list.

## Validating a publication

You can validate a publication to check for warnings and errors. Validation is an optional step. You should find and resolve warnings and errors before you run a publication.

See Process report codes and messages on page 158.

The validation process performs these functions:

- Checks the dimension, hierarchy, and cube definitions in a publication.

- Executes data-specific validations to check the source database for invalid source data in dimensions, cubes, and facts.
- Executes target-specific application validations to check that the data and definition values are valid in the target system.
- Validates that the dimension and fact data, dimension definitions values, and cube definition values are valid for field size and allowable character standards.

The validation process does not fix errors. The errors that will cause the publication to fail, are provided to you. You can then resolve the errors before you run the publication. Validation is a batch process. You can start the validation process on the **Publication** page and view the results in the **Publication Process Monitor**.

1. Select **Analytic Modeling > Publications**. The Publications page is displayed with a list of all publication definitions.
2. Select a publication and click **Validate**.
3. Select one of more validation options and click **OK**.

| Option | Description |
|---|---|
| Validate the selected definition to ensure internal consistency | This option validates conditions for codes: 101, 102, 103, 104, 105, 106 and 107. |
| Validate the selected definition against the source database connection | This option validates condition for codes: 108 and 109. |
| Validate all subordinate definitional objects | This option validates the selected publications and the cubes, dimensions, and hierarchies selected for the publication. For a cube validation, the option validates the cubes, dimensions and hierarchies selected for the cubes. For a dimension validation, this option validates the dimensions and hierarchies selected for the dimension. This option validates conditions for code: 112. |
| Validate the data in the source database | This option validates conditions for codes: 110, 111, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008 and 1009. |

**Note:** When you validate a dimension, the hierarchies selected for the dimension are validated. When you validate a cube, the dimensions in the cube are validated.

See Process report codes and messages on page 158.

4. To view the results, select **Analytic Modeling > Publications Monitor**. The page shows a list of publication and validation processes.

## Publishing a definition

You publish a definition to publish cubes and dimensions to target applications. Publishing is a batch process. Start the publication process on the **Publications** page and view the results in the **Publications Process Monitor**. When you publish, the definition is validated before it is published to the target.

1. Select **Analytic Modeling > Publications**. The **Publications** page is displayed with a list of all publication definitions.
2. Select one publication and click **Publish**.
3. To view the results, select **Analytic Modeling > Publications Monitor**. The page shows a list of publication and validation processes.

## Deleting a publication

You can delete publication definitions that have never been published and are not on a schedule.

1. Select **Analytic Modeling > Publications**. The **Publications** page is displayed with a list of all publication definitions.
2. Select one or more publications to delete.
3. Click **Delete**. A confirmation dialog appears to confirm that you want to delete the publication.
4. Click **OK** to delete the publication definition. Alternatively, click **Cancel** to cancel the deletion.

# Monitoring a publication or validation process

The publication and validation processes run in batch mode. You can use the **Publications Monitor** to view the status and results of validation and publication processes that have been submitted. You can continue to use the Business Vault while the processes run in the background.

You can view the details for process information, warnings, and errors. You also can put processes on hold or cancel them. The publication processes listed have been started directly from the publication definition, re-run through the monitor, or run on a schedule. The validation processes listed were validated from a hierarchy, dimension, or cube list page or validated from the publication list. You can run a process again through the monitor.

## Accessing the publications monitor

You can use the **Publications Monitor** to view the status of validation and publishing processes. You can place a process on hold, cancel, or rerun. The Publications that are listed include:

- Publication processes run on-demand from the Publication Definition
- Validation processes run on-demand from the Publication, Hierarchy, Cube, or Dimension Definition
- Publication processes run on a publication schedule
- Publication processes rerun from the publication monitor

From the publications monitor, you can refresh the list, filter the list, use the grid selections to personalize the display, and export the list.

1 Select **Monitoring > Publications Monitor**. The **Publications Monitor** is displayed with a list of all publication and validation processes that are scheduled to run, on hold, are currently running, or are finished. The **Publications Monitor** list displays read-only columns for:

**Subject Name**
The name of the publication to publish or the name of the hierarchy, dimension, cube, or publication definition to validate.

**Subject Type**
The type of process. If the operation is validation, then the subject type indicates if the process is validating a hierarchy, dimension, cube, or publication definition. If the operation is publication, then the subject type is publication.

**Status**
The current status of the process. These are the statuses:

- Runnable: the process is in the queue available to run.
- On Hold: the process is on hold and will not run. You can either cancel the process or run it to remove the hold.
- Running: the process is currently running.
- Completed: the process has completed successfully. Click **Details** to view the results.
- Completed with Errors: the process has completed unsuccessfully. Click **Details** to view the results and errors.
- Canceled: the process has been canceled either before it started or while it was running.

**Schedule Name**
The name of the schedule that initiated the process. The schedule name is blank if the process is run on-demand.

**Operation**
The process type of Validation or Publication.

**Run by**
The user ID of the person who submitted the publication or validation process. If the publication is run on a schedule, then the user ID is the user that created the schedule.

**Created On**
The date and time on which the publication or validation process was created.

**Details**
The details option shows the informational, warning, and error messages for the validation or publication process.

2 The columns displayed are shown by default. To show more columns on the list, such as GUID, click **Grid Settings** and then select **Column Personalization**.

3 Check the columns to display or clear the check box to hide the column.

4 To refresh the publication and validation list, click **Refresh**. The list is updated with new and updated process details.

5 To suspend a publication or validation process, click **Hold**.

See Holding a publication or validation process on page 144.

6 To start a publication or validation process, click **Run**.

See Running a publication process on page 144.

**Note:** When you select a publication or validation process from the Publication Monitor, the version used for the process is the version of the definition that was used when the process was originally run. To run a process using the current version of the definitions and model objects, submit a new validation process or run the publication from the Publications function.

7 To cancel a publication or validation process, click **Cancel**.

See Canceling a publication or validation process on page 145.

8 To navigate from a publication or validation process to a subject definition, click **Go to Subject Definition**.

See Navigating to a subject definition on page 146.

## Holding a publication or validation process

You can place a publication or validation process on hold. A process will remain on hold until you select to run it or cancel it.

- If a process status is runnable, then you can place the process on hold and it will not start.
- If a validation process is running, then you can place the process on hold to suspend the process.
- If a publication process is running, then you can place the process on hold. This stops the process at the current state or stops submitting publishing jobs to the target. Any jobs previously submitted to the target, will continue.
- The next process in the Publications queue remains in Runnable status until the process that is on-hold is cancelled or run.

**Note:** If you place a process on hold, then subsequent processes are prevented from running. You can either take the process off hold to run it or cancel the process to run the next process in the queue.

1 Select **Monitoring > Publications Monitor**.

2 Select one or more publication or validation processes to put on hold and click **Hold**. The publication or validation status is changed to *On-Hold*.

## Running a publication process

You can run a publication or validation process on-demand from the **Publications Monitor** or directly from the publication definition. Use the **Publications Monitor** page to run processes that have previously run, are currently on hold, or are scheduled to run in the future. When you run validation or publication processes from the monitor, the definitions saved for the prior process are used.

To run a publication or validation process from the **Publications Monitor**:

1 Select **Monitoring > Publications Monitor**.

2 Select one publication processes to run and click **Run**. If the process is on hold, the status will change to **`Runnable`** or **`Running`**. If the process was completed or completed with errors, a new process is submitted.

**Note:** When you select a publication or validation process from the Publication Monitor, the version used for the process is the version of the definition that was used when the process was originally run. To run a process using the current version of the definitions and model objects, submit a new validation process or run the publication from the Publications function.

3 Click **Refresh** to see the current status.

## Viewing the results of a publication or validation process

You can use the **Publications Monitor** to view the results of a publication or validation process. The monitor shows the current status of each validation and publication process. Each process has a Details dialog with informational, warning, and error messages.

See Troubleshooting on page 169 and Process report codes and messages on page 158 for error details.

1 Select **Monitoring > Publications Monitor**.

2 Locate your publication or publication process in the list. Processes that have run successfully have a green checkmark. Processes that ended with errors have an error indicator.

3 To view the detail report for processes that have ended successfully or in error, click **Details** in the Details column. The Process report shows the process steps run for the validation or publishing process. Use the report to review errors and warnings. Optionally, the detail report text may be copied into a text editor and saved in a file.

See Process report codes and messages on page 158.

4 Click **OK** to close the **Process report** dialog.

## Canceling a publication or validation process

You can cancel processes that have not run, are on hold, or are currently running. If you cancel a validation process that is running, then the process is stopped. If you cancel a publication process that is currently running, then the process stops sending process job information to the target. Processes that have already been submitted to the target continue to run.

You cannot cancel a publication process that has submitted a job process to OLAP Server. The OLAP Server process continues to run.

1 Select **Monitoring > Publications Monitor**.

2 Select one or more processes to cancel and click **Cancel**. The status of a process that is **`Runnable`**, **`On hold`**, or **`Running`** is changed to **`Canceled`**.

## Navigating to a subject definition

You can navigate to the subject definitions used in validation or publication processes. When you navigate to a definition, you navigate to the version of each definition used for the validation or publication process.

You can use the **Go to** option, to navigate to a publication definition version if the subject is a publication. You can navigate to a publication, cube, dimension, or hierarchy definition version from a validation process.

1 Select **Monitoring > Publications Monitor**.

2 Select **Go to Subject Definition**. The detail page for the subject definition is displayed. hat

**Note:** The tag for the definition version tag is displayed in blue. The Version Effective On: date and time corresponds to the date and time of the publication or validation process or the definition used in the publication process.

If you navigate to a definition that has associated definitions, such as a publication definition that has cubes and dimensions, you can navigate to the associated definition versions using the **Go to** option on the associated cube or dimension.

3 Click **Back** to navigate through each definition version back to the Publications Monitor.

# Scheduling publication processes

You can optionally create schedules for publication processes. You can use the **Publication Schedules** to establish recurring dates and times to run publishing processes. Schedules may be setup for intraday, daily, weekly and monthly recurrence patterns.

When you create a recurring schedule, you can publish using the current definitions of cubes, dimensions, and hierarchies or use saved versions of the definitions. Saved definitions are the definition versions that were used the last time the publication was run. Current definitions are the latest versions of the dimension, hierarchy, and cube definitions for the publication process. The options are available if you want to continue to publish up to date dimension and fact data without updating the dimension, hierarchy, and cube definitions to their current versions. For example, if you have updated a product hierarchy, then you can wait until you are ready to implement the change by publishing the definition version saved with the publication schedule.

After a publication schedule is created, you must activate the schedule to start publishing on the scheduled start times. The schedule continues to process the publication according to the schedule until the scheduled end date. You can deactivate a schedule to stop future scheduled publication processes. If a process is scheduled but has not run yet, then you can put the schedule on hold or run it on-demand through the **Publication Process Monitor**.

If you do not create a schedule, then you can run publications on-demand through the **Publication Definition** page and you can run previously-run publication processes through the **Publication Process Monitor**.

If you have a main publication with next publications defined, you can set up a schedule for the main publication. The next publications are submitted to the publication queue if and when the main publication ends successfully.

## Accessing publication schedules

You can use **Publication Schedules** to create recurring publishing processes. The list shows the schedule name and publication name. The status indicates if the schedule is active or inactive. Active schedules run at the scheduled intervals until the scheduled end date. Inactive schedules will not run. The recurrence pattern options are intraday, daily, weekly or monthly.

The source is the source database where the data for the dimensions and facts resides. The Business Vault extracts data from the source when building dimensions and facts. The publication target is the database or application to which the publication results are sent. The last updated by is the user ID of the person creating or modifying the schedule. The last update time (UTC) is the date and time, converted to the UTC time zone, that the schedule was saved.

From the publication schedules list, you can refresh the list, filter the list, and use the grid selections to personalize the display and to export the list.

1 Select **Analytic Modeling > Publication Schedules**. The **Publications Schedules** page is displayed with a list of all publication schedules. The list displays read-only columns for:

**Name**
The name of the publication schedule.

**Publication**
The name of the publication definition.

**Status**
The current status indicates if the publication schedule is active or inactive. Active schedules are run at the scheduled intervals until the scheduled end date. Inactive schedules do not run.

**Recurrence Pattern**
The schedule type to publish on an intraday, daily, weekly or monthly pattern.

**Source Database Connection**
The source of the data to use for dimension and cube data.

**Publication Target**
The target database or application to which the dimension, cube and fact data is published.

**Last Updated By**
The user ID of the person who last updated the publication.

**Last Updated On (UTC)**
The date and time on which the publication was last updated. The date and time are in UTC format.

2 The columns displayed are shown by default. To show more columns on the list, such as Next Run Date and End Date, click **Grid Settings**. Select **Column Personalization**.

3 Check the columns to display or clear the check box to hide the column.
4 To refresh the publication schedule list, click **Refresh**. The list is updated with new and updated publication schedule details.
5 To create a new publication schedule, click **New**.
See Creating a new publication schedule on page 148.
6 To duplicate a publication schedule, click **Duplicate**.
See Duplicating a publication schedule on page 151.
7 To activate a publication schedule, click **Activate**.
See Activating a schedule on page 151.
8 To deactivate a publication schedule, click **Deactivate**.
See Deactivating a schedule on page 151.
9 To delete a publication schedule, click **Delete**.
See Deleting a publication schedule on page 152.
10 To edit a publication schedule, click **Drill-down**.
See Editing a publication schedule on page 150.

## Creating a new publication schedule

A publication schedule allows you to specify the publication definition to publish on a recurring basis. You select a publication definition and setup the schedule.

You can select to run the schedule with the current definitions of dimensions, hierarchies and cubes or saved definitions. The first time a publication runs, it uses the most recent versions, of each definition. For subsequent publications, you can select to publish with the current definitions or the saved versions that were previously used in the publishing process.

Processes run on schedules have preset schedules start dates and times. All dates and times are expressed in the UTC (Universal Time Coordinated) time zone using a 24-hour format. When you select a time, convert the time from your desired time to the UTC time expressed in 24-hour format. For example, the Eastern time zone conversion to UTC is minus 5 hours. To start a process at 8am Eastern, enter 03:00:00 in UTC. To start a process at 10pm Eastern (22:00:00 Eastern), enter 17:00:00 UTC.

You can create schedules for these recurrences:

- Intraday: Use an intraday schedule to run the publication process one or more times throughout a 24-hour period.
- Daily: Use a daily schedule to run the publication process once a day. You can setup the days of the week to run the process, or you can run the process at a set number of daily intervals.
- Weekly: Use a weekly schedule to run the publication process one or more times a week. You select the day or days of the week to run the process, and setup if the process runs each week or number of weeks between each occurrence.
- Monthly: Use a monthly schedule to run the publication process on a set day once a month or on a set number of monthly intervals or relative day of the month.

1 Select **Analytic Modeling > Publication Schedules**.
2 To create a new publication schedule, click **New**.
3 Specify this information:

**Name**
Specify a name for the publication schedule. The name must be a unique schedule name.

**Publication definition**
Select the publication definition on which to base the schedule.

**Start Date (UTC)**
Specify a start date in UTC format.

**End Date (UTC)**
Specify an end date in UTC format.

4 Specify one definition version option:
- To run each publication with the latest versions of cube, dimension, and hierarchy definitions, select **Publish with current cube and dimension definitions**. This option uses the current versions each time the process runs on the schedule.
- To run the first publication with the current definitions, select **Republish with saved versions of cube and dimension definitions (applicable for schedule recurrences)**. Each subsequent publication processes re-uses the definitions that were used the previous time the publication schedule ran.

5 To create an intraday schedule,
a Specify this information:

**Recurrence pattern**
Specify **`Intraday`**.

b Click **New** to specify the intraday times for the publication process to run. The date and time must be entered in UTC format.
c Specify the **Hour** and **Minute** in UTC format. Specify **`AM`** or **`PM`**.
d Continue to click **New** to add each scheduled start time throughout the day. To remove start times from the schedule, select one or more start times and click **Delete**.

6 To create a daily schedule,
a Specify this information:

**Recurrence pattern**
Specify **`Daily`**.

**Time (UTC)**
Specify the time to run during the day. The time is in UTC format.

b To publish on specific days of the week, select the **Days** option and select the specific days of the week.
c To specify the number of days between publication processes, select the **Days Interval** option. Specify the interval in the **Every number of days**.

7 To create a weekly schedule,

a Specify this information:

**Recurrence pattern**
Specify **`Weekly`**.

**Time (UTC)**
Specify a time to run during the day. The time is in UTC format.

b To specify the weekly interval, specify the **Every number of weeks** option. Select each day of the week to run the schedule.

**8** To create a monthly schedule,

a Specify this information:

**Recurrence pattern**
Specify **`Monthly`**.

**Time (UTC)**
Specify the start time in UTC format.

b To select a specific day of every selected number of months, select the **Specific day of the month** option. Specify the day number and the number of months between each recurrence.

c Alternatively, select the **relative day of the month** option. Specify the relative day of the month, the weekday, and the number of months between each recurrence.

**9** To save the schedule, click **Save**.

**10** Click **Back** to return to the Publication Schedules list.

**11** To start the process on the scheduled times, select the schedule and click **Activate**. The schedule status defaults to Inactive status, which means that the publication will not run on the scheduled start time.

## Editing a publication schedule

You can update a publication schedule at any time. Updating a publication schedule affects the future scheduling of the publication process. It does not affect scheduled processes that are actively running. After you edit and save a publication schedule, you must reactivate the schedule.

**1** Select **Analytic Modeling > Publication Schedules**. The **Publications Schedules** page is displayed with a list of all publication schedules.

**2** To edit a publication schedule, click **Drill-down**.

**3** Change the publication schedule options.

**4** To save the schedule, click **Save**.

**5** Click **Back** to return to the **Publication Schedules** page.

**6** Select the schedule and click **Activate**.

## Duplicating a publication schedule

You can duplicate a publication schedule. Duplicating a schedule copies all options and settings into a new schedule with a different publication name.

You can duplicate a schedule to update the definitions used in the publishing process. For example, if you have a daily cube update, then you can republish the cube every day using the same definitions. To update the cube with the current definitions, then create a duplicate schedule. The first time that the new schedule runs, it uses the current definition versions. It uses the latest versions of cube, dimension and hierarchy definitions. The second and subsequent times that the schedule runs, it re-uses the saved versions.

1. Select **Analytic Modeling > Publication Schedules**.
2. Select a publication schedule and click **Duplicate**.
3. Specify a new publication name and update the schedule options.
4. To save the schedule, click **Save**.
5. Click **Back** to return to the schedules list.
6. Select the schedule and click **Activate**. The schedule status defaults to **`Inactive`** status. The publication will not run on the scheduled start time.

## Activating a schedule

To start the publishing process on the scheduled intervals, you must activate a schedule. A new schedule defaults to an inactive status and does not publish. Activate a publication schedule to process for future start times.

1. Select **Analytic Modeling > Publication Schedules**. The **Publications Schedules** page is displayed with a list of all publication schedules.
2. Select one or more publication schedules with an inactive status. Click **Activate**. The schedule status changes from **`Inactive`** to **`Active`**.
3. Use the **Publications Monitor** to monitor scheduled processes.

## Deactivating a schedule

To stop scheduled processes from starting, you must deactivate a schedule. You can deactivate a schedule to temporarily hold a publication from running on its schedule. New schedules are always created in an inactive state and must be activated to run. Deactivating a schedule does not impact scheduled processes that are currently running or are on hold. Deactivating a schedule does not impact scheduled processes that are already scheduled to run, are running, or have completed in the publications monitor.

1. Select **Analytic Modeling > Publication Schedules**. The **Publications Schedules** page is displayed with a list of all publication schedules.

2 Select one or more publication schedules with an active status and click **Deactivate**. The schedule status changes from **`Active`** to **`Inactive`**.

## Deleting a publication schedule

To stop the recurring publication process, you can delete a publication schedule. Deleting a schedule has no impact on previously run scheduled processes, processes on hold, or processes that are currently running.

To stop the processes on a temporary basis, deactivate the schedule. Inactive schedules can be activated later, and the schedule information is retained. Delete schedules that are no longer needed.

1 Select **Analytic Modeling > Publication Schedules**. The **Publications Schedules** page is displayed with a list of all publication schedules.
2 Select the publication schedules to delete and click **Delete**. A confirmation dialog is displayed.
3 Click **OK** to delete the schedule. A message is displayed that the schedule is successfully deleted. Click **Cancel** to cancel the deletion.

# Chapter 19: Localization

You can publish dimensions and cubes to a target system in a single locale or multiple locales. The locales available are:

- Default (abbreviation = default, locale code = 0)
- English (abbreviation = en-us, locale code = 9)
- German (abbreviation = de, locale code = 7)
- French (abbreviation = fr, locale code = 12)
- Spanish (abbreviation = es, locale code = 10)
- Portuguese (abbreviation = pt-br, locale code = 1046)
- Dutch (abbreviation = nl, locale code = 19)
- Czech (abbreviation = cs, locale code = 5)
- Chinese (abbreviation = cn-zh, locale code = 4)
- Japanese (abbreviation = ja, locale code = 17)
- Russian (abbreviation = ru, locale code = 25)
- Italian (abbreviation = it, locale code = 16)

The translated string values published with dimensions and cubes originate in two areas:

- Source data used in dimensions and hierarchies
- Translatable values in hierarchy, dimension, and cube definitions

If your source data and definitions contain localized values, then the values are published to the target application in the locales that you specify on the publication target. For locale-specific source data, the source data used in dimensions and hierarchies must be associated with data store BOD mappings. The localized values are in BOD mappings and are stored in separate locale tables.

The Business Vault distinguishes localized values in the hierarchy and dimension definitions when the definitions are associated with a data source that has BOD mappings. The localized values are designated in the Business Vault, even if the BOD data has only the default locale or a single locale. If you use a localized property, such as an item name or description, in a hierarchy or dimension definition, then the caption is considered a localized value. If you use a localized property for an attribute value, then the attribute value is tagged as a translated value by default. You can see the translated value option check box in the attribute grid.

When a dimension definition is published, you should publish the locales in which to publish the localized values. You must select one locale. You can select the default locale or the locale(s) in which your data is stored. The locale(s) selected may be based on the locale(s) supported by the BI reports and dashboards.

See Publishing dimensions and cubes on page 131.

The definitions that you import with Infor-supplied content can have translated values for display names, captions, and attribute values. When you import a definition, localized values are imported with the definition. Localized values are published with the dimension or cube if the locale is selected in the publication target.

You can use the export and import translation functions to add and update localized values for dimension and cube display names and members created in the Business Vault definitions.

For a preconfigured dimension, you can add localized values for the dimension display name. For a time dimension, created through a time dimension definition, the Business Vault already contains localized values. If you change any of the default values in the time dimension definition, you may export the value formats and add or edit the localization formats.

For a hierarchy definition, you can add or edit localized values for members created in the definition. For a manual hierarchy, you can add or edit localized values for hierarchy members and for translatable attribute values. For a rule-based hierarchy, you can specify localized values for hierarchy structure members and translatable attribute values. For a level-based hierarchy, you can specify localized values for missing and unknown member captions and translatable attribute values.

**Note:** Named hierarchies are not eligible for localization. Hierarchy display names, hierarchy descriptions, and hierarchy level names are published in the default locale, which is the locale in which the values are specified in the definition.

When you publish a dimension to the Infor BI OLAP Server target, the default attribute table specified in the dimension definition's More Options section contains the localized values for member captions. When you publish localized values for attributes, then the localized values are stored in the attribute table specified for the attribute in the dimension definition. If your source data does not contain localized values, then de-select the attribute translation options. Each localized attribute value uses one attribute column in an OLAP Server attribute table.

See Hierarchies on page 40 and Dimensions on page 84.

# Setting up and publishing using localization

If the target is Infor BI OLAP Server, then the dimension display names are published in the extended properties for each selected target locale.

A dimension published in multiple locales has attribute table columns designated for each target locale. The locale-specific data for member captions and attribute values is selected from the data source. Member captions are always in the default attribute table specified in the dimension. Translated attribute values are in the locale table specified for each attribute in the dimension definition. The locale-specific values in the attribute table are set by these rules:

- If locale-specific data is found in the data source for a localized member caption or attribute value, then the locale-specific data is used for caption and attribute values.
- If locale-specific data is not found in the data source for a localized member caption, then the locale-specific caption name is left blank.
- If locale-specific data is not found in the data source for a localized attribute value, then the default locale value is used.

Follow these summarized steps to identify, select, and publish localized data and dimension information to a publication target.

1. Setup BOD Mappings for the data store that is associated with the database connection.

   See the *Infor Business Vault Administration Guide* for additional information on data stores and BOD mappings.
2. Import definitions that contain localized values. Localized values can be included in hierarchy, dimension, and cube definitions.
3. Select localized properties in hierarchy and dimension definitions to use for member captions and attribute values. Right-click **Technical Details** for properties in the Property pane and identify localized values. Localized values, specifically for the Infor Business Vault Base Data Store schema, have table names ending with _LC.

   See Hierarchies on page 40 and Dimensions on page 84.
4. Export definition translations to incorporate localized values, update localized values, and import the translations back into the Business Vault. Localized values become part of the definition.
5. Create a Publication Target and select the locales to publish dimensions and cubes.

   See Publishing dimensions and cubes on page 131.
6. Publish the dimensions and cubes to the target. The localized strings available in the definitions and in the data source are published to the target.

# Exporting definition translations

You can export translations from hierarchies, dimensions, or cubes. When you export translations, the values that are available to be localized, are exported into Excel files. You can edit these files. When you import the files back into the Business Vault, the translated values become part of the definition.

You can export subordinate definition translations for cubes and dimensions. For dimensions, subordinate definitions are the hierarchy translations that are selected for the dimension. For cubes, subordinate definitions are the dimension translations that are selected for the cube and all hierarchy translations selected for each dimension.

You can localize display names for cubes. For dimensions, display names, and top level member captions can be localized. For hierarchies, members that are added directly in the Business Vault definition can be localized. You can add translated strings for manually-created member captions, string attribute values, missing value captions, attribute values, unknown value captions, and attribute values.

A definition translation export creates a `Translations.zip` file that contains an Excel workbook for each type of definition selected. For example, if you are exporting translations for cubes and you have selected the **Include subordinate definitions** option, then a `Cubes.xlsx`, `Dimensions.xlsx`, and a `Hierarchies.xlsx` file are exported in separate files in the `Translations.zip` . Each Excel workbook contains a worksheet for each definition.

1. Select **Analytic Modeling > Hierarchies > Dimensions** or **Cubes**.
2. From the displayed list, select the hierarchies, dimensions, or cubes to export.

3 Click **Export**. The Export wizard is displayed.
4 To include associated definition translations, such as dimensions and hierarchies associated with a cube, or hierarchies associated with a dimension, select **Include subordinate definitions**.
5 Select **Translations** to export translations.
6 Optionally, specify **Comments**. Comments are included in the export `readme.txt` file.
7 Click **Next**. A list of definitions selected for the translations export are displayed on the Export panel.
8 Click **Finish** to start the export. Click **X** to cancel.
9 Select a location to save the `Translations.zip` file.

   The `Translations.zip` file contains all the definitions that are exported in Excel file formats, and a `ReadMe.txt` file.

# Updating definition translations

To add and update localized values, unzip the `Translations.zip` export file. You can edit the Excel spreadsheets to add or update localized values. The Cubes spreadsheet contains a worksheet for each cube translation, the Dimensions spreadsheet contains a worksheet for each dimension translation and the Hierarchies spreadsheet contains a worksheet for each hierarchy translation.

The spreadsheets contain columns and rows for the Property, Default value, and a column for each locale. Each locale is in a separate column. Only specify localized values for the locales in which you plan to publish dimensions and cubes. The locale columns are listed with the locale's abbreviation.

To specify a localized value for the properties, position the cursor at the intersection of the default value and the locale. Enter the localized value in the locale column.

**Table 1: Locale columns**

| Language | Locale column |
|---|---|
| English | **en-us** |
| German | **de** |
| French | **fr** |
| Spanish | **es** |
| Portuguese | **pt-br** |
| Dutch | **nl** |
| Czech | **cs** |
| Chinese | **cn-zh** |
| Japanese | **ja** |
| Russian | **ru** |
| Italian | **it** |

Do not update these columns. Updating the values in these columns may corrupt the spreadsheet and cause import errors.

- **Property**: the property columns contain details about the definition objects.
- **Meta**: the meta column contains metadata to identify the unique key (GUID) for the value.
- **Default**: the default column contains the value of the default locale. Changes made to the default values are not imported. To change the default locale value, update the value in the Business Vault definition, and export the translations again.
- **en-de**: for internal use only
- **en-bw**: for internal use only

Save the updated Excel workbooks after you specify the localized values. Create a new zip file that contains the updated Excel workbooks and the `readme.txt` file.

# Importing definition translations

You can import hierarchy, dimension, and cube definition translations. You can import from the **Hierarchies**, **Dimensions**, or **Cubes** main pages. You must import the entire file. You cannot select individual definition translations in the import file.

When you import translations, you must select a database connection. The definition translations are associated with the definitions that are part of the application that you are currently using.

1. Select **Analytic Modeling > Hierarchies > Dimensions** or **Cubes**.
2. Click **Import**.
3. Click **Browse** and select the translation `.zip` file to import. The comments that are associated with the `.zip` file, and a list of the definition translations in the import file, are displayed.
4. Leave the default option, **Overwrite existing definition translations with the imported versions** selected for translation imports.
5. Select a database connection.
6. Click **Import**. When the import process completes successfully, the localized values are updated and are available for publication. Localized values are not displayed in the definition. You must publish the dimension or cube with the locales selected in the publication target. You can see the localized values through the target application

# Appendix A: Process report codes and messages

The validation and publication processes run unattended. The process generates a Process Report, accessible through the Details link on the Publications Monitor. The Publications Monitor lists each validation and publication process run on-demand or on a schedule.

The process report includes informational (INFO) messages and may include warning (WARN) messages. A process that ends successfully shows a **`Completed`** status. A process that ends unsuccessfully shows a **`Completed in Error`** status. A process that ends with data exceptions shows a **`Completed with Exceptions`** status. The process report includes at least one error (ERROR) message.

A validation process, run on-demand, validates for the conditions associated with the validation options that you selected. The options are listed on the Validation dialogs for hierarchies, dimensions, cubes and publications. A publication process, run on-demand or through a schedule, automatically validates the publication, cubes, and dimensions associated with the publication. Validation options, available in the Publication Definition, allow you to skip select or all data validations.

If you selected the cube fact publishing or the dimension publication options for the publication process, then results are logged for OLAP Server processes. Error and data exception logs are available through Infor BI OLAP Server error and data exception reports.

See Editing a publication on page 140.

## Reviewing the Process Report

The process report lists the process steps for the validation or publication process. The messages are listed in chronological order, and the datetime values are displayed in Universal Coordinated Time (UTC) format. The UTC format is the default time zone for all dates and times in the Business Vault.

Each step in the process is represented by an Informational (INFO), Warning (WARN) or Error (ERROR) code and message. Use the Codes and Messages information to understand the step and purpose.

The process report outlines each step in the validation or publishing process. The INFO 113-general information messages, outline the steps. A validation or publishing process is assigned a Process ID, listed in the first lines of the report.

These Message Types are included in the report:

- DEFINITION_CHECKPOINT

Every process automatically checks the hierarchies, dimensions, and cubes selected in the validation or publishing process. Definition checkpoint validations ensure that the definitions are complete by checking for required values. Valid field lengths and characters are verified. The definition validations correspond to the validation option: **Validate the selected definition for internal consistency**.

- DATA_STRUCTURE_CHECKPOINT

  Validation processes run with the **Validate the selected definition against the source database connection** option and all publication processes, check the data structures referenced in the definitions. Data structure checkpoints verify that the source database entities and columns used in the definitions are valid.

- INTER_RELATED_DEFINITION_CHECKPOINT

  Validation process run with the **Validate all subordinate definitions option and all publication processes** option, check the inter-related, or subordinate definitions. For cubes, interrelated definitions are the dimensions in the cubes, and the hierarchies in the dimension. The validation ensures that the dimensions selected for the cube share the same source database connection. The validations ensure that dimensions contain valid hierarchies, such as the same entity, caption, and unique ID values. For a publication, the validation checks that the source database connection is valid for the dimensions and cubes selected.

- DATA_CHECKPOINT

  Validation process run with the **Validate the data in the source database option and publication processes** option, that do not skip all data validations, check the data in the source database to ensure that the data is valid for the dimensions and cubes. For dimensions, the source data is checked for valid size, valid characters, duplicate members, valid weights and other validations. For cubes, the source data is checked for valid fact data.

- OLAP Process

  Indicate the interaction of processes between the Business Vault and the target Infor BI OLAP Server. Each dimension, cube, and cube fact load is validated before it is published. Each dimension, cube, and fact load measure are published as jobs to the OLAP Server **Load from Source** database. The Load from Source database is the integration database between the two applications.

  When the job is submitted by the Business Vault, OLAP Server processes the job and returns a status code and a job completion time. The jobs in a publication are single-threaded. If a job completes successfully in OLAP Server, Business Vault submits the next job in the publication. This process continues until all of the dimensions, cubes, and fact load measures in the process complete successfully or end in an error.

  If any OLAP Server job ends in error, the publication process stops, and the publication status is **`Completed in Error`**. If an OLAP Server job ends with data exceptions, the publication process continues, and the publication status is **`Completed with Exceptions`**.

  If an OLAP Server job ends in error, or with data exceptions, see the Infor BI OLAP Server data exception and error reports for details. See the Process Report for process ID and the OLAP Server job number. Alternatively, use the Infor BI OLAP Server SDK Guide for status codes and descriptions.

  A dimension is published to OLAP Server in one job. Publishing a dimension updates the dimension's properties, localized values, dimension access cube, and dimension members through the OLAP Server dimension's extended properties.

  A cube is published to OLAP Server in a series of jobs. The first job is to create the cube. If the cube already exists in the OLAP Server database, the OLAP Server job status of 42-duplicate cube is returned. If the cube definition has changed, the Business Vault submits a job to delete the cube

and facts and create the cube again. This ensures that the cube contains the proper dimension and measure values. If the cube definition did not change, the Business Vault submits a job to update the properties for the cube's access control setting and the localized cube display name through the OLAP Server cube's extended properties. After the cube properties are updated, the Business Vault submits a job to publish the cube facts. A job is submitted for each cube fact that is published.

# Codes and messages

This table contains informational, warning, and error codes and messages for validating hierarchies, dimensions, cubes, and publications. Additionally, it contains the codes and messages for publishing dimensions and cubes to a target application. These messages are displayed in the Publications Monitor Details' Process report:

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 100<br>Severity: Error<br>Message Type:<br>DATA_CHECKPOINT | Fatal - unrecoverable | General process error: The process encountered a fatal system error and could not continue. The problem may be due to a server, network or services issue. Check system resources and run the process again.<br>Range-based hierarchy validation: A range-based dimension has more than one hierarchy selected. A range-based dimension must have only one manual hierarchy associated with it. The manual hierarchy must have a numeric attribute used for the range values.<br>See Range-based hierarchies on page 79.<br>Locale validation: Publications fail with error 100 if no locales are selected for the publication target. Verify that a locale is selected on the publication target, and the target is activated.<br>See Accessing publication targets on page 132. |
| Code 101<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECKPOINT | is null or blank | The definition has an empty or null value in one or more of the following fields: dimension display name, dimension description, attribute name, attribute description, cube display name, cube description or cube fact name. Update the definition to add names and descriptions.<br>If the dimension uses named hierarchies, then one or more of the selected hierarchy's hierarchy display name or description is null. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 102<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECK-POINT | value is too long | These values have a maximum length of 50 characters: dimension definition name, dimension display name, dimension description, attribute name, attribute description, hierarchy level name, cube definition name and cube fact name. Update the definition to shorten the names and descriptions to 50 characters or less. |
| Code 103<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECK-POINT | Too many fields | A dimension attribute table has too many attributes defined. Dimensions may have 3 attribute tables of 49 attributes each, including an attribute value for each localized member caption and each localized attribute value. Review the dimension definition and update the attribute table selected for each attribute. Ensure that each attribute table has 49 or fewer attributes.<br>See Standard dimensions on page 89 or Time dimensions on page 101. |
| Code 104<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECK-POINT | Not valid name | A definition value contains invalid characters. Invalid characters are [ ] \ / : * ? "" < > \| <TAB> <LF> <CR>. The characters are not valid for the following values: hierarchy definition name, dimension definition name, dimension display name, dimension description, attribute name, attribute description, cube definition name, cube display name, cube description and cube fact name. Update the definition to remove the invalid characters. |
| Code 105<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECK-POINT | length too long | The hierarchy and dimension attribute names and attribute descriptions have a maximum length of 50 characters. Update the definition to shorten the attribute name and description to 50 characters or less. Text type attributes have a maximum length of 254 characters. Shorten text attributes to a size of 254 or less. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 106<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECK-POINT | Incomplete required reference information | A standard dimension definition is invalid if it does not have any hierarchies selected and the definition's entity, caption and unique ID values are blank. A dimension without hierarchies is called a flat dimension since the dimension members are in a flat hierarchy without a top-level dimension member or a hierarchy with a dimension top-level member and a list of children under the parent.<br>Update the definition to select a hierarchy or specify the entity, caption and unique ID.A standard dimension definition is invalid if the hierarchies selected for the dimension do not share the same source database connection.<br>See Standard dimensions on page 89. |
| Code 107<br>Severity: Error<br>Message Type:<br>DEFINITION_CHECK-POINT | not valid definition | Cube definition validation: if the fact has a measure dimension associated with it, the measure dimension's members must be used for the measure mappings, the cube fact must have at least 1 measure mapping with a value, and the cube fact must have a valid dimension mapping value for each dimension.<br>See Cubes on page 115.<br>Level-based hierarchy definition validation: If a missing or unknown value is defined for the lowest level (leaf) level, each intermediate level in the hierarchy must have a missing value member defined.<br>See Level-based hierarchy on page 45. |
| Code 108<br>Severity: Error<br>Message Type:<br>DATA_STRUC-TURE_CHECKPOIN T | not valid property reference | The hierarchy, dimension or cube definition references an invalid source database entity or column. Update the definition to use a valid entity or property reference. |
| Code 109<br>Severity: Error<br>Message Type:<br>Structure validation | connection failed | The connection to the source database connection or the target database connection failed. Verify that the source and target databases in the database connections are valid and accessible. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 110<br>Severity: Error<br>Message Type:<br>DATA_CHECKPOINT | not valid data<br>database related error | The Business Vault data validation process encountered a database-related error. A SQL exception was encountered while retrieve data from the source database during the data validation process. The process failed to create a dimension or cube fact view. The problem may be a connection problem with the source database. The problem may be caused by invalid dimension or fact data.<br>To resolve the error, check the process report for other errors that may affect this problem. Ensure that the database connection, the entity and columns in the source database are valid. Ensure that custom properties and custom entities used in the definitions are valid and use the correct syntax.<br>Cube data validation: A cube definition's fact mapping contains references to missing value and unknown value replacements. The missing value and unknown value replacements in a cube definition's fact mappings are invalid.<br>The missing value and unknown value replacements must be the unique IDs of leaf-level members in the dimension. Update the cube definition's fact mappings. Cross-reference the cube definition's fact mappings for missing and unknown unique ID values to the dimension and hierarchies in the dimension. Ensure that the dimension and hierarchy unique IDs match the missing and unknown value unique IDs.<br>The error may occur if the data type of the fact values do not match the data type of the dimension unique ID values. Ensure that the unique ID data types match. Correct any discrepancies and save the definitions.<br>See Cubes on page 115. |
| Code 112<br>Severity: Error<br>Message Type:<br>INTER_RELATED_DEFINITION_CHECKPOINT | not valid interrelated reference | The cube, dimension or hierarchy definition's source database connection, entity and properties do not match the publication definition's source database connection's entity or properties. Verify that the definitions and the publication definitions use the same source database connections or have the same database structure and use the same models. |
| Code 113<br>Severity: Information | INFO | General information message for the validation or publication process. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 114<br>Severity: Information<br>Message Type:<br>OLAP Process | olap job submitted | Information message for jobs submitted to the Infor BI OLAP server target. The message includes the OLAP server job number and the dimension, cube, or fact load name. |
| Code 115<br>Severity: Information<br>Message Type:<br>OLAP Process | olap jobs | Information message for jobs to be published to the Infor BI OLAP server target. The message includes the dimension, cube, or fact load name. |
| Code 116<br>Severity: Information<br>Message Type:<br>OLAP Process | olap server returned an error | The OLAP Server job ended in error. The message includes the Business Vault publication process ID and the OLAP Server job's error status number.<br>Resolution: Determine the OLAP job that failed by checking the OLAP Server job number listed in the 114 OLAP job submitted message. See the Infor OLAP Server SDK Guide for the error code and description. See the Infor OLAP Server troubleshooting procedures to determine the cause of the error. |
| Code 117<br>Severity: Error | not valid filter | A definition has an incomplete filter. The validation checks the filters on the level-based hierarchy definition, the dimension definition's subsets and the cube definition's fact filters. Edit the definition to correct the filter. |
| Code 118<br>Severity: Information<br>Message Type:<br>OLAP Process | olap job completed with status | Each OLAP Server job process completes with a status. A status of 0 is a successful job completion. A status of 42 for a cube job indicates that the cube already exists in the OLAP database. The Business Vault submits a job to delete the cube and create it, if the cube definition has changed. A status other than 42 indicates that the job ended in error. Refer to the Infor OLAP Server SDK Guide for error codes and message descriptions. |
| Code 119<br>Severity: Error | number of dimensions in the cube is invalid. A cube may have between 2 and 30 dimensions. | A cube can have between 2 and 30 dimensions. |
| Code 120<br>Message Type:<br>DEFINITION CHECK POINT | measure dimension should be the last dimension in the cube when publishing the data type of string | When publishing measures with the data type of string, the measure dimension should be the last dimension of the cube. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 121<br>Severity: Warning<br>Message Type: DATA_CHECKPOINT | Cube fact will not be published to OLAP Server. | Cube fact partial load parameter values are empty or NULL for the listed dimensions.<br>The cube fact load is setup as a partial load, but there are no partial load parameters available. Therefore, the fact load is skipped.<br>Ensure that the partial load parameter values are either included in the source when the publication runs or specify the parameter values in the cube definition. If the cube definition is using partial load parameter values from the source, the publication reads the source table, BV_PARTIAL_LOAD_PARAMETER VALUES. The partial load values selected are read when the publication runs, after the publication's pre-process configuration step ends successfully. If no parameter values are found in the source table, the cube fact partial load is skipped. The fact is not published to OLAP Server. |
| Code 122<br>Severity: Informational<br>Message Type: DATA_CHECKPOINT | Cube fact partial load parameter values | The publication is processing the fact load as a partial load. The dimensions and dimension values used, are listed for the partial load. The partial load dimension values are listed as unique IDs. The parameter values are used to clear the areas of the cube first and replace the areas of the cube with facts that match the parameter values. |
| Code 123<br>Severity: Informational | Configuration return code | This message displays the return code for the configuration.<br>• A return code of 0 indicates success.<br>• A return code not equal to 0 indicates failure. |
| Code 124<br>Severity: Informational | Configuration return message | This is the message associated with the configuration. The output message is `SQL Agent Job completed successfully!` |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 125<br>Severity: Error | Configuration reported error. The publication process will stop in error. | An error return code has been returned. A non-zero return code indicates a failure. The publication will end in error. If the configuration is a pre-process, the publication stops before any dimensions and cubes are validated and published.<br>The messages are:<br>• `SQL Agent Job Execution error: Check supplied job name`. The job does not exist or the job parameters are incorrect.<br>• `SQL Agent Job was already running!` The job is running when the publication attempted to run the process concurrently.<br>• `SQL Agent Job was stopped prior to completion on step`. The job execution was stopped at the step listed in the message.<br>• `SQL Agent Job was stopped prior to/after/before completion of the <jobname>`. The job was stopped.<br>• `SQL Agent Job ended in error.` The message lists the job and step name. |
| Code 1000<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | membername (element names) contain invalid characters | The unique ID of a dimension member contains an invalid character. Invalid characters are [ ] <TAB> <Carriage Return> and <Line Feed>. The validation lists up to 10 occurrences of the error. If the member's unique ID is defined in the Business Vault definition, update the definition to remove the invalid characters. If the unique ID is mapped from the source data, either update the source data or filter the data from the dimension. |
| Code 1001<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | weight contains non-numeric value | The dimension member has an invalid weight. Weight values must be numeric. If the member's weight is defined in the Business Vault definition, update the definition to use a valid weight. If the member's weight is mapped from the source data, update the definition to use a numeric value. |
| Code 1002<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | membername (elementnames) contains NULL value | The dimension member's unique ID is blank or null. Verify that all dimension member unique Ids have valid values. Update the dimension and hierarchy definition's to verify that the unique ID mapping for all members are valid. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 1003<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | membername (element names) is longer than 71 characters | A dimension member's unique ID is longer than 71 characters. The unique ID is called the Element Name in OLAP Server. The element name limit is 71 characters. To resolve, review the unique ID values of dimension members. Ensure that the unique IDs are 71 characters or less. |
| Code 1004<br>Severity: Information<br>Message Type: DATA_CHECKPOINT | publication contains duplicate unique IDs (member name or element name) | A dimension has duplicate members based on the member's unique ID. Duplicate members are valid in a dimension. The message includes the dimension name and up to 10 occurrences of the duplicate members. The dimension data is valid, and the dimension members are published to OLAP Server. |
| Code 1005<br>Severity: Warning<br>Message Type: DATA_CHECKPOINT | publication contains duplicate unique IDs (MemberName or element name) within its parent that is top level element. | The dimension has duplicate top level dimension members. In OLAP Server, the duplicate top level members are consolidated into a single top level dimension member. |
| Code 1006<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | publication contains duplicate unique Ids (MemberName or element name) within its parent. | The dimension has duplicate members under the same parent member. Dimensions may have dupliate members, but the members must be under different parent members. Resolution: Review the error message for up to 10 occurrences of duplicate members. Update the dimension and hierarchy definitions to eliminate the duplicate members under the same parent member. Review the hierarchy definitions to ensure that the member's unique ID values are distinct. Review the hierarchies selected for a dimension. If multiple hierarchies contain duplicate members, use the hierarchy prefix to distinguish duplicate members from different hierarchies. |
| Code 1007<br>Severity: Warning<br>Message Type: DATA_CHECKPOINT | Publication contains duplicate uniqueIds (MemberName or element name) that is top level element. | The dimension has duplicate members, and at least one duplicate is a top level dimension member. In OLAP Server, the top level member is not a top level member anymore. The duplicate members are consolidated to a single member and positioned as a child member. |

| Code/Severity/Type | Message | Description |
|---|---|---|
| Code 1008<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | Dimension limit is 10,000,000 child members under a parent member. | The dimension has a parent member with over 10,000,000 (10 billion) children members. The OLAP Server limit is 10 billion children under a parent. Update the dimension definition to ensure that each parent in a dimension has fewer than 10 billion children. Add additional hierarchy levels if necessary. |
| Code 1009<br>Severity: Error<br>Message Type: DATA_CHECKPOINT | Node doesn't exists in dimension mapping value | The cube facts reference dimension values that are not valid dimension members. Each cube fact must have valid dimension member references, or the cube fact must use the dimension mapping's missing value and unknown value replacements. Edit the cube definition and review the cube fact data. Ensure that each fact contains valid dimension references or use the missing value and unknown value replacements. Every fact must have valid dimension references or the fact must use the missing value and unknown value replacements to load the facts into the cube.<br>See Cubes on page 115. |

# Appendix B: Troubleshooting

This section contains troubleshooting information for the Infor Business Vault Analytic Modeling.

### The Dimension Definition does not show all hierarchies in the Available hierarchies selection list.

**Cause**: The hierarchies available are the hierarchies that share common characteristics with the dimension. The hierarchies available to add to a dimension are in the Available Hierarchies list in the dimension definition.

The available list contains level-based and rule-based hierarchies that share the same characteristics as the dimension, such as the same entity, common models associated with a database connection, caption, and unique ID. All manual hierarchies are also available to add to a dimension, because all members are defined directly in the Business Vault.

See Standard dimensions on page 89.

### Some fields in the definitions have a (*) after them.

**Cause**: If a definition is associated with a source database connection, then the entity and properties that you select for the definition, are associated with the database connection and its models. If you change the database connection associated with a definition, change the models associated with a definition, or change the data structure of the source database, then any missing entities or values have a (*) suffix to indicate that the entity or property is not found.

**Solution**: You can update the definition to select a valid entity and properties. If the definition looks correct, then verify that the database connection has the correct models associated with it. Additionally, verify that the tables and views associated with the database for the database connection have the tables, views, and fields associated with values in the definition.

### There are duplicate rows in the level-based hierarchy preview.

**Cause**: In a level-based hierarchy preview, each member of the hierarchy displays in an indented structure to show the caption, unique ID, weight, and attribute values. The attribute values for each member are specific to that level and to that member. If you see the same member in the tree more than once, then it may be caused by using different attribute values for the member.

**Solution**: Compare the attribute values for the duplicate members in the preview to determine if the attribute value for duplicate members are unique or the same. For example, when defining a product hierarchy of line, type, and model, if the attribute values for a model, such as a model description, are

assigned to a product line, each product line will appear in the grid for each model description attribute value.

#### A cube cannot be deleted due to a constraint violation error. This error message is displayed: `Constraint violations have occurred. A constraint violation occurred during deletion that is no longer present. Try again.`

**Cause**: The cube cannot be deleted because dimensions are selected for the cube.

**Solution**: Follow these steps:

1. Edit the cube.
2. De-select the dimensions in the cube and click **Save**.
3. Delete the cube.

   If you continue to receive the error, ensure that the cube does not exist in any publication definitions. Cubes cannot be deleted if publication definitions are setup to publish the cube.

#### Dimension publishing is failing with OLAP Server error 299.

**Note:** This is not an issue for a cloud deployment.

**Cause**: In Business Vault version 11.3.4, you can publish a dimension with one or more named hierarchies. The dimensions can be published to OLAP Server version 11 or 12. The default settings in Business Vault are for OLAP Server version 12.

These instructions configure Business Vault with Infor OLAP Server version 11. The difference between OLAP Server 11 and 12 settings is a property to publish dimensions with named hierarchies. If the property is set to true and the Business Vault publishes a dimension with named hierarchies to OLAP Server version 11, the dimension publication fails with `OLAP Server error 299, invalid dimension data in table _Dimensions`.

**Solution**: Update the default setting in the `bv.publishing.properties` file.

1. Browse to and select the Business Vault User Interface service folder: `webapps\Business Vault\WEB-INF\classes`.
2. Open the `bv.publishing.properties` file in a text editor such as Notepad++. Select **Run as Administrator**.
3. Change the value for the **publishing.namedHierarchies.omitNamedHierarchiesParams** property from **`true`** to **`false`**.
4. Save and close the `bv.publishing.properties` file.
5. Restart the Business Vault User Interface service.

#### Dimension publishing is failing with the error: `Error converting data type.`

**Cause**: Hierarchy and dimension members have required Unique ID and Sort By values. The Unique ID is the key value of each member. The Sort By value determines how a member is sorted under its parent. The error occurs because the Unique ID and Sort By values are different types, such as integers and dates.

**Solution**: In most cases, the solution is to use string-type values for Unique ID and Sort By values. You can define a custom property to convert the values to *nvarchar* or *varchar* value types.

Additionally, you can encounter the error for attribute values and weights. Ensure that the values for weights are numeric. Ensure that the attribute values conform to the attribute type and size selected in the hierarchy and dimension definitions. You can define custom properties to convert values to the selected attribute type as necessary. Custom properties are custom expressions maintained in the **Properties** pane.

See Properties and custom model objects on page 21.

You can encounter errors when publishing dimensions and hierarchies if the captions, unique ID, and attribute values do not conform to the same type and attribute type and size specified in the definitions

#### `An unexpected problem has occurred` or `Unable to query` errors are displayed in hierarchy definitions or in the Browser.

**Cause**: Hierarchy definitions and the **Browser** in the Manual Hierarchy and Rule-based Hierarchy functions can display errors when the Caption or Sort By values are text, ntext, or image database column types. The Business Vault is unable to process the sorting to display the information in the definition.

**Solution**: Select another Caption or Sort By value. Alternatively, create a custom property to convert the value to another type, such as **`nvarchar`**. Custom properties are custom expressions maintained in the Properties pane.

See Properties and custom model objects on page 21.

#### Localized values are not published in cubes and dimensions.

**Cause**: Publishing dimensions with localized values and localized data requires setup in the data source, definitions, and publishing targets.

**Solution**: See Localization on page 153.

#### The dimension has the same members in multiple hierarchies but the members in the dimension in OLAP Server look different.

**Cause**: You can add multiple hierarchies to a dimension. When the dimension is published to Infor BI OLAP Server, the hierarchies are grouped in a single dimension. Each member in a hierarchy, regardless of its position as a top level in a dimension, intermediate level or lowest level, has a unique ID associated with it.

If members in different hierarchies have the same unique IDs, then the members in OLAP Server may be grouped differently than anticipated. Some general guidelines to follow are:

- If multiple hierarchies selected for the dimension have similar structures and members, then use the hierarchy prefix in the dimension definition. The hierarchy prefix adds characters onto the unique IDs of the intermediate levels to distinguish them for each hierarchy. So, if two customer hierarchies have levels for Country, then the country unique IDs associated with hierarchy one have to be different than the country unique IDs associated with hierarchy two. The result is two distinct hierarchies that have the countries in both hierarchies.
- If duplicate members are in one or more hierarchies in a dimension, OLAP Server processes the duplicate members according to the scenarios:

- If you have a dimension member that is a top-level member and a child member, then the member will only be added as a child in OLAP Server. OLAP Server does not create the same members as top-level members and children.
- If you have a duplicate leaf member in a dimension because the member is in more than one hierarchy, then the member is added with the attribute values assigned to the member in the last hierarchy loaded.
- If you have a duplicate leaf member in a dimension because the member is in more than one hierarchy, then the weight assigned to the member for each distinct parent will be used. So, if the same member is in two hierarchies and rolls up to different parents, then the member may have a different weight for each parent.

### Publication and validation processes are ending with a Completed in Error status.

**Cause**: Validation and publication processes can end with a Completed in Error status when the process is reporting an error.

**Solution**: In the **Publications Monitor**, click the **Details** option to view the Process Report. The report lists the tasks and statuses of the steps in the validation or publication process.

See Process report codes and messages on page 158 for a list of codes, messages, and explanations of the issues.

If publication processes fail with OLAP Server error codes, then refer to Infor BI OLAP Server for details. If the problem is data-related, then you may have to review the data in the dimension or fact views, created in the source database, associated with the source database connection in the publication definition. Database views are created for each dimension published and one or more fact views is created for cube fact data publishing.

### Publication processes are in Running status but the process report has “No report information available”

**Cause**: Publication definitions for dimension and cube publishing require a target.

**Solution**: Verify that the publication definition has a valid target. To navigate to the publication definition version, select the publication process in the **Publications Monitor**. Select **Go to Subject Definition** or right-click the subject name and select **Go to Subject Definition**. The target should not be blank on the publication definition.

If the target is blank, navigate to the **Publications Monitor** and cancel the publication process. Select **Analytic Modeling > Publications**. Edit the publication definition and select a valid target. Save the definition. Run the publication from the Publications page. The new process appears in **`Running`** status with details in the process report or the process appears in **`Runnable`** status in the publications queue.

See Publishing dimensions and cubes on page 131 for more details.

### Dimension publishing is failing because there are too many attributes in an attribute table.

**Cause**: Infor BI OLAP Server has three attribute tables per dimension. Each table can have up to 49 attributes.

**Solution**: If a publication is failing because there are too many attributes assigned to a table, then you can limit or change the number of attributes assigned to each table.

In the More Options section of the dimension definition, the primary attribute table is used as the attribute table for the dimension member captions. One attribute is used for the caption. A separate attribute is used for each localized caption. If you publish a dimension with a target publishing to three locales, then three attributes are created in the primary attribute table, one for each locale.

In the dimension definition, each attribute is stored in the attribute table assigned for it. If the attribute value is translated, then one attribute is used for each locale specified in the publication target.

To understand and limit the attribute per attribute table:

- Update the dimension definition to limit the number of attributes per attribute table to 49 or fewer.
- The primary attribute table specified in More Options uses one attribute for the dimension member caption for each locale specified in the publication target.
- If attribute values are translated, then ensure that the number of attribute values per locale is below the 49 attributes per table limit.
- Only select the translate option for attributes if there are localized values available.
- Update the publication target to publish to only locales in which there are localized values. If the definitions are only published in 1 locale, then the publication target should only specify the default locale or the language of the system.

#### Publishing a preconfigured dimension is failing.

*Cause*: Preconfigured dimensions build and populate dimension definitions and data by using a configuration. The configuration references stored procedures in the source database associated with the database connection. Publishing a preconfigured dimension runs the configuration to build the dimension with the associated hierarchies and dimension members using the parameters entered in the dimension definition.

**Solution**: Review the configuration or contact the owner of the configuration to determine the cause of the problems.

#### Publishing fails with the message `jobs pending for the job object.`

**Cause**: Publishing processes can fail if there are jobs pending. Pending jobs may be the result of cancelling publications after they are published to Infor BI OLAP Server.

**Solution**: Refer to Infor BI OLAP Server documentation for more information. The Business Vault cannot cancel jobs after they are published as jobs to OLAP Server.

#### Model import fails with references to objects.

**Cause**: Models contain references to objects in the same model and references to models in other models. If the database connection has multiple models associated with it, then the references in a model import must either have the referenced objects in the import file or already in an existing model in the Business Vault.

**Solution**: Ensure that you import models together or import them in dependency order to ensure that the referenced objects exist.

#### Model import fails with the message: `An unexpected problem has occurred - Internal Server Error.`

**Cause**: This error message can be caused by a server time out error.

**Solution**: If you are importing multiple models, then try exporting and importing one model at a time.

#### Model or definition file import fails with import aborted message.

**Cause**: Model or definition export files created in Business Vault 11.3 cannot be imported into an earlier version of the Business Vault, such as Business Vault 11.2 or 11.1.0.1. The import error states `Import Aborted` with the version number of the file and the version number supported by the Business Vault. The version numbers vary depending on the file and the release level of the Business Vault.

#### Hierarchy, dimension, or cube definition import fails.

**Cause**: Dimension, hierarchy, and cube definitions contain references to model objects and to other definitions. If a definition uses a model object, such as a relationship, custom entity, or custom property, then the model object has to be in a model in the Business Vault before the definition can be imported successfully.

If the model is not associated with the database connection, then this message is displayed: `The INSERT statement conflicted with the FOREIGN KEY constraint "BV_HD_X_EDM_FK_DB_X_EDM". The conflict occurred in database (Business Vault UI database name), table "dbo.BV_DB_X_EDM".`

**Solution**: A dimension definition has references to the hierarchies associated with it, and a cube definition has references to the dimensions associated with it. When you import definitions, ensure that the dependent, referenced definitions are already available in the Business Vault or included in the import file. The referenced definitions must be available before the definition can be imported successfully.

#### Rule-based hierarchy definition imports are failing.

**Cause**: Rule-based hierarchy definitions exported from Business Vault version 11.1.0.1 may fail to import into Business Vault version 11.2 or 11.3. The import may fail if the hierarchy contains duplicate members, and the members have different captions, attribute values, or localized values.

#### Cannot save a manual hierarchy definition through Infor Ming.leTM when using Internet Explorer 10 or 11

**Cause**: The error message, `The object doesn't support the property of the method "keys`, is displayed in the browser console.

**Solution**: The issue may be caused by your browser settings. Change the settings to: **`Internet Explorer 10`** if you are using IE10, or to **`Internet Explorer 11`** if using IE11. Set the Document Mode to **`Standards`**.

**Duplicating a publication definition and changing the cube selection is freezing in a Google Chrome browser.**

**Solution**:

1. Duplicate the publication definition
2. Navigate to the **Dimensions** tab.
3. De-select the dimensions.
4. Navigate to the **Cubes** tab and change the cube selection.
5. Navigate to the **Dimensions** tab. The Available dimensions listed are dimensions associated with the selected cubes.
6. Select the dimensions and save the definition.

Alternatively, you can use another browser such as Mozilla® FireFox or Microsoft® Internet Explorer.

# Appendix C: Analytic modeling frequently asked questions

This section contains frequently asked questions for the Infor Business Vault analytic modeling features.

### What is a hierarchy?

A hierarchy is a structure to organize data into a series of parent and child relationships between hierarchy members. Hierarchies are used for analysis purposes to view information at different levels and to organize the information in a hierarchical structure. A hierarchy consists of one or more hierarchy trees, or organizations of branches from highest-level members to lowest-level leaf members. Hierarchy branches may vary in depth.

In the Business Vault, you can define different types of hierarchies, including manual hierarchies, level-based hierarchies, rule-based hierarchies, and range-based hierarchies. Hierarchies are built when they are included in a dimension and published to a target analysis application.

### What are the different hierarchy types?

There are three hierarchy definition types:

- Level-based hierarchy: An organizational structure to group and aggregate dimensional data into levels. You can use this type of hierarchy for large customer and product hierarchies in which the levels are data-driven. You can define attribute values at each level and you can preview a sample of the data in a hierarchy. When you publish the hierarchy, new and updated data in the data source is incorporated into the hierarchy.
- Manual hierarchy: An organizational structure in which the hierarchy branches and leaves are defined manually. You can use this type of hierarchy for smaller, fixed hierarchies like currency types and measure hierarchies. A manual hierarchy is also used to define hierarchy ranges, like aging ranges, where transactions are categorized into dimension range buckets according to the ranges setup in the manual hierarchy.
- Rule-based hierarchy: An organizational structure in which the hierarchy is defined manually, and dimension members are assigned to the hierarchy either through direct assignment or assignment rules. You can use this type of hierarchy for balance sheet and income statement account hierarchies.

### What is a dimension?

A dimension provides a basis for performing multi-dimensional analysis of business data. A standard dimension contains one or more hierarchies. A cube contains multiple dimensions that form the basis of multi-dimensional analysis. Dimension examples include currency, products, customers, time, and measure.

In the Business Vault, you can define three types of dimensions; standard dimensions, time dimensions, and preconfigured dimensions. Standard dimensions are defined in the definition, where you can select the hierarchies, attributes, and dimension settings. Time dimensions are daily or monthly date dimensions. Preconfigured dimensions require predefined configurations. The configurations contain many of the dimension settings, including the hierarchies and attributes. You can specify parameter values in a preconfigured dimension definition. There is no distinction between a standard dimension and a preconfigured dimension when a dimension is published to a target analysis application.

### What is a measure dimension?

A measure dimension contains the measure values. Measure values are the amounts and quantities analyzed in an analysis cube such as revenue, units sold, and quantity. The measures provide the quantitative values for analysis.

In Analytic Modeling, measure dimensions have a manual hierarchy in which the measures are defined. There are different settings to identify a dimension as a measure dimension. The dimension definition type can be Measure.

In a cube definition, one dimension is selected as the measure dimension for the cube. There can only be one measure dimension per cube. In the cube definition, a fact can be associated with a measure dimension that is used for mapping fact properties to measure values.

### What is a cube?

Cubes are the structures for multi-dimensional analysis. Cubes combine the dimensions such as customers and products with quantitative values, called measures. Use the cube feature to select dimensions for the cube. Specify the facts, or the transaction sources, to associate dimension and measure values. Cubes are modeled in the Business Vault and published to a target.

### What is a fact?

A fact is part of a cube definition. A fact source is a database table or view in the database connection selected for a cube. A fact source can be a transaction table or view that has information for each dimension reference and one or more measure values, or the quantitative values in an analysis cube. Most facts have one or more measure values that are mapped by selecting a measure dimension in the cube. A cube can have one or more facts associated with it so measure values can be sourced from multiple transaction tables or views.

### What is a model?

A model is a collection of objects that represents and enhances the physical database tables, views, and columns used to define hierarchies, dimensions, and cubes. Models are containers for user-friendly aliases, table relationships, custom properties, virtual tables, and preconfigured dimensions.

The objects in a model, like custom property expressions, are used when the definition is setup. The expressions are used when the dimension and fact data is published to an analysis target.

Models are not required for Analytic Modeling.

See Properties and custom model objects on page 21.

### How do you publish a hierarchy?

You cannot publish a hierarchy individually. You must publish a hierarchy in a dimension. You can create a New Dimension from a hierarchy. If you create a dimension from a hierarchy, the hierarchy is selected for the dimension. When you publish the dimension, the hierarchy is published.

### How do you send dimensions and cubes to Infor BI OLAP Server?

The Business Vault Analytic Modeling features allow you to define and design hierarchies, dimensions, and cubes. Analytic modeling does not build multi-dimensional analysis cubes or dimensions.

The definitions must be published on-demand or through scheduling features, to send the information and data to an analysis target, such as Infor BI OLAP Server. OLAP Server builds the cubes and dimensions. Use the publication process to define what to publish, to monitor the process, and to setup one-time or recurring publication schedules. You can also validate dimension and cube definitions against the source and target data sources. You can view the status and results of a validation or publication process using the publication monitor.

See Publishing dimensions and cubes on page 131.

### How do I ensure dimensions and cubes have been published to Infor BI OLAP Server?

The **Publications Monitor** shows the status of the publication process to build dimensions, cubes, and load cube facts. The process finished successfully if the status of the process is completed. You can review the Details report for more information:

- The publication process finished unsuccessfully if the status is completed with errors. If a process finished unsuccessfully due to an OLAP Server error, the OLAP Server error number is displayed in the Details report. See the OLAP Server and the log file, `ALEAPR.txt` for more details.
- If the publication process is active, then the publication is in process.
- If the publication process status is runnable, then the publication process has not started yet.
- If the publication status is On Hold, then the publication process has not started and the process must be taken off hold.

### How can I tell which version of a dimension, hierarchy, or cube published to OLAP Server?

From the **Publications Monitor**, select a publication process and click **Go to Subject Definition** or right-click the publication process and select **Go to Subject Definition**. The publication definition is displayed.

On the **Cubes** tab, right-click the cube fact to go to the version of the cube definition that is published. The page version tag for the cube definition is displayed in blue. The version tag indicates the version that is published. On the selected Dimensions, right-click the dimension and select **Go to Dimension** to view the dimension version. From the dimension definition, right click the selected hierarchy and select **Go to Hierarchy**.

### Can I publish to other sources other than Infor BI OLAP Server?

Not at this time. Currently, dimensions and cubes can only be published to Infor BI OLAP Server.

### What are the sizing guidelines for the Analytic Modeling functions?

See the *Infor Business Vault Sizing Guide*.

### Can I delete cubes that have been published to Infor BI OLAP Server?

After a cube has been published to Infor BI OLAP Server, the cube cannot be deleted in the Business Vault. You must go to Infor BI OLAP Server to delete the published cube.

### Can I purge validation and publication processes on the Publications Monitor page?

No. Validation and publication processes cannot be purged.

### Can I purge data from the Infor BI OLAP Server Load from Source database?

No. Data cannot be purged from the Load from Source database.

### Are data stores and BOD mappings required for Analytic Modeling?

BOD mappings are not required for Analytic Modeling. If BOD mappings are setup, then they are used to obtain some of the metadata to handle locale-specific values and to extract the maximum variations for BOD data to publish for analysis purposes.

See the *Infor Business Vault Administration Guide*.

### Do I need to setup a database connection when using the Analytic Modeling feature?

A database connection is the source of data to use while defining hierarchies, dimensions, and cubes and publishing dimensions and cubes. Database connections are required for level-based hierarchy definitions, rule-based hierarchy definitions, and dimension definitions that contain level-based or rule-based hierarchies, preconfigured dimension definitions, cube definitions, and publishing processes.

The only time that a database connection is not required is to define a manual hierarchy definition, and to select the manual hierarchy in a standard dimension definition. In this situation, the hierarchy members are defined in the manual hierarchy definition. A database connection is required to publish the dimension that contains the manual hierarchy. The database view that the Business Vault creates to publish a dimension requires the database connection.

### Can I copy a hierarchy, dimension, and cube definitions from one Business Vault installation to another?

Yes. You can copy a hierarchy, dimension, and cube definition that can be exported from one Business Vault installation and imported into another Business Vault installation. You can use the export and import functions to move the definitions from one environment to another, such as a test environment to a production environment. You can also use the export and import features to import Infor-provided content for hierarchies, dimensions, and cubes.

You can associate definitions with models. If you use models associated with the database connections used in the definitions, then you must export the models separately. You must import the models into the installation before importing the definitions.

### What type of security is provided with the Analytic Modeling features?

Three roles are associated with the Infor Business Vault. The roles are setup in Infor Federation Services (IFS). A BVUser role must be setup to access any Business Vault options, including the analytic modeling functions. A BVAdmin role grants authority to maintain model objects used in analytic modeling functions. The model objects that a user with the BVAdmin role maintains property aliases, maintain entity aliases, maintain custom entities, and maintain entity relationships stored in editable models. A BVDatabaseAdmin role has permission to maintain database connections and to maintain models associated with database connections.

See the *Infor Business Vault Installation Guide*.

### Why are some analytic modeling functions disabled?

In the Business Vault application, there are certain analytic modeling functions that are grayed out or disabled. For example:

- In the **Properties** pane, the **Add** button is disabled and you cannot add a custom property.
- The **Assign Alias** option is disabled and you cannot assign an alias for a standard property.
- When you drill down to a property to view relationships, the **New Relationship** option is disabled and you cannot add a new relationship.
- On the **Hierarchy** page, the **Add Custom Entity** button is disabled when you right-click an entity.

To enable these functions, check these conditions:

- Ensure that the user is assigned the security role of BVAdmin. This role is required to maintain model objects.
- Ensure that you have models set up on the Database Connections page on the Models tab. The models contain the properties and entities, table relationships or joins, custom properties or expressions, custom entities, and preconfigured dimension configurations.
- Ensure that the models are in the necessary order if you have more than one model. The top model is the first model that is used when accessing the content in definitions. If options are disabled, you either do not have a model, you do not have any editable models, the models are locked, or the model is not the top model. Select **Database Connections > Models** to check the order of the models.

### What are the More Options used for?

The More Options sections of the dimension definitions are used for Infor BI OLAP Server specific settings. They are not required for publishing dimensions and cubes to other targets.

See Dimensions on page 84. Refer to the Infor BI OLAP Server documentation for additional information.

### What do the comparison operators on the Filters, Rules, and Subsets dialog do?

The comparison operators available on Filters, Rules, and Subsets lines limit and select the values that are either included or excluded in a hierarchy filter, a rule-based hierarchy rule, or a dimension subset group, respectively. A filter, rule, or subset uses a SQL Server `SELECT` statement based on the filter, rule, and subsets dialogs. The filter provides the logic for the `WHERE` clause in the `SELECT` statement.

The default operator is Contains, though from a system performance perspective, using Equals may be faster. The list of comparison operators available in the filter, rule, and subset lines are listed along with the `WHERE` clause operator logic.

| Comparison Operator | WHERE clause operator |
|---|---|
| Greater Than | > |
| Greater Than or Equal to | >= |
| Less Than | < |
| Less Than or Equal to | <= |
| Equals | = |
| Does Not Equal | != |
| Contains | LIKE |
| Does Not Contain | NOT LIKE |
| Is Empty | IS NULL |
| Is Not Empty | IS NOT NULL |
| Starts with | LIKE N'value' + '%' |
| Does not start with | NOT LIKE N'value' + '%' |
| Ends with | LIKE '%' +'value' |
| Does not end with | NOT LIKE '%' +'value' |

### What are Missing values, Unknown values and Unassigned values?

Missing values are substitute dimension members that are added to hierarchy definitions. The missing values are used to substitute values when the source data is missing. For example, if a hierarchy has a country and city level for each customer, and the customer does not have an address, then the missing country and missing city values are used as a substitute. A missing value is used as the lowest level, leaf member of a dimension to accommodate missing values in facts. For example, if a sales order line has no product to map to the product dimension in a cube, then the missing value is used as a substitute so the fact may be published in the cube. Missing values are not required in a hierarchy.

Unknown values are substitute dimension members that you add to a dimension to substitute when the fact has dimension references that are not in the dimension. As in the example above, if a sales order line has products that are not in the product dimension, then the unknown value is used as a substitute so the fact may be published in the cube. Unknown values are not required.

Unassigned values are unique to the rule-based hierarchy and published in a dimension. An unassigned value is a parent member for hierarchy members that are not directly assigned to the hierarchy or assigned through a rule. When the hierarchy is published in a dimension, hierarchy members that have no hierarchy assignment are children under the unassigned value member that you designate. Unassigned values are not required in a hierarchy. If members in a hierarchy are unassigned, then they are not included in the hierarchy when it is published in a dimension.

In cube definitions, you may select one missing value and one unknown value per dimension for each fact. They do not need to be the unique IDs of the special missing and unknown values that are setup in a hierarchy. They do need to be lowest-level members in the dimension. They are not required, but the cube fact loads to Infor BI OLAP Server will fail if the fact load contains any missing dimension references or unknown dimension values.

### What's the difference between the Measure Dimension in the Cube definition's Selected Dimension grid and the Measure Dimension selection in the Facts tab?

There are two measure dimensions options in a cube definition. On the Selected Dimensions grid, a Measure dimension checkbox denotes that the dimension selected is selected as the measure dimension in Infor BI OLAP Server. This does not have to be the dimension that has measure members.

On the **Facts** tab, you select the source tables or views for fact transaction data. The measure dimension selected for a fact source is the dimension to associate the fact mappings. This selection is optional and based on your fact source. When you select a measure dimension for a fact source, the dimension must be a dimension with a single, manual hierarchy.

# Glossary

### access cube
Identifies an OLAP Server DAC cube. This is an OLAP server dimension access security cube that provides dimension level security.

### alias
An alternative name for a property or entity displayed in the analytic modeling definitions. Aliases are used for user-friendly names in place of physical database table, view and field names. Users with a BVAdmin role can maintain aliases stored in editable models.

### analytic modeling
Business Vault functions that you can use to design and define hierarchies, dimensions, and cubes for multi-dimensional analysis.

### assignments
In a rule-based hierarchy definition, dimension members are assigned to the hierarchy either through direct assignment or assignment rules. Assignments are used to specify the members under a parent member. The members are assigned to each member are based on the rule or direct assignment that is defined. Members are added to the hierarchy by their assignments when the hierarchy is published in a dimension.

### attributes
Attributes are additional details associated with dimension members. Use the definition functions to setup attributes and attribute values. When you publish a dimension, the attributes associated with the dimension are published to the target. The attribute values, are sourced from the hierarchies selected for the dimension.

### attribute table
Infor BI OLAP Server has three attribute tables to store attribute values. The **Primary Attribute Table** option in the dimension definition represents the default table for attributes added to a dimension. The primary attribute table is also the table that is used to store the dimension member captions in the default language and localized captions. In a dimension definition, specify the attribute table that will store each attribute value.

### attribute type
Attribute type is the type of value that can be added or selected for the attribute value. The four types of attributes are:

- String values are character values, generally used for text values. Technically, string values are used for nvarchar, varchar and char fields. The size of a string attribute specifies the number of characters.
- Numeric values are decimal and integer values. You can specify the size and decimal places for numeric attributes.
- Date values are used for dates. Date values must be entered in **`YYYYMMDD`** format. Custom properties, that used as attribute values, must be converted to date format.
- Logical values are Boolean values such as blank, true, or false.

### BOD
Business Object Document. An XML document such as a Sales Order, Requisition or Purchase Order. There are three types of BODs used by Infor: Master Data, Transactional and Balance.

### BOD mapping
Provides the instructions to parse information from a BOD in a data store.

### cube
The structures for multi-dimensional analysis. Cubes combine the dimensions such as customers and products with quantitative values, called measures. Use the cube feature to select dimensions for the cube. Specify the facts, or the transaction sources, to associate dimension and measure values. After you model cubes in the Business Vault, you can publish the cube to a target.

### custom entity
A user defined entity that contains a filter that is applied to a physical table or view.

### custom property
Manually added by a user through an expression. Custom properties can be used everywhere properties are shown in the Business Vault application in the Property Browser

### database connection
The Business Vault references for databases that contain the database information and connection details. Databases are associated with data stores and BOD mappings. Database connections are used in analytic modeling to define source databases for definitions and publishing, and target databases to publish dimensions and cubes.

### data store
Relational databases into which BOD data is shredded for use by reporting or BI applications.

### definition version
A version is a snapshot of a definition at the time the definition is saved. Each time a definition is saved, a copy of the definition is retained. Versions are used during the publishing process. You can publish using the saved version or publish with the current version.

Versions are not available for Publication Target definitions, data store and BOD mapping definitions, and Database Connection definitions.

### dimension
Provides a basis for performing multi-dimensional analysis of business data. A standard dimension is comprised of one or more hierarchies. Multiple dimensions can be included in a cube. Some examples of dimensions in a Finance cube include: Currency, Company, and Cost Center. Some examples of dimensions in a Sales cube include: Customer, Company, Product, and Date.

### dimension type
Each dimension must have a dimension type. The dimension type is the ODBO type.

### direct assignments
See assignments.

### entities
Objects that are modeled such as a table or view in a database.

### facts
Allow for a structured organization of transactions such sales orders, invoices, and general ledger (GL) balances. They provide the quantitative values for measure values and KPIs. The facts are the measures. They are the numerical values added to provide meaning to a dimension. Examples include: Revenue, Cost, and Quantity.

### fact source
A table or view reference to a transaction table in a database that stores the transactions for a cube, such as sales orders, invoices, and General Ledger balances. Facts provide the quantitative values for measure values and KPIs mapped in a cube.

### filter
Used to determine which records to include in the hierarchy for Level-Based and Rule-Based Hierarchies. Properties or entered values may be used in the comparison. Filter includes comparison operators such as, contains, and equals.

### hierarchy
An organizational structure of members organized and structured in a series of parent-child relationships.

### KPI
Key Performance Indicator

### level
The fields which allow a user to specify the structure for the hierarchy. In other words, a level defines what will happen as a user drills down through the actual hierarchy structure that has been generated as a result of the level -based hierarchy definition

### level-based hierarchy
An organizational structure to group and aggregate dimensional data into levels. This type of hierarchy is used for large customer and product hierarchies in which the levels are data-driven. Attribute values are defined at each level. You can preview a sample of the data in a hierarchy while defining the hierarchy. New and updated data in the data source is automatically incorporated into the hierarchy when the hierarchy is published.

### localization
Export locale-specific strings that are used in hierarchy, dimension, and cube definitions. Specify the localized text and import them into the Business Vault definitions. Publish dimensions and cubes with localized values to analysis targets like Infor BI OLAP Server.

### manual hierarchy
An organizational structure in which the hierarchy branches and leaves are defined manually. This type of hierarchy is used for smaller, fixed hierarchies like currency types and measure hierarchies with few branches and leaves

### measure dimension
The numerical values added to provide meaning to a dimension, for example, Revenue, Cost, or Quantity.

### missing value

A missing value is a substitute, or replacement value. The value is used when the data source does not provide information for a level or a member.

### model

Models are containers for user-friendly aliases, table relationships, custom properties, custom entities, and preconfigured dimensions.

### not NULL

Indicates that a column is required.

### NULL

Indicates that a column is blank or optional.

### preconfigured dimension

A more advanced dimension structure. The dimension utilizes a configuration, which is a custom configuration defined in the source database and in the Business Vault database. The preconfigured dimension shows parameters for a user to specify before saving and publishing the dimension. Preconfigured dimensions provide a method for a content provider, for example, an Infor consultant or representative, to tailor dimensions for specific analysis requirements.

### preview

You can use the preview function to view the results of building the Level-Based hierarchy before it is generated or published. The preview displays a subset of the results from the data source.

### properties

An attribute or characteristic of an entity that is a column in a view or a table but can be defined with a custom expression.

### properties browser

The property browser is used in several Business Vault Analytic modeling pages to display properties. These include: Level-Based Hierarchy, Rule-Based Hierarchy, Dimensions (standard dimensions only) and Cubes pages.

### publication

Configure publication instructions such as what to publish and where to publish such as to Infor BI OLAP Server.

### publication monitor

The publication monitor allows you to monitor the progress and results of the validation and publication processes. You can view error and audit logs and to put publications on hold.

### publication schedule

You can configure publication schedules for daily, weekly or monthly publications.

### publication target

You can configure the target applications and locales for published dimensions and cubes.

### publishing

The process of sending instructions and data to a target system, such as Infor BI OLAP Server, to create dimensions, cubes, and load fact data.

### range-based hierarchy

A hierarchy where categories or classifications are manually defined based on a value or range of values. The hierarchy has categorization buckets or groups that are used to form the structure of the hierarchy. Each transaction in a fact is categorized into one hierarchy bucket based on its value, for example, accounts payable aging buckets. Companies group payables into buckets 1-30 days, 31-60 days, 61-90 days, over 90 days, etc. A range-based hierarchy is setup using a manual hierarchy, marking the attribute in the dimension that contains the numeric range value, and specifying the fact value to use to group transactions into the range buckets.

### raw data vault

Compresses and stores versions of all BODs directed to the Business Vault from ION.

### relationship

A means by which you can join properties in one entity to properties in a related entity.

### rule-based hierarchy

An organizational structure in which the hierarchy structure is defined manually, and dimension members are assigned to the hierarchy either through direct assignment or assignment rules. This type of hierarchy is generally used for balance sheet and income statement account hierarchies.

### subset

A subgroup of dimension members.

### time dimension

Define date dimensions for monthly calendars with days or months as the lowest level. Your calendar can start in any month and include any number of past and future years. Optionally, you can include additional hierarchies for year-to-date, quarter-to-date, and month-to-date. Mont-to-date hierarchies are available for calendars with day defined as the lowest level. Attributes can be selected from a predefined list. Date formats and related text strings are customizable. Language localization is available for both text strings and date formats

### unassigned value

Unassigned value is a parent member for hierarchy members that are not directly assigned to the hierarchy or assigned through a rule. When the hierarchy is published in a dimension, hierarchy members that have no hierarchy assignment are children under the assigned value member that you designate.

### unknown value

Unknown values are substitute dimension members that you can add to a hierarchy and publish in a dimension. Substitute unknown values can be used in a cube definition as a substitute fact mapping for unknown dimension values. When the fact is published as part of a cube, facts with unknown dimension values are added to the cube using the unknown value. The unknown value is applicable to the leaf level only.

### validation

Validation is a process to check hierarchy, dimension, cube, and publication definitions. Validation is a batch process.

### weight

Weights are used as an aggregation value for measures as they roll up to their parent in a cube.