



Constraint Based Configuration Model Explained

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Meet Your Presenter

Hope Enochs

- Wide range of AX knowledge; certified in AX 2012 Trade and Logistics as well as Projects
- Over 30 years' experience managing ERP implementations in multiple industries including manufacturing environments, wholesale, retail, service providers, utilities, natural gas and public sector.
- 8 of those years was spent as the Director of Operations for a small industry specific software company leading the team in the sales, development, implementation and on-going support of the product.
- Designed, developed and implemented a project management methodology that tripled the number of implementations using the same number of resources.
- Developed and delivered training programs for professional training companies including a college continuing education department.



Course Objectives Are:

- Explain the product configuration terminology and concepts
- Describe the product configuration process
- Product configuration setup
- Build a product configuration model
- Prepare a product configuration model for release
- Product configuration access

Session Agenda

Explain Product configuration & It's Uses:

Product configuration Is a constraint-based product configuration tool that uses the Microsoft Solver Foundation® (MSF) product technology that is designed for modeling and constraint solving.

Why Use Product Configuration?

Reasons to use a constraint-based product configuration model.

- Respond to the specialized needs of the customer.
- Reduce high costs tied to stocking and moving inventory.
- Lower records maintenance by reducing the number of products and BOMs' managed.
- Developer license is not required to create and maintain product configuration models in Microsoft Dynamics AX 2012.

Customers can purchase items that meet their individual needs.

Instead of having one or two choices when purchasing a home entertainment system, you can configure the product specifically for a customer.

What is the Product Configuration Tool?

Save Time and Improve Customer Service!

- Flexible tool that promotes reusability for areas that require constant setup.
- Provides access to frequently selected data by using configuration templates.
- Provides a visual overview of the component structure.
- Components and attributes can be easily arranged into logical groups by using attribute groups.

Example:

You could have a popular version of a home entertainment system that includes several components (audio system and a video system) and subcomponents (receiver, speakers, DVD player, and TV).

When you create a template, you can pre-define the features that each component and subcomponent include.

This can save you time when you configure the product on sales orders, sales quotations, purchase orders, and production orders.

Product Configuration Terminology

Common Terms Associated With Product Configuration

- Product Configuration Model
- Attribute Types
- Attribute Group
- Attribute Value
- Expression Constraint
- Table Constraint
- Product Master

Product Configuration Terminology

Common Terms Associated With Product Configuration

1. **Product configuration model:** Represents a generic product structure that can be differentiated to specific instances based on values selected by the user.
2. **Attribute types:** Attribute types are defined to specify the set of data types for all attributes that are used in a product configuration model.
3. **Attribute group:** An attribute group can be defined to increase the usability of the configuration user interface. A subset of attributes defined for a component can be grouped and a title is attached to the group.
4. **Attribute value:** A specific value for a product characteristic. For example, the color "red" for the attribute type named "color."
5. **Expression constraint:** A constraint type, in the form of an expression. The MSF constraint solver will be used. All constraint expressions must follow the syntax defined by MSF.
6. **Table constraint:** A constraint type specifying allowed attribute combinations. Each row in the table represents a legal combination of values. User defined table constraints consist of Attribute types. System defined table constraints represent a view on an existing table that is present in the Application Object Tree (AOT).
7. **Product master:** A product master serves as a template for models for variants. The variants of a product master can be predefined or created in sales scenarios by using product configuration.

Product Configuration Process

Product configuration consists of the following areas:

Product configuration setup

1.Product configuration setup: This includes setting up the product configuration parameters.

Building a product configuration model

2.Building a product configuration model: This is the largest and most complex area. It involves components, attribute types, product configuration model, attributes, constraints, subcomponents, user requirements, BOM lines, route operations, and product configuration APIs.

Preparing a product configuration model for release

3.Preparing a product configuration model for release: It involves customizing the configuration user interface, validating a testing a model, building configuration templates, adding configuration translations, and creating, approving, and activating versions.

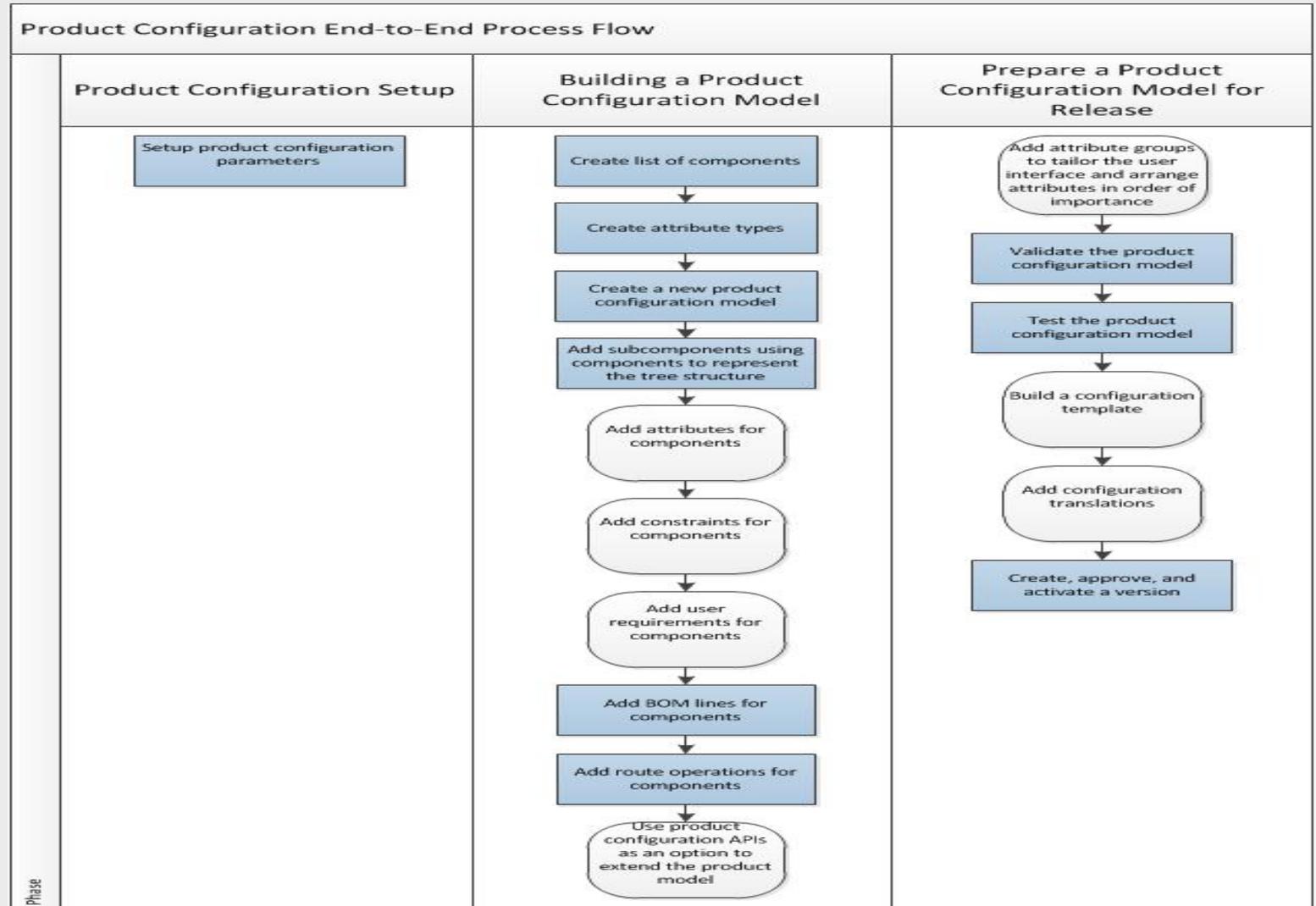
Product configuration access

4.Product configuration access: You can configure lines by using the Microsoft Dynamics AX 2012 Windows client or the Enterprise Portal.

Product Configuration Process Flow

The image displays the product configuration process flow.

Product configuration access is not included in the process flow figure because it occurs after the product configuration model is built and ready to use.



Product Configuration Setup

Parameters for product configuration

✓ Item lookup method

1. The number sequence that uniquely identifies all the configurations that you create.
2. The item lookup method determines whether configurable items display together with all the other items, or if you want them to display on a separate tab.

✓ Configuration document type

1. The configuration document type lets you add a note to the order line. The note will show the results of the configuration that you just created. This includes the components, attributes, and all selections made.

✓ Default configuration ID

1. Default configuration ID: The initial name of the configuration that is applied to product variants when product variants are released together with constraint-based product masters. Basically, when you configure a sales order line, the value in this field will default to the grid on the **Lines** FastTab.

✓ Number sequence for constraint-based product configuration models

Building a Product Configuration Model

Building a product configuration model includes the following elements:

- ✓ Components
- ✓ Attribute types
- ✓ Product configuration model
- ✓ Attributes
- ✓ Constraints
- ✓ Subcomponents
- ✓ User requirements
- ✓ BOM lines
- ✓ Route operations
- ✓ Product configuration API

Several processes are used to build a product configuration model.

Many of these processes are setup once and can be used across many product configuration models: components, attribute types, subcomponents, BOM lines, and route operations.

The product configuration API is an optional process that can extend the functionality of the product configuration model.

Preparing a Product Configuration Model for Release

Steps for preparing a product configuration model for release includes:

- ✓ Customizing the configuration user interface
- ✓ Validating a product configuration model
- ✓ Testing a product configuration model
- ✓ Building configuration templates
- ✓ Adding configuration translations
- ✓ Creating, approving, and activating versions

Preparing a Product Configuration Model for Release

Steps for preparing a product configuration model for release includes:

1. Optional: Customizing (tailoring) the configuration user interface creates attribute groups, and lets you arrange the attribute groups and corresponding attributes to display the information more clearly to the end user.
2. Mandatory: When errors display after validating the product configuration model, all errors must be resolved before you can test the product configuration model.
3. Optional: Testing the product configuration model lets you verify the attributes for each component display as you expect when configuring the product.
4. Optional: Configuration templates do not have to be created.

Product Configuration Access

You can configure order lines for a product configuration model by using two methods:

- ✓ Microsoft Dynamics AX 2012 Windows client
- ✓ Enterprise Portal

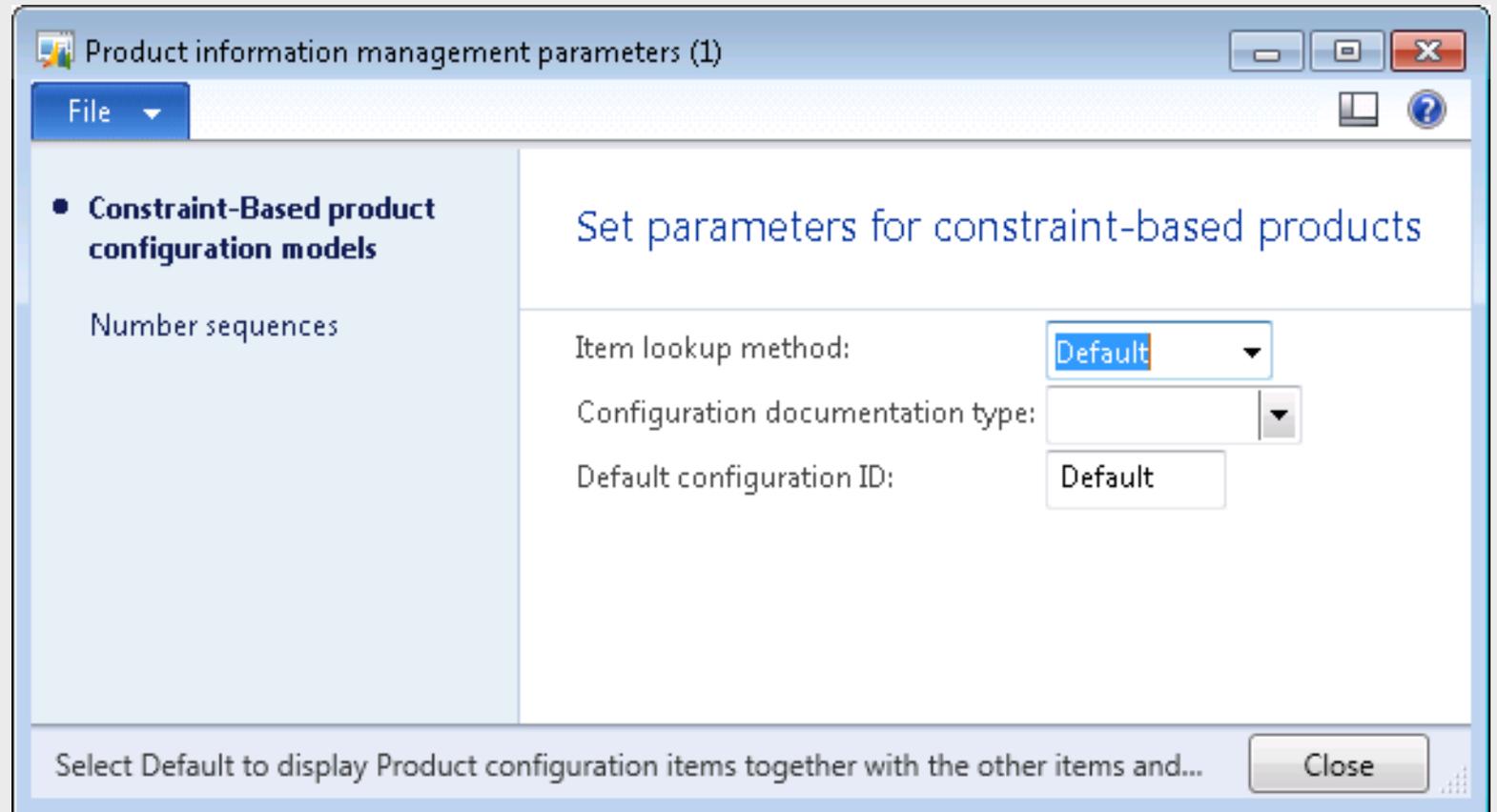
Microsoft Dynamics AX 2012 client: You can configure lines for sales quotations, sales orders, purchase orders, and production orders.

Enterprise Portal: You can configure lines for sales quotations and sales orders.

Product Information Management Parameters Form

Parameters for product configuration are setup on the **Product information management parameters** form.

The parameters must be setup or the system will display warning messages when you try to test the **Configure line** form or configure lines.



The screenshot shows a software window titled "Product information management parameters (1)". The window has a "File" menu and a sidebar on the left with a tree view containing "Constraint-Based product configuration models" and "Number sequences". The main area is titled "Set parameters for constraint-based products" and contains three fields: "Item lookup method:" with a dropdown menu set to "Default", "Configuration documentation type:" with an empty dropdown menu, and "Default configuration ID:" with a text box containing "Default". At the bottom, there is a footer with the text "Select Default to display Product configuration items together with the other items and..." and a "Close" button.

Components in Product Configuration

Guide for Using Components in AX:

- ✓ Generic element that can be assigned to a product configuration model
- ✓ Can include other components as subcomponents
- ✓ Can use a component multiple times in a product configuration model
- ✓ Can reuse a component in multiple configuration models
- ✓ Items must have constraint-based configuration as the **Configuration technology**
- ✓ To be used as components to build a product configuration model

Product Types

Two core types of products can be defined manually in Microsoft Dynamics AX 2012:

Products: These are uniquely identifiable products that do not have variations associated with them. No product dimensions can be associated with the definition. You can think of them as standard or base products.

Product masters: These serve as templates for models for variants. The variants of a product master can be predefined or created in sales scenarios by using product configuration. A product master is associated with one or more product dimensions, or for some configurations, one or more product attributes.

The variants of a product master can be predefined or created in sales scenarios by using product configuration.

You cannot configure an order line for an item that is not defined as a product master.

The following table explains the four configuration types that are supported in Microsoft Dynamics AX 2012

Items that have constraint-based configuration as the **Configuration technology** can be used as components to build a product configuration model.

Configuration technology	Definition
Constraint-based configuration	Selecting constraint-based configuration lets the product be used in a product configuration model.
Dimension-based configuration	A configuration technology that is used to create product variants by selecting values for product dimensions. Any combination of the product dimensions is permitted.
Predefined variant	The product can be modeled based on the product dimensions, color, configuration, and size. This is the only option that can be set up directly with product variants.
Rule-based configuration	Variants are configured by using Product Builder when the variants are added to transaction lines.

Components Form

Use the Components form to create components.

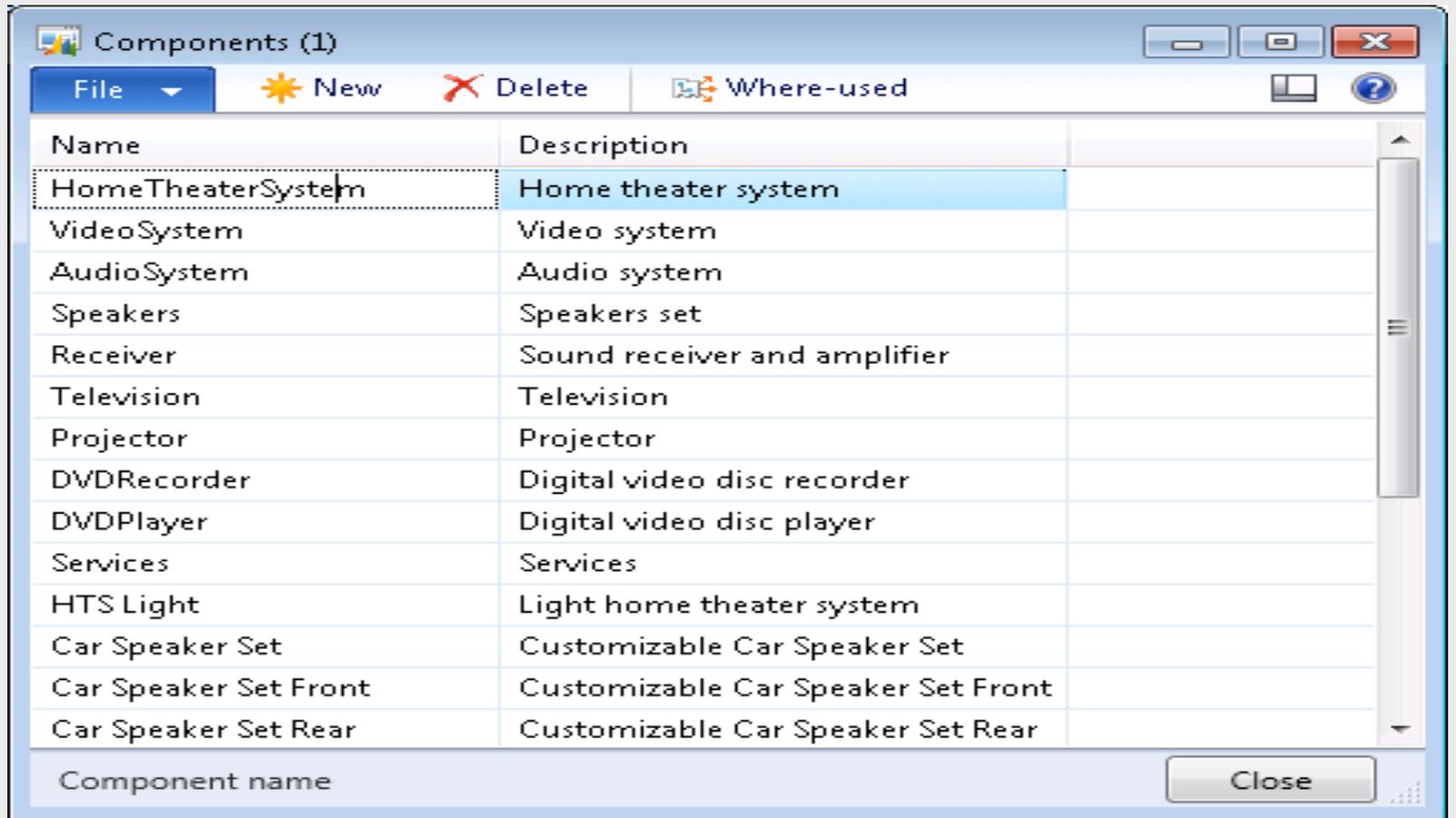
You can access the **Components** form from several locations:

1. **Product configuration models** list page

2. **Constraint-based product configuration model details** form

3. **Subcomponents** FastTab.

You specify a **Name** and **Description** when you create a component on the **Components** form.



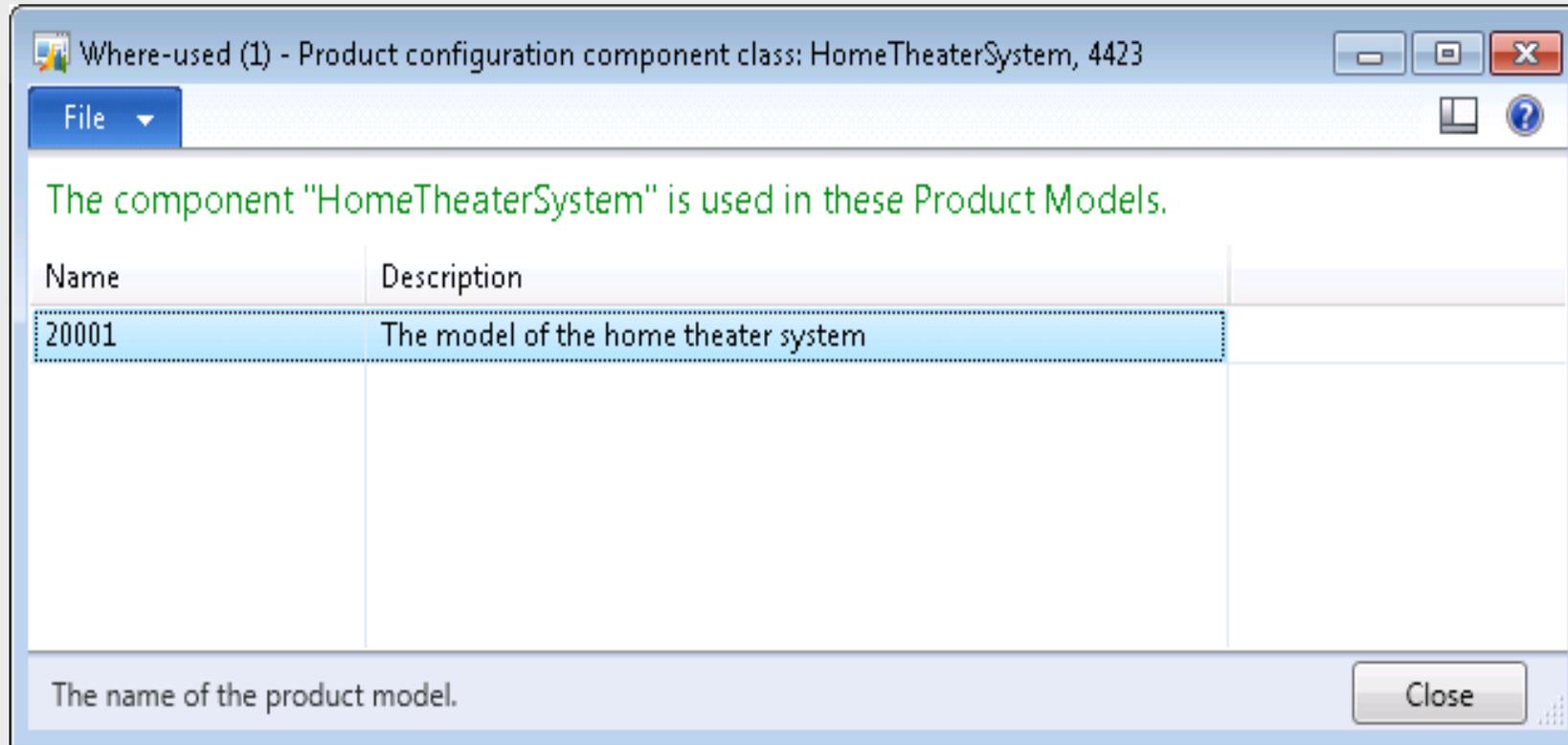
The screenshot shows a software window titled "Components (1)" with a menu bar containing "File", "New", "Delete", and "Where-used". Below the menu bar is a table with two columns: "Name" and "Description". The table contains the following data:

Name	Description
HomeTheaterSystem	Home theater system
VideoSystem	Video system
AudioSystem	Audio system
Speakers	Speakers set
Receiver	Sound receiver and amplifier
Television	Television
Projector	Projector
DVDRecorder	Digital video disc recorder
DVDPlayer	Digital video disc player
Services	Services
HTS Light	Light home theater system
Car Speaker Set	Customizable Car Speaker Set
Car Speaker Set Front	Customizable Car Speaker Set Front
Car Speaker Set Rear	Customizable Car Speaker Set Rear

At the bottom of the window, there is a "Component name" label and a "Close" button.

Where-Used Form

The **Where-used** form displays the list of product configuration models that use the selected component.



The screenshot shows a window titled "Where-used (1) - Product configuration component class: HomeTheaterSystem, 4423". The window contains a "File" menu, a message stating "The component 'HomeTheaterSystem' is used in these Product Models.", and a table with two columns: "Name" and "Description". The table has one row with the value "20001" in the "Name" column and "The model of the home theater system" in the "Description" column. At the bottom of the window, there is a label "The name of the product model." and a "Close" button.

Name	Description
20001	The model of the home theater system

The **Where-used** form can be accessed by clicking **Where-used** on the **Components** form.

Attributes for Constraint Based Configuration

Attribute Types

- ✓ Define the possible values that can be assigned to the attribute
- ✓ Specify the set of data types for all attributes that are used in a product configuration model
- ✓ Define one time and then reuse for any attribute in all product configuration models

NOTE: You can use decimal values, text without a fixed list, and integers without ranges in a product configuration model. However, you cannot use these data types when you write a constraint.

NOTE: Microsoft Solver Foundation (MSF) constraint solver only supports text with a fixed list, boolean values, and integers with ranges. Currency and DateTime data types are shown in the list in the **Type** field. However, they cannot be used in a product configuration model.

Attribute Types Form

Use the Attribute types form to define the attribute types and default values that you can select when you define attributes for products and categories.

The screenshot shows the 'Attribute Types Form' for 'ColorTextDomain'. The 'General' section includes the following fields:

- Name: ColorTextDomain
- Type: Text
- Fixed list:

The 'Values' section contains a table with the following data:

Value	Solver value
Red	Red
Blue	Blue
Green	Green
Dark Blue	DarkBlue
Metallic Black	MetallicBlack
Metallic Silver	MetallicSilver
Silver	Silver
Black	Black

Attribute Types Form

Use the Attribute types form to define the attribute types and default values that you can select when you define attributes for products and categories.

The following list includes examples of values that might be used for the different attribute types.

- **Text:** Add list of colors that are available to select for a set of stereo speakers.
- **Boolean:** Add a true or false attribute type that can apply the same color to all stereo components, without having to select the color for each component.
- **Integer:** Add a valid range of values from zero to one for the number of televisions to include in a home entertainment system.
- **Decimal:** The length of the power cable for a home entertainment system is available in meters.

Product Configuration Models

Putting it All Together

- ✓ Created to represent a generic product structure
- ✓ Consist of one or more components tied together through subcomponent relationships.
- ✓ One perspective is the logical side that consists of subcomponents, user requirements, attributes, and constraints.
- ✓ The second perspective is the physical side that consists of BOM lines and route operations

Adding a product configuration model is simple and consists of populating just a few fields.

However, building a product configuration model involves adding all of the elements (attributes, constraints, subcomponents, and so on) to the product configuration model.

New Product Configuration Model Form

You can create a new product configuration model by:

- ✓ Adding a new component for the root component.
- ✓ Selecting an existing component for the root component.

New Product Configuration Model Form

New product configuration made globally:

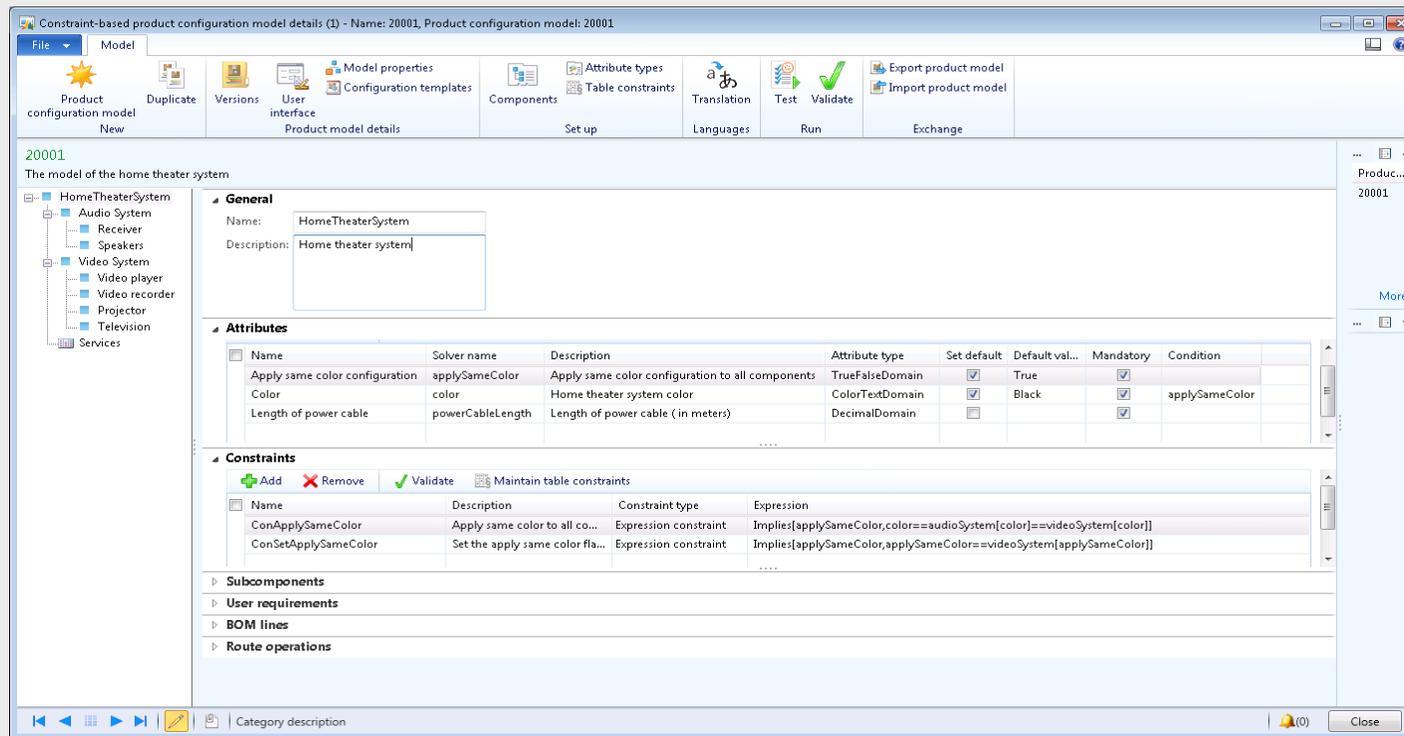
If you decide to add a new product configuration model and select an existing root component, any modifications that you make to the elements within the model, will be made globally. All other product configuration models that contain the same elements are also affected.

Specify the following values when you create a product configuration model:

1. Name
2. Description
3. Root component
4. Name

Constraint-Based Product Configuration Model Details Form

You can also use the Constraint-based product configuration model details form to create a product configuration model.



Constraint-Based Product Configuration Model Details Form

Constraint-based product configuration model

The **Constraint-based product configuration model details** form includes the complete definition of the product configuration model.

This includes the following elements as shown in the Constraint-Based Product Configuration Model Details Form figure:

- Attributes
- Constraints
- Subcomponents
- User requirements
- BOM lines
- Route operations

The tree structure for the product configuration model displays in the left pane on the **Constraint-based product configuration model details** form.

The root component, components, and subcomponents display in the tree structure.

Subcomponents

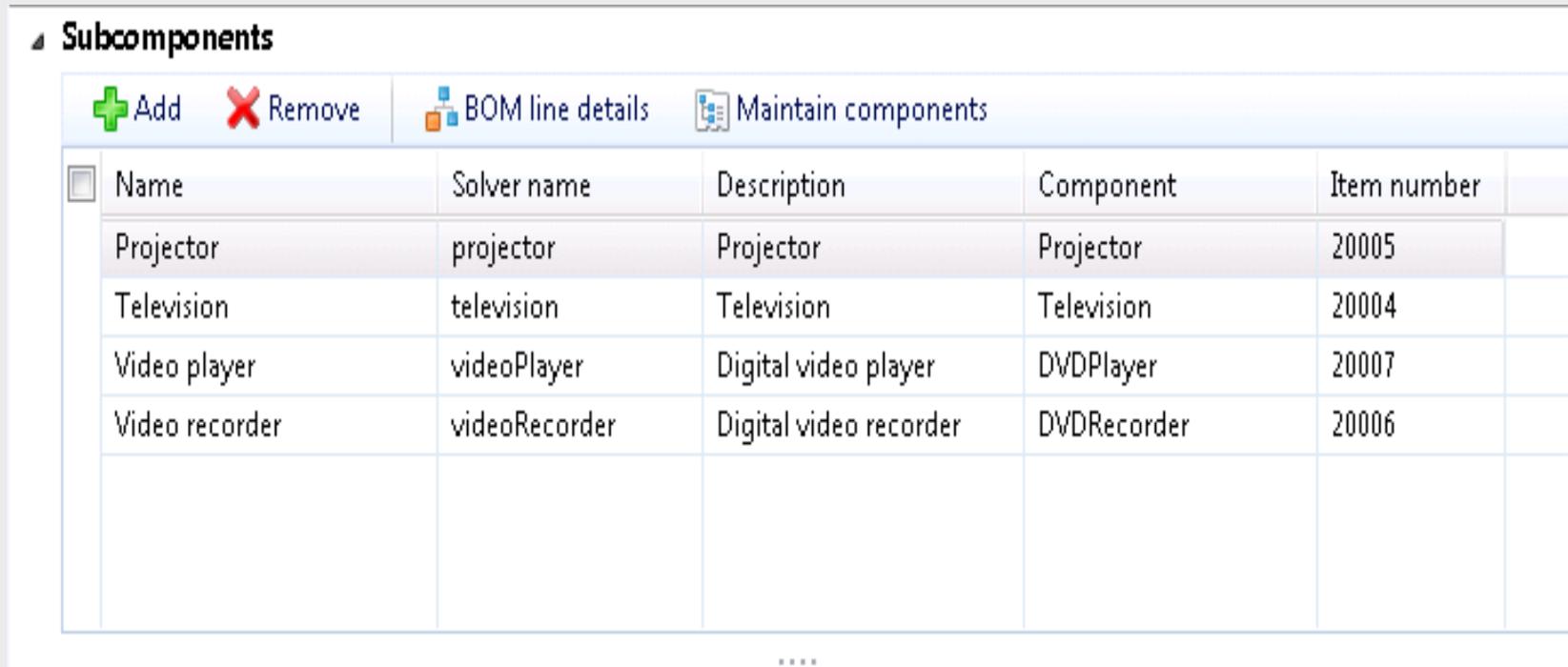
Adding Subcomponents

- ✓ Use to create a parent/child relationship between two components
- ✓ Use to build the structure of the product configuration model
- ✓ Encourage the reuse of components in multiple product configuration models

NOTE: When you add a subcomponent to a product configuration model, you can only select items that have constraint-based configuration as the configuration technology in the **Released product details** form. Otherwise, the item cannot be selected on the **Subcomponents** FastTab in the **Constraint-based product configuration model details** form

Subcomponents FastTab

Use the **Subcomponents** FastTab to add subcomponents to a component.



The screenshot shows the 'Subcomponents' FastTab interface. At the top, there are four buttons: '+ Add' (green plus), 'X Remove' (red X), 'BOM line details' (blue cube icon), and 'Maintain components' (blue document icon). Below these buttons is a table with the following columns: Name, Solver name, Description, Component, and Item number. The table contains five rows of data, with the first row highlighted in light blue.

<input type="checkbox"/>	Name	Solver name	Description	Component	Item number
	Projector	projector	Projector	Projector	20005
	Television	television	Television	Television	20004
	Video player	videoPlayer	Digital video player	DVDPlayer	20007
	Video recorder	videoRecorder	Digital video recorder	DVDRecorder	20006

Before you can add a subcomponent to a product configuration model, you must first add a record for the component on the **Components** form.

Attributes

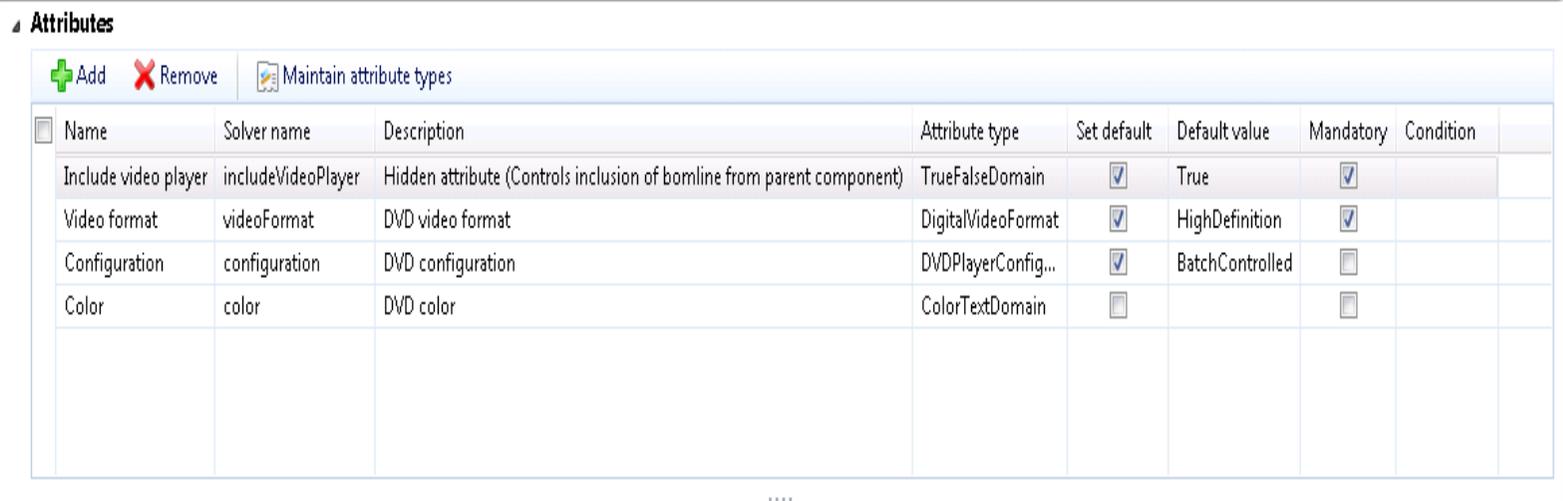
You can use attributes to specify the features that you can select when a distinct product variant is configured.

- ✓ Describe the properties of the components
- ✓ Each component has one or more attributes that identify its properties
- ✓ Select from the attributes during the configuration process
- ✓ Examples: Size of TV, length of power cable, or color of speakers

Attributes FastTab

Use the Attributes FastTab to add attributes to a component.

Attributes can be used in constraints and conditions. When attributes are created and added to a product configuration model, the attribute's attribute types are referenced as shown in the **Attributes** FastTab figure.



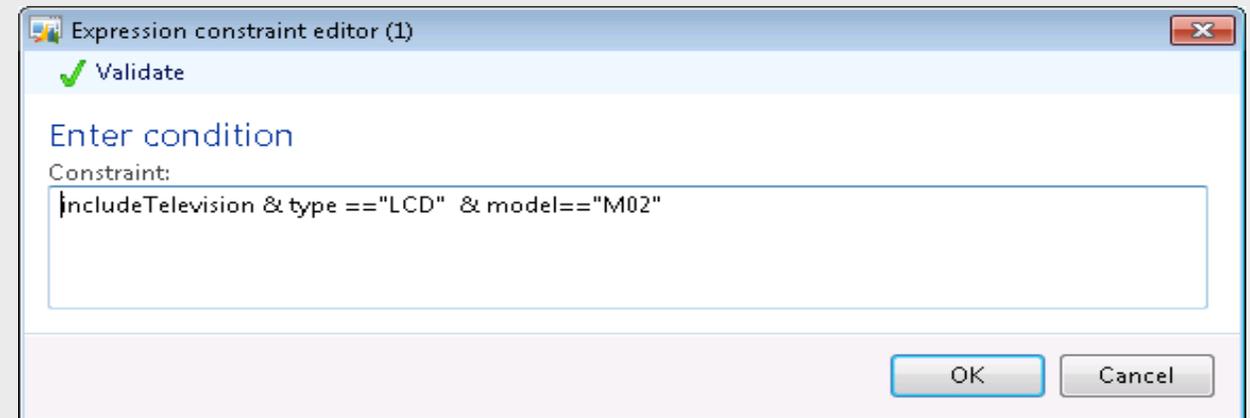
The screenshot shows the 'Attributes' FastTab interface. At the top, there are buttons for '+ Add', 'X Remove', and 'Maintain attribute types'. Below this is a table with the following columns: Name, Solver name, Description, Attribute type, Set default, Default value, Mandatory, and Condition. The table contains four rows of attribute data.

Name	Solver name	Description	Attribute type	Set default	Default value	Mandatory	Condition
Include video player	includeVideoPlayer	Hidden attribute (Controls inclusion of bomline from parent component)	TrueFalseDomain	<input checked="" type="checkbox"/>	True	<input checked="" type="checkbox"/>	
Video format	videoFormat	DVD video format	DigitalVideoFormat	<input checked="" type="checkbox"/>	HighDefinition	<input checked="" type="checkbox"/>	
Configuration	configuration	DVD configuration	DVDPlayerConfig...	<input checked="" type="checkbox"/>	BatchControlled	<input type="checkbox"/>	
Color	color	DVD color	ColorTextDomain	<input type="checkbox"/>		<input type="checkbox"/>	

Conditions and Expression Constraint Editor Form

Use the Expression constraint editor form to create an expression constraint or a condition that will be handled by the MSF constraint solver during the product configuration model process.

IMPORTANT: Only attributes of type boolean, text with a fixed list, and integers with a range are used by the MSF constraint solver.



The screenshot shows a dialog box titled "Expression constraint editor (1)". At the top left, there is a green checkmark icon followed by the text "Validate". Below this, the text "Enter condition" is displayed. Underneath, the label "Constraint:" is followed by a text input field containing the expression: `!includeTelevision & type == "LCD" & model == "M02"`. At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

Example 1 - Expression Constraint

The following expression uses a simple equal operation == to show the relationship between the left speaker and right speaker. Consider a stereo system that must have the same size speakers for the left speaker and the right speaker.

Expression: `leftSpeaker[size] == rightSpeaker[size]`

In the expression, `leftSpeaker` and `rightSpeaker` are the solver names of the two subcomponents, and `size` is an attribute of type integer with a fixed range.

Note: Expression constraints and conditions use arithmetic, boolean operators, and functions to create the constraint or condition.

Example 2 - Expression Constraint

The following expression uses the or operator Or to determine when to use a route operation named inspection for a home entertainment system product configuration model.

Expression: Or[includedlcdTV,includedvdPlayer]

In the expression, includedlcdTV and includedvdPlayer are the solver names of the two attributes Include LCD TV and Include DVD Player. Both attributes have a boolean attribute type of true or false.

The route operation for inspection is used only when the LCD TV or the DVD player is selected to be in home entertainment system. Otherwise, if you do not select the LCD TV or the DVD player, there is nothing to inspect.

Constraints

Constraints: Describe the restrictions of the product configuration model, and how they are used to make sure that only valid values are selected when the product configuration model is configured.

Expression constraints: Use expression constraints to express relations between attributes to make sure that compatible values are selected when you configure a product.

Table constraints: A constraint type that specifies allowed attribute combinations.

User-defined: A user-defined table constraint is static and consists of columns that represent attribute types.

System defined: A system defined table constraint represents a view on an existing table or table view that is present in the Application Object Tree (AOT).

A constraint is a restriction that a product configuration model must satisfy.
Constraints are processed by using the MSF constraint solver.

Constraints FastTab

You can add constraints to a product configuration model by using the Constraints FastTab on the Constraint-based product configuration model details form.

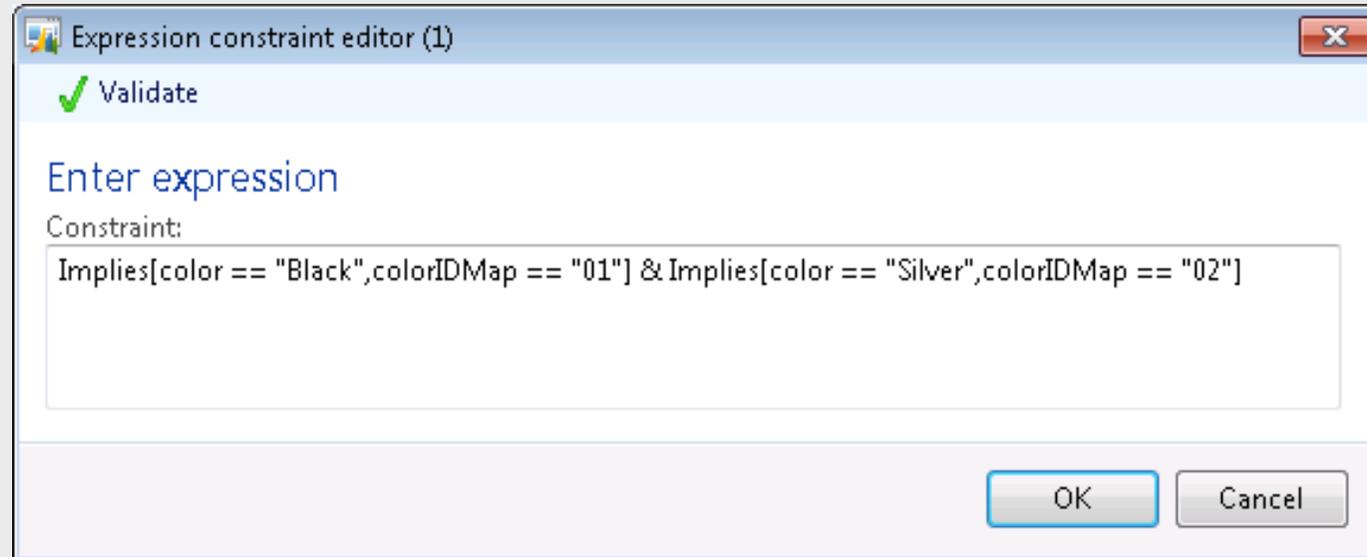
Expression constraints are characterized by an expression that uses arithmetic and boolean operators and functions as shown in the Constraints FastTab figure.

An expression constraint is written for a specific component in a product configuration model. It cannot be reused or shared with another component. However, the expression constraints for a component can reference attributes of the component's subcomponents.

Constraints				
+ Add - Remove ✓ Validate Maintain table constraints				
Name	Description	Constraint type	Expression	Table constraint definition
ConColor (ID map)	Constraint color (ID map)	Expression constraint	Implies[color == "Black",colorIDMap == "01"] & Implies[color == "Silver",colorIDMap == "02"]	
ConSize	Constraint sizing table	Table constraint		TVSize

Expression Constraints

Expression constraints are written as declarative constraints, and use MSF constraint solver to solve the constraints. You must use Optimization Modeling Language (OML) syntax when you write the constraints as shown in the Expression Constraint Editor Form figure.



The screenshot shows a window titled "Expression constraint editor (1)". At the top left, there is a green checkmark icon followed by the text "Validate". Below this, the text "Enter expression" is displayed in blue. Underneath, the label "Constraint:" is followed by a text input field containing the OML expression: `Implies[color == "Black",colorIDMap == "01"] & Implies[color == "Silver",colorIDMap == "02"]`. At the bottom right of the window, there are two buttons: "OK" and "Cancel".

Edit Table Constraint Form

The Edit Table Constraint Form figure displays the relationships on the **Allowed combinations** FastTab in the **Edit Table Constraint** form.

A user-defined table constraint is a type of matrix that can be used to describe the set of combinations for the attribute values that are defined by attribute types.

For example, if televisions are produced, the matrix for the user-defined table constraint might have columns for the TV type and TV size.

File

Name: TVSize

Description: Television size

Type: User defined

Table fields

+ Add - Remove

Name	Attribute type
TVType	TelevisionType
TVSize	TelevisionSize

Allowed combinations

+ Add - Remove ✓ Validate

	TVType	TVSize
	LCD	42
▶	LCD	50
	Plasma	50
	Plasma	60
	Projection	50
	Projection	60
*		

A short description of the record. Close

New Table Constraint Form

System-defined table constraints bind columns of a table to attributes for components in a product configuration model as shown in the New Table Constraint Form figure.

New table constraint (1)

Define columns

Specify which fields to include in the constraint

Add Remove

<input type="checkbox"/>	Name	Field name	Attribute type
<input type="checkbox"/>	Color	InventColorId	ColorTextDomain
<input type="checkbox"/>	Site	InventSiteId	Site

Optional: Select a query to filter the table

Select query...

< Back Next > Cancel

User Requirements

User requirements can represent the soft requirements for a product where you know more about the product than the customer.

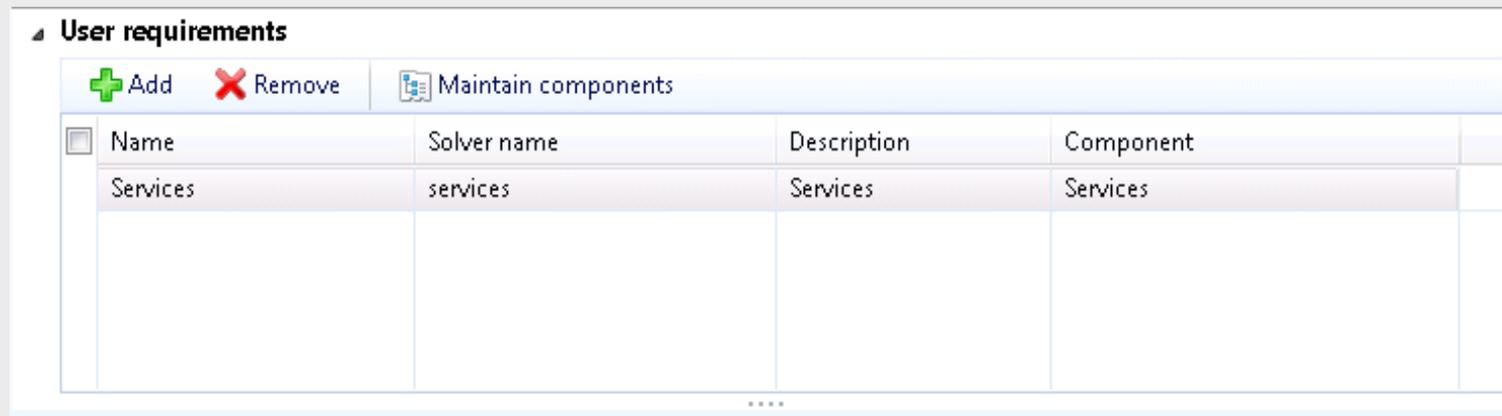
For example:

Contoso Entertainment Systems offers services to customers that can help them use or more fully enjoy the products that they purchase. When a customer buys a home entertainment system, he might not understand how to set it up because of the complexity of having several components. After years of use, maintenance and repair issues might occur. Or, the customer might want to refine his system to increase the overall performance.

This type of service can be added as a user requirement to the product configuration model.

User Requirements FastTab

User requirements do not have their own level in the generated BOM. They are mapped to components. However, you cannot associate them with a product master item. Other than that, they resemble subcomponents as shown in the User Requirements FastTab figure.



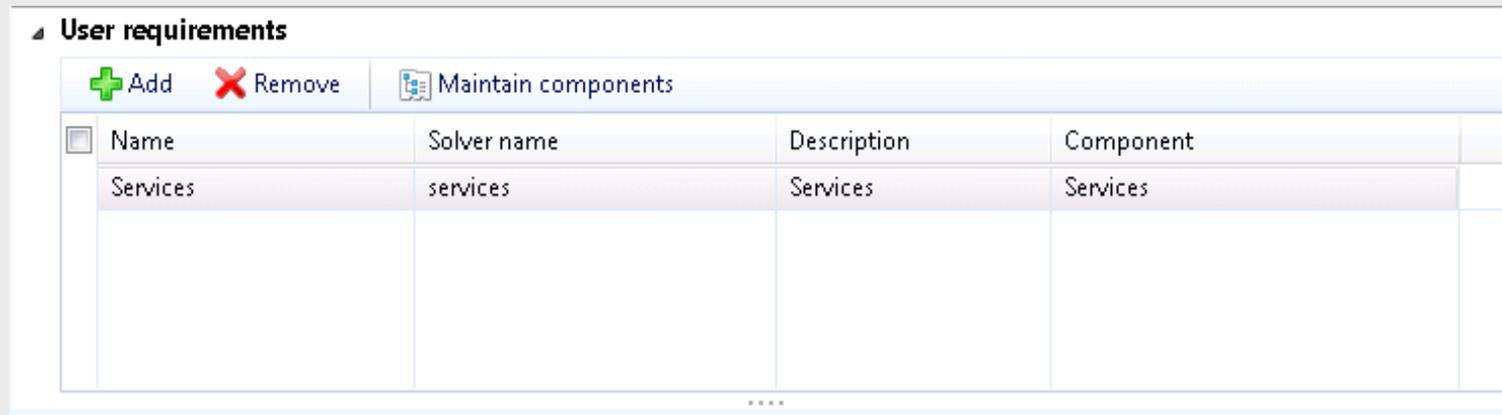
The screenshot shows a software interface titled "User requirements". It features a toolbar with three buttons: a green plus sign for "Add", a red minus sign for "Remove", and a blue icon for "Maintain components". Below the toolbar is a table with the following structure:

<input type="checkbox"/>	Name	Solver name	Description	Component
<input type="checkbox"/>	Services	services	Services	Services

There are four dots "...." centered below the table.

User Requirements FastTab

- When you add a user requirement to a product configuration model, you must add attributes and BOM lines to the corresponding component to represent the user requirement.
- You might have constraints that you want to use in multiple configuration models, or have BOMs or operations that you want to use across several models.
- The BOM and route operations of user requirements are pulled up into the parent item in kind of a phantom BOM way.
- A phantom BOM is a BOM structure that is not an item. It represents the recipe of something that you do not intend to store as a unit.



<input type="checkbox"/>	Name	Solver name	Description	Component
<input type="checkbox"/>	Services	services	Services	Services

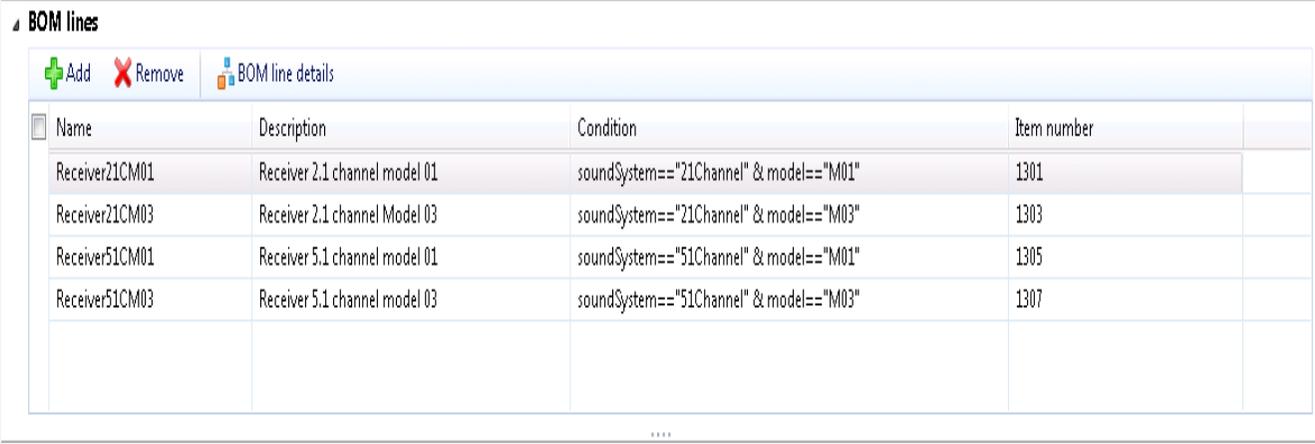
BOM Lines

Bill of Material Lines

- ✓ Are included in the product configuration model to identify the manufacturing BOM for each component
- ✓ Can reference an item or a service, and all item properties can be set to a fixed value or mapped to an attribute
- ✓ Are held together in a BOM structure that is created for the subcomponent and the item that is represented
- ✓ Conditions for BOM lines can be used in a product configuration model to include or exclude a specific BOM line when you configure a product

BOM Lines FastTab

BOM lines are added to a product configuration model by using the BOM lines FastTab as shown in the BOM Lines FastTab figure.

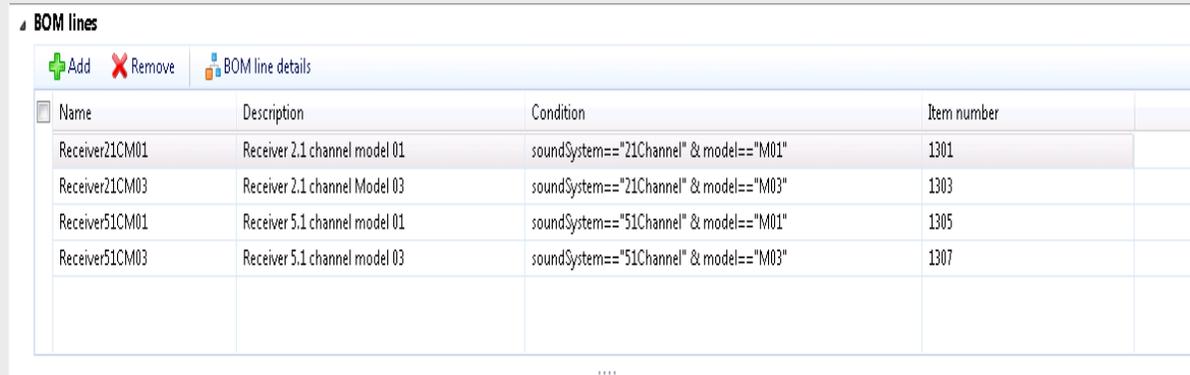


The screenshot displays the 'BOM lines' FastTab interface. It features a table with four columns: Name, Description, Condition, and Item number. The table contains four rows of data, each representing a different receiver model and its associated item number. The interface also includes 'Add' and 'Remove' buttons, and a 'BOM line details' link.

Name	Description	Condition	Item number
Receiver21CM01	Receiver 2.1 channel model 01	soundSystem=="21Channel" & model=="M01"	1301
Receiver21CM03	Receiver 2.1 channel Model 03	soundSystem=="21Channel" & model=="M03"	1303
Receiver51CM01	Receiver 5.1 channel model 01	soundSystem=="51Channel" & model=="M01"	1305
Receiver51CM03	Receiver 5.1 channel model 03	soundSystem=="51Channel" & model=="M03"	1307

BOM Lines FastTab

For each BOM line, you will specify the following:



The screenshot shows a software interface titled "BOM lines". It features a table with four columns: Name, Description, Condition, and Item number. Above the table are buttons for "Add" (with a plus icon), "Remove" (with a minus icon), and "BOM line details" (with a magnifying glass icon). The table contains four rows of data, each representing a BOM line with its name, description, condition, and item number.

Name	Description	Condition	Item number
Receiver21CM01	Receiver 2.1 channel model 01	soundSystem=="21Channel" & model=="M01"	1301
Receiver21CM03	Receiver 2.1 channel Model 03	soundSystem=="21Channel" & model=="M03"	1303
Receiver51CM01	Receiver 5.1 channel model 01	soundSystem=="51Channel" & model=="M01"	1305
Receiver51CM03	Receiver 5.1 channel model 03	soundSystem=="51Channel" & model=="M03"	1307

Name: Name of the BOM line.

Description: Description of the BOM line.

Condition: Adding a condition to the BOM line is optional.

The field contains a drop-down to access the **Expression constraint editor** form.

The form lets you write a condition for the selected BOM line.

The expression entered must follow MSF syntax.

You can validate the expression syntax that you enter is correct by clicking **Validate**.

Performing this action passes the condition to MSF constraint solver.

Item number: Reference to the item number that represents the BOM line.

BOM Line Details Form

Use the **BOM line details** form to select the item that will represent the BOM line.

The screenshot shows a software window titled "BOM line details (1)". At the top, there is a field for "Item number" with the value "1301" and a dropdown arrow. To the right are radio buttons for "Value" (selected) and "Attribute". Below this is a section titled "Details" with several sub-sections:

- Subcontractor**: "Set: Vendor account: [text field] Value Attribute
- BOM**:
 - "Set: Position: [text field] Value Attribute
 - "Set: Line type: Item [dropdown] Value Attribute
 - "Set: Calculation: Value Attribute
 - "Set: Subroute: [text field] Value Attribute
 - "Set: Sub-BOM: [text field] Value Attribute
- Project**: "Set: Set subproduction to Consumed: Value Attribute
- Valid**:
 - "Set: From date: [text field] Value Attribute
 - "Set: To date: [text field] Value Attribute
- Operation**:
 - "Set: Oper. No. [text field] Value Attribute
 - "Set: End: Value Attribute
- Consumption**: "Set: Resource consumption: Value Attribute

Below the "Details" section are expandable sections for "Setup" and "Dimension". At the bottom right are "OK" and "Cancel" buttons. A footer bar contains the text "Identification number for this item".

BOM Line Details Form

Use this form to set up value assignments for BOM line fields.

The **Item number** field at the top of the form is used to indicate whether the value of the selected line is determined by an item number or by an attribute as shown in the BOM Line Details Form figure.

- ✓ The **BOM line details** form contains three FastTabs:
- ✓ **Details** FastTab: You can set the values for the Subcontractor, BOM, Project, Valid, Operation, and Consumption group fields based on a value or an attribute.
 - ✓ If attribute is selected, then you can select the value for the attribute when you configure the product.
 - ✓ A value can also be selected, depending on a constraint.
 - ✓ This behavior is the same for all fields.
 1. **Item number**: Select the **Value** field option on the top of the **BOM line details** form to filter by item number in the **Item number** field.
 2. If you select the **Attribute** field option on the top of the form, then select the attribute in the **Item number** field.
- ✓ **Setup** FastTab: You can set the values for the Consumption calculation, Rounding-up, and Measurement group fields based on a value or an attribute.
- ✓ **Dimension** FastTab: You can set the values for the Inventory dimensions group fields based on a value or an attribute.

BOM line details (1)

Item number: 1301

Value Attribute

Details

Subcontractor

Set: Vendor account: Value Attribute

BOM

Set: Position: Value Attribute

Set: Line type: Item Value Attribute

Set: Calculation: Value Attribute

Set: Subroute: Value Attribute

Set: Sub-BOM: Value Attribute

Project

Set: Set subproduction to Consumed: Value Attribute

Valid

Set: From date: Value Attribute

Set: To date: Value Attribute

Operation

Set: Oper. No. Value Attribute

Set: End: Value Attribute

Consumption

Set: Resource consumption: Value Attribute

▶ **Setup**

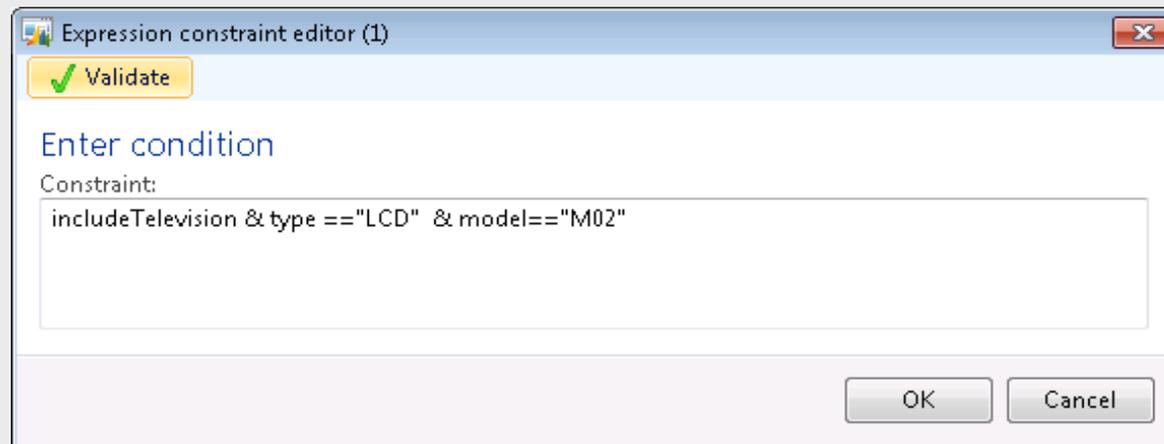
▶ **Dimension**

OK Cancel

Identification number for this item

Expression Constraint Editor Form

Optionally, to specify that the BOM line is included only under a certain condition, in the Condition field, click the arrow to open the Expression constraint editor form. In the Constraint field, enter the expression constraint that defines the condition that must be met.



The screenshot shows a dialog box titled "Expression constraint editor (1)". At the top left, there is a yellow button with a green checkmark and the text "Validate". Below this, the text "Enter condition" is displayed in blue. Underneath, the label "Constraint:" is followed by a text input field containing the expression: `includeTelevision & type == "LCD" & model == "M02"`. At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

Route Operations

Route operations are included in product configuration models to identify the manufacturing routes for the subcomponents.

- ✓ Like a production BOM, a route must be approved before it can be used, and it must also be marked as active.
- ✓ An operation in a route is attached to a specific resource or capabilities that the resource must own.
- ✓ A route can be defined and attached to more than one item exactly like an operation can be defined and attached to more than one route.
- ✓ A route only contains operations and does not depend on BOM components.

A production route in Microsoft Dynamics AX brings together a sequence of steps or operations which defines a manufacturing process

Route Operations Fast Tab

Add route operations to a product configuration model by using the **Route operations** FastTab on the **Constraint-based product configuration model details** form.

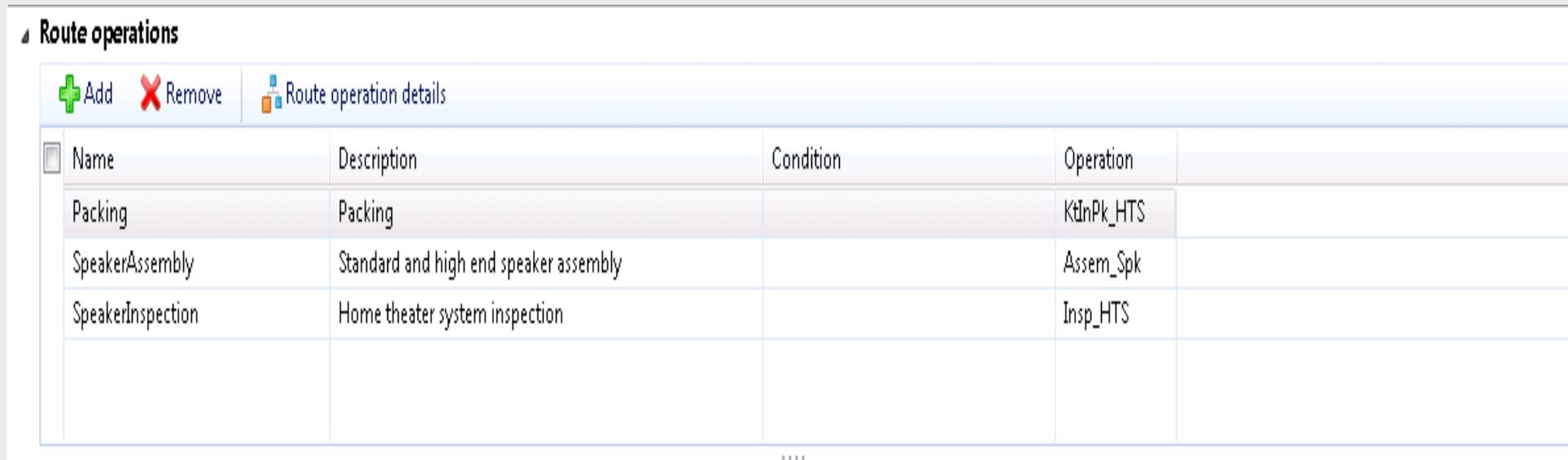
<input type="checkbox"/>	Name	Description	Condition	Operation
<input type="checkbox"/>	Packing	Packing		KtInPk_HTS
<input type="checkbox"/>	SpeakerAssembly	Standard and high end speaker assembly		Assem_Spk
<input type="checkbox"/>	SpeakerInspection	Home theater system inspection		Insp_HTS

Route Operations Fast Tab

The definition of route operations resemble how BOM lines are defined for a product configuration model.

However, route operations are not mapped to an item number as shown in the Route Operations FastTab figure.

Instead they are mapped to an operation.



The screenshot shows a software interface titled "Route operations". At the top, there are three buttons: a green plus sign labeled "Add", a red X labeled "Remove", and a blue square icon labeled "Route operation details". Below these buttons is a table with the following data:

<input type="checkbox"/>	Name	Description	Condition	Operation
<input type="checkbox"/>	Packing	Packing		KtInPk_HTS
<input type="checkbox"/>	SpeakerAssembly	Standard and high end speaker assembly		Assem_Spk
<input type="checkbox"/>	SpeakerInspection	Home theater system inspection		Insp_HTS
<input type="checkbox"/>				

Route Operation Details Form

You can use the Route operation details form to set up value assignments for route operation fields. The Operation field at the top of the form can be used to indicate whether the value of the selected line is determined by a selected operation or by an attribute.

The screenshot shows a software window titled "Route operation details (1) - Name: Packing, Packing". The window contains several sections for configuring route operations:

- Operation:** KtdnPk_HTS. Radio buttons for "Value" (selected) and "Attribute".
- Details:**
 - Operation:**
 - Set: Oper. No.: 10. Radio buttons for "Value" (selected) and "Attribute".
 - Set: Next: 0. Radio buttons for "Value" (selected) and "Attribute".
 - Set: Priority: Primary. Radio buttons for "Value" and "Attribute".
 - Set: Link type: . Radio buttons for "Value" and "Attribute".
 - Route:**
 - Set: Property: . Radio buttons for "Value" and "Attribute".
 - Set: Route group: 10. Radio buttons for "Value" (selected) and "Attribute".
 - Set: Route type: Standard. Radio buttons for "Value" and "Attribute".
- Setup:**
 - Consumption calculation:**
 - Set: Formula: Standard. Radio buttons for "Value" and "Attribute".
 - Set: Factor: 0.00. Radio buttons for "Value" and "Attribute".
 - Set: Costing resource: . Radio buttons for "Value" and "Attribute".
 - Cost categories:**
 - Set: Setup category: HTSSetup. Radio buttons for "Value" (selected) and "Attribute".
 - Set: Run time category: HTSProc. Radio buttons for "Value" (selected) and "Attribute".
 - Set: Quantity category: HTSQty. Radio buttons for "Value" (selected) and "Attribute".
- Times:** (Collapsed)
- Resource requirements:** (Collapsed)

Buttons for "OK" and "Cancel" are at the bottom right. A footer note says "Identify the route group."

Route Operations Details Form FastTabs

The Route operations details form contains four FastTabs:

- ✓ Details FastTab: You can set the values for the Operation group and Route group fields based on a value or an attribute. If attribute is selected, then you can select the value for the attribute during the product model configuration process. This behavior is the same for all fields except for fields on the Resource requirements FastTab.
- ✓ Setup FastTab: You can set the values for the Consumption calculation group fields and Cost categories group fields based on a value or an attribute.
- ✓ Times FastTab: You can set the values for the Times group fields and Overlap group fields based on a value or an attribute.
- ✓ Resource requirements FastTab: Enter the resource requirements for the operation. These requirements can include the resource type, resource group, or the individual resource that is needed. You can also define requirements according to the capabilities the resource must have to perform the operation.

Route Operations Details Form FastTabs

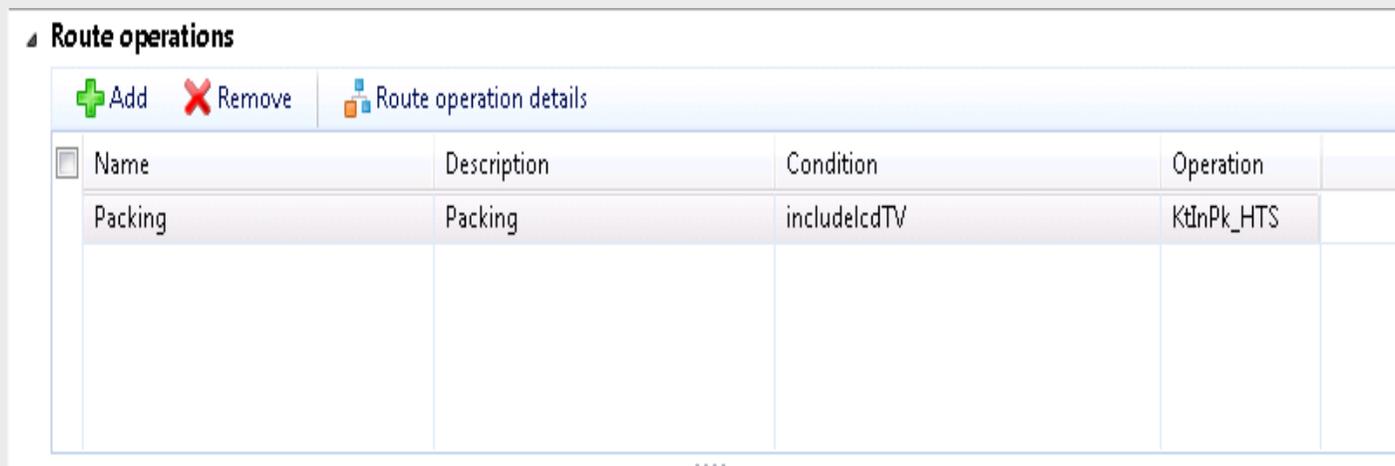
The Route operations details form how-to:

You can access the **Route operation details** form through

1. **Product information management > Common > Product configuration models** list page.
2. Select the product configuration model.
3. Click **Edit** in the **Maintain** group of the Action Pane to open the **Constraint-based product configuration model details** form.
4. Click the **Route operations** FastTab and select the existing route operation.
5. Click the **Route operation details** button in the **Route operations** FastTab to open the **Route operation details** form.

Route Operation with Condition

To specify that the route operation is included only under a certain condition, in the **Condition** field, click the arrow to open the **Expression constraint editor** form. In the **Constraint** field, enter the expression constraint that defines the condition that must be met.



Route operations

+ Add - Remove Route operation details

<input type="checkbox"/>	Name	Description	Condition	Operation	
	Packing	Packing	includeLCDTV	KtInPk_HTS	

Product Configuration APIs

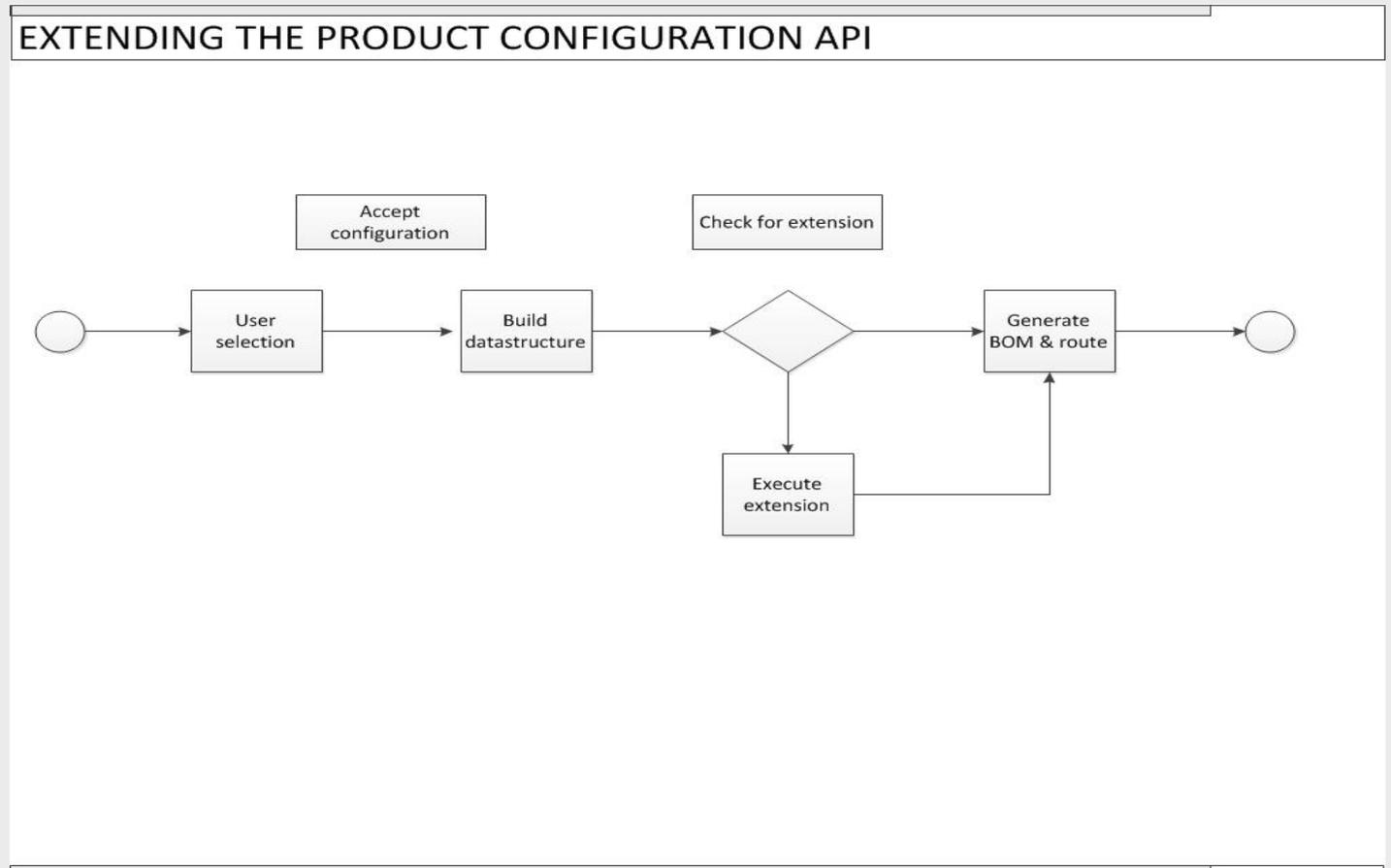
Microsoft Dynamics AX 2012 includes product configuration Application Programming Interfaces (APIs). The APIs can be used by developers to extend the capabilities of a product configuration model.

The key areas of the product configuration API include the following:

- ✓ The main purpose is to modify the configured BOM structure, the route, or to writeback to the order line.
- ✓ The API provides support for all data types.

Extending The Product Configuration API Figure

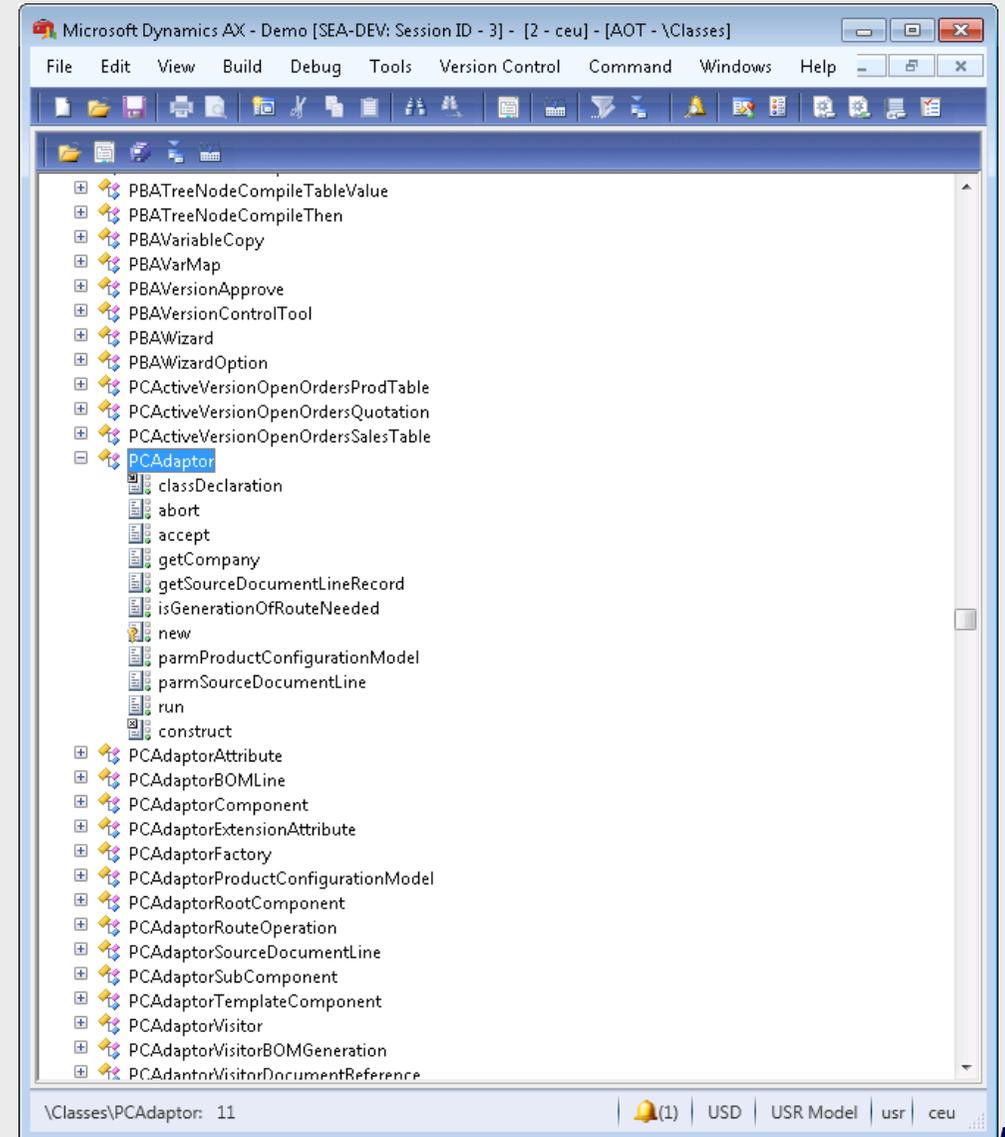
The API is executed when you complete a configuration session, after you configure a product.



AOT Form

The key classes of the API include the following as shown in the AOT Form figure:

1. PCAdaptor
2. PCAdaptorProductConfigurationModel
3. PCAdaptorComponent
4. PCAdaptorSubComponent
5. PCAdaptorSourceDocumentLine
6. PCAdaptorAttribute
7. PCAdaptorBOMLine
8. PCAdaptorRouteOperation



PCAdaptor Classes

The PCAdaptor class provides the following:

- ✓ An entry point to extend and overwrite the run method.
- ✓ Access to the data structure that matches the elements within the product configuration model.
- ✓ You can extend from the PCAdaptor class and use the PCAdaptorExtensionAttribute to create the relation between an adaptor class and a product configuration model.

The PCAdaptorAttribute class is used mainly for reading values.

The PCAdaptorBOMLine and PCAdaptorRouteOperation class parm methods are used to modify inclusion and field values.

Customizing the Configuration User Interface

There are several options that are available to use to further customize how and when subcomponents and attributes display on the Configure line form.

The options include the following:

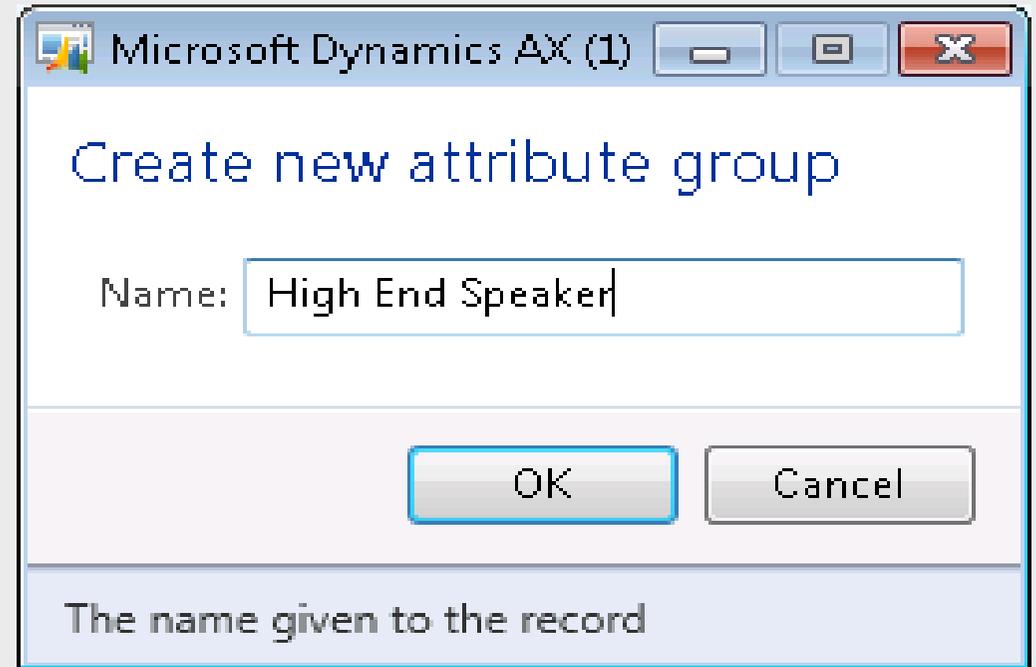
- ✓ Attribute groups: An attribute group is used to group the attributes for a root component or subcomponent in a product configuration model. You can group similar attributes to display together to help the user better understand the product features.
- ✓ Arranging attribute groups and subcomponents: You can arrange attribute groups and subcomponents to display in a specific order on the Configure line form. Ordering the attribute groups can help organize the attributes in a logical sequence that display when testing the user interface or configuring an order line.
- ✓ Hiding attributes: Attributes can be hidden and not display in an attribute group on the Configure line form when testing or configuring an order line.

Create New Attribute Group Form

To create an attribute group, you must specify a name for the attribute group in the Name field on the Create new attribute group form.

An attribute group is used to group the attributes for a root component or subcomponent in a product configuration model.

Components can frequently contain a greater number of attributes to correctly describe the product, and it is easy to organize them.



Microsoft Dynamics AX (1)

Create new attribute group

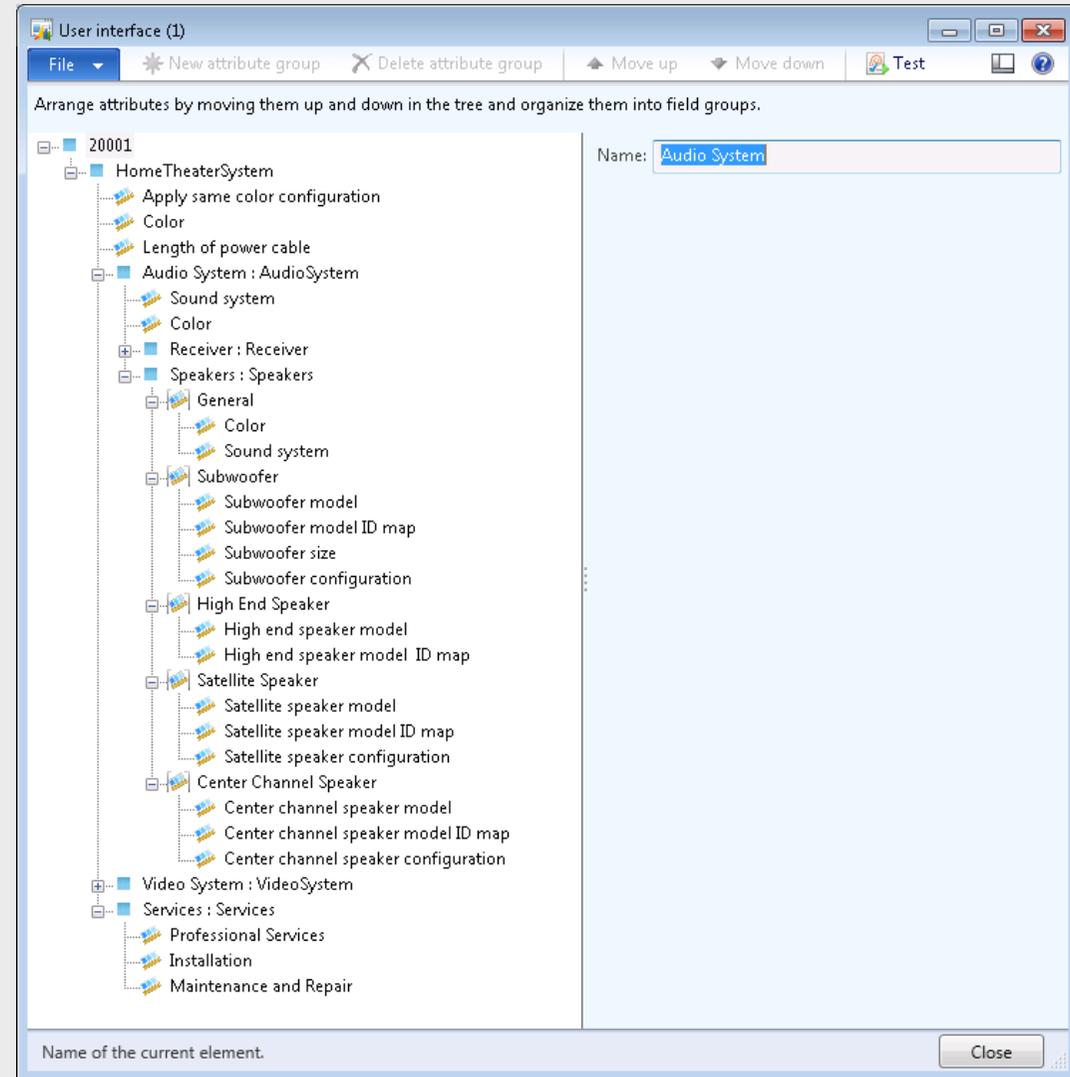
Name: High End Speaker

OK Cancel

The name given to the record

User Interface Form

The User interface form provides a full view of the product configuration model tree structure.



User Interface Form

The **User interface** form lets you arrange attribute groups and subcomponents in the tree structure to customize how they display by using the following options.

New attribute group: Adds a new attribute group.

Delete attribute group: Deletes an attribute group.

Move up: Lets you move an attribute group up in the tree structure within the selected component or subcomponent. You can also move subcomponents up in the tree structure.

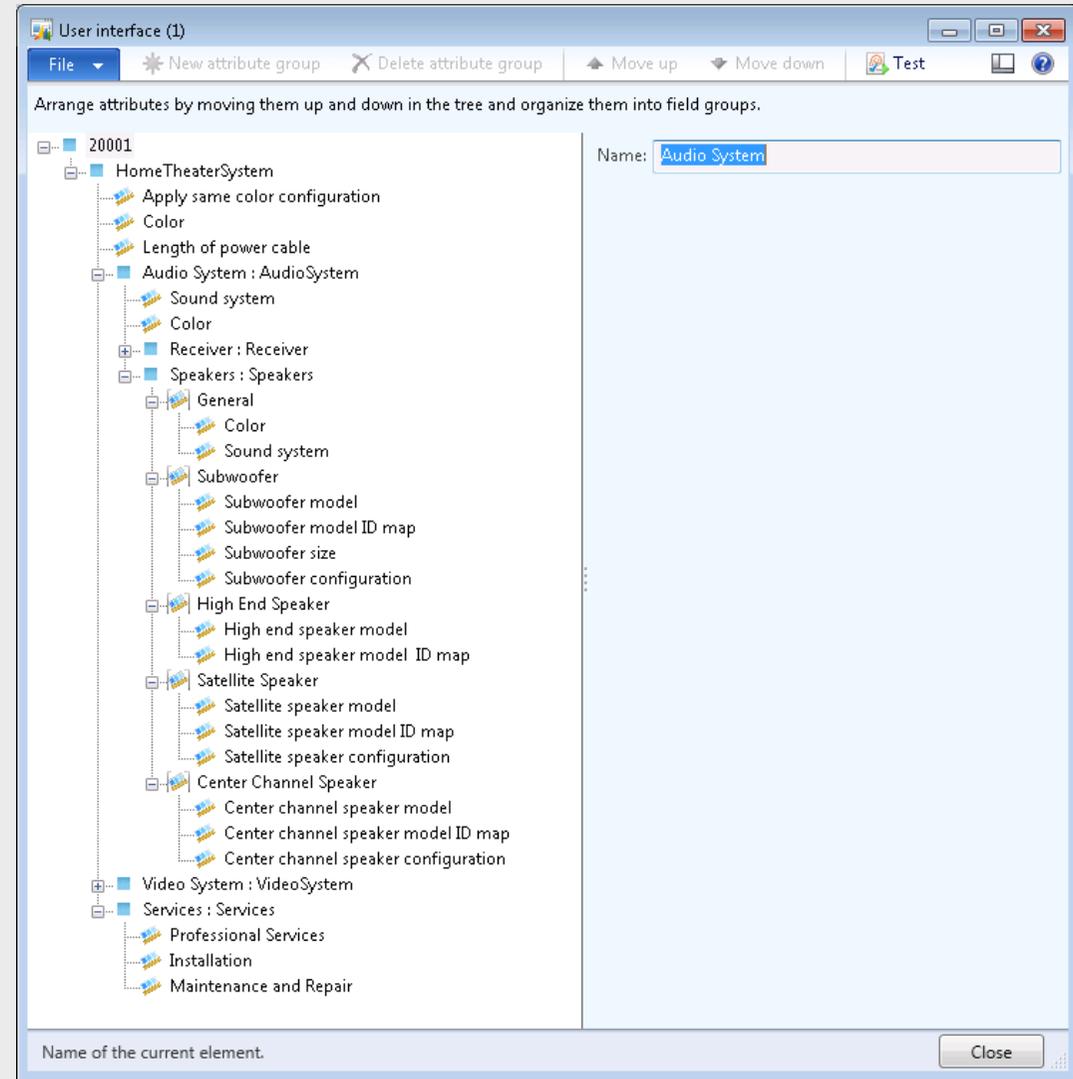
Move down: Lets you move an attribute group down in the tree structure within the selected component or subcomponent. You can also move subcomponents down in the tree structure.

Test: Clicking **Test** lets you test the **Configure line** form and verify the attribute groups display correctly on the **Configure line** form.

When attributes are not selected to be hidden, the attributes will display under the attribute group. The attribute group will be shown as a FastTab that can be expanded on the **Configure line** form.

TIP: *New attribute group* is available only when a root component or subcomponent is selected in the tree structure.

TIP: *Delete attribute group* is available only when an attribute group is selected in the tree structure.



Configure Line Form

Clicking Test lets you test the configuration and verify the attribute groups display correctly on the Configure line form.

The screenshot shows a software window titled "Configure line (1)". At the top, it displays "Test product model: 20001" and "20001 The model of the home theater system". Below this is a "Load template" button and a tree view on the left. The tree view shows a hierarchy: HomeTheaterSystem > Audio System > Speakers (highlighted in blue). Other items in the tree include Receiver, Video System, Video player, Video recorder, Projector, Television, and Services. The main area of the window is a configuration form for "Speakers". It is divided into several sections, each with a title and a set of dropdown menus:

- General**: Color (Metallic Black), Sound system (5.1 channel)
- Subwoofer**: Subwoofer model (Model 00), Subwoofer size (12), Subwoofer configuration (01)
- High End Speaker**: High End Speaker Model (Mahogany 16 inches)
- Satellite Speaker**: Satellite speaker model (Model 02), Satellite speaker configuration (01)
- Center Channel Speaker**: Center channel speaker model (Model 01), Center channel speaker model ID map (1151), Center channel speaker configuration (01)

At the bottom right of the form, there are three buttons: "Next", "OK", and "Cancel".

Hiding Attributes

You can hide attributes to not display on the Configure line form.

- ✓ Hide attributes to reduce the number of attributes on the Configure line form
- ✓ Hide specific attributes that are less important to the customer

Hiding Attributes

How To hide attributes to not display on the Configure line form.

Hide attribute: Select the **Hide attribute** check box to hide the attribute from displaying on the **Configure line** form.

When you click **Test** on the **User interface** form to verify the organization of the attribute groups and attributes, the hidden attribute will not display on the **Configure line** form.

Condition: Create the condition that you want the attribute to be hidden.

Validate: Select **Validate** to confirm the syntax of the condition follows MSF standards.

Test the User Interface

Test the user interface to:

- ✓ Verify that the attribute groups that you created display on the Configure line form in the order that you planned.
- ✓ Verify that the attributes within the attribute groups display in logical order on the Configure line form.
- ✓ Verify that any attributes that you designate as hidden do not display on the Configure line form.

To test the product configuration model, click **Test** on the **User interface** form to display the **Configure line** form.

Validating and Testing a Product Configuration Model

After you add information to the product configuration model, it is time to check that the information is correct and that it displays in a logical and understandable format.

- ✓ The two operations that are performed at this point are as follows:
- ✓ **Validate:** Validating checks that the constraints for the product configuration model are valid.
- ✓ **Test:** Testing displays the **Configure line** form and lets you visually inspect the configuration experience and select the values for all the defined attributes. The purpose with testing is to let the product designer verify that the complete configuration experience is in order, e.g. attribute values, constraints, default values, mandatory and hidden attributes, and so on.

Validating and Testing a Product Configuration Model Notes

NOTE: *We recommend that you validate the product configuration model before you test it. If you test the product configuration model first, and errors are present, the system displays a generic infolog message that does not help you resolve the error.*

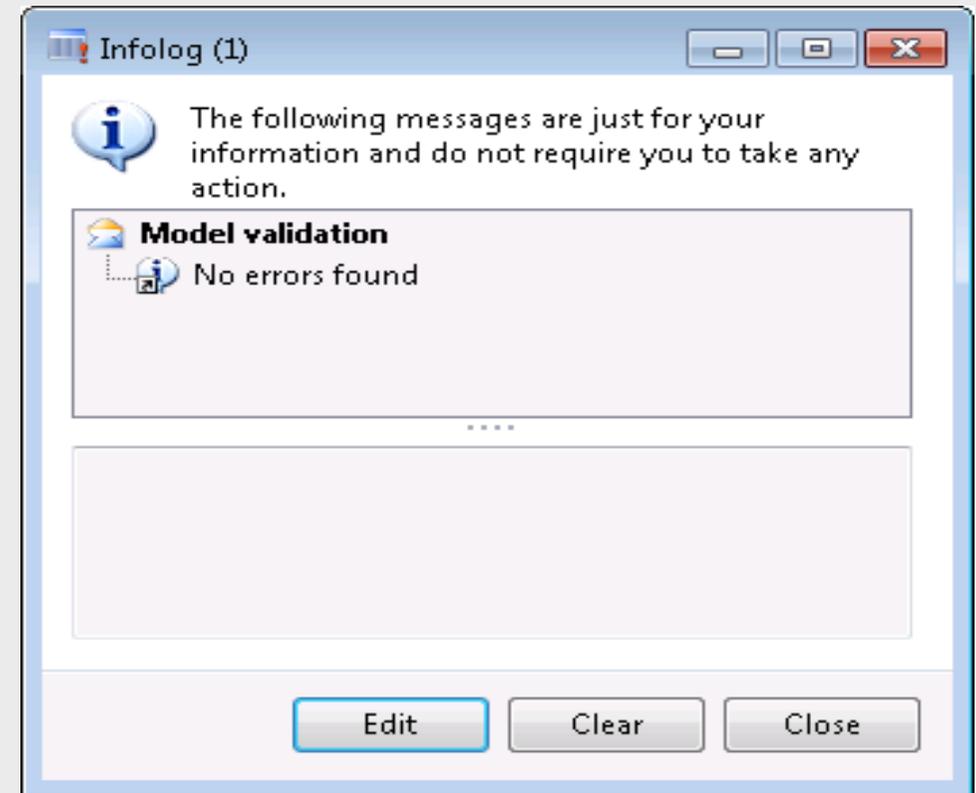
There are several methods of validation that can be performed while you are creating a product configuration model.

1. The lowest level of validation is performed for a single expression constraint. Typically, the product designer performs this validation to verify the syntax of an expression constraint is correct. Also, a condition for a BOM line or a route operation can be validated in isolation. Multiple attributes can be referenced in one constraint. The validation for the expression constraint will consider the whole expression and determine whether it is valid.
2. Validation can also be done for a user-defined table constraint definition. In this case the user can verify that the values entered for each field are inside the domain of the corresponding attribute types.
3. Finally, validation can be done for a complete product configuration model to verify the complete syntax is correct, and that all naming and modeling conventions are respected.

Infolog Form with No Errors

Validation displays No errors found.

***NOTE:** If the MSF constraint solver detects errors in the product configuration model during validation, the errors should be resolved before you continue. However, the product designer is free to continue working on the model, but no configuration can be completed before the issue is resolved.*



Testing a Product Configuration Model

After you create a product configuration model, you can test that it performs as expected by simulating the process that occurs when the product is configured.

- ✓ The test will reflect any changes that are made by using the User interface form.
- ✓ You can verify that the attribute values are correct, and that the attribute descriptions guide the user in selecting the correct values.
- ✓ Finally, upon completing a test session, the system tries to create the BOM and the route that corresponds to the selected attribute values.
- ✓ The BOM and route only exist temporarily, and are deleted when the process closes.

The process closes some seconds after the user clicks **OK** on the **Configure line** form.

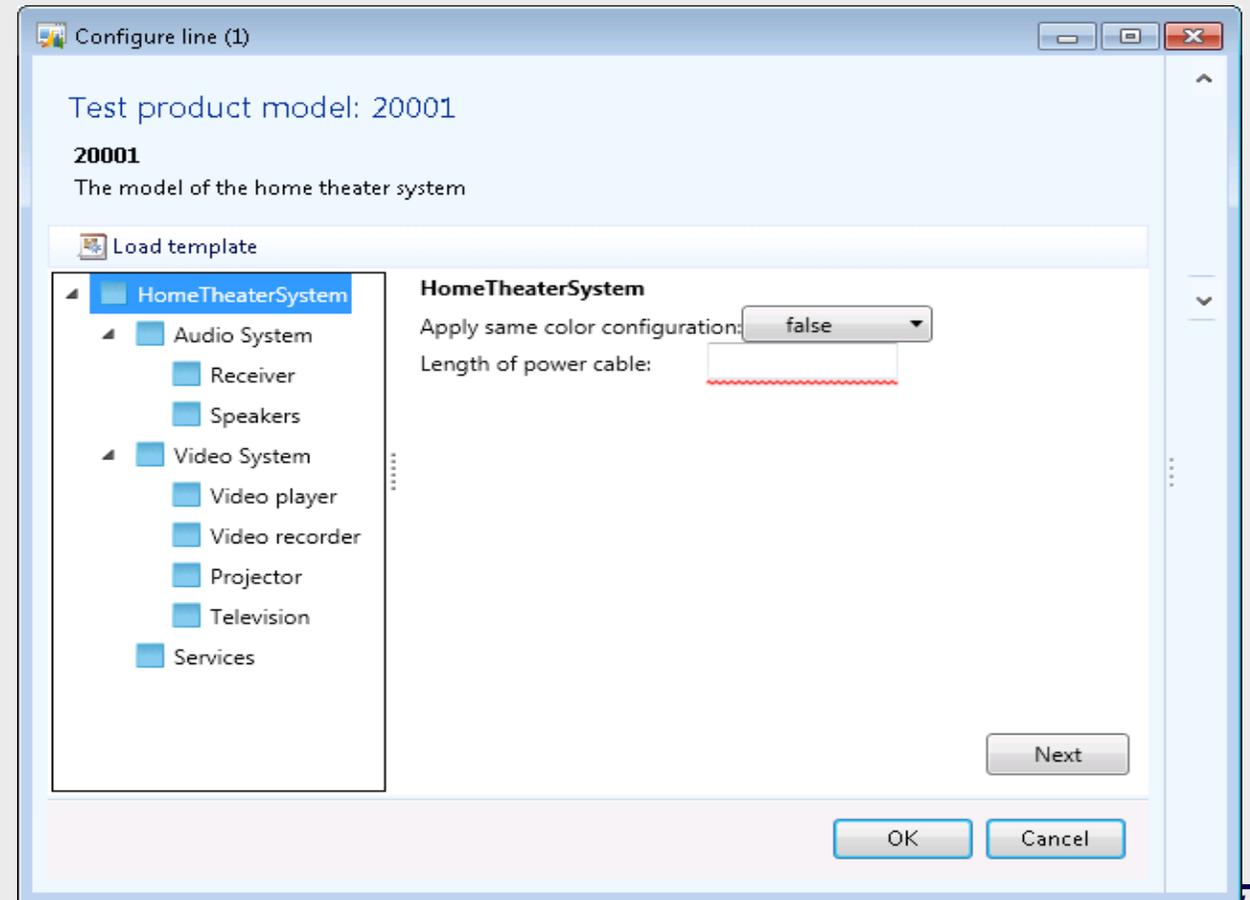
The length of time is completely dependent on the size and complexity of the product configuration model.

Configure Line Form Test

Testing a product configuration model

***TIP:** If errors are detected in the production configuration model, the system displays an error message on the **Infolog** form. The **Infolog** form displays the following message text: Failed to parse OML data. This error message will not help you resolve the error. It is more helpful to first validate the product configuration model to determine the cause of the error.*

***NOTE:** All mandatory fields are highlighted in the color red on the **Configure line** form. You must specify a value for all mandatory fields when testing and configuring a product configuration model before you click **OK**. If all mandatory fields do not contain values and the user clicks **OK**, the system displays an **Infolog** form with the text: The configuration is not finished. Not all fields have a value.*



The screenshot shows a window titled "Configure line (1)" with a light blue background. At the top, it displays "Test product model: 20001" and "20001 The model of the home theater system". Below this is a "Load template" section. On the left, a tree view shows the configuration structure: "HomeTheaterSystem" (expanded), "Audio System" (expanded), "Receiver", "Speakers", "Video System" (expanded), "Video player", "Video recorder", "Projector", "Television", and "Services". On the right, the "HomeTheaterSystem" configuration details are shown, including "Apply same color configuration:" with a dropdown menu set to "false" and "Length of power cable:" with a red dashed line indicating a mandatory field. At the bottom right, there are "Next", "OK", and "Cancel" buttons.

Building Configuration Templates

Building configuration templates

- ✓ Configuration template is a completely or partly configured product configuration model
- ✓ Configuration template is created to reduce the work needed to configure products
- ✓ One or more configuration templates can be created for a product configuration model to either speed up the configuration process or promote specific product attribute combinations

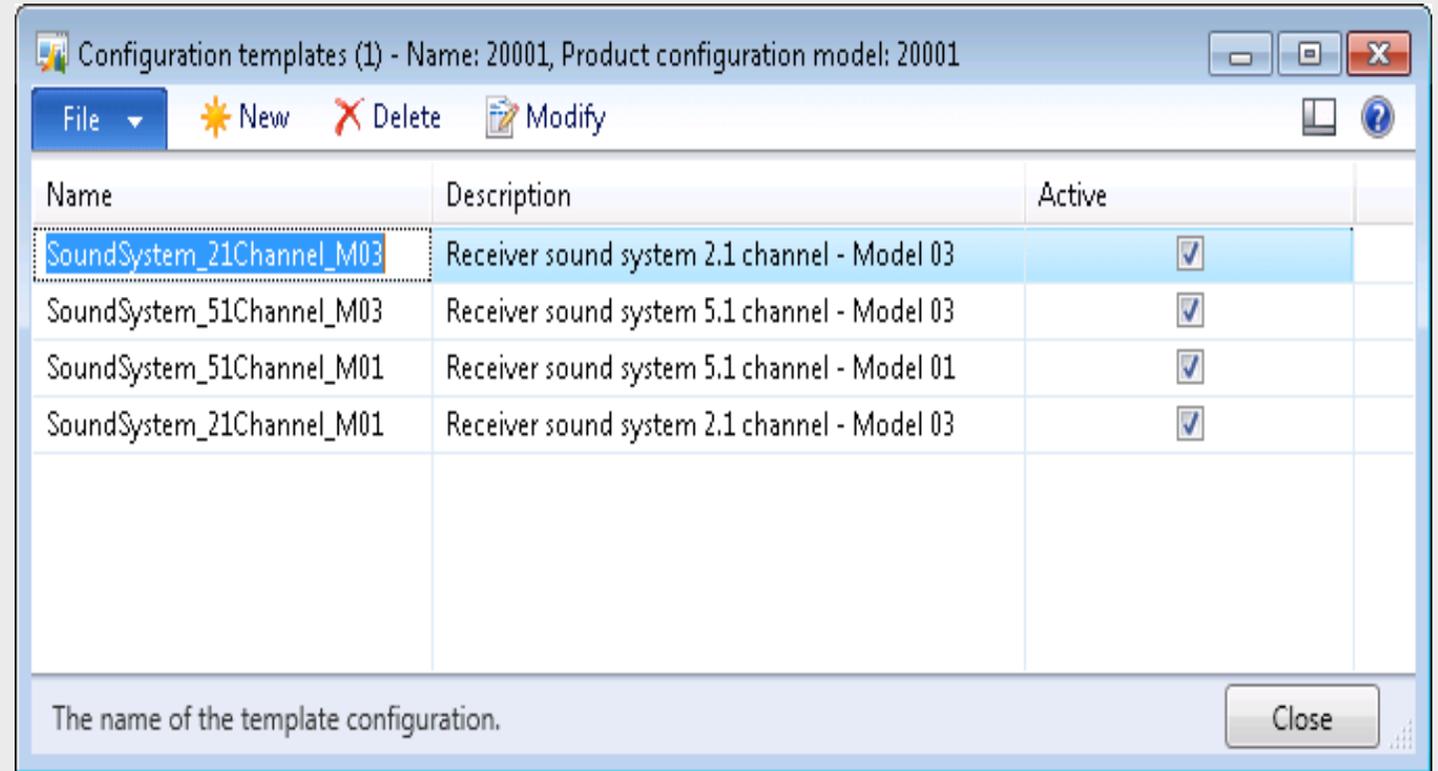
Promoting specific product attribute combinations could be a response to a sales campaign that places focus on a certain set of product features.

Your company could have excess inventory for components with specific attributes that it wants to sell quickly.

You can create a configuration template that uses the attributes of these components to help the order entry team with the increased demand that is expected.

Configuration Templates Form

The Configuration templates form is used to create and modify configuration templates for product configuration models.



Adding Configuration Translations

With the translation functionality included in the product configuration feature, you can create translated text for:

- ✓ Name and description of product configuration models
- ✓ Components
- ✓ Subcomponents
- ✓ Attributes
- ✓ Attribute groups
- ✓ Configuration templates

The product configuration feature lets you provide translated text for product configuration models.

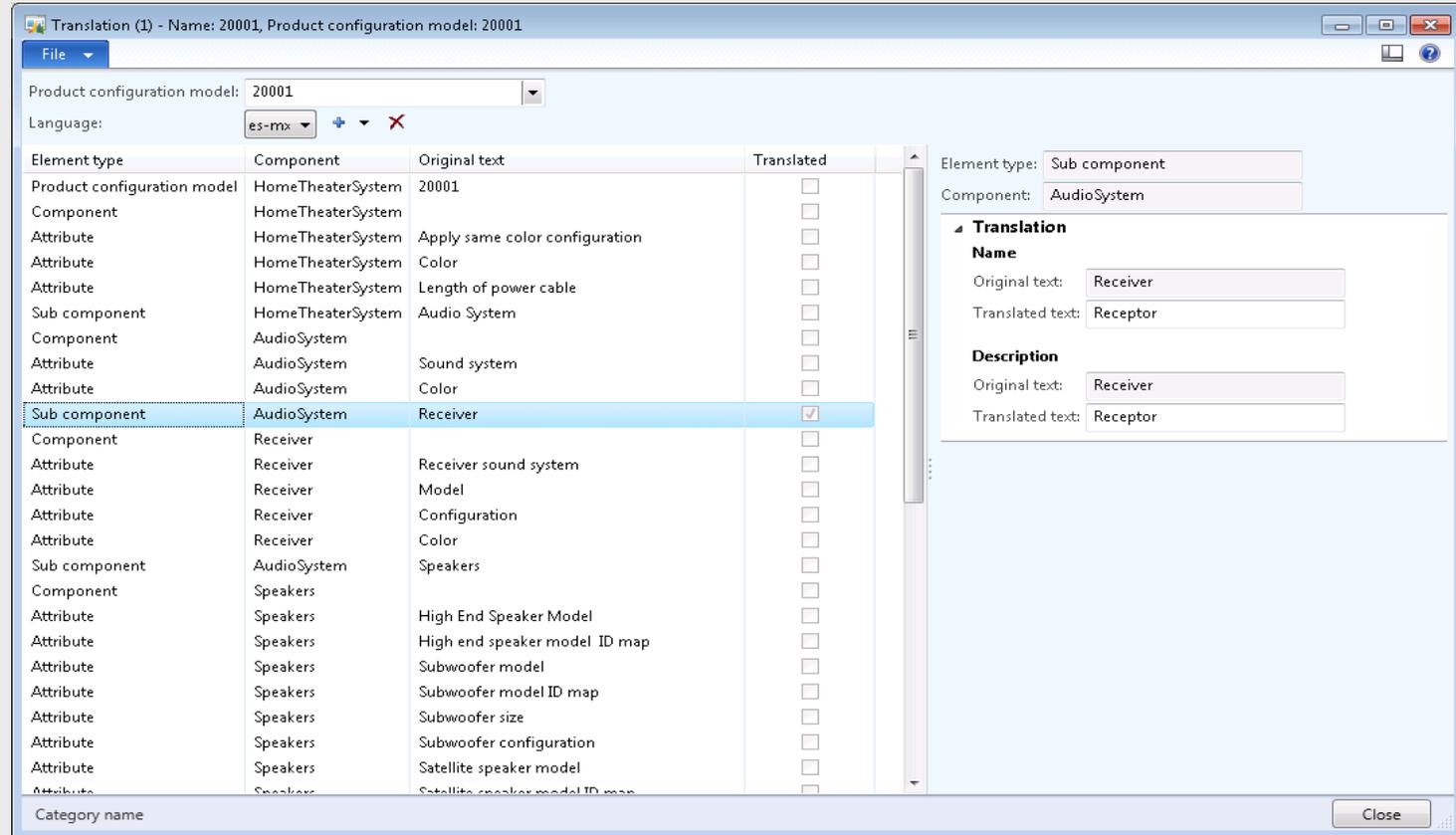
Many companies manufacture, sell, and support their products in countries/regions throughout the world.

Global trade accounts for increased company revenue in every sector of the market.

To take advantage of today's global marketplace, translating product information in to other languages is an important option to have.

Translation Form

The Translation form lets you create translated text for all available languages.



Translation Form

To display the translated text values for the product configuration model on the **Configure line** form, you must change the language setting for your user in Microsoft Dynamics® AX 2012 to the language that your translations are translated.

If you are using the Enterprise Portal, you must also change the language setting for your user.

For each element that is translated, the following fields display on the **Translation** form:

1. **Product configuration model:** This is a filter field. Select the product configuration model that you want to create translated text for.
2. **Language:** Language is a filter field. Select the language that you are creating translated text for. You can click the + button when you want to add translations for a new language.
3. **Element type:** The type of element that is translated. Values for this field include the following:
 - Product configuration model
 - Component
 - Subcomponent
 - Attribute
 - Attribute group
 - Configuration template
4. **Component:** The **Component** field is a reference field that displays the component that the translatable element belongs to.
5. **Original text:** Displays the original text of the selected element type and component combination.
6. **Translated:** When this check box is selected, the text that is selected is translated.
7. **Translation:** On the **Translation** FastTab, you can enter translated text for the name and description of the selected element.
8. **Name:** In the **Original text** field, the name of the selected element displays in the system language. In the **Translated text** field, enter the translated text for the selected element's name.
9. **Description:** In the **Original text** field, the description of the selected element is shown in the system language. In the **Translated text** field, enter the translated text for the selected element's description.

Element type	Component	Original text	Translated
Product configuration model	HomeTheaterSystem	20001	<input type="checkbox"/>
Component	HomeTheaterSystem		<input type="checkbox"/>
Attribute	HomeTheaterSystem	Apply same color configuration	<input type="checkbox"/>
Attribute	HomeTheaterSystem	Color	<input type="checkbox"/>
Attribute	HomeTheaterSystem	Length of power cable	<input type="checkbox"/>
Sub component	HomeTheaterSystem	Audio System	<input type="checkbox"/>
Component	AudioSystem		<input type="checkbox"/>
Attribute	AudioSystem	Sound system	<input type="checkbox"/>
Attribute	AudioSystem	Color	<input type="checkbox"/>
Sub component	AudioSystem	Receiver	<input checked="" type="checkbox"/>
Component	Receiver		<input type="checkbox"/>
Attribute	Receiver	Receiver sound system	<input type="checkbox"/>
Attribute	Receiver	Model	<input type="checkbox"/>
Attribute	Receiver	Configuration	<input type="checkbox"/>
Attribute	Receiver	Color	<input type="checkbox"/>
Sub component	AudioSystem	Speakers	<input type="checkbox"/>
Component	Speakers		<input type="checkbox"/>
Attribute	Speakers	High End Speaker Model	<input type="checkbox"/>
Attribute	Speakers	High end speaker model ID map	<input type="checkbox"/>
Attribute	Speakers	Subwoofer model	<input type="checkbox"/>
Attribute	Speakers	Subwoofer model ID map	<input type="checkbox"/>
Attribute	Speakers	Subwoofer size	<input type="checkbox"/>
Attribute	Speakers	Subwoofer configuration	<input type="checkbox"/>
Attribute	Speakers	Satellite speaker model	<input type="checkbox"/>
Attribute	Speakers	Satellite speaker model ID map	<input type="checkbox"/>

Creating, Approving, and Activating Versions

Almost There!

- ✓ The most important step in the preparing a model for release process is to create a version for the product configuration model.
- ✓ To configure an order line, an approved and activated version of the product configuration model must exist.
- ✓ A version represents the relationship between the product configuration model and a product master.

A product configuration model that has an active version can be configured from a sales order, sales quotation, purchase order, and production order.

NOTE: The **Configure line** form will not display when you try to configure an order line if the product configuration model version is not approved and activated.

Versions Form
Use the
Versions
form to create
different
versions of a
product
configuration
model.

Versions (1) - Name: 20001, Product configuration model: 20001

File New Delete Approve Activate

Product number	From date	To date	Approved	Approver	Active
20001	3/22/2010	3/1/2012	<input checked="" type="checkbox"/>	000014	<input checked="" type="checkbox"/>

Identification of the product Close

Versions

Working with Versions

- ✓ **Create a version:** You can use a version to select a product on an order line. You can then use a version to create a distinct product configuration that has a BOM and a route.
- ✓ **Approve a version:** You must approve a version before you can activate the version.
- ✓ **Activate a version:** Before you can use an approved product configuration model version to configure a line, you must activate the version.
- ✓ **Modify a version:** Change effective dates or the approver.
- ✓ **Delete a version:** A version can be deleted at any time.

***IMPORTANT:** A version of a product configuration model that is not approved and activated cannot be used to configure an order line.*

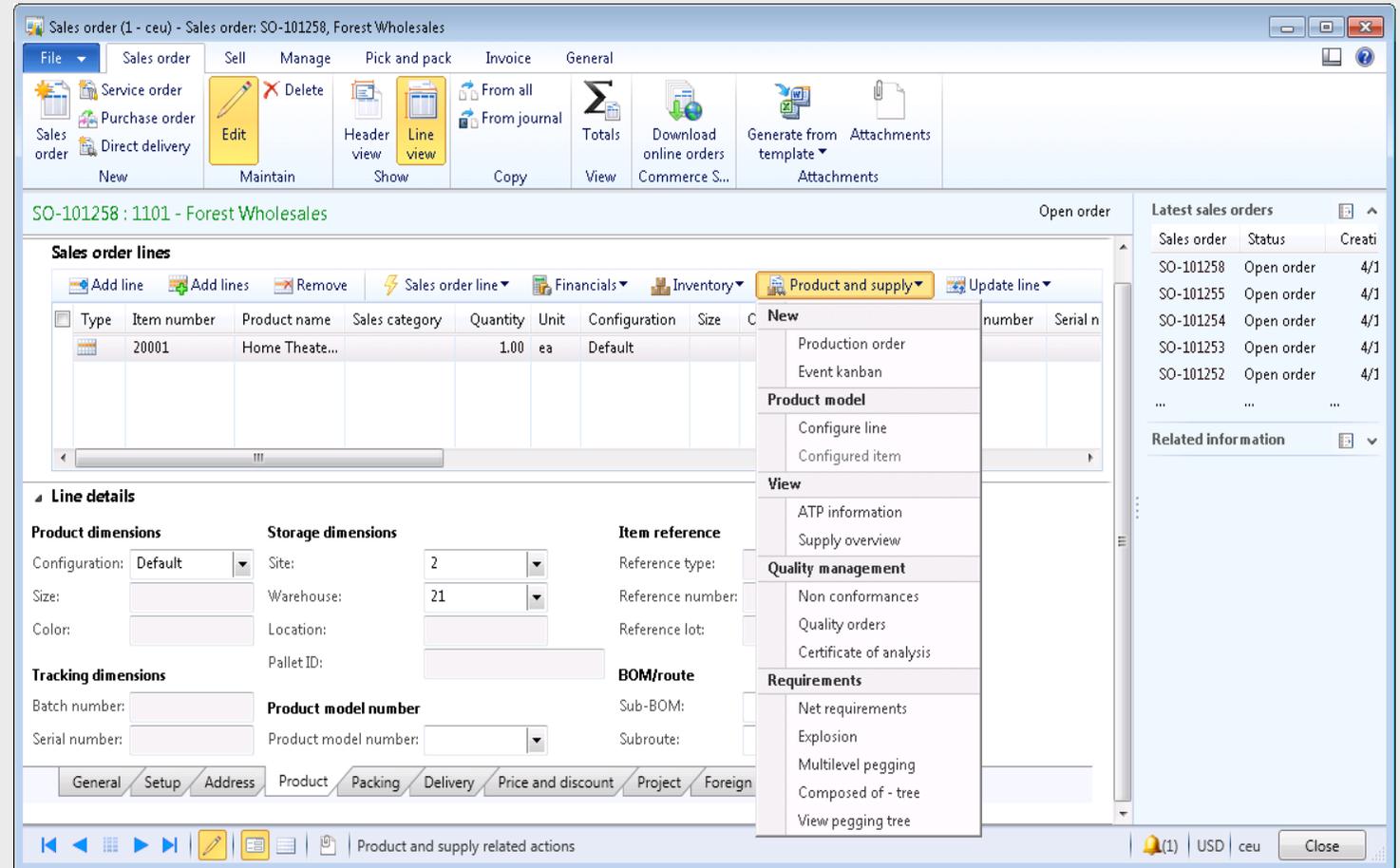
Configure Line Form

Use the Configure line form to configure a product from a sales order, sales quotation, purchase order, and production order.

The screenshot shows a software window titled "Configure line (1)". The main area is titled "Configure selected item" and displays the product "20001 The model of the home theater system". A "Load template" button is visible. On the left, a tree view shows the product structure: "HomeTheaterSystem" (expanded) containing "Audio System" (with sub-items "Receiver" and "Speakers") and "Video System" (with sub-items "Video player", "Video recorder", "Projector", "Television", and "Services"). The main configuration area for "HomeTheaterSystem" includes a dropdown for "Apply same color configuration" set to "false" and a text input for "Length of power cable" with the value "5". A "Next" button is located at the bottom right of the configuration area. On the right side of the window, there are two panels: "Attribute details" showing "Length of power cable" and "Length of power cable (in meters)", and "Price and ship date" showing "Price: 3,394.74" and "Ship date: 4/24/2012". At the bottom of the window are "OK" and "Cancel" buttons.

Sales Order Form

Click Product and Supply > Configure line on the Sales order form to access the Configure line form.



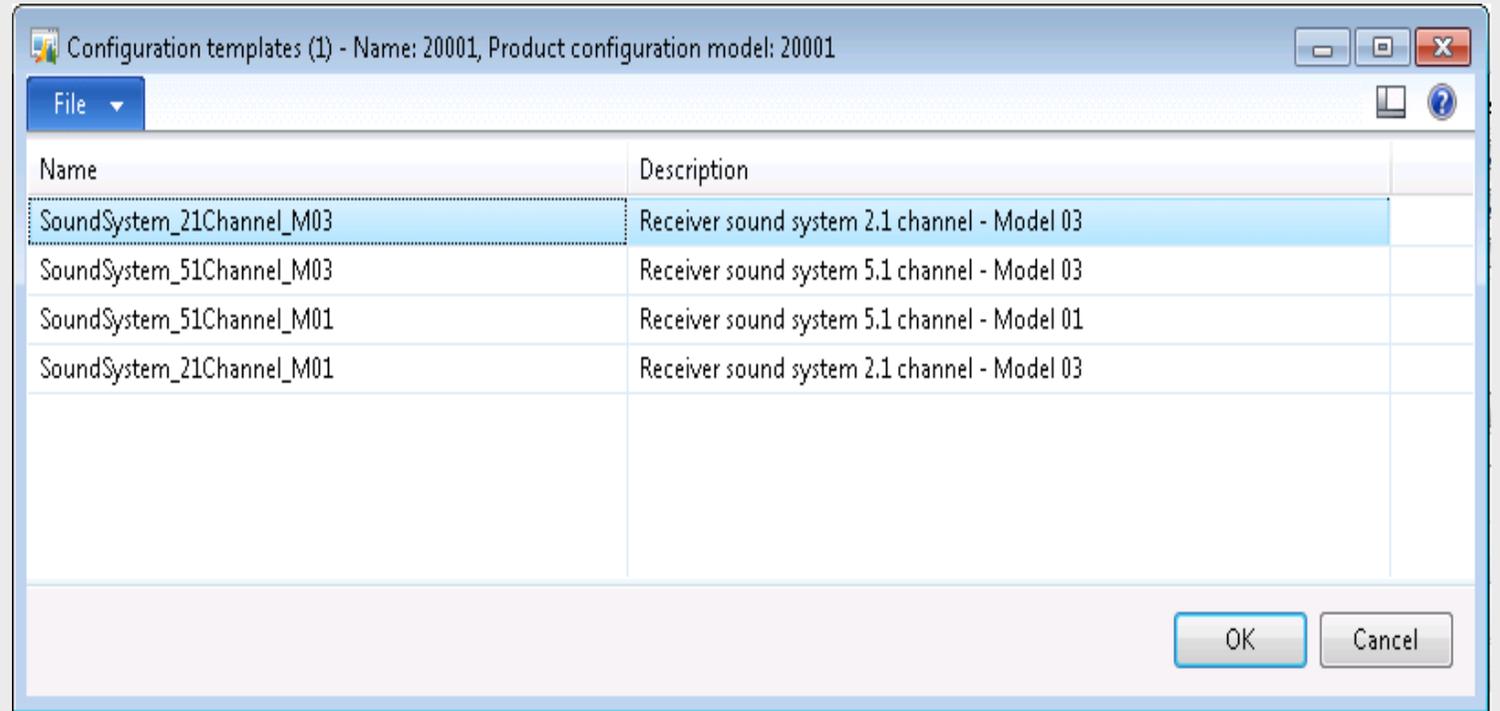
Configure Line Form Options

Several buttons are available for you to use on the Configure line form:

- ✓ **Load template:** Click **Load template** to open the **Configuration templates** form. Only existing templates for the product configuration model that are active will display.
- ✓ **Next:** Click **Next** to select the next component or subcomponent in the left pane tree structure. After the system advances to the component or subcomponent, you can select the attributes.
- ✓ **Cancel:** Click **Cancel** to cancel changes that you make on the Configure line form.
- ✓ **OK:** Click **OK** to accept the configuration changes and close the Configure line form.
- ✓ **Price:** Click **Price** in the **Price and ship** date group to calculate the price for the product that is based on the selected product configuration.
- ✓ **Ship date:** Click **Ship date** in the **Price and ship date** group to calculate the required ship date based on the selected product configuration.

Configuration Templates Form

When you configure an order line, you can use the Configuration templates form to select a configuration template with the attribute values selected.



The screenshot shows a window titled "Configuration templates (1) - Name: 20001, Product configuration model: 20001". The window contains a table with the following data:

Name	Description
SoundSystem_21Channel_M03	Receiver sound system 2.1 channel - Model 03
SoundSystem_51Channel_M03	Receiver sound system 5.1 channel - Model 03
SoundSystem_51Channel_M01	Receiver sound system 5.1 channel - Model 01
SoundSystem_21Channel_M01	Receiver sound system 2.1 channel - Model 03

At the bottom right of the window, there are "OK" and "Cancel" buttons.

Sales Order Form

Review the BOM and route structure values by clicking the Line details FastTab on the Sales order form.

Select the Product tab and review the values in the Sub-BOM and Subroute fields in the BOM/route group.

Sales order (1 - ceu) - Sales order: SO-101240, Basketball Stadium

File Sales order Sell Manage Pick and pack Invoice General

Service order Delete Header view Line view From all From journal Totals Download online orders Generate from template Attachments

Sales order Purchase order Direct delivery Edit Maintain Show Copy View Commerce S... Attachments

SO-101240 : 2121 - Basketball Stadium Open order

Latest sales orders

Sales order	Status	Creation date
SO-101240	Open order	5/21/2010
SO-100691	Invoiced	7/1/2007
SO-100188	Invoiced	7/1/2006

Related information

Line details

Product dimensions Configuration: 000035_203 Size: Color:

Storage dimensions Site: 2 Warehouse: 21 Location: Pallet ID:

Item reference Reference type: Reference number: Reference lot:

Tracking dimensions Batch number: Serial number:

Product model number Product model number:

BOM/route Sub-BOM: BOM_0000078 Subroute: RTE_0000034

General Setup Address Product Packing Delivery Price and discount Project Foreign trade Financial dimensions

Descriptive name of configuration

USD ceu Close

Sales Order Form

The Configuration field

The **Configuration** field in the grid no longer displays the default value from the **Product information management parameters** form.

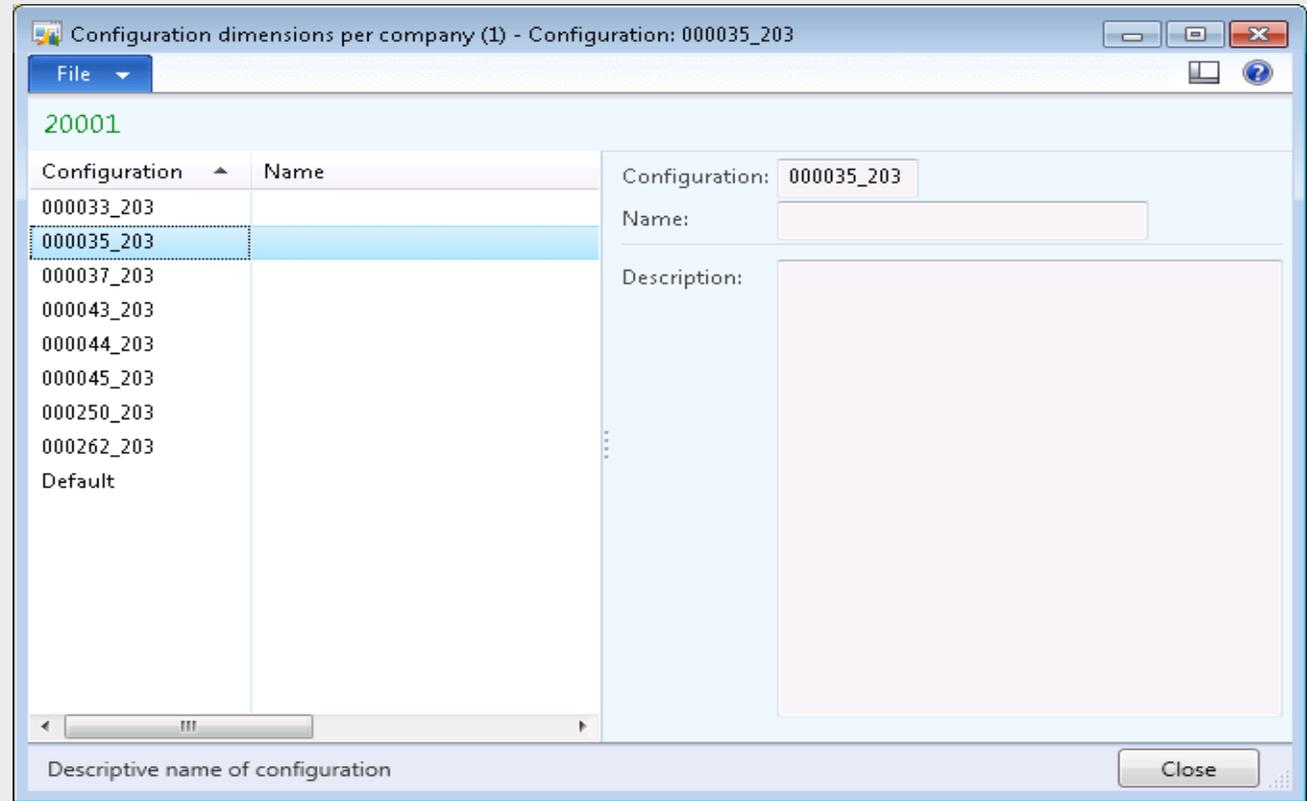
The **Configuration** field now displays a unique configuration ID number that is generated from the **Constraint-based product configuration name** number sequence code as shown in the Sales Order Form figure.

This configuration ID number can be tracked to identify your item in the inventory system.

Type	Item number	Product name	Sales category	Quantity	Unit	Configuration	Size	Color	Site	Warehouse	Batch number
	20001	Home Theater System / Home Theater Syst...		1.00	ea	000035_203			2	21	

Configuration Dimensions Per Company

Review all configuration IDs that exist for the configured item on the Configuration dimensions per company form.



Bills of Materials Form

Use the Bills of materials form to create or change a BOM, to define a configuration group route, or to associate an existing BOM with specific item numbers.

The screenshot displays the 'Bills of materials (1 - ceu)' application window. It features a menu bar with 'File', 'New', and 'Delete'. Below the menu is a tabbed interface with 'Overview' and 'Configuration route'. The main area contains two tables.

Lines	Designer	Approve	Configuration rules	Functions	
<input type="checkbox"/> BOM	Name	Site	Item group	Approved by	Approved
<input checked="" type="checkbox"/> BOM_0000078	Product model no. 20001 (HomeTheaterSys...	2	HTS	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000079	Product model no. 20001 (audioSystem)	2	HTS	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000080	Product model no. 20001 (receiver)	2	Receivers	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000081	Product model no. 20001 (speakers)	2	Speakers	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000082	Product model no. 20001 (videoSystem)	2	HTS	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000083	Product model no. 20001 (television)	2	Television	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000084	Product model no. 20001 (videoPlayer)	2	DVD Player	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000085	Product model no. 20001 (videoRecorder)	2	DVR	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000086	Product model no. 20001 (HomeTheaterSys...	2	HTS	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000087	Product model no. 20001 (audioSystem)	2	HTS	000014	<input checked="" type="checkbox"/>
<input type="checkbox"/> BOM_0000088	Product model no. 20001 (receiver)	2	Receivers	000014	<input checked="" type="checkbox"/>

Item number	Configuration	Size	Color	Site	From date	To date	From qty.	Active	Approved by	Approved
<input checked="" type="checkbox"/> 20001	000035_203			2			0.00	<input checked="" type="checkbox"/>	000014	<input checked="" type="checkbox"/>

The bottom status bar shows navigation icons, 'BOM identification', a notification bell with '(0)', 'USD | ceu', and a 'Close' button.

Route Details Form

Use the Route details form to create, update, and approve routes.

The screenshot displays the 'Route details (1 - ceu)' window. The title bar indicates the route ID 'RTE_00000034 : Product model no. 20001 (HomeTheat...'. The interface includes a menu bar with 'File' and 'Route', and a toolbar with buttons for 'Edit', 'Route', 'Delete', 'Route', 'Approve', 'Refresh', 'Export to Microsoft Excel List', and 'Attachments'. The main content area is divided into sections: 'General' and 'Versions'. The 'General' section shows fields for 'Route number' (E_00000034), 'Name' (Product model no. 20001 (HomeT...), 'Item group' (HTS), 'Approved by' (000014), and 'Approved' (checked). The 'Versions' section contains a table with columns for 'Item number', 'Configuration', 'Size', 'Color', 'Site', 'From date', 'To date', 'From qty.', 'Active', 'Approved by', and 'Approved'. A single row is visible with the following data: Item number 20001, Configuration 000035_203, Site 2, From qty. 0.00, Active checked, Approved by 000014, and Approved checked. The bottom status bar shows navigation icons, 'Route identification', and a 'Close' button.

Item number	Configuration	Size	Color	Site	From date	To date	From qty.	Active	Approved by	Approved
20001	000035_203			2			0.00	<input checked="" type="checkbox"/>	000014	<input checked="" type="checkbox"/>

Create Production Order Form

Click
Configure
production to
access the
Configure
line form.

Create production order (1 - ceu) - New Record

BOM Route Configure production

Identification
Production: D_00005219
Item number: 20001
Name: Home Theater System

Inventory dimensions
Configuration: Default
Site: 2
Warehouse: 21

Production
Type: Standard
Quantity: 1.00
Delivery: 4/3/2012
Time: 10:00 am

BOM/route
BOM date: 4/3/2012
BOM number:
Route number:

Groupings
Pool:
Production group:

Setup
Ledger: Item and category
Reservation: Manual

Project
Project ID:
Activity number:
Posting method: None

Finished item
Category:
Line property:
Sales currency:
Unit:

Create Cancel

Product Configuration on EP

Enterprise Portal provides:

- ✓ Access to the Microsoft Dynamics AX 2012 application from a web browser.
- ✓ External users, and users who do not require the rich user interface that the client application offers, the ability to configure lines.

For example, a sales team member who is visiting a customer site can create a sales order for the customer by using the Enterprise Portal.

The sales team member does not have to enter the customer's order information in a separate document and wait until he is in the office to create sales orders.

He can use the Enterprise Portal to complete his work.

Sales Site

Sales Access

- ✓ Can use the Sales website in the Enterprise Portal to configure a sales quotation line and sales order line for a product configuration model
- ✓ Can be useful when you have an organization with many employees who do not have to access Microsoft Dynamics AX 2012 regularly

You can activate users in the Enterprise Portal with access restricted to only the tasks that they have to complete. This can also be helpful when the employees in your organization are in many locations.

Home Role Center Page

When you access the Enterprise Portal, the Home Role center page appears.

The screenshot displays the Home Role Center page in Internet Explorer. The browser address bar shows the URL: <http://sea-dev/sites/DynamicsAx/Enterprise%20Portal/EPDefaultRoleCenter.aspx?WCMP=CEU&WMI=EPDefaultRoleCenter>. The page features a navigation menu on the left with categories like Common, My information, Customer self-service, and Administration. The main content area includes 'Activities' and 'Quick links' sections. A 'Work list' table is prominently displayed, listing tasks with their due dates and creation dates.

Subject	Document type	ID	Due date	From	Creation date	Association
The batch job Change based al...	Batch jobs history	Job description: Change based alerts...		Auto-generated	7/11/2011 5:48:15 AM	ceu
Brief on RFP release			1/25/2011 4:00:00 PM		1/24/2011 1:01:10 PM	ceu
Finalize RFP			1/27/2011 4:00:00 PM		1/24/2011 1:00:22 PM	ceu
Draft RFP			1/29/2011 4:00:00 PM		1/24/2011 1:00:02 PM	ceu
Complete source selection plan			1/24/2011 4:00:00 PM		1/24/2011 12:59:35 PM	ceu
Develop evaluation criteria(Sco...			1/25/2011 4:00:00 PM		1/24/2011 12:58:59 PM	ceu
Select evaluation committee m...			1/25/2011 4:00:00 PM		1/24/2011 12:58:29 PM	ceu
Source selection plan and strat...			1/25/2011 4:00:00 PM		1/24/2011 12:58:06 PM	ceu

Sales Website Page

You can use the Sales website to maintain customers, cases, sales quotations, sales orders, customer returns, and many more.

The screenshot displays a web browser window with the URL `http://sea-dev/sites/DynamicsAx/Sales/Enterprise%20Portal/EPSalesTableList.aspx?WMI=EPSalesTableList&WCMP=CEU`. The page features a navigation menu with options like Home, Procurement, Sales, Compliance, Project management, Service management, Vendor portal, and Customer self-service. A search bar is present with the text "Search this site...".

The main content area is titled "All sales orders" and includes a search filter and a dropdown menu set to "Sales order". Below this is a table listing sales orders:

Sales order	Customer account	Name	Invoice account	Order type	Status	Quality order status	Project ID
<input checked="" type="checkbox"/>	SO-100005	2002	River Hotel	2002	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100006	2003	Rainbow Hotel	2003	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100007	2202	Black Curve Airport (US)	2202	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100008	2012	Pear Conference Center	2012	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100009	2013	Grape Conference Center	2013	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100010	2001	Waterfall Hotel	2001	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100011	3003	Contoso Retail Los Angeles	3003	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100012	3008	Contoso Retail New York	3008	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100013	3004	Contoso Retail Portland	3004	Sales order	Invoiced	None
<input type="checkbox"/>	SO-100014	3009	Contoso Retail Dallas	3009	Sales order	Invoiced	None

Below the table, a detailed view for sales order "SO-100005" is shown, including the currency (USD) and a list of items:

Item n...	Product name	Sales category	Quantity	Unit	Unit price	Net amou...
1001	LCD Television Model 01 / #1 : H...		600.00	ea	2,212.58	1,327,548...
1001	LCD Television Model 01 / #1 : N...		500.00	ea	1,292.36	646,180.00
1001	LCD Television Model 01 / #1 : N...		450.00	ea	1,746.76	786,042.00

On the right side of the page, there are sections for "Latest sales orders" (showing SO-100005 as Invoiced on 7/1/2006) and "Related information" (listing Open quotations, Open sales orders, Unpaid invoices, and Open return orders).

Configure Selected Item Page

You can use the **Configure selected item** page to configure a product from a sales order and a sales quotation in the Enterprise Portal.

Configure selected item

Page

Configuration templates

Load template

Price and ship date

Calculated price per unit: 3394.74 Calculate

Confirmed ship date: 4/26/2012 Calculate

Product configuration model

- HomeTheaterSystem
 - Audio System
 - Receiver
 - Speakers
 - Video System
 - Video player
 - Video recorder
 - Projector
 - Television
 - Services

Services

Professional Services: false

Installation: false

Maintenance and Repair: false

OK

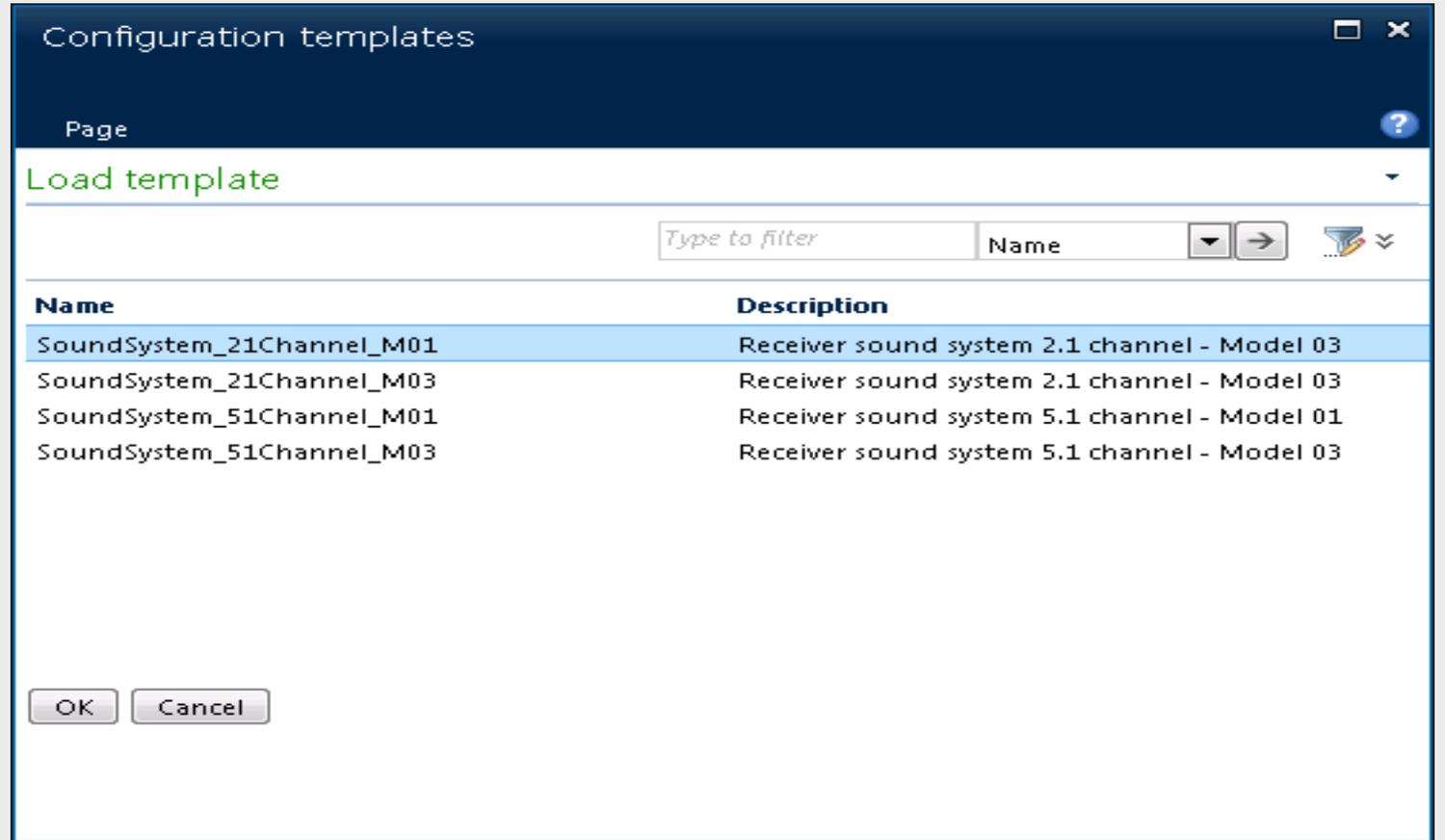
Configure Selected Item Page FastTabs

The **Configure selected item** page consists of three FastTabs:

- ✓ **Configuration templates:** Use to load a configuration from a template.
- ✓ **Price and ship date:** Use to calculate a price and ship date based on the configuration.
- ✓ **Product configuration model:** Shows a tree structure that contains the product configuration model component structure.

Configuration Templates Page

When you configure a line, use the Configuration templates page to select a configuration template with the attribute values already selected.



New Sales Order Page

Click the **Configure line** icon located to the right side of the **Net amount** column in the **Lines** FastTab to open the **Configure selected item** page.

The screenshot displays the 'New sales order' application window. The window title is 'New sales order'. The interface includes a menu bar with 'Page' and 'Edit' options. Below the menu bar are icons for 'Save and close', 'Close', 'Totals', 'Commit', and 'View'. The main content area is divided into two sections: 'Customer' and 'Lines'.

Customer

Customer account: 1101
Invoice account: 1101
Contact:
Tax exempt number:
Sales taker: Julia Funderburk

Pool: 10
Currency: USD
Language: en-us
Site:
Warehouse:

Lines

Buttons: Add line, Remove

Item number	Site	Warehouse	Product number	Quantity	Unit	Unit price	Discount percent	Discount	Net amount
20001	2	21	20001:000283_203::	1.00	ea	3,394.74	0.00	0.00	3,394.74

Delivery address: Main warehouse, Gate 2

Buttons: Save and close, Close

New Sales Order Page

After you click **OK** on the **Configure selected item** page, you can review the **Product number** field in the **Lines** FastTab on the **New sales order** page. The **Product number** field no longer displays the default value from the **Product information management parameters** form next to the product number.

The **Product number** field now displays a unique configuration ID number that is generated from the **Constraint-based product configuration name** number sequence code.

New sales order

Page Edit

Save and close Close Totals

Commit View

Customer

Customer account: 1101 Pool: 10

Invoice account: 1101 Currency: USD

Contact: Language: en-us

Tax exempt number: Site:

Sales taker: Julia Funderburk Warehouse:

Lines

Add line Remove

Item number	Site	Warehouse	Product number	Quantity	Unit	Unit price	Discount percent	Discount	Net amount
20001	2	21	20001:000283_203::	1.00	ea	3,394.74	0.00	0.00	3,394.74

Delivery address Main warehouse, Gate 2

Save and close Close

New Sales Quotation Page

Click the Configure line icon located to the right side of the Net amount column in the Lines FastTab to open the Configure selected item page.

New sales quotation

Page Create

Save and close Close

Commit

Sales quotation

Customer account: 1101 Type: Resale USD

Prospect: Expiration date: 5/4/2012

Invoice account: 1101 Site:

Contact: Warehouse:

Tax exempt number: Currency: USD

Sales taker: Julia Funderburk

Language: en-us

Lines

Add line Remove

Item number	Site	Warehouse	Product number	Quantity	Unit	Unit price	Discount percent	Discount	Net amount
20001	2	21	20001: Default: :	1.00	ea	0.00	0.00	0.00	0.00

Delivery address Main warehouse, Gate 2

Save and close Close

Summit **AXUG** **16**