AIMMS User's Guide - Viewing Identifier Selections

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Chapter 7

Viewing Identifier Selections

Identifier overviews

Although the **Model Explorer** is a very convenient tool to organize all the information in your model, it does not allow you to obtain a simultaneous overview of a group of identifiers that share certain aspects of your model. By mutual comparison of important attributes (such as the definition), such overviews may help you to further structure and edit the contents of your model, or to discover oversights in a formulation.

This chapter

To assist you in creating overviews that can help you analyze the interrelationships between identifiers in your model, AIMMS offers the **Identifier Selector** tool and **View** windows. This chapter helps you understand how to create meaningful identifier selections with the **Identifier Selector**, and how to display such selections using different views.

7.1 Creating identifier selections

Select by similarity

When you are developing or managing a large and complicated model, you sometimes may need an overview of all identifiers that have some sort of similarity. For example, it may be important to have a simultaneous view of

- all the constraints in a model,
- all variables with a definition,
- all parameters using a certain domain index, or
- all identifiers that cover a specific part of your model.

Identifier selections

In AIMMS, you can create a list of such identifiers using the configurable **Identifier Selector** tool. This tool helps you to create a selection of identifiers according to a set of one or more criteria of varying natures. You can let AIMMS create a once only selection directly in the **Model Explorer**, or create a compound selection in the **Identifier Selector**, which allows you to intersect or unite multiple selections.

Creating once only selections

If you need a selection only once, then you can create it directly in the **Model Explorer** by

- either manually selecting one or more nodes in the tree, or
- using the **View-Selection** menu to create a custom selection based on one or more of the conditional selection criteria offered by AIMMS (explained below).

In both cases, the resulting list of selected identifiers will be highlighted in the model tree. If you like, you can narrow down or extend the selection by applying one or more subsequent conditional selections to the existing selection.

The Identifier Selector

If you need a specific selection more than once, then you can create it in the **Identifier Selector** tool. The **Identifier Selector** consists of a tree in which each node contains one of the three types of identifier selectors described below. Figure 7.1 illustrates an example selector tree.

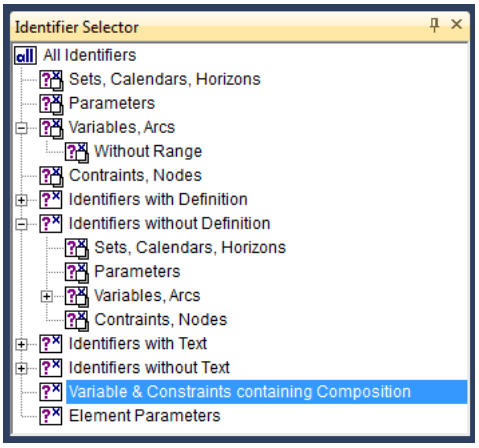

Figure 7.1: The selector tree

Selector types

In the **Identifier Selector** tool, you can add nodes corresponding to several types of identifier selectors:

- a *node-based selector*, where all the identifiers below one or more user-selected nodes in the model tree are added to the selection,
- a *conditional selector*, where the list of identifiers is created dynamically on identifier type and/or the contents of one of their respective attributes,
- a *set-dependent selector*, where the list of identifiers is created dynamically based on a specific set in either the domain or range of identifiers, or
- a *type-based selector*, where the list of identifiers consists of all variables of a certain type (e.g. free, nonnegative, binary) or all constraints of

a certain type (≤, = or ≥). This selector can only be used in combination with the Math Program Inspector.

While the above four selectors allow you to define selections based on a symbolic criteria, the four types of identifier selectors below allow you to specify selections based on individual criteria. The main purpose of these selectors is to define selections that can be used in the Math Program Inspector (see Chapter 9).

- an *element-dependent selector*, where the list of individual identifiers is created dynamically based of the occurrence of one or more specific elements in the domain,
- a *scale-based selector*, where the list of identifiers is built up from all variables and constraints for which the ratio between the largest absolute value and the smallest absolute value in the corresponding row or column of the matrix exceeds a given value,
- a *status-based selector*, where the list of identifiers is built up from all variables and constraints for which the solution satisfies some property (e.g. feasible, basic, at bound), or
- a *value-based selector*, where the list of identifiers is built up from all variables and constraints for which the level, bound, marginal, or bound violation value satisfy satisfy some property.

Through the **View-Selection** menu in the **Model Explorer** you can only create a new, or refine an existing, selection using a *conditional selector*.

Selection dialog box

To create a selector, AIMMS offers special dialog boxes which let you specify the criteria on which to select. As an example the dialog box for creating a conditional selector is illustrated in Figure 7.2. In it, you can select (by double

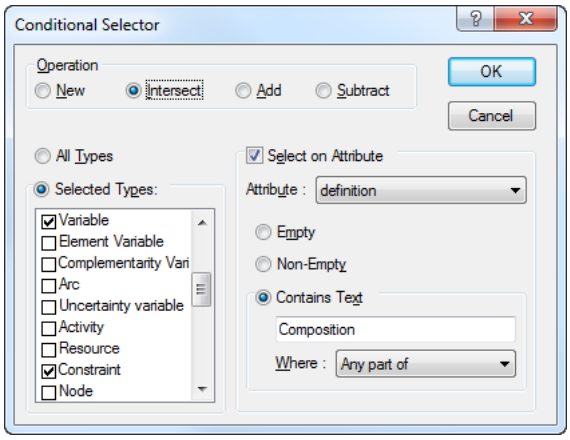

Figure 7.2: The **Conditional Selector** dialog box

clicking) one or more identifier types that you want to be part of the selection

and filter on specific attributes that should be either empty, nonempty, or should contain a particular string.

Compound selections

The tree structure in the **Identifier Selector** defines combinations of selectors by applying one of the set operators *union*, *difference* or *intersection* with respect to the identifier selection represented by the parent node. The root of the tree always consists of the fixed selection of all model identifiers. For each subsequent child node you have to indicate whether the node should add identifiers to the parent selection, should remove identifiers from the parent selection, or should consider the intersection of the identifiers associated with the current and the parent selection. Thus, you can quickly compose identifier selections that satisfy multiple selection criteria. The type of set operation applied is indicated by the icon of each node in the identifier selector.

Refining model tree selections

In the **Model Explorer**, the *union*, *difference* and *intersection* operations apply to the identifier selection that is currently highlighted in the model tree. You can use them to add identifiers to the current selection, to remove identifiers from the current selection, or filter the current selection by means of an additional criterion.

Using selections

The list of identifiers that results from a (compound) identifier selector can be used in one of the following ways:

- you can display the identifiers in a **View** window of your choice (explained in the next section),
- you can restrict the set of variables and constraints initially displayed in the **Math Program Inspector** (see Chapter 9), or
- by dragging and dropping a selector into the **Model Explorer**, the corresponding identifiers will be highlighted in the model tree.

Advanced drag and drop

The drag-and-drop features of AIMMS make it very easy to fill a **View** window with identifiers from either the model tree, the **Identifier Selector** or other **View** windows. If you drag-and-drop a selection into any other AIMMS window, AIMMS will interpret this as a special search action to highlight all occurrences of the selected identifiers as follows:

- in the *model tree* all identifiers in the selection will be highlighted,
- in the *page* or *template tree* all pages that contain reference to the identifiers in the selection will be highlighted,
- in an end-user *page*, in edit mode, all objects that contain references to the identifiers will be selected, and
- in the *menu builder tree*, AIMMS will highlight all menu items that reference one or more identifiers in the selection.

In addition, AIMMS also supports the 'drag-and-drop-search' action in a **View** window by pressing both the **Shift** and **Control** key during the drop operation.

7.2 Viewing identifier selections

Overview of attributes

After you have created an identifier selection, in either the **Model Explorer** or in the **Identifier Selector**, you may want to compare or simultaneously edit multiple attributes of the identifiers in the selection. In general, sequential or simultaneous, opening of all the corresponding single attribute forms is impractical or unacceptable for such a task. To assist, AIMMS offers special identifier **View** windows.

Identifier views

A **View** window allows you to view one or more attributes simultaneously for a number of identifiers. Such a **View** window is presented in the form of a table, where each row represents a single identifier and each column corresponds to a specific attribute. The first column is always reserved for the identifier name. An example of an identifier **View** window is given in Figure 7.3.

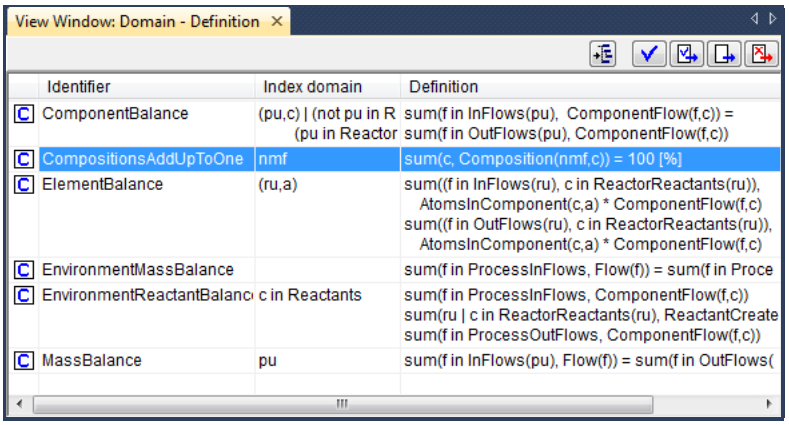

Figure 7.3: Example of a **View** window

Editing in a View window

In addition to simply viewing the identifier content in a **View** window, you can also use it to edit individual entries. To edit a particular attribute of an identifier you can just click on the relevant position in the **View** window and modify the attribute value. This can be convenient, for instance, when you want to add descriptive text to all identifiers for which no text has yet been provided, or when you want to make consistent changes to units for a particular selection of identifiers. As in a single attribute form, the changes that you make are not committed in the model source until you use one of the special compile buttons at the top right of the window (see also Section 5.3).

Opening a View window

Using the **Edit-Open with** menu, or the **Open with** item in the right- mouse pop-up menu, you can open a particular **View** window for any identifier selection in the model explorer or in the identifier selector. Selecting the **Open with** menu will open the **View Manager** dialog box as displayed in Figure 7.4. In the **View Manager** you must select one of the available *view window definitions*, with which to view the given identifier selection. For every new project, the **View Manager** will automatically contain a number of basic view window definitions that can be used to display the most common combinations of identifier attributes.

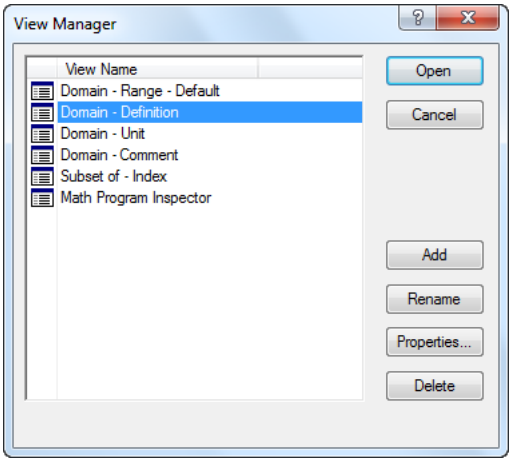

Figure 7.4: The **View Manager** dialog box

Creating a view window definition

Using the **Add**, **Delete** and **Properties** buttons in the **View Manager**, you can add or delete view window definitions to the list of available definitions, or modify the contents of existing definitions. For every view window definition that you add to the list or want to modify, AIMMS will open the **View Definition Properties** dialog box as illustrated in Figure 7.5. With this dialog box you can

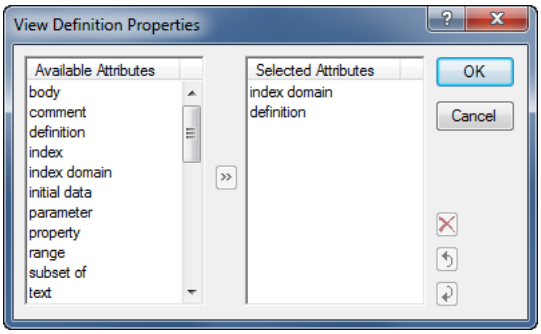

Figure 7.5: **View Definition Properties** dialog box

add or remove attributes from the list of attributes that will be shown in the **View** window, or change the order in which the particular attributes are shown.

Changing the View window contents

After opening a **View** window, with the contents of a particular identifier selection, you can add new identifiers to it by dragging and dropping other identifier selections from either the **Model Explorer** or the **Identifier Selector**. Using the **Edit-Delete** menu or the **Del** key, on the other hand, you can delete any subselection of identifiers from the **View** window. At any time you can save the modified identifier selection as a new node in the identifier selector tree through the **View-Selection-Save** menu.

Selecting identifier groups

Besides selecting individual identifiers from the model tree, you can also select whole groups of identifiers by selecting their parent node. For example, if you drag-and-drop an entire declaration section into a **View** window, all the identifiers contained in that section will be added to the view.

Specifying a default view

As can be seen at the bottom of the **View Manager** dialog box in Figure 7.4, it is possible to associate a default view definition with every selector in the **Identifier Selector**. As a consequence, whenever you double-click on such an identifier selector node, AIMMS will immediately open a default **View** window with the current contents of that selection.