Retek® Predictive Application Server™

11.0.3

Configuration Guide

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When contacting Customer Support, please provide:

- Product version and program/module name.

- Functional and technical description of the problem (include business impact).

- Detailed step by step instructions to recreate.

- Exact error message received.

- Screen shots of each step you take.

Contents

Chapter 1 – Introduction

Overview

The RPAS configuration tools provide a flexible means to configure and build RPAS-based applications with customer-specific business parameters. Release 11.0.3 of the configuration tools is focused on supporting configuration requirements for Retek planning applications on the RPAS 11.0.3 platform.

The configuration tools consist of an integrated set of task-specific configuration "aids" that can be used to configure a solution from scratch, or to use an existing solution configuration template as a basis from which to make customer-specific changes. RPAS functionality is exposed via APIs to the configuration tools, which provide a streamlined and user-friendly interface to utilize RPAS functionality. Once configured, a set of installer scripts is used to build an RPAS domain and the configured solution.

This document describes how to use the RPAS configuration tools and how to build an RPAS domain.

Concepts

The core of the RPAS configuration tools is the configuration manager. The configuration manager provides an overall view of the configuration components (projects and solutions, which contain hierarchies, measures, rules, workbook templates, and wizards).

An RPAS configuration represents the overall workspace. For example, you could create a workspace called XYZ for customer XYZ. Within configuration XYZ, you create one or more projects. Each project represents an RPAS domain. For example, within configuration XYZ, you might create separate projects called Financial Planning and Item Planning.

For each project, you create hierarchies and dimensions within those hierarchies. Hierarchies are the structures used by an organization to describe the relationships that exist between the dimensions that comprise a hierarchy. For each project, the following hierarchies are automatically created: Calendar, Product, Location, and Measure. You create and define dimensions for these hierarchies, and for any additional hierarchies that you create.

For each project, you can also specify data interfaces for measures (that is, the data files from which measure data will be imported).

Each project contains one or more solutions, which corresponds to an application configuration (for example, Financial Planning or Item Planning). For each solution, you define measures, rules, workbooks, and, optionally, wizards.

Measures are any item of data that can be represented on a grid in a worksheet (in other words, they are multidimensional variables). Measures are the data points that are used in the customer's business process.

Rules are collections of expressions that describe the relationships between measures. Expressions are the basis of all calculations of the relationships between measures, and are evaluated by the calculation engine during a calculation. Expressions are written in a syntax that allows for the calculation of a single measure from other measures, constants and parameters, using standard arithmetical functions and a rich set of mathematical, technical and business functions. Expressions are therefore an algorithmic statement of a relationship between measures. All the expressions in a rule must use the same measures; that is, all inverses of a rule must be defined in expressions for that rule They must also have a different target measure (that is, the measure on the left hand side of the expression that is calculated by the expression).

A workbook is the easily viewed, easily manipulated multidimensional framework used to perform specific business functions such as creating a merchandise plan and reviewing availability data. To present data, a workbook can contain any number of multidimensional spreadsheets, called worksheets, as well as measures that are used on the worksheets and the rules that are used to generate the measure data.. All of these components work together to facilitate viewing and analysis of business functions. The configuration tools allow you to configure workbook templates incorporating these various components.

A wizard is a feature that steps the user through the process of building a new workbook. A wizard displays successive dialogs that require the user to answer a sequence of questions or enter selections regarding the content of the workbook. Responses to these questions are used to automatically format and populate the workbook. The configuration tools allow you to create custom wizard formats.

Configuration Steps

Follow these steps to create an RPAS configuration.

- Create a configuration. See Working with configurations.

- Create projects. See Working with projects.

- Create solutions. See Working with solutions.

- Create hierarchies and dimensions. See Working with hierarchies and Working with dimensions.

- Create measure classes and measures. See

Working with classes and Working with measures.

- Create rule sets, rule groups, and rules. See Working with rule sets, Working with rule groups, and Working with rules.

- Create workbooks, workbook tabs, and worksheets. See Working with workbooks, Working with workbook tabs, and Working with worksheets.

- Create wizards. See Working with wizards.

- Define data import information. See Working with the Data Interface Manager.

- Build an RPAS domain. See Chapter 10 – Building an RPAS domain.

Chapter 2 – Using menus and toolbars

Overview

Application main menu bar

The menu bar and the items contained in each menu are context-sensitive, and change according to what you are working on and how you are working. Menu items that are grayed out are not available to you in your current work mode.

The menu bar displays the following options:

- File
- Window
- Help

Menu shortcuts

You can also access menus by pressing the Alt key followed by the underlined letter for the menu item. For example, <Alt+F> accesses the File menu. Some menu items have shortcut key combinations; those that do have the key combination displayed next to the menu item name. For example, <Ctrl+N> accesses the New file dialog box. In addition to key combinations, some menu items can be directly accessed from toolbar buttons.

In addition, standard Windows shortcuts are included in the tools, although they may not appear on a menu. Examples are Ctrl+V (copy) and Ctrl+C (paste).

File

File > New

Accesses a dialog box from which you can create a new configuration.

File > Open

Displays a dialog box that allows you to access all the configurations that you have created and saved. To open a configuration, highlight the selection you want to view and click Open.

File > Close

The Close menu item is only available when a configuration is open. If the configuration has been previously saved and no new changes have been made, selecting Close closes the workbook.

File > Save

Stores all the information in the configuration. If the configuration you are working on has previously been saved, then selection of this menu item will update the stored information. If the configuration has not been previously saved, then selection of this menu item will open the Save As dialog box, which will prompt you for a configuration name. The Save menu item is only enabled when a workbook has been created or opened.

File > Save As

Opens a dialog box in which you can specify the name of the configuration to be saved. The Save As menu item is only enabled when a configuration is open.

In the Configuration text field of the Save As dialog, type a name for the configuration.

Selecting the "Use Defaults" check box saves the configuration in the default location. This location defaults to the last location you saved to. If the "Use Defaults" check box is not checked, you can specify a directory in which to save the configuration. If the directory does not exist, it will be created. Alternately, you can click Browse to select a directory in which to save the configuration.

Click OK to save the configuration, or click Cancel to return to the configuration without saving.

File > Properties

The General tab allows you to specify how many items to display in the Most Recently Used (MRU) list.

File > MRU (Most Recently Used) List

The MRU (Most Recently Used) List is located just above the Exit option on the File menu. The MRU List is a list of the most recently opened configurations. When a configuration is displayed on the MRU List, it can be accessed quickly by selecting that configuration directly from the File menu.

If you open a configuration that already exists and save it under a new name by selecting Save As from the File menu, then both the old and the new configuration names will appear on the MRU List.

File > Exit

 The Exit option logs you off of the application and exits the system completely.

If you have an unsaved configuration open at the time you select Exit, the Close dialog box will be opened, informing you that modifications have been made to the configuration.

Window

The Window menu allows you to navigate quickly through your open configurations. This provides an alternative to using the tree structure in the Configuration Manager window.

Window > Configuration > Hierarchies

Opens the Hierarchy Definition window for the configuration you select. See Chapter 4 – Hierarchies for more information.

Window > Configuration > Data Interface

Opens the Data Interface window for the configuration you select. See …

Window > Configuration > Solution > Measures

Opens the Measure Definition window for the solution you select. See Chapter 5 – Measures for more information.

Window > Configuration > Solution > Rules

Opens the Rule Definition window for the solution you select. See Chapter 6 – Rules for more information.

Window > Configuration > Solution > Workbooks

Opens the Workbook Designer window for the solution you select. See Chapter 7 – Workbooks for more information.

Window > Configuration > Solution > Wizard Designer

Opens the Wizard Designer window for the solution you select. See Chapter 8 – for more information.

Help

Help > Contents

Displays the Table of Contents for the online help system.

Help > Index

Displays an index of the terms found in the online help system.

Help > Search

Use this function to search the online help system for a word or phrase.

Quick (right-click) menus

Overview

In various areas throughout the application, context-sensitive quick menus, also called right-click menus, are available to access certain commands. To access a quick menu, place the cursor over an appropriate screen area and click the right mouse button. These quick menus are context-sensitive; that is, their availability, appearance, and the options they offer differ depending on your current mode of work.

There are other uses for quick menus, as well, depending on your mode of work. The following is a description of the various right-click menus you may encounter:

Configuration Manager quick menu – Obtained when you right-click over the left frame of the Configuration Manager window. Use this menu to create new configurations, projects, and solutions. You can also use it to open, save, rename, clone, and close existing configurations, projects and solutions.

Hierarchy Definition quick menu – Obtained when you right-click over the Hierarchy window. Use this menu to create, delete, and rename hierarchies and dimensions.

Measure quick menus include the Measure Definition menu, and menus for the Classes tab, Measures tab, and Invalid Measures tab. Use these menus to create, rename, and delete classes and measures; validate and invalidate measures; realize and unrealized measures; specify measure attributes; push measures down and pull measures up; and show and hide measures.

Rule quick menus include the Rule definition menu and the Rules menu. Use these menus to add, rename, and delete rules, rule groups, and rule sets; add expressions to rules; edit expressions; and generate load and commit rules.

Workbooks Designer menu – Obtained when you right-click over the Workbook Designer window. Use this menu to add and remove workbooks, workbook tabs, and worksheets; clone workbooks, edit properties of workbooks, workbook tabs, and worksheets; and move workbook tabs.

Wizard Designer menu – Obtained when you right-click over the Wizard Designer window. Use this menu to delete wizards and wizard pages.

Configuration Manager

New > Configuration

Creates a new configuration.

New > Project

Creates a new project within the selected configuration.

New > Solution

Creates a new solution within the selected project.

Open

Displays the Open dialog box, from which you can select a configuration to open.

Close

Closes the current configuration. If you have made any changes and have not yet saved them, the Save dialog box is displayed, allowing you to save your changes before closing the configuration.

Close All

Closes all open configurations. For each configuration you have changed and have not yet saved, the Save dialog box is displayed, allowing you to save your changes before closing the configuration.

Save

Saves any changes you have made to the selected configuration.

Save As

Opens the Save As dialog box, allowing you to save the selected configuration under another name.

Save All

Saves changes you have made to all open configurations.

Rename

Opens the Rename dialog box, allowing you to specify a new name for the selected object.

Clone

Opens the Clone dialog box, allowing you to create an exact duplicate of the selected object.

Move

Opens the Move dialog box, allowing you to move the selected object from one location to another.

Delete

Allows you to delete a project or solution, with a delete confirmation message. The user cannot delete a configuration, however.

Hierarchy Definition

The following options are available on the Hierarchy Definition quick menu:

New Hierarchy

Creates a new hierarchy in the Hierarchy Definition window. By default, the hierarchy is assigned a name starting with H followed by the next available number (for example, H59).

Note: A new hierarchy can only be created after the MEAS hierarchy.

New Dimension

Creates a new dimension within the selected hierarchy. By default, the dimension is assigned a name starting with D followed by the next available number (for example, D23).

Set User Maintained

Allows a dimension to be set as a user-defined dimension.

Delete

Opens the Confirm Delete dialog, allowing you to delete the selected hierarchy object.

Rename

Makes the name field editable, allowing you to change the name of the selected hierarchy object.

Undo

Undoes the last action.

Redo

Redoes the last undone action.

Measure

Measure Definition

The following options are available on the Measure Definition quick menu:

Add Major Class

Adds a major class to the Measure Definition window. By default, the class is assigned a name starting with "class" followed by the next available number (for example, class1004).

Add Minor Class

Adds a minor class underneath the selected class. By default, the class is assigned a name starting with "class" followed by the next available number (for example, class1009).

Pull Up

Pulls the selected class up one level in the measure classification structure.

Note: You cannot pull up a major class. Nor can you pull up a minor class directly beneath a major class.

Push Down

Pushes the selected class down one level in the measure classification structure. A new class is created to take the place of the class you are pushing down. By default, the new class is assigned a name starting with "class" followed by the next available number (for example, class1014).

Show

Shows the classes and measures associated with the selected class on the Classes and Measures tabs. A check in the box next to the class indicates that the measures are shown.

Hide

Hides the classes and measures associated with the selected class. The classes and measures are not displayed on the Classes or Measures tabs. The box next to the class is unchecked.

Show All

Shows all classes and measures for the solution on the Classes and Measures tabs. The boxes next to all classes are checked.

Hide All

Hides all classes and measures for the solution. No classes or measures are listed on the Classes or Measures tabs, and the boxes next to all classes are unchecked.

Realize

Realizes the selected measure, and checks the Realized box on the Measures tab. This option is available only if the measure is not already realized.

Unrealize

Unrealizes the selected measure, and unchecks the Realized box on the Measures tab. This option is available only if the measure is already realized.

Rename

Makes the name field editable, allowing you to change the name of the selected class.

Edit Attributes

Highlights the attributes for the selected measure so you can edit them.

Delete

Displays the Confirm Delete dialog, allowing you to delete the selected class.

Undo

Undoes the last action.

Redo

Redoes the last undone action.

Classes tab

The following options are available on the Classes tab quick menu:

Undo

Undoes the last action.

Redo

Redoes the last action.

Measures tab

The following options are available on the Measures tab quick menu:

Realize All

Realizes all of the displayed measures. The box in the Realized column is checked for each measure.

Unrealize All

Unrealizes all of the displayed measures. The box in the Realized column is unchecked for each measure.

Invalidate

Invalidates the selected measure and moves it to the Invalid Measures tab.

Invalidate All

Invalidates all measures and moves them to the Invalid Measures tab.

Validate All

Validates all measures and moves them from the Invalid Measures tab to the Measures tab.

Undo

Undoes the last action.

Redo

Redoes the last undone action.

Invalid Measures tab

The following options are available on the Invalid Measures tab quick menu:

Validate

Validates the selected measure and moves it to the Measures tab.

Validate All

Validates all measures and moves them to the Measures tab.

Undo

Undoes the last action.

Redo

Redoes the last undone action.

Rule

Rule Definition

The following options are available on the Rule Definition quick menu:

Add > Rule Set

Displays the Add Rule Set dialog, allowing you to add a rule set to the solution.

Add > Rule Group

Displays the Add Rule Group dialog, allowing you to add a rule group to the selected rule set.

Add > Rule

Displays the Add Rule dialog, allowing you to add a rule to the selected rule group.

Rename > Rule Set

Displays the Rename Rule Set dialog, allowing you to change the name and description of the selected rule set.

Rename > Rule Group

Displays the Rename Rule Group dialog, allowing you to change the name and description of the selected rule group.

Delete > Rule Set

Displays the Confirm Delete dialog, allowing you to delete the selected rule set.

Note: All rule groups within the rule set are also deleted.

Delete > Rule Group

Displays the Confirm Delete dialog, allowing you to delete the selected rule group. You cannot delete the load, commit, calc, and refresh rule groups. If you attempt to delete them, the Confirm Delete dialog is displayed, allowing you to empty the rule groups instead.

Note: All rules within the rule group are also deleted.

Undo

Undoes the last action.

Redo

Redoes the last undone action.

Advanced > Generate Load Rules

Auto generates rules in the load rule group, based on the measures contained in the calc rule group that also have a database defined in the measure tool.

Advanced > Generate Commit Rules

Auto generates rules in the commit rule group, based on the measures contained in the calc rule group.

Rules

The following options are available on the Rules quick menu:

Add > Rule

Displays the Add Rule dialog, allowing you to add a rule to the selected rule group.

Add > Expression

Displays the Add Expression dialog, allowing you to add an expression to the selected rule.

Rename Rule

Displays the Rename Rule dialog, allowing you to change the name and description of the existing rule.

Apply Pattern

Displays the Apply Pattern dialog, allowing you to auto generate rules using the same rule pattern as the selected rule.

Edit Expressions

Displays the Edit Expression dialog, allowing you to add expressions to the rule and edit existing expressions.

Delete > Rule

Displays the Confirm Delete dialog, allowing you to delete the rule from the selected rule group.

Undo

Undoes the last action.

Redo

Redoes the last undone action.

Workbook Designer

The following options are available on the Workbook Designer quick menu:

New > Workbook

Creates a new workbook in the selected solution.

New > Workbook Tab

Creates a new workbook tab in the selected workbook.

New > Worksheet

Creates a new worksheet in the selected workbook tab.

New > Profile

Creates a new measure profile in the selected worksheet.

Clone > Workbook x

Clones the selected workbook, creating a new workbook containing the same tabs, worksheets, and properties as the selected workbook.

Shift Workbook Tab Left

Moves the selected workbook tab one position to the left.

Shift Workbook Tab Right

Moves the selected workbook tab one position to the right.

Edit Properties > Workbook x

Displays the Properties dialog, allowing you to edit the properties of the selected workbook.

Edit Properties > Workbook Tab x

Displays the Properties dialog, allowing you to edit the properties of the selected workbook tab.

Edit Properties > Worksheet x

Displays the Properties dialog, allowing you to edit the properties of the selected worksheet.

Remove > Workbook x

Displays the Confirm Delete dialog, allowing you to remove the selected workbook.

Remove > Workbook Tab x

Displays the Confirm Delete dialog, allowing you to remove the selected workbook tab.

Remove > Worksheet x

Displays the Confirm Delete dialog, allowing you to remove the selected worksheet.

Wizard Designer

The following options are available on the Wizard Designer quick menu:

Delete Page

Deletes the selected wizard page.

Delete Wizard

Deletes the selected wizard and all associated wizard pages.

Buttons

Hierarchy Definition

Move dimension up

Moves the selected dimension up one position in the hierarchy table. Note that this indicates the dimension's position in the data file only, and not the hierarchy.

Move dimension down

Moves the selected dimension down one position in the hierarchy table. Note that this indicates the dimension's position in the data file only, and not the hierarchy.

Data Interface Manager

New Meas

Displays the New Measure Specification dialog, allowing you to specify the data interface for a measure.

Delete Meas

Displays the Confirm Delete dialog, allowing you to remove the measure from the list.

Rule Definition

Rule filtering

Allows you to select one of four filters for displaying rules:

- Disable Filtering – all rules are displayed.

- Filter by Measure – filters by measures contained in the rule.

- Filter by Size

- Filter by Validity – only valid rules are displayed.

Toggle the display of rule descriptions

Allows you to display or hide rule descriptions. If you hide rule descriptions, only the rule name and associated measures are displayed in a shorthand format.

Workbook Designer

Move selected Workbook Tab to the left

Moves the selected workbook tab one position to the left.

Move selected Workbook Tab to the right

Moves the selected workbook tab one position to the right.

Create a new workbook template

Creates a new workbook template in the selected solution.

Create a new workbook tab

Creates a new workbook tab in the selected workbook.

Create a new worksheet

Creates a new worksheet in the selected workbook tab.

Edit properties

Displays the Properties dialog for the selected workbook, workbook tab, or worksheet.

Delete workbook or workbook component

Displays the Confirm Delete dialog, allowing you to delete the selected workbook, workbook tab, or worksheet.

Undo last action

Undoes the last action.

Redo last action

Redoes the last undone action.

Cut to clipboard

Cuts the selected object and places it on the clipboard.

Copy to clipboard

Copies the selected object and places it on the clipboard.

Paste from clipboard

Pastes the object from the clipboard into the workbook.

Wizard Designer

Create a new wizard

Creates a new wizard in the selected solution.

Create a new wizard page

Creates a new wizard page in the selected wizard.

Add a Label

Adds a label to the selected wizard page.

Add a Button

Adds a button to the selected wizard page.

Add a radio button

Adds a radio button to the selected wizard page.

Add a check box

Adds a check box to the selected wizard page.

Add a combo box

Adds a combo box to the selected wizard page.

Add a text box

Adds a text box to the selected wizard page.

Toggle gridlines

Displays or hides the gridlines on the selected wizard page.

Finer gridlines

Displayes more closely spaced gridlines on the wizard page.

Coarser gridlines

Displays less closely spaced gridlines on the wizard page.

Align left

Aligns the control to the left.

Center horizontally

Centers the control horizontally.

Align right

Aligns the control to the right.

Align top

Aligns the control at the top.

Center vertically

Centers the control vertically.

Align bottom

Aligns the control at the bottom.

Space horizontally

Spaces the control horizontally.

Space vertically

Spaces the control vertically.

Chapter 3 – Configuration Manager

Overview

The configuration manager is the starting point for creating a new configuration, or opening an existing configuration. It provides a high-level view of all the components necessary to configure an RPAS application, and is used to navigate to the various tools used to configure those components.

Working with configurations

A configuration represents the overall workspace for the RPAS implementation. Each configuration contains one or more projects, which in turn contain one or more solutions.

Creating a new configuration

To create a new configuration:

1   From the File menu (or via the right click menu), select New, and then select Configuration.

2   Type the name of your new configuration in the text box.

3   If you want to save the new configuration in the default directory, go to Step 5. Otherwise, uncheck the Use Defaults check box.

4   Type the name of the directory in which to save the new configuration. Alternately, click Browse to choose a directory.

5   Click OK to save the new configuration in the specified directory.

Opening an existing configuration

To open an existing configuration:

1   From the File menu (or via the right click menu), select Open.

2   Browse the directory structure until you locate the configuration you want to open.

3   Click OK to open the selected configuration.

OR

1   From the File menu, select a configuration from the displayed list of recently used configurations.

Saving a configuration

To save a configuration:

1   From the File menu, select Save. Any changes you have made to the configuration are saved.

Cloning a configuration

You can create an exact copy of an existing configuration by cloning it. To clone a configuration:

1   From the Configuration Manager right-click menu, select Clone.

2   Type the new name for the configuration in the text box.

3   Click OK to save the configuration under the new name.

Renaming a configuration

To rename a configuration:

1   From the Configuration Manager right-click menu, select Rename.

2   Type the new name for the configuration in the text box.

3   Click OK to save the configuration under the new name.

Working with projects

A project corresponds to an RPAS domain. Each configuration can have one or more projects. For example, you can create separate project (and, therefore, separate domains) for Planning and Forecasting.

Creating a new project

To create a new project:

1   From the File Menu or Configuration Manager right-click menu, select New, and then select Project.

2   Type the name of the new project in the text box.

3   Select the workspace (configuration) in which to create the new project.

4   Click OK to create the new project in the specified workspace.

Cloning a project

You can create an exact copy of an existing project by cloning it. To clone a project:

1   Select the project that you want to clone.

2   From the Configuration Manager right-click menu, select Clone.

3   Type the new name for the project in the text box.

4   Select the workspace (configuration) in which to create the cloned project.

5   Click OK to save the cloned project in the specified workspace.

Renaming a project

To rename a project:

1   Select the project that you want to rename.

2   From the Configuration Manager right-click menu, select Rename.

3   Type the new name for the project in the text box.

4   Click OK to save the project under the new name.

Moving a project

You can move a project from one configuration to another. To move a project:

1   Select the project that you want to move.

2   From the Configuration Manager right-click menu, select Move.

3   Type the name of the project in the text box.

   Note: This is the name the project is called after it has been moved.

4   Select the workspace (configuration) to which you want to move the project.

5   Click OK to move the project to the specified workspace.

Working with solutions

A solution corresponds to an application configuration (for example, TopPlan or KeyPlan). Each project can contain one or more solutions. For each solution, you define measures, rules, workbooks, and wizards.

Creating a new solution

To create a new solution:

1   From the File Menu or Configuration Manager right-click menu, select New, and then select Solution.

2   Type the name of the new solution in the text box.

3   Select the project in which to create the new solution.

4   Click Finish to create the new solution in the specified project.

Renaming a solution

To rename a solution:

1   Select the solution that you want to rename.

2   From the Configuration Manager right-click menu, select Rename.

3   Type the new name for the solution in the text box.

4   Click Finish to save the solution under the new name.

Cloning a solution

You can create an exact copy of an existing configuration by cloning it. To clone a solution:

1   Select the solution that you want to clone.

2   From the Configuration Manager right-click menu, select Clone.

3   Type the new name for the solution in the text box.

4   Select the project in which to create the cloned solution.

5   Click Finish to save the cloned solution in the specified project.

Moving a solution

You can move a solution from one project to another. To move a solution:

1   Select the solution that you want to move.

2   From the Configuration Manager right-click menu, select Move.

3   Type the name of the solution in the text box.

   Note: This is the name the solution is called after it has been moved.

4   Select the project to which you want to move the solution.

5   Click Finish to move the solution to the specified project.

Example

The following example shows the dialog box for adding a new project to the TPGA061103 configuration.
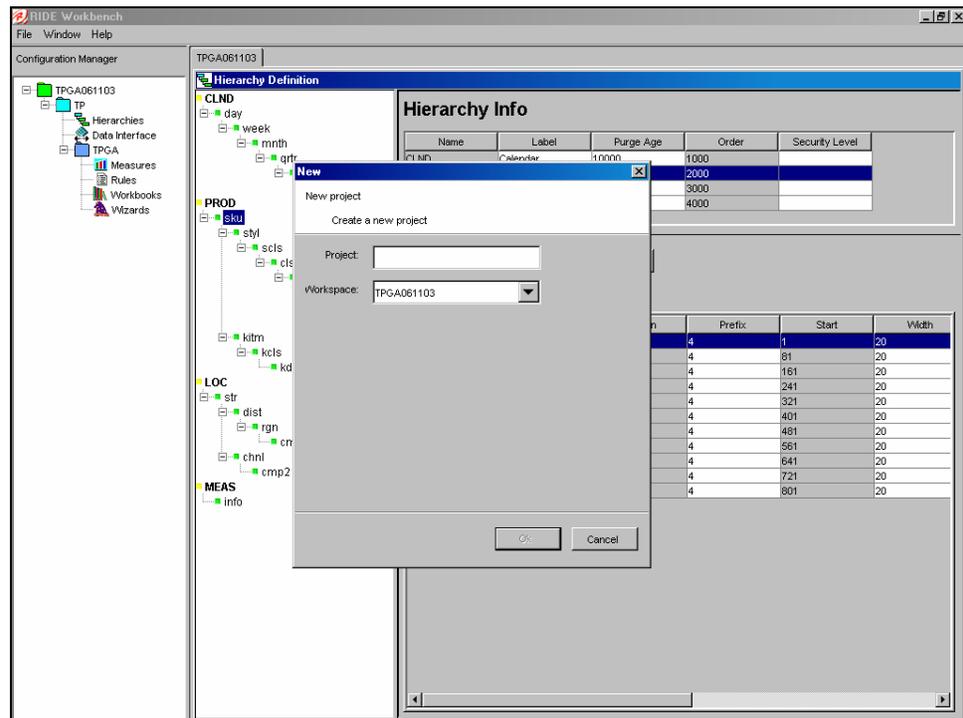
Chapter 4 – Hierarchies

Overview

The hierarchy definition tool allows you to define and construct hierarchies, dimensions within those hierarchies, and relationships between dimensions.

When you create a project, the calendar, product, location, and measure hierarchies are automatically created by default. These hierarchies are required by RPAS and cannot be deleted, nor their hierarchy order changed. The order indicates the order in which the hierarchies are expected in the file used for hierarchy data loading. Additional hierarchies can be created as well. Dimensions for each of the hierarchies can then be defined. These hierarchies and dimensions are used for all solutions within the project. Therefore, two or more solutions can only be in the same project if they use the same hierarchy structure.

Understanding hierarchies and dimensions

Hierarchies are the structures that an organization uses to describe the relationships between and among the many dimensions.

The following illustrates an example of a product hierarchy and the dimensions within that hierarchy.
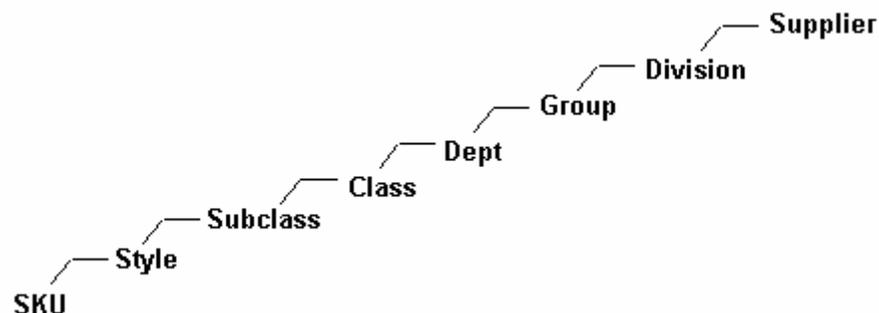
Merchandising system product hierarchy structure

Dimensional level relationships in a product hierarchy

SKU, style, and class are examples of specific dimensions that define the relationship between individual products. For this reason, SKU, style, and class are said to be dimensions of the product hierarchy.

For example, consider an apparel manufacturer where shirts are one of the company's many product classes. The following figure shows a possible relationship between dimensional levels in the company's product hierarchy.
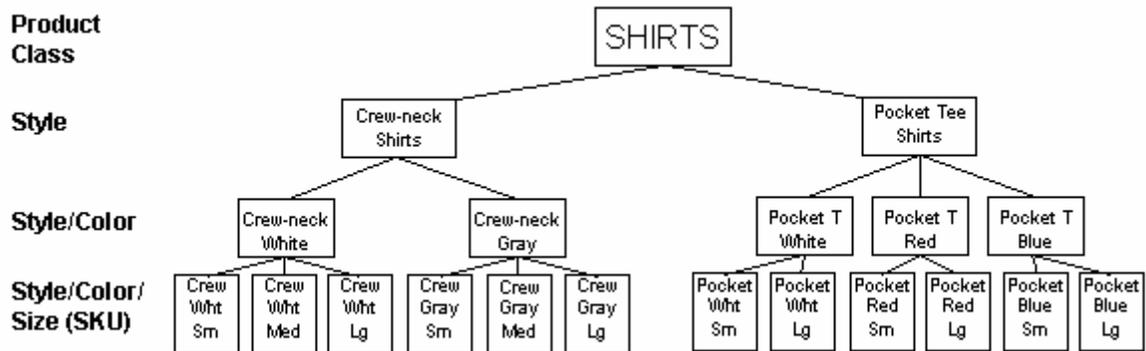
The items at the bottom of the hierarchy can be defined at their lowest level by SKU. Items at each successively higher level in the hierarchy contain the elements directly beneath; that is, lower level components in the hierarchy roll up (or aggregate) into higher ones. In this product hierarchy, shirts at the SKU level roll up into aggregate style/color groupings (for example, white crew-necks). Shirts at the style/color level can then be rolled up to the style level (for example, crew-necks); and styles can be rolled up into the product class level (for example, shirts).

Dimensional level relationships in a location hierarchy

This company can represent its hierarchy of locations in a similar fashion. In the following location hierarchy, stores are identified at their lowest level (the Store dimension) by city/store number. This hierarchical level rolls up into the state dimension, and the state level can be further aggregated into the region.
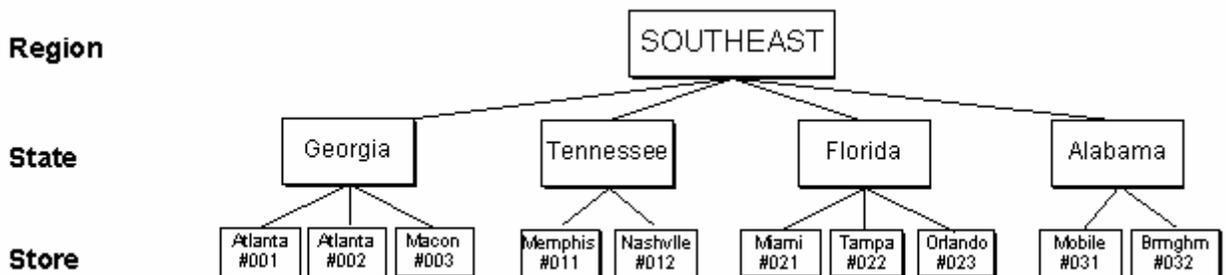
Hierarchy rules (alternate hierarchies)

Certainly, hierarchies can be much more complex than those in the examples. Note that an item at a particular level in a hierarchy can be rolled up along more than one hierarchical path (that is, an alternate hierarchy). However, for any given path of rollup, that item can only belong to one parent at any higher dimensional level. For example, if a given store location is rolled up to the state level, it can only belong to one state position (for example, Georgia or Florida, but not both). You can view data at any level of detail you want by drilling down or rolling up through levels in the hierarchy. Hierarchies define the path of data aggregation and spreading.

Working with hierarchies

Creating a new hierarchy

Note: New hierarchies can only be created beneath the Measure Hierarchy.

To create a new hierarchy:

1 From the Hierarchy Definition right-click menu, select New Hierarchy.

2 To change the name of the newly created hierarchy, click the hierarchy name twice and type the new name (or change the name in the hierarchy info table).

Note: Hierarchy names can contain a maximum of four characters.

Specifying hierarchy information

To specify hierarchy information:

1 In the Hierarchy Definition window, click the name of the hierarchy for which you want to specify information or select it in the hierarchy info table.

2 In the Hierarchy Info frame, type the following:

Attribute	Description
Name	The RPAS internal name of the hierarchy. The hierarchy name can contain a maximum of four characters.
Label	The hierarchy label that is displayed to RPAS users.
Purge Age	The number of days (without a load) before a position is purged from a dimension in this hierarchy.
Security Level	If position-level security is enabled, specifies the name of the dimension for which security is enabled.

Note: The Order column indicates the order in which the hierarchy information is expected in the file used for hierarchy data loading.

Deleting a hierarchy

To delete a hierarchy:

1 In the Hierarchy Definition window, select the hierarchy that you want to delete.

2 From the Hierarchy Definition right-click menu, select Delete.

3 Click Yes in the Confirm Delete dialog box to delete the hierarchy.

Renaming a hierarchy

To rename a hierarchy:

1   In the Hierarchy Definition window, select the hierarchy that you want to rename.

2   From the Hierarchy Definition right-click menu, select Rename (or just change it in the hierarchy info table).

3   Type the new name for the hierarchy.

Note: Hierarchy names can contain a maximum of four characters.

OR

1   Click the hierarchy name twice, and then type the new name.

Note: Hierarchy names can contain a maximum of four characters.

Working with dimensions

Creating a new dimension

To create a new dimension:

1   From the Hierarchy Definition window, select the hierarchy or dimension under which to create the new dimension.

Note: You can create only one top-level dimension per hierarchy.

2   From the Hierarchy Definition right-click menu, select New Dimension (you can also use the insert key).

Specifying dimension information

To specify dimension information:

1   In the Hierarchy Definition window, select the dimension for which you want to specify information (or select the dimension in the Dimension Info table).

2   In the Dimension Info frame, specify the following information, which are used during the data loading process:

Attribute	Description
Name	The RPAS internal name for the dimension. The dimension name can contain a maximum of four characters.
Label	The dimension label that is displayed to RPAS users.

Attribute	Description
Prefix	Number of characters (0 to 4) for an automatic prefix put on all position names loaded and stripped from all position names exported. The prefix is taken from the internal dimension name. If the number of characters is greater than the dimension name, an underscore is used to pad the prefix. If the number of characters is less than the dimension name then the right most characters from the dimension name are used. **Note:** The Day dimension must have a prefix of 3.
Width	Width of position names for this dimension in the hierarchy load file.
Label Width	Width of position labels for this dimension in the hierarchy load file.
Database	The name of the database in which the dimension information is stored.

These fields are non-editable and provide the following information:

Attribute	Description
Column	Identifies the column in the hierarchy load file.
Start	Identifies the start position of the dimension name in the hierarchy load file.
Label Start	Identifies the start position for the label in the hierarchy load file.
Aggs	Identifies the dimension that the current dimension aggregates.
User Dim	Indicates whether or not the dimension is user-defined.

Deleting a dimension

To delete a dimension:

1   In the Hierarchy Definition window, select the dimension that you want to delete.

2   From the Hierarchy Definition right-click menu, select Delete.

3   Click Yes in the Confirm Delete dialog box to delete the dimension.

Renaming a dimension

To rename a dimension:

1 In the Hierarchy Definition window, select the dimension that you want to rename.

2 From the Hierarchy Definition right-click menu, select Rename.

3 Type the new name for the dimension.

Note: Dimension names can contain a maximum of four characters.

OR

1 Click the dimension name twice, and then type the new name.

Note: Dimension names can contain a maximum of four characters.

Creating an alternate hierarchy

To create an alternate hierarchy:

1 In the Hierarchy Definition window, select the dimension from which you want to create an alternate hierarchy.

2 From the Hierarchy Definition right-click menu, select New Dimension (you can also use the insert key).

Example

In the following example, the Calendar, Product, Location, Hardware, and Measure hierarchies are displayed. Dimension information for the Calendar hierarchy is shown in the Dimension Info window.

Chapter 5 – Measures

Overview

The measure definition tool allows you to define classes of measures and specify default attributes for each class. After you have defined the class structure, the measure definition tool auto-generates prototype measures by combining the classes you created. You can also specify attributes for individual measures, thereby overriding the class default attributes for those measures.

Concepts

A major class is the highest level in the class inheritance hierarchy. Attributes defined at this level are inherited by all minor classes created under a major class.

Within each major class, you create one or more minor classes. You can also create minor classes underneath minor classes. You can also modify attributes at the minor class level. Measures are auto-generated by combining the minor classes at the lowest level (that is, those minor classes with no further minor classes beneath them).

After you have defined your major and minor classes, the measure definition tool auto-generates prototype measures based on the combination of classes you have created. These prototype measures cannot be used elsewhere in the configuration tools until you have realized them. See Realizing and unrealizing measures.

Because the measure definition tool auto-generates measures based on all possible combinations of minor classes, you must identify measures that are either not valid or will never be used in a solution. By invalidating them, you mark them as off-limits for use, but retain their details in case you need to validate them at some point in the future. See Invalidating and validating measures.

Class process

1   Create major classes, which are measure components.

2   Create minor classes, which are sub-groupings or specific items in a major class.

3   Define measure attributes at the major class level. The minor classes will inherit the attributes associated with the major class they belong within.

4   If necessary, modify the measure attributes at the minor class level.

5   After you create major and minor classes, the configuration tool creates prototype measures by creating all the possible combinations between the classes. The auto-generation of measures saves you from having to create all the measures manually.

6   Because all possible measures are created from the combinations of classes, you must identify those that are either invalid or will not be used in a solution. Measures that you invalidate are moved to the Invalid Measures tab. These measures cannot be used in the configuration, but are not lost in case you later decide to validate them so they can be used.

7   The last step is to realize measures, thus allowing them to be used in other parts of the configuration.

Measure classification design

There are two basic principles to keep in mind to make the measure tool as powerful as possible.

First, major and minor classes should be designed with the idea of *maximizing default attributes*. For example, if a configuration has 2000 measures, and 1500 of them are of data type *real*, then every effort should be made to see that the attribute *real* is only explicitly set a very small handful of times at the minor class level, and not 1500 times at the actual measure level. Measures are the composition of minor classes, and it is in those minor classes that defaults should be set.

The other major principle is to use minor classes to make measure definition manageable. For example, in the case in the previous paragraph, we established that we want to define the data type of *real* only a few times. What we want to avoid, though, is grouping all 1500 of these measures into a single minor class such that we cannot easily edit smaller subgroups of those 1500 measures. Remember that minor classes can also have minor classes, so within those 1500 measures, we could break them out further based on aggregation method, such as total, max, recalc, etc. Ideally, the "checking" of a lowest level minor class should allow the user to easily view and manage every resulting measure within that minor class.

Measure Attribute Inheritance/over-writing defaults

Measure attributes are inherited at the class level. Attributes defined for a class are spread down to all of the minor classes that belong to that class, and also to the measures associated with that class. Attributes can then be over-written either at the minor class or measure level. Note that once an attribute is changed at the measure level, changes made at the class level will no longer be inherited by that measure.

Working with classes

Creating a major class

To create a major class:

1 From the Measure Definition right-click menu, select Add Major Class.

Creating a minor class

To create a minor class:

1 In the Measure Definition window, select the class under which to create the minor class.

2 From the Measure Definition right-click menu, select Add Minor Class.

Displaying classes

By checking or unchecking the check boxes next to the class names, you determine which classes are displayed in the Class Defaults tab.

If you want to display information about a class in the Class Defaults tab, check the box next to the class name.

If you do not want to display information about a class in the Class Defaults tab, uncheck the box next to the class name.

Note: Checking or unchecking a box causes the boxes for all subclasses to be checked or unchecked, accordingly.

Specifying class information

To specify class information:

1 In the Measure Definition tool, select the class for which you want to specify information.

2 On the Classes tab, specify the following information applicable to the measures inheriting from the class. The defaults entered here will be inherited by the child minor classes, and will also be inherited by the auto-generated measures. Not all attributes need to be entered for all classes. Also, attributes defined for measure classes listed fist will override attributes for classes further down the list.

Attribute	Description
Identifier	The identifier of the class. The identifier is used to create measure names.
Label	The label that is used to generate measure labels, which are displayed to RPAS users.
Description	A description of the class.

Attribute	Description
Data Type	Must be one of the following types:
	Real – Floating point numeric values. Most measures are of this type.
	Integer – Numeric integer values. There are no special 'spreading' algorithms for integer measures, which should normally be used only for measures that are calculated 'bottoms up'.
	Date – Date and time. Can easily be converted to position names by standard functions.
	String – Variable length strings, typically used for notes and names.
	Boolean – True or false values, typically used for flags and indicators.
NA Value	The suggested value for unpopulated (na) cells. Initially, the base array of a measure is defined with this value; however, the value is subject to change in order to optimize the compression factor.
Base Intersection	Lowest level at which data is stored for a measure. Double clicking on this field will bring up a dialog box that contains the hierarchies that were defined using the Hierarchy tool. One dimension from each hierarchy can be selected.

Attribute	Description
Agg Method	The default aggregation method for the class:
	recalc – recalculate measure at each level, via recalc expression
	none – measure cannot be aggregated
	total – for numeric types, sum of all values
	average – for numeric types, average of all values (requires total)
	average_pop – for numeric types, average of populated values (requires total and popcount)
	min – minimum of all values
	max – maximum of all values
	min_pop – minimum of populated values
	max_pop – maximum of populated values
	pst – for numeric types, period start total (first along time dimension and total along other dimensions)
	pet – for numeric types, period end total
	first – first of all values in base (relevant for ordered dimensions)
	last – last of all values in base (relevant for ordered dimensions)
	first_pop – first populated value in base
	last_pop – last populated value in base
	and – for Boolean types, and of all values
	or – for Boolean types, or of all values
	ambig – ambig of all values (all values equal, otherwise ambig)
	ambig_pop – ambig of all populated values
	popcount – count of populated values in base

Attribute	Description
Spread Method	The default spread method for the measure:
	prop – for numeric types, spread value proportionally (non-zero total) or evenly (zero total)
	even – for numeric types, spread value evenly
	even_pop – for numeric types, spread value evenly across populated cells
	delta – for numeric types, increment each cell evenly
	delta_pop – for numeric types, increment each cell evenly across populated cells
	repl – for all types, replicate the value to each cell
	repl_pop – for all types, replicate the value to each populated cell
	ps_delta – for numeric types and pst agg methods, apply delta to starting period with decreasing effect towards ending period
	pe_delta – for numeric types and pet agg methods, apply delta to ending period with decreasing effect towards starting period
Base State	The editability of the measure at the base level (read or write).
Agg State	The editability of the measure at the aggregate level (read or write).
Database	The database where the measure is stored in the domain.
	If the database is NA then the measure is not stored.
	Specifies the relative path from domain root. You should specify the database as "data/dbname" so the database is not built directly in the root directory of the domain.

Attribute	Description
View Type	Indicates if the measure is calculated when viewed.
	If the view type is not *none*, then the measure must not be materialized (that is, they are not stored in workbook or domain) and must appear on the left hand side of one and only one expression in a rule group. Synchronized view types are maintained immediately at cell edit time.
	View types include:
	none – measure is stored
	view_only – measure is calculated when viewed (aggstate and basestate must be read-only)
	sync_first_lag – period 1 from first measure (no calendar), periods 2..N from second measure 1..N-1 (lag) [eg. bop ⇔ os & eop]
	sync_lead_last – periods 1..N-1 from first measure 2..N (lead), period N from second measure (no calendar) [eg. eop ⇔ bop & cs]
	sync_first – get period 1 from measure (similar to first agg type along calendar dimension) [eg. os ⇔ bop]
	sync_last – get period N from measure (equivalent to last agg type along calendar dimension) [eg. cs ⇔ eop]
Sync With	A comma-separated list of measures used for synchronization. Depends on view type.
Insertable	Indicates whether the measure is visible to user for inclusion in workbooks (used in addition to measure security). Possible values are true and false.
UI Type	Indicates whether the measure is a picklist or not. If a measure is defined as a picklist, users must choose a value for the measure from a list of valid values defined using the *range* attribute.
Range	Specify suitable range for the measure at edit time.
	For numeric values, the syntax is as Lower Bound : Upper Bound.
	For strings, it is the maximum length.
	For picklist measures (both numeric and string) values can be explicitly listed as "a,b,c,d…"; additionally labels can be specified for each value such as "valuea(labela), valueb(labelb), …" where the labels will be displayed in the user interface.
Purge Age	The number of days (without a load) before measure data is purged.
Refreshable	Not currently used.
Shown	True or false.

Renaming a class

To rename a class:

1   In the Measure Definition window, select the class that you want to rename.

2   From the Measure Definition right-click menu, select Rename.

3   Type the new name for the class.

> **Note:** Changing the class name changes the class label, not the class identifier.

OR

1   Click the class name twice, and then type the new name.

> **Note:** Changing the class name changes the class label, not the class identifier.

Moving classes

To move a measure from one class to another:

1   In the Measure Definition window, select the class that you want to move.

2   Drag the class to its new location and release it.

> **Note:** You cannot move a major class.

Working with measures

Based on the major and minor classes that were defined, the Measure Tool will auto-create and name measures based on the class combinations. The attributes for these measures will be inherited from the class attributes. Once realized, the attributes can then be over-written for individual measures by entering them the same way as on the classes tab. Note that once over-written at the measure level, changes made at the class level will no longer spread down to that measure as it will retain the over-written value.

Realizing and unrealizing measures

When a measure is auto-generated by the Measure Tool, it is considered a prototype measure and cannot be edited or used in any other configuration component. To enable the measure to be edited and/or used elsewhere in the configuration, it must be realized first.

To realize a measure:

1   In the Measure Definition window, select the classes containing the measures you want to realize.

2   In the Measures tab, for each measure that you want to realize, select the check box in the Realized column.

   OR

   If you want to realize all measures in the classes you selected, from the Measures tab right-click menu, select Realize All.

To unrealized a measure:

1   In the Measure Definition window, select the classes containing the measures you want to unrealize.

2   In the Measures tab, for each measure that you want to unrealize, deselect the check box in the Realized column.

OR

If you want to unrealize all measures in the classes you selected, from the Measures tab right-click menu, select Unrealize All.

Renaming a measure

To rename a measure:

1   In the Measures tab, click the name of the measure you want to rename.

Note: The measure must be realized before you can rename it.2 Type the new name for the measure.

Invalidating and validating measures

As the Measure Tool auto-generates measures for all class combinations, some of the measures that are auto-generated may not be valid, or may not ever be used. Measures that fall into this category can be invalidated, which will move them to the Invalid Measures tab. These measures will not be able to be used in the configuration, but are not lost in case they are decided later to be valid and wanted.

To invalidate a measure:

1   In the Measure Definition window, select the classes containing the measures you want to invalidate.

2   In the Measures tab, select the measures that you want to invalidate.

3   From the Measures tab right-click menu, select Invalidate.

To invalidate all measures:

1   In the Measure Definition window, select the classes containing the measures you want to invalidate.

2   From the Measures tab right-click menu, select Invalidate All.

To validate a measure:

1   In the Measure Definition window, select the classes containing the measures you want to validate.

2   In the Invalid Measures tab, select the measures that you want to validate.

3   From the Invalid Measures tab right-click menu, select Validate.

To validate all measures:

1   In the Measure Definition window, select the classes containing the measures you want to validate.

2   From the Invalid Measures tab right-click menu, select Validate All.

Showing measures

To show a measure:

1   In the Measure Definition window, check the check boxes next to the classes whose measures you want to show.

OR

1   Select the classes containing the measures you want to show.

2   From the Measure Definition right-click menu, select Show.

To show all measures:

1   From the Measure Definition right-click menu, select Show All.

Hiding measures

To hide a measure:

1   In the Measure Definition window, uncheck the check boxes next to the classes whose measures you want to hide.

OR

1   Select the classes containing the measures you want to hide.

2   From the Measure Definition right-click menu, select Hide.

To hide all measures:

1   From the Measure Definition right-click menu, select Hide All.

Sorting measures

In the Measures and Invalid Measure tabs, you can sort measures by attribute value. To sort measures:

1   In the Measures or Invalid Measures tab, check the check box next to the attribute that you want the measures sorted by.

The measures are sorted according to the value of the attribute selected. The sort order is either alphabetic or numeric, depending on the attribute selected.

Pushing measures down

To push a measure down:

1   In the Measure Definition window, select the class that you want to push down.

2   From the Measure Definition right-click menu, select Push Down.

The class is pushed down one level in the class hierarchy, and a new class is created to take the place of the pushed-down class.

Note: You cannot push down a major class.

Pulling measures up

To pull a measure up:

1   In the Measure Definition window, select the class that you want to pull up.

2   From the Measure Definition right-click menu, select Pull Up.

The class is pulled up one level in the class hierarchy.

Note: You cannot pull a minor class up to become a major class.

Sorting measures by attribute

The checkboxes at the top of the Measures table allow you to sort the measure view. You can sort measures based on any of the attributes in the table.

Example

In the following example, the measures associated with the checked classes are displayed. Realized measures are identified by a checkmark in the Realized column.
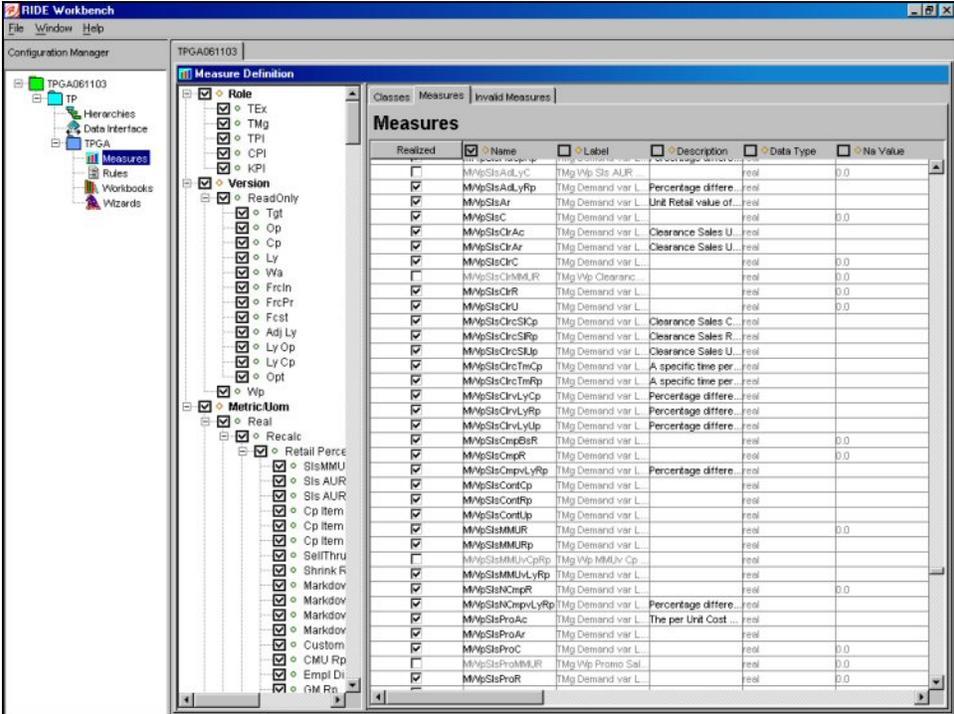
Chapter 6 – Rules

Overview

The rule definition tool allows you to define, organize, and manage rules, rule groups, and rule sets. It also allows you to create expressions and add expressions to rules.

Concepts

Understanding the RPAS calculation engine

The RPAS calculation engine is an engine that is built to support OLAP type calculations against a multi-dimensional model. The engine is very powerful and flexible, and, at first sight, very complex. However, when the 'building blocks' of the calculation engine are properly understood, much of this apparent complexity goes away. This overview of the calculation engine processes will therefore start by describing the three fundamental processes of aggregation, spreading and expression evaluation, before explaining how the various processes integrate into a comprehensive whole.

RPAS supports an OLAP type model. In this model, individual pieces of data, named 'cells', apply to a single position in one or more hierarchies or dimensions. These will typically include a 'measures' dimension, a calendar or time hierarchy, and other hierarchies such as for products and locations. The measures dimension is fundamentally different to the other hierarchies, since measures (which in other systems may be referred to by terms such as facts, performance indicators or variables) represent the fundamental events or measurements that are being recorded, whereas the positions in the other hierarchies provide a context for the measurement: where, when, what, etc. Measures relate to one another through rules and expressions: positions in all the other hierarchies relate to each other through hierarchical relationships.

RPAS supports two different forms of relationships between cells: hierarchical relationships that require 'aggregation' and 'spreading', and measure relationships that require rules and expressions. Hierarchical relationships, such as weeks rolling up to months, or stores rolling up to regions, require the aggregation of data values from lower levels in a hierarchy to higher levels, using a variety of methods, as appropriate to the measure. To enable such data to be manipulated at higher levels, RPAS supports 'spreading' the changes, also using a variety of methods. Aggregation and spreading are basic capabilities of the engine that require no coding by the implementer, other than the selection of aggregation and spreading types to use for a measure.

The inherent relationships between measures can be modeled through a rich rule and expression syntax. Most of the effort in configuring an application model is in modeling these relationships.

The RPAS calculation engine is designed to be robust, and extensible, but in complete control of the calculation process. It enforces integrity of the data by ensuring that, where possible, all known 'relationships' between cells, for whatever reason, are always enforced. Much of the logic of the processing of rules and rule groups depends on this basic principal.

Expressions

Expressions are the basis of all calculations of the relationships between measures, and are evaluated by the calculation engine during a calculation. Expressions are written in a syntax that allows for the calculation of a single measure from other measures, constants and parameters, using standard arithmetical functions and a rich set of mathematical, technical and business functions. Expressions are therefore an algorithmic statement of a relationship between measures.

Rules

An expression describes the relationship between measures in a way that causes a measure to be calculated through the expression. An expression may be said to 'solve' the relationship for the measure that is calculated through the expression. In some cases, there may be business methodology reasons for wanting more than one of the measures in a relationship to be calculable or solvable through that relationship. To support this requirement, RPAS has the concept of a rule, which consists of one or more expressions that describe the same relationship between measures, but that solve for different measures. All the expressions in a rule must use the same measures, and must have a different target measure (i.e. the measure on the left hand side of the expression that is calculated by the expression).

Where a rule has multiple expressions, those expressions are given a priority sequence, to help the calculation engine to select a calculation path that follows business priorities. Consider the rule that relates together sales value, sales units and sales price. Let us assume that there are three expressions in this rule, that is, that each of the measures involved in the rule may be 'solved' through the rule. If a user makes a change to, say, sales value, it should be clear that the calculation engine could enforce the mutual integrity of all the cells by holding the sales price constant and recalculating a new sales units. It could also achieve the same end by keeping the sales units constant, and recalculating the sales price. Both approaches are mathematically valid, and produce a consistent result, with complete data integrity. However, it is likely that one approach makes more 'business sense' than the other (in this case, most businesses in most circumstances would want the price to remain constant and have the units recalculated), and the prioritization of the expressions in the rule provides this information to the calculation engine. Considerable care should be taken in the design of models to ensure that appropriate expression priorities are established.

In essence, the calculation engine, when given a choice, will always select the highest priority expression in the rule that is available to be selected. In this example, therefore, the expression that calculates sales units would have a higher priority than the expression that calculates sales price. Similar consideration of the desired effect of a change to sales units will probably lead to a conclusion that the expression that calculates sales value would also have a higher priority than the expression that calculates sales price. But what of the relative priority of the expressions to calculate sales value and sales units? What is the 'business priority' for those expressions? That may vary from implementation to implementation. Indeed, it may even vary from one type of plan to another in the same implementation: for a financial merchandise plan, such as a TopPlan, the preferred behavior may be that a change to just sales price causes a recalculation of the sales units, whereas in a unit oriented lower level plan such as a KeyPlan, the preferred behavior may be that a change to just sales price causes a recalculation of sales value.

The same measure may appear in multiple rules. Indeed, this will frequently be necessary, since the same measure can be involved in a number of different relationships with other measures. For example, there may be a relationship between sales value, sales units and sales price. Sales value may also be involved in another relationship with closing stock and a cover value, and yet another with opening stock, receipts, markdowns and closing stock.

Rule groups

It is most unusual for a model to only require a single rule. In most cases, there will be a collection of relationships between measures that must be maintained. In RPAS, a Rule Group is a collection of rules that are treated as a unit by the calculation engine, with the integrity of all the rules in the rule group being maintained together. The calculation engine always has one (and only one) active rule group. Even if all that is required is a single expression, that single expression will be in a rule, and that single rule will be in a rule group.

Rules within a rule group are given a priority. The calculation engine uses this to select a calculation path that follows business priorities, by using rule priorities to determine which rule to enforce when there is a choice to be made

Within a system as a whole, there may be many rules defined. The validation of rules is performed in isolation, but rules within a rule group are also validated in the context of all the other rules in the rule group. This can mean that a rule that is perfectly valid syntactically, is not valid within a particular rule group. Rule group validations include:

- Each rule in a rule group must represent a completely different measure relationship. Therefore no two rules in a rule group may use exactly the same collection of measures, and neither may one rule group use a collection of measures that is a sub-set of the collection of measures in another rule.

- There must be an expression that calculates each recalc measure

- Any measure that is on the LHS of the only expression in a rule may not be on the LHS of any other expression.

Although there may only be one active rule group at any time, RPAS allows for the definition of multiple rule groups to satisfy different calculation requirements. Rule groups may be one of four different types: load, calculate, refresh and commit. The RPAS application automatically uses the load rule group when loading data into the workbook, the refresh rule group to refresh data and the commit rule group when committing data to the domain. These rule groups are perfectly 'normal', so although they will typically include many rules that use the master modifier to load or commit data, they may also have other rules. It is perfectly possible, for example, to commit data to the domain for a measure that does not exist in the workbook, merely by including the appropriate rule to calculate the measure (with the master modifier) in the commit rule group. Similarly, a measure may be loaded into a workbook that does not exist in the domain, by including an appropriate rule to calculate the measure in the load rule group.

RPAS supports multiple calculation rule groups. Menu options may be configured to allow the user to select a different calculation rule group. RPAS ensures a smooth transition from one calc rule group to another.

Rule group transitions

Although only a single rule group may be active at any time, RPAS supports the transition from one rule group to another. The calculation engine ensures the integrity of measure relationships at all times, so this process is not merely a case of switching from one rule group to another, as there is no guarantee that the integrity of the rules in the rule group being transitioned into have been maintained.

RPAS makes a worse case assumption when transitioning rule groups. Any rule that is in both the old and new rule groups is assumed to have its integrity maintained. Any other rule is assumed to be potentially wrong, and so is flagged as 'affected'. A normal calculation is then initiated, with expressions to be evaluated determined by the usual process. All affected rules will therefore have their integrity imposed by the evaluation of an expression, and 'knock-on' effects may cause some rules that occur in both the old and new rule groups to also be evaluated. Since all base intersections must be calculated during rule group transition, a large or complex rule group transition is likely to take longer than a normal calculate.

Note that there are circumstances when automatic rule group transitions occur:

- On data loading. Data is loaded using the load rule group. This will typically load measures by calculating them from the data values held on the domain using the master modifier, but may also calculate other measures that are not explicitly loaded. When the load is complete, the system will automatically transition to the calculate rule group

- On data refreshing. Data refreshing causes some measures to be updated from values held on the domain. The measures to be refreshed will have been selected by the user. Refreshing uses the refresh rule group, but there is no real transition: the measures that are affected by the refreshed measures are treated as affected in the calculate rule group, and a normal calculate of that rule group follows. Effectively, data refreshing causes a calculation using the calculate rule group as if the cells that were refreshed were directly changed by the user.

- On data committing. There is a normal transition from the current calculate rule group to the commit rule group. This will typically commit measures by calculating them on the domain by using the master modifier. If any non-master measures are calculated, they will be treated as refreshed, and there will be a 'refresh' transition back to the calculate rule group.

Understanding RPAS functions

RPAS Functions are mechanisms for performing operations within an expression that are controlled and executed by the calculation engine.

- There is always a single measure on the left hand side of a normal expression; that is, a function always has only one measure output.

- The calculation engine controls and executes the evaluation of a function.

- Functions may be used in long expressions with other functions and keywords.

- The data that can be referenced is limited to the scope of the workbook.

Refer to the *RPAS 11 Rule Functions* document for details about RPAS functions.

Working with rule sets

Adding a rule set

To add a rule set:

1   From the Rule Definition right-click menu, select Add and then select Rule Set.

2   Type the Name and Description of the rule set.

> **Note:** The name can contain a maximum of 16 characters, consisting of letters, numbers, and spaces only.

3   Click OK to create the rule set.

The rule set is created, along with the following default rule groups: load, commit, calc, and refresh. The rule group names are prefixed with the name of the rule set followed by an underscore.

Deleting a rule set

To delete a rule set:

1   In the Rule Definition window, select the rule set that you want to delete.

2   From the Rule Definition right-click menu, select Delete and then select Rule Set.

3   Click Yes in the Confirm Delete dialog box to delete the rule set.

Renaming a rule set

To rename a rule set:

1   In the Rule Definition window, select the rule set that you want to rename.

2   From the Rule Definition right-click menu, select Rename and then select Rule Set.

3   Type the new Name and Description for the rule set.

4   Click OK to accept the new name and description.

Working with rule groups

Creating a rule group

To create a rule group:

1   In the Rule Definition window, select the rule set in which to create a new rule group.

2   From the Rule Definition right-click menu, select New and then select Rule Group.

3   Type the Name and Description for the rule group.

4   Click OK to create the rule group.

Deleting a rule group

To delete a rule group:

1   In the Rule Definition window, select the rule group that you want to delete.

2   From the Rule Definition right-click menu, select Delete and then select Rule Group.

3   Click Yes in the Confirm Delete dialog box to delete the rule group.

Renaming a rule group

To rename a rule group:

1   In the Rule Definition window, select the rule group that you want to rename.

2   From the Rule Definition right-click menu, select Rename and then select Rule Group.

3   Type the new Name and Description for the rule group.

4   Click OK to accept the new name and description.

Copying a rule group

To copy a rule group:

1   In the Rule Definition window, select the rule group that you want to copy.

2   From the Rule Definition right-click menu, select Advanced-Copy Rule Group.

3   In the Rule Set field select the desired destination Rule Set.

4   In the Rule Group frame select the desired destination Rule Group.

5   Select Replace or Append. Replace will overwrite all rules that already exist in the destination rule group. Append will add to the rules already in the destination rule group.

6   Click OK.

Working with rules

Creating a rule

To create a rule:

1   In the Rule Definition window, select the rule group in which to create a rule.

2   From the Rule Definition right-click menu, select New and then select Rule.

3   Type the Name and Description for the rule.

4   If you want to add an expression to the rule, click Next.

5   To add an expression to the rule,

   a.   Enter the expression directly into the expression text box

   b.   click Expression Builder.

   See "Building an expression" for more information.

6   After you have added the expression, click Finish to create the rule.

Building an expression

To build an expression:

1   In the Edit Expression window, click the button to the right of the expression field to open the Expression Builder.

2   In the Expression Builder window, select the desired measure classes to display measures. Based on the class selections made, realized measure will be displayed

3   Select the measures you want to use in the expression by double clicking on them.

4   Using the selected measures, the functions available from the dropdown list, and the mathematical operators, construct an expression.

5   Click Finish to return to the Edit Expression window.

    If you have created an invalid expression, a warning message is displayed and the font color is red.

6   Click OK to add the expression to the rule.

Rule/expression ordering

To order a rule or expression:

1   In the Rule Definition window, select the rule or expression that you want to move.

2   Click the down arrow to move the rule or expression down the list, or click the up arrow to move the rule or expression up the list.

Editing an expression

To edit an expression:

1   In the Rule Definition window, select the rule group containing the expression you want to edit.

2   Select the rule containing the expression you want to edit.

3   From the Rule right-click menu, select Edit Expressions.

4   Either edit the expression in the text box, or click the button to edit the expression using the Expression Builder.

    See "Building an expression" for information on using the Expression Builder.

5   Click OK to accept the changes you made to the expression.

Adding an expression

To add an expression to a rule:

1 In the Rule Definition window, select the rule group containing the rule to which you want to add an expression.

2 Select the rule to which you want to add an expression.

3 From the Rule right-click menu, select Add and then select Expression.

4 Either type the expression in the text box, or click the Expression Builder button to create an expression using the Expression Builder.

See "Building an expression" for information on using the Expression Builder.

5 Click OK to add the expression to the rule.

Deleting an expression

To delete an expression:

1 In the Rule Definition window, select the rule group containing the expression you want to delete.

2 Select the rule containing the expression you want to delete.

3 From the Rule right-click menu, select Edit Expressions.

4 Click the Delete button next to the expression you want to delete.

5 Click OK to accept the changes you made.

Applying a rule pattern

To apply a rule pattern:

1 Select the rule to use as the pattern basis.

2 Select Apply Pattern from the right click menu.

3 A dialog box will be displayed listing candidate rules patterned after the selected rule. Select the desired rules.

4 Click OK.

Deleting a rule

To delete a rule:

1 In the Rule Definition window, select the rule group containing the rule you want to delete.

2 Select the rule you want to delete.

3 From the Rule right-click menu, select Delete and then select Rule.

4 Click Yes in the Confirm Delete dialog box to delete the rule.

Renaming a rule

To rename a rule:

1   In the Rule Definition window, select the rule group containing the rule you want to rename.

2   Select the rule you want to rename.

3   From the Rule right-click menu, select Rename Rule.

4   Type the new Name and Description for the rule.

5   Click OK to accept the new name and description.

Filtering rules

To filter rules:

1   In the Rule Definition window, click the Rule Filtering button.

2   Select one of the following options:

Filter	Description
Disable Filtering	All rules are displayed.
Filter by Measure	Works in conjunction with the measure classes box in the bottom left corner of the screen. Rules are filtered to show those whose measures conform to the selected class scheme.
Filter by Size	Rules are filtered to show those with more than one expression.
Filter by Validity	Only invalid rules are displayed.

Only those rules satisfying the filtering criteria are displayed.

Auto generating load and commit rules

Rules for the load and commit rule groups can be auto-generated based on the calc rule group. To auto-generate load or commit rules:

1   Select the calc rule group to use as a basis.

2   Right mouse click to and select Advanced.

3   Select Generate Load Rules or Generate Calc Rules

4   Click Yes on the Non-Undoable dialog box. This will also clear out the undo stack.

Note: Measures to be used in the load rule group must have a database assigned in the Measure tool.

Copying rules

To copy rules:

1   Right-click in the Rule/Expression frame in the Rule Definition Tool.

2   Select Copy Selected Rules.

3   In the Rule Set field, select the desired destination Rule Set.

4   In the Rule Group frame, select the desired destination Rule Group.

5   Select Replace or Append.

    Replace will overwrite all rules that already exist in the destination rule group. Append will add to the rules already in the destination rule group.

6   Click the Next button.

7   Select the rules to be copied by selecting the check boxes for the desired rules.

8   Click Finish.

To find and replace measures in the copied rules:

1   Click the Find/Replace button.

2   In the Find field enter the portion of the measure you wish to replace.

    Note: The Find function is case sensitive.

3   In the Replace With field enter the measure replacement.

4   Select Forwards or Backwards to search the rules either forwards or backwards in the rule list.

5   Click the Find Next button. The first candidate measure to be replaced will be displayed in the bottom left field.

6   Click the Replace/Find Next button to replace the current candidate measure and display the next candidate measure.
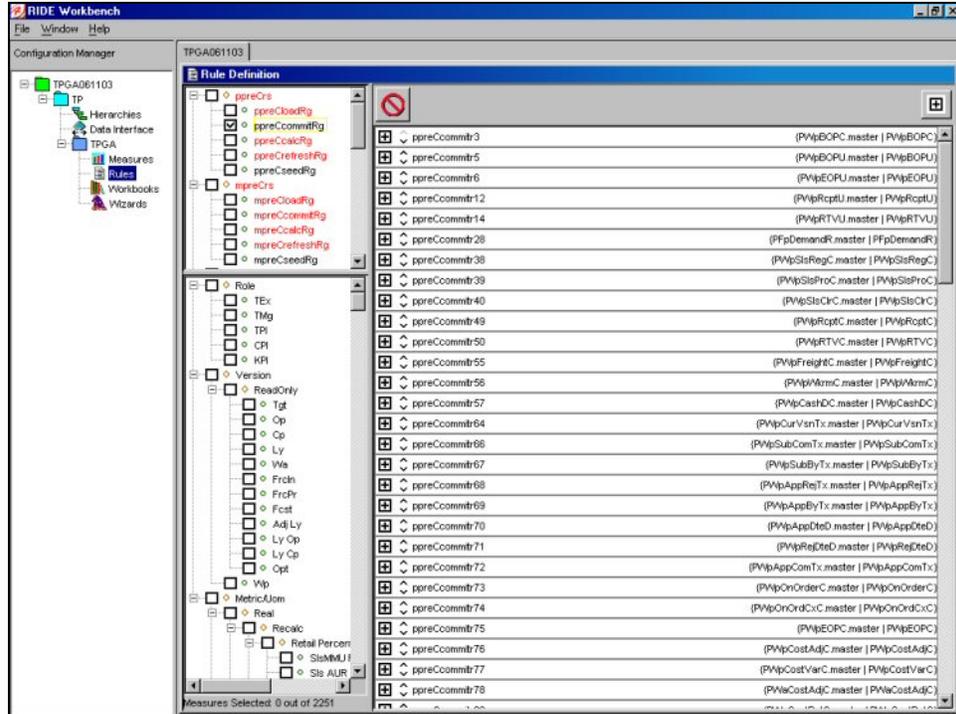
    OR

    Click the Replace All button to replace all instances of the measure.

7   When you are finished, close the Find/Replace box.

8   Click the Finish button.

Example

In the following example, the rules in the *commit* rule group for the ppreCrs rule set are displayed. Because filtering is disabled, all rules in the selected rule group are displayed.

Chapter 7 – Workbooks

Overview

The workbook designer allows you to select and integrate the various components of a workbook template: tabs, worksheets, rule groups, wizards, and workflow processes.

A workbook is the easily viewed, easily manipulated multidimensional framework used to perform specific business functions such as generating trading information and reviewing availability data. To present data, a workbook can contain any number of multidimensional spreadsheets, called worksheets, as well as graphical charts and related reports. All of these components work together to facilitate viewing and analysis of business functions.

A workbook tab is a major subdivision of a workbook. By default, each workbook contains one workbook tab, but it can contain many tabs.

Worksheets are multidimensional spreadsheets used to display workbook-specific information. Workbooks can include one or many worksheets. Worksheets can present data in the form of numbers in a grid, or these numeric data values can be easily converted to a graphical chart.

Wizards are used to build workbooks in the RPAS client. By specifying requested information on wizard pages, a workbook will be created. The workbook designer allows you to specify which wizards will be used to build the workbooks.

Working with workbooks

Creating a workbook

To create a workbook:

1   From the Workbook Designer right-click menu, select New and then select Workbook.

OR

In the Workbook Designer window, click the New Workbook button.

A workbook will be created with one tab and one worksheet.

Editing workbook properties

To edit workbook properties:

1   Select the workbook whose properties you want to edit.

2   Click the Edit Properties button and select the workbook name.

3   In the General tab, type the RPAS Name, User Label, and Group.

4   In the Rules tab, select the Rule Set to use with the workbook.

5   If you do not want to use the default rules associated with the rule set, uncheck the Use Default Rules check box. Then specify the Load Rules, Commit Rules, Calc Rules, and Refresh Rules for the workbook.

Note: If you are setting properties for the first time for a workbook, the next step you would want to take is assigning measures to worksheets. See **Error! Reference source not found.**.

6   In the Default Axis Layout tab, specify the default axis layout to use with all worksheets in this workbook. Hierarchies will be positioned in the worksheet based on this. You can override the defaults by specifying axis information in the worksheet properties.

7   In the Wizards tab, select either the Standard or Custom wizard.

Wizard Type	Procedure
Standard	1. Click on the Advanced button 2. Hierarchies that are used in the base intersections for the measures used in the rule set assigned to the workbook will be displayed. 3. Select the desired dimension from each hierarchy. This will specify the base dimension from which a Workbook can be built in the RPAS client.
Custom	If custom wizard layouts have been defined using the Wizard Designer, click on the pick list and select the custom wizard that you wish to be used to build the Workbook.

8   In the Custom Menus tab, use the right-click menu to add the custom menu.

This tab is optional and is used to create a menu-driven process within the workbook using rule group transitioning. For example, custom menus are used to define an approval process.

Attribute	Description
Menu Label	The name of the menu that will be displayed in the RPAS client.
Label	The label that will be displayed in the menu.
Function	Defaults to RuleGroupProcessor and cannot be changed.
Arguments	The rule groups to be used in the process, separated by commas.

Note: Duplicate label names are not allowed.

9   In the Hier Mods tab, for each hierarchy, enter the dimensions separated by commas.

This tab is optional. The Hier Mods (Hierarchy Modifications) function is used to define the workbook hierarchy structure if different from what is defined using the hierarchy tool. For example, if the Product Hierarchy Dimensions are configured as Dept, Class, Style, Sku, but in the Workbook only Dept and Class need to be visible, Hier Mods would be used.

10 In the Dynamic Hierarchies tab,:

This tab is optional and is used to configure a hierarchy whose member positions are dynamic and not constant. For example, if Cluster is an alternate hierarchy off of Store in the Location Hierarchy, and the stores that are included in the cluster can differ by product

Attribute	Description
Name	The name of the dynamic hierarchy. **Note:** Duplicate names are not allowed.
Measure	Click on the Select Measure button to get a list of the measures used in the Workbook. Double click to select the desired measure.
Label Measure	Enter the label measure.
Measure Hier	Enter the measure hierarchy.
Measure Dim	Enter the measure dimension.
Hier	Enter the hierarchy.
Dim	Enter the dimension.
Modified Dim	Enter the modified dimension.

Note: Measures that have been unrealized, renamed, or invalidated are displayed in red.

11 The measures tab allows you to override the following measure information at the workbook level: Label, Description, Base State, Agg State, UI Type, and Range.

In the Measures tab:

a   Click in the Identifier Column.

b   Click the Select Measure button.

c   Select the desired measure from the list of realized measures used in the rule set assigned to the workbook.

d   Specify the desired attribute information.

12 Click OK to accept the changes you have made.

Removing a workbook

To remove a workbook:

1   Select the workbook that you want to remove.

2   From the Workbook Designer right-click menu, select Remove and then select the workbook name

OR

Click the Remove button and select the workbook name.

3   Click Yes in the Confirm Delete dialog box to delete the workbook. Associated Worksheets and Tabs will also be removed.

Cloning a workbook

To clone a workbook:

1   From the Workbook Designer right-click menu, select Clone and then select the name of the workbook that you want to clone.

A new workbook, which contains the same tabs, worksheets, and properties as the cloned workbook, is created.

2   If necessary, edit the properties of the newly created workbook.

See Editing workbook properties for more information.

Working with workbook tabs

Creating a workbook tab

To create a workbook tab:

1   Select the workbook in which to create a new workbook tab.

Note: A single workbook tab is automatically created when you create a new workbook.

2   From the Workbook Designer right-click menu, select New and then select Workbook Tab.

OR

Click the Create a New Workbook Tab button.

Moving a workbook tab

To move a workbook tab:

1   Select the workbook containing the workbook tab you want to move.

2   Select the workbook tab that you want to move.

3   From the Workbook Designer right-click menu, select Shift Workbook Tab Left or Shift Workbook Tab Right, depending on where you want to move the workbook tab.

OR

Click the Left Arrow or Right Arrow buttons, depending on where you want to move the workbook tab.

Note: You must repeat this step for each position you want to move the workbook tab.

Editing workbook tab properties

To edit workbook tab properties:

1   Select the workbook containing the workbook whose properties you want to edit.

2   Select the workbook tab whose properties you want to edit.

3   From the Workbook Designer right-click menu, select Edit Properties and then select the name of the workbook tab.

OR

Click the Edit Properties button and select the name of the workbook tab.

4   In the General tab, type the RPAS Name and the User Label.

5   Click OK to accept the changes you have made.

Removing a workbook tab

To remove a workbook tab:

1   Select the workbook containing the workbook tab you want to remove.

2   Select the workbook tab that you want to remove.

3   From the Workbook Designer right-click menu, select Remove and then select the name of the workbook tab.

OR

Click the Remove button and select the name of the workbook tab.

4   Click Yes in the Confirm Delete dialog box to delete the workbook tab.

Working with worksheets

Creating a worksheet

To create a worksheet:

1   Select the workbook in which to create a new worksheet.

2   Select the workbook tab in which to create a new worksheet

Note: A single worksheet is automatically created when you create a new workbook or workbook tab.

3   From the Workbook Designer right-click menu, select New and then select Worksheet

OR

Click the Create a New Worksheet button.

Editing worksheet properties

To edit worksheet properties:

1   Select the workbook containing the worksheet whose properties you want to edit.

2   Select the workbook tab containing the worksheet whose properties you want to edit.

3   Select the worksheet whose properties you want to edit.

4   From the Workbook Designer right-click menu, select Edit Properties and then select the name of the worksheet.

OR

Click the Edit Properties button and select the name of the worksheet.

5   In the General tab, type the RPAS Name and the User Label.

6   In the Base Intersection tab, select the measure for the base intersection.

7   In the Axis tab, specify which hierarchies should be assigned to each axis. This setting overrides the default axis information specified in the workbook properties dialog.

8   Click OK to accept the changes you have made.

Removing a worksheet

To remove a worksheet from a workbook:

1   Select the workbook containing the worksheet you want to remove.

2   Select the workbook tab containing the worksheet you want to remove.

3   Select the worksheet you want to remove.

4   From the Workbook Designer right-click menu, select Remove and then select the name of the worksheet.

OR

Click the Remove button and select the name of the worksheet.

Adding measures to a worksheet

To add measures to a worksheet:

1   Check the checkboxes next to the classes in the Selected Class column for the corresponding measures to add. The matching measures will appear in the Matching Measures column as the classes are checked. Only realized measures will be displayed.

2   Select the measures to add from the Matching Measures column.

3   Drag and drop the measure into either the Viewable or Default column.

If a measure is added to the Default column it will also be added to the viewable column in bold font.

The default profile contains the list of measures that will initially be displayed for this worksheet in the RPAS client. The viewable profile contains the list of measures that are not initially displayed, but that the RPAS client user can add to be displayed in their view of the worksheet. There is also a third category of measures that cannot be viewed in the workbook designer – hidden measures. Measures that are considered hidden are those that are used in the rule set assigned to a workbook, but that are not assigned to any of the profiles in any of the worksheets contained in that workbook. This might include measures that are used purely for calculation purposes and would have no usefulness to the RPAS client user.

Example

The following example shows a solution with several workbooks. The View Targets tab on the Manager Pre Season workbook is open. The workbook tab has one worksheet, also called View Targets.

Chapter 8 – Wizards

Overview

The wizard designer allows you to define the graphical wizard layout for custom wizards .

Working with wizards

Creating a wizard

To create a new wizard:

1   In the Wizard Designer window, click the Create a New Wizard button.

Creating a wizard page

To create a new wizard page:

1   In the Wizard Designer window, click the Create a New Wizard Page button.

2   Click one of the following buttons, depending on which control you want to add:

Button	Description
Add a label	A non-editable text field.
Add a button	A button that performs an action when the user clicks it (for example, Save, Cancel, or Next).
Add a radio button	Used to select one option from a group of options, when only one can be specified.
Add a check box	Used to select from a group of options when one or more can be specified.
Add a combo box	The user can select from choices presented on a drop-down list.
Add a text box	A single- or multi-line text field that the user can edit.

3   Click on the wizard page grid to place the selected control on the page.

4   If necessary, reposition the control by dragging it to the appropriate place on the grid.

Editing control properties

To edit control properties:

1   On the wizard page, click the control whose properties you want to edit.

2   Type the appropriate information for each of the following fields:

Field	Description
type	The control type.
text	The text to be displayed on the control label.
name	The RPAS internal name of the control.
locx	The x coordinate of the control on the wizard page. The value of this field is automatically changed when you move the control using your mouse.
locy	The y coordinate of the control on the wizard page. The value of this field is automatically changed when you move the control using your mouse.
width	The width of the control, in pixels.
height	The height of the control, in pixels.

Example

In the following example, a wizard with one wizard page is displayed. At this point, the page has two buttons, Next and Cancel. The information for the wizard, wizard page, and selected component (Next button) is displayed in the left pane of the Wizard Designer window.
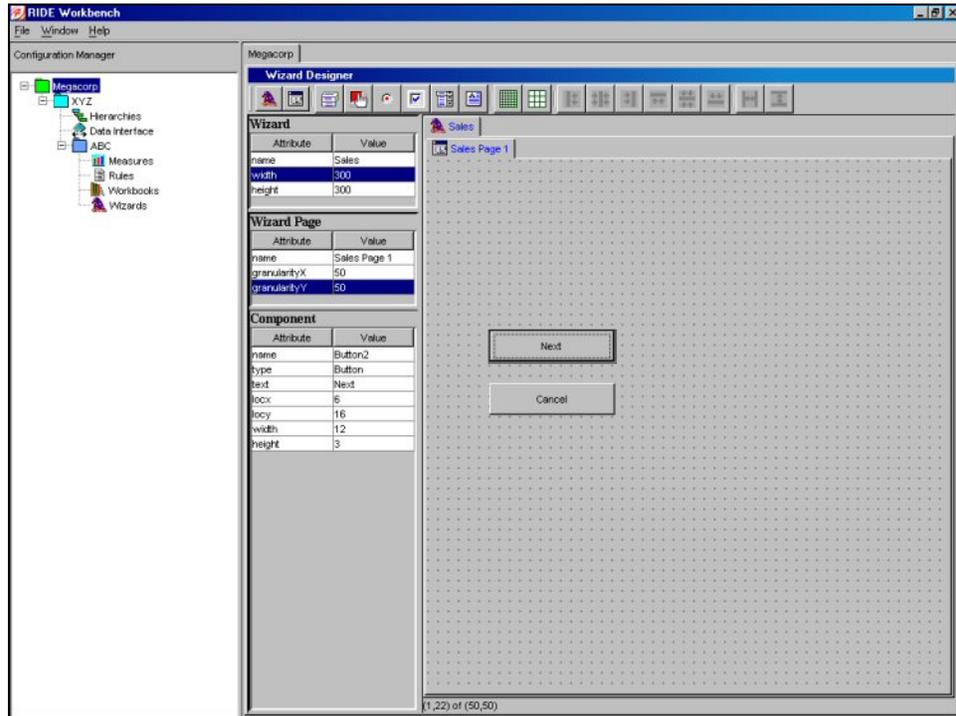
Chaper 9 – Using the Data Interface Tool

Overview

The data interface tool is used to specify the data import files from which measure data will be loaded.

Working with the Data Interface Manager

To specify where measure data is loaded from:

1   Click the New Measure button. The list of realized measures defined in the measure tool is displayed.

2   Select the desired measure and click OK.

3   If the measure load intersection is different from the measure base intersection, click on the Load Intersection field and select appropriate dimensions using the list boxes.

4   Enter the file name from which data for the measure will be loaded.

5   Enter the file start position for the measure data.

6   Enter the file column width for the measure data.

Chapter 10 – Building an RPAS domain

Overview

This chapter provides detailed instructions for how to create an RPAS 11 domain using an existing configuration created using the configuration tools.

Because building an RPAS domain is currently a manual process, the person building the domain should be skilled in administering UNIX or NT servers and should have scripting skills.

This chapter contains the following sections:

- Prerequisites

- Client-side procedures

- Server-side procedures

- Loading measure data.

Prerequisites

The following prerequisites are required before beginning the domain build process:

- Installation of RPAS on your server. Refer to the *RPAS 11.0.3 Installation Guide* for more information.

- Installation of the Configuration Tools on your server. Refer to the *RPAS 11.0.3 Installation Guide* for more information.

- Pre-existing configuration built using the Configuration Tools

Client-side procedures

Step 1: Create the Configuration

To begin the domain build process, you need to start with a configuration that was built using the Configuration Tools. You can use a purchased configuration or create a new one with your specific hierarchies and measures. If you are creating a new configuration, be sure to note the path where your configuration is saved on your local disk. Once you have your configuration ready, continue with the following steps to build the domain.

Note: In your configuration, if you create a measure that requires a database, you need to specify the database as **data/dbname**. If you do not specify the *data* part of the path, then the measure database will be built directly under the domain root.

Step 2: Zip up the Configuration folder

1   Find the location where you saved your configuration.

2   Using Windows Explorer, go to the path of the configuration.

3   Right-mouse click on the Configuration folder, and select Add to Zip. You
    should zip up the entire contents of the Configuration beginning with the
    Configuration root folder such that the zip file will include the Project(s) and
    Solution(s). It is important that you zip up the entire Configuration for the
    entire directory structure and not just the specific .xml files.

    In the example below, you should click on TPGA to highlight the folder, then
    right-mouse click and select **Add to TPGA.zip**.

    📁 Configurations   (directory for all configurations)

       📁 TPGA   (Configuration Name directory)

          📁 TP   (Project directory)

             TPGA.xml   (Configuration .xml file)
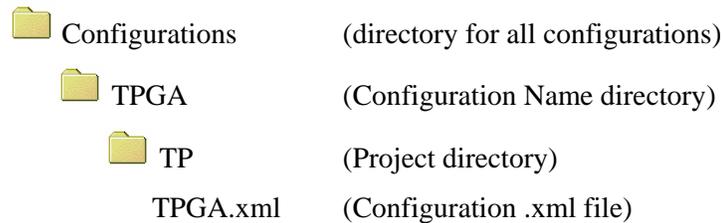
4   Using FTP, transfer the <Configuration>.zip file over to the server in binary
    mode. You can place it in your home directory for now.

Server-side procedures

Note: The configuration tools are supported on all platforms (Sun, HPUX, AIX,
and NT); however, they require Java v1.4 or higher. Make sure that the server
you will be using has this version of Java.

Step 1: Unzip the configuration file

1   Find the location where you want to put your configuration file.

2   Move the <Configuration>.zip file to this location.

3   Unzip the <Configuration>.zip file using the UNIX command:

    ```
    unzip –a <Configuration>.zip
    ```

Step 2: Verify the environment variable settings

Prior to beginning this step, you should have installed RPAS and the Configuration Tools on your server. During that process, you should have set up the necessary environment variables for RPAS and the Configuration Tools. Refer to the *RPAS 11.0.3 Installation Guide* if the environment variables below have not been set up.

Log into the server. Use the commands below to verify your environment settings:

```
echo $RPAS_HOME

echo $RIDE_HOME

echo $JAVA_HOME

echo $PATH
```

Note: The path for the RPAS_HOME variable changes with each new RPAS release.

If you make any changes to the environment variable settings, remember to exit and restart your UNIX session in order to execute your .profile and make the changes effective. This step is very important before you continue to the remaining steps.

Step 3: Get the input files ready

1   Designate a directory for the location of your input files, and move your files into this directory.

As a recommendation, Retek Services has used the directory name **to_rpas** as a standard for the location of input files. At a minimum, the hierarchy files (product, location, and calendar hierarchy files) are needed to build the domain. At this time, a calendar file must be loaded.

2   If necessary, rename the hierarchy files to **prod.dat**, **loc.dat**, and **clnd.dat**. These file names are required. The format of these files must match the hierarchy configuration specified using the configuration tools.

Step 4: Build the domain

Run the **rpasInstall** script to build the domain. This executable is located in the path to $RIDE_HOME/bin. The syntax for the rpasInstall script is as follows:

```
rpasInstall [-testinstall | -fullinstall | patchinstall]
-cn <config_name> -ch <config_home> -dh <domain_home>
-in <input_directory> [-rf <function_name>]
[-am <measure_attribute>] -log <logfile_name>
```

where:

Argument	Description
-testinstall	Optional. Used for testing, it just generates configuration files.
-fullinstall	Builds a full domain and loads the hierarchy files.
-patchinstall	Updates or unregisters and reregisters measures that have changed.
-cn config_name	Specifies the name of the configuration.
-ch config_home	Specifies the directory containing the root directory of the configuration.
-dh domain_home	Specifies the directory in which domains will be built (not the domain root).
-in input_directory	Specifies the name of the directory containing the input files.
-rf function_name	Optional. The filename of the function to register. It is case sensitive.
-am measure_attribute	Optional. The measure attribute name.
-log logfile_name	Specifies the name of the logfile.

rpasInstall options

Note: The **–testinstall**, **-fullinstall**, and **–patchinstall** options are all optional parameters, although one of them *must* be specified for the rpasInstall command.

–testinstall

The –testinstall option should only be used for a new domain. It only generates the configuration files, meaning it creates the domain shell with only the repos and setup directory. Because it does not build out the domain, it runs very fast. Within the setup directory, the configuration will be converted into the **init_hparm.mspl** file, which is a text version of the long-used standard procedure asetup.init_hparm, to be loaded into the domain.

–fullinstall

The –fullinstall option will build a pristine domain with only the hierarchy input files. It does not load measure data.

–patchinstall

The –patchinstall option will update the measure attributes that are indeed updateable without impacting any previously loaded data.

> **Warning:** For those measure attributes that are **NOT** updateable, the –patchinstall option will unregister the measure and re-register it, thus losing any previously loaded data. Please refer to the list of measure attributes in the *RPAS Developer's Guide* as to which measure attributes are updateable and which ones are not. The Configuration Tools will allow you to update all of the attributes, but the Installer will determine whether the measure must be unregistered or not depending on whether the attribute is updateable or not. The –patchinstall option will not rebuild the domain. Please be aware that by unregistering a measure, all data that has been stored for that measure will be permanently deleted from the domain. Any data for that measure will have to be re-loaded into the domain.

–cn config_name

The –cn config_name option is used to specify the name of the configuration (without the .xml extension) that you specified in the Configuration Tools. This is also known as the root directory for the configuration. So, in the example above, the name of the configuration is TPGA. For this option, you should *not* specify the path leading up to configuration directory name as that is specified using the –ch config_home option. The –cn config_name option is required.

–ch config_home

The –ch config_home option is used to specify the full directory path leading up to the configuration name. Do not include the configuration name as part of this option. This is the path that contains your configuration located on the server where you unzipped it, not including the configuration directory name. The –ch config_home option is required.

–dh domain_home

The –dh domain_home option is used to specify the directory path where the domain(s) will be built. This directory MUST already exist. Therefore, you must manually create it. Within the domain_home path, a directory will be created with the name of the configuration, and then within that directory, a subdirectory will be created for each Project. You do not specify the name of the domain root as it will use the name of the Project that you specified in the Configuration Tool to be the name of the domain root. The –dh domain_home option is required.

–in

The –in option designates the location of the input_directory, which is the directory path that contains the hierarchy files to load or the measure registration file. The –test option should not be specified if the input_directory parameter is specified. The –in input_directoy option is required if the –fullinstall option is used. Otherwise, it is optional.

–rf register_function

The –rf register_function option is used to specify the name of the function that you want to register. This option should be used to register a shared object file that is located in the RPAS_HOME/applib directory and is not automatically validated by the RPAS JNI file. Currently, the Forecast procedure must be registered using this option if it is used in a rule within the configuration. When you specify the function name with this option, do not include the *lib* or *.so* part of the function name. The –rf option is an optional parameter.

–am attribute_measure

The –am attribute_measure option is used to specify the name of the attribute measure to register. The –am attribute_measure option is an optional parameter.

–log

The –log option designates the path and logfile_name that will contain output from the domain creation process. The logfile will be located in the directory from where the Installer is initiated, meaning the present working directory, if a path is not specified. There will be output from the Installer in the window from where the process is initiated. You can use the UNIX command: `tail -f logfile` to view the logfile as the process is executing.

At a high-level, the **rpasInstall** script performs the following functionality automatically:

- Creates a "pristine" domain or shell domain without any data or hierarchy files loaded – only contains source and application extension code

- Builds the hparm configuration file

- Builds the measure configuration file

- Builds the rule configuration file

- Executes abatch.create, which loads in hierarchy files

- Registers measures, rules, and templates

Note: The rpasInstall script only loads the hierarchy files and builds the domain. It does not load any measure data. The hierarchy files are copied to the `/input/processed` directory of the domain and appended with a time-date stamp.

You should execute this script in the path where your configuration is located (see Step 1 above). For ease of execution, we recommend creating a script to execute the rpasInstall command. Remember to change the permissions of the file to executable permissions (that is, 755). You must also add lines before and after the rpasInstall call to set the usermode to single for better domain build performance.

For example, here is a script called **createDomain.sh**:

```
export USERMODE=SINGLE

rpasInstall –fullinstall -cn TopPlan –ch /test/Config
-dh /test/domains –in /test/to_rpas -log rpasInstall.log

export USERMODE=
```

Validate Domain Build Results

Once the domain build process finishes, you should check the logfile to verify that the process executed successfully. You should search for the words **ERROR** and **FAILURE** inside the logfile. The end of the logfile should look similar to the output below:

```
Time: 58.451


COMPLETE (23 tasks)

Warnings: 0
```

Applying Patches

When there is a new release of the RPAS Configuration Tools, you will replace the entire Tools directory with the new release. We recommend that you make a backup copy of your pre-existing configuration before using it with the new Tools release.

In order to patch your domain with changes to your configuration, use the –patchinstall option when running the Installer. We recommend that you first make a backup of your domain before applying patches.

Also, be careful to run the –patchinstall option in order to patch a domain instead of the –fullinstall option.

Loading measure data

> **Note:** This step is optional. If you have already purchased a solution template that contains a script to load data, you can skip this section and proceed with the installation process of your solution template.

The measure configuration is stored in the */repos/measures* directory of the domain in a file called **<*Solutio*n>_meas.cfg**. Similarly, the rules will be stored in a **<Solution>_rule.cfg** file and the templates will be stored in **<Solution>_tmpl.cfg**.

The configuration files will be used to register the measures when the domain is created.

As an interim solution, below is the process to load measure data.

1   Move the data files to the /input directory of the domain. They must have a valid measure filename, such as xxx.ovr, xxx.rpl, xxx.inc, or xxx.clr, where xxx is the measure name.

2   Use the *loadMeasure* utility to load your data. LoadMeasure should be in your path, meaning that you can run it from any directory. The syntax for loadMeasure is as follows:

loadMeasure –d domainPath –m measName (–l | –a) {–u user:password}

Argument	Description
–d domainPath	Specifies the domain in which to load the measure.
–m measName	Specifies the name of the measure to load. The name should be lowercase.
–l	Use this argument to load the named measure.
–a	Use this argument to apply any staged loads for the named measure.
–u user:password	Specifies an Acumate user and password. If –u is not specified, adm is used.

The loadMeasure utility must be used for each measure for which you want to load data. It is recommended to redirect the output to a log file.

For example:

```
loadMeasure -d /domains/D01 -m rsal -l >
/domains/logs/rsal.log.d01 &
```

After building the domain

After building the domain and loading measure data, the next steps are as follows:

- Use the RPAS Configure utility to denote the location of the domain on the server and designate a DomainDaemon port number. See The Configure utility in Chapter 11.

- Execute a DomainDaemon process with the port number specified in the Configure utility. Refer to the *RPAS 11.0.3 Administrator's Guide* for instructions on executing the DomainDaemon.

- View the domain using the RPAS client. Set up the appropriate permissions on the measures in the domain using the Measure Administration workbook and then view the measures by building a Measure Analysis workbook. Refer to the *RPAS 11.0.3 Administrator's Guide* for instructions on using these workbooks.

Chapter 11 – Configuring the RPAS client

After creating an RPAS domain and starting the DomainDaemon, you must configure the RPAS client to connect to the domain. This section provides instructions for configuring the Windows client and configuring the Web client. For details on installing the Windows client and Web client, refer to the *RPAS 11.0.3 Installation Guide*.

Configuring the Windows client

The Configure utility

Configure® is a Windows® application that configures the client/server communication for RPAS. Configure lets users specify communication parameters and produces files that are used as input to the client. These files must be in FCF (Foundation Configuration File) format. The files contain the necessary information for the client to start up the communication with the server. These files can be stored on the client machine or on the network. When the client is executed, a file named Foundation.FCF is expected in the same directory. If the file has a different name or if it is stored somewhere in the network, then the path to this file must be passed in as an argument to the client.

Configure consists of a menu bar, a main view and the advanced settings dialog box.

To launch Configure, double-click the Configure.exe file.

The Menu bar

The files produced by Configure may contain multiple connections. Each connection will be specific for a server with certain communication settings. Connections need to have unique descriptions, and they can be added and deleted using the menu bar.

Configure menu bar

The Main view

The main view has the basic connection parameters. On this view, three groups of controls are available:

- The connection group

- The domains group

- The Advanced Settings dialog

The Connection group

Field	Description
Database server	The hostname or the IP address of the server. Example: atldev03 or 10.2.1.23
Daemon port	The port number on which the domain daemon is listening. Must be an integer between 2048 and 65535. Example: 55278

The Domains group

Field	Description
Domain	The name of the domain. Select a domain from the list or type the name of a new domain and click Add Domain. You can delete a domain from the list by selecting it and then clicking Delete Domain.
Domain path	Domain path is the full path to the directory containing the domain. Example: /acufs001/atltest/topplan
User	The database user that is specified for the domain. Example:adm
Password	The database password that is specified for the domain. Example:adm

The Advanced Settings dialog

Default database login

Field	Description
User	The database (Acumate) user that will be used by the client if a domain specific user has not been entered. Example: adm
Password	Like the default database user, default database password will be used if a domain specific password has not been entered. Example:adm
Database port range	Port range is used to specify the range of ports on which the Acumate processes will be started by the DomainDaemon. The port start and port end fields are the lower and upper limits of this range respectively. These fields must be integers between 2048 and 65535. Example:Start: 40000End: 45000
Compression threshold	The number of bytes above which client and server will be using compression. Only advanced users should be manipulating this number.

Web tunnelling

Web tunneling is not currently supported in RPAS 11.0.

Proxy settings

Proxy settings are not currently supported in RPAS 11.0.

Language configuration

By default, the language of the RPAS client is determined by the language of the client-side operating system. You can override this behavior by setting the Language entry in the Options section of the foundation.ini file, like this:

```
[Options]

Language=10
```

If the RPAS client cannot find the library for the language you specify, it will default to English. The following languages are currently supported:

Language	Code
Korean	18
English	9
Spanish	10
French	12

Configuring the Web client

1   Click **Domains** on the Administration Console to open the RPAS Domain
    Configuration window. This window allows specification of the location of
    RPAS domains. Each domain that can be accessed by a user must be
    specified with the dialog.

RPAS Domain Configuration Window

2   To add a new domain, click **New**, enter the following information, and then click **Confirm**.

Field	Description
Description	This is displayed to a user when they are selecting a domain to log in to. Required.
Path	The full path to the directory containing the domain on the database server. Required.
Database Server Name	The hostname of the database server containing the domain. Required.
Daemon Port	The port number of the DomainDaemon process running on the database server. Required.
Staging Prefix	Only used by retail.com deployments. This can be set to anything you wish.
Memory Size	Leave blank. Not used right now.
Start Port	Start of the range of ports used by a client PC to connect to the database server. This must be > 1025. If not specified, The RPAS database server will try to find a free port whenever a client connects.
End Port	End of the range of ports used by a client PC to connect to the database server must be < 65536.
Client Version	Leave blank. Not used right now.

3   To change an existing domain configuration, select the domain from the Domains list, modify any of the fields, and click **Confirm**. If you click **Cancel**, any changes you have made are discarded.

4   If you click **Delete**, you delete the currently selected domain configuration.

5   To copy all of the domain settings, select a domain from the Domains list and click **Copy**.

To update the selected domains settings with the copied settings, select another domain and click **Paste**.

Appendix A – Translation configuration

Overview

String translation must be performed manually. This appendix describes the process for finding strings to be translated.

Procedures

The procedure for string translation within RPAS is in three parts:

1   Analyze the string in question to determine if it needs if it needs to be translated, and, if so, the best approach to take.

2   Place the string into the appropriate input file templates.

3   Insert the appropriate RPAS library invocations to dynamically build the string.

Analyzing the string

Follow these steps to analyze the string:

1   Determine if the message in question has direct meaning to the end-user (rather than just to RPAS developers or application developers). If so, the message should be translated.

> **Note:** If your schedule demands are such that you do not have time to prepare your string for translation, we suggest using the utility wrappers **LanguageManager::needToTranslate()** and **LanguageManager::englishOnly()** to temporarily designate your string. You can use other methods, such as special TODO comments that can be searched for later.

2   Are there simple variable substitutions for the string, such as names or numbers? If so, these can be parameterized using the **%*n*** notation. For example:

```
String(firstName + lastName + " purchased " + amount + "
shares today.")
```

will eventually become

```
%1 %2 purchased %3 shares today.
```

in the messages overlay file.

3   If, however, your message string depends on certain conditions in order to be formulated, such as

```
String(firstName + lastName + " will be coming in " +
(arrivalTime <= 8 ? "early" : "late") + " today.")
```

it becomes a bit trickier to translate. In theory, one could turn **early** and **late** into separate resources, then develop the message as

```
%1 %2 will be coming in %3 today.
```

but this assumes that the language in question doesn't have a peculiar translation rule for what seems to us to be a polar opposite situation, *e.g.*,

```
Joe Smith will be coming in early today.
```

```
Joe Smith will be late coming in today.
```

I don't think this would happen for this particular case, but it is conceivable for non-English languages to use grammatical rules unfamiliar to English-speakers for even slightly more complex cases. So rewriting the string composition code as

```
arrivalTime <= 8 ?
```

```
String(firstName + lastName + " will be coming in early
today.") :
```

```
String(firstName + lastName + " will be coming in late
today.")
```

may be more appropriate.

Adding the string to resource files

1   In *wherever_your_data_file_templates_are*/**input**, there are two types of files that are specifically configured to handle localizable messages: **msgs.dat** and **r_msgt.ovr.***language*.

Choose a unique identifier for your message string. Prepend an application-specific acronym to whatever ID you use (for example, ASO_NO_LOC_SELECT).

Note: RPAS core message IDs are prepended with **R_** to delineate them from messages that others might add.

2   Add this identifier, along with a *short* description, to **msgs.dat**.

Important: This input file has a fixed-width column format. Make sure you have enough trailing spaces at the end of the description to match the other entries already there. You can use `wc -lc filename` to return the number of lines and characters, respectively, in the file in question. Then, ensure that the resulting division does not have a remainder.

3   Add the message ID and corresponding resource string to the appropriate **r_msgt.ovr** file. Adding a resource here is slightly trickier. You are still dealing with a fixed-width file, except now the line lengths are considerably longer, exceeding the 80-column width that you might be used to in a terminal window or text editor.

4   If the string in question represents a *dimension label*, then you will only need to modify the appropriate **r_dimt.ovr.***language* file, *not* the **r_msgt** files. These files are even trickier, as there are no spaces between the four-character dimension label ID and the label itself. The good news is that the label ID does not require a separate entry in a **dims.dat** file (or **msgs.dat**, for that matter).

Adding the C++ code to build the string

1   This only applies to messages. Dimension labels, as well as other types of RPAS object labels, are handled implicitly within the RPAS infrastructure.

2   Your source code should include <rpas/LanguageManager.h> if it doesn't already.

3   Next, grab the message resource in question, using the message ID you previously created:

```
String msgTemplate =
LanguageManager::instance().getMessage("ASO_NO_LOC_SELEC
T");
```

4   If the resource didn't have any parameters, you're done. Otherwise, what you have is a string format, requiring further processing. For example, if your message required three separate parameters:

```
String::StringVectorT msgParms;

msgParms.push_back(firstName);

msgParms.push_back(lastName);

msgParms.push_back(amount.toString());

String msgFormatted =
msgTemplate.formatMessage(msgParms);
```

Appendix B – Configuring planning solutions with Forecast procedure

Forecast Procedure Syntax

Syntax Legend

[…] all options listed in brackets are optional

{…|…} options listed in "{}" with "|" separators are mutually exclusive (either/or)

{…,…} options listed in "{}" with "," separators way are a complete set.

Bold – labels

Italics – indicates a temporary placeholder for a constant or a measure (will end with 'meas')

Italics/meas – indicates that the placeholder can be either a constant or a measure.

BoldItailics – indicates a numeric placeholder for the dynamic portion of a label. Usually a number from 1 to N

Normal – normal text that has to be there.

<u>Underlined And Large font</u> – Used to identify the function name.

Syntax

FORECAST: *FORMEAS* [, **INT**: *INTMEAS*, **CUMINT**:*CUMINTMEAS*, **PEAKS**:*PEAKSMEAS*, **CHMETHOD**:*METHMEAS*, **CHLEVEL**:*LVLMEAS*, **CHTREND**:*TRENDMEAS*, **ALERTS**:*ALERTSMEAS*] <- <u>FORECAST</u>(**MASK**:*MEASKMEAS*, {**STARTDATE**:*STARTDATE* | **STARTDATEMEAS**:*STARTDATEMEAS*}, **FORECASTLENGTH**:*FORECASTLENGTH*, **PERIOD**:*PERIOD* [

[,{**PROMO_*0***:PROMO0*, **PROMOEFF_*0***:*PROMOEFF0*, **PROMOOVER_*0***:*PROMOOVER0,* **PROMOTYPE_*0***:*PROMOTYPE0*} … {,**PROMO_*N***:PROMON, **PROMOEFF_*N***:*PROMOEFFN*,**PROMOOVER_*N***:*PROMOOVERN,* **PROMOTYPE_*N***:*PROMOTYPEN*}],

HISTSTART: *HISTSTARTMEAS*, {**FRCSTSTARTMEAS**:*FRCSTSTARTMEAS* | **FRCSTSTART**:*FRCSTSTART*}, **MINWINTERS**:*MINWINTERSMEAS*, **MINHOLT**: *MINHOLTMEAS*, **MINCROSTON**:*MINCROSTON*, **MAXALPHA**:*MAXALPHA*, **MAXWINTERSALPHA**:*MAXWINALPHA*, **MAXPROFILEALPHA**:*MAXPROFILEALPHA*, **BAYESALPHA**:*BAYESALPHA*, **TRENDDAMP**:*TRENDDAMP*, **VALID_DD**:*VALID_DD*, **PROMO_IN_BASELINE**:*PROMO_IN_BASELINE*, **PLAN**:*PLAN*, **PROFILE**:*PROFILE*, **DDPROFILE**:*DDPROFILE*, **VERBOSE**:*VERBOSE*, **CUSTOMERID**:*CUSTOMERID*, **AGGPROF**:*AGGPROF*, **SPREADPROF**:*SPREADPROF*, **READMODE**:*READMODE*, **BAYESIAN_HORIZ**,*BAYESIAN_HORIZ*, **MINB**:*MINB*, **MAXB**:*MAXB*, **KEEPCLAMPEDMAXB**:*KEEPCLAMPEDMAXB*, **SMOOTHBASELINE**:*SMOOTHBASELINE*, **CAUSALMERGE**:*CAUSALMERGE*, **CAPS**:*CAPSMEAS*, **CAPRATIOS**:*CAPRATIOSMEAS*, **USECAPPING**:*USECAPPING*, **MINCAPHIST**:*MINCAPHIST*, **PLANINT**:*PLANINTMEAS*, **PLANCUMINT**:*PLANCUMINTMEAS*]

Examples

Example 1: startdate as string

```
FORECASTOUT <-FORECAST(BAYESALPHA:0.15, FORECASTLENGTH:12,
HISTORY:RSAL, MASK:METHMASK1, MAXALPHA:0.99, MAXB:50,
MAXWINTERSALPHA:0.99, MINCROSTON:5, MINHOLT:13,
MINWINTERS:104, PERIOD:52, PLAN:BAYES_PLAN1,
SMOOTHBASELINE:TRUE, STARTDATE:"D19980505", TRENDDAMP:0.5,
HISTSTART:H_STARTDATE1, FRCSTSTART:F_STARTDATE1)
```

Example 2: startdate as parameter measure

```
FORECAST:FORECASTOUT <-FORECAST(BAYESALPHA:0.15,
FORECASTLENGTH:12, HISTORY:RSAL, MASK:METHMASK1,
MAXALPHA:0.99, MAXB:50, MAXWINTERSALPHA:0.99, MINCROSTON:5,
MINHOLT:13, MINWINTERS:104, PERIOD:52, PLAN:BAYES_PLAN1,
SMOOTHBASELINE:TRUE, STARTDATEMEAS:TODAY*, TRENDDAMP:0.5,
HISTSTART:H_STARTDATE1, FRCSTSTART:F_STARTDATE1)
```

Example 3: getting multiple results

```
FORECAST: FORECASTMEAS,  INT:INTMEAS,  CUMINT:CUMINTMEAS,
PEAKS: PEAKSMEAS <-FORECAST(BAYESALPHA:0.15,
FORECASTLENGTH:12, HISTORY:RSAL, MASK:METHMASK1,
MAXALPHA:0.99, MAXB:50,  MAXWINTERSALPHA:0.99, MINCROSTON:5,
MINHOLT:13, MINWINTERS:104, PERIOD:52, PLAN:BAYES_PLAN1,
SMOOTHBASELINE:TRUE, STARTDATEMEAS:TODAY*, TRENDDAMP:0.5,
HISTSTART:H_STARTDATE1, FRCSTSTART:F_STARTDATE1)
```

Forecast Parameter Table

Parameter Legend

Left Hand Side – Label identifies a Left Hand Side(LHS) Parameter. In other words, these are the labels identify output parameters that will appear on the left hand side of the equal sign. Otherwise the parameter is Right Hand Side(RHS) or input parameter.

Required – Label identifies required parameters.

Measure – Indicates whether the parameter is expected to be a measure or not.

Allowed to be Multiple – Allowed to be multiple measures.

Forecast Parameters

Label	Parameter/ Result	Required	Measure	Allowed to be multiple	Type	Description
ALERTS	RESULT	N	Y	Y	?	Not needed for Planning Configuration
CHALPHA	RESULT	N	Y	N	double	ES alpha
CHLEVEL	RESULT	N	Y	N	int	ES level
CHMETHOD	RESULT	N	Y	N	int	Chosen method, Refer to Forecast Model/Model List table.
CHTREND	RESULT	N	Y	N	double	ES trend
CUMINT	RESULT	N	Y	N	double	Cumulative interval forecast
FORECAST	RESULT	Y	Y	N	double	Measure forecast result is located
INT	RESULT	N	Y	N	double	Interval forecast
PEAKS	RESULT	N	Y	N	double	Peaks… for calculating baseline of forecast
AGGPROF	PARAMETER	N	Y	N	double	Profile to aggregate promotions to source level
BAYESALPHA	PARAMETER	N	N	N	double	Max Bayesian alpha
BAYESIAN_HORIZ	PARAMETER	N	Y	N	int	Horizon to which the Bayesian adjustment is applied
CAPRATIOS	PARAMETER	N	Y	N	double	Cap ratio for each time series
CAPS	PARAMETER	N	Y	N	double	Caps for each time series
CAUSALMERGE	PARAMETER	N	N	N	?	Not needed for Planning Configuration
CUSTOMERID	PARAMETER	N	N	N	string	Must be valid
DDPROFILE	PARAMETER	N	Y	N	double	Deseasonalized demand measure for profile-based forecasting
FORECASTLENGTH	PARAMETER	Y	N	N	int	Length of forecast
FRCSTSTART	PARAMETER	N	N	N	datetime	Forecast start date

Label	Parameter/ Result	Required	Measure	Allowed to be multiple	Type	Description
FRCSTSTARTMEAS	PARAMETER	N	Y	N	datetime	Measure of forecast start dates
HISTORY	PARAMETER	Y	Y	N	double	Input measure forecast is based on
HISTSTART	PARAMETER	N	Y	N	double	Historical startdate
KEEPCLAMPEDMAXB	PARAMETER	N	N	N	double	Whether variables exceeding minb are clampled or values are dropped and regression is re-run
KEEPCLAMPEDMINB	PARAMETER	N	N	N	double	Whether variables exceeding minb are clampled or values are dropped and regression is re-run
MASK	PARAMETER	Y	Y	N	bool	Array identifying what forecast method is used for each time series. Please see the Method list. Refer to Forecast Model/Model List table.
MAXALPHA	PARAMETER	N	N	N	double	Max alpha parameter
MAXB	PARAMETER	N	N	N	double	Maximum ratio between beta and baseline
MAXPROFILEALPHA	PARAMETER	N	N	N	double	Max alpha for profile method
MAXWINTERSALPHA	PARAMETER	N	N	N	double	Max alpha in Winters method
MINB	PARAMETER	N	N	N	double	Minimum ratio between beta and baseline
MINCAPHIST	PARAMETER	N	N	N	double	Minimum number of weeks before capping can be used.
MINCROSTON	PARAMETER	N	N	N	int	Min Croston history
MINHOLT	PARAMETER	N	N	N	int	Min Holt history
MINWINTERS	PARAMETER	N	N	N	int	Min winters history

Label	Parameter/ Result	Required	Measure	Allowed to be multiple	Type	Description
PERIOD	PARAMETER	Y	N	N	int	Forecasting period for calculating seasonal coefficients
PLAN	PARAMETER	N	Y	N	double	Plan measure
PLANCUMINT	PARAMETER	N	Y	N	double	Cumulative Interval of the plan associated with the plan(PARAMETER forecast). Bayesian only.
PLANINT	PARAMETER	N	Y	N	double	Interval of the plan associated with the plan(PARAMETER forecast). Bayesian only.
PROFILE	PARAMETER	N	Y	N	double	Seasonal profile measure
PROMO	PARAMETER	N	Y	Y	int	Promo variable measure(one for each promotion)
PROMO_IN_BASELINE	PARAMETER	N	Y	N	bool	Indicator that says if the promotion is incorporated in the baseline
PROMOEFF	PARAMETER	N	Y	Y	double	The effect of the promotion (written)
PROMOOVER	PARAMETER	N	Y	Y	bool	Promo effect override measure (one for each promotion)
PROMOTYPE	PARAMETER	N	Y	Y	int	Promo type measure (one for each promotion)
READMODE	PARAMETER	N	N	N	int/enum	Whether mode is Random or Sequential.
SMOOTHBASELINE	PARAMETER	N	N	N	bool	
SPREADPROF	PARAMETER	N	Y	N	double	Profile to spread forecast to final level
STARTDATE/ STARTDATEMEAS:	PARAMETER	Y	N	N	date as string/ date as measure	Forecast start date . This or startdatemeas is required

Label	Parameter/ Result	Required	Measure	Allowed to be multiple	Type	Description
TRENDDAMP	PARAMETER	N	N	N	double	Trend damping parameter
USECAPPING	PARAMETER	N	N	N	bool	Boolean associate with each time series whether capping is used or not.
VALID_DD	PARAMETER	N	N	N	int	Max non-zero history to use deseasonalized demand value for seasonal profile-based forecasting
VERBOSE	PARAMETER	N	N	N	bool	A lot of debugging information will be printed

Forecast Method/Model List

Model	Numeric Value
FORECAST	1
SIMPLE	2
HOLT	3
WINTERS	4
CAUSAL	5
AVERAGE	6
NO FORECAST	7
COPY	8
CROSTON	9
M. WINTERS	10
A.WINTERS	11
SIMPLE CROSTON	12
BAYESIAN	13
LOADPLAN	14
PROFILE	15
SPREAD	16
NN	17

Parameter/Model Dependencies

The following is a list of models and the labels of the parameters that are required for the model to work.

Bayesian – plan

MWinters -

Forecast Procedure Configuration Notes

Note: The following notes are intended to serve as a guide for configuring the Forecast procedure within the configuration tools. For specific information on the Forecast procedure itself please contact the RDF team.

- The following syntax must be used within the rule:

  ```
  forecast <- Forecast(…)
  ```

- This rule will remain red indicating that it is invalid since the RPAS JNI cannot validate it at this point in time. Therefore, there is no validation for this rule. Please refer to the Forecast documentation for the appropriate input parameters and output measures.

- The resultant measure (that is, frcstout) should be at the same intersection as your history measure (that is, pos). This will be the baseintersection of the final level.

- The Forecast procedure is a multi-result procedure, meaning that it can return multiple results with one procedure call within a rule. In order to get multiple results, the resultant measures must be configured in the Measure Tool and the specific measure label must be used on the left-hand-side (LHS) of the procedure call. The resultant measure parameters must be comma-separated in the procedural call as in the example below:

  ```
  forecast:frcstout,cumint:cumintout,int:intout<-
  Forecast(forecastlength:12,history:pos,mask:frcstmask,period:2
  6,startdatemeas:todaymeas)
  ```

- For standard deviations, specify the int measure on the LHS of the Forecast procedure call in addition to the forecast measure.

- You must configure/register all input measures (that is, type/baseintersection/picklist):

  Startdate (scalar, date type)

  Mask (picklist)

  - range value – see Forecast Method list
  - range syntax: 0(No Forecast), 1(Simple), 2(Holt), 3(Croston)
  - naval – for Planning, set to 8 for Bayesian for all products/locations

  History start date (by prod/loc)

  Forecast start date (by prod/loc)

  Forecast mask (by prod/loc)

- Be sure to create load and commit rules for the input measures, primarily for startdatemeas and forecast mask measures. Since the RPAS JNI cannot validate the Forecast procedure call, all input measures must exist within other rules in the rule set in order for them to be available for selection in the Workbook Tool.

- Need to determine the rule that will automatically update the startdatemeas each week with the current week's date.

- The domain must be built using the latest release of RPAS. You will get the following message in the log since the Forecast function is not validated. This is ok.

```
Warning: unable to parse new expression (Unknown special
expression: Forecast)
```

- Must register Forecast libraries after the domain build using the regfunction RPAS utility. Libraries must be located in the $RPAS_HOME/applib directory. Libraries include: libAppMath.so, libArrayUtilityExpression.so, libForecast.so, libForecastEngine.so. Do not specify the *lib* or *.so* part of the function name with the regfunction utility. Example:

```
regfunction -d /domains/D01 -l AppMath

regfunction -d /domains/D01 -l ArrayUtilityExpression

regfunction -d /domains/D01 -l Forecast

regfunction -d /domains/D01 -l ForecastEngine
```

- Use the Mace command to execute the forecast rule with the rule group (that is, frcst_batch).

```
mace -d /domains/D01 -run -group frcst_batch
```

Forecast method picklist notes

- The syntax for the range is # (value), # (value),…

  For Example:

```
0(No Frcst), 1(Simple), 2(Holt), 3(Croston)
```

  Spaces are allowed within the label inside the parantheses.

- Be sure to define your picklist measure with basestate and aggstate = write. If you define it as read, only the first value in the picklist range will show up.

- Set the measure type to int.

- For the Forecast Method measure, set the baseint to item/str (no week).

- You can specify the naval to a numeric integer within the range, such as 2 in the example above. Then, within the client, it automatically defaults to that value, such as Holt. If you specify the naval outside the range, then the picklist is displayed with NA. Given this ability, the planning teams can then specify 8 as the naval such that Bayesian is used for all item/stores. In this case, it may be desirable to configure the picklist measure as a scalar such that it cannot be changed on an item/store basis.

Glossary

configuration

A configuration represents the overall workspace for an RPAS implementation. For example, a configuration could represent a company or a division.

dimension

Levels of a hierarchy, such as day, week, month, year for a calendar hierarchy.

expression

Expressions are the basis of all calculations of the relationships between measures, and are evaluated by the calculation engine during a calculation. Expressions are written in a syntax that allows for the calculation of a single measure from other measures, constants and parameters, using standard arithmetical functions and a rich set of mathematical, technical and business functions. Expressions are therefore an algorithmic statement of a relationship between measures.

hierarchy

Hierarchies are the structures used by an organization to describe the relationships that exist between the many dimensions. For each project, the following hierarchies are automatically created: Calendar, Product, Location, and Measure.

major class

A major class specifies the default measure attribute information that is inherited by all minor classes. Ultimately, this attribute information is inherited by the measures that are generated from the class structure.

measure

Any item of data that can be represented on a grid in a worksheet.

measure profile

The worksheet-specific set of viewable measures

minor class

A minor class inherits measure attribute information from the major class to which it belongs. Attribute information can also be modified at this level. Measures generated from these classes inherit the attribute information defined for the minor class.

project

Each project within a configuration represents an RPAS domain. For example, configuration XYZ could contain Planning and Forecasting projects.

realize

When a measure is auto-generated by the Measure Tool, it is considered a prototype measure and cannot be edited or used in any other configuration component. To enable the measure to be edited and/or used elsewhere in the configuration, it must be realized first.

rule

Rules are collections of expressions that describe the same relationship between measures, but that solve for different measures. All the expressions in a rule must use the same measures, and must have a different target measure (the measure on the left hand side of the expression that is calculated by the expression).

See *expression*.

rule group

A rule group is a collection of rules that are treated as a unit by the calculation engine, with the integrity of all the rules in the rule group being maintained together. The calculation engine always has one (and only one) active rule group.

rule set

A collection of rule groups, each of which is used by the calculation engine for a specific purpose. By default, each rule set contains the following rule groups: load, calculate, refresh and commit.

solution

A solution corresponds to an application configuration within an RPAS domain. For example, project XYZ could contain KeyPlan and TopPlan solutions.

wizard

A wizard is a feature that steps the user through the process of building a new workbook from a template. A wizard displays successive dialogs that require the user to answer a sequence of questions or enter selections regarding the content of the workbook. Responses to these questions are used to automatically format and populate the workbook.

workbook

A workbook is the easily viewed, easily manipulated multidimensional framework used to perform specific business functions such as generating trading information and reviewing availability data.

workbook tab

A workbook tab is a major subdivision of a workbook. By default, each workbook contains one workbook tab, but it can contain many tabs.

worksheet

Worksheets are multidimensional spreadsheets used to display workbook-specific information. Workbooks can include one or many worksheets. Worksheets can present data in the form of numbers in a grid, or these numeric data values can be easily converted to a graphical chart.

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