

# SAS Forecast Studio Stored Processes: Configuration

## Contents

---

|  |          |
|--|----------|
| <b>WHAT IS A STORED PROCESS? . . . . .</b>                       | <b>3</b> |
| <b>CONFIGURE SAS FORECAST STUDIO STORED PROCESSES . . . . .</b>  | <b>3</b> |
| <b>PRE-DEFINED MACRO VARIABLES FOR USE WITH STORED PROCESSES</b> | <b>4</b> |

## 2 ♦ *SAS Forecast Studio Stored Processes: Configuration*

# SAS Forecast Studio Stored Processes: Configuration

---

## What Is a Stored Process?

A stored process is a SAS program that is stored centrally on a server. A client application can then execute the program, and can receive and process the results. Stored processes enable you to maintain and manage code centrally, give you better control over changes, enhance security and application integrity, and ensure that every client executes the latest version of code that is available. Stored processes are like other SAS programs, except that they have an additional feature that enables you to customize the program's execution. This feature enables the invoking application to supply parameters at the time that the stored process is invoked. For example, if you have a stored process that analyzes monthly sales data, you could create a MONTH variable in the stored process. At execution time, you would supply the parameter MONTH=MAY to analyze May sales data. For more information about how to create a stored process and to invoke it in a client application, refer to the stored process section of the *SAS Integration Technologies: Developer's Guide*.

---

## Configure SAS Forecast Studio Stored Processes

A SAS Forecast Studio project stores information hierarchically in project directories, or folders, depending on the server's operating system. For an opened project, you can execute a stored process interactively by using the information stored in the project, and by using the level and node of the hierarchy that currently is selected.

To configure a SAS Forecast Studio stored process, perform the following steps:

1. Save your SAS code in the **!SASROOT\ForecastStudio\Reports\Samples** directory. If the folder does not exist, then create a new folder with that name.
2. Open SAS Management Console and connect to a metadata repository as the SAS Administrator (e.g., *sasadm*).
3. Expand the **Stored Process Manager** folder.
4. Expand the **Forecast Studio** folder.
5. Expand the **Stored Processes** folder.
6. If there is not a **Samples** folder, then right-click the **Stored Processes** folder, select **New Folder**, and create a new folder named **Samples**.
7. Right-click the **Samples** folder and select **New Stored Process**.
8. Enter the name of your SAS program and a description (optional), and click **Next**.

#### 4 ♦ SAS Forecast Studio Stored Processes: Configuration

9. Select **SASMain** as the SAS server. You need to add a source repository, which is a directory where the programs can be found.
  - (a) Click **Manage**.
  - (b) Click **Add**.
  - (c) Enter **c:\SAS\ForecastStudio\Reports\Samples** as the location, which is the same location where you saved your **.sas** file above, and a description (optional).
  - (d) Click **OK**.
  - (e) Click **OK** again.
10. Select or enter the directory where you saved your SAS code above as the source repository, enter the name of your SAS program as the source file, select **Transient result package** as the output, and click **Next**.
11. Click **Finish** on the Parameter panel.

You can find your new report in SAS Forecast Studio from the **Forecasting** → **Reports** menu option. If you have a project opened, then you can run the report.

---

## Pre-defined Macro Variables for Use with Stored Processes

To assist you with creating stored processes, pre-defined macro variables are provided. These macro variables contain information about the project as well as the location in the hierarchy that you are currently viewing.

[Table 1](#) lists the macro variables and their descriptions. You can use these macro variables in any stored process which you create for a Forecast Studio project.

**Table 1.** Pre-defined Macro Variables

| Name   | Description                                     | Format      |
|--|---|-------------|
| <b>Macro Variables for Project Information</b> |   |             |
| HPF_PROJECT                                    | The name of the project.                        | SAS name    |
| HPF_PROJECT_LOCATION                           | System path to the project directory or folder. | System path |
| HPF_DESC                                       | Description of the Forecast Studio Project.     | SAS label   |

**Table 1.** Pre-defined Macro Variables (continued)

| Name  | Description   | Format  |
|---|---|---|
| HPF_INCLUDE   | <p>Project include file.</p> <p>This macro variable specifies the system path and file name that contains the SAS code to assign SAS libraries and catalogs associated with the project.</p> <p>By default, all libraries and catalogs are assigned with Read Only access (ACCESS=READONLY).</p> <p>For example, the following SAS code assigns project library names with Read Only access:<br/>%include "&amp;HPF_INCLUDE";</p> <p>For example, the following SAS code assigns project library names with Read and Write access:<br/>%let HPF_READ_ONLY = 0;<br/>%include "&amp;HPF_INCLUDE";</p> | System file name                              |
| <b>Macro Variables for Project Input Data Information</b> |   |   |
| HPF_INPUT_LIBNAME   | SAS library reference for the input data set.   | SAS name                                      |
| HPF_INPUT_DATASET   | SAS member for the input data set.  | SAS name                                      |
| <b>Macro Variables for Project Variable Information</b>   |   |   |
| HPF_NUM_BYVARS  | <p>Number of BY variables.</p> <p>If there are no BY variables, HPF_NUM_BYVARS is set to zero.</p>  | Nonnegative integer                           |
| HPF_BYVARS  | <p>List of BY variable names.</p> <p>The order of the BY variable names is the same as specified in the project.</p> <p>The macro variable is always defined; but if there are no BY variables, HPF_BYVARS is set to NULL.</p>  | List of SAS names separated by a single space |
| HPF_BYVAR&n   | <p>BY variable name listed in the <math>n^{th}</math> position of the ordered list of BY variables (HPF_BYVARS).</p> <p>The first BY variable name is stored in HPF_BYVAR1, the second in HPF_BYVAR2, and the last is stored in HPF_BYVAR&amp;HPF_NUM_BYVARS.</p> <p>If there are no BY variables (&amp;HPF_NUM_BYVARS is zero), these macro variables are not defined.</p>   | SAS name                                      |
| HPF_NUM_DEPVARs   | <p>Number of dependent variables.</p> <p>There is always at least one dependent variable.</p>   | Positive integer                              |

**Table 1.** Pre-defined Macro Variables (continued)

| Name               | Description   | Format  |
|--------------------|---|---|
| HPF_DEPVARs        | List of all dependent variable names.<br>The order of the dependent variable names is the same as specified in the project.   | List of SAS names separated by a single space |
| HPF_DEPVAR&n       | Dependent variable name listed in the $n^{th}$ position of the ordered list of dependent variables (HPF_DEPVARs).<br>The first dependent variable name is stored in HPF_DEPVAR1, the second in HPF_DEPVAR2, and the last is stored in HPF_DEPVAR&HPF_NUM_DEPVARs.<br>Since there is always at least one dependent variable associated with a project, HPF_DEPVAR1 is always defined.            | SAS name                                      |
| HPF_NUM_INDEPVARs  | Number of independent variables.<br>If there are no independent variables, HPF_NUM_INDEPVARs is set to zero.  | Nonnegative integer                           |
| HPF_INDEPVARs      | List of all independent variable names.<br>The order of the independent variable names is the same as specified in the project.<br>The macro variable is always defined; but if there are no independent variables, HPF_INDEPVARs is set to NULL.   | List of SAS names separated by a single space |
| HPF_INDEPVAR&n     | Independent variable name listed in the $n^{th}$ position of the ordered list of independent variables (HPF_INDEPVARs).<br>The first independent variable name is stored in HPF_INDEPVAR1, the second in HPF_INDEPVAR2, and the last is stored in HPF_INDEPVAR&HPF_NUM_INDEPVARs.<br>If there are no independent variables (&HPF_NUM_INDEPVARs is zero), these macro variables are not defined. | SAS name                                      |
| HPF_NUM_REPORTVARs | Number of reporting variables.<br>If there are no reporting variables, then HPF_NUM_REPORTVARs is set to zero.  | Nonnegative integer                           |
| HPF_REPORTVARs     | List of all reporting variable names.<br>The order of the reporting variable names is the same order as specified in the project.<br>The macro variable is always defined; but if there are no reporting variables, then HPF_REPORTVARs is set to NULL.   | List of SAS names separated by a single space |

**Table 1.** Pre-defined Macro Variables (continued)

| <b>Name</b>  | <b>Description</b>  | <b>Format</b>                 |
|--|---|-------------------------------|
| HPF_REPORTVAR&n  | Report variable name listed in the $n^{th}$ position of the ordered list of report variables (HPF_REPORTVARS).<br>The first report variable name is stored in HPF_REPORTVAR1, the second in HPF_REPORTVAR2, and the last is stored in HPF_REPORTVAR&HPF_NUM_REPORTVARS.<br>If there are no reporting variables (&HPF_NUM_REPORTVARS is zero), then these macro variables are not defined. | SAS name                      |
| <b>Macro Variables for Project Time ID Information</b> |   |                               |
| HPF_TIMEID   | Time ID variable name.  | SAS name                      |
| HPF_TIMEID_FORMAT<br>SAS format name                   | Time ID format name   |                               |
| HPF_SEASONALITY  | Length of the seasonal cycle.<br>A seasonality of 1 implies no seasonality.   | Positive integer              |
| HPF_INTERVAL   | Time interval name.   | SAS time interval             |
| HPF_DATASTART  | Start date/date-time/time value of the project.<br>The starting time ID value of the project input data set<br>(&HPF_LIBNAME..&HPF_DATASET).  | SAS date/date-time/time value |
| HPF_DATAEND  | End date/date-time/time value of the project.<br>The ending time ID value of the project input data set<br>(&HPF_LIBNAME..&HPF_DATASET).  | SAS date/date-time/time value |
| <b>Macro Variables for Project Data Options</b>        |   |                               |
| HPF_SETMISSING   | Missing value interpretation.   |                               |
| HPF_TRIMMISS   | Missing value trimming.   |                               |
| HPF_ZEROMISS   | Zero value interpretation.  |                               |
| <b>Macro Variables for Project Diagnostic Options</b>  |   |                               |
| HPF_DIAGNOSE_INTERMITTENT                              | Intermittency threshold value.  | Positive number               |
| HPF_DIAGNOSE_SEASONTTEST                               | Seasonality significance level.   | P-value                       |
| <b>Macro Variables for Project Selection Options</b>   |   |                               |
| HPF_SELECT_CRITERION                                   | Model selection criterion.  |                               |
| HPF_SELECT_HOLDOUT                                     | Holdout sample absolute size.<br>Zero implies that the model fit is used for selection.   |                               |
| HPF_SELECT_HOLDOUTPCT                                  | Holdout sample percent size.  | Positive integer              |

**Table 1.** Pre-defined Macro Variables (continued)

| Name   | Description  | Format              |
|--|--|---------------------|
| HPF_SELECT_MINOBS_NON_MEAN                               | Minimum number of observations required before a non-mean model is selected.   | Positive integer    |
| HPF_SELECT_MINOBS_TREND                                  | Minimum number of observations required before a trend model is selected.  | Positive integer    |
| <b>Macro Variables for Project Forecast Options</b>      |  |                     |
| HPF_LEAD   | Length of the forecast horizon or lead.  | Nonnegative integer |
| HPF_BACK   | Number of time periods to omit.  | Positive integer    |
| HPF_FORECAST_ALPHA                                       | Confidence level size.   | P-value             |
| <b>Macro Variables for Project Hierarchy Information</b> |  |                     |
| HPF_NUM_LEVELS   | Number of levels in the hierarchy.<br>The levels of the hierarchy are numbered from 1 (the top of the hierarchy) to &HPF_NUM_LEVELS (the leaves of the hierarchy).<br>If there is no hierarchy, then the number of levels is 1.  | Positive integer    |
| HPF_LEVEL_DATAWHERE&n                                    | Input data WHERE clause for the $n^{th}$ level, where $n$ ranges from 1 to &HPF_NUM_LEVELS.<br>These WHERE clauses can be used to subset the input data sets for each level in the hierarchy to obtain information about the currently selected node.<br>The WHERE clause at level 1 (the top) is stored in HPF_LEVEL_DATAWHERE1, the WHERE clause at the lowest level (the leaves) is stored in HPF_LEVEL_DATAWHERE&HPF_NUM_LEVELS.<br><b>Note:</b> You must unquote this macro variable.<br>For example,<br>%unquote<br>(&&HPF_CURRENT_DATAWHERE&n); | SAS WHERE clause    |

**Table 1.** Pre-defined Macro Variables (continued)

| Name                             | Description   | Format           |
|----------------------------------|---|------------------|
| HPF_LEVEL_OUTWHERE&n             | <p>Output data WHERE clause for the <math>n^{th}</math> level where <math>n</math> ranges from 1 to &amp;HPF_NUM_LEVELS.</p> <p>These WHERE clauses can be used to subset the input data sets for each level in the hierarchy to obtain information about the currently selected node.</p> <p>The WHERE clause at level 1 (the top) is stored in HPF_LEVEL_OUTWHERE1, the WHERE clause at the lowest level (the leaves) is stored in HPF_LEVEL_OUTWHERE&amp;HPF_NUM_LEVELS.</p> <p><b>Note:</b> You must unquote this macro variable. For example,<br/> %unquote<br/> (&amp;&amp;HPF_LEVEL_OUTWHERE&amp;n);</p> | SAS WHERE clause |
| HPF_LEVEL_RECONCILE_DATASET&n    | Reconciled forecast data set for the $n^{th}$ level.  |                  |
| HPF_LEVEL_RECONCILE_STATISTICS&n | Reconciled statistics data set for the $n^{th}$ level.  |                  |
| HPF_LEVEL_BYVARS&n               | <p>List of BY variable names associated with the <math>n^{th}</math> level, where <math>n</math> ranges from 1 to &amp;HPF_NUM_LEVELS.</p> <p>The variables names are separated by a single space.</p> <p>The BY variables at level 1 (the top) are stored in HPF_LEVEL_BYVARS1, the BY variables for the lowest level (the leaves) are stored in HPF_LEVEL_BYVARS&amp;HPF_NUM_LEVELS.</p>  | SAS name         |
| HPF_LEVEL_LIBNAME&n              | <p>SAS library reference for the <math>n^{th}</math> level, where <math>n</math> ranges from 1 to &amp;HPF_NUM_LEVELS.</p> <p>The library reference at level 1 (the top) is stored in HPF_LEVEL_LIBNAME1, the library reference at the lowest level (the leaves) is stored in HPF_LEVEL_LIBNAME&amp;HPF_NUM_LEVELS.</p>   | SAS LIBNAME      |

**Table 1.** Pre-defined Macro Variables (continued)

| Name   | Description  | Format                        |
|--|--|-------------------------------|
| HPF_LEVEL_NSERIES&n  | <p>Number of series associated with the <math>n^{th}</math> level, where <math>n</math> ranges from 1 to &amp;HPF_NUM_LEVELS.</p> <p>The number of series at level 1 (the top) is stored in HPF_LEVEL_NSERIES1, the number of series at the lowest level (the leaves) is stored in HPF_LEVEL_NSERIES&amp;HPF_NUM_LEVELS.</p> | Positive integer              |
| <b>Macro Variables for Project Reconcile Information</b>         |  |                               |
| HPF_RECONCILE_LEVEL  | <p>Number of the reconciliation level.</p> <p>The reconciliation level number ranges from 1 to &amp;HPF_NUM_LEVELS, depending on the level of reconciliation.</p>  | Positive integer              |
| HPF_RECONCILE_BYVAR  | BY variable of reconciliation level.   | SAS name                      |
| HPF_RECONCILE_METHOD   | Reconciliation method.   |                               |
| <b>Macro Variables for Interactive Current Level Information</b> |  |                               |
| HPF_CURRENT_LEVEL  | <p>The level number associated with the current level.</p> <p>The current level number ranges from 1 to &amp;HPF_NUM_LEVELS, depending on the currently selected level of the hierarchy.</p>   | Positive integer              |
| HPF_CURRENT_LIBNAME  | SAS library reference for the currently selected level of the hierarchy.   | SAS LIBNAME                   |
| HPF_CURRENT_LEVEL_START  | <p>Start date/date-time/time value of the current level.</p> <p>The starting time ID value of the input data set for the currently selected level of the hierarchy.</p>  | SAS date/date-time/time value |
| HPF_CURRENT_LEVEL_END  | <p>End date/date-time/time value of the current level.</p> <p>The ending time ID value of the input data set for the currently selected level of the hierarchy.</p>  | SAS date/date-time/time value |
| HPF_CURRENT_LEVEL_NSERIES  | Number of series (or nodes) associated with the currently selected level of the hierarchy.   | Positive integer              |

**Table 1.** Pre-defined Macro Variables (continued)

| Name                    | Description   | Format  |
|-------------------------|---|---|
| HPF_CURRENT_DATAWHERE   | <p>Input data WHERE clause for the currently selected node.</p> <p>This WHERE clause can be used to subset the input data set to obtain information about the currently selected node of the hierarchy.</p> <p><b>Note:</b> You must unquote this macro variable. For example,<br/> <code>%unquote (&amp;HPF_CURRENT_DATAWHERE);</code></p> | SAS WHERE clause                              |
| HPF_CURRENT_OUTWHERE    | <p>Output data WHERE clause for the currently selected node.</p> <p>This WHERE clause can be used to subset the output data sets to obtain information about the currently selected node.</p> <p><b>Note:</b> You must unquote this macro variable. For example,<br/> <code>%unquote (&amp;HPF_CURRENT_OUTWHERE);</code></p>                | SAS WHERE clause                              |
| HPF_NUM_CURRENT_BYVARS  | Number of BY variable names for the currently selected level of the hierarchy.  | Nonnegative integer                           |
| HPF_CURRENT_BYVARS      | <p>List of BY variable names for the currently selected level of the hierarchy.</p> <p>The macro variable is always defined; but if there are no BY variables, HPF_CURRENT_BYVARS is set to NULL.</p>   | List of SAS names separated by a single space |
| HPF_CURRENT_BYVARS&n    | $n^{th}$ BY variable name for the current level.  | SAS name                                      |
| HPF_CURRENT_DEPVAR      | Dependent variable name associated with the currently selected node of the hierarchy. This variable is contained in the list of dependent variables (HPF_DEPVAR).   | SAS name                                      |
| HPF_CURRENT_SERIESSTART | <p>Start date/date-time/time value of the current node.</p> <p>The starting time ID value of the series for the currently selected node of the hierarchy.</p>   | SAS date/date-time/time value                 |
| HPF_CURRENT_SERIESEND   | <p>End date/date-time/time value of the current node.</p> <p>The ending time ID value of the series for the currently selected node of the hierarchy.</p>   | SAS date/date-time/time value                 |

**Table 1.** Pre-defined Macro Variables (continued)

| Name   | Description   | Format                                |
|--|---|---------------------------------------|
| HPF_CURRENT_HORIZON  | Horizon date/date-time/time value of the current node.<br>The time ID value of the start of the multi-step ahead forecast for the currently selected node of the hierarchy.   | SAS date/<br>date-time/<br>time value |
| <b>Macro Variables for Metadata Repository Information</b> |   |                                       |
| HPF_METADATA_HOST  | Metadata server host name.  |                                       |
| HPF_METADATA_PORT  | Metadata server port number.  |                                       |
| HPF_METADATA_REPNAME                                       | Metadata repository name.   |                                       |
| <b>Macro Variables for Other Information</b>               |   |                                       |
| HPF_READ_ONLY  | Project access Read Only flag.<br>By default, stored processes have Read Only access with respect to the project libraries. This macro variable changes this access to Write.<br>For example, the following SAS code assigns project library names with Read Only access:<br><code>%include "&amp;HPF_INCLUDE";</code><br>For example, the following SAS code assigns project library names with Write access:<br><code>%let HPF_READ_ONLY = 0;</code><br><code>%include "&amp;HPF_INCLUDE";</code> | Boolean                               |
| HPF_DEFAULT_LOCATION                                       | Default path to the system directory where the SAS Forecast Studio projects are currently stored.   | System path name                      |