SAS® Decision Manager 5.1: Administrator's Guide

Configuration Properties

Properties for All Environments

After you install SAS Decision Manager, review the configuration properties listed in Table A.1 to ensure that the values are appropriate for your environment. For instructions about modifying these properties, see "Configuration Properties: How To Configure Services" in SAS Viya Administration: Configuration Properties .

Table A.1 *SAS Decision Manager Configuration Properties*

Service	Property	Default	Description
Decisions service	taskExecutor.maxThreadsPerRequest	4	Specifies the maximum number of threads that can be used for processing requests.
	taskExecutor.minItemsPerThread	5	Specifies the minimum number of items that can be processed inside the same thread.
Score Execution service	deleteExecutions	false	Specifies whether existing test results for a rule set, model, or decision test are deleted before the test is re-run. By default, existing results are not deleted when a test is re-run.

Properties for Multi-tenancy Environments

After you onboard a tenant, you need to define two configuration properties. Complete these steps for each tenant:

1. Sign in to SAS Environment Manager as an administrator.

   Note: If you are already logged in to SAS Decision Manager, access SAS Environment Manager by clicking ≡ and selecting **Manage Environment**.
2. Click 🔧 on the navigation bar.
3. On the **View** menu, select **All services**.
4. Select **Reference Data service** from the list of services.
5. Click ⊞. The Select Definition window appears.

6 Select **sas.referencedata.casformats**. The New sas.referencedata.casformats Configuration window appears.
7 In the **backupLibrary** field, enter `Formats`.
8 In the **formatsLibrary** field, enter `userformats3`.
9 Click **Save**.

Managing Permissions

About Permissions

You use SAS Environment Manager to manage identities and authorization for SAS Viya. Information is available in the SAS Viya administration documentation:

- "Two Authorization Systems" in SAS Viya Administration: Orientation to Authorization
- "Identity Management Overview" in SAS Viya Administration: Identity Management

You can configure user access based on folders, object types, or specific objects. To grant full access to an object, a user must have access to all of the service endpoints (object URIs) that are associated with the object. For more information, see "Full Access and Service Endpoints" on page 3.

The default permissions for SAS Decision Manager are described in "Default Permissions" on page 2.

Default Permissions

By default, authenticated users have permission to do the following:

- create rule sets, lookup tables, and decisions
- update and delete any rule set, lookup table, or decision that they created
- publish any rule set, lookup table, decision, or model that they created
- create a test definition for any rule set, decision, or model that they created

By default, only the user that created a test definition can do the following:

- view, update, or delete the test definition
- run the test and view the test results
- run a rule-fired analysis or decision-path tracking analysis and view the results

You can grant access to test definitions and test results to users other than the user that created the definition either by adding the users to the SASScoreUsers group or by granting the users access to specific test results. For more information, see "Granting Access to Test Results" on page 3.

Modifying the Default Permissions

You can modify the default permissions in the following ways:

- Modify permissions for specific objects in the Edit Authorization window.For more information, see "General Authorization: How to (Authorization Window)" in SAS Viya Administration: General Authorization .
- Modify the existing rules or create new rules. For more information, see the following topics:
  - "General Authorization: How to (Rules Page)" in SAS Viya Administration: General Authorization
  - "Granting Permissions for Object URIs" on page 4

- Modify the existing groups or create new ones. For more information, see the following topics:
  - "Manage Custom Groups" in SAS Viya Administration: Identity Management
  - "Granting Access to Test Results" on page 3

Full Access and Service Endpoints

In order to have full access to an object, a user must have access to the folder that contains the object, to the specific object, to any additional objects that are referenced the object, and to the service endpoints for all object types.

Service endpoints for specific object types are represented by the object URIs.These object URIs are shown in "Granting Permissions for Object URIs" on page 4. You grant permissions for object URIs by creating or modifying rules in SAS Environment Manager.

For example, in order to have full access to a specific decision, the user must have access to the following:

- the folder that contains the decision.
- the decision, plus any rule sets, lookup tables, or models that are included in the decision.
- the service endpoints for the object types for the folder, the decision, and all of the objects that are included in the decision. If the decision contains a model, the endpoints for the model repository and the model project (if the model is in a project) must be included.
- the service endpoints for the object types that are needed to create and run a decision test: /scoreDefinitions/definitions and /scoreExecution/executions. Alternatively, the user can be a member of the SASScoreUsers group. See "Granting Access to Test Results" on page 3 for more information.
- the service endpoints that are needed to publish the decision: /modelPublish/destination and /modelPublish/destination/{*destination*}.

Note: If a user has access to a decision but does not have access to a model or rule set that is referenced in the decision, SAS Decision Manager displays ⊗ next to the rule set or model name. SAS Decision Manager displays the message `A model or rule set that is used in the decision cannot be found`.

Granting Access to Test Results

By default, only the user who creates a rule set test, decision test, or model test can view, update, or delete the test definition or run the test. Only a user who runs a test can view the test results and run rule-fired analyses or decision-path tracking analyses. Other users cannot access the test definition or test results unless one of the following is true:

- the user is a member of the SASScoreUsers group. SAS Decision Manager configures the SASScoreUsers group automatically. Members of this group have full access to test definitions and results. These permissions enable access through the user interface, the score definition service, and the score execution service. For instructions on adding users to a group, see "Manage Custom Groups" in SAS Viya Administration: Identity Management .

  Note: It is recommended that you control access to test definitions and results by using the SASScoreUsers group rather than by creating rules for specific test definitions or results.

- you created rules that grant the user access to the URIs that are generated when a particular test is run. The Test Results page, Rule-Fired Analysis page, and Decision Path Tracking page for a test list the URIs to all of the test results. See "General Authorization: How to (Rules Page)" in SAS Viya Administration: General Authorization for instructions about creating rules in SAS Environment Manager. Specify the URIs of the results in the **Object URI** field in the New Rule window.

  Note: Each time a test is run, the IDs for the test results are regenerated. Therefore, the URI to the test results changes.

Granting Permissions for Object URIs

By default, general rules exist for all object URIs in SAS Decision Manager. Before you create a new group or rule, review the existing rules. You should modify existing rules if possible, rather than create a new rule for an object URI.

See "General Authorization: How to (Rules Page)" in SAS Viya Administration: General Authorization for instructions about creating and modifying rules in SAS Environment Manager. To grant permissions for an object URI, specify the object URI in the New Rule window. Permissions that can be granted for specific URIs are shown in Table A.2 on page 4.

Note: In the New Rule window, the **Container URI** is a URI to a folder.

Table A.2 *Object URIs for Objects in SAS Decision Manager*

Object URI	Permissions That Can Be Granted
/businessRules/ruleSets	Create, read, update, and delete rule sets. Create new versions of rule sets. Generate SAS code for rule sets.
/businessRules/rules	Import and export rule sets.
/decisions/flows	Create, read, update, and delete decisions. Create new versions of decisions. Generate SAS code for decisions.
/modelPublish/models	Publish rule sets, models, and decisions to a CAS server, a Hadoop database, or a Teradata database.
/modelPublish/destinations	Define new publish destinations.
/modelPublish/destinations/{*destinationName*}	Update or delete an existing destination.
/referenceData/domains	Create, read, update, and delete lookup tables.
/referenceData/domainEntries	Import and export lookup tables.
/scoreDefinitions/definitions/**	Create, read, update, and delete rule set, decision, and model tests in the user interface and score definition service.
/scoreExecution/executions/**	Run rule set, decision, and model tests in the user interface and the score execution service. Run rule-fired analyses and decision-path tracking analyses.

Promoting Content

Promotion is the process of capturing content and moving it to a different location. The following scenarios are supported:

- migrating content from SAS 9.4 to SAS Viya.
- moving content from one SAS Viya environment to another (for example, from a test environment to a production environment).

To migrate business rule content and decision content from SAS Decision Manager 3.2 on SAS 9.4 to SAS Decision Manager 5.1 on SAS Viya, you can use the sas-dcmtransfer-cli command-line interface. For more information, see the following topics:

- "Using SAS Decision Manager CLIs" in SAS Decision Manager: Command-Line Interfaces
- "Command-Line Interface: Preliminary Instructions" in SAS Viya Administration: Command-Line Interfaces
- "sas-dcmtransfer-cli" in SAS Decision Manager: Command-Line Interfaces

Note: Test definitions and test results for rule sets, models, and decisions are not migrated when rule sets, models, and decisions are migrated. To migrate test definitions and test results, the URIs for each definition or results table must be listed in the transfer request. However, it is recommended that you re-create and rerun the test in the target environment rather than migrate the test information.

To migrate content other than business rule content or decision content, or to promote content between SAS Viya environments, use the SAS Viya sas-transfer commands. For more information, see "Promotion Overview" in SAS Viya Administration: Promotion (Import and Export) .

Configuring Publishing Destinations

Overview

You can configure SAS Decision Manager to publish content to the following destinations:

- SAS Micro Analytic Service. The default SAS Micro Analytic Service destination is named **maslocal**. This default destination is configured automatically when SAS Decision Manager is installed.
- SAS Cloud Analytic Services (CAS).
- Teradata.
- Hadoop. Hadoop.

You can configure multiple destinations of each type except the SAS Micro Analytic Service. Each destination must have a unique name.

Note: You must have administrative privileges to configure publishing destinations.

Note: If other products that use publishing destinations, such as SAS Model Manager or Model Studio, are installed on the same server, you do not need to configure separate publishing destinations for each product. Publishing destinations are shared by these products when they are installed on the same server.

Additional information about the administrative tasks required to configure publishing destinations is available in the following topics:

- "External Credentials: How To" in SAS Viya Administration: External Credentials
- "Manage Caslibs" in SAS Viya Administration: Data
- "CAS Authorization: How to (Authorization Window)" in SAS Viya Administration: Cloud Analytic Services Authorization

Configure a Publishing Destination for CAS

1 Post a request to `/modelPublish/destinations`. The request must include the header and body fields listed in Table A.3 on page 6.

Table A.3 HTTP Request Header and Body Fields to Create a CAS Destination

Name	Value	Comments
Header Fields		
Content-type	application/ vnd.sas.models.publishing.destination+json	
Accept	*/*	
Body Fields		
name	*destination_name*	Specify a unique name for the destination.
casLibrary	CASUSER	Specify a global caslib.
casServerName	*server_name*	Specify the server name that on which the library resides.
destinationType	cas	
destinationTable	*table_name*	Specify the name of the CAS table to which the rule set, model, or decision is to be published.

2 (Optional) Verify that the destination is configured correctly.

Configure a Publishing Destination for Teradata

Note: Your user ID must have permission to create a global caslib.

1 Sign in to SAS Environment Manager as an administrator.

   Note: If you are already logged in to SAS Decision Manager, access SAS Environment Manager by clicking ≡ and selecting **Manage Environment**.

2 Create an authentication domain.

3 Create a global Teradata CAS library.
   - a Click ▦ on the navigation bar.
   - b On the **View** menu, select **Libraries**.
   - c Click ✚. The New Caslib window appears.
   - d Select the CAS server where you want the published content to reside.
   - e Select **Teradata** as the data source type. The fields in the window change.
   - f Enter a unique name for the library.
   - g In the **Data Source** section of the window, enter values for the fields listed in the following table:

Table A.4 Teradata Caslib Settings

Field	Description
Authentication domain	Select the authentication domain that you created in Step 2.
Data transfer mode	Select the data transfer mode, **Serial** or **Parallel**, for your database.
Server	The name of the Teradata server.

Field	Description
Database	The name of the Teradata database.
Schema	The name of the database schema.

Note: Accept the default values for the remaining fields in the New Caslib window.

h Click **Save** to create the library.

4 Grant authenticated users permission to publish to the library.

5 Post a REST request to `/modelPublish/destinations`. The request must include the header and body fields listed in Table A.5 on page 7.

Table A.5 HTTP Request Header and Body Fields to Create a Teradata Destination

Name	Value	Comments
Header Fields		
Content-type	application/vnd.sas.models.publishing.destination +json	
Accept	*/*	
Body Fields		
name	*destination_name*	Specify a unique name for the destination.
casLibrary	CASUSER	Specifies a global caslib that is used to store files or tables needed by the publishing service.
casServerName	*server_name*	Specify the server name that you selected in Step 3d.
destinationType	teradata	
databaseCasLibrary	*library_name*	Specify the global caslib name that you created in Step 3f. This library is used for metadata about the Teradata database.
destinationTable	*table_name*	Specify the name of the table in the Teradata database to which the rule sets, models, or decisions are to be published.

6 (Optional) Verify that the destination is configured correctly.

Configure a Publishing Destination for Hadoop

Note: Your user ID must have permission to create a global caslib.

Note: As a publishing destination for SAS Decision Manager, Apache Hadoop is supported only through Apache Hive.

1 Sign in to SAS Environment Manager as an administrator.

Note: If you are already logged in to SAS Decision Manager, access SAS Environment Manager by clicking ≡ and selecting **Manage Environment**.

2 Create an authentication domain.

3 Create a Hadoop global CAS library.

a Click ▦ on the navigation bar.

b In the **View** menu, select **Libraries**.

c Click ✱. The New Caslib window appears.

d Select the CAS server where you want the published content to reside.

e Select **Hadoop** as the data source type. The fields in the window change.

f Enter a unique name for the library.

g In the **Data Source** section of the window, enter values for the fields listed in the following table:

Table A.6 Hadoop Caslib Settings

Field	Description
Authentication domain	Select the authentication domain that you created in Step 2.
Server	The name of the Hadoop server that runs the Hive service.
Hadoop config dir	The path to the directory that contains the configuration files for the Hadoop server. This path must be available to the location where SAS Decision Manager is running.
Hadoop jar path	The path to the directory that contains the JAR files for the Hadoop server. This path must be available to the location where SAS Decision Manager is running.

Note: Accept the default values for the remaining fields in the New Caslib window.

h Click **Save** to create the library.

4 Grant authenticated users permission to publish to the library.

5 Post a REST request to `/modelPublish/destinations`. The request must include the header and body fields listed in Table A.5 on page 7.

Table A.7 HTTP Request Header and Body Fields to Create a Hadoop Destination

Name	Value	Comments
Header Fields		
Content-type	application/vnd.sas.models.publishing.destination +json	
Accept	*/*	
Body Fields		
name	*destination_name*	Specify the name of the destination.
user	*user_ID*	Specify the user ID that will be used to connect to Hadoop database.
casLibrary	CASUSER	Specify a global caslib that is used to store files or tables that are needed by the publishing service. Specify the name of the CAS library that you entered in Step 3f.

casServerName	*server_name*	Specify the CAS server name that you selected in Step 3d.
destinationType	hadoop	
destinationTable	*table_name*	Specify the name of the table in the Hadoop database to which the rule set, model, or decision is to be published.
configDir	*JAR_file_directory_path*:*config_file_directory_path*	Specify the paths to the JAR file directory and the configuration file directory. Separate the two pathnames with a colon (:). These names must match the names that you specified in Step 3g.
hdfsDir	*data_directory_path*	Specify the path to the HDFS directory where rule sets, models, and decisions are to be published. **Note:** The directory name is case sensitive.

6 (Optional) Verify that the destination is configured correctly.

Create an Authentication Domain

1 Sign in to SAS Environment Manager as an administrator.

Note: If you are already logged in to SAS Decision Manager, access SAS Environment Manager by clicking ≡ and selecting **Manage Environment**.

2 Click on the navigation bar.
3 Click . The New Domain window appears.
4 Enter an ID (a unique name) for the domain, and select **Authentication** for the domain type.
5 Click +. The Select Identities window appears.
6 Add the appropriate identities to the domain, and click **OK** to return to the New Domain window. This window now contains additional fields for a user ID and password.
7 Enter the user ID and password that will be used to connect to the database, and click **Save**.

Grant Users Permission to Publish

1 Sign in to SAS Environment Manager as an administrator.

Note: If you are already logged in to SAS Decision Manager, access SAS Environment Manager by clicking ≡ and selecting **Manage Environment**.

2 Select the library to which you want users to be able to publish content.
3 Click , and select **Edit Authorization**. The Edit Authorization window appears.
4 Move the slider for **Authenticated Users** to include **Write** permission.

5 Click **Close**.

Verify the Destination Configuration

You can verify that a destination has been configured correctly in one of two ways:

- publish a rule set or decision from SAS Decision Manager. See *SAS Decision Manager: User's Guide* for more information.
- connect to the URL for your server (http://*server_name*/modelPublish/destinations) and search for the destination name.

Managing Test Data

When you run a rule set, model, or decision test, several files are created. The URI to the test definition and all of the test results are displayed on the Test Results page.

By default, when you re-run an existing test, the previous test results are not deleted before the new results are generated. To automatically delete test results, set the `deleteExecutions` configuration property to True.See "Properties for All Environments" on page 1 for more information.

When a test definition is deleted, the associated test results are normally deleted. To delete results files such as log files, code files, and CAS tables that are not deleted when the associated test is deleted, use the `sas-scoreexecution-cli` command-line interface. See "sas-scoreexecution-cli" in SAS Decision Manager: Command-Line Interfaces for more information.