Chapter 1

SAS Intelligent Decisioning
Command-Line Interfaces

Using SAS Intelligent Decisioning CLIs

Global Commands

Global Options

Dictionary

dcmtransfer Plug-in

scoreexecution Plug-in

Using SAS Intelligent Decisioning CLIs

In SAS Viya, a command-line interface (CLI) is a user interface to the SAS Viya REST services. In this interface, you enter commands on a command line and receive a response back from the system. You can use a CLI to interact directly with SAS Viya programmatically without a GUI. For information about the CLIs that are provided with SAS Viya, see “Command-Line Interface: Overview” in SAS Viya Administration: Using the Command-Line Interfaces.

The SAS Intelligent Decisioning CLIs are plug-ins to the SAS Viya admin CLI. Two administrative CLIs are available with SAS Intelligent Decisioning:

dcmtransfer
   enables you to transfer rule sets, rule flows, lookup tables, and decisions from a SAS 9.4 environment to a SAS Viya environment.

scoreexecution
   lists or deletes resources such as log files, code files, jobs, and SAS Cloud Analytic Services (CAS) tables that were not deleted when the associated rule set, decision, or model test was deleted.

To use these CLIs, you must create a profile and sign in to SAS Viya. For instructions, see “Command-Line Interface: Preliminary Instructions” in SAS Viya Administration: Using the Command-Line Interfaces.

Global Commands

The following commands are available for all CLIs:
authenticate
enables you to log on to and log off from the environment. When you log on, this command prompts you for your SAS Viya user ID and password.

Alias auth

See “Global Command: Authenticate” in SAS Viya Administration: Using the Command-Line Interfaces

See “Command-Line Interface: Preliminary Instructions” in SAS Viya Administration: Using the Command-Line Interfaces

help
displays the list of commands that are available for a CLI.

Alias h

Example sas-scoreexecution-cli help

plugins list
displays the list of command line plugins for a CLI.

Note No plugins are available for the SAS Intelligent Decisioning CLIs.

Example sas-admin plugins list

profile
creates or displays the connection profile that defines your SAS Viya deployment. This command asks you to enter the SAS Viya service endpoint, your preferred output type, and whether you want to enable colored output.

Alias prof

See “Global Command: Profile” in SAS Viya Administration: Using the Command-Line Interfaces

See “Command-Line Interface: Preliminary Instructions” in SAS Viya Administration: Using the Command-Line Interfaces

---

Global Options

The following options apply to all CLIs.

--colors-enabled true|false
enables or disables ANSI-colored output.

Note This option does not work in all environments.

Tip You can set the environment variable $SAS_CLI_COLOR instead of specifying this option.

--help
displays the list of commands and options that are available for the CLI. If this option is specified after a command, it displays the Help for that command.
**Example**

```
sas-dcmtransfer-cli authenticate9x --help
```

**--insecure**

allows connections to TLS sites without validating the server certificates.

**--locale locale**

specifies the locale to use, such as `en` (English) or `de` (German).

**Tip**

You can set either the environment variable `$LC_ALL` or `$LANG` instead of specifying this option.

**See**

See [https://www.w3schools.com/tags/ref_language_codes.asp](https://www.w3schools.com/tags/ref_language_codes.asp) for the list of language codes.

**--output format**

specifies the format for the output from the CLI. Specify `text`, `json`, or `fulljson`.

**Tip**

You can set the environment variable `$SAS_OUTPUT` instead of specifying this option.

**See**

“Output Type” in [SAS Viya Administration: Using the Command-Line Interfaces](https://support.sas.com/documentation/viya/administration/)

**--profile profile_name**

specifies the name of the profile to use.

**Alias** `-p`

**Default** Default

**Tips**

You can set the environment variable `$SAS_CLI_PROFILE` instead of specifying this option.

You can use the command `CLI-name profile list` to see the list of available profiles.

**--quiet**

suppresses all output from the CLI except the data.

**Alias** `-q`

**--sas-endpoint URL**

specifies the URL to the SAS services.

**Tip**

You can set the environment variable `$SAS_SERVICES_ENDPOINT` instead of specifying this option.

**--verbose**

displays additional details about the commands that are processed, in addition to the output data.

**--version**

prints the version of the CLI.
Dictionary

dcmtransfer Plug-in
Enables you to transfer rule sets, rule flows, lookup tables, and decisions from a SAS 9.4 environment to a SAS Viya environment.

Notes: Data tables, tests, comments, attachments, and version information are not transferred. Vocabularies are not transferred, but the terms used in rule sets and decisions are transferred within those objects.
Lookup tables must be activated in the target environment. See “Activate a Lookup Table” in SAS Intelligent Decisioning: User’s Guide for more information.


See: “Global Options” on page 2
“Global Commands” on page 1

Syntax
sas-admin <global-options> dcmtransfer command <command-options>

Commands
In addition to the global commands in “Global Commands” on page 1, you can specify the following commands:

authenticate9x subcommand <options>
logs you in to and out of the SAS 9.4 environment. You can specify the following subcommands:

login
logs you in to the SAS 9.4 environment. The login subcommand accepts these options:

--password password
specifies your password.

--service-endpoint protocol://host_name:port
specifies the URI for the SAS 9.4 environment.

Note Do not specify localhost. You must provide a fully qualified host name.

Example http://mySAS94server:7980

--user user-id
specifies your user ID.
Tip If you do not specify any options, the login subcommand prompts you for the SAS 9.4 service endpoint, user ID, and password.

logout
logs you out of the SAS 9.4 environment.

Alias auth9x

export9x object-type <export-options>
exports the specified object types from SAS 9.4. For the object type, specify one of the following: decisions, lookups, ruleflows, or rulesets. If you do not specify any options, the CLI prompts you for the required information.

Note: Beginning with SAS Intelligent Decisioning 5.1, SAS Intelligent Decisioning does not support rule flows. You cannot export complex rule flows. However, you can export simple rule flows from previous releases of SAS Intelligent Decisioning and import them as decisions into the current release. If you specify ruleflows, the rule flows are exported as decisions. If you specify decisions, information about the rule flows that are referenced in the decision is added to the mapping file for the decision.

Restriction You cannot export objects that use DATAGRID variables.

See “Options for the export9x Command” on page 5

import9x object-type <import-options>
imports SAS Intelligent Decisioning objects into SAS Viya. For the object type, specify one of the following: decisions, lookups, ruleflows, or rulesets.

See “Options for the import9x Command” on page 6

Options for the export9x Command

--content filename
specifies the name of the file to which you want to write the exported content.

Default content.json

--mappings filename
specifies the name of the mapping file. This file describes the relationship between the exported content and any associated objects.

Default mappings.json

See “Modifying the Mapping File” on page 9

--report filename
specifies the file to which you want the CLI to write messages that are generated while the content is exported.

Default export_report.json
**--uri URI**
specifies the URI for the objects that you want to export. This option is required.

You can specify the URI in any of the following forms.

--uri /SASBusinessRulesManagerWeb/rest/object-type?limit=214783647
--uri /SASDecisionManager/rest/decisions?limit=214783647
specifies all objects of the type object-type up to a maximum of 21478367. (This number is the maximum value for an integer.)

--uri /SASBusinessRulesManagerWeb/rest/object-type?filter_query
--uri /SASDecisionManager/rest/decisions?filter_query
specifies all objects that meet the filter criteria and that are of the type specified by the object-type argument.

Restriction This option is not available for lookup tables.

See “Query Parameters for the --uri Option” on page 9

--uri /SASBusinessRulesManagerWeb/rest/object-type/object-ID
--uri /SASDecisionManager/rest/decisions/object-ID
specifies the object with the ID object-ID that matches the type specified by the object-type argument.

--uri /SASWIPClientAccess/rest/navigation/814100/folder-ID
specifies all of the objects in the folder with the ID folder-ID that match the type specified by the object-type argument.

Restriction This form is not valid for exporting decisions.

Tip The number 814100 is the object type for a business rules folder.

--uri /SASWIPClientAccess/rest/navigation/814100/DCMFOLDER_ROOT_ID
specifies all objects in the business rules database that match the type specified by the object-type argument.

Restriction This form is not valid for exporting decisions.

Tip DCMFOLDER_ROOT_ID is the ID for the root folder.

--uri @filename.txt
specifies all of the objects that are identified by the URIs in the specified text file. The URIs in the text file must all be URIs for objects of the type specified by the object-type argument. Each URI must be on a separate line.

**Options for the import9x Command**

**--content filename**
specifies the file that contains the objects that you want to import.

Default content.json

**--force <true | false>**
specifies whether you want existing objects to be replaced if they already exist in the target SAS Viya environment. If you specify true, then existing objects with the same name are deleted and re-created from the imported content. If you specify false, error messages are generated for the duplicate objects.

The CLI searches the SAS Viya environment for existing objects before it imports new objects. The search criteria that the CLI uses to determine whether an object
already exists depends on the information in the mapping file. If the target information for an object is available, the CLI uses it as the search criteria. If the target information is not available, the CLI uses the source information. For example, if you are importing a rule set, the CLI uses the target.id and target.revisionId as the search criteria. If that information is not available, it uses the source.name and source.folderpath.

Specifying --force without specify true or false is equivalent to specifying --force true.

<table>
<thead>
<tr>
<th>Alias</th>
<th>-f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>false</td>
</tr>
</tbody>
</table>

See “Modifying the Mapping File” on page 9

--- mappings filename
specifies the name of the mapping file.

| Default | mappings.json |

See “Modifying the Mapping File” on page 9

--- report filename
specifies the file to which you want the CLI to write messages that are generated while the content is imported.

| Default | import_report.json |

--- target-folder-path /pathname
Specifies the folder in the SAS Viya environment that you want to import the decisions into.

| Default | /Public |

Restriction This option is valid only when the object type in the import9x subcommand is decisions.

Details

Transferring Content from a SAS 9.4 Environment to a SAS Viya Environment


To transfer business rules and decision content from a SAS 9.4 environment to a SAS Viya environment:

1. Log on to the machine where SAS Viya is running. For example, on Linux systems, you can use the ssh command:

   ssh -y machine-name

2. Change to the SAS Viya bin directory:

   cd /opt/sas/viya/home/bin

3. Create a default profile:

   sas-admin profile init
The CLI prompts you for the URL (service endpoint) for SAS Viya, for the output type that you want, and whether you want to enable color output.

4. Respond to the prompts as follows:

   **Service Endpoint**
   Specify the URL for the SAS Viya environment. Use the following format:
   `communications-protocol://web-server-host-name:web-server-port`
   For example: `http://host.example.com:7980`

   **Output type**
   Specify your preferred format for CLI output (`text`, `json`, or `fulljson`).
   *Note:* For information about the output types, see “Output Type” in *SAS Viya Administration: Using the Command-Line Interfaces*.

   **Enable ANSI colored output**
   Specify whether to enable colored output (`y` or `n`).

5. Log on to the SAS Viya environment:
   ```
   sas-admin auth login
   ```
   The CLI prompts you for the user ID and password for the SAS Viya environment.

6. Log on to the SAS 9.4 environment:
   ```
   sas-admin dcmtransfer auth9x login
   ```
   The CLI prompts you for the URL (service endpoint) for the SAS 9.4 environment and the user ID and password for that environment.

7. Export the SAS 9.4 content:
   ```
   sas-admin dcmtransfer export9x object-type <export-options>
   ```
   If you do not specify any options, the CLI prompts you for the required information.

   By default, the `export9x` command creates three files:
   - **contents.json**
     This file contains the exported content. Do not modify the contents of this file.
   - **mappings.json**
     This file describes the relationships between the exported content and any associated objects. For example, if you export rule sets, the mapping file contains information about any lookup tables that are referenced in the rule sets and all folders where the rule sets and lookup tables reside. You can modify some of the data in this file before you import content into the SAS Viya environment. For more information, see “Modifying the Mapping File” on page 9.
   - **export_report.json**
     This file contains any messages that were generated when the content was exported.
   
   You can use the `–content`, `–mappings`, and `–report` options to change these filenames.

8. Import the content into the SAS Viya environment:
   ```
   sas-admin dcmtransfer import9x object-type <import-options>
   ```
   By default, the `import9x` command looks for a file named `contents.json` that contains the content that was exported from SAS 9.4, and a file named `mappings.json` that describes the relationship between the exported content and any associated objects. If you specified the `–content` or `–mappings` options on the
**export9x** command in Step 7 on page 8, then specify the same options on the **import9x** command.

*Note:* When you view imported content in SAS Intelligent Decisioning, any errors in the content are marked with the error icon .

9. Log off from the SAS 9.4 environment:

    sas-admin dcmtransfer auth9x logout

10. Log off from the SAS Viya environment:

    sas-admin auth logout

---

**Query Parameters for the --uri Option**

The following table lists the query parameters that you can specify as part of the URI when you are exporting SAS 9.4 content. The parameters that are available depend on the object type that you are exporting.

<table>
<thead>
<tr>
<th>Object Type</th>
<th>Available Parameters</th>
<th>Objects Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule Sets</td>
<td><strong>name=</strong>&quot;rule-set-name&quot;</td>
<td>Rule sets that match the specified name. This parameter is case sensitive.</td>
</tr>
<tr>
<td></td>
<td><strong>vocabularyName=</strong>&quot;vocabulary-name&quot;</td>
<td>Rule sets that use the specified vocabulary</td>
</tr>
<tr>
<td>Rule flows</td>
<td><strong>name=</strong>&quot;rule-flow-name&quot;</td>
<td>Rule flows that match the specified name. This parameter is case sensitive.</td>
</tr>
<tr>
<td></td>
<td><strong>simpleOnly=</strong>&quot;true&quot;</td>
<td>Beginning with SAS Intelligent Decisioning 5.1, SAS Intelligent Decisioning does not support complex rule flows.</td>
</tr>
<tr>
<td>Decisions</td>
<td><strong>name=</strong>&quot;decision-name&quot;</td>
<td>Decisions that match the specified name. This parameter is case sensitive.</td>
</tr>
<tr>
<td></td>
<td><strong>vocabularyName=</strong>&quot;vocabulary-name&quot;</td>
<td>Decisions that use the specified vocabulary</td>
</tr>
</tbody>
</table>

---

**Modifying the Mapping File**

The mapping file provides information about exported content and any associated objects. The content of the mapping file depends on the content that is exported. For example, if you export rule flows, then the mapping file contains information about the rule sets that are included in the rule flows and all folders where the rule sets and rule flows reside. If you export decisions, the mapping file contains information about the models and rule sets that are referenced in the decision. (Rule flows are exported as rule sets. Also, in SAS 9.4, decisions are not in folders, so the mapping file for decisions does not contain folder information.)
By default, rule flows that are imported as decisions, rule sets, and lookup tables are imported into a folder that has the same name as the folder in which it resided in the SAS 9.4 environment. To import the content into a different folder, edit the mapping file.

You can change some of the information in the mapping file. You can change the `target.*` fields, but do not change the `source.*` fields. For example, you can change the folders into which the content is imported and the IDs that are assigned to the imported content. The following table lists the fields in the mapping file for each object type and specifies whether you can change the field before the content is imported.

**Table 1.1 Fields in the sas-dcmtransfer CLI Mapping File**

<table>
<thead>
<tr>
<th>Object</th>
<th>Field</th>
<th>Description</th>
<th>Can Be Changed</th>
</tr>
</thead>
<tbody>
<tr>
<td>folders</td>
<td>source.folderPath</td>
<td>Folder path in the SAS 9.4 environment</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>target.folderPath</td>
<td>Folder path in the SAS Viya environment. By default, this field is set to the same path as source.folderPath.</td>
<td>Yes</td>
</tr>
<tr>
<td>lookups</td>
<td>source.id</td>
<td>Lookup table ID in the SAS 9.4 environment</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>source.name</td>
<td>Lookup table name</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>source.folderPath</td>
<td>Lookup folder path in the SAS 9.4 environment</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>target.id</td>
<td>Lookup table ID in the SAS Viya environment</td>
<td>Yes</td>
</tr>
<tr>
<td>ruleSets</td>
<td>source.id</td>
<td>Rule set ID in the SAS 9.4 environment</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>source.name</td>
<td>Rule set name</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>source.folderPath</td>
<td>Rule set folder path</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>target.id</td>
<td>Rule set ID in the SAS Viya environment</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>target.revisionId</td>
<td>Rule set version ID in the SAS Viya environment. If no version ID is specified, then the revision ID is set to <code>current</code>. When the rule set information is displayed in the user interface, the current version number is displayed.</td>
<td>Yes</td>
</tr>
<tr>
<td>models</td>
<td>source.id</td>
<td>Model ID in the SAS 9.4 environment</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>source.name</td>
<td>Model name</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>target.id</td>
<td>Model ID in the SAS Viya environment</td>
<td>Yes</td>
</tr>
</tbody>
</table>

For example, if you export a rule set that references two lookup tables, the mappings file might look like this:

```json
{
    "folders": {
        "source": {
            "folderPath": "/A"
        }
    }
```
If you export rule flow that references two rule sets, the mapping file might look like this:

```json
{
  "folders": [
    {
      "source": {
        "folderPath": "/A"
      },
      "target": {
        "folderPath": "/A"
      }
    },
    {
      "source": {
        "id": 10094,
        "name": "LookupABC",
        "folderPath": "/B"
      },
      "target": {
        "id": "2e95e765-1242-4c06-ad5a-e05fdc3932fb"
      }
    }
  ],
  "ruleSets": [
    {
      "source": {
        "id": 10043,
        "name": "RuleSetXYZ",
        "folderPath": "/A"
      },
      "target": {
        "id": ",",
        "revisionId": ""
      }
    },
    {
      "source": {
        "id": 10093,
        "name": "LookupXYZ",
        "folderPath": "/A"
      },
      "target": {
        "id": ""
      }
    }
  ]
}
```
Examples

Example 1
The following command exports the rule set with the ID 10093:

```sh
sas-admin dcmtransfer export9x rulesets
--uri /SASBusinessRulesManagerWeb/rest/ruleSets/10093
```

Example 2
The following command exports the decision with the ID d246d283-fd80-4d37-96ad-18fd9cd508c8:

```sh
sas-admin dcmtransfer export9x decisions
--uri /SASDecisionManager/rest/decisions/d246d283-fd80-4d37-96ad-18fd9cd508c8
```

Example 3
The following command exports all rule flows:

```sh
dsas-admin dcmtransfer export9x ruleflows
--uri /SASBusinessRulesManagerWeb/rest/ruleFlows?limit=2147483647
```

Example 4
The following command exports all lookup tables, writes the exported content to the file lookupContent.json, and writes the mapping information to the file lookupMappings.json:

```sh
dsas-admin dcmtransfer export9x lookups
--mappings lookupMappings.json
--content lookupContent.json
--uri /SASWIPClientAccess/rest/navigation/814100/DCMFOLDER_ROOT_ID
```

Example 5
The following command exports all rule sets that use the vocabulary named LoanApplications:

```sh
dsas-admin dcmtransfer export9x rulesets
--uri /SASBusinessRulesManager/rest/ruleSets?vocabularyName="LoanApplications"
```

Example 6
The following command imports all of the rule sets in the file content.json. It uses the mapping file mappings.json:

```sh
dsas-admin dcmtransfer import9x rulesets
```
**Example 7**
The following command imports all lookup tables in the file lookupContent.json. It uses the mapping file lookupMappings.json.
```
sas-admin dcmtransfer import9x lookups --content lookupContent.json --mappings lookupMappings.json
```

**Example 8**
The following command imports all rule flows in the file content.json. It uses the mapping file mappings.json. The rule flows are imported as decisions.
```
sas-admin dcmtransfer import9x ruleflows
```

**Example 9**
The following command imports all rule flows as decisions. The decisions are imported into the folder named /LoanApplications. Any decision that has the same name as the rule flow that is being imported is replaced.
```
sas-admin dcmtransfer import9x ruleflows --force --target-folder-path /LoanApplications
```

---

**scoreexecution Plug-in**

Lists or deletes resources such as log files, code files, jobs, and SAS Cloud Analytic Services (CAS) tables that were not deleted when the associated rule set, decision, or model test was deleted.

**Requirement:** You must create a profile and sign in before using the CLI. See “Command-Line Interface: Preliminary Instructions” in *SAS Viya Administration: Using the Command-Line Interfaces* for information.

**See:**
- “Global Options” on page 2
- “Global Commands” on page 1

---

**Syntax**

```
sas-admin <global-options> scoreexecution command <command-options>
```

**Commands**

In addition to the global commands in “Global Commands” on page 1, you can specify the following commands:

- **list-hanging-resources**
  lists the resources that are no longer used by the score execution service.
  
  ```
  --file filename
  ```
  
  Specifies the file to write the list of resources to. You can use this file with the **remove-hanging-resources** command to delete the resources.

  **Alias** -f

- **remove-hanging-resources**
  deletes resources that are no longer used by the score execution service.
  
  ```
  --file filename
  ```
  
  Specifies the file that contains the URIs of the resources that you want to remove.
**Alias**  
-`f`

**Examples**

**Example 1**  
The following command displays detailed information about the unused resources:

```bash
sas-admin --output fulljson scoreexecution list-hanging-resources
```

**Example 2**  
The following command displays information about unused resources in a table format:

```bash
sas-admin --output text scoreexecution list-hanging-resources
```

**Example 3**  
The following command displays only the URIs of the unused resources:

```bash
sas-admin --output text --quiet scoreexecution list-hanging-resources
```

**Example 4**  
The following command writes the URIs for unused resources to a file named uris.txt:

```bash
sas-admin scoreexecution list-hanging-resources --file uris.txt
```

**Example 5**  
The following command deletes the unused resources listed in the file uris.txt:

```bash
sas-admin scoreexecution remove-hanging-resources --file uris.txt
```
Chapter 2

Transferring Version Comments

When you use the SAS Viya transfer CLI to transfer objects from one environment to another, all of the content is transferred except for notes that are associated with specific versions of the objects. To transfer the version notes for an object, complete these steps:

1. Export a transfer package from the source environment that contains the version notes that are associated with the object:

   ```
sas-admin transfer export
   --resource-uri /comments/comments?filter=startsWith(resourceUri,'object-uri')
   
   The object URI is displayed on the Properties tab for the object in SAS Intelligent Decisioning, or you can retrieve object URIs by using the SAS Intelligent Decisioning REST API. Object URIs have the following format:

   /businessRules/ruleSets/rule-set-ID
   /decisions/flows/decision-ID
   /referenceData/domains/lookup-table-ID
   /treatmentDefinitions/definitions/treatment-ID
   /treatmentDefinitions/definitionGroups/treatment-group-ID
   
   Record the transfer package ID.

   2. Download the package to your local machine, and store it in a JSON file named MyPackage.json:

   ```
sas-admin transfer download --id transfer-package-ID --file /tmp/MyPackage.json
   
   3. Upload the JSON file to the target environment:

   ```
sas-admin transfer upload --file /tmp/MyPackage.json
   
   Record the upload package ID.

   4. Import the version comments into the target environment:

   ```
sas-admin transfer import --id upload-package-ID
   
   For more information, see “Promotion: How To (CLI)” in SAS Viya Administration: Promotion (Import and Export).
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