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What’s New in SAS Business Data Network 3.3

Overview

The user interface for SAS Business Data Network has been rewritten in HTML5. Previously, applications in SAS 9.4 – and many SAS solutions that are based on SAS 9.3 and SAS 9.4 – used the Adobe Flash Player to provide interactive user interfaces. Adobe announced that it intends to end support for Flash technology and will cease to update and distribute the Flash Player at the end of 2020. Browser vendors will disable Flash by default in 2019. For more information about Adobe Flash end-of-life, see SAS Software and Its Use of the Adobe Flash Player.

Features of the HTML5 Interface

The HTML5 interface for SAS Business Data Network is displayed in a window that contains the following sections:

- Tools
- Folders
- Tags
- Filters
- Terms List
- Term Details
Accessibility Features of SAS Business Data Network

Overview

SAS Business Data Network has not been tested for compliance with U.S. Section 508 standards and W3C web content accessibility guidelines. If you have specific questions about the accessibility of SAS products, send them to accessibility@sas.com or call SAS Technical Support.

Documentation Format

Please contact accessibility@sas.com if you need this document in an alternative digital format.
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Chapter 1
Introduction to SAS Business Data Network

What Is SAS Business Data Network?

SAS Business Data Network is an application that enables you to manage business terms. It supports a collaborative approach to managing the following information:

• descriptions of business terms, including their requirements and attributes
• related source data and reference data
• contacts (such as technical owners, business owners, and interested parties)
• relationships between terms and processes (such as SAS Data Management Studio jobs, services, and business rules)

By linking terms to business rules and data monitoring processes, SAS Business Data Network provides a single entry point for all data consumers to better understand their data. Data stewards, IT staff, and enterprise architects can use the terms to promote a common vocabulary across projects and business units. Permissions can be set to allow only specific users to access or control the data in SAS Business Data Network.

SAS Business Data Network enables collaboration of domain knowledge between business users, technical users, and data stewards. SAS Business Data Network can be used as a single entry point for all data consumers to better understand their data. It consists of a web user interface that documents business terms and their associated rules, jobs, applications, data, documentation, and other information. Technical users use the network to document information about tables and columns that implement the business terminology. This information can be used to relate jobs and other information to terms and to share knowledge about data transformations. It serves as a data dictionary to describe details of data models and other data-related information. Data stewards can view data from a business standpoint to better visualize problem areas by domain in order to identify and fix data issues more effectively.
Benefits of SAS Business Data Network

Overview

SAS Business Data Network enables you to discover, document, and manage a glossary of business terms. The record for a term can include a definition of the term; the networked relationship of the term to other terms; and the relationship of the term to other content such as documents, web pages, tables, and business rules.

Typically, a user who understands the business terminology used in an organization provides the initial information in SAS Business Data Network. This user can also associate documents or rules that describe each term. Import and export features enable a user to quickly populate the SAS Business Data Network with terms. Then, a more technical user can add information related to the network of terms. Examples of this information include jobs that are used to modify the term and data that is related to the network of terms. The network of terms is fully integrated with impact analysis to help you understand how your physical data and business processes interrelate. The user interface supports roles, capabilities and security for terms, and term attributes. The roles and capabilities are fully customizable to match your site requirements.

SAS Business Data Network supports the following key elements:

- “Non-Collaborative Terms” on page 4
- “Collaborative Terms” on page 4
- “Term Type Templates” on page 5

Non-Collaborative Terms

You can enter non-collaborative terms, which do not undergo a review and approval process, or collaborative terms, which are reviewed and approved. Simple collaboration consists of a review for business content and approval. Extended collaboration adds a technical review to the review and approval process.

Collaborative Terms

Collaborative terms are enabled through integration with SAS Workflow Studio. Users can send terms into a collaborative flow for review and approval before publishing. Several default collaborative reviews are available for customization, or you can create your own collaborative reviews to match your business needs. The SAS Business Data Network user interface guides the user through the collaborative review flow for a term. Status is also shown at each step in the review.

You can quickly see collaborative review tasks that are waiting on your input in the SAS Task Manager and in views in the network. A number of quick actions enable users to update the review for multiple terms together. Different reviews can be used for different actions in the network of terms. For example, you can have one review that you use when creating terms and another when deleting terms. You can also tie different reviews to different term types. For example, you can have one review when working with supplier information types and a different one for working with your data dictionary tables and columns.
**Term Type Templates**

Another important feature is support for multiple, customized term templates. These templates are defined by creating and editing term types. See “Managing Term Types” on page 61. Administrators are now able to create templates with custom attributes for terms and term hierarchies. You can also determine whether attributes are required and set default values for attributes in a term. Required attributes can be useful if you want to enforce the collection of standard information for every term that is built from the template.

Most of the attributes of a term are now fully customizable via the term type. For example, you might have a set of term types that represent the tables and columns in your data dictionary. You can create a term type for tables with the information that you want to use to describe tables in your system. Then you can create a different column template with the information that you want to capture about columns. You can have any number of custom term types. These term types serve as templates that match the information that you want to capture in your terms.
Chapter 2

Accessing SAS Business Data Network

Accessing SAS Business Data Network

Overview

You can access SAS Business Data Network in the following ways:

• “Use a Standard URL” on page 7
• “Connect from the Web Search Tool” on page 8

Use a Standard URL

You can access SAS Business Data Network from a standard URL that has the following format: http://hostname/SASBusinessDataNetwork.

If your site is not using the default port for SAS Business Data Network, you must specify the port in the URL. For example, if the port is 7980, you can access SAS Business Data Network from the following URL: http://hostname:7980/SASBusinessDataNetwork.

1. Click the URL that is supplied by your system administrator, or paste it into the address field of your browser.

2. Enter your user ID and password in the appropriate fields.

   Note: Your password is case-sensitive. Your user ID might be case-sensitive, depending on the operating system that is used to host the web application server. If you need assistance, contact your system administrator.

3. Click Sign In to access SAS Business Data Network in a browser window.

4. To log off from SAS Business Data Network, click the icon that represents your user name in the upper right of the SAS Business Data Network window. Then, click Sign out in the drop-down menu.
Note: When you click **Sign out**, you are logged off from all tabs opened by SAS Business Data Network.

Be careful when you log on to SAS Business Data Network in one browser tab and then log on to SAS Business Data Network (or a different SAS web application) in another browser tab. The same credentials are used automatically for subsequent authentication attempts.

**Connect from the Web Search Tool**

The web search tool is a separate web page that contains a field that you can use to search for terms in SAS Business Data Network. You can click a term listed in the search results to display it in SAS Business Data Network. See “Using Web Search” on page 31.

If you have already logged on to one of the SAS applications, you will be taken directly to SAS Business Data Network. If you have not logged on to a SAS application, you will see the Sign In window explained in “Use a Standard URL” on page 7. Follow the same steps to log on to SAS Business Data Network.
Main Window for SAS Business Data Network

Overview

The SAS Business Data Network window is divided into sections where you can create and manage your terms:
Figure 3.1 SAS Business Data Network Window

The window contains the following elements:

- “Tools” on page 10
- “Folders” on page 11
- “Tags” on page 12
- “Filter” on page 12
- “Terms List” on page 13
- “Term Details” on page 15

Tools

Use the items in the Tools section at the left edge to work with the following:

- Terms
- Term Types on page 61
- Deleted Terms on page 63
- Snapshots on page 41
The tools that are listed in this section depend according to the permissions for the user who has signed in to the SAS Business Data Network application.

**Folders**

*Figure 3.3  Folder Options and Tasks*

Use the Folders section to access folders and perform folder-related tasks:

**Table 3.1  Folder Options and Tasks**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Top Level Terms| Top Level Terms displays a list of the top-level terms entered into SAS Business Data Network. The terms that are displayed are based on the permissions assigned to the user currently signed in to SAS Business Data Network.  
  The Total count displayed on the right side lists the number of top-level terms. |
| Notifications  | The Notifications element displays a list of the collaborative terms entered into SAS Business Data Network for which the current user is a potential or actual owner. The terms must be created and managed through a collaborative review and approval process.  
  See “Approving Collaborative Terms” on page 28 for more information.                                                                                   |
| My Drafts      | My Drafts displays the draft terms in collaborative flows and the non-collaborative drafts that the current user has created.                                                                                  |
| Search         | Displays a field to search for terms entered into SAS Business Data Network. The default search is on term names. Click to expand the search to term attributes and term notes. The function searches the terms’ names, descriptions, attribute values, and notes to find matching terms.  
  The subset of terms that matches the search text is displayed in a terms table below the Search field.  
  The search results are displayed under the Terms List.                                                                                                 |

Perform general term maintenance. See “Maintain Terms” on page 24.
The **Total count** above the list counts the number of top-level terms. The count increases as you drill down into child terms because it displays the number of terms at each level of the hierarchy.

### Tags

The Tags section displays the tags that you add to your terms. When you click a tag, the terms list is constrained to display only the terms that are associated with the selected tag. The section also contains tools for creating and maintaining tags:

- Create new tags
- Rename a selected existing tag
- Delete a selected existing tag
- Display the Add Terms to Tag window
- Display a selected tag in SAS Lineage

Click 📚 to create a new tag and 📚 to perform the other tag management functions in the list. You can also right-click any tag to access these functions.

*Figure 3.4  Tags Options*

### Filter

Use the elements in the Filter section on your list of terms to limit its contents to terms that have specific characteristics.
The filter feature provides a set of tools that you can use to filter the list of terms. You can filter by term name, type, importance, status, period of last modification, workflow, and the contact for the term. Note that you can filter on multiple types, levels of importance, and statuses at once. The filter is applied to the set of terms on the current page.

If you click a tag and apply a filter to the list of terms associated with the selected tag, you can filter those terms. The **Total count** displayed on the right side lists the number of terms that are associated with the selected tag. This list can include both parent and child terms. This count updates as you expand the hierarchy. For example, you can select a tag that displays 5 terms. If you drill down into one of those terms, count updates with the number of children of that term.

**Terms List**

The Terms list contains a paged table that displays 500 terms at a time. You can click **Next** or **Previous** to access terms that come before or after the current page of terms. You can also use the drop-down arrow to select a range of terms that you have already accessed.
The items displayed above the Terms list enable you to work with the terms in the list:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="icon" /></td>
<td>Display the number of opened terms. Click the number icon to display a list of the opened terms. Click a term in the list to reopen it.</td>
</tr>
<tr>
<td><img src="image2" alt="icon" /></td>
<td>Navigates to the adjacent term’s child terms. Breadcrumbs are displayed at the top of the terms list as you drill down in a term’s hierarchy. For example: Search &gt; Logistics &gt; Logistics Organization</td>
</tr>
<tr>
<td><img src="image3" alt="icon" /></td>
<td>Refresh the terms and tags lists. This refresh resets the display to the initial page of terms and resets any breadcrumbs back to the top level.</td>
</tr>
<tr>
<td><img src="image4" alt="icon" /></td>
<td>Create a new term</td>
</tr>
<tr>
<td><img src="image5" alt="icon" /></td>
<td>Open a selected term so that you can view or edit it</td>
</tr>
<tr>
<td><img src="image6" alt="icon" /></td>
<td>Delete one or more selected terms that are not being processed through a workflow</td>
</tr>
<tr>
<td><img src="image7" alt="icon" /></td>
<td>Display the term in SAS Lineage (if present in the Relationship Service)</td>
</tr>
<tr>
<td><img src="image8" alt="icon" /></td>
<td>Displays the previous page of terms</td>
</tr>
<tr>
<td><img src="image9" alt="icon" /></td>
<td>Displays the current page of terms. Click the drop-down arrow to access previously loaded pages.</td>
</tr>
</tbody>
</table>

Figure 3.6  Terms List
<table>
<thead>
<tr>
<th>Tool</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next</td>
<td>Displays the next page of terms</td>
</tr>
</tbody>
</table>
|     | Sets an ascending or descending sort order on a selected column in the terms list:  
|     | • Importance  
|     | • Last modified  
|     | • Status  
|     | • Term name  
|     | • Term type  
|     | Sorting on a column operates across all pages of data. Therefore, new data is loaded from the server and the current page is reset to the initial page. |

### Term Details

Use the Term Details section to display detailed information about a selected term. See “View or Edit Term” on page 15.

#### Figure 3.7 Term Details

![Loading Dock](image)

### View or Edit Term

You can use the View or Edit Term section to view or edit a term that you selected from the term list in the main SAS Business Data Network window. The View section appears when you perform one of the following actions:

- Click the link of a term in the list
- Select a term and click Open
Right-click a term and click **Open**

You can click **Edit** to work with the term in the Edit section. You can also launch the Edit section directly by selecting a term, clicking ![edit_icon](image), and clicking the **Edit** item. Finally, you can right-click a selected term and select **Edit**.

When you open a term, you display a series of tabs that contain information and settings that are related to the selected term:

**Figure 3.8 View Tabs**

![View Tabs](image)

A collaborative term displays the same tabs, but it also contains an approvals toolbar:

**Figure 3.9 Collaborative Flow Status Toolbar**

![Collaborative Flow Status Toolbar](image)

You can use this toolbar to claim and unclaim a term. You can also perform a variety of task-appropriate actions, such as rejecting terms, adding comments, and submitting terms for approval. You can add comments when you click transitional steps in the flow, such as **Submit for Approval**. For information about collaborative terms, see “Approving Collaborative Terms” on page 28.

The following tabs are available from the View mode of a **Terms** tab:

- **Identification**
- **Hierarchy**
- **Associated Items**
- **Notes & Contacts**
- **History**

The **Identification** tab is displayed in both the View section and the Edit section. The tab contains the following elements:

**Description**

Enables you to review or enter a text description of the term. For example, the description of the term **Warehouse** can be entered as **Storage facility for goods and raw materials**.

**Requirements**

Enables you to view or enter detailed requirements related to the term. For example, the requirements for **Warehouse** can be entered as **Must meet size and security standards**.
Attributes
Enables you to review or specify attributes for the selected term. These attributes are determined by the term type, which is shown in the Details section of the Identification tab. For example, the Warehouse term could have a type of Create Extended.

Details
Enables you to view detailed information about the term, such as Type, Status, Importance, and a Locked by indicator. The default status indicators include the following: Production, Editing, On Hold, Under Review, and Not Specified. For example, Warehouse could have a status of Under Review. The Locked by value is updated only by other actions that lock or unlock the term.

Links
Enables you to review or add links to external sources to the term. These links can provide access to background or conceptual information about the term. You can also edit or delete existing links in the Edit section.

Tags
Enables you to review or add a tag to the term that clarifies the content of the term and its relationship to other terms. For example, you could add the Logistics tag to the term Warehouse. You must be in View mode to make changes to the list of tags. The tags list is associated with all versions of a term, not a specific version.

Related Terms
Enables you to review or connect the selected term to related terms. For example, Mailroom could be entered as one of the related terms to Warehouse. You must be in View mode to make changes to related terms. A term can be related to more than 100 terms, but only the first 100 related terms are displayed in both the term details and term View modes.

The Associated Items tab is available in the View and Edit sections. In the View section, it displays the items that you have associated with the selected term. In the Edit section, you can add and maintain associations with items. These items can also come from or be imported from other data management applications that can export items in a compatible format. Some of the items that can be associated are shown in the following list:

- collections
- data jobs
- fields
- process jobs
- profiles
- reference data domains
- rules
- SAS columns
- SAS jobs
- SAS libraries
- tables
- tasks
- work tables
- transformations
The full list of possible associations is available in the Add items from Lineage window that you use to search for associations.

The Notes & Contacts tab is available in the View section. The Add Contact window enables you to add contacts with an interest in or responsibility for the term, such as a Warehouse Manager. You can also manage the existing contacts, send messages out to the full contacts list, and set your notification setting.

You can add text notes to the term in the Add Note window. You can also edit or delete an existing note.

The Hierarchy and History tabs also are displayed only in the View section. The Hierarchy tab displays the selected term in its hierarchical position. You can also select and remove the parent term for the selected term.

The History tab displays a list that includes the creation of the term and all of its modifications. Each item in the list is given a version number. You can select an item and open it to review it in read-only view. You can also click Restore to return the term to that version and its contents. The draft of a term starts with version 0.1. The number keeps increasing until you publish the term. Then, the term is designated as version 1.0.

As you save additional drafts, the minor version number is incremented until you publish the term. The major version number of the published term is incremented each time the term is published.

The following display shows the tabs available in the Edit section for the term Country Club:

**Figure 3.10  Edit Tabs**

---

### Settings Window

To access the Settings window, click the icon that represents your user name in the upper right of the SAS Business Data Network window. Then click Settings in the drop-down menu to specify user locale, theme, and accessibility preferences for SAS Business Data Network. You can click Reset Messages to reset all error and warning messages.
Adding Terms

Overview
When you add a term, you specify a name, type, and a position in the hierarchy. You can either add a new term as a child to an existing term or add a term without specifying a parent term. The term appears in the Terms list. Then, you can open the term in the View section and define it in its property tabs in the Edit section. For the term definition process, see “Defining and Editing Terms” on page 20. The ability to view and edit terms is based on the permissions attached to the current user’s role in SAS Business Data Network.

Add a New Term

1. Display the Terms list.
2. (Optional) Review the Terms list to determine where the new term will reside in the hierarchy. You can skip this step if you know that the new term will be a top-level term. The term in this example is a child term to the Logistics Organization term.

3. Click in the toolbar above the list.

4. Enter the new term name in the Name field. For example, you can enter Warehouse Facility as your new term name.

5. Select the Add as child to check box. Note that this check box is optional. You can leave it deselected and not add the new term as a child to an existing term.

6. Click to select the parent term in the Select Terms window. Then, click OK to save the selection. The parent term for Warehouse Facility is Logistics.

Figure 4.1 New Term Window

The parent term that you selected is shown in the Add as child to field. In this example, the parent term is Logistics.

7. Click the Type field to see a list of the available term types. Select a type.

8. Click OK to save the new term and display it in an edit window that is named for the term (Warehouse Facility, in this case.) See “Defining and Editing Terms” on page 20 for information about defining the term.

Note: Newly created terms are added to the bottom of the terms list. They are then moved to their appropriate page the next time that the terms list is refreshed.

Defining and Editing Terms

Newly added terms are immediately displayed in the Edit section of the SAS Business Data Network window. You can define the term by working through its property tabs.

Open an existing term for edit using one of the following methods:

- Select the existing term, click , and click Edit.
- Right-click the term and click Edit.

Click the Identification tab to define the parameters for the term. Perform the following steps to define a term, such as Warehouse Facility.

1. Enter a description for the term, such as Storage facility for goods and raw materials.
2. If appropriate, enter any requirements for the term, such as *Must meet size and security standards*.

3. If the term type for the term supports custom attributes, you can add attributes to the term or manage existing attributes. Otherwise, terms inherit the attributes set for their term types and new attributes cannot be added. For information about term types, see “Managing Term Types” on page 61.

   The following existing attributes are available for term types that support them:
   - Single line text entry
   - Multi-line text entry Boolean URL MultiLineText
   - Rich text
   - Single selection
   - Multiple selection
   - Boolean
   - Date
   - URL

   If the term type does support new attributes, click ↓ in the Attributes section to access the New Attribute window. You can enter a label, instructions, and value. You can also specify whether the attribute is required. You can use the toolbar in the Attributes section to edit, and delete the custom attributes that you create. Note, however, that highlighted attributes created in rich text do not display the highlighting in SAS Business Data Network. SAS Business Data Network does not have the capacity to store the highlighting.

4. Specify details for the term. For *Warehouse Facility*, the type is *AllExtended*, the status *Under Review*, and importance *Medium*. The values for importance and status can be edited, but the type cannot be changed.

5. If appropriate, add links to internal or external sources such as websites.

6. If appropriate, add related terms from SAS Business Data Network, such as *Mailroom* and *Picking*. You can select more than one term at a time.

   **Note:** If you need to add notes and contacts, tags, or related terms, you click View to open the term in the View section. These functions are not available in the Edit section.

   You can also click the **Associated Items** tab to view or edit the items that you have associated with a selected term.

   Perform the following steps on a term that you opened and placed in Edit mode:

   1. Click **Add Items** to access the Add Items from Lineage window:
2. For this example, leave the Search field empty and make sure that Select all is selected, as is the default.

3. Click Submit Search to run the search and see the results. The search results include an unfiltered list of all of the items that are available to associate with the selected term.

4. Select the items that you want to add as associated items. You can use shortcuts such as Control-A, Shift-Click, and Control-Click to select multiple items.

5. Click Add items to return to the Edit mode for the selected term and add the selected associated terms in the Associated Items tab. You can use the items in the Associated Items toolbar to perform the following functions when the selected term is open in Edit mode:
   • Add items
   • Remove items
   • Add a note to a selected item
   • Display a lineage diagram in SAS Lineage for a selected item. For more information, see the SAS Lineage: User’s Guide.

If your term is a non-collaborative term, you can save it as draft or publish it. Click to save a private version of the term to the terms list that only you can review and edit. Click Publish to save the term to the terms list for any user to review and edit.

If your term is a collaborative term, click Save Draft to save the term. If you are ready to submit it for review and approval, you can use a separate Submit action.

Reviewing and Maintaining Terms

Overview

You can review and maintain SAS Business Data Network by using the tools included in the SAS Business Data Network main window. Perform the following tasks:
Review Terms

You can quickly review your terms in the Terms list at the top of the screen:

Figure 4.3  Terms List

You can filter and search this list with the Filter and Search buttons in the pane on the left side of the window. You can click a tag in the pane to constrain the list to items associated with the tag.

Also, you can select a term in the list and review its property tabs at the bottom of the screen. The Identification tab for the term Warehouse Facility is shown in the following display:

Figure 4.4  Identification Tab

For information about the content of the tabs, see the SAS Business Data Network main window Help. The History tab displays a list that documents when the term was created and modified. Each change is listed as a version. You can select a version and click Restore to return to the selected version. For example, if you added an associated item to a term in version 2, you can select version 1. Then you can click Restore to return to the version of the term without the added associated item.

Notes and contacts, hierarchy information, related terms, and tags are added to the term and remain there until removed. They are not related to versions and are not removed if a previous version is restored.
**Add Notes and Contacts to the Term**

Click the **Notes & Contacts** tab for a term in the Terms list. Then click the appropriate sections for notes and contacts to add notes and contacts to the term. You can click to remove all of a term's contacts or turn your term notifications on or off.

Click to send a notification to all the contacts associated with a term:

*Figure 4.5  Notify All Contacts*

This notification can be sent only to contacts defined with an email address.

The **Notes & Contacts** and **History** tabs are not used to define terms.

**Maintain Terms**

**Overview**

You can use the options under and the buttons on the toolbar to maintain the terms in SAS Business Data Network. Perform the following tasks:

- “Create a Tag and Add It to Terms ” on page 24
- “Change the Parent of a Term” on page 25
- “Save a PDF Report for a Term ” on page 25
- Add Fonts for PDF Reports on page 26
- “Perform General Term Maintenance” on page 27

**Create a Tag and Add It to Terms**

You can add a tag to the list that is displayed in the SAS Business Data Network main window. You can also associate this tag with any other term in SAS Business Data Network. When you click the tag, only the tagged terms are displayed in the terms list.

1. Click in the Tags section.
2. Enter the name of the tag in the **Name** field in the New tag window. For example, you can create a tag named *Logistics*.
3. Click **OK** to create the new tag.
4. Verify that the new tag is added to the tags in the left pane of the SAS Business Data Network main window.

You can also select a tag. Then, you can click in the Tags section to perform the following maintenance functions on the tag:

- Rename the selected tag in the Rename window.
- Delete the selected tag in the Delete tag window.
- Add terms to the selected tag in the Add terms to the tag window.
- Open SAS Lineage for the selected tag.

**Change the Parent of a Term**

You can change the parent of a term to move it to a different position in the terms hierarchy.

1. Select one or more terms that you want to move from the terms list.
2. Click above the Terms list and click Select parent to access the Select Parent window. You can also right-click a term and select the action.
3. Navigate to the term that you want to select as the new parent. You can use search, filter, and tagging functions to reduce the number of terms displayed in the Terms field. For example, you can select the term Warehouse Facility as the new parent for a Loading Dock term. Then, click OK to save the change. The term Loading Dock has moved from under Logistics to under Warehouse Facility.

**Save a PDF Report for a Term**

You can save a PDF report that contains summarized information about one or more selected terms. Select the terms for the report and click . Then click Save as PDF Report.

The Report Options window enables you to select from the following report sections:

- Attributes
- Related terms
- Hierarchy
- Associated Items
- Contacts
- Notes
- History

Click OK to see a link to the report. The link is located at the bottom of the SAS Business Data Network window in the browser used in this example:
Add Fonts for PDF Reports

By default, only western European characters are displayed properly in the output of a PDF report. To enable other character sets, you must add the sas.dm.businessdata.pdf.report.font.normal and sas.dm.businessdata.pdf.report.font.bold options to the Java Virtual Machine.

1. Locate the file that contains the Java Virtual Machine options for your system:
   - On a Windows system, the directory path is \Web\WebAppServer\SASServer13_1\conf\wrapper.conf.
   - On a UNIX system, the directory path is Web/WebAppSERVER/SASServer13_1/bin/setenv.sh.

2. Open the appropriate configuration file. These files are named as follows:
3. Add the options to the configuration file. The syntax of the options in Windows is similar to the following:

```
```

The numbers might change. They are based on what is currently present in the wrapper.conf file.

UNIX is similar. Just be sure to add the options that begin with the characters -D to the end of the JVM_OPTS value in the setenv.sh file.

4. After you finish these updates for either Windows or UNIX, restart SASServer13_1. If SASServer13 is re-installed, the values are lost and must be added again.

These options enable your PDF reports to access additional TrueType fonts. The fonts that you can add depend on the TrueType Fonts that are available, and the location of the font files can vary. By default, SAS ships TrueType Font files in the `SASHome/ReportFontsforClients/9.4` directory.

### Perform General Term Maintenance

Click above the Terms list to perform general term maintenance:

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit</td>
<td>Edit a selected term. See &quot;Defining and Editing Terms&quot; on page 20.</td>
</tr>
<tr>
<td>Publish</td>
<td>Publish a selected term. Publish is enabled only for publishing draft versions of non-collaborative terms. For collaborative terms, the publish action appears in the workflow actions submenu when that step of the workflow is reached.</td>
</tr>
<tr>
<td>Restore to last published</td>
<td>Restore a selected term to the last published version.</td>
</tr>
<tr>
<td>Workflow actions</td>
<td>Perform a selected workflow action on a selected term (such as claim, approve, or reject changes). See &quot;Approving Collaborative Terms&quot; on page 28.</td>
</tr>
<tr>
<td>Select parent</td>
<td>Select a parent for one or more selected terms.</td>
</tr>
<tr>
<td>Remove parent</td>
<td>Remove one or more selected terms from a parent to child relationship.</td>
</tr>
<tr>
<td>Unlock</td>
<td>Unlock a selected term.</td>
</tr>
<tr>
<td>Rename term</td>
<td>Rename a selected term.</td>
</tr>
<tr>
<td>Duplicate term</td>
<td>Duplicate a selected term.</td>
</tr>
</tbody>
</table>
## Approving Collaborative Terms

### Overview

Collaborative term review and approval enables you to divide the responsibilities for creating, reviewing, and approving terms among the members of your team. In this way, each role can be fulfilled by the most qualified member of the group. Each person participating in the collaborative process must be added to the appropriate groups in SAS Management Console to use workflows.

You can enable collaboration by selecting the appropriate term type in the **Type** field when you create a term. The Term Type Manager section contains fields that enable you to specify optional workflows that support creating, editing, and deleting terms. You can specify default status values and importance labels for each term type. You can also use the **Business Roles** section create groups of specific users for notifications. For more information about term types, see “Managing Term Types” on page 61.

**Note:** These workflows must be configured for your instance of SAS Business Data Network. See “Configuring Workflow in SAS Business Data Network” on page 80.

### An Example of Approval Processing

#### Overview

The processes to conduct simple and extended collaborative term review approval are identical, except for the inclusion of a technical review component in the extended version. Therefore, the following example of extended processing illustrates the simpler process. The extended process contains the following stages:
• “Term Creation” on page 29
• “Collaborative Term Review and Approval Functions” on page 30
• “A Sample Collaborative Flow” on page 30

**Term Creation**
Follow the process described in “Adding Terms” on page 19 to create the term. Be sure to select the appropriate **Type** to specify the type of collaborative term flow that you want to use. The *Shelving Rack* term needs both a business review and a technical review, so the type selected is Create Extended:

**Figure 4.8  Extended Review Process Term**

![Image of Extended Review Process Term]

Click **OK** to create the term. Now you can click **Submit** in the toolbar to add it to the collaborative term flow. All of the users who have been added as contacts to the term are notified by email when the term is created or changed. You can define default contacts on a term type, and those contacts will be added initially to all new terms of that type. Email is enabled by default for SAS Business Data Network. However, you can enable or disable email notifications that are being sent to you when you are logged in.

Note that the **Create Extended** term type is not a default term type. It was created using the process described in “Managing Term Types” on page 61.

When you open the term, you can see its workflow toolbar:

**Figure 4.9  Workflow Toolbar**

![Image of Workflow Toolbar]

The term is also added to the Notifications list for these users. The Notifications view contains terms in collaborative flows for which the current user is a potential or actual owner. The current user does not have to have been added as a contact for the term.
Collaborative Term Review and Approval Functions

You can process a term through a collaborative flow by using the functions listed in the following table:

**Table 4.2  Collaborative Term Review and Approval Functions**

<table>
<thead>
<tr>
<th>Function</th>
<th>Action</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim a term for processing</td>
<td>Click Claim</td>
<td>Provides access to term in collaborative workflow.</td>
</tr>
<tr>
<td>Release a term from processing</td>
<td>Click Unclaim</td>
<td>Returns term to terms list without changing its status.</td>
</tr>
<tr>
<td>Reject a proposed term</td>
<td>Click Reject</td>
<td>Marks a term as rejected but leaves it in the terms list to be deleted</td>
</tr>
<tr>
<td>Clears changes made to a term</td>
<td>Click Clear Changes</td>
<td>Discards unpublished drafts for a term and restores the term to its last published version.</td>
</tr>
<tr>
<td>Delete a term</td>
<td>Click Delete</td>
<td>Marks a term for deletion.</td>
</tr>
<tr>
<td>Submit a term for review</td>
<td>Click Submit for Review</td>
<td>Places term in the collaborative flow for business or technical review.</td>
</tr>
<tr>
<td>Approve a term in its current state</td>
<td>Click Approve Changes</td>
<td>Places term in the collaborative flow.</td>
</tr>
<tr>
<td>Approve the term and publish it to the terms list</td>
<td>Click Publish</td>
<td>Removes term from the collaborative flow and publishes it to the terms list.</td>
</tr>
</tbody>
</table>

**Note:** SAS Business Data Network 3.1 and SAS Business Data Network 3.3 create incompatible workflows. Therefore, any collaborative terms that you are processing in a SAS Business Data Network 3.1 workflow cannot be migrated to SAS Business Data Network 3.3. If you have existing 3.1 terms that you need to use in a collaborative workflow, process and publish the terms in a workflow in SAS Business Data Network 3.1. You can then migrate the published terms and use them in a SAS Business Data Network 3.3 workflow.

A Sample Collaborative Flow

This example follows the Shelving Rack term through an extended collaborative flow.

1. Select the Shelving Rack term.
2. Click Submit for Review.
3. A business approver clicks Claim to claim the term for processing in the Business Review Step.
4. A business approver clicks Approve Changes to approve the term in the business review. The term is passed to the Technical Editing Step.
5. A technical editor clicks **Claim** to claim the term for processing in the Technical Editing Step.

6. A technical editor clicks **Submit for Review** to move the term to the Technical Review Step.

7. A technical approver clicks **Claim** to claim the term for processing in the Technical Review Step.

8. A technical approver clicks **Publish** to remove the term from the collaborative flow and add it to the terms list with a Production status.

---

**Using Web Search**

**Overview**

The **Search** tool enables you to search for SAS Business Data Network terms in a web browser with a web-based search tool. You can use this tool to search for terms without opening and logging on to SAS Business Data Network.

You can also add a bookmarklet for Search to your supported browser and register Search as a search provider with your browser. These features give you easy access to Search. Perform the following tasks:

- “Satisfy Prerequisites” on page 31
- “Search for a Term” on page 31
- “Configure Your Browser to Use Search Extras” on page 33

**Satisfy Prerequisites**

In order to use Search, you must satisfy the following prerequisites:

- Install a supported browser. The search tool should render and function correctly in Google Chrome 67.0 and later, Mozilla Firefox 60.0 and later, Microsoft Edge 42.1 and later, and Microsoft Internet Explorer 11.

- Enable JavaScript in your browser.

- Install SAS Business Data Network.

- Ensure that your users have been placed in the proper groups to use Search and that appropriate permissions have been granted.

**Search for a Term**

1. Open the web page for SAS Business Data Network - Search. The URL for the page uses the following pattern: `<server name>:\<port number>\SASBusinessDataNetwork/search`

   Enter your User ID and Password credentials and click **Sign On** to sign in to the Search page.
2. The following display shows an empty Search page:

*Figure 4.10  Empty Search Page*

3. Enter a search term in the **Search Business Data Network** field. For example, you could enter *test* as the search term. Note that **Search Business Data Network** is installed as the default search provider.

4. Click **Search**.

5. Review the search results.
The results in Microsoft are shown in the following display:

**Figure 4.11  Search Results**

![Search Results](image)

The search results enable you to see all of the matches in a terms list or open a single matched term.

**Configure Your Browser to Use Search Extras**

You can use the tools in the SAS Business Data Network Search Extras page to make it easier to access Search with a supported browser.

You can add the bookmarklet shown in the top half of the page to the bookmarks toolbar in Microsoft Internet Explorer and Google Chrome browsers.
The bookmarklet is the blue object that shown in the following display:

*Figure 4.12  Bookmarklet Section of Extras Page*

```
SAS® Business Data Network - Search

Back to Search

BOOKMARKLET

Drag this bookmarklet to your bookmarks toolbar:

[SAS® Business Data Network Search]

When you want to search for a word or phrase in SAS® Business Data Network Search, simply highlight the text and click on the bookmark in your toolbar.
```

Simply drag and drop the object into the bookmarks toolbar of your Microsoft Internet Explorer, Google Chrome, or Mozilla Firefox browser. Depending on the browser, a dialog box might be displayed. For example, Internet Explorer displays a confirmation dialog box. Then, you can click Yes to add a SAS® Business Data Network link. That link takes you directly to the Search page.

The bookmarklet for these browsers enables you to do the following:

- Highlight a word or phrase on any HTML web page, including pages outside of SAS Business Data Network pages.
- Click the bookmarklet to instantly open a new browser tab directly to the SAS Business Data Network results page. (You might need to sign in if you have not done so recently.)
- Click the bookmarklet without highlighting a word or phrase to open the SAS Business Data Network Search page.

In Internet Explorer, the icon for Search is included in the set of search providers included with the search field, as shown in the following display:

*Figure 4.13  Search Providers in Internet Explorer*

```
[Search Providers]
```

You can remove the search provider from Internet Explorer through the following menu path: Tools ⇒ Manage add ons, ⇒ Search Providers. To remove the search provider for Chrome, select Settings ⇒ Search ⇒ Manage search engines. Simply delete the search button from the Firefox search toolbar.
Chapter 5
Working with Snapshots

Creating a Snapshot
Overview
If you are an administrator in SAS Business Data Network, you can create a snapshot to save a read-only view of your data that is taken at a given time. You can give each snapshot a specific name and description. Then you can view or delete your snapshots whenever you need to. You must have administrative access to SAS Business Data Network to create, view, and delete snapshots.

Create a Snapshot
1. Click the Snapshots item in the Tools section of the SAS Business Data Network window.
2. Click New Snapshot in the Snapshots window.
3. Name the new snapshot in the New Snapshot window. You can also add an appropriate description:
4. Click **OK** in the New Snapshot window.

   The new snapshot is created and displayed in the Snapshots list:

---

### Viewing a Snapshot

#### Overview

You can click ![Snapshot](image) in the Snapshots window to access a read-only view of a selected snapshot in a new browser tab. You can also right-click a snapshot and select the **View** item. Because each snapshot records the contents of a SAS Business Data Network instance when it is created, you cannot edit the contents of snapshots.
A snapshot is shown in the following display:

**Figure 5.3  Snapshot**

![Snapshot](image)

**Note:** You can export terms that have been published. Select one or more published terms. Then click and click **Export terms**.

The snapshot label at the top of the snapshot lists the snapshot name and the time and date of its creation.

You can perform the following tasks in a viewed snapshot:

- **Search for Terms** on page 37
- **Filter by Tags** on page 38
- **Review a Selected Term** on page 38
- **Review and Export Term Types** on page 39

**Search for Terms**

You can click **Search** to access the **Search** pane in a snapshot. Enter text in the **Search** field and click **Search** to search on a term name.
Search results are shown in the following display:

**Figure 5.4  Search Results**

![Search Results](image)

**Filter by Tags**

You can click on a tag in the list on the left side of the snapshot to filter the term list by a selected tag, such as the **Health Care** tag:

**Figure 5.5  Terms Filtered by a Tag**

![Terms Filtered by a Tag](image)

**Review a Selected Term**

You can select a term in the terms list and click **Open** to review it in detail:
You can click the **Identification**, **Hierarchy**, **Notes & Contacts**, and **History** tabs to review the information that they contain. However, you cannot edit the contents of these tabs while you are viewing the snapshot.

You can click ![Save](image) in a detailed term view to save information about the selected term in a PDF document.

When you finish reviewing the term, click ![Close](image) to return to the list of terms. You can click the number in the top right corner to open any of the previously opened terms.

**Review and Export Term Types**

You can click **Term Types** in the upper right corner of the SAS Business Data Network window to see the list of the term types that are contained in the snapshot:
Figure 5.7  Term Types in a Selected Snapshot

Note that you filter this list in the Filter field. You can also open and review a term type by clicking the link under the term or selecting the term type and clicking , as shown in the following display:

Figure 5.8  Term Type

Click to return to the list of term types. You can click the number in the top right corner to open any of the opened term types.
You cannot edit these term types, but you can export them to an XML document. Select the term type that you need to export. Then click and select **Export term types**. Click the prompt in the Snapshot section to open the XML document:

*Figure 5.9  Term Type Export*

![XML Document Example]

This export document is stored in a designated place and available to be imported when needed.

---

**Maintaining Snapshots**

If you are an administrator in SAS Business Data Network, you can click **Snapshots** in the Tools section to access the Snapshots window. You can perform the following maintenance functions in the Snapshots window:

- Click to create a new snapshot.
- Click to view an existing snapshot.
- Click to delete an existing snapshot from SAS Business Data Network.

The Snapshots window is shown in the following display:

*Figure 5.10  Snapshots Window*
Chapter 6
Importing and Exporting Terms

You can import lists of terms stored in either XML or CSV format into SAS Business Data Network. This feature enables you to add any number of terms to SAS Business Data Network without having to add them individually. Instead, you can include them in a file and then import the file.

You can also export selected terms from SAS Business Data Network into files that use an XML format. The exported terms can be imported into other SAS Business Data Network installations.

The entity definition export feature in SAS Business Data Network enables you to define one or more business terms with the correct attributes. Then you can export that set of terms into an Entity Definition file that can be imported in Master Data Foundation projects or SAS MDM.

SAS Business Data Network contains a command-line application to import relationships into the Relationship service. This tool enables you to disable importing relationships when you run XML and CSV import operations and run the import relationships later. This approach improves the performance of the import process.
Importing and Exporting Terms in XML

Overview

SAS Business Data Network supports the following XML-based import and export operations:

- “Importing Terms from an XML File” on page 45
- “Exporting Terms to an XML File” on page 46
- “Export Terms to an Entity Definition” on page 48

The XML-based import files and the export files share an identical XML-based format and must support UTF-8. The term names contained in the files cannot exceed 100 characters in length. Issues can occur when the terms that you import contain characters outside of the character set that has been configured for your database.

You can export a short list of terms from SAS Business Data Network and review the file to examine the XML structure. Then you can use the file that you created in the export as a template for importing additional terms. You can review a sample XML file in “Exporting Terms to an XML File” on page 46.

The .xsd schema for SAS Business Data Network term imports and a sample term XML import file are available in the share directory in your installation. The .xsd schema is named relationshipobjects.xsd, and the sample term import file is named bdntermimport_sample.xml. Instructions for verifying your XML with the schema are available at many internet websites.

The available resource types for the XML files used for importing and exporting terms in SAS Business Data Network are listed in the following table:

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDNTERM</td>
<td>The term listed in SAS Business Data Network. Each term is required to have a unique identifier in the Identity attribute. Term names cannot be longer than 99 characters and are case sensitive.</td>
</tr>
<tr>
<td>BDNTERMREF</td>
<td>A reference to a SAS Business Data Network term. The term can exist in the SAS Business Data Network database, or somewhere within the import XML document. The BDNTERMREF Resource must be contained within a dependency element. Any term references occurring outside of a dependency element are ignored.</td>
</tr>
<tr>
<td>BDNTAG</td>
<td>Tags associated with the term (displayed in the Tags field in the Identification tab).</td>
</tr>
</tbody>
</table>
### Resource Type

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDNNOTE</td>
<td>Notes associated with the term (displayed in the Notes section of the Notes &amp; Contacts tab).</td>
</tr>
<tr>
<td>BDNCONTACT</td>
<td>Contacts associated with the term (displayed in the Contacts section of the Notes &amp; Contacts tab).</td>
</tr>
<tr>
<td>BDNATTRIB</td>
<td>Attributes associated with the term (displayed in the Attributes field in the Identification tab).</td>
</tr>
<tr>
<td>BDNACCOUNT</td>
<td>A reference to an account that is connected to a contact. This reference type is ignored if not related to a BDNCONTACT.</td>
</tr>
<tr>
<td>BDNROLE</td>
<td>A reference to a role that is connected to a contact. This reference type is ignored if not related to a BDNCONTACT.</td>
</tr>
<tr>
<td>URI</td>
<td>A URI for a link associated with the term (displayed in the Links field on the Identification tab).</td>
</tr>
</tbody>
</table>

### Importing Terms from an XML File

1. Display the main window for SAS Business Data Network, if you have not done so already.
2. Click 📉 in the Terms section and select Import Terms.
3. Navigate to the folder that contains the XML file to be imported.
4. Select the XML file. The file that you select must have an .xml extension and a name that is encoded in UTF-8.
5. Click Open to access the Import Terms window. The terms in the file are imported into the current SAS Business Data Network.
6. Click Import to import the terms. You can select the check box to publish the results of the import to the Relationship service. The publish step can take a long time, however.
The Import Terms window is shown in the following figure:

![Import Terms](image)

Note that when a term is imported that already exists in SAS Business Data Network with the same name and same ancestry, the existing term's history is maintained. This behavior enables you to roll back to the pre-imported version of the term. The imported term completely replaces the old term in every other regard. Therefore, the imported term must be a complete definition of the term. A complete definition includes all the attributes and dependencies (such as related terms, associated items, notes, and tags) defined as they are expected to appear in SAS Business Data Network.

The original term's children are still maintained. Disassociate a child term with a parent term through import by importing the child term with a different "P" type dependency or no "P" type dependency at all.

**Exporting Terms to an XML File**

1. Display the main window for SAS Business Data Network, if you have not done so already.
2. Select one or more terms in the Terms section. You must select terms, or no terms will be exported.
3. Click in the Terms section and select Export Terms.
5. Click Export in the Export Terms window. Specify an appropriate name for the file.
6. Click the arrow next to the name of the exported file in the bottom right corner of the window to open the file or see where it was saved.

The exported file has the structure that is described in the “Overview” on page 44 of this topic. The following display shows the beginning of a sample XML file.
This segment defines the first term, which is *Warehouse*:

**Figure 6.2  XML File for Warehouse**

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<Resources>
  <Resource label="Warehouse" identity="Warehouse" type="BDNTERM">
    <Attributes>
      <attribute name="Description" value="Storage facility for goods and raw materials"/>
      <attribute name="Requirements" value="Must meet size and security standards"/>
      <attribute name="Status" value="Not Specified"/>
      <attribute name="Importance" value="Medium"/>
    </Attributes>
    <Dependencies>
      <dependency type="A">
        <Resource identity="Logistics" type="BDNTAG"/>
      </dependency>
    </Dependencies>
  </Resource>
</Resources>
```

The term *Warehouse* has a type of BDNTERM, and the label and identity attributes are set to the text "Warehouse." The identity attribute is required, but an empty label attribute can be filled with contents of the identity. This particular term contains attributes and values for *Description, Requirements, Status, and Importance* that populate fields on the Identification tab when the term is selected in SAS Business Data Network. The term contains a type A dependency, which can be used for related terms, tags, and links. In this case, the dependency connects the term to the *Logistics* tag, which has a resource type of BDNTAG.

The following display contains the next term that contained in the XML file:

**Figure 6.3  Term with Type a Dependency**

```xml
<Resources>
  <Resource label="Loading Dock" identity="Warehouse\Loading Dock" type="BDNTERM">
    <Attributes>
      <attribute name="Description" value="Facility for incoming and outgoing goods"/>
      <attribute name="Requirements" value=""/>
      <attribute name="Status" value="Not Specified"/>
      <attribute name="Importance" value="Medium"/>
    </Attributes>
    <Dependencies>
      <dependency type="D">
        <Resource label="Warehouse" identity="Warehouse" type="BDNTERMREF"/>
      </dependency>
    </Dependencies>
  </Resource>
</Resources>
```

Like *Warehouse, Loading Dock* and *Mailroom* are defined using the BDNTERM type, but the treatment of the identity attributes is different. In this example, the *Loading Dock* term is defined in relationship to the term *Warehouse*, in the form of the following code:
The relationship between the parent Warehouse and the child Loading Dock is reinforced by the use of a type D dependency between the two. The label and identity for the dependency are "Warehouse", and the resource type is "BDNTERMREF." When you export a term, you must also select the related terms, or those relationships will be lost. Direct descendants of a term are exported with the term.

The final section of the code contains yet another use of a dependency.

The term Section is defined in the code shown in the following display:

**Figure 6.4  Another Type of Dependency**

```xml
<Resource label="Section" identity="Warehouse\Section"
  type="BDNTERM">
  <Attributes>
    <attribute name="Description" value="Section of the warehouse designated for a specific product or type of product"/>
    <attribute name="Requirements" value="Must be secure and accessible"/>
    <attribute name="Status" value="Not Specified"/>
    <attribute name="Importance" value="Medium"/>
  </Attributes>
  <Dependencies>
    <dependency type="D">
      <Resource label="Warehouse" identity="Warehouse"
        type="BDNTERMREF"/>
    </dependency>
    <dependency type="A">
      <Resource label="Picking" identity="Picking"
        type="BDNTERMREF"/>
      <Resource identity="Logistics" type="BDNTAG"/>
    </dependency>
  </Dependencies>
</Resource>
</Resources>
```

The parent and child relationship between Warehouse and Section is defined in the same way as the relationship between Warehouse and Loading Dock. It uses the identity attribute in the resource and the type D dependency. The Section term uses a type A dependency, just as Warehouse did, to connect the term to the Logistics tag (resource type BDNTAG). However, this time, the dependency also establishes a connection to Picking, which is a related term with a resource type of BDNTERMREF.

**Export Terms to an Entity Definition**

You can use the entity definition export feature to define one or more business terms with the correct attributes. Then, you can export that set of terms into an Entity Definition file that can be imported in Master Data Foundation projects or SAS Master Data Management. The same method can also be used to perform the following tasks:

- Select a set of terms to export.
- Create SAS Master Data Management metadata that enables the user to convert terms into attribute groups on existing entity definitions.
Perform the following steps:

1. Display the main window for SAS Business Data Network, if you have not done so already.

2. Select one or more terms in the Terms section. You must select terms, or no terms will be exported.

3. Click: in the Terms section and select **Export Terms**.

4. Select **Definition** in the submenu. An Export Terms window is displayed.

5. Click **Export**. Specify an appropriate name for the file.

---

**Importing Terms from CSV Files**

**Overview**

SAS Business Data Network supports importing lists of terms stored in comma-separated-value format (CSV) files. You should create these term lists in Microsoft Excel and export them to CSV files. You should avoid entering terms directly into a CSV format using a text editor. Plain text editors do not support putting a newline character in the cell for attributes like description, requirements, or multi-line and rich text attributes.

- “Importing Terms from CSV Files” on page 49
- “Rules for Importing CSV Files” on page 49
- “Example” on page 57

**Importing Terms from CSV Files**

1. Display the main window for SAS Business Data Network, if you have not done so already.

2. Click: in the Terms section and select **Import Terms**.

3. Navigate to the folder that contains the CSV file to be imported.

4. Select the CSV file. The file that you select must have an .csv extension and a name that is encoded in UTF-8.

5. Click **Open**. The terms in the file are imported into the current SAS Business Data Network.

**Rules for Importing CSV Files**

**Overview**

Specific rules have been developed for the SAS Business Data Network tool for importing CSV files. Therefore, you must inspect your CSV files before you import them using the tool. Otherwise, you might not get the results that you expect. The import operation might fail, or data might be imported into the wrong places in the SAS Business Data interface.
These rules can be divided into the following types:

- “General CSV Formatting Rules” on page 50
- “Column Rules” on page 51
- “Attribute Rules” on page 53

**General CSV Formatting Rules**

General CSV formatting rules apply to CSV import in SAS Business Data Network. For example, values with multiple embedded commas must be enclosed in double quotation marks. Multiline values must also be double quoted. Applications such as Excel enforce some of these rules when they export data to CSV files.

Examine your CSV files for compliance with the following formatting rules:

Values with multiple embedded commas
must be enclosed in double quotation marks.

Multiline values
must be enclosed in double quotation marks. Note that the multi-line fields in Excel files are not supported by the SAS Business Data Network CSV import tool.

Types and paths

When the type of a term is not specified, the Default term type is used.

Paths can use only a backslash as a separator. Using a forward slash or any other character as a separator is invalid. For example, State Health Plan\Benefit Focus is a valid path. State Health Plan/Benefit Focus and State Health Plan*Benefit Focus are invalid paths. If the path is not found, an error is displayed to the user and the term is not imported.

The path to a term can end at either the parent term or the term name. The path for top-level terms can be empty. For example, the following types and paths are valid:

The following table illustrates valid type and paths in a CSV file:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>(No path specified for this top-level term)</td>
</tr>
<tr>
<td>Benefit Focus</td>
<td>Empty Cell</td>
<td>State Health Plan (Path extends to parent term)</td>
</tr>
<tr>
<td>United Health</td>
<td>Empty Cell</td>
<td>State Health Plan\United Health (Path extends to term)</td>
</tr>
</tbody>
</table>

The empty cells in the Type column fall back to the default value.

**Case sensitivity**

User-defined attribute names are case sensitive. However, system column names are not case sensitive.
In the following header row, the names Name, Type, and Path in the first three columns are system columns unaffected by case.

*Table 6.2  Case Sensitivity Rules*

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Name</th>
<th>Division</th>
<th>Rating</th>
<th>division</th>
<th>raTing</th>
</tr>
</thead>
</table>

However, the columns named Rating and raTing and Division and division are user-defined attributes that are case sensitive. Therefore, these columns are treated as four separate user-defined attributes. The difference in case between them marks them as individual entities.

Names

Names cannot contain a backslash, but forward slashes are permitted. For example, BCBC/Financial is valid, but BCBS/Financial is invalid.

*Column Rules*

Examine your CSV files for compliance with the following column rules:

System attributes and system columns

Columns with the following names are eligible to be designated as the system attributes: Name, Type, Path, Description, Requirements, Status, Importance, CreatedByUser, ModifiedByUser, Version, and VersionId. The first occurrence of any of these column names in the header is designated as the system column. Subsequent occurrences of the same column name are treated as user-defined attributes.

The column named Name in the first column is the system column. The column named Name in the fourth column is a user-defined attribute. The columns named Type and Path are the only instances of these columns and are treated as system columns.

*Table 6.3  System Columns and User-defined Attributes*

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data object</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>Data object2</td>
</tr>
</tbody>
</table>

The Name system column (Data object) is displayed in the Terms list in SAS Business Data Network when the CSV file is imported. The Name user-defined attribute (Data object2) is displayed in the Attributes field in the Identification tab.

When there are multiple instances (columns) of a user-defined attribute, the final occurrence is treated as a user-defined attribute.

*Table 6.4  Multiple User-defined Attributes*

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Name</th>
<th>Name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data object</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>Data object2</td>
<td>Data object3</td>
<td>Data object4</td>
</tr>
</tbody>
</table>

The first Name column (Data object) is treated as the system column. The final Name column (Data object4) is treated as a user-defined attribute. The other Name columns (Data object2 and Data object3) are ignored when the CSV file is imported.
Number of columns

The number of columns in a data record must be equal the number of columns in the header. When a data record has more columns than the number of columns in the header, all of the values in the extra columns are ignored.

The header row for the following table contains Name, Type, Path, and Description columns:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
</tr>
</tbody>
</table>

However, suppose that the data record contains one or more extra columns. This file can be displayed as follows in a text editor:

Name, Type, Path, Description
State Health Plan,, State Health Plan

The first line of the file defines the four columns in the file header: Name, Type, Path, and Description. The second line of the file forms the first data record of the file. The three commas in this data record represent three empty columns that fill the Type, Path, and Description columns in the first data record row in the table. Therefore, the text that should fill the Description column in the table (State Health Plan) is ignored.

Extra columns that are not included in the header row are simply ignored. However, if the data columns have fewer fields than the header row, then the file is invalid. If a row in the file shown in the table above had only three columns, it would be invalid because the header row contains four columns.

Column header

must be contained in the first line of the CSV file.

Mandatory columns

All CSV files must contain Name, Type, and Path columns. These mandatory columns must be defined in the header and can be listed in any order.

Both of the following tables are valid:

<table>
<thead>
<tr>
<th>Name</th>
<th>Tags</th>
<th>Path</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>A,b</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tags</th>
<th>Name</th>
<th>Type</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>A,b</td>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
</tr>
</tbody>
</table>
Table 6.8  Base Column Summary

<table>
<thead>
<tr>
<th>Column</th>
<th>Are Blanks Allowed?</th>
<th>Valid Values</th>
<th>Example</th>
<th>Value When Blank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>No</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>Error</td>
</tr>
<tr>
<td>Type</td>
<td>Yes</td>
<td>An exact match to a SAS Business Data Network term type</td>
<td>Empty Cell</td>
<td>Default</td>
</tr>
<tr>
<td>Path</td>
<td>Yes</td>
<td>Empty Cell</td>
<td>Term1\Term2\Term3</td>
<td>Term becomes root term</td>
</tr>
</tbody>
</table>

Table 6.9  System Attribute Column Summary

<table>
<thead>
<tr>
<th>Column</th>
<th>Data Type</th>
<th>Are Multiples Allowed?</th>
<th>Value When Blank</th>
<th>Value Not Matched in CSV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements</td>
<td>Multi-line text allowed with line return</td>
<td>No</td>
<td>None</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Importance</td>
<td>Should be one of those set on the term type (case insensitive)</td>
<td>No</td>
<td>Picks up default from term type</td>
<td>Empty Cell</td>
</tr>
<tr>
<td>Status</td>
<td>Should be one of those set on the term type (case insensitive)</td>
<td>No</td>
<td>Picks up default from term type</td>
<td>Empty Cell</td>
</tr>
<tr>
<td>Tags</td>
<td>Empty Cell</td>
<td>Yes</td>
<td>None</td>
<td>New tag created</td>
</tr>
</tbody>
</table>

Attribute Rules
Examine your CSV files for compliance with the following attribute rules:

Custom user-defined attributes
You can define user-defined attributes for the term types in SAS Business Data Network. (See “Review or Edit a Term Type” on page 63 for more information.) When you import these user-defined attributes in a CSV file, the column name in the CSV file must match the attribute name defined in the SAS Business Data Network term type. If a default value is defined in the term type, then the user-defined attributes for the term are set to the default value from the term type. If validation fails, then the value is blank.
The following table lists the user-defined attribute types that are available for SAS Business Data Network term types and describes their characteristics:

**Table 6.10  User-defined Attribute Types**

<table>
<thead>
<tr>
<th>Attribute Type</th>
<th>Column Name</th>
<th>Column Value</th>
<th>Validation</th>
<th>Invalid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Line Text</td>
<td>Defined in term type</td>
<td>Single line of text</td>
<td>None</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Multi-Line Text</td>
<td>Defined in term type</td>
<td>Multiple lines of text (ALT +ENTER in Excel)</td>
<td>None</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Single Select</td>
<td>Defined in term type</td>
<td>One of the values defined in term type must match case</td>
<td>Set if a matching value found in list</td>
<td>Not Selected</td>
</tr>
<tr>
<td>Multi-Select</td>
<td>Defined in term type</td>
<td>One or more of the values defined in term type. Separated by commas. Case-sensitive.</td>
<td>Set if a matching value found in list</td>
<td>Not Selected</td>
</tr>
<tr>
<td>Boolean</td>
<td>Defined in term type</td>
<td>Yes, No, Y, N, True, False</td>
<td>Default</td>
<td>Default</td>
</tr>
<tr>
<td>Date</td>
<td>Defined in term type</td>
<td>Accepted format is YYYY-MM-DD. Other formats produce unexpected results.</td>
<td>Default taken, if specified</td>
<td>Blank</td>
</tr>
<tr>
<td>URL</td>
<td>Defined in term type</td>
<td>Valid URL format</td>
<td>Empty Cell</td>
<td>No validation done during CSV import</td>
</tr>
<tr>
<td>Rich Text</td>
<td>Defined in term type</td>
<td>&lt;html&gt;&lt;BODY &gt;&lt;P align=&quot;left&quot;&gt;&lt;B&gt;&lt;U&gt;AT2 a BOLD and Underline&lt;/B&gt; &lt;/U&gt;&lt;/P&gt;</td>
<td>Empty Cell</td>
<td>No validation performed</td>
</tr>
</tbody>
</table>

If the term type supports new user-defined attributes, then any attribute that is not defined for that term’s term type is imported as a user-defined attribute.

The user-defined attributes that you add use the following format:

| Value | Instructions | Required |

The column name is the Attribute name.
Complex attributes

The following items have been designated as complex attributes: Tags, Links, Related Terms, Associated Items, Notes, and Contacts. You can also think of them as system attributes that correspond to elements present in SAS Business Data Network.

The data for a term can include one or more complex attributes. If multiple complex attributes are present, each attribute must be contained in a single cell of the data record and be separated by commas. Each of these attributes is defined by various properties. Those properties must be separated by a pipe symbol (|). For example, links use the following format:

```
label | URI
```

Here is an example of a link in this format:

```
cnn | Http://www.cnn.com
```

When you include multiple links, separate them with commas. Then surround them in quotation marks in the CSV file to indicate that they are part of a single column, as follows:

```
"cnn | Http://www.cnn.com, newsweek | Http://newsweek.com"
```

Additional descriptions and examples of these complex attributes are provided in remaining CSV import rules.

Tags

All tags must be defined in a single column. The individual tags must be separated by commas. Tag has only one property, which is Name.

The following table shows tags added to a term:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Tags</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>Health Care Providers, Pharmacy Providers</td>
</tr>
</tbody>
</table>

Links

All links must be defined in a single column. The individual links must be separated by commas. The link properties are Label and URI. They must be separated by the pipe symbol (|).

The following table shows links added to a term:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Links</th>
</tr>
</thead>
</table>

Related Terms

All related terms must be defined in a single column. The individual related terms must be separated by commas. The related term properties are Path and Label. They
must be separated by the pipe symbol (|). The Path must be a valid path to the term. Label is not required.

The following table shows related terms added to terms:

**Table 6.13  Related Terms**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Related Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>CEDS</td>
</tr>
<tr>
<td>Benefit Focus</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>CEDS</td>
</tr>
</tbody>
</table>

The first file depicted in the table contains two related terms. Both of them have labels. The second file in the table also contains two related terms, but only the first one contains a label.

**Associated Items**

All associated items must be defined in a single column. The individual associated items must be separated by commas. The required associated items properties are Name, ID, and Type. Description, Notes, and Path are optional properties. The properties must be separated by the pipe symbol (|). The order of the properties that you define is important.

The associated items properties must be entered in the exact order that is shown in the last paragraph. Therefore, all associated items must begin with the three required properties, which are Name | ID | Type. If you need to use optional properties, add them to the end of the required list and provide a blank space for any property that you omit. For example, an associated item that includes the optional notes and path properties but not the description property would be structured as follows: Name | ID | Type | | Notes | Path.

The following table shows associated items added to a term:

**Table 6.14  Associated Items**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Associated Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>&quot;Abort</td>
</tr>
</tbody>
</table>

The associated item in the file depicted in the table is enclosed in double quotation marks because the Notes portion of the associated item contains a comma.

**Notes**

All notes must be defined in a single column. Individual notes must be separated by commas. The note properties are Content and CreatedByUser. They must be separated by the pipe symbol (|). If the user is omitted, or not in the system, then the name of the user who is performing the import job is used.
The following table shows notes added to a term:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>Somenotes</td>
</tr>
</tbody>
</table>

Contacts

All contacts must be defined in a single column. Individual contacts must be separated by commas. The contact properties are User and Role. They must be separated by the pipe symbol (|). Text matching is done in the role. The role is case sensitive and must match the set values. Otherwise, the contact will not be created. The contact does not have to exist in the system.

The following table shows contacts added to a term:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Path</th>
<th>Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Health Plan</td>
<td>Empty Cell</td>
<td>Empty Cell</td>
<td>login</td>
</tr>
</tbody>
</table>

Example

This example shows an Excel file that has been exported to a CSV file and then processed for importing into SAS Business Data Network. Then it shows where the data in the file has been added in the SAS Business Data Network interface.

The following display shows a portion of the exported CSV file:

<table>
<thead>
<tr>
<th>Name</th>
<th>path</th>
<th>Type</th>
<th>Description</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSVBasic1</td>
<td>CSVBasic1</td>
<td>Default</td>
<td>Description, w</td>
<td>requirements</td>
</tr>
<tr>
<td>CSVBasic2</td>
<td>CSVBasic1</td>
<td>Default</td>
<td>Description, w</td>
<td>requirements</td>
</tr>
<tr>
<td>CSVBasic3</td>
<td>CSVBasic1\CSVBasic2\CSVBasic3</td>
<td>Default</td>
<td>Description, w</td>
<td>requirements</td>
</tr>
<tr>
<td>CSVBasic4</td>
<td>CSVBasic1\CSVBasic2\CSVBasic3</td>
<td>Default</td>
<td>Description, w</td>
<td>requirements</td>
</tr>
<tr>
<td>CSVBasic5</td>
<td>CSVBasic1\CSVBasic2\CSVBasic3</td>
<td>Default</td>
<td>Description, w</td>
<td>requirements</td>
</tr>
</tbody>
</table>

When CSV terms are imported into SAS Business Data Network successfully, you can see them in the Terms list.

The formatted columns in the CSV file generated the formatting of the imported file in SAS Business Data Network. For example, the formatting in the first row in the links column of the CSV file is shown in the following display:
The label and URL for each link are separated by a | (pipe) symbol. The two links also are separated by a comma. Both of these formatting choices are specified in the “Importing Terms from CSV Files” on page 49 and are needed to ensure that the links are properly displayed in the SAS Business Data Network.

Associated items follow the same pattern.

The formatting in associated items column of the CSV file is shown in the following display:

The associated item in the first row is enclosed in double quotation marks because the Notes portion of the associated item contains a comma. The individual associated items are separated by commas, and the properties are separated by | (pipe) symbols.

---

### Command-Line Processing for Imported Terms

#### Overview

The installation of SAS Business Data Network includes a command-line application that you can use to rebuild lineage after an import. You should do this if you import XML or CSV terms without importing the relationships for the terms at the same time. Disabling relationship importing improves the performance of importing terms. The tool name for Windows is UpdateRelationships.exe. For UNIX, the tool name is UpdateRelationships.

The command-line application executables are installed in the following location:

```
SASHome\SASBusinessDataNetworkMidtier\3.3\tools
```

See:

- “Usage Information” on page 59
- “Example” on page 59
Usage Information

The following table lists the options available for the command-line application:

Table 6.17  Options

<table>
<thead>
<tr>
<th>Command</th>
<th>Name</th>
<th>Function</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>-b</td>
<td>SAS Business Data Network URL</td>
<td>Specifies the URL to SAS Business Data Network.</td>
<td>Yes</td>
</tr>
<tr>
<td>-h</td>
<td>Help</td>
<td>Displays help for this application.</td>
<td>No</td>
</tr>
<tr>
<td>-l</td>
<td>Publish level</td>
<td>Specifies the publish level. Available arguments are tagsOnly</td>
<td>termsOnly</td>
</tr>
<tr>
<td>-nc</td>
<td>No clean</td>
<td>Specifies that SAS Business Data Network resources should not be deleted from the Relationship service before publishing. Default=false. Therefore, SAS Business Data Network resources are deleted from the Relationship service unless this option is set to true.</td>
<td>No</td>
</tr>
<tr>
<td>-o</td>
<td>Output level</td>
<td>Specifies the output level when publishing to the relationship service. Available arguments are TRACE</td>
<td>DEBUG</td>
</tr>
<tr>
<td>-p</td>
<td>Password</td>
<td>Specifies the password for connecting to SAS Business Data Network.</td>
<td>Yes</td>
</tr>
<tr>
<td>-t</td>
<td>Import file type</td>
<td>Specifies the type of file referred to by the file path option. Applies only if file path option is specified. The valid values are CSV and XML. Default=XML.</td>
<td>No</td>
</tr>
<tr>
<td>-u</td>
<td>User</td>
<td>Specifies the user name for connecting to SAS Business Data Network.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Example

In this example, the publish level option (-l) is set to termsOnly.

This means that the tags associated with those terms are not published. The following text is entered in the command line application:

C:\Program Files\SASHome\SASBusinessDataNetworkMidtier\3.3\tools\UpdateRelationships
-b http://<BDN.company.com>/SASBusinessDataNetwork
If the publication is successful, the following message is displayed: **Publish succeeded**. Otherwise, an error message that indicates the issue encountered is displayed.
Chapter 7
SAS Business Data Network Administration

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Managing Term Types

Overview

You can use the Term Types section of the SAS Business Data Network window to perform the following tasks:

- “Create a New Term Type” on page 62
- “Review or Edit a Term Type” on page 63
- “Import or Export Term Types” on page 63

The Term Types section contains all of the term types that have been defined in SAS Business Data Network.

You can use the toolbar or the ➤ button to perform the following functions:

- Refresh the list of term types
- Open the New Term Type section to define a new term type
- Open a selected term type for review or edit
- Duplicate a selected term type and open it for review or edit
- Disable a selected term type
- Delete a selected term type
• Import one or more term types in an XML file
• Export one or more selected term types in an XML file

Create a New Term Type

Click **New Term Type** to display the **Settings** tab in the New Term Type section. The tab is divided into the following sections:

- Type Identification
- Workflows (optional)
- Specify status values and set the default
- Specify importance values and set the default
- Business Roles

The **Type Identification** fields enable you to name and describe a new term type. For example, you can enter **Simple term create** and describe it as follows: create term in simple collaborative flow.

The **Workflows (optional)** fields enable you to associate workflows for creating, editing, and deleting terms with a term type. Of course, if a term type is used with non-workflow terms that do not go through a collaborative review and approval process, it will not be associated with a workflow. The workflows are sorted into create, edit, and delete types. They are deployed by an administrator in SAS Workflow Studio. You can choose from these workflows to create term types that support very specific portions of the collaborative flow such as extended term creation and delete term. Then, you can associate the term types with specific users in the **Business Roles** table, which is described below.

For example, you can specify **Extended Create Term** for terms used in an extended collaborative flow. You can also specify **Create Term** for terms used in a simple collaborative flow. Finally, you have the option to not specify a workflow for terms that are not used in a collaborative flow.

The **Specify status values and set the default** table enables you to select a default status value to associate with the term, create new status values, and edit or delete existing status values. The following default status values are available: Production, Editing, On Hold, Under Review, and Not Specified.

The **Specify importance labels and set the default** table enables you to select a default importance to associate with the term or edit an existing label. The following importance labels are available: Critical, High, Medium, Low, Very Low, and Not Specified.

The **Business Roles** table enables you to create business role labels that can be added to contacts for terms of this type. You can create notification groupings by associating these roles with specific groups of users. These labels do not affect which users can perform workflow actions for these terms.

Click **Attributes** to display the **Attributes** tab in the New Term Type section. The sub-tab displays a table that contains the list of attributes for the current term type. You can click **New Attribute** to define a new attribute and display it in the table. The attribute can include the following elements:

- Label
- Instructions
- Type, selection from the following options: Single Line Text Entry, Multi-Line Text Entry, Rich Text, Single Selection, Multiple Selection, Boolean, URL, and Date
• Default value
• Require a value check box

You can also edit, remove, and preview an existing attribute.

**Review or Edit a Term Type**

You can select an existing term type in the Term Type section to review and edit its elements. Click **Save** to save your changes. Use caution when you update the attributes for a term type. When you import term types, the attributes in the imported term type replace the attributes in the existing term type for the current SAS Business Data Network instance. The attributes also update existing terms of that type.

**Import or Export Term Types**

You can import or export XML lists of term types in the Term Type section. Click and select **Import Term Types** or **Export Term Types**.

---

**Managing Deleted Terms**

You can manage terms that you have marked for deletion. To access this window, click **Deleted Terms** in the Tools section of the SAS Business Data Network main window.

The Deleted Terms section contains all of the terms that have been marked for deletion in SAS Business Data Network. You can use the toolbar to perform the following functions:

• Restore one or more selected terms

• Purge one or more selected terms

• Purge all of the terms that are marked for deletion

• Refresh the list of deleted terms

---

**Managing Root-Level Authorizations**

**Overview**

When you log on to SAS Business Data Network, you are granted access to applications and features based on the roles and capabilities that are associated with your log on. Typically, these roles are assigned to a group to which you belong. For example, by default, members of the Data Management Executives group have the Data Management: Business Data Network role. This role has capabilities that enable you to view terms and their contents and notify contacts in SAS Business Data Network. Without these capabilities, you cannot see terms in SAS Business Data Network.

You can add and remove identities in the Authorization - Root Level window. To access this window, sign in as a user with administrative access and click in the Folders section of the SAS Business Data Network main window. Then click **Manage root-level**...
authorizations. Click for information about using the Authorization - Root Level window. Denying Create Children permission to a group or user at root level prevents that group or user from creating any term. The Authorization-Root window is shown in the following display:

*Figure 7.1 Authorization - Root Level Window*

Each row in the table is an identity that has been added to the SAS Business Data authorizations. You can set Read, Write, Create Children, and Delete permissions for each identity in the table.

The following attributes are available for each permission:

- Inherit
- Grant
- Deny
**Default Groups, Roles, and Capabilities**

The groups, roles, and capabilities listed in the following table are installed in SAS Management Console when SAS Business Data Network is installed:

**Table 7.1 Default Groups, Roles, and Capabilities**

<table>
<thead>
<tr>
<th>Role Name</th>
<th>Role Description</th>
<th>Capability IDs</th>
<th>Groups That Get This Role by Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Data Network: Administration</td>
<td>Provides all functionality related to administrative activities</td>
<td>ViewApplication, ViewTermAttributes, ViewTermStatus, ViewTermImportance, ViewTermLinks, ViewTermRelatedTags, ViewTermRelatedTerms, ViewTermHierarchy, ViewTermAssociatedItems, ViewTermNotes, ViewTermContacts, ViewTermHistory, ViewTermComments, EditTermTypes, SecureTermTypes, SecureTerms, ImportTerms, UnlockAnotherUsersTerms, ViewAnotherUsersDraft, ManageDeletedTerms, EditTags, EditTerms, EditTermContents, EditTermAttributes, EditTermStatus, EditTermImportance, EditTermLinks, EditTermRelatedTags, EditTermRelatedTerms, EditTermHierarchy, EditTermAssociatedItems, EditTermNotes, EditTermContacts, RestoreTermVersion, NotifyContacts, Workflow Publish, Workflow Delete</td>
<td>Data Management Administrators</td>
</tr>
<tr>
<td>Business Data Network: Power Editor</td>
<td>Provides all the functionality for creating and editing terms</td>
<td>ViewApplication, ViewTermAttributes, ViewTermStatus, ViewTermImportance, ViewTermLinks, ViewTermRelatedTags, ViewTermRelatedTerms, ViewTermHierarchy, ViewTermAssociatedItems, ViewTermNotes, ViewTermContacts, ViewTermHistory, ViewTermComments, UnlockAnotherUsersTerms, ImportTerms, EditTags, EditTerms, EditTermContents, EditTermAttributes, EditTermStatus, EditTermImportance, EditTermLinks, EditTermRelatedTags, EditTermRelatedTerms, EditTermHierarchy, EditTermAssociatedItems, EditTermNotes, EditTermContacts, RestoreTermVersion, NotifyContacts</td>
<td>Data Management Power Users</td>
</tr>
<tr>
<td>Role Name</td>
<td>Role Description</td>
<td>Capability IDs</td>
<td>Groups That Get This Role by Default</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Business Data Network: Technical Editor</td>
<td>Provides all the functionality for creating and editing terms</td>
<td>ViewApplication, ViewTermAttributes, ViewTermStatus, ViewTermImportance, ViewTermLinks, ViewTermRelatedTags, ViewTermRelatedTerms, ViewTermHierarchy, ViewTermAssociatedItems, ViewTermNotes, ViewTermContacts, ViewTermHistory, ViewTermComments, EditTags, EditTerms, EditTermContents, EditTermAttributes, EditTermStatus, EditTermImportance, EditTermLinks, EditTermRelatedTags, EditTermRelatedTerms, EditTermHierarchy, EditTermAssociatedItems, EditTermNotes, EditTermContacts, RestoreTermVersion, NotifyContacts</td>
<td>Data Management Power Users</td>
</tr>
<tr>
<td>Business Data Network: Business Editor</td>
<td>Provides all the functionality for creating and editing terms</td>
<td>ViewApplication, ViewTermAttributes, ViewTermStatus, ViewTermImportance, ViewTermLinks, ViewTermRelatedTags, ViewTermRelatedTerms, ViewTermHierarchy, ViewTermAssociatedItems, ViewTermNotes, ViewTermContacts, ViewTermHistory, ViewTermComments, EditTags, EditTerms, EditTermContents, EditTermAttributes, EditTermStatus, EditTermImportance, EditTermLinks, EditTermRelatedTags, EditTermRelatedTerms, EditTermHierarchy, EditTermAssociatedItems, EditTermNotes, EditTermContacts, RestoreTermVersion, NotifyContacts</td>
<td>Data Management Business Users</td>
</tr>
<tr>
<td>Business Data Network: Technical Approver</td>
<td>Provides all the functionality for approving terms</td>
<td>ViewApplication, ViewTermAttributes, ViewTermStatus, ViewTermImportance, ViewTermLinks, ViewTermRelatedTags, ViewTermRelatedTerms, ViewTermHierarchy, ViewTermAssociatedItems, ViewTermNotes, ViewTermContacts, ViewTermHistory, ViewTermComments, EditTermNotes, EditTermContacts, NotifyContacts, Workflow Publish, Workflow Delete</td>
<td>Data Management Stewards</td>
</tr>
</tbody>
</table>
## Define Users and Link Them to Groups (and Roles)

SAS Business Data Network is installed as part of a bundle of products. After installation, an administrator uses SAS Management Console to perform the following tasks:

- Create a user definition for each person who uses SAS Business Data Network
- Create any custom groups (and roles) that you might require if the default groups provided by SAS Business Data Network do not meet your needs
- Assign each user to one or more of the default or custom groups in order to grant each user the capabilities that he or she requires

For more information about defining users and groups in SAS Management Console, see *SAS Management Console: Guide to Users and Permissions*. 
Part 2

Installation and Configuration

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# Chapter 8

## Installing and Configuring SAS Business Data Network

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</tbody>
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### Installing SAS Business Data Network

SAS Business Data Network is available through SAS delivery channels. See your SAS Software Order Email (SOE) for information about installing SAS Business Data Network.

### Performing SAS Business Data Network Migration

#### Overview

Install SAS Business Data Network and review instructions.html. Then, you are ready to migrate data from the Business Data Network module of DataFlux Web Studio 2.4 to SAS Business Data Network 3.3. Note that SAS Business Data Network 3.3 requires SAS 9.4M6. Some of these steps might not be necessary for a migration from SAS.
Business Data Network 3.1 or SAS Business Data Network 3.2 to SAS Business Data Network 3.3.

The migration process includes the following steps:

- “Begin Post-Installation Steps” on page 72
- “Run the ASEXPORT Procedure” on page 72
- “Prepare for Workflows” on page 74
- “Export Relationships and Lineage to the Relationships Service” on page 75
- “Run SAS Business Data Network Migration” on page 77
- “Review Migration Results” on page 78
- “Resolve Any Errors” on page 79

**Begin Post-Installation Steps**

Once SAS Business Data Network has been installed, you can perform post-installation steps. You must be an administrator who has the Business Data Network: Administration role.

Perform the following tasks to prepare for the migration:

- Verify that both the DataFlux Authentication Server and the SAS Metadata Server are running.
- Verify that you are a member of the SAS Administrators group on the SAS Metadata Server and an Administrator on the DataFlux Authentication Server. Ensure that you are logged on to each of these servers with the user ID and password that you specify when you run the ASEXPORT procedure.
- Stop the SASServer 13 running instance.
- Move the JDBC driver JAR file for the database that was used with the version of the SAS Business Data Network module of DataFlux Web Studio to the proper location for the SAS Business Data Network installation. (Note that some databases might require more than one JAR file.) This step is necessary because the migration code needs JDBC 4 drivers for the appropriate source database to read the data from the old databases.

Typically, the JAR file can be found in the installation of the source database. If you are not sure which JAR files to use, ask your database administrator. You can also search the database vendor’s website. The JAR files must be appropriate for JDBC 4 and Java 6. They must also work with the correct version of your database. You might also need to copy other files, such as license files and ancillary JAR files.

After ensuring that SASServer 13 has been stopped, copy the JAR file (and any other files that are needed) to the lib directory under the SASServer13_1 installation. The path varies by installation but is similar to C:\SAS\Config\Lev1\Web\WebAppServer\SASServer13_1\lib.
- Restart SASServer13_1.

**Run the ASEXPORT Procedure**

You must run the ASEXPORT Procedure to move the DataFlux Authentication Server IDs to the SAS Metadata Server.
The following example shows this application of the ASEXPORT Procedure:

```
proc ASEXPORT meta=
   {
      user='username' password='password'
      server='host-name'
      port=port_number
      repos='repository.name'
      filter=(DOMAINS "***
                USERS "***
                LOGINS *Login
                [Domain/AuthenticationDomain[@OutboundOnly='0']]*)
   }
as=
   {
      server='host-name'
      user='domain\username'
      pass='password'
      port=port_number
      filter=(DOMAINS "***
                 USERS "***
                 LOGINS "*)
   }
verbose
out=asx
;

/*
 * Auto-match domains by name.
 */
match DOMAINS;

/*
 * Add remaining unmatched domains (optional)
 */
add DOMAINS;

/*
 * Auto-match users by FQLN.
 */
match USERS;

/*
 * Add remaining unmatched users (optional)
 */
add USERS;

/*
 * List everything for review
 */
list;

/*
 * Create an input file (per noforward) for proc METADATA that we can review.
 * Don't export passwords or their hosting outbound logins.
 */
```
export;
quit;

Note: This code sample has optional add statements that might not apply. If users or domains do not match, then they are created in SAS Metadata Server unconditionally. A criteria= option is required on the add statements to prevent the addition of all unmatched domains and users. You can also use an initial filter of something other than *

. Doing so can prevent unmatched domains and users from being available in the snapshot pulled back from DataFlux Authentication Server and SAS Metadata Server.

For more information about the ASEXPORT Procedure, see Chapter 9, “ASEXPORT Procedure,” on page 83.

Prepare for Workflows

For information about preparing to support workflows in SAS Business Data Network, see “Configuring Workflow in SAS Business Data Network” on page 80. You also must disable the Terminate Tasks capability in SAS Task Manager for most SAS Business Data network users (or roles). Disabling this capability can prevent the accidental termination of SAS Business Data Network workflows due to the termination of a SAS Task Manager task.

1. Log on to SAS Management Console as an administrative user.
2. Select a SAS Business Data Network role that you need to modify.
3. Click the Capabilities tab for that role.
4. Navigate to the Task Lifecycle folder under the Task Manager 2.1 folder.
The **Capabilities** tab is shown in the following display:

*Figure 8.1 Capabilities Tab*

5. Deselect the **Terminate Tasks** item.

6. Select the next SAS Business Data Network role to modify and perform the modification. Repeat until all the roles have been modified.

**Export Relationships and Lineage to the Relationships Service**

**Overview**

You must perform the following processes to ensure that the Relationships Service contains the data necessary for SAS Business Data Network to function:

Perform the following steps:

- Scheduled Collection and Loading Using SAS Management Console
- Export Data Management Platform Objects
- Export Visual Process Orchestration Objects

**Scheduled Collection and Loading Using SAS Management Console**

SAS Management Console is used to schedule the collection and loading of information about resources and their relationships. You must enable the relationship service collection and loading.

1. Log on to the SAS Management Console as an administrative user.
2. Expand the **Configuration Manager** under the **Application Management** node.
3. Expand **SAS Application Infrastructure**. Then, locate Web Infra Platform Services 9.4 and expand the node.
4. Right-click **Select RelationshipContentService**.

Select **Properties** from the pop-up menu, as shown in the following display:

![Figure 8.2 RelationshipContentService Path](image)

5. On the **Settings** tab, change the value for **Scheduling for Load Task Enabled** from **false** to **true**.

6. Restart the web application server.

Relationship metadata is loaded into the relationship database when the web application server is restarted. The default setting schedules the load operation to occur every hour. Subsequent runs of the load operation search for all content that has been changed or created since the last load and update the relationship database for the changed objects. You can schedule the load to run hourly, daily, weekly, or you can create your own custom schedule.

**Export Data Management Platform Objects**

You must export Data Management Platform objects to the SAS Web Infrastructure Platform before clients such as SAS Business Data Network can then use the data. For instructions, see the “Exporting Lineage Data to SAS Web Infrastructure Platform” topic in *DataFlux Data Management: User’s Guide*.

SAS Business Data Network enables you to associate Data Management Platform objects such as rules, tasks, jobs, files, and other content to SAS Business Data Network objects. This feature can cause complications when you upgrade SAS Business Data Network at the same time that you upgrade Data Management Server.

When you do a side-by-side install of Data Management Server and SAS Business Data Network, the location of Data Management Platform objects changes from the Data Management Server 2.5 location. Therefore, the objects associated with SAS Business Data Network terms have different paths and need to be reassociated.

When you perform an upgrade in place of Data Management Server, the object locations stay the same. Most of the objects, except jobs, remain associated with SAS Business Data Network terms. You must follow all of the steps specified in the migration process.

**Note:** Job objects have different pathnames and are not found in the new infrastructure. You must go into SAS Business Data Network 3.1 and reattach these objects after refreshing the lineage.

**Export SAS Visual Process Orchestration Objects**

SAS Visual Process Orchestration 2.2 exports relationship data to the SAS Web Infrastructure Platform so that clients such as SAS Business Data Network can use the data. After SAS Visual Process Orchestration 2.2 is shipped, you can find instructions in the *SAS Visual Process Orchestration: User’s Guide*. 
Run SAS Business Data Network Migration

You must complete the fields and select options in the Business Data Network Migration window and run the migration to complete the migration process. The window is located at the following location: `yourserver:port/SASBusinessDataNetwork/migration/configure`. Note that you can execute an optional test run to anticipate problems.

The fields are listed in following table:

**Table 8.1  SAS Business Data Network Migration Fields and Options**

<table>
<thead>
<tr>
<th>Field or Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection to BDN 2.x database server</td>
<td></td>
</tr>
<tr>
<td>Type of database server</td>
<td>Specifies the databases that were supported by BDN 2.x: SQL Server, Oracle, and DB2.</td>
</tr>
<tr>
<td>Database server host</td>
<td>Specifies the name of the machine hosting the database server instance.</td>
</tr>
<tr>
<td>Database server port</td>
<td>(Optional) Specifies the port to which the database server instance is listening.</td>
</tr>
<tr>
<td>Database name</td>
<td>Specifies the name of the database within the server instance.</td>
</tr>
<tr>
<td>Override generated JDBC URL</td>
<td>The migration configuration generates a JDBC URL to connect to the BDN 2.x database. If a correct URL for the database cannot be generated by the migration code, selecting this check box enables the user to override the generated JDBC URL. This is used in case the user cannot resolve a connection problem.</td>
</tr>
<tr>
<td>JDBC URL to database</td>
<td>When <strong>Override generated JDBC URL</strong> is not selected, specifies the generated JDBC URL to the database. When <strong>Override generated JDBC URL</strong> is selected, the text field is editable so that you can enter the JDBC URL to the database.</td>
</tr>
<tr>
<td>BDN 2.x database connection properties</td>
<td>Specifies additional properties needed for connecting to the BDN 2.x database. An example for SQL Server is the instance name: <code>instanceName=SQLSERVER2008</code>.</td>
</tr>
<tr>
<td>Optional prefix for BDN 2.x tables</td>
<td>Specifies an optional prefix for the tables that can include catalog and schema prefixes. An example is <code>Repository1.BDN_</code>.</td>
</tr>
<tr>
<td>User name for database connection</td>
<td>Specifies the user name for connecting to the database.</td>
</tr>
</tbody>
</table>
### Field or Option | Description
--- | ---
Password for database connection | Specifies the password for connecting to the database.

**Options**

<table>
<thead>
<tr>
<th>Field or Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep temporary tables</td>
<td>When selected, specifies that the tables copied from the 2.x database to the 3.1 database are not dropped after running the migration. The copied tables are put into a schema named SAS_BDN_TEMP.</td>
</tr>
<tr>
<td>Skip copying the tables from the source BDN database</td>
<td>When selected, skips the step of copying the tables from the source BDN database. If the temporary tables are kept from a previous migration run, they can be reused in a subsequent migration run, thereby saving the time required to copy the tables again. There is no need to connect to the source BDN database when the copy is skipped. Therefore, the database values are not needed.</td>
</tr>
<tr>
<td>Test run</td>
<td>When selected, executes a migration run in which none of the SQL statements to create tables or write to tables are actually executed. Security, lineage, and user preferences are not updated. The source database tables are read.</td>
</tr>
<tr>
<td>Run</td>
<td>Runs the migration.</td>
</tr>
</tbody>
</table>

When you run the migration, an attempt to read one of the source BDN 2.1 tables is made (if the **Skip copying source tables** option is not selected). If that attempt fails, an error message is displayed in the user interface.

### Review Migration Results

If the attempt is successful, the migration begins and the status page is displayed. The status page refreshes itself periodically.
When the migration is complete, the status page scrolls back to the top. The following display shows a portion status page from a test run:

Figure 8.3  Migration Run Status

Business Data Network Migration Status

Status: Complete: Success

Log


Resolve Any Errors

You must manually resolve any errors uncovered in the migration run. Note that the following steps are executed during the migration.

1. If copying the source tables, the following steps are performed:
   • Temporary tables are dropped.
   • Temporary tables are created.
   • Source tables are copied into the temporary tables.

2. Users in the source BDN 2.x database are matched to users in SAS Metadata Server by DataFlux Authentication Server IDs. If a matching user is not found in SAS Metadata Server, the user’s name is used as the user ID. This information is logged.

3. Target tables are truncated. Anything existing in the BDN 2.x database is lost. The truncate is required because of the number of foreign keys between tables.

4. The temporary tables are copied to the target table. During the copy, many items are added, updated, or replaced. These processes include the following steps:
   • Fragmented big strings are collapsed to single strings.
   • Account IDs are replaced with user IDs.
   • The template term is updated to a term type.
   • Type IDs are added.
   • Audit records in DG_NOTS are not copied.

5. Security ACLs are created for all terms. This process is slow. Therefore, the ACLs are created in batches of one thousand in order to give an indication of progress.

6. Relationships are pushed into the relationships database. This process is slow.

7. Notification settings are copied to the preferences service.
Configuring Workflow in SAS Business Data Network

Overview

This document lists the steps for deploying and using workflows that enable the collaborative term review and approval process in SAS Business Data Network. The SAS Workflow Studio client is needed to deploy the workflows, but it does not have to be installed on the same machine as the server.

Perform the following tasks:

- “Turn On Workflow Events” on page 80
- “Add Connection Information to SAS Workflow Studio” on page 81
- “Deploying Workflows in SASWorkflow Studio” on page 81
- “Associating Workflows with Term Types” on page 81

Turn On Workflow Events

In the file C:\SAS\Config\Lev1\Web\WebAppServer\SASServer1_1\sas_webapps\sas.workflow.war\WEB-INF\spring-config\messaging-config.xml, change the default-request-channel value for workflow events from nullChannel to workflowEventFilterTransformChannel. Note that the exact path might differ depending on your deployment’s server definitions.

The original tag is shown in the following display:

Figure 8.4  Original Tag

```
<si:gateway id="workflowSendEventGateway" service-interface="com.sas.workflow.integration.WorkflowEventGateway" default-request-channel="nullChannel"/>
```

The modified tag is shown in the following display:

Figure 8.5  Modified Tag

```
<si:gateway id="workflowSendEventGateway" service-interface="com.sas.workflow.integration.WorkflowEventGateway" default-request-channel="workflowEventFilterTransformChannel"/>
```

Afterward, restart the following services:

- SAS httpd - WebServer
- SAS WebAppServer SASServer1_1
- SAS WebAppServer SASServer2_1
- SAS WebAppServer SASServer13_1
Add Connection Information to SAS Workflow Studio

In the file `Lev1/Web/WebServer/htdocs/sas/sas-environment.xml`, add an entry to specify your connection information.

The following display shows a sample connection information entry:

```xml
<environment name="server name" default="false" platform-version="9.4">
  <desc>fully qualified server name</desc>
  <block-desc>fully qualified server name</block-desc>
  <service-registry>
    http://fully qualified server name:SASWIPClientAccess/remote/ServiceRegistry
  </service-registry>
  <service-registry interface-type="soap">
    http://fully qualified server name:SASWIPSSoapService/remote/ServiceRegistry
  </service-registry>
</environment>
```

This entry must specify the actual machine name and not an alias. Otherwise, SAS Workflow Studio displays an error when it tries to resolve the alias.

For more information about workflow configuration, see the *SAS Intelligence Platform: Web Application Administration Guide*.

Deploying Workflows in SAS Workflow Studio

2. Log on as an administrative user. Use the path Server ⇒ Log On to connect to the server that you added to the environments file in the Add Connection Information to SAS Workflow Studio section.
3. Navigate to Manage Templates in the Server section. Click New Tags and create a new tag named BusinessData. This tag marks a workflow as one that is usable in SAS Business Data Network.
4. Open a workflow file that you want to deploy. You can find the default SAS Business Data Network workflows at the following location: `SASHome\SASBusinessDataNetworkMidTier\3.3\Config\workflows`.
5. Navigate to Save to Repository under Server. Select the BusinessData tag. Then select the Activate check box and click OK to deploy the workflow.
6. Repeat steps 4 and 5 for each workflow that you want to deploy.

Associating Workflows with Term Types

Click Term Types on the upper left corner of the SAS Business Data Network window to access the Term Types section. Then open a term type. You can choose a workflow that you deployed in the previous section as the Create, Edit, or Delete workflow for the term type.
Overview: ASEXPORT Procedure

The ASEXPORT procedure is a SAS procedure used to migrate metadata from DataFlux Authentication Server to SAS Metadata Server. The procedure supports direct object migration through the SAS Open Metadata Interface. It also supports the creation of an export package that is compatible with PROC METADATA.

The following steps illustrate the workings of the ASEXPORT procedure:

1. The META= connection and filter parameters are used to connect to SAS Metadata Server.
2. The AS= connection and filter parameters are used to connect to DataFlux Authentication Server.
3. The MATCH, MATCH SINGLETON, ADD, and DELETE statements use these working sets to build up the mappings between DataFlux Authentication Server and SAS Metadata Server objects.
4. The LIST statement lists them.
5. The EXPORT statement exports them to a file, forwards them to the SAS Metadata Server, or both.

6. The file created by the EXPORT statement can be used directly by the METADATA procedure as its IN= procedure option.

---

Concepts: ASEXPORT Procedure

**Overview**

The matches between DataFlux Authentication Server and SAS Metadata Server objects are managed internally by the relationships in the tabular data represented in the following three schemas:

- **AS Schema**
- **META Schema**
- **X Schema**

Note that the maximal set of working objects available for export is controlled by the various filters specified on the procedure statement.

**AS Schema**

The AS schema includes the working set of DataFlux Authentication Server objects that are extracted using the initial filters specified in the AS(FILTER) procedure suboptions. The AS schema is a one to one tabular snapshot of Authentication Server objects read in using the META/FILTER options.

This schema consists of the following tables:

- **DOMAINS** extracted using the AS(FILTER(DOMAINS)) suboption.
- **USERS** extracted using the AS(FILTER(USERS)) suboption.
- **GROUPS** extracted using the AS(FILTER(GROUPS)) suboption.
- **LOGINS** extracted using the AS(FILTER(LOGINS)) suboption.

The AS schema contains a representation of the DataFlux Authentication Server objects currently in the working set of source objects. These objects are available for selection into the working set of export mappings in the X.DOMAIN_MAP, X.USER_MAP and X.GROUP_MAP tables. The schema is displayed in the following sample:

```sql
create table AS.DOMAINS
(
    NAME              NVARCHAR(256)  NOT NULL,
    NAME_N            NVARCHAR(256)  NOT NULL,
    "DESC"            NVARCHAR(256)  NOT NULL,
    IS_CS_USERID      NCHAR(1)       NOT NULL,
    IS_DQ_USERID      NCHAR(1)       NOT NULL,
    ...  
)
```
The META schema includes the working set of SAS Metadata Server objects extracted using the initial filters specified in the META(FILTER) procedure suboptions. This schema consists of the following tables:

**DOMAINS**
- extracted using the META(FILTER(DOMAINS)) suboption.

**USERS**
- extracted using the META(FILTER(GROUPS)) suboption.

**GROUPS**
- extracted using the META(FILTER(GROUPS)) suboption.

**LOGINS**
- extracted using the META(FILTER(LOGINS)) suboption.

The META schema contains a representation of the SAS Metadata Server objects currently in the working set of destination objects. These objects are available for selection into the working set of export mappings in the X.DOMAIN_MAP, X.USER_MAP and X.GROUP_MAP tables. The schema is displayed in the following sample:

create table META.DOMAINS
(
    ID                NCHAR(17)      NOT NULL,
    AS_ID             NVARCHAR(128),
    NAME              NVARCHAR(60)   NOT NULL,
    NAME_N            NVARCHAR(60)   NOT NULL,
    "DESC"            NVARCHAR(200)  NOT NULL,
);
X Schema

The X schema includes normalized content, views, and joined result sets produced from matches between objects represented in the AS and META schemas.

This schema consists of the following tables or views:

**DOMAIN_MAP**
contains the working set of (AS:Domain, OMSOBJ:AuthenticationDomain) domain mappings currently queued for export.

**USER_MAP**
contains the working set of (AS:Group, OMSOBJ:IdentityGroup) group mappings currently queued for export.

**GROUP_MAP**
contains the working set of (AS:Group, OMSOBJ:IdentityGroup) group mappings currently queued for export.

**AS_LOGINS_N**
contains views of AS.LOGINS with additional FQLN_N column where the column contains a normalized fully qualified login name that can be matched with logins in MS.LOGINS. Login name qualification and normalization is governed by the naming rules inferred from the AS.DOMAINS(IS_CS_USERID, IS_DQ_USERID, IS_UPN_USERID) columns.
MS_LOGINS_N
contains views of MS.LOGINS with additional FQLN_N column where the column contains a normalized fully qualified login name that can be matched with logins in AS.LOGINS. Login name qualification and normalization is governed by the naming rules inferred from the AS.DOMAINS(IS_CS_USERID, IS_DQ_USERID, IS_UPN_USERID) columns.

The X schema contains the working set of DataFlux Authentication Server:SAS Metadata Server export mappings. These mappings are used along with utility tables to assist in matching and selection criteria when using the MATCH, MATCH SINGLETON, ADD, and REMOVE statements.

The contents are listed in following table:

Table 9.1 X Schema Contents

<table>
<thead>
<tr>
<th>Table or View</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X.DOMAIN_MAP</td>
<td>Current working set of domain object mappings.</td>
</tr>
<tr>
<td>X.USER_MAP</td>
<td>Current working set of user object mappings.</td>
</tr>
<tr>
<td>X.GROUP_MAP</td>
<td>Current working set of group object mappings.</td>
</tr>
<tr>
<td>X.AS_LOGINS_N</td>
<td>View of AS.LOGINS with normalized fully qualified login name column, FQLN_N.</td>
</tr>
<tr>
<td>X.MS_LOGINS_N</td>
<td>View of META.LOGINS with normalized fully qualified login name, FQLN_N.</td>
</tr>
</tbody>
</table>

The schema is displayed in the following sample:

```sql
create table X.DOMAIN_MAP
(
    AS_NAME              NVARCHAR(256)  NOT NULL,
    AS_NAME_N            NVARCHAR(256)  NOT NULL,
    AS_DESC              NVARCHAR(256)  NOT NULL,
    AS_IS_CS_USERID      NCHAR(1)       NOT NULL,
    AS_IS_DQ_USERID      NCHAR(1)       NOT NULL,
    AS_IS_UPN_USERID     NCHAR(1)       NOT NULL,
    META_ID              NCHAR(17),
    META_AS_ID           NVARCHAR(128),
    META_NAME            NVARCHAR(60)   NOT NULL,
    META_NAME_N          NVARCHAR(60)   NOT NULL,
    META_DESC            NVARCHAR(200)  NOT NULL,
    META_OUTBOUND_ONLY   NCHAR(1)       NOT NULL,
    META_TRUSTED_ONLY    NCHAR(1)       NOT NULL
);
create table X.USER_MAP
(
    AS_ID                NCHAR(32)      NOT NULL,
    AS_NAME              NVARCHAR(256)  NOT NULL,
    AS_NAME_N            NVARCHAR(256)  NOT NULL,
    AS_DESC              NVARCHAR(256)  NOT NULL,
    AS_ENABLED           NCHAR(1)       NOT NULL,
    META_ID              NCHAR(17),
    META_NAME            NVARCHAR(60)   NOT NULL,
    META_NAME_N          NVARCHAR(60)   NOT NULL,
    META_DESC            NVARCHAR(200)  NOT NULL,
    META_OUTBOUND_ONLY   NCHAR(1)       NOT NULL,
    META_TRUSTED_ONLY    NCHAR(1)       NOT NULL
);
create table X.GROUP_MAP
(
    AS_ID                NCHAR(32)      NOT NULL,
    AS_NAME              NVARCHAR(256)  NOT NULL,
    AS_NAME_N            NVARCHAR(256)  NOT NULL,
    AS_DESC              NVARCHAR(256)  NOT NULL,
    AS_OWNER_ID          NCHAR(32),
    META_ID              NCHAR(17),
    META_AS_ID           NCHAR(32),
    META_NAME            NVARCHAR(60)   NOT NULL,
    META_NAME_N          NVARCHAR(60)   NOT NULL,
    META_DESC            NVARCHAR(200)  NOT NULL
);
Syntax: ASEXPORT Procedure

**Requirement:** The target SAS Metadata Server and the source DataFlux Authentication Server must be running. Connection information for these servers must be available. A trusted user must also be available.

**Tip:** PROC ASEXPORT supports RUN-group processing.

**PROC ASEXPORT**<proc-options>;

  MATCH DOMAIN | USER | GROUP / <match-options>;
  MATCH SINGLETON DOMAIN | USER | GROUP / <match-options>;
  ADD DOMAIN | USER | GROUP / <add-options>;
  REMOVE DOMAIN | USER | GROUP / <remove-options>;
  LIST <type-list> / <list-options>;
  EXPORT / <export-options>;
  UNDO;

<table>
<thead>
<tr>
<th>Statement</th>
<th>Task</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC ASEXPORT</td>
<td>Export or migrate DataFlux Authentication Server content.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>MATCH</td>
<td>Match DataFlux Authentication Server objects with an equivalent SAS Metadata Server objects and place the matches into the working set of export mappings.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>MATCH SINGLETON</td>
<td>Match a single DataFlux Authentication Server object with an equivalent SAS Metadata Server object and place the match into the working set of export mappings.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>ADD</td>
<td>Add DataFlux Authentication Server objects that are unmatched in the working set of SAS Metadata Server objects to the working set of export mappings.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>REMOVE</td>
<td>Remove objects matching the specified criteria from the working set of export mappings.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>LIST</td>
<td>List the current working set of export mappings in the SAS log.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>EXPORT</td>
<td>Export the working set of export mappings and clear the mapping tables, X.DOMAIN_MAP, X.USER_MAP and X.GROUP_MAP.</td>
<td>Ex. 1</td>
</tr>
<tr>
<td>UNDO</td>
<td>Undo changes to the working set of export mappings. These mappings result from the most recent MATCH, MATCH SINGLETON, ADD, or REMOVE statement that was not followed by a RUN or EXPORT statement.</td>
<td>Ex. 1</td>
</tr>
</tbody>
</table>
PROC ASEXPORT Statement

Exports or migrates DataFlux Authentication Server content.

Syntax

PROC ASEXPORT
  <METACON=(SAS-Metadata-Server-connection-arguments)>
  <ASCON=(DataFlux-Authentication-Server-connection-arguments)>
  <OUT=fileref>
  <HEADER=NONE | SIMPLE | FULL>
  <VERBOSE>
;

Optional Arguments

METACON=(metadata-server-connection-arguments)
  Server connection arguments establish communication with SAS Metadata Server.
  The metadata system options are used in place of omitted attributes.

FILTER=(filter-strings)
  is the set of filter strings used to retrieve the working set of SAS Metadata Server
  objects using a templated GetMetadataObjects query with a XMLSelect search
  criteria. There is one filter per object type. If a filter is "*" or is omitted, then no
  subsetting is done when retrieving the objects and all objects of the associated
  metadata type are retrieved.

METACON uses the following filter strings:

DOMAINS="XMLSelect-search-filter"
  specifies a valid XMLSelect search= string used to match objects of type
  AuthenticationDomain.

USERS="XMLSelect-search-filter"
  specifies a valid XMLSelect search= string used to match objects of type
  Person.

GROUPS="XMLSelect-search-filter"
  specifies a valid XMLSelect search= string used to match objects of type
  IdentityGroup.

  Restriction The GROUPS option is not supported for SAS Business Data
  Network.

LOGINS="Select-filter"
  specifies the search criteria used to match objects of type Login. The filter is
  the value of the Search= attribute of the Logins association specified in the
  query template.

PASSWORD="password"
  is the password for the authenticated user ID on SAS Metadata Server.

Alias PW= or METAPASS=
PORT=number
is the TCP port that SAS Metadata Server listens to for requests. This port number was used to start the SAS Metadata Server.

Alias METAPORT=

Requirement Do not enclose the port number in quotation marks.

REPOSITORY=repository-name
is the name of the repository to use for all SAS Metadata Server requests. The repository name must be foundation.

Alias METAREPOSITORY=

SERVER="host-name"
is the host name or network IP address of the computer that hosts SAS Metadata Server. The value LOCALHOST can be used if the SAS session is connecting to SAS Metadata Server on the same computer.

Alias METASERVER= or HOST= or IPADDR=

USER="authenticated-user-ID"
is an authenticated user ID on SAS Metadata Server. SAS Metadata Server supports several authentication providers.

Alias METAUSER= or ID= or USERID=

Alias META=

ASCON=(authentication-server-connection-arguments)
server connection arguments establish communication with DataFlux Authentication Server.

FILTER=(filter-strings)
is the set of filter strings used to retrieve the working set of DataFlux Authentication Server objects. Filter strings are simple name and value pairs or value lists where values are ODBC pattern strings or constants. There is one filter per object type. If a filter is "*" or is omitted, then no subsetting is done when retrieving the objects and all objects of the associated type are retrieved.

ASCON uses the following filter strings:

DOMAINS="domains-filter"
specifies a valid domain search filter. The following filter columns are supported:

caseSensitivity=TRUE|T|YES|1|
FALSE|F|NO|0
specifies to select domains with principal identities matching the specified case sensitivity Boolean. The specified value is compared as case insensitive.

description=domain-description
specifies to select domains that pass the specified description pattern. The specified value is compared as case insensitive and should be quoted.
domain=domain-name | (domain-name1, domain-name2 ...)

specifies to select domains that meet the specified pattern. Values are compared as case insensitive and can be quoted.

partOfLogin=TRUE|T|YES|1|FALSE|F|NO|0

Specifies to select domains that match the specified part of login Boolean. The specified value is compared as case insensitive.

isUPN=TRUE|T|YES|1|FALSE|F|NO|0

specifies to select domains that match the specified is UPN Boolean. The specified value is compared as case insensitive.

USERS=”XMLSelect-search-filter”
specifies a valid user search filter. The following filter columns are supported:

subject=user-name | (user-name1, user-name2 ...)

specifies to select users that match the specified names. Values are compared case insensitive and can be quoted.

identifier=user-identifier | (user-identifier1, user-identifier2 ...)

specifies to select users that match the unique user identifiers. Values are compared as case insensitive.

description=user-description

specifies to select users that pass the specified user description pattern. Values are compared as case insensitive and should be quoted.

enabled=TRUE|T|YES|1|FALSE|F|NO|0

specifies to TRUE if the user is enabled.

GROUPS=”XMLSelect-search-filter”
specifies a valid group search filter. The following filter columns are supported:

group=group-name | (group-name1, group-name2 ...)

specifies the name of group. Values are compared as case insensitive and can be quoted.

identifier=group-identifier | (group-identifier1, group-identifier2 ...)

specifies to select groups that match the unique group identifiers. Values are compared as case insensitive.

description=group-description

specifies to select groups that pass the specified group description pattern. Values are compared as case insensitive and should be quoted.

ownerName=group-owner-name

specifies the name of group’s user owner. The value is compared as case insensitive and can be quoted.

Restriction  The GROUPS option is not supported for SAS Business Data Network.
LOGINS="Select-filter"
    specifies a valid user login search filter. The filter is the value of the Search=
    attribute of the Logins association specified in the query template. The select
    filter is a domain name or list of domain names, specified as follows:
    domain-name | (domain-name1, domain-name2 ...)

PASSWORD="password"
    is the password for the authenticated user ID on DataFlux Authentication Server.

    Alias   PW=

PORT=number
    is the TCP port that DataFlux Authentication Server listens to for requests. This
    port number was used to start the DataFlux Authentication Server.

    Requirement   Do not enclose the port number in quotation marks.

SERVER="host-name"
    is the host name or network IP address of the computer that hosts DataFlux
    Authentication Server. The value LOCALHOST can be used if the SAS session
    is connecting to DataFlux Authentication Server on the same computer.

    Alias   HOST= or IPADDR=

URI="IOM-uri"
    is the complete IOM uri specification of DataFlux Authentication Server. A URI
    can be specified instead of the server and port.

USER="authenticated-user-ID"
    is an authenticated user ID on DataFlux Authentication Server. DataFlux
    Authentication Server supports several authentication providers.

    Alias   ID= or USERID=

OUT=fileref
    specifies an XML file used by the EXPORT statement to store either the output
    result returned by SAS Metadata Server or the input that would have been submitted
    to SAS Metadata Server when exported using the NOFORWARD option. The value
    must be a fileref, not a pathname. Therefore, you must first submit a FILENAME
    statement to assign a fileref to a pathname. In most cases, the output XML string
    is identical to the input XML string, with the addition of the requested values within
    the XML elements.

    If the OUT= argument is omitted and the VERBOSE option is specified, PROC
    ASEXPORT output is written to the SAS log.

    Note: PROC ASEXPORT can generate large XML output. You might need to
    specify a large LRECL value or RECFM=N (streaming output) to avoid
    truncation of long output lines.

    Note: Under z/OS, fixed-length records in the XML method call are not supported
    by PROC METADATA. Specify RECFM=V (or RECFM=N as suggested above)
    when you create the XML method call.

    Alias   OUTFILE=

Restriction   SAS Business Data Network does not support z/OS connections.
HEADER= NONE | SIMPLE | FULL
specifies whether to include an XML header in the output FILE= and OUT= XML
files. The declaration specifies the character-set encoding for web browsers and
XML parsers to use when processing national language characters in the output
XML file.

NONE
omits an encoding declaration. Web browsers and parsers might not handle
national language characters appropriately.

SIMPLE
inserts an XML header that specifies the XML version number: This is the
default value when the HEADER= argument is not specified.

FULL
inserts an XML declaration that represents the encoding that was specified when
creating the output XML file. The source for the encoding varies, depending on
the operating environment. In general, the encoding value is taken from the
ENCODING= option specified in the FILENAME statement, or from the
ENCODING= system option.

SAS attempts to use that encoding for the output XML file (and in the XML
header). The encoding can vary. A single encoding can have multiple names or
aliases that can appear in the XML header. These names might not be valid or
recognized in all XML parsers. When generating the encoding attribute in the
XML header, SAS attempts to use an alias that will be recognized by Internet
Explorer. If the alias is not found, SAS attempts to use a name that will be
recognized by Java XML parsers. If the name is not found, SAS uses an alias by
which SAS will recognize the encoding.

VERBOSE
specifies to print input or output XML strings to the SAS log.

MATCH Statement

Matches DataFlux Authentication Server objects with an equivalent SAS Metadata Server objects and
places the matches into the working set of export mappings. The MATCH statement name is followed by
the type of object being matched for export. This object type can be DOMAIN, USER, or GROUP. The
MATCH statement has two options, CRITERIA= and LOG.

Syntax

MATCH <type> / <match-options>;
  <CRITERIA="match-criteria">
  <LOG>

Optional Arguments

CRITERIA="match-criteria"
specifies match criteria used to associate DataFlux Authentication Server objects and
SAS Metadata Server objects for insertion into the working set of export mappings.
The criteria must be valid SQL WHERE syntax that does not use the WHERE
keyword. It must reference only the SQL entities available for the type of objects
being matched.
The following table lists those entities per object type:

**Table 9.2 Match Entities**

<table>
<thead>
<tr>
<th>Type</th>
<th>SQL Entities Available in Match Criteria WHERE Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>All columns in AS.DOMAINS and META.DOMAINS</td>
</tr>
<tr>
<td>USERS</td>
<td>All columns in AS.USERS, META.USERS, X.AS_LOGINS_N, and X.MS_LOGINS_N</td>
</tr>
<tr>
<td>GROUPS</td>
<td>All columns in AS.GROUPS and META.GROUPS</td>
</tr>
</tbody>
</table>

The MATCH statement always joins objects using the default matching criteria per object type and then subsets based on the CRITERIA= WHERE clause specified. If omitted, a CRITERIA= value of “1=1” is implied so that no further subsetting occurs.

The following table documents the default match criteria per object type:

**Table 9.3 MATCH Criteria**

<table>
<thead>
<tr>
<th>Type</th>
<th>Default CRITERIA= value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>(AS.DOMAINS.NAME_N=META.DOMAINS.NAME_N) and (META.DOMAINS.AS_ID is NULL)</td>
</tr>
<tr>
<td>USERS</td>
<td>(X.AS_LOGINS_N.USER_ID=AS.USERS.ID) and (X.MS_LOGINS_N.FQLN_N=X.AS_LOGINS_N.FQLN_N) and (META.USERS.ID=X.MS_LOGINS_N.OWNER_ID) and (META.USERS.AS_ID is NULL)</td>
</tr>
<tr>
<td>GROUPS</td>
<td>(AS.GROUPS.NAME_N=META.GROUPS.NAME_N) and (META.GROUPS.AS_ID is NULL)</td>
</tr>
</tbody>
</table>

**LOG**

specifies to print match results in the SAS log.

---

**MATCH SINGLETON Statement**

Matches a single DataFlux Authentication Server object with an equivalent SAS Metadata Server object and places the match into the working set of export mappings. The MATCH SINGLETON statement name is followed by the type of object being matched for eventual export. The object type can be DOMAIN, USER, or GROUP. The MATCH SINGLETON statement has two options, CRITERIA and LOG.

**Syntax**

MATCH SINGLETON <type> / <match-singleton-options>;

<CRITERIA="match-criteria">
Optional Arguments

CRITERIA="match-criteria"
specifies match criteria used to associate a single DataFlux Authentication Server object with a single SAS Metadata Server object for insertion into the working set of export mappings. The criteria must be valid SQL WHERE syntax that does not use the WHERE keyword. It must reference only the SQL entities available for the type of objects being matched.

The following table lists those entities per object type:

Table 9.4 MATCH SINGLETON Entities

<table>
<thead>
<tr>
<th>Type</th>
<th>SQL Entities Available in Match Criteria WHERE Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>All columns in AS.DOMAINS and META.DOMAINS</td>
</tr>
<tr>
<td>USERS</td>
<td>All columns in AS.USERS, META.USERS, X.AS_LOGINS_N, and X.MS_LOGINS_N</td>
</tr>
<tr>
<td>GROUPS</td>
<td>All columns in AS.GROUPS and META.GROUPS</td>
</tr>
</tbody>
</table>

The MATCH SINGLETON statement always joins objects using the default matching criteria per object type and then subsets based on the user’s CRITERIA=WHERE clause. If omitted, a CRITERIA= value of “1=1” is implied such that no further subsetting occurs. Specifying criteria that produces more than one match results in an error, and no additional mapping is queued for export. The following table documents the default match singleton criteria per object type:

The following table documents the default match singleton criteria per object type:

Table 9.5 MATCH SINGLETON Criteria

<table>
<thead>
<tr>
<th>Type</th>
<th>Default CRITERIA= value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>The domain is neither already exported nor queued for export in the current working set of export mappings.</td>
</tr>
<tr>
<td>USERS</td>
<td>(X.AS_LOGINS_N.USER_ID=AS.USERS.ID) and (X.MS_LOGINS_N.OWNER_ID=META.USERS.ID) and The user is neither already exported nor queued for export in the current working set of export mappings.</td>
</tr>
<tr>
<td>GROUPS</td>
<td>The group is neither already exported nor queued for export in the current working set of export mappings.</td>
</tr>
</tbody>
</table>

LOG
specifies to print match results in the SAS log.
ADD Statement

Adds DataFlux Authentication Server objects that are unmatched in the working set of SAS Metadata Server objects to the working set of export mappings. The ADD statement name is followed by the type of object being added for export. The object type can be DOMAIN, USER, or GROUP. The ADD statement has two options, CRITERIA and LOG.

Syntax

ADD <type> / <add-options>;
   <CRITERIA="match-criteria">
   <LOG>

Optional Arguments

CRITERIA="match-criteria"
specifies criteria used to select DataFlux Authentication Server objects into the working set of export mappings. The criteria must be valid SQL WHERE syntax that does not use the WHERE keyword. It must reference only the SQL entities available for the type of objects being matched.

The following table lists those entities per object type:

Table 9.6  ADD Entities

<table>
<thead>
<tr>
<th>Type</th>
<th>SQL Entities Available in Match Criteria WHERE Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>All columns in AS.DOMAINS</td>
</tr>
<tr>
<td>USERS</td>
<td>All columns in AS.USERS, X.AS_LOGINS_N</td>
</tr>
<tr>
<td>GROUPS</td>
<td>All columns in AS.GROUPS</td>
</tr>
</tbody>
</table>

The ADD statement always selects AS objects using the default criteria per object type and then subsets based on the CRITERIA= WHERE clause specified. If omitted, a CRITERIA= value of “1=1” is implied such that no further subsetting occurs.

The following table documents the default add criteria per object type:

Table 9.7  ADD Criteria

<table>
<thead>
<tr>
<th>Type</th>
<th>Default CRITERIA= value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>The domain is neither already exported nor queued for export in the current working set of export mappings.</td>
</tr>
</tbody>
</table>
Type | Default CRITERIA= value
--- | ---
**USERS** | (X.AS_LOGINS.N.USER_ID=AS.USERS.ID) and The user is neither already exported nor queued for export in the current working set of export mappings.

**GROUPS** | The group is neither already exported nor queued for export in the current working set of export mappings.

**LOG**
specifies to print ADD statement results in the SAS log.

**REMOVE Statement**
Removes objects matching the specified criteria from the working set of export mappings. The REMOVE statement name is followed by the type of objects being removed from the working set of export mappings. The object type can be DOMAIN, USER, or GROUP. The REMOVE statement has two options, CRITERIA and LOG.

**Syntax**
```
REMOVE <type> / <remove-options>;
  <CRITERIA="match-criteria">
  <LOG>
```

**Optional Arguments**
**CRITERIA="match-criteria"**
specifies criteria used to select DataFlux Authentication Server objects into the working set of export mappings. The criteria must be valid SQL WHERE syntax that does not use the WHERE keyword. It must reference only the SQL entities available for the type of objects being matched:
```
remove domains / criteria="x.domain_map.as_name_n='EURNET'" log;
```
The following table lists those entities per object type:

**Table 9.8  REMOVE Criteria**

<table>
<thead>
<tr>
<th>Type</th>
<th>SQL Entities Available in Match Criteria WHERE Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAINS</td>
<td>All columns in X.DOMAIN_MAP</td>
</tr>
<tr>
<td>USERS</td>
<td>All columns in X.USER_MAP</td>
</tr>
<tr>
<td>GROUPS</td>
<td>All columns in X.GROUP_MAP</td>
</tr>
</tbody>
</table>
The MATCH statement always selects objects mapped for export (those accumulated via the prior MATCH, MATCH SINGLETON, and ADD statements) using the specified criteria. The default CRITERIA= value is always “1=1” such that all export mappings are cleared.

**LOG**

specifies to print REMOVE statement results in the SAS log.

---

**LIST Statement**

Lists the current working set of export mappings in the SAS log. The LIST statement name is optionally followed by the type of objects being listed. The object type can be DOMAIN, USER, or GROUP. The LIST statement has one option, VERBOSE.

**Syntax**

```
LIST <type> / <list-options>;
<VERBOSE>
```

**Optional Argument**

VERBOSE

verbose output.

---

**EXPORT Statement**

Exports the working set of export mappings and clears the mapping tables, which are X.DOMAIN_MAP, X.USER_MAP and X.GROUP_MAP. EXPORT has three options, NOFORWARD, VERBOSE, and NOVERBOSE.

**Syntax**

```
EXPORT <export-options>;
<NOFORWARD>
<VERBOSE>
<NOVERBOSE>
```

**Optional Arguments**

**NOFORWARD**

prevents forwarding of generated XML to the metadata server. When NOFORWARD is specified, the OUT= file will contain SAS Metadata Server input XML. Otherwise, it will contain output response XML.

**VERBOSE**

specifies to print generated input or output response XML to the SAS log. The VERBOSE option is ignored if the NOVERBOSE is also specified. The VERBOSE option is implied if the procedure’s OUT= option is omitted because the log becomes the destination for generated or response XML.
NOVERBOSE

specifies to not print generated input or output response XML to the SAS log. The NOVERBOSE option overrides the VERBOSE option of the procedure and EXPORT statements. The NOVERBOSE option is ignored if the procedure’s OUT= option is omitted.

Details

The EXPORT statement exports all export mappings and clears the mapping tables, which are X.DOMAIN_MAP, X.USER_MAP and X.GROUP_MAP.

Each new exported object and existing matched object is mapped in metadata using the ExternalIdentities association to an ExternalIdentity object with the following attributes:

- For new objects, ImportType='AuthenticationServer.Import'
- For matched or “tagged” objects, ImportType='AuthenticationServer.Match'
- Context='AuthenticationServer.ID'
- Name='AS:Server/server-name', where the server name consists of the fixed ‘AS:Server/’ prefix followed by the PUBLIC group identifier of the source DataFlux Authentication Server.

The export process creates mappings between source DataFlux Authentication Server objects and target SAS Metadata Server objects. Multiple DataFlux Authentication Server domains can map to the same SAS Metadata Server AuthenticationDomain object. Other object types map 1:1 in the two stores. However, exports from multiple DataFlux Authentication Server instances can also produce n:1 mappings. The Name attribute of the ExternalIdentity objects used in the mappings uniquely identifies the source DataFlux Authentication Server.

The EXPORT statement writes SAS Metadata Server output into the file specified by the OUT option or the SAS log if the VERBOSE procedure statement option is specified and the OUT= option is omitted. If the NOFORWARD option is specified, then the statement unconditionally writes input XML into the file specified by the OUT= option or the SAS log if OUT= is omitted. If the OUT= option is specified, then the XML is also written to the SAS log if the EXPORT statement’s NOVERBOSE option is omitted and either the procedure’s VERBOSE option or the EXPORT statement’s VERBOSE option is specified.

UND0 Statement

Undoes changes to the working set of export mappings. These changes result from the most recent MATCH, MATCH SINGLETON, ADD, or REMOVE statement that was not followed by a RUN or EXPORT statement.

Syntax

UND0;
Example: Exporting from a DataFlux Authentication Server to a SAS Metadata Server

**Features:**

- PROC ASEXPORT statement
- MATCH SINGLETON statement
- MATCH statement
- ADD statement
- LIST statement
- EXPORT statement

**Details**

This example demonstrates the following actions:

- specify metadata values
- create explicit singleton matches between these two domains
- auto-match domains by name
- add remaining unmatched domains
- perform explicit user matching
- auto-match users by FQLN
- add remaining unmatched users
- list everything for review
- create an input file (per noforward) for PROC METADATA that we can review

**Assign a file reference.** The FILENAME statement assigns a libref to an external SAS library that contains a permanent SAS catalog.

```sas
filename asx 'C:\TableServer\asexport.xml';
```

**Specify metadata values.**

```sas
proc ASEXPORT meta=
  {
    user='username' password='password'
    server='localhost'
    port=port_number
    repos='repositoryID'
    filter=(DOMAINS **
      USERS **
      LOGINS *Login[Domain/AuthentcationDomain
      [@OutboundOnly='0']]*)
  }
as=
  {
    server='localhost'
    user='username'
    pass='password'
  }
```
port=port_number
filter=(DOMAINS *domain=(domain_names)*
   USERS  *enabled=TRUE subject=(ADMUSER,
   Shared_Login_Manager, tsadm, 'USER%')"
   LOGINS *(login IDs for included domains)*)
}
verbose
tracefile='C:\TableServer\asexport.croc' traceloc=SQL
traceflags='319'
retain
out=asx

Create explicit singleton matches between these two domains.

match singleton DOMAIN / criteria="as.domains.name_n='LOCAL' and
meta.domains.name_n='domain_name'" log;
match singleton DOMAIN / criteria="as.domains.name_n='UNIX' and
meta.domains.name_n='domain_name'" log;

Auto-match domains by name.

match DOMAINS / log;

Add remaining unmatched domains.

add DOMAINS / log;

Perform explicit user matching. Attempt at least one user that has a matching Login.
Nothing should match.

match singleton USER / criteria="as.users.name_n='SHARED_LOGIN_MANAGER' and
meta.users.name_n='FEDERATION SERVER SHARED LOGIN MANAGER'" log;
match singleton USER / criteria="as.users.name_n='USER1' and
meta.users.name_n='TSADM'" log;
match singleton USER / criteria="as.users.name_n='TSADM' and
meta.users.name_n='TSADM'" log;

Auto-match users by FQLN.

match USERS / log;

Add remaining unmatched users.

add USERS / log;

List everything for review.

list DOMAINS USERS;

Create an input file (per noforward) for proc METADATA that we can review.

export / noforward noverbose;

End processing of PROC ASEXPORK.

quit;
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