

Policies in Designer 4.0.1

Novell[®] Designer for Identity Manager

4.0.1

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About This Guide

Novell Identity Manager 4.0.1 is a data sharing and synchronization service that enables applications, directories, and databases to share information. It links scattered information and enables you to establish policies that govern automatic updates to designated systems when identity changes occur.

Identity Manager provides the foundation for account provisioning, security, single sign-on, user self-service, authentication, authorization, automated workflows, and Web services. It allows you to integrate, manage, and control your distributed identity information so you can securely deliver the right resources to the right people.

This guide provides detailed information on using Designer 4.0.1 for Identity Manager 4.0.1.

- ♦ [Chapter 1, “Overview,” on page 17](#)
- ♦ [Chapter 3, “Managing Policies with the Policy Builder,” on page 21](#)
- ♦ [Chapter 4, “Using Additional Builders and Editors,” on page 45](#)
- ♦ [Chapter 5, “Using the XPath Builder,” on page 73](#)
- ♦ [Chapter 6, “Defining Schema Map Policies,” on page 79](#)
- ♦ [Chapter 7, “Controlling the Flow of Objects with the Filter,” on page 95](#)
- ♦ [Chapter 8, “Using Predefined Rules,” on page 111](#)
- ♦ [Chapter 9, “Testing Policies with the Policy Simulator,” on page 147](#)
- ♦ [Chapter 10, “Storing Information in Resource Objects,” on page 171](#)
- ♦ [Chapter 11, “Using ECMAScript in Policies,” on page 177](#)
- ♦ [Chapter 12, “Conditions,” on page 191](#)
- ♦ [Chapter 13, “Actions,” on page 229](#)
- ♦ [Chapter 14, “Noun Tokens,” on page 287](#)
- ♦ [Chapter 15, “Verb Tokens,” on page 311](#)

There are additional reference chapters for the pre-Identity Manager Policy Builder:

- ♦ [Chapter 2, “Using the Pre-Identity Manager 3.5 Policy Builder,” on page 19](#)
- ♦ [Chapter 16, “Pre-Identity Manager 3.5 Builders,” on page 325](#)
- ♦ [Chapter 17, “Pre-Identity Manager 3.5 Conditions,” on page 341](#)
- ♦ [Chapter 18, “Pre-Identity Manager 3.5 Actions,” on page 361](#)
- ♦ [Chapter 19, “Pre-Identity Manager 3.5 Noun Tokens,” on page 385](#)
- ♦ [Chapter 20, “Pre-Identity Manager 3.5 Verb Tokens,” on page 395](#)

Audience

This guide is intended for Identity Manager administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation and enter your comments there.

Documentation Updates

For the most recent version of *Policies in Designer*, visit the [Identity Manager Documentation Web site](http://www.novell.com/documentation/idm401) (<http://www.novell.com/documentation/idm401>).

Additional Documentation

For documentation on using the Identity Manager drivers, see the [Identity Manager Drivers Documentation Web site](http://www.novell.com/documentation/idm401drivers/index.html) (<http://www.novell.com/documentation/idm401drivers/index.html>).

For documentation on using Designer, see the [Designer 4.0.1 for Identity Manager 4.0.1 Documentation Web site](http://www.novell.com/documentation/idm401/designer_admin/?page=/documentation/idm40/designer_admin/data/front.html) (http://www.novell.com/documentation/idm401/designer_admin/?page=/documentation/idm40/designer_admin/data/front.html).

Documentation Conventions

In Novell documentation, a greater-than symbol (>) is used to separate actions within a step and items in a cross-reference path.

Overview

1

Policies manage the data that is synchronizing between the Identity Vault and the remote data store. The policies are stored in the policy sets (see [“Understanding Policy Components”](#) in *Understanding Policies for Identity Manager 4.0.1*.) Designer provides a wide set of tools for defining and debugging policies to control how information flows from one system to another, and under what conditions. The following sections explain how to use the tools that are provided to help manage the policies:

- ♦ [Chapter 3, “Managing Policies with the Policy Builder,”](#) on page 21
- ♦ [Chapter 4, “Using Additional Builders and Editors,”](#) on page 45
- ♦ [Chapter 5, “Using the XPath Builder,”](#) on page 73
- ♦ [Chapter 6, “Defining Schema Map Policies,”](#) on page 79
- ♦ [Chapter 7, “Controlling the Flow of Objects with the Filter,”](#) on page 95
- ♦ [Chapter 8, “Using Predefined Rules,”](#) on page 111
- ♦ [Chapter 9, “Testing Policies with the Policy Simulator,”](#) on page 147
- ♦ [Chapter 10, “Storing Information in Resource Objects,”](#) on page 171
- ♦ [Chapter 11, “Using ECMAScript in Policies,”](#) on page 177

This section also contains a detailed reference section to all of the elements in DirXML Script. For more information on DirXML Script, see [“DirXML Script DTD”](#) in the *Identity Manager 4.0.1 DTD Reference*.

- ♦ [Chapter 12, “Conditions,”](#) on page 191
- ♦ [Chapter 13, “Actions,”](#) on page 229
- ♦ [Chapter 14, “Noun Tokens,”](#) on page 287
- ♦ [Chapter 15, “Verb Tokens,”](#) on page 311

There are also reference sections for the pre-Identity Manager Policy Builder:

- ♦ [Chapter 2, “Using the Pre-Identity Manager 3.5 Policy Builder,”](#) on page 19
- ♦ [Chapter 16, “Pre-Identity Manager 3.5 Builders,”](#) on page 325
- ♦ [Chapter 17, “Pre-Identity Manager 3.5 Conditions,”](#) on page 341
- ♦ [Chapter 18, “Pre-Identity Manager 3.5 Actions,”](#) on page 361
- ♦ [Chapter 19, “Pre-Identity Manager 3.5 Noun Tokens,”](#) on page 385
- ♦ [Chapter 20, “Pre-Identity Manager 3.5 Verb Tokens,”](#) on page 395

1.1 Policies

As part of understanding how policies work, it is important to understand the components of policies.

- ♦ Policies are made up of rules.



- ◆ A rule is a set of conditions (see [Chapter 12, “Conditions,” on page 191](#)) that must be met before a defined action (see [Chapter 13, “Actions,” on page 229](#)) occurs.
- ◆ Actions can have dynamic arguments that derive from tokens that are expanded at runtime.
- ◆ Tokens are broken up into two classifications: nouns and verbs.
 - ◆ Noun tokens (see [Chapter 14, “Noun Tokens,” on page 287](#)) expand to values that are derived from the current operation, the source or destination data stores, or some external source.
 - ◆ Verb tokens (see [Chapter 15, “Verb Tokens,” on page 311](#)) modify the concatenated results of other tokens that are subordinate to them.
- ◆ Regular expressions (see “[Regular Expressions](#)” in *Understanding Policies for Identity Manager 4.0.1*) and XPath 1.0 expressions (see “[XPath 1.0 Expressions](#)” in *Understanding Policies for Identity Manager 4.0.1*) are commonly used in the rules to create the desired results for the policies.
- ◆ A policy operates on an XDS document and its primary purpose is to examine and modify that document.
- ◆ An operation is any element in the XDS document that is a child of the input element and the output element. The elements are part of the Novell `nds.dtd`; for more information, see “[NDS DTD](#)” in the *Identity Manager 4.0.1 DTD Reference*.
- ◆ An operation usually represents an event, a command, or a status.
- ◆ The policy is applied separately to each operation. As the policy is applied to each operation in turn, that operation becomes the current operation. Each rule is applied sequentially to the current operation. All of the rules are applied to the current operation unless an action is executed by a prior rule that causes subsequent rules to no longer be applied.
- ◆ A policy can also get additional context from outside of the document and cause side effects that are not reflected in the result document.

Using the Pre-Identity Manager 3.5 Policy Builder

2

Designer contains two Policy Builders: the pre-Identity Manager 3.5 Policy Builder and the Identity Manager 3.5 and Newer Policy Builder. The Policy Builders are similar except for the following:

- ◆ You can enable and disable trace only at the driver level in the pre-Identity Manager 3.5 Policy Builder.
- ◆ The DirXML Script elements are different between the two builders.

These differences require two Policy Builders. For information on how to use both Policy Builders, see [Chapter 3, “Managing Policies with the Policy Builder,” on page 21](#), which documents the Identity Manager 3.5 and Newer Policy Builder. The only difference is an additional icon that enables  and disables  tracing on rules, actions, conditions, and tokens.

For a list of the DirXML Script elements for the pre-Identity Manager 3.5 Policy Builder:

- ◆ [Chapter 17, “Pre-Identity Manager 3.5 Conditions,” on page 341](#)
- ◆ [Chapter 18, “Pre-Identity Manager 3.5 Actions,” on page 361](#)
- ◆ [Chapter 19, “Pre-Identity Manager 3.5 Noun Tokens,” on page 385](#)
- ◆ [Chapter 20, “Pre-Identity Manager 3.5 Verb Tokens,” on page 395](#)

For a list of the DirXML Script elements for the Identity Manager 3.5 and Newer Policy Builder:

- ◆ [Chapter 12, “Conditions,” on page 191](#)
- ◆ [Chapter 13, “Actions,” on page 229](#)
- ◆ [Chapter 14, “Noun Tokens,” on page 287](#)
- ◆ [Chapter 15, “Verb Tokens,” on page 311](#)

Managing Policies with the Policy Builder


3

The Policy Builder is a complete graphical interface for creating and managing the policies that define the exchange of data between connected systems.

- ◆ [Section 3.1, “Accessing the Policy Builder,” on page 21](#)
- ◆ [Section 3.2, “Using the Policy Builder,” on page 23](#)
- ◆ [Section 3.3, “Creating a Policy,” on page 24](#)
- ◆ [Section 3.4, “Creating a Rule,” on page 28](#)
- ◆ [Section 3.5, “Creating an Argument,” on page 33](#)
- ◆ [Section 3.6, “Variable Selector,” on page 35](#)
- ◆ [Section 3.7, “Editing a Policy,” on page 39](#)
- ◆ [Section 3.8, “Viewing the Policy in XML,” on page 42](#)

3.1 Accessing the Policy Builder

There are two different Policy Builders included in Designer: one that works with the new policy features for Identity Manager 3.5 and newer, and an older one that does not support these features. The Policy Builder version is determined by the version of Identity Manager. To set the version of Identity Manager:



- 1 Open a project in Designer.
- 2 Click the *Outline* tab, then select the *Show Model Outline* icon .
- 3 Right-click the server object, then click *Properties*.
- 4 Select the appropriate *Identity Manager Version*.

When the Identity Manager version is set to 3.5 or newer, the new Policy Builder is available. If the version is set to anything older than 3.5, the old Policy Builder is available.


The Policy Builder can be accessed from the Model Outline view, from the Policy Flow view, or from a policy set.

- ◆ [Section 3.1.1, “Model Outline View,” on page 21](#)
- ◆ [Section 3.1.2, “Policy Flow View,” on page 22](#)
- ◆ [Section 3.1.3, “Policy Set,” on page 22](#)

3.1.1 Model Outline View

- 1 Open a project in Designer.
- 2 Click the Outline view, then select the *Show Model Outline* icon .
- 3 Double-click a policy  listed in the Model Outline view or right-click and select *Edit*.

3.1.2 Policy Flow View

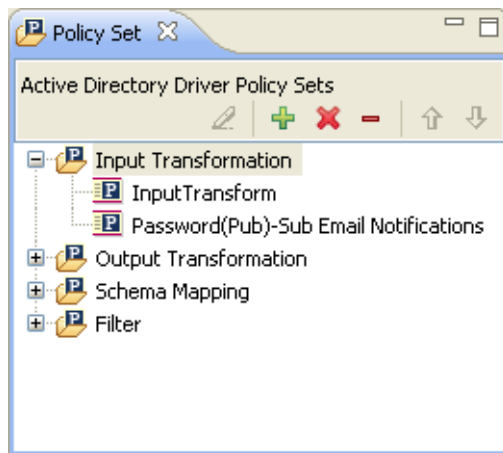
- 1 Open a project in Designer.
- 2 Select the *Outline* tab, then select the *Show Policy Flow* icon.
- 3 Double-click a policy  in the Policy Flow view.

You can also right-click in the Policy Flow view, select *Edit Policy*, then select the policy you want to edit.

3.1.3 Policy Set

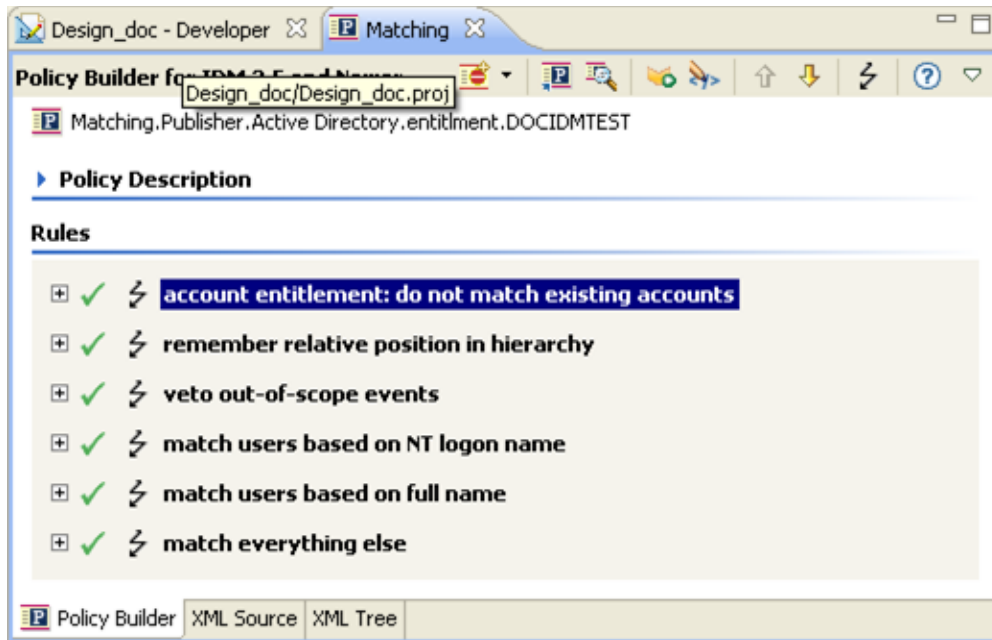
- 1 Open a project in Designer.
- 2 Click the Outline view, then select the *Show Model Outline* icon.
- 3 Select the policy in the policy set, then click *Edit the policy*.

You can also right-click the policy in the policy set, then click *Edit*.



To see all of the information in the Policy Builder window without scrolling, double-click the policy tab so the Policy Builder fills the entire window. To minimize the window, double-click the policy tab.

Figure 3-1 Policy Builder Full Screen



For information on using the Policy Builder, see [Section 3.2, “Using the Policy Builder,”](#) on page 23.














3.2 Using the Policy Builder

The Policy Builder enables you to add, view, and delete the rules that make up a policy. You can also use it to import and save policies and rules, and manage XML namespaces. The Policy Builder contains the [“Action Builder”](#) on page 45 and the [“Condition Builder”](#) on page 52.

The following tips describe how to perform some common Policy Builder tasks:

Table 3-1 Common Policy Builder Tasks

Tasks	Description
✓ Disable	Disables a policy, rule, condition, or action.
⊖ Enable	Enables a policy, rule, condition, or action.
⚡ Disable Trace	Disables tracing on a rule, condition, or action.
⚡ Enable Trace	Enables tracing on a rule, condition, or action.
⚡ in the tool bar	Enables DirXML Script tracing on the policy.
✎ Edit	Edits the name of a rule or edits the description of a rule.
✖ Delete	Deletes a rule or a policy.
🔍 Browse	Browses a list of values to use when populating a field.

Tasks	Description
 Add a rule	Adds a new rule or a predefined rule.
 Import	Imports a policy from a file.
 Save to File	Saves a policy to a file.
 Deploy	Deploys a policy to the Identity Vault.
 Compare	Compares the policy in the Policy Builder to an existing policy in the Identity Vault.
 Policy Simulator	Launches the Policy Simulator and tests the policies in the Policy Builder.
 Edit Namespace	Adds multiple XML namespaces to the rule or policy.
 XPath Builder	Launches the XPath Builder to create XPath expressions.
 Expand	Expands all of the rules in a policy.
 Collapse	Collapses all of the rules in a policy.
 Move up	Moves a rule up in the policy.
 Move down	Moves a rule down in the policy.
 Save	Click the save icon in the tool bar, click <i>File > Save</i> , or press Ctrl+S to save your work.
Policy Description	Adds a comment to a policy or rule. Comments are stored directly in the policy or rule, and can be as long as necessary.

3.3 Creating a Policy

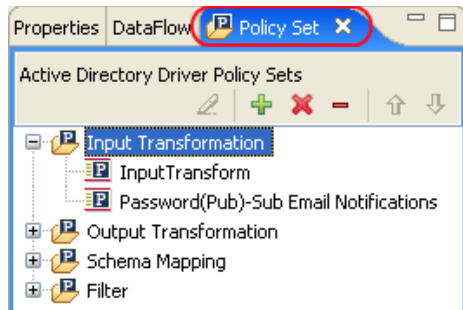
A policy sends data to the connected systems. A policy is created through the policy set.

- ♦ [Section 3.3.1, “Accessing the Policy Set,” on page 24](#)
- ♦ [Section 3.3.2, “Using the Policy Set,” on page 25](#)
- ♦ [Section 3.3.3, “Using the Add Policy Wizard,” on page 26](#)

3.3.1 Accessing the Policy Set

- 1 Select a driver object from the *Outline* view in an open project.

2 Select the *Policy Set* tab.



3.3.2 Using the Policy Set

The policy set contains a toolbar and a list of policies.

The policy list displays all the policies contained in the selected policy set. During a transformation, the policies within the list are executed from top to bottom. The toolbar contains buttons and a drop-down menu that you can use to manage policies displayed in the list, including, editing, adding, deleting, renaming, and changing the processing order of the policies.

Policy Set Toolbar

The policy set displays a copy of the policy. The buttons on the toolbar are enabled or disabled depending upon the item you have selected. The different icons are described below.

Table 3-2 *Policy Set Toolbar*

Operation	Description
Edit the policy	Launches the Policy Builder.
Create or add a new policy to the Policy Set	Launches the Add Policy Wizard.
Remove and delete the selected policy	Deletes the policy from the project.
Remove the selected policy from the Policy Set, but do not delete it	Removes the policy from the selected policy set object but doesn't delete the policy.
Move the policy up the policy chain	Moves the policy up in the processing order.
Move the policy down the policy chain	Moves the policy down in the processing order.

Keyboard Support

You can move through the policy set with keystrokes as well as using the mouse. The supported keystrokes are listed below.

Table 3-3 Keyboard Support


Keystroke	Description
Up-arrow	Moves the selected policy up in the processing order.
Down-arrow	Moves the selected policy down in the processing order.
Delete	Deletes the policy from the project.
Minus	Removes the policy from the selected policy set, but does not delete it.
Plus	Launches the Add Policy Wizard.
Ctrl+Z	Undoes the last operation.
Ctrl+Y	Redoes the last operation.

3.3.3 Using the Add Policy Wizard

The Add Policy Wizard launches when you click the *Create or add a new policy to the Policy Set* icon in the toolbar. The Add Policy Wizard enables you to do the following:

- ♦ [“Creating a Policy” on page 26](#)
- ♦ [“Copying a Policy” on page 27](#)
- ♦ [“Linking to a Policy” on page 28](#)

To launch the Add Policy Wizard:

- 1 Select a driver in the *Outline* view.
- 2 Select a policy set item in the policy set, then click *Create or add a new policy to the Policy Set* .

Creating a Policy

- 1 In the Add Policy Wizard, select *Create a new policy*, then click *Next*.

You can also add a policy by right-clicking a policy set in the Policy Flow view, selecting *Add Policy*, then selecting how to create the policy:

- ♦ *DirXML Script*
 - ♦ *XSLT*
 - ♦ *Link To Existing*
 - ♦ *Copy Existing*
 - ♦ *Schema Map* (Only displayed, if the Schema Map policy set is selected.)
- 2 In the Create Policy dialog box, specify a policy name, then click *Next*.

Select Open Editor after creating object to automatically launch the Policy Builder after creating the new policy.

Create Policy

Specify the name of the new policy and the container where it will be created.



Policy Name:

Policy Container:

Open Editor after creating object.

Accept the default container, or browse to and select the Driver, Publisher, or Subscriber object where you want the policy to be created.

If a policy is not reused by multiple drivers, you typically create that policy under the driver or channel that is using it.

This decision depends on how you want to organize the policies. By default, policies are placed under the container object that is selected in the *Outline* tab when the Add Policy Wizard is launched.

For example, if you move to a Publisher object in the *Outline* tab and then add a policy to a policy set, the policy defaults to the Publisher container.

You can change this setting if you want to create policies in a different container. For example, you can set up a policy library, put all of the common policies under this driver, and then simply reference the policies from the other drivers. That way, the policy is common. If you need to change a policy, you need to do it only once.

- 3 In the Select Type dialog box, select the type of policy you want to implement, then click *Finish*.

The policy type defaults to *DirXML Script*. You can select *XSLT*, if you don't want to use DirXML Script.


If you create a Schema Map policy set, an additional option is available for *Schema Map*.

The new policy appears in the expanded policy set.

Copying a Policy

- 1 In the Add Policy Wizard, select *Copy a policy*, then click *Next*.
- 2 In the Create Policy dialog box, provide the necessary policy information, then click *OK*.
 - ♦ Specify a name for the new policy

- ◆ Accept the default container, or browse to and select the Driver, Publisher, or Subscriber object where you want the policy to be created.
- ◆ Browse to and select the policy you want to copy, then click *Finish*.

Copy Policy 

Specify the name of the new policy, the container where it will be created and the policy to be copied.

Policy Name:


Policy Container:

Policy to be Copied:

Open Editor after creating object.

Linking to a Policy

- 1 In the Add Policy Wizard, select *Link a policy*, then click *Next*.
- 2 In the Link Policy dialog box, click *Browse* to launch the model browser.

Link Policy 

Specify the existing policy to link into the Policy Set.

Policy to Link:

- 3 Browse to and select the Policy object you want to link into the policy set, then click *OK*.

Linking a policy into a policy set doesn't create a new Policy object. Instead, it adds a reference to an existing policy. This reference can be to any existing policy within the current Identity Vault. It doesn't need to be contained within the current Driver object, but the policy type must be valid for the policy set that it is being linked to. For example, you can't link a Schema Map policy into an Input policy set.

Linking a policy into a policy set is not permitted when viewing all policies.

- 4 Click *Finish* to link to the selected policy.

3.4 Creating a Rule

A rule is a set of conditions that must be met before a defined action occurs. Rules are created from condition groups, conditions, and actions.

Rules can be created in four different ways:

- ◆ [Section 3.4.1, "Creating a New Rule," on page 29](#)
- ◆ [Section 3.4.2, "Using Predefined Rules," on page 31](#)
- ◆ [Section 3.4.3, "Including an Existing Rule," on page 32](#)
- ◆ [Section 3.4.4, "Importing a Policy From an XML File," on page 32](#)

3.4.1 Creating a New Rule


When you create a rule, you create condition groups, conditions, and actions. Each rule is composed of conditions, actions, and arguments. For more information, click the Help icon (?) when creating each item. The help files contain a definition and an example of the item being used.

- ♦ “Creating a Rule” on page 29
- ♦ “Creating a Conditional Group” on page 30
- ♦ “Creating a Condition” on page 30
- ♦ “Creating an Action” on page 31

Creating a Rule

Policy Builder includes a wizard to step you through the process of creating a rule.

NOTE: On any of the wizard dialog boxes, you can click *Finish* to exit the wizard and create a rule with the details you have specified to that point.

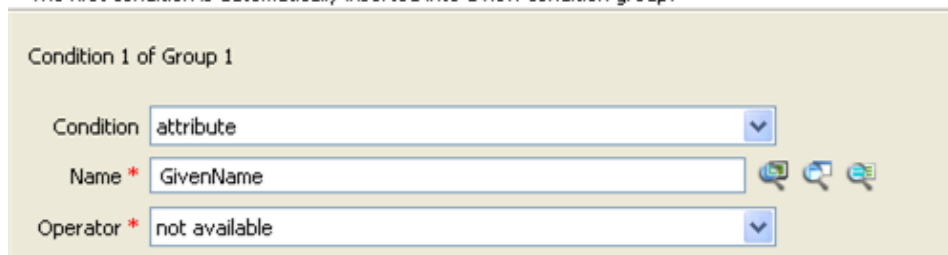
- 1 In Policy Builder toolbar, click *Rule* .
- 2 In the Name and Describe Rule dialog box, specify the name of the rule, then click *Next*.
- 3 In the Select the Condition Structure dialog box, select the rule’s condition structure, then click *Next*.

You can choose *OR Conditions*, *AND Groups* or *AND Conditions*, *OR Groups*.

- 4 In the Define the Condition dialog box, select the condition you want, specify the appropriate information, then click *Next*.

Define the Condition

Select the values to complete the syntax of the condition. Values with an * are required to be valid. The first condition is automatically inserted into a new condition group.



Condition 1 of Group 1

Condition attribute

Name * GivenName

Operator * not available

The icons next to the *Name* field let you browse the Identity Vault schema, the connected application schema, or use the Variable Selector to select the appropriate information.

- 5 In the Continue Defining Conditions dialog box, select the appropriate option, then click *Next*.
If desired, you can define additional conditions or condition groups before proceeding. For this example, there is only one condition.

Continue Defining Conditions?

Select whether to continue defining your condition or proceed to defining actions for your rule.



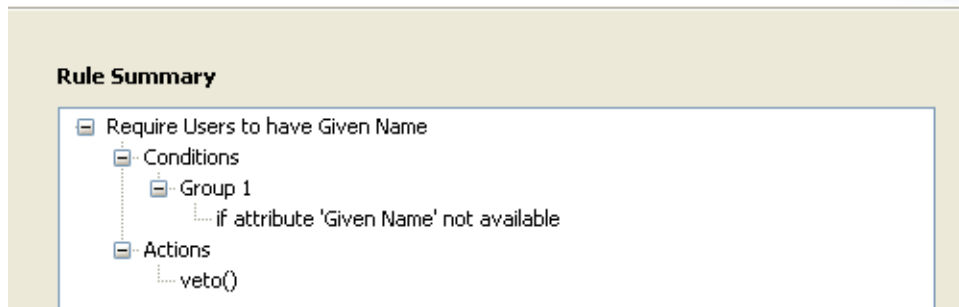
Select one:

- Continue (Define actions for the rule)
- Define another condition in the same condition group
- Define a new condition in a new condition group

- 6 In the Define the Action dialog box, select the action that you want, then click *Next*.
- 7 In the Continue Defining Actions dialog box, select the appropriate option, then click *Next*.
If desired, you can define additional actions before proceeding. For this example, there is only one action.
- 8 In the Summary page, click *Finish* to create the rule.
You can expand or collapse the view of the rule by clicking the plus or minus sign.

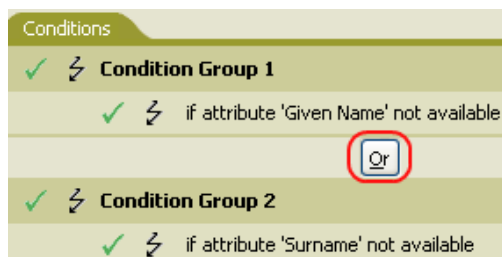
Summary

The following is a summary of the new rule to be created.



Creating a Conditional Group

- 1 In the Policy Builder, right-click the *Conditions* tab then click *Append Condition Group*.
You can also right-click the name of the *Condition Group*, then click *New > Insert Condition Group Before* or *Insert Condition Group After*.
Change the condition for the Condition Groups by clicking the *And/Or* icon.

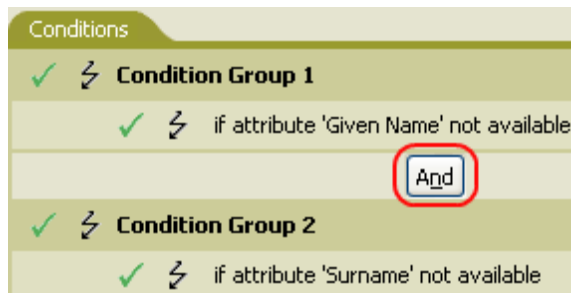


Creating a Condition

- 1 Right-click the condition, then click *New > Insert Condition Before* or *Insert Condition After*.

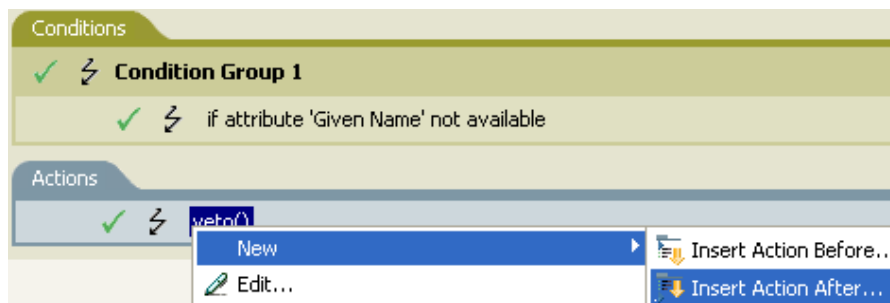


You can change the condition by clicking the *And/Or* icon.



Creating an Action

- 1 Right-click the action, then click *New > Insert Action Before* or *Insert Action After*.

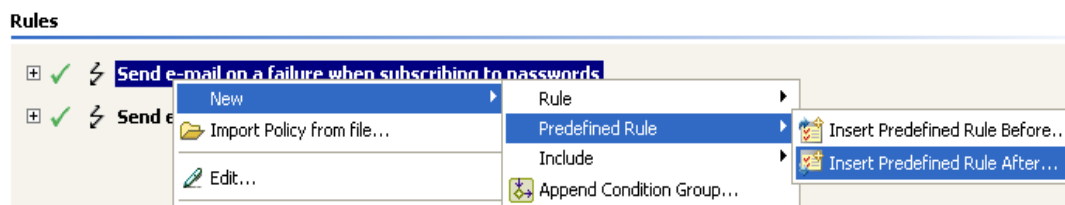


3.4.2 Using Predefined Rules

Designer includes a list of predefined rules. You can import and use these rules as well as create your own rules.

- 1 Right-click in the Policy Builder and select *New > Predefined Rules > Insert Predefined Rule Before* or *Insert Predefined Rule After*.

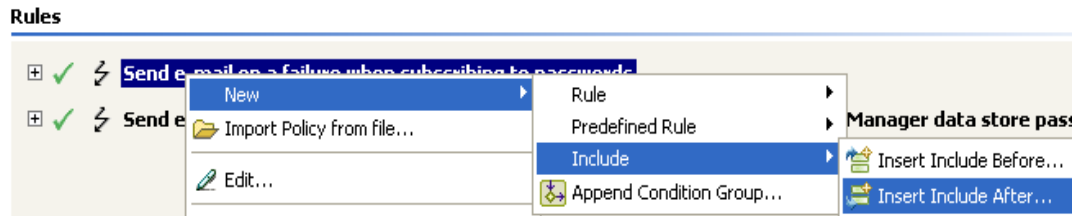
See [Chapter 8, “Using Predefined Rules,”](#) on page 111 for more information.





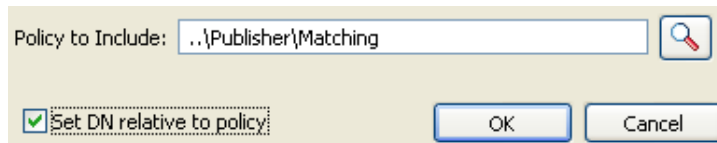
3.4.3 Including an Existing Rule

Designer allows you to include the rules from another policy.

- 1 Right-click in the Policy Builder and click *New > Include > Insert Include Before* or *Insert Include After*.



- 2 Click the Browse icon .
- 3 Browse to the policy  you want to include, then click *OK*.
- 4 The field is now populated with the path to the policy. Click *OK*.



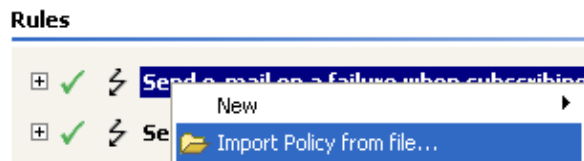
The rule is a link to the original rule. You cannot edit the rule in this location. Access the original rule to make changes.



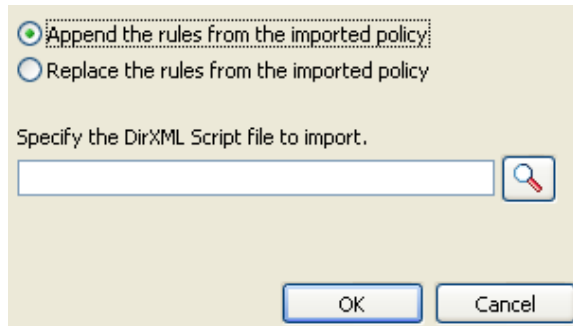
3.4.4 Importing a Policy From an XML File

Rules and policies can be saved as XML files. If you have a file that contains a rule or a policy you want to use, the Policy Builder allows you to import the file.

- 1 In the Policy Builder, right-click and select *Import Policy from file*.



- 2 Select one of the two options: *Append the rules from the imported policy* or *Replace the rules from the imported policy*.



3 Click the browse icon and select the file that contains the policy, then click *Open*.

4 Click *OK*.

3.5 Creating an Argument

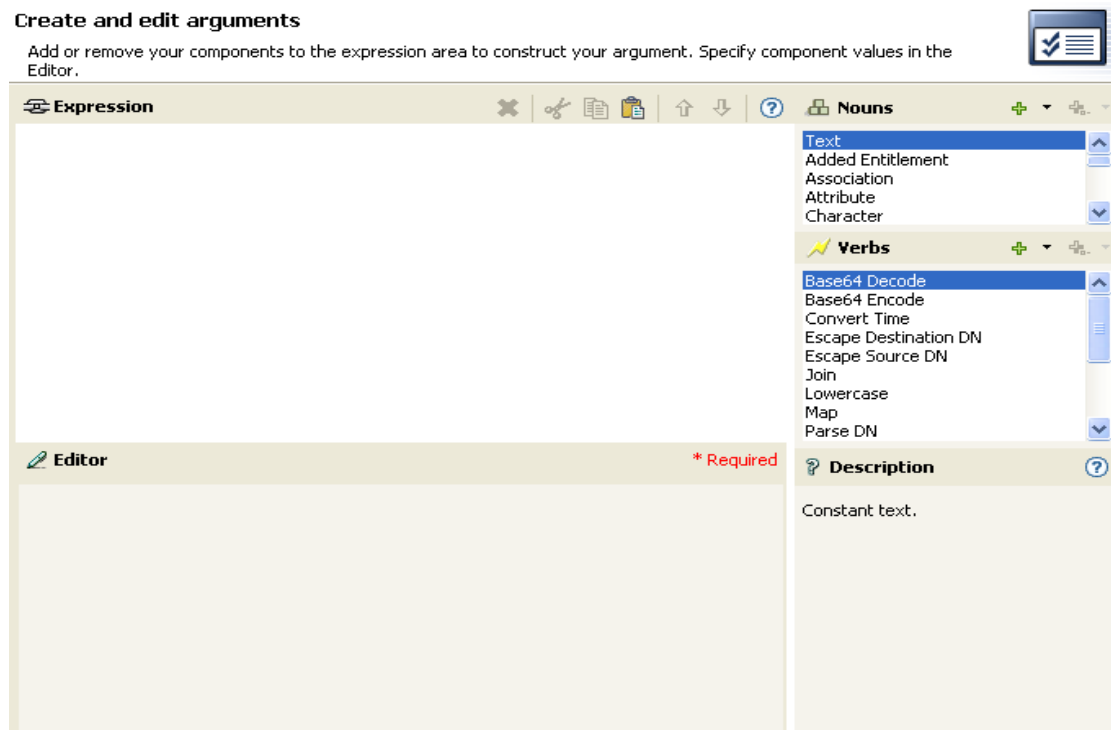
The Argument Builder provides a dynamic graphical interface that enables you to construct complex argument expressions for use within the Policy Builder. To access the Argument Builder, see [“Argument Builder” on page 47](#).

Arguments are dynamically used by actions and are derived from tokens that are expanded at run time.

Tokens are broken up into two classifications: nouns and verbs. Noun tokens expand to values that are derived from the current operation, the source or destination data stores, or some external source. Verb tokens modify the results of other tokens that are subordinate to them.

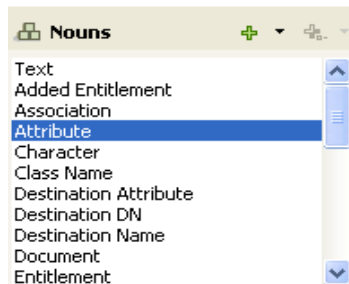
To define an expression, select one or more noun tokens (values, objects, variables, etc.), and combine them with verb tokens (substring, escape, uppercase, and lowercase) to construct arguments. Multiple tokens are combined to construct complex arguments.

Figure 3-2 Argument Builder

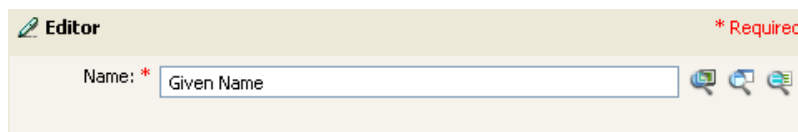


For example, if you want the argument set to an attribute value, you select the attribute noun, then select the attribute name:

- 1 Double-click *Attribute* in the list of noun tokens to add it to the *Expression* pane.

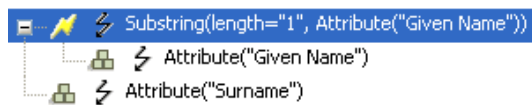


- 2 Browse to and select the attribute name in the *Editor* field.



You can browse the Identity Vault schema or the connected application schema.

If you only want a portion of this attribute, you can combine the attribute token with the substring token. The expression displays a substring length of 1 for the Given Name attribute combined with the entire Surname attribute.

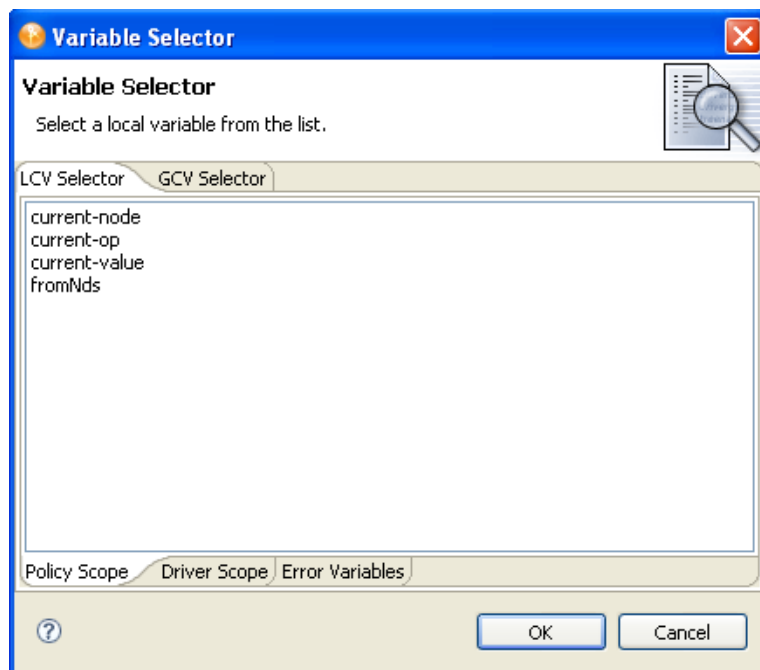


After you add a noun or verb, you can provide values in the editor, then immediately add another noun or verb. You do not need to refresh the Expression pane to apply your changes; they appear when the next operation is performed.

See [“Noun Tokens” on page 287](#) and [“Verb Tokens” on page 311](#) for a detailed reference on the noun and verb tokens. See [“Argument Builder” on page 47](#) for more information on the Argument Builder.

3.6 Variable Selector

The variable selector provides a list of variables that you can select and insert into conditions, actions, and tokens.



- ◆ [Section 3.6.1, “Dynamic Variable Expansion,” on page 36](#)
- ◆ [Section 3.6.2, “Accessing the Variable Selector From the Conditions Tab,” on page 36](#)
- ◆ [Section 3.6.3, “Accessing the Variable Selector From the Actions Tab,” on page 37](#)
- ◆ [Section 3.6.4, “Accessing the Variable Selector From the Argument Builder,” on page 38](#)
- ◆ [Section 3.6.5, “XPath Expressions,” on page 39](#)

3.6.1 Dynamic Variable Expansion

The variable selector allows for the use of dynamic variable expansion in conditions, actions, and tokens. It is used when the writer of the DirXML script doesn't know what value to enter during the design phase, and wants the value to be populated dynamically when the code is run (for local variables) or when the driver starts (for global variables). Dynamic variables are not used when the policy needs to refer directly to the variable itself. Instead, they are used when the policy needs to refer to the value of the variable.

Many actions support dynamic variable expansion in their attributes or content. Where supported, an embedded reference of the form `$variable-name$` is replaced with the value of the local variable with the given name. An embedded reference of the form `~variable-name~` is replaced with the value of the global variable name. `$variable-name$` and `~variable-name~` must be legal variable names. For information on what constitutes a legal XML name, see [W3C Extensible Markup Language \(XML\)](http://www.w3.org/TR/2006/REC-xml11-20060816/#sec-suggested-names) (<http://www.w3.org/TR/2006/REC-xml11-20060816/#sec-suggested-names>).

If the given variable does not exist, the reference is replaced with the empty string. Where it is desirable to use a single `$` and not have it interpreted as a variable reference, use an additional `$` as an escape character (for example, You owe me \$\$100.00).

NOTE: If the global variable doesn't exist on the driver or driver set, the driver does not start.


3.6.2 Accessing the Variable Selector From the Conditions Tab

- 1 In the Policy Builder, double-click the *Conditions* tab.

For instructions on accessing the Policy Builder, see [Section 3.1, “Accessing the Policy Builder,”](#) on page 21.

- 2 Select one of the following conditions:

- ♦ [If Attribute](#) (page 193)
- ♦ [If Destination Attribute](#) (page 198)
- ♦ [If Entitlement](#) (page 202)
- ♦ [If Global Configuration Value](#) (page 204)
- ♦ [If Local Variable](#) (page 206)
- ♦ [If Named Password](#) (page 210)
- ♦ [If Operation Attribute](#) (page 213)
- ♦ [If Source Attribute](#) (page 221)

- 3 Click the *Launch variable browser* icon  next to the field where you want to insert a dynamic variable.

- 4 Select the variable, then click *OK*.

Or, for conditions that don't bring up the *Launch variable browser* icon:

- 1 Select one of the following operators:

- ♦ Equal
- ♦ Greater than
- ♦ Less than


- ♦ Not equal
 - ♦ Not greater than
 - ♦ Not less than
- 2 Click the *Launch variable browser* icon next to the field where you want to insert the dynamic variable.
 - 3 Select the variable, then click *OK*.

3.6.3 Accessing the Variable Selector From the Actions Tab

- 1 In the Policy Builder, double-click the *Actions* tab.


For instructions on accessing the Policy Builder, see [Section 3.1, “Accessing the Policy Builder,” on page 21](#).

- 2 In the *Do* field, select one of the following options:
 - ♦ [Add Destination Attribute Value \(page 231\)](#)
 - ♦ [Add Destination Object \(page 233\)](#)
 - ♦ [Add Role \(page 234\)](#)
 - ♦ [Add Source Attribute Value \(page 235\)](#)
 - ♦ [Add Source Object \(page 236\)](#)
 - ♦ [Append XML Element \(page 237\)](#)
 - ♦ [Append XML Text \(page 238\)](#)
 - ♦ [Clear Destination Attribute Value \(page 240\)](#)
 - ♦ [Clear Source Attribute Value \(page 242\)](#)
 - ♦ [Clear SSO Credential \(page 242\)](#)
 - ♦ [Clone By XPath Expressions \(page 243\)](#)
 - ♦ [Clone Operation Attribute \(page 244\)](#)
 - ♦ [Delete Destination Object \(page 245\)](#)
 - ♦ [Delete Source Object \(page 246\)](#)
 - ♦ [Move Destination Object \(page 254\)](#)
 - ♦ [Move Source Object \(page 256\)](#)
 - ♦ [Reformat Operation Attribute \(page 256\)](#)
 - ♦ [Remove Destination Attribute Value \(page 258\)](#)
 - ♦ [Remove Role \(page 259\)](#)
 - ♦ [Remove Source Attribute Value \(page 261\)](#)
 - ♦ [Rename Destination Object \(page 262\)](#)
 - ♦ [Rename Operation Attribute \(page 263\)](#)
 - ♦ [Rename Source Object \(page 263\)](#)
 - ♦ [Send Email from Template \(page 265\)](#)
 - ♦ [Set Default Attribute Value \(page 266\)](#)
 - ♦ [Set Destination Attribute Value \(page 268\)](#)

- ♦ [Set Destination Password \(page 269\)](#)
 - ♦ [Set Local Variable \(page 270\)](#)[Set Source Attribute Value \(page 274\)](#)
 - ♦ [Set Source Password \(page 275\)](#)
 - ♦ [Set SSO Credential \(page 276\)](#)
 - ♦ [Set SSO Passphrase \(page 277\)](#)
 - ♦ [Set XML Attribute \(page 278\)](#)
 - ♦ [Start Workflow \(page 278\)](#)
 - ♦ [Strip Operation Attribute \(page 281\)](#)
 - ♦ [Strip XPath Expression \(page 281\)](#)
 - ♦ [Veto If Operation Attribute Not Available \(page 284\)](#)
- 3 Click the *Launch variable browser* icon  next to the field where you want to insert the dynamic variable.
- 4 Select the variable, then click *OK*.

3.6.4 Accessing the Variable Selector From the Argument Builder

- 1 In the Argument Builder, select one of the following noun tokens from the *Nouns* section:
- ♦ [Text \(page 288\)](#)
 - ♦ [Added Entitlement \(page 289\)](#)
 - ♦ [Attribute \(page 290\)](#)
 - ♦ [Destination Attribute \(page 292\)](#)
 - ♦ [Entitlement \(page 295\)](#)
 - ♦ [Generate Password \(page 296\)](#)
 - ♦ [Global Configuration Value \(page 296\)](#)
 - ♦ [Local Variable \(page 296\)](#)
 - ♦ [Named Password \(page 298\)](#)
 - ♦ [Operation Attribute \(page 299\)](#)
 - ♦ [Query \(page 301\)](#)
 - ♦ [Removed Attribute \(page 302\)](#)
 - ♦ [Removed Entitlement \(page 303\)](#)
 - ♦ [Source Attribute \(page 304\)](#)
 - ♦ [Time \(page 306\)](#)
 - ♦ [Unique Name \(page 306\)](#)
 - ♦ [XPath \(page 310\)](#)
- Or, select one of the following verb tokens from the *Verbs* section:
- ♦ [Convert Time \(page 312\)](#)
 - ♦ [Map \(page 316\)](#)


- 2 Click the *Launch variable browser* icon  next to the field where you want to insert the dynamic variable.
- 3 Select the variable, then click *OK*.

3.6.5 XPath Expressions

Instead of using the DirXMLScript engine to perform the variable expansion, as is the case with most variable expansion, XPath uses built in XPath functionality and the XSLT processor to do the variable expansion.

For conditions, actions, and tokens that contain XPath expressions, a single \$ sign at the beginning of the policy denotes a dynamic variable, which is displayed in the *Value* field. This is also true for the XPath token in the Argument Builder, and for all actions that contain XPath. This is because in order to maintain valid XPath, only one \$ sign can be used.

The following procedure gives an example of using the variable selector with XPath expressions:

- 1 In the Policy Builder, click the *Actions* tab.
 - 2 In the *Do* field, select the *clone by XPath expressions* option.
 - 3 After the *Specify source XPath expression* field, click the *Launch variable browser* icon .
 - 4 Select an item and click *OK*.
- Only one \$ sign is displayed before the policy.

3.7 Editing a Policy




The Policy Builder allows you to create and edit policies. You can drag and drop rules, conditions and actions. For additional operations, access the Policy Builder toolbar. To display a context menu, right-click an item.



















- ♦ [Section 3.7.1, “Actions and Menu Items in the Policy Builder,” on page 39](#)
- ♦ [Section 3.7.2, “Keyboard Support,” on page 41](#)
- ♦ [Section 3.7.3, “Renaming a Policy,” on page 41](#)
- ♦ [Section 3.7.4, “Saving Your Work,” on page 41](#)
- ♦ [Section 3.7.5, “Policy Description,” on page 42](#)

3.7.1 Actions and Menu Items in the Policy Builder

The table contains a list of the different actions and menu items in the Policy Builder.

Table 3-4 *Policy Builder Actions and Menu Items*

Operation	Description
 <i>Collapse All</i>	Collapses all expanded rules.
 <i>Compare Deployed Policy</i>	Compares the policy in the Policy Builder to an existing policy in the Identity Vault.
 <i>Copy</i>	Copies the selected item to the Clipboard.

Operation	Description
<i>Copy and drop</i>	Select the item, press Ctrl, then drag the item.
 <i>Cut</i>	Cuts the selected item and copies it to the Clipboard.
 <i>Delete</i>	Deletes the selected item.
 <i>Deploy Policy</i>	Deploys the policy into the Identity Vault.
 <i>Disable</i>	Displays a rule, condition, or action as disabled.
 <i>Disable Trace</i>	Disables trace on the rule.
 <i>DirXML Script Tracing</i>	Enables DirXML Script Tracing on the policy.
<i>Drag and drop</i>	Enables you to select an item, then relocate it. Select the item, then drag it to the new location.
 <i>Edit</i>	Enables you to edit the selected item. To open the Rule Builder, select a rule, then click <i>Edit</i> .
 <i>Enable</i>	Displays a rule, condition, or action as enabled.
 <i>Enable Trace</i>	Enables tracing on the rule.
 <i>Expand All</i>	Expands all the rules so that you can view the conditions and actions of each rule.
 <i>Import Policy from file</i>	Imports a policy from the file system and appends it to the policy, or replaces all the rules of the policy.
 <i>Launch Policy Simulator</i>	Launches the Policy Simulator.
<i>Move and drop</i>	Enables you to select and move an item. Select the item, then drag it.
 <i>Move down</i>	Moves the item down in the list of policies.
 <i>Move up</i>	Moves the item up in the list of policies.
<i>New > Append Condition Group</i>	Creates a new condition group after a selected item.
<i>New > Include > Insert Include Before or Insert Include After</i>	Creates a new Include before or after the selected item.
<i>New > Predefined Rule > Insert Predefined Rule Before or Insert Predefined Rule After</i>	Inserts a predefined rule before or after the selected item.
<i>New > Rule > Insert Rule Before or Insert Rule After</i>	Creates a new rule before or after the selected item.
 <i>Paste</i>	Pastes the contents of the Clipboard after the selected item.
 <i>Preferences</i>	Enables you to change how the information is displayed.
 <i>Redo</i>	Redoes the previous action.
<i>Select</i>	Click any item to select it.
 <i>Undo</i>	Undoes the previous action.

3.7.2 Keyboard Support

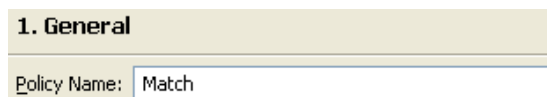
You can move through the Policy Builder with keystrokes as well as using the mouse. The supported keystrokes are listed below.

Table 3-5 Keyboard Support in the Policy Builder

Keystroke	Description
Ctrl+C	Copies the selected item into the Clipboard.
Ctrl+X	Cuts the selected item and adds it to the Clipboard.
Ctrl+V	Pastes the contents of the Clipboard after the selected item.
Delete	Deletes the selected Item.
Left-arrow	Collapses a rule node.
Right-arrow	Expands a rule node.
Up-arrow	Navigates up.
Down-arrow	Navigates down.
Ctrl+Z	Undo
Ctrl+Y	Redo

3.7.3 Renaming a Policy

- 1 In the Outline view, select the policy you want to rename.
- 2 Right-click and select *Properties*.
- 3 Change the name of the policy in the *Policy Name* field.



The screenshot shows a dialog box with a tab labeled "1. General". Below the tab is a text input field labeled "Policy Name:" containing the text "Match".

- 4 Click *OK*.

3.7.4 Saving Your Work

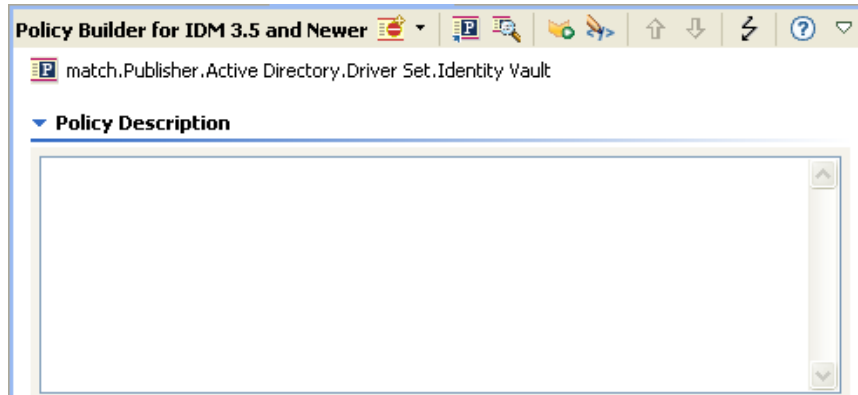
Do one of the following:

- ♦ From the main menu, click *File > Save* (or *Save All*).
- ♦ Close the editor by clicking the *X* in the editor's tab.
- ♦ Select *Close* from the main menu's file menu.
- ♦ Press Ctrl+S.

3.7.5 Policy Description

The description fields provide a place to add notes about the functionality of the policy. You can add a description for the policy and you can add a description for the rule.

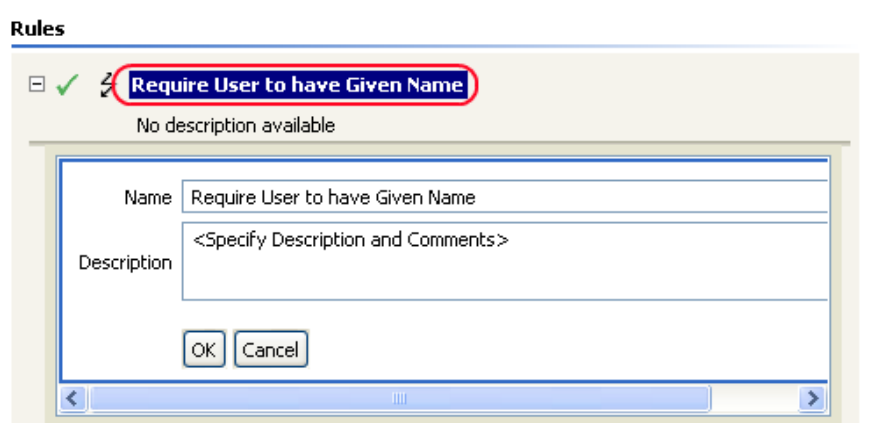
- 1 In the Policy Builder, click *Policy Description*.



- 2 Provide a description of the policy.
- 3 Save the policy by pressing Ctrl+S.

To add a description to a rule:

- 1 Double-click the name of the rule.



- 2 Specify a description of the rule in the *Description* field.
- 3 Save the rule by pressing Ctrl+S.

3.8 Viewing the Policy in XML

Designer enables you to view, edit, and validate the XML by using an XML editor. Click the *XML Source* or *XML Tree* tabs to access the XML editor. For more information about the XML editor, see “[The Novell XML Editor](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

Figure 3-3 *View Policy in XML*



Using Additional Builders and Editors

4

Although you define most arguments in the Argument Builder, there are several more builders and editors that are used by the Condition editor and Action editor in the Policy Builder. Each builder can recursively call anyone of the builders in the following list:

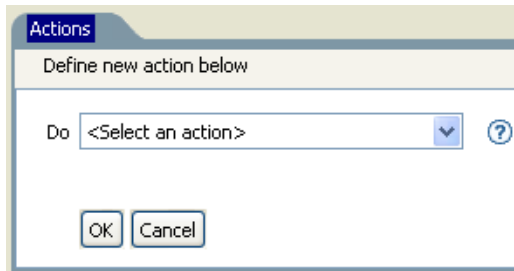
- ◆ [Section 4.1, “Action Builder,” on page 45](#)
- ◆ [Section 4.2, “Actions Builder,” on page 46](#)
- ◆ [Section 4.3, “Argument Builder,” on page 47](#)
- ◆ [Section 4.4, “Condition Builder,” on page 52](#)
- ◆ [Section 4.5, “Conditions Builder,” on page 53](#)
- ◆ [Section 4.6, “Match Attribute Builder,” on page 55](#)
- ◆ [Section 4.7, “Action Argument Component Builder,” on page 57](#)
- ◆ [Section 4.8, “Argument Value List Builder,” on page 58](#)
- ◆ [Section 4.9, “Named String Builder,” on page 58](#)
- ◆ [Section 4.10, “Condition Argument Component Builder,” on page 59](#)
- ◆ [Section 4.11, “Pattern Builder,” on page 60](#)
- ◆ [Section 4.12, “String Builder,” on page 61](#)
- ◆ [Section 4.13, “XPath Builder,” on page 62](#)
- ◆ [Section 4.14, “Mapping Table Editor,” on page 62](#)
- ◆ [Section 4.15, “Global Configuration Value Definition Editor,” on page 67](#)
- ◆ [Section 4.16, “Namespace Editor,” on page 68](#)
- ◆ [Section 4.17, “Local Variable Selector,” on page 70](#)

4.1 Action Builder

The Action Builder enables you to add, view, and delete the actions that make up a rule. Actions can also contain other actions.

4.1.1 Creating an Action

- 1 In the Policy Builder, create a new rule or edit an existing rule.
- 2 Double-click the *Actions* tab to launch the Action Builder.













3 Select the desired action from the drop-down list, then click *OK*.


4.1.2 Additional Options for the Action Builder

There are additional options in the action builder to manage the actions. Right-click the action to see the additional options.

Table 4-1 *Action Builder Additional Options*

Option	Description
New > Insert Action Before	Adds a new action before the current action.
New > Insert Action After	Adds a new action after the current action.
 Edit	Launches the Action Builder.
 Move up	Moves the selected action up in the order of execution.
 Move down	Moves the selected action down in the order of execution.
 Cut	Cuts the selected action and adds it to the clipboard.
 Copy	Copies the action to the clipboard.
 Paste	Pastes the action that is in the clipboard to the desired location in the Action Builder.
 Delete	Deletes the selected action.
 Undo	Undoes the prior action.
 Redo	Redoes the prior action.
 Preferences	Allows you to set default functionality in the Policy Builder.

4.2 Actions Builder

The Actions Builder allows you to create an action inside of another action. To launch the Actions Builder, select one of the following actions, then click the *Edit the actions* icon .

- ♦ [For Each \(page 249\)](#)
- ♦ [Implement Entitlement \(page 254\)](#)
- ♦ [If \(page 252\)](#)
- ♦ [While \(page 285\)](#)

In the following example the add destination attribute value action is performed for each Group entitlement that is being added in the current operation.

Figure 4-1 For Each Action

The screenshot shows the configuration for a 'For Each' action. The 'Do' dropdown is set to 'for each'. The 'Specify node set' field contains 'Added Entitlement("Group")'. The 'Specify action' field contains 'do-add-dest-attr-value'. Both fields have a small grid icon to their right.

To define the action of the add destination attribute value, click the *Edit the actions* icon. This launches the Actions Builder. In the Actions Builder, you define the desired action. In the following example, the member attribute is added to the destination object for each added Group entitlement.

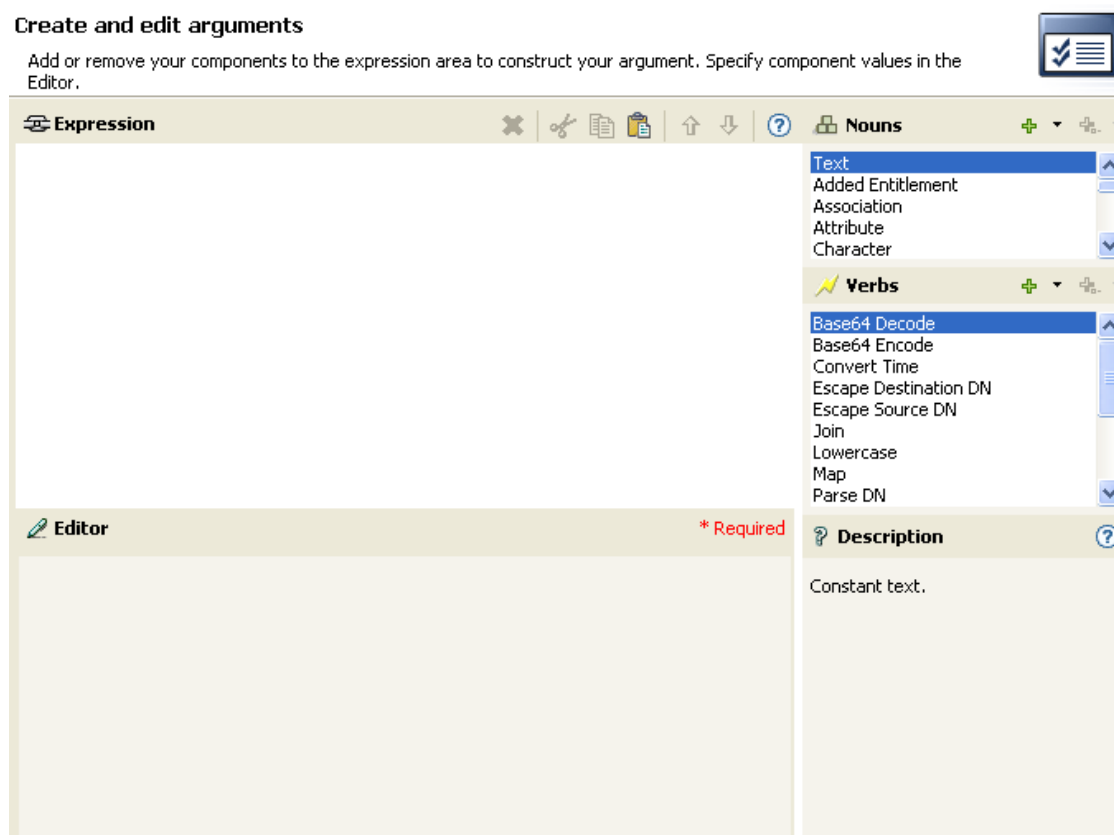
Figure 4-2 Actions Builder

The screenshot shows the configuration for the 'add destination attribute value' action in the Actions Builder. The 'Do' dropdown is set to 'add destination attribute value'. The 'Specify attribute name' field contains 'Member'. The 'Specify class name' field contains 'Group'. The 'Select mode' dropdown is set to 'add to current operation'. The 'Select object' dropdown is set to 'DN'. The 'Specify DN' field contains 'Local Variable("current-node")'. The 'Specify value type' dropdown is set to 'string'. The 'Enter string' field contains 'Destination DN()'. There are small icons to the right of the 'Specify attribute name', 'Specify class name', and 'Specify DN' fields.

4.3 Argument Builder

The Argument Builder provides a dynamic graphical interface that enables you to construct complex argument expressions for use within Rule Builder.

Figure 4-3 Argument Builder



The Argument Builder consists of six separate sections:

Nouns: Contains a list of all of the available noun tokens. Double-click a noun token to add it to the *Expression* pane. See “[Noun Tokens](#)” on page 287 for more information.

Verbs: Contains a list of all of the available verb tokens. Double-click a verb token to add it to the *Expression* pane. See “[Verb Tokens](#)” on page 311 for more information.

Description: Contains a brief description of the selected noun or verb token. Click the *Help* icon to launch additional help.















Expression: Contains the argument that is being built. Multiple noun and verb tokens can be added to a single argument. Tokens can be arranged in different orders through the *Expression* pane.

Editor: Provide the values for the nouns and the verbs in the *Editor* pane.

Toolbar: Allows you to manipulate the noun and verb tokens. See [Table 4-2](#) for a list of all of the options in the toolbar.

Table 4-2 Argument Builder Toolbar Options

Option	Description
Delete	Deletes the selected token.

Option	Description
 <i>Cut</i>	Cuts the selected token to the Clipboard.
 <i>Copy</i>	Copies the selected token to the Clipboard.
 <i>Paste</i>	Pastes the token from the Clipboard into the Argument Builder.
 <i>Move Up</i>	Moves the selected token up.
 <i>Move Down</i>	Moves the selected token down.
 <i>Help</i>	Launches the help.
 <i>Append noun</i>	Appends a noun token to the end of the argument as a sibling token.
 <i>Insert noun</i>	Inserts a noun token into the argument.
 <i>Append noun to child token list</i>	Appends a noun token as a child token instead of as a sibling token.
 <i>Insert noun at beginning of child token list</i>	Inserts a noun token into the argument as the first child in the token list instead of as a sibling token.
 <i>Append verb</i>	Appends a verb token to the end of the argument as a sibling token.
 <i>Insert verb</i>	Inserts a verb token into the argument.
 <i>Append verb to child token list</i>	Appends a verb token as a child token instead of as a sibling token.
 <i>Insert verb at beginning of child token list</i>	Inserts a verb token into the argument as the first child in the token list instead of as a sibling token.

You can select to trace each token or disable the tracing of the token in the Argument Builder. To disable tracing:

- 1 Click the trace icon to disable tracing.




To enable tracing:

- 1 Click the disable trace icon to enable tracing.



- ♦ [Section 4.3.1, “Launching the Argument Builder,” on page 49](#)
- ♦ [Section 4.3.2, “Argument Builder Example,” on page 50](#)

4.3.1 Launching the Argument Builder

To launch the Argument Builder, select one of the following actions, then click the *Edit the arguments* icon .

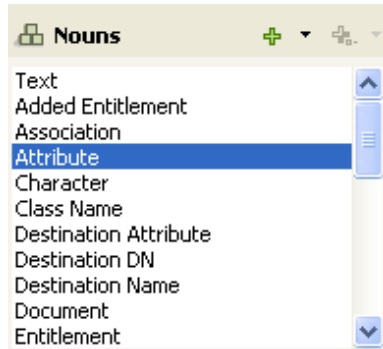
- ♦ [Add Association \(page 230\)](#)
- ♦ [Add Destination Attribute Value \(page 231\)](#)

- ◆ [Add Destination Object \(page 233\)](#)
- ◆ [Add Source Attribute Value \(page 235\)](#)
- ◆ [Append XML Text \(page 238\)](#)
- ◆ [Clear Destination Attribute Value \(page 240\)](#) (when the selected object is DN or Association)
- ◆ [Clear Source Attribute Value \(page 242\)](#) (when the selected object is DN or Association)
- ◆ [Delete Destination Object \(page 245\)](#) (when the selected object is DN or Association)
- ◆ [Delete Source Object \(page 246\)](#) (when the selected object is DN or Association)
- ◆ [Find Matching Object \(page 246\)](#)
- ◆ [For Each \(page 249\)](#)
- ◆ [Move Destination Object \(page 254\)](#)
- ◆ [Move Source Object \(page 256\)](#)
- ◆ [Reformat Operation Attribute \(page 256\)](#)
- ◆ [Remove Association \(page 258\)](#)
- ◆ [Remove Destination Attribute Value \(page 258\)](#)
- ◆ [Remove Source Attribute Value \(page 261\)](#)
- ◆ [Rename Destination Object \(page 262\)](#) (when the selected object is DN or Association and Enter String)
- ◆ [Rename Source Object \(page 263\)](#) (when the selected object is DN or Association and Enter String)
- ◆ [Set Destination Attribute Value \(page 268\)](#) (when the selected object is DN or Association and Enter Value Type is not structured)
- ◆ [Set Destination Password \(page 269\)](#)
- ◆ [Set Local Variable \(page 270\)](#)
- ◆ [Set Operation Association \(page 271\)](#)
- ◆ [Set Operation Class Name \(page 271\)](#)
- ◆ [Set Operation Destination DN \(page 272\)](#)
- ◆ [Set Operation Property \(page 273\)](#)
- ◆ [Set Operation Source DN \(page 273\)](#)
- ◆ [Set Operation Template DN \(page 273\)](#)
- ◆ [Set Source Attribute Value \(page 274\)](#)
- ◆ [Set Source Password \(page 275\)](#)
- ◆ [Set XML Attribute \(page 278\)](#)
- ◆ [Status \(page 280\)](#)
- ◆ [Trace Message \(page 282\)](#)

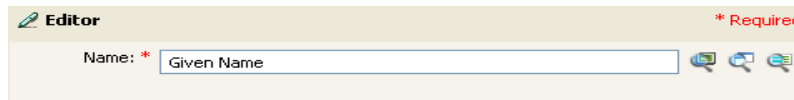
4.3.2 Argument Builder Example

The following example creates an argument for a username from the first letter of the first name and the entire last name:

- 1 Double-click *Attribute* from the list of nouns.

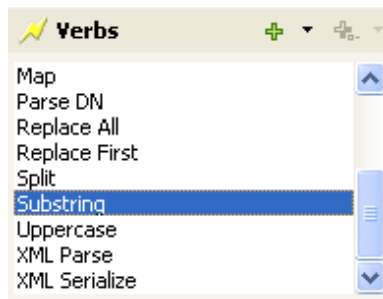


2 Specify or select the Given Name attribute.

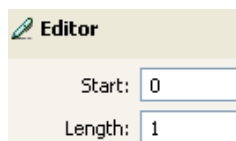


You can browse the Identity Vault attributes, the application attributes, or launch the variable browser. For more information on the variable browser, see [Section 3.6, “Variable Selector,” on page 35](#).

3 Double-click *Substring* from the list of verbs.



4 Type 1 in the *Length* field.

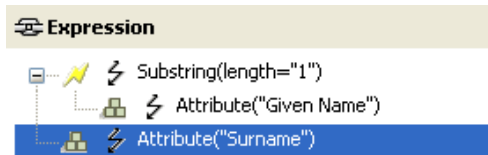


5 Select the *Given Name* attribute, then click the *Move Down* icon.



6 Double-click *Attribute* from the list of nouns.

7 In the *Name* field, specify or browse to the *Surname* attribute.



The argument takes the first character of the Given Name attribute and adds it to the Surname attribute to build the desired value.

- 8 Click *Finish* to save the argument.

4.4 Condition Builder

The Condition Builder enables you to add, view, and delete the conditions that make up a rule. A condition contains one or more conditions and one or more condition groups. The condition groups contain two different condition structures, which define the logic of condition groups. The two condition structures are:

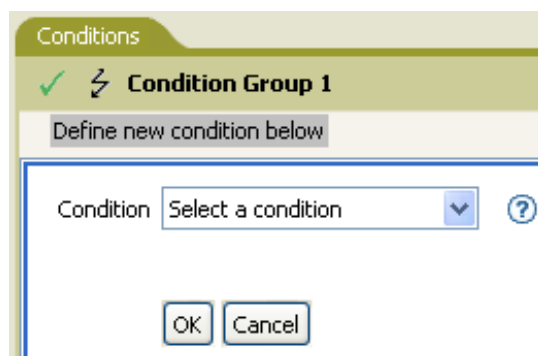
- ♦ OR Conditions, AND Groups
- ♦ AND Conditions, OR Groups

To create and customize a condition, see the following sections:

- ♦ [Section 4.4.1, “Creating a Condition,” on page 52](#)
- ♦ [Section 4.4.2, “Additional Options for the Condition Builder,” on page 52](#)

4.4.1 Creating a Condition

- 1 In the Policy Builder, create a new rule or edit an existing rule.
- 2 Double-click the *Conditions* tab to launch the Condition Builder.













- 3 Select the desired condition from the drop-down list, then click *OK*.

4.4.2 Additional Options for the Condition Builder


There are additional options in the condition builder to manage the conditions. Right-click the condition to see the additional options.

Table 4-3 Condition Builder Options

Option	Description
New > Insert Condition Before	Adds a condition before the current condition.
New > Insert Condition After	Adds a condition after the current condition.
 Edit	Launches the Condition Builder.
 Move up	Moves the selected condition up in the order of execution.
 Move down	Moves the selected condition down in the order of execution.
 Cut	Cuts the select condition and adds it to the clipboard.
 Copy	Copies the condition and adds it to the clipboard.
 Paste	Pastes the condition that is in the clipboard in the desired location in the Condition Builder.
 Delete	Deletes the selected condition.
 Undo	Undoes the prior action in the Condition Builder.
 Redo	Redoes the prior action in the Condition Builder.
 Preferences	Allows you to set default functionality in the Policy Builder.

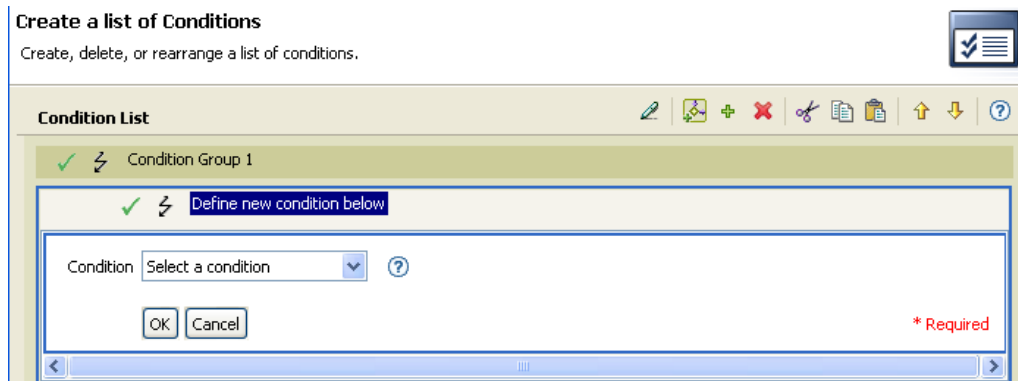
For additional information on the Condition Builder and the rules, see [Section 3.4, “Creating a Rule,”](#) on page 28.

4.5 Conditions Builder

The Conditions Builder allows you to create a condition inside of an action. To launch the Conditions Builder, select one of the following actions, then click the *Edit the actions* icon  next to the *If conditions* field.

- ♦ [If \(page 252\)](#)
- ♦ [While \(page 285\)](#)












1 In the Conditions Builder, browse to and select the desired condition.



2 Define the condition, then click *OK*.

The Conditions Builder has additional options that the Condition Builder. Right-click the Conditions Builder.

Table 4-4 Conditions Builder Options

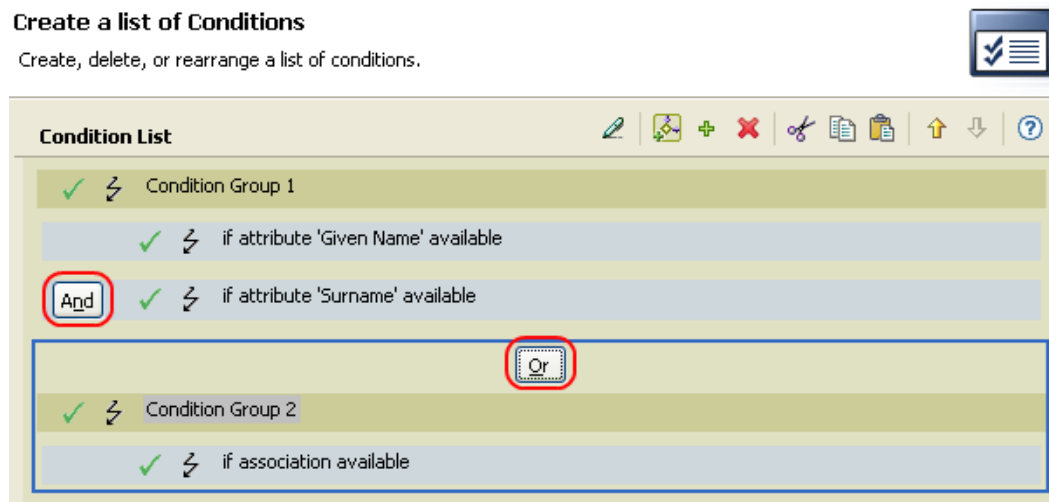
Option	Description
New > Insert Condition Group Before	Adds a condition group before the selected condition group.
New > Insert Condition Group After	Adds a condition group after the selected condition group.
Append Conditions	Appends a condition in the condition group.
 Expand All Conditions	Expands all conditions that are part of the selected condition group.
 Collapse All Conditions	Collapses all conditions that are part of the selected condition group.
 Move up	Moves the selected condition group up in the rule.
 Move down	Moves the selected condition group down in the rule.
 Cut	Cuts the selected condition group from the rule and adds it to the clipboard.
 Copy	Copies the selected condition group and adds it to the clipboard.
 Paste	Pastes the condition group from the clipboard into the Conditions Builder.
 Delete	Deletes the selected condition or condition group.
 Undo	Undoes the prior action in the Conditions Builder.
 Redo	Redoes the prior action in the Condition Builder.
 Preferences	Allows you to set default functionality in the Policy Builder.

If you have multiple conditions and conditions groups, the *And/Or* icons are tied together. If you change the *And/Or* icon for the condition groups, it is changed for the conditions as well.

Figure 4-4 Conditions Builder And/Or Icons

Create a list of Conditions


Create, delete, or rearrange a list of conditions.




4.6 Match Attribute Builder


The Match Attribute Builder enables you to select attributes and values used by the [Find Matching Object](#) (page 246) action to determine if a matching object exists in a data store.


For example, if you wanted to match users based on a common name and a location:

- 1 Select the action of *find matching object*.
- 2 Select the scope of the search for the matching objects. Select from *entry*, *subordinates*, or *subtree*.
- 3 Specify the DN of the starting point for the search.
- 4 Click the *Edit match attributes* icon  to launch the Match Attribute Builder.

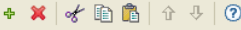
Do 




Select scope:

Specify DN: 

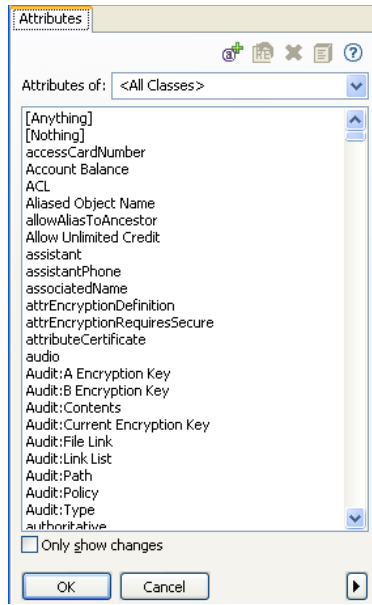
Specify match attributes: 

- 5 Click the *Browse the Identity Vault attributes* icon, the *Browse application attributes* icon, or the *Launch variable browser* icon. For more information on the *Launch variable browser* icon, see [Section 3.6, "Variable Selector,"](#) on page 35.

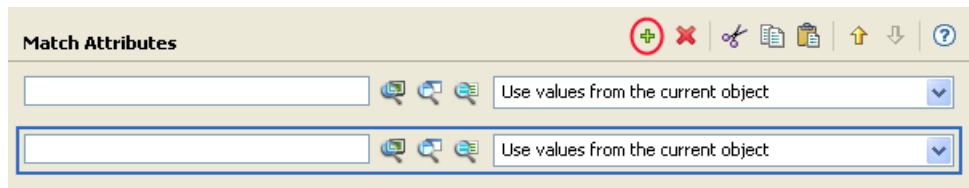
Match Attributes 

   Use values from the current object

- 6 Browse to and select the desired attribute, then click *OK*.



If you want to add more than one attribute, click the *Append new item* icon to add another line.



You can browse the Identity Vault schema or the connected system schema.

7 Click *Finish*.

The Match Attribute Builder also allows you to specify another value, instead of using the value from the current object.


To use another value:

- 1 Launch the Match Attribute Builder, then select *Other Value* from the drop-down list.
- 2 Select the desired value type.
 - ◆ counter
 - ◆ dn
 - ◆ int
 - ◆ interval
 - ◆ octet
 - ◆ state
 - ◆ string
 - ◆ structured

- ♦ teleNumber
- ♦ time

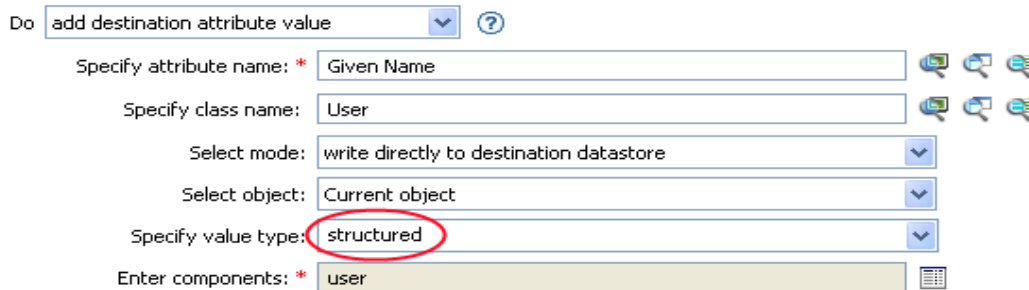
3 Specify the value, then click *OK*.

4.7 Action Argument Component Builder

To launch the Action Argument Component Builder, select one of the following actions when the *Select Value Type* selection is *structured*, then click the *Edit the components* icon .

- ♦ [Add Destination Attribute Value](#) (page 231)
- ♦ [Add Source Attribute Value](#) (page 235)
- ♦ [Reformat Operation Attribute](#) (page 256)
- ♦ [Remove Destination Attribute Value](#) (page 258)
- ♦ [Remove Source Attribute Value](#) (page 261)
- ♦ [Set Destination Attribute Value](#) (page 268)
- ♦ [Set Source Attribute Value](#) (page 274)

Figure 4-5 Add Destination Attribute Value Action



Do: add destination attribute value

Specify attribute name: * Given Name


Specify class name: User


Select mode: write directly to destination datastore

Select object: Current object

Specify value type: structured

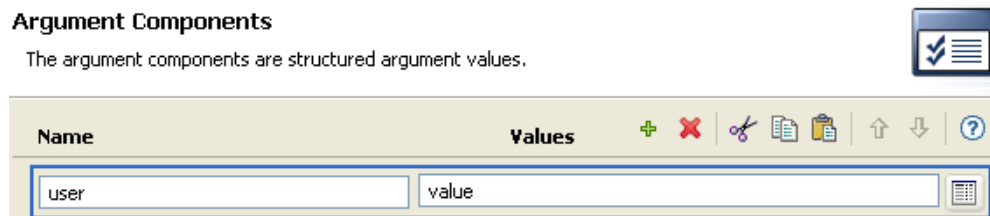
Enter components: * user

- 1 Make sure the value type is set to *structured*, then click the *Edit the components* icon .
- 2 Create the value of the action component.

You can type the value, or click the *Edit the arguments*  icon to create the value in the Argument Builder.

Argument Components


The argument components are structured argument values.



Name	Values
user	value


- 3 Click *Finish*.




4.8 Argument Value List Builder


To launch the Argument Value List Builder, select the following action, then click the *Edit the arguments* icon .


- ◆ [Set Default Attribute Value \(page 266\)](#)

Figure 4-6 Set Default Attribute Value

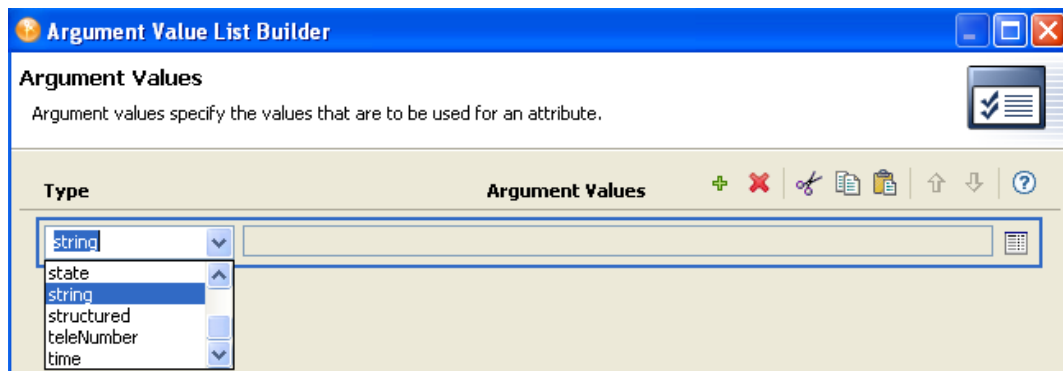
Do 

Specify attribute name: *   

Write back: 

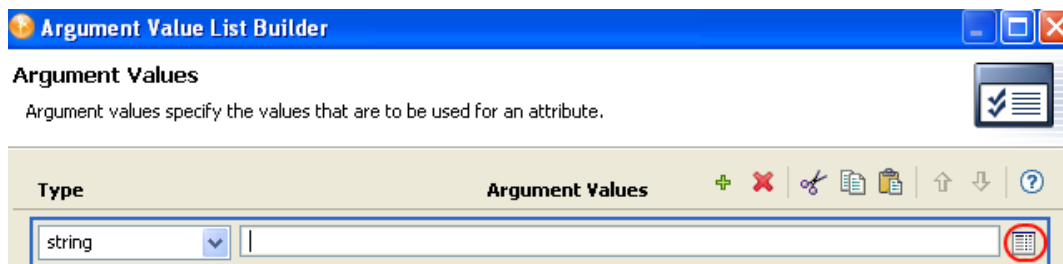
Specify argument values: * 

- 1 Select the type of the value: *counter*, *dn*, *int*, *interval*, *octet*, *state*, *string*, *structured*, *teleNumber*, *time*.




- 2 Create the value of the list.

You can type the value, or click the *Edit the arguments* icon to create the value in the Argument Builder.



- 3 Click *Finish*.

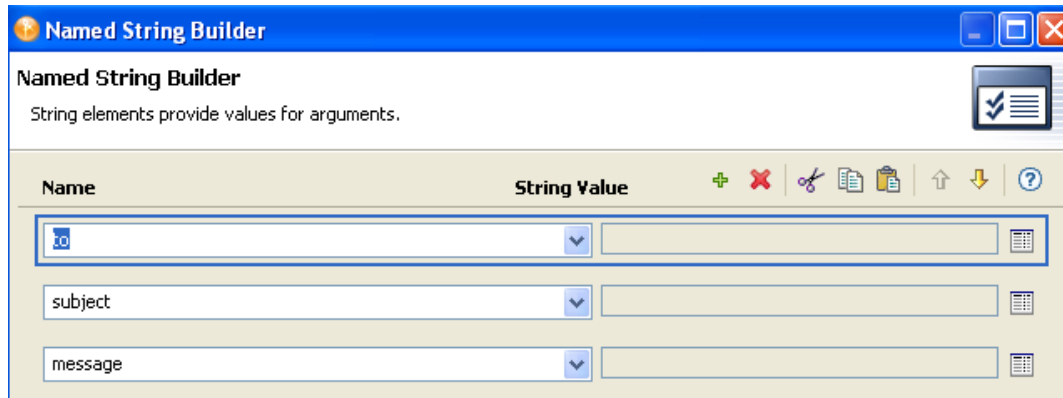
4.9 Named String Builder

To launch the Named String Builder, select one of the following actions, then click the *Edit the strings* icon  next to the *Strings* field.

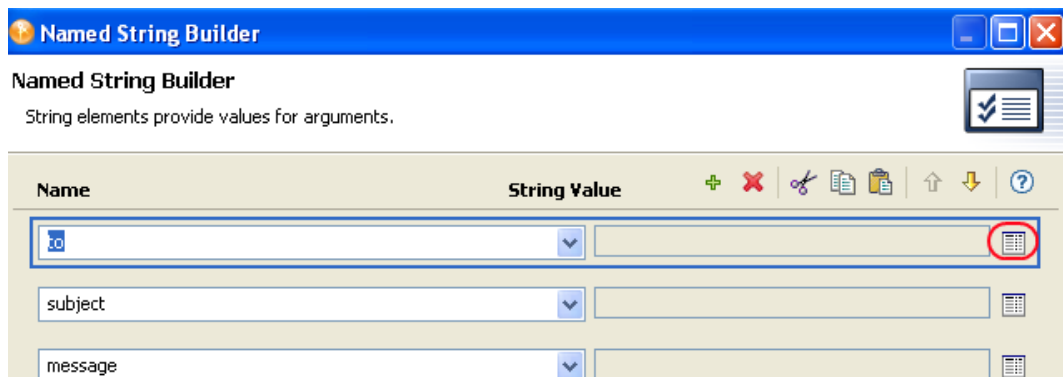
- ◆ [Add Role \(page 234\)](#)

- ◆ Generate Event (page 250)
- ◆ Remove Role (page 259)
- ◆ Send Email (page 264)
- ◆ Send Email from Template (page 265)
- ◆ Start Workflow (page 278)

1 Select the name of the string from the drop-down list.




2 Create the value for the string by clicking the *Edit the arguments* icon to launch the Argument Builder.



3 Click *Finish*.

For a Send Email action, the named strings correspond to the elements of the e-mail. A complete list of possible values is contained in the help file corresponding to the action that launches the Named String Builder.

4.10 Condition Argument Component Builder

To launch the Condition Argument Component Builder, select one of the following conditions, then select the structured selection for *Mode* in order to see the *Launch ArgComponent Builder* icon .

- ◆ If Attribute (page 193)
- ◆ If Destination Attribute (page 198)

- ♦ [If Operation Attribute \(page 213\)](#)
- ♦ [If Source Attribute \(page 221\)](#)

Figure 4-7 *If Attribute mode*

Condition ?

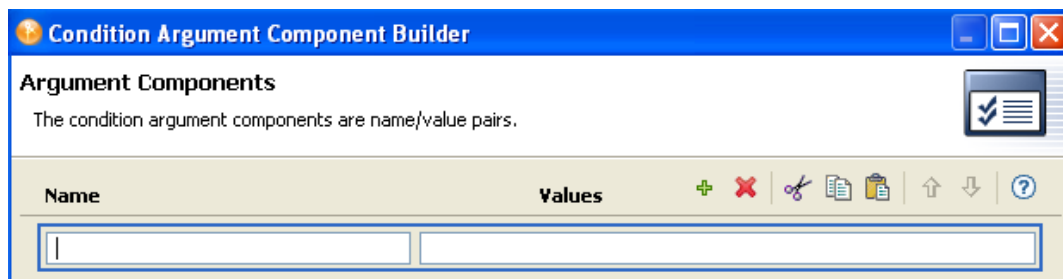
Name * ? ? ?

Operator *

Mode

Value

1 Specify the name and value of the condition component.



2 Click *Finish*.

4.11 Pattern Builder

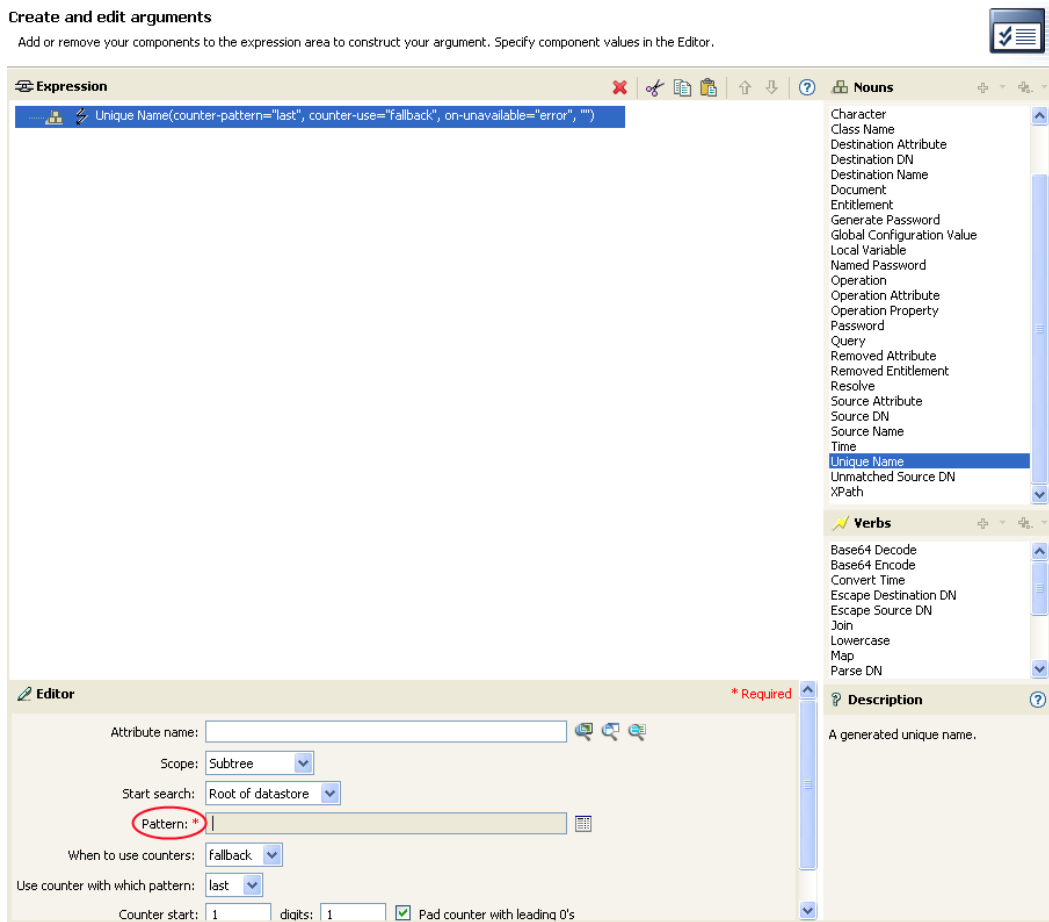
You can launch the Pattern Builder from the Argument Builder editor when the [Unique Name \(page 306\)](#) token is selected. The Argument Builder editor pane shows a *Pattern* field where you can click to launch the Pattern Builder.


For information on how to access the Argument Builder, see [“Launching the Argument Builder” on page 49](#).

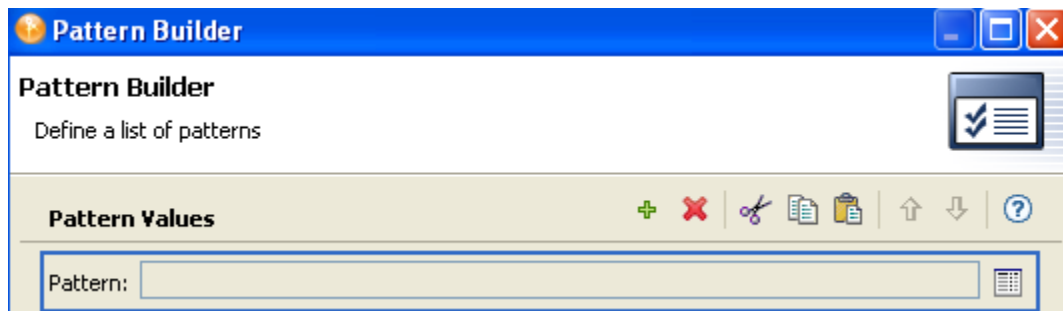
Figure 4-8 Unique Name Token in the Argument Builder


Create and edit arguments

Add or remove your components to the expression area to construct your argument. Specify component values in the Editor.



1 Click the *Edit patterns* icon  to launch the Pattern Builder.




2 Specify the pattern or click the *Edit the arguments* icon  to use the Argument Builder to create the pattern.

3 Click *Finish*.

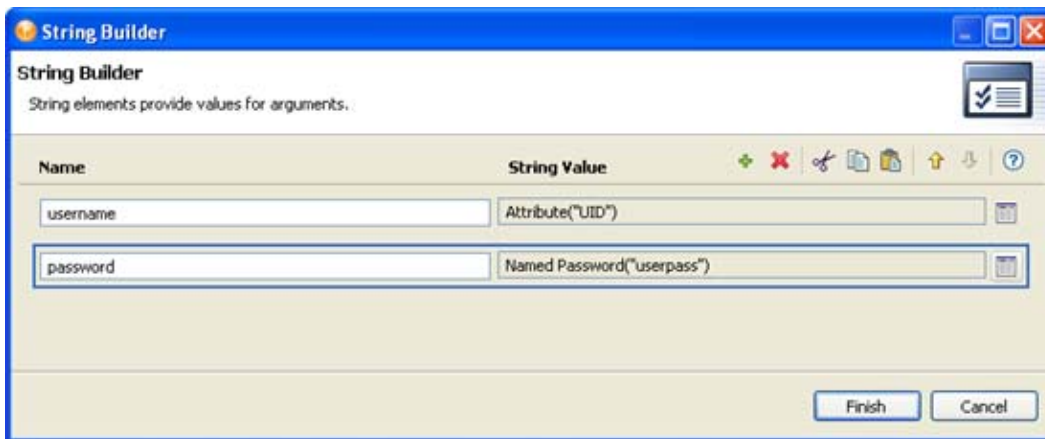
4.12 String Builder

The String Builder enables you to construct name/value pairs for use in certain actions, including [Set SSO Credential](#) and [Clear SSO Credential](#).

To open String Builder, select the *Edit the Strings* icon  next to the appropriate field when defining a new action or modifying an existing action. For example, The Set SSO Credential action contains a *Login Parameter Strings* field for necessary login parameter strings. String Builder allows you to create the appropriate strings.

In the String Builder, specify a name for each string you want to add to the action, then manually, or using the Argument Builder, create the appropriate string value.

Figure 4-9 String Builder Example



4.13 XPath Builder

The XPath Builder is a powerful tool that allows you to build and test an XPath expression against any XML document. See [“Using the XPath Builder” on page 73](#) for more information.

4.14 Mapping Table Editor

The Mapping Table editor allows you to create, edit, and manage mapping table objects. A mapping table object is used by a policy to map a set of values to another set of corresponding values. After a mapping table object is created, the [Map \(page 316\)](#) token maps the results of the specified tokens from the values specified in the mapping table.

To use a mapping table object, the following steps must be completed:

1. [Section 4.14.1, “Creating a Mapping Table Object,” on page 62](#)
2. [Section 4.14.2, “Adding a Mapping Table Object to a Policy,” on page 64](#)

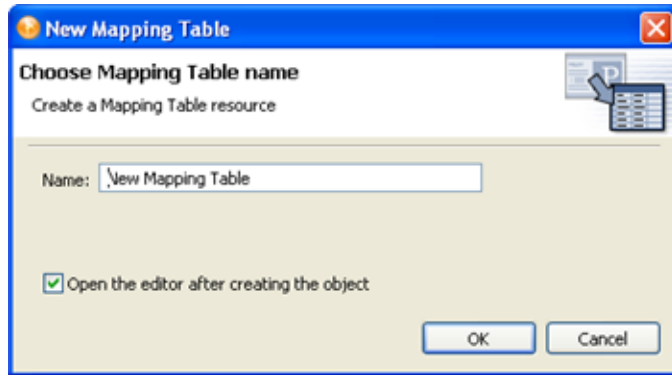
To edit a mapping table, see [Section 4.14.3, “Editing a Mapping Table Object,” on page 65](#).

4.14.1 Creating a Mapping Table Object

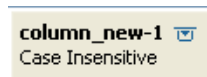
A mapping table object can be created in a library, driver object, Publisher channel, or Subscriber channel.

- 1 In the Outline view, right-click the location to create the mapping table, then select *New > Mapping Table*.
- 2 Specify the name of the mapping table object, then click *OK*.

Select *Open the editor after creating the object* to open the Mapping Table editor.

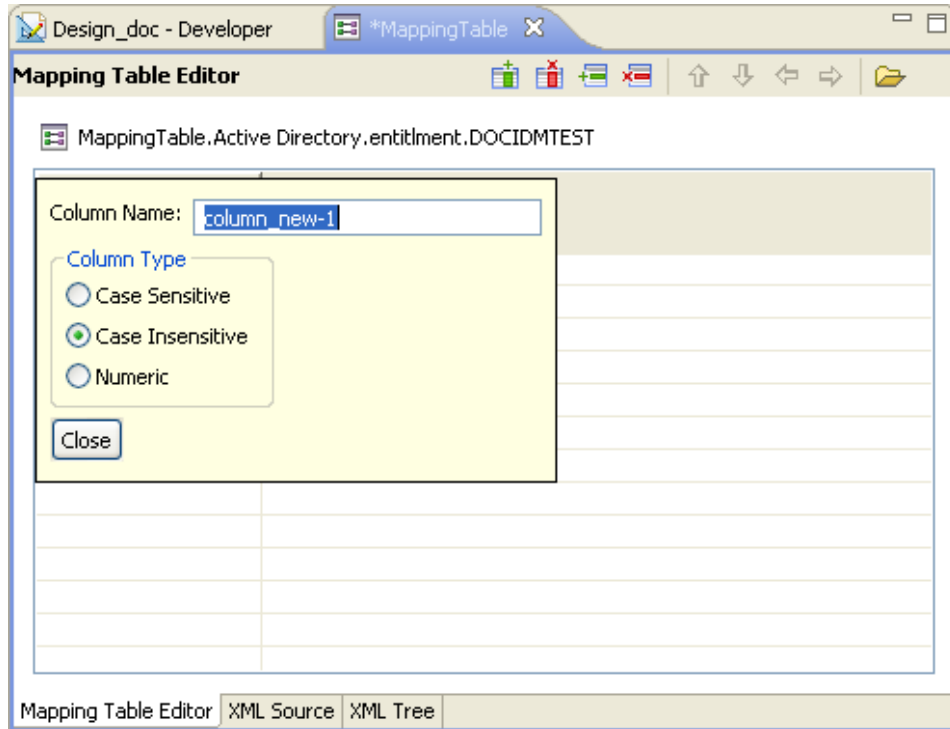


- 3 In the File Conflict message, click *Yes* to save the project before opening the Mapping Table editor.
- 4 In the Mapping Table editor, select *column_new-1*.



- 5 Specify a column name and data type, then click *Close*.



Column names must be unique. The data type lets you specify if the column values are *Case Sensitive*, *Case Insensitive*, or *Numeric*.



- 6 Select *New Value* to specify a cell value.

MapTable1.Delimited Text.Driver Set.

Dept	
Case Insensitive	
New Value	

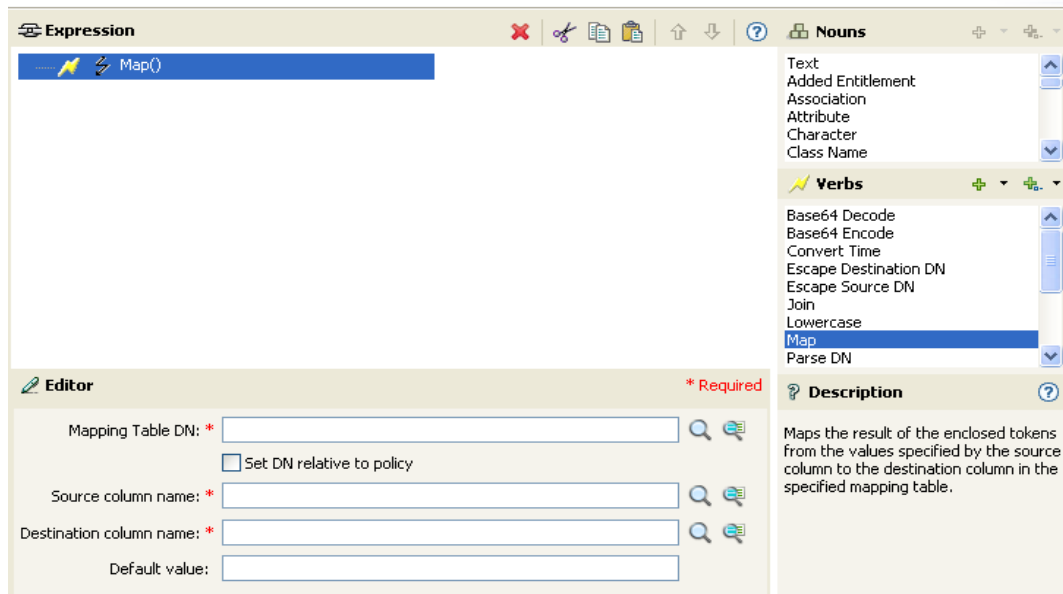
- 7 (Optional) To add another column, click the *Add Column* icon , then repeat [Step 4](#) and [Step 5](#).
- 8 (Optional) To add another row, click the *Add Row* icon , then repeat [Step 6](#).
- 9 Press Ctrl+S to save the mapping table object.
- 10 Continue with [Section 4.14.2, “Adding a Mapping Table Object to a Policy,”](#) on page 64.

4.14.2 Adding a Mapping Table Object to a Policy

- 1 Either create a policy to use the mapping table in, or select an existing policy to edit.
- 2 Launch the Argument Builder in the Policy Builder.
For information on how to access the Argument Builder, see [“Launching the Argument Builder”](#) on page 49.
- 3 Double-click *Map* from the list of verbs to add it to the expression panel.

Create and edit arguments

Add or remove your components to the expression area to construct your argument. Specify component values in the Editor.

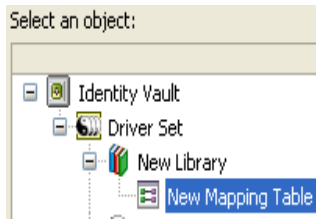


The screenshot shows the Argument Builder interface. The top bar displays 'Expression' and 'Nouns'. The main area contains a 'Map()' verb. The right sidebar shows a list of verbs, with 'Map' selected. The bottom section, labeled 'Editor', contains the following fields:

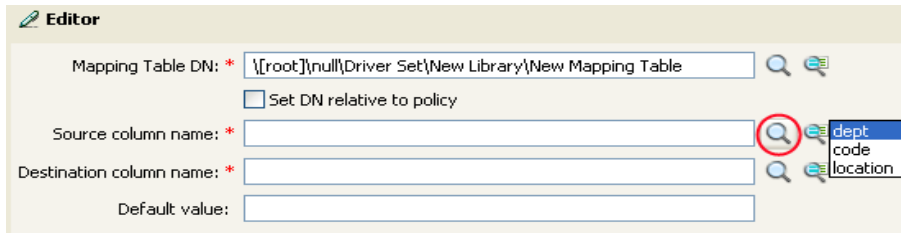
- Mapping Table DN: * (with a search icon and a help icon)
- Set DN relative to policy
- Source column name: * (with a search icon and a help icon)
- Destination column name: * (with a search icon and a help icon)
- Default value:

The 'Description' section on the right states: "Maps the result of the enclosed tokens from the values specified by the source column to the destination column in the specified mapping table."

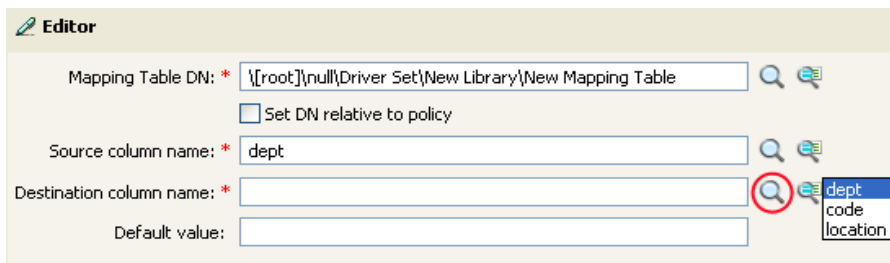
- 4 In the *Mapping Table DN* field, browse to and select the mapping table object created in [Section 4.14.1, “Creating a Mapping Table Object,”](#) on page 62, then click *OK*.



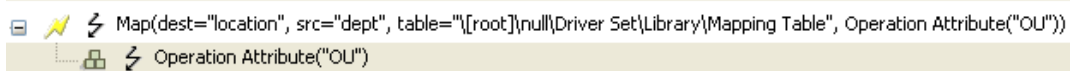
- 5 Select whether the mapping table DN is set relative to the policy or not.
- 6 Select the source column name by clicking the *Browse* icon.



- 7 Select the destination column name by clicking the *Browse* icon.



The mapping table can be used in any manner at this point. In this example, the OU attribute is populated with the value derived from the mapping table.









4.14.3 Editing a Mapping Table Object

Designer provides the following options to edit the mapping table:

Table 4-5 *Editing Options for the Mapping Table Editor*

Option	Description
Undo Add Column	Undoes the last action performed in the table.
Redo Add Column	Redoes the action that was undone.
Add Column	Inserts a column to the mapping table.
Add Row	Inserts a row to the mapping table.

Option	Description
 Delete Column	Deletes a column from the mapping table.
 Delete Row	Deletes a row from the mapping table.
 Move Row Up	Moves the selected row up in the mapping table.
 Move Row Down	Moves the selected row down in the mapping table.
 Move Column Left	Moves the selected column left in the mapping table.
 Move Column Right	Moves the selected column right in the mapping table.


The Mapping Table Editor also supports keyboard shortcuts for several of its operations:

Table 4-6 Keyboard Shortcuts for the Mapping Table Editor

Keyboard Shortcut	Description
Ctrl+Shift+Insert	Insert a column to the right of the current column.
Ctrl+Shift+Delete	Delete the current column. You are prompted to confirm the deletion.
Ctrl+Shift+C	Rename the current column. Opens the Column Edit dialog box.
Alt+Insert	Insert a row below the current row.
Alt+Delete	Delete the current row. You are prompted to confirm the deletion.
Ctrl+Up Arrow	Navigate up one row.
Ctrl+Down Arrow	Navigate down one row.
Ctrl+Left Arrow	Navigate left one column.
Ctrl+Right Arrow	Navigate right one column.

4.14.4 Importing Data from a CSV File

The Mapping Table editor allows you to import data that is stored in a CSV file. It then populates the table with the information in the CSV file. To import a CSV:

- 1 In an empty Mapping Table, select *Import From CSV file* .
- 2 Browse to and select the CSV file, then click *Open*.
- 3 Click *Yes* to overwrite your existing data.
- 4 Press Ctrl+S to save the data in the table.

4.14.5 Exporting Data to a CSV File

The Mapping Table editor allows you to export data to a CSV file. To export data to a CSV file:

- 1 When the data in the Mapping Table is ready to export, select *Export To CSV File* .

- 2 Click *Yes* to save this editor's changes and continue.
- 3 Specify a name and location for the CSV file, then click *Save*.

4.14.6 Testing a Mapping Table Object

You can use the Policy Simulator to test the functionality of the mapping table. The Policy Simulator tests the mapping table by testing the policy that is using the mapping table. For more information, see [Chapter 9, "Testing Policies with the Policy Simulator," on page 147](#).

4.15 Global Configuration Value Definition Editor

Global Configuration objects contain global configuration variables (GCVs) and are used when the configuration values are referenced from content in packages.

To create a Global Configuration object:

- 1 Right-click an Identity Vault, driver set, or driver in the Modeler, then click *New > Global Configuration*.
- 2 Specify a name for the Global Configuration object, then click *OK*.
- 3 Double-click the new object in the Outline view, then click *GCVs*.
- 4 Click *Add*, then fill in the following fields to create the GCVs:

Name: Specify the name for the GCV.

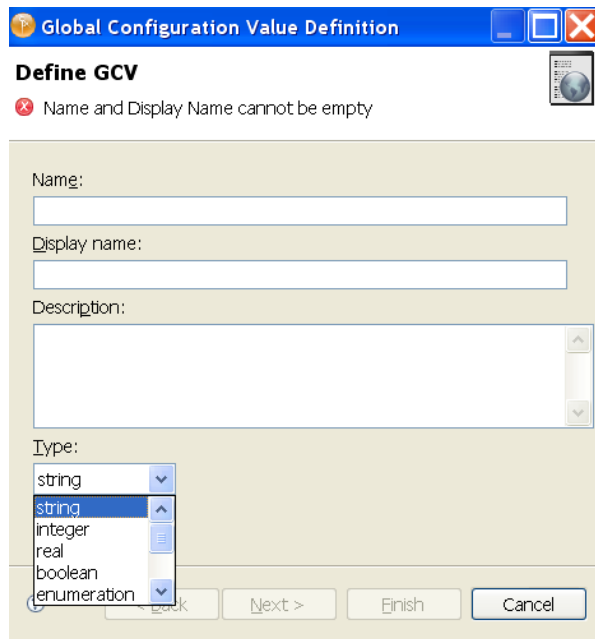
Display Name: Specify the name that is displayed for the GCV.

Description: Specify a description of the GCV.

Type: Select the type of GCV that you are creating and fill in the appropriate information for the type. The options are:

- ♦ **string:** Select whether the string is contained on multiple lines by clicking *Multi-line*. A string value is a sequence of Unicode characters.
- ♦ **integer:** Specify the minimum value and maximum value of the integer. An integer value contains one or more Unicode characters.
- ♦ **real:** Specify the minimum value and maximum value of the real. A real value describes a real or floating point number.
- ♦ **boolean:** The boolean value is either true or false.
- ♦ **enumeration:** The enumeration value is a defined set of strings. To create an enumeration value, click *Add*, then specify the display name and value for the enumeration, then click *OK*. Repeat this process for each string you add to the enumeration value.
- ♦ **dn:** The dn value is obtained from the DN syntax of an object in the Identity Vault. You must select the dn syntax type and the namespace of the DN.
 - ♦ **Syntax:** The syntax options are ldap, slash, qualified-slash, dot, qualified-dot, and custom.
 - ♦ **DN Space:** Select whether the namespace is from the connected system (application) or from Identity Manager (dirxml).
- ♦ **list:** The list value contains an ordered list of zero or more strings. Specify the delimiter character that is used to separate the items in the list.

- ♦ **password-ref:** Specify the key value of a named password. A named password key valued can be any non-empty sequence of Unicode characters.
- ♦ **structured:** A structured value is similar to structures in the C programming language. A structure contains to fundamental parts: a template that defines a set of simple types, and zero or more instances that contain the actual values of the structured control value. Specify the minimum and maximum instances, as well as the value separator and instance separator for the structure value.



5 Click *Finish*.


6 Repeat [Step 4](#) and [Step 5](#) for each GCV you want to add, then click *OK* to save the changes.

For more information about defining GCVs, you can refer to [Explaining GCVs \(http://www.novell.com/communities/node/11344/explaining-gcvs-part-1\)](http://www.novell.com/communities/node/11344/explaining-gcvs-part-1).

4.16 Namespace Editor

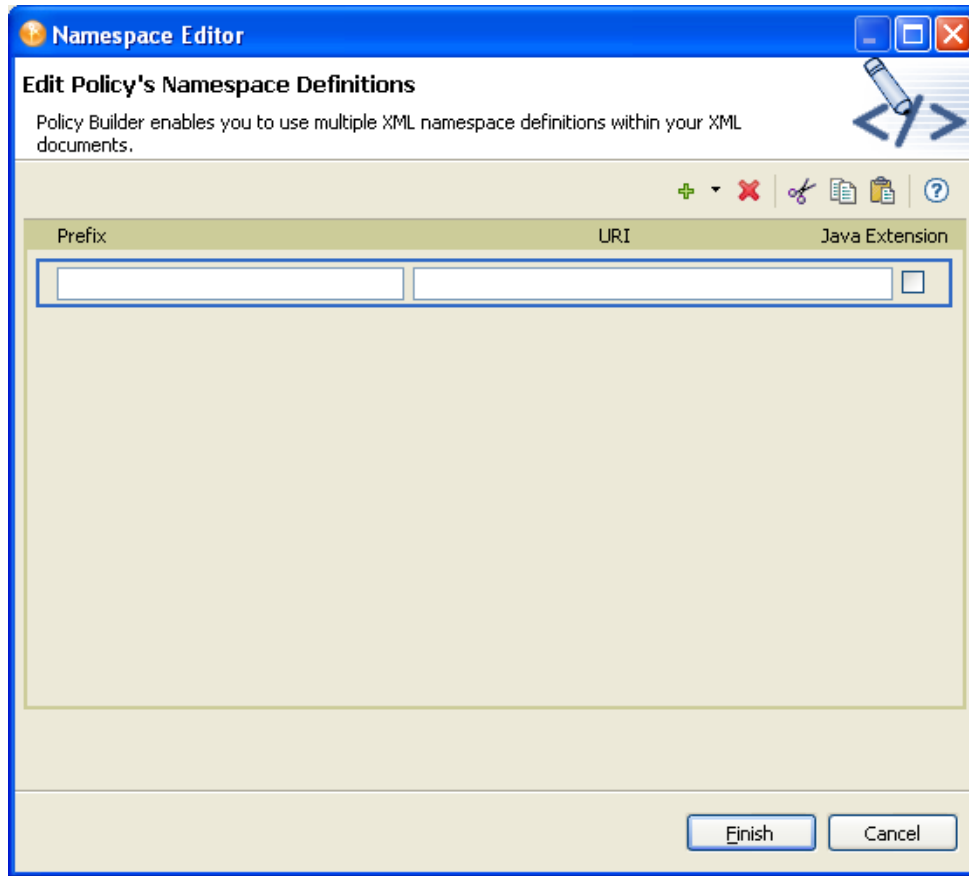
The Policy Builder enables you to use multiple XML namespaces within your XML documents. You launch the Namespace editor when you access the following DirXML Script elements in the Policy Builder:

- ♦ [Append XML Element \(page 237\)](#)
- ♦ [Append XML Text \(page 238\)](#)
- ♦ [Clone By XPath Expressions \(page 243\)](#)
- ♦ [Set XML Attribute \(page 278\)](#)
- ♦ [Strip XPath Expression \(page 281\)](#)
- ♦ [XPath \(page 310\)](#)

1 Click the *Edit the policy's namespace definitions*  icon.

2 Specify the namespace prefix.

- 3 Specify the URI.
- 4 Do not select *Java Extension*.



You can also access Java* classes through XPath by using XML namespaces. To create a namespace for a Java class, specify the namespace prefix in the *Name* field, the class name in the *URI* field, and select the *Java Extension* check box.

4.16.1 Accessing Java Classes Using Namespaces

Novell provides several Identity Manager Java classes that can be called by using XPath expressions from the Policy Builder. The following links open Javadoc references for these Java classes:

- ♦ [com.novell.nds.dirxml.driver.XdsQueryProcessor](http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsQueryProcessor.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsQueryProcessor.html>)
- ♦ [com.novell.nds.dirxml.driver.XdsCommandProcessor](http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsCommandProcessor.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsCommandProcessor.html>)
- ♦ [com.novell.nds.dirxml.driver.DNConverter](http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/DNConverter.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/DNConverter.html>)

The Java Developer Kit (JDK*) also provides several useful classes, such as `java.lang.String`, and `java.lang.System`. References for these classes are available with the JDK.

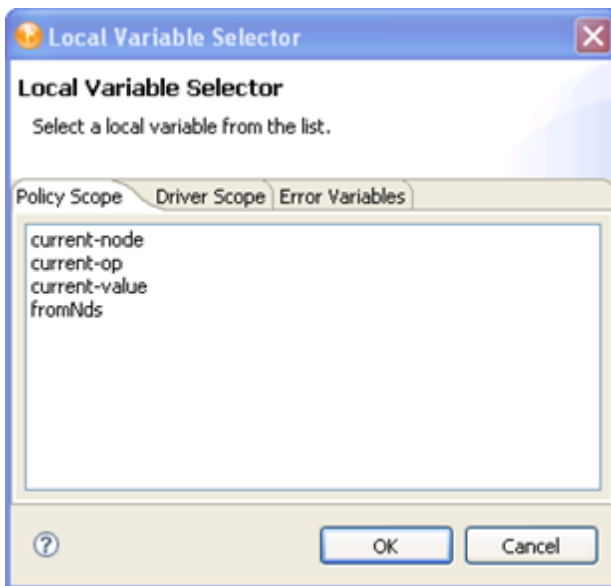
For additional information on using XPath and the Novell Java classes listed above, consult the [DirXML Driver Developer Kit \(http://developer.novell.com/documentation/dirxml/dirxmlbk/ref/dirxmlfaq.html\)](http://developer.novell.com/documentation/dirxml/dirxmlbk/ref/dirxmlfaq.html).

4.17 Local Variable Selector

Policies use local variables and they have different scopes. A local variable is defined for a specific policy or it is defined for a driver. If a local variable scope is set to driver, then any policy in the driver can use this variable.

The Policy Builder contains a Local Variable Selector that allows you to select any local variables that have been defined for use in the selected policy.

Figure 4-10 Local Variable Selector

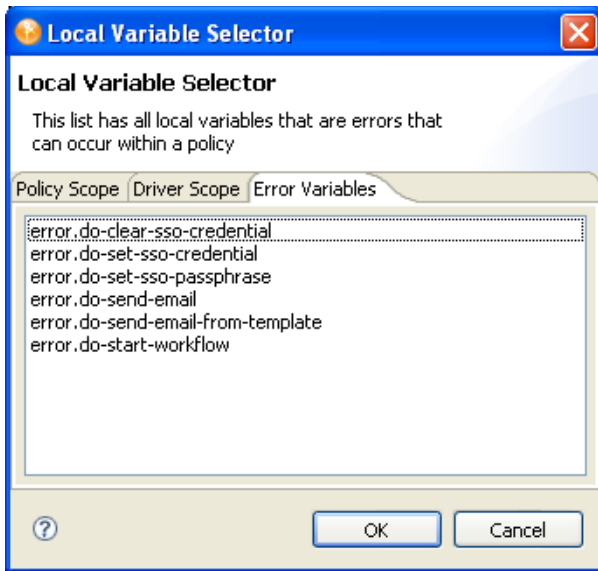


The Local Variable Selector is accessed through the following actions, conditions, and tokens:

- ◆ [If Local Variable \(page 206\)](#)
- ◆ [Set Local Variable \(page 270\)](#)
- ◆ [Local Variable \(page 296\)](#)

The Local Variable Selector displays three tabs:

Figure 4-11 Error Variables



Policy Scope: Lists any local variables with a scope of policy.

Driver Scope: Lists any local variables with a scope of driver.

Error Variables: Lists local variables that are set, if an error is encountered during the execution of the policy that contains the following actions:

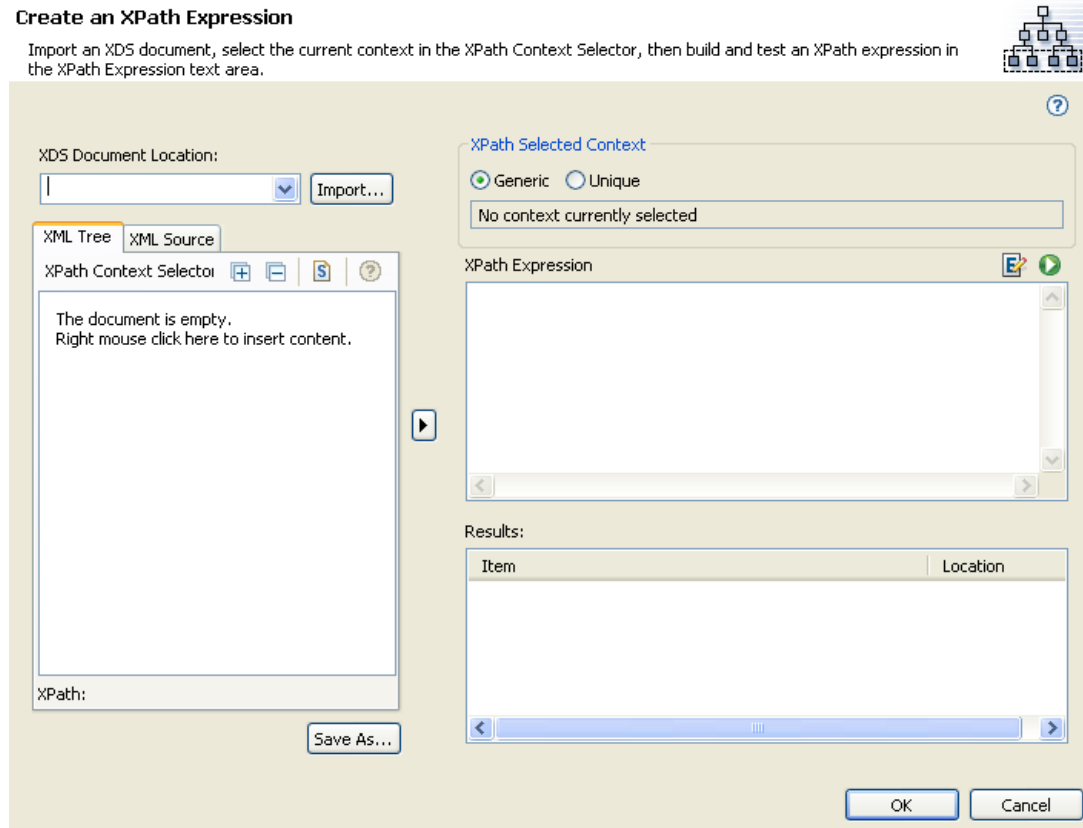
- ◆ [Clear SSO Credential \(page 242\)](#)
- ◆ [Set SSO Credential \(page 276\)](#)
- ◆ [Set SSO Passphrase \(page 277\)](#)
- ◆ [Send Email \(page 264\)](#)
- ◆ [Send Email from Template \(page 265\)](#)
- ◆ [Start Workflow \(page 278\)](#)

Using the XPath Builder


5

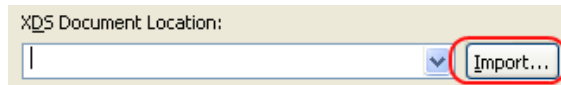
The XPath Builder is a powerful tool that allows you to build and test an XPath expression against any XML document. You can test different expressions against an XDS document and modify the XDS document while testing the expression. For more information about XPath expression, see “XPath 1.0 Expressions” in *Understanding Policies for Identity Manager 4.0.1*.

Figure 5-1 XPath Builder

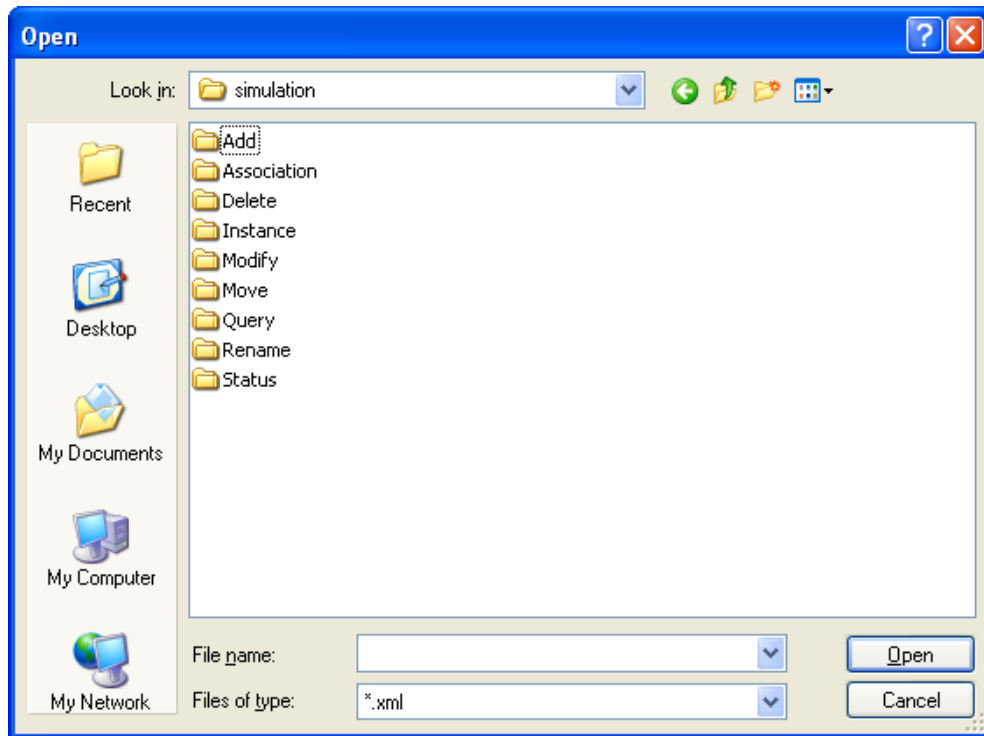


To use the XPath Builder:

- 1 In the Policy Builder, select any of the following conditions or actions, then click the *Launch XPath Builder* icon 
 - ◆ [If XPath Expression](#) (page 226)
 - ◆ [Append XML Element](#) (page 237)
 - ◆ [Append XML Text](#) (page 238)
 - ◆ [Clone By XPath Expressions](#) (page 243)
 - ◆ [Set XML Attribute](#) (page 278)
 - ◆ [Strip XPath Expression](#) (page 281)
- 2 Select *Import* to browse to and select the XDS document to test.

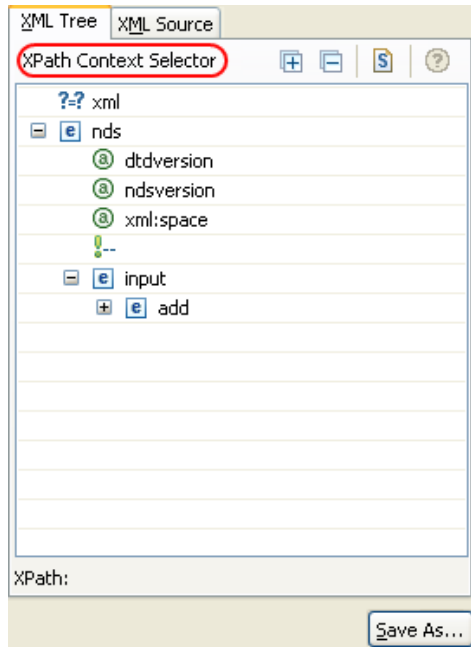



Designer comes with sample event files you can use to test the XPath expression against. The files are located in the plug-in `com.novell.designer.idm.policy_version\simulation`, where *version* is the current version of Designer. The events are Add, Association, Delete, Instance, Modify, Move, Query, Rename, and Status.

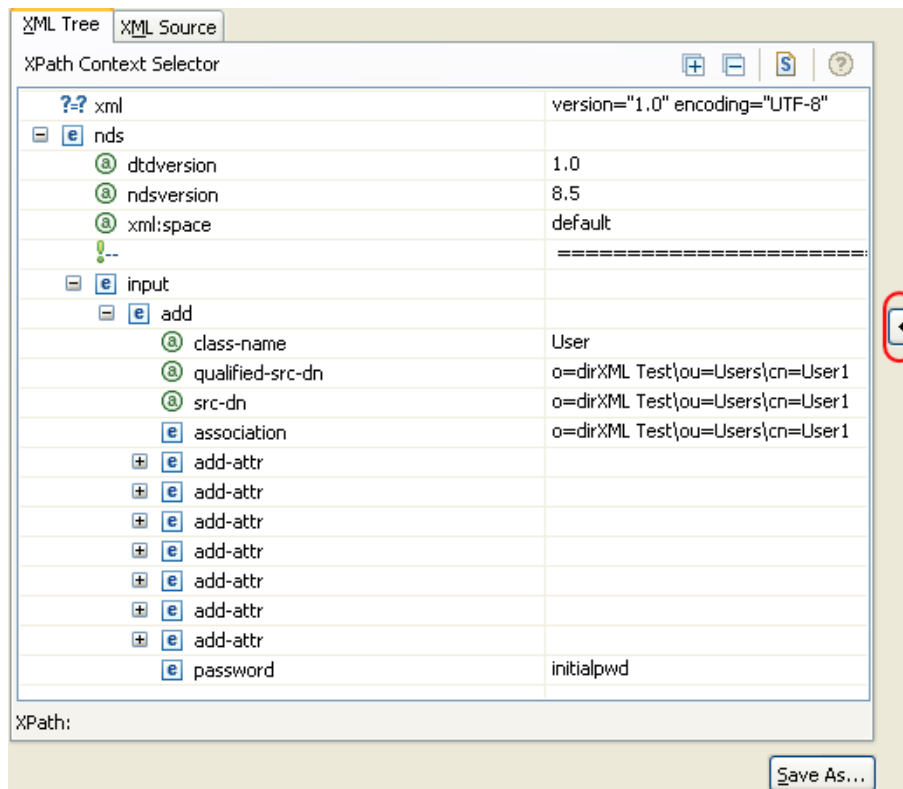


- 3 Double-click the folder to display the available events. Each event has different files you can select. For example, if you select *Add* you have three options: *Organization.xml*, *OrganizationalUnit.xml*, and *User.xml*. The file indicates the event. If you select *User.xml*, it is an Add event for a User object.
- 4 Select a file, then click *Open*.

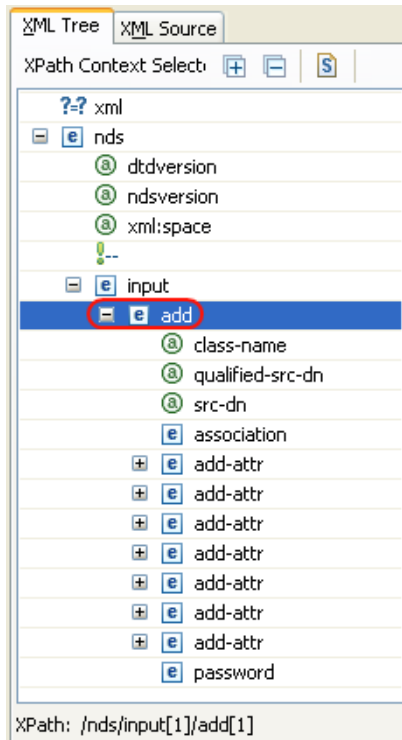
The input document is now displayed in the *XPath Context Selector* view. The *XML Source* tab allows you to use an XML source editor to edit the imported document, or an XML document from another editor can be copied and pasted into the source view. If you change the document, click *Save As* to save the changed document.



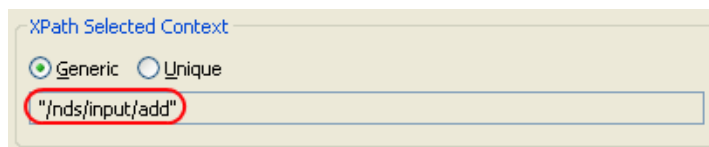
If you want to see the XDS document without scrolling, click the *Hide XPath Details* icon . To see the *XPath Expression* and *Results* windows, click *Show XPath Details* icon.



- 5 Select the current position in the document from which you want to start building your XPath expression.



The XPath context that you have selected is displayed in the *XPath Selected Context* as shown.

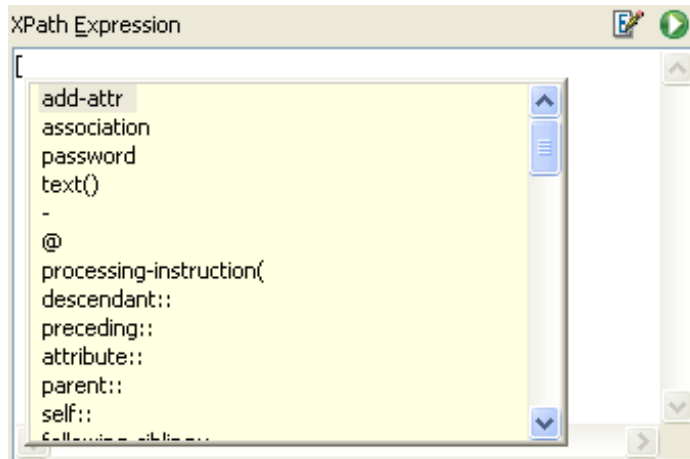


6 Select *Generic* or *Unique*.

Generic searches the entire XML document to match the specified XPath expression. It returns results for each instance of the XPath expression. In this example, the XPath expression is “/nds/input/add”. It searches the entire XML document for each instance of add.

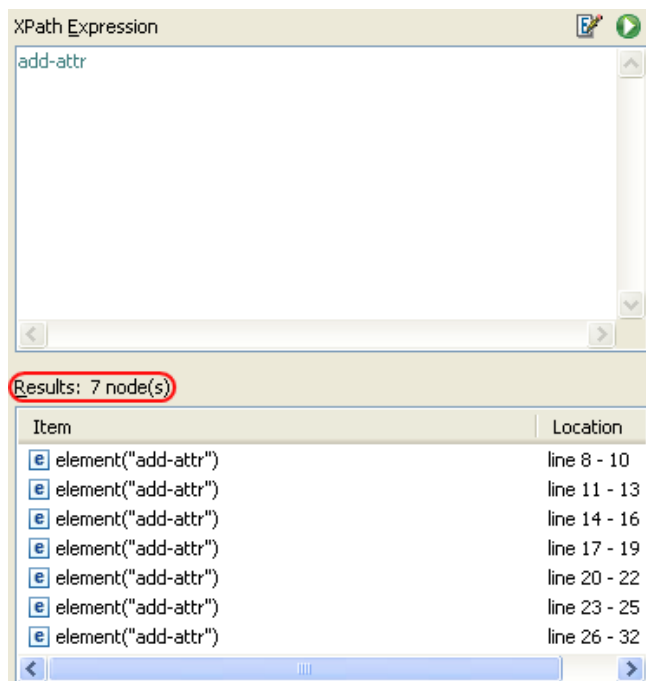
Unique searches the XML document until it finds a match and then stops. The unique XPath expression is “/nds/input[1]/add[1]”. It searches for the first instance of add and then stops. You can specify which instance you want to use by selecting the next instance of the XPath element in the *XML Context Selector*.


7 Specify an XPath expression in the *XPath Expression* field.



NOTE: Using the keystroke combination Ctrl+Space+3, /, [, or (triggers code completion. The expression is evaluated up until the cursor location, and insertable elements are shown in a drop-down box.

The results of your XPath expression appear in the *Results* text area below.



If the XPath editor does not evaluate the expression, click the *Evaluate XPath expression* icon  to force the XPath Builder to evaluate the expression.

- 8 (Optional) Click the *ECMA Expression Editor* icon to use a valid ECMAScript expression instead of an XPath expression.
- 9 When you are finished building and testing an XPath expression, click *OK* to close the XPath Builder.

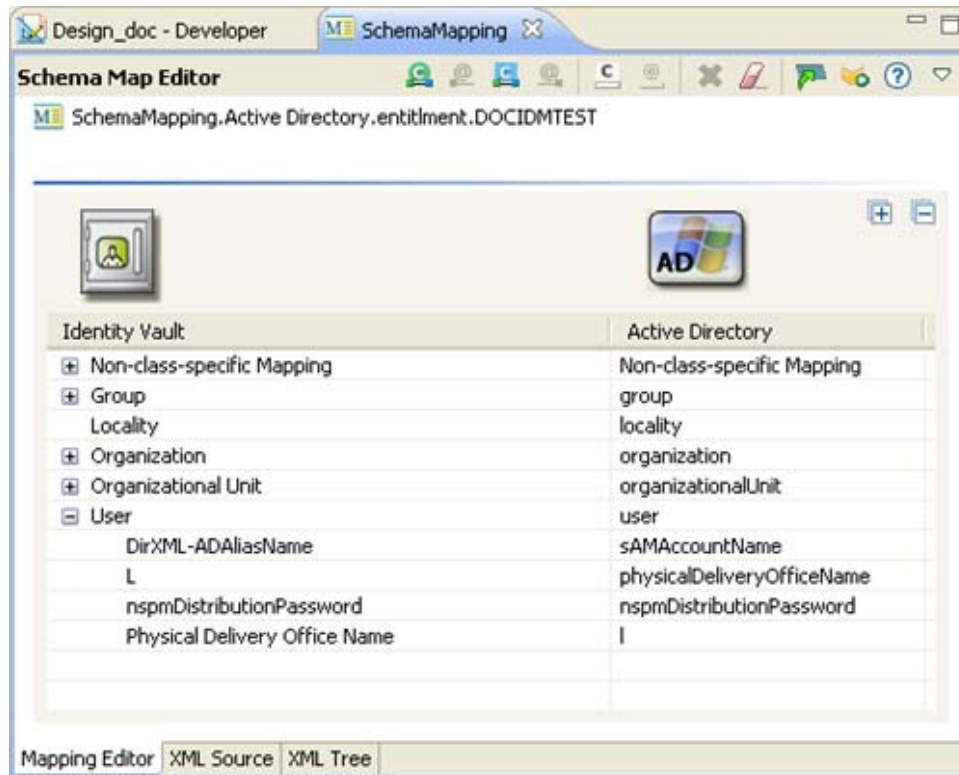
The text displayed in the *XPath Expression* is placed into the policy that you are editing.




Defining Schema Map Policies

6

Schema Map policies map class names and attribute names between the Identity Vault namespace and the application namespace. All documents passed between the Metadirectory engine and the application shim in either direction on either channel are passed through the Schema Map policy. There is one Schema Map policy per driver.

Figure 6-1 The Schema Map Editor



NOTE: The Schema Map editor is for creating and managing schema map policies. If you want to manage the actual schema on the Identity Vault or Application, use the Manage Schema tool, which is accessible by clicking the pull-down menu , then selecting *Manage Identity Vault Schema*  or *Manage Application Schema* .

For more information, see “[Managing the Schema](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

This section includes the following topics:

- ♦ [Section 6.1, “Using the Schema Map Editor,”](#) on page 80
- ♦ [Section 6.2, “Editing a Schema Map Policy,”](#) on page 83
- ♦ [Section 6.3, “Testing Schema Map Policies,”](#) on page 88
- ♦ [Section 6.4, “Exporting and Importing with the Schema Map Editor,”](#) on page 89

- ♦ Section 6.5, “Accessing the Schema Map Policy in XML,” on page 89
- ♦ Section 6.6, “Additional Schema Map Policy Options,” on page 90

6.1 Using the Schema Map Editor



The Schema Map editor allows you to edit the Schema Map policies. This section includes the following topics:

- ♦ Section 6.1.1, “Accessing the Schema Map Editor,” on page 80
- ♦ Section 6.1.2, “Navigating the Schema Map Editor,” on page 81
- ♦ Section 6.1.3, “Understanding the Schema Map Editor Toolbar,” on page 82


6.1.1 Accessing the Schema Map Editor

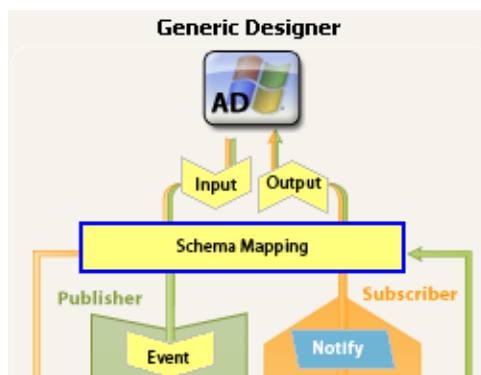
There are three different ways to access the Schema Map editor in Designer:

Outline View To open the Schema Map editor from the Outline view:


- 1 In an open project, click the *Outline* tab.
- 2 Click *Show Model Outline* .
- 3 Expand the driver where you want to manage the schema map policy.
- 4 Double-click the *Schema Map* icon  to launch the Schema Map editor.
You can also right-click the icon, then select *Edit*.

Policy Flow View To open the Schema Map editor from the Policy Flow view:

- 1 In an open project, click the *Outline* tab.
- 2 Click *Show Policy Flow* .
- 3 Double-click the Schema Mapping object, select the *Schema Mapping* policy, then click *Edit* to launch the Schema Map Editor.
You can also right-click the *Schema Mapping* object, then select *Edit Policy* to launch the Schema Map Editor.

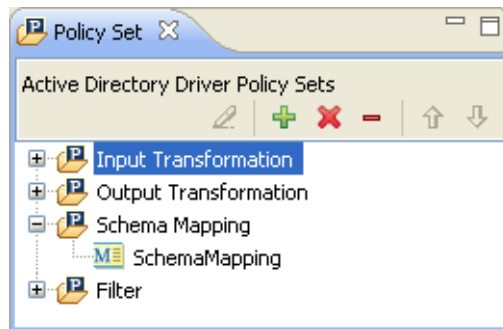


Policy Set View To open the Schema Map editor from the Policy Set view:

- 1 In an open project, click the *Outline* tab.
- 2 Click the *Show Model Outline* icon. 

- 3 In the Outline view, select the appropriate driver object.
- 4 In the Policy Set view, open the *Schema Mapping* folder, then double-click the Schema Mapping policy to launch the Schema Map editor.

You can also right-click the Schema Mapping policy, then click *Edit* to launch the Schema Map editor.



6.1.2 Navigating the Schema Map Editor


The Schema Map Editor uses standard point-and-click navigation. However, it also provides keyboard-based navigation options as described in [Table 6-1](#).












NOTE: The Schema Map Editor lets you order the list of mapped classes and attributes alphabetically (ascending or descending.) To do so, click either the gray Identity Vault header or the gray application datastore header that appears above the list of mapped classes. If you first select a class mapping and then click one of the headers, only the attributes within the class mapping are ordered.







Table 6-1 *Schema Map Editor Keyboard Support*

Keystroke	Description
Up-arrow	Moves the cursor up in the Schema Map editor.
Down-arrow	Moves the cursor down in the Schema Map editor.
Left-arrow	Collapses the information displayed
Right-arrow	Expands the information displayed.
Insert	Adds a class.
Ctrl+Insert	Adds an attribute.
Delete	Deletes the selected items.
Enter	Opens edit mode for the currently selected field. Press Enter a second time to commit the change in Schema Map editor.
Esc	Exits the edit mode.

6.1.3 Understanding the Schema Map Editor Toolbar

The Schema Map editor includes a toolbar that provides access to the following features. Several of these features, along with an option to *Edit*  a selected mapping, is also available from a drop-down menu by right-clicking in the Schema Map editor.

Tool	Description
	<i>Insert Identity Vault Class</i> launches a dialog box from which you can add a new ID Vault class, and its associated attributes, to the schema map. For more information, see “Adding an Identity Vault Class or Attribute” on page 83 .
	<i>Insert Identity Vault Attribute</i> launches a dialog box from which you can add additional attributes to an existing ID Vault class in the schema map. For more information, see “Adding an Identity Vault Class or Attribute” on page 83 .
	<i>Insert Application Class</i> launches a dialog box from which you can add a new Application class, and its associated attributes, to the schema map. For more information, see “Adding an Application Class or Attribute” on page 85 .
	<i>Insert Application Attribute</i> launches a dialog box from which you can add additional attributes to an existing Application class in the schema map. For more information, see “Adding an Application Class or Attribute” on page 85 .
	<i>Insert Class Row</i> adds an empty class row to the schema map. You can then populate the class fields manually or by selecting from the drop-down menu of available classes.
	<i>Insert Attribute Row</i> adds an empty attribute row to the selected class in the schema map. You can then populate the attribute fields manually or by selecting from the drop-down menu of available attributes.
	<i>Delete</i> deletes the selected class or attribute mappings from the schema map.
	<i>Clear All Items</i> deletes all class and attribute entries from the schema map.
	<i>Synchronize with the Filter Editor</i> instructs the Schema Map editor to update the Filter policy with any schema mappings you have added in the Schema Map editor. The Schema Map editor does not synchronize deleted entries to the Filter policy. For more information about filter policies and the Filter editor, see Chapter 7, “Controlling the Flow of Objects with the Filter,” on page 95 .
	<i>Launch Policy Simulator</i> launches the Policy Simulator. For more information, see Chapter 9, “Testing Policies with the Policy Simulator,” on page 147 .
	<i>Help</i> launches the context-sensitive help for the Schema Map editor.

Tool	Description
	<p>The pull-down menu opens a secondary menu of schema map editor tools, including the following:</p> <ul style="list-style-type: none">  <i>Save to File</i> exports the current schema map to an XML file.  <i>Import from File</i> imports a schema map from a previously saved XML file.  <i>Manage Identity Vault Schema</i> launches the Manage Schema tool. For more information, see “Managing the Schema” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i>.  <i>Manage Application Schema</i> launches the Manage Schema tool. For more information, see “Managing the Schema” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i>.  <i>Refresh Application Schema</i> queries a live application for its current schema. This lets you update the application schema in Designer as it changes on the live system.

6.2 Editing a Schema Map Policy

The Schema Map editor allows you to create and edit schema map policies. This section includes the following topics:

- ◆ [Section 6.2.1, “Adding or Deleting Classes and Attributes,” on page 83](#)
- ◆ [Section 6.2.2, “Refreshing the Application Schema,” on page 87](#)
- ◆ [Section 6.2.3, “Editing Items,” on page 87](#)
- ◆ [Section 6.2.4, “Sorting Schema Map Entries,” on page 88](#)
- ◆ [Section 6.2.5, “Managing the Schema,” on page 88](#)

For information about exporting and importing a schema map policy, see [Section 6.4, “Exporting and Importing with the Schema Map Editor,” on page 89](#).

6.2.1 Adding or Deleting Classes and Attributes

There are three types of classes or attributes you can add to a schema map. The process for adding each type of class or attribute varies.


When you add or remove a class or attribute in the Schema Map policy, Designer updates relevant filters at the same time. For more information about filters, see [Chapter 7, “Controlling the Flow of Objects with the Filter,” on page 95](#).

- ◆ [“Adding an Identity Vault Class or Attribute” on page 83](#)
- ◆ [“Adding an Application Class or Attribute” on page 85](#)
- ◆ [“Adding a Non-class-specific Attribute Mapping” on page 86](#)
- ◆ [“Deleting a Class or Attribute Mapping” on page 87](#)

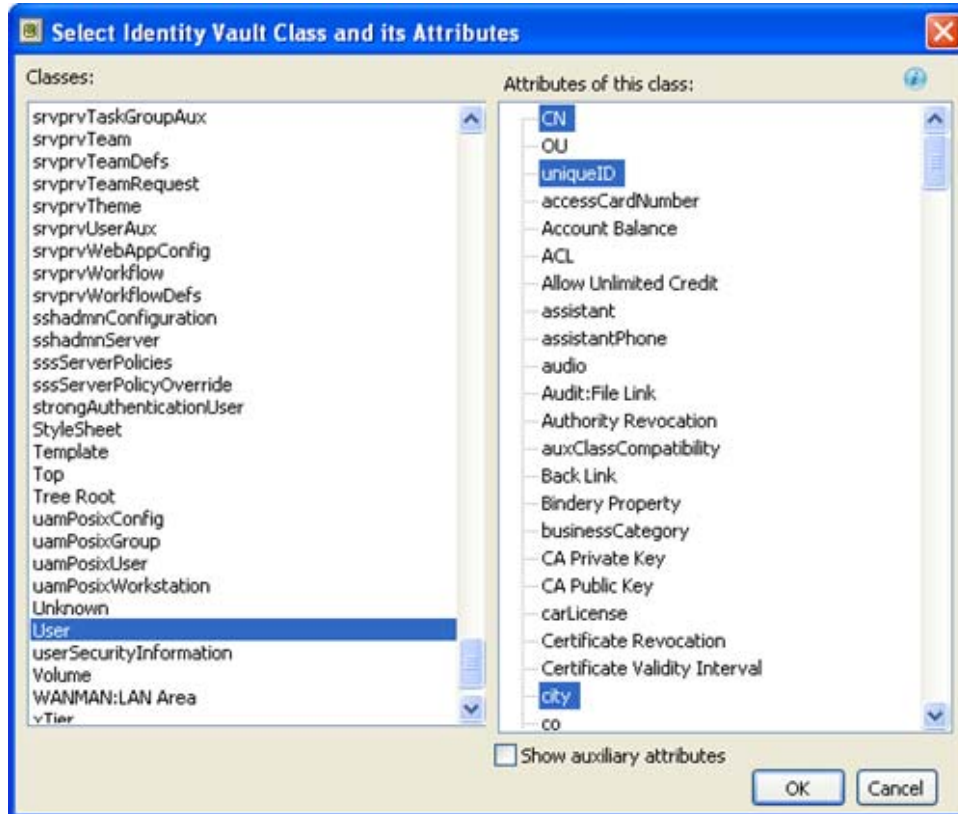
Adding an Identity Vault Class or Attribute

You can both add new Identity Vault classes and attributes to a schema map, and add additional Identity Vault attributes to an existing class mapping.

To add a new Identity Vault class and attributes to a schema map:

- 1 In the Schema Map Editor, select *Insert Identity Vault Class* . You can also right-click in the Schema Map editor, then click *Insert Identity Vault Class*.
- 2 In the Select Identity Vault Class and its Attributes page, select a class and the relevant class attributes to add to the schema map, then click *OK*.

Use Shift+click and Ctrl+click to select multiple attributes, if desired.




- 3 In the Schema Map Editor, double-click each class and attribute you added to the schema map, then specify the appropriate Application class (or attribute) to which you want to map it.

You can either select the class or attribute name from the drop-down list, or type it in the field manually.

Identity Vault	Active Directory
+ Non-class-specific Mapping	Non-class-specific Mapping
- Group	group
DirXML-ADAliasName	sAMAccountName
GID	guid
Locality	locality
+ Organization	organization
+ Organizational Unit	organizationalUnit
+ User	user

- 4 To save the schema map changes, select *File > Save*.

To add additional Identity Vault attributes to an existing class mapping:


- 1 In the Schema Map Editor, select a class mapping, then select *Add Identity Vault Attributes* . You can also right-click in the Schema Map editor, then select *Insert Identity Vault Attributes*.
- 2 In the Select ID Vault Attributes page, select the desired attributes to add to the class mapping, then click *OK*.
Use Shift+click and Ctrl+click to select multiple attributes, if desired.
- 3 In the Schema Map Editor, double-click each attribute you added to the schema map, then specify the appropriate Application attribute to which you want to map it.
You can either select the attribute from the drop-down list, or type it in the field manually.

Identity Vault	Active Directory
<input type="checkbox"/> Non-class-specific Mapping	Non-class-specific Mapping
<input type="checkbox"/> Group	group
DirXML-ADAliasName	sAMAccountName
<input type="text" value="GID"/>	<input type="text" value="guid"/>
Locality	locality
<input type="checkbox"/> Organization	organization
<input type="checkbox"/> Organizational Unit	organizationalUnit
<input type="checkbox"/> User	user


- 4 To save the schema map changes, select *File > Save*.

Adding an Application Class or Attribute

You can both add new Application classes and attributes to a schema map, and add additional Application attributes to an existing class mapping.

IMPORTANT: To view an application's schema classes and attributes, the driver must be able to retrieve the schema information from a live application environment. This occurs automatically when a driver starts (right-click the driver, then select *Live > Start Driver*). However, you can refresh the application schema at any time by selecting *Refresh Application Schema* .

To add a new Attribute class and attributes to a schema map:

- 1 In the Schema Map Editor, select *Insert Application Class* .
You can also right-click in the Schema Map editor, then click *Insert Application Class*.
- 2 In the Select Application Class and its Attributes page, select a class and the relevant class attributes to add to the schema map, then click *OK*.
Use Shift+click and Ctrl+click to select multiple attributes, if desired.
- 3 In the Schema Map Editor, double-click each class and attribute you added to the schema map, then specify the appropriate Application class (or attribute) to which you want to map it.
You can either select the class or attribute name from the drop-down list, or type it in the field manually.

Identity Vault	Active Directory
+ Non-class-specific Mapping	Non-class-specific Mapping
- Group	group
DirXML-ADAliasName	sAMAccountName
GID	guid
Locality	locality
+ Organization	organization
+ Organizational Unit	organizationalUnit
+ User	user

4 To save the schema map changes, select *File > Save*.

To add additional Application attributes to an existing class mapping:

1 In the Schema Map Editor, select a class mapping, then select *Insert Application Attributes* .

You can also right-click in the Schema Map editor, then select *Insert Identity Vault Attributes*.

2 In the Select App Attributes page, select the desired attributes to add to the class mapping, then click *OK*.

Use Shift+click and Ctrl+click to select multiple attributes, if desired.

3 In the Schema Map Editor, double-click each attribute you added to the schema map, then specify the appropriate Identity Vault attribute to which you want to map it.

You can either select the attribute from the drop-down list, or type it in the field manually.

Identity Vault	Active Directory
+ Non-class-specific Mapping	Non-class-specific Mapping
- Group	group
DirXML-ADAliasName	sAMAccountName
GID	guid
Locality	locality
+ Organization	organization
+ Organizational Unit	organizationalUnit
+ User	user

4 To save the schema map changes, select *File > Save*.

Adding a Non-class-specific Attribute Mapping

Sometimes an attribute mapping doesn't apply to a specific class. In this case you can define the attribute mapping in the Non-class-specific container.

To add a non-class-specific attribute mapping:

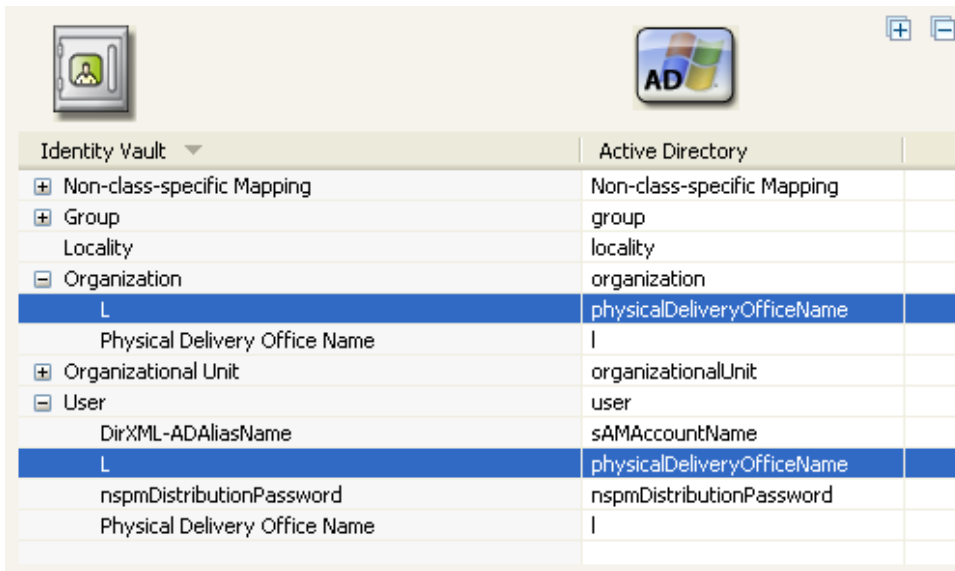
1 Select the *Non-class-specific Mapping* entry in the Schema Map Editor.

2 Add the appropriate attribute mapping using one of the methods described previously.

For more information, see [“Adding an Identity Vault Class or Attribute” on page 83](#) and [“Adding an Application Class or Attribute” on page 85](#).


Deleting a Class or Attribute Mapping


If you do not want an Identity Vault class or an attribute to be mapped to an Application class or attribute, the best practice is to completely remove the class or the attribute from the Schema Map policy. To remove multiple classes or attributes at the same time, use Ctrl-click or Shift-click to select more than one class or attribute at a time.




Identity Vault	Active Directory	
Non-class-specific Mapping	Non-class-specific Mapping	
Group	group	
Locality	locality	
Organization	organization	
L	physicalDeliveryOfficeName	
Physical Delivery Office Name	I	
Organizational Unit	organizationalUnit	
User	user	
DirXML-ADAliasName	sAMAccountName	
L	physicalDeliveryOfficeName	
nspmDistributionPassword	nspmDistributionPassword	
Physical Delivery Office Name	I	

You can add or remove attributes and classes from the Schema Map policy in the following ways:

- ◆ Select the classes or attributes you want to remove, then right-click and select *Delete*.
- ◆ Select the classes or attributes you want to remove, then click *Delete*  in the Schema Map editor toolbar.
- ◆ Select the classes or attributes you want to remove, then press the Delete key.

You can also delete all classes and attributes at once by selecting *Clear All Items* .

6.2.2 Refreshing the Application Schema

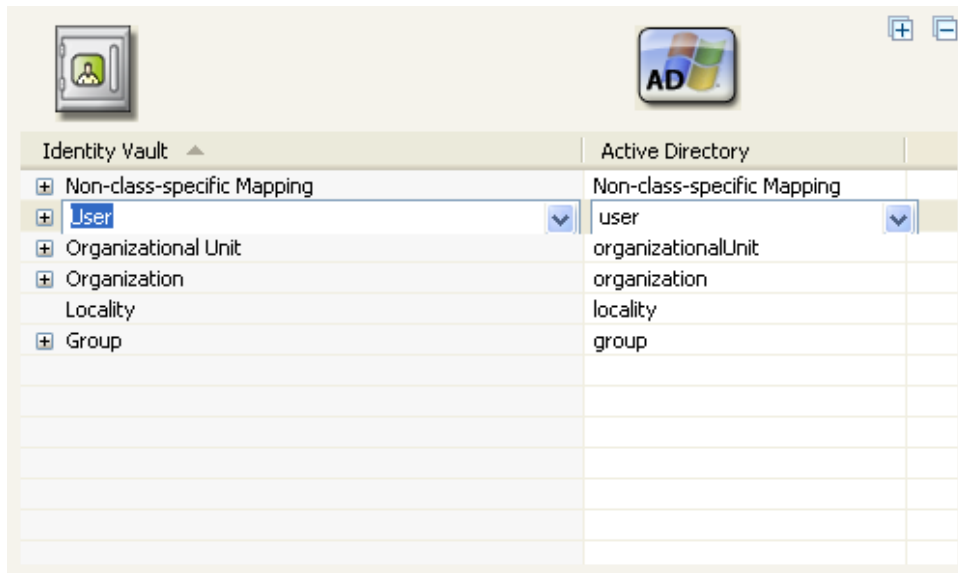
If you have modified the schema in the application, these changes need to be reflected in the Schema Map policy. To make the new schema available, click the toolbar pull-down menu, then select *Refresh Application Schema* .

Refreshing the application schema requires a connection to the live application because the application driver must be able to query the application for the updated schema.

6.2.3 Editing Items

To edit a mapping, double-click the selected row. An in-place editor appears, allowing you to edit the mapping.

Figure 6-2 *In-line Edits in the Schema Map Editor*







6.2.4 Sorting Schema Map Entries

The Schema Map editor allows you to sort entries in ascending/descending order by clicking on the column heading. Click the Identity Vault heading to sort entries based on Identity Vault items. Click the connected system heading to sort entries based on connected system items.

6.2.5 Managing the Schema

Designer allows you to manage the Identity Vault schema and any connected system's schema. You can import the schema, modify it, and deploy the changed schema back into the Identity Vault or the Application.

To manage the Identity Vault schema, click the pull-down menu , then select *Manage Identity Vault Schema* . This opens the Manage Schema tool and displays information about the classes and attributes in the Identity Vault schema.


To manage the Application schema, click the pull-down menu , then select *Manage Application Schema* . This opens the Manage Schema tool and displays information about the classes and attributes in the Application schema.

For more information about how to manage the schema, see “[Managing the Schema](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

6.3 Testing Schema Map Policies

Designer comes with a tool called the Policy Simulator. It allows you to test your policies without implementing them in a production environment. You can launch the Policy Simulator through the Schema Map editor to test your policy after you have modified it.

To access the Policy Simulator and test the Schema Map policy:

- 1 Click the *Launch Policy Simulator* icon  in the toolbar.
- 2 Select *To Identity Vault* or *From Identity Vault* as the simulation point of the Schema Map policy.



For more information on the Policy Simulator, see [Chapter 9, “Testing Policies with the Policy Simulator,”](#) on page 147.

6.4 Exporting and Importing with the Schema Map Editor

Designer allows you to export a schema map policy document to an XML file. It also allows you to Import an XML file from a particular point on the file system to the Schema Map Editor.



6.4.1 Exporting a Schema Map Policy

Schema Map policies can be exported from the editor and saved as an XML file located in the file system.

- 1 In the Schema Map editor, click the pull-down menu , then select *Save to File* .
- 2 Specify a filename and location where you want to export your schema map policy, then click *Save*.

6.4.2 Importing a Schema Map Policy

The Exported policies which were saved as XML files on the file system can be re-imported to the Schema Map editor. This functionality saves you the effort of redoing the class or attribute mappings again. To import a schema map policy:

- 1 In the Schema Map editor, click the pull-down menu , then select *Import from File* .
- 2 In the Import a Schema Map File dialog box, browse to the schema file you want to import, then click *Open*.

Specify whether you want to append the imported schema mappings to the existing schema map, or replace the existing schema map with the imported schema map.

6.5 Accessing the Schema Map Policy in XML

Designer enables you to view, edit, and validate the XML by using an XML editor. Click the *XML Source* tab or the *XML Tree* tab to access the XML editor. For more information about the XML editor, see “[The Novell XML Editor](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

6.6 Additional Schema Map Policy Options







When you right-click a Schema Map policy, there are multiple options presented in the Outline view, the Policy Flow view, and the Policy Set view.

- ◆ [Section 6.6.1, “Outline View Additional Options,” on page 90](#)
- ◆ [Section 6.6.2, “Policy Flow View Additional Options,” on page 91](#)
- ◆ [Section 6.6.3, “Policy Set View Additional Options,” on page 92](#)

6.6.1 Outline View Additional Options

There are additional options to manage the Schema Map policy in the Outline view. Right-click the Schema Map policy in the Outline view to see the additional options.







Table 6-2 *Schema Map Policy Options in the Outline View*

Option	Description
 Edit	Launches the Schema Map editor. For more information, see Section 6.2, “Editing a Schema Map Policy,” on page 83 .
 Copy	Creates a copy of the Schema Map policy.
 Save As	Saves the Schema Map policy as a .xml file.
 Simulate	Tests the Schema Map policy. For more information, see Section 6.3, “Testing Schema Map Policies,” on page 88 .
Export to Configuration File	Saves the Schema Map policy as a .xml file.
Live > Deploy	Deploys the Schema Map policy into the Identity Vault. For more information, see “Deploying a Policy to an Identity Vault” in the Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide .
 Live > Compare	Compares the Schema Map policy in Designer to the Schema Map policy in the Identity Vault. For more information, see “Using the Compare Feature When Deploying” in the Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide .
Open With > Designer Built-in Editor	Launches the Schema Map editor.
Open With > Novell XML Editor	Launches the XML editor. For more information, see “The Novell XML Editor” in the Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide .
Open With > Text Editor	Launches the text editor.
 Delete	Deletes the selected Schema Map policy.
Properties	Allows you to rename the Schema Map policy.

6.6.2 Policy Flow View Additional Options

There are additional options to manage the Schema Map policy in the Policy Flow view. Right-click the Schema Map policy in the Policy Flow view to see the additional options.

Table 6-3 Enter Table Title Here







Option	Description
 Add Policy > DirXML Script	Adds a new Schema Map policy by using DirXML Script.
 Add Policy > XSLT	Adds a new Schema Map policy by using XSLT.
 Add Policy > Schema Map	Adds a new Schema Map policy containing no information.
Add Policy > Link to Existing	Allows you to browse and select an existing Schema Map policy to link to the current Schema Map policy.
Add Policy > Copy Existing	Allows you to browse to and select an existing Schema Map policy to copy to the current Schema Map policy.
 Edit Policy > Schema Map	Launches the Schema Map editor. For more information, see Section 6.2, “Editing a Schema Map Policy,” on page 83.
 DirXML Script Tracing	Enables DirXML Script tracing on the Schema Map policy.
 Simulate	Tests the Schema Map policy. For more information, see Section 6.3, “Testing Schema Map Policies,” on page 88.
Live > Import	Imports an existing Schema Map policy from the Identity Vault. For more information, see “Importing Channels, Policies, and Schema Items from the Identity Vault” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .
Live > Deploy	Deploys the selected Schema Map policy into the Identity Vault. For more information, see “Deploying a Policy to an Identity Vault” <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .
Live > Compare	Compares the selected Schema Map policy to a Schema Map policy in the Identity Vault. For more information, see “Using the Compare Feature When Deploying” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .
Live > Driver Configuration > Import Attribute	Allows you to import attributes from the Identity Vault and compare the attributes from the Identity Vault to what is in Designer. For more information, see “Importing Channels, Policies, and Schema Items from the Identity Vault” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .

Option	Description
Live > Driver Configuration > Deploy Attributes	Allows you to deploy attributes from Designer into the Identity Vault and compare the attributes from Designer with the attributes in the Identity Vault. For more information, see “Deploying a Policy to an Identity Vault” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .
Live > Driver Configuration > Compare Attributes	Allows you to compare attributes from the selected Schema Map policy to attributes in the Identity Vault. For more information, see “Using the Compare Feature When Deploying” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .
Live > Driver Status	Displays the status of the driver.
Live > Start Driver	Starts the driver.
Live > Stop Driver	Stops the driver.
Live > Restart Driver	Restarts the driver.
Delete All Set Policies	Deletes all policies in the selected policy set.
Remove All Set Policies	Removes all policies from the selected policy set, but does not delete the existing policies.

6.6.3 Policy Set View Additional Options

There are additional options to manage the Schema Map policy in the Policy Set view. Right-click the Schema Map policy in the Policy Set view to see the additional options.

Table 6-4 Policy Set View Options

Option	Description
 Edit	Launches the Schema Map editor. For more information, see Section 6.2, “Editing a Schema Map Policy,” on page 83.
 Copy	Creates a copy of the Schema Map policy.
 Save As	Saves the Schema Map policy as a .xml file.
 Simulate	Tests the Schema Map policy. For more information, see Section 6.3, “Testing Schema Map Policies,” on page 88.
 Remove	Removes the Schema Map policy from the policy set, but does not delete the Schema Map policy from the Identity Vault.
Link to Existing Policy	Allows you to browse to another Schema Map policy and link it into the existing policy.
 Move up	Moves the Schema Map policy up in the execution order of the policy.

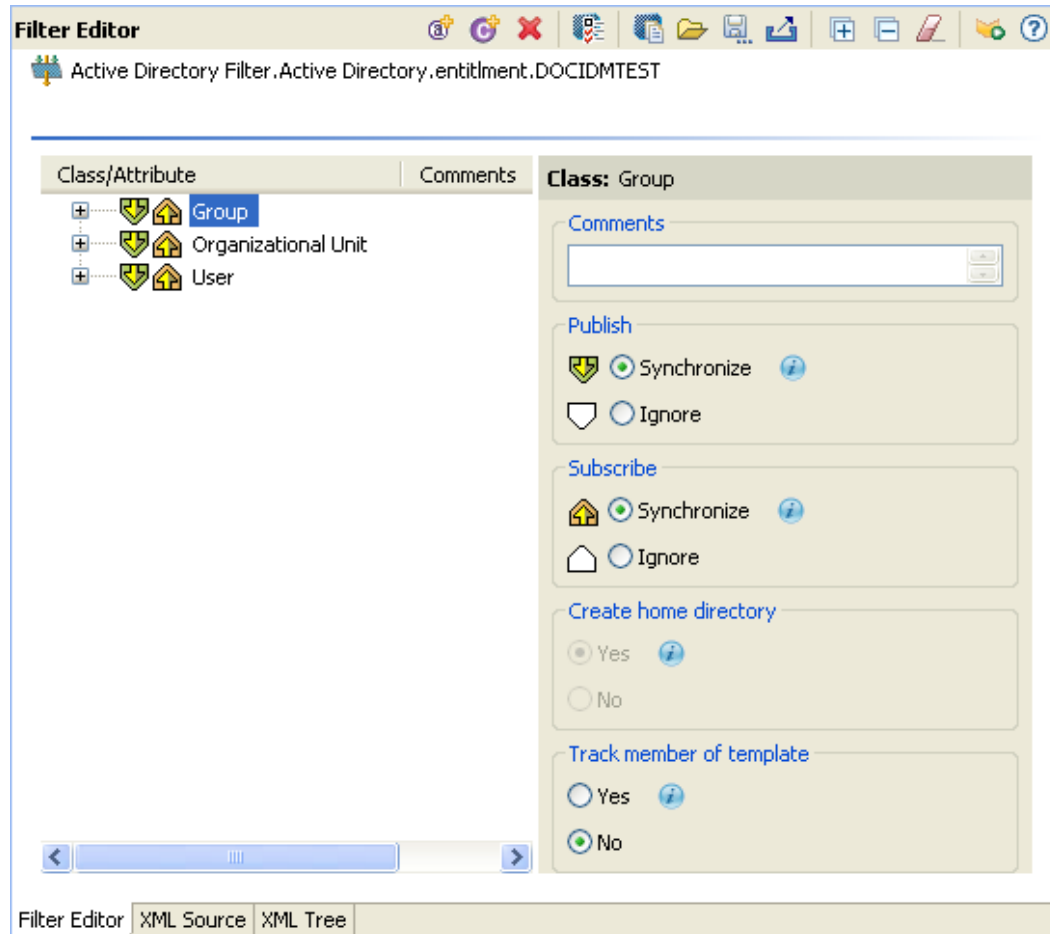
Option	Description
⏴ Move down	Moves the Schema Map policy down in the execution order of the policy.
Export to Configuration File	Saves the Schema Map policy as a .xml file.
Live > Deploy	Deploys the Schema Map policy into the Identity Vault.
Live > Compare	Compares the Schema Map policy in Designer to the Schema Map policy in the Identity Vault.
✖ Delete	Deletes the selected Schema Map policy.
Properties	Allows you to rename the Schema Map policy.

Controlling the Flow of Objects with the Filter

7

The Filter editor allows you to manage the filter. In the Filter editor, you define how each class and attribute should be handled by the Publisher and Subscriber channels.

Figure 7-1 The Filter Editor



When information is synchronized between connected systems, the connected system can receive the changes or just be notified that a change has occurred. Designer displays this information in the Policy Flow view as *Sync* and *Notify* filters.

If a filter is set to Sync, then the objects modifications are automatically synchronized to the connected system. If the filter is set to Notify, then the object modification is reported to the metadirectory engine, but the object is not automatically synchronized. For more information, see [Section 7.2.5, “Changing the Filter Settings,” on page 101.](#)

This section includes the following topics:

- ◆ Section 7.1, “Using the Filter Editor,” on page 96
- ◆ Section 7.2, “Editing the Filter,” on page 100
- ◆ Section 7.3, “Testing the Filter,” on page 106
- ◆ Section 7.4, “Exporting and Importing Filter Files,” on page 106
- ◆ Section 7.5, “Adding Comments to Classes and Attributes,” on page 106
- ◆ Section 7.6, “Viewing the Filter in XML,” on page 107
- ◆ Section 7.7, “Deploying the Filter,” on page 107
- ◆ Section 7.8, “Additional Filter Options,” on page 107

7.1 Using the Filter Editor

The Filter editor allows you to edit filter policies. This section includes the following topics:


- ◆ Section 7.1.1, “Accessing the Filter Editor,” on page 96
- ◆ Section 7.1.2, “Navigating the Filter Editor,” on page 98
- ◆ Section 7.1.3, “Understanding the Filter Editor Toolbar,” on page 99

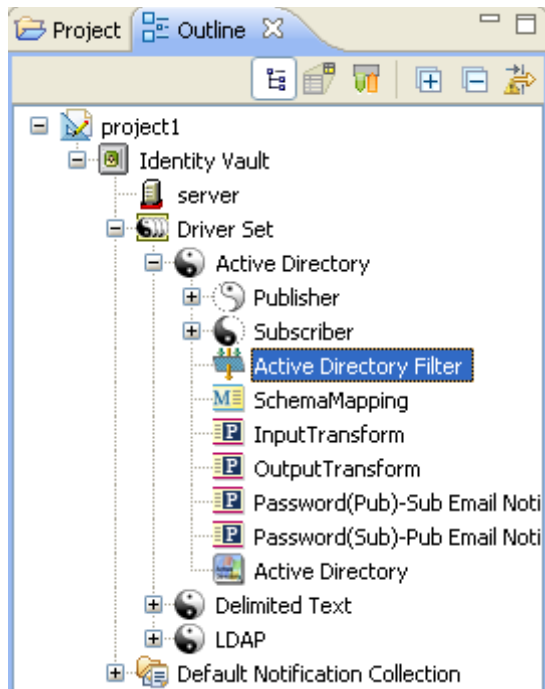
7.1.1 Accessing the Filter Editor

The Filter editor allows you to edit the filter. There are three different ways to access the Filter editor:

- ◆ “Model Outline View” on page 96
- ◆ “Policy Flow View” on page 97
- ◆ “Policy Set View” on page 98


Model Outline View

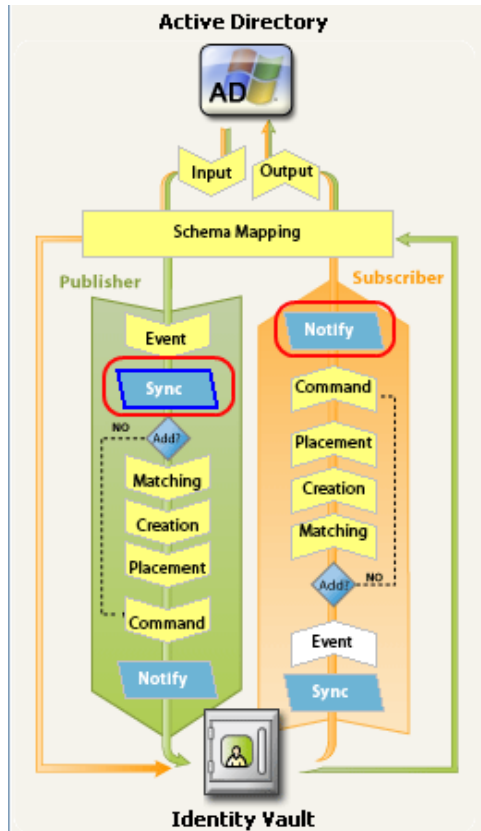
- 1 In the Outline view, select the *Show Model Outline* icon .
- 2 In the Model Outline, open the driver for which you want to manage a filter.



3 Double-click the Filter object (or right-click it and select *Edit*) to launch the Filter editor.

Policy Flow View

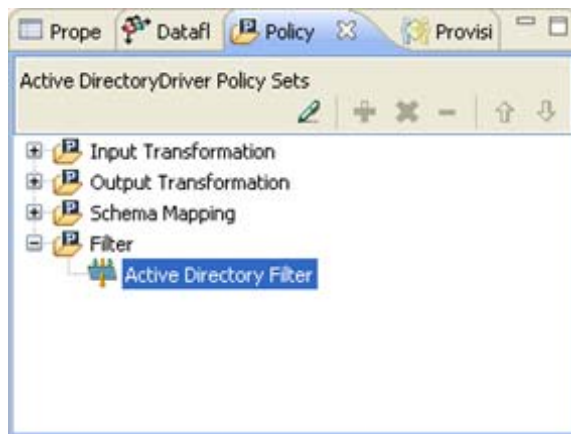
1 In the Outline view, select the *Show Policy Flow* icon. 



- 2 In the Policy Flow, double-click the *Sync* icon or the *Notify* objects (or Right-click and select *Edit Policy > Filter*) to launch the Filter editor.

Policy Set View

- 1 Double-click the filter object in the Policy Set view.



7.1.2 Navigating the Filter Editor

The Filter Editor uses standard point-and-click navigation. However, it also provides keyboard-based navigation options as described in [Table 7-1](#).



NOTE: The Filter Editor lets you order the classes/attributes as needed:








- ◆ Click the header bar above the class/attribute list to switch between ascending and descending order. This sorts both the classes and the attributes within the classes.
 - ◆ Click and drag individual classes or attributes to create a custom order.
-







Table 7-1 Filter Editor Keyboard Support

Keystroke	Description
Up-arrow	Moves the cursor up in the Filter editor.
Down-arrow	Moves the cursor down in the Filter editor.
Left-arrow	Collapses the information displayed.
Right-arrow	Expands the information displayed.
Insert	Adds a class.
Ctrl+Insert	Adds an attribute.
Delete	Deletes the selected items.
Esc	Exits the edit mode.
Ctrl+A	Selects all classes and attributes in the Filter editor.

7.1.3 Understanding the Filter Editor Toolbar

The Filter editor includes a toolbar that provides access to the following features. Each of these features, along with options to Undo  and Redo  recent actions, is also available from a drop-down menu by right-clicking in the Filter Editor.

Tool	Description
	Add Attributes opens the Schema Browser so you can select attributes from the selected class to add to the filter policy. For more information, see “Adding an Attribute” on page 101 .
	Add Classes opens the Schema Browser so you can select classes from the Identity Vault schema to add to the filter policy. For more information, see “Adding a Class” on page 100 .
	<i>Delete</i> deletes the selected attributes and classes from the filter policy.
	<i>Default Attribute Settings</i> lets you define default values for all attributes added to the filter policy. For more information, see Section 7.2.4, “Setting Default Values for Attributes,” on page 101 .
	<i>Copy an Existing Filter</i> lets you copy the filter policy from another Designer object. For more information, see Section 7.2.3, “Copying an Existing Filter,” on page 101 .
	<i>Import Filter</i> imports an existing filter policy from a previously saved XML file. For more information, see Section 7.4.2, “Importing a Filter File,” on page 106 .
	<i>Export Filter</i> saves the current filter policy to an XML file. For more information, see Section 7.4.1, “Exporting a Filter File,” on page 106 .

Tool	Description
	<i>Deploy Filter</i> deploys the filter policy to a live Identity Manager environment. For more information, see Section 7.7, “Deploying the Filter,” on page 107 .
	<i>Expand All</i> expands all Class/Attribute groups in the filter policy.
	<i>Collapse All</i> collapses all Class/Attribute groups in the filter policy.
	<i>Clear Filter</i> deletes all class and attribute entries from the filter policy.
	<i>Launch Policy Simulator</i> launches the Policy Simulator. For more information, see Chapter 9, “Testing Policies with the Policy Simulator,” on page 147 .
	<i>Help</i> launches the context-sensitive help for the Filter editor.

7.2 Editing the Filter

The Filter editor allows you to create and edit the filter. It provides the following primary tasks:

- ♦ [Section 7.2.1, “Removing or Adding Classes and Attributes,” on page 100](#)
- ♦ [Section 7.2.2, “Modifying Multiple Attributes,” on page 101](#)
- ♦ [Section 7.2.3, “Copying an Existing Filter,” on page 101](#)
- ♦ [Section 7.2.4, “Setting Default Values for Attributes,” on page 101](#)
- ♦ [Section 7.2.5, “Changing the Filter Settings,” on page 101](#)



7.2.1 Removing or Adding Classes and Attributes

By removing or adding classes and attributes, you determine the objects that synchronize between the connected data store and the Identity Vault.

- ♦ [“Removing a Class or Attribute” on page 100](#)
- ♦ [“Adding a Class” on page 100](#)
- ♦ [“Adding an Attribute” on page 101](#)

Removing a Class or Attribute

If you do not want a class or an attribute to synchronize, the best practice is to completely remove the class or the attribute from the filter. To remove attributes and classes from the filter, do one of the following:

- ♦ Right-click the class or attribute you want to remove, then select *Delete*.
- ♦ Select the class or attribute you want to remove, then click *Delete* .
- ♦ Click *Clear Filter*  to delete all classes and attributes from the filter.


Adding a Class

- 1 Click *Add Classes* .

You can also right-click in the Filter editor, then select *Add Classes*.

- 2 Browse and select the class you want to add, then click *OK*.
- 3 Change the options to synchronize the information.
- 4 To save the changes, click *File > Save*.

Adding an Attribute


- 1 Click *Add Attributes* .
You can also right-click in the Filter editor, then select *Add Attribute*.
- 2 Browse and select the attribute you want to add, then click *OK*.
- 3 Change the options to synchronize the information.
- 4 To save the changes, click *File > Save*.

7.2.2 Modifying Multiple Attributes

The Filter editor allows you to modify more than one attribute at a time. Press the Ctrl key and select multiple attributes; when the option changes, it is changed for all of the selected attributes.

7.2.3 Copying an Existing Filter

You can copy an existing filter from another driver and use it in the driver you are currently working with.

- 1 Click *Copy an Existing Filter* .
You can also right-click in the Filter editor, then select *Copy an Existing Filter*.
- 2 Browse to and select the filter object you want to copy, then click *OK*.
If you have more than one Identity Vault in your project, you can copy filters from the other Identity Vaults. When you are browsing to select the other object, you can browse to the other Identity Vault and use a filter stored there.

7.2.4 Setting Default Values for Attributes

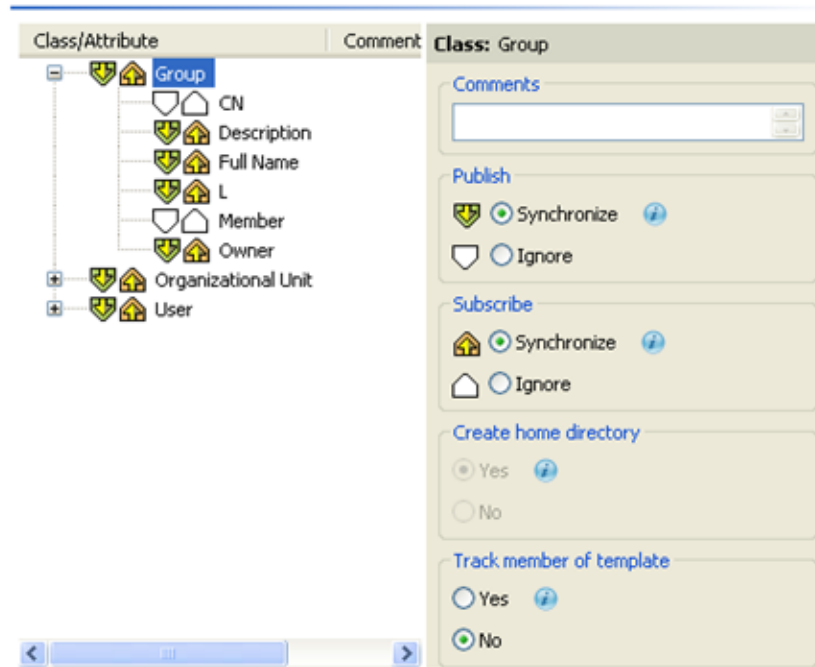
You can define the default values for new attributes when they are added to the filter.

- 1 Click *Default Attribute Settings* .
- 2 Select the options you want new attributes to have, then click *OK*.

7.2.5 Changing the Filter Settings

The Filter editor gives you the option of changing how information is synchronized between the Identity Vault and the connected system. The filter has different settings for classes and attributes.

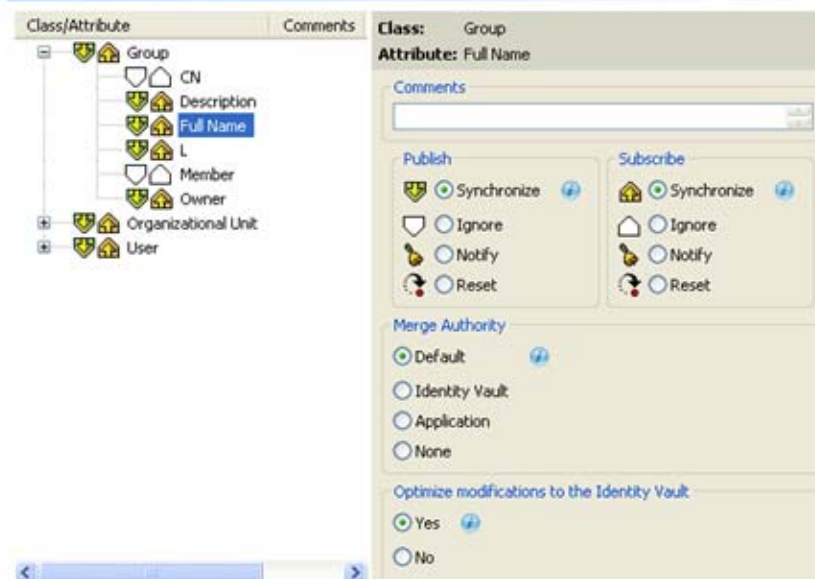
- 1 In the Filter editor, select a class.




2 Change the filter settings for the selected class.

See [Table 7-2 on page 103](#) for information on each of the class settings available in the Filter Editor.

3 In the Filter Editor, select an attribute.



4 Change the filter settings for the selected attribute, then click *Save*  (in the Designer toolbar) to save the changes.

See [Table 7-3 on page 104](#) for information on each of the attribute settings available in the Filter Editor.

Table 7-2 *Filter Editor Class Settings*

Options	Definitions
<i>Publish</i>	<ul style="list-style-type: none"> ◆ Synchronize: Allows the class to synchronize from the connected system into the Identity Vault. ◆ Ignore: Does not synchronize the class from the connected system into the Identity Vault.
<i>Subscribe</i>	<ul style="list-style-type: none"> ◆ Synchronize: Allows the class to synchronize from the Identity Vault into the connected system. ◆ Ignore: Does not synchronize the class from the Identity Vault into the connected system.
<i>Create Home Directory</i>	<p><i>Create Home Directory</i> allows you to create a home directory for a User object in eDirectory. The option only works for eDirectory.</p> <ul style="list-style-type: none"> ◆ Yes: Automatically creates home directories. ◆ No: Does not create home directories.
<i>Track Member of Template</i>	<ul style="list-style-type: none"> ◆ Yes: Determines whether or not the Publisher channel maintains the Member of Template attribute when it creates objects from a template. ◆ No: Does not track the Member of Template attribute. <p>When a User object is created using an eDirectory Template object, the eDirectory driver maintains the Member of Template attribute, if the <i>Track Member of Template</i> option is selected. The option only works for eDirectory.</p>


Table 7-3 *Filter Editor Attribute Settings*

Options	Definitions
<i>Publish</i>	<ul style="list-style-type: none"> ◆ Synchronize: Changes to this object are reported and automatically synchronized. ◆ Ignore: Changes to this object are neither reported nor automatically synchronized. ◆ Notify: Changes to this object are reported, but not automatically synchronized. ◆ Reset: Resets the object value to the value specified by the opposite channel. (You can set this value on either the Publisher channel or Subscriber channel, not both.) <p>The <i>Reset</i> option makes a data store the authoritative source of information. For example, if employee addresses should only be changed in the HR database, then set the <i>Reset</i> option in the filter for this attribute. When an address is changed in the e-mail system and sent to the HR database, the filter sends the information from the HR database back to the e-mail system and the employee's address is not changed.</p>
<i>Subscribe</i>	<ul style="list-style-type: none"> ◆ Synchronize: Changes to this object are reported and automatically synchronized. ◆ Ignore: Changes to this object are neither reported nor automatically synchronized. ◆ Notify: Changes to this object are reported, but not automatically synchronized. ◆ Reset: Resets the object value to the value specified by the opposite channel. (You can set this value on either the Publisher channel or Subscriber channel, not both.) <p>The <i>Reset</i> option makes a data store the authoritative source of information. For example, if employee addresses should only be changed in HR database, then set the <i>Reset</i> option in the filter for this attribute. When an address is changed in the e-mail system and sent to the HR database, the filter sends the information from the HR database back to the e-mail system and the employee's address is not changed.</p>

Options	Definitions
<i>Merge Authority</i>	<ul style="list-style-type: none"> ◆ Default: If an attribute is not being synchronized in either channel, no merging occurs. <p>If an attribute is being synchronized in one channel and not the other, then all existing values on the destination for that channel are removed and replaced with the values from the source for that channel. If the source has multiple values and the destination can only accommodate a single value, then only one of the values is used on the destination side.</p> <p>If an attribute is being synchronized in both channels and both sides can accommodate only a single value, the connected application acquires the Identity Vault values unless there is no value in the Identity Vault. If this is the case, the Identity Vault acquires the values from the connected application (if any).</p> <p>If an attribute is being synchronized in both channels and only one side can accommodate multiple values, the single-valued side's value is added to the multi-valued side if it is not already there. If there is no value on the single side, you can choose the value to add to the single side.</p>
<i>Optimize Modification to Identity Manager</i>	<p>This is always valid behavior.</p> <ul style="list-style-type: none"> ◆ Identity Vault: Behaves the same way as the default behavior if the attribute is being synchronized on the Subscriber channel and not on the Publisher channel. <p>This is valid behavior when synchronizing on the Subscriber channel.</p> <ul style="list-style-type: none"> ◆ Application: Behaves the same as the default behavior if the attribute is being synchronized on the Publisher channel and not on the Subscriber channel. <p>This is valid behavior when synchronizing on the Publisher channel.</p> <ul style="list-style-type: none"> ◆ None: No merging occurs regardless of synchronization. <ul style="list-style-type: none"> ◆ Yes: Changes to this attribute are examined on the Publisher channel to determine the minimal change made in the Identity Vault. ◆ No: Changes are not examined. <p>When an operation is a Modify on the Publisher channel, the Metadirectory engine examines the current state of the object in the Identity Vault and changes the Modify to update only the values that are changing. For example, if an object has attributes of a, b, c, and d and the Publisher channel receives a Modify event to remove all existing values and add a, b, d, and e, the optimize process knows that the minimal change is to remove d and add e.</p> <p>Using this option can take a long time to process events on attributes that have more than 1,000 values.</p>

7.3 Testing the Filter

Designer comes with a tool called the Policy Simulator, which allows you to test policies without implementing them in a production environment. You can launch the Policy Simulator through the Filter editor to test your policy after you have modified it.

- 1 Click *Launch Policy Simulator* .
- 2 Select *To Identity Vault* or *From Identity Vault* as the simulation point of the filter.


For more information on the Policy Simulator, see [Chapter 9, “Testing Policies with the Policy Simulator,”](#) on page 147.

7.4 Exporting and Importing Filter Files


Designer allows you to Import an XML filter file from a particular point on the file system to the filter editor. It also allows you to Export an XML filter file to a particular location on the file system.

- ♦ [Section 7.4.1, “Exporting a Filter File,”](#) on page 106
- ♦ [Section 7.4.2, “Importing a Filter File,”](#) on page 106

7.4.1 Exporting a Filter File

- 1 Select *Export Filter* .
- 2 In the Export Filter dialog box, specify a file name and location for the XML filter file, then click *Save*.

7.4.2 Importing a Filter File

- 1 Select *Import Filter* .
- 2 In the Import Filter File dialog box, browse to the filter file you want to import, then click *Open*.
Specify whether you want to append the imported filter rules to the existing filter rules, or replace the existing filter rules with the imported filter rules.

NOTE: Both the Import and Export features enable the user to export filter editor documents and re-import them if required, thereby avoiding the need to redo the entire task of adding classes and attributes and assigning their properties.

7.5 Adding Comments to Classes and Attributes

Filter Editor lets you add additional comments to the classes and attributes in the filter. These comments are visible in the Filter Editor, and in Designer’s generated documentation for the project.

- 1 In the Filter Editor, select the class or attribute to which you want to add a comment, then type the desired comment in the *Comments* field.


Once entered, the comment is visible in the Comments column next to its associated class or attribute.

7.6 Viewing the Filter in XML

Designer enables you to view, edit, and validate the XML by using an XML editor. Click the *XML Source* tab or the *XML Tree* tab to access the XML editor. For more information about the XML editor, see “The Novell XML Editor” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

7.7 Deploying the Filter

To deploy the filter to the live Identity Vault:

1 Click *Deploy Filter* .

2 In the Deployment Summary page, click *Deploy*.

The Deployment Summary displays Designer’s Compare feature so you know what the differences are between Designer’s filter and the currently deployed filter, if any. For more information about the Compare feature, see “Using the Compare Feature When Deploying” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

3 In the Deployment Results page, click *OK*.

The Deployments Results page notes any errors or warnings that occurred during the deployment process.

7.8 Additional Filter Options




When you right-click a filter object, there are multiple options presented in the Outline view, the Policy Flow view, and the Policy Set view.

- ♦ [Section 7.8.1, “Outline View Additional Options,” on page 107](#)
- ♦ [Section 7.8.2, “Policy Flow View Additional Options,” on page 108](#)
- ♦ [Section 7.8.3, “Policy Set View Additional Options,” on page 109](#)

7.8.1 Outline View Additional Options

The Outline view offers the following filter-related options. To access them, right-click the filter object in the Outline view.

Table 7-4 Filter Outline View Additional Options




Option	Description
 Edit	Launches the Filter editor. For more information, see Section 7.2, “Editing the Filter,” on page 100 .
 Save As	Saves the filter as a <code>.xml</code> file.
 Simulate	Launches the Policy Simulator. For more information, see Section 7.3, “Testing the Filter,” on page 106 .
Export to Configuration File	Saves the filter as a <code>.xml</code> file.

Option	Description
Live > Deploy	Deploys the filter into the Identity Vault.
Live > Compare	Compares the filter with an existing filter object in the Identity Vault.
Open With > Designer Built-in Editor	Launches the Filter editor. For more information, see Section 7.2, “Editing the Filter,” on page 100 .
Open With > Novell XML Editor	Launches the XML editor. For more information, see “ The Novell XML Editor ” in the <i>Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide</i> .
Open With > Text Editor	Launches the built-in text editor.

7.8.2 Policy Flow View Additional Options

The Policy Flow view offers the following filter-related options. To access them, right-click the filter object in the Policy Flow view.

Table 7-5 Filter Policy Flow View Additional Options




Option	Description
 Edit	Launches the Filter edit. For more information, see Section 7.2, “Editing the Filter,” on page 100 .
 Save As	Saves the selected Policy Set as a .xml file.
 Simulate	Launches the Policy Simulator. For more information, see Section 7.3, “Testing the Filter,” on page 106 .
Live > Import	Allows you to import filter details from the Identity Vault.
Live > Deploy	Allows you to deploy the filter into the Identity Vault.
Live > Compare	Compares the filter to an existing filter in the Identity Vault.
Live > Driver Configuration > Import Attributes	Allows you to import attributes from the Identity Vault and compare the attributes from the Identity Vault to what is in Designer.
Live > Driver Configuration > Deploy Attributes	Allows you to deploy attributes from Designer into the Identity Vault and compare the attributes from Designer with the attributes in the Identity Vault.
Live > Driver Configuration > Compare Attributes	Allows you to compare attributes from the selected Schema Map policy to attributes in the Identity Vault.
Live > Driver Status	Displays the status of the driver.
Live > Start Driver	Starts the driver.
Live > Stop Driver	Stops the driver.

Option	Description
Live > Restart Driver	Restarts the driver.

7.8.3 Policy Set View Additional Options

The Policy Set view offers the following filter-related options. To access them, right-click the filter object in the Policy Set view.

Table 7-6 Filter Policy Set View Additional Options

Option	Description
 Edit	Launches the Filter editor. For more information, see Section 7.2, “Editing the Filter,” on page 100.
 Save As	Saves the filter as a .xml file.
 Simulate	Launches the Policy Simulator. For more information, see Section 7.3, “Testing the Filter,” on page 106.
Export to a Configuration File	Save the filter as a .xml file.
Live > Deploy	Allows you to deploy the filter into the Identity Vault.
Live > Compare	Compares the filter to an existing filter in the Identity Vault.

Using Predefined Rules

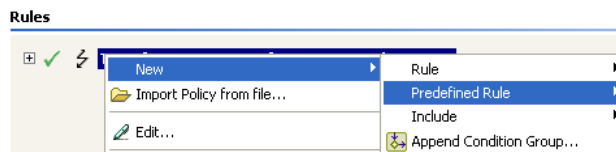
8

Designer includes 19 predefined rules. You can import and use these rules as well as create your own rules. These rules include common tasks that administrators use. You need to provide information specific to your environment to customize the rules.

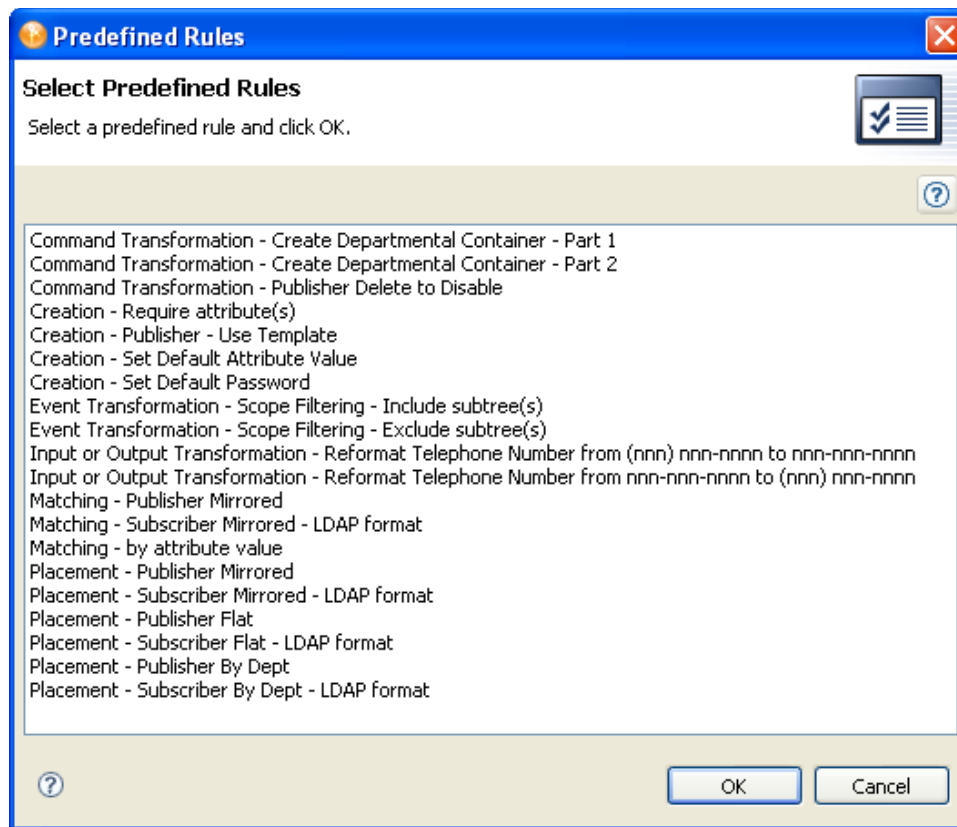
- ◆ Section 8.1, “Command Transformation - Create Departmental Container - Part 1 and Part 2,” on page 112
- ◆ Section 8.2, “Command Transformation - Publisher Delete to Disable,” on page 115
- ◆ Section 8.3, “Creation - Require Attributes,” on page 116
- ◆ Section 8.4, “Creation - Publisher - Use Template,” on page 118
- ◆ Section 8.5, “Creation - Set Default Attribute Value,” on page 119
- ◆ Section 8.6, “Creation - Set Default Password,” on page 121
- ◆ Section 8.7, “Event Transformation - Scope Filtering - Include Subtrees,” on page 123
- ◆ Section 8.8, “Event Transformation - Scope Filtering - Exclude Subtrees,” on page 124
- ◆ Section 8.9, “Input or Output Transformation - Reformat Telephone Number from (nnn) nnn-nnnn to nnn-nnn-nnnn,” on page 126
- ◆ Section 8.10, “Input or Output Transformation - Reformat Telephone Number from nnn-nnn-nnnn to (nnn) nnn-nnnn,” on page 128
- ◆ Section 8.11, “Matching - Publisher Mirrored,” on page 129
- ◆ Section 8.12, “Matching - Subscriber Mirrored - LDAP Format,” on page 131
- ◆ Section 8.13, “Matching - By Attribute Value,” on page 133
- ◆ Section 8.14, “Placement - Publisher Mirrored,” on page 134
- ◆ Section 8.15, “Placement - Subscriber Mirrored - LDAP Format,” on page 136
- ◆ Section 8.16, “Placement - Publisher Flat,” on page 138
- ◆ Section 8.17, “Placement - Subscriber Flat - LDAP Format,” on page 140
- ◆ Section 8.18, “Placement - Publisher By Dept,” on page 142
- ◆ Section 8.19, “Placement - Subscriber By Dept - LDAP Format,” on page 144

To access the predefined rules:

- 1 In the Policy Builder, right-click and select *New > Predefined Rules > Insert Predefined Rule Before* or *Insert Predefined Rule After*.



The Predefined Rules dialog box displays a list of the available rules.




8.1 Command Transformation - Create Departmental Container - Part 1 and Part 2

This rule creates a department container in the destination data store, if one does not exist. Implement the rule on the Command Transformation policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.


There are two steps involved in using the predefined rules: creating a policy in the Command Transformation policy set and importing the predefined rule. If you already have a Command Transformation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.1.1, “Creating a Policy,”](#) on page 112
- ♦ [Section 8.1.2, “Importing the Predefined Rule,”](#) on page 113
- ♦ [Section 8.1.3, “How the Rule Works,”](#) on page 114

8.1.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.
- 2 Select the Command Transformation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.

- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:




Policy Container:

Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Command Transformation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).



8.1.2 Importing the Predefined Rule



- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Command Transformation - Create Department Container - Part 1*, then click *OK*.

   **Command Transformation - Create Departmental Container - Part 1**



No description available



Conditions

  **Condition Group 1**

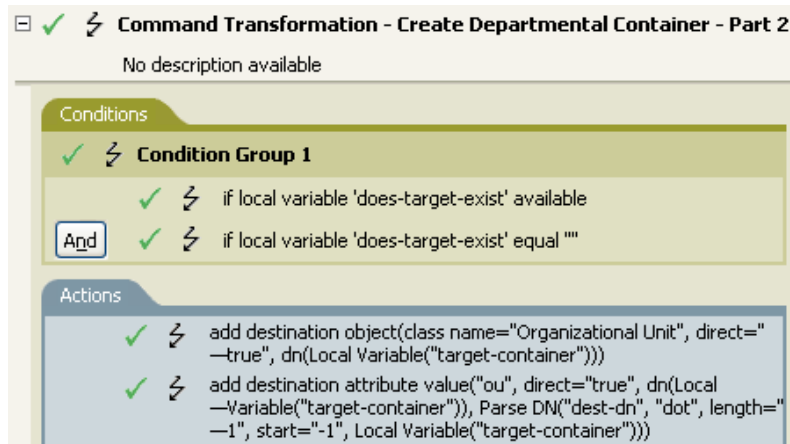
  if operation equal "add"

Actions

  set local variable("target-container", Destination DN(length="-2"))

  set local variable("does-target-exist", Destination Attribute —("objectclass", class name="Organizational Unit", dn(Local —Variable("target-container"))))

- 3 Right-click in the Policy Builder and click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 4 Select *Command Transformation - Create Department Container - Part 2*, then click *OK*.



5 Save the rule by clicking *File > Save*.

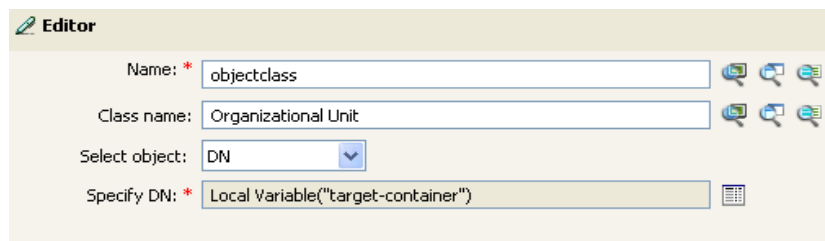
There is no information to change that is specific to your environment.

IMPORTANT: Make sure that the rules are listed in order. Part 1 must be executed before Part 2.

8.1.3 How the Rule Works

This rule is used when the destination location for an object does not exist. Instead of getting a veto because the object cannot be placed, this rule creates the container and places the object in the container.

Part 1 looks for any Add event. When the Add event occurs, two local variables are set. The first local variable is named target-container. The value of target-container is set to the destination DN. The second local variable is named does-target-exist. The value of does-target-exist is set to the destination attribute value of objectclass. The class is set to OrganizationalUnit. The DN of the OrganizationalUnit is set to the local variable of target-container.



Part 2 checks to see if the local variable does-target-exist is available. It also checks to see if the value of the local variable does-target-exist is set to a blank value. If the value is blank, then an Organizational Unit object is created. The DN of the organizational unit is set to the value of the local variable target-container. It also adds the value for the OU attribute. The value of the OU attribute is set to the local variable of target-container. It uses the source format as the destination DN and the destination format is dot format.


8.2 Command Transformation - Publisher Delete to Disable


This rule transforms the Delete event for a user object into disabling the user object. Implement the rule on the Command Transformation policy in the driver. The rule needs to be implemented on the Publisher channel.

There are two steps involved in using the predefined rules: creating a policy in the Command Transformation policy set and importing the predefined rule. If you already have a Command Transformation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.2.1, “Creating a Policy,”](#) on page 115
- ♦ [Section 8.2.2, “Importing the Predefined Rule,”](#) on page 115
- ♦ [Section 8.2.3, “How the Rule Works,”](#) on page 116

8.2.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Command Transformation policy set in the Policy Set view, then click *Create or add a new policy to the policy set* icon  to create a new policy.
- 3 Select *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

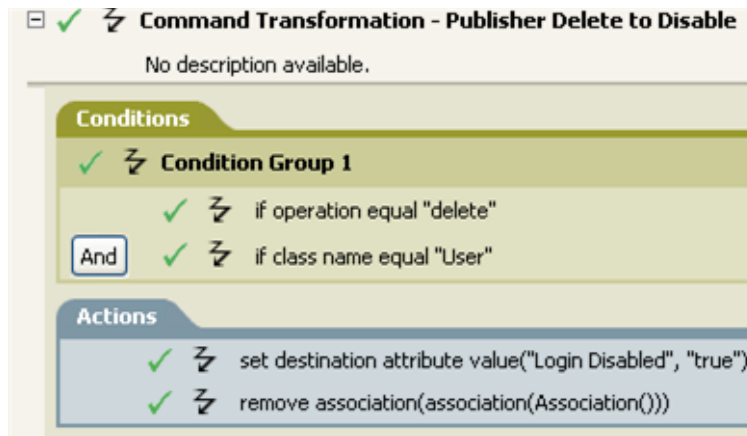
Policy Container:

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Command Transformation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.2.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Command Transformation - Publisher Delete to Disable*, then click *OK*.

- 3 Expand the predefined rule.



- 4 Save the rule by clicking *File > Save*.

There is no information to change in the rule that is specific to your environment.

8.2.3 How the Rule Works

This rule is used when a Delete event occurs in the connected data store. Instead of the user object being deleted in the Identity Vault, the User object is disabled. Anytime a Delete event occurs for a User object, the destination attribute value of Login Disabled is set to True and the association is removed from the User object. The User object can no longer log in to the Novell eDirectory tree, but the User object was not deleted.


8.3 Creation - Require Attributes

This rule does not allow user objects to be created unless the required attributes are populated. Implement the rule on the Creation policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.


There are two steps involved in using the predefined rules: creating a policy in the Creation policy set and importing the predefined rule. If you already have a Creation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.3.1, "Creating a Policy,"](#) on page 116
- ♦ [Section 8.3.2, "Importing the Predefined Rule,"](#) on page 117
- ♦ [Section 8.3.3, "How the Rule Works,"](#) on page 118

8.3.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.
- 2 Select the Creation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.

- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

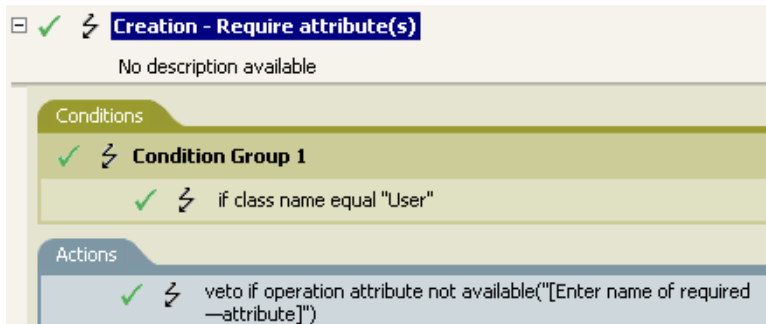
Policy Container:

Open the editor after creating the object.

- 6 Select *Open Editor* after creating policy, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Creation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.3.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder and click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Creation - Require attributes*, then click *OK*.
- 3 Expand the predefined rule.



Creation - Require attribute(s)

No description available

Conditions

Condition Group 1

if class name equal "User"

Actions

veto if operation attribute not available("[Enter name of required attribute]")

- 4 Edit the action by double-clicking the *Actions* tab.
- 5 In the *Specify Name* field, browse to and select the attributes you require for a User object to be created, then click *OK*.
- 6 Click *OK*.
- 7 Save the rule by selecting *File > Save*.

8.3.3 How the Rule Works

This rule is used when your business processes require a user to have specific attributes populated when the user object is created. When a user object is created, the rule vetoes the creation of the object unless the required attributes are provided. You can have one or more required attributes.

If you want more than one required attribute, right-click the *Actions* tab and select *Append Action*. Select *veto if operation attribute not available*, then browse to the attribute you want to require.


8.4 Creation - Publisher - Use Template

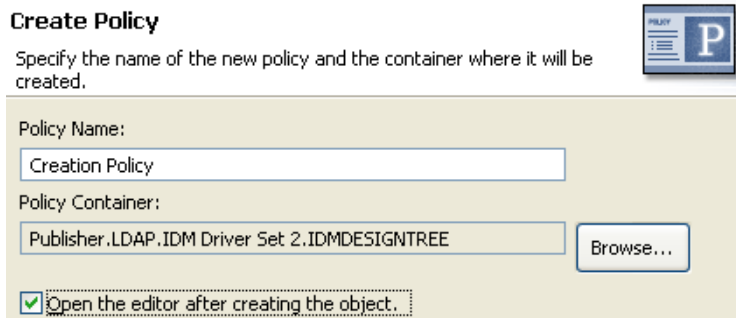
This rule allows the use of a Novell eDirectory template object during the creation of a User object. Implement the rule on the Publisher Creation policy in the driver. You can implement the rule only on the Publisher channel.

There are two steps involved in using the predefined rules: creating a policy in the Creation policy set and importing the predefined rule. If you already have a Creation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.4.1, “Creating a Policy,” on page 118](#)
- ♦ [Section 8.4.2, “Importing the Predefined Rule,” on page 119](#)
- ♦ [Section 8.4.3, “How the Rule Works,” on page 119](#)

8.4.1 Creating a Policy

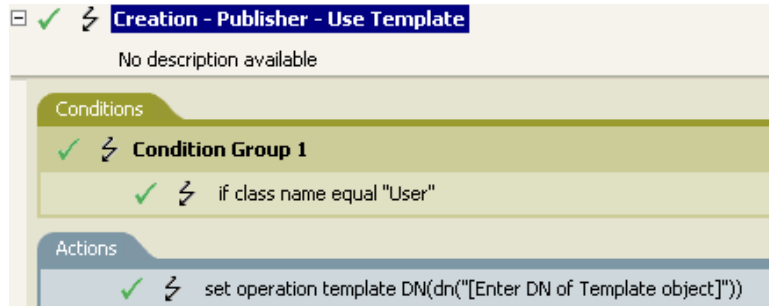
- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Creation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set icon*  to create a new policy.
- 3 Select *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.




- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Creation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.4.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Creation - Publisher - Use Template*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 Delete *[Enter DN of Template object]* from the *Enter DN* field.
- 6 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 7 Select *Text* in the noun list.
- 8 Double-click *Text* to add it to the argument.
- 9 In the editor, click the browse icon, browse to and select the template object, then click *OK*.
- 10 Click *Finish*.
- 11 Save the rule by clicking *File > Save*.

8.4.3 How the Rule Works

This rule is used when you want to use a template object to create a user in the Identity Vault. If you have attributes that are the same for different users, using the template saves time. You fill in the information in the template object, and when the User object is created, Identity Manager calls the template and uses that to create the User object.

During the creation of User objects, the rule performs the action of the set operation template DN. The action calls the template object and creates the User object with the information in the template.


8.5 Creation - Set Default Attribute Value


This rule allows you to set default values for attributes that are assigned during the creation of User objects. Implement the rule on the Subscriber Creation policy or Publisher Creation policy in the driver.

There are two steps involved in using the predefined rules: creating a policy in the Creation policy set and importing the predefined rule. If you already have a Creation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.5.1, “Creating a Policy,”](#) on page 120
- ♦ [Section 8.5.2, “Importing the Predefined Rule,”](#) on page 120
- ♦ [Section 8.5.3, “How the Rule Works,”](#) on page 121

8.5.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.
- 2 Select the Creation policy set in the Policy Set view, then click the *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

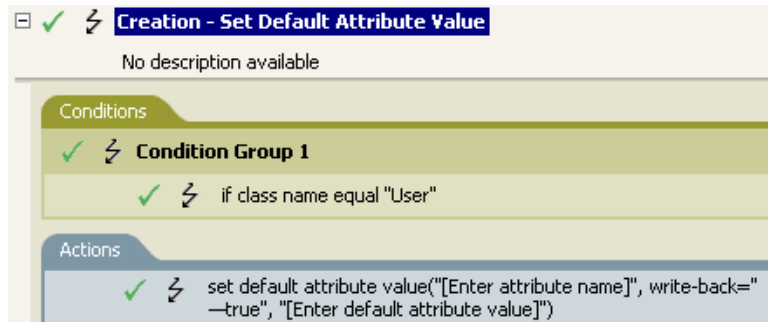
Policy Container:



Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Creation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.5.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Creation - Set Default Attribute Value*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 In the *Specify attribute name* field, click the browse icon, then browse to and select the attribute you want to create.
- 6 Click the *Edit the value list* icon  to launch the Argument Value List Builder.
- 7 Select the type of data you want the value to be.
- 8 Delete *[Enter default attribute value]*, then click the *Edit the arguments* icon  to launch the Argument Builder.
- 9 Create the value for the attribute in the Argument Builder, then click *OK*.
- 10 Click *Finish*.
- 11 Save the rule by clicking *File > Save*.

8.5.3 How the Rule Works

This rule is used when you want to create a User object with default attributes and values. When a User object is created, the rule sets the attribute and the value for that attribute.

If you want more than one attribute value defined, right-click the *Actions* tab and click *Append Action*. Select the action, set the default attribute value, and follow [Step 1 on page 120](#) through [Step 11 on page 121](#) to assign the value to the attribute.

8.6 Creation - Set Default Password


During the creation of user objects, this rule sets a default password for user objects. Implement the rule on the Creation policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.


There are two steps involved in using the predefined rules: creating a policy in the Creation policy set and importing the predefined rule. If you already have a Creation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.6.1, “Creating a Policy,” on page 121](#)
- ♦ [Section 8.6.2, “Importing the Predefined Rule,” on page 122](#)
- ♦ [Section 8.6.3, “How the Rule Works,” on page 123](#)

8.6.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.

- 2 Select the Creation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:




Policy Container:

Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Creation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).



8.6.2 Importing the Predefined Rule



- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Creation - Set Default Password*, then click *OK*.
- 3 Expand the predefined rule.

   **Creation - Set Default Password**



No description available

Conditions

  **Condition Group 1**

  if class name equal "User"

Actions

  set destination password(Attribute("Given Name")+Attribute—"Surname"))

- 4 Save the rule by clicking *File > Save*.

There is no information to change in the rule that is specific to your environment.

8.6.3 How the Rule Works

This rule is used when you want User objects to be created with a default password. During the creation of a User object, the password that is set for the User object is the Given Name attribute plus the Surname attribute of the User object.

You can change the value of the default password by editing the argument. You can use the Argument Builder to set the password to any other value you want.


8.7 Event Transformation - Scope Filtering - Include Subtrees


This rule excludes all events that occur except for the specific subtree. Implement the rule on the Event Transformation policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.

There are two steps involved in using the predefined rules: creating a policy in the Event Transformation policy set and importing the predefined rule. If you already have an Event Transformation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.7.1, “Creating a Policy,”](#) on page 123
- ♦ [Section 8.7.2, “Importing the Predefined Rule,”](#) on page 124
- ♦ [Section 8.7.3, “How the Rule Works,”](#) on page 124

8.7.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.
- 2 Select the Event Transformation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

Policy Container:

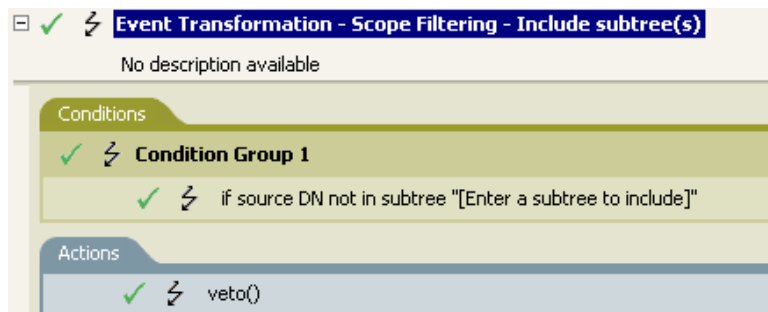
Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.

- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Event Transformation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.7.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then select *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Event Transformation - Scope Filtering - Include subtrees*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 Delete *[Enter a subtree to include]* in the *Value* field.
- 6 Click the browse button to browse the Identity Vault for the part of the tree you were you want events to synchronize, then click *OK*.
- 7 Click *OK*.
- 8 Save the rule by clicking *File > Save*.

8.7.3 How the Rule Works

This rule is used when you want to exclude part of the Identity Vault from synchronizing. It allows you to synchronize some objects and not other objects, without using the Filter. When an event occurs anywhere but in that specific part of the Identity Vault, it is vetoed.


8.8 Event Transformation - Scope Filtering - Exclude Subtrees


This rule excludes all events that occur in a specific subtree. Implement the rule on the Event Transformation policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.

There are two steps involved in using the predefined rules: creating a policy in the Event Transformation policy set and importing the predefined rule. If you already have an Event Transformation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.8.1, “Creating a Policy,”](#) on page 125
- ♦ [Section 8.8.2, “Importing the Predefined Rule,”](#) on page 125
- ♦ [Section 8.8.3, “How the Rule Works,”](#) on page 126

8.8.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.
- 2 Select the Event Transformation policy set in Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

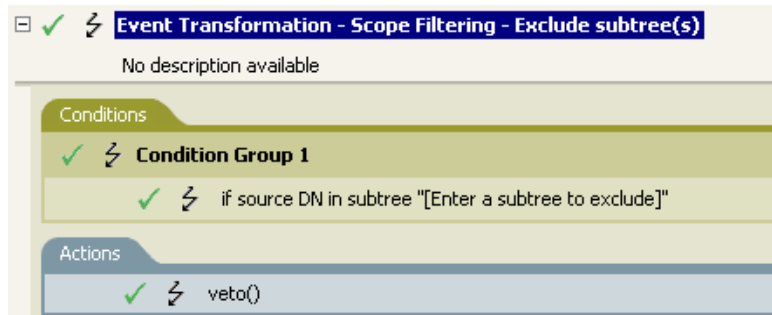
Policy Container:

Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Event Transformation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.8.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule*.
- 2 Select *Event Transformation - Scope Filtering - Exclude subtrees*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 Delete *[Enter a subtree to exclude]* in the *Value* field.
- 6 Click the browse icon to browse the Identity Vault for the part of the tree where you want to exclude events from synchronizing, then click *OK*.
- 7 Click *OK*.
- 8 Save the rule by clicking *File > Save*.

8.8.3 How the Rule Works

This rule is used when you want to exclude part of the Identity Vault from synchronizing. It allows you to synchronize some objects and not other objects, without using the Filter. When an event occurs in that specific part of the Identity Vault, it is vetoed.


8.9 Input or Output Transformation - Reformat Telephone Number from (nnn) nnn-nnnn to nnn-nnn-nnnn

This rule transforms the format of the telephone number when a desired condition is met. Implement the rule on the Input or Output Transformation policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.

There are two steps involved in using the predefined rules: creating a policy in the Input or Output Transformation policy set and importing the predefined rule. If you already have an Input or Output Transformation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.9.1, “Creating a Policy,” on page 126](#)
- ♦ [Section 8.9.2, “Importing the Predefined Rule,” on page 127](#)
- ♦ [Section 8.9.3, “How the Rule Works,” on page 127](#)

8.9.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select a driver.
- 2 Select the Input or Output Transformation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.

- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy

Specify the name of the new policy and the container where it will be created.

Policy Name:

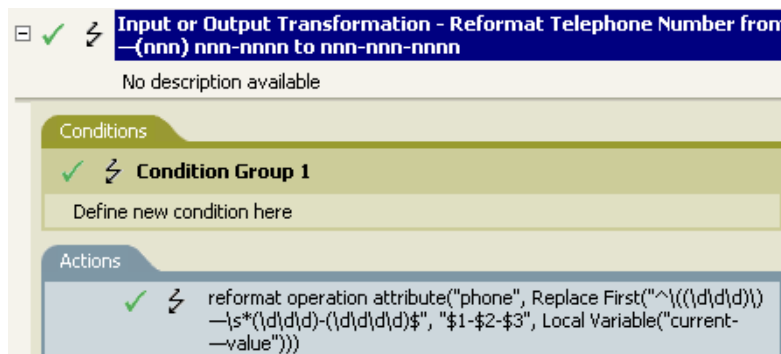
Policy Container:

Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Input or Output Transformation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.9.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Input or Output Transformation - Reformat Telephone Number from (nnn) nnn-nnnn to nnn-nnn-nnnn*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 Define the condition you want to have occur when the telephone number is reformatted.
- 6 Click *OK*.
- 7 Save the rule by clicking *File > Save*.

8.9.3 How the Rule Works

This rule is used when you want to reformat the telephone number. You define the condition that is to be met when the telephone number is reformatted.


8.10 Input or Output Transformation - Reformat Telephone Number from nnn-xxx-xxxx to (xxx) xxx-xxxx


This rule transforms the format of the telephone number when a desired condition is met. Implement the rule on the Input or Output Transformation policy. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.

There are two steps involved in using the predefined rules; creating a policy in the Input or Output Transformation policy set and importing the predefined rule. If you already have an Input or Output Transformation policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.10.1, “Creating a Policy,” on page 128](#)
- ♦ [Section 8.10.2, “Importing the Predefined Rule,” on page 128](#)
- ♦ [Section 8.10.3, “How the Rule Works,” on page 129](#)

8.10.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select a driver.
- 2 Select the Input or Output Transformation policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

Policy Container:

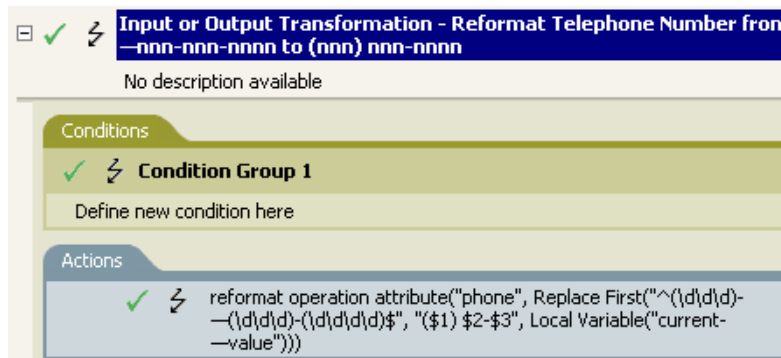
Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Input or Output Transformation policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.10.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder and click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.

- 2 Click *Input or Output Transformation - Reformat Telephone Number from nnn-xxx-xxxx to (nnn) xxx-xxxx*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 Define the condition you want to have occur when the telephone number is reformatted.
- 6 Click *OK*.
- 7 Save the rule by clicking *File > Save*.

8.10.3 How the Rule Works

This rule is used when you want to reformat the telephone number. You define the condition that is to be met when the telephone number is reformatted.


8.11 Matching - Publisher Mirrored

This rule matches for objects in the Identity Vault by using the mirrored structure in the data store from a specified point. Implement the rule on the Matching policy in the driver. You can implement the rule only on the Publisher channel.

There are two steps involved in using the predefined rules: creating a policy in the Matching policy set and importing the predefined rule. If you already have a Matching policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.11.1, “Creating a Policy,” on page 129](#)
- ♦ [Section 8.11.2, “Importing the Predefined Rule,” on page 130](#)
- ♦ [Section 8.11.3, “How the Rule Works,” on page 131](#)

8.11.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Matching policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy

Specify the name of the new policy and the container where it will be created.



Policy Name:

Matching

Policy Container:

Publisher.LDAP.IDM Driver Set 2.IDMDESIGNTREE

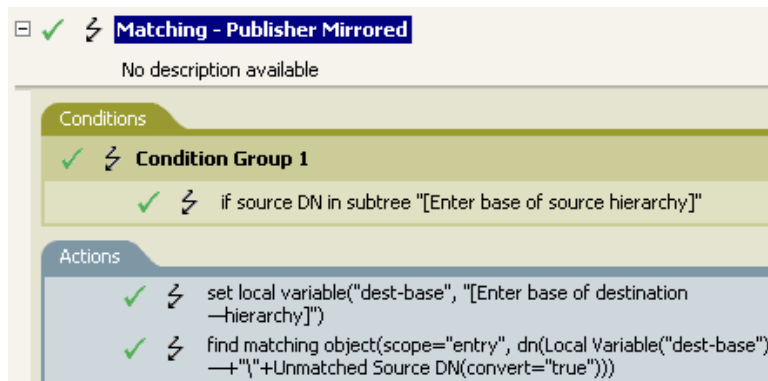
Browse...


Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Matching policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.11.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Matching - Publisher Mirrored*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 In the *Value* field, browse to and select the container in the source hierarchy where you want the matching to start, then click *OK*.
- 6 Click *OK*.
- 7 Edit the action by double-clicking the *Actions* tab.
- 8 Delete *[Enter base of destination hierarchy]* from the *Specify string* field.
- 9 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 10 Select *Text* in the noun list.
- 11 Double-click *Text* to add it to the argument.

- 12 In the editor, click the browse button, browse to the container in the destination hierarchy where you want the source structure to be matched, then click *OK*.
- 13 Click *Finish*.
- 14 Save the rule by clicking *File > Save*.

8.11.3 How the Rule Works

This rule matches for objects in the Identity Vault by using the mirrored structure in the data store from a specified point. When an Add event occurs and the driver checks to see if the object exists, it starts checking at the specific DN in the data store. The driver then sets a local variable of dest-base to be the starting point in the Identity Vault that the structure is mirrored to in the data store. The driver then creates the context it is searching by adding the local variable of dest-base plus a \ and the source DN of the object. It creates the path it is looking for in the slash format.


8.12 Matching - Subscriber Mirrored - LDAP Format

This rule matches for objects in the data store by using the mirrored structure in the Identity Vault from a specified point. Implement the rule on the Matching policy in the driver. You can implement the rule only on the Subscriber channel.

There are two steps involved in using the predefined rules: creating a policy in the Matching policy set and importing the predefined rule. If you already have a Matching policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.12.1, “Creating a Policy,” on page 131](#)
- ♦ [Section 8.12.2, “Importing the Predefined Rule,” on page 132](#)
- ♦ [Section 8.12.3, “How the Rule Works,” on page 132](#)

8.12.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Subscriber channel.
- 2 Select the Matching policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy

Specify the name of the new policy and the container where it will be created.



Policy Name:

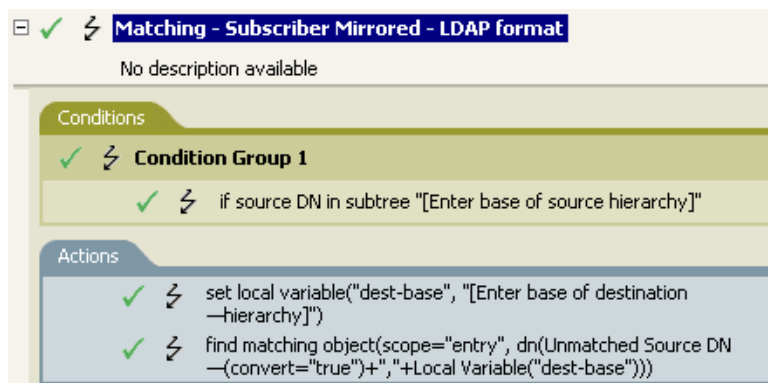
Policy Container:


Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Matching policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.12.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Matching - Subscriber Mirrored - LDAP format*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 In the *Value* field, browse to and select the container in the source hierarchy where you want the matching to start, then click *OK*.
- 6 Click *OK*.
- 7 Edit the action by double-clicking the *Actions* tab.
- 8 Delete *[Enter base of destination hierarchy]* from the *Specify String* field.
- 9 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 10 Select *Text* in the noun list.
- 11 Double-click *Text* to add it to the argument.
- 12 In the editor, click the browse icon, browse to and select the container in the destination hierarchy where you want the source structure to be matched, then click *OK*.
- 13 Click *Finish*.
- 14 Save the rule by clicking *File > Save*.

8.12.3 How the Rule Works

This rule matches for objects in the data store by using the mirrored structure in the Identity Vault from a specified point. When an Add event occurs and the driver checks to see if the object exists, it starts checking at the specific DN in the Identity Vault. The driver then sets a local variable of dest-

base to be the starting point in the data store that the structure is mirrored to in the Identity Vault. The driver then creates the context it is searching by adding the source DN of the object and a local variable of dest-base. It creates the path it is looking for in LDAP format.


8.13 Matching - By Attribute Value


This rule matches for objects by specific attribute values. Implement the rule on the Matching policy in the driver. You can implement the rule on either the Subscriber or the Publisher channel or on both channels.

There are two steps involved in using the predefined rules; creating a policy in the Matching policy set and importing the predefined rule. If you already have a Matching policy that you would like to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.13.1, “Creating a Policy,” on page 133](#)
- ♦ [Section 8.13.2, “Importing the Predefined Rule,” on page 134](#)
- ♦ [Section 8.13.3, “How the Rule Works,” on page 134](#)

8.13.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher or Subscriber channel.
- 2 Select the Matching policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

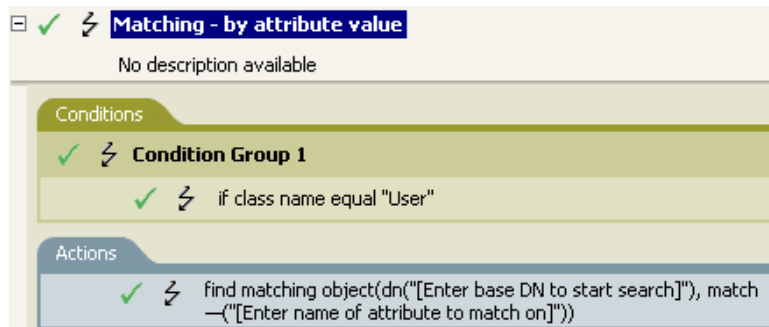
Policy Name:



Policy Container:

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Matching policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.13.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Matching - by attribute value*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 Delete *[Enter base DN to start search]* from the *Specify DN* field.
- 6 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 7 Select *Text* in the noun list.
- 8 Double-click *Text* to add it to the argument.
- 9 In the editor, click the browse button, browse to and select the container where you want the search to start, then click *OK*.
- 10 Click *Finish*.
- 11 In the *Specify Match Attributes* field, click the *Edit the match attributes* icon  to launch the Match Attribute Builder.
- 12 Click the browse button and select the attributes you want to match. You can select one or more attributes to match against, then click *OK*.
- 13 Click *Finish*.
- 14 Save the rule by clicking *File > Save*.

8.13.3 How the Rule Works

This rule matches for User objects by attributes. When a User object is synchronized, the driver uses the rule to check and see if the specified attributes exist. If the attributes do not exist, a new User object is created.


8.14 Placement - Publisher Mirrored


This rule places objects in the Identity Vault by using the mirrored structure in the data store from a specified point. Implement the rule on the Placement policy in the driver. You can implement the rule only on the Publisher channel.

There are two steps involved in using the predefined rules: creating a policy in the Placement policy set and importing the predefined rule. If you already have a Placement policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.14.1, “Creating a Policy,”](#) on page 135
- ♦ [Section 8.14.2, “Importing the Predefined Rule,”](#) on page 135
- ♦ [Section 8.14.3, “How the Rule Works,”](#) on page 136

8.14.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Placement policy set in the policy set, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

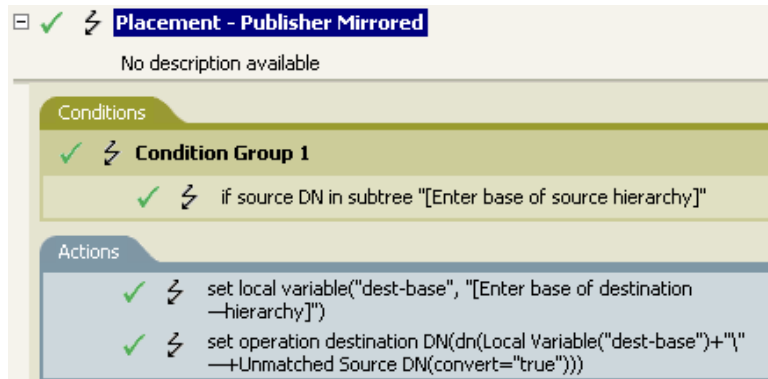
Policy Container:


Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Placement policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.14.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Placement - Publisher Mirrored*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the condition by double-clicking the *Conditions* tab.
- 5 In the *Value* field, browse to and select the container in the source hierarchy where you want the object to be acted upon, then click *OK*.
- 6 Edit the action by double-clicking the *Actions* tab.
- 7 Delete *[Enter base of destination hierarchy]* from the *Specify String* field.
- 8 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 9 Select *Text* in the noun list.
- 10 Double-click *Text* to add it to the argument.
- 11 In the editor, click the browse button, browse to and select the container in the destination hierarchy where you want the object to be placed, then click *OK*.
- 12 Click *Finish*.
- 13 Save the rule by clicking *File > Save*.

8.14.3 How the Rule Works

If the User object resides in the source hierarchy, the object is placed in the mirrored structure from the data store. The placement starts at the point that the local variable *dest-base* is defined. It places the User object in the location of *dest-base*\unmatched source DN. The rule uses the slash format.


8.15 Placement - Subscriber Mirrored - LDAP Format


This rule places objects in the data store by using the mirrored structure in the Identity Vault from a specified point. Implement the rule on the Placement policy in the driver. You can implement the rule only on the Subscriber channel.

There are two steps involved in using the predefined rules: creating a policy in the Placement policy set and importing the predefined rule. If you already have a Placement policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.15.1, “Creating a Policy,” on page 137](#)
- ♦ [Section 8.15.2, “Importing the Predefined Rule,” on page 137](#)
- ♦ [Section 8.15.3, “How the Rule Works,” on page 138](#)

8.15.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Subscriber channel.
- 2 Select the Placement policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:




Policy Container:

Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Placement policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).



8.15.2 Importing the Predefined Rule



- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Placement - Subscriber Mirrored - LDAP format*, then click *OK*.
- 3 Expand the predefined rule.

   **Placement - Subscriber Mirrored - LDAP format**



No description available



Conditions

  **Condition Group 1**


  if source DN in subtree "[Enter base of source hierarchy]"

Actions

  set local variable("dest-base", "[Enter base of destination -hierarchy]")

  set operation destination DN(dn(Unmatched Source DN(convert="true")+", "+Local Variable("dest-base")))

- 4 Edit the condition by double-clicking the *Conditions* tab.

- 5 In the *Value* field, browse to the container in the source hierarchy where you want the object to be acted upon, then click *OK*.
- 6 Edit the action by double-clicking the *Actions* tab.
- 7 Delete *[Enter base of destination hierarchy]* from the *Specify String* field.
- 8 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 9 Select *Text* in the noun list.
- 10 Double-click *Text* to add it to the argument.
- 11 In the editor, click the browse button, browse to the container in the destination hierarchy where you want the object to be placed, then click *OK*.
- 12 Click *Finish*.
- 13 Save the rule by clicking *File > Save*.

8.15.3 How the Rule Works

If the User object resides in the source hierarchy, then the object is placed in the mirrored structure from the Identity Vault. The placement starts at the point that the local variable *dest-base* is defined. It places the User object in the location of the unmatched source DN, *dest-base*. The rule uses LDAP format.


8.16 Placement - Publisher Flat

This rule places objects from the data store into one container in the Identity Vault. Implement the rule on the Placement policy in the driver. You can implement the rule only on the Publisher channel.

There are two steps involved in using the predefined rules: creating a policy in the Placement policy set and importing the predefined rule. If you already have a Placement policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.16.1, “Creating a Policy,” on page 138](#)
- ♦ [Section 8.16.2, “Importing the Predefined Rule,” on page 139](#)
- ♦ [Section 8.16.3, “How the Rule Works,” on page 140](#)

8.16.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Placement policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy

Specify the name of the new policy and the container where it will be created.



Policy Name:

Placement Policy

Policy Container:

Publisher.LDAP.IDM Driver Set 2.IDMDESIGNTREE

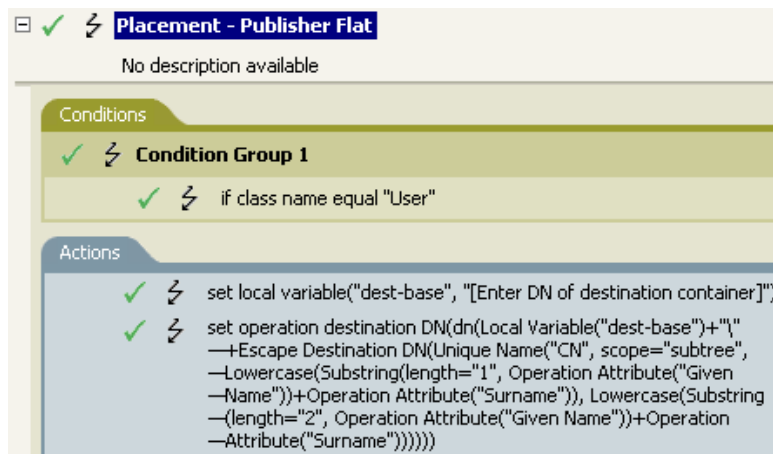
Browse...


Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Placement policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.16.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Placement - Publisher Flat*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 Delete *[Enter DN of destination container]* from the *Specify String* field.
- 6 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 7 Select *Text* in the noun list.
- 8 Double-click *Text* to add it to the argument.
- 9 In the editor, click the browse button, then browse to and select the destination container where you want all of the User objects to be placed, then click *OK*.

- 10 Click *Finish*.
- 11 Save the rule by clicking *File > Save*.

8.16.3 How the Rule Works

This rule places all User objects in the destination DN. The rule sets the DN of the destination container as the local variable dest-base. The rule then sets the destination DN to be the dest-base\CN attribute. The CN attribute of the User object is the first two letters of the Given Name attribute plus the Surname attribute in lowercase. The rule uses slash format.


8.17 Placement - Subscriber Flat - LDAP Format

This rule places objects from the Identity Vault into one container in the data store. Implement the rule on the Subscriber Placement policy in the driver.

There are two steps involved in using the predefined rules: creating a policy in the Placement policy set and importing the predefined rule. If you already have a Placement policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.17.1, “Creating a Policy,”](#) on page 140
- ♦ [Section 8.17.2, “Importing the Predefined Rule,”](#) on page 141
- ♦ [Section 8.17.3, “How the Rule Works,”](#) on page 141

8.17.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Placement policy set in Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy

Specify the name of the new policy and the container where it will be created.

Policy Name:

Policy Container:

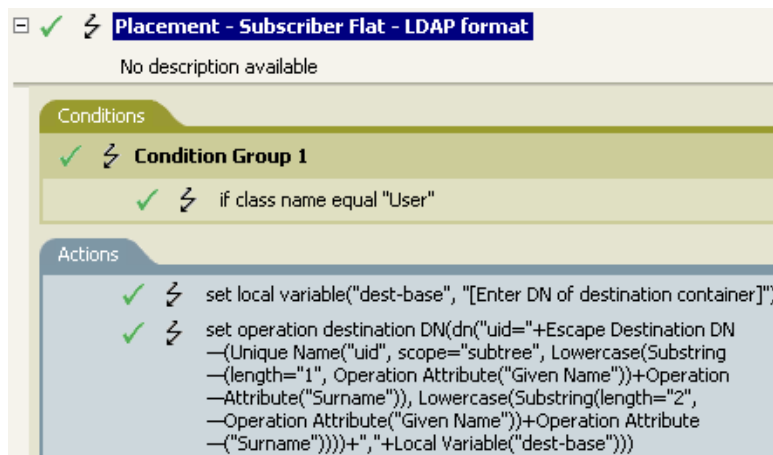
Open the editor after creating the object.


- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.

- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Placement policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.17.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Placement - Subscriber Flat - LDAP format*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 Delete *[Enter DN of destination container]* from the *Specify String* field.
- 6 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 7 Select *Text* in the noun list.
- 8 Double-click *Text* to add it to the argument.
- 9 In the editor, add the destination container where you want all of the User objects to be placed. Make sure the container is specified in LDAP format, then click *OK*.
- 10 Click *Finish*.
- 11 Save the rule by clicking *File > Save*.

8.17.3 How the Rule Works

This rule places all User objects in the destination DN. The rule sets the DN of the destination container as the local variable *dest-base*. The rule then sets the destination DN to be *uid=unique name,dest-base*. The *uid* attribute of the User object is the first two letters of the Given Name attribute plus the Surname attribute in lowercase. The rule uses LDAP format.


8.18 Placement - Publisher By Dept


This rule places objects from one container in the data store into multiple containers in the Identity Vault. Implement the rule on the Placement policy in the driver. You can implement the rule only on the Publisher channel.

There are two steps involved in using the predefined rules: creating a policy in the Placement policy set and importing the predefined rule. If you already have a Placement policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.18.1, “Creating a Policy,”](#) on page 142
- ♦ [Section 8.18.2, “Importing the Predefined Rule,”](#) on page 142
- ♦ [Section 8.18.3, “How the Rule Works,”](#) on page 143

8.18.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Publisher channel.
- 2 Select the Placement policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.

Create Policy 

Specify the name of the new policy and the container where it will be created.

Policy Name:

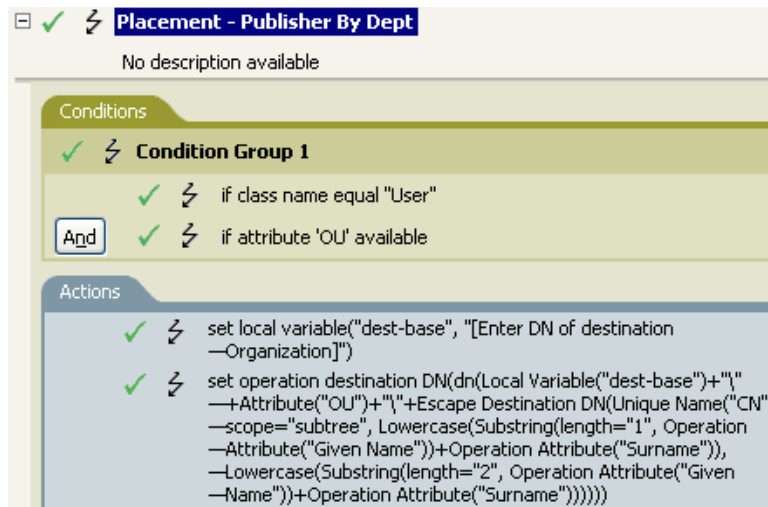
Policy Container:


Open the editor after creating the object.

- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Placement policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.18.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Placement - Publisher By Dept*, then click *OK*.
- 3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 Delete *[Enter DN of destination Organization]* from the *Specify String* field.
- 6 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 7 Select *Text* in the noun list.
- 8 Double-click *Text* to add it to the argument.
- 9 In the editor, click the browse button, then browse to and select the parent container in the Identity Vault. Make sure all of the department containers are child containers of this DN, then click *OK*.
- 10 Click *Finish*.
- 11 Save the rule by clicking *File > Save*.

8.18.3 How the Rule Works

This rule places User objects in proper department containers depending upon the value that is stored in the OU attribute. If a User object needs to be placed and has the OU attribute available, then the User object is placed in the `dest-base\value of OU attribute\CN` attribute.

The `dest-base` is a local variable. The DN must be the relative root path of the department containers. It can be an organization or an organizational unit. The value stored in the OU attribute must be the name of a child container of the `dest-base` local variable.

The child containers must be associated for the user objects to be placed. The value of the OU attribute must be the name of the child container. If the OU attribute is not present, this rule is not executed.

The CN attribute of the User object is the first two letters of the Given Name attribute plus the Surname attribute in lowercase. The rule uses slash format.


8.19 Placement - Subscriber By Dept - LDAP Format

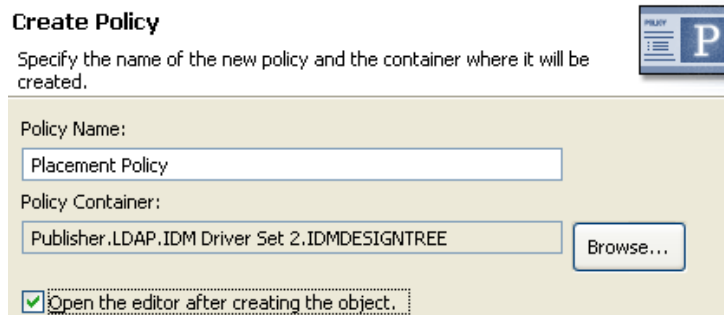
This rule places objects from one container in the Identity Vault into multiple containers in the data store based on the OU attribute. Implement the rule on the Placement policy in the driver. You can implement the rule only on the Subscriber channel.

There are two steps involved in using the predefined rules: creating a policy in the Placement policy set and importing the predefined rule. If you already have a Placement policy that you want to add this rule to, skip to [Importing the Predefined Rule](#).

- ♦ [Section 8.19.1, “Creating a Policy,” on page 144](#)
- ♦ [Section 8.19.2, “Importing the Predefined Rule,” on page 144](#)
- ♦ [Section 8.19.3, “How the Rule Works,” on page 145](#)

8.19.1 Creating a Policy

- 1 From the Outline view or the Policy Flow view, select the Subscriber channel.
- 2 Select the Placement policy set in the Policy Set view, then click *Create or add a new policy to the Policy Set* icon  to create a new policy.
- 3 Click *Create a new policy*, then click *Next*.
- 4 Name the policy.
- 5 Use the default location or browse and select another location to place the policy in the driver.



Create Policy

Specify the name of the new policy and the container where it will be created.

Policy Name:

Policy Container:

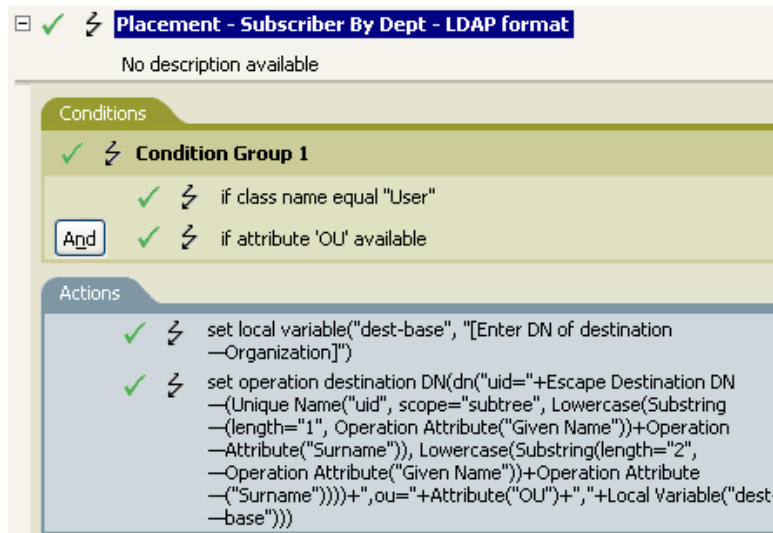
Open the editor after creating the object.


- 6 Select *Open Editor after creating policy*, then click *Next*.
- 7 Select *DirXML Script* for the type of policy, then click *Finish*.
- 8 A file conflict window appears with the message “Before editing this item you need to save. Do you wish to save the editor’s changes and continue?” Click *Yes*. The Policy Builder is launched and the new Placement policy is saved.
- 9 Continue with [Importing the Predefined Rule](#).

8.19.2 Importing the Predefined Rule

- 1 Right-click in the Policy Builder, then click *New > Predefined Rule > Insert Predefined Rule Before* or *Insert Predefined Rule After*.
- 2 Select *Placement - Subscriber By Dept - LDAP format*, then click *OK*.

3 Expand the predefined rule.



- 4 Edit the action by double-clicking the *Actions* tab.
- 5 Delete *[Enter DN of destination Organization]* from the *Specify string* field.
- 6 Click the *Edit the arguments* icon  to launch the Argument Builder.
- 7 Select *Text* in the noun list.
- 8 Double-click *Text* to add it to the argument.
- 9 In the editor, add the parent container in the data store. The parent container must be specified in LDAP format. Make sure all of the department containers are child containers of this DN, then click *OK*.
- 10 Click *Finish*.
- 11 Save the rule by clicking *File > Save*.

8.19.3 How the Rule Works

This rule places User objects in proper department containers depending upon the value that is stored in the OU attribute. If a User object needs to be placed and has the OU attribute available, then the User object is placed in the uid=unique name,ou=value of OU attribute,dest-base.

The dest-base is a local variable. The DN must be the relative root path of the department containers. It can be an organization or an organizational unit. The value stored in the OU attribute must be the name of a child container of the dest-base local variable.

The child containers must be associated for the User objects to be placed. The value of the OU attribute must be the name of the child container. If the OU attribute is not present, then this rule is not executed.

The uid attribute of the User object is the first two letters of the Given Name attribute plus the Surname attribute as lowercase. The rule uses LDAP format.

Testing Policies with the Policy Simulator

9

The Policy Simulator allows you to test and debug a single policy or a group of policies contained in a policy set without implementing the policy in the Identity Vault. It also provides a graphical editor to create XDS Input documents. With these features, you can test the policies without affecting the production environment or the connected system.

For more information about common tasks with the Policy Simulator, see the following sections:

- ♦ [Section 9.1, “Accessing the Policy Simulator,” on page 147](#)
- ♦ [Section 9.2, “Creating an XDS Input Document,” on page 148](#)
- ♦ [Section 9.3, “Using the Operation Data Editor,” on page 155](#)
- ♦ [Section 9.4, “Using the Hex Editor,” on page 156](#)
- ♦ [Section 9.5, “Simulating a Policy,” on page 164](#)
- ♦ [Section 9.6, “Simulating Policies with Java Extensions,” on page 168](#)
- ♦ [Section 9.7, “Simulating Policies with Referenced Directories,” on page 169](#)

The Policy Simulator uses XML. The eDirectory document type definition file (`nds.dtd`) defines the schema of the XML documents that the Metadirectory engine can process. XML documents that do not conform to this schema generate errors. To verify whether the document conforms to the `nds.dtd` and to find information about why errors are occurring, see the “[NDS DTD](#)” in the *Identity Manager 4.0.1 DTD Reference*.

If the policy uses a mapping table object or ECMAScript object, the Policy Simulator tests these objects when the policy is tested. It also allows you to test included policies and referenced GCVs.



The Policy Simulator cannot simulate the initial policy sets from application drivers such as SOAP and Delimited text. These drivers use comma-separated files or text files as input, and the XML or XDS is derived from policies in the policy chain. Currently, the Policy Simulator only accepts valid XML or XDS as input. Additional functionality is being considered for future releases.

9.1 Accessing the Policy Simulator



The Policy Simulator can be accessed in three different ways:

- ♦ [“Outline View” on page 147](#)
- ♦ [“Policy Flow View” on page 148](#)
- ♦ [“Editors” on page 148](#)

9.1.1 Outline View

- 1 Click the *Show Model Outline* icon .
- 2 Right-click the driver, publisher, subscriber, mapping rule, filter, or any policy you want to simulate, then select *Simulate* .

9.1.2 Policy Flow View

- 1 Click the *Show Policy Flow* icon .
- 2 Right-click the Input, Output, Schema Map, filter, or any policy set icons you want to simulate, then select *Simulate* .

9.1.3 Editors

You can access the Policy Simulator through the Policy Builder, the Schema Map editor, or the Filter editor by selecting the *Policy Simulator* icon  in the toolbar of each editor.

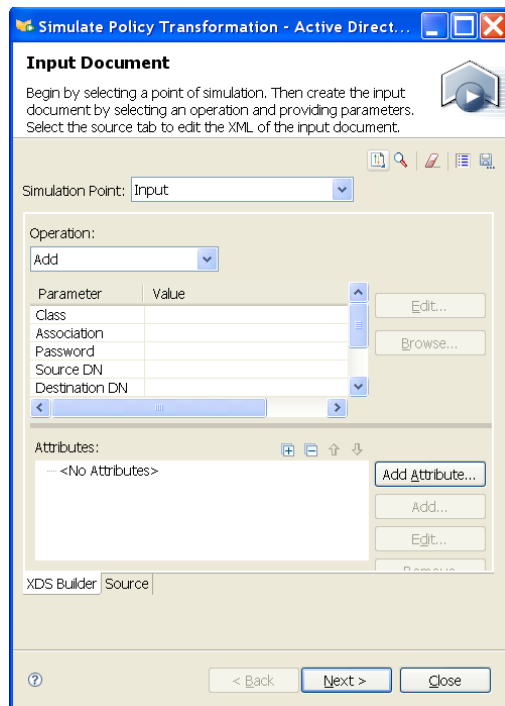
9.2 Creating an XDS Input Document

In order to simulate a policy, you must have a valid XDS Input document. The policy consumes the input document and the results are displayed as if the policy was executed. The simulator provides a graphical editor, to help you create the input document. The editor is called the XDS Builder.

You access the XDS Builder by clicking the *XDS Builder* tab in the Policy Simulator.

For information on how to access the Policy Simulator, see [“Accessing the Policy Simulator” on page 147](#).

Figure 9-1 XDS Builder



Click the *Source* tab in the Policy Simulator to display the input document in XML. The XDS Builder creates this input document. You can modify the XML by editing the XML directly or using the XDS Builder.

The XDS Builder allows you to select the operation type as well as provide the operation parameters, attributes, and values. XDS Builder saves the parameters and values of the simulator for the current Designer session. To make the simulator input available after Designer has been shut down, save the input document to disk.

After you have created the XDS input document, you need to analyze the results. For more information, see [Section 9.5, “Simulating a Policy,” on page 164](#).

The Policy Simulator has several different components. Each component helps create the input document to test the policy against.


- ◆ [Section 9.2.1, “Source,” on page 149](#)
- ◆ [Section 9.2.2, “Import an XDS Document,” on page 149](#)
- ◆ [Section 9.2.3, “Use an Identity Vault Object As a Template,” on page 149](#)
- ◆ [Section 9.2.4, “Clear All Parameters,” on page 150](#)
- ◆ [Section 9.2.5, “Configuration Options,” on page 150](#)
- ◆ [Section 9.2.6, “Save the Input Document,” on page 151](#)
- ◆ [Section 9.2.7, “Simulation Point,” on page 151](#)
- ◆ [Section 9.2.8, “Operation,” on page 151](#)
- ◆ [Section 9.2.9, “Parameter and Value,” on page 152](#)
- ◆ [Section 9.2.10, “Attributes,” on page 153](#)

9.2.1 Source

The Policy Simulator allows you to create the input document in XML without using the builder. The *Source* tab is an XML editor.

9.2.2 Import an XDS Document


The Policy Simulator allows you to import an existing input document to test the policy against.

- 1 In the toolbar, select *Import an XDS input document from a file* .
- 2 Browse to and select the existing input document, then click *Open*.
- 3 Click *Next* to test the policy against this existing information.

Designer comes with sample input document files you can use. The files are located in the plug-in `com.novell.designer.idm.policy\simulation`. The events are Add, Association, Delete, Instance, Modify, Move, Query, Rename, and Status.

9.2.3 Use an Identity Vault Object As a Template

The Policy Simulator allows you to use an existing Identity Vault object to populate the input document.

- 1 In the toolbar, select *Browse to an object in the Identity Vault to use as a template* .
- 2 If you are not logged in to the Identity Vault, specify the following information; otherwise skip to [Step 3](#).
 - 2a Specify the host name of the Identity Vault server.

It can be the IP address of the server or the DNS name of the server.

2b Specify a DN of a user object to authentication to the Identity Vault.

2c Specify the password of the user in [Step 2b](#), then click *OK*.

3 Browse to and select the desired object, then click *OK*.


If the simulation point is set to *Input*, *Output*, or *Schema Map Inbound*, a warning message is displayed. (For more information about simulation points, see [“Simulation Point” on page 151](#).) The warning message informs the user that the input document should be created by using the application’s attribute names and value formats. The XDS Builder converts the Identity Vault attribute names to the corresponding application attribute by using the Schema Map policy, as long as the driver references the Schema Map policy. However, the values for the attributes might be in an incorrect format.

4 Click *OK* if a warning message is displayed.

5 Click *Next* to test the policy against the object.

9.2.4 Clear All Parameters


The Policy Simulator allows you to clear all parameters, attributes, and values that have been set. You can create a new input document without launching the XDS Builder again.

1 In the toolbar, select *Clear* .

2 Specify information to create a new input document.

9.2.5 Configuration Options

The Policy Simulator allows you to set configuration options for the simulation.

1 In the toolbar, select *Configure options for the simulation* .

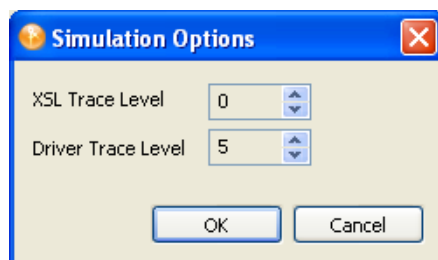
2 Specify the desired *XSL Trace Level*.

If you have XSL in your policy and you want to see the XSL trace results, specify a value. If the value is set to 0, no information is displayed. The range of the trace value is 0 to 4.

3 Specify the desired *Driver Trace Level*.


To set the results of the simulation, set a value in the *Driver Trace Level* field. The range of the trace value is 0 to 5.

4 Click *OK*.



9.2.6 Save the Input Document

The Policy Simulator does not store the input document for future sessions in Designer. If you want to use the input document for a later session in Designer, the input document must be saved.

- 1 In the toolbar, click *Save* .
- 2 Browse to a location where you want to save the file, then specify a filename.
- 3 Click *Save* to save the input document.

Novell recommends that you do not save the input document in the same directory where Designer is installed or it might be overwritten during a Designer upgrade.

9.2.7 Simulation Point

The Policy Simulator allows you to select a policy set or group of policies to simulate with a specific operation.

Figure 9-2 *Simulation Point in the Policy Simulator*



You can select a Driver object, Publisher channel, Subscriber channel, policy, or rule as the simulation point. If you select a Driver object, Publisher channel, or Subscriber channel, the *Simulation Point* options are:

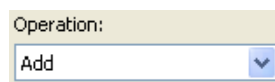
<i>Input</i>	<i>Publisher Placement</i>	<i>Subscriber Command</i>
<i>Schema Map Inbound</i>	<i>Publisher Command</i>	<i>Subscriber Placement</i>
<i>Publisher Event</i>	<i>Publisher Notify Filter</i>	<i>Subscriber Creation</i>
<i>Publisher Sync Filter</i>	<i>Output</i>	<i>Subscriber Matching</i>
<i>Publisher Matching</i>	<i>Schema Mapping Outbound</i>	<i>Subscriber Event</i>
<i>Publisher Creation</i>	<i>Subscriber Notify Filter</i>	<i>Subscriber Sync Filter</i>

NOTE: If you want to test a single policy, launch the simulator from the selected policy. If you do select a specific policy or rule to test, the *Simulation Point* options are *To Identity Vault* and *From Identity Vault*.

9.2.8 Operation

The XDS Builder allows you to select the type of operation that the input document performs.

Figure 9-3 *Operation Options in the XDS Builder*



The available operations are:

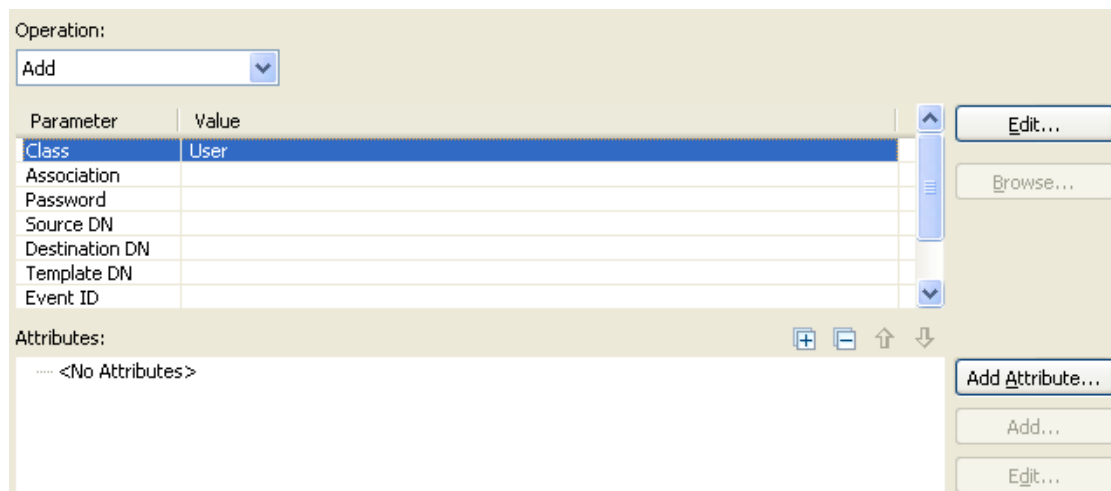
Add	Modify	Remove Association
Add Association	Modify Association	Rename
Check Object Password	Modify Password	Status
Check Password	Move	Sync
Delete	Query	Instance
Get Named Password	Extended Query	

Depending upon which operation is selected, the XDS Builder displays different options and screens.

9.2.9 Parameter and Value

The XDS Builder allows you to define parameters and specify values for the selected operation. Each operation displays different parameters.

Figure 9-4 Parameters and Values in the XDS Builder



The list of parameters for each operation is set, and cannot be changed. You do not need to have each parameter defined for the simulation to work; just define the parameters that apply to your policy. You can edit the parameter value by double-clicking the value or selecting the value and clicking the *Edit* button.

All parameter values are edited inline, with the exception of *Class* and *Operation Data* parameters. Editing these parameters launches a dialog box that allows you to select a class name or edit the operation data.

Parameters that contain a reference to an object enable the *Browse* button. Although these values can be edited inline, the *Browse* button allows you to browse for an object in the application or the Identity Vault, depending on the current simulation point. For any Publisher channel or Input simulation point the *Browse* button for any source parameters such as Source DN launches the application browser. While all destination parameters such as Destination DN launches the Identity Vault Browser.

Likewise, for any Subscriber channel or Output simulation point, the *Browse* button for any source parameters such as Source DN launches the Identity Vault browser. However, the *Browse* button for all destination parameters such as Destination DN, launches the application Browser.

Editing the *Class* parameter launches the application class browser when the Input, Output, or Schema Map inbound policy simulation point is selected. For all other simulation points, the Identity Vault class browser is opened. If the desired class is not included in the application or Identity Vault schema, it can be added during the simulation process. For more information about managing a schema in Designer, see “[Class List Toolbar](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

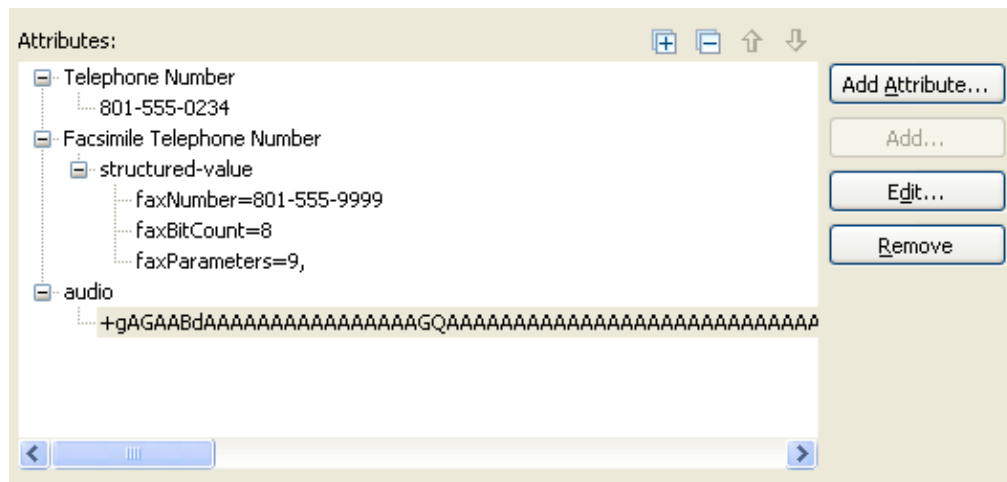
Editing the *Operation Data* parameter launches the Operation Data editor. For more information, see [Section 9.3, “Using the Operation Data Editor,”](#) on page 155.

9.2.10 Attributes

The Input Document *Attributes* field allows you to add, edit, and remove attribute values for simulating operations.

- ♦ “[Working with Attribute Values](#)” on page 153
- ♦ “[Simulating the Adding of an Attribute](#)” on page 154
- ♦ “[Simulating the Modification of an Attribute](#)” on page 154

Figure 9-5 XSD Input Document - Attribute Field



Working with Attribute Values

Because there are several different attribute types, the Attributes field provides different ways of manipulating attribute values.

- ♦ **Add a New Attribute:** To add a new attribute to the attribute list, click *Add Attribute*. For more information, see “[Simulating the Adding of an Attribute](#)” on page 154.
- ♦ **Remove an Attribute:** To remove an attribute from the attribute list, select the attribute, then click *Remove* (or right-click the attribute, then select *Remove*.)
- ♦ **Add an Attribute Value:** To add another value to an existing attribute, select the attribute, then click *Add* (or right-click the attribute, then select *Add*.)

- ♦ **Remove an Attribute Value:** To remove a value from an existing attribute, select the value, then click *Remove* (or right-click the value, then select *Remove*.)
- ♦ **Change an Attribute Value:** To change the value of an existing attribute, select an attribute value, then click *Edit* (or double-click an attribute value.)

If the attribute uses a structured value, you can change each of the value components separately. You cannot modify the entire structured value at once.

If the attribute is an octet string, Simulator opens the Hex Editor to modify the value. For more information, see [Section 9.4, “Using the Hex Editor,” on page 156](#).

- ♦ **Identity Vault Schema** When working with Identity Vault attributes with structured values, the Simulator displays customized Value editor dialog boxes that describe each of the structured value components. For example, adding a Facsimile Telephone Number attribute launches a Value Editor dialog box that asks for the Fax Number, Bit Count, and Parameters for the attribute, each of which is a component of the Facsimile Telephone Number structured value.

However, when working with an Application schema, the Simulator uses a generic structured value dialog box since it cannot know the type of data that comprises the structured value.

Simulating the Adding of an Attribute

- 1 Select *Add* in the *Operation* field of the Simulator.
- 2 Double-click *Class* in the *Parameter* field of the Simulator.
- 3 Browse to and select the desired class, then click *OK*.
- 4 Click *Add Attribute*.

The *Add Attribute* icon launches the Identity Vault or application attribute browser, based on the simulation point.

- 5 Browse to and select the desired attribute, then click *OK*.
- 6 Specify the attribute value, then click *OK*.

Based on the attribute type, Simulator opens either the Value editor or the Hex editor so you can specify the attribute value.

- 7 Click *Next* in the Simulator to view the results of the Add operation with the specified attribute value.

Simulating the Modification of an Attribute

There are multiple events that cause an attribute to be modified. They are:

- ♦ **Add Value:** Adds a new value to the attribute.
- ♦ **Remove Value:** Removes a single value from the attribute.
- ♦ **Remove All Values:** Removes all values stored in the attribute.
- ♦ **Remove:** Removes the attribute.

When you are simulating a Modify operation, you need to select which event occurs to modify the attribute. The Simulator allows you to do that:

- 1 In the Policy Simulator, select *Modify* in the *Operation* field of the XDS Builder.
- 2 Double-click *Class* in the *Parameter* column.

- 3 Browse to and select the desired class, then click *OK*.
- 4 Click the *Add Attribute* button.
- 5 Browse to and select the desired attribute, then click *OK*.
- 6 Right-click the attribute, then select one of the modifying events:
 - ♦ Add Value
 - ♦ Remove Value
 - ♦ Remove All Values
 - ♦ Remove

You can add multiple events to a single attribute.

- 7 Click *Next* in the Policy Simulator to view the results of the Modify operation.

The Policy Simulator allows you to modify the values of the attribute and change the order of events that occur to an attribute. When you right-click an event in the *Attributes* field, you have additional options that allow to make these changes:

- ♦ **Add:** Allows you to add content to the attribute value.
- ♦ **Change to Add Value/Change to Remove Value:** Allows you to change the event from Add Value to Remove Value or vice versa.
- ♦ **Remove:** Removes the selected event from the list of events to occur on an attribute.
- ♦ **Move Up:** Moves the selected event up in the order of execution.
- ♦ **Move Down:** Moves the selected event down in the order of execution.

9.3 Using the Operation Data Editor

The Operation Data editor allows you to create an operation data element for the selected operation by specifying attributes and values that should be included in the node. An XML fragment should also be included in the node.

- 1 In the *Parameter* column of the Policy Simulator, double-click the *Operation Data* field.
- 2 In the Operation Data editor, click *Add* to add the desired attribute.
- 3 Specify the name of the attribute in the *Attribute* field.
- 4 Specify the value of the attribute in the *Value* field.
- 5 If you want to add an additional attribute, repeat [Step 2](#) through [Step 4](#).
- 6 Click the *Data* field, then specify the XML fragment.

Attribute	Value
from-reset	true
old-dn	cn=joe,o=company

Data:

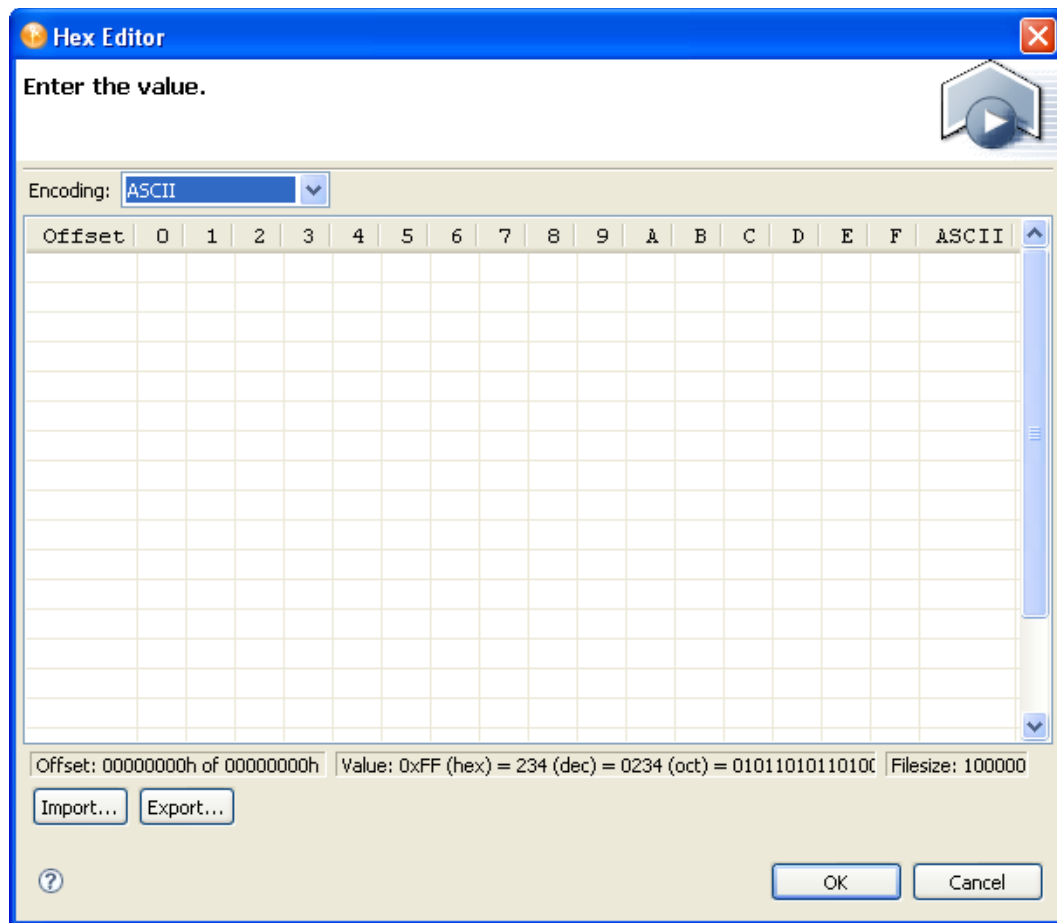
```
<node>my operation data</node>
```

7 Click *OK* to save the information.

9.4 Using the Hex Editor

The Hex editor allows you to view or edit any attribute values in hex mode. For example, if you are synchronizing eDirectory attribute values of type octet string, then you can edit this information through Designer.

Figure 9-6 Hex Editor




- ◆ Section 9.4.1, “Accessing the Hex Editor,” on page 157
- ◆ Section 9.4.2, “Importing Data into the Hex Editor,” on page 158
- ◆ Section 9.4.3, “Inserting Data in the Hex Editor,” on page 158
- ◆ Section 9.4.4, “Appending Data in the Hex Editor,” on page 159
- ◆ Section 9.4.5, “Editing Data in the Hex Editor,” on page 160
- ◆ Section 9.4.6, “Reverting Changes in the Hex Editor,” on page 162
- ◆ Section 9.4.7, “Deleting Data in the Hex Editor,” on page 162
- ◆ Section 9.4.8, “Moving the Cursor in the Hex Editor,” on page 163
- ◆ Section 9.4.9, “Exporting Data from the Hex Editor,” on page 163

9.4.1 Accessing the Hex Editor

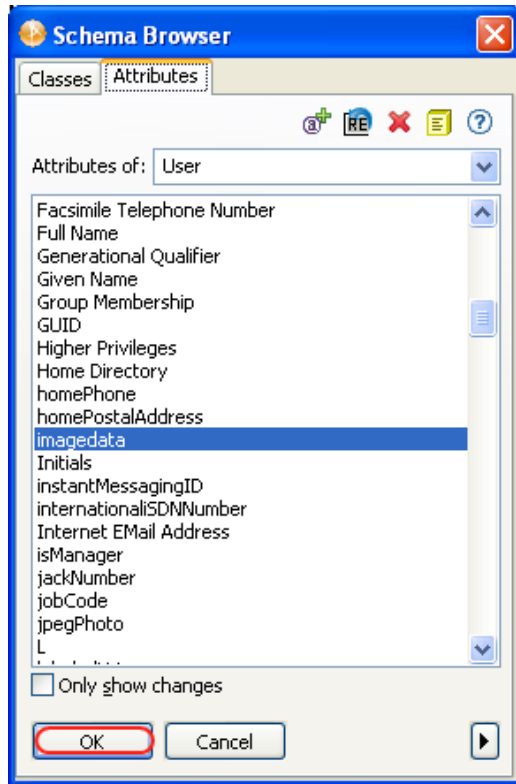
The Hex editor is inside of the Policy Simulator. The Hex editor is opened for all attributes that have an eDirectory syntax of octet string or unknown and an application syntax type of octet. You can also access the Hex editor by following these steps:

- 1 Launch the Policy Simulator and do the following:
 - 1a Set the *Simulation Point* to *Publisher Creation*.

- 1b Add a class parameter of *User*.
- 1c Click the *Add Attribute* button to add a new attribute to the class.
- 2 In the Schema Browser, select *Add an Attribute* .

Follow the steps in the New Attribute Wizard to create a new attribute. Make sure you specify the attribute's syntax type as *Octet String*.

For more information, see “[Creating Identity Vault Attributes](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.
- 3 In the Schema Browser, select the new attribute, then click *OK* to launch the Hex editor.



9.4.2 Importing Data into the Hex Editor

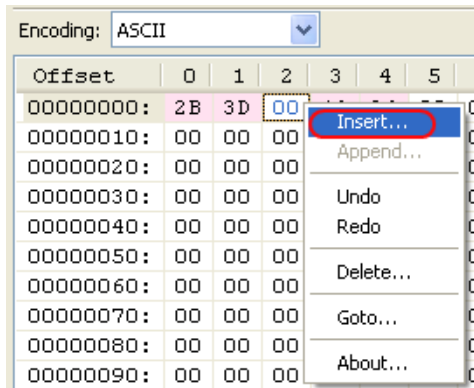
You can import data from a file into the Hex editor.

- 1 Click *Import* in the Hex editor.
- 2 Browse to and select the file that has the information to import, then click *Open*.

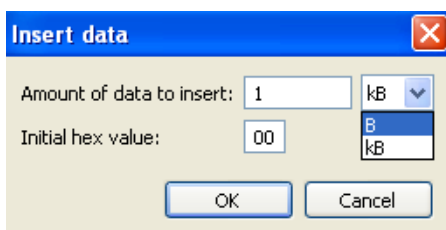
9.4.3 Inserting Data in the Hex Editor

You can press the Insert key to insert a single byte, or you can use the following method to add multiple bytes:

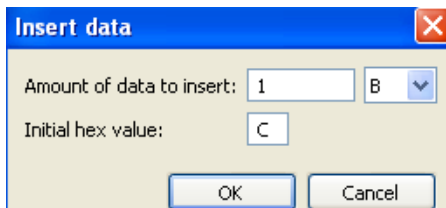
- 1 Select where you want to insert new data, then right-click in the Hex editor and select *Insert*.



2 Specify the amount of data to add in bytes (*B*) or kilobytes (*kB*).

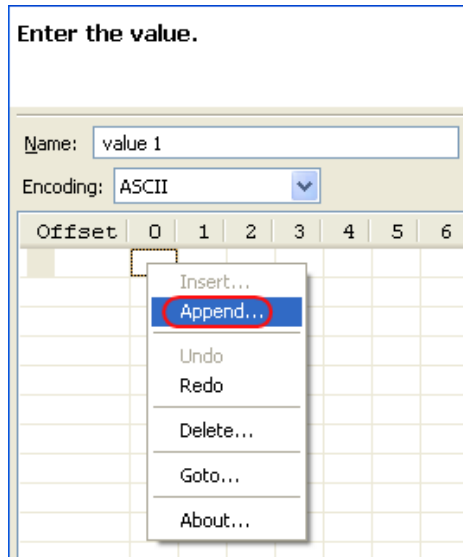


3 Specify the initial hex value, then click *OK*.



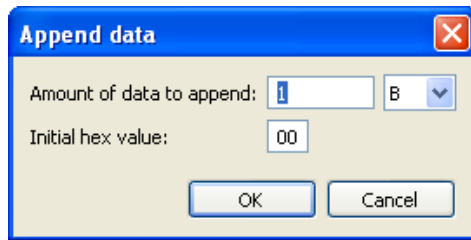
9.4.4 Appending Data in the Hex Editor

1 Right-click in the Hex editor, then select *Append*.



The *Append* option is available when you right-click the first byte in the table, if there is no data. It is also available when you right-click the last byte if there is data.

- 2 Specify the amount of data to append in bytes or kilobytes.



- 3 Specify the initial hex value, then click *OK*.

9.4.5 Editing Data in the Hex Editor

- 1 From the *Encoding* drop-down list, select the desired encoding for the value.

Encoding: ASCII																	
Offset	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASCII
00000000:	2B	3D	1A	24	00	00	00	00	00	00	00	00	00	00	00	00	+ = . \$
00000010:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000020:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000030:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000040:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000050:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000060:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000070:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000080:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000090:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000A0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000B0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000C0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000D0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000E0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000F0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000100:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000110:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000120:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .

Offset: 00000003h of 0000012Fh (69%) Value: 0x00 (hex) = 0 (dec) = 00 (oct) = 00000000 (bin) Filesize: 304 bytes

When the encoding is selected, the far right column displays the value encoded.

- 2 Select the cell of data to edit, then edit the data.

Encoding: ASCII																	
Offset	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASCII
00000000:	2B	3D	1A	24	00	00	00	00	00	00	00	00	00	00	00	00	+ = . \$
00000010:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000020:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000030:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000040:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000050:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000060:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000070:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000080:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000090:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000A0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000B0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000C0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000D0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000E0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000F0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000100:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000110:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000120:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .

Offset: 00000003h of 0000012Fh (0%) Value: 0x24 (hex) = 36 (dec) = 044 (oct) = 00100100 (bin) Filesize: 304 bytes

When a cell is selected, the value is displayed in blue.

- 3 Click OK to save the changes.

The Hex editor also displays the value as hex, decimal, octet, and binary.

Figure 9-7 Value Displayed in Multiple Formats

Offset	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASCII
00000000:	2B	3D	1A	24	00	00	00	00	00	00	00	00	00	00	00	00	+ = . \$
00000010:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000020:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000030:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000040:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000050:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000060:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000070:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000080:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000090:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000A0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000B0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000C0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000D0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000E0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
000000F0:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000100:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000110:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .
00000120:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	. . . . .

Offset: 000000D3h of 0000012Fh (69%) Value: 0x00 (hex) = 0 (dec) = 00 (oct) = 00000000 (bin) Filesize: 304 bytes

9.4.6 Reverting Changes in the Hex Editor

If you make a change in the Hex editor and want to undo it:

- 1 Right-click in the Hex editor, then select *Undo*.
The last change you had made is undone.

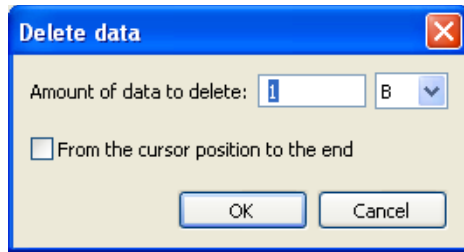
If you decide you want that change back:

- 1 Right click in the Hex editor, then select *Redo*.
The change that was undone is now redone.

9.4.7 Deleting Data in the Hex Editor

You can delete a single byte of data by pressing the Delete key. The Hex editor also allows you to delete sections of data from the table:

- 1 Right-click in the Hex editor, then select *Delete*.
- 2 Specify the amount of data to delete in bytes or kilobytes, then click *OK*.



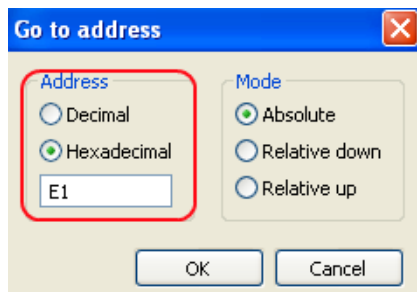
Data is deleted from the current cursor position.

If you select *From the cursor position to the end*, it deletes all data in the Hex editor from the cursor position in the table to the end of the table.

9.4.8 Moving the Cursor in the Hex Editor

You can move the cursor to a specified position in the Hex editor:

- 1 Right-click in the Hex editor, then select *Goto*.
- 2 Select whether the address specified in the table is a *Decimal* or *Hexadecimal* offset, then specify the value.



- 3 Select the mode of moving the cursor:
 - ♦ **Absolute:** Moves the cursor to the specified offset.
 - ♦ **Relative Down:** Moves the cursor down from where the cursor is currently located in the Hex editor.
 - ♦ **Relative Up:** Moves the cursor up from where the cursor is currently located in the Hex editor.
- 4 Click *OK* to move the cursor.

9.4.9 Exporting Data from the Hex Editor

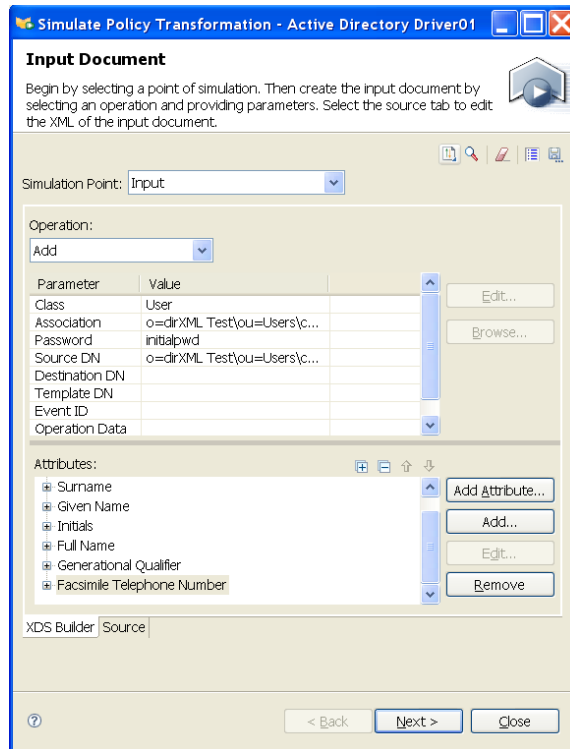
You can export data from the Hex editor to a file.

- 1 Click *Export* in the Hex editor.
- 2 Specify a filename and location for the file, then click *Save*.

9.5 Simulating a Policy

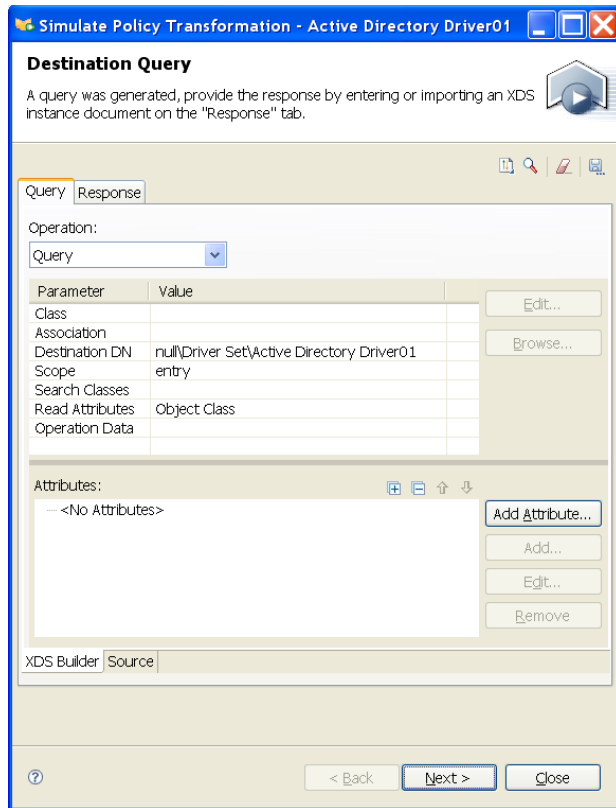
After the XDS input document has been created, you can use it to simulate the behavior of a policy.

- 1 In the Policy Simulator, after the XDS input document is complete, click *Next*.



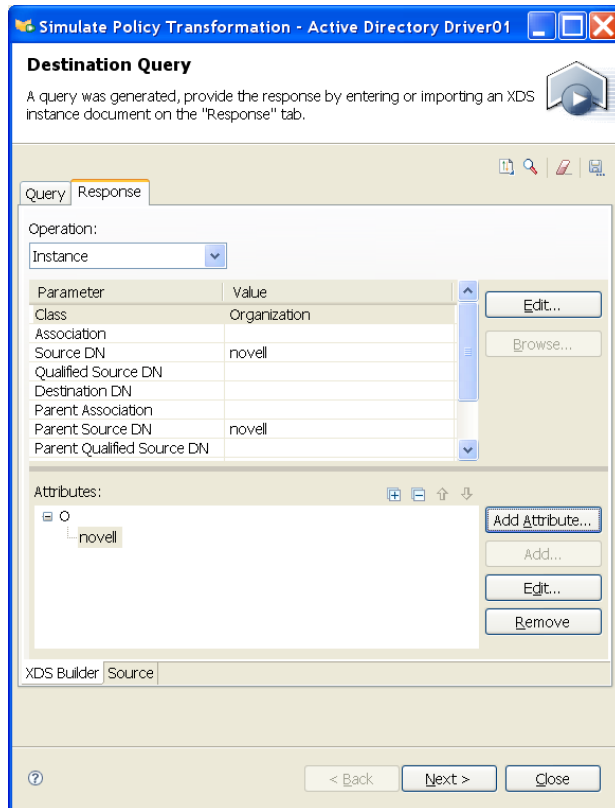
- 2 If the policy you are simulating generates a query, review the query in the *Query* tab, and model the query response in the *Response* tab, then click *Next*.

NOTE: As with Input Documents, you can browse the Identity Vault for objects that you want to use as templates for the simulator query or response.



Field	Description
Parameter Table	<p>Displays the query parameters generated during the policy simulation. This matches the XML displayed in the <i>Source</i> tab. For information on using the Parameter table, see Section 9.2.9, "Parameter and Value," on page 152.</p> <p>You can adjust the query parameters to vary the response generated when you send the query to the Application or ID Vault.</p>
Attributes Field	<p>Allows you to refine your query by searching for objects that contain particular values. For information on the Attributes field, see Section 9.2.10, "Attributes," on page 153.</p>
<i>Submit to Vault</i>	<p>Sends the specified query to the Identity Vault to generate a Response instance document. The Simulator determines the query destination automatically and displays the appropriate button.</p> <p><i>Submit to Vault</i> requires valid associations in the Association parameter. This is typically possible only when the ID Vault is deployed.</p>

Similarly, you can model the Response instance page from the Response tab, which displays a list of objects that satisfy the query. The policy uses this response data to determine what it should do.

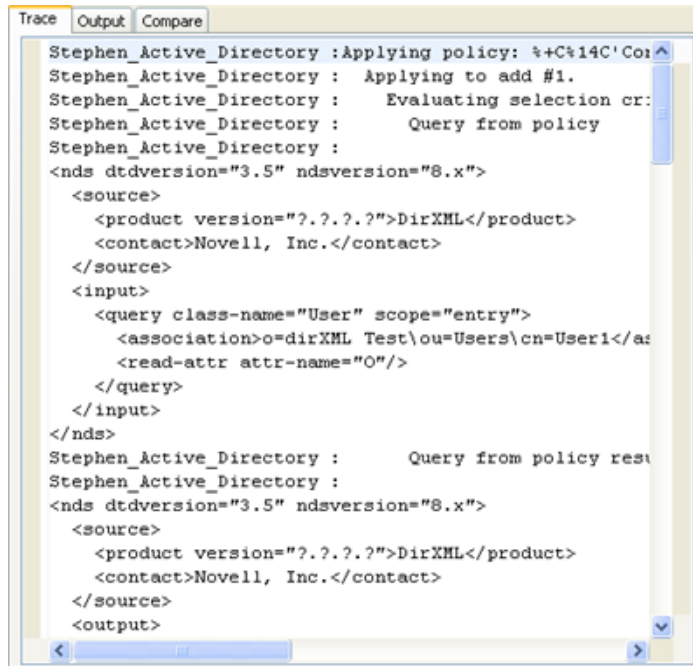


Field	Description
Parameter Table	Displays the parameters of the response instance document. This matches the XML displayed in the <i>Source</i> tab. For information on using the Parameter table, see Section 9.2.9, "Parameter and Value," on page 152.
Attributes Field	Allows you to modify the response by adding or modifying the attributes in the instance document. For information on the Attributes field, see Section 9.2.10, "Attributes," on page 153.

3 Click *Next*.

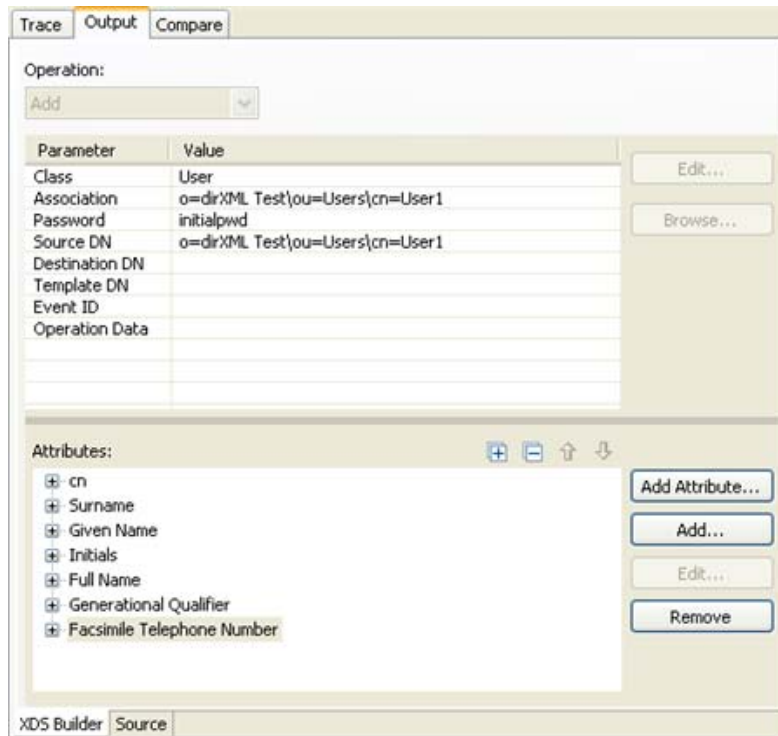
4 In the View Transform Results page, examine the results of the transformation based on your defined XDS input document.

Trace: The *Trace* tab displays the events that occur when the policy processes the defined input document. This is similar to what you would see in DS Trace if the policy processed the same input in a live IDM environment. You can configure the level of trace detail. For more information, see [Section 9.2.5, "Configuration Options," on page 150.](#)

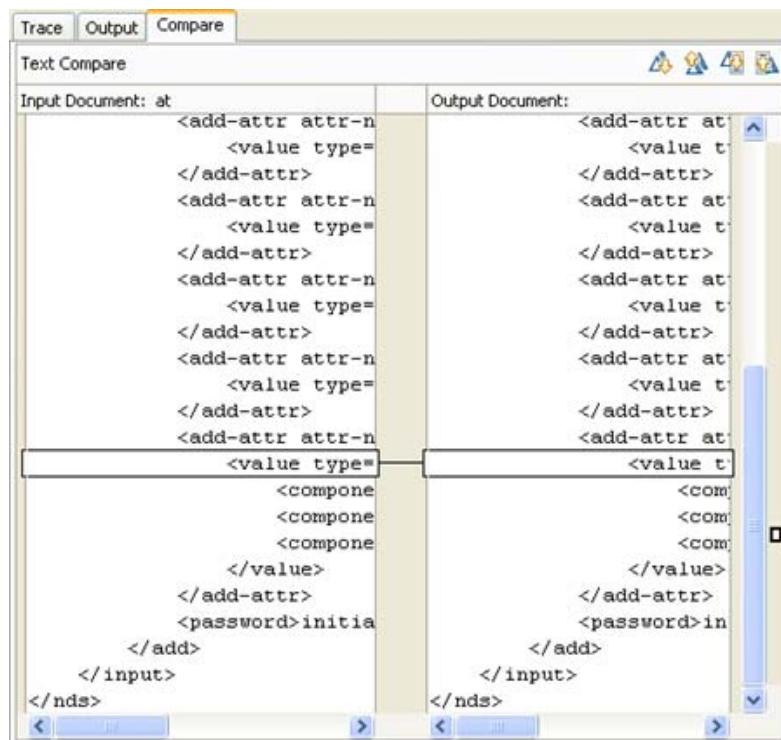


Output: The *Output* tab displays the output document generated when the policy processes the defined input document.

You can edit the output document in the XDS Builder or through the *Source* tab. If the operation was vetoed, the operation listed in the *Output* tab is indicated.



Compare: The *Compare* tab displays the input document and the output document side-by-side so you can examine the changes resulting from the policy processing of the input document.



5 After examining the policy effects on the input document, click one of the buttons at the bottom of the View Transform Results page:

Back: Re-opens the Input Document page so you can repeat the simulation with a different settings.

Next: Uses the current output document as the input document for the next policy set in the driver. This lets you examine how the policies work together as data flows from one policy to another.

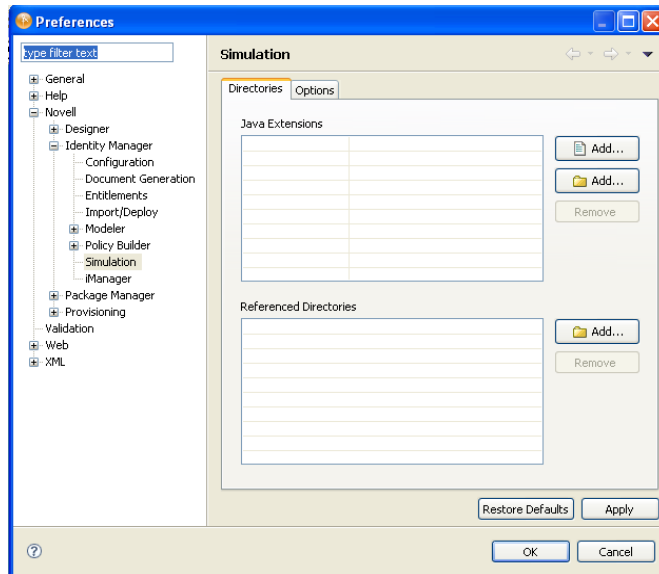
Close: Closes the Policy Simulator.

9.6 Simulating Policies with Java Extensions

Policies that contain references to external Java extensions can now be simulated by adding the appropriate .jar file or directory to the class path.

To add a .jar file or directory to the Java class path:

- 1 Select *Windows > Preferences* from the tool bar.
- 2 Navigate to the *Novell > Identity Manager > Simulation* page.
- 3 Copy the .jar file containing the Java class to the specified directory and simulate the policy.



4 Click *Apply* to save your changes, or click *OK* to save your changes and close the window.

Designer allows you to specify more than one directory that contains the external Java classes.

- 1 Click *Add files* to select a specific `.jar` file to add to the class path. Alternatively, click *Add directories* to add all `.jar` files in the specified directory to the class path.
- 2 Browse to and select the desired file or directory, then click *OK*.
- 3 To remove a file or directory entry from the Java Extensions list, select the appropriate entry, then click *Remove*.

9.7 Simulating Policies with Referenced Directories

Policies that contain references to external directories can be simulated by adding the appropriate `.jar` file or directory to the class path.

To add a referenced directory or the Java extension:

- 1 Select *Windows > Preferences* from the tool bar.
- 2 Click *Novell > Identity Manager > Simulation*.
- 3 Click *Add* to add the Java extension or the referenced directory, then click *OK*.
- 4 Simulate your policy and the Java class path is executed.

Storing Information in Resource Objects

10

Resource objects store information that drivers use. The resource objects can hold arbitrary data in any format. Novell Identity Manager contains different types of resource objects.

- ♦ [Section 10.1, “Generic Resource Objects,” on page 171](#)
- ♦ [Section 10.2, “Mapping Table Objects,” on page 172](#)
- ♦ [Section 10.3, “ECMAScript Objects,” on page 173](#)
- ♦ [Section 10.4, “Credential Application Objects,” on page 173](#)
- ♦ [Section 10.5, “Credential Repository Objects,” on page 173](#)
- ♦ [Section 10.6, “Package Objects,” on page 173](#)
- ♦ [Section 10.7, “Library Objects,” on page 174](#)

10.1 Generic Resource Objects

Generic Resource objects allow you to store information that a policy consumes. It can be any information stored in text or XML format. A resource object is stored in a library or driver object. An example of using a resource object is when multiple drivers need the same set of constant parameters. The resource object stores the parameters and the drivers use these parameters at any time.

- ♦ [Section 10.1.1, “Creating a Generic Resource Object,” on page 171](#)
- ♦ [Section 10.1.2, “Using a Generic Resource Object,” on page 172](#)

10.1.1 Creating a Generic Resource Object

- 1 In the Outline view, right-click the location where you want to create the resource object, then select *New > Resource*.
- 2 Specify the name of the resource object.
- 3 Select the content type: *XML* or *Text*.
- 4 Select the check box for *Open the editor after creating the object*, then click *OK*.

Set Resource Name

Enter a name for your new resource.



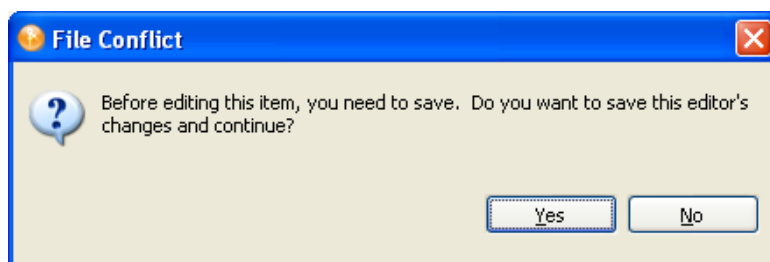
Name:

Content type:

Open the editor after creating the object.

OK Cancel

5 Click *Yes* in the file conflict messages.



6 Specify the desired text or XML, then press Ctrl+S to save the resource object.

10.1.2 Using a Generic Resource Object

A resource object is a place to store information. It is an eDirectory object, and to use the information in the object, you treat it as any other eDirectory object. The attribute DirXML-Data stores the information in the resource object, and the attribute DirXML-Content type stores the label of the information.

To read the information stored in the resource object, use the [Source Attribute \(page 304\)](#) or [Destination Attribute \(page 292\)](#) tokens. To write information to the object, use the following actions:

- [Clear Destination Attribute Value \(page 240\)](#)
- [Clear Source Attribute Value \(page 242\)](#)
- [Set Default Attribute Value \(page 266\)](#)
- [Set Source Attribute Value \(page 274\)](#)

10.2 Mapping Table Objects

A mapping table object is used by a policy to map a set of values to another set of corresponding values. After a mapping table object is created, the [Map \(page 316\)](#) token maps the results of the specified tokens from the values specified in the mapping table. For more information, see [Section 4.14, "Mapping Table Editor," on page 62.](#)

10.3 ECMAScript Objects

ECMAScript objects are resource objects that store ECMAScripts. The ECMAScript is used by policies and style sheets. For more information, see [Chapter 11, “Using ECMAScript in Policies,”](#) on page 177.

10.4 Credential Application Objects

Application objects store authentication parameter values for Novell Credential Provisioning policies. There are application objects for Novell SecureLogin and for Novell SecretStore. For information on how to create application objects for SecureLogin, see “[Creating an Application Object](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*. For information on how to create application objects for SecretStore, see “[Creating an Application Object](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*.

10.5 Credential Repository Objects

Repository objects store static configuration information for Novell Credential Provisioning policies. There are repository objects for Novell SecureLogin and for Novell SecretStore. For information on how to create repository objects for SecureLogin, see “[Creating a Repository Object](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*. For information on how to create repository objects for SecretStore, see “[Creating a Repository Object](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*.

10.6 Package Objects

There are resource objects that are used to make package management work. For more information about packages, see “[Managing Packages](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

- ♦ [Section 10.6.1, “DS Objects,”](#) on page 173
- ♦ [Section 10.6.2, “Package Prompts,”](#) on page 174
- ♦ [Section 10.6.3, “Filters,”](#) on page 174

10.6.1 DS Objects

A DS Resource object contains information that creates eDirectory objects in the Identity Vault. To create a DS object:

- 1 Right-click on the Identity Vault, driver set, or driver in the modeler, then click *New > DS Object*.
- 2 Specify the name for the DS object.
- 3 Click the browse icon, then browse to and select the DS object you want to add to this Resource object.
- 4 (Conditional) If your authentication information is not saved in Designer, specify the following information to log into the Identity Vault:
Host: Specify the IP address or DNS name of the server that contains your Identity Vault.

Username: Specify the DN of a user object to authenticate to the Identity Vault. Specify the name using dot notation.

Password: Specify the password of the user entered above.

- 5 After selecting the object, click *OK*.
- 6 Click *Yes*, to save the object so it can be opened in the editor.
- 7 Review the information in the XML editor, then close the editor.

10.6.2 Package Prompts

Package prompts are Resource objects that allow you to add prompts to packages you create. For more information, see “[Creating Package Prompts](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

10.6.3 Filters

Filters are Resource objects that allow you to add filters to packages. This object can only be created on driver objects and if the *Enable Package Developer Mode* option is selected on the Identity Vault.

To create a filter Resource object:

- 1 Right-click the Identity Vault, then click *Properties*.
- 2 Verify that the *Enable Package Developer Mode* option is selected, then close this page.
- 3 Right-click the driver, then click *New > Resource*.
- 4 Specify an name for the filter Resource object.
- 5 In the content type drop-down list, select *application/vnd.novell.dirxml.filter-ext+xml*, then click *OK*.
- 6 Click *Yes*, to save the object so it can be opened in the editor.
- 7 Add the desired information to the filter, then close the Filter Editor.

10.7 Library Objects

Packages replace and enhance the functionality that library objects provide. For more information about packages, see “[Managing Packages](#)” in the *Designer 4.0.1 for Identity Manager 4.0.1 Administration Guide*.

Library objects store multiple policies and other resources that are shared by one or more drivers. A library object can be created in a driver set object or any eDirectory container. Multiple libraries can exist in an eDirectory tree. Drivers can reference any library in the tree as long as the server running the driver holds a Read/Write or Master replica of the library object.


Style sheets, policies, rules, and other resource objects can be stored in a library and be referenced by one or more drivers.

- ♦ [Section 10.7.1, “Creating Library Objects,”](#) on page 175
- ♦ [Section 10.7.2, “Adding Policies to the Library Objects,”](#) on page 175
- ♦ [Section 10.7.3, “Using Policies in the Library Objects,”](#) on page 176

10.7.1 Creating Library Objects

- 1 Right-click a driver set or the Identity Vault object in the Outline view, then click *New > Library*.
- 2 Specify the name of the library object, then click *OK*.

Set Library Name
Enter a name for your new library.



Name:

10.7.2 Adding Policies to the Library Objects

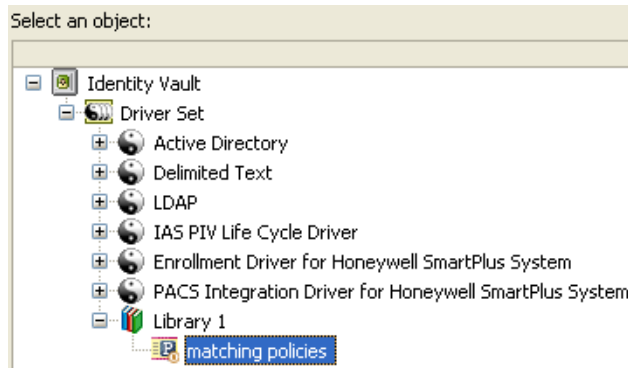
Libraries can hold any policy, XSLT style sheets, or any type of resource object.

- 1 Right-click the library object, select *New*, then select the type of object you want stored in the library. The options are:
 - ♦ **Credential Application:** Stores application authentication parameter values for Novell Credential Provisioning policies. For information, see “[Creating an Application Object](#)” or “[Creating an Application Object](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*.
 - ♦ **Credential Repository:** Stores static configuration information for Novell Credential Provisioning policies. For information, see “[Creating a Repository Object](#)” or “[Creating a Repository Object](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*.
 - ♦ **DirXML Script:** Creates a policy set. See [Section 3.3, “Creating a Policy,”](#) on page 24 for more information.
 - ♦ **ECMAScript:** Creates an ECMAScript object. See [Section 11.1, “Creating an ECMAScript Object,”](#) on page 177 for more information.
 - ♦ **Mapping Table:** Creates a mapping table object. For more information, see [Section 4.14.1, “Creating a Mapping Table Object,”](#) on page 62.
 - ♦ **Resource:** Creates a generic resource object. For more information, see [Section 10.1.1, “Creating a Generic Resource Object,”](#) on page 171.
 - ♦ **Schema Map:** Creates a Schema Map object. For more information, see [Chapter 6, “Defining Schema Map Policies,”](#) on page 79.
 - ♦ **XSLT:** Creates an XSLT style sheet in the library. For more information, see “[Defining Policies by Using XSLT Style Sheets](#)” in *Understanding Policies for Identity Manager 4.0.1*.
 - ♦ **From Copy:** Creates a copy of an existing object.

10.7.3 Using Policies in the Library Objects

After you have created the library, you can use any of the resources stored in the library in any policy.

- 1 Double-click the desired policy in the Outline view.
- 2 Right-click in the Policy Builder, then select *New > Include > Insert Include Before* or *Insert Include After*.
- 3 Browse to and select the desired resource stored in the library object, then click *OK* twice.



Using ECMAScript in Policies

11

ECMAScript is a scripting programming language, standardized by Ecma International. It is often referred to as JavaScript* or JScript, but these are actually implementations of ECMAScript. Identity Manager supports ECMAScript. ECMAScript objects are resource objects that store ECMAScripts. The ECMAScript is called through a policy to provide advanced functionality that DirXML Script or XSLT style sheets cannot provide.

Identity Manager uses the ECMAScript objects in two different ways: to create a custom form in the provisioning request definition editor, and to call an ECMAScript function in policies. For more information on custom forms, see [Creating Custom Forms \(http://www.novell.com/documentation/idm35/dgpro/data/prdefcreateformschapter.html\)](http://www.novell.com/documentation/idm35/dgpro/data/prdefcreateformschapter.html).

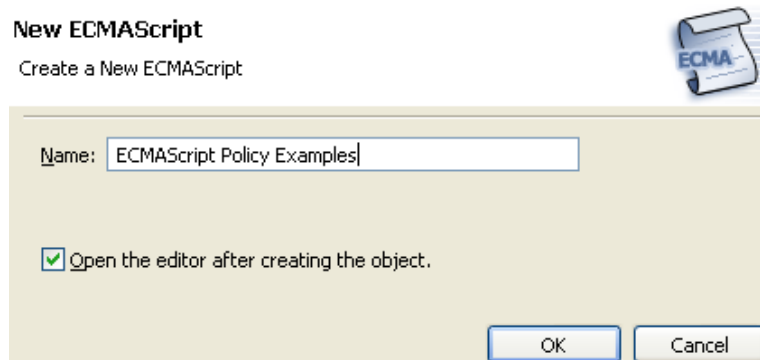
This section explains how to use the ECMAScript editor, how to use ECMAScript with policies, and how to use ECMAScript with custom forms. It does not explain the ECMAScript language. See the [ECMAScript Language Specification \(http://www.ecma-international.org/publications/standards/Ecma-262.htm\)](http://www.ecma-international.org/publications/standards/Ecma-262.htm) for information on how to use the ECMAScript language.

- ♦ [Section 11.1, “Creating an ECMAScript Object,” on page 177](#)
- ♦ [Section 11.2, “Using the ECMAScript Editor,” on page 178](#)
- ♦ [Section 11.3, “Examples of ECMAScripts with Policies,” on page 186](#)

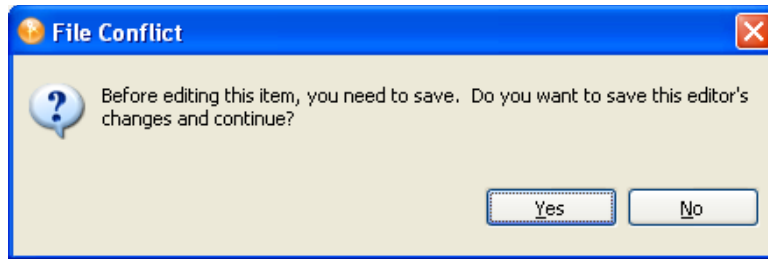
11.1 Creating an ECMAScript Object

ECMAScript objects can be created in a library, driver object, Publisher channel, or Subscriber channel.

- 1 In the Outline view, right-click the location to create the ECMAScript object, then select *New > ECMAScript*.
- 2 Specify the name of the ECMAScript object.
- 3 Select the check box for *Open the editor after creating the object*, then click *OK*.



- 4 Click *Yes* in the file conflict message to save the ECMAScript object.



- 5 Either type the ECMAScript, or copy the ECMAScript into the editor from an existing file.
- 6 To save the ECMAScript press Ctrl+S after the ECMAScript is finished.

For information on how to use the ECMAScript editor, see [Section 11.2, “Using the ECMAScript Editor,”](#) on page 178.

11.2 Using the ECMAScript Editor

ECMAScript objects are supported only with servers that have Identity Manager 3.5 or later installed. If a server in a selected driver set is earlier than Identity Manager 3.5, an error message is displayed, and Designer does not allow the object to be created. Change the version of the server to Identity Manager 3.5 or later on the properties of the server, then the ECMAScript object can be created.

Designer provides an ECMAScript editor, which also includes an ECMA Expression Builder. You use both to create the ECMAScript.

To access the ECMAScript editor:

- 1 Right-click an ECMAScript object in the Outline view, then select *Edit*.

or

When creating an ECMAScript object, select the check box *Open the editor after creating the object*.

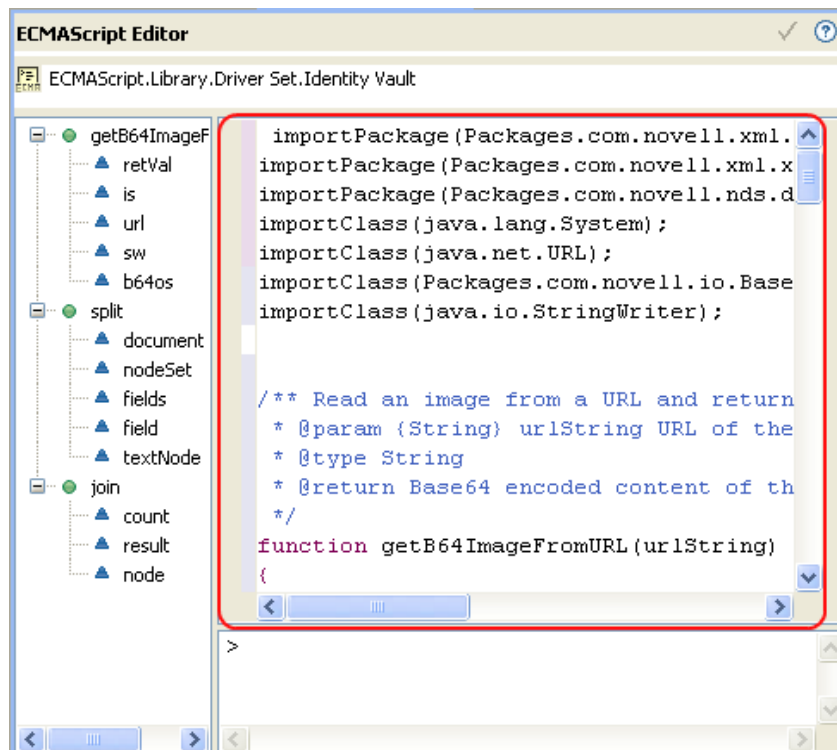
The ECMAScript editor provides different types of functionality depending upon which section you are using.

- ♦ [Section 11.2.1, “Main Scripting Area,”](#) on page 178
- ♦ [Section 11.2.2, “Expression Builder,”](#) on page 181
- ♦ [Section 11.2.3, “Functions and Variables,”](#) on page 183
- ♦ [Section 11.2.4, “Error Display,”](#) on page 184
- ♦ [Section 11.2.5, “Shell Area,”](#) on page 184

11.2.1 Main Scripting Area

The ECMAScript editor provides a main scripting area where the ECMAScript is created. You can type a new script, or copy an existing one.

Figure 11-1 Main Scripting Area



- ◆ [“Using an Existing ECMAScript” on page 179](#)
- ◆ [“Editing an ECMAScript” on page 179](#)
- ◆ [“Coding Help for ECMAScript” on page 180](#)

Using an Existing ECMAScript



- 1 Open the ECMAScript in a text editor, then copy the script.
- 2 Paste the ECMAScript into the ECMAScript editor.
- 3 Press Ctrl+S to save the ECMAScript.

Editing an ECMAScript

There are multiple options available for use to edit the ECMAScript.

Table 11-1 ECMAScript Editing Options

Option	Description
Undo Typing	Undoes the typing that has occurred.
Redo	Redoes the last action.
Cut	Cuts the selected area and adds it to the clipboard.
Copy	Copies the selected area into the clipboard.

Option	Description
 Paste	Pastes the information in the clipboard into the main scripting area.
 Delete	Deletes the selected information from the main scripting area.
Select All	Selects all of the information in the main scripting area.
Find/Replace	Finds and replaces the specified information.
Show Expression Builder	Launches the Expression Builder. For more information, see Section 11.2.2, “Expression Builder,” on page 181.

Coding Help for ECMAScript

The ECMA Script editor contains coding helps. To access the coding helps, right-click in the left margin of the main scripting area, then select the desired option.

Table 11-2 Coding Help

Option	Description
Toggle Breakpoints	To be implemented.
Enable Breakpoints	Sets breakpoints in the ECMAScript.
Breakpoints Properties	Displays the properties of the breakpoints.
Add Bookmarks	Places a bookmark icon on a line in the ECMAScript editor.
Add Tasks	Places a task icon in a line as a reminder of additional work that needs to be done. If you open the Task view from the toolbar, by selecting <i>Window > Show View > Tasks</i> , the task is displayed.
Revert Block	To be implemented.
Delete Added Line	Deletes the last line added.
Show Quick Diff	To be implemented.
Show Line Numbers	Displays line numbers in the main scripting area.
Preferences	Sets the line delimitation and sets the suffix for the files created in the ECMAScript editor. By default, there is no translation for line delimiters, and the suffix is <code>.js</code> .

11.2.2 Expression Builder

The Expression Builder helps in creating ECMAScript expressions. The Expression Builder can be accessed in two ways through the ECMAScript editor; it can also be accessed through the Policy Builder and the Argument Builder.

To access the Expression Builder in the ECMAScript editor:

- 1 Right-click in the main scripting area of the ECMAScript editor, then click *Show Expression Builder*.

or

Right-click the shell area of the ECMAScript editor, then click *Show Expression Builder*.

To access the Expression Builder through the Policy Builder:

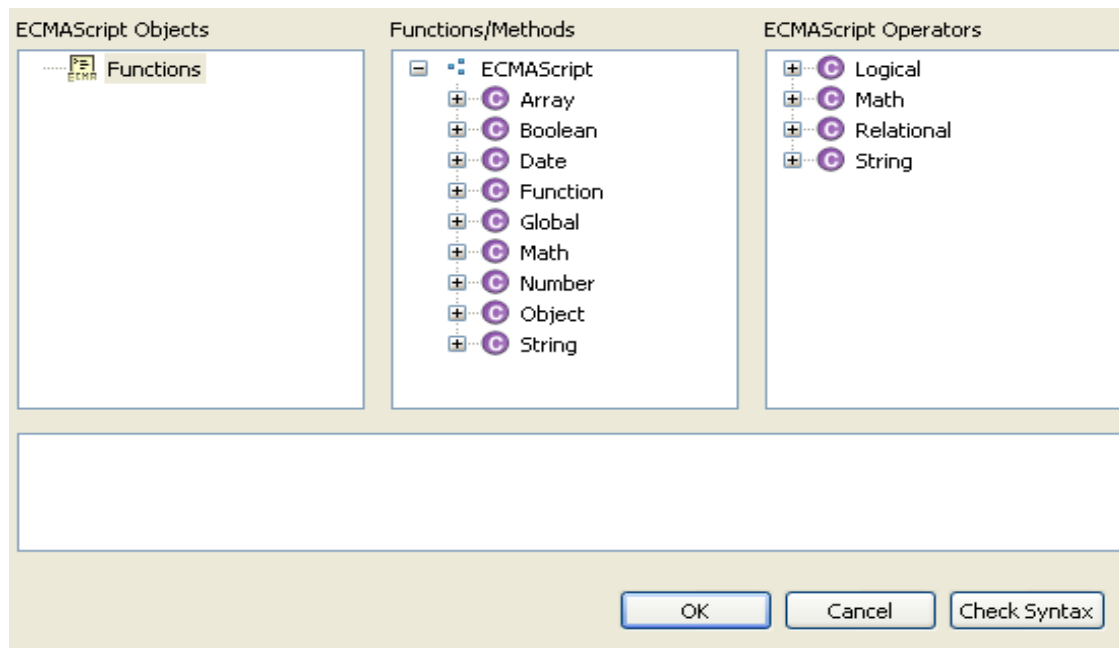
- 1 Click the *Launch ECMA Expression Builder* icon next to the following actions or conditions:
 - ♦ [If XPath Expression](#)
 - ♦ [Append XML Element](#)
 - ♦ [Append XML Text](#)
 - ♦ [Clone By XPath Expressions](#)
 - ♦ [Set XML Attribute](#)
 - ♦ [Strip XPath Expression](#)

To access the Expression Builder through the Argument Builder:

- 1 Double click the [XPath](#) noun token.
- 2 Click the *Launch ECMA Expression Builder* icon in the Argument Builder.

The Expression Builder has three panes; *ECMAScript/Variables*, *Functions/Methods*, and *ECMAScript Operators*.

Figure 11-2 *Expression Builder*



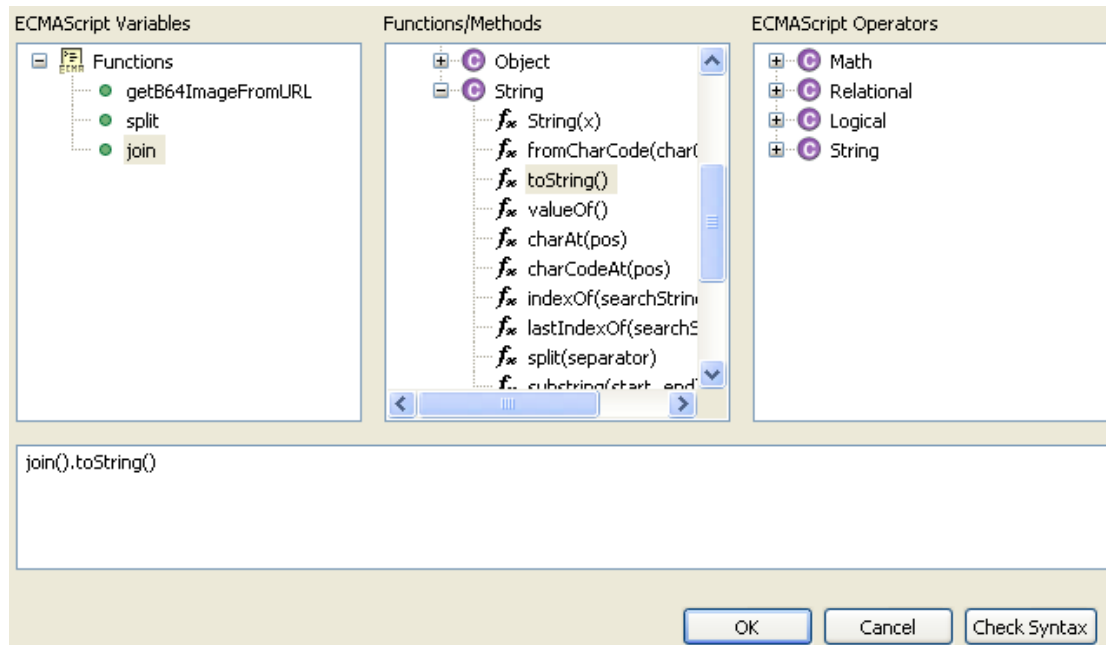
ECMAScript Objects lists all of the current defined functions in the ECMAScript. *Function/Methods* contains the standard ECMAScript functions. *ECMAScript Operators* displays the standard ECMAScript operators.

To use the Expression Builder:

- 1 (Optional) Click the desired *ECMAScript Objects*.
- 2 (Optional) Click the desired *Functions/Methods*.
- 3 (Optional) Click the desired *ECMAScript Operators*.
- 4 Click *Check Syntax* to validate the expression.
- 5 Click *OK* to close the Expression Builder.

In the following example, the join ECMAScript variable is used with the toString function or method, but there is no ECMAScript operator selected.

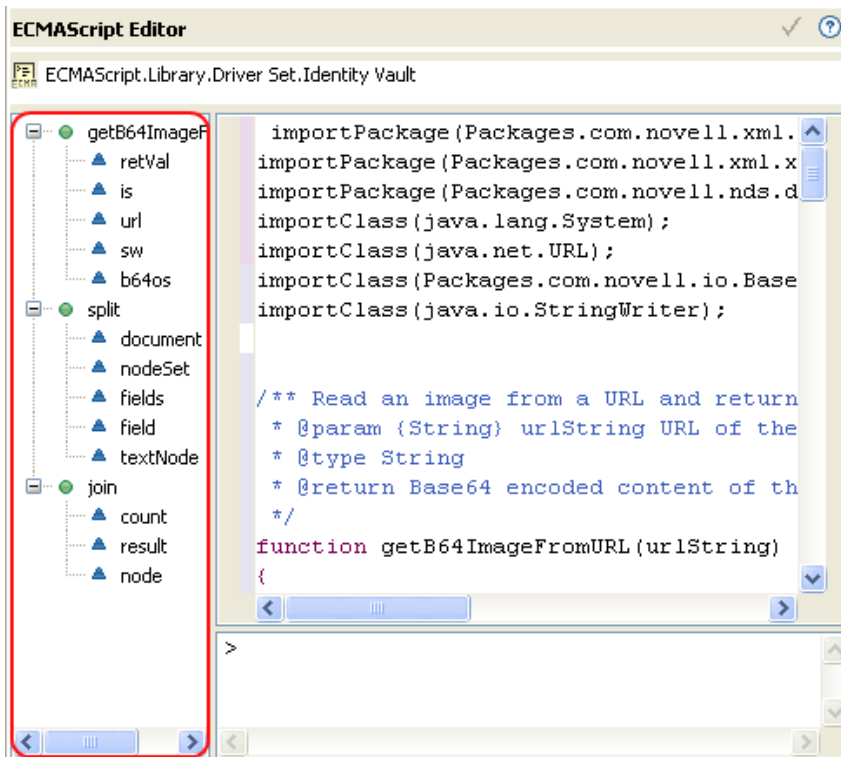
Figure 11-3 Expression Builder Example



11.2.3 Functions and Variables

As functions and variables are defined in the ECMAScript, they are displayed on the left side of the ECMAScript editor.

Figure 11-4 Functions and Variables

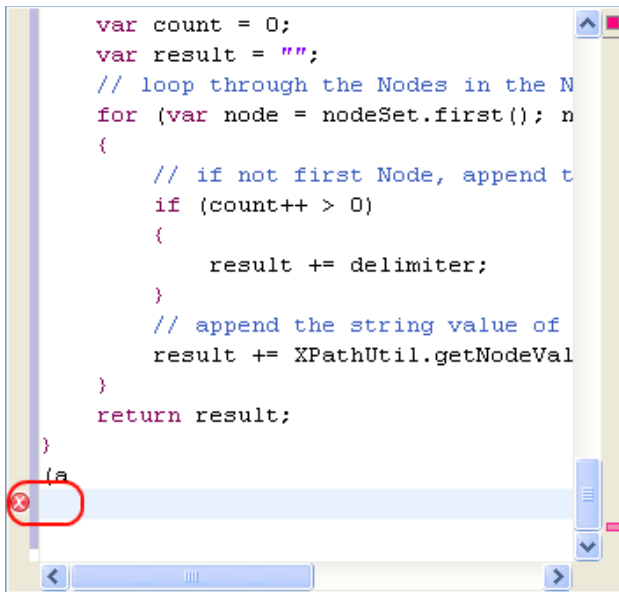


All of the variables that are stored in a function are grouped together. You can expand a function to view all of the variables, by clicking the plus icon (arrow icon in Linux). You can view the function without the variables by clicking the minus icon (arrow icon in Linux).

11.2.4 Error Display

As the ECMAScript is created, errors are displayed in the main scripting area and in the Problems view. The main scripting area displays the errors as a red X on the line where the error occurs.

Figure 11-5 Main Scripting Area Errors



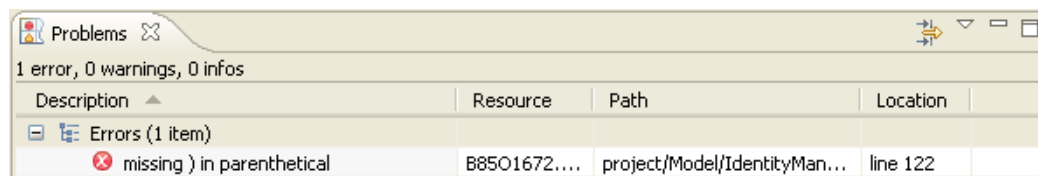
The Problems view accumulates the errors as the ECMAScript is typed, displays the cause of the error.

Double-click the error in the Problems view. The cursor jumps to the problem line in the main scripting area.

To access the Problems view:

- 1 In the toolbar, select *Window > Show View > Other > General > Problems*.

The Problems view is displayed below the ECMAScript editor.



11.2.5 Shell Area

The shell area of the ECMAScript area allows you execute the ECMAScript. After the ECMAScript is created, you can test the functionality of the script.

Figure 11-6 Shell Area

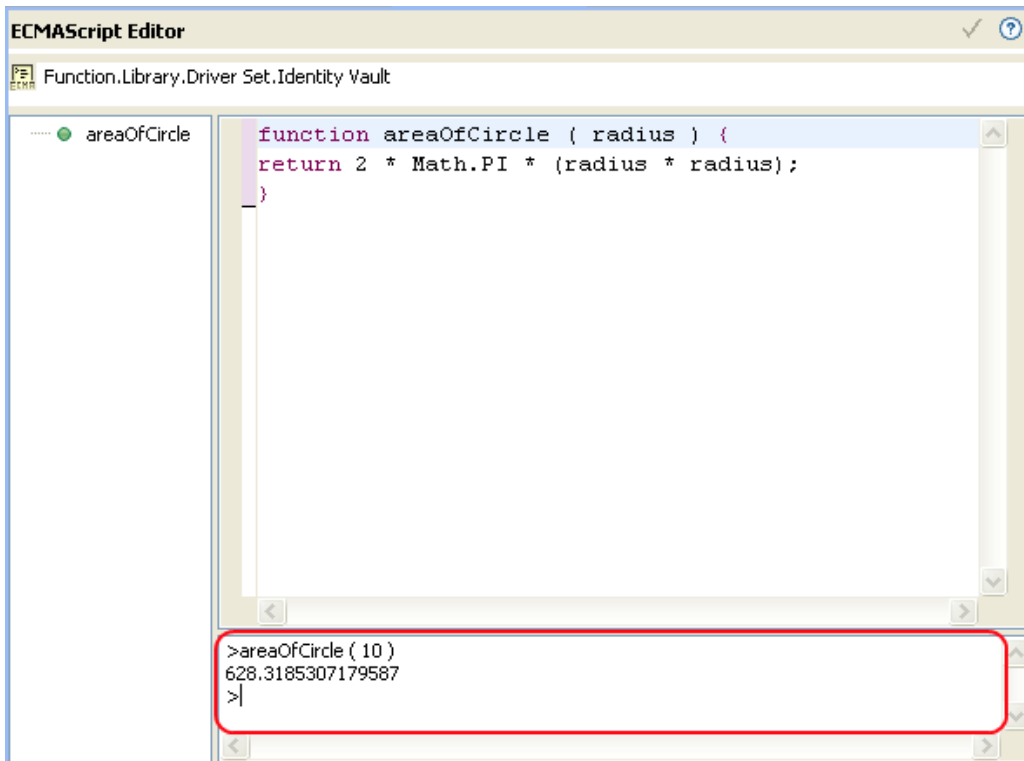


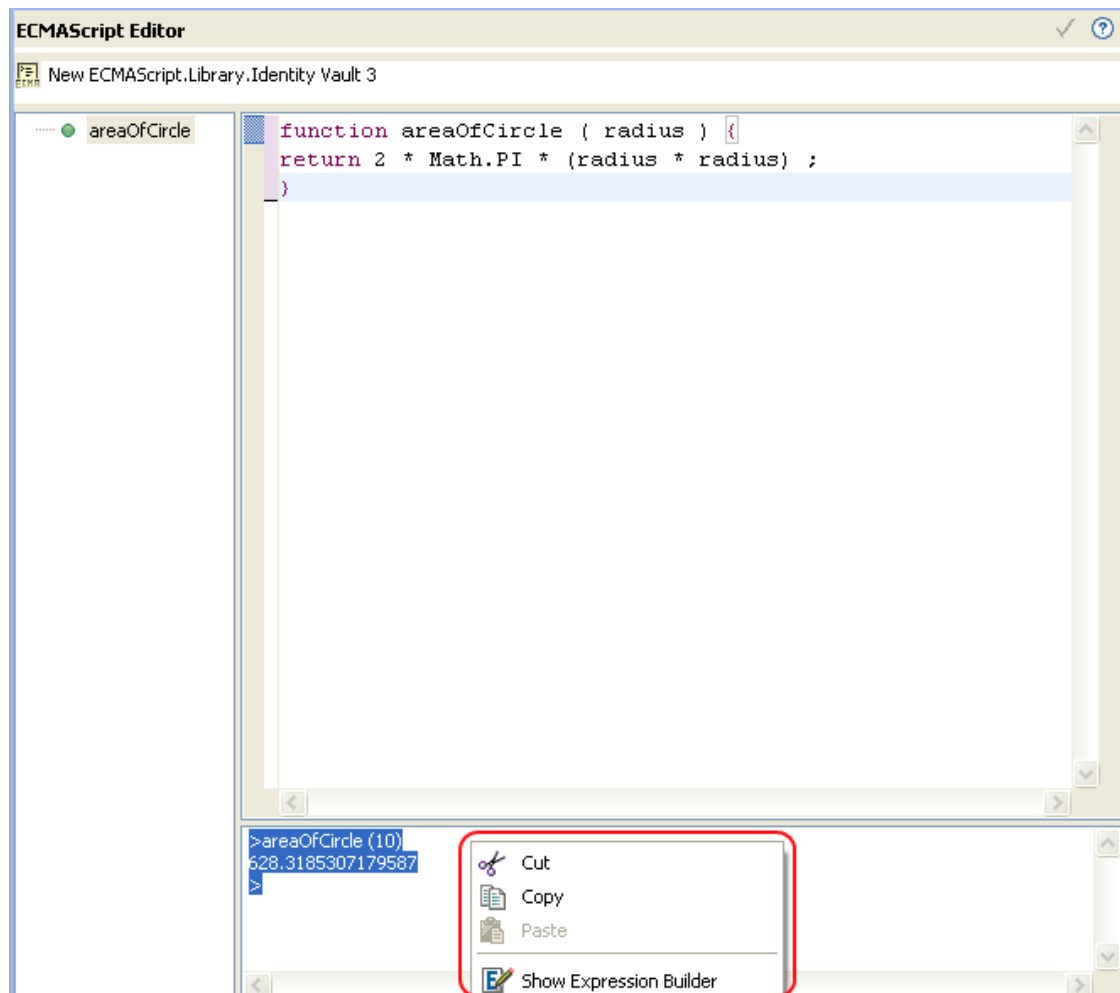
Figure 11-6 contains an example of a function that determines the area of a circle. The function is tested by specifying a value of `areaOfCircle(10)`. The shell displays the value of 628.3185307179587.

To execute the expression, press the Enter key. If you want to enter more than one line of code in the console, press Enter on the numeric keypad.

Additional Options in Shell Area

If you right-click inside the shell area you are presented with the following additional options:

Figure 11-7 Shell Area Additional Options



- ◆ **Cut, Copy and Paste:** Enables you to cut, copy and paste from and into the shell area.
- ◆ **Show Expression Builder:** Launches ECMA Expression Builder.

11.3 Examples of ECMAScripts with Policies

The following examples use the ECMAScript file `demo.js` (http://www.novell.com/documentation/idm35/policy_designer/samples/demo.js) with different policies. The `demo.js` file contains three ECMAScript function definitions.

- ◆ Section 11.3.1, “DirXML Script Policy Calling an ECMAScript Function,” on page 187
- ◆ Section 11.3.2, “XSLT Policy Calling an ECMAScript Function at the Driver Level,” on page 188
- ◆ Section 11.3.3, “XSLT Policy Calling an ECMAScript Function in the Style Sheet,” on page 189

11.3.1 DirXML Script Policy Calling an ECMAScript Function

The DirXML Script policy converts an attribute that is a URL reference to a photo to the Base64 encoded photo data by calling the ECMAScript function `getB64ImageFromURL()`. The policy can be used as an Input Transformation or Output Transformation policy.

The function reads an image from a URL and returns the content as a Base64 encoded string.

```
<?xml version="1.0" encoding="UTF-8"?><!DOCTYPE policy PUBLIC "policy-builder-
dtd" "C:\Program
Files\Novell\Designer\eclipse\plugins\com.novell.designer.idm.policybuilder_1
.2.0.200612180606\DTD\dirxmlscript.dtd"><policy>
  <rule>
    <description>Reformat photo from URL to octet</description>
    <conditions/>
    <actions>
      <do-reformat-op-attr name="photo">
        <arg-value type="octet">
          <token-xpath expression="es:getB64ImageFromURL(string($current-
value))"/>
        </arg-value>
      </do-reformat-op-attr>
    </actions>
  </rule>
</policy>
```

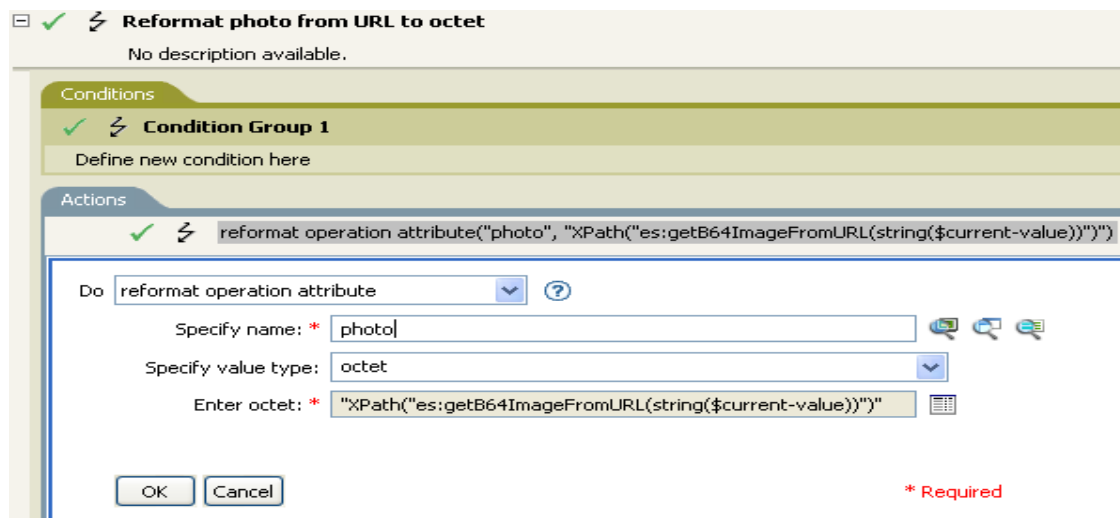
Function: `<static> String getB64ImageFromURL(<String> urlString)`

Parameters: `urlString` (URL of the image file)

Returns: Base64 encoded content of the image (or empty string if error)

The file [ReformatPhoto.xml](#) (`../samples/ReformatPhoto.xml`) calls the ECMAScript function `getB64ImageFromURL` from a DirXML Script policy. The file [phototest.xml](#) (`../samples/phototest.xml`) is a sample input document that shows the policy in action.

Figure 11-8 *Reformat Photo Example*



The ECMAScript calls the `getB64ImageFromURL` function, which then returns the current value as a string.

11.3.2 XSLT Policy Calling an ECMAScript Function at the Driver Level

The XSLT policy either splits a single comma-delimited value into multiple values, or joins multiple values into a single comma-delimited value. The XSLT policy is defined at the driver level and can be used as an Input Transformation or Output Transformation policy.

NOTE: DirXML Script has the split and join functionality built into it, but XSLT does not. This type of function allows XSLT to have the split and join functionality.

There are two functions:

- ♦ [“Join” on page 188](#)
- ♦ [“Split” on page 188](#)

Join

The Join function joins the text values of Nodes in a NodeSet into a single string

```
<!-- template that joins the joinme attribute values into a single value -->
<xsl:template match="*[@attr-name='joinme']//*[value] | *[@attr-
name='joinme'] [value]">
  <xsl:copy>
    <xsl:apply-templates select="@*|node()[not(self::value)]"/>
    <value>
      <xsl:value-of select="es:join(value)"/>
    </value>
  </xsl:copy>
</xsl:template>
```

Function: `<static> String join(<NodeSet> nodeSet, <string> delimiter)`

Parameters: `nodeSet` (the input NodeSet) and `delimiter` (the delimiter to split on. Optional: default = none).

Returns: The concatenation of the string values of the Nodes in the `nodeSet`, separated by the delimiter.

Split

The Split function splits a string into a NodeSet.

```
<!-- template that splits the splitme attribute values into multiple values -
->
<xsl:template match="*[@attr-name='splitme']//value">
  <xsl:for-each select="es:split(string(.))">
    <value>
      <xsl:value-of select="."/>
    </value>
  </xsl:for-each>
</xsl:template>
```

Function: `<static> NodeSet split(<String> inputString, <String> delimiter)`

Parameters: `inputString` (the script to split) and `delimiter` (the delimiter to split on. Optional: default = “,”).

Returns: A NodeSet containing text nodes.

The file [SplitJoin.xsl](#) (`./samples/SplitJoin.xsl`) calls the join or split functions in an XSLT style sheet. The file [splitjointest.xml](#) (`./samples/splitjointest.xml`) is an input document that shows the style sheet in action.

11.3.3 XSLT Policy Calling an ECMAScript Function in the Style Sheet

The XSLT policy demonstrates embedding ECMAScript function definitions with the XSLT style sheet. The functions convert a string to uppercase.

```
<!-- define ecma script functions -->
<es:script>
function uppercase(input)
{
    return String(input).toUpperCase();
}
</es:script>
```

The file [uppercase.xsl](#) (`./samples/uppercase.xsl`) defines the ECMAScript function with the XSLT style sheet. The file [uppercasetest.xml](#) (`./samples/uppercasetest.xml`) is an input document that shows the style sheet in action.

Conditions define when actions are performed. Conditions are always specified in either [Conjunctive Normal Form \(CNF\)](http://mathworld.wolfram.com/ConjunctiveNormalForm.html) (<http://mathworld.wolfram.com/ConjunctiveNormalForm.html>) or [Disjunctive Normal Form \(DNF\)](http://mathworld.wolfram.com/DisjunctiveNormalForm.html) (<http://mathworld.wolfram.com/DisjunctiveNormalForm.html>). These are logical expression forms. The actions of the enclosing rule are only performed when the logical expression represented in CNF or DNF evaluates to True or when no conditions are specified.

This section contains detailed information about all conditions that are available through the Policy Builder interface.

- ♦ [“If Association” on page 191](#)
- ♦ [“If Attribute” on page 193](#)
- ♦ [“If Class Name” on page 196](#)
- ♦ [“If Destination Attribute” on page 198](#)
- ♦ [“If Destination DN” on page 201](#)
- ♦ [“If Entitlement” on page 202](#)
- ♦ [“If Global Configuration Value” on page 204](#)
- ♦ [“If Local Variable” on page 206](#)
- ♦ [“If Named Password” on page 210](#)
- ♦ [“If Operation” on page 210](#)
- ♦ [“If Operation Attribute” on page 213](#)
- ♦ [“If Operation Property” on page 217](#)
- ♦ [“If Password” on page 218](#)
- ♦ [“If Source Attribute” on page 221](#)
- ♦ [“If Source DN” on page 223](#)
- ♦ [“If XML Attribute” on page 225](#)
- ♦ [“If XPath Expression” on page 226](#)

If Association

Performs a test on the association value of the current operation or the current object. The type of test performed depends on the operator specified by the operation attribute.

Fields

Operator

Operator	Returns True When...
Associated	There is an established association for the current object.

Operator	Returns True When...
Available	There is a non-empty association value specified by the current operation.
Equal	The association value specified by the current operation is exactly equal to the content of the if association.
Greater Than	The association value specified by the current operation is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	The association value specified by the current operation is less than the content of the condition when compared by using the specified comparison mode.
Not Associated	There is not an established association for the current object.
Not available	The association is not available for the current object.
Not Equal	The association value specified by the current operation is not equal to the content of the if association.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.


Mode	Description
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

This example tests to see if the association is available. When this condition is met, the actions that are defined are executed.

Condition 

Operator *

If Attribute

Performs a test on attribute values of the current object in either the current operation or the source data store. It can be logically thought of as If Operation Attribute or If Source Attribute, because the test is satisfied if the condition is met in the source data store or in the operation. The test performed depends on the specified operator.

Fields

Name

Specify the name of the attribute to test. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a value available in either the current operation or the source data store for the specified attribute.
Equal	There is a value available in either the current operation or the source data store for the specified attribute, which equals the specified value when compared by using the specified comparison mode.
Greater Than	There is a value available in either the current operation or the source data store for the specified attribute that is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	There is a value available in either the current operation or the source data store for the specified attribute that is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.

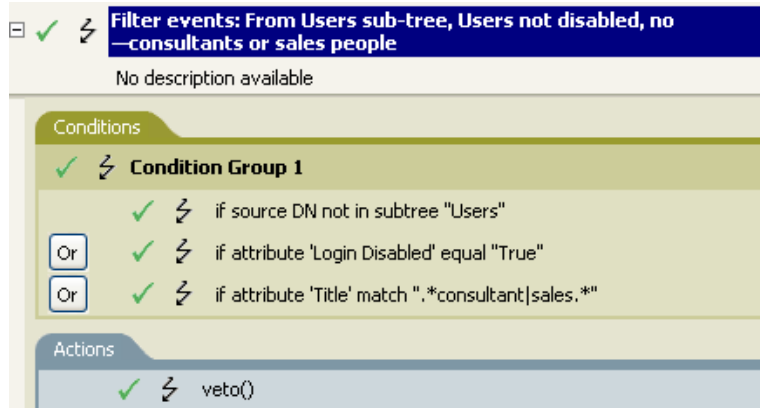
Mode	Description
Regular Expression	<p>The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression.</p> <p>For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html).</p> <p>The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.</p>
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

The example uses the condition If Attribute when filtering for User objects that are disabled or have a certain title. The policy is Policy to Filter Events, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `001-Event-FilterByContainerDisabledOrTitle.xml` (`./samples/001-Event-FilterByContainerDisabledOrTitle.xml`).



The condition is looking for any User object that has an attribute of Title with a value of consultant or sales.

Condition

Name *

Operator *

Mode

Value

If Class Name

Performs a test on the object class name in the current operation.

Fields

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is an object class name available in the current operation.
Equal	There is an object class name available in the current operation, and it equals the specified value when compared by using the specified comparison mode.
Greater Than	There is an object class name available in the current operation, and it is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	There is an object class name available in the current operation, and it is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.

Operator	Returns True When...
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

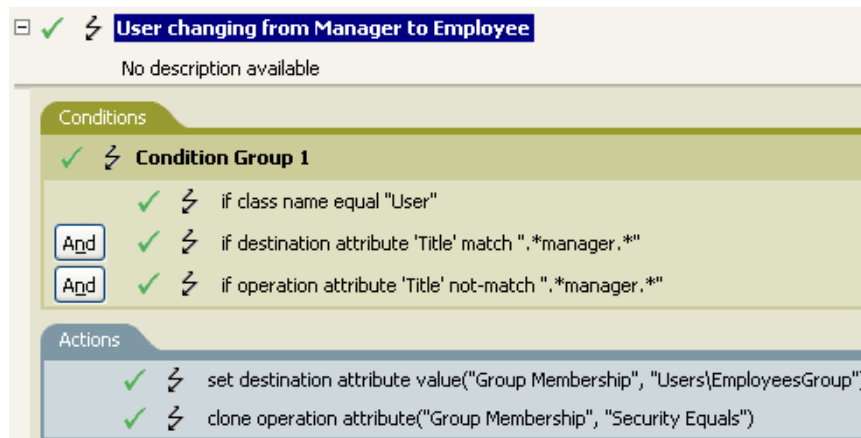
The operators that contain the comparison parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal

- ◆ Not Greater Than
- ◆ Not Less Than

Example

The example uses the condition If Class Name to govern group membership for a User object based on the title. The policy is Govern Groups for User Based on Title Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `004-Command-GroupChangeOnTitleChange.xml` (`../samples/004-Command-GroupChangeOnTitleChange.xml`).



Checks to see if the class name of the current object is User.

Condition

Operator *

Mode

Value

If Destination Attribute

Performs a test on attribute values of the current object in the destination data store. The test performed depends on the specified operator.

Fields

Name

Specify the name of the attribute to test. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a value available in the destination data store for the specified attribute.
Equal	There is a value available for the specified attribute in the destination data store that equals the specified value when compared by using the specified comparison mode.
Greater Than	There is a value available for the specified attribute in the destination data store that is greater than the content of the condition when compared by using the specified comparison mode. If mode="structured", the content must be a set of <component> elements; otherwise, it must be text.
Less Than	There is a value available for the specified attribute in the destination data store that is greater than the content of the condition when compared by using the specified comparison mode. If mode="structured", the content must be a set of <component> elements; otherwise, it must be text.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Great Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, "Variable Selector," on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.

Mode	Description
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

The example uses the condition If Attribute to govern group membership for a User object based on the title. The policy is Govern Groups for User Based on Title Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in “[Understanding Policy Components](#)”. To view the policy in XML, see [004-CommandGroupChangeOnTitleChange.xml \(../samples/004-Command-GroupChangeOnTitleChange.xml\)](#).

The screenshot shows a policy configuration window titled "User changing from Manager to Employee". The window has a status bar with a checkmark and a refresh icon, and a description field that says "No description available". Below this, there are two main sections: "Conditions" and "Actions".


Conditions:




- Condition Group 1:**
 - if class name equal "User"
 - And** if destination attribute 'Title' match ".*manager.*"
 - And** if operation attribute 'Title' not-match ".*manager.*"


Actions:


- set destination attribute value("Group Membership", "Users\EmployeesGroup")
- clone operation attribute("Group Membership", "Security Equals")



The policy checks to see if the value of the title attribute contains manager.

Condition 

Name *   

Operator * 

Mode 

Value  

If Destination DN

Performs a test on the destination DN in the current operation. The test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a destination DN available.
Equal	There is a destination DN available, and it equals the specified value when compared by using semantics appropriate to the DN format of the destination data store.
in Container	There is a destination DN available, and it represents an object in the container, specified by value, when compared by using semantics appropriate to the DN format of the destination data store.
In Subtree	There is a destination DN available, and it represents an object in the subtree, specified by value, when compared by using semantics appropriate to the DN format of the destination data store.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not in Container	In Container would return False.
Not In Subtree	In Subtree would return False.


Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:



- ◆ Equal
- ◆ In Container
- ◆ In Subtree
- ◆ Not Equal

- ◆ Not in Container
- ◆ Not in Subtree

Example

Condition 

Operator *

Value  

If Entitlement

Performs a test on entitlements of the current object, in either the current operation or the Identity Vault. The test performed depends on the specified operator.

Fields

Name

Specify the name of the entitlement to test for the selected condition. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Operator

Select the condition test type.

Operator	Returns True When...
Available	The named entitlement is available in either the current operation or the Identity Vault.
Changing	The current operation contains a change (modify attribute or add attribute) of the named entitlement.
Changing From	The current operation contains a change that removes a value (remove value) of the named entitlement, which has a value that equals the specified value when compared by using the specified comparison mode.
Changing To	The current operation contains a change that adds a value (add value or add attribute) to the named entitlement. It has a value that equals the specified value when compared by using the specified comparison mode.
Equal	There is a value available for the specified attribute in the destination data store that equals the specified value when compared by using the specified comparison mode.
Greater Than	The named entitlement is available and granted in either the current operation or the Identity Vault and has a value that is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	The named entitlement is available and granted in either the current operation or the Identity Vault and has a value that is less than the content of the condition when compared by using the specified comparison mode.
Not available	Available would return False.

Operator	Returns True When...
Not Changing	Changing would return False.
Not Changing From	Changing From would return False.
Not Changing To	Changing To would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Changing From
- ◆ Changing To
- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Changing From
- ◆ Not Changing To
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.


Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.



Mode	Description
Numeric	Compares numerically.
Binary	Compares the binary information.


The operators that contain the comparison mode parameter are:


- ◆ Changing From
- ◆ Changing To
- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Changing From
- ◆ Not Changing To
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than



Example

Condition 

Name *  

Operator * 

Mode 

Value  

If Global Configuration Value

Performs a test on a global configuration value. The test performed depends on the specified operator.

Remark

For more information on using variables with policies, see “[Understanding Policy Components](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Fields

Name

Specify the name of the global value to test for the selected condition. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a global configuration value with the specified name.
Equal	There is a global configuration value with the specified name, and its value equals the specified value when compared by using the specified comparison mode.
Greater Than	There is a global configuration value with the specified name, and its value is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	There is a global configuration value with the specified name, and its value is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.


Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.



Mode	Description
Regular Expression	<p>The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression.</p> <p>For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html).</p> <p>The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.</p>
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.


The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

Condition 

Name *  

Operator * 

If Local Variable

Performs a test on a local variable. The test performed depends on the specified operator.

Remark

For more information on using variables with policies, see “[Understanding Policy Components](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Fields

Name

Specify the name of the local variable to test for the selected condition. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a local variable with the specified name that has been defined by an action of a earlier rule within the policy.
Equal	There is a local variable with the specified name, and its value equals the specified value when compared by using the specified comparison mode.
Greater Than	There is a local variable with the specified name, and its value is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	There is a local variable with the specified name, and its value is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less than or equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.

Mode	Description
Regular Expression	<p>The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression.</p> <p>For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html).</p> <p>The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.</p>
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal
- ◆ Greater Than
- ◆ Not Greater Than
- ◆ Less Than
- ◆ Not Less Than

Example

The example adds a User object to the appropriate Employee or Manager group based on Title. It also creates the group, if needed, and sets up security equal to that group. The policy is Govern Groups for User Based on Title Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see [003-Command-AddCreate-Groups.xml \(../samples/003-Command-AddCreateGroups.xml\)](#).

- ⊕ ✓ ⚡ **Set local variables to test existence of groups and for placement**
- ⊖ ✓ ⚡ **Create ManagersGroup, if needed**
No description available

Conditions

- ✓ ⚡ **Condition Group 1**
- ✓ ⚡ if local variable 'manager-group-info' available
- And ✓ ⚡ if local variable 'manager-group-info' not equal "group"

Actions

- ✓ ⚡ add destination object(class name="Group", when="before", dn(Local Variable("manager-group-dn")))

- ⊕ ✓ ⚡ **Create EmployeesGroup, if needed**
- ⊕ ✓ ⚡ **If Title indicates Manager, add to ManagerGroup and set rights**
- ⊕ ✓ ⚡ **If Title does not indicate Manager, add to EmployeeGroup and set rights**

The policy contains five rules that are dependent on each other.

- ⊖ ✓ ⚡ **Set local variables to test existence of groups and for placement**
No description available

Conditions

- ✓ ⚡ **Condition Group 1**
- ✓ ⚡ if class name equal "User"

And

- ✓ ⚡ **Condition Group 2**
- ✓ ⚡ if operation equal "add"
- Or ✓ ⚡ if operation equal "modify"

Actions

- ✓ ⚡ set local variable("manager-group-dn", "Users\ManagersGroup")
- ✓ ⚡ set local variable("manager-group-info", Destination Attribute("Object Class", dn(Local Variable("manager-group-dn"))))
- ✓ ⚡ set local variable("employee-group-dn", "Users\EmployeesGroup")
- ✓ ⚡ set local variable("employee-group-info", Destination Attribute("Object Class", dn(Local Variable("employee-group-dn"))))

For the If Locate Variable condition to work, the first rule sets four different local variables to test for groups and where to place the groups.

Condition: local variable ?

Name * 🔍 🗨

Operator * ▼

Mode ▼

Value 🔍 🗨

The condition the rule looks for is to see if the local variable of manager-group-info is available and if manager-group-info is not equal to group. If these conditions are met, then the destination object of group is added.

If Named Password

Performs a test on a named password from the driver in the current operation with the specified name. The test performed depends on the selected operator.

Fields

Name


Specify the name of the named password to test for the selected condition. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).



Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a password with the specified name available.
Not Available	Available would return False.

Example

Condition 

Name *  

Operator *

If Operation

Performs a test on the name of the current operation. The type of test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True When...
Equal	The name of the current operation is equal to the content of the condition when compared by using the specified comparison mode.
Greater Than	The name of the current operation is greater than content of the condition when compared by using the specified comparison mode.

Operator	Returns True When...
Less Than	The name of the current operation is less than content of the condition when compared by using the specified comparison mode.
Not Equal	Equal would return False.
Not Greater Than	Greater Than would return False.
Not Less Than	Less Than would return False.

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, "Variable Selector," on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than

- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than



The values are the operations that the Metadirectory engine looks for:

- ◆ add
- ◆ add-association
- ◆ check-object-password
- ◆ check-password
- ◆ delete
- ◆ generated-password
- ◆ get-named-password
- ◆ init-params
- ◆ instance
- ◆ modify
- ◆ modify-association
- ◆ modify-password
- ◆ move
- ◆ password
- ◆ query
- ◆ query-schema
- ◆ remove-association
- ◆ rename
- ◆ schema-def
- ◆ status
- ◆ sync
- ◆ trigger





This list is not exclusive. Custom operations can be implemented by drivers and administrators.

Example









The example adds a User object to the appropriate Employee or Manager group based on Title. It also creates the group, if needed, and sets up security equal to that group. The policy name is Govern Groups for User Based on Title Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `003-Command-AddCreateGroups.xml` (`../samples/003-Command-AddCreateGroups.xml`).



Set local variables to test existence of groups and for placement
 No description available









Conditions


- 

Condition Group 1
 - 

 if class name equal "User"


And


- 

Condition Group 2
 - 

 if operation equal "add"
 - 

Or
 - 

 if operation equal "modify"



Actions

- 

 set local variable("manager-group-dn", "Users\ManagersGroup")
- 

 set local variable("manager-group-info", Destination Attribute("Object Class", dn(Local Variable("manager-group-dn"))))
- 

 set local variable("employee-group-dn", "Users\EmployeesGroup")
- 

 set local variable("employee-group-info", Destination Attribute("Object Class", dn(Local Variable("employee-group-dn"))))

Condition 

Operator * 

Mode 

Value  

The condition checks to see if an Add or Modify operation has occurred. When one of these occurs, it sets the local variables.

If Operation Attribute

Performs a test on attribute values in the current operation. The test performed depends on the specified operator.

Fields

Name

Specify the name of the attribute to test. Supports variable expansion. For more information, see [Section 3.6, "Variable Selector," on page 35](#).

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a value available in the current operation (<add-attr>, <add-value> or <attr>) for the specified attribute. Available would return False if there is only a <remove-value> or a <remove-all-values> value for the specified attribute.

Operator	Returns True When...
Changing	<p>The current operation contains a change (<modify-attr> or <add-attr>) of the specified attribute.</p> <p>Changing would return True if it is an <add-attr>, <add-value>, <remove-value>, or <remove-all-values> operation for the specified attribute.</p>
Changing From	<p>The current operation contains a change that removes a value (<remove-value>) of the specified attribute that equals the content of the condition when compared by using the specified comparison mode. If mode=structured, then the content must be a set of <component>'s. Otherwise, it must be text.</p>
Changing To	<p>The current operation contains a change that adds a value (<add-value> or <add-attr>) to the specified attribute that equals the content of the condition when compared by using the specified comparison mode. If mode=structured, then the content must be a set of <component>'s. Otherwise, it must be text.</p>
Equal	<p>There is a value available in the current operation (other than a <remove-value>) for the specified attribute that equals the content of the condition when compared by using the specified comparison mode. If mode=structured, then the content must be a set of <component>'s. Otherwise, it must be text.</p> <p>Supports variable expansion.</p>
Greater Than	<p>There is a value available in the current operation (other than a <remove-value>) for the specified attribute that is greater than the content of the condition when compared by using the specified comparison mode. If mode=structured, then the content must be a set of <component>'s. Otherwise, it must be text.</p> <p>Supports variable expansion.</p>
Less Than	<p>There is a value available in the current operation (other than a <remove-value>) for the specified attribute that is less than the content of the condition when compared by using the specified comparison mode. If mode=structured, then the content must be a set of <component>'s. Otherwise, it must be text.</p> <p>Supports variable expansion.</p>
Not Available	Available would return False.
Not Changing	Changing would return False.
Not Changing From	Changing From would return False.
Not Changing To	Changing To would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Changing From
- ◆ Changing To
- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Changing From
- ◆ Not Changing To
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.

The operators that contain the comparison mode parameter are:

- ◆ Changing From
- ◆ Changing To
- ◆ Equal
- ◆ Greater Than

- ◆ Less Than
- ◆ Not Changing From
- ◆ Not Changing To
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

The example adds a User object to the appropriate Employee or Manager group based on Title. It also creates the group, if needed, and sets up security equal to that group. The policy name is Govern Groups for User Based on Title Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `003-Command-Add-CreateGroups.xml` (`../samples/003-Command-AddCreateGroups.xml`).

The screenshot shows a policy configuration interface with the following steps:

- Set local variables to test existence of groups and for placement
- Create ManagersGroup, if needed
- Create EmployeesGroup, if needed
- If Title indicates Manager, add to ManagerGroup and set rights
 - No description available

The detailed view of the selected step shows:

- Conditions**
 - Condition Group 1
 - if class name equal "User"
 - And
 - if operation attribute 'Title' match ".*manager.*"
- Actions**
 - set destination attribute value("Group Membership", Local Variable("manager-group-dn"))
 - clone operation attribute("Group Membership", "Security Equals")

Condition

Name *

Operator *

Mode

Value

The condition checks to see if the attribute of Title is equal to `.*manager.*`, which is a regular expression. The condition looks for a title that has zero or more characters before manager and a single character after manager. It would find a match if the User object’s title was sales managers.

If Operation Property

Performs a test on an operation property on the current operation. An operation property is a named value that is stored as an attribute on an <operation-data> element within an operation. It is typically used to supply additional context that might be needed by the policy that handles the results of an operation. The test performed depends on the selected operator.

Fields

Name

Specify the name of the operation property to test for the selected condition. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is an operation property with the specified name on the current operation.
Equal	There is an operation property with the specified name on the current operation, and its value equals the provided content when compared by using the specified comparison mode.
Greater Than	There is an operation property with the specified name on the current operation, and its value is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	There is an operation property with the specified name on the current operation, and its value is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode


The condition has a comparison mode parameter that indicates how a comparison is done.


Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.


The operators that contain the comparison mode parameter are:


- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than



Example

Condition 

Name * 

Operator * 

Mode 

Value  

If Password

Performs a test on a password in the current operation. The test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a password available in the current operation.
Equal	There is a password available in the current operation, and its value equals the content of the condition when compared by using the specified comparison mode.
Greater Than	There is a password available in the current operation, and its value is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	There is a password available in the current operation, and its value is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.

Mode	Description
Regular Expression	<p>The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression.</p> <p>For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html).</p> <p>The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.</p>
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

If you are implementing Novell Credential Provisioning policies, there is a sample Subscriber Command Transformation policy that uses the password condition. The sample file is called `SampleSubCommandTransform.xml`. It is found in the `\dirxml\utilities` folder on the Identity Manager media. For more information, see “[Example Credential Provisioning Policies](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*. To view the policy in XML, see `SampleSubCommandTransform.xml (./samples/SampleSubCommandTransform.xml)`.

The Subscriber Command Transformation policy checks to see if a password is available when an object is added. If the password is available, then the Novell SecureLogin and Novell SecretStore credentials are provisioned.

Add operation-data element to password subscribe operations (if needed)
 Add payload data to modify-password subscribe operations
 Add payload data to add subscribe operations
 No description available

Conditions
 Condition Group 1
 if operation equal "add"
 And if password available

Actions
 append XML element("sso-sync-data", "operation-data")
 append XML element("sso-target-user-dn", "operation-data/sso-sync-data")
 append XML text("operation-data/sso-sync-data/sso-target-user-dn", Source Attribute("DirXML-ADContext"))
 append XML element("sso-app-username", "operation-data/sso-sync-data")
 append XML text("operation-data/sso-sync-data/sso-app-username", Source Attribute("CN"))
 append XML element("password", "operation-data/sso-sync-data")
 append XML text("operation-data/sso-sync-data/password", Password())
 append XML element("nsl-set-passphrase-answer", "operation-data/sso-sync-data")
 append XML text("operation-data/sso-sync-data/nsl-set-passphrase-answer", Source Attribute("workforceID"))

Condition
 Operator *

If Source Attribute

Performs a test on attribute values of the current object in the source data store. The test performed depends on the specified operator.

Fields

Name

Specify the name of the source attribute to test for the selected condition. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a value available in the source data store for the specified attribute.
Equal	There is a value available in the source data store for the specified attribute. It equals the specified value when compared by using the specified comparison mode.

Operator	Returns True When...
Greater Than	There is a value available in the source data store for the specified attribute that is greater than the content of the condition when compared by using the specified comparison mode. If the mode is structured, the content must be a set of components; otherwise, it must be text.
Less Than	There is a value available in the source data store for the specified attribute that is less than the content of the condition when compared by using the specified comparison mode. If the mode is structured, the content must be a set of components; otherwise, it must be text.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Great Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.


Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.




Mode	Description
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.


The operators that contain the comparison mode parameter are:


- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than



Example

Condition 

Name *   

Operator * 

Mode 

Value  

If Source DN

Performs a test on the source DN in the current operation. The test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is a source DN available.
Equal	There is a source DN available, and it equals the content of the specified value in-container.
In Container	There is a source DN available, and it represents an object in the container specified by the content of If Source DN, when compared by using semantics appropriate to the DN format of the source data store.
In Subtree	There is a source DN available, and it represents an object in the subtree identified by the specified value.
Not Available	Available would return False.

Operator	Returns True When...
Not Equal	Equal would return False.
Not In Container	In Container would return False.
Not In subtree	In Subtree would return False.

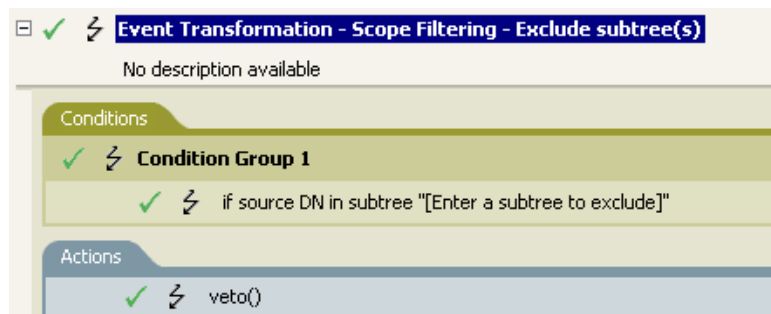
Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ In Container
- ◆ In Subtree
- ◆ Not Equal
- ◆ Not in Container
- ◆ Not in Subtree

Example

The example uses the condition If Source DN to check if the User object is in the source DN. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.8, “Event Transformation - Scope Filtering - Exclude Subtrees,” on page 124](#). To view the policy in XML, see [predef_transformation_filter_exclude_subtrees.xml \(../samples/predef_transformation_filter_exclude_subtrees.xml\)](#).



Condition

Operator *

Value

The condition checks to see if the source DN is in the Users container. If the object comes from that container, it is vetoed.

If XML Attribute

Performs a test on an XML attribute of the current operation. The type of test performed depends on the operator specified by the operation attribute.

Fields

Name

Specify the name of the XML attribute. An XML attribute is a name/value pair associated with an element in an XDS document.

Operator

Select the condition test type.

Operator	Returns True When...
Available	There is an XML attribute with the specified name on the current operation.
Equal	There is a an XML attribute with the specified name on the current operation, and its value equals the content of the condition when compared by using the specified comparison mode.
Greater Than	There is a an XML attribute with the specified name on the current operation, and its value is greater than the content of the condition when compared by using the specified comparison mode.
Less Than	The association value specified by the current operation is less than the content of the condition when compared by using the specified comparison mode.
Not Available	Available would return False.
Not Equal	Equal would return False.
Not Greater Than	Greater Than or Equal would return False.
Not Less Than	Less Than or Equal would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	<p>The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression.</p> <p>For more information, see Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html).</p> <p>The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.</p>
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Example

Condition

Name *

Operator *

If XPath Expression

Performs a test on the results of evaluating an XPath 1.0 expression.

Fields

Operator

Select the condition test type.

Operator	Returns True When...
True	The XPath expression evaluates to True.
Not True	True would return False.

Value

Contains the value defined for the selected operator. The value is used by the condition. Each value supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#). The operators that contain the value field are:

- ◆ Equal
- ◆ Greater Than
- ◆ Less Than
- ◆ Not Equal
- ◆ Not Greater Than
- ◆ Not Less Than

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions” in *Understanding Policies for Identity Manager 4.0.1*](#).

Example

If you are implementing Novell Credential Provisioning policies, there is a sample Subscriber Command Transformation policy that uses the XPath Expression condition. The sample file is called `SampleSubCommandTransform.xml`. It is found in the `\dirxml\utilities` folder on the Identity Manager media. For more information, see [“Example Credential Provisioning Policies” in *Novell Credential Provisioning for Identity Manager 4.0.1*](#). To view the policy in XML, see `SampleSubCommandTransform.xml (./samples/SampleSubCommandTransform.xml)`.

The sample Credential Provisioning policy checks each Add operation to see if there is operation data associated with the Add. If there is no operation data, the Novell SecureLogin and Novell SecretStore credentials are provisioned.

[-] ✓ ⚡ **Add operation-data element to password subscribe operations (if needed)**

No description available

Conditions

✓ ⚡ **Condition Group 1**

✓ ⚡ if operation equal "add"

And

✓ ⚡ if password available

And

✓ ⚡ if XPath expression not true "operation-data"

Or

✓ ⚡ **Condition Group 2**

✓ ⚡ if operation equal "modify-password"

And

✓ ⚡ if XPath expression not true "operation-data"

Actions

✓ ⚡ append XML element("operation-data", ".")

[+] ✓ ⚡ **Add payload data to modify-password subscribe operations**

[+] ✓ ⚡ **Add payload data to add subscribe operations**

Condition XPath expression [v] (?)

Operator * not true [v]

Value operation-data [🔍] [🔗] [🔧] [🔍]

Policies perform actions when the associated conditions are met. Some actions have a *Mode* field. The policy does not honor the mode at run time if the context in which the policy is running is incompatible with the selected mode.

This section contains detailed information about the actions available in the Policy Builder interface:

- ♦ [“Add Association” on page 230](#)
- ♦ [“Add Destination Attribute Value” on page 231](#)
- ♦ [“Add Destination Object” on page 233](#)
- ♦ [“Add Role” on page 234](#)
- ♦ [“Add Source Attribute Value” on page 235](#)
- ♦ [“Add Source Object” on page 236](#)
- ♦ [“Append XML Element” on page 237](#)
- ♦ [“Append XML Text” on page 238](#)
- ♦ [“Break” on page 240](#)
- ♦ [“Clear Destination Attribute Value” on page 240](#)
- ♦ [“Clear Operation Property” on page 241](#)
- ♦ [“Clear Source Attribute Value” on page 242](#)
- ♦ [“Clear SSO Credential” on page 242](#)
- ♦ [“Clone By XPath Expressions” on page 243](#)
- ♦ [“Clone Operation Attribute” on page 244](#)
- ♦ [“Delete Destination Object” on page 245](#)
- ♦ [“Delete Source Object” on page 246](#)
- ♦ [“Find Matching Object” on page 246](#)
- ♦ [“For Each” on page 249](#)
- ♦ [“Generate Event” on page 250](#)
- ♦ [“If” on page 252](#)
- ♦ [“Implement Entitlement” on page 254](#)
- ♦ [“Move Destination Object” on page 254](#)
- ♦ [“Move Source Object” on page 256](#)
- ♦ [“Reformat Operation Attribute” on page 256](#)
- ♦ [“Remove Association” on page 258](#)
- ♦ [“Remove Destination Attribute Value” on page 258](#)
- ♦ [“Remove Role” on page 259](#)
- ♦ [“Remove Source Attribute Value” on page 261](#)
- ♦ [“Rename Destination Object” on page 262](#)
- ♦ [“Rename Operation Attribute” on page 263](#)

- ◆ “Rename Source Object” on page 263
- ◆ “Send Email” on page 264
- ◆ “Send Email from Template” on page 265
- ◆ “Set Default Attribute Value” on page 266
- ◆ “Set Destination Attribute Value” on page 268
- ◆ “Set Destination Password” on page 269
- ◆ “Set Local Variable” on page 270
- ◆ “Set Operation Association” on page 271
- ◆ “Set Operation Class Name” on page 271
- ◆ “Set Operation Destination DN” on page 272
- ◆ “Set Operation Property” on page 273
- ◆ “Set Operation Source DN” on page 273
- ◆ “Set Operation Template DN” on page 273
- ◆ “Set Source Attribute Value” on page 274
- ◆ “Set Source Password” on page 275
- ◆ “Set SSO Credential” on page 276
- ◆ “Set SSO Passphrase” on page 277
- ◆ “Set XML Attribute” on page 278
- ◆ “Start Workflow” on page 278
- ◆ “Status” on page 280
- ◆ “Strip Operation Attribute” on page 281
- ◆ “Strip XPath Expression” on page 281
- ◆ “Trace Message” on page 282
- ◆ “Veto” on page 283
- ◆ “Veto If Operation Attribute Not Available” on page 284
- ◆ “While” on page 285

This section contains detailed information about all actions available in the Policy Builder.

Add Association

Sends an `add association` command with the specified association to the Identity Vault.

Fields

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.


DN

Specify the DN of the target object or leave the field blank to use the current object.


Association


Specify the value of the association to be added.


Example

Do 

Select mode:

 Leave the DN field below blank to use the current object

Specify DN: 

Specify association: * 

Add Destination Attribute Value

Adds a value to an attribute on an object in the destination data store.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Specify the DN, association, or current object as the target object.

Value Type

Select the syntax of the attribute value to be added. The options are string, counter, dn, int, interval, octet, state, structured, teleNumber, or time.

Value

Specify the attribute value to be added.

Example

The example adds the destination attribute value to the OU attribute. It creates the value from the local variables that are created. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.1, “Command Transformation - Create Departmental Container - Part 1 and Part 2,”](#) on page 112. To see the policy in XML, see [predef_command_create_dept_container1.xml \(../samples/predef_command_create_dept_container1.xml\)](#) and [predef_command_create_dept_container2.xml \(../samples/predef_command_create_dept_container2.xml\)](#).

Command Transformation - Create Departmental Container - Part 1

No description available

Conditions

Condition Group 1

if operation equal "add"

Actions

- set local variable("target-container", Destination DN(length="-2"))
- set local variable("does-target-exist", Destination Attribute —("objectclass", class name="Organizational Unit", dn(Local —Variable("target-container"))))

Command Transformation - Create Departmental Container - Part 2

No description available

Conditions

Condition Group 1

- if local variable 'does-target-exist' available
- And if local variable 'does-target-exist' equal ""

Actions

- add destination object(class name="Organizational Unit", direct="—true", dn(Local Variable("target-container")))
- add destination attribute value("ou", direct="true", dn(Local —Variable("target-container")), Parse DN("dest-dn", "dot", length="—1", start="—1", Local Variable("target-container")))

Do ?

Specify attribute name: *   


Specify class name:   

Select mode: 

Select object: 

Specify DN: * 

Specify value type: 

Enter string: * 

Add Destination Object

Creates an object of the specified type in the destination data store, with the name and location specified in the *Enter DN* field. Any attribute values to be added as part of the object creation must be done in subsequent Add Destination Attribute Value actions, using the same DN.

Fields

Class Name

Specify the class name of the object to be created. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

DN

Specify the DN of the object to be created.

Remarks

Any attribute values to be added as part of the object creation must be done in subsequent [Add Destination Attribute Value](#) actions, using the same DN.

Example

The example creates the department container that is needed. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.1, “Command Transformation - Create Departmental Container - Part 1 and Part 2,” on page 112](#) from the predefined rules. To see the policy in XML, see [predef_command_create_dept_container1.xml \(../samples/predef_command_create_dept_container1.xml\)](#) and [predef_command_create_dept_container2.xml \(../samples/predef_command_create_dept_container2.xml\)](#).

The screenshot shows a configuration window for a rule named "Command Transformation - Create Departmental Container - Part 1". The window has a title bar with a close button, a checkmark, and a refresh icon. Below the title bar, it says "No description available". The main area is divided into two sections: "Conditions" and "Actions".

Conditions:

- Condition Group 1
 - if operation equal "add"

Actions:

- set local variable("target-container", Destination DN(length="-2"))
- set local variable("does-target-exist", Destination Attribute —("objectclass", class name="Organizational Unit", dn(Local —Variable("target-container"))))

Command Transformation - Create Departmental Container - Part 2
 No description available

Conditions

Condition Group 1

- if local variable 'does-target-exist' available
- And** if local variable 'does-target-exist' equal ""

Actions

- add destination object(class name="Organizational Unit", direct="true", dn(Local Variable("target-container")))
- add destination attribute value("ou", direct="true", dn(Local Variable("target-container")), Parse DN("dest-dn", "dot", length="-1", start="-1", Local Variable("target-container")))

Do

Specify class name: *

Select mode:

Specify DN: *

The OU object is created. The value for the OU attribute is created from the destination attribute value action that occurs after this action.

Add Role

Initiates a request to the Roles Based Provisioning Module (RBPM) to assign the specified role (in the Role DN field) to the specified user (in the Authorized User DN field). This field is only available if the Identity Manager server version is set to 3.6 or later.

Fields

Role DN

Specify the name of the role to assign, in LDAP format. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

User Application URL

Specify the URL of the User Application server hosting the Roles Based Provisioning module. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Authorized User DN

Specify the name of the user authorized to request the role assignment, in LDAP format. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).


Password

Specify the authorized user password. You can enter a clear text password (not recommended) or use the Argument Builder to specify a Named Password.

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

Strings


(Optional) Specify additional argument strings for the Role assignment request. You can enter the strings manually, or select the *Edit the Strings* icon  to open the Named String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.9, “Named String Builder,” on page 58](#).



The Add Role action supports the following string arguments:


String Name	Description
description	A description of the reason for the request used for auditing and (if necessary) approval purposes. Default: Request generated by policy.
effective-time	The time (in CTIME format) the role assignment should become effective. Default: now
expiration-time	The time (in CTIME format) the role assignment automatically expires. Default: never
sod-justification	A justification for requesting an exception for any Separation of Duty violations this assignment will trigger. Default: No exception will be requested and the request will fail if it causes a violation.



NOTE: By default, the Named String Builder does not display this string. However, you can manually add it to the string list.


Example


Do 


Specify role DN: *  

Specify user application URL: * 

Specify authorized user DN: *  

Specify password: * 

Select object: 

Specify strings: 

Add Source Attribute Value

Adds the specified attribute on an object in the source data store.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Specify the DN, association, or the current object as the target object.



Value Type




Select the syntax of the attribute value to be added. The options are string, counter, dn, int, interval, octet, state, structured, teleNumber, or time.




String


Specify the attribute value to be added.


Example


Do  


Specify attribute name: *   

Specify class name:   

Select object: 

Specify association: * 

Specify value type: 

Enter string: * 

Add Source Object

Creates an object of the specified type in the source data store, with the name and location provided in the DN field. Any attribute values to be added as part of the object creation must be done in subsequent [Add Source Attribute Value](#) actions, using the same DN.

Fields

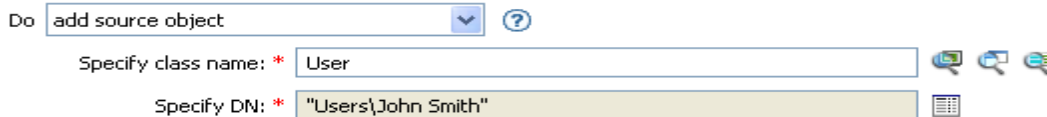
Class Name

Specify the class name of the object to be added. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

DN

Specify the DN of the object to be added.

Example



The screenshot shows a configuration interface with the following fields:

- Do:** A dropdown menu with the text "add source object" and a question mark icon.
- Specify class name: *** A text input field containing the value "User".
- Specify DN: *** A text input field containing the value "Users\John Smith".

There are also several small icons (a magnifying glass, a speech bubble, and a list icon) to the right of the input fields.

Append XML Element

Appends a custom element, with the name specified in the *Name* field, to the set of elements selected by the XPath expression. If *Before XPath Expression* is not specified, the new element is appended after any existing children of the selected elements. If *Before XPath Expression* is specified, it is evaluated relative to each of the elements selected by the expression to determine which of the children to insert before. If *Before XPath Expression* evaluates to an empty node set or a node set that does not contain any children of the selected element, the new element is appended after any existing children; otherwise, the new element is inserted before each of the nodes in the node set selected by before that are children of the selected node.

Fields

Name

Specify the tag name of the XML element. This name can contain a namespace prefix if the prefix has been previously defined in this policy. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

XPath Expression

Specify an XPath 1.0 expression that returns a node set containing the elements to which the new elements should be appended.

Insert

Select whether to insert the XPath expression before the source XPath expression or append the XPath expression to the end of the current node in the destination XPath expression.

Before XPath Expression

Specify an XPath 1.0 expression that evaluates relative to each of the nodes selected by the expression that returns a node set containing the child nodes that the new elements should be inserted before. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#).

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions” in *Understanding Policies for Identity Manager 4.0.1*](#).

Example

If you are implementing Novell Credential Provisioning policies, there is a sample Subscriber Command Transformation policy that uses the XPath Expression condition. The sample file is called `SampleSubCommandTransform.xml`. It is found in the `\dirxml\utilities` folder on the Identity Manager media. For more information, see “[Example Credential Provisioning Policies](#)” in *Novell Credential Provisioning for Identity Manager 4.0.1*. To view the policy in XML, see `SampleSubCommandTransform.xml (../samples/SampleSubCommandTransform.xml)`.

The sample file uses the append XML element action to add the Novell SecureLogin or Novell SecretStore credentials to the user object when it is provisioned.

+

✓ ⚡ **Add operation-data element to password subscribe operations (if needed)**

+

✓ ⚡ **Add payload data to modify-password subscribe operations**

▢ ✓ ⚡ **Add payload data to add subscribe operations**

No description available

Conditions

✓ ⚡ **Condition Group 1**

✓ ⚡ if operation equal "add"

And ✓ ⚡ if password available

Actions

- ✓ ⚡ append XML element("sso-sync-data", "operation-data")
- ✓ ⚡ append XML element("sso-target-user-dn", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/sso-target-user-dn", Source Attribute("DirXML-ADContext"))
- ✓ ⚡ append XML element("sso-app-username", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/sso-app-username", Source Attribute("CN"))
- ✓ ⚡ append XML element("password", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/password", Password())
- ✓ ⚡ append XML element("nsl-set-passphrase-answer", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/nsl-set-passphrase-answer", Source Attribute("workforceID"))

Do append XML element

Enter element name: * sso-sync-data

Specify XPath expression: * operation-data

Insert: Append to end of XPath expression

Append XML Text

Appends the specified text to the set of elements selected by the XPath expression. If Before XPath Expression is not specified, the text is appended after any existing children of the selected elements. If Before XPath Expression is specified, it is evaluated relative to each of the elements selected by the expression to determine which of the children to insert before. If Before XPath Expression evaluates to an empty node set or a node set that does not contain any children of the selected element, then the text is appended after any existing children; otherwise, the text is inserted before each of the nodes in the previously selected node set that are children of the selected node.

Fields

XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the elements to which the new elements should be appended. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#).

String

Specify the text to be appended.

Insert

Select whether to insert the XPath expression before the source XPath expression or append the XPath expression to the end of the current node in the destination XPath expression.

Before XPath Expression

Specify the XPath 1.0 expression that evaluates relative to each of the nodes selected by the expression that returns a node set containing the child nodes that the text should be inserted before. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#).

Remarks

For more information on using XPath expressions with policies, see “[XPath 1.0 Expressions](#)” in [Understanding Policies for Identity Manager 4.0.1](#).

Example

If you are implementing Novell Credential Provisioning policies, there is a sample Subscriber Command Transformation policy that uses the XPath Expression condition. The sample file is called `SampleSubCommandTransform.xml`. It is found in the `\dirxml\utilities` folder on the Identity Manager media. For more information, see “[Example Credential Provisioning Policies](#)” in [Novell Credential Provisioning for Identity Manager 4.0.1](#). To view the policy in XML, see [SampleSubCommandTransform.xml \(./samples/SampleSubCommandTransform.xml\)](#).

The example is using the append XML text action to find the Novell SecureLogin or Novell SecretStore application username. By obtaining the application name, the credentials can be set for the user object when it is provisioned.

- ⊕ ✓ ⚡ **Add operation-data element to password subscribe operations (if needed)**
- ⊕ ✓ ⚡ **Add payload data to modify-password subscribe operations**
- ⊖ ✓ ⚡ **Add payload data to add subscribe operations**

No description available

Conditions

- ✓ ⚡ **Condition Group 1**
- ✓ ⚡ if operation equal "add"
- And ✓ ⚡ if password available

Actions

- ✓ ⚡ append XML element("sso-sync-data", "operation-data")
- ✓ ⚡ append XML element("sso-target-user-dn", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/sso-target-user-dn", Source Attribute("DirXML-ADContext"))
- ✓ ⚡ append XML element("sso-app-username", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/sso-app-username", Source Attribute("CN"))
- ✓ ⚡ append XML element("password", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/password", Password())
- ✓ ⚡ append XML element("nsl-set-passphrase-answer", "operation-data/sso-sync-data")
- ✓ ⚡ append XML text("operation-data/sso-sync-data/nsl-set-passphrase-answer", Source Attribute("workforceID"))

Do ?

Specify XPath expression: * ?

Specify string: * ?

Insert: ?

Break

Ends processing of the current operation by the current policy.

Example

Do ?

Clear Destination Attribute Value

Removes all values for the named attribute from an object in the destination data store.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, "Variable Selector," on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.


Object




Select the target object type. This object can be the current object, or can be specified by a DN or an association.




DN


Select the DN, association, or current object as the target object.


Example


Do 

Specify attribute name: *   

Specify class name:   

Select mode: 

Select object: 

Specify DN: * 

Clear Operation Property

Clears any operation property with the provided name from the current operation. The operation property is the XML attribute attached to an `<operation-data>` element by a policy. An XML attribute is a name/value pair associated with an element in the XDS document.

Fields

Property Name

Specify the name of the operation property to clear. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

Do 

Specify property name: * 

Clear Source Attribute Value

Removes all values of an attribute from an object in the source data store.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. This value might be required for schema map purposes if the object is other than current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Select the DN, association, or current object as the target object.

Example

The screenshot shows a configuration window for the 'Clear Source Attribute Value' operation. It includes the following fields:

- Do:** A dropdown menu set to 'clear destination attribute value' with a help icon.
- Specify attribute name: *** A text input field containing 'Member' with three icons to its right.
- Specify class name:** A text input field containing 'User' with three icons to its right.
- Select mode:** A dropdown menu set to 'add to current operation'.
- Select object:** A dropdown menu set to 'DN'.
- Specify DN: *** A text input field containing '"Users\John Smith"' with a list icon to its right.

Clear SSO Credential

Clears the Single Sign On credential so objects can be deprovisioned. Additional information about the credential to be cleared can be provided in the *Enter login parameter strings* field. The number of the strings and the names used are dependent on the credential repository and application for which the credential is targeted. For more information, see [Novell Credential Provisioning for Identity Manager 4.0.1](#).

Fields

Credential Repository Object DN

Specify the DN of the repository object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).


Target User DN

Specify the DN of the target users.

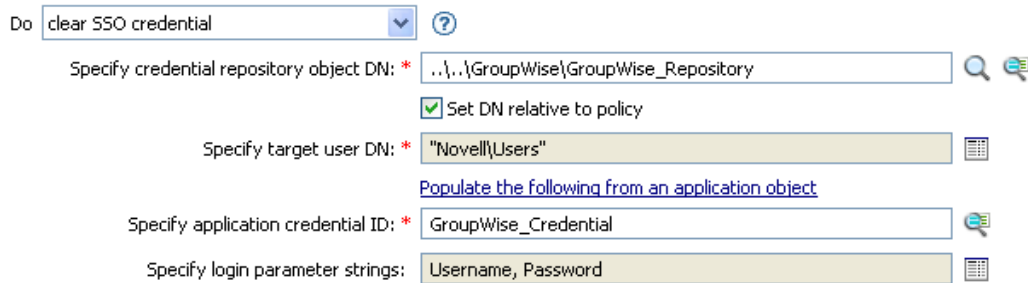
Application Credential ID

Specify the application credential that is stored in the application object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Login Parameter Strings

Specify each login parameter for the application. The login parameters are the authentication keys stored in the application object. You can enter the strings manually, or select the *Edit the Strings* icon  to open the String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.12, “String Builder,”](#) on page 61.

Example



The screenshot shows a configuration form with the following fields and values:

- Do:** clear SSO credential (dropdown menu)
- Specify credential repository object DN: *** ..\..\GroupWise\GroupWise_Repository (text field)
- Set DN relative to policy (checkbox)
- Specify target user DN: *** "Novell\Users" (text field)
- [Populate the following from an application object](#) (link)
- Specify application credential ID: *** GroupWise_Credential (text field)
- Specify login parameter strings:** Username, Password (text field)

Clone By XPath Expressions

Appends deep copies of the nodes specified by the source field to the set of elements specified by the destination field. If Before XPath Expression is not specified, the non-attribute cloned nodes are appended after any existing children of the selected elements. If Before XPath Expression is specified, it is evaluated relative to each of the elements selected by expression to determine which of the children to insert before. If Before XPath Expression evaluates to an empty node set or a node set that does not contain any children of the selected element, the non-attribute cloned nodes are appended after any existing children; otherwise, the non-attribute cloned nodes are inserted before each of the nodes in the previously selected node set that are children of the selected node.

Fields

Source XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the nodes to be copied. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,”](#) on page 39.

Destination XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the elements to which the copied nodes are to be appended. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,”](#) on page 39.

Insert

Select whether to insert the XPath expression before the source XPath expression or append the XPath expression to the end of the current node in the destination XPath expression.


Before XPath Expression





Specify the XPath 1.0 expression that evaluates relative to each of the nodes selected by the expression that returns a node set containing the child nodes that the text should be inserted before. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#).





Remarks

For more information on using XPath expressions with policies, see “[XPath 1.0 Expressions](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Example

Do 

Specify source XPath expression: *    

Specify destination XPath expression: *    

Insert:

Clone Operation Attribute

Copies all occurrences of an attribute within the current operation to a different attribute within the current operation.

Fields

Source Name

Specify the name of the attribute to be copied from. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Destination Name

Specify the name of the attribute to be copied to. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

The example adds a User object to the appropriate Employee or Manager group based on Title. It also creates the group, if needed, and sets up security equal to that group. The policy is Govern Groups for User Based on Title Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To see the policy in XML, see [003-Command-AddCreateGroups.xml](#) (`../samples/003-Command-AddCreateGroups.xml`).

- ⊕ ✓ ⚡ **Set local variables to test existence of groups and for placement**
- ⊕ ✓ ⚡ **Create ManagersGroup, if needed**
- ⊕ ✓ ⚡ **Create EmployeesGroup, if needed**
- ☐ ✓ ⚡ **If Title indicates Manager, add to ManagerGroup and set rights**
No description available

Conditions

- ✓ ⚡ **Condition Group 1**
- ✓ ⚡ if class name equal "User"
- And ✓ ⚡ if operation attribute 'Title' match ",*manager.*"

Actions

- ✓ ⚡ set destination attribute value("Group Membership", Local Variable("manager-group-dn"))
- ✓ ⚡ clone operation attribute("Group Membership", "Security Equals")

- ⊕ ✓ ⚡ **If Title does not indicate Manager, add to EmployeeGroup and set rights**

Do: clone operation attribute ?

Specify source name: * ?

Specify destination name: ?

The Clone Operation Attribute is taking the information from the Group Membership attribute and adding it to the Security Equals attribute so the values are the same.

Delete Destination Object

Deletes an object in the destination data store.

Fields

Class Name

(Optional) Specify the class name of the object to delete in the destination data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.


Object




Select the target object type to delete in the destination data store. This object can be the current object, or can be specified by a DN or an association.

DN

Select the DN, association, or current object as the target object.


Example

Do 

Specify class name:   

Select mode:

Select object:

Specify DN: * 

Delete Source Object

Deletes an object in the source data store.

Fields

Class Name

(Optional) Specify the class name of the object to delete in the source data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).


Object




Select the target object type to delete in the source data store. This object can be the current object, or can be specified by a DN or an association.

DN


Select the DN, association, or current object as the target object.

Example

Do 

Specify class name:   

Select object:

Specify DN: * 

Find Matching Object

Finds a match for the current object in the destination data store.

Fields

Scope

Select the scope of the search. The scope might be an entry, a subordinate, or a subtree.

DN

Specify the DN that is the base of the search.

Match Attributes

Specify the attribute values to search for.

IMPORTANT: To improve performance when using the find matching object verb, create an index for the attributes that you are going to use when querying the Identity Vault. For more information about indexes, see the [Novell eDirectory 8.8 Administration Guide \(http://www.novell.com/documentation/edir88/edir88/index.html?page=/documentation/edir88/edir88/data/a5tuuu5.html\)](http://www.novell.com/documentation/edir88/edir88/index.html?page=/documentation/edir88/edir88/data/a5tuuu5.html).

Remarks

Find Matching Object is only valid when the current operation is an add.

The DN argument is required when the scope is “entry,” and is optional otherwise. At least one match attribute is required when the scope is “subtree” or “subordinates.”

The results are undefined if the scope is “entry” and there are match attributes specified. If the destination data store is the connected application, then an association is added to the current operation for each successful match that is returned. No query is performed if the current operation already has a non-empty association, thus allowing multiple find matching object actions to be strung together in the same rule.

If the destination data store is the Identity Vault, then the destination DN attribute for the current operation is set. No query is performed if the current operation already has a non-empty destination DN attribute, thus allowing multiple find matching object actions to be strung together in the same rule. If only a single result is returned and it is not already associated, then the destination DN of the current operation is set to the source DN of the matching object. If only a single result is returned and it is already associated, then the destination DN of the current operation is set to the single character ￼. If multiple results are returned, then the destination DN of the current operation is set to the single character �.

Example

The example matches on User objects with the attributes CN and L. The location where the rule is searching starts at the Users container and adds the information stored in the OU attribute to the DN. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.13, “Matching - By Attribute Value,” on page 133](#). To see the policy in XML, see [predef_match_by_attribute.xml \(./samples/predef_match_by_attribute.xml\)](#).

Matching - by attribute value

No description available


Conditions

Condition Group 1

if class name equal "User"

Actions

find matching object(dn("[Enter base DN to start search]"), match -("[Enter name of attribute to match on]"))








Do 




Select scope:




Specify DN:

Specify match attributes:

When you click the *Argument Builder* icon, the Match Attribute Builder comes up. You specify the attribute you want to match on in the builder. This example uses the CN and L attributes.

Match Attributes       


  

The left fields store the attributes to match. The right fields allow you to specify to use the value from the current object to match or to use another value. If you select *Other Value*, there are multiple value types to specify:








- ◆ counter
- ◆ dn
- ◆ int
- ◆ interval
- ◆ octet
- ◆ state
- ◆ string
- ◆ structured
- ◆ teleNumber
- ◆ time




To use another value:

- 1 Launch the Match Attribute Builder by selecting *Edit the match attributes*, then select *Other Value*.

Match Attributes 

The match attributes specify the attributes that are to be used to find a match for the action.

Match Attributes       

Select Value Type:

Specify String:

- 2 Select the desired value type.
- 3 Specify the value, then click *Finish*.

For Each

Repeats a set of actions for each node in a node set.

Fields

Node Set

Specify the node set.

Action


Specify the actions to perform on each node in the node set.


Remarks


The current node is a different value for each iteration of the actions, if a local variable is used.

If the current node in the node set is an entitlement element, then the actions are marked as if they are also enclosed in an [Implement Entitlement](#) action. If the current node is a query element returned by a query, then that token is used to automatically retrieve and process the next batch of query results.


Example




Do 




Specify node set: * 


Specify action: * 


The following is an example of the Actions Builder, used to provide the action argument:


Do 


Specify attribute name: *   


Specify class name:   

Select mode: 

Select object: 

Specify DN: * 

Specify value type: 

Enter string: * 

For more information on the Action Argument Component Builder, see [Section 4.2, “Actions Builder,”](#) on page 46.

Generate Event

Sends a user-defined event to Novell Audit or Sentinel.

Fields

ID


ID of the event. The provided value must result in an integer in the range of 1000-1999 when parsed by using the `parseInt` method of `java.lang.Integer`. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Level

Level of the event.

Level	Description
log-informational	Positive events of any importance.
log-alert	Events that require immediate attention.
log-critical	Events that can cause parts of the Metadirectory engine or driver to malfunction.
log-debug	Events of relevance for support or engineers to debug the operation of the Metadirectory engine or driver.
log-emergency	Events that cause the Metadirectory engine or driver to shut down.
log-error	Events describing errors that can be handled by the Metadirectory engine or driver.
log-notice	Events (positive or negative) that an administrator can use to understand or improve use and operation.
log-warning	Negative events not representing a problem.

Strings

Specify user-defined string, integer, and binary values to include with the event. You can enter the strings manually, or select the *Edit the Strings* icon  to open the Named String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.9, “Named String Builder,” on page 58](#).

The Generate Event action supports the following strings:

String Name	Description
data	Data entered here is stored in the blob event field.
data-type	Specifies the data-type of the value in the data tag.
subTarget	The subcomponent of the target being acted upon.
target	The object being acted upon.

String Name	Description
target-type	Integer specifying a predefined format for the target. Predefined values for target-type are currently: <ul style="list-style-type: none"> ◆ 0 = None ◆ 1 = Slash Notation ◆ 2 = Dot Notation ◆ 3 = LDAP Notation
text1	Text entered here is stored in the text1 event field.
text2	Text entered here is stored in the text2 event field.
text3	Text entered here is stored in the text3 event field.
value	Any number entered here is stored in the value event field. You can also access this field using the <code>value1</code> tag.
value3	Any number entered here is stored in the value3 event field.

Remarks

The Novell Audit or Sentinel event structure contains a target, a subTarget, three strings (text1, text2, text3), two integers (value, value3), and a generic field (data). The text fields are limited to 256 bytes, and the data field can contain up to 3 KB of information, unless a larger data field is enabled in your environment.

Example

The example has four rules that implement a placement policy for User objects based on the first character of the Surname attribute. It generates both a trace message and a custom Novell Audit or Sentinel event. The Generate Event action is used to send Novell Audit or Sentinel an event. The policy name is Policy to Place by Surname and is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see [001-Placement-BySurname.xml](#) (`../samples/001-Placement-BySurname.xml`).

Setup Local Variables
 Surname A-I: place in Users1
 No description available

Conditions

Condition Group 1

if class name equal "User"
 if operation attribute 'Surname' match "[a-i].*"

And

Actions

set operation destination DN(dn("Training\Users\Active\Users1"+"'+Operation Attribute('CN')"))
 trace message(color="yellow", Local Variable("LVUsers1"))
 generate event(id="1000", text1=Local Variable("LVUsers1"))

Surname J-R: place in Users2
 Surname S-Z: place in Users3

Do

Specify ID: *

Select level:

Specify strings:

If

Conditionally performs a set of actions.

Fields

If Conditions

Specify the desired condition.

Then Perform Actions

Specify the desired actions, if the conditions are True.

Else Perform Actions

(Optional) Specify the desired actions, if the conditions are False.

Example

During an Add or Modify operation, if the attribute of Title equals manager, the user object is added to the ManagerGroup group. If the Title does not equal manager, then the user object is added to the UsersGroup group. To view the policy in XML, see [if.xml \(../samples/if.xml\)](#).

☰ ✓ ⚡ If

Conditions

✓ ⚡ **Condition Group 1**

✓ ⚡ if operation equal "add"

Or ✓ ⚡ if operation equal "modify"

Actions

✓ ⚡ if

if operation attribute 'Title' equal "manager"

then

set destination attribute value("Group Membership", class name="User", "Novell\Users\ManagerGroup")

else

set default attribute value("Group Membership", "Novell\Users\UsersGroup")

Do if

If conditions: and(if operation attribute 'Title' equal "manager")

Then perform actions: do-set-dest-attr-value

Else perform actions: do-set-default-attr-value

When you create the if action, you must add a condition and one action. In this example, there are two separate actions. The condition is if a user object has the title of manager.

Create a list of Conditions

Create, delete, or rearrange a list of conditions.



Condition List ✎ + ✖ ✂ 📄 📂 ⬆ ⬇ ?

✓ ⚡ Condition Group 1

✓ ⚡ if operation attribute 'Title' equal "manager"

The action is to add the user object to the ManagerGroup group.

Create a list of Actions

Create, delete, or rearrange a list of actions.



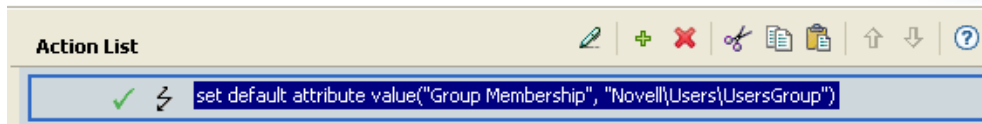
Action List ✎ + ✖ ✂ 📄 📂 ⬆ ⬇ ?

✓ ⚡ set destination attribute value("Group Membership", class name="User", "Novell\Users\ManagerGroup")

If the title does not equal manager, the user object is placed in the UsersGroup group.

Create a list of Actions

Create, delete, or rearrange a list of actions.



Implement Entitlement

Designates actions that implement an entitlement so that the status of those entitlements can be reported to the agent that granted or revoked the entitlement.

Fields

Node Set

Node set containing the entitlement being implemented by the specified actions.

Action

Actions that implement the specified entitlements.

Example

Do ?

Specify node set: * ?

Specify action: * ?

The following is an example of the Actions Builder, used to provide the action argument:

Do ?

Specify attribute name: * ?

Specify class name: ?

Select mode: ?

Select object: ?

Specify DN: * ?

Specify value type: ?

Enter string: * ?

For more information on the Actions Builder, see [Section 4.2, “Actions Builder,”](#) on page 46.

Move Destination Object

Moves an object into the destination data store.

Fields

Class Name

(Optional) Specify the class name of the object to move into the destination data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object to Move

Select the object to be moved. This object can be the current object, or can be specified by a DN or an association.

Container to Move to

Select the container to receive the object. This container is specified by a DN or an association.

DN or Association

Specify whether the DN or association of the container is used.

Example

The example contains a single rule that disables a user’s account and moves it to a disabled container when the Description attribute indicates it is terminated. The policy is named Disable User Account and Move When Terminated, and it is available for download from the Novell Support Web site. For more information, see “[XPath 1.0 Expressions](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view this policy in XML, see [005-Command-DisableMoveOnTermination \(./samples/005-Command-DisableMoveOnTermination.xml\)](#).

The screenshot displays a policy configuration window titled "On Termination, disable user and move to Disabled container". The interface is divided into two main sections: "Conditions" and "Actions".

Conditions:

- Condition Group 1** (checked and expandable):
 - if operation equal "modify"
 - And if class name equal "User"
 - And if operation attribute 'Description' match "^terminated.*"

Actions:

- set destination attribute value("Login Disabled", direct="true", "True")
- move destination object(when="after", dn("Users\Disabled"))

Do

Specify class name:

Select mode:

Select object to move:

Select container to move to:

Specify DN: *

The policy checks to see if it is a modify event on a User object and if the attribute Description contains the value of terminated. If that is the case, then it sets the attribute of Login Disabled to True and moves the object into the User\Disabled container.

Move Source Object

Moves an object into the source data store.

Fields

Class Name

(Optional) Specify the class name of the object to move into the source data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Object to Move

Select the object to be moved. This object can be the current object, or it can be specified by a DN or an association.

Select Container

Select the container to receive the object. This container is specified by a DN or an association.

Example

Do

Specify class name:

Select object to move:

Specify DN: *

Select container to move to:

Specify DN: *

Reformat Operation Attribute

Reformats all values of an attribute within the current operation by using a pattern.

Fields

Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Value Type

Specify the syntax of the new attribute value.

Value

Specify a value to use as a pattern for the new format of the attribute values. If the original value is needed to construct the new value, it must be obtained by referencing the local variable `current-value`.

Example

The example reformats the telephone number. It changes it from (nnn)-nnn-xxxx to nnn-xxx-xxxx. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.9, “Input or Output Transformation - Reformat Telephone Number from \(nnn\) nnn-xxxx to nnn-xxx-xxxx,” on page 126](#). To view the policy in XML, see [predef_transformation_reformat_telephone1.xml \(../samples/predef_transformation_reformat_telephone1.xml\)](#).

The screenshot shows the configuration for a transformation rule titled "Input or Output Transformation - Reformat Telephone Number from (nnn) nnn-xxxx to nnn-xxx-xxxx". The rule has no description available. It contains one condition, "Condition Group 1", and one action, "reformat operation attribute". The action is configured with the following details:

- Do: reformat operation attribute
- Specify name: * phone
- Specify value type: string
- Enter string: * "Replace First("^\\(\\d\\d\\d\\)\\s*(\\d\\d\\d\\)-(\\d\\d\\d\\d\\d\\d\\)\$", "\$1-\$2-\$3", Local Variable("current-value"))"

The action `reformat operation attribute` changes the format of the telephone number. The rule uses the Argument Builder and regular expressions to change how the information is displayed.

The close-up shows the regular expression: `Replace First("^\\(\\d\\d\\d\\)\\s*(\\d\\d\\d\\)-(\\d\\d\\d\\d\\d\\d\\)$", "$1-$2-$3", Local Variable("current-value"))`. A dotted line indicates that the `Local Variable("current-value")` is a reference to the `current-value` variable.

Remove Association

Sends a remove association command to the Identity Vault.

Fields

Mode

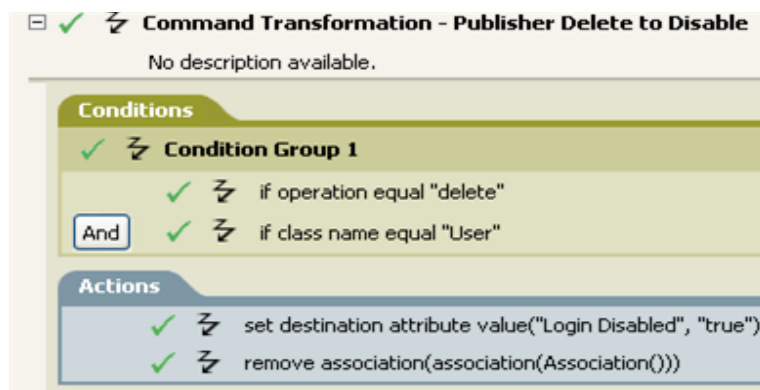
Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Association

Specify the value of the association to be removed.

Example

The example takes a Delete operation and disables the User object instead. The transforms an event. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.2, “Command Transformation - Publisher Delete to Disable,” on page 115](#). To view the policy in XML, see [predef_command_delete_to_disable.xml \(../samples/predef_command_delete_to_disable.xml\)](#).



Do

Select mode:

Specify association: *

When a Delete operation occurs for a User object, value of the Login Disabled attribute is set to True and the association is removed from the object. The association is removed because the associated object in the connected application no longer exists.

Remove Destination Attribute Value

Removes an attribute value from an object in the destination data store.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.


Value Type




Specify the attribute syntax of the value you want to remove.




Value


Specify the attribute value of the value you want to remove.


Example


Do 


Specify attribute name: *   


Specify class name:   

Select mode: 

Select object: 

Specify DN: * 

Specify value type: 

Enter string: * 

Remove Role

Initiates a request to the Roles Based Provisioning Module (RBPM) to revoke the specified role (in the Role DN field) from the specified user (in the Authorized User DN field). This field is only available if the Identity Manager server version is set to 3.6 or later.

Fields

Role DN

Specify the name of the role to revoke, in LDAP format. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

User Application URL

Specify the URL of the User Application server hosting the Roles Based Provisioning module. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Authorized User DN

Specify the name of the user authorized to request the role assignment, in LDAP format. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Password

Specify the authorized user password. You can enter a clear text password (not recommended) or use the Argument Builder to specify a Named Password.


Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN or Association

Select the DN or association as the target object.



Strings



(Optional) Specify additional argument strings for the Role assignment request. You can enter the strings manually, or select the *Edit the Strings* icon  to open the Named String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.9, “Named String Builder,” on page 58](#).



The Remove Role action supports the following string arguments:



String Name	Description
description	A description of the reason for the request used for auditing and (if necessary) approval purposes. Default: Request generated by policy.
effective-time	The time (in CTIME format) the role assignment should become effective. Default: now


Example


Do  


Specify role DN: *  

Specify user application URL: *  

Specify authorized user DN: *  

Specify password: * 

Select object: 

Specify strings: 

Remove Source Attribute Value

Removes the specified value from the named attribute on an object in the source data store.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

DN or Association

Select the DN or association as the target object.


Value Type




Specify the syntax of the attribute value to be removed.




String

Specify the attribute value to be removed.


Example

Do 


Specify attribute name: *   

Specify class name:   

Select object:

Specify DN: * 

Specify value type:

Enter string: * 

Rename Destination Object

Renames an object in the destination data store.

Fields

Class Name

(Optional) Specify the class name of the object to rename in the destination data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.


DN or Association




Select the DN or association as the target object.

String

Specify the new name of the object.


Example


Do 

Specify class name:   

Select mode:

Select object:

Specify DN: * 

Specify string: * 

Rename Operation Attribute

Renames all occurrences of an attribute within the current operation.

Fields

Source Name

Specify the original attribute name. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Destination Name

Specify the new attribute name. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

Do ?

Specify source name: *

Specify destination name:

Rename Source Object

Renames an object in the source data store.

Fields

Class Name

(Optional) Specify the class name of the object to rename in the source data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Select Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

DN or Association

Select the DN or association as the target object.

String

Specify the new name of the object.

Example

Do: rename source object

Specify class name: User

Select object: DN

Specify DN: * "Novell\Users\jdoe"

Specify string: * "JoeDoe"

Send Email

Sends an e-mail notification.

Fields

ID

(Optional) Specify the User ID in the SMTP system sending the message. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Server

Specify the SMTP server name. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Message Type


Select the e-mail message type.

Password

(Optional) Specify the SMTP server account password.

IMPORTANT: You can store the SMTP server account password as a Named Password on the driver object. This allows the password to be encrypted; otherwise, you enter the password and it is stored in clear text. For more information on Named Passwords, see “[Securely Storing Driver Passwords with Named Passwords](#)” in the *Identity Manager 4.0.1 Common Driver Administration Guide*.

Strings


Specify the values containing the various e-mail addresses, subject, and message. You can enter the strings manually, or select the *Edit the strings* icon  to open the Named String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.9, “Named String Builder,” on page 58](#).


The Send Email action supports the following string arguments:


String Name	Description
bcc	Adds the address to the list of BCC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.


String Name	Description
cc	Adds the address to the list of CC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
custom-smtp-header	Specifies a custom SMTP header to add to the e-mail message.
encoding	Specifies the character encoding to use for the e-mail message.
from	Specifies the address to be used as the originating e-mail address.
message	Specifies the content of the e-mail message.
reply-to	Specifies the address to be used as the e-mail message reply address.
subject	Specifies the e-mail subject.
to	Adds the address to the list of e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.


Example


Do 

Specify ID: 

Specify server: * 

Select message type: 

Specify password: 

Specify strings: 

Send Email from Template

Generates an e-mail notification by using a template.

Fields


Notification DN

Specify the slash form DN of the SMTP notification configuration object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Template DN


Specify the slash form DN of the e-mail template object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Password

(Optional) Specify the SMTP server account password. Select the *Edit the arguments* icon  to open the Argument Builder and specify the password argument.

IMPORTANT: You can store the SMTP server account password as a Named Password on the driver object. This allows the password to be encrypted; otherwise, you enter the password and it is stored in clear text. For more information on Named Passwords, see “[Securely Storing Driver Passwords with Named Passwords](#)” in the *Identity Manager 4.0.1 Common Driver Administration Guide*.

Strings

Specify additional string arguments for the e-mail message. You can enter the strings manually, or select the *Edit the strings* icon  to open the Named String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.9, “Named String Builder,”](#) on page 58.



Send Email from Template supports the following string arguments that you can use to specify the various e-mail addresses.



String Name	Description
bcc	Adds the address to the list of BCC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
cc	Adds the address to the list of CC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
custom-smtp-header	Specifies a custom SMTP header to add to the e-mail message.
encoding	Specifies the character encoding to use for the e-mail message.
reply-to	Specifies the address to be used as the e-mail message reply address.
to	Adds the address to the list of e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.



In addition to the reserved field names listed above, Send Email from Template supports Global Configuration Values (GCVs) for creating the desired string.


Each template can also define fields that can be replaced in the subject and body of the e-mail message.


Example

Do  

Specify notification DN: *  

Specify template DN: *  

Specify password: 

Specify strings: 

Set Default Attribute Value

Adds default values to the current operation (and optionally to the current object in the source data store) if no values for that attribute already exist. It is only valid when the current operation is Add.

Fields

Attribute Name

Specify the name of the default attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Write Back

Select whether or not to also write back the default values to the source data store.

Argument Values

Specify the default values of the attribute.

Example

The example sets the default value for the company attribute. You can set the value for an attribute of your choice. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.5, “Creation - Set Default Attribute Value,” on page 119](#). To view the policy in XML, see [predef_creation_set_default_attribute_value.xml \(../samples/predef_creation_set_default_attribute_value.xml\)](#).

The screenshot shows the configuration for a rule named "Creation - Set Default Attribute Value". The rule has no description available. It consists of one condition group and one action.

Conditions:

- Condition Group 1: if class name equal "User"

Actions:

- set default attribute value("[Enter attribute name]", write-back="true", "[Enter default attribute value"])

The configuration form below the rule shows the following values:

- Do: set default attribute value
- Specify attribute name: * company
- Write back: true
- Specify argument values: * Digital Airlines

Argument Values

Argument values specify the values that are to be used for an attribute.

Type	Argument Values
string	Digital Airlines

To build the value, the Argument Value List Builder is launched. See [Section 4.8, “Argument Value List Builder,” on page 58](#) for more information on the builder. You can set the value to what is needed. In this case, we used the Argument Builder and set the text to be the name of the company.

Set Destination Attribute Value

Adds a value to an attribute on an object in the destination data store, and removes all other values for that attribute.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object in the destination data store. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

Value Type

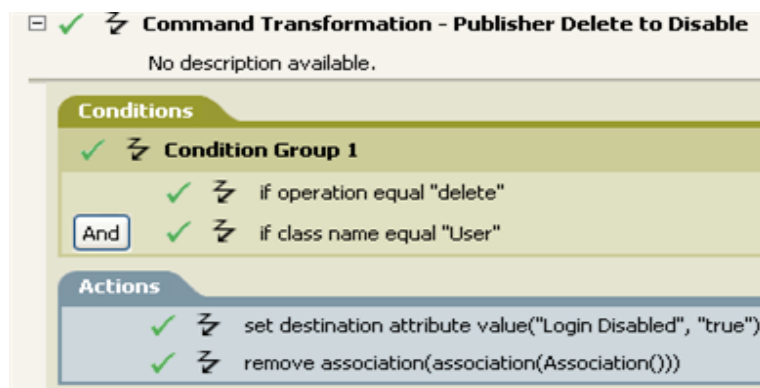
Select the syntax of the attribute value to set.


String




Specify the attribute values to set.




Example


The example takes a Delete operation and disables the User object instead. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.2, “Command Transformation - Publisher Delete to Disable,” on page 115](#). To view the policy in XML, see [predef_command_delete_to_disable.xml](#) (`../samples/predef_command_delete_to_disable.xml`).





Do 


Specify attribute name: *   

Specify class name:   

Select mode: 

Select object: 

Specify value type: 

Enter string: * 

The rule sets the value for the attribute of Login Disabled to true. The rule uses the Argument Builder to add the text of true as the value of the attribute. See [Section 4.3, “Argument Builder,”](#) on page 47 for more information about the builder.

Set Destination Password

Sets the password for an object in the destination data store.

Fields

Class Name

(Optional) Specify the class name for the object to set the password on in the destination data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

New Password


Specify the password to be set.

Old Password

Specifies the old password, which is used to confirm that you have rights to change the password.

NOTE: This field is only available if the Identity Manager server version is set to 3.6 or later.


Example


Do 

Specify class name:

Select mode:

Select object:

Specify new password: * Password Poli"/> 

Specify old password: 

* Required

Set Local Variable

Sets a local variable.

Fields

Variable Name

Specify the name of the new local variable. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Scope

Select the scope of the local variable. This can be set to the driver or to the policy. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Variable Type

Select the type of local variable. This can be a string, an XPath 1.0 node set, or a Java* object.

String

Specify the attribute values to set.

Example

The example adds a User object to the appropriate Employee or Manager group based on Title. It also creates the group, if needed, and sets up security equal to that group. The policy name is Govern Groups for User Based on Title, and it is available for download from the Novell Support Web site. For more information, see [“Downloading Identity Manager Policies” in *Understanding Policies for Identity Manager 4.0.1*](#). To view the policy in XML, see [003-AddCreateGroups.xml](#) (`../samples/003-Command-AddCreateGroups.xml`).

Set local variables to test existence of groups and for placement
 No description available

Conditions

- Condition Group 1**
 - if class name equal "User"
- Condition Group 2**
 - if operation equal "add"
 - if operation equal "modify"

Actions

- set local variable("manager-group-dn", "Users\ManagersGroup")
- set local variable("manager-group-info", Destination Attribute("Object Class", dn(Local Variable("manager-group-dn"))))
- set local variable("employee-group-dn", "Users\EmployeesGroup")
- set local variable("employee-group-info", Destination Attribute("Object Class", dn(Local Variable("employee-group-dn"))))

Do

Enter variable name: *

Select scope:

Select variable type:

Specify string: *

The local variable is set to the value that is in the User object's destination attribute of Object Class plus the Local Variable of manager-group-info. The Argument Builder is used to construct the local variable. See [Section 4.3, "Argument Builder,"](#) on page 47 for more information.

Set Operation Association

Sets the association value for the current operation.

Fields

Association

Provide the new association value.

Example

Do

Specify association: *

Set Operation Class Name


Sets the object class name for the current operation.


Fields

String

Specify the new class name.

Example

Do 

Specify string: * 

Set Operation Destination DN

Sets the destination DN for the current operation.

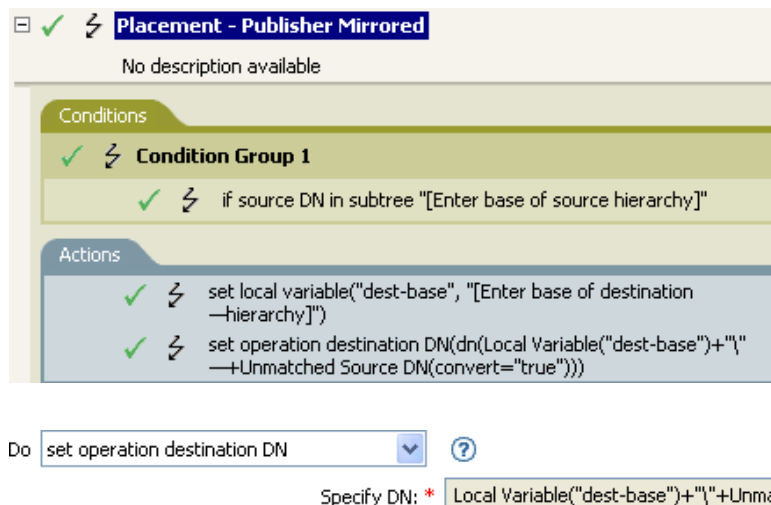
Fields

DN

Specify the new destination DN.

Example

This example places the objects in the Identity Vault, by using the structure that is mirrored from the connected system. You need to define at what point the mirroring begins in the source and destination data stores. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.14, “Placement - Publisher Mirrored,” on page 134](#). To view the policy in XML, see [predef_place_pub_mirrored.xml \(../samples/predef_place_pub_mirrored.xml\)](#).



The screenshot shows the configuration for a rule named "Placement - Publisher Mirrored". It includes a description field with "No description available". Under the "Conditions" section, there is a "Condition Group 1" with a single condition: "if source DN in subtree '[Enter base of source hierarchy]'". Under the "Actions" section, there are two actions: "set local variable('dest-base', '[Enter base of destination hierarchy]')" and "set operation destination DN(dn(Local Variable('dest-base')+\""+Unmatched Source DN(convert='true'))))". Below the screenshot, the "Do" field is set to "set operation destination DN" and the "Specify DN:" field contains the expression: "Local Variable('dest-base')+\""+Unmatched Source DN(conver".

The rule sets the operation destination DN to be the local variable of the destination base location plus the source DN.

Set Operation Property

Sets an operation property. An operation property is a named value that is stored within an operation. It is typically used to supply additional context that might be needed by the policy that handles the results of an operation.

Fields

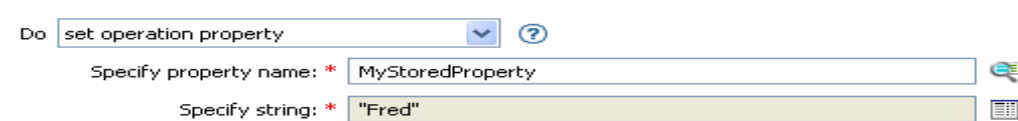
Property Name

Specify the name of the operation property. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

String

Specify the name of the string.

Example



The screenshot shows a configuration interface for the 'Set Operation Property' action. It features a dropdown menu with the text 'set operation property' and a help icon. Below the dropdown are two input fields: 'Specify property name: * MyStoredProperty' and 'Specify string: * "Fred"'. Both input fields have a small icon to their right.

Set Operation Source DN

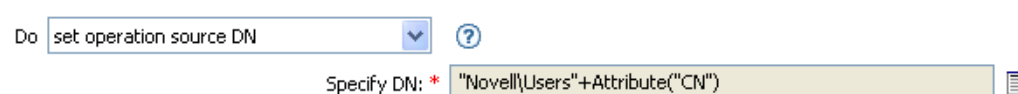
Sets the source DN for the current operation.

Fields

DN

Specify the new source DN.

Example



The screenshot shows a configuration interface for the 'Set Operation Source DN' action. It features a dropdown menu with the text 'set operation source DN' and a help icon. Below the dropdown is one input field: 'Specify DN: * "Novell\Users"+Attribute("CN")'. The input field has a small icon to its right.

Set Operation Template DN

Sets the template DN for the current operation to the specified value. This action is only valid when the current operation is Add.

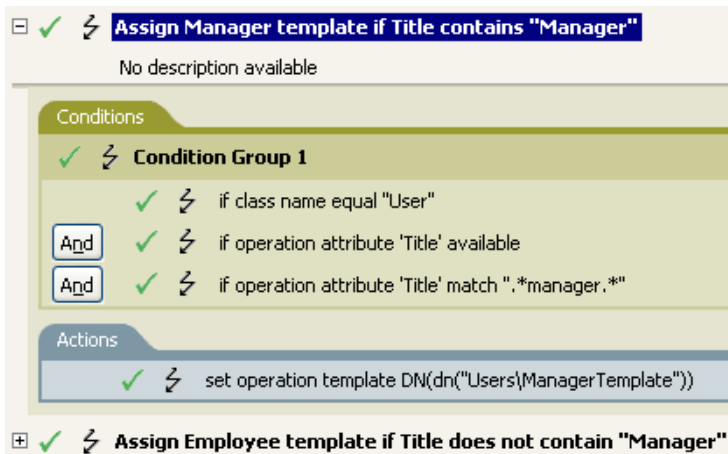
Fields

DN

Specify the template DN.

Example

The example applies the Manager template if the Title attribute contains the word Manager. The name of the policy is Policy: Assign Template to User Based on Title, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `003-Create-AssignTemplateByTitle.xml` (`../samples/003-Create-AssignTemplateByTitle.xml`).



Do ?

Specify DN: *

The template Manager Template is applied to any User object the has the attribute of Title available and contains the word Manager somewhere in the title. The policy uses regular expressions to find all possible matches.

Set Source Attribute Value

Adds a value to an attribute on an object in the source data store, and removes all other values for that attribute.

Fields

Attribute Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object in the source data store. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

Value Type

Select the syntax of the attribute value.

Value




Specify the attribute value to be set.




Example


The example detects when an e-mail address is changed and sets it back to what it was. The policy name is Policy: Reset Value of the E-mail Attribute, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see [001-Input_PushBackOnEmail](#) ([../samples/001-Input-PushBackOnEmail.xml](#)).


The screenshot shows the configuration for a policy named "Push back on email changing". It includes a "Conditions" section with "Condition Group 1" containing two conditions: "if class name equal 'User'" and "if operation attribute 'Email' changing", connected by an "And" operator. The "Actions" section contains two actions: "set source attribute value('Email', Destination Attribute('Internet EMail Address'))" and "strip operation attribute('Email')".


Do ?

Specify attribute name: *   

Specify class name:   

Select object: 

Specify value type: 

Enter string: * 

The action takes the value of the destination attribute Internet EMail Address and sets the source attribute of Email to this same value.

Set Source Password

Sets the password for an object in the source data store.

Fields

Class Name

(Optional) Specify the class name of the object to set the password on in the source data store. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Object

Select the target object. This object can be the current object, or can be specified by an DN or an association.

New Password

Specify the password to be set.

Old Password

Specifies the old password, which is used to confirm that you have rights to change the password.

NOTE: This field is only available if the Identity Manager server version is set to 3.6 or later.

Example

The screenshot shows a configuration dialog for the action 'set source password'. It includes the following fields:

- Do:** A dropdown menu with 'set source password' selected and a help icon.
- Specify class name:** A text box containing 'User' with a help icon.
- Select object:** A dropdown menu with 'Current object' selected.
- Specify new password: *** A text box containing '"Generate Password(policy-dn="[root]\Security>Password Poli' with a help icon.
- Specify old password:** A text box containing 'Password()' with a help icon.

At the bottom, there are 'OK' and 'Cancel' buttons. A dashed box contains the message: 'Action modified. Click OK to update the policy or click Cancel to discard changes.' To the right of this box is the text '* Required'.

Set SSO Credential

Sets the SSO credential when a user object is created or when a password is modified. This action is part of the Credential Provisioning policies. For more information, see [Novell Credential Provisioning for Identity Manager 4.0.1](#).

Fields

Credential Repository Object DN

Specify the DN of the repository object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).


Target User DN

Specify the DN of the target users.


Application Credential ID



Specify the application credential that is stored in the application object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Login Parameter Strings


Specify each login parameter for the application. The login parameters are the authentication keys stored in the application object. You can enter the strings manually, or select the *Edit the strings* icon  to open the String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.12, “String Builder,” on page 61](#).

Example


Do 


Specify credential repository object DN: *  

Set DN relative to policy

Specify target user DN: * 

[Populate the following from an application object](#)

Specify application credential ID: * 

Specify login parameter strings: 

Set SSO Passphrase

Sets the Novell SecureLogin passphrase and answer when a User object is provisioned. This action is part of the Credential Provisioning policies. For more information, see [Novell Credential Provisioning for Identity Manager 4.0.1](#).

Fields

Credential Repository Object DN

Specify the DN of the repository object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Target User DN

Specify the DN of the target users.

Question String



Specify the SecureLogin passphrase question.

Answer String


Specify the SecureLogin passphrase answer.


Example

Do ?

Specify credential repository object DN: *  

Set DN relative to policy

Specify target user DN: * 

Answer string: * 

The SecureLogin passphrase question and answer are stored as strings in the policy.

Set XML Attribute

Sets an XML attribute on a set of elements selected by an XPath expression.

Fields

Name

Specify the name of the XML attribute. This name can contain a namespace prefix if the prefix has been previously defined in this policy. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

XPath Expression



XPath 1.0 expression that returns a node set containing the elements on which the XML attribute should be set. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#).





String


Specify the value of the XML attribute.

Example

Do ?

Enter attribute name: *  

Specify XPath expression: *    

Specify string: * 

Start Workflow

Starts the workflow specified by workflow-id for the recipient DN on the User Application server specified by a URL and by using credentials specified by the ID and password. The recipient must be an LDAP format DN of an object in the directory served by the User Application server. The additional arguments to the workflow can be specified by named strings. The number of the strings and the names used are dependent on the workflow to be started.

Remark

There are some names that have special meaning and are available regardless of the workflow being started.

- ♦ **:InitiatorOverrideDN:** The LDAP format DN of the initiator of the workflow, if other than the User used to authenticate.
- ♦ **:CorrelationID:** An identifier used to correlate related workflows.

If any error occurs while starting the workflow, the error string is available to the enclosing policy in the local variable named `error.do-start-workflow`. Otherwise, that local variable is unavailable.

Fields

Provisioning Request DN

Specify the DN of the workflow to start in LDAP format. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

User Application URL

Specify the URL of the User Application server where the workflow will run. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Authorized User DN

Specify the DN of a user authorized to start workflows on the User Application server in LDAP format. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).


Authorized User Password

Specify the password of the authorized user to start workflows on the User Application server. Store the password as a Named Password on the driver object. This allows the password to be encrypted when it is stored.

Recipient DN

Specify the DN of the recipient of the workflow in LDAP format.

Strings

Specify the arguments for the workflow. You can enter the strings manually, or select the *Edit the strings* icon  to open the Named String Builder and specify the strings. For more information about the Named String Builder, see [Section 4.9, “Named String Builder,” on page 58](#).

The arguments are defined on the workflow. Depending on how the workflow is defined, some of the arguments might be required for the workflow to start.

Example

The following example starts a workflow process each time there in an Add operation. The workflow is a request for a cell phone. To view the policy in XML, see [start_workflow.xml \(../samples/start_workflow.xml\)](#).

Start Workflow

No description available

Conditions

Condition Group 1

if operation equal "add"

Actions

```
start workflow(id="cn=WorkflowAdmin,o=People", url="http://localhost:8080/IDMProv", workflow-id="CN=ApproveCellPhone,—CN=RequestDefs,CN=AppConfig,CN=UserApplication,—CN=DriverSet,O=novell", arg-password(Named Password—"workflow-admin")), dn(Parse DN("qualified-slash", "ldap", XPath—"@qualified-src-dn")), provider="ACMEWireless", reason="new—hire")
```

Do start workflow

Specify provisioning request DN: * CN=ApproveCellPhone,CN=RequestDefs,CN=AppConfig,CN=

Specify user application URL: * http://localhost:8080/IDMProvo

Specify authorized user DN: * cn=WorkflowAdmin,o=People

Specify authorized user password: * Named Password("workflow-admin")

Specify recipient DN: * Parse DN("qualified-slash", "ldap", XPath("@qualified-src-dn"))

Specify strings: provider, reason

Status

Generates a status notification.

Fields

Level

Specify the status level of the notification. The levels are error, fatal, retry, success, and warning. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

String

Provide the status message by using the Argument Builder.

Remarks

If level is retry, then the policy immediately stops processing the input document and schedules a retry of the event currently being processed.

If the level is fatal, the policy immediately stops processing the input document and initiates a shutdown of the driver.

If a the current operation has an event-id, that event-id is used for the status notification; otherwise, there is no event-id reported.

Example

Do ?

Specify level: *

Specify string: *

Strip Operation Attribute

Strips all occurrences of an attribute from the current operation.

Fields

Name

Specify the name of the attribute to be stripped. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

The example detects when an e-mail address is changed and sets it back to what it was. The policy name is Policy: Reset Value of the E-mail Attribute, and it is available for download from the Novell Support Web site. For more information, see [“Downloading Identity Manager Policies” in *Understanding Policies for Identity Manager 4.0.1*](#). To view the policy in XML, see `001-Input-PushBackOnEmail.xml` (`../samples/001-Input-PushBackOnEmail.xml`).

The screenshot shows the configuration for a policy named "Push back on email changing". It includes a "Conditions" section with two conditions: "if class name equal 'User'" and "if operation attribute 'Email' changing", connected by an "And" operator. The "Actions" section contains two actions: "set source attribute value('Email', Destination Attribute('Internet EMail Address'))" and "strip operation attribute('Email')". Below the screenshot, the "Do" field is set to "strip operation attribute" and the "Specify name:" field is set to "Email".

The action strips the attribute of Email and keeps the value that was in the destination Email attribute.

Strip XPath Expression

Strips nodes selected by an XPath 1.0 expression.

Fields


XPath Expression





Specify the XPath 1.0 expression that returns a node set containing the nodes to be stripped. Supports variable expansion. For more information on variable expansion and XPath, see [Section 3.6.5, “XPath Expressions,” on page 39](#).

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions” in *Understanding Policies for Identity Manager 4.0.1*](#).

Example

Do 

Specify XPath expression: *    

Trace Message

Sends a message to DSTRACE.

Fields

Level

Specify the trace level of the message. The default level is 0. The message only appears if the specified trace level is less than or equal to the trace level configured in the driver.

For information on how to set the trace level on the driver, see [“Viewing Identity Manager Processes” in the *Identity Manager 4.0.1 Common Driver Administration Guide*](#).

Color

Select the color of the trace message.

String

Specify the value of the trace message.

Example

The example has four rules that implement a Placement policy for User objects based on the first character of the Surname attribute. It generates both a trace message and a custom Novell Audit or Sentinel event. The Trace Message action is used to send a trace message to DSTRACE. The policy name is Policy to Place by Surname and it is available for download from the Novell Support Web site. For more information, see [“Downloading Identity Manager Policies” in *Understanding Policies for Identity Manager 4.0.1*](#). To view the policy in XML, see [001-Placement-BySurname.xml](#) ([../samples/001-Placement-BySurname.xml](#)).

Setup Local Variables
 Surname A-I: place in Users1
 No description available

Conditions

Condition Group 1

if class name equal "User"
 if operation attribute 'Surname' match "[a-i].*"

Actions

set operation destination DN(dn("Training\Users\Active\Users1"+" "+Operation Attribute("CN")))

trace message(color="yellow", Local Variable("LVUsers1"))

generate event(id="1000", text1=Local Variable("LVUsers1"))

Surname J-R: place in Users2
 Surname S-Z: place in Users3

Do

Specify level:

Select color:

Specify string: *

The action sends a trace message to DSTRACE. The contents of the local variable is LVUsers1 and it shows up in yellow in DSTRACE.

Veto

Vetoes the current operation.

Example

The example excludes all events that come from the specified subtree. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.8, “Event Transformation - Scope Filtering - Exclude Subtrees,”](#) on page 124. To view the policy in XML, see [predef_transformation_filter_exclude_subtree.xml](#) (../samples/predef_transformation_filter_exclude_subtrees.xml).

Event Transformation - Scope Filtering - Exclude subtree(s)
 No description available

Conditions

Condition Group 1

if source DN in subtree "[Enter a subtree to exclude]"

Actions

veto()

Do veto ?

The action vetoes all events that come from the specified subtree.

Veto If Operation Attribute Not Available

Conditionally cancels the current operation and ends processing of the current policy, based on the availability of an attribute in the current operation.

Fields

Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

The example does not allow User objects to be created unless the attributes Given Name, Surname, Title, Description, and Internet EMail Address are available. The policy name is Policy to Enforce the Presences of Attributes, and it is available for download from the Novell Support Web site. For more information, see [“Downloading Identity Manager Policies” in *Understanding Policies for Identity Manager 4.0.1*](#). To view the policy in XML, see [001-Create-RequiredAttrs.xml \(../samples/001-Create-RequiredAttrs.xml\)](#).

☐ ✓ ⚡ **User required attributes: First/Last Name, Title, Description, Email**
No description available

Conditions

✓ ⚡ **Condition Group 1**

✓ ⚡ if class name equal "User"

Actions

- ✓ ⚡ veto if operation attribute not available("Given Name")
- ✓ ⚡ veto if operation attribute not available("Surname")
- ✓ ⚡ veto if operation attribute not available("Title")
- ✓ ⚡ veto if operation attribute not available("Description")
- ✓ ⚡ veto if operation attribute not available("Internet EMail Address")

Do veto if operation attribute not available ?
Specify name: *   

The actions vetoes the operation if the attributes of Given Name, Surname, Title, Description, and Internet Email Address are not available.

While

Causes the specified actions to be repeated while the specified conditions evaluate to True.

Fields

Conditions

Specify the condition to be evaluated.

Actions

Specify the actions to be repeated if the conditions evaluate to True.

Example

While

Conditions

Condition Group 1

if operation equal "add"

Actions

set local variable("counter", "1")

while

if local variable 'counter' not greater than "10"

do

trace message(color="yellow", level="0", "Counter = -'+Local Variable("counter"))

set local variable("counter", XPath("\$counter + 1"))

Do ?

Specify conditions: * ?

Specify action: * ?

Noun tokens expand to values that are derived from the current operation, the source or destination data stores, or some external source.

This section contains detailed information about the noun tokens available in the Policy Builder interface.

- ◆ [“Text” on page 288](#)
- ◆ [“Added Entitlement” on page 289](#)
- ◆ [“Association” on page 289](#)
- ◆ [“Attribute” on page 290](#)
- ◆ [“Character” on page 291](#)
- ◆ [“Class Name” on page 292](#)
- ◆ [“Destination Attribute” on page 292](#)
- ◆ [“Destination DN” on page 293](#)
- ◆ [“Destination Name” on page 294](#)
- ◆ [“Document” on page 295](#)
- ◆ [“Entitlement” on page 295](#)
- ◆ [“Generate Password” on page 296](#)
- ◆ [“Global Configuration Value” on page 296](#)
- ◆ [“Local Variable” on page 296](#)
- ◆ [“Named Password” on page 298](#)
- ◆ [“Operation” on page 299](#)
- ◆ [“Operation Attribute” on page 299](#)
- ◆ [“Operation Property” on page 300](#)
- ◆ [“Password” on page 301](#)
- ◆ [“Query” on page 301](#)
- ◆ [“Removed Attribute” on page 302](#)
- ◆ [“Removed Entitlement” on page 303](#)
- ◆ [“Resolve” on page 303](#)
- ◆ [“Source Attribute” on page 304](#)
- ◆ [“Source DN” on page 304](#)
- ◆ [“Source Name” on page 305](#)
- ◆ [“Time” on page 306](#)
- ◆ [“Unique Name” on page 306](#)
- ◆ [“Unmatched Source DN” on page 309](#)
- ◆ [“XPath” on page 310](#)

Text

Expands to the text.

Fields

Text

Specify the text. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Example

The example is from the Govern Groups for User Based on Title policy, which is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `003-Command-AddCreateGroups.xml` (`../samples/003-Command-AddCreateGroups.xml`).

The Text token is used in the action Set Location Variable to define the DN of the manager’s group. The Text token can contain objects or plain text.

Set local variables to test existence of groups and for placement
No description available

Conditions

- ✓ ⚡ **Condition Group 1**
 - ✓ ⚡ if class name equal "User"
- ✓ ⚡ **Condition Group 2**
 - ✓ ⚡ if operation equal "add"
 - Or
 - ✓ ⚡ if operation equal "modify"

Actions

- ✓ ⚡ set local variable("manager-group-dn", "Users\ManagersGroup")
- ✓ ⚡ set local variable("manager-group-info", Destination Attribute("Object Class", dn(Local Variable("manager-group-dn"))))
- ✓ ⚡ set local variable("employee-group-dn", "Users\EmployeesGroup")
- ✓ ⚡ set local variable("employee-group-info", Destination Attribute("Object Class", dn(Local Variable("employee-group-dn"))))

..... 🏠 ⚡ "Users\ManagersGroup"

Editor

Text:

The Text token contains the DN for the manager's group. You can browse to the object you want like to use, or type the information into the editor.

Added Entitlement

Expands to the values of an entitlement granted in the current operation.

Fields

Name

Name of the entitlement. Supports variable expansion. For more information, see [Section 3.6, "Variable Selector,"](#) on page 35.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that entitlement. If it is used in a context where a string is expected, the token expands to the string value found.

Example

A screenshot of a code editor showing a token expansion. The token is `Added Entitlement("manager")`. A tooltip is visible above the token, containing a small icon of a document with a lightning bolt and the text `Added Entitlement("manager")`.

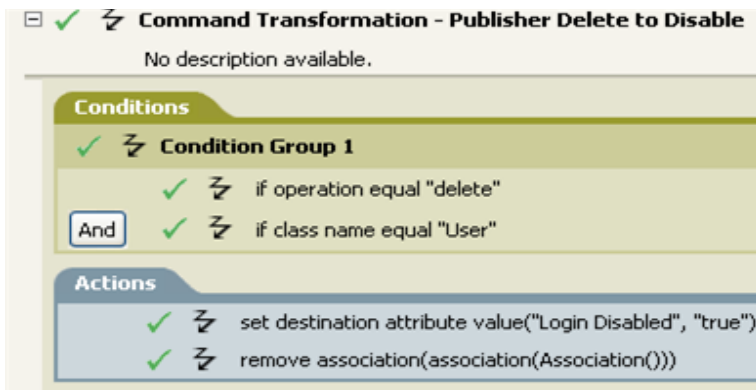
Association

Expands to the association value from the current operation.

Example

The example is from the predefined rules that come with Identity Manager. For more information on the predefined rule, see [Section 8.2, "Command Transformation - Publisher Delete to Disable,"](#) on page 115.

The action of Remove Association uses the Association token to retrieve the value from the current operation. The rule removes the association from the User object so that any new events coming through do not affect the User object. To view the policy in XML, see [predef_command_delete_to_disable.xml](#) (`../samples/predef_command_delete_to_disable.xml`).



Attribute

Expands to the value of an attribute from the current object in the current operation and in the source data store. It can be logically thought of as the union of the operation attribute token and the source attribute token. It does not include the removed values from a Modify operation.

Fields

Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).




Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.



Example



The example is from the predefined rules that come with Identity Manager. For more information, see [Section 8.6, “Creation - Set Default Password,” on page 121](#).

The action of Set Destination Password uses the attribute token to create the password. The password is made up of the Given Name attribute and the Surname attribute. When you are in the Argument Builder Editor, you browse and select the attribute you want to use. To view the policy in XML, see [predef_creation_set_default_password.xml \(../samples/predef_creation_set_default_password.xml\)](#).






Creation - Set Default Password
 No description available



Conditions





Condition Group 1



 if class name equal "User"




Actions



 set destination password(Attribute("Given Name")+Attribute-("Surname"))



 Attribute("Given Name")



 Attribute("Surname")

Editor

Name: *




Character

Expands to a character specified by a Unicode* code point.

Remarks

For a listing of Unicode values and characters, see [Unicode Code Charts \(http://www.unicode.org/charts/\)](http://www.unicode.org/charts/).



Fields

Character Value

The Unicode code point of the character. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

A hexadecimal number can be specified if it is prefixed with 0x, as in C-based programming languages.

Example



 Character(value="10")



Editor

Character value: *

Class Name

Expands to the object class name from the current operation.

Example

```
.....   Class Name()
```

Destination Attribute

Expands to the specified attribute value an object.

Fields

Name

Name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Select Object

Select Current Object, Association, or DN.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Example

The example is from the Govern Groups for User Based on Title policy, which is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `003-Command-AddCreateGroups.xml` (`../samples/003-Command-AddCreateGroups.xml`).

The policy creates the Destination Attribute with the Argument Builder. The action of Set Local Variable contains the Destination Attribute token.

Set local variables to test existence of groups and for placement
 No description available

Conditions

- Condition Group 1**
 - if class name equal "User"
- Condition Group 2**
 - if operation equal "add"
 - if operation equal "modify"

Actions

- set local variable("manager-group-dn", "Users\ManagersGroup")
- set local variable("manager-group-info", Destination Attribute("Object Class", dn(Local Variable("manager-group-dn"))))
- set local variable("employee-group-dn", "Users\EmployeesGroup")
- set local variable("employee-group-info", Destination Attribute("Object Class", dn(Local Variable("employee-group-dn"))))

Destination Attribute("Object Class", dn())

Editor

Name: *

Class name:

Select object:

Specify DN: *

You build the Destination Attribute through the Editor. In this example, the attribute of Object Class is set. The DN is used to select the object. The value of DN is the Local Variable of manager-group-dn.

Destination DN

Expands to the destination DN specified in the current operation.

Fields

Start

Specify the RDN index to start with:

- ♦ Index 0 is the root-most RDN
- ♦ Positive indexes are an offset from the root-most RDN
- ♦ Index -1 is the leaf-most segment
- ♦ Negative indexes are an offset from the leaf-most RDN towards the root-most RDN

Length

Specify the number of RDN segments to include. Negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc.

Convert

Select whether or not to convert the DN to the format used by the source data store.

Remarks

If start and length are set to the default values {0,-1}, the entire DN is used; otherwise, only the portion of the DN specified by start and length is used.

Example

The example uses the Destination DN token to set the value for the local variable of target-container. The policy creates a department container for the User object if it does not exist. The policy is from the predefined rules that come with Identity Manager. For more information, see [Section 8.1, “Command Transformation - Create Departmental Container - Part 1 and Part 2,”](#) on page 112. To view the policy in XML, see [predef_command_create_dept_container1.xml](#) (`../samples/predef_command_create_dept_container1.xml`).

The screenshot displays the configuration for a policy named "Command Transformation - Create Departmental Container - Part 1". The policy has no description available. It is configured with the following conditions and actions:

- Conditions:**
 - Condition Group 1:**
 - if operation equal "add"
- Actions:**
 - set local variable("target-container", Destination DN(length="-2"))
 - set local variable("does-target-exist", Destination Attribute --("objectclass", class name="Organizational Unit", dn(Local --Variable("target-container"))))



Below the actions, the "Destination DN(length="-2")" token is shown. At the bottom, the "Editor" section shows the following settings:

- Start: 0
- Length: -2
- Convert to source DN format: false

Destination Name

Expands to the unqualified Relative Distinguished Name (RDN) of the destination DN specified in the current operation.

Example

```
.....   Destination Name()
```

Document



Reads the XML document pointed to by the URI and returns the document node in a node set. The URI can be relative to the URI of the including policy. With any error, the result is an empty node set.

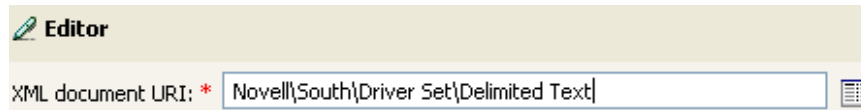
Fields

XML Document URI

Specify the XML document URI.

Example

```
.....   Document("Novell\South\Driver Set\Delimited Text")
```



Entitlement

Expands to the values of a granted entitlement from the current object.

Fields

Name

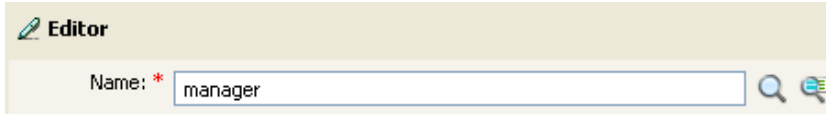
Name of the entitlement. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that entitlement. If it is used in a context where a string is expected, the token expands to the string value found.

Example

```
.....   Entitlement("manager")
```



Generate Password

Generates a random password that conforms to the specified password policy.

Fields



Password Policy

The DN of the password policy that receives the randomly generated password. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Set DN relative to policy

Select whether the DN of the password policy is relative to the policy being created.

Example

```
.....   Generate Password(policy-dn="[root]\Security>Password Policies\Sample Password Policy")
```

Global Configuration Value



Expands to the value of a global configuration variable.

Fields

Name

Name of the global configuration value. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

```
.....   Global Configuration Value("ConnectedSystemName")
```

Local Variable

Expands to the value of a local variable.

Fields

Name

Specify the name of the local variable. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

The example is from the Govern Groups for User Based on Title policy, which is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `003-Command-AddCreateGroups.xml` (`../samples/003-Command-AddCreateGroups.xml`).

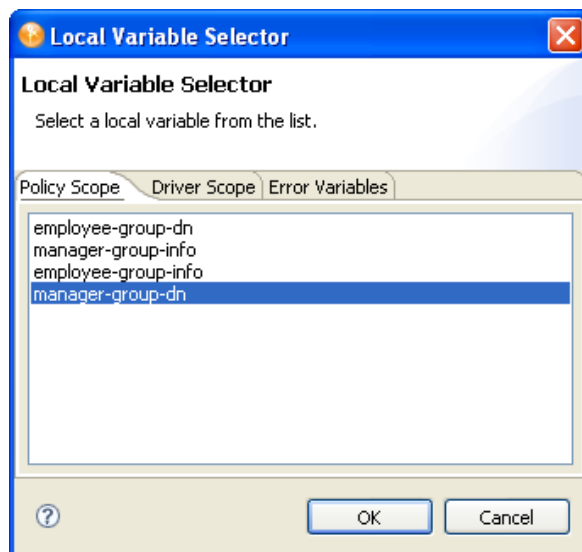
The action Add Destination Object uses the Local Variable token.

The screenshot displays a policy configuration window with the following elements:

- Conditions:**
 - Condition Group 1**
 - if local variable 'manager-group-info' available
 - And**
 - if local variable 'manager-group-info' not equal "group"
- Actions:**
 - add destination object(class name="Group", when="before", dn(Local Variable("manager-group-dn")))

Below the main configuration, there is a section for **Local Variable("manager-group-dn")**.

The **Editor** section shows a text input field for the variable name, containing `manager-group-dn`.



The Local Variable can only be used if the action Set Local Variable has been used previously in the policy. It sets the value that is stored in the Local Variable. In the Editor, you click the *browse* icon and all of the local variables that have been defined are listed. Select the correct local variable.

The value of the local variable is group-manager-dn. In the example, the Set Local Variable action defines group-manager-dn as DN of the manager's group Users\ManagersGroup.

Named Password

Expands to the named password from the driver.

Fields

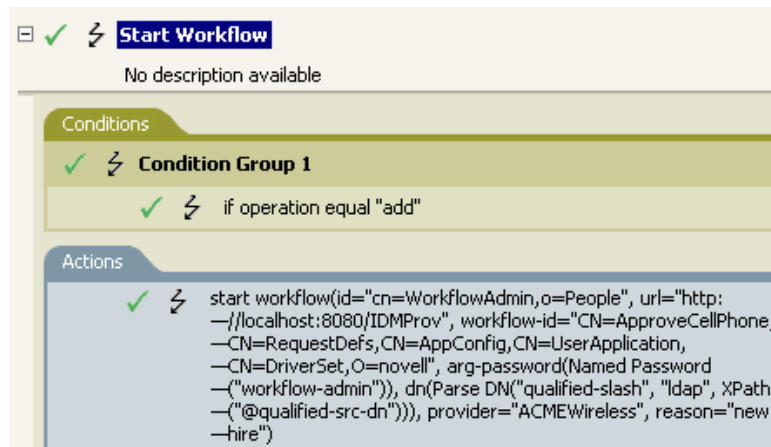
Name

Name of the password. Supports variable expansion. For more information, see [Section 3.6, "Variable Selector,"](#) on page 35.

Example

The Named Password noun token can only be used if a Named Password has been set on the driver object. The Named Password is used to save a password in an encrypted form. For more information on Named Passwords, see ["Securely Storing Driver Passwords with Named Passwords"](#) in the *Identity Manager 4.0.1 Common Driver Administration Guide*.

The example uses the [Start Workflow \(page 278\)](#) action. It requires that the password for the workflow administrator be entered. To view the policy in XML, see [start_workflow.xml \(../samples/start_workflow.xml\)](#).



The screenshot shows a configuration window for the "Start Workflow" action. At the top, there is a title bar with a close button, a checkmark, and a refresh icon, followed by the text "Start Workflow" and "No description available". Below this, there are two main sections: "Conditions" and "Actions".

The "Conditions" section contains a single condition: "Condition Group 1" with a sub-condition "if operation equal 'add'".

The "Actions" section contains one action: "start workflow(id='cn=WorkflowAdmin,o=People', url='http://localhost:8080/IDMProv', workflow-id='CN=ApproveCellPhone, -CN=RequestDefs, CN=AppConfig, CN=UserApplication, -CN=DriverSet, O=novell', arg-password(Named Password -('workflow-admin')), dn(Parse DN('qualified-slash', 'ldap', XPath -('@qualified-src-dn'))), provider='ACMEWireless', reason='new -hire')".

Do

Specify provisioning request DN: *

Specify user application URL: *

Specify authorized user DN: *

Specify authorized user password: *

Specify recipient DN: *

Specify strings:

Named Password("workflow-admin")

Editor

Password name: *

Select Named Password

The selected named password is passed to the expression in the Argument Builder.

Server:

Name	Display Name
smt-admin	smt-admin
workflow-admin	workflow-admin

Operation

Expands to the name of the current operation.

Example

Operation()

Operation Attribute

Expands to the value of an attribute in the current operation. The operation can be an <add-attr>, <add-value>, or <attr>. If this token is evaluated in a context where a node-set result is expected, then all the available values are returned as nodes in a node-set. Otherwise, the first available value is returned as a string.

Fields

Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35.](#)

Example

The example has four rules that implement a Placement policy for User objects based on the first character of the Surname attribute. It generates both a trace message and a custom Novell Audit or Sentinel event. The policy name is Policy to Place by Surname, and it is available for download from the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `001-Placement-BySurname.xml` (`../samples/001-Placement-BySurname.xml`).

The screenshot displays the configuration for a policy rule named "Surname A-I: place in Users1". The interface is divided into several sections:

- Setup Local Variables:** A section at the top with a green checkmark and a lightning bolt icon.
- Surname A-I: place in Users1:** The main rule title, followed by "No description available".
- Conditions:** A section containing "Condition Group 1" with two conditions:
 - if class name equal "User"
 - if operation attribute 'Surname' match "[a-i].*"
- Actions:** A section containing three actions:
 - set operation destination DN(`dn("Training\Users\Active\Users1"+" "+Operation Attribute("CN"))`)
 - trace message(color="yellow", Local Variable("LVUsers1"))
 - generate event(id="1000", text1=Local Variable("LVUsers1"))
- Variables:** A list of variables used in the rule:
 - "Training\Users\Active\Users1"
 - " "
 - Operation Attribute("CN")
- Editor:** A text input field labeled "Name:" with the value "CN".

The action Set Operation Destination DN contains the Operation Attribute token. The Operation Attribute token sets the Destination DN to the CN attribute. The rule takes the context of Training\Users\Active\Users and adds a \ plus the value of the CN attribute.

Operation Property



Expands to the value of the specified operation property on the current operation.

Fields

Name

Specify the name of the operation property. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).



Example

```
.....   Operation Property("myStoredproperty")
```

Password

Expands to the password specified in the current operation.

Example

```
.....   Password()
```

Query

Queries the source or destination data store and returns the resulting instances.

Fields

Datstore

Specify the data store to query.

Scope

Select the scope of the query. The options are entry, subordinates, or subtree.

Max Result Count

Specify the maximum number of results returned from the query.

Class Name

Specify the class name in the query. If a class name is not specified, all classes are searched. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Select Object

Specify the base of the query. It can be the DN or an association. If neither is selected, the query starts at the root of the datastore.

Match Attributes

Select the attributes to search for.

IMPORTANT: To improve performance when using the query noun, create an index for the attributes that you are going to use when querying the Identity Vault. For more information about indexes, see the [Novell eDirectory 8.8 Administration Guide \(http://www.novell.com/documentation/edir88/edir88/index.html?page=/documentation/edir88/edir88/data/a5tuu5.html\)](http://www.novell.com/documentation/edir88/edir88/index.html?page=/documentation/edir88/edir88/data/a5tuu5.html).

Read Attribute

Specify the set of attributes to return. If nothing is specified, no attributes are read. Use an asterisk to read all attributes.

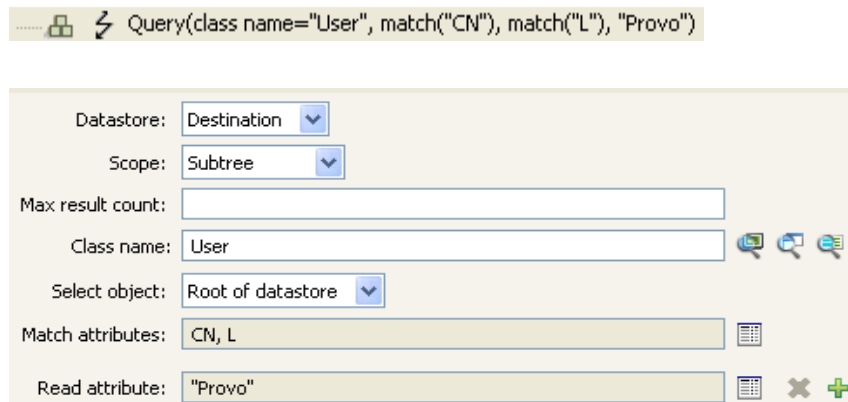
Remarks

The Query token returns a `node set` containing the instance elements found as a result of the query. To effectively use the results of a Query token it must be used in a context that is expecting a `node set`. For example, you could assign the result to a variable of type `node set`, or iterate through the result using a `for each` loop.

Treating the `node set` as if it were a `string` seldom provides anything useful. Extracting useful information from the `node set` or its constituent instance elements requires the use of an XPath expression and knowledge of the structure of an instance element. For additional information, see the following:

- ♦ “instance” in the [Identity Manager 4.0.1 DTD Reference](#).
- ♦ “Downloading Identity Manager Policies” in [Understanding Policies for Identity Manager 4.0.1](#).
- ♦ Chapter 5, “Using the XPath Builder,” on page 73.

Example



Query(class name="User", match("CN"), match("L"), "Provo")

Datastore:	Destination
Scope:	Subtree
Max result count:	
Class name:	User
Select object:	Root of datastore
Match attributes:	CN, L
Read attribute:	"Provo"

Removed Attribute

Expands to the specified attribute value being removed in the current operation. It applies only to a Modify operation.

Fields


Name

Specify the name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Example

```
.....   Removed Attribute("Member")
```

Removed Entitlement

Expands to the values of the an entitlement revoked in the current operation.

Fields

Name

Specify the name of the entitlement. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that entitlement. If it is used in a context where a string is expected, the token expands to the string value found.

Example

```
.....   Removed Entitlement("manager")
```

Resolve

Resolves the DN to an association key, or the association key to a DN in the specified data store.

Fields


Datastore

Select the destination or source datastore to be queried.

Resolve Type

Select to resolve the association key to a DN or to resolve the DN to an association key.

Example

```
.....   Resolve(datastore="src", dn())
```

Editor

Datasource: Source

Resolve type: DN to Association

DN: * \Novell\Users\ManagerGroup

Source Attribute

Expands to the values of an attribute from an object in the source data store.

Fields

Name

Name of the attribute. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Object

Select the source object. This object can be the current object, or can be specified by a DN or an association.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Example

Source Attribute("Member", class name="Group")

Editor

Name: * Member

Class name: Group

Select object: Current object

Source DN

Expands to the source DN from the current operation.

Fields

Start

Specify the RDN index to start with:

- ◆ Index 0 is the root-most RDN
- ◆ Positive indexes are an offset from the root-most RDN
- ◆ Index -1 is the leaf-most segment
- ◆ Negative indexes are an offset from the leaf-most RDN towards the root-most RDN

Length

Number of RDN segments to include. Negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc.



Convert


Select whether or not to convert the DN to the format used by the destination data store.

Remarks

If start and length are set to the default values {0,-1}, the entire DN is used; otherwise, only the portion of the DN specified by start and length is used.


Example

.....   Source DN(length="-2")

 **Editor**

Start:



Length:

Convert to destination DN format: 

Source Name

Expands to the unqualified relative distinguished name (RDN) of the source DN specified in the current operation.

Example

.....   Source Name()

Time

Expands to the current date/time into the format, language, and time zone specified.

Fields

Format

Specify the date/time format. Select a named time format or specify a custom format pattern. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Language

Specify the language. (It defaults to the current system language.) Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).



Time zone

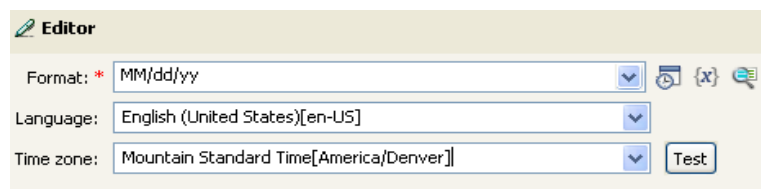
Specify the time zone. (It defaults to the current system time zone.) Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Remark

The *Test* icon displays the time format that is created by selecting the format, language, and time zone.

Example

```
.....   Time(format="MM/dd/yy", lang="en-US", tz="America/Denver")
```



Unique Name

Expands to a pattern-based name that is unique in the destination data store according to the criteria specified.

Fields

Attribute Name

Specify the name of attribute to check for uniqueness.

IMPORTANT: To improve performance when using the unique name noun, create an index for the attributes that you are going to use when querying the Identity Vault. For more information about indexes, see the [Novell eDirectory 8.8 Administration Guide \(http://www.novell.com/documentation/edir88/edir88/index.html?page=/documentation/edir88/edir88/data/a5tuuu5.html\)](http://www.novell.com/documentation/edir88/edir88/index.html?page=/documentation/edir88/edir88/data/a5tuuu5.html).

Scope

Specify the scope in which to check uniqueness. The options are subtree or subordinates.

Start Search

Select a starting point for the search. The starting point can be the root of the data store, or can be specified by a DN or association.

Pattern

Specify patterns to use to generate unique values by using the Argument Builder.

Counters Use

Select when to use a counter. The options are:

- ◆ never
- ◆ always
- ◆ fallback

Counters Pattern

Select which pattern to use the counter with. The options are:

- ◆ first
- ◆ last
- ◆ all

Start

The starting value of the counter. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Digits

Specify the width in digits of counter; the default is 1. The *Pad counter with leading 0's* option prepends 0 to match the digit length. For example, with a digit width of 3, the initial unique value would be appended with 001, then 002, and so on. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

If Cannot Construct Name

Select the action to take if a unique name cannot be constructed. The options are:

- ◆ Ignore, return empty
- ◆ Generate warning, return empty name
- ◆ Generate error, abort current transaction
- ◆ Generate fatal error, shut down driver

Remarks

Each <arg-string> element provides a pattern to be used to create a proposed name.

A proposed name is tested by performing a query for that value in the name attribute against the destination data store by using the <arg-dn> element or the <arg-association> element as the base of the query and scope as the scope of the query. If the destination data store is the Identity Vault and name is omitted, then a search is performed against the pseudo-attribute “[Entry].rdn”, which represents the RDN of an object without respect to what the naming attribute might be. If the destination data store is the application, then name is required.

A pattern can be tested with or without a counter as indicated by counter-use and counter-pattern. When a pattern is tested with a counter, the pattern is tested repeatedly with an appended counter until a name is found that does not return any instances or the counter is exhausted. The counter starting value is specified by counter-start and the counter maximum value is specified in terms of the maximum number of digits as specified by counter-digits. If the number of digits is less than those specified, then the counter is right-padded with zeros unless the counter-pad attribute is set to False. The counter is considered exhausted when the counter can no longer be represented by the specified number of digits.

As soon as a proposed name is determined to be unique, the testing of names is stopped and the unique name is returned.

The order of proposed names is tested as follows:

- ♦ Each pattern is tested in the order specified. If counter-use=“always” and the pattern is one of the patterns indicated by the counter-pattern, then the pattern is tested with a counter; otherwise, it is tested without a counter.
- ♦ If no unique name has been found after the patterns have been exhausted and counter-use=“fallback”, then the patterns indicated by the counter-pattern are retried with a counter.

If all specified combinations of patterns and counters are exhausted, then the action specified by the on-unavailable is taken.

Example

```
..... Unique Name("CN", counter-pattern="last", counter-use="fallback", on-unavailable="error", Uppercase()+Uppercase()+Attribute
```

The following is an example of the Editor pane when constructing the unique name argument:

Attribute name: CN

Scope: Subtree

Start search: Root of datastore

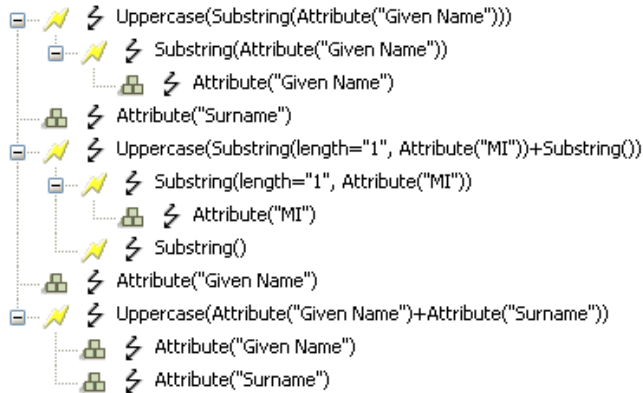
Pattern: * "Uppercase(Substring(Attribute("Given Name")))+Attribute("Su..."

When to use counters: fallback

Use counter with which pattern: first

Counter start: 1 digits: 1 Pad counter with leading 0's

The following pattern was constructed to provide unique names:



If this pattern does not generate a unique name, a digit is appended, incrementing up to the specified number of digits. In this example, nine additional unique names would be generated by the appended digit before an error occurs (pattern1 - pattern99).

Unmatched Source DN

Expands to the part of the source DN in the current operation that corresponds to the part of the DN that was not matched by the most recent match of an If Source DN condition.

Fields

Convert

Select whether or not to convert the DN format used by the destination data store.

Remarks

If there are no matches, the entire DN is used.

Example

The example is from the predefined rules that come with Identity Manager. For more information, see [Section 8.12, “Matching - Subscriber Mirrored - LDAP Format,” on page 131](#). To view the policy in XML, see [predef_match_sub_mirrored.xml \(../samples/predef_match_sub_mirrored.xml\)](#).

The action of Finding Matching Object uses the Unmatched Source DN token to build the matching information in LDAP format. It takes the unmatched portion of the source DN to make a match.

Matching - Subscriber Mirrored - LDAP format
 No description available

Conditions

- Condition Group 1**
 - if source DN in subtree "[Enter base of source hierarchy]"

Actions

- set local variable("dest-base", "[Enter base of destination hierarchy]")
- find matching object(scope="entry", dn(Unmatched Source DN -(convert="true")+";"+Local Variable("dest-base")))

Unmatched Source DN(convert="true")
 ";"
 Local Variable("dest-base")

Editor

Convert to destination DN format:

XPath

Expands to the results of evaluating an XPath 1.0 expression.

Fields

Expression

XPath 1.0 expression to evaluate.

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions”](#) in *Understanding Policies for Identity Manager 4.0.1*.

Example

XPath("//*[@attr-name='OU']/value[start-with(string(.),xxx')]")

Editor

XPath expression: *

Verb tokens modify the concatenated results of other tokens that are subordinate to them.

This section contains detailed information about all verbs that are available through the Policy Builder interface.

- ♦ [“Base64 Decode” on page 311](#)
- ♦ [“Base64 Encode” on page 312](#)
- ♦ [“Convert Time” on page 312](#)
- ♦ [“Escape Destination DN” on page 313](#)
- ♦ [“Escape Source DN” on page 314](#)
- ♦ [“Join” on page 314](#)
- ♦ [“Lowercase” on page 315](#)
- ♦ [“Map” on page 316](#)
- ♦ [“Parse DN” on page 317](#)
- ♦ [“Replace All” on page 319](#)
- ♦ [“Replace First” on page 320](#)
- ♦ [“Split” on page 321](#)
- ♦ [“Substring” on page 321](#)
- ♦ [“Uppercase” on page 323](#)
- ♦ [“XML Parse” on page 323](#)
- ♦ [“XML Serialize” on page 324](#)

Base64 Decode

Decodes the result of the enclosed tokens from Base64-encoded data to bytes, then converts the bytes into a string by using the specified character set.

Fields

Character Set

Specify the character set that converts the decoded bytes to a string. It can be any character set supported by Java. If the field is left blank, the character set defaults to the system encoding as specified by the file.encoding System property. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example

```
Base64 Decode(charset="UTF-8", Operation Attribute("data"))
  Operation Attribute("data")
```

Base64 Encode

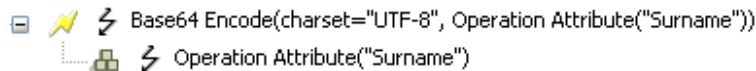
Converts the result of the enclosed tokens to bytes by using the specified character set, then Base64-encodes the bytes.

Fields

Character Set

Specify the character set that converts the string to bytes. It can be any Java-supported character set. If the field is left blank, the character set defaults to the system encoding as specified by the `file.encoding` System property. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Example



```
Base64 Encode(charset="UTF-8", Operation Attribute("Surname"))
Operation Attribute("Surname")
```

Convert Time

Converts the date and time represented by the result of the enclosed tokens from the source format, language, and time zone to the destination format, language, and time zone.

Fields

Source Format

Specify the source date/time format. Select a named time format or specify a custom format pattern. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Source Language

Specify the source language (defaults to the current system language). Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Source Time Zone

Specify the source time zone (defaults to the current system time zone). Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Destination Format

Specify the destination date/time format. Select a named time format or specify a custom format pattern. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Destination Language

Specify the destination language (defaults to the current system language). Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Destination Time Zone

Specify the destination time zone (defaults to the current system time zone). Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,”](#) on page 35.

Offset

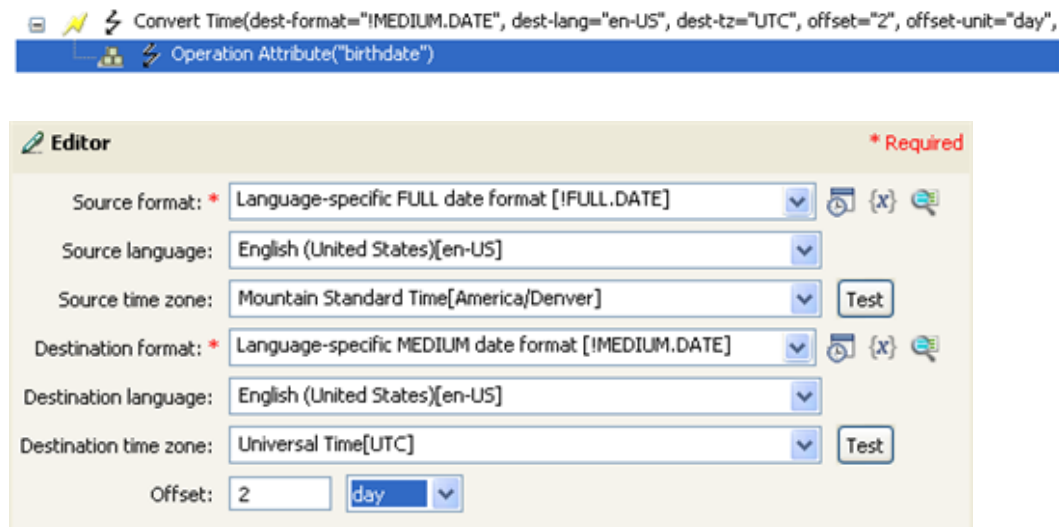
Specifies an offset to apply to the time in the selected noun. Specify an offset number, then select the appropriate time unit from the drop-down list (seconds, minutes, hours, days, weeks, months, years.)

NOTE: This field is only available if the Identity Manager server version is set to 3.6.

Remark

The *Test* icon displays the time format that is created by selecting the format, language, and time zone.

Example



Escape Destination DN

Escapes the enclosed tokens according to the rules of the DN format of the destination data store.

Example

The example is from the predefined rules that come with Identity Manager. For more information, see [Section 8.16, “Placement - Publisher Flat,”](#) on page 138. To view the policy in XML, see [predef_place_pub_flat.xml](#) (../samples/predef_place_pub_flat.xml).

The action of Set Operation Destination DN uses the Escape Destination DN token to build the destination DN of the User object.

Placement - Publisher Flat

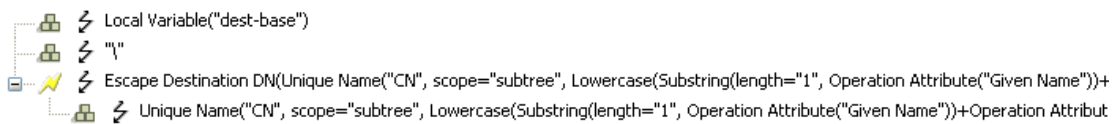
No description available

Conditions

- Condition Group 1
 - if class name equal "User"

Actions

- set local variable("dest-base", "[Enter DN of destination container]")
- set operation destination DN(dn(Local Variable("dest-base")+""
 - +Escape Destination DN(Unique Name("CN", scope="subtree",
 - Lowercase(Substring(length="1", Operation Attribute("Given
 - Name))+Operation Attribute("Surname")), Lowercase(Substring
 - (length="2", Operation Attribute("Given Name))+Operation
 - Attribute("Surname"))))))))

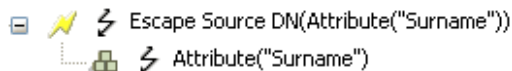


The Escape Destination DN token takes the value in Unique Name and sets it to the format for the destination DN.

Escape Source DN

Escapes the enclosed tokens according to the rules of the DN format of the source data store.

Example



Join

Joins the values of the nodes in the node set result of the enclosed tokens, separating the values by the characters specified by delimiter. If the comma-separated values (CSV) are true, then CSV quoting rules are applied to the values.

Fields

Delimiter

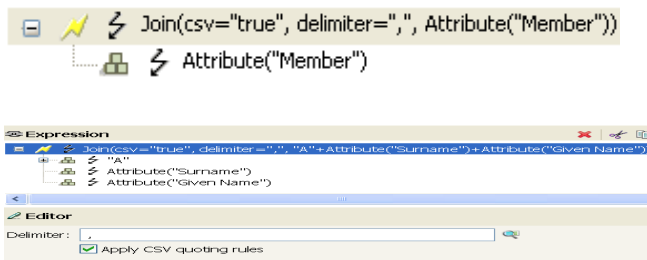
(Optional) Specify the string used to delimit the joined values. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Apply CSV Quoting Rules

Applies CSV quoting values.

Example

The example combines all of the members of the group into a CSV record.

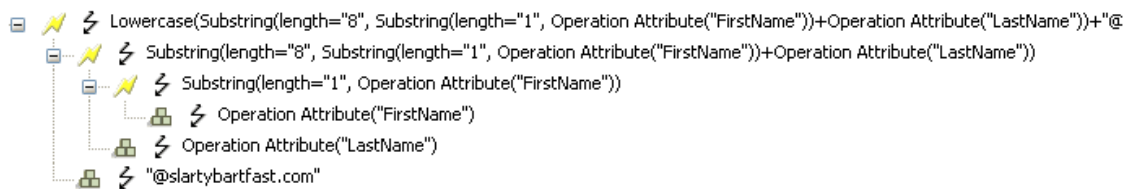
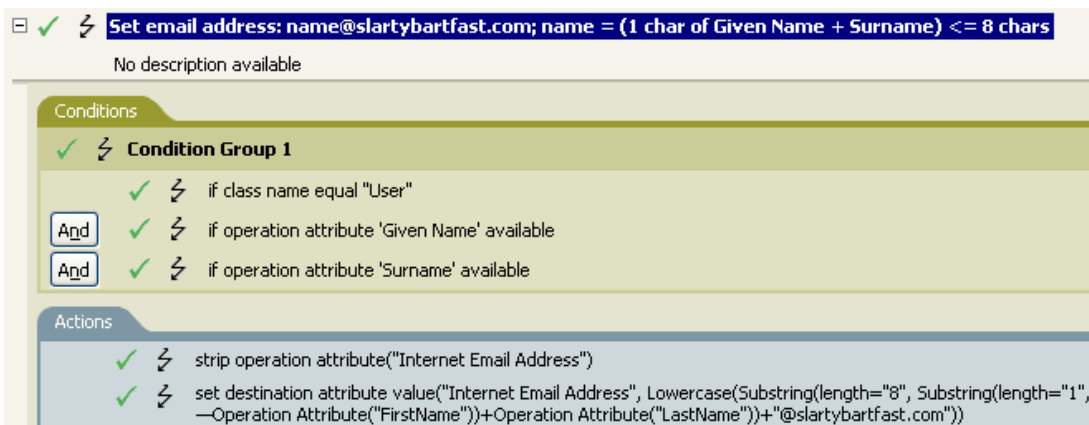


Lowercase

Converts the characters in the enclosed tokens to lowercase.

Example

This example sets the e-mail address to be name@slartybartfast.com where the name equals the first character of the Given Name plus the Surname. The policy name is Policy: Create E-mail from Given Name and Surname, and it is available for download at the Novell Support Web site. For more information, see [“Downloading Identity Manager Policies”](#) in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see [001-Command-SetEmailByGivenNameAndSurname.xml](#) (`../samples/001-Command-SetEmailByGivenNameAndSurname.xml`).



The Lowercase token sets all of the information in the action Set Destination attribute value to lowercase.

Map

Maps the result of the enclosed tokens from the values specified by the source column to the destination column in the specified mapping table.

Remarks

If this token is evaluated in a context where a node set result is expected and multiple rows are matched by the value being mapped, a node set is returned that contains the values from the destination column of each matching row. Otherwise, only the value from the first matching row is returned.

The table attribute should be the slash form DN of the Resource object containing the mapping table to be used. The DN might be relative to the including policy.

Fields

Mapping Table DN

Specify the slash form DN of a Resource object containing the mapping table. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Set DN Relative to Policy

When it is enabled, it displays the mapping table DN relative to the policy. This is the default.

Source Column Name

Specify the name of the source column. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Destination Column Name

Specify the name of the destination column. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).



Default Value

Specifies a value to return if the value being mapped does not match any values in the Source column.



NOTE: This field is only available if the Identity Manager server version is set to 3.6.



Example

Editor * Required

Mapping Table DN: * ..\..\Library\Departments Table  

Set DN relative to policy

Source column name: * dept  

Destination column name: * code  

Default value: 126

Parse DN

Converts the enclosed token's DN to an alternate format.

Fields

Start

Specify the RDN index to start with:

- ◆ Index 0 is the root-most RDN
- ◆ Positive indexes are an offset from the root-most RDN
- ◆ Index -1 is the leaf-most segment
- ◆ Negative indexes are an offset from the leaf-most RDN towards the root-most RDN

Length

Number of RDN segments to include. Negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc.

Source DN Format

Specifies the format used to parse the source DN.

Destination DN Format

Specify the format used to output the parsed DN.

Source DN Delimiter

Specify the custom source DN delimiter set if Source DN Format is set to custom.

Destination DN Delimiter

Specify the custom destination DN delimiter set if Destination DN Format is set to custom.

Remarks

If start and length are set to the default values {0,-1}, then the entire DN is used; otherwise, only the portion of the DN specified by start and length is used.

When specifying custom DN formats, the eight characters that make up the delimiter set are defined as follows:

- ◆ Typed Name Boolean Flag: 0 means names are not typed, and 1 means names are typed
- ◆ Unicode No-Map Character Boolean Flag: 0 means don't output or interpret unmappable Unicode characters as escaped hex digit strings, such as \FEFF. The following Unicode characters are not accepted by eDirectory: 0xfeff, 0xffff, 0xfffd, and 0xffff.
- ◆ Relative RDN Delimiter
- ◆ RDN Delimiter
- ◆ Name Divider
- ◆ Name Value Delimiter
- ◆ Wildcard Character
- ◆ Escape Character

If RDN Delimiter and Relative RDN Delimiter are the same character, the orientation of the name is root right, otherwise the orientation is root left.

If there are more than eight characters in the delimiter set, the extra characters are considered as characters that need to be escaped, but they have no other special meaning.

Example

The example uses the Parse DN token to build the value the Add Destination Attribute Value action. The example is from the predefined rules that come with Identity Manager. For more information, see [Section 8.1, “Command Transformation - Create Departmental Container - Part 1 and Part 2,”](#) on page 112. To view the policy in XML, see [predef_command_create_dept_container2.xml](#) ([../samples/predef_command_create_dept_container2.xml](#)).

Command Transformation - Create Departmental Container - Part 2
No description available

Conditions

Condition Group 1

- if local variable 'does-target-exist' available
- And if local variable 'does-target-exist' equal ""

Actions

- add destination object(class name="Organizational Unit", direct="true", dn(Local Variable("target-container")))
- add destination attribute value("ou", direct="true", dn(Local Variable("target-container")), Parse DN("dest-dn", "dot", length="-1", start="-1", Local Variable("target-container")))

Parse DN("dest-dn", "dot", length="-1", start="-1", Local Variable("target-container"))

Local Variable("target-container")

Editor

Start:

Length:

Source DN format: ▼

Destination DN format: ▼

The Parse DN token takes the information from the source DN and converts it to dot notation. The information from the Parse DN is stored in the attribute value of OU.

Replace All

Replaces all occurrences of a regular expression in the enclosed tokens.

Fields

Regular Expression

Specify the regular expression that matches the substring to be replaced. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Replace With

Specify the replacement string. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).




Remarks



For details on creating regular expressions, see:

- [Java ‘Class Pattern’ information \(http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html)
- [Java ‘Class Matcher’ information \(http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll\(java.lang.String\)\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll(java.lang.String))


The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.


Example

   Replace All("(.)", "\$1", Destination DN())

  Destination DN()

Editor

Regular expression: * 

Replace with: 

Replace First

Replaces the first occurrence of a regular expression in the enclosed tokens.

Fields

Regular Expression

Specify the regular expression that matches the substring to replace. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Replace With

Specify the replacement string. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Remarks

The matching instance is replaced by the string specified in the *Replace with field*.

For details on creating regular expressions, see:

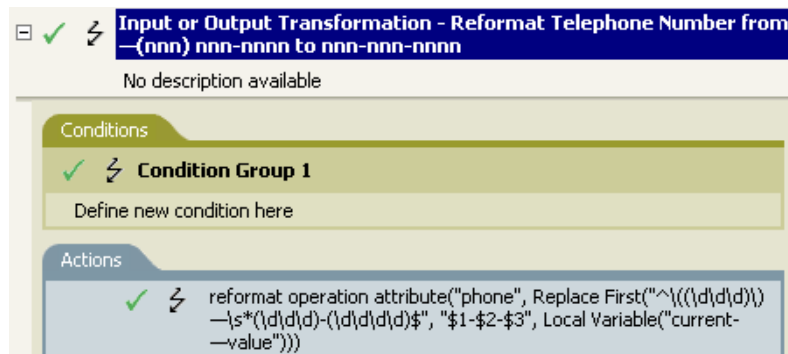
- ♦ [Java ‘Class Pattern’ information \(http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html)
- ♦ [\(java.lang.String\) \(http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll\(java.lang.String\)\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll(java.lang.String))

The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.

Example

The example reformats the telephone number (nnn)-nnn-nnnn to nnn-nnn-nnnn. The rule is from the predefined rules that come with Identity Manager. For more information, see [Section 8.9, “Input or Output Transformation - Reformat Telephone Number from \(nnn\) nnn-nnnn to nnn-nnn-nnnn,” on page 126](#). To view the policy in XML, see [predef_transformation_reformat_telephone1.xml \(../samples/predef_transformation_reformat_telephone1.xml\)](#).

The Replace First token is used in the Reformat Operation Attribute action.



Replace First("^\d\d\d\s*\d\d-\d\d\d\$", "\$1-\$2-\$3", Local Variable("current-value"))
Local Variable("current-value")

Editor

Regular expression: *

Replace with:

The regular expression of `^\d\d\d\s*\d\d-\d\d\d$` represents (nnn) nnn-nnnn and the regular expression of `$1-$2-$3` represents nnn. This rule transforms the format of the telephone number from (nnn) nnn-nnnn to nnn-xxx-xxxx.

Split

Splits the result of the enclosed tokens into a node set consisting of text nodes based on the pattern specified by delimiter. If comma-separated values (CSV) are true, then CSV quoting rules are honored during the parsing of the string.

Fields

Delimiter

Regular expression that matches the delimiter characters. Supports variable expansion. For more information, see [Section 3.6, “Variable Selector,” on page 35](#).

Apply CSV Quoting Rules

Applies CSV quoting values.

Example

Split(csv="true", delimiter=".", "Does,John,Doe, John")
"Does,John,Doe, John"

Editor

Delimiter: *

Apply CSV quoting rules

Substring

Extracts a portion of the enclosed tokens.

Fields

Start

Specify the starting character index:

- ♦ Index 0 is the first character.
- ♦ Positive indexes are an offset from the start of the string.
- ♦ Index -1 is the last character.
- ♦ Negative indexes are an offset from the last character toward the start of the string.

For example, if the start is specified as -2, then it starts reading at the first character from the end. If -3 is specified, then it starts 2 characters from the end.

Length

Number of characters from the start to include in the substring. Negative numbers are interpreted as $(\text{total \# of characters} + \text{length}) + 1$. For example, -1 represents the entire length of the original string. If -2 is specified, the length is the entire string -1. For a string with 5 characters, a length of -1 = $(5 + (-1)) + 1 = 5$, -2 = $(5 + (-2)) + 1 = 4$, etc.

Example

This example sets the e-mail address to be name@slartybartfast.com where the name equals the first character of the Given Name plus the Surname. The policy name is Policy: Create E-mail from Given Name and Surname, and it is available for download at the Novell Support Web site. For more information, see [“Downloading Identity Manager Policies”](#) in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see [001-Command-SetEmailByGivenNameAndSurname.xml](#) ([../samples/001-Command-SetEmailByGivenNameAndSurname.xml](#)).

The screenshot displays a policy configuration in Identity Manager Designer. The policy name is "Set email address: name@slartybartfast.com; name = (1 char of Given Name + Surname) <= 8 chars". The conditions section, titled "Condition Group 1", includes three conditions: "if class name equal 'User'", "if operation attribute 'Given Name' available", and "if operation attribute 'Surname' available", all connected by "And" operators. The actions section includes "strip operation attribute('Internet Email Address')" and "set destination attribute value('Internet Email Address', Lowercase(Substring(length='8', Substring(length='1', —Operation Attribute('FirstName'))+Operation Attribute('LastName'))+'@slartybartfast.com'))". Below the main configuration, a detailed XML view of the policy is shown, including the full expression for the email address: `Lowercase(Substring(length="8", Substring(length="1", Operation Attribute("FirstName"))+Operation Attribute("LastName"))+"@slartybartfast.com")`.

The Substring token is used twice in the action Set Destination Attribute Value. It takes the first character of the First Name attribute and adds eight characters of the Last Name attribute to form one substring.

Uppercase

Converts the characters in the enclosed tokens to uppercase.

Example

The example converts the first and last name attributes of the User object to uppercase. The policy name is Policy: Convert First/Last Name to Uppercase and it is available for download at the Novell Support Web site. For more information, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*. To view the policy in XML, see `002-Command-UppercaseNames.xml` (`../samples/002-Command-UppercaseNames.xml`).

The screenshot shows a policy configuration window titled "Convert First/Last name to uppercase". It includes a description field with "No description available". The configuration is divided into "Conditions" and "Actions" sections.

Conditions:

- Condition Group 1:** if class name equal "User"
- Condition Group 2:**
 - if operation attribute 'Given Name' changing
 - if operation attribute 'Surname' changing

The two condition groups are connected by an "And" operator, and the two conditions within the second group are connected by an "Or" operator.

Actions:

- reformat operation attribute("Given Name", Uppercase(Operation Attribute("Given Name")))
- reformat operation attribute("Surname", Uppercase(Operation Attribute("Surname")))

The screenshot shows the XML representation of the Uppercase action. It consists of a root element `Uppercase(Operation Attribute("Given Name"))` with a child element `Operation Attribute("Given Name")`.

XML Parse

Parses the result of the enclosed tokens as XML and returns the resulting document node in a node set. If the result of the enclosed tokens is not well-formed XML or cannot be parsed for any reason, an empty node set is returned.

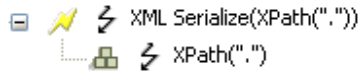
Example

The screenshot shows the XML representation of the XML Parse action. It consists of a root element `XML Parse(Base64 Decode(charset="UTF-8", Operation Attribute("data")))` with two child elements: `Base64 Decode(charset="UTF-8", Operation Attribute("data"))` and `Operation Attribute("data")`.

XML Serialize

Serializes the node set result of the enclosed tokens as XML. Depending on the content of the node set, the resulting string is either a well-formed XML document or a well-formed parsed general entity. If a node set is passed, it returns a string representation of the node set. If a string value of a node set is passed, it returns a string of valid tokens escaped of XML or HTML characters that can be included in a text node. For example, you can use the XML Serialize token to trace a node set and return a particular variable in a readable format, which can be useful for debugging purposes. You can also use XML Serialize to escape special characters, including `&`, `&`, `<`, or `<`.

Example



Although you define most arguments by using the Argument Builder, there are several more builders that are used by the Condition Editor and Action Editor in the Policy Builder. Each builder can recursively call anyone of the builders in the following list:

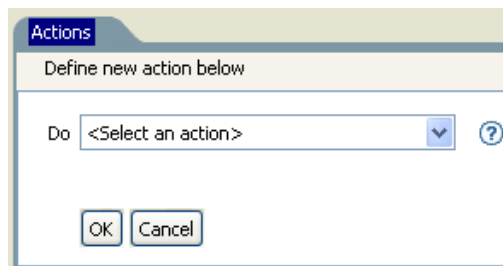
- ◆ [Section 16.1, “Action Builder,” on page 325](#)
- ◆ [Section 16.2, “Actions Builder,” on page 326](#)
- ◆ [Section 16.3, “Argument Builder,” on page 327](#)
- ◆ [Section 16.4, “Action Argument Component Builder,” on page 331](#)
- ◆ [Section 16.5, “Condition Builder,” on page 332](#)
- ◆ [Section 16.6, “Condition Argument Component Builder,” on page 333](#)
- ◆ [Section 16.7, “Match Attribute Builder,” on page 333](#)
- ◆ [Section 16.8, “Named String Builder,” on page 335](#)
- ◆ [Section 16.9, “Pattern String Builder,” on page 336](#)
- ◆ [Section 16.10, “Argument Value List Builder,” on page 338](#)
- ◆ [Section 16.11, “Namespace Editor,” on page 338](#)

16.1 Action Builder

The Action Builder enables you to add, view, and delete the actions that make up a rule. Action can also contain other actions.

16.1.1 Creating an Action

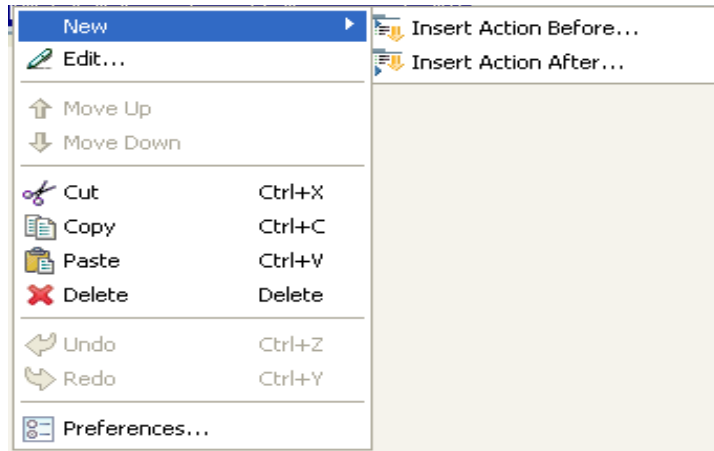
- 1 In the Policy Builder, create a new rule or edit an existing rule.
- 2 Double-click the *Actions* tab to launch the Action Builder.



- 3 Select the desired action from the drop-down list, then click *OK*.


16.1.2 Additional Options for the Action Builder

- 1 Right-click the action to see the additional options:



- ♦ **New > Insert Action Before:** Adds a new action before the current action.
- ♦ **New > Insert Action After:** Adds a new action after the current action.
- ♦ **Edit:** Launches the Action Builder.
- ♦ **Move the selected item up:** Moves the selected action up in the order of execution.
- ♦ **Move the selected item down:** Moves the selected action down in the order of execution.
- ♦ **Cut, Copy, Paste, or Delete an Action:** Cuts, copies, pastes, or deletes the action.
- ♦ **Undo or Redo:** Undoes or redoes the last action.
- ♦ **Preferences:** Allows you to set default functionality in the Policy Builder.
- ♦ **Help:** Select an action, then click the *Help* icon to see information specific to that action.

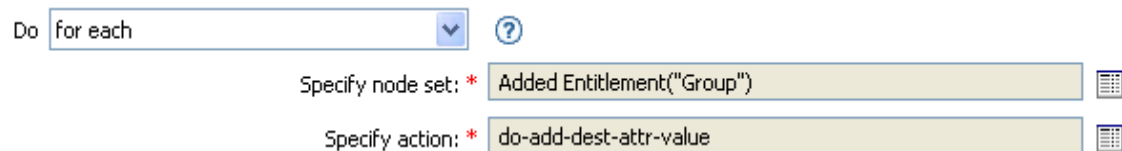
16.2 Actions Builder

The Actions Builder allows you to create an action inside of another action. To launch the Actions Builder, select one of the following actions, then click the *Edit the arguments* icon .

- ♦ [For Each \(page 369\)](#)
- ♦ [Implement Entitlement \(page 371\)](#)


In the following example the add destination attribute value action is performed for each Group entitlement that is being added in the current operation.




Figure 16-1 For Each Action







To define the action of the add destination attribute value, click the icon that launches the Actions Builder. In the Actions Builder, you define the desired action. In the following example, the member attribute is added to the destination object for each added Group entitlement.


Figure 16-2 Actions Builder


Do 


Specify attribute name: *   


Specify class name:   

Select mode: 

Select object: 

Specify DN: * 

Specify value type: 

Enter string: * 

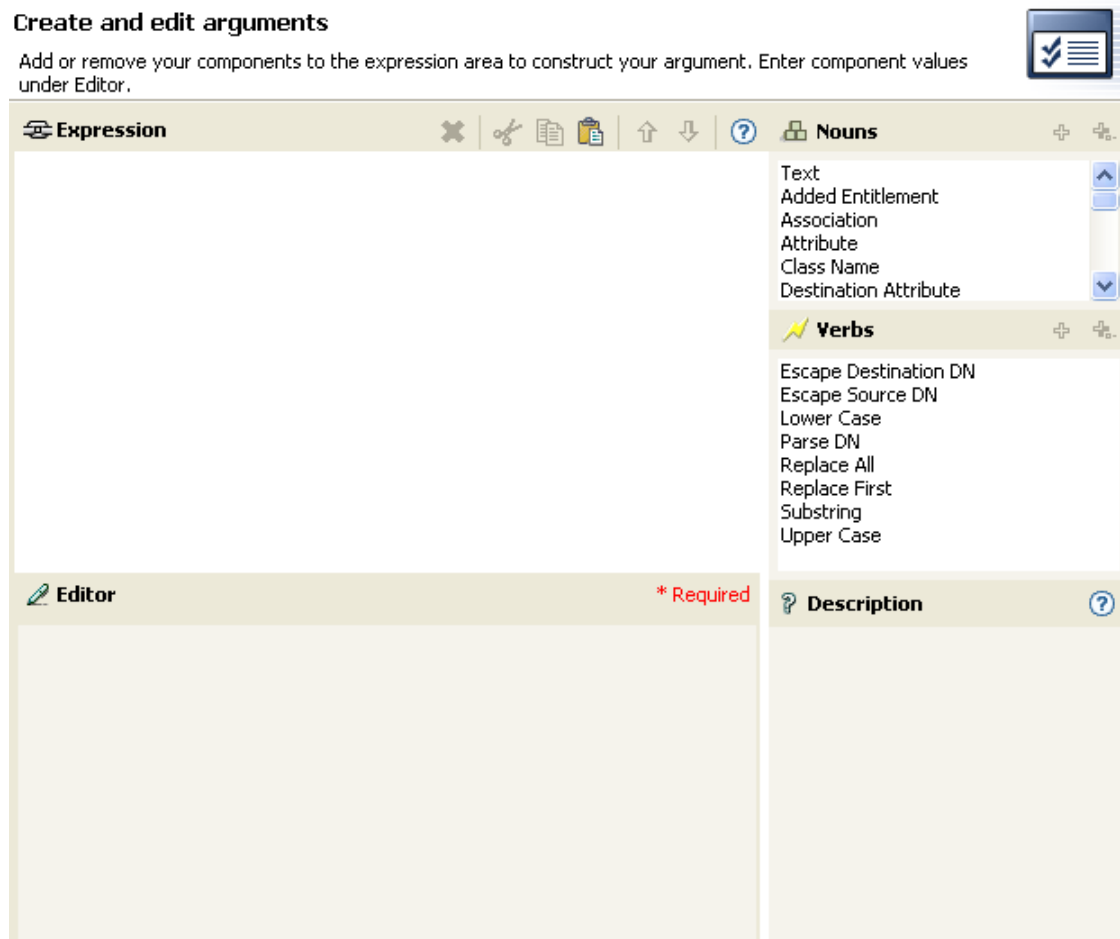
16.3 Argument Builder

The Argument Builder provides a dynamic graphical interface that enables you to construct complex argument expressions for use within Rule Builder.

The Argument Builder consists of five separate sections:


- ♦ **Nouns:** Contains a list of all of the available noun tokens. Select a noun token, then click *Add* to add the noun token to the *Expression* pane. See “Pre-Identity Manager 3.5 Noun Tokens” on page 385 for more information.
- ♦ **Verbs:** Contains a list of all of the available verb tokens. Select a verb token, then click *Add* to add the verb token to the *Expression* pane. See “Pre-Identity Manager 3.5 Verb Tokens” on page 395 for more information.
- ♦ **Description:** Contains a brief description of the noun or verb token. Click the help icon to launch additional help.
- ♦ **Expression:** Contains the argument that is being built. Multiple noun and verb tokens can be added to a single argument. Tokens can be arranged in different orders through the *Expression* pane.
- ♦ **Editor:** Provide the values for the nouns and the verbs in the *Editor* pane.

Figure 16-3 Pre-Identity Manager 3.5 Argument Builder



- ◆ [Section 16.3.1, “Launching the Argument Builder,” on page 328](#)
- ◆ [Section 16.3.2, “Argument Builder Example,” on page 329](#)

16.3.1 Launching the Argument Builder

To launch the Argument Builder, select one of the following actions, then click the *Edit the Arguments* icon .

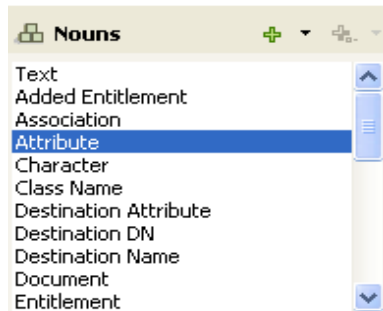
- ◆ [Add Association \(page 362\)](#)
- ◆ [Add Destination Attribute Value \(page 363\)](#)
- ◆ [Add Destination Object \(page 363\)](#)
- ◆ [Add Source Attribute Value \(page 364\)](#)
- ◆ [Append XML Text \(page 365\)](#)
- ◆ [Clear Destination Attribute Value \(page 366\)](#) (when the selected object is DN or Association)
- ◆ [Clear Source Attribute Value \(page 366\)](#) (when the selected object is DN or Association)
- ◆ [Delete Destination Object \(page 368\)](#) (when the selected object is DN or Association)
- ◆ [Delete Source Object \(page 368\)](#) (when the selected object is DN or Association)

- ◆ Find Matching Object (page 369)
- ◆ For Each (page 369)
- ◆ Move Destination Object (page 371)
- ◆ Move Source Object (page 372)
- ◆ Reformat Operation Attribute Value (page 372)
- ◆ Remove Association (page 373)
- ◆ Remove Destination Attribute Value (page 373)
- ◆ Remove Source Attribute Value (page 373)
- ◆ Rename Destination Object (page 374) (when the selected object is DN or Association and Enter String)
- ◆ Rename Source Object (page 375) (when the selected object is DN or Association and Enter String)
- ◆ Set Destination Attribute Value (page 377) (when the selected object is DN or Association and Enter Value Type is not structured)
- ◆ Set Destination Password (page 378)
- ◆ Set Local Variable (page 378)
- ◆ Set Operation Association (page 378)
- ◆ Set Operation Class Name (page 379)
- ◆ Set Operation Destination DN (page 379)
- ◆ Set Operation Property (page 379)
- ◆ Set Operation Source DN (page 379)
- ◆ Set Operation Template DN (page 380)
- ◆ Set Source Attribute Value (page 380)
- ◆ Set Source Password (page 380)
- ◆ Set XML Attribute (page 381)
- ◆ Status (page 382)
- ◆ Trace Message (page 383)

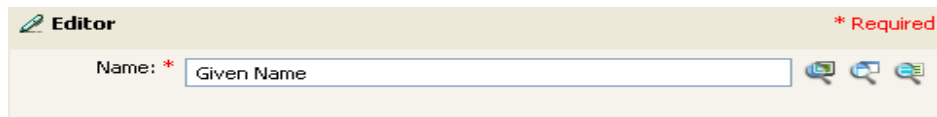
16.3.2 Argument Builder Example

The following example creates an argument for a user name from the first letter of the first name and the entire last name:

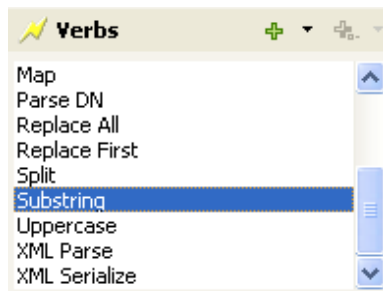
- 1 Double-click *Attribute* from the list of nouns.



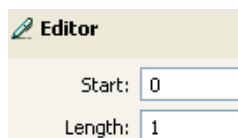
2 Specify or select the Given Name attribute.



3 Double-click *Substring* from the list of verbs.



4 Type 1 in the *Length* field.

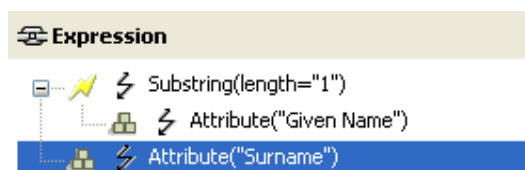


5 Select the *Given Name* attribute, then click the *Move Down* icon.



6 Double-click *Attribute* from the list of nouns.


7 Specify or browse to the *Surname* attribute.



The argument takes the first character of the Given Name attribute and adds it to the Surname attribute to build the desired value.

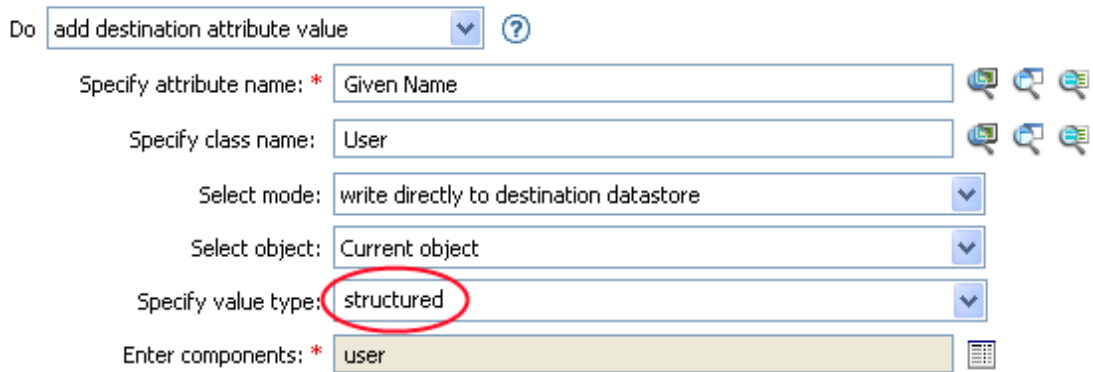
8 Click *OK* to save the argument.

16.4 Action Argument Component Builder




To launch the Action Argument Component Builder, select one of the following actions when the *Enter value type* selection is *structured*, then click the *Edit components* icon .




- ◆ [Add Destination Attribute Value](#) (page 363)
- ◆ [Add Source Attribute Value](#) (page 364)
- ◆ [Reformat Operation Attribute Value](#) (page 372)
- ◆ [Remove Destination Attribute Value](#) (page 373)
- ◆ [Remove Source Attribute Value](#) (page 373)
- ◆ [Set Destination Attribute Value](#) (page 377)
- ◆ [Set Source Attribute Value](#) (page 380)


Figure 16-4 Add Destination Attribute Value Action





Do ?


Specify attribute name: *   

Specify class name:   

Select mode: 


Select object: 

Specify value type: 

Enter components: * 

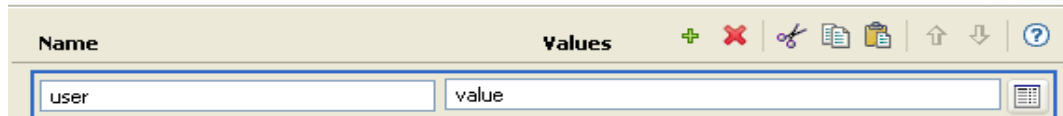
1 Click the *Edit the components* icon  when the value type is set to structured.


2 Create the value of the action component.

You can type the value, or click the *Edit the arguments*  icon to create the value in the Argument Builder.

Argument Components

The argument components are structured argument values.



Argument Components 

The argument components are structured argument values.

Name	Values
<input type="text" value="user"/>	<input type="text" value="value"/>

3 Click *Finish*.

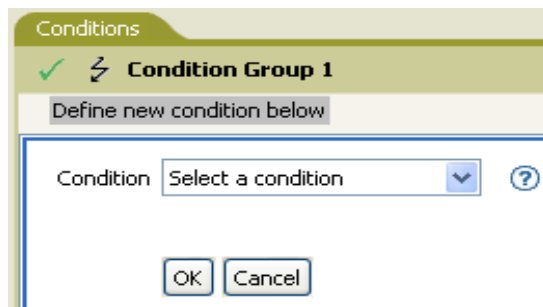
16.5 Condition Builder

The Condition Builder enables you to add, view, and delete the conditions that make up a rule. A condition contains one or more conditions and one or more condition groups. The condition groups contain two different condition structures, which define the logic of condition groups. The two condition structures are:

- ♦ *OR Conditions, AND Groups*
- ♦ *AND Conditions, OR Groups*
- ♦ [Section 16.5.1, “Creating a Condition,” on page 332](#)
- ♦ [Section 16.5.2, “Additional Options for the Condition Builder,” on page 332](#)

16.5.1 Creating a Condition

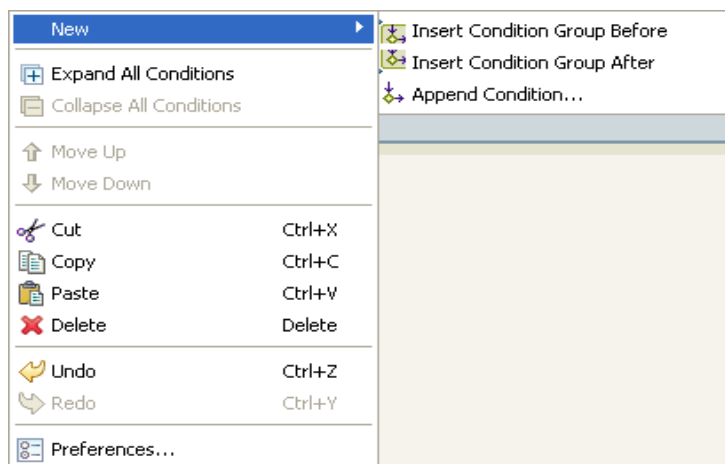
- 1 In the Policy Builder, create a new rule or edit an existing rule.
- 2 Double-click the *Conditions* tab to launch the Condition Builder.



- 3 Select the desired condition from the drop-down list, then click *OK*.

16.5.2 Additional Options for the Condition Builder

- 1 Right-click the condition to see the additional options:




- ♦ **New > Insert Condition Before:** Adds a condition before the current condition.

- ◆ **New > Insert Condition After:** Adds a condition after the current condition.
- ◆ **Edit:** Launches the Condition Builder.
- ◆ **Move the selected item up:** Moves the selected condition up in the order of execution.
- ◆ **Move the selected item down:** Moves the selected condition down in the order of execution.
- ◆ **Cut, Copy, Paste, or Delete:** Cuts, copies, pastes, or deletes the condition.
- ◆ **Undo or Redo:** Undoes or redoes the last action.
- ◆ **Preferences:** Allows you to set default functionality in the Policy Builder.
- ◆ **Help:** Select a condition, then click the *Help* icon to see information specific to that condition.

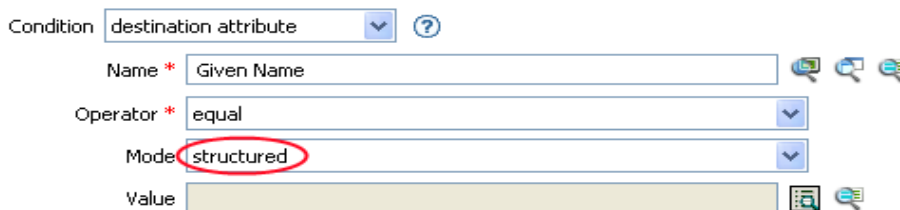
For additional information on the Condition Builder and the rules, see [Section 3.4, “Creating a Rule,”](#) on page 28.

16.6 Condition Argument Component Builder

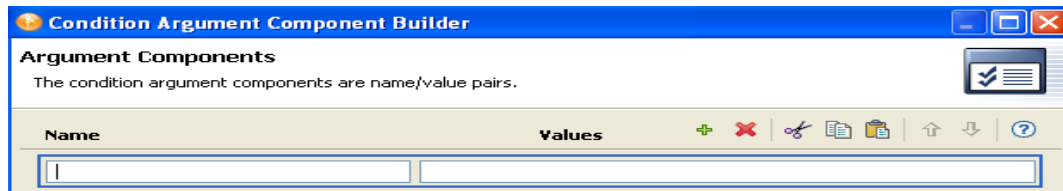
To launch the Condition Argument Component Builder, select one of the following conditions, then select the structured selection for Mode in order to see the *Launch ArgComponent Builder* icon .

- ◆ [If Attribute \(page 342\)](#)
- ◆ [If Destination Attribute \(page 345\)](#)
- ◆ [If Association \(page 341\)](#)

Figure 16-5 *If Attribute mode*



- 1 Specify the name and value of the condition component.





- 2 Click *Finish*.

16.7 Match Attribute Builder


The Match Attribute Builder enables you to select attributes and values used by the [Find Matching Object \(page 369\)](#) action to determine if a matching object exists in a data store.


For example, if you wanted to match users based on a common name and a location:


- 1 Select the action of *find matching object*.
- 2 Select the scope of the search for the matching objects. Select from *entry*, *subordinates*, or *subtree*.
- 3 Specify the DN of the starting point for the search.
- 4 Click the *Edit match attributes* icon  to launch the Match Attribute Builder.

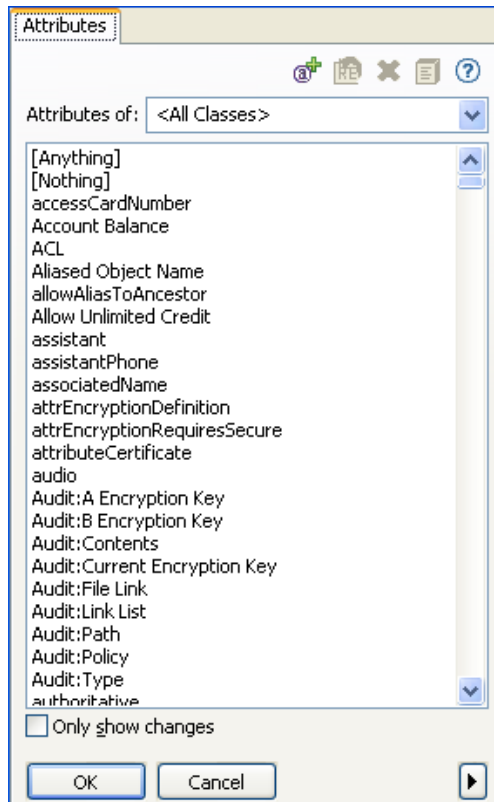
Do 

Select scope:


Specify DN: 

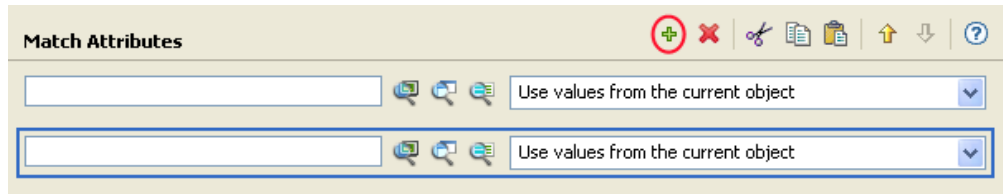
Specify match attributes: 

- 5 Click the *Browse attributes*  icon to launch the Schema Browser.
- 6 Click the *Attributes* tab, then browse to and select the desired attribute.



- 7 Click *OK*.

If you want to add more than one attribute, click the *Append new item* icon  to add another line.



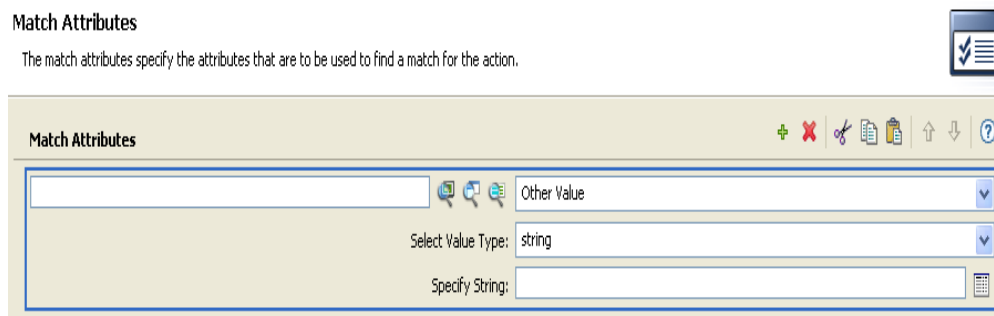
8 Click *Finish*.

The Match Attribute Builder also allows you to specify another value, instead of using the value from the current object. To use a different value, select *Other Value* instead of *Use values from current object*. There are multiple value types to specify:

- ◆ counter
- ◆ dn
- ◆ int
- ◆ interval
- ◆ octet
- ◆ state
- ◆ string
- ◆ structured
- ◆ teleNumber
- ◆ time

To use the another value:


1 Launch the Match Attribute Builder, then select *Other Value*.




2 Select the desired value type.

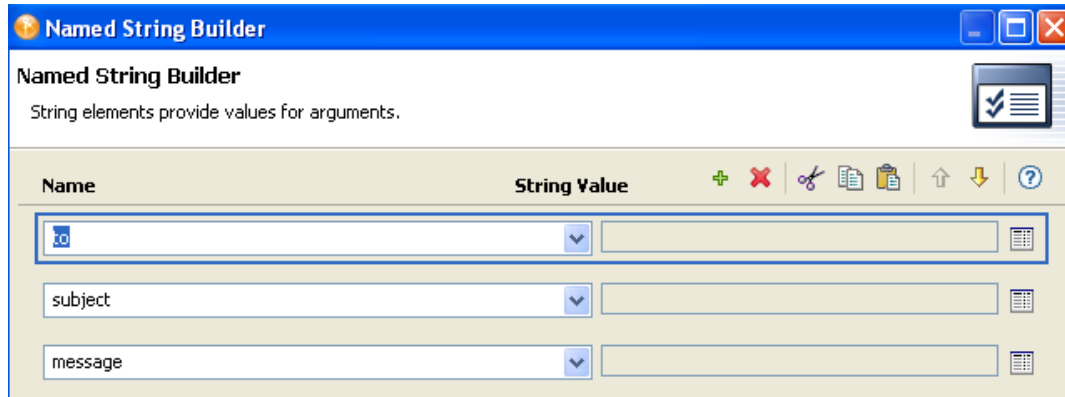
3 Specify the value, then click *OK*.

16.8 Named String Builder

To launch the Named String Builder, select one of the following actions, then click the *Edit the strings* icon .

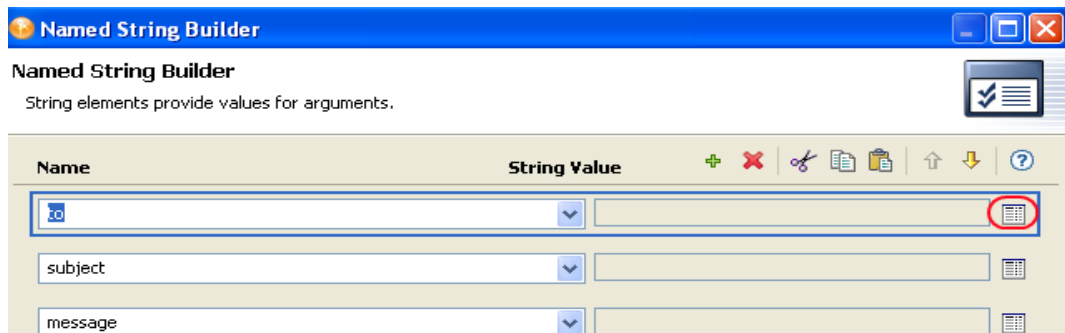
- ◆ [Generate Event \(page 370\)](#)

- ◆ [Send Email \(page 375\)](#)
 - ◆ [Send Email from Template \(page 376\)](#)
- 1 Select the name of the string from the drop-down list.
 - 2 Create the value for the string by clicking the *Edit the arguments* icon  to launch the Argument Builder.



- 3 Click *Finish*.

For a Send Email action, the named strings correspond to the elements of the e-mail:



A complete list of possible values is contained in the help file corresponding to the action that launches the Named String Builder.

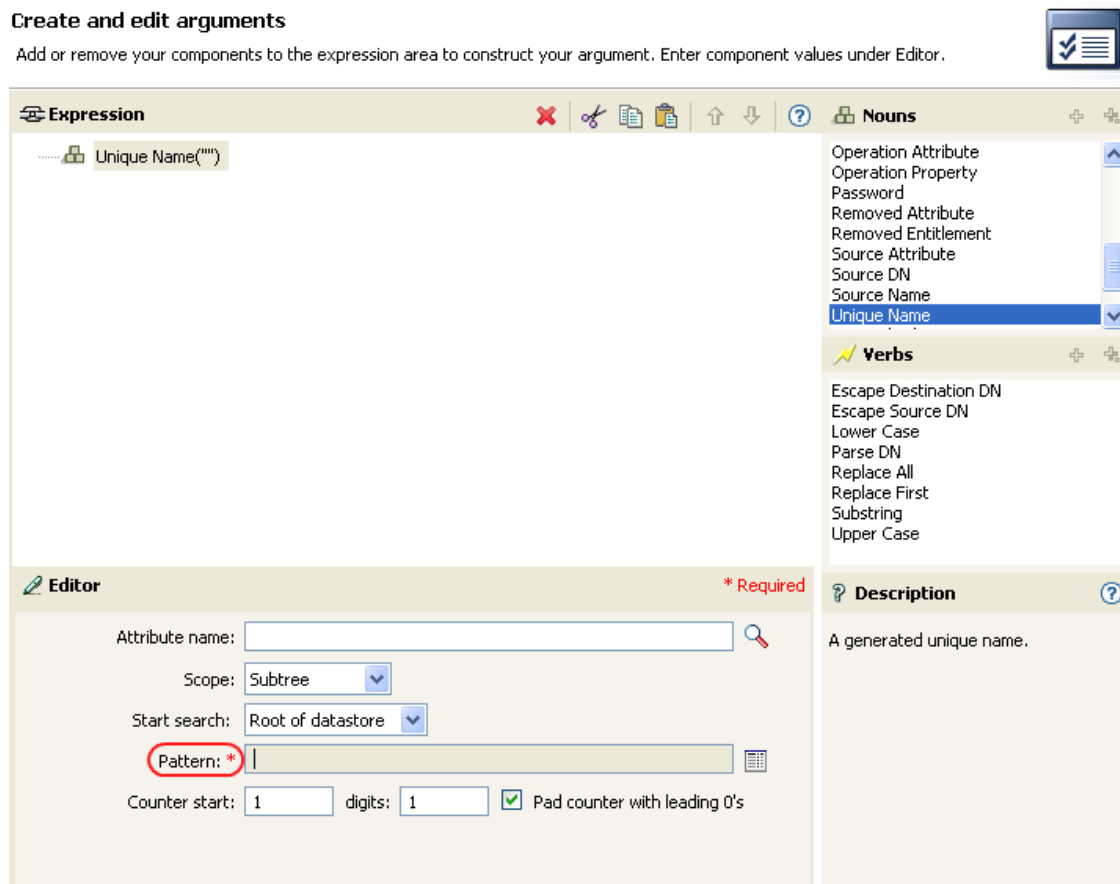
16.9 Pattern String Builder



You can launch the Pattern String Builder from the Argument Builder editor when the [Unique Name \(page 392\)](#) token is selected. The Argument Builder editor pane shows a Pattern field where you can click to launch the Pattern String Builder.

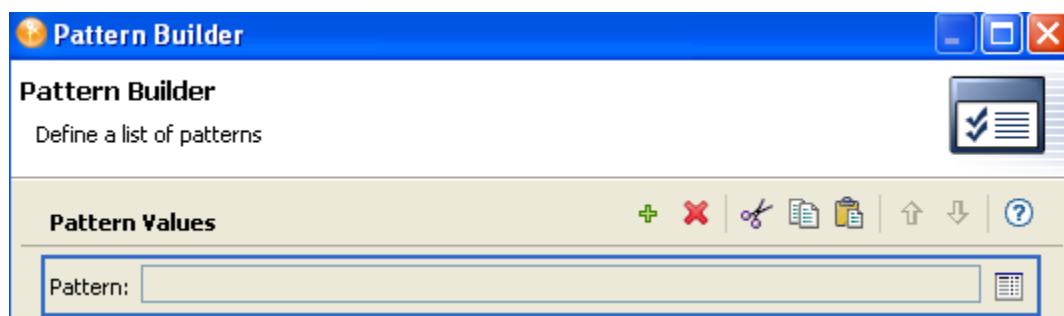
Figure 16-6 Unique Name Token in the Argument Builder

Create and edit arguments

Add or remove your components to the expression area to construct your argument. Enter component values under Editor.




- 1 Click the *Edit patterns* icon  to launch the Pattern Builder.
- 2 Specify the pattern or click the *Edit the arguments* icon  to use the Argument Builder to create the pattern.



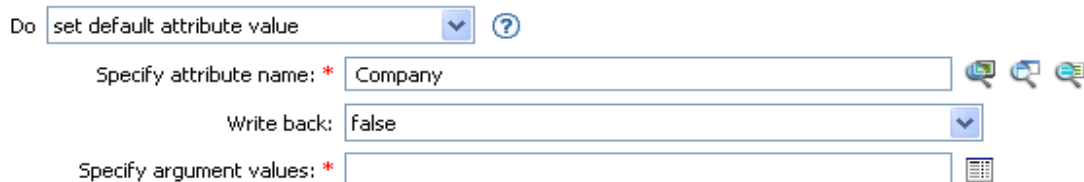
- 3 Click *Finish*.



16.10 Argument Value List Builder




To launch the Argument Value List Builder, select the following action, then click the *Edit the arguments* icon .


- ♦ [Set Default Attribute Value \(page 377\)](#)


Figure 16-7 *Set Default Attribute Value*




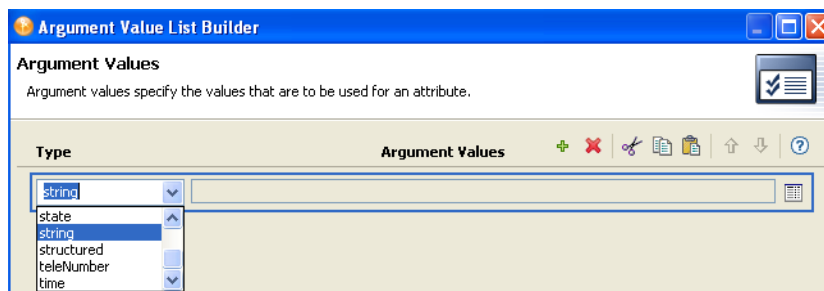
Do set default attribute value  



Specify attribute name: *   

Write back: false 

Specify argument values: * 

- 1 Select the type of the value: *counter*, *dn*, *int*, *interval*, *octet*, *state*, *string*, *structured*, *teleNumber*, *time*.
- 2 Click the *Edit the value lists* icon .



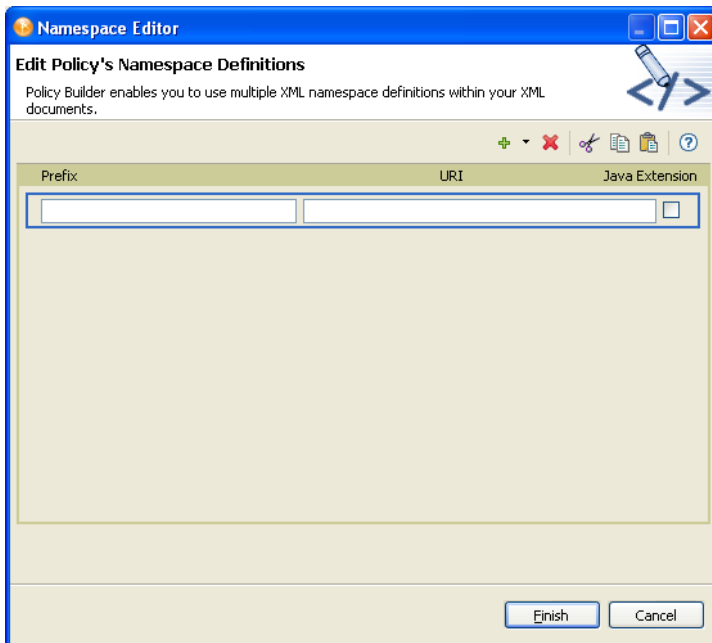
- 3 Click the *Edit the arguments* icon .
- 4 Create the value of the action component.
You can type the value, or click the *Edit the arguments*  icon to create the value in the Argument Builder.
- 5 Click *Finish*.

16.11 Namespace Editor

The Policy Builder enables you to use multiple XML namespaces within your XML documents. To define a namespace, specify the namespace prefix in the *Name* field, and the URI in the *URI* field. Leave the *Java Extension* check box deselected.

You can also access Java classes through XPath by using XML namespaces. To create a namespace for a Java class, specify the namespace prefix in the *Name* field, the class name in the *URI* field, and select the *Java Extension* check box.

Figure 16-8 Namespace Editor



16.11.1 Accessing Java Classes by Using Namespaces

Novell provides several Identity Manager Java classes that can be called by using XPath expressions from the Policy Builder. The following links open JavaDoc references for these Java classes:

- ♦ [com.novell.nds.dirxml.driver.XdsQueryProcessor](http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsQueryProcessor.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsQueryProcessor.html>)
- ♦ [com.novell.nds.dirxml.driver.XdsCommandProcessor](http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsCommandProcessor.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/XdsCommandProcessor.html>)
- ♦ [com.novell.nds.dirxml.driver.DNConverter](http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/DNConverter.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/api/com/novell/nds/dirxml/driver/DNConverter.html>)

The Java Developer Kit (JDK*) also provides several useful classes, such as `java.lang.String`, and `java.lang.System`. References for these classes are available with the JDK.

For additional information on using XPath and the Novell Java classes listed above, consult the [DirXML Driver Developer Kit](http://developer.novell.com/documentation/dirxml/dirxmlbk/ref/dirxmlfaq.html) (<http://developer.novell.com/documentation/dirxml/dirxmlbk/ref/dirxmlfaq.html>).

Pre-Identity Manager 3.5 Conditions

17

Conditions define when actions are performed. Conditions are always specified in either **Conjunctive Normal Form (CNF)** (<http://mathworld.wolfram.com/ConjunctiveNormalForm.html>) or **Disjunctive Normal Form (DNF)** (<http://mathworld.wolfram.com/DisjunctiveNormalForm.html>). These are logical expression forms. The actions of the enclosing rule are only performed when the logical expression represented in CNF or DNF evaluates to True or when no conditions are specified.

This section contains detailed information about all conditions that are available through the pre-Identity Manager 3.5 Policy Builder interface.

- ♦ “If Association” on page 341
- ♦ “If Attribute” on page 342
- ♦ “If Class Name” on page 343
- ♦ “If Destination Attribute” on page 345
- ♦ “If Destination DN” on page 346
- ♦ “If Entitlement” on page 347
- ♦ “If Global Configuration Value” on page 348
- ♦ “If Local Variable” on page 350
- ♦ “If Named Password” on page 351
- ♦ “If Operation Attribute” on page 351
- ♦ “If Operation Property” on page 353
- ♦ “If Operation” on page 355
- ♦ “If Password” on page 356
- ♦ “If Source Attribute” on page 357
- ♦ “If Source DN” on page 358
- ♦ “If XPath Expression” on page 359

If Association

Performs a test on the association value of the current operation or the current object. The type of test performed depends on the operator specified by the operation attribute.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
Associated	There is an established association for the current object.
Not Association	There is not an established association for the current object.
Available	There is a non-empty association value specified by the current operation.
Not available	The association is not available for the current object.
Equal	The association value specified by the current operation is exactly equal to the content of the if association.
Not Equal	The association value specified by the current operation is not equal to the content of the if association.

Value

Contains the value defined for the select operator. The value is used by the condition.

- ◆ Equal
- ◆ Not Equal

If Attribute

Performs a test on attribute values of the current object in either the current operation or the source data store. It can be logically thought of as If Operation Attribute or If Source Attribute, because the test is satisfied if the condition is met in the source data store or in the operation. The test performed depends on the specified operator.

Fields

Name

Specify the name of the attribute to test.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a value available in either the current operation or the source data store for the specified attribute.
Not Available	Available would return False.
Equal	There is a value available in either the current operation or the source data store for the specified attribute, which equals the specified value when compared by using the specified comparison mode.

Operator	Returns True when...
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Class Name

Performs a test on the object class name in the current operation.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is an object class name available in the current operation.
Not Available	Available would return False.
Equal	There is an object class name available in the current operation, and it equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Destination Attribute

Performs a test on attribute values of the current object in the destination data store. The test performed depends on the specified operator.

Fields

Name

Specify the name of the attribute to test.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a value available in the destination data store for the specified attribute.
Not Available	Available would return False.
Equal	There is a value available for the specified attribute in the destination data store that equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.

Mode	Description
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Destination DN

Performs a test on the destination DN in the current operation. The test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a destination DN available.
Not Available	Available would return False.
Equal	There is a destination DN available, and it equals the specified value when compared by using semantics appropriate to the DN format of the destination data store.
Not Equal	Equal would return False.
In Container	There is a destination DN available, and it represents an object in the container, specified by value, when compared by using semantics appropriate to the DN format of the destination data store.
Not in Container	In Container would return False.
In Subtree	There is a destination DN available, and it represents an object in the subtree, specified by value, when compared by using semantics appropriate to the DN format of the destination data store.
Not in Subtree	In Subtree would return False.

Value

Contains the value defined for the select operator. The value is used by the condition.

- ◆ Equal

- ◆ Not Equal
- ◆ In Container
- ◆ Not in Container
- ◆ In Subtree
- ◆ Not in Subtree

If Entitlement

Performs a test on entitlements of the current object, in either the current operation or the Identity Vault. The test performed depends on the specified operator.

Fields

Name

Specify the name of the entitlement to test for the selected condition.

Operator

Select the condition test type.

Operator	Returns True when...
Available	The named entitlement is available in either the current operation or the Identity Vault.
Not available	Available would return False.
Equal	There is a value available for the specified attribute in the destination data store that equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.
Changing	The current operation contains a change (modify attribute or add attribute) of the named entitlement.
Not Changing	Changing would return False.
Changing From	The current operation contains a change that removes a value (remove value) of the named entitlement, which has a value that equals the specified value, when compared by using the specified comparison mode.
Not Changing From	Changing From would return False.
Changing To	The current operation contains a change that adds a value (add value or add attribute) to the named entitlement. It has a value that equals the specified value, when compared by using the specified comparison mode.
Not Changing To	Changing To would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal

- ◆ Not Equal
- ◆ Changing To
- ◆ Changing From
- ◆ Not Changing To
- ◆ Not Changing From

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal
- ◆ Changing To
- ◆ Changing From
- ◆ Not Changing To
- ◆ Not Changing From

If Global Configuration Value

Performs a test on a global configuration value. The test performed depends on the specified operator.

Remark

For more information on using variables with policies, see “[Downloading Identity Manager Policies](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Fields

Name

Specify the name of the global value to test for the selected condition.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a global configuration value with the specified name.
Not Available	Available would return False.
Equal	There is a global configuration value with the specified name, and its value equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Local Variable

Performs a test on a local variable. The test performed depends on the specified operator.

Remark

For more information on using variables with policies, see “[Variables](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Fields

Name

Specify the name of the local variable to test for the selected condition.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a local variable with the specified name that has been defined by an action of a earlier rule within the policy.
Not Available	Available would return False.
Equal	There is a local variable with the specified name, and its value equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.

Mode	Description
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Named Password

Performs a test on a named password from the driver in the current operation with the specified name. The test performed depends on the selected operator.

Fields

Name

Specify the name of the named password to test for the selected condition.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a password with the specified name available.
Not Available	Available would return False.

If Operation Attribute

Performs a test on attribute values in the current operation. The test performed depends on the specified operator.

Fields

Name

Specify the name of the attribute to test.

Operator

Select the condition test type.

Operator Returns True when...

Operator	Returns True when...
Available	There is a value available in the current operation other than a remove value for the specified attribute.
Not Available	Available would return False.
Equal	There is a value available in the current operation other than a remove value for the specified attribute. It equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.
Changing	The current operation contains a change other than a remove value for the specified attribute.
Not Changing	Changing would return False.
Changing From	The current operation contains a change that removes a value other than a remove value of the specified attribute. It equals the specified value when compared by using the specified comparison mode.
Not Changing From	Changing From would return False.
Changing To	The current operation contains a change that adds a value other than a remove value to the specified attribute. It equals the specified value when compared by using the specified comparison mode.
Not Changing To	Changing To would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal
- ◆ Changing To
- ◆ Changing From
- ◆ Not Changing To
- ◆ Not Changing From

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal
- ◆ Changing To
- ◆ Changing From
- ◆ Not Changing To
- ◆ Not Changing From

If Operation Property

Performs a test on an operation property on the current operation. An operation property is a named value that is stored as an attribute on an <operation-data> element within an operation. It is typically used to supply additional context that might be needed by the policy that handles the results of an operation. The test performed depends on the selected operator.

Fields

Name

Specify the name of the operation property to test for the selected condition.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is an operation property with the specified name on the current operation.
Not Available	Available would return False.
Equal	There is a an operation property with the specified name on the current operation, and its value equals the provided content when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Operation

Performs a test on the name of the current operation. The type of test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
Equal	The name of the current operation is equal to the content of the condition when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

The values are the operations that the Metadirectory engine looks for:

- ◆ add
- ◆ add-association
- ◆ check-object-password
- ◆ check-password
- ◆ delete
- ◆ get-named-password
- ◆ init-params
- ◆ instance
- ◆ modify
- ◆ modify-association
- ◆ modify-password
- ◆ move
- ◆ password
- ◆ query
- ◆ query-schema
- ◆ remove-association
- ◆ rename
- ◆ schema-def

- ♦ status
- ♦ sync

This list is not exclusive. Custom operations can be implemented by drivers and administrators.

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.

The operators that contain the comparison mode parameter are:

- ♦ Equal
- ♦ Not Equal

If Password

Performs a test on a password in the current operation. The test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a password available in the current operation.
Not Available	Available would return False.

If Source Attribute

Performs a test on attribute values of the current object in the source data store. The test performed depends on the specified operator.

Fields

Name

Specify the name of the source attribute to test for the selected condition.

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a value available in the source data store for the specified attribute.
Not Available	Available would return False.
Equal	There is a value available in the source data store for the specified attribute. It equals the specified value when compared by using the specified comparison mode.
Not Equal	Equal would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

Comparison Mode

The condition has a comparison mode parameter that indicates how a comparison is done.

Mode	Description
Case Sensitive	Character-by-character case sensitive comparison.
Case Insensitive	Character-by-character case insensitive comparison.
Regular Expression	The regular expression matches the entire string. It defaults to case insensitive, but can be changed by an escape in the expression. See Sun's Web site (http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html) . The pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed by using the appropriate embedded escapes.
Source DN	Compares by using semantics appropriate to the DN format for the source data store.

Mode	Description
Destination DN	Compares by using semantics appropriate to the DN format for the destination data store.
Numeric	Compares numerically.
Binary	Compares the binary information.
Structured	Compares the structured attribute according to the comparison rules for the structured syntax of the attribute.

The operators that contain the comparison mode parameter are:

- ◆ Equal
- ◆ Not Equal

If Source DN

Performs a test on the source DN in the current operation. The test performed depends on the specified operator.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
Available	There is a source DN available.
Not Available	Available would return False.
Equal	There is a source DN available, and it equals the content of the specified value in-container.
Not Equal	Equal would return False.
In Container	There is a source DN available, and it represents an object in the container specified by the content of If Source DN, when compared by using semantics appropriate to the DN format of the source data store.
Not In Container	In Container would return False.
In Subtree	There is a source DN available, and it represents an object in the subtree identified by the specified value.
Not In subtree	In Subtree would return False.

Value

Contains the value defined for the select operator. The value is used by the condition. The operators that contain the value field are:

- ◆ Equal
- ◆ Not Equal

- ◆ In Container
- ◆ Not in Container
- ◆ In Subtree
- ◆ Not in Subtree

If XPath Expression

Performs a test on the results of evaluating an XPath 1.0 expression.

Fields

Operator

Select the condition test type.

Operator	Returns True when...
True	The XPath expression evaluates to True.
Not True	True would return False.

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions”](#) in *Understanding Policies for Identity Manager 4.0.1*.

Actions are performed when conditions of the enclosing rule are met. Some actions have a *Mode* field. The mode is not honored at run time if the context in which the policy is running is incompatible with the selected mode.

This section contains detailed information about all actions that are available through using the pre-Identity Manager Policy Builder interface.

- ♦ [“Add Association” on page 362](#)
- ♦ [“Add Destination Attribute Value” on page 363](#)
- ♦ [“Add Destination Object” on page 363](#)
- ♦ [“Add Source Attribute Value” on page 364](#)
- ♦ [“Add Source Object” on page 364](#)
- ♦ [“Append XML Element” on page 365](#)
- ♦ [“Append XML Text” on page 365](#)
- ♦ [“Break” on page 365](#)
- ♦ [“Clear Destination Attribute Value” on page 366](#)
- ♦ [“Clear Operation Property” on page 366](#)
- ♦ [“Clear Source Attribute Value” on page 366](#)
- ♦ [“Clear SSO Credential” on page 367](#)
- ♦ [“Clone By XPath Expression” on page 367](#)
- ♦ [“Clone Operation Attribute” on page 368](#)
- ♦ [“Delete Destination Object” on page 368](#)
- ♦ [“Delete Source Object” on page 368](#)
- ♦ [“Find Matching Object” on page 369](#)
- ♦ [“For Each” on page 369](#)
- ♦ [“Generate Event” on page 370](#)
- ♦ [“Implement Entitlement” on page 371](#)
- ♦ [“Move Destination Object” on page 371](#)
- ♦ [“Move Source Object” on page 372](#)
- ♦ [“Reformat Operation Attribute Value” on page 372](#)
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Add Association

Sends an `add association` command with the specified association to the Identity Vault.

Fields

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

DN

Specify the DN of the target object or leave the field blank to use the current object.

Association

Specify the value of the association to be added.

Add Destination Attribute Value

Adds a value to an attribute on an object in the destination data store.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Specify the DN, association, or current object as the target object.

Value Type

Select the syntax of the attribute value to be added. The options are string, counter, dn, int, interval, octet, state, structured, teleNumber, or time.

Value

Specify the attribute value to be added.

Add Destination Object

Creates an object of the specified type in the destination data store, with the name and location specified in the *Enter DN* field. Any attribute values to be added as part of the object creation must be done in subsequent Add Destination Attribute Value actions, using the same DN.

Fields

Class Name

Specify the class name of the object to be created.

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

DN

Specify the DN of the object to be created.

Remarks

Any attribute values to be added as part of the object creation must be done in subsequent [Add Destination Attribute Value](#) actions, using the same DN.

Add Source Attribute Value

Adds the specified attribute on an object in the source data store.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Specify the DN, association, or the current object as the target object.

Value Type

Select the syntax of the attribute value to be added. The options are string, counter, dn, int, interval, octet, state, structured, teleNumber, or time.

Value

Specify the attribute value to be added.

Add Source Object

Creates an object of the specified type in the source data store, with the name and location provided in the DN field. Any attribute values to be added as part of the object creation must be done in subsequent [Add Source Attribute Value](#) actions, using the same DN.

Fields

Class Name

Specify the class name of the object to be added.

DN

Specify the DN of the object to be added.

Append XML Element

Appends a custom element, with the name specified in the *Name* field, to the set of elements selected by the XPath expression.

Fields

Name

Specify the tag name of the XML element. This name can contain a namespace prefix if the prefix has been previously defined in this policy.

XPath Expression

Specify an XPath 1.0 expression that returns a node set containing the elements to which the new elements should be appended.

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions”](#) in *Understanding Policies for Identity Manager 4.0.1*.

Append XML Text

Appends the specified text to the set of elements selected by the XPath expression.

Fields

XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the elements to which the new elements should be appended.

String

Specify the text to be appended.

Remarks

For more information on using XPath expressions with policies, see [“XPath 1.0 Expressions”](#) in *Understanding Policies for Identity Manager 4.0.1*.

Break

Ends processing of the current operation by the current policy.

Fields

There are no fields for the Break action.

Clear Destination Attribute Value

Removes all values for the named attribute from an object in the destination data store.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Select the DN, association, or the current object as the target object.

Clear Operation Property

Clears any operation property with the provided name from the current operation. The operation property is the XML attribute attached to an `<operation-data>` element by a policy. An XML attribute is a name/value pair associated with an element in the XDS document.

Fields

Property Name

Specify the name of the operation property to clear.

Clear Source Attribute Value

Removes all values of an attribute from an object in the source data store.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object. This value might be required for schema map purposes if the object is other than current object.

Object

Select the target object type. This object can be the current object, or can be specified by a DN or an association.

DN

Select the DN, association, or current object as the target object.

Clear SSO Credential

Clears the Single Sign On credential so objects can be deprovisioned. Additional information about the credential to be cleared can be provided in the *Enter login parameter strings* field. The number of the strings and the names used are dependent on the credential repository and application for which the credential is targeted. For more information, see [Novell Credential Provisioning for Identity Manager 4.0.1](#).

Fields

Credential Repository Object DN

Specify the DN of the repository object.

Target User DN

Specify the DN of the target users.

Application Credential ID

Specify the application credential that is stored in the application object.

Login Parameter Strings

Specify each login parameter for the application. The login parameters are the authentication keys stored in the application object.

Clone By XPath Expression

Appends deep copies of the nodes specified by the source field to the set of elements specified by the destination field.

Fields

Source XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the nodes to be copied.

Destination XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the elements to which the copied nodes are to be appended.

Remarks

For more information on using XPath expressions with policies, see “[XPath 1.0 Expressions](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Clone Operation Attribute

Copies all occurrences of an attribute within the current operation to a different attribute within the current operation.

Fields

Source Name

Specify the name of the attribute to be copied from.

Destination Name

Specify the name of the attribute to be copied to.

Delete Destination Object

Deletes an object in the destination data store.

Fields

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object type to delete in the destination data store. This object can be the current object, or can be specified by a DN or an association.

DN

Select the DN, association, or current object as the target object.

Delete Source Object

Deletes an object in the source data store.

Fields

Object

Select the target object type to delete in the source data store. This object can be the current object, or can be specified by a DN or an association.

DN

Select the DN, association, or current object as the target object.

Find Matching Object

Finds a match for the current object in the destination data store.

Fields

Scope

Select the scope of the search. The scope might be an entry, a subordinate, or a subtree.

DN

Specify the DN that is the base of the search.

Match Attributes

Specify the attribute values to search for.

Remarks

Find Matching Object is only valid when the current operation is an add.

The DN argument is required when the scope is “entry,” and is optional otherwise. At least one match attribute is required when the scope is “subtree” or “subordinates.”

The results are undefined if the scope is “entry” and there are match attributes specified. If the destination data store is the connected application, then an association is added to the current operation for each successful match that is returned. No query is performed if the current operation already has a non-empty association, thus allowing multiple find matching object actions to be strung together in the same rule.

If the destination data store is the Identity Vault, then the destination DN attribute for the current operation is set. No query is performed if the current operation already has a non-empty destination DN attribute, thus allowing multiple find matching object actions to be strung together in the same rule. If only a single result is returned and it is not already associated, then the destination DN of the current operation is set to the source DN of the matching object. If only a single result is returned and it is already associated, then the destination DN of the current operation is set to the single character ￼. If multiple results are returned, then the destination DN of the current operation is set to the single character �.

For Each

Repeats a set of actions for each node in a node set.

Fields

Node Set

Specify the node set.

Action

Specify the actions to perform on each node in the node set.

Remarks

The current node is a different value for each iteration of the actions, if a local variable is used.

If the current node in the node set is an entitlement element, then the actions are marked as if they are also enclosed in an [Implement Entitlement](#) action. If the current node is a query element returned by a query, then that token is used to automatically retrieve and process the next batch of query results.

Generate Event

Sends a user-defined event to Novell Audit or Sentinel.

Fields

ID

ID of the event. The provided value must result in an integer in the range of 1000-1999 when parsed by using the `parseInt` method of `java.lang.Integer`.

Level

Level of the event.

Level	Description
log-emergency	Events that cause the Metadirectory engine or driver to shut down.
log-alert	Events that require immediate attention.
log-critical	Events that can cause parts of the Metadirectory engine or driver to malfunction.
log-error	Events describing errors that can be handled by the Metadirectory engine or driver.
log-warning	Negative events not representing a problem.
log-notice	Events (positive or negative) that an administrator can use to understand or improve use and operation.
log-info	Positive events of any importance.
log-debug	Events of relevance for support or engineers to debug the operation of the Metadirectory engine or driver.

Strings

Specify user-defined string, integer, and binary values to include with the event. These values are provided by using the Named String Builder.

Tag	Description
target	The object being acted upon.

Tag	Description
target-type	Integer specifying a predefined format for the target. Predefined values for target-type are currently: <ul style="list-style-type: none"> ◆ 0 = None ◆ 1 = Slash Notation ◆ 2 = Dot Notation ◆ 3 = LDAP Notation
subTarget	The subcomponent of the target being acted upon.
text1	Text entered here is stored in the text1 event field.
text2	Text entered here is stored in the text2 event field.
text3	Text entered here is stored in the text3 event field.
value	Any number entered here is stored in the value event field.
value3	Any number entered here is stored in the value3 event field.
data	Data entered here is stored in the blob event field.

Remarks

The Novell Audit or Sentinel event structure contains a target, a subTarget, three strings (text1, text2, text3), two integers (value, value3), and a generic field (data). The text fields are limited to 256 bytes, and the data field can contain up to 3 KB of information, unless a larger data field is enabled in your environment.

Implement Entitlement

Designates actions that implement an entitlement so that the status of those entitlements can be reported to the agent that granted or revoked the entitlement.

Fields

Node Set

Node set containing the entitlement being implemented by the specified actions.

Action

Actions that implement the specified entitlements.

Move Destination Object

Moves an object into the destination data store.

Fields

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object to Move

Select the object to be moved. This object can be the current object, or can be specified by a DN or an association.

Container to Move to

Select the container to receive the object. This container is specified by a DN or an association.

DN or Association

Specify whether the DN or association of the container is used.

Move Source Object

Moves an object in the source data store.

Fields

Object to Move

Select the object to be moved. This object can be the current object, or it can be specified by a DN or an association.

Select Container

Select the container to receive the object. This container is specified by a DN or an association.

Reformat Operation Attribute Value

Reformats all values of an attribute within the current operation by using a pattern.

Fields

Name

Specify the name of the attribute.

Value Type

Specify the syntax of the new attribute value.

Value

Specify a value to use as a pattern for the new format of the attribute values. If the original value is needed to construct the new value, it must be obtained by referencing the local variable `current-value`.

Remove Association

Sends a remove association command to the Identity Vault.

Fields

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Association

Specify the value of the association to be removed.

Remove Destination Attribute Value

Removes an attribute value from an object in the destination data store.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Select Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

Value Type

Specify the syntax of the new attribute value.

String

Specify the value of the new attribute.

Remove Source Attribute Value

Removes the specified value from the named attribute on an object in the source data store.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

Value Type

Specify the syntax of the attribute value to be removed.

String

Specify the attribute value to be removed.

Rename Destination Object

Renames an object in the destination data store.

Fields

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

String

Specify the new name of the object.

Rename Operation Attribute

Renames all occurrences of an attribute within the current operation.

Fields

Source Name

Specify the original attribute name.

Destination Name

Specify the new attribute name.

Rename Source Object

Renames an object in the source data store.

Fields

Select Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

String

Specify the new name of the object.

Send Email

Sends an e-mail notification.

Fields

ID

(Optional) Specify the User ID in the SMTP system sending the message.

Server

Specify the SMTP server name.

Password

(Optional) Specify the SMTP server account password.

IMPORTANT: You can store the SMTP server account password as a Named Password on the driver object. This allows the password to be encrypted; otherwise, you enter the password and it is stored in clear text. For more information on Named Passwords, see Using Named Password in the [Novell Identity Manager Administration Guide \(http://www.novell.com/documentation/idm35/index.html\)](http://www.novell.com/documentation/idm35/index.html).

Message Type

Select the e-mail message type.

Strings

Specify the values containing the various e-mail addresses, subject, and message. The following table lists valid named string arguments:

String Name	Description
to	Adds the address to the list of e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
cc	Adds the address to the list of CC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.

String Name	Description
bcc	Adds the address to the list of BCC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
from	Specifies the address to be used as the originating e-mail address.
reply-to	Specifies the address to be used as the e-mail message reply address.
subject	Specifies the e-mail subject.
message	Specifies the content of the e-mail message.
encoding	Specifies the character encoding to use for the e-mail message.

Send Email from Template

Generates an e-mail notification by using a template.

Fields

Notification DN

Specify the slash form DN of the SMTP notification configuration object.

Template DN

Specify the slash form DN of the e-mail template object.

Password

(Optional) Specify the SMTP server account password.

IMPORTANT: You can store the SMTP server account password as a Named Password on the driver object. This allows the password to be encrypted; otherwise, you enter the password and it is stored in clear text. For more information on Named Passwords, see Using Named Passwords in the [Novell Identity Manager Administration Guide \(http://www.novell.com/documentation/idm35/index.html\)](http://www.novell.com/documentation/idm35/index.html).

Strings

Specify additional fields for the e-mail message. The following table contains reserved field names, which specify the various e-mail addresses:

String Name	Description
to	Adds the address to the list of e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
cc	Adds the address to the list of CC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
bcc	Adds the address to the list of BCC e-mail recipients; multiple instances are allowed. Can contain a comma-separated list of recipients.
reply-to	Specifies the address to be used as the e-mail message reply address.
encoding	Specifies the character encoding to use for the e-mail message.

Each template can also define fields that can be replaced in the subject and body of the e-mail message.

Set Default Attribute Value

Adds default values to the current operation (and optionally to the current object in the source data store) if no values for that attribute already exist. It is only valid when the current operation is Add.

Fields

Attribute Name

Specify the name of the default attribute.

Write Back

Select whether or not to also write back the default values to the source data store.

Values

Specify the default values of the attribute.

Set Destination Attribute Value

Adds a value to an attribute on an object in the destination data store, and removes all other values for that attribute.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object in the destination data store. Leave the field blank to use the class name from the current object.

Mode

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

Value Type

Select the syntax of the attribute value to set.

String

Specify the attribute values to set.

Set Destination Password

Sets the password for an object in the destination data store.

Fields**Mode**

Select whether this action should be added to, before, or after the current operation, or written directly to the destination data store.

String

Specify the password to be set.

Set Local Variable

Sets a local variable with the given name to the string value specified, the XPath 1.0 Node Set specified, or the Java* Object specified.

Fields**Variable Name**

Specify the name of the new local variable.

Variable Type

Select the type of local variable. This can be a string, an XPath 1.0 node set, or a Java object.

String

Specify the value of the variable, in the format required by the *Variable Type* field.

Set Operation Association

Sets the association value for the current operation.

Fields

Association

Specify the new association value.

Set Operation Class Name

Sets the object class name for the current operation.

Fields

String

Specify the new class name.

Set Operation Destination DN

Sets the destination DN for the current operation.

Fields

DN

Specify the new destination DN.

Set Operation Property

Sets an operation property. An operation property is a named value that is stored within an operation. It is typically used to supply additional context that might be needed by the policy that handles the results of an operation.

Fields

Property Name

Specify the name of the operation property.

String

Specify the name of the string.

Set Operation Source DN

Sets the source DN for the current operation.

Fields

DN

Specify the new source DN.

Set Operation Template DN

Sets the template DN for the current operation to the specified value. This action is only valid when the current operation is Add.

Fields

DN

Specify the template DN.

Set Source Attribute Value

Adds a value to an attribute on an object in the source data store, and removes all other values for that attribute.

Fields

Attribute Name

Specify the name of the attribute.

Class Name

(Optional) Specify the class name of the target object in the source data store. Leave the field blank to use the class name from the current object.

Object

Select the target object. This object can be the current object, or can be specified by a DN or an association.

Value Type

Select the syntax of the attribute value.

Value

Specify the attribute value to be set.

Set Source Password

Sets the password for an object in the source data store.

Fields

String

Specify the password to be set.

Set SSO Credential

Sets the SSO credential when a user object is created or when a password is modified. This action is part of the Credential Provisioning policies. For more information, see [Novell Credential Provisioning for Identity Manager 4.0.1](#).

Fields

Credential Repository Object DN

Specify the DN of the repository object.

Target User DN

Specify the DN of the target users.

Application Credential ID

Specify the application credential that is stored in the application object.

Login Parameter Strings

Specify each login parameter for the application. The login parameters are the authentication keys stored in the application object.

Set SSO Passphrase

Sets the Novell SecureLogin passphrase and answer when a User object is provisioned. This action is part of the Credential Provisioning policies. For more information, see [Novell Credential Provisioning for Identity Manager 4.0.1](#).

Fields

Credential Repository Object DN

Specify the DN of the repository object.

Target User DN

Specify the DN of the target users.

Question Strings

Specify the SecureLogin passphrase question.

Answer String

Specify the SecureLogin passphrase answer.

Set XML Attribute

Sets an XML attribute on a set of elements selected by an XPath expression.

Fields

Name

Specify the name of the XML attribute. This name can contain a namespace prefix if the prefix has been previously defined in this policy.

XPath Expression

XPath 1.0 expression that returns a node set containing the elements on which the XML attribute should be set.

String

Specify the value of the XML attribute.

Remarks

For more information on using XPath expressions with policies, see “[XPath 1.0 Expressions](#)” in *Understanding Policies for Identity Manager 4.0.1*.

Status

Generates a status notification.

Fields

Level

Specify the status level of the notification. The levels are error, fatal, retry, success, and warning.

Message

Provide the status message by using the Argument Builder.

Remarks

If level is retry, then the policy immediately stops processing the input document and schedules a retry of the event currently being processed.

If the level is fatal, the policy immediately stops processing the input document and initiates a shutdown of the driver.

If a the current operation has an event-id, that event-id is used for the status notification; otherwise, there is no event-id reported.

Strip Operation Attribute

Strips all occurrences of an attribute from the current operation.

Fields

Name

Specify the name of the attribute to be stripped.

Strip XPath

Strips nodes selected by an XPath 1.0 expression.

Fields

XPath Expression

Specify the XPath 1.0 expression that returns a node set containing the nodes to be stripped.

Remarks

For more information on by using XPath expressions with policies, see [“XPath 1.0 Expressions”](#) in *Understanding Policies for Identity Manager 4.0.1*.

Trace Message

Sends a message to DSTRACE.

Fields

Level

Specify the trace level of the message. The default level is 0. The message only appears if the specified trace level is less than or equal to the trace level configured in the driver.

For information on how to set the trace level on the driver, see [“Viewing Identity Manager Processes”](#) in the *Identity Manager 4.0.1 Common Driver Administration Guide*.

Color

Select the color of the trace message.

String

Specify the value of the trace message.

Veto

Vetoes the current operation.

Fields

There are no fields.

Veto If Operation Attribute Not Available

Conditionally cancels the current operation and ends processing of the current policy, based on the availability of an attribute in the current operation.

Fields

Name

Specify the name of the attribute.

Pre-Identity Manager 3.5 Noun Tokens

19

Noun tokens expand to values that are derived from the current operation, the source or destination data stores, or some external source.

This section contains detailed information about all noun tokens that are available through using the pre-Identity Manager Policy Builder interface.

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- ♦ [“Association” on page 386](#)
- ♦ [“Attribute” on page 386](#)
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Added Entitlement

Expands to the values of an entitlement granted in the current operation.

Fields

Name

Name of the entitlement.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that entitlement. If it is used in a context where a string is expected, the token expands to the string value found.

Association

Expands to the association value from the current operation.

Fields

There are no fields.

Attribute

Expands to the value of an attribute from the current object in the current operation and in the source data store. It can be logically thought of as the union of the operation attribute token and the source attribute token. It does not include the removed values from a Modify operation.

Fields

Name

Specify the name of the attribute.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Class Name

Expands to the object class name from the current operation.

Fields

There are no fields.

Destination Attribute

Expands to the specified attribute value an object.

Fields

Name

Name of the attribute.

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Select Object

Select Current Object, DN, or Association.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Destination DN

Expands to the destination DN specified in the current operation.

Fields

Convert

Select whether or not to convert the DN to the format used by the source data store.

Start

Specify the RDN index to start with:

- ♦ Index 0 is the root-most RDN
- ♦ Positive indexes are an offset from the root-most RDN
- ♦ Index -1 is the leaf-most segment
- ♦ Negative indexes are an offset from the leaf-most RDN towards the root-most RDN

Length

Specify the number of RDN segments to include. Negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc.

Remarks

If start and length are set to the default values {0,-1}, the entire DN is used; otherwise only the portion of the DN specified by start and length is used.

Destination Name

Expands to the unqualified Relative Distinguished Name (RDN) of the destination DN specified in the current operation.

Fields

There are no fields.

Entitlement

Expands to the values of a granted entitlement from the current object.

Fields

Name

Name of the entitlement.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that entitlement. If it is used in a context where a string is expected, the token expands to the string value found.

Global Configuration Value

Expands to the value of a global configuration variable.

Fields

Name

Name of the global configuration value.

Local Variable

Expands to the value of a local variable.

Fields

Name

Specify the name of the local variable.

Named Password

Expands to the Named Password from the driver.

Fields

Name

Specify the Named Password.

Operation

Expands to the name of the current operation.

Fields

There are no fields.

Operation Attribute

Expands to the value of an attribute from the current operation. It does not include the removed values from a modify operation.

Fields

Name

Specify the name of the attribute.

Operation Property

Expands to the value of the specified operation property on the current operation.

Fields

Name

Specify the name of the operation property.

Password

Expands to the password specified in the current operation.

Fields

There are no fields.

Removed Attribute

Expands to the specified attribute value being removed in the current operation. It applies only to a Modify operation.

Fields

Name

Specify the name of the attribute to remove.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Removed Entitlements

Expands to the values of the an entitlement revoked in the current operation.

Fields

Name

Specify the name of the entitlement.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that entitlement. If it is used in a context where a string is expected, the token expands to the string value found.

Source Attribute

Expands to the values of an attribute from an object in the source data store.

Fields

Class Name

(Optional) Specify the class name of the target object. Leave the field blank to use the class name from the current object.

Name

Name of the attribute.

Object

Select the source object. This object can be the current object, or can be specified by a DN or an association.

Remarks

If the token is used in a context where a node set is expected, the token expands to a node set containing all of the values for that attribute. If it is used in a context where a string is expected, the token expands to the string value found.

Source DN

Expands to the source DN from the current operation.

Fields

Convert

Select whether or not to convert the DN to the format used by the destination data store.

Start

Specify the RDN index to start with:

- ♦ Index 0 is the root-most RDN
- ♦ Positive indexes are an offset from the root-most RDN
- ♦ Index -1 is the leaf-most segment
- ♦ Negative indexes are an offset from the leaf-most RDN towards the root-most RDN

Length

Number of RDN segments to include. Negative numbers are interpreted as $(\text{total \# of segments} + \text{length}) + 1$. For example, for a DN with 5 segments a length of $-1 = (5 + (-1)) + 1 = 5$, $-2 = (5 + (-2)) + 1 = 4$, etc.

Remarks

If start and length are set to the default values $\{0, -1\}$, the entire DN is used; otherwise, only the portion of the DN specified by start and length is used.

Source Name

Expands to the unqualified relative distinguished name (RDN) of the source DN specified in the current operation.

Fields

There are no fields.

Text

Expands to the text.

Fields

Text

Specify the text.

Unique Name

Expands to a pattern-based name that is unique in the destination data store according to the criteria specified.

Fields

Attribute Name

Specify the name of attribute to check for uniqueness.

Scope

Specify the scope in which to check uniqueness. The options are subtree or subordinates.

Start Search

Select a starting point for the search. The starting point can be the root of the data store, or be specified by a DN or association.

Pattern

Specify patterns to use to generate unique values by using the Argument Builder.

Counter Start

The starting value of the counter.

Digits

Specify the width in digits of counter; the default is 1. The *Pad counter with leading 0's* option prepends 0 to match the digit length. For example, with a digit width of 3, the initial unique value would be appended with 001, then 002, and so on.

Remarks

Each `<arg-string>` element provides a pattern to be used to create a proposed name.

A proposed name is tested by performing a query for that value in the name attribute against the destination data store, using the `<arg-dn>` element or the `<arg-association>` element as the base of the query and scope as the scope of the query. If the destination data store is the Identity Vault and name is omitted, then a search is performed against the pseudo-attribute “[Entry].rdn”, which represents the RDN of an object without respect to what the naming attribute might be. If the destination data store is the application, then name is required.

A pattern can be tested with or without a counter as indicated by `counter-use` and `counter-pattern`. When a pattern is tested with a counter, the pattern is tested repeatedly with an appended counter until a name is found that does not return any instances or the counter is exhausted. The counter starting value is specified by `counter-start` and the counter maximum value is specified in terms of the maximum number of digits as specified by `counter-digits`. If the number of digits is less than

those specified, then the counter is right-padded with zeros unless the counter-pad attribute is set to False. The counter is considered exhausted when the counter can no longer be represented by the specified number of digits.

As soon as a proposed name is determined to be unique, the testing of names is stopped and the unique name is returned.

The order of proposed names is tested as follows:

- ♦ Each pattern is tested in the order specified. If counter-use="always" and the pattern is one of the patterns indicated by the counter-pattern, then the pattern is tested with a counter; otherwise, it is tested without a counter.
- ♦ If no unique name has been found after the patterns have been exhausted and counter-use="fallback", then the patterns indicated by the counter-pattern are retried with a counter.

If all specified combinations of patterns and counters are exhausted, then the action specified by the on-unavailable is taken.

Unmatched Source DN

Expands to the part of the source DN in the current operation that corresponds to the part of the DN that was not matched by the most recent match of an If Source DN condition.

Fields

Convert

Select whether or not to convert the DN format used by the destination data store.

Remarks

If there are no matches, the entire DN is used.

XPath

Expands to the results of evaluating an XPath 1.0 expression.

Fields

Expression

XPath 1.0 expression to evaluate.

Remarks

For more information on using XPath expressions with policies, see "[XPath 1.0 Expressions](#)" in *Understanding Policies for Identity Manager 4.0.1*.

Pre-Identity Manager 3.5 Verb Tokens

20

Verb tokens modify the concatenated results of other tokens that are subordinate to them.

This section contains detailed information about all verbs that are available through the pre-Identity Manager Policy Builder interface.

- ♦ [“Escape Destination DN” on page 395](#)
- ♦ [“Escape Source DN” on page 395](#)
- ♦ [“Lowercase” on page 395](#)
- ♦ [“Parse DN” on page 396](#)
- ♦ [“Replace All” on page 397](#)
- ♦ [“Replace First” on page 397](#)
- ♦ [“Substring” on page 398](#)
- ♦ [“Uppercase” on page 398](#)

Escape Destination DN

Escapes the enclosed tokens according to the rules of the DN format of the destination data store.

Fields

There are no fields.

Escape Source DN

Escapes the enclosed tokens according to the rules of the DN format of the source data store.

Fields

There are no fields.

Lowercase

Converts the characters in the enclosed tokens to lowercase.

Fields

There are no fields.

Parse DN

Converts the enclosed token's DN to an alternate format.

Fields

Start

Specify the RDN index to start with:

- ♦ Index 0 is the root-most RDN
- ♦ Positive indexes are an offset from the root-most RDN
- ♦ Index -1 is the leaf-most segment
- ♦ Negative indexes are an offset from the leaf-most RDN towards the root-most RDN

Length

Number of RDN segments to include. Negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc.

Source DN Format

Specifies the format used to parse the source DN.

Destination DN Format

Specify the format used to output the parsed DN.

Source DN Delimiter

Specify the custom source DN delimiter set if Source DN Format is set to custom.

Destination DN Delimiter

Specify the custom destination DN delimiter set if Destination DN Format is set to custom.

Remarks

If start and length are set to the default values {0,-1}, then the entire DN is used; otherwise, only the portion of the DN specified by start and length is used.

When specifying custom DN formats, the eight characters that make up the delimiter set are defined as follows:

- ♦ Typed Name Boolean Flag: 0 means names are not typed, and 1 means names are typed
- ♦ Unicode No-Map Character Boolean Flag: 0 means don't output or interpret unmappable Unicode characters as escaped hex digit strings, such as \FEFF. The following Unicode characters are not accepted by eDirectory: 0xfeff, 0xfffe, 0xfffd, and 0xffff.
- ♦ Relative RDN Delimiter
- ♦ RDN Delimiter
- ♦ Name Divider
- ♦ Name Value Delimiter

- ♦ Wildcard Character
- ♦ Escape Character

If RDN Delimiter and Relative RDN Delimiter are the same character, the orientation of the name is root right, otherwise the orientation is root left.

If there are more than eight characters in the delimiter set, the extra characters are considered as characters that need to be escaped, but they have no other special meaning.

Replace All

Replaces all occurrences of a regular expression in the enclosed tokens.

Fields

Regular Expression

Specify the regular expression that matches the substring to be replaced.

Replace With

Specify the replacement string.

Remarks

For details on creating regular expressions, see:

- ♦ [Sun's Java Web site \(http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html)
- ♦ [Sun's Java Web site \(http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll\(java.lang.String\)\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll(java.lang.String))

The pattern options `CASE_INSENSITIVE`, `DOTALL`, and `UNICODE_CASE` are used but can be reversed by using the appropriate embedded escapes.

Replace First

Replaces the first occurrence of a regular expression in the enclosed tokens.

Fields

Regular Expression

Specify the regular expression that matches the substring to replace.

Replace With

Specify the replacement string.

Remarks

The matching instance is replaced by the string specified in the *Replace with field*.

For details on creating regular expressions, see:

- ♦ Sun's Java Web site (<http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html>)
- ♦ Sun's Java Web site ([java.lang.String](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll)) (<http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll>) (`java.lang.String`)

The pattern option `CASE_INSENSITIVE`, `DOTALL`, and `UNICODE_CASE` are used but can be reversed by using the appropriate embedded escapes.

Substring

Extracts a portion of the enclosed tokens.

Fields

Start

Specify the starting character index:

- ♦ Index 0 is the first character.
- ♦ Positive indexes are an offset from the start of the string.
- ♦ Index -1 is the last character.
- ♦ Negative indexes are an offset from the last character toward the start of the string.

For example, if the start is specified as -2, then it starts reading at the first character from the end. If -3 is specified, then it starts 2 characters from the end.

Length

Number of characters from the start to include in the substring. Negative numbers are interpreted as $(\text{total \# of characters} + \text{length}) + 1$. For example, -1 represents the entire length of the original string. If -2 is specified, the length is the entire string -1. For a string with 5 characters, a length of -1 = $(5 + (-1)) + 1 = 5$, -2 = $(5 + (-2)) + 1 = 4$, etc.

Uppercase

Converts the characters in the enclosed tokens to uppercase.

Fields

There are no fields.