

Chapter 7

Using Policy Editor

This chapter describes how to use Policy Editor. Topics include:

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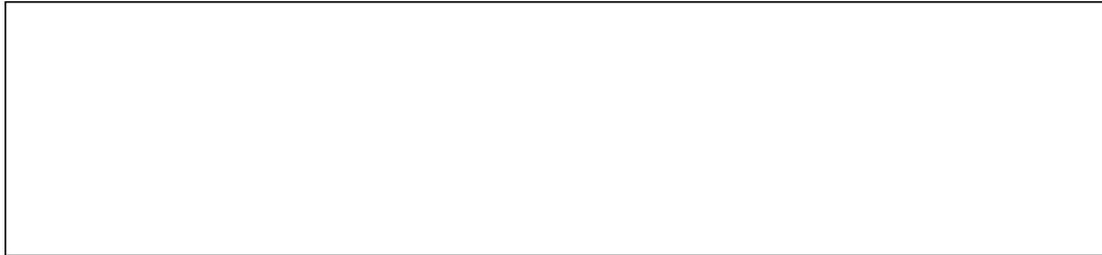
Overview of Policy Editor

Policy Editor allows you to define policies in the policy repository. It is a Java swing application that acts as an X11 application on Solaris. As a result, it complies with and provides complete X11 functionality.

Key Mapping

Figure 18 shows the keyboard modifier map and key map table that Policy Editor uses to convert event code into key symbols (keysyms) in X11.

Figure 18: Keyboard Modifier Map



You generate this map by entering the following command in UNIX:

```
xmodmap
```

To customize your keyboard, the key mapping can be changed with standard X11 utilities.

Nonroot Users

Nonroot operators can access Policy Editor. The home directory for nonroot operators stores operator customization and log files.

The files and directories in *pom_install_dir* are not changed when various operators use Policy Editor. Nonroot operators who want to use Policy Editor must have read/write permission on files and directories in *pom_install_dir*. The Policy Editor default installation gives read/write permission to all users (that is, user, group, and others). The operating system commands are used to restrict access as required.

When Policy Editor is started, the directory *POM_USER_DIR*, which is *< \$HOME > /.UMC/pom*, is used. The *< \$HOME >* variable is the user's home directory. The *< \$HOME >* directory must exist. The *.UMC/pom* directory path is created if it does not exist.

There are two subdirectories in *POM_USER_DIR*:

- *etc*—Contains the customization and configuration for this user
- *var*—Contains the log directory and file for this user

Exception Handling for the Directory

If Policy Editor detects a problem, such as a connection loss, when it accesses the directory, it displays a dialog box that describes the LDAP problem. If such a problem occurs, you can back up modified data to a different directory or to a file, or you can ignore the changes and open a different data source. You must either open or cancel the current operation.

The open operation opens the Open Directory Server dialog box, allowing you to change the connection parameters if it is necessary to connect to another directory.

Typically, there is one primary directory in the main office of the service provider and various secondary directories in regional centers. The service provider synchronizes policies between the master directory and the slave directories. As a result, changes to policies in each of the directories are controlled and propagated to the other required directories.

Providing Data Security

Policy Editor implements data security through:

- Simple authentication
- Access control

Simple authentication occurs when Policy Editor sends the fully qualified distinguished name (FQDN) of the client and the client's clear-text password to the directory.

The directory supports access control that defines and monitors different clients' access privileges on LDAP entries.

Working with Policy Data Files

Policy Editor does not support the reading of policy data files produced with earlier versions of the SDX software. This feature may work under some circumstances; for example, when Policy Editor is used in JUNOSe mode.

Multi-User and Multi-Instance Concurrency

Multiple operators with multiple instances can use Policy Editor simultaneously. Concurrency control manages different instances or different operators while they perform operations on the same policy object at the same time.

Concurrency control is transparent; that is, the system does not notify you of simultaneous changes to the same object. However, be aware that, if multiple operators work on the same objects at the same time, the object properties that one operator configures can be overwritten by another operator; that is, the system stores the second operation in the directory.

Table 15 shows various concurrence control scenarios. In this table both operation 1 and operation 2 are performed on the same object by two different operators or application instances. The commitment of operation 2 is later than that of operation 1.

Table 15: Concurrence Control Scenarios

Operation 1	Operation 2	Changes in the Directory
Delete	Delete	The object is deleted from the directory. Operation 2 is ignored.
Add	Add	The object created by operation 2 is stored in the directory.
Modify	Modify	The modification made by operation 2 is stored in the directory.
Delete	Modify	The modification made by operation 2 is stored in the directory. The object is re-created.
Modify	Delete	The object is deleted from the directory.

For the scenario of delete/delete, the object is deleted from the directory at the commitment of operation 1. When the same request is received from operation 2, it is silently ignored. For all other operations, operation 2 (that is, the latest operation) always prevails.

The directory ensures consistency for each entry but not across multiple entries. See *SRC-PE Integration Guide, Chapter 2, Overview of LDAP Integration*.

In summary, the directory does not maintain consistency among objects. To maintain consistency, all operators must be in contact with each other and agree on what the final state of the data should be.

Starting Policy Editor

To start Policy Editor, at the UNIX prompt (`#`), type:

```
cd /opt/UMC/pom/bin
./pomgui
```

To open a policy repository:

1. Click **File**, select **Open**, and click **Directory Server**.

The Open Directory Server dialog box appears.

2. Fill in the fields. See Table 16.

Table 16: Open Directory Server (LDAP Connection) Fields

Field	Description	Notes
LDAP Host	IP address or hostname of the directory	You can connect to only one directory at a time.
Port	Port number for the directory host connection	Default—389 Range—1–65535 Type—Integer
Base DN	Distinguished name of the base policy information in the directory	Default— <i>o = umc</i> If the base DN does not exist, you are prompted to create it. To create a base DN, the parent object must exist.
Policies RDN	Relative distinguished name of the policies information in the directory	This name is relative to the base DN.
Parameters RDN	Relative distinguished name of the base global parameters information in the directory	Default— <i>o = Parameters</i> This name is relative to the base DN.
Bind DN	Distinguished name used for binding to the directory	Default— <i>cn = pom, ou = components, o = operators, o = umc</i>
Password	Password associated with the bind DN	Default— <i>pom</i>

You can also filter the information (click Filter in the Open Directory Server dialog box). This filter function is the same as that of the filter function available through the Tools menu. (See *Filtering Searches* on page 177.)

You can also select Secure Connection if the directory host you connect to supports Transport Layer Security (TLS). Selecting Secure Connection forces encryption of the directory connection.

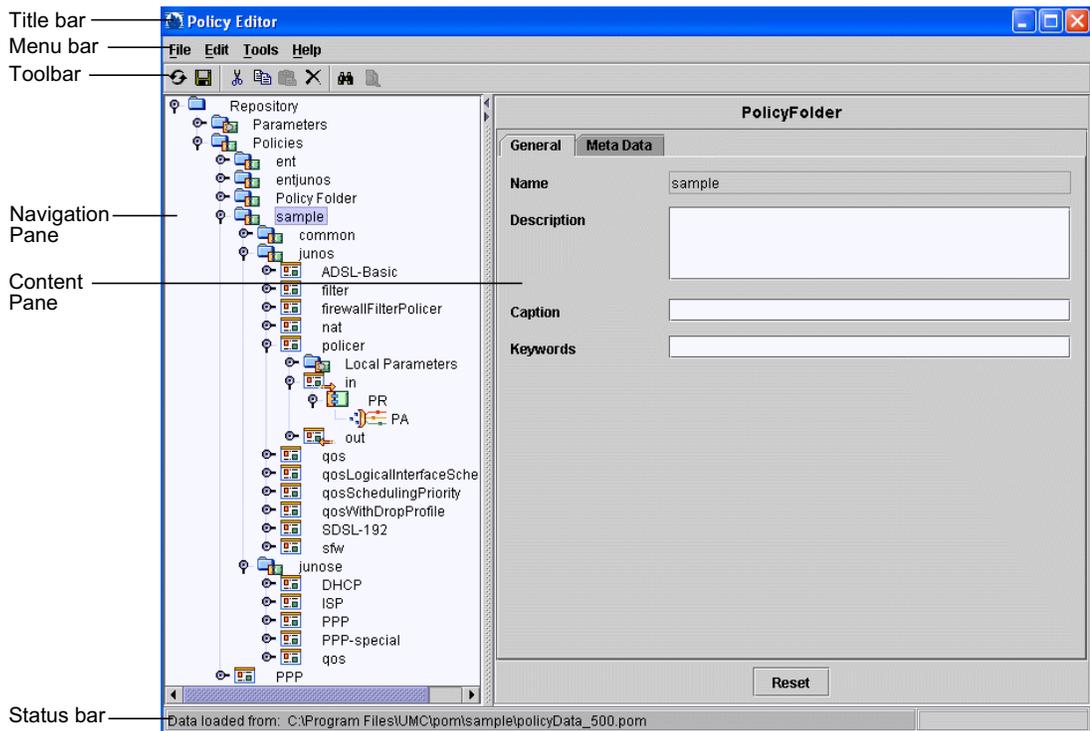
3. Click **OK**.

The system connects you to the policy repository and displays the Policy Editor window.

Understanding the Policy Editor Layout

The Policy Editor window contains six main areas: title bar, menu bar, toolbar, navigation pane, content pane, and status bar (see Figure 19). The first five areas are the same ones described in *SRC-PE Getting Started Guide, Chapter 43, Using SDX Admin*.

Figure 19: Policy Editor Window Layout

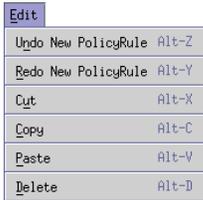


The status bar at the bottom of the Policy Editor window gives you additional information about Policy Editor. For example, the status bar can indicate the IP address of the policy repository to which you are connected.

Using the Menu Bar

The menu bar allows you to execute commands related to each of the menus. See the following tables for information about each menu command.

Menu	Command	Choose To
	New	Open another Policy Editor main window or open a Policy Editor configuration file.
	Open	Open data source to get data into the GUI. You can open a connection to the directory host or open a file.
	Close	For LDAP, the system prompts you to enter the requested directory connection parameters. Then the connection is made. For a file, you must choose a data file to be opened.
	Close	Close the connection to the directory or Close the current file. The policy objects in Policy Editor are cleared. NOTE: You receive a warning if you have not saved changes to the opened data source (directory or file).
	Save	Save changes to the directory or file. If the file did not previously exist, it is created. If the file exists, its contents are replaced with policies in Policy Editor.
	SaveAs	Save the policies in Policy Editor under a new file name. This in effect copies the policies to a new file. Be sure to give different versions of an object a unique name to avoid object name conflicts.
	Reload	Clear and reload policy objects in Policy Editor from the opened data source (directory or file). You receive a warning if there are pending changes that you have not saved to the opened data source (directory or file).
	Print	Print the file(s) you select.
	Exit	Exit the application. You receive a warning if there are pending changes that you have not saved to the opened data source (directory or file).

Menu	Command	Choose To
	Undo	Cancel the most recent operation.
	Redo	Reinstate the operation that you cancelled with Undo.
	Cut	Cut the currently selected object.
	Copy	Copy the currently selected object.
	Paste	Paste the object copies from the cut or copy operation to the currently selected object.
	Delete	Delete the currently selected object.

Menu	Command	Choose To	
Tools Filter... Find... Customize... Query... Manage...	Tools	Filter	Change the search filter used for the directory (see Table 21).
		Find	Find a specific instance of an object in Policy Editor.
		Customize	Customize the application based on your preferences.
		Query	Open the Router Query window. Use to find QoS profiles, policy groups, and routers.
		Manage	Allows you to access the CLIs of JUNOSe routers and JUNOS routing platforms.

Menu	Command	Choose To
Help About Policy Editor	About Policy Editor	View information about the Policy Editor software, including vendor name and software version.

Using the Toolbar

Table 17 shows the Policy Editor toolbar icons and the relationship between the icons and the menu commands. The toolbar icons exist in enabled and disabled modes. The mode depends on whether the operation is supported in the context of the selected object and on previous operations. For example, if no object was previously copied or cut, then Paste is disabled.

Table 17: Toolbar Functions

Icon	Corresponding Menu
	File > Reload
	File > Save
	Edit > Cut
	Edit > Copy
	Edit > Paste
	Edit > Delete
	Tools > Find
	Tools > Filter

Using the Navigation Pane

The navigation pane represents the policy management system in a tree format. The top-level folder is the root; the tree branches down to subfolders and then to individual objects.

The tree structure provides instance navigation and manipulation of the policy objects. However, not all objects are available in the navigation pane. For example, ProtocolCondition in the ClassifyTrafficCondition object is considered part of the ClassifyTrafficCondition object. Thus ProtocolCondition is not shown as a branch of ClassifyTrafficCondition in the navigation pane. ProtocolCondition is manipulated as part of the content pane for ClassifyTrafficCondition. For more information about navigating through ClassifyTrafficCondition objects, see *Using the Content Pane* on page 185.

Figure 20 shows the policy object hierarchy that is supported. All the connections between the objects are a parent-child relationship.

Figure 20: Policy Object Hierarchy in Navigation Pane

```

organizationFolder (logical root folder : Policy Repository)
  |-- organizationFolder (global folder : Parameters)
    |-- Parameter (global)
  |-- organizationFolder
    |-- policyGroup
    |-- organizationFolder
      |-- policyGroup
        |-- organizationFolder (logical folder: Local Parameters)
          |-- Parameter (local)
        |-- policyList
          |-- policyRule
            |-- ClassifyTrafficCondition
            |-- FilterAction
            |-- ForwardAction
            |-- MarkAction
            |-- NextHopAction
            |-- NextInterfaceAction
            |-- RateLimitAction
            |-- TrafficClassAction
  
```

To manipulate objects in the navigation pane:

- Select an object—Click on the object. When you select an object, the object details appear in the content pane (see Table 19). From this pane you can add, change, or modify policy object parameters.
- Expand an object—Click on the expansion indicator icon to the left of the object (see Table 18). When the object is expanded, the icon points down. If there is no expansion indicator, then the object has been expanded to its lowest level.
- Collapse an object—Click on the expansion indicator icon to the left of the object. When the object is collapsed, the icon points toward the object.

After you have selected the object(s) you want, you can modify, add, cut, copy, paste, delete, or show messages for the object(s).

Navigation Pane Icons

Policy Editor uses different icons in the navigation pane to differentiate various object types under Policy Editor control. Table 18 shows and describes the icons used in the Policy Editor navigation pane.

Table 18: Policy Object Icons

Icon	Type	Description
	Expansion indicator	When indicator points down, folder is expanded
	Collapsed indicator	When indicator points toward the folder, folder is collapsed but can be expanded
	Repository folder	Repository folder is closed; you cannot see the contents
	Parameters folder	Folder containing local or global parameters
	Policies folder	Policy folder—Contains policy groups
	Valid policy group	Policy group—Contains valid policy lists
	Invalid policy group	Policy group—Contains invalid policy lists
	Ingress policy list	Ingress policy list—Contains ingress policy rules
	Egress policy list	Egress policy list—Contains egress policy rules
	Policy rule	Policy rule—Contains condition and action
	Classify	Condition object—Classify-traffic condition
	Forward	Action object—Forward action and NAT action
	Filter	Action object—Filter action and reject action
	Next hop	Action object—Next-hop action, routing instance action, and static routing instance action
	Next interface	Action object—Next-interface action
	Traffic mirror	Action object—Traffic mirror action
	Rate limit	Action object—Rate-limit action, policer action, traffic-shape action
	Mark	Action object—Mark action
	Traffic class	Action object—Traffic-class action, reference forwarding action, scheduler map action, loss priority action, FlowSpec action, DOCSIS action, and service class name action.
	Parameter	Parameter object with valid values
	Invalid parameter	Parameter object with invalid values

General Procedures for Using Policy Editor

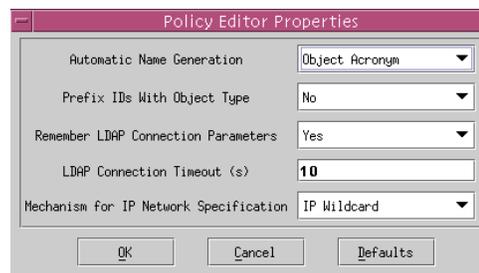
This section describes some general procedures that you can perform with Policy Editor.

Customizing Policy Editor Properties

The Customize command allows you to customize some of the properties in Policy Editor. To customize Policy Editor properties:

1. Click **Tools > Customize**.

The Policy Editor Properties dialog box appears.



2. Select the parameters you want from the drop-down box in each field (see Table 19).

Table 19: Policy Editor Properties

Field	Options
Automatic Name Generation	Suggests the name base for the newly created object: <ul style="list-style-type: none"> ■ Object Type Based—Object type is used as prefix ■ Object Acronym—Object acronym is used as prefix ■ Anonymous—Word <i>anonymous</i> is used as prefix ■ None—No prefix is used
Prefix IDs With Object Type	Specifies whether or not object names in the navigation pane are prefixed with their object type. <ul style="list-style-type: none"> ■ Yes—Object names are prefixed with object type Example—PolicyGroup_fast ■ No—Object names are not prefixed with object type Example—Fast
LDAP Connection Timeout (s)	inactive
Remember LDAP Connection Parameters	<ul style="list-style-type: none"> ■ Yes—System remembers the connection information ■ No—System does not remember the connection information
Mechanism for IP Network Specification	Choose between the following available IP address field labels: <ul style="list-style-type: none"> ■ IP Mask ■ IP Wildcard

Opening Multiple Policy Editor Windows

Clicking File > New Window allows you to open another main Policy Editor window. You can have multiple Policy Editor windows running at the same time. The status bar at the bottom of the window shows what the window is connected to.

You can copy and paste information from one window to another. You cannot cut and paste information from one window to another. If you use the drag-and-drop function (see *Using Drag and Drop to Cut and Paste Objects* on page 179), the operation will copy and paste information to the other window.

Printing Policy Objects

You can print the properties specified for a policy object or objects that you select either to a text file or to a printer. To print the information to a printer, you must have the printer configured to the system. (See your operating system or printer manual for configuration.)

The format of the print data is a structured representation of the object(s) you have selected.

You can print the properties from policy groups and policy folders; you cannot print the properties from a policy list, policy rule, policy condition, or policy action.

Undoing and Redoing Operations

Clicking Edit > Undo allows you to undo the last operation you performed on an object. Your most recent addition, modification, or deletion is canceled. Similarly, clicking Edit > Redo allows you to redo the last operation you performed on an object.

You can undo or redo up to 10 operations. However, you must undo or redo the most recent operation first. That is, if you want to undo a modification you made before you added an object, you must undo adding the object before you can undo your earlier modification.

When you click Undo or Redo, the name of the object type, not the name of the specific object, appears.

Filtering Searches

The Filter option allows you to limit the number of objects loaded in the navigation pane based on attributes of the policy group. Use the filter to group and identify objects that satisfy the search criteria. Filter is not active when you work with files.

Figure 21: Search Filter Window

The filter is applied only to a search operation on the directory. It has no effect on newly created objects in the navigation pane or from the Save operation, because they do not result in an LDAP search operation.

Table 20 lists the supported attributes for the policy group search filter.

Table 20: LDAP Search Attributes

Filed Title	Attribute
Name	LDAP string for the policy group name
Keywords	LDAP string for keywords
Description	LDAP string for the description
Caption	LDAP string for the caption

Each entry creates a Boolean expression. For example, if you type **internet** in the Description field, the resulting Boolean expression is `PolicyGroup.Description = *internet*`. `PolicyGroup.Description` maps to the corresponding LDAP attribute name.

If you specify more than one field in the Filter window, the system combines the information in a logical AND operation.

Before changing the search filter, the system prompts you to save the changes made to the objects. You must save your changes because changing the filter results in cleaning the policy objects in the navigation pane and the Policy Editor directory cache.

Finding Objects in the Navigation Pane

The Find command allows you to find objects in the navigation pane based on object type and name. The Find operation is started from the current selection in the navigation pane. If you have not selected an object in the navigation pane, Find starts from the root of the tree (that is, the Repository folder).

To find a policy object:

1. Click **Tools > Find**.

The Find dialog box appears.



2. Select an object type from the Object Type drop-down menu.

Object Type is a mandatory field. If you do not select an object type and you start the Find operation, the system prompts you to enter an object type.

3. (Optional) Type the object name in the Name field.

4. Click **Find**.

You can refine your search as follows:

- Match case—Make the search case sensitive.
- Wrap search—Wrap back to the top of the search area when the end of the search area is reached.
- Direction—Find objects in the Up or Down directions with respect to the current selection in the navigation pane.

If the object cannot be found, the system displays a warning stating that the object matching the given criteria cannot be found.

If the object is found, select it. The system displays the information about the object in the content pane.

Running Queries for QoS Policy Information

See *SRC-PE Solutions Guide, Chapter 1, Managing Tiered and Premium Services with QoS on JUNOS Routers with the SRC CLI*.

Accessing Router CLIs

You can use the Manage menu item to access the CLIs of JUNOSe routers and JUNOS routing platforms through a Telnet or SSH connection.

Modifying Policies

You can modify policies by using either the navigation or content pane.

To modify the information in the fields of a content pane, select the object (policy group, policy list, or policy rule), and then enter the data in the fields to be changed. The changes are saved after you click Save from the File menu.

Selecting Multiple Objects

You can perform operations (such as print, cut, or paste) on multiple objects that you select in the navigation pane. Highlight and select multiple objects by pressing Ctrl and clicking each object you want to select. The objects do not need to be in consecutive order. To select a group of objects in consecutive order, press Shift and click the consecutive objects you want to select.

To deselect an object, click on it again. It will no longer be highlighted.

Although you can select objects of different types, it is not useful to do so. Some, but not all, operations can be performed concurrently on multiple objects that are of different types.

Using Drag and Drop to Cut and Paste Objects

You can cut and paste selected objects by holding down the left mouse key and dragging the object or objects to a new place in the navigation pane. If an object you have re-placed has the same name as an object already in the folder, you are prompted to rename it.

Cutting Objects

Policy Editor places information that you cut into a clipboard for future use. To cut a policy object:

1. Highlight the policy group, policy list, or policy rule, and right-click.
2. Click **Cut**.

If you cut a policy group, policy list, or policy rule, the system deletes any child objects and references that exist.

Copying Objects

When you copy an object, the system leaves the information in the original location and copies it to the clipboard for future use. To copy a policy object:

1. Highlight the policy group, policy list, or policy rule you want to copy, and right-click.
2. Click **Copy**.

Be sure to change the policy group, policy list, or policy rule child objects and references.

Pasting Objects

Pasting a policy group, policy list, or policy rule object means copying the object from the clipboard to a new folder.

To paste a policy object:

1. Highlight the object that you want to paste the information into, and right-click.
2. Click **Paste**.

Be sure to give the pasted policy group, policy list, or policy rule a unique name. If the object itself has child objects, the child object names are present. Policy Editor assists you with the name for the pasted object; the system either preserves the name of the original object or suggests a different one to avoid name conflict.

Deleting Policy Objects

To delete a policy object:

1. Highlight the policy object, and right-click.
2. Click **Delete**. The Deleting dialog box appears.
3. Click **OK** to delete the policy object. Click **Cancel** to close the dialog box without deleting the policy object.



NOTE: If you change or delete an item, make sure that you change or delete all of its dependencies.

Reloading a Policy Object

Reload gets the last saved copy of the information. All the information that you entered since the last save and before you execute the reload command is lost.

If you delete a policy object and then decide that you want to keep it:

1. Select **File**, and click **Reload**. The Reloading from Data Source dialog box appears.
2. Click **No**, and the element or object is not deleted.



NOTE: If you save the policy, the deleted information is lost.

Using Pop-Up Menus

If you select a folder or individual object in the navigation pane and then right-click, a pop-up menu appears. Available commands relative to the selected object appear. If the command appears dimmed, it is not available.

Figure 22 is an example of an object pop-up menu.

Figure 22: Sample Object Pop-Up Menu

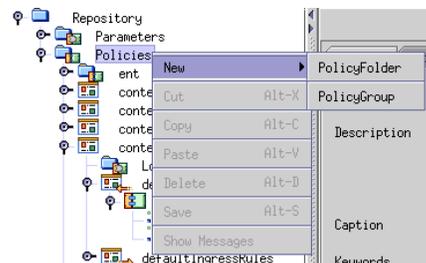


Table 21 lists the menu selections that are available from the various pop-up menus.

Table 21: Policy Editor Pop-Up Menus

Object Selected	Menu Item	Description
Parameters folder	New	New policy group.
		New organizational folder.
		New parameter.
		Available for organizational folder for global and local parameters folder.
	Cut	Cuts selected object.
		Cut is not allowed on the top folder, which is the base DN.
	Copy	Copies selected object.
	Paste	Pastes previously copied or cut object in this container, when available.
	Delete	Deletes selected object.
		Delete is not allowed on the top folder, which is the base DN.
Save		
Show Messages	Displays transient messages that are related to Policy Editor knowledge of the selected object. The messages can include information such as validation error messages or the modification status of the object in Policy Editor. (For example, does it require a Save, or is it up to date?) If there are no messages, the menu item is not available.	
Parameter	New	
	Cut	Cuts selected object.
	Copy	Copies selected object.
	Paste	Pastes previously copied or cut object in this container. If there are no previously copied or cut objects, the menu item is not available.
	Delete	Deletes selected object.

Table 21: Policy Editor Pop-Up Menus (continued)

Object Selected	Menu Item	Description
Policy Folder	New	New policy folder or policy group.
	Cut	Cuts selected object. Cut is not allowed on the top folder, which is the base DN.
	Copy	Copies selected object.
	Paste	Pastes previously copied or cut object in this container. If there are no previously copied or cut objects, the menu item is not available.
	Delete	Deletes selected object. Delete is not allowed on the top folder, which is the base DN.
	Save	
	Show Messages	Displays transient messages that are related to Policy Editor knowledge of the selected object. The messages can include information such as validation error messages or the modification status of the object in Policy Editor. (For example, does it require a Save, or is it up to date?) If there are no messages, the menu item is not available.
Policy Group	New	New JUNOS or JUNOSe policy list.
	Cut	Cut selected object.
	Copy	Copies selected object.
	Paste	Pastes previously copied or cut object in this container. If there are no previously copied or cut objects, the menu item is not available.
	Delete	Deletes selected object.
	Save	
	Show Messages	Displays transient messages that are related to Policy Editor knowledge of the selected object. The messages can include information such as validation error messages or the modification status of the object in Policy Editor. (For example, does it require a Save, or is it up to date?) If there are no messages, the menu item is not available.
Policy List	New	New policy rules are displayed relative to the selected object.
	Cut	Cuts selected object.
	Copy	Copies selected object.
	Paste	Pastes previously copied or cut object in this container. If there are no previously copied or cut objects, the menu item is not available.
	Delete	Deletes selected object.

Table 21: Policy Editor Pop-Up Menus (continued)

Object Selected	Menu Item	Description
Policy Rule	New	New conditions and actions are displayed relative to the selected object.
	Cut	Cuts selected object.
	Copy	Copies selected object.
	Paste	Pastes previously copied or cut object in this container. If there are no previously copied or cut objects, the menu item is not available.
	Delete	Deletes selected object.
Any condition		
Any action	New	Selection is not available.
	Delete	Deletes selected object.
	Cut	Cuts selected object.
	Copy	Copies selected object.
	Paste	Selection is not available.

Using the Content Pane

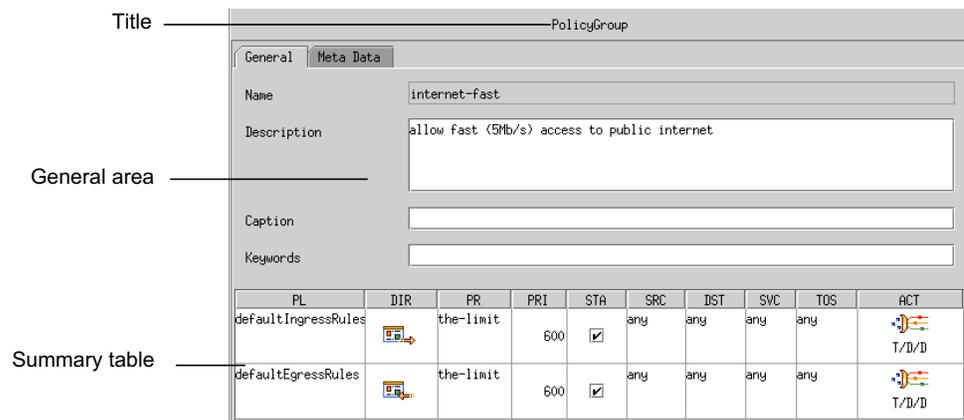
The content pane (see Figure 19) lists the details of a policy object. *Chapter 6, Policy Management Overview* contains samples of Policy Editor content panes for the various objects.

The content pane is used for access to object details and the modification of policy objects. The information in the Meta Data tab represents creation and modification timestamps for the objects. For policy group, policy list, and policy rule objects, the General tab in the content pane consists of two subsections: a general area and a summary table:

- General area—Shows general information about the object. You are provided with various mechanisms to update data, such as captions and descriptions.
- Summary table—Shows information related to the object in a summary form.

Figure 23 shows a PolicyGroup pane with its general area and summary table.

Figure 23: Content Pane Sections—General Area and Summary Table



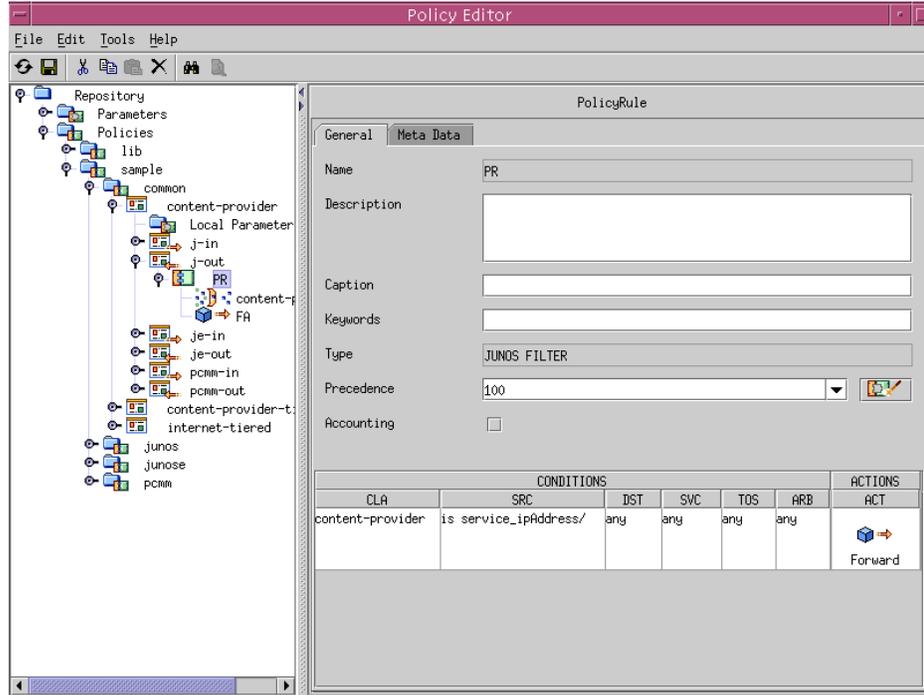
You can update the data in the summary table itself or from a dialog box that appears when you double-click on an object in the summary table. If you right-click within a cell, a pop-up menu appears from which you can perform additional actions.

You can also double-click on a policy list or policy rule object in the summary table to select an object in the navigation pane.

The content pane changes based on your interaction to show only relevant information.

You can also modify values for conditions and actions by selecting a policy rule object in the navigation pane. The summary table in the General tab of the PolicyRule pane contains five columns, as shown in Figure 24.

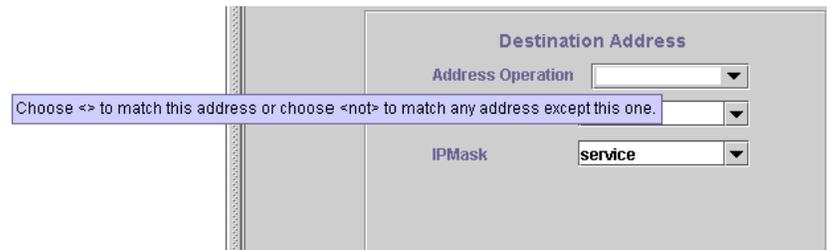
Figure 24: Condition and Action Columns in PolicyRule Pane



Using Tool Tips

Tool tips provide information about toolbar buttons, the fields in a pane, and objects in the navigation pane. Tool tips are provided only for buttons, fields, or objects that can benefit from the additional information. To view tool tips, place the cursor over a button, field, or object. The tool tip appears (for example, see Figure 25).

Figure 25: Tool Tip for Address Operation



Internationalization

Policy Editor supports translating messages (strings), such as label texts, error messages, menu items, and dialogs into local languages.

External property files are provided so that a knowledgeable operator can customize these user-visible strings into local languages without altering the software code. In a property file, each externalized string variable is stored as an entry that is part of a key-value pair.

The key is a meaningful representation of a specific string variable; for example, `RateLimitActionPanel.PeakRate.label`. The value is a customized part of the string content; for example, `Peak Rate (bps)`.

The following shows several examples of externalized strings with customized parts of the string content:

```
...
RateLimitActionPanel.PeakRate.label=PeakRate(bps)
RateLimitActionPanel.PeakBurst.label=PeakBurst(bytes)
RateLimitActionPanel.CommittedAction.label=CommittedAction
...
```

This feature provides different user-visible contents in Policy Editor based on the customer's location. With the same code, but with different external property files, various users can see different visual representations of the same string.

Some constraints are applied to the external properties to ensure proper layout in Policy Editor panes. In the preceding example, a constraint is placed on the maximum length of the label.

For example, if the maximum length of the label is 39 characters but the actual label length is 200 characters, Policy Editor uses the first 39 characters of the label and logs an error in the log file.

Table 22 lists files that contain externalized strings. They are located in the directory `< pom-install-dir >/etc`.

Table 22: Files with Externalized Strings

File Name	Purpose
HelpDialog.properties	Help
MenuAttributes.properties	Menus
PanelAttributes.properties	Panels
FindDialog.properties	Find dialog
CustomizationAttributes.properties	Customize dialog
LDAPConnectionDialog.properties	LDAP connection dialog
FilterDialog.properties	Filter dialog

Storing and Retrieving Policies

In addition to the directory, Policy Editor lets you use store policies in and retrieve policies from the file system where Policy Editor is running. The policy engine uses only the policies in the directory. The policies in the files are for your use locally and are not visible to the policy engine.

A connection to the directory is required for file operations. The file format supported is internal to Policy Editor. It is not a public, open file format.



NOTE: You must not manually edit the file by using another editor. This operation can cause corrupted files or version problems in the files.

Sorting Objects

The objects in object collection views are sorted in case-insensitive nonlocale lexicographical order using Unicode with the object name/id.

The following logic is used for comparing two strings. It is specified by `String.compareToIgnoreCase` in Java:

1. Two strings are compared lexicographically, ignoring case and locale. The system achieves this operation by converting each string to uppercase and then lowercase before performing the lexicographical string comparison.
2. This method returns an integer whose sign is that of the following:

```

this.toUpperCase().toLowerCase().compareTo(str.toUpperCase().
toLowerCase())

```



NOTE: This sorting logic does not take locale into account and results in an unsatisfactory ordering for certain locales (for example, Turkey).

3. The sort is applied to every level in a hierarchy for objects in that level when object collection is part of the hierarchy. For example, the policy group folder can contain several policy list objects. The objects are sorted alphabetically using the policy list name for comparison.
4. The object type or other attributes can take higher precedence over the name sort. For example, the precedence can be (in order of highest to lowest) direction, condition, actions, sorted name. This order sorts the group by functionality. It is used in the multicolumn sort operations. Within each group the objects are sorted. In addition, logical ordering can exist, which takes precedence over alphabetic ordering.