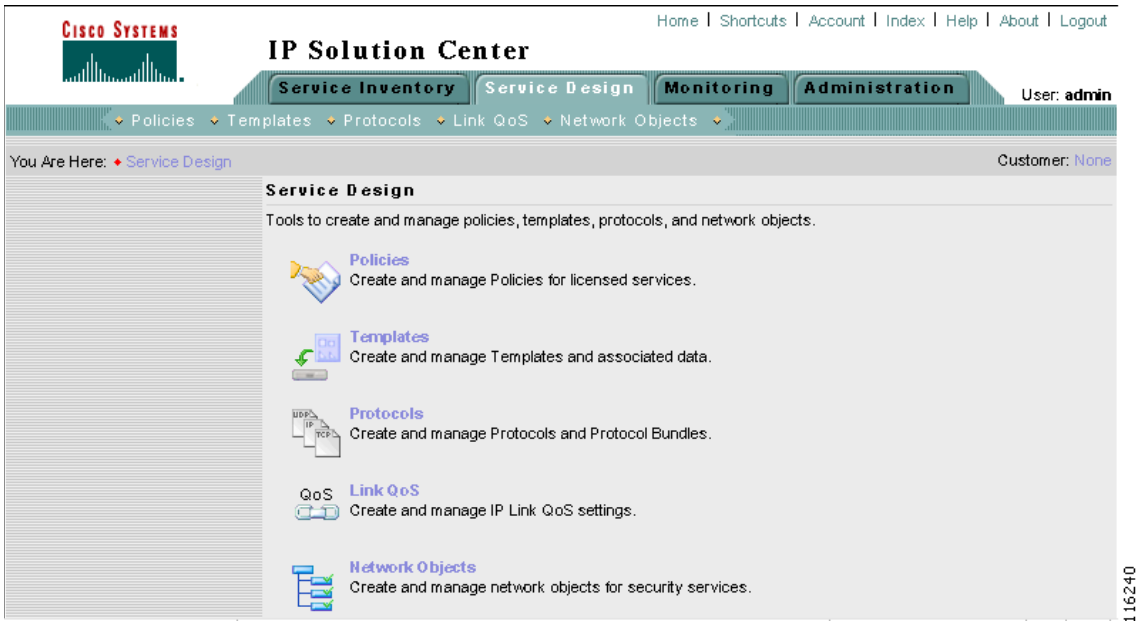
Service Design

From the Home window of Cisco IP Solution Center (ISC), you receive upon logging in, click the **Service Design** tab and you receive a window as shown in Figure 6-1, "Service Design Selections."

Figure 6-1 Service Design Selections



Next you can navigate to the following selections:

- **Policies, page 6-2** Create and manage Policies for licensed services.
- **Templates, page 6-2** Create and manage Templates and associated data.
- **Protocols, page 6-43** Create and manage Protocols and Protocol Bundles.**- This feature is NOT SUPPORTED in this release. -**
- **Link QoS, page 6-51** Create and manage IP Link QoS settings.
- **Network Objects, page 6-57** Create and manage network objects for security services.**- This feature is NOT SUPPORTED in this release. -**

Policies

Policies is explained in each of the *User Guides* for each of the licensed services.

Templates

Templates supports the browsing, creation, and deletion of Template Folders, Templates, and Data Files as well as the viewing of Template-generated configurations. The configuration created from the template and data file can be downloaded to devices. When creating a Service Request, you can select from the list of templates and data files and associate them with the Service Request. At Deploy time, the template and data file are instantiated and the configuration is appended or prepended to the configlet generated by ISC.

ISC provides a way to integrate a template with ISC configlets.

For a given customer edge router, you specify the following:

- template name
- template data file name
- whether the template configuration file should be appended or prepended to the ISC configlet
- whether the template configuration file is active or inactive for downloading to the edge device

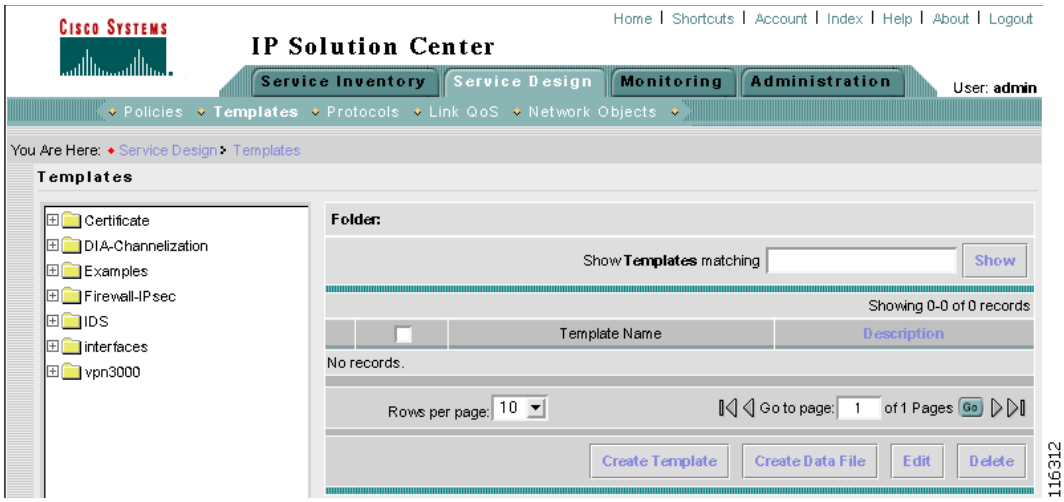
The template data files are tightly linked with the corresponding template. You can use a data file and its associated template to create a template configuration file. The template configuration file is merged with (either appended or prepended to) the ISC configlet. ISC downloads the combined ISC configlet and template configuration file to the edge device router.

- You can download a template configuration file to a router.
- You can apply the same template to multiple edge routers, assigning the appropriate template data file for each device. Each template data file includes the specific data for a particular device (for example, the management IP address or host name of each device).

To use Templates, do the following:

Step 1 Navigate to **Service Design** > **Templates** and you receive a window as shown in Figure 6-2, "Templates."

Figure 6-2 Templates



Template examples are shown in the left column. A complete list of template examples is specified in the "Template Examples" section on page 6-22. A complete list of Repository variables is shown in the "Summary of Repository Variables" section on page 6-25.

Step 2 Then you can do any of the following:

- View Templates Tree and Data Pane, page 6-3
- Create Folders and Subfolders, page 6-4
- Create Template, page 6-5
- Create Data File, page 6-14
- Edit, page 6-19
- Delete, page 6-21

View Templates Tree and Data Pane

When you navigate to **Service Design > Templates**, you receive a window as shown in Figure 6-3, "Tree and Data Pane Structure."

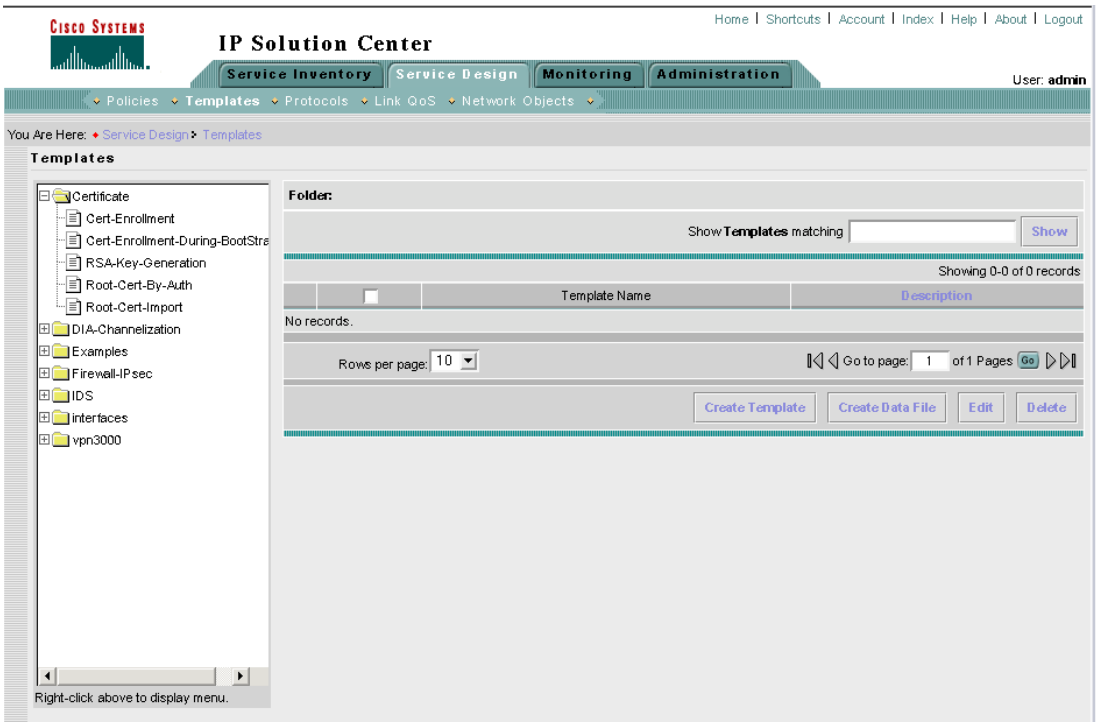
The Templates tree is in the left column. You can continue clicking the **+** sign next to each created folder and subfolder until you get to the last level of information. The last possible level is the template name. Data file information is not kept in the tree.

The right section of the window is the data pane. The name of the folder or template is in the upper-left corner. When you select the check box next to the template or data file information, the **Create Template**, **Create Data File**, **Edit**, or **Delete** buttons are enabled as described in the following sections.

When there are many templates in a folder or many data files in a template, the **Show Template Matching** or **Show Data File Matching** filter in the upper right hand corner of the data pane can be very useful. For example, you might just want to work with templates or data files that start with **abc**. In this case, enter **abc*** in the field and then click the **Show** button. Only the templates or data files that start with **abc** appear.

You can also **View** configurations when the table displays data files.

Figure 6-3 Tree and Data Pane Structure



Create Folders and Subfolders

To create a new folder or subfolder, do the following:

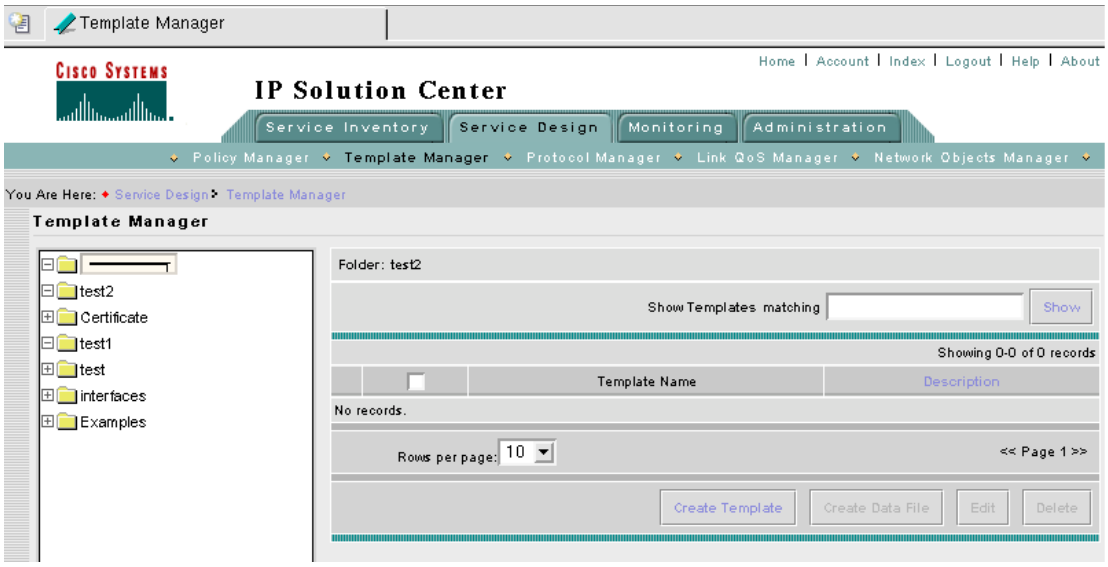
Step 1 Navigate to **Service Design** > **Templates**.

Step 2 In the **Templates** tree, right-click in the white area and select **New** > **Folder** to create a new folder or right-click on an existing folder or subfolder and select **New** > **Folder** to create a subfolder.

Note There is no limit to the number of levels of folders and subfolders you can create.

Step 3 In the new text field that appears in the **Templates** tree, type the new folder or subfolder name, as shown in the first entry of the **Templates** tree in Figure 6-4, "Folder Naming."

Figure 6-4 Folder Naming



Copying Folders or Subfolders

You can copy a folder or subfolder and paste it into another folder or subfolder, as follows:

Step 1 Select a folder or subfolder and then right-click and you receive the opportunity to copy. Click **Copy**.

Step 2 Select the folder or subfolder into which you want to paste the copied folder or subfolder and all its content. Right-click and you receive the opportunity to paste. Click **Paste**.

Step 3 You will see the new folder or subfolder and all its content in the selected location. You can edit and rename from there.

Create Template

You can either create a new template in an existing folder or you can create a new folder first and then create the template. To create a new folder, see the section "Create Folders and Subfolders".

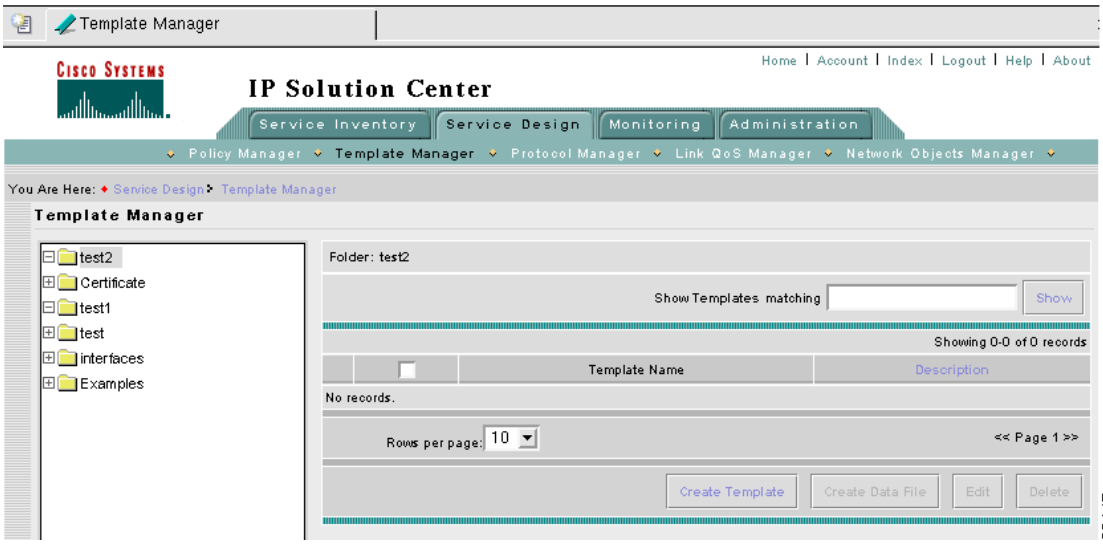
To create a new template, do the following:

Step 1 Navigate to **Service Design > Templates**.

Step 2 In the **Templates** tree, click on the folder in which you want to create a new template.

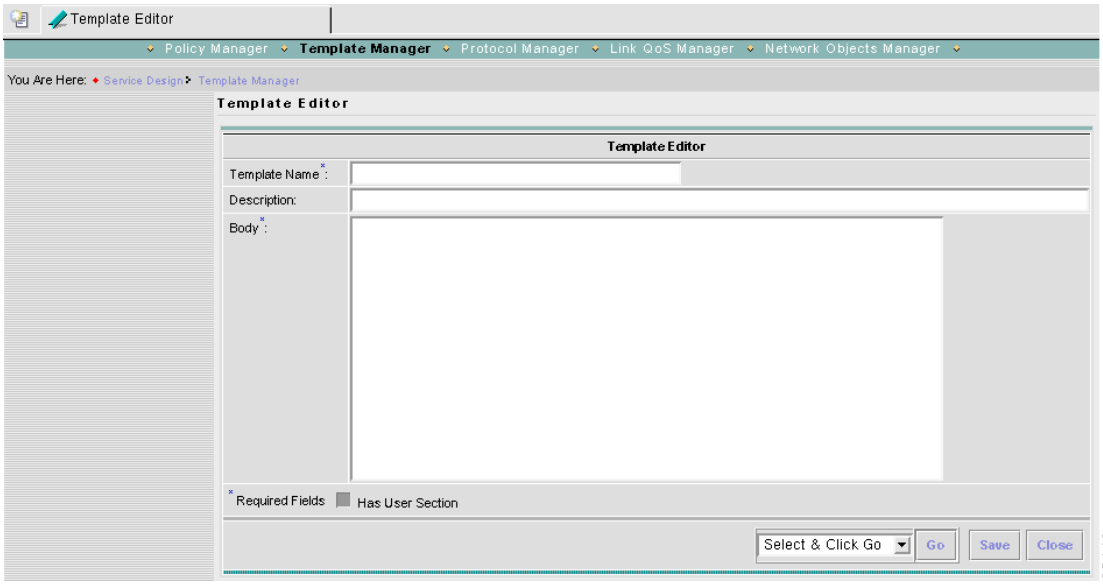
Step 3 A window appears as shown in Figure 6-5, "Folder with Existing Templates."

Figure 6-5 Folder with Existing Templates



Step 4 Click the **Create Template** button and you receive a window as shown in Figure 6-6, "Template Editor."

Figure 6-6 Template Editor



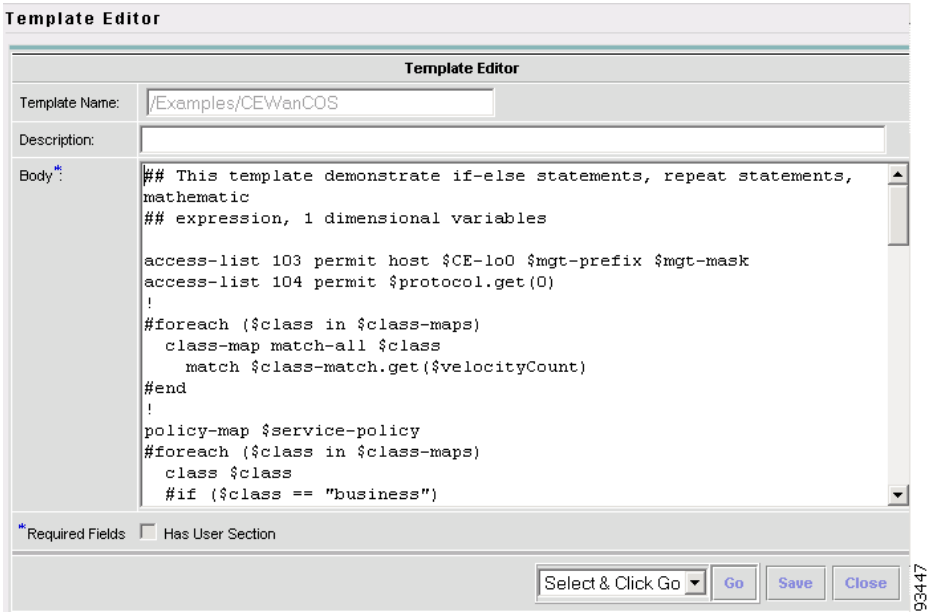
Step 5 Enter the following:

- **Template Name** (required) This must be a unique name within a folder. This name must begin with an alphabetic character and can only contain alphanumeric characters, underscores, and hyphens.
- **Description** (optional) You can enter any description here.
- **Body** (required) Enter the configuration text, Velocity template language directives, and variables that you want included.

Note The Velocity template language is explained at http://jakarta.apache.org/velocity/user-guide.html.

An example template is shown in Figure 6-7, "Example Template."

Figure 6-7 Example Template



ISC has the template system predefined variable **$TMSystem** that can be used within the template body text to access template system functions. The syntax is as follows, where, $ipAddrMask is a string that contains an IP address and its mask in the format of: 10.33.4.5/30:

$TMSystem.getAddr ($ipAddrMask) returns: 10.33.4.5

$TMSystem.getMask ($ipAddrMask) returns: 255.255.255.252

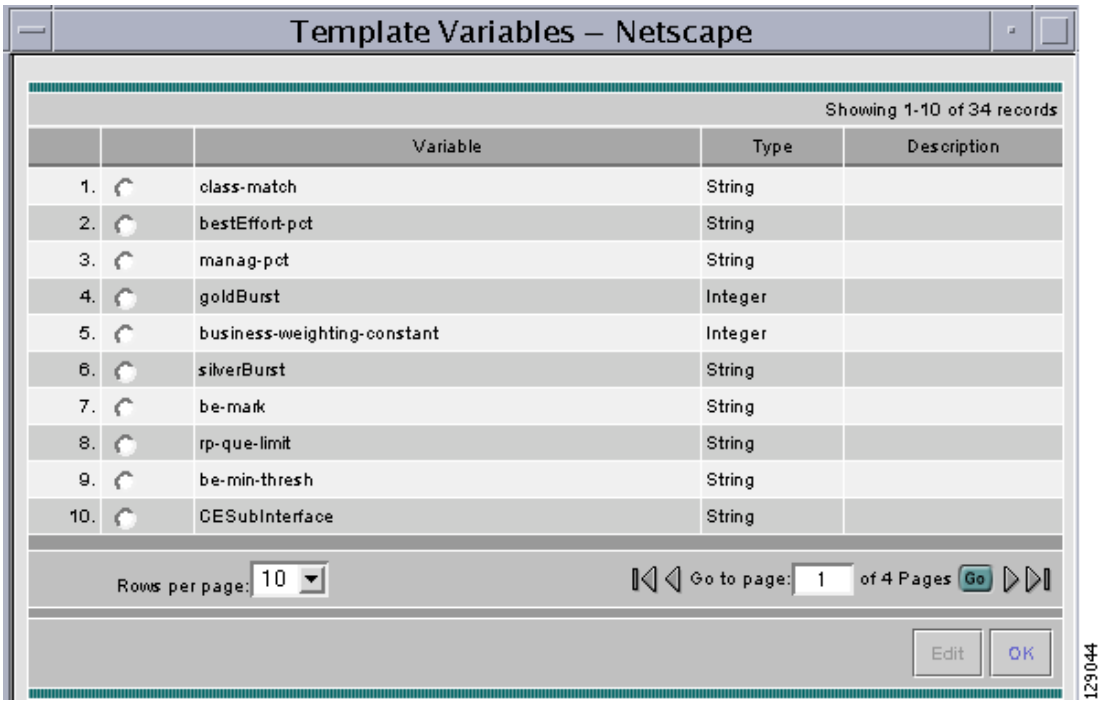
$TMSystem.getReverseMask ($ipAddrMask) returns: 0.0.0.3

$TMSystem.getNetworkAddr ($ipAddrMask) returns: 10.33.4.4

$TMSystem.getClassfulNetworkAddr ($ipAddrMask) returns: 10.0.0.0

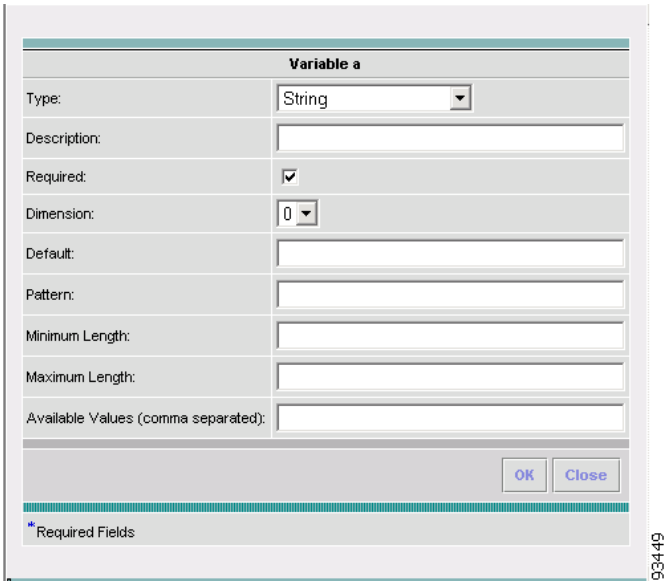
Step 6 Click the **Select & Click Go** drop-down button. If you want to validate the information you entered in Step 5, select **Validate** and then click the **Go** button. Otherwise, select **Variables** and then click the **Go** button and you receive a window as in Figure 6-8, Template Variables".

Figure 6-8 Template Variables



Step 7 Click the radio button for the Variable you want to edit and click **Edit**. You receive a window as in Figure 6-9, "Variable Definition—Type String."

Figure 6-9 Variable Definition—Type String



Step 8 In Figure 6-9, click the drop-down menu for **Type** to receive the following choices:

- **String** Proceed to Step 9.
- **Integer** Proceed to Step 10.

- **Float** Proceed to Step 11.
- **IPv4** Address Proceed to Step 12.
- **Sub-Template** Proceed to Step 13.
- **Dynamic Java Class** Proceed to Step 14.
- **Dynamic URL** Proceed to Step 15.

Step 9 The default Type to appear is **String**, a combination of ASCII characters considered as a group. The resulting Variable window is shown in Figure 6-9 and its attributes are as follows:

- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.
- **Dimension** Choose **0** (default), which indicates a scalar or enum variable; choose **1**, in which case the variable becomes a one-dimensional array; or choose **2**, in which case the variable becomes a two-dimensional array.
- **Default** (optional) If there is a default value for the specified variable, specify it here. If you also have **Available Values** defined, this default value must be an **Available Value**.
- **Pattern** (optional) Specify a regular expression pattern of the string. For example, a pattern of **isc[0-9]+** defines a string that starts with **isc** followed by one or more digits from **0** to **9**.
- **Minimum Length** (optional) If you specify a minimum length, the string cannot be less than the length specified here.
- **Maximum Length** (optional) If you specify a maximum length, the string cannot exceed the length specified here.
- **Available Values** (optional) Enter string values for this variable. Separate the values by commas.

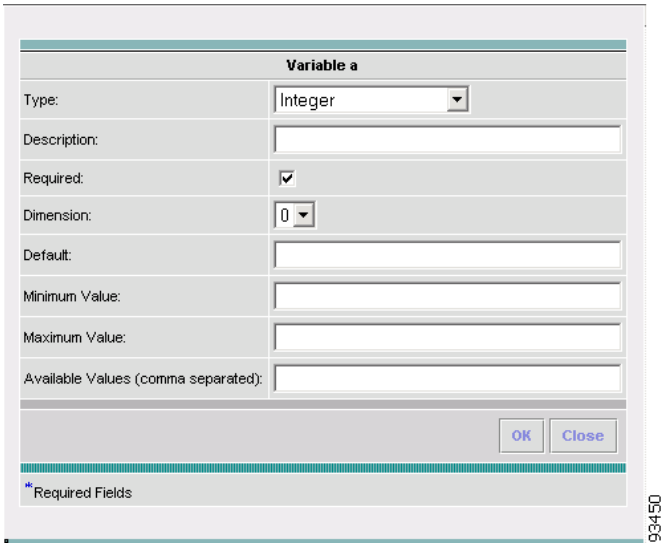
After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Step 10 When you choose the Type **Integer**, a whole number, the resulting Variable window is shown in Figure 6-10 and its attributes are as follows:

- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.
- **Dimension** Choose **0** (default), which indicates a scalar or enum variable; choose **1**, in which case the variable becomes a one-dimensional array; or choose **2**, in which case the variable becomes a two-dimensional array.
- **Default** (optional) If there is a default value for the specified variable, specify it here. If you also have **Available Values** defined, this default value must be an **Available Value**.
- **Minimum Value** (optional) If you specify a minimum value, the integer cannot be less than the value specified here.
- **Maximum Value** (optional) If you specify a maximum value, the integer cannot exceed the value specified here.
- **Available Values** (optional) Enter integer values for this variable. Separate the values by commas.

After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Figure 6-10 Variable Definition—Type Integer

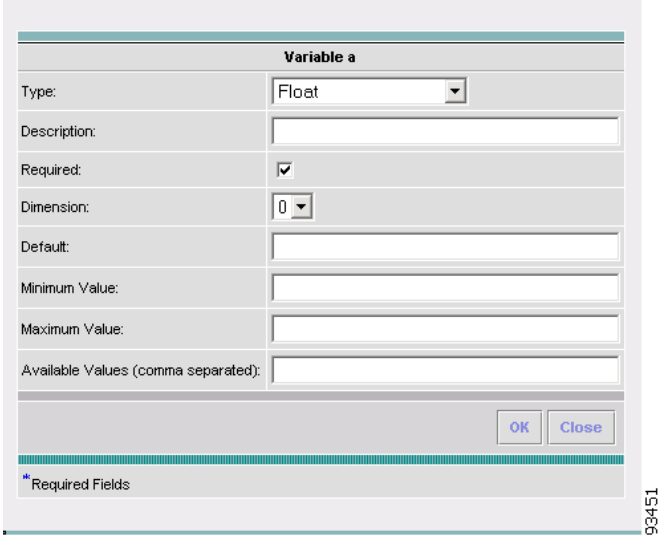


Step 11 When you choose the Type **Float**, a number that has no fixed number of digits before or after the decimal point, the resulting Variable window is shown in Figure 6-11 and its attributes are as follows:

- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.
- **Dimension** Choose **0** (default), which indicates a scalar or enum variable; choose **1**, in which case the variable becomes a one-dimensional array; or choose **2**, in which case the variable becomes a two-dimensional array.
- **Default** (optional) If there is a default value for the specified variable, specify it here. If you also have **Available Values** defined, this default value must be an **Available Value**.
- **Minimum Value** (optional) If you specify a minimum value, the floating point value cannot be less than the value specified here.
- **Maximum Value** (optional) If you specify a maximum value, the floating point value cannot exceed the value specified here.
- **Available Values** (optional) Enter floating point values for this variable. Separate the values by commas.

After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Figure 6-11 Variable Definition—Type Float

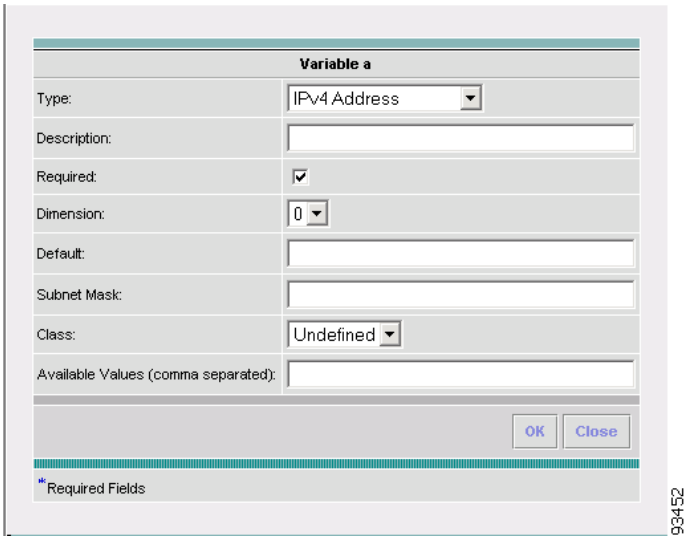


Step 12 When you choose the Type **IPv4**, the resulting Variable window is shown in Figure 6-12 and its attributes are as follows:

- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.
- **Dimension** Choose **0** (default), which indicates a scalar or enum variable; choose **1**, in which case the variable becomes a one-dimensional array; or choose **2**, in which case the variable becomes a two-dimensional array.
- **Default** (optional) If there is a default value for the specified variable, specify it here. If you also have **Available Values** defined, this default value must be an **Available Value**.
- **Subnet Mask** (optional) Enter a valid subnet mask.
- **Class** (optional) Enter the class of the IP address. The options are: **A**, **B**, or **C**.
- **Available Values** (optional) Enter IPv4 values for this variable. Separate the values by commas.

After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Figure 6-12 Variable Definition—Type IPv4



Step 13 When you choose the Type **Sub-Template**, you instantiate one subtemplate into the Main template. The resulting Variable window is shown in Figure 6-13 and its attributes are as follows:

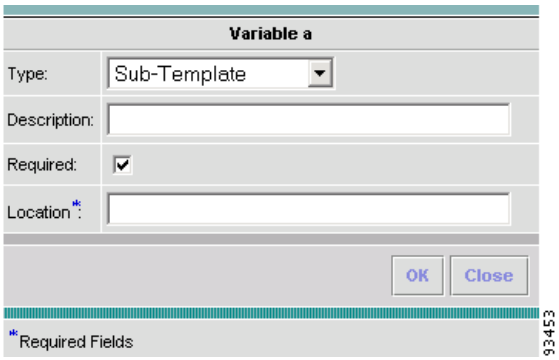
- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.
- **Location** (required) Enter the full path name of the parent template. For example **/test2/testyy**.

The variable varName is defined as the subtemplate type (by selecting **Variables** and clicking **Go**). The Sub-Template defined earlier is called and you must provide the subtemplate path. The syntax is as follows:

$<*varName*>**.callWithDatafile (**<*DatafileName*>**)**

After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Figure 6-13 Variable Definition—Type Sub-Template



Step 14 When you choose the Type **Dynamic Java Class**, the resulting Variable window is shown in Figure 6-14 and its attributes are as follows:

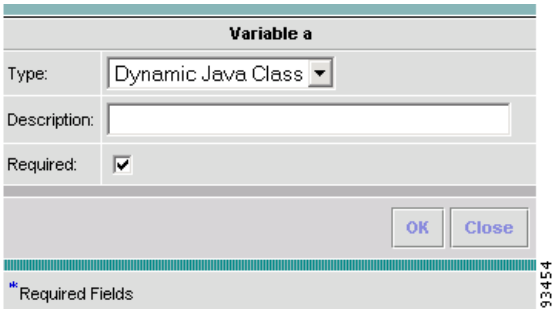
- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.

The variable varName is defined as the Dynamic Java Class type (by selecting **Variables** and clicking **Go**). The syntax is as follows:

$<*varName*>**.**<*method_name_in_Java_class*> ([<*parameters*>])

After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Figure 6-14 Variable Definition—Type Dynamic Java Class



Step 15 When you choose the Type **Dynamic URL**, the resulting Variable window is shown in Figure 6-15 and its attributes are as follows:

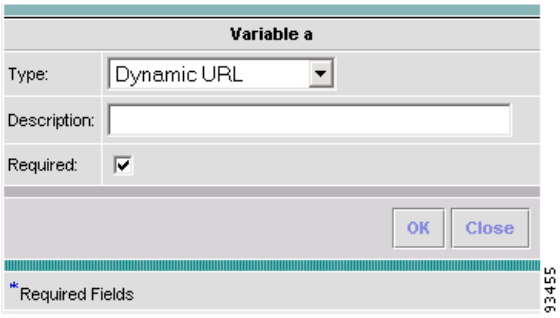
- **Description** (optional) You can enter any descriptive statement about this variable here.
- **Required** Leave the default of the selected check box if this variable is required. Otherwise, deselect it.

The variable varName is defined as the Dynamic URL type (by selecting **Variables** and clicking **Go**). The syntax is as follows:

$<*varName*>**.callURL** (<*url-address*>)

After you enter all the data, click **OK** to accept this information for the specified variable; continue editing all variables you want to change in this same way, then click **OK** in a window such as Figure 6-8, which now includes these updated variables; click **Save** and then **Close** or click **Close** and when asked, agree to **Save** for a window such as Figure 6-6. Create a Data File is shown in the "Create Data File" section on page 6-14, **Edit** is shown in the "Edit" section on page 6-19, and **Delete** is shown in the "Delete" section on page 6-21.

Figure 6-15 Variable Definition—Type Dynamic URL



Copying Templates

You can copy a template and paste it into another folder, as follows:

Step 1 Select a template and then right-click and you receive the opportunity to copy. Click **Copy**.

Step 2 Select the folder into which you want to paste the copied template and all its data files. Right-click and you receive the opportunity to paste. Click **Paste**.

Step 3 You will see the new template and all its data files in the selected location. You can edit and rename from there.

Create Data File

You can create a new data file from an existing template. If the template you want is not available, go to the "Create Template" section on page 6-5.

To create a data file, do the following:

Step 1 Navigate to **Service Design** > **Templates**.

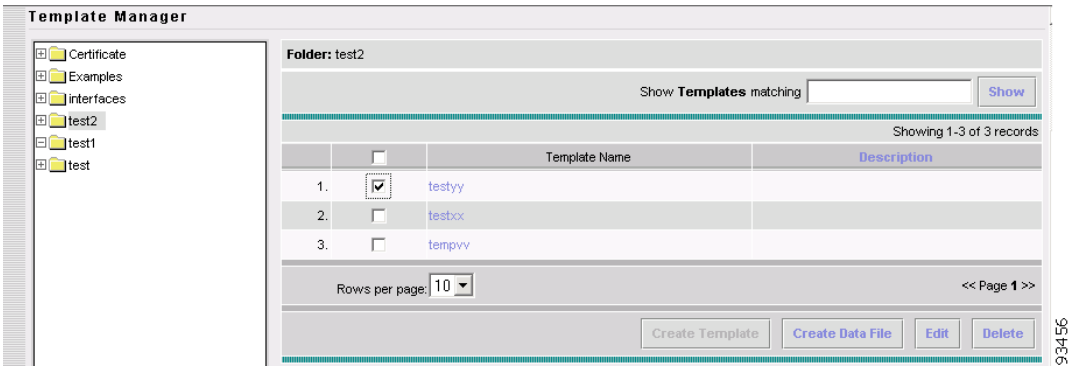
Step 2 In the **Templates** tree in the left part of your window, do one of the following

1. Left-click on the folder or subfolder in which the template for which you want to create a data file exists or

2. Click on the + next to the folder of choice and then click on the template for which you want to create a data file.

Step 3 If you chose 1. in Step 2, a window appears as shown in Figure 6-16, "Choose Existing Template > Create Data File."

Figure 6-16 Choose Existing Template > Create Data File

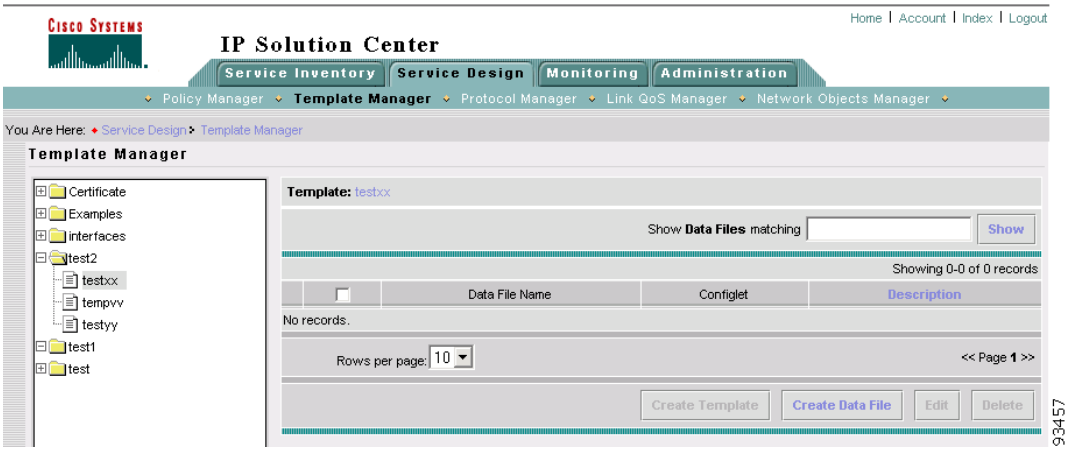


Select the check box for the template for which you want to create a data file and click **Create Data File**. Then proceed to Step 5.

Otherwise, proceed to Step 4.

Step 4 If you chose 2. in Step 2, the buttons appear as shown in Figure 6-17, "Choose Existing Template > Create Data File."

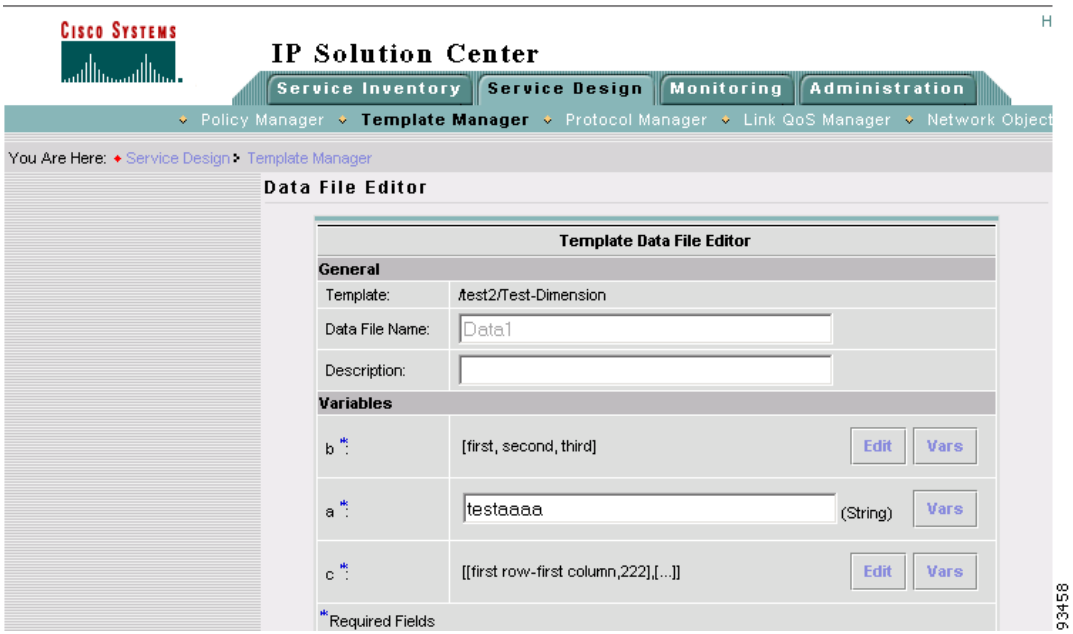
Figure 6-17 Choose Existing Template > Create Data File



Click **Create Data File** and proceed to Step 5.

Step 5 An example of a window that appears is shown in Figure 6-18, "Template Data File Editor."

Figure 6-18 Template Data File Editor



Step 6 In the **General** area, fill in the following:

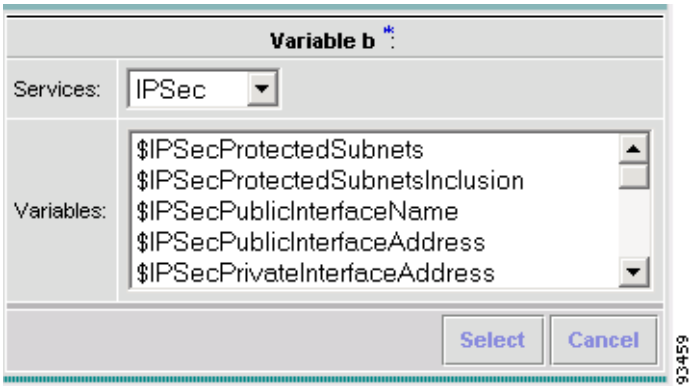
- **Data File Name** (required) This must be a unique name. This name must begin with an alphabetic character and can only contain alphanumeric characters and the underscore.
- **Description** (optional) Enter any description that helps you identify this data file.

Step 7 In the example in Figure 6-18, in the **`Variables`** area, **a** is a string variable (**Dimension** defined when the template was created was **0**); **b** is a one-dimensional array (**Dimension** defined when the template was created was **1**); and **c** is a two-dimensional array (**Dimension** defined when the template was created was **1**).

If **a** is a Dynamic Java Class variable, you *must* enter the entire Java Class package name. For example: com.cisco.isc.class_name.

Step 8 If you click **Vars** as shown in Figure 6-18, you receive a window as shown in Figure 6-19, "Template Data File Editor."

Figure 6-19 Template Data File Editor



Click the **Services** drop-down menu to have access to variables for:

- **IPsec - NOT SUPPORTED in this release. -**
- **IPsecRA** (IPsec Remote Access) **- NOT SUPPORTED in this release. -**
- **NAT - NOT SUPPORTED in this release. -**
- **MPLS**
- **L2VPN**

Then click the entry in **Variables** that you want to use and click **Select**.

If you have a **0** dimensional entry (set as **Dimension 0** when creating a template), you can only enter variables in the provided field.

Step 9 When you click **Edit**., as shown in Figure 6-18, the resulting window depends on whether you are editing a **1** or **2** dimensional array.

Proceed to Step 10 for information about a **1** dimensional array.

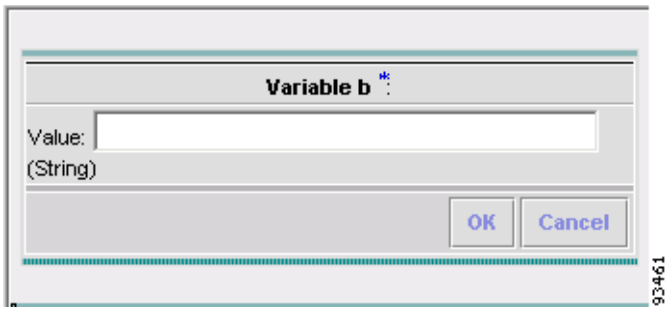
Proceed to Step 13 for information about a **2** dimensional array.

Step 10 For a one-dimensional array (set as **Dimension 1** when creating the template), when you click **Edit**, you receive a window as shown in Figure 6-20, "Editing a One-Dimensional Array."

Figure 6-20 Editing a One-Dimensional Array

Step 11 To add a variable, click **Add** and a window, as shown in Figure 6-21, "Adding a Variable," appears in which you can add the variable. Then click **OK**.

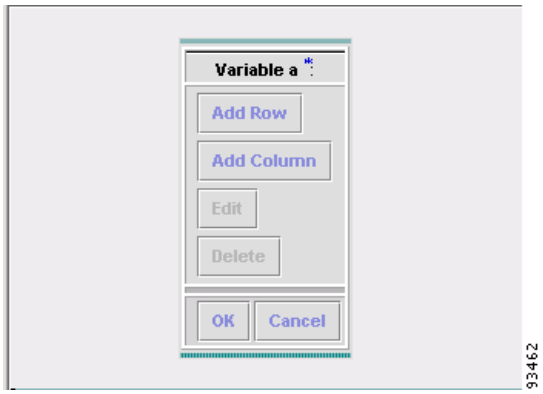
Figure 6-21 Adding a Variable



Step 12 To edit or delete a variable, highlight the variable in Figure 6-20 and click **Edit** or **Delete**. For **Edit** you receive a figure as in Figure 6-21. Then click **OK**. For **Delete**, *be sure* you want to delete. After you click **Delete**, it automatically occurs and the window is updated. Proceed to Step 19.

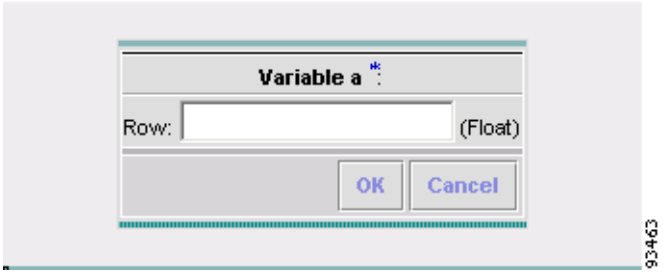
Step 13 For a two-dimensional array (set as **Dimension 2** when creating the template), when you click **Edit**, you receive a window as shown in Figure 6-22, "Editing a Two-Dimensional Array.

Figure 6-22 Editing a Two-Dimensional Array



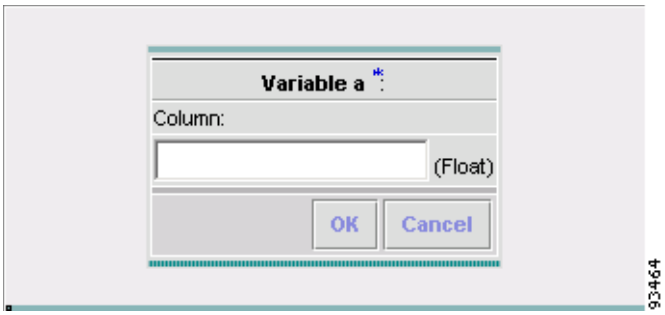
Step 14 Click **Add Row** in Figure 6-22 and a window, as shown in Figure 6-23, "Enter Row Information," appears. Enter a value and click **OK**.

Figure 6-23 Enter Row Information



Step 15 Click **Add Column** in Figure 6-22 and a window as shown in Figure 6-24, "Enter Column Information," appears. Enter a value and click **OK**.

Figure 6-24 Enter Column Information



Step 16 A resulting window, as shown in Figure 6-25, "Two-Dimensional Array Results," appears.

Figure 6-25 Two-Dimensional Array Results

Step 17 You can select any of the check boxes (toggles) and you can then **Edit** or **Delete** that row or column. You can also continue to **Add Row** and **Add Column** as shown in Step 15 and Step 16, respectively.

Step 18 When you complete setting up your two-dimensional array, click **OK** in Figure 6-25.

Step 19 A window as shown in Figure 6-18 is updated to reflect the new data file information.

Step 20 You can then click **Save** and then **Close** to save this information and close this file; click **Configure** to show the configuration file; or click **Close** and then be sure to click **OK**, if you want to save the information you have created. If you do not want to save this information, click **Close** and then click **Cancel**.

Edit

To edit a Template or Data File, do the following:

Step 1 Navigate to **Service Design > Templates**.

Step 2 In the **Templates** tree, left-click on the folder or subfolder in which the template you want to edit exists or the template in which the data file you want to edit exists. Alternatively, when the name in the upper left corner of the data pane is a template, you can click on the template name to edit the template.

Step 3 To edit a template, a window appears as shown in Figure 6-26, "Choose Existing Template > Edit." To edit a data file, a window appears as shown in Figure 6-27, "Choose Existing Data File > Edit."

Figure 6-26 Choose Existing Template > Edit

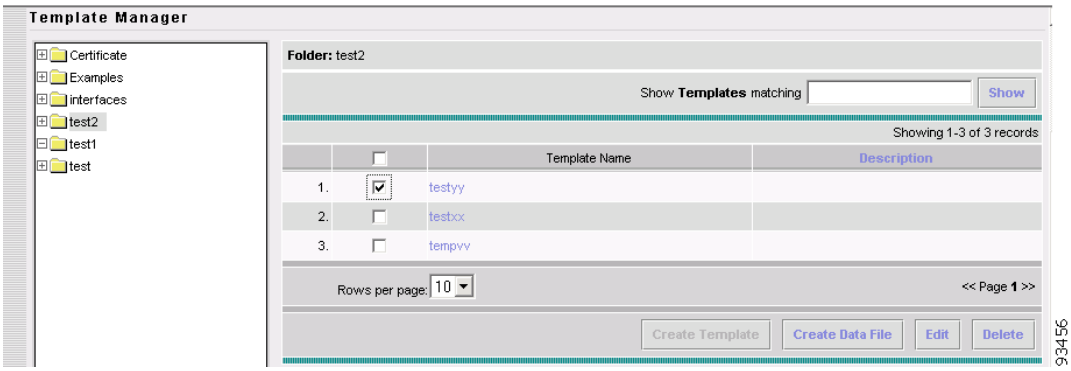
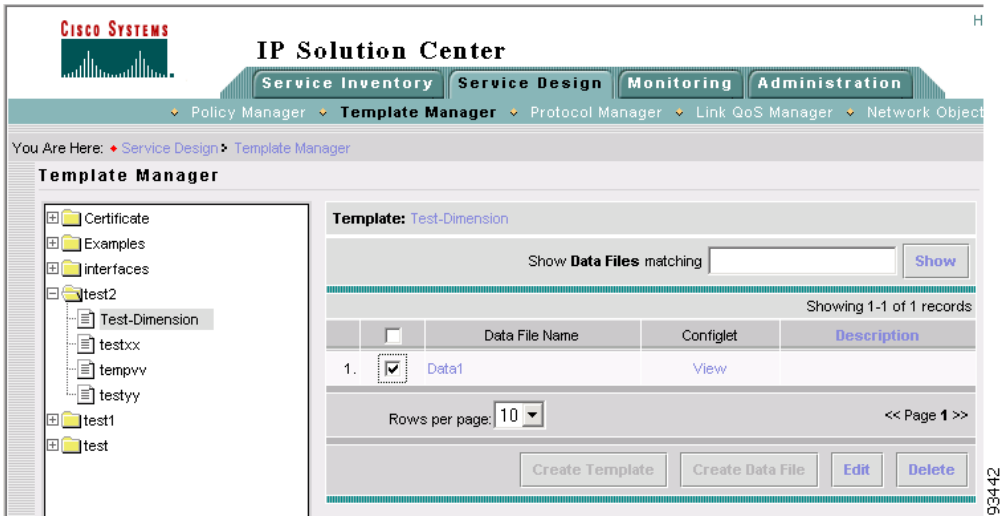


Figure 6-27 Choose Existing Data File > Edit



Step 4 Select the check box for the template or data file you want to edit.

Note For a data file, there is a **Configlet** column in which you can click **View** to view the configuration file.

Step 5 Click **Edit**.

Step 6 When editing a template, you receive a window as shown in Figure 6-6, "Template Editor." Then proceed as in in the "Create Template" section on page 6-5. When editing a data file, you receive a window as shown in Figure 6-17, "Choose Existing Template > Create Data File." Then proceed as in Step 5 in the "Create Data File" section on page 6-14.

Delete

To delete a Template or Data File, do the following:

Step 1 Navigate to **Service Design > Templates**.

Step 2 In the **Templates** tree, left-click on the folder or subfolder in which the template you want to delete exists or the template in which the data file you want to delete exists.

Step 3 To delete a template, a window appears as shown in Figure 6-28, "Choose Existing Template > Delete." To delete a data file, a window appears as shown in Figure 6-29, "Choose Existing Data File > Delete."

Figure 6-28 Choose Existing Template > Delete

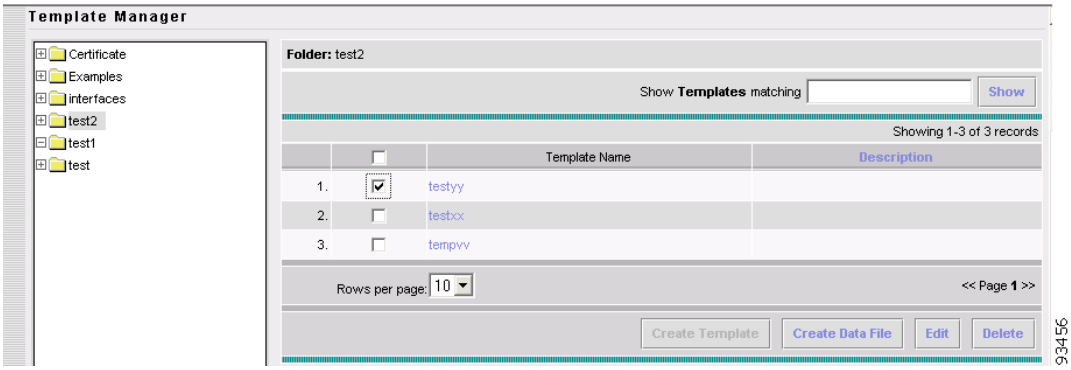
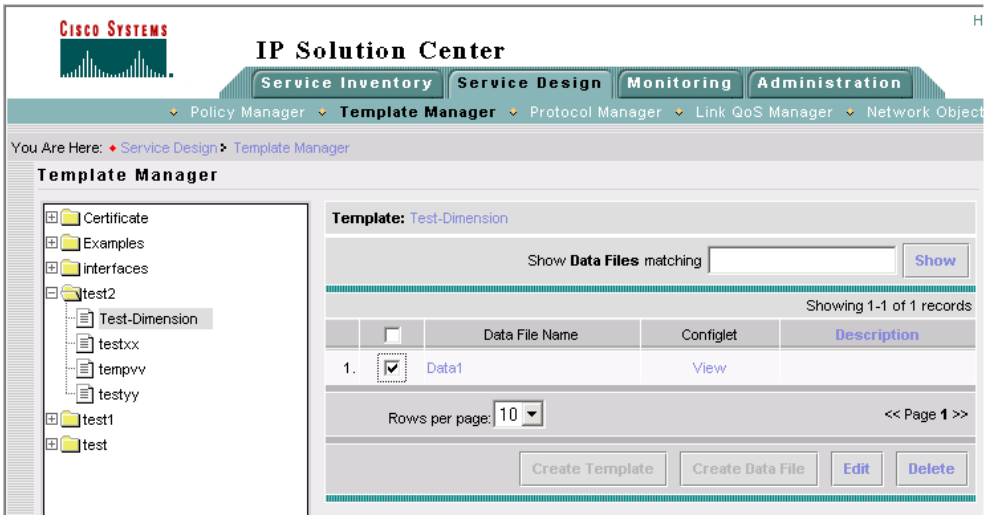


Figure 6-29 Choose Existing Data File > Delete



Step 4 Select the check box for the template or data file you want to delete.

Note For a data file, there is a **Configlet** column in which you can click **View** to view the configuration file.

Step 5 Click **Delete**.

Step 6 You receive an updated window as shown in Figure 6-28, "Choose Existing Template > Delete" or Figure 6-29, "Choose Existing Data File > Delete" with the deleted template or data file no longer available.

Template Examples

In the left column, the hierarchy pane, of **Service Design > Templates**, as shown in Figure 6-2, "Templates," template examples appear. See Table 6-1, "Template Examples and Their Descriptions."

Table 6-1 Template Examples and Their Descriptions

Folder	Template	Description
Certificate	Cert-Enrollment	Cisco IOS commands to generate private/public key pair for this router.
	Cert-Enrollment-During-BootStrap	Example that generates the PKSC12 package for the specified device and imports the package to the device. Both runscep and runscep_ms take the following parameter. $ms_ca_server indicates if the CA server is Microsoft Certificate Server. Usage: /vob/ntg/dev/bin/runscep <*FQDN of Router*> <*URL of CA Server*> <*challenge password*> <*common name*> <*privatekey size*> [client-email]
	RSA-Key-Generation	Cisco IOS commands to generate private/public key pair for this router.
	Root-Cert-By-Auth	Sample Cisco IOS template to authenticate root certificate server and obtain root certificate.
	Root-Cert-Import	Sample Cisco IOS template to import root certificate to the router.
DIA-Channelization	10K-CHOC12-STS1-PATH	Sample template to break down channelized OC12 to STS-1 paths.
	10K-CT3-CHANNELIZED	Sample template creates T1 out of channnelized T3 line card.
	10K-CT3-UNCHANNELIZED	Sample template Creates either a fullrate T3 or a subrate T3 interface out of a channelized T3.
	PA-MC-E3-CHANNELIZED	Sample template Creates E1 (channel groups) out of E3.
	PA-MC-STM1-AU3-CHANNELIZE	Sample template Creates E1 (channel groups) out of TUG-2. This template uses AU-3 AUG mapping that further creates TUG-2s.

Table 6-1 Template Examples and Their Descriptions (continued)

Folder	Template	Description
	PA-MC-STM1-AU4-CHANNELIZE	Sample template Creates E1 (channel groups) out of TUG-2. This template uses AU-4 AUG mapping that creates TUG-3s and TUG-2s.
	PA-MC-T3-CHANNELIZED	Sample template Creates T1 (channel groups) out of T3.
Examples	AccessList	Demonstrates templates with nested repeat loop and multi-dimension variable.
	AccessList1	Demonstrates the simplest template variable substitution.
	CEWanCOS	Demonstrates if-else statements, repeat statements, mathematical expressions, and one-dimensional variables.
Firewall-IPsec **- NOT SUPPORTED in this release. -**	Permit-IPsec-IOS	Allow only IPsec traffic, management traffic, and data traffic that came through an IPsec tunnel on a Cisco IOS router.
	Permit-IPsec-PIX	Sample Cisco IOS template to enroll with root certificate server and obtain certificate of this router.
IDS/ Audit	Set-Audit_Rule	Set up ACLs for the audit rule. Set up the audit rule for signatures of information and attack types. Apply the audit rule to the interfaces.
IDS/ Initialization	Set-Thresholds	Set the threshold beyond which spamming in e-mail messages is suspected. Set the threshold beyond which queued events are dropped from the event queue for sending to the NetRanger Director.
IDS/ Notification	Notify-Director	Specify the messages in NetRanger format for event notification. Specify the local Post Office parameters used when sending event notification to the NetRanger Director. Specify Post Office parameters for the NetRanger Director receiving event notification from the router.
	Notify-Syslog-Console	Specify the messages in the syslog format for event notification. Specify the syslog console as the event destination.
	Notify-Syslog-Server	Specify the messages in the syslog format for event notification. Specify the syslog server as the event destination.

Table 6-1 Template Examples and Their Descriptions (continued)

Folder	Template	Description
IDS/ Signature	Disable-Signatures	Disable individual signatures.
	Enable-Signatures	Enable a list of signatures or qualify the audit of the signatures with an access control list.
interfaces **- NOT SUPPORTED in this release. -**	noshutdownIf	Brings up all nonsecured interfaces of a given device in the IPsec Service Request.
	shutdownIf	Shuts down all nonsecured interfaces of a given device in the IPsec Service Request.
vpn3000/ Events **- NOT SUPPORTED in this release. -**	EmailRecipient-Create	Creates an e-mail recipient record.
	EmailRecipient-Modify	Modifies an e-mail recipient record.
	EventClass-Create	Sets up EventClass record parameters.
	EventClass-Modify	Modifies a particular event class.
	FTPLogBackup	Sets up FTP log back up parameters.
	General-Event	Sets up general event parameters.
	SMTPServer-Create	Creates an Simple Mail Transfer Protocol (SMTP) server.
	SMTPServer-Modify	Modifies SMTP server parameters.
	SyslogServer-Create	Sets up syslog server record parameters.
	SyslogServer-Modify	Modifies syslog server record parameters.
	TrapDestination-Create	Sets up Trap Destination record parameters.
	TrapDestination-Modify	Modifies a particular trap destination.
vpn3000/ Routing **- NOT SUPPORTED in this release. -**	Create-OSPFArea	Creates general OSPF Area parameters.
	Default-Gateway	Sets up a default gateway.
	Ethernet-OSPF	Configures an Open Shortest Path First (OSPF) interface of a particular Ethernet interface.
	Ethernet-RIP	Sets up a Routing Information Protocol (RIP) protocol for a particular Ethernet interface.
	General-OSPF	Sets up General OSPF parameters.
	Modify-OSPFArea	Modifies a particular OSPF area.

Table 6-1 Template Examples and Their Descriptions (continued)

Folder	Template	Description
	Static-Routes	Configures static route records.
	VRRP	Sets up VRRP redundancy
vpn 3000/ Servers **- NOT SUPPORTED in this release. -**	DHCP-Server	Sets up Dynamic Host Configuration Protocol (DHCP) server parameters.
	DHCP-Server-Modify	Modifies DHCP server parameters.
	DNS-Server	Sets up Domain Name System (DNS) server parameters.
	FTP-Server	Sets up File Transfer Protocol (FTP) server parameters.
	HTTP-Server	Sets up Hypertext Transfer Protocol (HTTP) server parameters.
	SNMP-Communities	Sets up an SNMP communities string.
	SNMP-Server	Sets up SNMP server parameters.
	SSH	Sets up SSH record parameters.
	SSL	Sets up SSL record parameters.
	TFTP-Server	Sets up Trivial File Transfer Protocol (TFTP) server parameters.
	Telnet-SSL-Server	Sets up telnet over Secure Socket Layer (SSL) parameters.
	Telnet-Server	Sets up telnet server parameters.

Summary of Repository Variables

This section contains the following tables:

- Table 6-2 on page 6-26, "IPsec Remote Access Repository Variables - NOT SUPPORTED in this release. -"
- Table 6-3 on page 6-26, "IPsec Site-to-Site Repository Variables - NOT SUPPORTED in this release. -"
- Table 6-4 on page 6-29, "L2VPN Repository Variables"
- Table 6-5 on page 6-32, "MPLS Repository Variables"
- Table 6-6 on page 6-39, "NAT Repository Variables - NOT SUPPORTED in this release. -"
- Table 6-7 on page 6-40, "QoS Repository Variables"
- Table 6-8 on page 6-41, "VPLS Repository Variables"

Table 6-2 provides a summary of the IPsec Remote Access Repository variables available from ISC Templates.**- NOT SUPPORTED in this release. -**

Table 6-2 IPsec Remote Access Repository Variables - NOT SUPPORTED in this release. -

Repository Variable	Dimension	Description	Example
RA-AAServerNameList	1	List of authentication server names	North_Am_AA
RA-GroupNameList	1	List of Group names	North_AM_Sales
RA-IPSecPrivateInterfaceAddress (also known as RA-UnsecureInterfaceIPAddressMask\List	1	List of private interface IP addresses and their subnet masks	171.23.44.33/24 171.23.45.33/24
RA-IPSecPrivateInterfaceName (also known as RA-UnsecureInterfaceNameList)	1	List of private interface names	Ethernet0, Ethernet1
RA-IPSecProtectedSubnets (also known as RA-LocalProtectedIPAddressMaskList	1	List of IP address ranges and subnet masks protected by this edge device	209.165.20.129/30 209.165.20.130/30 ...
RA-IPSecProtectedSubnetsInclusion	1	Specifies whether the current prefix is to be included or excluded	true, false
RA-IPSecPublicInterfaceAddress (also known as RA-SecureInterfaceIPAddressMaskList)	1	List of public interface IP addresses and their masks	192.209.10.10/30 192.209.11.10/30
RA-IPSecPublicInterfaceName (also known as RA-SecureInterfaceNameList)	1	List of CPE's public interface names	Serial0/0, Serial0/1
RA-SplitTunnelingNetworkLists	2	List of split-tunneling networks	List 0 (Sales Group) 10.1.1.0/24 10.1.2.0/24
RA-SplitTunnelingTypeList	1	List of split-tunneling types	Entry 0 (Acct Group) in-list Entry1 (Mkt Group) in-list

Table 6-3 provides a summary of the IPsec Site-to-Site Repository variables available from ISC Templates. **- NOT SUPPORTED in this release. -**

Table 6-3 IPsec Site-to-Site Repository Variables - NOT SUPPORTED in this release. -

Repository Variable	Dimension	Description	Example
IPSecEigrpAsNumber	0	EIGRP AS number	193
IPSecGreDeleteInterfaceName	1	DMVPN GRE interface name to be deleted	Tunnel0, Tunnel2

Table 6-3 IPsec Site-to-Site Repository Variables (continued) - NOT SUPPORTED in this release. -

Repository Variable	Dimension	Description	Example
IPSecGreInterfaceName	1	DMVPN GRE interface name to be added	Tunnel0, Tunnel2
IPSecMultipointGreDeleteInterface Name	1	List of GRE point-to-multipoint interfaces to be deleted	Tunnel0, Tunnel2
IPSecMultipointGreInterfaceName	1	List of GRE point-to-multipoint interfaces created by ISC	Tunnel0, Tunnel2
IPSecOspfAreaId	0	OSPF Area ID	0
IPSecOspfProcessId	0	OSPF router process ID	10
IPSecPrivateInterfaceAddress	1	List of private interfaces IP addresses	209.165.202.131, 209.165.203.131
IPSecPrivateInterfaceName	1	List of private interface names	Ethernet1, Ethernet0
IPSecPrivateTunnelEndptInterface Address	0	IPsec private tunnel endpoint IP address	2.2.2.2/24
IPSecPrivateTunnelEndptInterfaceName	0	IPsec private tunnel endpoint interface names	FastEthernet0/1
IPSecProtectedSubnets	1	List of IP addresses protected by this edge device	1.1.1.0/24, 1.1.1.3/0...
IPSecProtectedSubnetsInclusion	1	Specifies whether the current prefix is to be included or excluded	true, false
IPSecPublicInterfaceAddress	1	List of IP addresses for the CPE's public interfaces	209.165.202. 129/24, 209.165.203. 129/24
IPSecPublicInterfaceName	1	List of public interface names	Serial1/1, Serial1/2
IPSecPublicTunnelEndptInterface Address	0	IPsec tunnel endpoint interface address	1.1.1.1/24
IPSecPublicTunnelEndptInterfaceName	0	IPsec tunnel endpoint interface name	Serial1/1
IPSecRemoteAddress	1	List of IPsec endpoint's IP addresses for remote peers	209.165.202. 131/28, 209.165.203. 131/24
IPSecRemoteDeviceType	1	Type of the remote device	Cisco IOS, PIX, VPN 3000

Table 6-3 IPsec Site-to-Site Repository Variables (continued) - NOT SUPPORTED in this release. -

Repository Variable	Dimension	Description	Example
IPSecRemoteFailoverAddress	2	IPsec tunnel endpoint IP address for the remote peers	209.165.202.131/28, 209.165.203.131/24
IPSecRemoteFailoverDeviceType	2	Remote failover device type	PIX, Cisco IOS, VPN 3000,...
IPSecRemoteFailoverGreInterfaceName	2	Name of the GRE point-to-point interface created to the remote failover devices	Tunnel1, Tunnel2,...
IPSecRemoteFailoverHostName	2	List of failover devices for the remote peers	IPsec_Atlanta, IPsec_NY,...
IPSecRemoteFailoverWildcardPreshared Key	2	Wildcard preshared key for remote failover devices	<*my_secret1*>, <*my_secret2*>,...
IPSecRemoteGreInterface Name	1	Name of the GRE point-to-point interface created for the remote peer	Tunnel1, Tunnel2
IPSecRemoteHostName	1	List of remote peer host names	IPsec_Atlanta, IPsec_NY
IPSecRemoteOpType	1	Operation type for the current tunnel	ADD, DELETE
IPSecRemotePresharedKey	1	List of preshared keys to be used to establish tunnels with remote peers	<*secret_value1*>, <*secret_value2*> Note: Keys are 128 alphanumeric characters
IPSecRemoteSiteName	1	Names of remote sites	San Jose, New York
IPSecRemoteSubnets	2	List of IP addresses protected by remote peers	209.165.202.129 209.165.202.130...
IPSecRemoteSubnetsInclusion	2	Specifies whether the current remote prefix is to be included or excluded	true, false,...
IPSecRemoteWildcardPresharedKey	1	Wildcard preshared key for remote devices	<*secret_value1*>, <*secret_value2*> Note: Keys are 128 alphanumeric characters
IPSecRoutingProtocol	0	IPsec VPN routing protocol	NONE or OSPF

Table 6-3 IPsec Site-to-Site Repository Variables (continued) - NOT SUPPORTED in this release. -

Repository Variable	Dimension	Description	Example
IPSecStaticAdminDistance	0	Administration distance for static routes	1
IPSecTopologyRole	0	Topology role for the current device	HUB, SPOKE

Table 6-4 provides a summary of the L2VPN Repository variables available from ISC Templates.

Table 6-4 L2VPN Repository Variables

Repository Variable	Dimension	Description
AC_Loopback_Address	0	PE loopback address also known as the router ID
CE_DLCI	0	DLCI value on CE for Frame Relay encapsulation
CE_Encap	0	Encapsulation of the CE interface
CE_Intf_Desc	0	Interface description for the CE interface
CE_Intf_Main_Name	0	Major interface name for the CE interface
CE_Intf_Shutdown	0	Shutdown flag for the CE interface
CE_VCD	0	VCD value on CE for ATM encapsulation
CE_VCI	0	VCI value on CE for ATM encapsulation
CE_Vlan_ID	0	VLAN ID on CE for Ethernet encapsulation
CE_VPI	0	VPI value on CE for ATM encapsulation
L2VPNCLECeFacingEncapsulation	0	Encapsulation of the UNI
L2VPNCLECeFacingInterfaceName	0	Name of the UNI
L2VPNCLEPeFacingEncapsulation	0	Encapsulation of the NNI (should always be dot1q)
L2VPNCLEPeFacingInterfaceName	1	Name of the NNI (uplinks) (the number can be more than 1 in case of a ring topology, hence any array)
L2VPNDFBIT_SET	0	Indicates not to fragment the bit set (for L2TPv3 only)
L2VPNDynamicModeUseDefaults	0	Dynamic session setup using ISC default values (for L2TPv3 only)
L2VPN_intf_main_name	1	The main interface name for a CE or PE port
L2VPNIP_PMTU	0	Enable the discovery of the path MTU for tunneled traffic (for L2TPv3 only)
L2VPNIP_TOS	0	Configure the value of the TOS byte in IP headers of tunneled packets or reflects the TOS byte value from the inner IP header (for L2TPv3 only)

Table 6-4 L2VPN Repository Variables (continued)

Repository Variable	Dimension	Description
L2VPNIP_TTL	0	Configure the value of the time to live byte in the IP headers (for L2TPv3 only)
L2VPNL2TP_CLASS_NAME	0	The L2TP class name to overwrite the default L2TP class name (for L2TPv3 only)
L2VPNL2TPv3Sequence	0	Specifies the direction in which sequencing of data packets in a pseudo wire is enabled (for L2TPv3 only)
L2VPNLocalCookieHighValue	0	Specifies the last 4 bytes of the value that the peer PE must include in the cookie field of incoming L2TP packets (for L2TPv3 only)
L2VPNLocalCookieLowValue	0	Specifies the first 4 bytes of the value that the peer PE must include in the cookie field of incoming L2TP packets (for L2TPv3 only)
L2VPNLocalCookieSize	0	Specifies the size (0, 4, or 8) of the cookie field of incoming L2TP packets (for L2TPv3 only)
L2VPNLocalLoopBack	1	The head of the L2TPv3 tunnel
L2VPNLocalSessionId	0	Specifies the ID for the local L2TPv3 session (for L2TPv3 only)
L2VPNLocalSwitchLoopBack1	1	The loopback1 for the local switch (for L2TPv3 only)
L2VPNLocalSwitchLoopBack2	1	The loopback2 for the local switch (for L2TPv3 only)
L2VPNRemoteCookieHighValue	1	Specifies the last 4 bytes of the value that this PE must include in the cookie field of incoming L2RP packets (for L2TPv3 only)
L2VPNRemoteCookieLowValue	1	Specifies the first 4 bytes of the value that this PE must include in the cookie field of incoming L2RP packets (for L2TPv3 only)
L2VPNRemoteCookieSize	1	Specifies the size (0, 4, or 8) of the cookie field of outgoing L2TP packets (for L2TPv3 only)
L2VPNRemoteLoopback	0	The tail of the L2TPv3 tunnel
L2VPNRemoteSessionID	1	Specifies the ID for the remote L2TPv3 session (for L2TPv3 only)
L2VPNSessionSetupMode	0	Defines how the L2TPv3 session is set up (static or dynamic) (for L2TPv3 only)
L2VPNTransportMode	0	Defines how the L2TPv3 data is transferred (for Frame Relay: DLCI or Port; for ATM: VP or VC) (for L2TPv3 only)
L2VPNUniMajorInerfaceName	0	The main interface name of the UNI
L2VPNVcId	0	The virtual circuit ID of the L2TPv3 or AToM tunnel

Table 6-4 L2VPN Repository Variables (continued)

Repository Variable	Dimension	Description
PE_DLCI	0	DLCI value on PE for Frame Relay encapsulation
PE_Encap	0	Encapsulation of the PE interface
PE_Intf_Desc	0	Interface description for the PE interface
PE_Intf_Main_Name	0	Major interface name for the PE interface
PE_VCD	0	VCD value on PE for ATM encapsulation
PE_VCI	0	VCI value on PE for ATM encapsulation
PE_Vlan_ID	0	VLAN ID on PE for Ethernet encapsulation
PE_VPI	0	VPI value on PE for ATM encapsulation
PseudoWire_Class_Type_Of_Core	0	Core type of the Service Provider over which L2VPN is provisioned
Uni_Aging	0	Length of time the MAC address can stay on the port security table
Uni_Cdp_Enable	0	Flag to enable or disable layer 2 tunnelling on a Cisco Discover Protocol (CDP)
Uni_Cdp_Threshold	0	Number of packets per second to be received before the interface is shut down for the CDP protocol
Uni_Mac_Address	0	Number of MAC addresses allowed for port security
Uni_Port_Security	0	Flag to enable or disable security on a UNI interface
Uni_Protocol_Tunnelling	0	Flag to enable or disable Layer 2 Bridge Protocol Data Unit (BPDU) protocol tunnelling on a UNI interface
Uni_Recovery_Interval	0	Amount of time to wait before recovering a UNI port
Uni_Shutdown	0	Flag indicating whether the User Network Interface (UNI) is shutdown
Uni_Speed	0	Value of the UNI link speed
Uni_Stp_Enable	0	Flag to enable or disable layer 2 tunnelling on a Spanning Tree Protocol (STP)
Uni_Stp_Threshold	0	Flag to enable or disable layer 2 tunnelling on an STP
Uni_Violation_Access	0	Action taken when a port security violation is detected
Uni_Vtp_Enable	0	Flag to enable or disable layer 2 tunnelling on a VLAN Trunk Protocol (VTP)
Uni_Vtp_Threshold	0	Flag to enable or disable layer 2 tunnelling on a VTP

Table 6-5 provides a summary of the MPLS Repository variables available from ISC Templates.

Table 6-5 MPLS Repository Variables

Repository Variable	Dimension	Description
Advertised_Routes_To_CE	2	List of one or more IP addresses of the advertised static route to be placed on the PE to define the CE's address space
CE_BGP_AS_ID	0	BGP AS ID on a CE when the routing protocol between a CE and a PE is BGP
CE_DLCI	0	DLCI value on CE for Frame Relay encapsulation
CE_EIGRP_AS_ID	0	EIGRP AS ID on a CE when the routing protocol between a CE and a PE is EIGRP
CE_Facing_MVRFCE_BGP_AS_ID	0	BGP AS ID on an MVRFCE when the routing protocol between a CE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_DLCI	0	DLCI value on CE facing MVRFCE interface for Frame Relay encapsulation, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_EIGRP_AS_ID	0	EIGRP AS ID on an MVRFCE when the routing protocol between a CE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Intf	0	Name of the CE facing interface on an MVRFCE, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Intf_Address	0	IP address assigned to the CE facing MVRFCE interface, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Intf_Encap	0	Encapsulation for CE facing of an MVRFCE interface, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Intf_Name	0	Name of the CE facing MVRFCE interface, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Intf_Type	0	Interface type for CE facing of an MVRFCE interface, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Ospf_Process_ID	0	OSPF process ID on MVRFCE when the routing protocol between a CE and an MVRCE is OSPF, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_Tunnel_Src_ Addr	0	Tunnel source address on CE facing MVRFCE interface for GRE encapsulation when an MPLS link includes an MVRFCE

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
CE_Facing_MVRFCE_VCD	0	VCD value on CE facing MVRFCE interface for ATM encapsulation, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_VCI	0	VCI value on CE facing MVRFCE interface for ATM encapsulation, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_VLAN_ID	0	VLAN ID on CE facing MVRFCE interface for Ethernet encapsulation, when an MPLS link includes an MVRFCE
CE_Facing_MVRFCE_VPI	0	VPI value on CE facing MVRFCE interface for ATM encapsulation, when an MPLS link includes an MVRFCE
CE_Intf_Address	0	IP address assigned to the CE interface
CE_Intf_Encap	0	Encapsulation of the CE interface
CE_Intf_Name	0	Name of the CE interface
CE_MVRFCE_Bandwidth_Metric_For_ Redistribution	0	Bandwidth metric for redistribution of EIGRP when the routing protocol between a CE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFC
CE_MVRFCE_BGP_AS_ID	0	BGP AS ID on a CE when the routing protocol between a CE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
CE_MVRFCE_Delay_Metric_For_ Redistribution	0	Delay metric for redistribution of EIGRP when the routing protocol between a CE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFC
CE_MVRFCE_EIGRP_AS_ID	0	EIGRP AS ID on a CE when the routing protocol between a CE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
CE_MVRFCE_Loading_Metric_For_ Redistribution	0	Loading metric for redistribution of EIGRP when the routing protocol between a CE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFC
CE_MVRFCE_MTU_Metric_For_ Redistribution	0	MTU metric for redistribution of EIGRP when the routing protocol between a CE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFC
CE_MVRFCE_Ospf_Process_ID	0	OSPF process ID on CE when the routing protocol between a CE and an MVRCE is OSPF, when an MPLS link includes an MVRFCE

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
CE_Ospf_Process_ID	0	OSPF process ID on CE when the routing protocol between a CE and a PE is OSPF
CE_Tunnel_Src_Addr	0	Tunnel source address on CE for GRE encapsulation
CE_VCD	0	VCD value on CE for ATM encapsulation
CE_VCI	0	VCI value on CE for ATM encapsulation
CE_Vlan_ID	0	VLAN ID on CE for Ethernet encapsulation
CE_VPI	0	VPI value on CE for ATM encapsulation
Export_Map	0	Name of the export map associated with the VRF
Extra_CE_Loopback_Required	0	Flag to indicate whether an extra loopback request is required on the CE
Import_Map	0	Name of the import map associated with the VRF
Is_Default_Info_Originate	0	Flag to indicate whether the **default-information originate** command for BGP on the PE when STATIC is a running protocol between a CE and a PE
Is_Default_Routes_Sent_To_CE	0	Flag to indicate whether the default routes are sent to a remote CE
Join_Grey_Mgmt_Vpn	0	Flag to indicate whether MPLS will join a Grey Management VPN
Max_route_threshold	0	Percentage of the maximum number of routes that can be imported into the VRF
Max_Routes	0	Maximum number of routes than can be imported into the VRF
MPLSExportRouteTargets	1	List of Route Targets that are exported for a particular VRF associated with the MPLS VPN link
MPLSImportRouteTargets	1	List of Route Targets that are imported for a particular VRF associated with the MPLS VPN link
MPLSCLEPeFacingInterfaceName	0	The name of the interface on the device facing the PE for that particular MPLS VPN link
MPLSCLEPeFacingEncapsulation	0	The encapsulation of the interface on the device facing the PE for that particular MPLS VPN link
MPLSCLECeFacingInterfaceName	0	The name of the interface on the device facing the CE for that particular MPLS VPN link
MPLSCLECeFacingEncapsulation	0	The encapsulation of the interface on the device facing the CE for that particular MPLS VPN link

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
MPLSCeInterfaceMask	0	The mask of the IP address assigned to the CE interface for a particular MPLS VPN link
MPLSPeInterfaceMask	0	The mask of the IP address assigned to the PE interface for a particular MPLS VPN link
MPLSCeLoopbackAddress	0	The IP address of the extra CE loopback address for a particular MPLS VPN link
MVRFCE_CE_Advertised_Routes_To_CE	2	List of one or more IP addresses of the advertised static route to be placed on the PE to define the CE's address space, when the MPLS link includes an MVRFCE
MVRFCE_CE_IP_Unnumbered	0	Flag to indicate whether the MVRCE to CE link is unnumbered, when an MPLS link includes an MVRFCE
MVRFCE_CE_Is_Default_routes_Sent_To_CE	0	Flag to indicate whether the default routes are sent to a remote CE, when an MPLS link includes an MVRFCE
MVRFCE_CE_NBR_ALLOW_AS_IN	0	AllowASIn flag when the routing protocol between a CE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
MVRFCE_CE_NBR_AS_OVERRIDE	0	ASOverride flag when the routing protocol between a CE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
MVRFCE_CE_Ospf_Area_Number	0	OSPF area number when the routing protocol between a CE and an MVRCE is OSPF, when an MPLS link includes an MVRFCE
MVRFCE_CE_Routes_To_Reach_Other_Sites	2	List of one or more IP addresses to specify the static routes to put on the CE, when the MPLS link includes an MVRFCE
MVRFCE_CE_Routing_Protocol	0	Routing protocol between MVRFCE and CE
PE_BGP_AS_ID	0	BGP AS ID on a PE when the routing protocol between a CE and a PE is BGP
PE_Cable_Both_Helper_Address_List	1	List of DHCP server IP addresses to which both cable modem and host UDP broadcasts are forwarded
PE_Cable_Modem_Helper_Address_list	1	List of DHCP server IP addresses to which cable modem UDP broadcasts are forwarded
PE_Cable_Modem_Host_Helper_Address_List	1	List of DHCP server IP addresses to which host UDP broadcasts are forwarded
PE_Cable_Modem_Secondary_Address_List	1	List of cable modem secondary addresses for cable interfaces
PE_CE_Bandwidth_Metric_For_Redistribution	0	Bandwidth metric for redistribution of EIGRP when the routing protocol between a CE and a PE is EIGRP

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
PE_CE_Delay_Metric_For_ Redistribution	0	Delay metric for redistribution of EIGRP when the routing protocol between a CE and a PE is EIGRP
PE_CE_IP_Unnumbered	0	Flag to indicate whether the PE to CE link is unnumbered
PE_CE_Loading_Metric_For_ Redistribution	0	Loading metric for redistribution of EIGRP when the routing protocol between a CE and a PE is EIGRP
PE_CE_MTU_Metric_For_ Redistribution	0	MTU metric for redistribution of EIGRP when the routing protocol between a CE and a PE is EIGRP
PE_CE_NBR_Allow_AS_In	0	AllowASIn flag when the routing protocol between a CE and a PE is BGP
PE_CE_NBR_AS_Override	0	ASOverride flag when the routing protocol between a CE and a PE is BGP
PE_CE_Ospf_Area_Number	0	OSPF area number when the routing protocol between a CE and a PE is OSPF
PE_CE_Reliability_Metric_For_ Redistribution	0	Reliability metric for redistribution of EIGRP when the routing protocol between a CE and a PE is EIGRP
PE_CE_Routing_Protocol	0	Routing protocol between PE and CE
PE_DLCI	0	DLCI value on PE for Frame Relay encapsulation
PE_EIGRP_AS_ID	0	EIGRP AS ID on a PE when the routing protocol between a CE and a PE is EIGRP
PE_Facing_MVRFCE_BGP_AS_ID	0	BGP AS ID on an MVRFCE when the routing protocol between a PE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_DLCI	0	DLCI value on PE facing MVRFCE interface for Frame Relay encapsulation, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_EIGRP_AS_ID	0	EIGRP AS ID on an MVRFCE when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_Intf	0	Name of the PE facing interface on an MVRFCE, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_Intf_Address	0	IP address assigned to the PE facing MVRFCE interface, when an MPLS link includes an MVRFCE

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
PE_Facing_MVRFCE_Intf_Encap	0	Encapsulation for PE facing of an MVRFCE interface, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_Intf_Name	0	Name of the PE facing MVRFCE interface, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_Intf_Type	0	Interface type for PE facing of an MVRFCE interface, when an MPLS link includes an MVRFCE
PE_FACING_MVRFCE_OSPF_ Process_ID	0	OSPF process ID on an MVRFCE when the routing protocol between a PE and an MVRCE is OSPF, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_Tunnel_Src_Addr	0	Tunnel source address on PE facing MVRFCE interface for GRE encapsulation when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_VCD	0	VCD value on PE facing MVRFCE interface for ATM encapsulation, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_VCI	0	VCI value on PE facing MVRFCE interface for ATM encapsulation, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_VLAN_ID	0	VLAN ID on PE facing MVRFCE interface for Ethernet encapsulation, when an MPLS link includes an MVRFCE
PE_Facing_MVRFCE_VPI	0	VPI value on PE facing MVRFCE interface for ATM encapsulation, when an MPLS link includes an MVRFCE
PE_Intf_Address	0	IP address assigned to the PE interface
PE_Intf_Desc	0	Interface description for the PE interface
PE_Intf_Encap	0	Encapsulation of the PE interface
PE_Intf_Name	0	Name of the PE interface
PE_Intf_Shutdown	0	Shutdown flag for the PE interface
PE_IS_Cable_Modem_Maintenance_ Interface	0	Flag to indicate whether the interface is a maintenance interface
PE_MVRFCE_Bandwidth_Metric_For_ Redistribution	0	Bandwidth metric for redistribution of EIGRP when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_MVRFCE_BGP_AS_ID	0	BGP AS ID on a PE when the routing protocol between a PE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
PE_MVRFCE_Delay_Metric_For_ Redistribution	0	Delay metric for redistribution of EIGRP when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_MVRFCE_EIGRP_AS_ID	0	EIGRP AS ID on a PE when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_MVRFCE_IP_Unnumbered	1	Flag to indicate whether the PE to MVRFCE link is unnumbered, when an MPLS link includes an MVRFCE
PE_MVRFCE_Loading_Metric_For_ Redistribution	0	Loading metric for redistribution of EIGRP when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_MVRFCE_MTU_Metric_for_ redistribution	0	MTU metric for redistribution of EIGRP when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_MVRFCE_NBR_ALLOW_AS_IN	0	AllowASIn flag when the routing protocol between a PE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
PE_MVRFCE_NBR_AS_OVERRIDE	0	ASOverride flag when the routing protocol between a PE and an MVRFCE is BGP, when an MPLS link includes an MVRFCE
PE_MVRFCE_Ospf_Area_Number	0	OSPF area number when the routing protocol between a PE and an MVRCE is OSPF, when an MPLS link includes an MVRFCE
PE_MVRFCE_OSPF_Process_ID	0	OSPF process ID on PE when the routing protocol between a PE and an MVRCE is OSPF, when an MPLS link includes an MVRFCE
PE_MVRFCE_Reliability_Metric_For_ Redistribution	0	Reliability metric for redistribution of EIGRP when the routing protocol between a PE and an MVRFCE is EIGRP, when an MPLS link includes an MVRFCE
PE_MVRFCE_Routing_Protocol	0	Routing protocol between PE and MVRFCE, when an MPLS link includes an MVRFCE
PE_OSPF_PROCESS_ID	0	OSPF process ID on PE when the routing protocol between a CE and a PE is OSPF
PE_Tunnel_Src_Addr	0	Tunnel source address on PE for GRE encapsulation
PE_VCD	0	VCD value on PE for ATM encapsulation
PE_VCI	0	VCI value on PE for ATM encapsulation

Table 6-5 MPLS Repository Variables (continued)

Repository Variable	Dimension	Description
PE_Vlan_ID	0	VLAN ID on PE for Ethernet encapsulation
PE_VPI	0	VPI value on PE for ATM encapsulation
rd	0	Route Distinguisher value for the VRF
Redistribute_Connected	0	Flag to indicate whether the connected routes are redistributed into BGP on the PE
Redistribute_Static	0	Flag to indicate whether the static routes are redistributed into BGP on the PE
Redistributed_Protocol	1	List of routing protocols to be redistributed
Rip_Metrics	0	Metric for redistribution associated with RIP
Routes_To_Reach_Other_Sites	2	List of one or more IP addresses to specify the static routes to put on the CE.
vrfName	0	Name of the VRF

Table 6-6 provides a summary of the NAT Repository variables available from ISC Templates. **- NOT SUPPORTED in this release. -**

Table 6-6 NAT Repository Variables - NOT SUPPORTED in this release. -

Repository Variable	Dimension	Description	Example
InsideInterfaceNameList	1	List of NAT inside interface names, empty for non-Cisco IOS devices	Ethernet0, Ethernet1, ...
NATIsOverlapping	0	If the site behind this device is overlapping with others. The value is either **true** or **false**.	true, false
NATLocalExPrefixList	1	List of exclusion prefixes (IP address ranges) behind this device.	10.10.1.5/32 10.11.1.0/30...
NATLocalPrefixList	1	List of prefixes (IP address ranges) behind this device	10.10.1.0/24 10.11.1.0/24...
NATPeerExPrefixList	1	List of peer's exclusion prefixes (IP address ranges)	10.12.1.1/32 10.13.1.8/30
NATPeerPrefixList	1	List of peer's prefixes (IP address ranges)	10.12.1.0/24 10.13.1.0/24
OutsideInterfaceNameList	1	List of NAT outside interface names, empty for non-Cisco IOS devices	Serial0, Serial1, ...

Table 6-7 provides a summary of the QoS Repository variables available from ISC Templates.

Table 6-7 QoS Repository Variables

Repository Variable	Dimension	Description	Example
QoS_Customer	0	Name of the customer	ABC
QoS_Policy	0	Name of the QoS policy	Gold
QoS_Supported_MPLS	0	Boolean flag to indicate whether MPLS is supported in the core. The value is either **true** or **false**.	true false
QoS_PE_Remarking_ReRateLimiting	0	Boolean flag to indicate whether re-marking and re-rate-limiting is required on PE. The value is either **true** or **false**.	true false
QoS_CE_Marking_RateLimiting_ Interfaces	1	List of marking and rate-limiting interfaces on CE	serial0 serial1 ethernet1
QoS_CE_Marking_RateLimiting_ Interface_Encap	1	List of interface encapsulation types of the marking and rate-limiting interfaces on CE (same order as QoS_CE_Marking_Rate Limiting_Interfaces)	HDLC HDLC ethernet
QoS_PECLE_Marking_RateLimiting_ Interface	0	Name of the marking and rate-limiting interface on PECLE (for Ethernet QoS)	ethernet1
QoS_PECLE_Marking_RateLimiting_ Interface_Encap	0	Interface encapsulation type of the marking and rate-limiting interface on PECLE (for Ethernet QoS)	ethernet
QoS_Link_Bandwidth	0	Bandwidth of the CE and PE link (bps)	128000
QoS_LinkEndpoint_Role	0	Role of the link endpoint (that is, CPE or PE)	CPE_Endpt PE_Endpt
QoS_LinkEndpoint_Hostname	0	Hostname of the link endpoint	enpe1
QoS_LinkEndpoint_Platform	0	Platform type of the link endpoint	7206
QoS_LinkEndpoint_Linecard_Model	0	Line-card model of the link endpoint	8OC03_ATM_TS-IR-B

Table 6-7 QoS Repository Variables (continued)

Repository Variable	Dimension	Description	Example
QoS_LinkEndpoint_Interface	0	Interface name of the link endpoint	FastEthernet8/10.700
QoS_LinkEndpoint_Interface_Encap	0	Interface encapsulation type of the link endpoint interface	DOT1Q
QoS_LinkEndpoint_Type	0	Enumerator to indicate the type of the link endpoint (“Interface”, “ATM”, or “FRAME_RELAY”)	FRAME_RELAY
QoS_LinkEndpoint_FR_Dlci	0	Frame-Relay DLCI number of the link endpoint	102
QoS_LinkEndpoint_ATM_VPI	0	VPI value of the ATM VC of the link endpoint	110
QoS_LinkEndpoint_ATM_VCI	0	VCI value of the ATM VC of the link endpoint	256
QoS_LinkEndpoint_ATM_VCD	0	VCD value of the ATM VC of the link endpoint	Atm1
QoS_LinkEndpoint_ATM_PA_Model	0	The ATM port adaptor model of the link endpoint	PA-A1-OC3MM
QoS_LinkEndpointVLAN_Id	0	The VLAN ID of the link endpoint (Ethernet QoS)	800

Table 6-8 provides a summary of the VPLS Repository variables available from ISC Templates.

Table 6-8 VPLS Repository Variables

Repository Variables	Dimension	Description
VPLSCeEncapsulation	0	The encapsulation of the CE interface for a particular VPLS link
VPLSCeInterfaceName	0	The name of the CE interface for a particular VPLS link
VPLSCeMajorInterfaceName	0	The name of a major interface on a CE for a particular VPLS link
VPLSCLECeFacingEncapsulation	0	The encapsulation of interfaces for a particular device facing the CE
VPLSCLECeFacingInterfaceName	0	The interface name for a particular device facing the CE (the number can be more than 1 in case of a ring topology, hence any array)
VPLSCLEPeFacingEncapsulation	0	The encapsulation of interfaces for a particular device facing the PE

Table 6-8 VPLS Repository Variables (continued)

Repository Variables	Dimension	Description
VPLSCLEPeFacingInterfaceName	1	The list of interface names for a particular device facing the PE (the number can be more than 1 in case of a ring topology, hence any array)
VPLSDisableCDP	0	The flag to specify if the CDP has been disabled on a UNI for a particular VPLS link
VPLSFilterBPDU	0	The flag to specify whether the BPDUs will be filtered on a UNI for a particular VPLS link
VPLSPeEncapsulation	0	The encapsulation of the PE interface for a particular VPLS link
VPLSPeInterfaceDescription	0	The description assigned to the PE interface for a particular VPLS link
VPLSPeInterfaceName	0	The name of the PE interface for a particular VPLS link
VPLSPeMajorInterfaceName	0	The name of a major interface on a PE for a particular VPLS link
VPLSPeNeighbors	1	The list of PE POPs participating in a particular VPLS VPN
VPLSPeVfiName	0	The VFI name assigned to a particular VPLS instance existing on the PE POP
VPLSPeVlanId	0	The VLAN ID assigned to the PE for a particular VPLS link
VPLSPeVpnId	0	The VPN ID assigned to a particular VPLS VPN
VPLSSystemMTU	0	The maximum MTU value for a packet arriving on a UNI for a particular VPLS link
VPLSTunnelCDPEnable	0	The flag to specify if the CDP packets will be tunneled to the remote site for a particular VPLS link
VPLSTunnelCDPThreshold	0	The threshold value assigned for a CDP protocol before a violation action is reported on a UNI for a particular VPLS link
VPLSTunnelRecoveryInterval	0	Interval for the UNI to recover from a shutdown scenario
VPLSTunnelSTPEnable	0	The flag to specify if the STP packets will be tunneled to the remote site for a particular VPLS link
VPLSTunnelSTPThreshold	0	The threshold value assigned for a STP protocol before a violation action is reported on a UNI for a particular VPLS link
VPLSTunnelVTPEnable	0	The flag to specify if the VTP packets will be tunneled to the remote site for a particular VPLS link

Table 6-8 VPLS Repository Variables (continued)

Repository Variables	Dimension	Description
VPLSTunnelVTPThreshold	0	The threshold value assigned for a VTP protocol before a violation action is reported on a UNI for a particular VPLS link
VPLSUniAging	0	The aging timer set on a UNI for a particular VPLS link
VPLSUniDuplex	0	The duplex assigned to the UNI for a particular VPLS link
VPLSUniMajorInterfaceName	0	The name of a major interface on a UNI device for a particular VPLS link
VPLSUniMaxMacAddress	0	The maximum number of Mac addresses that can be learned on a UNI for a particular VPLS link
VPLSUniPortSecurity	0	The port security option on a UNI for a particular VPLS link
VPLSUniProtocolTunneling	0	The flag to specify if the protocols will be tunneled to the remote site for a particular VPLS link
VPLSUniSecureMacAddresses	1	The explicit list of Mac addresses that can be learned on a UNI for a particular VPLS link
VPLSUniShutdown	0	The shutdown flag on a UNI for a particular VPLS link
VPLSUniSpeed	0	The speed assigned to the UNI for a particular VPLS link
VPLSUniViolationAction	0	The violation action option on a UNI for a particular VPLS link
VPLSUseNativeVlan	0	The flag to specify if the native VLAN will be used on a UNI for a particular VPLS link

Protocols

- This feature is NOT SUPPORTED in this release. -

Protocols allows you to define customized protocol(s) that are not predefined. ISC defines most commonly used protocols. This Protocol Manager is used to customize protocol definition(s).The protocol is used by access rules in an ISC Firewall policy.

From Figure 6-1 on page 6-1, navigate **Service Design > Protocols** and you can choose either of the following:

- Protocols, page 6-44 Create and manage protocols.
- Protocol Bundles, page 6-49 Create and manage protocol bundles.

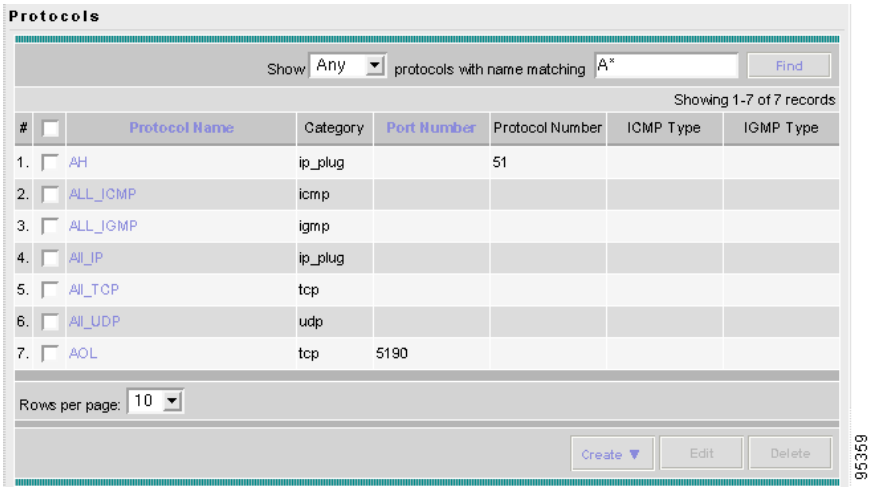
Protocols

The Protocols feature allows you to create customized protocols for TCP, UDP, ICMP, IGMP, and IP protocols.

All the possible choices for **Protocols** can be handled as follows:

Step 1 Navigate **Service Design > Protocols** and then choose **Protocols**. A window such as Figure 6-30, "Protocols," appears.

Figure 6-30 Protocols



Proceed to one of the following:

- Create TCP, page 6-44 Make no selections. From the **Create** drop-down menu, click **TCP.**
- Create UDP, page 6-45 Make no selections. From the **Create** drop-down menu, click **UDP**.
- Create ICMP, page 6-47 Make no selections. From the **Create** drop-down menu, click **ICMP**.
- Create IGMP, page 6-47 Make no selections. From the **Create** drop-down menu, click **IGMP**.
- Create IP, page 6-48 Make no selections. From the **Create** drop-down menu, click **IP**.
- Edit, page 6-48 Select one check box to select one protocol, and then click **Edit** to modify it.
- Delete, page 6-49 Select one or more check boxes to select one or more protocols, and then click **Delete** to delete the chosen protocols (you can select all the listed protocols by selecting the check box in the header row).

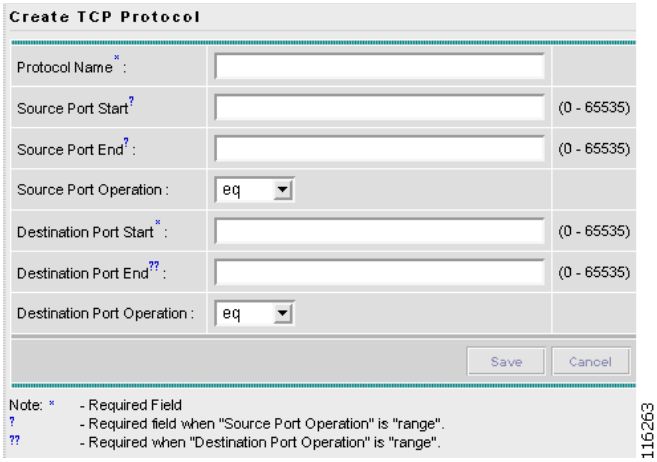
Create TCP

To create a TCP protocol, navigate **Service Design > Protocols,** choose **Protocols**, and follow these steps:

Step 1 Click the **Create** button and from the drop-down menu, click **TCP**.

Step 2 A window as shown in Figure 6-31, "Create TCP Protocol," appears.

Figure 6-31 Create TCP Protocol



Enter the following fields:

- **Protocol Name** (required)
- **Source Port Start** (optional) If the **Source Port Operation** is **range**, this field is required. Specify the **Source Port Start** (0-65535).
- **Source Port End** (optional If the **Source Port Operation** is **range**, this field is required. Specify the **Source Port End** (0-65535).
- **Source Port Operation** (optional) The drop-down menu choices are **eq** for equal; **gt** for greater than; **lt** for less than; **neq** for not equal; and **range** for a range of values. The check is for the port number and these qualifiers are for that port. For example, checking only for a port number equal (**eq**) to the port number specified, checking only for port numbers greater than (**gt**) the port specified, and so on.
- **Destination Port Start** (required) Specify the **Destination Port Start** (0-65535).
- **Destination Port End** (optional) If the **Destination Port Operation** is **range**, this field is required. Specify the **Destination Port End** (0-65535).
- **Destination Port Operation** (required when **Source Port Start** is specified) The drop-down menu choices are **eq** for equal; **gt** for greater than; **lt** for less than; **neq** for not equal; and **range** for a range of values. The check is for the port number and these qualifiers are for that port. For example, checking only for a port number equal (**eq**) to the port number specified, checking only for port numbers greater than (**gt**) the port specified, and so on.

Click **Save**.

Step 3 You return to an updated Figure 6-30 on page 6-44 and a **Status** block with a green check mark for **Succeeded**.

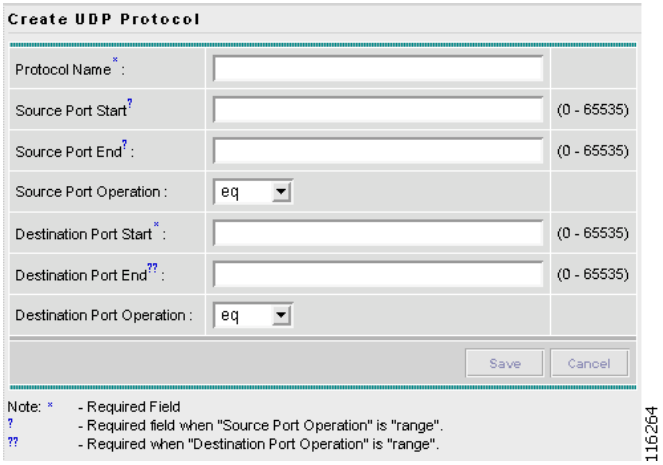
Create UDP

To create a UDP protocol, navigate **Service Design > Protocols,** choose **Protocols**, and follow these steps:

Step 1 Click the **Create** button and from the drop-down menu, click **UDP**.

Step 2 A window as shown in Figure 6-32, "Create UDP Protocol," appears.

Figure 6-32 Create UDP Protocol



Enter the following fields:

- **Protocol Name** (required)
- **Source Port Start** (optional) If the **Source Port Operation** is **range**, this field is required. Specify the **Source Port Start** (0-65535).
- **Source Port End** (optional If the **Source Port Operation** is **range**, this field is required. Specify the **Source Port End** (0-65535).
- **Source Port Operation** (required) The drop-down menu choices are **eq** for equal; **gt** for greater than; **lt** for less than; **neq** for not equal; and **range** for a range of values. The check is for the port number and these qualifiers are for that port. For example, checking only for a port number equal (**eq**) to the port number specified, checking only for port numbers greater than (**gt**) the port specified, and so on.
- **Destination Port Start** (required) Specify the **Destination Port Start** (0-65535).
- **Destination Port End** (optional) If the **Destination Port Operation** is **range**, this field is required. Specify the **Destination Port End** (0-65535).
- **Destination Port Operation** (required when **Source Port Start** is specified) The drop-down menu choices are **eq** for equal; **gt** for greater than; **lt** for less than; **neq** for not equal; and **range** for a range of values. The check is for the port number and these qualifiers are for that port. For example, checking only for a port number equal (**eq**) to the port number specified, checking only for port numbers greater than (**gt**) the port specified, and so on.

Click **Save**.

Step 3 You return to an updated Figure 6-30 on page 6-44 and a **Status** block with a green check mark for **Succeeded**.

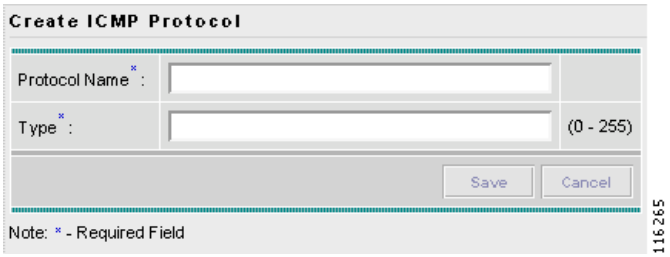
Create ICMP

To create an ICMP protocol, navigate **Service Design > Protocols,** choose **Protocols**, and follow these steps:

Step 1 Click the **Create** button and from the drop-down menu, click **ICMP**.

Step 2 A window as shown in Figure 6-33, "Create ICMP Protocol," appears.

Figure 6-33 Create ICMP Protocol



Enter the following fields:

- **Protocol Name** (required)
- **Type** (required) This must be a valid ICMP type (0-255).

Step 3 Click **Save**.

Step 4 You return to an updated Figure 6-30 on page 6-44 and a **Status** block with a green check mark for **Succeeded**.

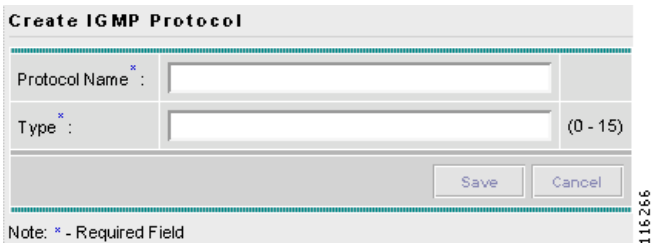
Create IGMP

To create an IGMP protocol, navigate **Service Design > Protocols,** choose **Protocols**, and follow these steps:

Step 1 Click the **Create** button and from the drop-down menu, click **IGMP**.

Step 2 A window as shown in Figure 6-34, "Create IGMP Protocol," appears.

Figure 6-34 Create IGMP Protocol



Enter the following fields:

- **Protocol Name** (required)
- **Type** (required) This must be a valid IGMP type (0-15).

Step 3 Click **Save**.

Step 4 You return to an updated Figure 6-30 on page 6-44 and a **Status** block with a green check mark for **Succeeded**.

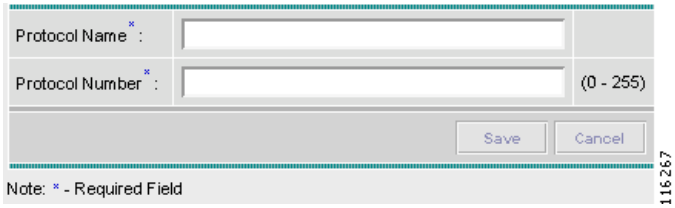
Create IP

To create an IP protocol, navigate **Service Design > Protocols,** choose **Protocols**, and follow these steps:

Step 1 Click the **Create** button and from the drop-down menu, click **IP**.

Step 2 A window as shown in Figure 6-35, "Create IP Protocol," appears.

Figure 6-35 Create IP Protocol



Enter the following fields:

- Protocol Name (required)
- **Protocol Number** (required) For example, for the GRE protocol, the protocol number is 47 (0-255).

Step 3 Click **Save**.

Step 4 You return to an updated Figure 6-30 on page 6-44 and a **Status** block with a green check mark for **Succeeded**.

Edit

From Figure 6-30 on page 6-44, do the following to edit a protocol:

Step 1 Select one check box, thus selecting only one protocol.

Click the **Edit** button and a window as shown in the create section for this protocol type appears, except that this is an Edit window and the **Name** cannot be changed. Complete the remaining fields as explained in the Create sections. And then click **Save**.

Step 2 Figure 6-30 appears with the updated information.

Delete

From Figure 6-30, do the following to delete protocols:

Step 1 Select one or more check boxes (to choose all the listed protocols, select the check box in the header row), thus selecting protocol(s).

Click the **Delete** button and a Confirm Delete window gives you the opportunity to continue, by clicking **Delete** or cancel the delete process by clicking **Cancel**.

Step 2 Figure 6-30 appears with the updated information.

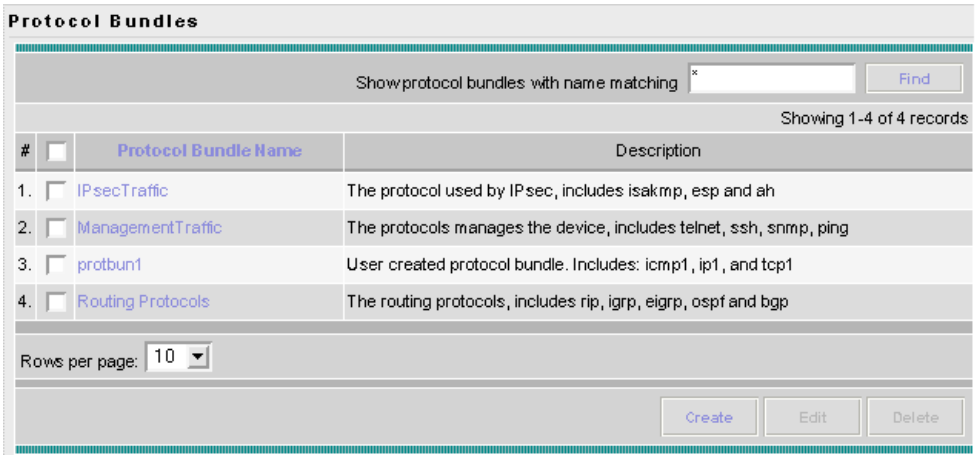
Protocol Bundles

Protocol Bundles allows you to group Protocols and to use them as a single entity.

All the possible choices for **Protocols Bundles** can be handled as follows:

Step 1 Navigate **Service Design > Protocols** and then choose **Protocol Bundles**. A window such as Figure 6-36, "Protocols Bundles," appears.

Figure 6-36 Protocols Bundles



Proceed to one of the following:

- Create Protocol Bundles, page 6-50 Make no selection. Click **Create**.
- Edit, page 6-48 Select one check box to select one protocol bundle, and then click **Edit** to modify it.
- Delete, page 6-49 Select one or more check boxes to select one or more protocol bundles, and then click **Delete** to delete the chosen protocol bundles (you can select all the listed protocol bundles by selecting the check box in the header row).

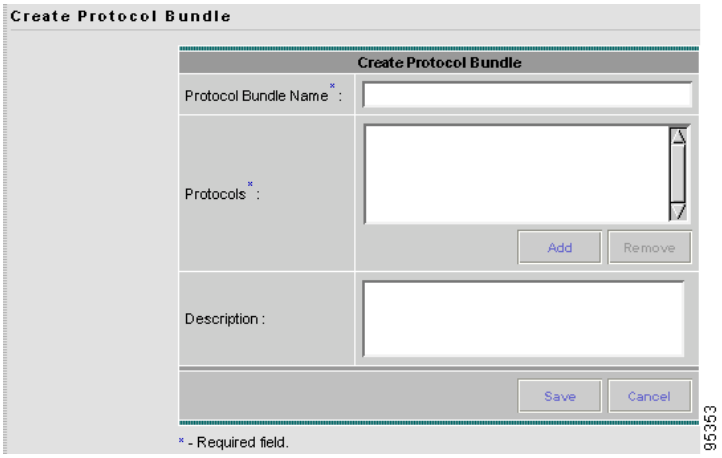
Create Protocol Bundles

Navigate **Service Design > Protocols,** choose **Protocol Bundles**, and follow these steps:

Step 1 Click the **Create** button.

Step 2 A window as shown in Figure 6-37, "Create Protocol Bundles," appears.

Figure 6-37 Create Protocol Bundles



Enter the following fields:

- **Protocol Bundle Name** (required)
- **Protocols** (required) Click **Add** and a list of protocols appears. Select one or more protocols for this protocol bundle and then click **Select**. The protocols are listed. You can select highlight one or more protocols and then click **Remove** to remove these selections.

Description (optional) This information is for clarity of description of the protocol bundle.

Step 3 Click **Save**.

Step 4 You return to an updated Figure 6-36 on page 6-49 and a **Status** block with a green check mark for **Succeeded**.

Edit Protocol Bundles

From Figure 6-36, do the following to edit a protocol bundle:

Step 1 Select one check box, thus selecting only one protocol bundle.

Click the **Edit** button and a window as shown in Figure 6-37 appears, except that this is an Edit Protocol Bundle window and the **Name** cannot be changed. Complete the remaining fields as explained in the "Create Protocol Bundles" section on page 6-50. And then click **Save**.

Step 2 Figure 6-36 appears with the updated information.

Delete Protocol Bundles

From Figure 6-36, do the following to delete protocol bundles:

Step 1 Select one or more check boxes (to choose all the listed protocol bundles, select the check box in the header row), thus selecting protocol bundle(s).

Click the **Delete** button and a Confirm Delete window gives you the opportunity to continue, by clicking **Delete** or cancel the delete process by clicking **Cancel**.

Step 2 Figure 6-36 appears with the updated information.

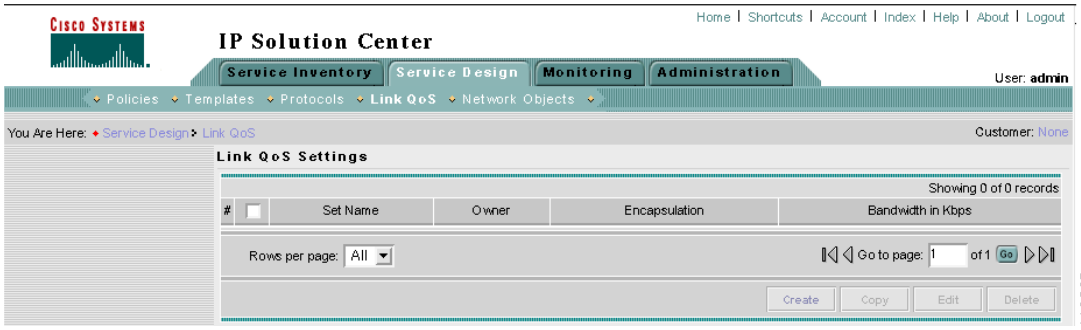
Link QoS

The Link QoS deals with link-level QoS settings such as Aggregate Shapers (FRTS; ATM Shapers, parent-level cb-shaper), Link Efficiency Mechanisms (FRF.12, LFIoMLPPP, and cRTP), and Interface-based CAR, those that depend on Layer2 encapsulation and link bandwidth.

You can create a link QoS setting for a network independent of a VPN service. To create a Link QoS setting for an MPLS service, see *Cisco IP Solution Center Quality of Service User Guide, 4.0*.

When you navigate **Service Design > Link QoS**, a window appears, as shown in Figure 6-38, "Link QoS Settings."

Figure 6-38 Link QoS Settings



The current Link QoS settings are available for QoS service requests, including the following information about each Link QoS setting:

- **Set Name** the name of your link QoS settings
- **Owner** Customer or Provider
- **Encapsulation**
- **Bandwidth (in kbps)** for IP Link QoS Setting

The explanation of the buttons and subsequent drop-down menus is given as follows:

- Create, page 6-52 This section explains how to create IP Link QoS Settings.
- Copy, page 6-56 This section explains how to copy an IP Link QoS Setting.

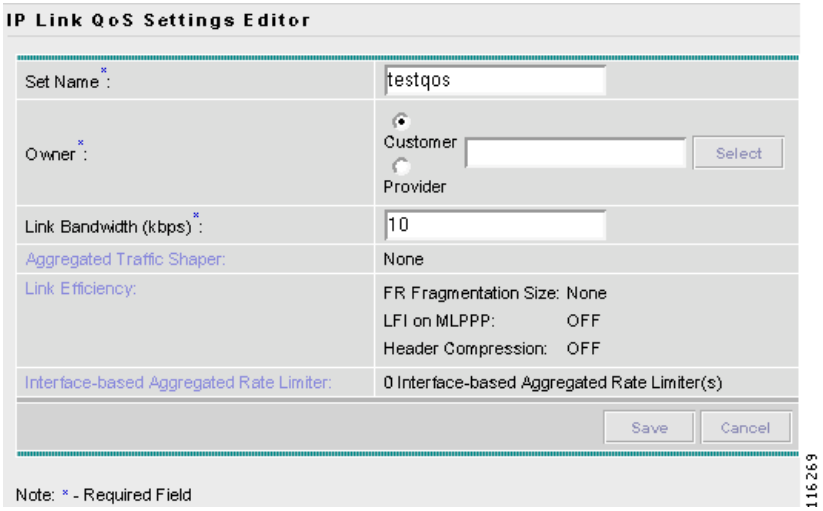
- Edit, page 6-56 This section explains how to edit an IP Link QoS Setting.
- Delete, page 6-56 This section explains how to delete an IP Link QoS Setting.

Create

When you navigate **Service Design > Link QoS**, click the **Create** button at the bottom of the window, as shown in Figure 6-38. To create IP Link QoS settings, proceed as follows:

Step 1 When you click the **Create** button, you receive a window as shown in Figure 6-39, "IP Link Settings Editor."

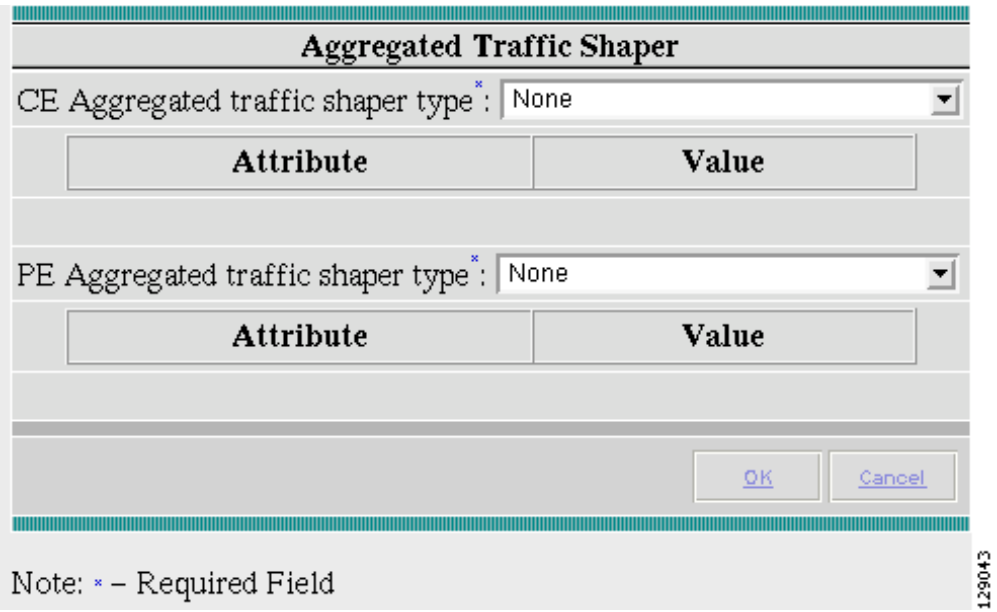
Figure 6-39 IP Link Settings Editor



Step 2 Fill in the following:

- **Set Name** (required) The name of the link QoS settings. Specify a name that describes the service offered by the settings. Examples: Frame_64K_Gold; ATM_2Mb_Silver. The name Frame_64K_Gold indicates that this set should be used on a CPE-PE link of bandwidth 64kbps, whose layer-2 encapsulation is Frame Relay and to meet an SLA of Gold.
- **Owner** (required) Keep the **Customer** radio button selected (default) or click the **Provider** radio button. Then click **Select** and you receive a list of the customers or providers, as applicable. You can filter this list. From the selected customers or providers, click the radio button for the customer or provider you want to select and click **Select**. You can repeat this procedure if you want to change your selection.
- **Link Bandwidth** (required) The link bandwidth specifies the maximum amount of bandwidth allocated for packets belonging to this link.
- **Aggregated Traffic Shaper** Applies traffic shaping QoS parameters to the device interface. Use this method instead of applying traffic shaping parameters with a service class. Click on the words **Aggregated Traffic Shaper** and you receive a window as shown in Figure 6-40, "Aggregated Traffic Shaper."

Figure 6-40 Aggregated Traffic Shaper



  - Click the drop-down menu for the **CE** and for the **PE** and select one of the following traffic shaper types. You receive another window in which to specify more information for **Attribute** and **Value**.

    FR Traffic Shaper Frame Relay Traffic Shaper. Class-based Parent-level Shaper that operates only in distributed mode on VIP-based routers, such as the Cisco 7500 series platforms.

    FR Traffic Shaper (non-MQC) Frame Relay Traffic Shaper. This shaper operates on 72xx and low-end routers.

    Parent-level Class-based Shaper Used in the context of nested policy. A nested policy consists of a bottom-level policy that identifies one or more classes of traffic, and a top-level policy that shapes the output of the traffic classes into a single shape rate. You can apply a nested policy to an interface or subinterface.

    ATM Traffic Shaper (VBR-rt) Variable bit rate-real time Intended for real-time applications, such as compressed voice over IP and video conferencing, that require tightly constrained delays (cell transfer delay or cell delay variation).

    ATM Traffic Shaper (VBR-nrt) Variable bit rate-non real time Follows a leaky bucket or token bucket algorithm.

    ATM Traffic Shaper (CBR) Constant bit rate Designed for ATM virtual circuits (VCs) that need a static amount of bandwidth that is continuously available for the duration of the active connection.

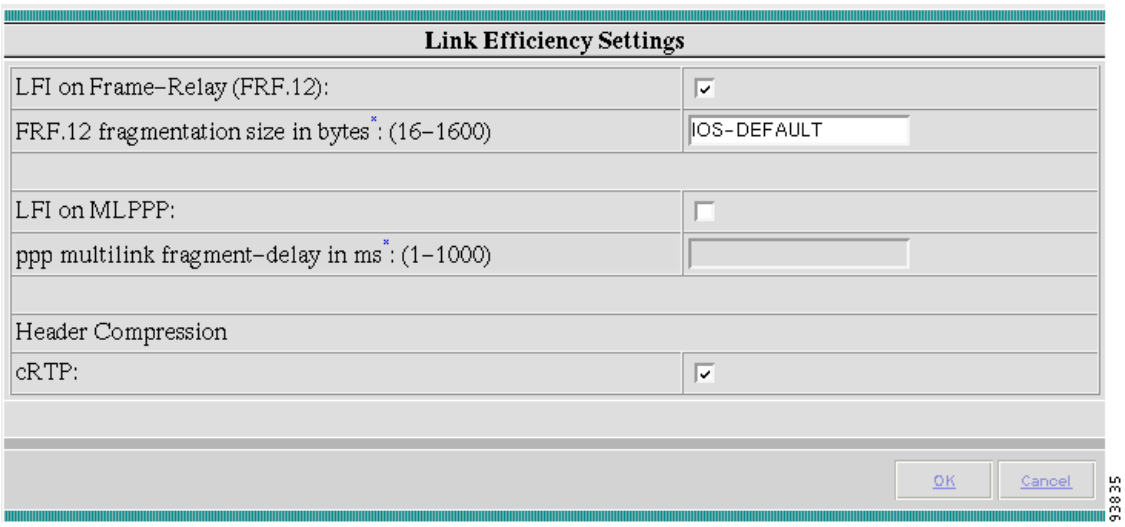
    ATM Traffic Shaper (ABR) Configures a router to transmit at a rate that varies with the amount of bandwidth available in the network or along the end-to-end transmission path.

    None

  - Click **OK**. The updated information appears in Figure 6-39.

- **Link Efficiency** Based on the bandwidth of CPE-PE link. Link efficiency features work with queueing and traffic shaping to improve the efficiency and predictability of the application service levels. Click on the words **Link Efficiency** and you receive a window as shown in Figure 6-41, "Link Efficiency Settings."

Figure 6-41 Link Efficiency Settings



  - Select the check box for one of the following:

    LFI on Frame Relay (FRF.12) (default) Supports the transport of real-time voice and data traffic on Frame Relay virtual circuits (VCs) without causing excessive delay to the real-time traffic. If you choose this, you can override the following field with a number (16 - 1600), which specifies the fragmentation size in bytes.

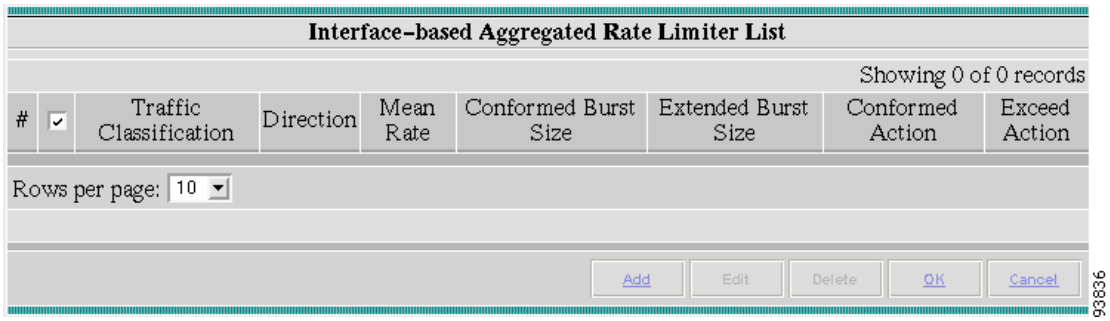
    or

    LFI on MLPP Multilink PPP (MLPPP) provides a method of splitting, recombining, and sequencing datagrams across multiple logical data links. MLPPP allows packets to be fragmented and the fragments to be sent at the same time over multiple point-to-point links to the same remote address.

  - Leave the **cRTP** check box for Header Compression selected (default) or deselect it. cRTP compresses the IP/UDP/RTP header in an RTP data packet from 40 bytes to approximately 2 to 5 bytes. Use cRTP on a WAN interface where bandwidth is an issue and much of the traffic is RTP traffic.
  - Click **OK**. The updated information appears in Figure 6-39.

- **Interface-based Aggregated Rate Limiter** This provides rate limiting for the traffic on a particular interface for the CPE-PE link. Click on the words **Interface-based Aggregated Rate Limiter** and you receive a window as shown in Figure 6-42, "Interface-based Aggregated Rate Limiter List."

Figure 6-42 Interface-based Aggregated Rate Limiter List



- **Add** is available when no choice is made. Click **Add** and you receive a window that lets you enter the following information. Then click **OK** to return to Figure 6-42 with updated information.

  Traffic Classification (required) Specifies the method for classifying traffic. Click **Edit** to access the Traffic Classification Editor and choose from these selections.

  Direction (required) Click the drop-down menu and choose **OUTPUT** (default) or **INPUT**. This specifies the direction of traffic to apply rate limiting parameters to.

  Mean Rate in bps: (8000 - 2000000000) (required).

  Conformed burst size in bytes: (1000 - 512000000) (required).

  Extended burst size in bytes: (2000 - 1024000000) (required).

  Conform—Action (required) Click the drop-down menu and choose: **Transmit**, which sends the packet; **Drop**, which drops the packet; **Set-dscp-transmit**, which sets the DSCP value and transmits the packet (must additionally specify a DSCP value in the drop-down menu); **Set-prec-transmit**, which sets the IP Precedence (0 to 7) values and sends the packet (must additionally specify an IP Precedence value in the drop-down menu); **Set-mpls-exp-transmit**, which sets the mpls experimental (0 to 7) values and sends the packet (must additionally specify an mpls experimental value in the drop-down menu); **Set-dscp-continue**, which sets the DSCP value and transmits the packet (must additionally specify a DSCP value in the drop-down menu); **Set-prec-continue**, which sets the IP Precedence (0 to 7) values and sends the packet (must additionally specify an IP Precedence value in the drop-down menu); or **Set-mpls-exp-continue**, which sets the mpls experimental (0 to 7) values and sends the packet (must additionally specify an mpls experimental value in the drop-down menu).

  Exceed—Action (required) Click the drop-down menu and use the same choices as in **Conform—Action** to specify how to handle packets that exceed the configured rate limit.

- **Edit** is available when one check box is selected. You can edit the information that is specified for **Add**. Click **Edit**. After you make your edits, click **OK**.
- **Delete** is available when one or more check boxes are selected. Click **Delete**. The selection is deleted without confirmation.

Note Be careful that you are sure you want to delete before clicking **Delete**. The deletion occurs automatically without confirmation.

- **OK** returns you to Figure 6-39.
- **Cancel** is available to cancel this process.

Step 3 After making all the selections in Step 2, click **Save** in Figure 6-39.

Step 4 Figure 6-38 reappears with the new IP Link QoS Setting and a **Status** box in the lower left corner with a green check mark for **Succeeded**.

Copy

The **Copy** button at the bottom of Figure 6-38, allows you to create a copy of a Link QoS and then make changes and save it with a new name.

Edit

The **Edit** button, at the bottom of Figure 6-38, allows you to edit a specific link QoS setting. Follow these steps:

Step 1 Navigate **Service Design > Link QoS Settings**.

Step 2 Select the check box for the row of the link QoS setting that you want to edit.

Step 3 Click the **Edit** button and a window appears as in Figure 6-39. Edit, following the windows in Create, page 6-52.

The **Owner** cannot be changed.

Step 4 Click **Save** and Figure 6-38 reappears with the new Link QoS Setting and a **Status** box in the lower left corner with a green check mark for **Succeeded**.

Delete

The **Delete** button, at the bottom of Figure 6-38, allows you to delete one or more link QoS settings. Follow these steps:

Step 1 Navigate **Service Design > Link QoS Settings**.

Step 2 Select the check box(es) for the row(s) of the link QoS setting(s) you want to delete or select the check box in the header row to select all the link QoS settings for deletion.

Step 3 Click the **Delete** button and the selected link QoS settings are deleted without a chance to confirm. Otherwise click **Cancel**.

Note You receive no opportunity to confirm what you want to delete, so be sure you want to delete what you have selected.

Network Objects

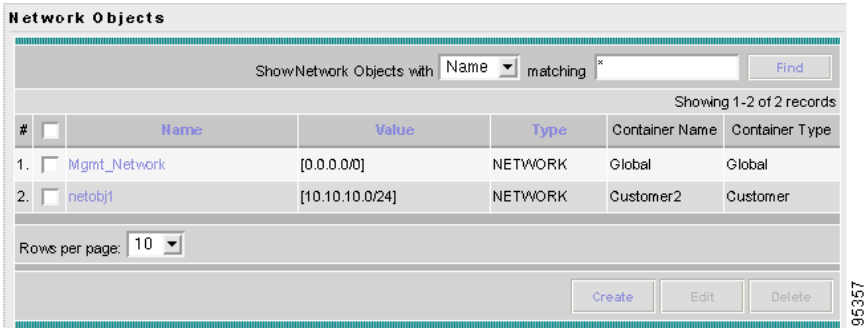
- This feature is NOT SUPPORTED in this release. -

Network Objects allows you to create network objects. When you define a network object, you can use this object in a QoS policy or Firewall policy**- Firewall policy is NOT SUPPORTED in this release. -** rather than using the actual address itself. This simplifies Firewall policy**- Firewall policy NOT SUPPORTED in this release. -** or QoS policy creation.

From Figure 6-1 on page 6-1, navigate **Service Design > Network Objects** and follow these steps:

Step 1 The first window to appear is as shown in Figure 6-43, "Network Objects."

Figure 6-43 Network Objects



Step 2 From this window, you can do any of the following:

- Create Network Objects, page 6-57 This is enabled when no network objects are selected.
- Edit Network Objects, page 6-59 This is enabled when only one network object is selected.
- Delete Network Objects, page 6-59 This is enabled when one or more network objects are selected.

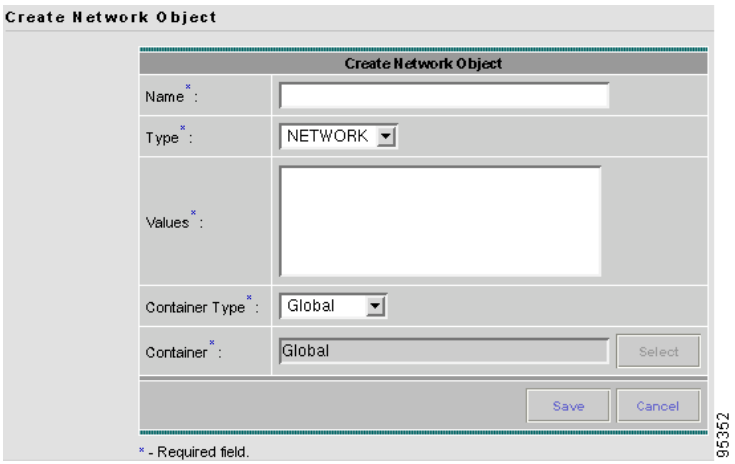
Create Network Objects

From Figure 6-43, do the following to create a network object:

Step 1 Select no check box, thus selecting no network objects.

Step 2 Click the **Create** button and a window as shown in Figure 6-44, "Create Network Object," appears.

Figure 6-44 Create Network Object



Enter the following information:

- **Name** (required)
- **Type** (required) Click the drop-down menu and choose **STRING** (a free-style string object), **NETWORK** (a range of IP addresses), or **HOST** (a specific IP address).
- **Values** (required) Enter a valid IP address in the format of a.b.c.d/e or a list of valid IP addresses in that format.
- **Container Type** (required) Click the drop-down menu and choose **Global**, **Customer**, **Site,** or **CPE**.
- **Container** (required) If you chose **Customer** (proceed to Step 3), **Site**, (proceed to Step 4), or **CPE** (proceed to Step 5) as the **Container Type**, then **Select** is enabled here. After you make your selection in the resulting window, click **Select** and you return to the updated Figure 6-44.

Step 3 If you set the **Container Type** to **Customer**, when you click **Select** for **Container**, a Customer for Container Selection window occurs, in which you can click one of the radio buttons and then click **Select**. This customer is added to your **Container**.

Step 4 If you set the **Container Type** to **Site**, when you click **Select** for **Container**, a Site for Container Selection window appears in which you can select one radio button for a site and then click **Select**. This site is added to your **Container**.

Step 5 If you set the **Container Type** to **CPE**, when you click **Select** for **Container**, a CPE for Container Selection window appears in which you can select one radio button for a CPE and then click **Select**. This CPE is added to your **Container**.

Step 6 Click **Save** in Figure 6-44 and you return to an updated Figure 6-43 on page 6-57.

Edit Network Objects

From Figure 6-43, do the following to edit a network object:

Step 1 Select one check box, thus selecting only one network object.

Click the **Edit** button and a window as shown in Figure 6-44 appears, except that this is an Edit Network Object window and the **Name** cannot be changed. Complete the remaining fields as explained in the "Create Network Objects" section on page 6-57. And then click **Save**.

Step 2 Figure 6-43 appears with the updated information.

Delete Network Objects

From Figure 6-43, do the following to delete network objects:

Step 1 Select one or more check boxes (to choose all the listed network objects, select the check box in the header row), thus selecting network object(s).

Click the **Delete** button and a Confirm Delete window gives you the opportunity to continue, by clicking **Delete** or cancel the delete process by clicking **Cancel**.

Step 2 Figure 6-43 appears with the updated information.