Modeling and Displaying Additional NE Properties

Prime Network models and displays a fixed set of network element properties in the Inventory windows. If there are additional properties you want to display and monitor, you can do so using Soft Properties.

These topics explain how to use Soft Properties to add new network element properties to the Inventory window and control how these new properties are displayed:

Note We recommend that the users who manage Soft Properties have the following:

- For their user account—Configurator or higher default permissions.
- For all assigned device scopes—Configurator or higher security level.

What are Soft Properties?

Soft properties are definitions that contain rules for retrieving new NE information, parsing the retrieved information, and displaying it in the Inventory window, either as an additional property or as a table. In effect, soft properties can be used to extend the default subset of device properties that Prime Network models. Using soft properties allows you to quickly adapt to new software upgrades and new requirements that arise during ongoing operation and deployment.

For example, consider the case where the Prime Network system monitors the port parameters of an ATM switch, and the operator installs a new software version on the switch that is capable of reporting the bit error rate (BER) for each of the ports. Since this capability was not supported in previous software versions of the NE, the Prime Network VNE might not support the property. To avoid the need for a new VNE from Cisco, you can immediately support the new BER feature by creating a soft property.

A soft property is implemented through a set of definitions that determine how to retrieve, parse, and display a certain MIB variable from the NE. Information can be retrieved from the NE using SNMP or Telnet/SSH, and the definitions are stored in the XML registry. You define the protocol and rules using the Soft Properties GUI client. The new properties are applied in runtime and do not require system restart.

You can also associate alarm conditions with a soft property and create a new TCA that will be displayed in the Prime Network Vision and Events GUI clients. Creating TCAs is described in Creating a New Threshold-Crossing Alarm, page 7-1.

When you develop the soft property, only the specific NE instance is affected so that you can debug it and determine any impact it may have on the VNE. When you restart the VNE, the soft property is applied to all similar components on that VNE. Then you can apply it to multiple devices and components.

Steps for Adding New NE Property Information to the Inventory

Figure 2-1 illustrates the steps required to define a new soft property.

Figure 2-1   *Flow for Creating New Soft Properties*
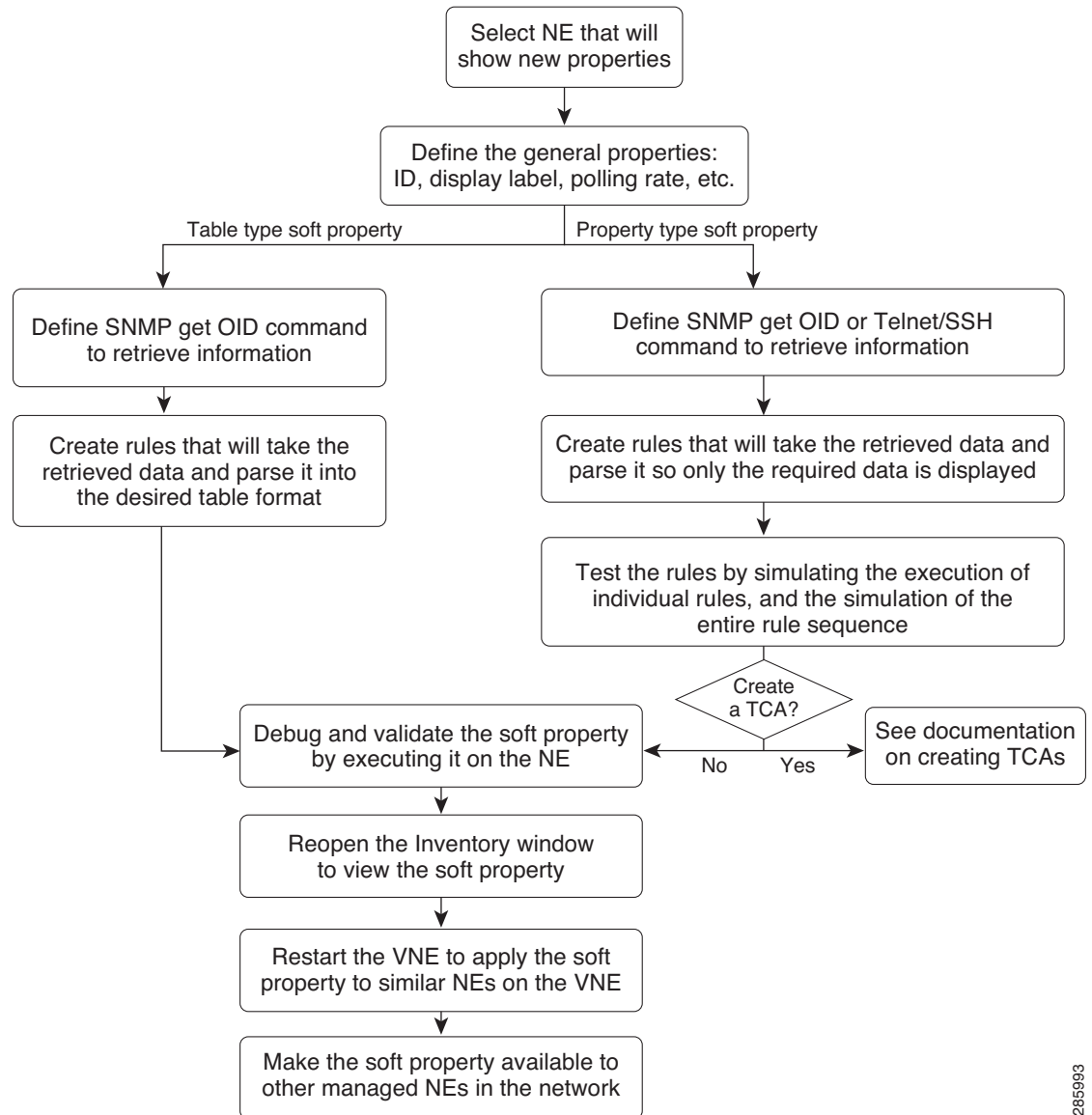
The steps are described in these topics:

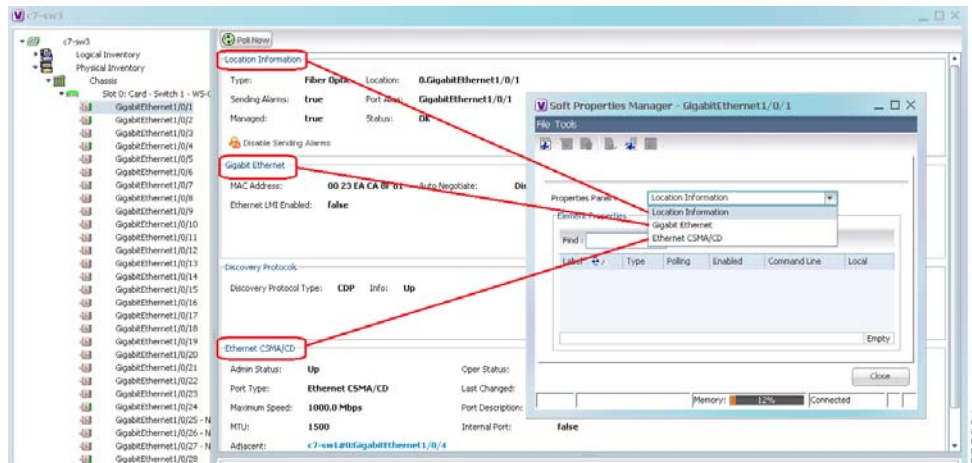# Displaying a New Property in the Inventory Window

This procedure leads you through the process of creating a new Property type so that new NE attributes can be modeled and displayed in the Inventory window. This allows you to monitor a new attribute on an ongoing basis.

To create a new Property type soft property:

Step 1   In Prime Network Vision, right-click the node on which you want to apply a new soft property. The node can be the NE itself or an inventory node. For example, you can create a soft property on a port.

Step 2   Choose **Management > Soft Properties Management**.

The Soft Properties Manager dialog box opens and displays any existing soft properties for the selected node. As shown in Figure 2-2, the choices in the Properties Panel drop-down list align to the panels in the Inventory window for the selected node. For example, the properties panels for an ATM port are Location Information, ATM, and DS3.

Figure 2-2   Soft Properties Manager Dialog Box

Step 3   From the Panel Properties drop-down list, choose the inventory panel in which you want the new property to be displayed.

Step 4   Open the Add Soft Property dialog box by choosing **File > New Element**.

Step 5   In the General tab, define the general parameters for the soft property.

Field	Description	Example
Name	Enter a unique identifier for the soft property.	**sp01**
Label	Identifying text that will be displayed in Inventory window.	**My Soft Property**
Description	(Optional) Description of the soft property	**Example of soft property**
Type	Type of soft property, which determines the format of the information. In this case, select **Property** to display the defined information in the form of an additional field in the Inventory window. Telnet/SSH or SNMP is used to retrieve and parse information from the NE.	**Property**

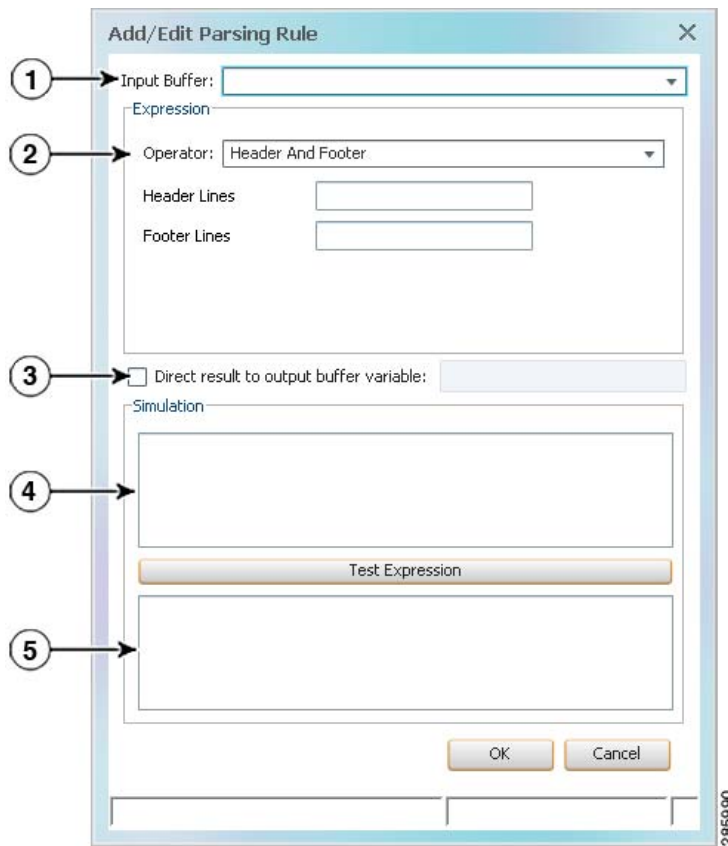| Field	Description	Example
Polling Rate	Rate at which Prime Network will poll the NE for the information. Prime Network applies the appropriate default. Do not change this unless you are familiar with polling and the implications of choosing different rates.	**Status**
Enabled	Whether the VNE is running the command. This field allows you to temporarily disable soft properties, if needed.	[selected]

Step 6   In the Parsing tab, select the protocol you want to use to retrieve the information.

Protocol	Description

Use SNMP get(OID)	SNMP retrieval expression. The SNMP OID must start with a dot.
	
	 1. Enter the OID in the text box; for example:
	
	 `.1.3.6.1.2.1.2.2.1.16.`
	
	 2. With the cursor in the text box, click **Ctrl-Spacebar** to display the available fields and their current values.
	
	 3. Choose a field from the drop-down list and press **Enter**. The variable is populated in the text box with surrounding $ characters. This example retrieves the interface OutOctets:
	
	 `.1.3.6.1.2.1.2.2.1.16.$ifIndex$`

Use Telnet/SSH	The Telnet/SSH retrieval expression. (To use Telnet, it must be enabled on the device.)
	
	 1. Enter the Telnet/SSH command in the text box; for example:
	
	 `show interface`
	
	 With the cursor in the text box, click **Ctrl-Spacebar** to display the available fields and their current values. For example:
	
	 2. Choose a field from the drop-down list and press **Enter**. The variable is populated in the text box with surrounding $ characters. For example, when this command is executed, *$portalias$* will be replaced with Ethernet1/0:
	
	 `.1.3.6.1.2.1.2.2.1.16.$portAlias$`

Step 7   Define parsing rules. You can create multiple rules in order to retrieve exactly the information you require. Click **Add** to start defining your parsing rules.

The Add/Edit Parsing Rule dialog box appears.

Figure 2-3   *Add/Edit Parsing Rule Dialog Box*

| 1	Input Buffer—Determines what input will be used for the parsing rule. The drop-down list in this field contains a blank item representing the default input, and a list of variables created by redirecting the output of previous rules (if any).
	If the input buffer is blank (default), the output of the previous parsing rule is used as this rule's input unless the output of the previous rule was directed to an output variable. In this case, the default input is the output of the last rule that was not directed to an output variable. For example, you create Rule 1. Then you create Rule 2 and Rule 3, but you redirect Rule 3's output to a variable. When you create Rule 4, it will use the output from Rule 2 as its input. That is because Rule 2 is the last rule with output that was *not* redirected.
2	Operator—Specifies a parsing operator. The operator you choose determines the fields that appear below it (Remove Lines, Match, Parse Integer, and so forth). See Supported Parsing Rules and Operators, page A-1.
3	Direct result to output buffer variable check box—When checked, you can save the parsing output as a variable with a unique name. This means that the output will not automatically be used as the input for the next rule, but the variable will be available for selection as the input for subsequent rules defined for this soft property.
4	Simulation panel—Allows you to test the rule by entering your rule and clicking **Test Expression**. This information is not saved when you close the window.
5	The parsed result that is displayed after clicking **Test Expression**. This information is not saved when you close the window.

Step 8   To simulate the parsing rule without sending the command to the device:

    a.   Enter the text into the top Simulation window. For example:

```
Name              Default RD              Interfaces
example            55:55
```
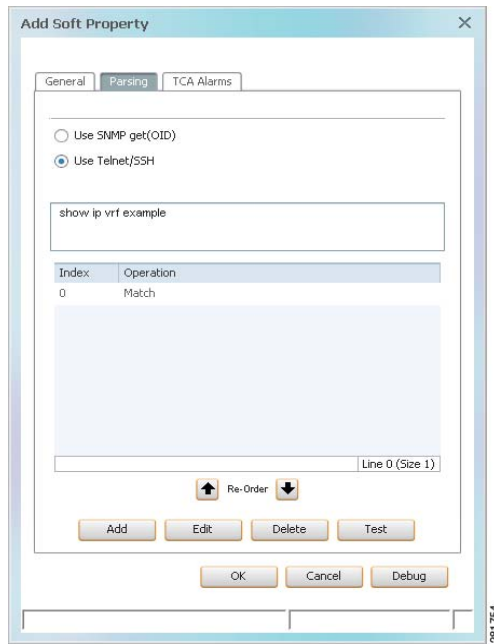
    b.   Click **Test Expression**. The parsing rule result is displayed, as shown in Figure 2-4.

Figure 2-4   *Match Parsing Rule*
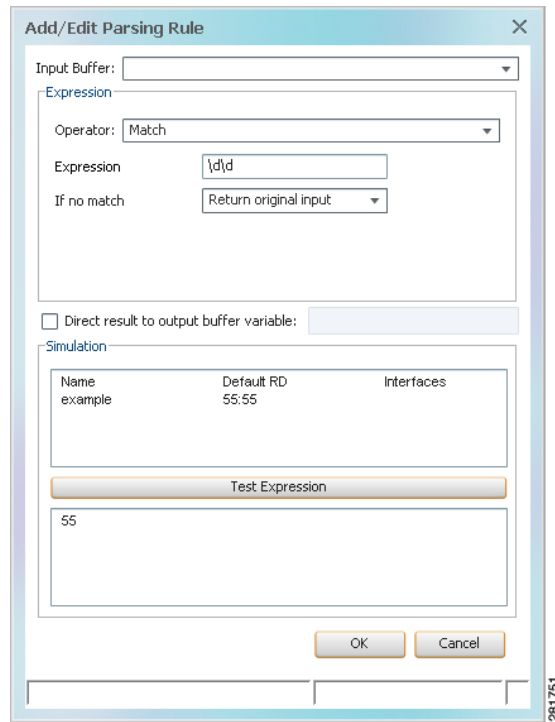
Step 9   Click **OK**. The rule is added to the Parsing tab, as shown in Figure 2-5.

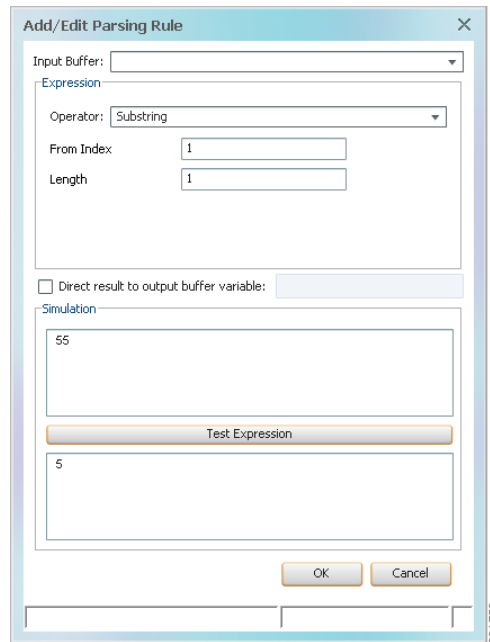*Figure 2-5*   *Parsing Tab with Match Parsing Rule*

Step 10   Click **Add** to create another parsing rule. For example:

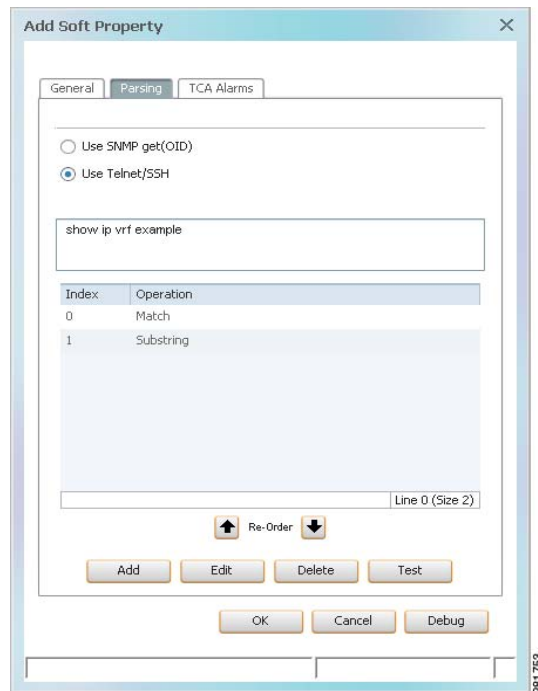| Operator	**Substring**
From Index	**1**
Length	**1**
Simulation text box	**55**

Step 11   Click **Test Expression**. The result 5 is displayed in the Result text box, as shown in Figure 2-6.

Figure 2-6   *Substring Parsing Rule*

Step 12   Click **OK**. The rule is added to the Parsing tab, as shown in Figure 2-7.

Figure 2-7   *Parsing Tab with Match and Substring Parsing Rules*

Step 13 To simulate the rule sequence without sending any commands to the device:

 a. From the Add Soft Property dialog box (Parsing tab), click **Test** to open the Test Parsing Rules dialog box.

 b. Copy the output of the native commands into the Input Buffer.

 c. Click Test (in the Test Parsing Rules dialog) and verify the results.

 a. Click **Close**.

Step 14 To send the command to the device to check its validity, in the Add Soft Properties dialog box, click **Debug**.
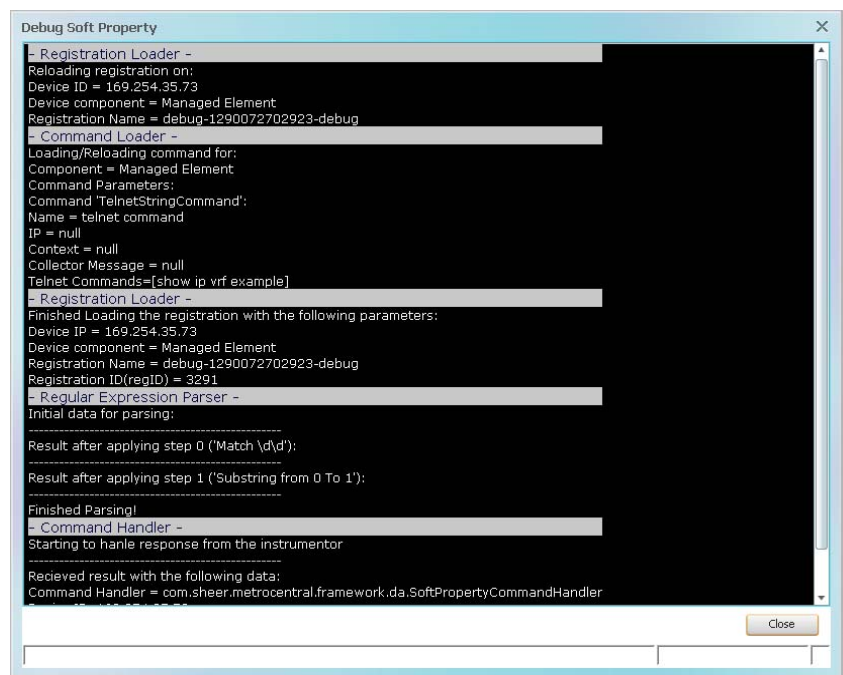
> **Note** No notification message is displayed when a VNE fails to collect properties. The properties are simply not populated in the GUI.

The results of the test are displayed Debug Soft Property dialog box.

Step 15 The Debug Soft Property dialog box is displayed.

*Figure 2-8   Debug Soft Property Dialog Box*

Step 16 After the Status is returned as valid, confirm that the input parameters have returned the correct values; for example:

```
Telnet Commands=[show ip vrf example]
```

Step 17 Click **Close** to exit the Debug Soft Property window.

Step 18   Click **OK** to exit the Add Soft Property dialog box. The new soft property is listed in the Soft Properties Manager dialog box, as shown in Figure 2-9.

Figure 2-9   Soft Properties Manager Window
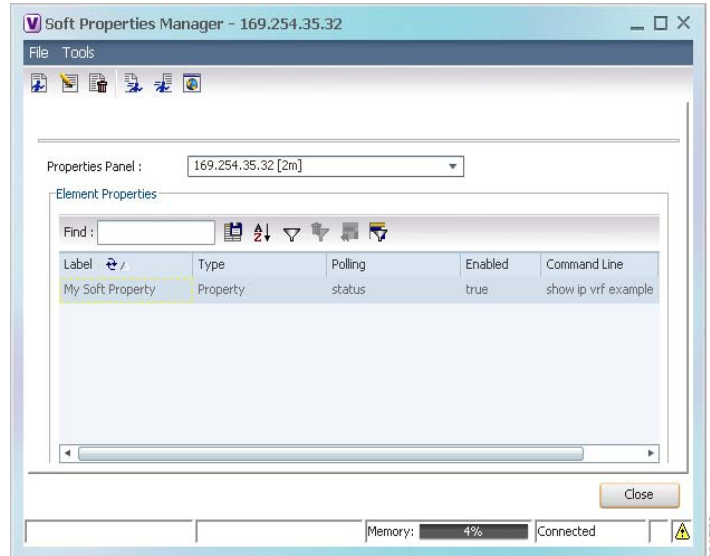
Step 19   Click **Close** to exit the Soft Properties Manager.

The soft property is activated on the NE. You should see the new information in your Inventory window the next time you open it. When you restart the VNE, the soft property is applied to all similar components on the VNE.

Take the appropriate next steps:

- To add a TCA to the soft property, see Creating a New Threshold-Crossing Alarm, page 7-1.
- To make other NEs display the property, see Making the Soft Property Available to Other NEs, page 2-14.

Adding a New Inventory Table Containing SNMP get Details

This procedure leads you through the process of creating a new Table type soft property that extracts information from the MIB and displays it (in a table) in the Inventory window.

To create a new Table type soft property:

Step 1   In Prime Network Vision, right-click the node on which you want to apply a new soft property. The node can be the NE itself or an inventory node. For example, you can create a soft property on a port.

Step 2   Choose **Management > Soft Properties Management**.

The Soft Properties Manager dialog box opens and displays any existing soft properties for the selected node. As shown in Figure 2-2, the choices in the Properties Panel drop-down list align to the panels in the Inventory window for the selected node. For example, the properties panels for an ATM port are Location Information, ATM, and DS3.

Step 3 From the Panel Properties drop-down list, choose NE inventory panel in which you want the new property table to be displayed.

Step 4 Open the Add Soft Property dialog box by choosing **File > New Element**.

Step 5 Define the general parameters for the soft property in the General tab.

Field	Description	Example
Name	Enter a unique identifier for the soft property.	**sp02**
Label	Identifying text that will be displayed in Inventory window.	**My Soft Table**
Description	(Optional) Description of soft property	**Example of a Soft Table**
Type	Type of soft property, which determines the format of the information. In this case, select **Table** to display the defined information in tabular format. An SNMP **get** is performed to retrieve NE information and display it in tabular form in the Inventory window.	**Table**
Polling Rate	Rate at which Prime Network will poll the NE for the information. Prime Network applies the appropriate default. Do not change this unless you are familiar with polling and the implications of choosing different rates.	**Status**
Enabled	Whether the VNE is running the command. This field allows you to temporarily disable soft properties, if needed.	(Selected)

Step 6 Define the SNMP retrieval expression. The SNMP OID must start with a dot.

    a. Enter the OID in the text box; for example:

        `.1.3.6.1.2.1.4.20.1.`

    b. With the cursor in the text box, click **Ctrl-Spacebar** to display the available fields and their current values.

    c. Choose a field from the drop-down list and press **Enter**.

Step 7 Click **Add** and define the column and data information in the Add Edit Column Controller dialog box. For example:

Column Title	**My First Column**
Column Data	**2**

Step 8 Add more column titles and data as needed; for example:

Column Title	**My Second Column**
Column Data	**5**

When you are done, click **OK**. See the example in Figure 2-10.

Figure 2-10   Add Soft Property Dialog Box

Step 9   To send the command to the device to check its validity, in the Add Soft Properties dialog box, click **Debug**.

> **Note**   No notification message is displayed when a VNE fails to collect properties. The properties are simply not populated in the GUI.

When you finish testing the rules, click **Close** to close the Debug Soft Property dialog box.

Step 10   Click **OK** to exit the Add Soft Property dialog box.

Step 11   Click **Close** to exit the Soft Properties Manager dialog box.

Step 12   Click **Close** to exit the Soft Properties Manager.

The soft property is activated on the NE. You should see the new information in your Inventory window the next time you open it. When you restart the VNE, the soft property is applied to all similar components on the VNE.

To make other NEs display the property, see Making the Soft Property Available to Other NEs, page 2-14.

Making the Soft Property Available to Other NEs

A property definition is applicable to all objects of the same type in the selected NE. After the soft property has been defined and tested on a specific instance of a managed element, it can be *published* and applied to a wider scope of managed NEs in the network. This requires moving the property definition from the specific NE instance to a higher level in the registry hierarchy.

The Soft Properties Publish Controller dialog box enables you to publish the soft property to one or more locations across the inheritance hierarchy (as defined in the system). In other words, you define the scope where the soft property is to be applied in the hierarchy.
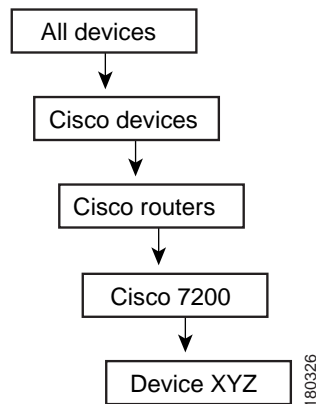
✎
Note   Users with Configurator privileges can add and publish soft properties on all devices.

Figure 2-11 shows an example of the inheritance hierarchy. In this example, the top level of the hierarchy is All devices, and the lowest level of the hierarchy is Device XYZ.

Figure 2-11   Inheritance Hierarchy Example

When a soft property is published to a node in the hierarchy, it overrides any inherited soft properties from a higher level and applies automatically to all its children. For example, if a soft property is published to Cisco 7200 devices, it overrides any variant of this soft property which is defined at a higher level, and is assigned to all devices of type Cisco 7200 in the system.

⚠
Caution   Soft property publishing can affect system memory usage, device utilization, and system performance. For example, publishing a property that contains the **show running-config** command to many devices could negatively impact system memory usage and device utilization. We strongly recommend that you measure the effect of publishing the soft property on system memory usage before you publish the soft property. To view the changes, you must restart the VNE or unit for the publishing to take effect.

To publish a soft property:

Step 1   In Prime Network Vision, right-click a managed element, then choose **Management > Soft Properties Management**. This opens the Soft Properties Manager window.

Step 2   Select the soft property you want to publish. Remember that the soft properties that are displayed depend on the NE, and the choice you make in the Properties Panel drop-down list.

Step 3   Open the hierarchy manager by choosing **Tools > Hierarchy Manager**.

Each row that is displayed in the hierarchy manager table represents a different level of the hierarchy. The rows are displayed in descending order; the top row is the highest level of the hierarchy and the bottom row is the lowest level of the hierarchy.

The following information is displayed in the table:

- Exist—When a node in the hierarchy is selected, it indicates that a local variant of the soft property exists for that node.
- VNE Hierarchy Location—The hierarchy path, as defined in the registry.
- IMO Class Name—Currently unavailable in this version.

Table 2-1 describes the icons that appear.

Table 2-1   Hierarchy Manager Window Tools

Icon	Name	Description
	Copy	Copies the soft property from a selected node in the hierarchy to another node in the hierarchy. A copy icon is displayed to the left of the selected node.
	Cut	Cuts the soft property from a selected node in the hierarchy to move it to another node in the hierarchy. A cut icon is displayed to the left of the selected node.
	Paste	Pastes the soft property that was copied or cut from a selected node in the hierarchy to another node in the hierarchy. A paste icon is displayed to the left of the selected node.
	Delete	Deletes the soft property from the selected node in the hierarchy. **Note** If the soft property has been deleted from all nodes, it is removed from the list in the main dialog box of the Soft Properties Manager.

Step 4   Select the node in the hierarchy from which you want to publish the soft property.

Step 5   Click the Copy or Cut icons to perform the required action.

Step 6   Select the node in the hierarchy where you want to publish the soft property, and click the Paste icon.

Step 7   Restart the VNE on which you want to publishing to take effect.

Making the Soft Property Available to Other NEs