

Administrator's Guide

CIRUS

Configuration Management

Version 3



SOLARWINDS.NET
NETWORK MANAGEMENT SOFTWARE

 Printed on Recycled Paper

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About SolarWinds.Net

SolarWinds.Net, Inc., founded in 1995, is a privately held Oklahoma Corporation with headquarters in Tulsa, Oklahoma. SolarWinds provides robust network management, network monitoring and network discovery software enabling businesses to provide fault management in multi-vendor configuration networks. Known for its award-winning networking toolsets and performance management applications, SolarWinds.Net recognizes the need for affordable solutions to maximize network performance and availability. SolarWinds' comprehensive products and services are distributed worldwide to a customer base in more than 140 countries worldwide, including military, Fortune 500 companies, government agencies and education institutions. The SolarWinds global business partner distributor network now exceeds 400 distributors and resellers worldwide. For more information, please visit <http://www.SolarWinds.Net>.

About the Author

Ryan Jett

As a key member of the SolarWinds Research and Development team, Ryan spends a significant amount of time documenting and testing SolarWinds applications as well as working with key customers. This multifaceted approach enables Ryan to write in such a way as to benefit both technical and non-technical customers, network engineers, and developers. When not writing, Ryan spends his time living below sea level and trying to communicate with the ever elusive mermaids of the East Indian Ocean. The rest of his time is spent in the heart of the Congo, searching for what he describes as "xebubula". Someday we hope to interpret that word and figure out what the heck he's talking about...

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Chapter 1: Introduction

Who Should Read This Guide

This guide is intended for those responsible for installing and setting up SolarWinds Cirrus Configuration Management version 3. This will normally be the system/network administrator. The Windows account used to install Cirrus will need to have administrative rights on the server.

What's Covered in This Guide

This guide includes sections that discuss

- Installation and setup
- Adding Nodes and getting started
- Scheduling tasks
- Performing inventory scans
- Modifying and comparing configs
- Creating and editing reports

Overview of Cirrus

Cirrus Configuration Management is a powerful application providing the network engineer with a quick and efficient method of managing the configurations of network devices: Routers, Switches, VPN Concentrators, Wireless Access Points, Firewalls, etc. Cirrus is a highly advanced, yet easy-to-use application designed to streamline and automate routine network configuration management tasks such as:

- Scheduled Back Ups of configs
- Ability to make Bulk Changes
- Updating access lists
- Device Inventory
- Changing SSIDs on Access Points
- Policy Reporting
- Altering community strings for a group of routers or switches
- Ability to roll out Mass Config Changes
- Config Comparisons

Cirrus can be used in a stand-alone or workgroup environment with multiple

users. Cirrus is scalable and is available in packages from 50 Nodes to an unlimited number of managed Nodes.

Cirrus Configuration Management supports many types of network devices from many hardware vendors. Device Command Templates for Cisco, Foundry, Dell, HP Juniper, Motorola, Aruba, Nortel, Arris and many others are included.

Cirrus Configuration Management includes detailed Device Inventory. The inventory includes interface and port details, IP Addresses, information about ARP tables, cards in each slot, firmware levels and much more. The information can be easily extracted and used by other applications.

How to Contact SolarWinds.Net

The SolarWinds website is an excellent resource located at <http://www.SolarWinds.Net>. If more information is needed, please do not hesitate to contact a SolarWinds representative.

Support

Visit the Support website at <http://SolarWinds.Net/Support/index.htm> to access the Knowledge Base, Frequently Asked Questions, obtain Program Updates, contact the Support Team, provide feedback, visit the User Forum, and more!

E-Mail

The SolarWinds Support Team can be E-Mailed at Support@SolarWinds.Net.

Sales

Send e-mail to a Sales representative at Sales@SolarWinds.Net for any sales needs.

Mail

SolarWinds.Net

6914 South Yorktown Avenue
Tulsa, OK 74136 USA

Chapter 2: Installation & Setup

This chapter will walk through the installation process for Cirrus. Installation proceeds in 3 steps:

- Installing Microsoft SQL Server
- Installing Cirrus
- Running the Startup Wizard

Licensing and Version Options

Cirrus is available in four different packages (personalized package options for larger installations are available):

	DL50	DL100	DL200	DL500
Maximum number of Nodes that can be managed	50	100	200	500

System Requirements

The System Requirements for Cirrus vary based upon the number of Nodes, frequency of config downloads, how long Configs are maintained in the database, and several other factors. The table below represents some general guidelines for a minimum configuration.

	Minimum System Requirements
Operating System	Windows 2000 Server with Service Pack 4 Windows 2003 Server with Service Pack 1 Windows XP Professional with Service Pack 2
CPU	Intel Pentium 3 (or equivalent) - 800 MHz or higher
Memory	256 MB of RAM
Hard Drive Space	1 GB of space available

Step 1: Installing SQL Server



Installing SQL Server is NOT required to run Cirrus. An Access database can be used instead.

A licensed copy of Microsoft SQL Server 2000 Desktop Engine (MSDE) is distributed with each copy of Cirrus. MSDE supports a maximum database size of 2GB. Depending on how the tool is used, it may be necessary to acquire and install either the Standard or the Enterprise version of SQL Server. MSDE may be installed from the CD or by logging into the customer area of the SolarWinds.Net website and downloading Cirrus.



SQL Server installation defaults are specified in the SETUP.INI file. If SQL Server needs to be installed anywhere but the default location, or logging needs to be enabled for troubleshooting, this file can be modified once it is saved to the hard drive. More information about installation options can be found on Microsoft's website at

<http://www.microsoft.com/sql>.

Step 2: Installing Cirrus

1. Begin the Installation of Cirrus from either the CD or the download file.
2. Choose the target directory where for the Cirrus installation. The default is C:\Program Files\SolarWinds\.
3. Follow the steps of the Installation Wizard and if prompted to do so, restart the computer.



If prompted to install the Software License Key, please follow the instructions in *Appendix A: Software License Key* on page 161.

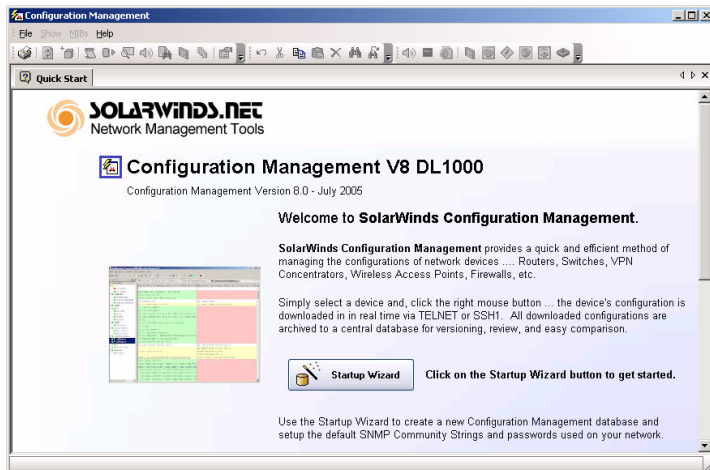
Step 3: Configuration and Setup

After installing Cirrus, it will be necessary to run the Startup Wizard to continue the installation and setup process. The Wizard will configure connectivity to the database and establish the default settings such as the Global Community String, Username, Password, Enable Level, and more.

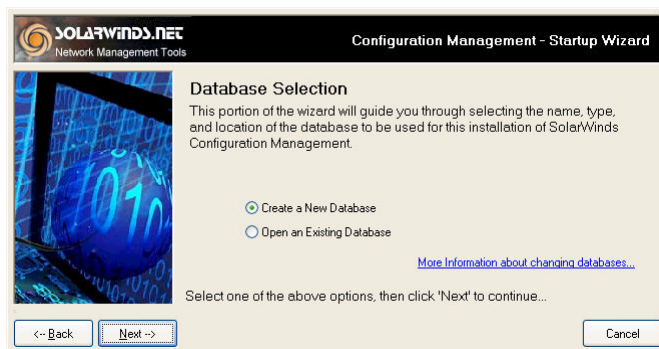
The two database formats supported by Cirrus are Microsoft Access and SQL Server 2000.

To begin,

1. Open SolarWinds Cirrus Configuration Management from the Windows Start menu: **Start → SolarWinds Configuration Management → Configuration Management**.



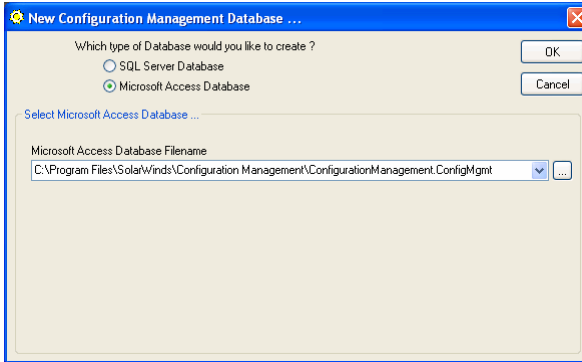
2. Click the **Startup Wizard** button in the middle of the *Quick Start* page, or select **New/Open Database Wizard** from the **File** menu.
3. Click **Next →** on the Welcome screen to begin the Wizard.



4. Ensure that **Create a New Database** is selected and then click **Next →** to open the *New Configuration Management Database* dialog.

Creating a Microsoft Access Database

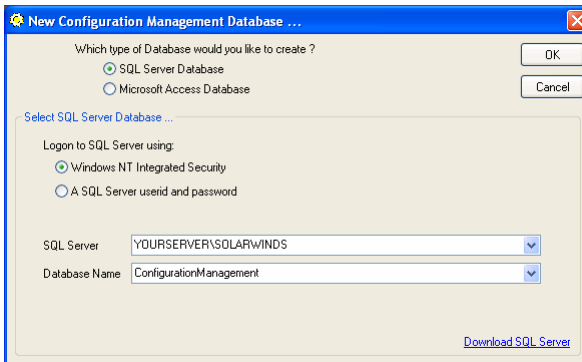
1. Select **Microsoft Access Database** at the top of the dialog.



2. The options at the bottom change to display a drop-down text box prompting for a filename. Type a path and filename for the new database, or use the **Ellipsis** button to browse to a location. Once satisfied with the path and filename, click **OK** to continue.

Creating a SQL Server Database

1. Select **SQL Server Database** at the top of the dialog.

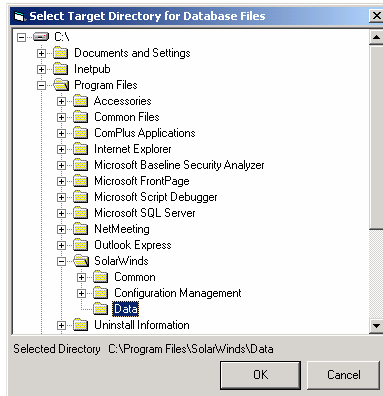


2. Select the name of the SQL server from the drop down list provided. Normally every SQL Server on the network will be displayed in the drop down list, but the name (or IP address) may need to be entered.
3. Create a new database by entering a Database Name in the text box provided or connect to an existing database by selecting the Database Name from the drop-down list.

4. Use the radio buttons to select the authentication type for the SQL Server and then click **OK** to continue.



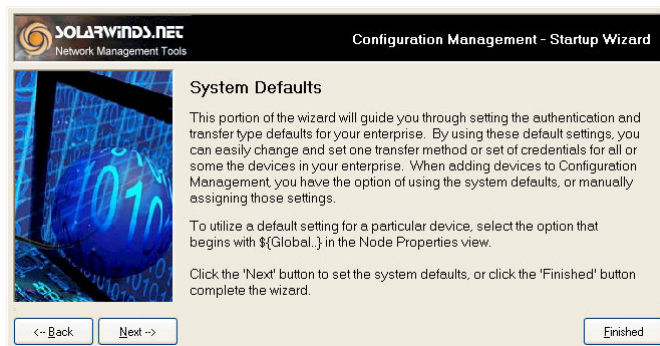
If the SQL Server ID and password option is used, an ID with sufficient rights to create new databases on that server must be used (for example, the SQL Administrator account).



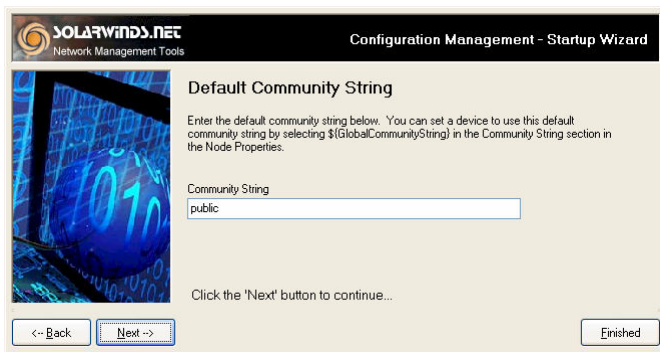
5. Select a location to save the database by navigating to the desired path and then click **OK** to continue.

Setting the System Defaults

After creating a database, the System Default settings will need to be set. These are fields such as Default Community String, Default Username, and Default Execute Protocol. When adding Nodes, the System Default settings are used unless otherwise specified.



1. Click **Next** → to begin the System Defaults setup.



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Configuration Management - Startup Wizard

Default Community String

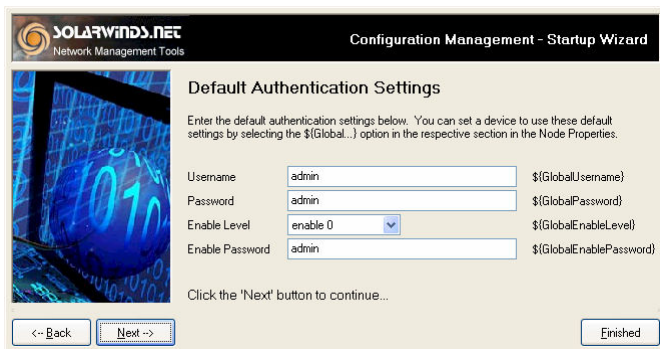
Enter the default community string below. You can set a device to use this default community string by selecting \$(GlobalCommunityString) in the Community String section in the Node Properties.

Community String
public

Click the 'Next' button to continue...

<- Back Next -> Finished

2. Enter the default community string for the Nodes on the network, and click **Next** → to continue.



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Configuration Management - Startup Wizard

Default Authentication Settings

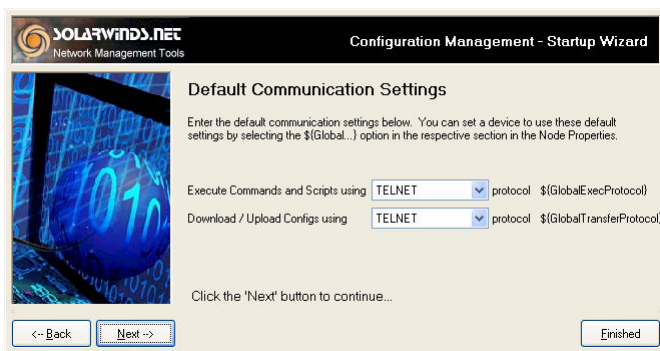
Enter the default authentication settings below. You can set a device to use these default settings by selecting the \$(Global...) option in the respective section in the Node Properties.

Username admin \$(GlobalUsername)
Password admin \$(GlobalPassword)
Enable Level enable 0 \$(GlobalEnableLevel)
Enable Password admin \$(GlobalEnablePassword)

Click the 'Next' button to continue...

<- Back Next -> Finished

3. Enter the Default Username, Password, Enable Level, and Enable Password. Click **Next** → to proceed.



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Configuration Management - Startup Wizard

Default Communication Settings

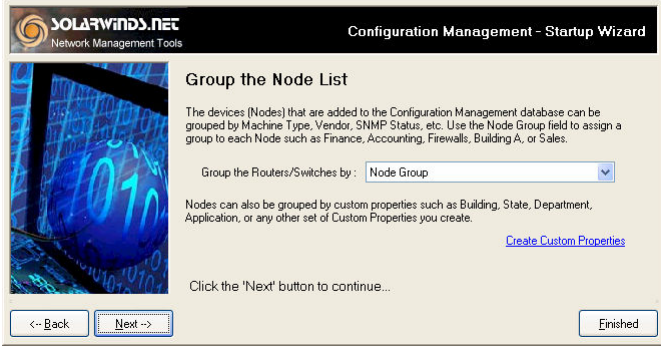
Enter the default communication settings below. You can set a device to use these default settings by selecting the \$(Global...) option in the respective section in the Node Properties.

Execute Commands and Scripts using TELNET protocol \$(GlobalExecProtocol)
Download / Upload Configs using TELNET protocol \$(GlobalTransferProtocol)

Click the 'Next' button to continue...

<- Back Next -> Finished

- Enter the Default Execute Protocol and Download/Upload Protocol, and then click **Next** → to continue.



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Configuration Management - Startup Wizard

Group the Node List

The devices (Nodes) that are added to the Configuration Management database can be grouped by Machine Type, Vendor, SNMP Status, etc. Use the Node Group field to assign a group to each Node such as Finance, Accounting, Firewalls, Building A, or Sales.

Group the Routers/Switches by:

Nodes can also be grouped by custom properties such as Building, State, Department, Application, or any other set of Custom Properties you create. [Create Custom Properties](#)

Click the 'Next' button to continue...

- Select a field to group the Nodes by in the Node List from the dropdown menu. If no grouping is required, select “<none>” at the top of the list.



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Configuration Management - Startup Wizard

Scheduled Job Authentication

Cirrus Configuration Management is installed with some sample Scheduled Jobs. However, these sample jobs need authentication credentials to run. Enter the authentication credentials below.

Please Note: When adding new Scheduled Jobs, you will need to reenter this information in the New Job Dialog box.

Enter your Windows login:

Enter your password:

Confirm the password:

- Enter the default Windows User information for Scheduled Job Authentication. This is the username and password of the Windows account the Scheduled Jobs will run as. Click the **Finished** button to complete the Startup Wizard.

What to Do Next

After successfully completing the Startup Wizard, the database must be populated with the network Nodes that are to be managed. This can be accomplished by either adding Nodes individually or by importing a list of Nodes.

Instructions on adding Nodes individually are located in *Chapter 3: Managing Nodes* on page 21.

Details on importing a list of Nodes can be found in *Chapter 3: Managing Nodes* on page 23.

Chapter 3: Managing Nodes

After creating a database, Nodes will need to be added to the Cirrus database. There are two ways to add a Node; add one device at a time, or importing a list of Nodes from a file. These two processes are described in this chapter.

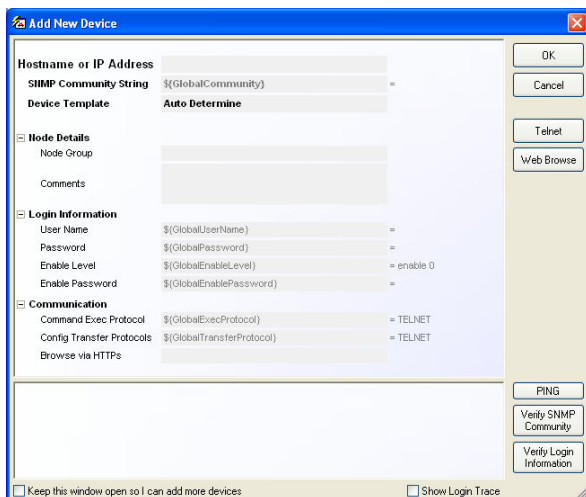
Adding Nodes

To add a single Node, click the  button on the toolbar, or select **Add New Node** from the **Nodes** menu. Once the *Add New Device* dialog is displayed, enter the Node's hostname or IP Address, login information, and communication protocols. In some cases, the **Device Command Template** will not be discovered automatically. If this happens, set the template manually by using the dropdown menu to assign a specific **Device Command Template**.



The default **Device Command Template** (*Auto Detect*) should always be tried first. If Cirrus is unable to determine the appropriate **Device Command Template**, or assigns the wrong template, then set it manually.

Also be sure to enter an appropriate *Node Group* for the Node. The *Node Group* is used by default to organize the Node Tree that is listed on the right side of the application. If the Node that is being added uses HTTPS when connecting to its web interface, set **Browse via HTTPS** to **Yes**.



The *Add New Device* dialog box contains the following fields and controls:

- Hostname or IP Address**: Text input field.
- SNMP Community String**: Text input field with value `$(GlobalCommunity)`.
- Device Template**: Text input field with value `Auto Determine`.
- Node Details** (expanded):
 - Node Group**: Text input field.
 - Comments**: Text input field.
- Login Information** (expanded):
 - User Name**: Text input field with value `$(GlobalUserName)`.
 - Password**: Text input field with value `$(GlobalPassword)`.
 - Enable Level**: Text input field with value `$(GlobalEnableLevel)` and a note "= enable 0".
 - Enable Password**: Text input field with value `$(GlobalEnablePassword)`.
- Communication** (expanded):
 - Command Exec Protocol**: Text input field with value `$(GlobalExecProtocol)` and a note "= TELNET".
 - Config Transfer Protocols**: Text input field with value `$(GlobalTransferProtocol)` and a note "= TELNET".
 - Browse via HTTPS**: Text input field.
- Buttons** (right side):
 - OK
 - Cancel
 - Telnet
 - Web Browse
 - PING
 - Verify SNMP Community
 - Verify Login Information
- Checkboxes** (bottom):
 - ☐ Keep this window open so I can add more devices
 - ☐ Show Login Trace



To find Node information, use the **Telnet** or **Web Browse** buttons to connect to the device.

When entering the *Login Information*, enter the values just as they would be typed when manually logging into the device. For example, if the only thing that needs to be typed for Enable Level 15 is “15”, then simply enter “15” for the value.

Four options are available for **Command Execute Protocol** and **Config Transfer Protocol**; TELNET, SSH1, SSH2, and SSH Auto. When selecting SSH Auto, Cirrus will first attempt to negotiate an SSH2 connection, if SSH2 is not supported, it will default to SSH1.

To confirm the community string is valid, click the **Verify SNMP Community** button.

Add New Device

Hostname or IP Address: 10.10.5.128

Node Details

Node Group: [Empty]

SNMP Community String: \$(GlobalCommunity) = public

Comments: [Empty]

Login Information

User Name: admin

Password: admin

Enable Level: 0

Enable Password: admin

Communication

Command Exec Protocol: \$(GlobalExecProtocol) = TELNET

Config Transfer Protocols: \$(GlobalTransferProtocol) = TELNET

IP Address 10.10.5.128

Validate SNMP Responding to SNMP Queries

SNMP Community Read-Write SNMP Community String

☐ Keep this window open so I can add more devices

Buttons: OK, Cancel, PING, Verify SNMP Community, Verify Login Information

To ensure the login information is accurate, click the **Verify Login Information** button.

Add New Device

Hostname or IP Address: 10.10.5.128

Node Details

Node Group: [Empty]

SNMP Community String: \$(GlobalCommunity) = public

Comments: [Empty]

Login Information

User Name: admin

Password: admin

Enable Level: 0

Enable Password: admin

Communication

Command Exec Protocol: \$(GlobalExecProtocol) = TELNET

Config Transfer Protocols: \$(GlobalTransferProtocol) = TELNET

IP Address 10.10.5.128

Validate Login Username and Password OK

☐ Keep this window open so I can add more devices

Buttons: OK, Cancel, PING, Verify SNMP Community, Verify Login Information (disabled)

Click the **OK** button to add the Node to the database. Clicking **OK** will automatically verify the community string and login information before adding the device.



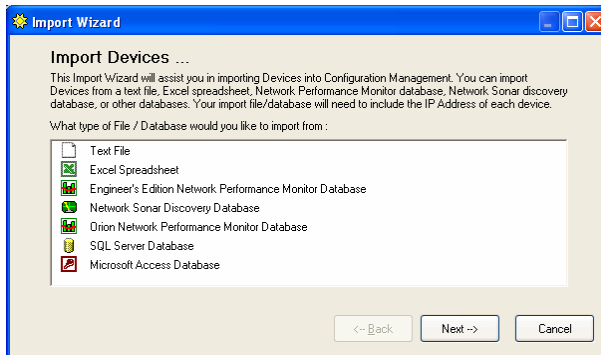
To keep the window open and add additional Nodes, ensure the **Keep this window open so I can add more Nodes** checkbox is selected.

Importing a List of Nodes

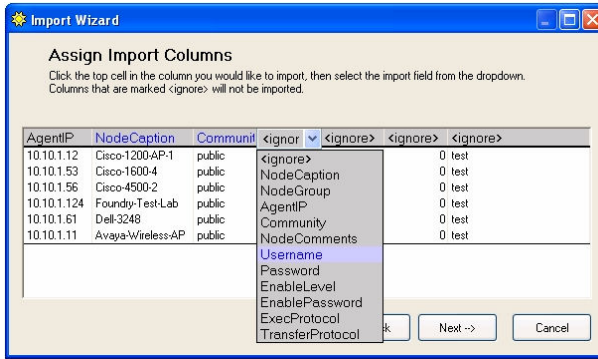
As opposed to entering Nodes one at a time, a list of Nodes can be imported from several different file types. Nodes can be imported from text files, Excel spreadsheets, Access databases, SQL databases, and Orion NPM or Engineer's Edition NPM databases. Cirrus can even import Nodes from a CiscoWorks or Kiwi CatTools database export.

Although there are small differences in the import process depending on the type of file used, most of the options are the same. The file-specific options are listed at the end of this section.

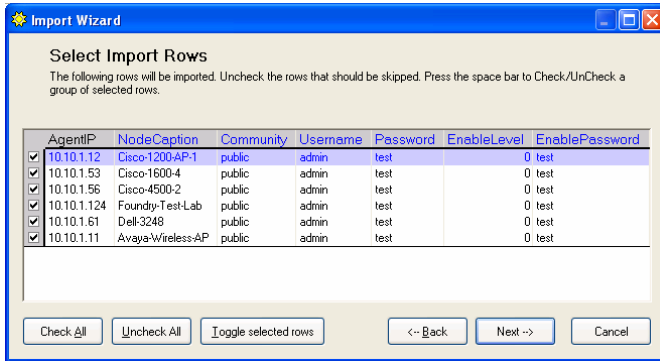
To launch the **Import Wizard**, select **Import Devices** from the **File** Menu.



Select the file type from the list and then click **Next →**. Select the file to import by either typing in the path, or by browsing to it, and then click **Next →**.



Assign each column a field name by clicking on the column header and selecting a field from the drop down list. To bypass a column during the import process, select “<ignore>” from the list. Once satisfied with the column name assignments, click **Next →**.

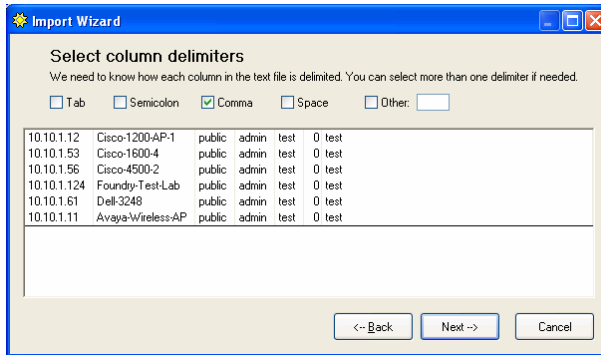


By default, all Nodes in the list will be included in the import. If there are Nodes in the list that need to be excluded, uncheck them, and then click **Next →** to continue.

The last page has two options; one allows the user to exclude Nodes that already exist in the Cirrus database, the other will discover details about the Nodes being imported. Leave the box checked to exclude Nodes with IP Addresses that already exist in the database. If importing a large list of Nodes, to save time, uncheck the option to discover device details after the import. Click **Import** to begin the import process. Once the process has complete, click **Done** to close the dialog.

Importing a Text File - Selecting Column Delimiters

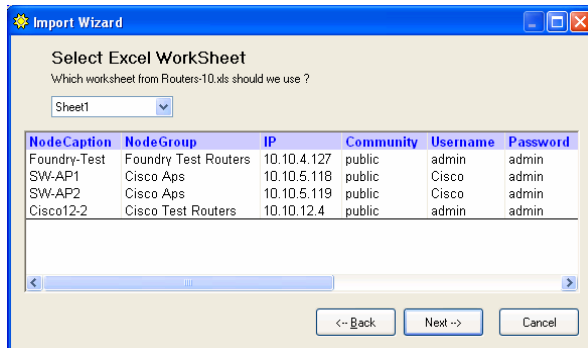
When importing from a text file, Column Delimiters will need to be defined.



Select the column delimiter used in the text file to separate each field. This is normally a comma or a space, or a combination of characters. As changes are made, the columns will align differently based on the selection(s). Once the columns are separated properly, click **Next →**.

Importing an Excel Spreadsheet – Selecting the Worksheet

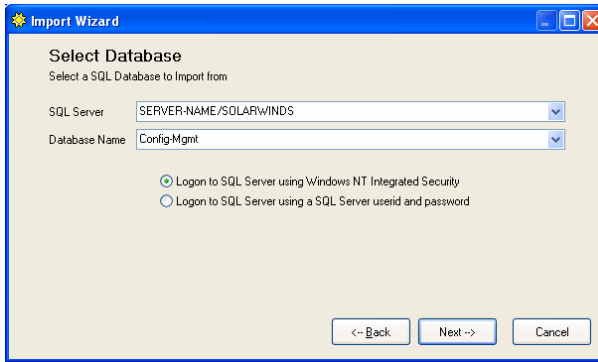
When importing from an Excel spreadsheet, the worksheet will need to be selected.



Select the worksheet from the drop-down list at the top of the dialog and then click **Next →** to continue the import process.

Importing from a SQL database – Connecting to the Server

When importing from an Orion NPM database or any other SQL database, a connection to the server will first need to be established.



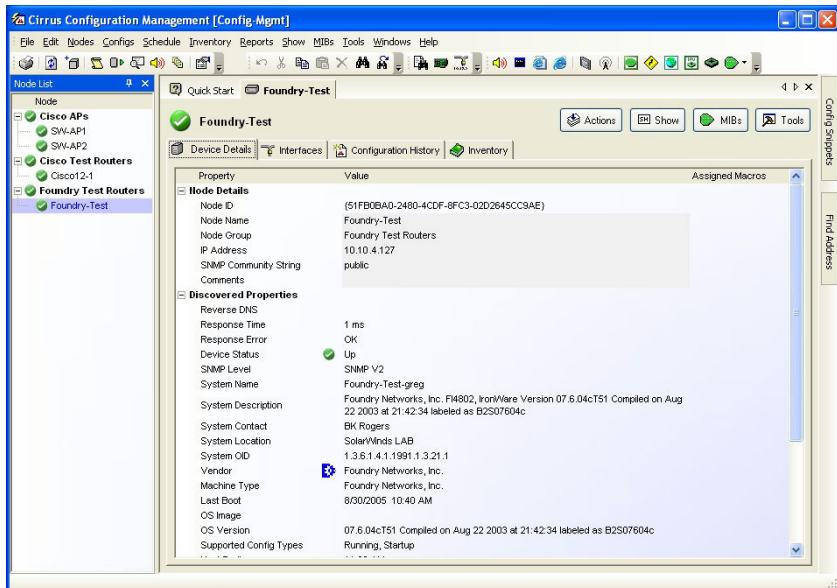
Select the SQL server from the drop-down list or type the server's IP Address or hostname. Then select the database name from the second drop-down list and choose the type of authentication required for the connection. Click **Next** → to continue the import process.

Editing Nodes

Once a Node has been added, the device's details can be modified by right-clicking on the Node in the Node List and then selecting **Edit Selected Nodes**.

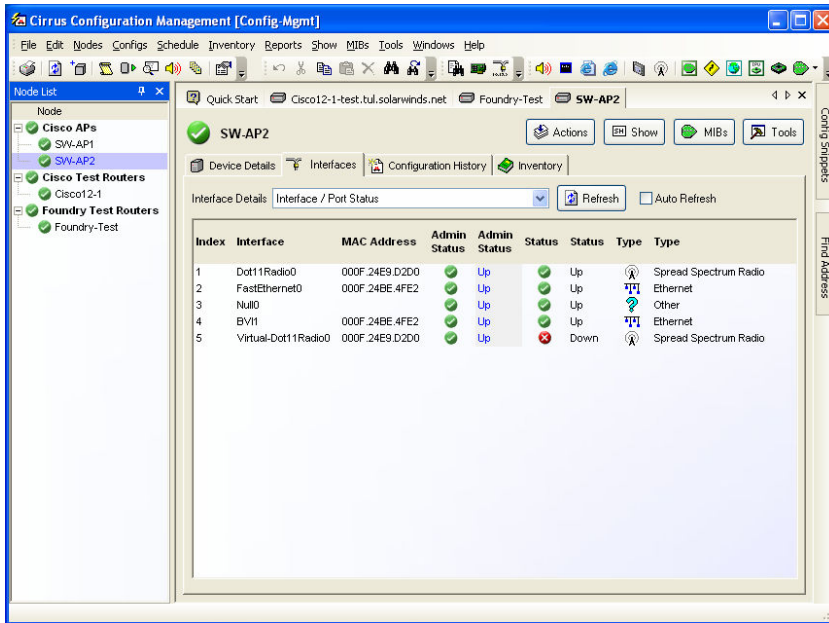
Device Details Tab

The Device Details tab is used to change the Node Name, Node Group, IP Address, login information, and more. Fields that appear in gray boxes can be edited. Double-click the field to edit the existing value, or use the drop-down list to select a different value.



Interfaces Tab

This tab is used to display interface details of a specific Node. Choose a category from the *Interface Details* drop-down menu and then click the **Refresh** button to display the selected statistics.



Check the **Auto Refresh** box to automatically update the statistics every 30 seconds.



To change the Auto Refresh time interval, select **Settings** from the **File** menu and then select **Interfaces** under the **Node Details Window** section. Adjust the slider to the desired interval and click **OK** to save the changes.

Right-click on an interface to see additional options such as Bandwidth Gauges, Graph Selected Statistics, Shutdown Selected Interface, and more.

Configuration History Tab

The Configuration History tab lists all configs that have been downloaded for the selected Node. The configs are separated by time periods such as “Last Week”, “Two Weeks Ago”, “Last Month”, and so on.

Right-click on a config or group of configs to be presented with additional options such as Edit Configs, Compare Selected Configs, Upload Selected Configs, and more.

ConfigTypeIcon	Config Type	ConfigTitle	Download Time	Modified Time
Last Week				
9/6/2005 05:48 PM - Running	Running	9/6/2005 05:48 PM - Running	9/6/2005 05:48 PM	
9/6/2005 05:47 PM - Running	Running	9/6/2005 05:47 PM - Running	9/6/2005 05:47 PM	
9/6/2005 05:41 PM - Running	Running	9/6/2005 05:41 PM - Running	9/6/2005 05:41 PM	
9/6/2005 05:40 PM - Running	Running	9/6/2005 05:40 PM - Running	9/6/2005 05:40 PM	
9/6/2005 05:37 PM - Running	Running	9/6/2005 05:37 PM - Running	9/6/2005 05:37 PM	
9/6/2005 05:25 PM - Running	Running	9/6/2005 05:25 PM - Running	9/6/2005 05:25 PM	
9/6/2005 05:23 PM - Running	Running	9/6/2005 05:23 PM - Running	9/6/2005 05:23 PM	
9/6/2005 05:08 PM - Running	Running	9/6/2005 05:08 PM - Running	9/6/2005 05:08 PM	
9/6/2005 01:23 PM - Running	Running	9/6/2005 01:23 PM - Running	9/6/2005 01:23 PM	
9/6/2005 01:18 PM - Running	Running	9/6/2005 01:18 PM - Running	9/6/2005 01:18 PM	
9/6/2005 01:01 PM - Running	Running	9/6/2005 01:01 PM - Running	9/6/2005 01:01 PM	
9/6/2005 09:35 AM - Running	Running	9/6/2005 09:35 AM - Running	9/6/2005 09:35 AM	
Two Weeks Ago				
9/2/2005 09:34 AM - Running	Running	9/2/2005 09:34 AM - Running	9/2/2005 09:34 AM	
9/1/2005 01:48 PM - Running	Running	9/1/2005 01:48 PM - Running	9/1/2005 01:48 PM	
8/31/2005 03:31 PM - Running	Running	8/31/2005 03:31 PM - Running	8/31/2005 03:31 PM	
8/30/2005 08:42 AM - Running	Running	8/30/2005 08:42 AM - Running	8/30/2005 08:42 AM	
8/30/2005 08:00 AM - Running	Running	8/30/2005 08:00 AM - Running	8/30/2005 08:00 AM	
8/29/2005 03:52 PM - Running	Running	8/29/2005 03:52 PM - Running	8/29/2005 03:52 PM	
8/29/2005 03:30 PM - Running	Running	8/29/2005 03:30 PM - Running	8/29/2005 03:30 PM	
Last Month				
8/24/2005 10:57 AM - Running	Running	8/24/2005 10:57 AM - Running	8/24/2005 10:57 AM	
8/24/2005 10:01 AM - Running	Running	8/24/2005 10:01 AM - Running	8/24/2005 10:01 AM	

Inventory Tab

The Inventory tab displays the information collected by the Inventory Engine. A dropdown menu is listed at the top categorizing the different statistics that can be displayed. Click a category to display the associated statistics. If no statistics are available, it may be necessary to perform an inventory on the selected node.



For details on performing Inventory, please refer to *Chapter 6: Inventory* on page 67.

Cirrus Configuration Management [Config Mgmt]

File Edit Nodes Configs Schedule Inventory Reports Show MIBs Tools Windows Help

Node List

- Cisco Access Points
 - SW-AP1
 - SW-AP2
- Cisco Test Routers
 - Cisco12-1
- Foundry Test Routers
 - Foundry-Test

Quick Start SW-AP1

Actions Show MIBs Tools

Device Details Interfaces Configuration History Inventory

Inventory Details

System Info

IP Addresses

Interfaces

Cisco 1200 Ac

TCP Ports

UDP Ports

VLANs

Technical Support

Physical Entities

RELEASE SOFTWARE (tc2)

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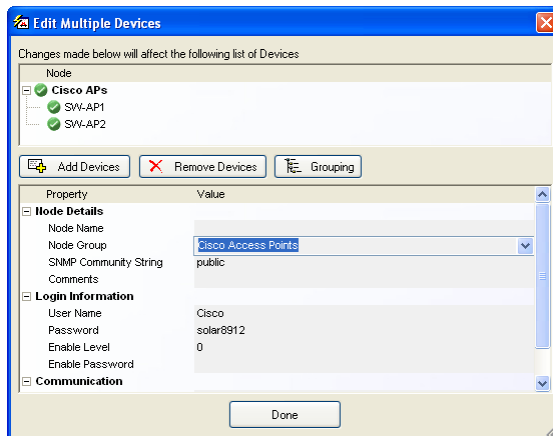
Cirrus Configuration Management Inventory includes details about each managed device. The following details can be included during device inventory.

- ARP Cache
- Interfaces or Ports
- Interface types (Frame Relay, ATM, Ethernet, FDDI, etc.)
- MAC Address of each interface
- IP Addresses assigned to each interface
- Subnetting Information
- Port Speeds
- MTU (maximum transmission unit) for each port
- Active UDP and TCP ports
- VLAN assignments
- Bridge Table
- Chassis details of Cisco devices

Editing Multiple Nodes

Many times it is necessary to make changes to more than one Node at a time. To edit two or more Nodes at the same time, select the devices on the Node List by using the Shift and Ctrl keys on the keyboard, and then right-click and select **Edit Multiple Nodes**.

The *Edit Multiple Devices* dialog is displayed listing the Nodes that have been selected at the top. To add or remove Nodes from the list, use the associated buttons below the list.



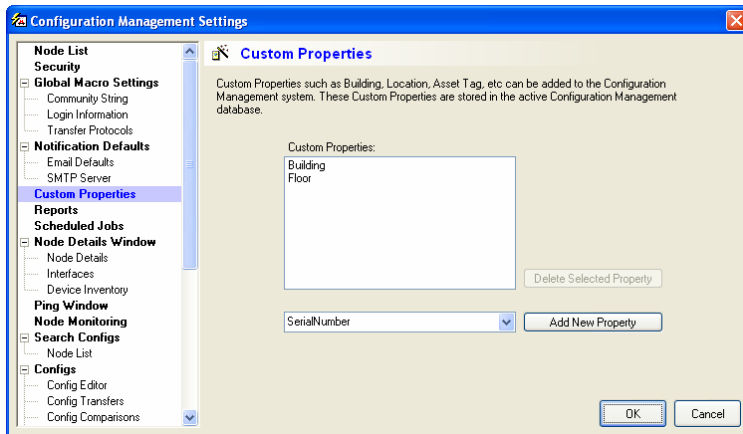
Make the appropriate changes to the Nodes and click **Done** to accept the changes. It may be necessary to refresh the Node List to show the changes by pressing the  button at the top of the Node List.

Custom Properties

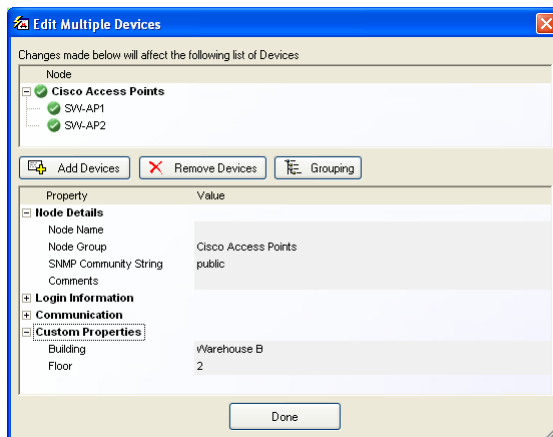
Cirrus includes the ability to add Custom Properties to each Node. Custom Properties are additional fields such as country, building, asset tag, serial number, etc. that can be defined and stored in the Cirrus database.

Cirrus provides a collection of the most commonly utilized properties to choose from. New custom properties can also be defined. Once a custom property is created, the properties can be edited in the Node Details of each device.

To define a Custom Property, click the  button on the toolbar, or select **Settings** from the **File** menu, and then select **Custom Properties** from the menu on the left. Select a property from the drop-down list or type in a new property, and then click the **Add New Property** button to create the Custom Property.



Once a Custom Property exists, the field will be displayed when viewing Node Details. To edit the Custom Properties, right-click on a node or group of nodes and click **Edit Selected Nodes** or **Edit Multiple Nodes**. The new Custom Properties will be displayed at the bottom of the Node Details.



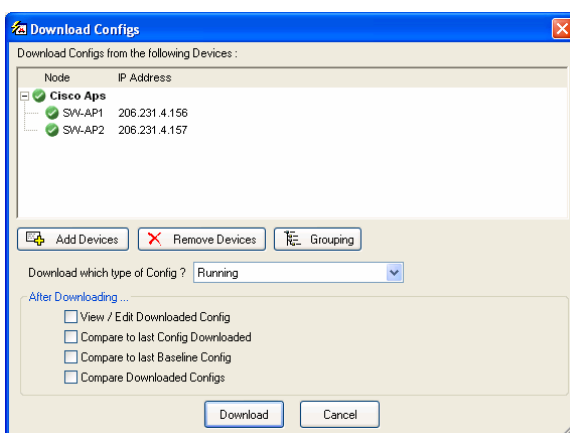
Enter the new values for the Custom Properties and then click **Done** to save the changes.

Chapter 4: Managing Configs

After adding Nodes, it's time to start managing configuration files. Configs can be downloaded, edited, compared, and uploaded all from the same console. This chapter explains the various tasks that help ease the pain of managing Configs.

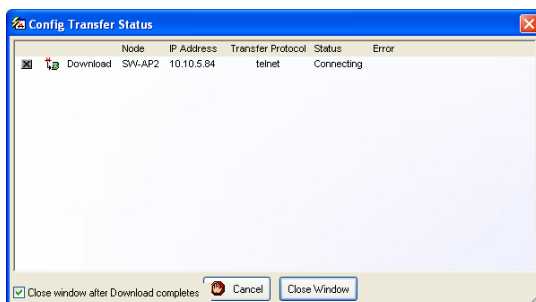
Downloading Configs

To download a config from a single node, or group of nodes, right-click on a node, group, or selection of nodes and select **Download Configs**.



Nodes can be added or removed from the list of Nodes by using the associated buttons below the list of Nodes.

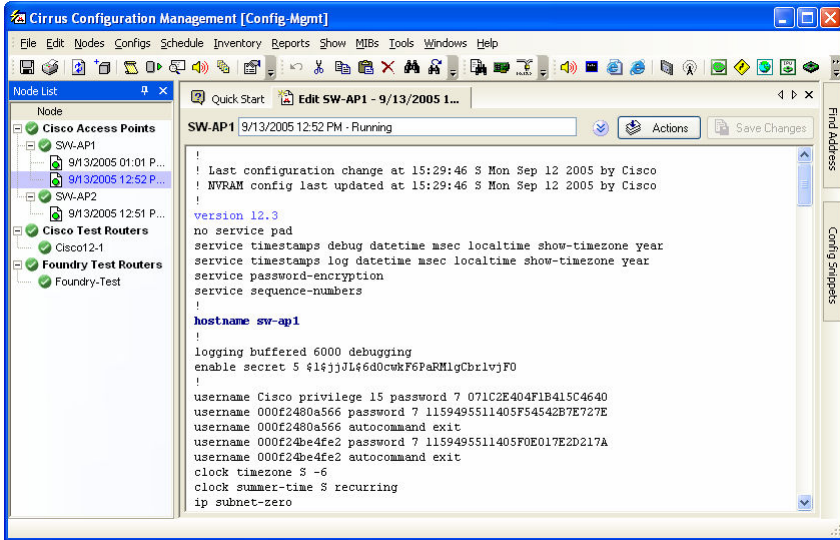
Select the type of config to download, either Running or Startup, and then check any *After Download* options needed such as **View / Edit Downloaded Config**. Click **Download** to start the transfer.



Once the download has finished, the configs are written to the database and any *After Download* options will be performed.

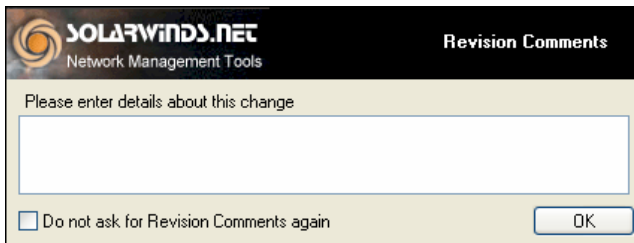
Editing Configs

To edit an existing configuration file, right-click on the file from the Node List and select **Edit Selected Configs**, or simply double-click the file.

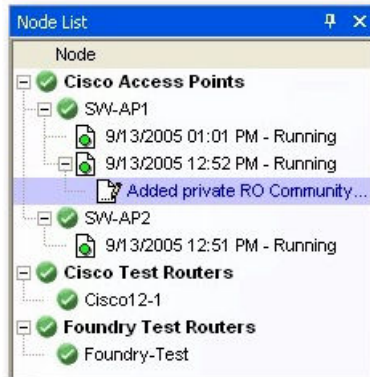


Saving Changes with Revisions

After making any changes to the configuration file, clicking the **Save Changes** button will open the *Revision Comments* dialog. This is used to enter any details regarding the changes made to the configuration file.

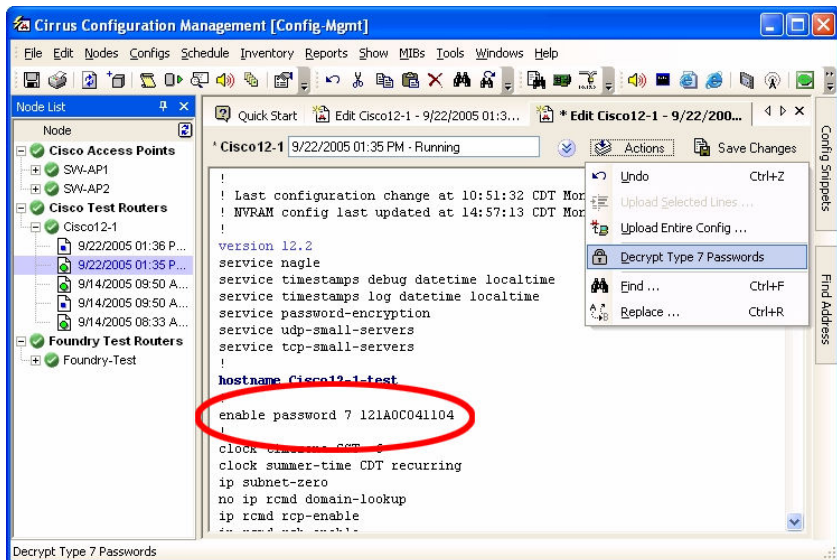


Enter a description of the changes made and click **OK** to save the configuration file. The revision is saved below the existing configuration file as a separate file with the Revision Comments as the name.



Decrypting Cisco Type 7 Passwords

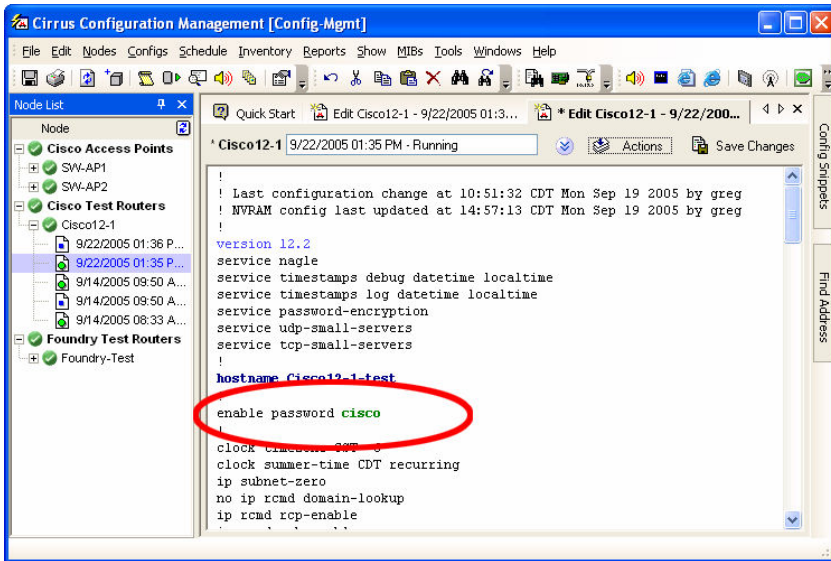
When viewing a configuration file, encrypted Cisco Type 7 passwords can be decrypted with the touch of a button. With a configuration file open, click the **Actions** button and then select **Decrypt Type 7 Passwords**.



Cirrus will scan the entire configuration file for all Cisco Type 7 encrypted passwords. All passwords that have been decrypted will appear green.



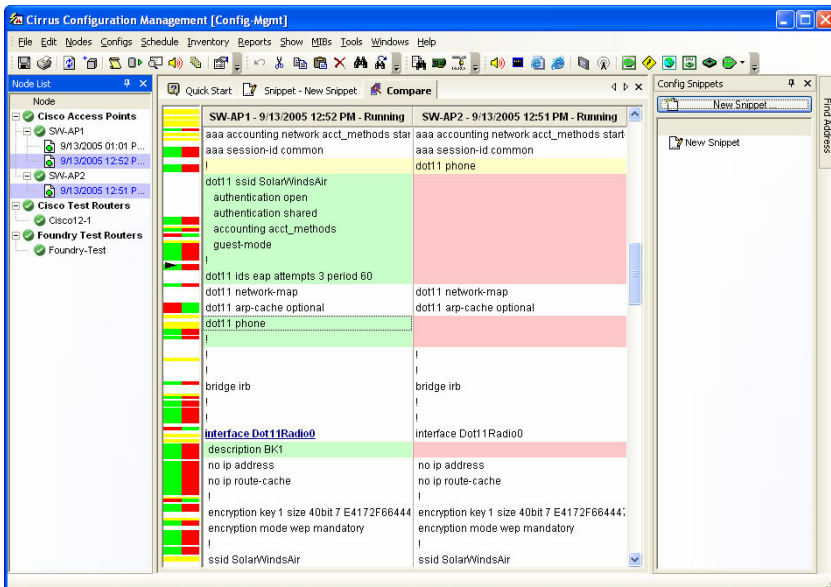
Decrypting the Type 7 Passwords alters the text of the configuration file. If the configuration file is saved after decrypting the passwords, the passwords will be saved without encryption.



Comparing Configs

Another feature of Cirrus is the ability to compare configuration files. Configs can be compared between two Nodes, or compare an older version with the current configuration.

To compare two configuration files, select the two files that are to be compared from the Node List and then right-click and select **Compare Selected Configs**.



The compared files will be shown in a side by side view. Lines that have been changed will be highlighted in yellow. Missing lines are highlighted in red. A green highlight means that the line has been added.

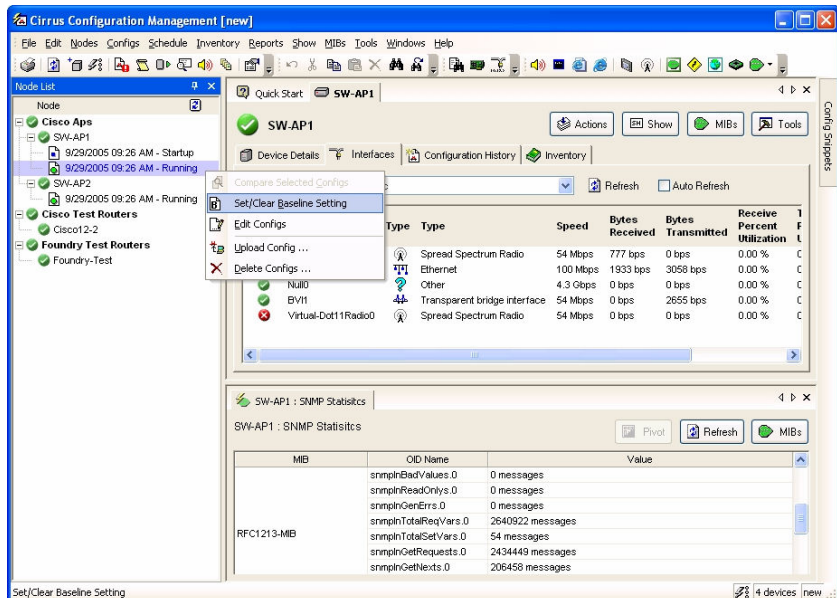
A Comparison Overview is displayed to the left of the side by side comparison. This scales to fit the size of the window allowing for an overview of the entire comparison. Click anywhere on the Comparison Overview to jump to the associated section of the configs being compared.

Also, the comparison can easily be printed by selecting **Print** from the **File** menu.

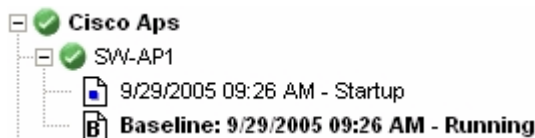
Setting a Baseline Config

A Baseline Config is a configuration file that is known to be a good configuration. When making a number of changes to a Node's configuration, it's a good idea to establish a known good configuration as a Baseline for future comparisons.

To set an existing configuration file as a Baseline, right-click on the config in the Node List and select **Set/Clear Baseline Setting**.



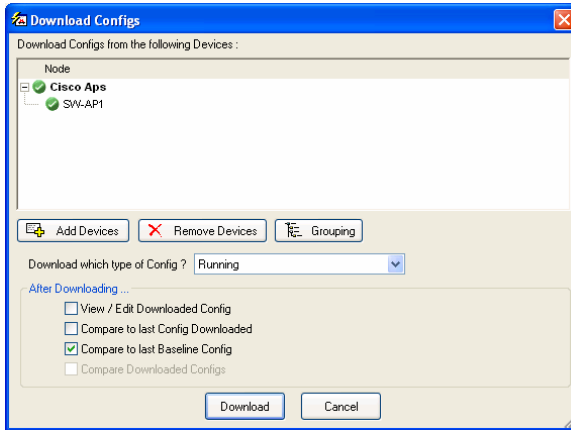
The config will then be highlighted in bold, and the word "Baseline" will be added to the beginning of the name of the config.





Several baseline configs can be established. To assign additional Baselines, right-click on a Node or group of Nodes and click **Set/Clear Baseline Setting**.

When downloading new configurations with a Baseline Config established for the same Node, check the option **Compare to last Baseline Config** in the *Download Config* dialog to automatically compare the new config to the Baseline.

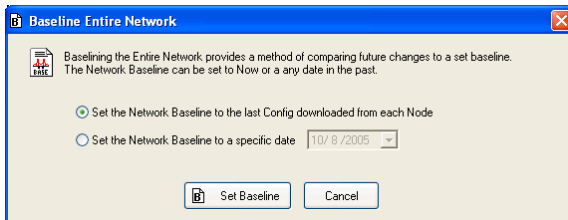


To remove the Baseline flag from a configuration file, right-click on the config in the Node List and select **Set/Clear Baseline Setting**.

Baseline Entire Network

In some situations, it may be appropriate to establish a Baseline configuration for every Node on the Network. The Baseline can be set to the last config downloaded for each Node, or it can be set to the configs downloaded on a specific date.

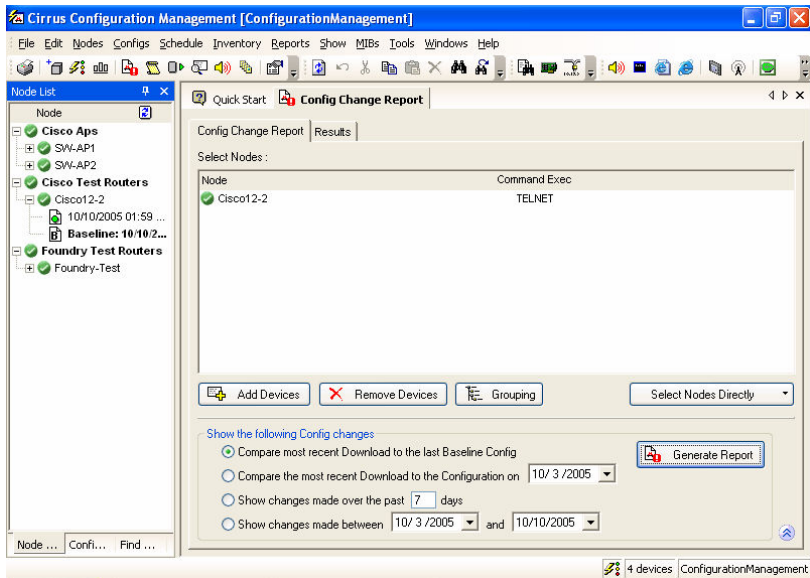
To create a Baseline for all Nodes, click the  button on the toolbar, or select **Baseline Entire Network** from the **Configs** menu. Select either the option to designate the last downloaded config of each node as a Baseline, or set the Baseline based on configs that were downloaded on a specific date. Click the **Set Baseline** button to flag the specified configs as Baseline Configs.



Config Change Reports

A Config Change Report shows all changes made between each configuration file over a specific time period. These Reports can show all changes that occurred during a specific date range, or all differences between the latest downloaded config and the Baseline Config.

To view this Report, select **Config Change Report** from the **Configs** menu.



At the bottom of the dialog, select the type of Config Change Report to generate. The default selection (**Compare most recent Download the last Baseline Config**) will display all the differences between the last Baseline Config, and the most recent Downloaded Config.

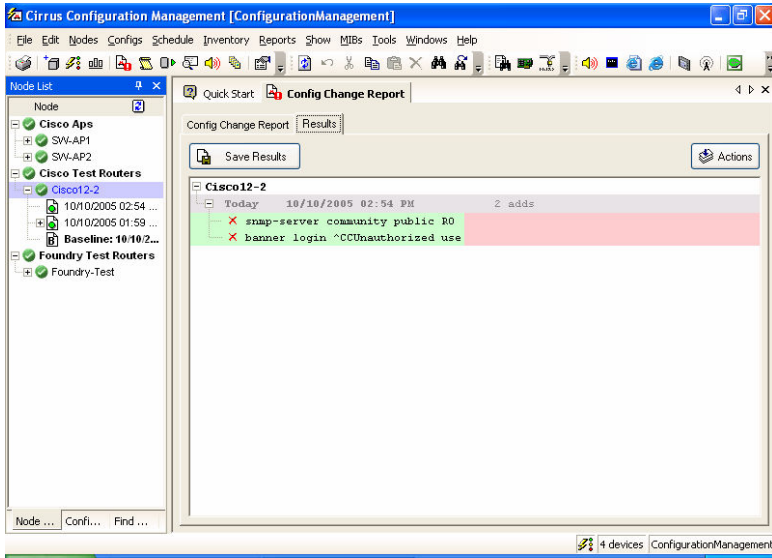
The second option, **Compare the most recent Download to the Configuration on a specific Date**, will show all differences between the most recent Downloaded Config and a Configuration on the specified date.



If there was no Config downloaded on the specified date, the next Config after that date will be used for the comparison.

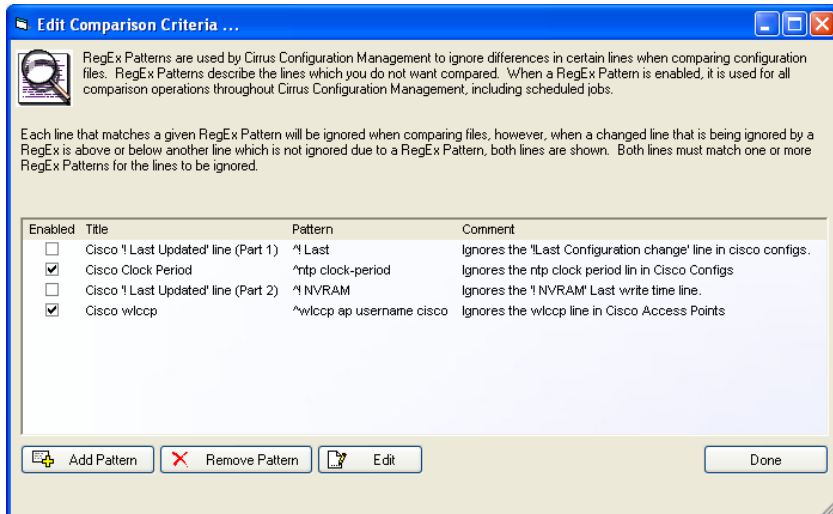
The last two options will show all changes made to a Node configuration that have occurred during a specific date range.

Select the type of Config Change Report to create, and then click the **Generate Report** button. The Report will be displayed on the Results tab.



Comparison Criteria and RegEx Patterns

When viewing Config Change Reports, some changes can be ignored such as the 'Last Configuration change' line in Cisco configs. To determine which lines should be ignored, click the **Comparison Criteria** button.

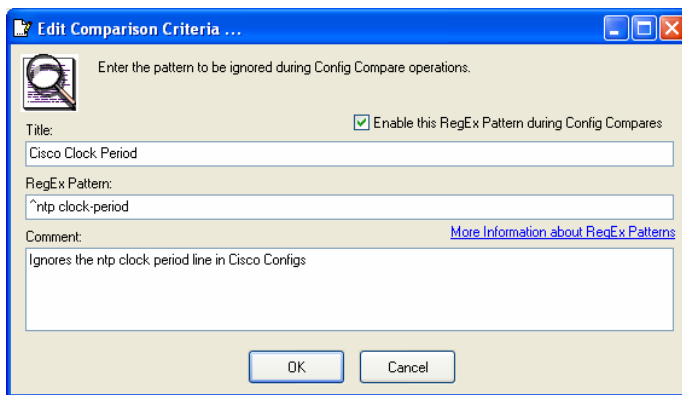


RegEx Patterns are used by Cirrus Configuration Management to ignore differences in certain lines when comparing configuration files. RegEx Patterns

describe the lines that are to be ignored. RegEx Patterns are global, and when a RegEx Pattern is enabled, it is used for all comparison operations throughout Cirrus Configuration Management, including Scheduled Jobs.

Each line that matches a given RegEx Pattern will be ignored when comparing files, however, when a changed line that is being ignored by a RegEx is above or below another line which is not ignored due to a RegEx Pattern, both lines are shown. Both lines must match one or more RegEx Patterns for the lines to be ignored.

There are a few example comparisons included with Cirrus. To enable a Comparison Criteria, check the box next to the pattern that is to be ignored. To create a new pattern, click the **Add Pattern** button.



Give the Comparison Criteria a name and add a comment if necessary. In the **RegEx Pattern** field, enter the RegEx Pattern that Cirrus is to ignore when running the Config Change Report.

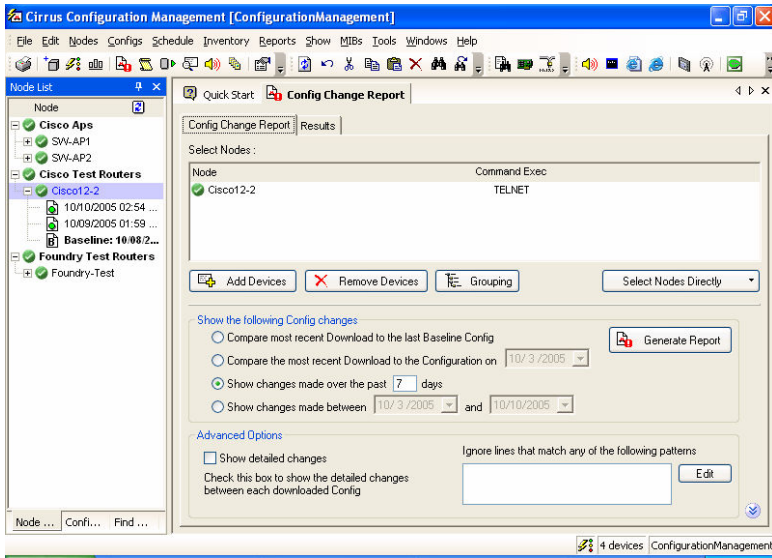
When the Config Change Report is executed, any lines that match one of the Comparison Criteria will be excluded in the Report.



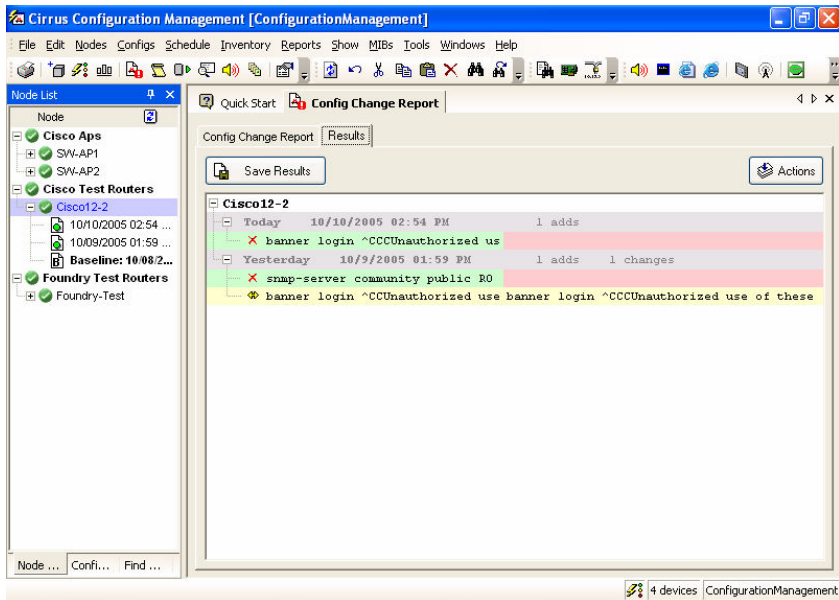
For more information about RegEx Patterns, refer to *Appendix D: Regular Expression Pattern Matching* on page 177.

Advanced Options

Before generating a Report, click the  button to display the Advanced Options.



Check **Show detailed changes** to display the differences between each configuration file separately. This will show each change from one config to the next. For example, if there were 4 configuration changes made in a specific date range, the Report will show the differences in the first config compared to the second config, and then show the differences in the second config compared to the third, and so on. The Report will be grouped by date, showing all changes made on each day.

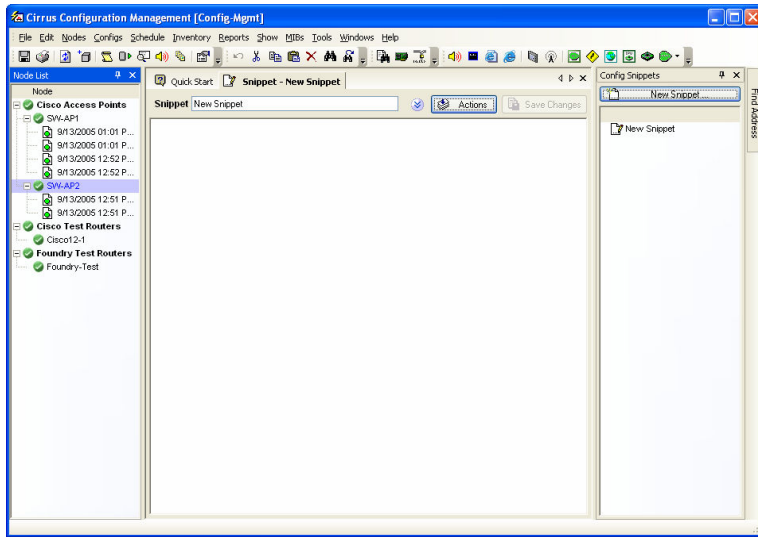


Config Snippets

A Config Snippets is a string of text that can be saved to a file allowing the user to merge sections of configs with ease. Config Snippets can be used to edit an existing config, or can even be uploaded directly to a Node or group of Nodes.

Creating a New Config Snippet

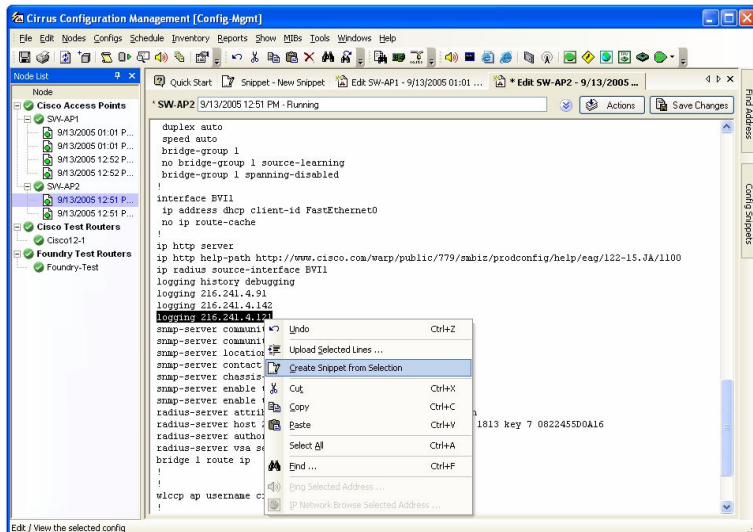
To create a new Config Snippet from scratch, click the **New Snippet** button at the top of the Config Snippets panel on the right-hand side.



If the Config Snippets panel is not displayed, it can be opened by selecting **Config Snippets** from the **Windows** menu.

Enter text for the new Config Snippet in the large text box provided. Give the Snippet a name ("New Snippet" by default) and click the **Save Changes** button.

Config Snippets can also be created by right-clicking on a selection of text and selecting **Create Snippet from Selection**.

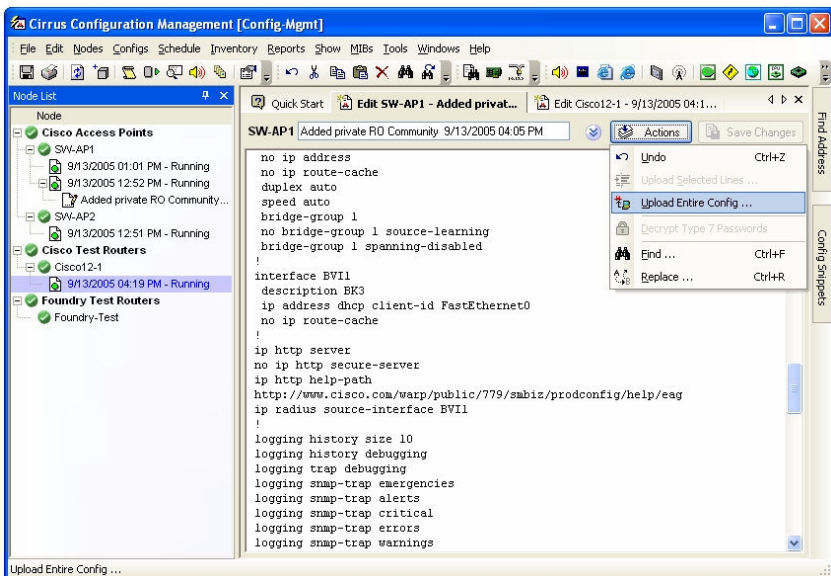


Uploading Configs

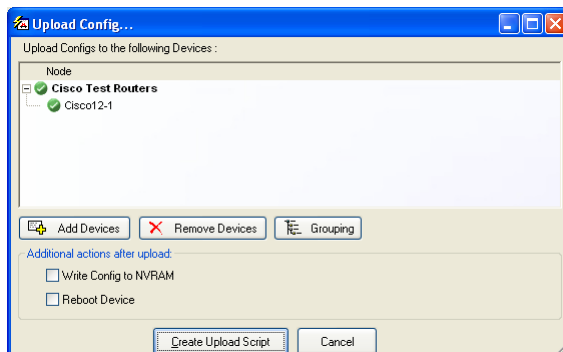
After editing configurations files, they can be uploaded to a node or group of nodes with ease. There are three different ways to upload configuration changes; Uploading and Entire Config, Uploading Selected Lines, and Uploading a Config Snippet.

Uploading an Entire Config

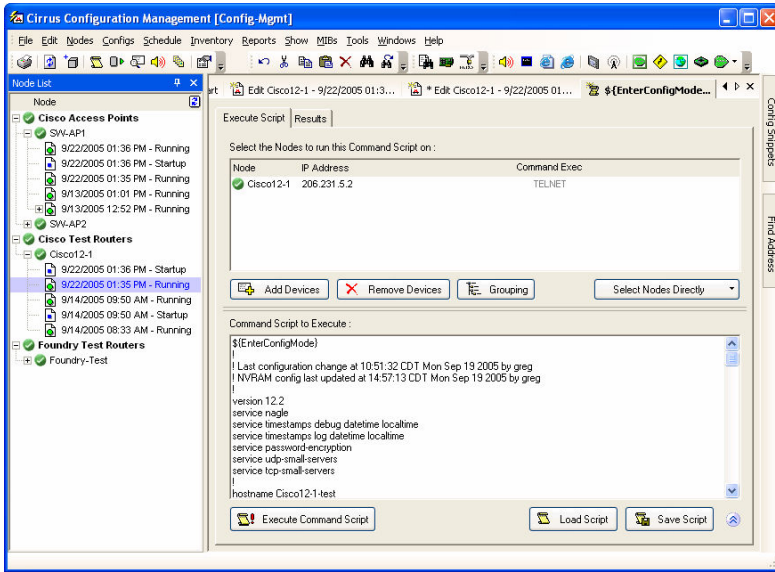
To upload an entire configuration file, right-click on the file and select **Upload Config**. Configuration files can also be uploaded when editing the config by clicking on **Action → Upload Entire Config**.



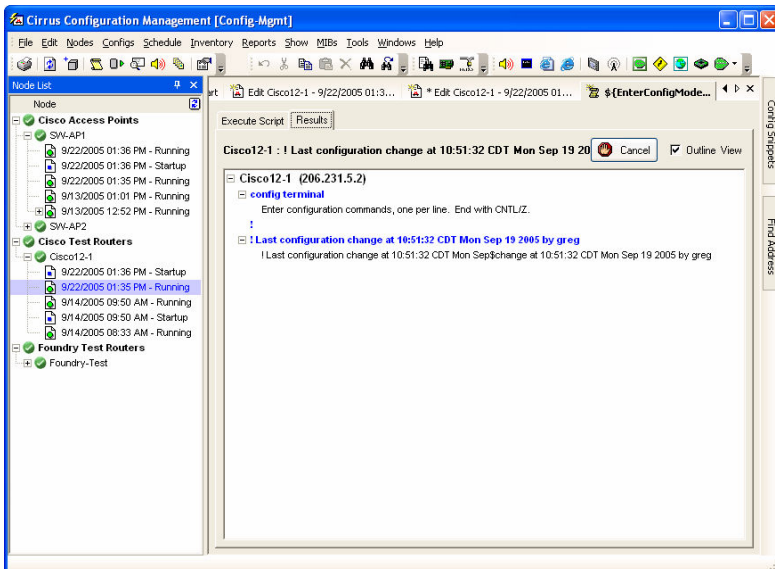
The *Upload Config* dialog is displayed. Additional Nodes can be added to the list of Nodes to upload to by using the associated buttons below the list.



If the configuration needs to be written to NVRAM or if the device needs to be rebooted following the upload, check the appropriate options at the bottom, and then click **Create Upload Script** to open the *Execute Script* dialog.



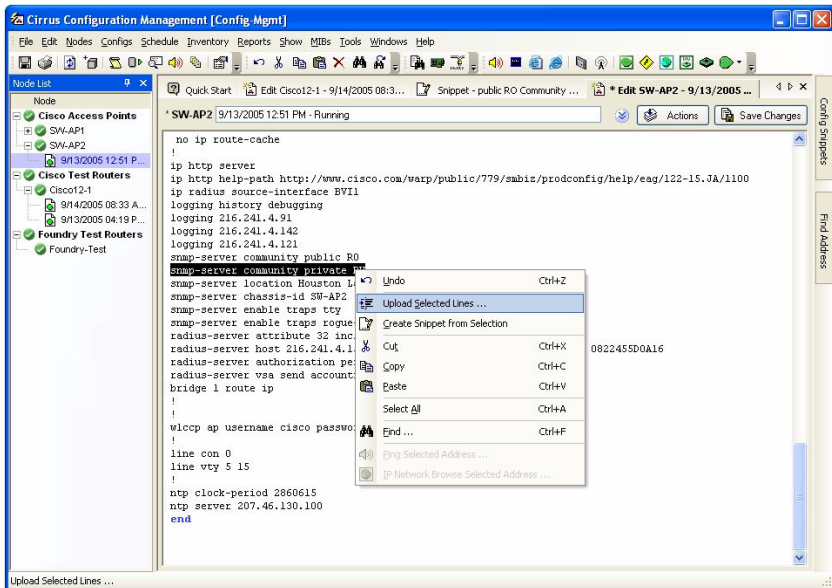
In the *Execute Script* dialog, Nodes can be added or removed, and the command script can be saved. Also, previous command scripts can be loaded to replace the automatically generated script. Once satisfied with the command script, click the **Execute Command Script** button to begin the upload process.



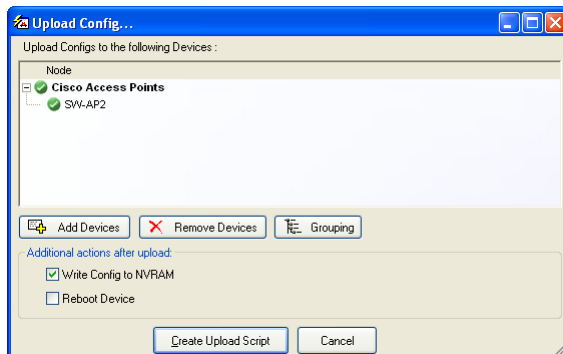
As the script is executed, the *Results* tab displays the progress as the configuration changes are uploaded. Once the upload command script completes, the results can be saved by clicking the **Save Results** button at the top of the dialog.

Uploading Selected Lines

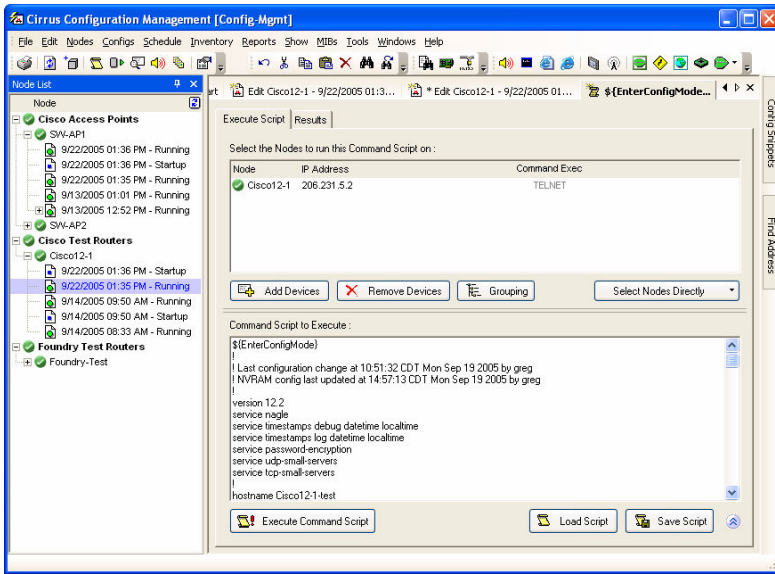
There are times when it is only necessary to upload a few lines of a configuration file. Cirrus includes the ability to upload only specific lines of a config. When editing a configuration file or Config Snippet, highlight the line(s) need to be uploaded, right-click, and select **Upload Selected Lines**.



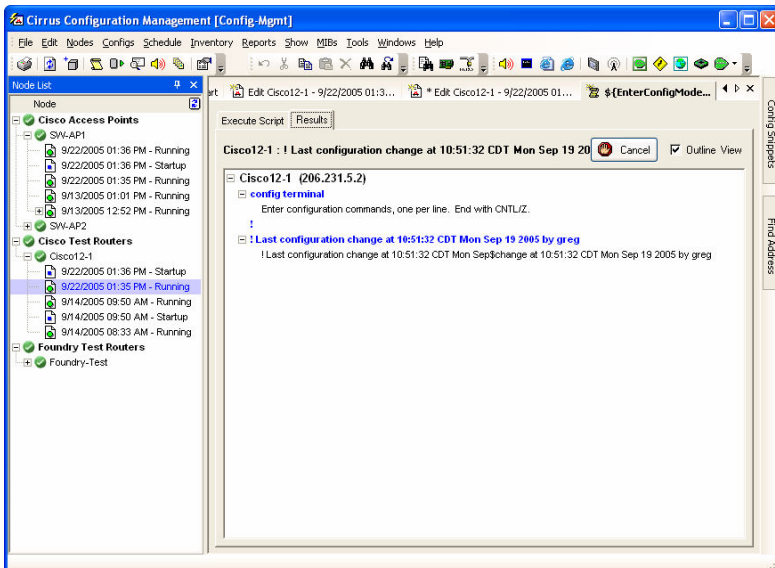
The *Upload Config* dialog is displayed. Additional Nodes can be added to the list of Nodes to upload to by using the associated buttons below the list.



If the configuration needs to be written to NVRAM or if the device needs to be rebooted following the upload, check the appropriate options at the bottom, and then click **Create Upload Script** open the *Execute Script* dialog.



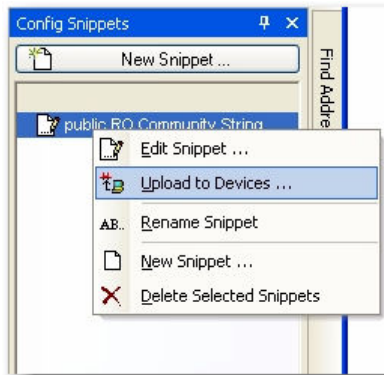
In the *Execute Script* dialog, Nodes can be added or removed, and the command script can be saved. Also, previous command scripts can be loaded to replace the automatically generated script. Once satisfied with the command script, click the **Execute Command Script** button to begin the upload process.



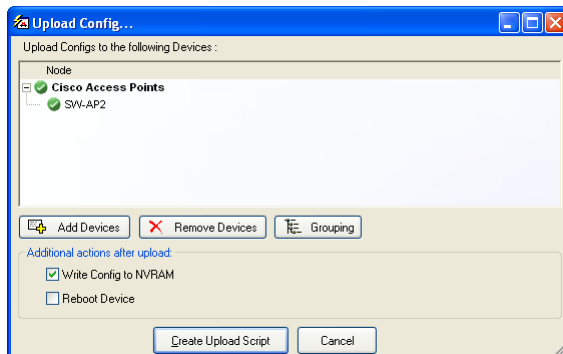
As the script is executed, the *Results* tab displays the progress as the configuration changes are uploaded. Once the upload command script completes, the results can be save by clicking the **Save Results** button at the top of the dialog.

Uploading a Config Snippet

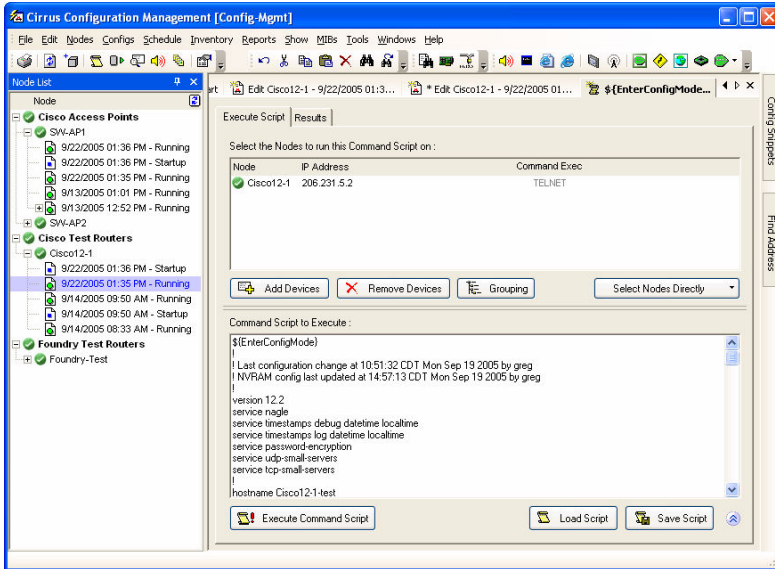
To upload a Config Snippet, either right-click on the Snippet in the Config Snippets window and click **Upload to Devices**, or click **Actions → Upload Entire Config** when editing the Snippet.



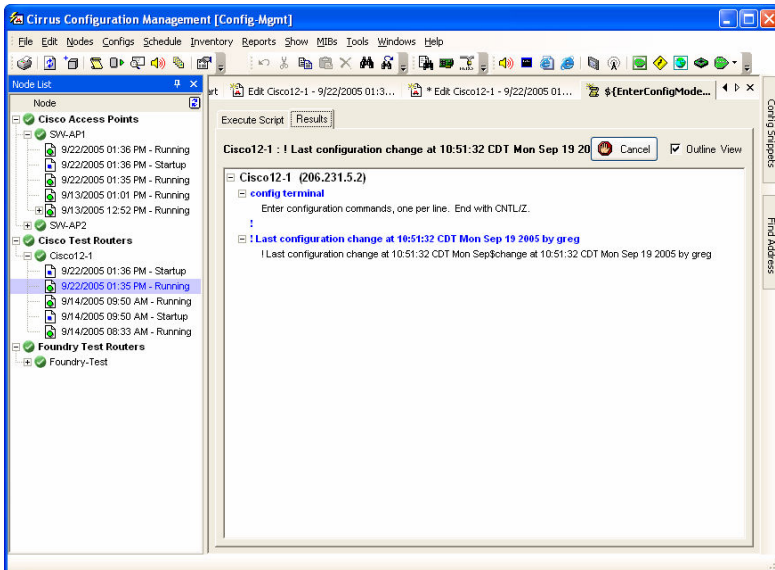
The *Upload Config* dialog is displayed. Additional Nodes can be added to the list of Nodes to upload to by using the associated buttons below the list.



If the configuration needs to be written to NVRAM or if the device needs to be rebooted following the upload, check the appropriate options at the bottom, and then click **Create Upload Script** open the *Execute Script* dialog.



In the *Execute Script* dialog, Nodes can be added or removed, and the command script can be saved. Also, previous command scripts can be loaded to replace the automatically generated script. Once satisfied with the upload command script, click the **Execute Command Script** button to begin the upload process.



As the script is executed, the *Results* tab displays the progress as the configuration changes are uploaded. Once the upload command script completes, the results can be saved by clicking the **Save Results** button at the top of the dialog.

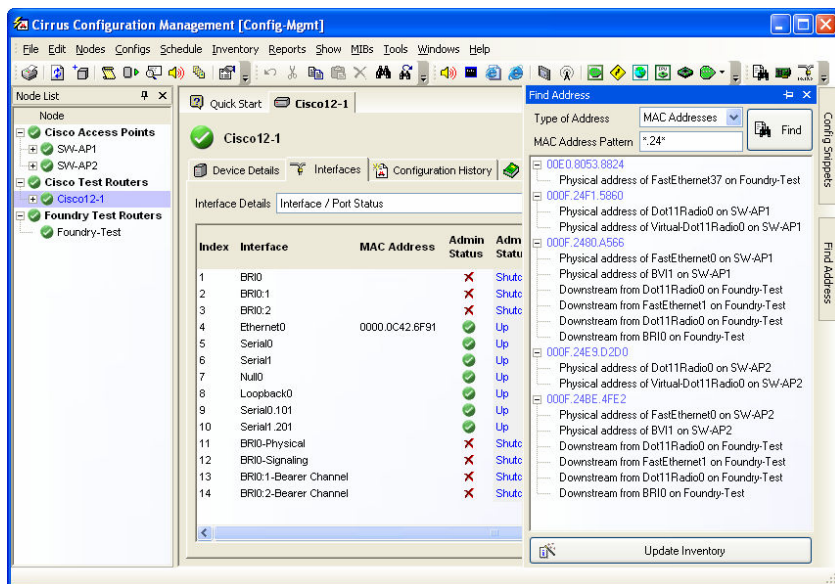
Finding an Address

Cirrus includes a search engine that will search the entire database (Nodes, configuration files, and Inventory) for a specific address. To open the Find Address tool, click the **Find Address** tab on the right side of the screen.



If **Find Address** is not displayed here, select **Find Address** from the **Windows** menu.

Select MAC Address, IP Address, or Hostname, enter the Address Pattern, and then click the **Find** button.

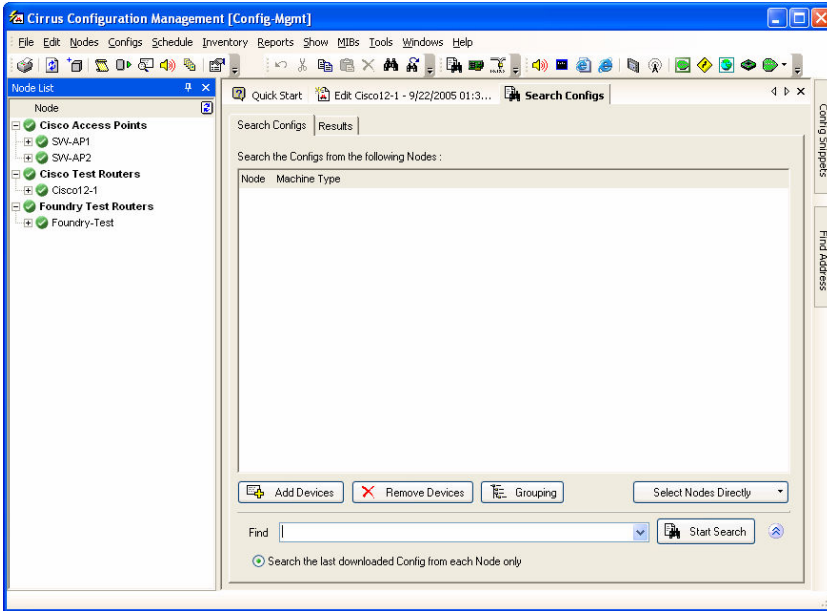


Once the results are displayed, right-click on a result and select **View Selected Node** to see the Node Details of the associated device.

To ensure the most accurate and complete results are available, click the **Update Inventory** button listed at the bottom of this tab to rescan all Nodes in the database for any updated information.

Search Configs

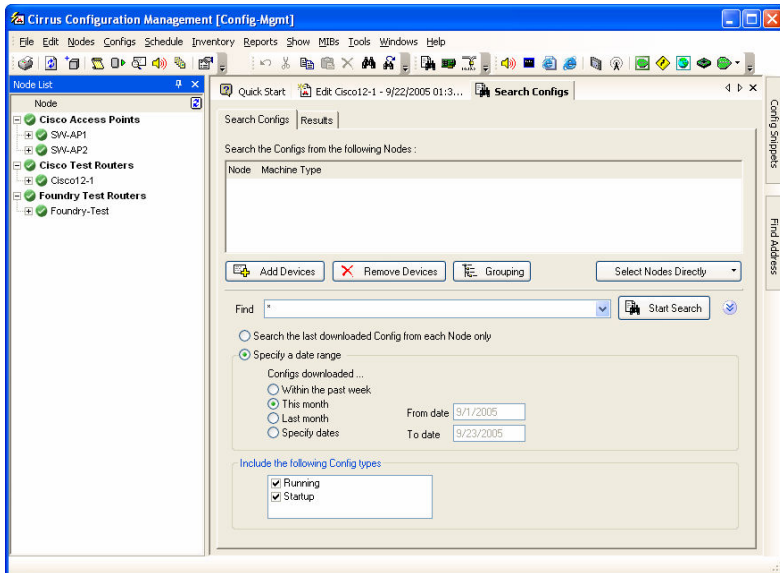
To search for specific strings of text within the configuration files stored in the Cirrus database, click the  button on the toolbar or select **Search Configs** from the **Edit** menu.



Click the **Add Devices** button to select which nodes to search. Alternately, click the **Select Nodes Directly** dropdown list and select either **All Nodes** or **Specify a Selection Criteria**.

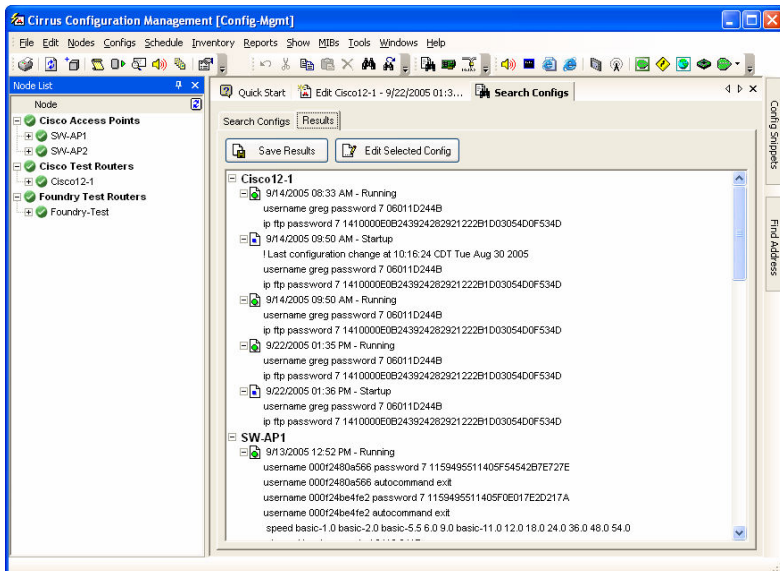
Once the devices or selection criteria have been selected, enter a string of text and click **Start Search** to search through the last downloaded config of each Node selected.

To search through more than just the last downloaded configuration files, click the  button to expand the Search Criteria.



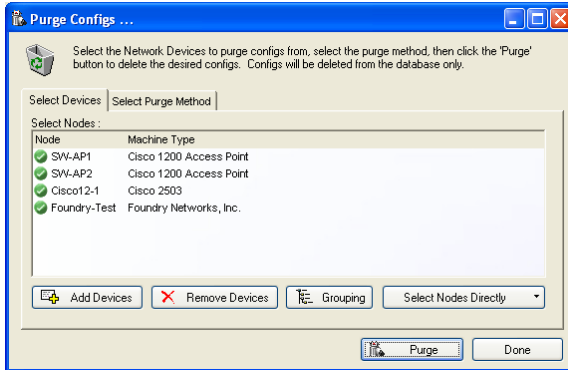
With the Search Criteria expanded, specify this week, this month, last month, or a specific date range. The type of configs to search can also be selected in this expanded window. Click **Start Search** to scan the database for the specified text within the date range selected.

Once the search completes, the Results tab is displayed. The results can be saved by clicking the **Save Results** button at the top of the dialog.

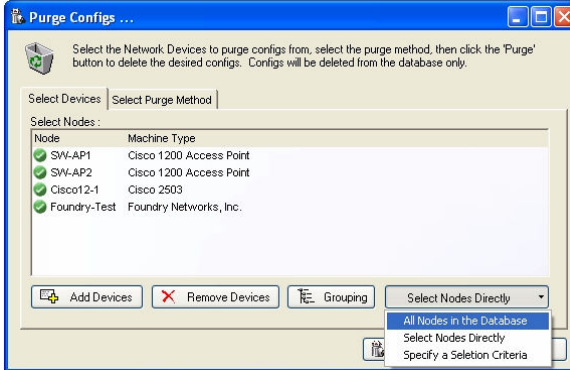


Purging Configs from the Database

As the Cirrus database grows in size, it may be necessary to delete existing configuration files from the database. To purge the database, select **Purge Configs** from the **Configs** menu.



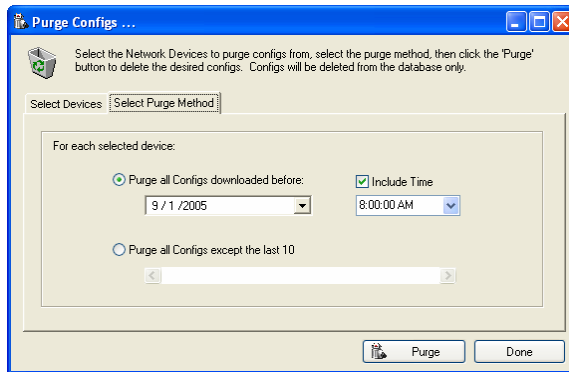
On the *Select Devices* tab, choose the nodes that need to have configuration files removed. There are three ways to select Nodes; **All Nodes in the Database**, **Select Nodes Directly**, and **Specify a Selection Criteria**. To change the selection method, click the **Select Nodes Directly** button and choose the new method.



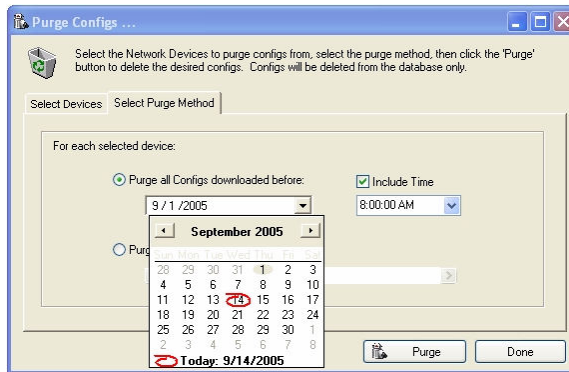
For details on how to specify selection criteria, please refer to the section in this chapter titled *Specifying a Selection Criteria* on page 56.

Selecting the Purge Method

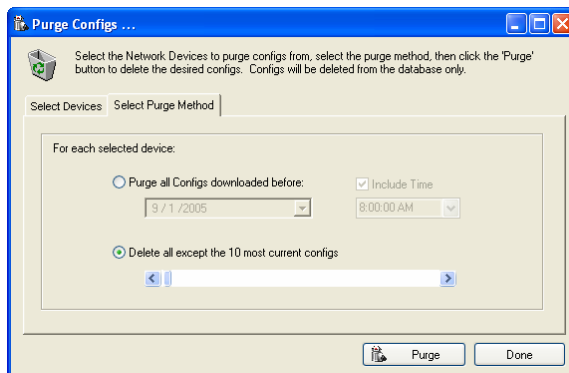
With the Nodes selected, click the *Select Purge Method* tab to establish which configs will be removed.



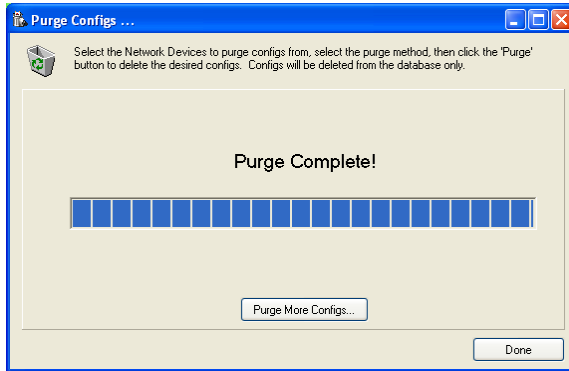
To remove configs older than a specific date, select **Purge all Configs downloaded before:** and then, specify the date and time (if required) by using the drop-down menus or by typing the date/time in the appropriate boxes.



Alternately, to remove all configs and keep only the last few, select **Purge all Configs except the last 10**, and then move the slider to adjust how many configuration files should be kept in the database.



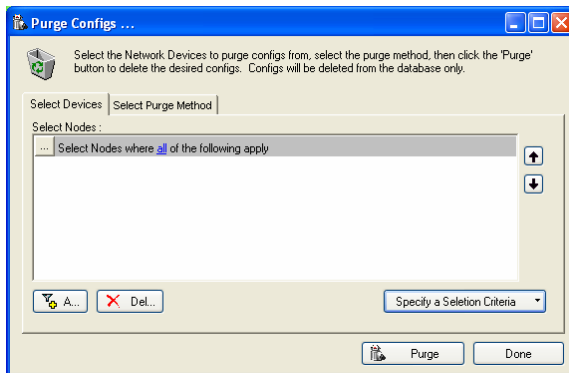
Once the Purge Method has been established, click the **Purge** button to remove the configuration files from the database.



Once the Purge has completed, click **Purge More Configs** to setup another purge, or click **Done** to close the window.

Specifying a Selection Criteria

In some instances, it may be easier to specify selection criteria as opposed to selecting a group of nodes. On the *Select Devices* tab, click the **Select Nodes Directly** button and select **Specify a Selection Criteria**

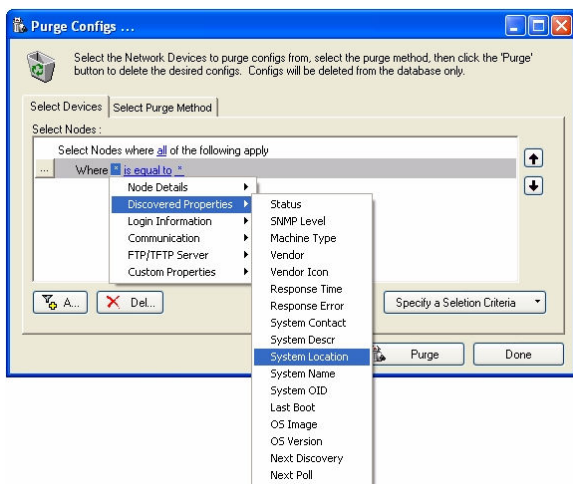


Two types of filtering conditions are available, each of which may be chosen from a list accessed by clicking the Ellipsis button at the left of each filter's entry.

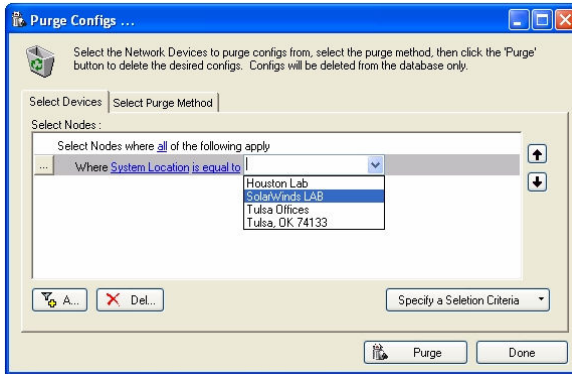
Choose the type of condition needed, referring to the following Condition Table for guidance in selecting the appropriate condition type.

Condition	Options
Elementary	is equal to * equal greater less greater or equal less or equal not equal is empty is not empty contains starts with Records where * (=DatabaseField) * (= SpecifiedValue)
Complex	all of the following all any none not all Select records where of the following apply

Add an Elementary Condition using the Ellipsis button. Click the first asterisk (*) and select the desired field using the flyout menu.



After selecting a field, choose a comparison, such as “is equal to”, and then enter the value or select it from the dropdown list.



When clicking the dropdown menu for the value, all values currently in the database for that field are displayed.

Once finished creating the selection criteria, choose a purge method and then click **Purge** to remove the configuration files from the database.



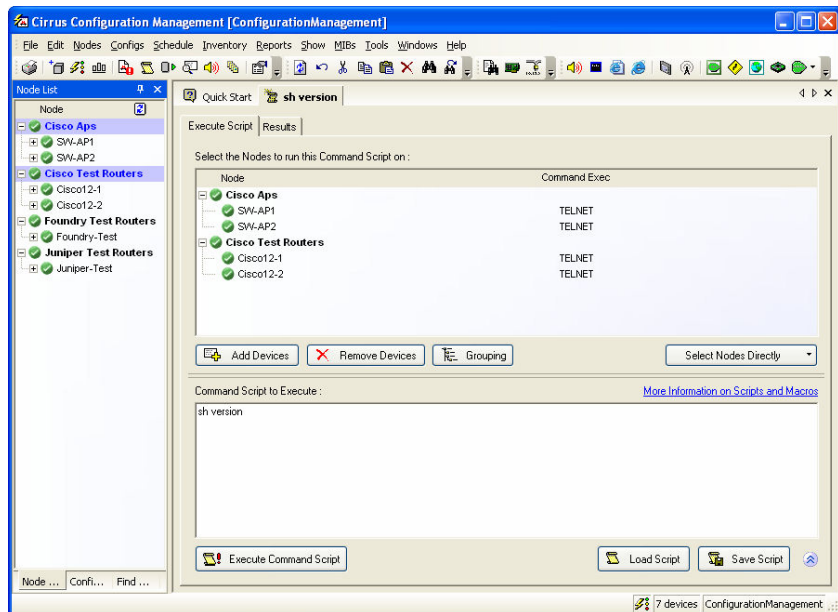
For details on selecting a purge method, please refer to the section in this chapter titled *Selecting the Purge Method* on page 54

Chapter 5: Command Scripts

Command Scripts can be executed to accomplish several different types of tasks such as Downloading Configs, Uploading Configs, Uploading IOS Images, Updating Login Banners, Access Control Lists (ACLs), and more. With the use of macros, a single script can be executed on several different device types without having to worry about syntax differences between each device.

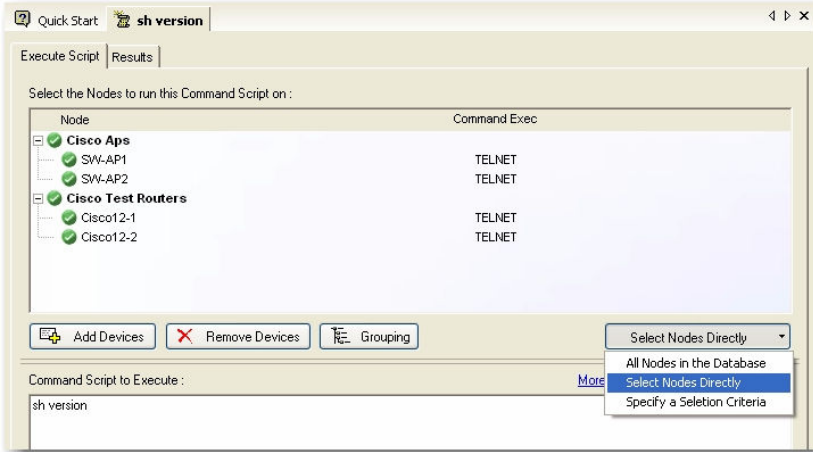
Getting Started

To launch the **Execute Command Script** window, click the  button on the toolbar, or select **Execute Command Script** from the **Nodes** menu.

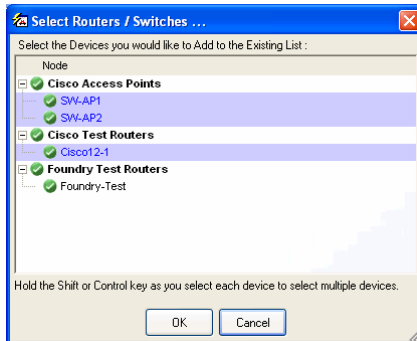


Selecting Nodes

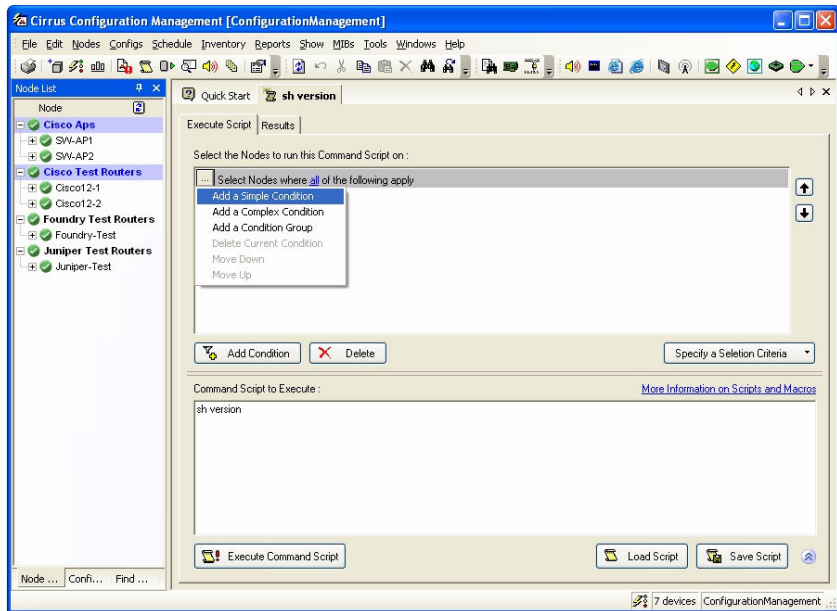
Once the **Execute Command Script** window is displayed, devices can be added using the associated buttons below the list of Nodes. To select a group of Nodes, choose the option **Select Nodes Directly** or **Specify a Selection Criteria**. Otherwise, select **All Nodes in the Database** to execute the script on every Node.



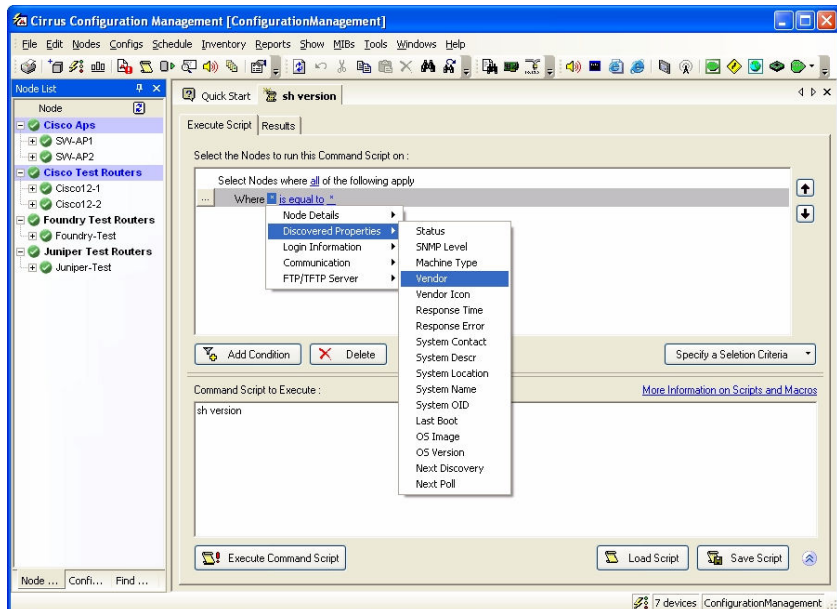
With the option **Select Nodes Directly** selected, click the  **Add Devices** button and choose the Nodes and/or Groups that are to be applied to this script and then click the **OK** button.



To select a group of Nodes based on a specific set of conditions, select the option **Specify a Selection Criteria**. Add a condition by clicking the  button and then click **Add a Simple Condition**.



Click the first asterisk (*) and then select the desired field using the submenu.



Select a condition (the default condition is “is equal to”) and then click the second asterisk (*) to assign a value for the condition. Type a value, or select one from the drop-down list.



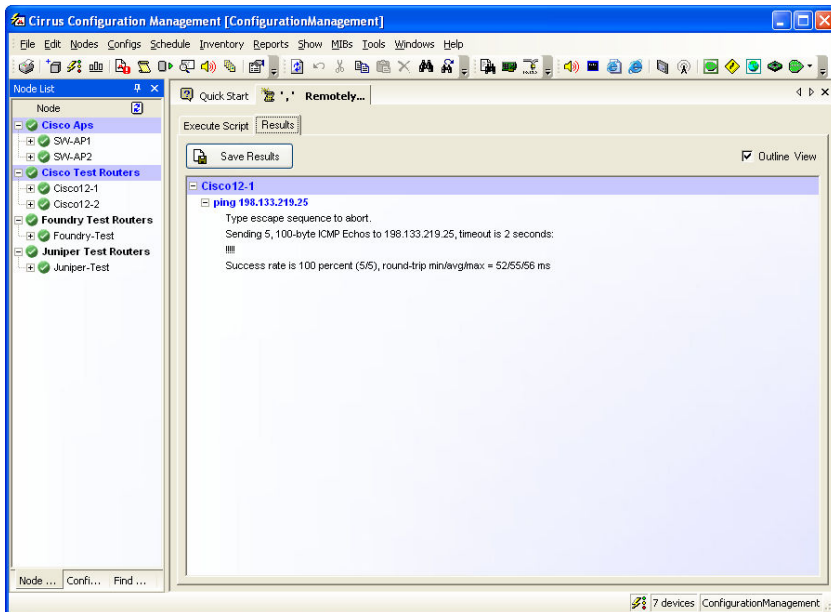
When clicking the dropdown menu for the value, all values currently in the database for that field are displayed.

Click the **OK** button once satisfied with the selection criteria, or group of Nodes.

Executing Command Scripts

Once satisfied with the selection of Nodes, type the script that is to be executed. The script consists of a single command or list of commands to be sequentially executed. The script should mirror commands entered when manually entering instructions using the command prompt. For example, when sending the “show version” command to a router via a TELNET session, the prompt requires the user to enter “sh version”. Add one line to the script that has the exact phrase as it is typed in the command prompt “sh version” (without quotes) with a carriage return (ENTER key) at the end of the line.

Click the **Execute Command Script** button to start the script. The **Results** tab will be opened automatically and the outcome of the script will be displayed as the output is received.

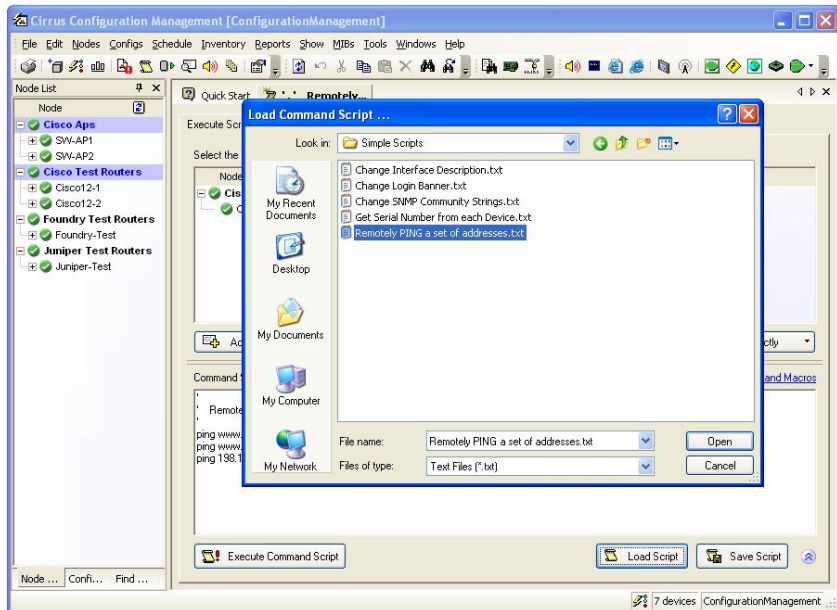


Uncheck the Outline View check box to display the results without any formatting.

Saving and Loading Command Scripts

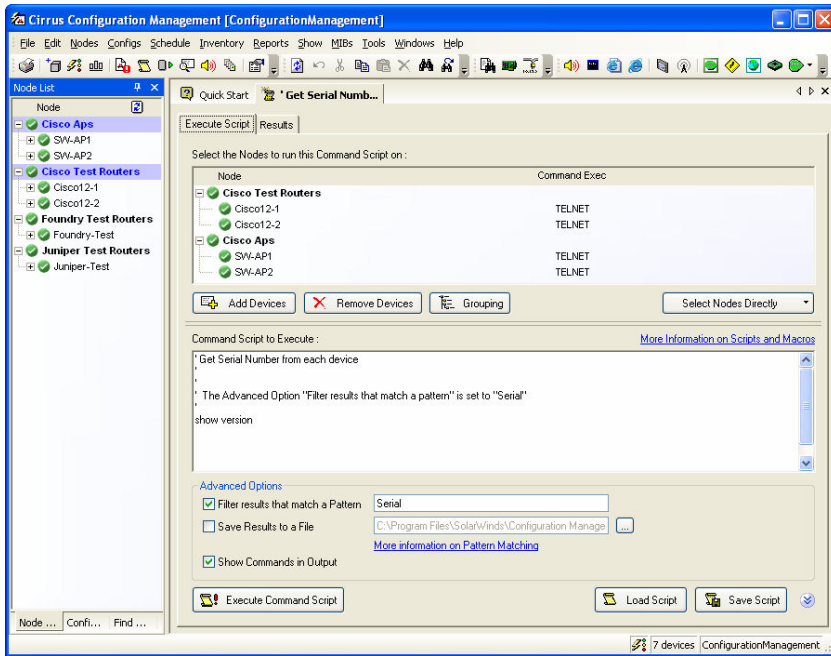
After running a successful script, the script can be saved for later use. On the **Execute Script** tab, click the **Save Script** button, type a filename and then click the **Save** button.

To load a previously saved script, or one of the example scripts that ships with Cirrus, click the **Load Script** button. To view the prepackaged example scripts, open the **\Sample Scripts** folder and select one of the available scripts.



Advanced Options

To display the **Advanced Options**, click the  button at the bottom-right of the window. The additional options are displayed below the **Command Script to Execute** text box.



The **Filter results that match a Pattern** option allows the user to show only the results that meet specific criteria when the script is executed. For example, adding the word “Serial” to the filter will only display lines that start with the word “Serial”. This specific filter is useful in trying to find the Serial Number of a Node or group of Nodes. The example script **Get Serial Number from each Device.txt** demonstrates this feature.



For details on Pattern Matching for filters, see *Appendix D: Regular Expression Pattern Matching* on page 177.

To automatically write the results of the script to a file, check the **Save Results to a File** check box. Type the path and filename for the log file, or click the  button to browse to a path and select a filename.

To hide the commands that are sent when the script is executed, uncheck the **Show Commands in Output** check box.

Using Macros within Scripts

One of the features that makes the Cirrus Scripting Engine so powerful is the ability to use macros within scripts. Cirrus Configuration Management uses a similar macro system as the one in Orion Network Performance Monitor. Macros always begin with a dollar sign and curly brace `${` and always end with a curly brace `}`.

These script macros are used to substitute the appropriate commands based on the device type. For example, the macro `${EnterConfigMode}` will parse as "config terminal" when communicating with Cisco IOS devices, but will parse as "configure" when communicating with an HP Procurve Switch.

Example Macro Script

Script containing macros that removes the "public" Read-Only Community String	<code>\${EnterConfigMode}</code> <code>no snmp-server community public RO</code> <code>\${ExitConfigMode}</code> <code>\${SaveConfig}</code> <code>\${Reboot}</code>
The same Script as it parses for Cisco IOS devices	<code>config terminal</code> <code>no snmp-server community public RO</code> <code>end</code> <code>write memory</code> <code>reload\${CRLF}y\${CRLF}y</code>
The same Script as it parses for a Dell PowerConnect Switch	<code>config</code> <code>no snmp-server community public RO</code> <code>end</code> <code>copy running-config startup-config\${CRLF}\${CRLF}</code> <code>reload\${CRLF}Yes</code>
Note: the <code>\${CRLF}</code> macro parses as a Carriage Return Line Feed.	

Script Macros are defined in **Device Command Templates**. These templates reside in the C:\Program Files\SolarWinds\Configuration Management\DeviceTypes folder. Each .ConfigMgmt-Commands file contains a System OID that is used to uniquely identify a device. Also included is a list of Command Names and the commands that will be sent to the device when the Command Name is called. These Command Names are the macros that are used when creating a script.

Here is a line taken from the Cisco IOS **Device Command Template**:

```
<Command Name="EnterConfigMode" Value="config terminal"/>
```

In this example, when a script is run on a Cisco IOS device, the macro `${EnterConfigMode}` will parse as "config terminal". New Command Names can be added as well as existing Command Names can be modified within these files.



Changing **Device Command Templates** alters the way Cirrus communicates with network devices. SolarWinds does not recommend changing a **Device Command Template** unless the user has advanced knowledge and experience with device commands and use of macros.

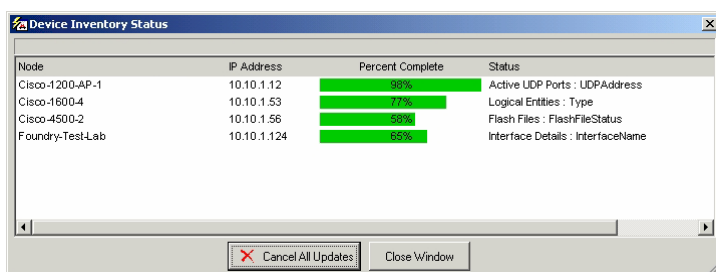
For a list of macros that can be used in Command Scripts and **Device Command Templates**, refer to *Appendix C: Macros* on page 176.

Chapter 6: Inventory

In addition to all of the config management functions, Cirrus has a very robust Inventory Engine. Inventory can be performed on all nodes, a group of Nodes, or just one Node at a time. The statistics collected by the Inventory Engine can easily be viewed in each device's details view.

Performing a Full Inventory

To perform an inventory on all Nodes managed by Cirrus, select **Start Full Inventory** from the **Inventory** menu.



The screenshot shows a window titled "Device Inventory Status" with a table of inventory progress. The table has four columns: Node, IP Address, Percent Complete, and Status. The "Percent Complete" column uses green progress bars to show the status of each node. The "Status" column lists the specific statistics being collected for each node.

Node	IP Address	Percent Complete	Status
Cisco-1200-AP-1	10.10.1.12	99%	Active UDP Ports : UDPAAddress
Cisco-1600-4	10.10.1.53	77%	Logical Entities : Type
Cisco-4500-2	10.10.1.56	50%	Flash Files : FlashFileStatus
Foundry-Test-Lab	10.10.1.124	65%	Interface Details : InterfaceName

At the bottom of the window, there are two buttons: "Cancel All Updates" (with a red X icon) and "Close Window".

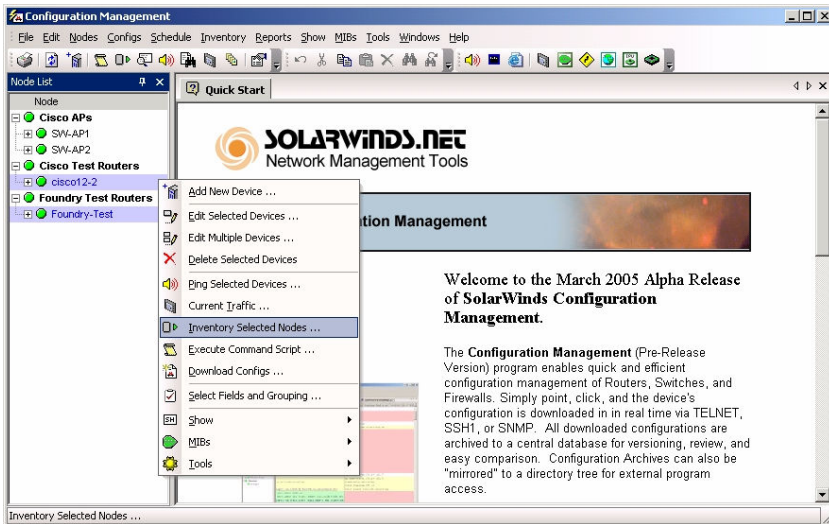


A Full Inventory can take several minutes, or even hours to complete depending on how many Nodes are being managed, and what Inventory statistics are being polled.

To establish what statistics will be collected, please refer to **Inventory Settings** on page 68.

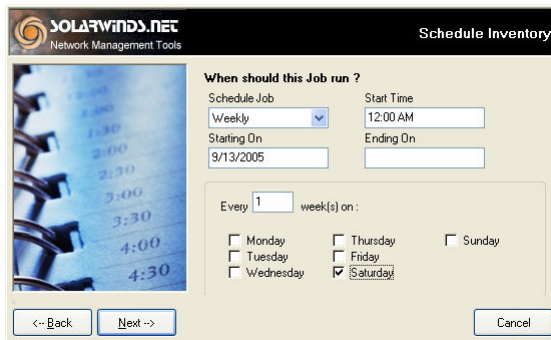
Running Inventory on a Single Device or Group

When needing to perform inventory on a single Node or group of Nodes, right-click on a node, node group, or selection of nodes and select **Inventory Selected Nodes**.



Scheduling an Inventory

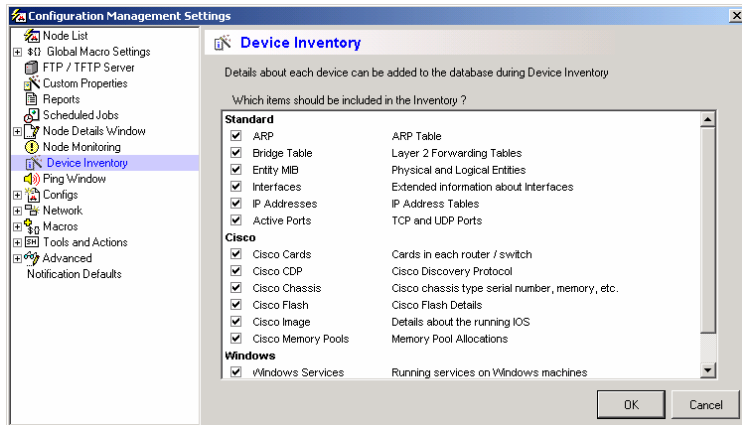
A full Inventory can be scheduled to run on a regular basis. To create a new Inventory Job, select **Schedule Inventory** from the **Inventory** menu. Give the Job a name, and then establish the time interval for the Job.



For more detailed instructions on Scheduling Tasks, please refer to *Chapter 9: Scheduling Tasks* on page 101.

Inventory Settings

Different networks require different statistics to be recorded during an inventory. To specify which statistics are collected during an inventory, open the *Inventory Settings* window by selecting **Inventory Settings** from the **Inventory** menu.

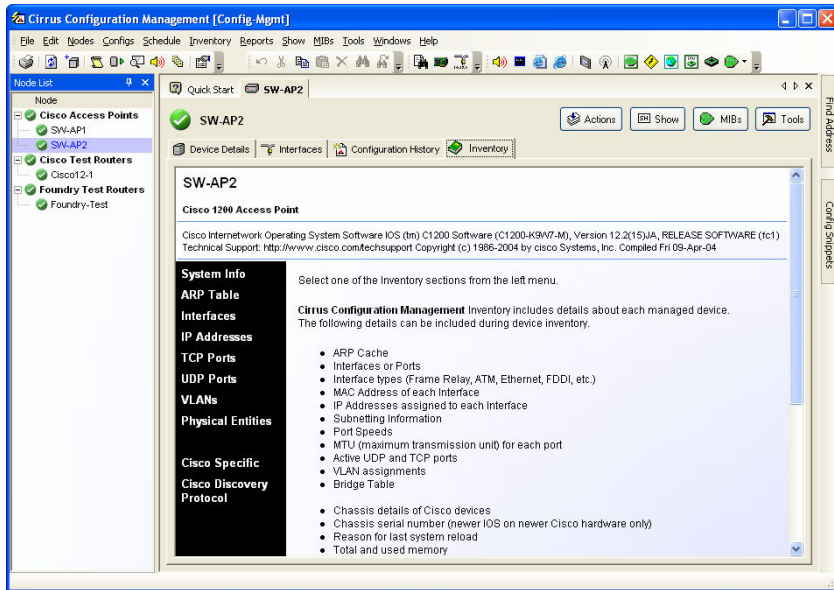


Check the statistics that are required for inventory and click **OK** to save the changes. The next time an inventory is performed, only the selected statistics will be collected.

Viewing Inventory

To view the inventory statistics collected by Cirrus, right-click on a Node, select **Edit Selected Nodes**, and then click the **Inventory** tab.

The Inventory tab displays the information collected by the Inventory Engine. A sub menu is listed on the left side categorizing the different statistics that can be displayed. Click a category on the right to display the associated statistics. If no statistics are available, it may be necessary to perform an inventory on the selected node.



These statistics can also be viewed directly from the database. To do this, open the Cirrus database using Microsoft Access or SQL Enterprise Manager. Each group of statistics will be stored in a corresponding table. Reports and queries can be performed just like any other database. For details on how to create reports or queries, refer to the documentation provided with Microsoft Access or SQL Enterprise Manager.

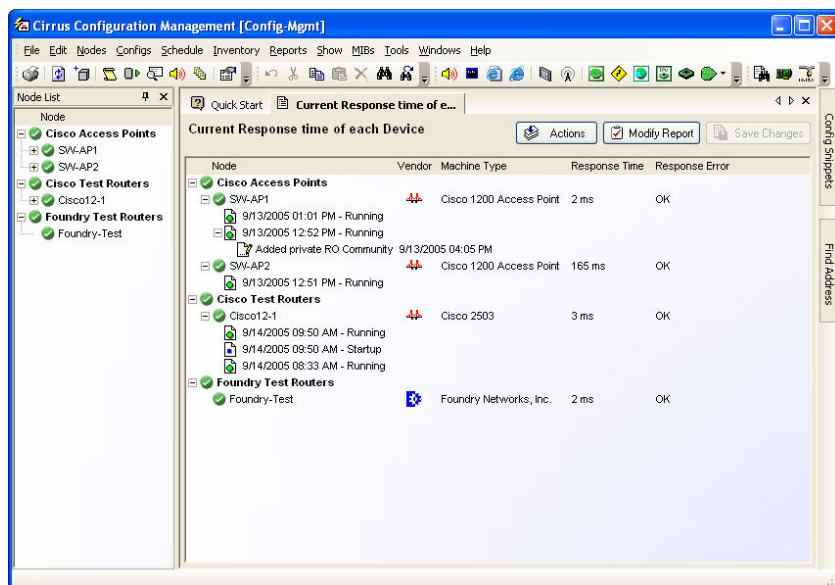
Chapter 7: Reports

SolarWinds has developed a Report viewer application, which provides a quick and easy way of extracting data from the database and displaying it in an easy to read format.

Several standard reports are included in the distribution of the program, which can be modified, and new reports can be created as necessary. Reports can be printed or emailed with just a click of a button.

Viewing Reports

To view a Report, select **View Report** from the **Reports** menu, select a Report and then click **OK**, or simply double-click the Report.



The report is displayed in a new tab with Report specific buttons added at the top of the tab. To print the Report, select **Print** from the **File** menu. To email the Report, select **Send To → Mail Recipient** from the **File** menu.

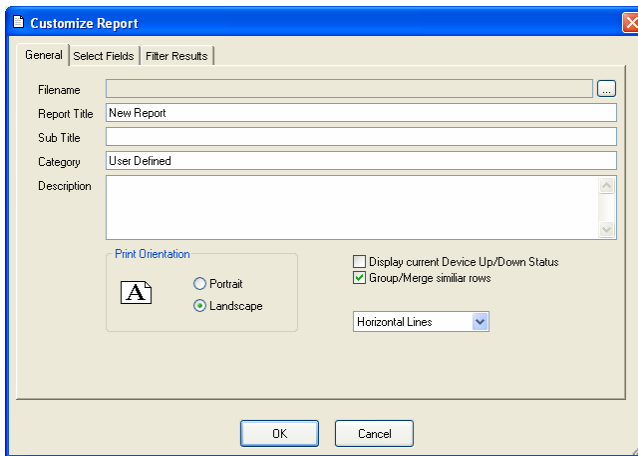
Creating and Editing Reports

To create a new Report, select **New Report** from the **Reports** menu. The Customize Report dialog is displayed.

Alternately, to edit an existing Report, select **View Report** from the **Reports** menu, and then open the Report that is to be modified. Click the **Modify Report** button to display the *Customize Report* dialog.

General Tab

The General tab is used to establish basic Report settings such as the Report Title, the Print Orientation, and the Filename.



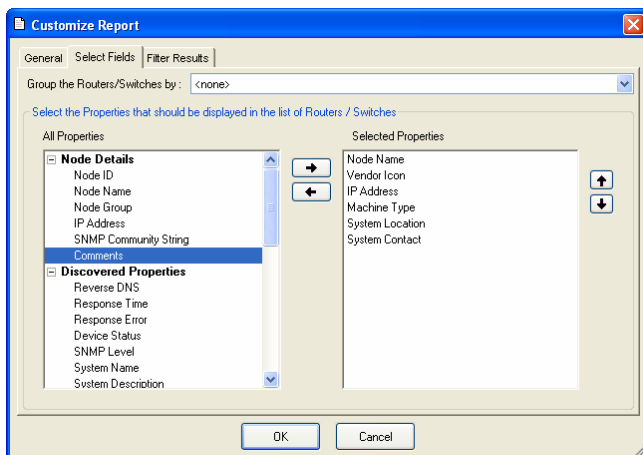
Click the Ellipsis button to the right of the Filename field to choose a path and filename for the Report.



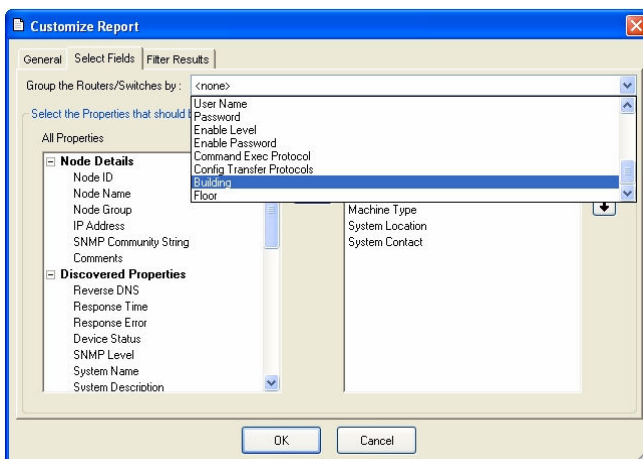
The default location for Reports is C:\Program Files\SolarWinds\Configuration Management\Reports. In order for a Report to be included with the list of existing Reports, it must be saved in the Reports folder under the Configuration Management folder.

Give the new Report a title, and then create a Sub Title and Description (these are optional fields). Set the Print Orientation (Portrait or Landscape), and select **Display current device Up/Down Status** and/or **Group/Merge similar rows** if desired. Also set what type of line will be displayed (No Lines, Grid Lines, or Horizontal Lines).

Select Fields Tab



On the *Select Fields* tab, select the properties that are to be added to the Report and click the  button to add the field.



To group the nodes by a category, click the dropdown list at the top and select the desired category. Custom Properties can be used when grouping Nodes.



For information on how to create Custom Properties, please refer to the *Custom Properties* section in *Chapter 3: Managing Nodes* on page 30.

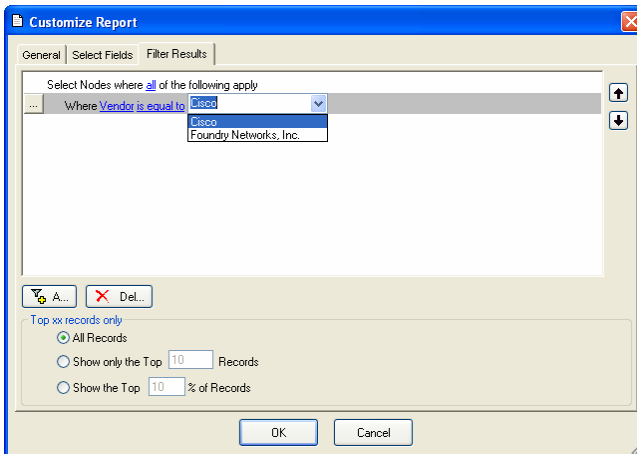
Filter Results Tab

The results of a Report can be filtered to display only the necessary information. Two types of filtering conditions are available, each of which may be chosen from a list accessed by clicking the Ellipsis button at the left of each filter's entry.

Choose the type of condition needed, referring to the following Condition Table for guidance in selecting the appropriate condition type.

Condition	Options
Elementary	is equal to * equal greater less greater or equal less or equal not equal is empty is not empty contains starts with Records where * (=DatabaseField) * (= SpecifiedValue)
Complex	all of the following all any none not all Select records where of the following apply

Add an Elementary Condition using the Ellipsis button. Click the first asterisk (*) and select the desired field using the flyout menu.



After selecting a field, choose a comparison, such as “is equal to”, and then enter the value or select it from the dropdown list.



When clicking the dropdown menu for the value, all values currently in the database for that field are displayed.

At the bottom of this tab is a section called **Top xx records only**. This section is used to limit the amount of records displayed when the report is executed. **All Records** is selected by default. Select **Show only the Top XX Records** to specify a number of reports to display. Alternately, select **Show the Top XX % of Records** to display only a specific percentage of results.

Click **OK** once finished creating any filters and establishing the amount of records to display.

To save the changes to the Report, click the **Save Changes** button displayed above the Report.

Deleting Reports

To delete an existing Report, select **View Report** from the **Reports** menu, select a Report or group of Reports, and then click the **Delete Selected Reports** button.

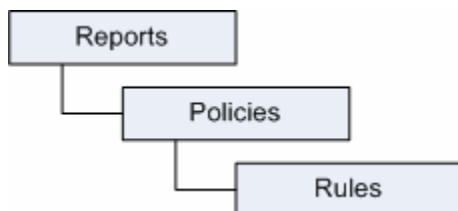
Scheduling Reports

To schedule a Report to be emailed or printed, select **Schedule Report** from the **Reports** menu. The *Schedule Report* dialog is displayed prompting for a name for the task. Give the task a name and then finish the Schedule Task Wizard. For detailed instructions on how to configure scheduled tasks, please refer to *Chapter 9: Scheduling Tasks* on page 101.

Chapter 8: Policy Reporting

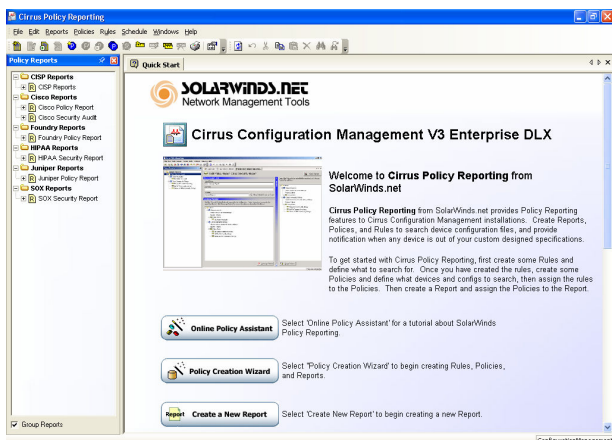
Policy Reports help ensure device configurations meet federal regulations such as SOX, HIPAA, and CISP, as well as internal business practices. Policy Reports scan Configuration files and report any Rule violations that are discovered. For example, a Rule is set to verify that a Config does not include a public read-only community string. A Report is run against Configs and will then display any Configs that violate the Rule and lists them with the line number the violation occurred on (if applicable). Several example Reports, Policies and Rules are included right out of the box.

A Policy Report is a Report that includes a collection of Policies. A Policy is a collection of Rules. A Report can contain several Policies which, in turn, can contain several Rules.



Getting Started

The **Cirrus Policy Reporting** application can be launched from the **Reports** menu in the main Cirrus application or from the **Windows Start Menu → SolarWinds Configuration Management → Cirrus Policy Reporting**.



Policy Creation Wizard

Launch the **Policy Creation Wizard** by clicking the  **Policy Creation Wizard** button from the **Quick Start** window.



Create a New Rule

Click the **Next ->** button twice to start creating a new Rule. Select **Walk me through creating a new Rule** and then click **Next ->**. Give the Rule a name and then click **Next ->**.



Add any comments to the Rule that will help describe the Rule in more detail. To assign this Rule to a specific Group, type a new Group name in the **Grouping** textbox or select an existing Group from the drop-down menu. Click the **Next →** button to continue.

SOLARWINDS.NET
Network Management Tools

Cirrus Policy Reporting - Policy Creation Wizard

Rule - Comment and Grouping

Enter a description for the Rule.

Comment
Verify the public community string is disabled

Enter a category to group this Rule by.

Grouping
Cisco SNMP

Click the 'Next' button to Continue...

<- Back Next -> Exit

Next, add the Search Pattern that the Rule is to look for and then click **Next →** to continue. The Search Pattern describes what the Rule is supposed to find or not find within the device configuration files. Complex, multiple line searches can be accomplished by using RegEx Expressions. For a few examples, click the **Example Search Patterns** link.



The **Simple Find** expressions allow the user to use the asterisk (*) and question mark (?) characters for wildcard characters.

SOLARWINDS.NET
Network Management Tools

Cirrus Policy Reporting - Policy Creation Wizard

Rule - Search Pattern

The search pattern describes what you want to find, or not find within the device configuration files. Complex multiple line searches can be accomplished using RegEx Expressions.

Search Pattern [Example Search Patterns...](#)
snmp-server community public

What kind of search pattern is it? 'Simple Find' expressions allow you to use * and ? for wildcard characters.

Search Pattern Type:

☒ RegEx Expression
☐ Simple Find

Click the 'Next' button to Continue...

<- Back Next -> Exit

The next step determines whether the Search Pattern should be found or not. Select **Found** or **Not Found** to determine how the Rule would be in violation. Click the **Next →** button to continue.

Set the Error Level to determine the severity of the Rule violation. Should the criteria of the Rule be met and in violation, the Error Level will be shown on the Report next to the Rule, giving viewers of the Report an indication of the severity of the Policy violation. Select **Informational**, **Warning**, or **Critical**, and then click **Next →** to continue.

The next step displays the Rule Details of the Rule that was just created. Ensure that the **Save This Rule** checkbox is checked and click **Next →** to continue on to creating a Policy.



SOLARWINDS.NET
Network Management Tools

Cirrus Policy Reporting - Policy Creation Wizard

Rule - Save the New Rule

Review the Rule Properties below. To not save the newly created Rule, uncheck the 'Save This Rule' checkbox below and click 'Next'. To change any of the rule properties, click the 'Back' button.

Rule Details:

Name: No public Community
Comment: Verify the public community string is disabled
Pattern: snmp-server community public
Pattern Type: RegEx Expression
Pattern Must Exist: No
Error Level: Warning

Click the 'Next' button to Continue... ☒ Save This Rule

<- Back Next -> Exit

Create a New Policy

A Policy is a collection of Rules and defines which Nodes the Rules apply to, as well as the Config types to search through.

When prompted to create a New Policy or skip ahead to create a New Report, select **Yes, Let's Create a New Policy** and then click **Next →**.

Give the Policy a name and add any comments about the Policy. To assign this Policy to a specific Group, type the Group name in the **Grouping** textbox, or select an existing group from the drop-down menu. Click the **Next →** button to continue.



SOLARWINDS.NET
Network Management Tools

Cirrus Policy Reporting - Policy Creation Wizard

Policy - New Policy Information

Enter a name for the new Policy.

Name
Basic Cisco Policy

Enter a description for the new Policy.

Comment
Checks for any basic Cisco Config Violations

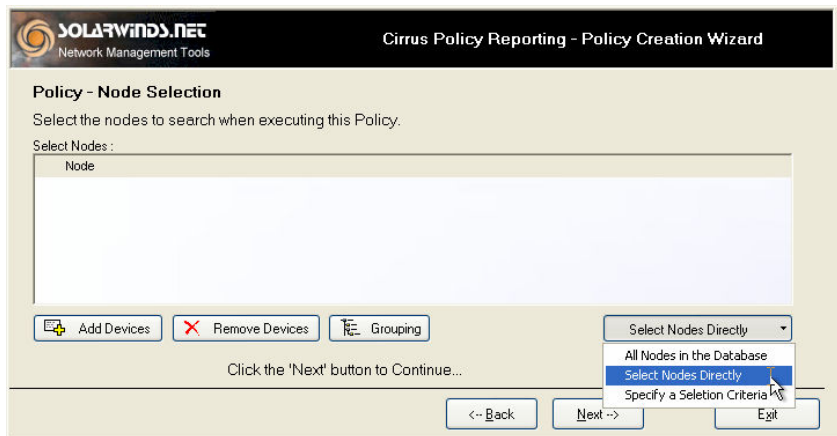
Enter a category for the new Policy.

Grouping
Cisco Policies

Click the 'Next' button to Continue...

<- Back Next -> Exit

Next, assign Nodes to the Policy using the associated buttons below the list of Nodes. To select a group of Nodes, choose the option **Select Nodes Directly** or **Specify a Selection Criteria**. Otherwise, select **All Nodes in the Database** to execute the Policy on every Node.



SOLARWINDS.NET
Network Management Tools

Cirrus Policy Reporting - Policy Creation Wizard

Policy - Node Selection

Select the nodes to search when executing this Policy.

Select Nodes :
Node

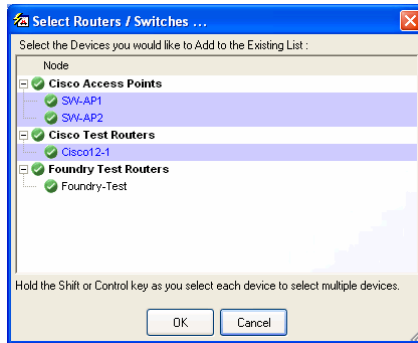
Add Devices Remove Devices Grouping

Click the 'Next' button to Continue...

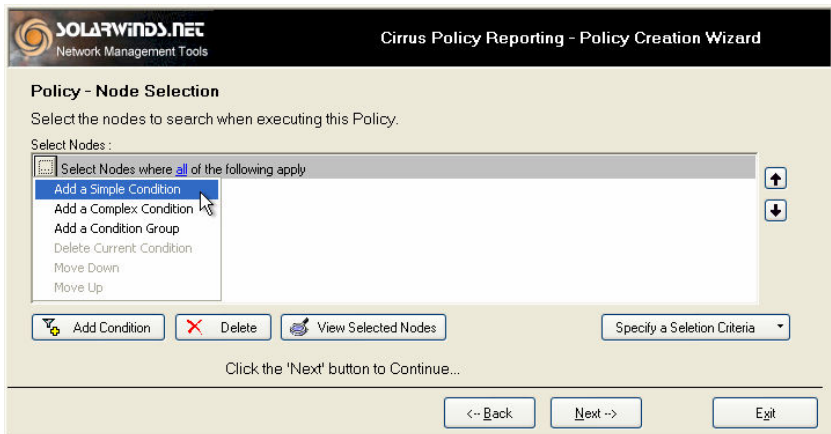
<- Back Next -> Exit

Select Nodes Directly
All Nodes in the Database
Select Nodes Directly
Specify a Selection Criteria

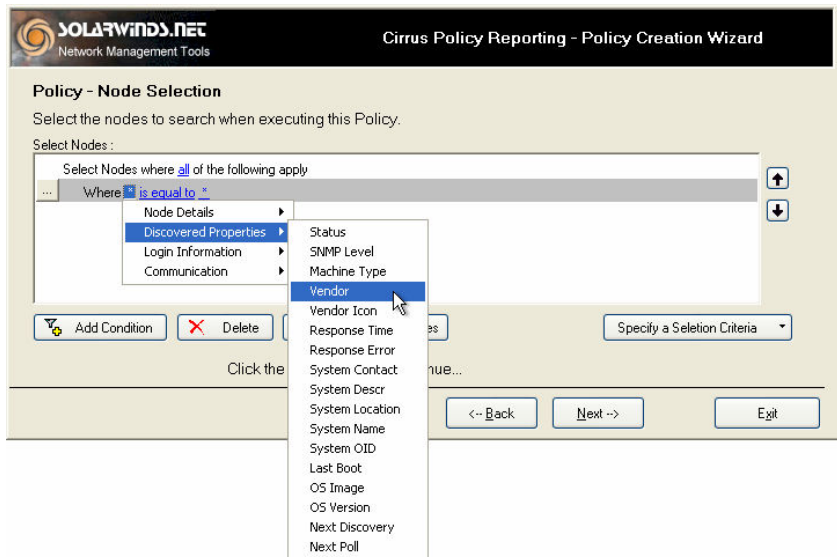
With the option **Select Nodes Directly** selected, click the  button and choose the Nodes and/or Groups that are to be applied to this Policy and then click the **OK** button.



To select a group of Nodes based on a specific set of conditions, select the option **Specify a Selection Criteria**. Add a condition by clicking the  button and then click **Add a Simple Condition**.



Click the first asterisk (*) and then select the desired field using the submenu.



Select a condition (the default condition is “is equal to”) and then click the second asterisk (*) to assign a value for the condition. Type a value, or select one from the drop-down list.



When clicking the dropdown menu for the value, all values currently in the database for that field are displayed.

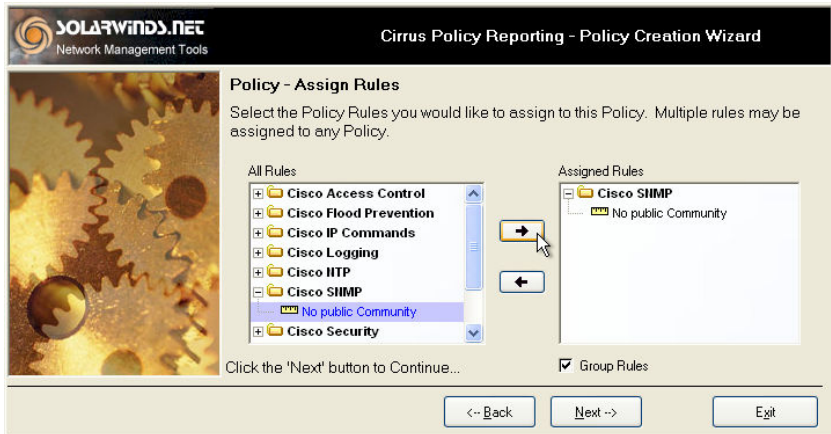
Click the **Next →** button once satisfied with the selection criteria, or group of Nodes.

Next, select the Config types to search when executing this Policy. Selecting the **Any** option searches the last downloaded Config regardless of what type it is. Otherwise, the Policy will search the last downloaded Config of the type selected. Once the Config type has been set, click the **Next →** button.

Now Rules need to be assigned to the Policy. Select the Rule(s) from the left column and then click the  button to add them to the Assigned Rules column on the right.



Check the **Group Rules** checkbox to list the Rules within their assigned Group names.



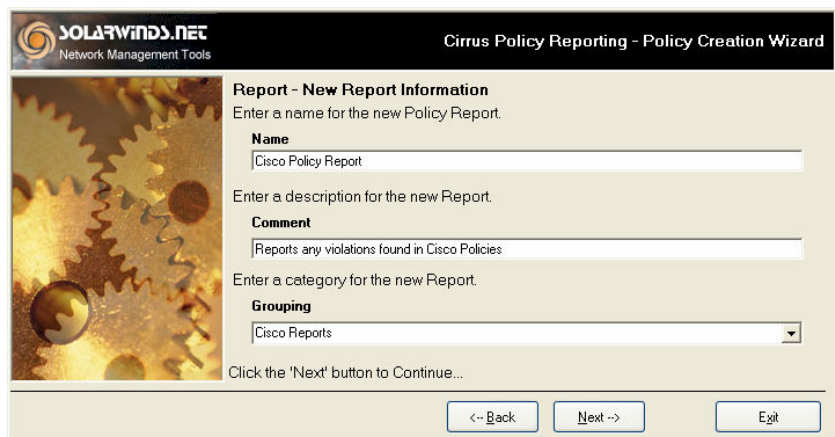
Once the Rules have been assigned, click the **Next**  button. The wizard will then prompt to save the Policy. Click the **Yes** button to save the Policy and move on to the next step in the wizard.

Create a New Report

Reports provide a method for grouping Policies together and displaying any Rule violations found within device configurations. Policies can belong to multiple Reports, and multiple Policies can be assigned to an individual Report.

Click **Next**  on the following screen to begin creating a new Report. When prompted to create a New Report, or to close the wizard, select **Yes, Let's Create a New Report**, and then click **Next** .

Give the Report a name, and add any comments to the Report. To assign this Report to a specific Group, type the Group name in the **Grouping** textbox, or select an existing Group from the drop-down menu. Click the **Next →** button to continue.



Now Policies need to be assigned to the Report. Select the Policies from the left column and then click the  button to add them to the Assigned Policies column on the right.

 Check the **Group Policies** checkbox to list the Policies within their assigned Group names.



Once the Policies have been assigned, click the **Next →** button. The wizard will then prompt to save the Report. Click the **Yes** button to save the Report.

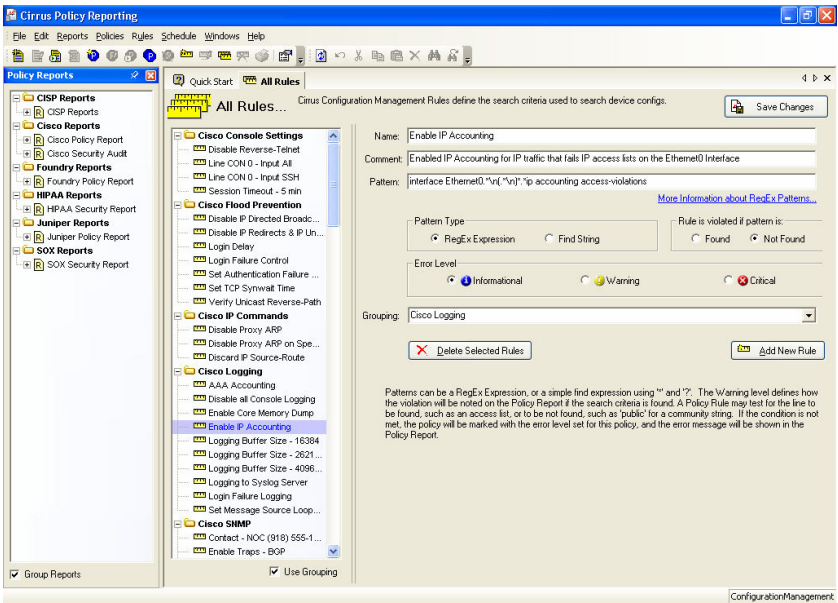
Click the **Exit** button to close the wizard, or click the **Back** button to make changes.

Rules

Rules describe what is to be found (or not found) in device configuration files. Rules contain the following properties:

Name	How the Rule will be shown in display lists and Reports
Comment	Description of the Rule
Grouping	Category the Rule belongs to
Pattern	RegEx Expression or Find String defining what to search for
Pattern Type	Type of Search Expression (RegEx or Find String)
Pattern Must Exist	Whether the pattern should the be found or not
Error Level	Error level to report if the Rule is in violation

To display all Rules, click the  button on the toolbar or select **View All Rules** from the **Rules** menu.



To edit an existing Rule, select the Rule from the **All Rules** list. To create a new Rule, click the **Add New Rule** button, or select **New Rule** from the **Rules** menu.

 Adding a description to the Comment field will enable the user to view the details of the Rule within the Report results by hovering the mouse cursor over the Rule.

Patterns can be a RegEx expression or a simple Find String expression using the asterisk (*) and question mark (?) for wildcards characters. The Error Level defines how the violation will be noted on the Report if the search criteria is found. A Rule can be set for the line to be found, such as an access list, or to be not found, such as 'public' for a community string. If the condition is not met, the Policy will be marked with the Error Level set for this Rule, and the error message will be shown in the Report.

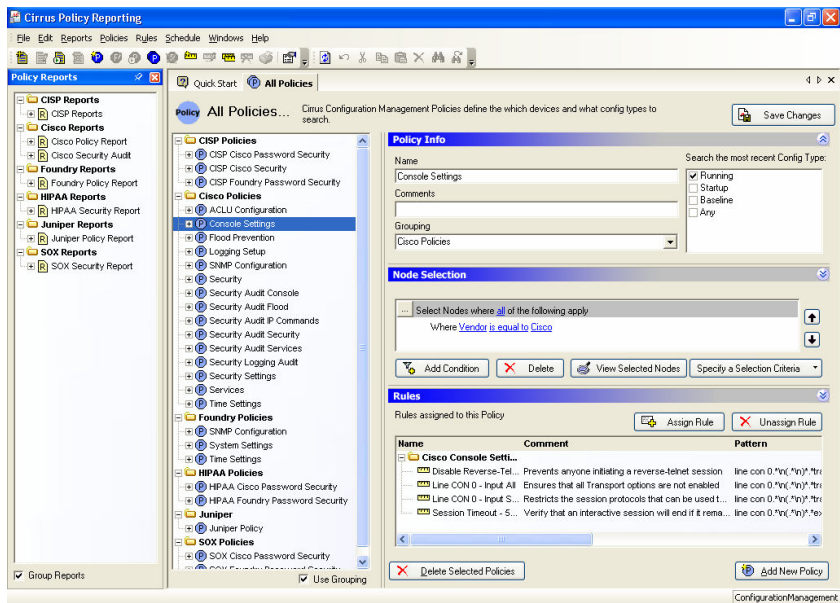
 For details on RegEx Patter Matching, see *Appendix D: Regular Expression Pattern Matching*.

When making changes to a Rule, be sure to click the  **Save Changes** button before moving on to other tasks.

To delete an existing Rule, select the Rule from the **All Rules** list and then click the  **Delete Selected Rules** button, or right-click on the Rule and select **Delete Selected Rules**.

Policies

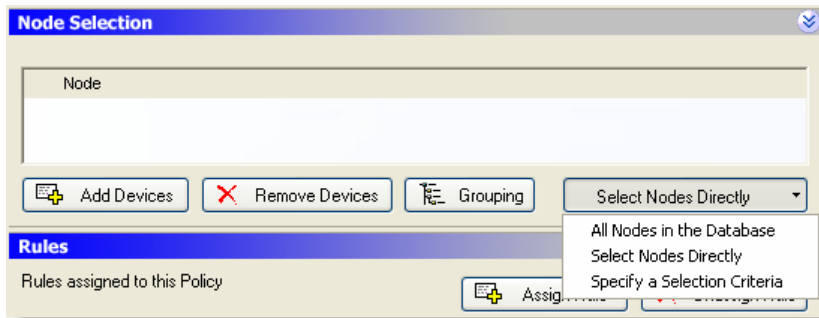
A Policy is a collection of one or more Rules. A Policy also defines which Nodes to include and the configuration file type to search. To display all Policies, click the  button on the toolbar, or select **View All Policies** from the **Policies** menu.



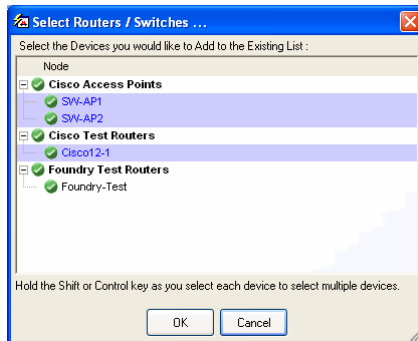
To edit an existing Policy, select the Policy from the **All Policies** list. To create a new Policy, click the **Add New Policy** button, or select **New Policy** from the **Policies** menu.

Select a Config Type to search when executing this Policy. Selecting the **Any** option searches the last downloaded Config regardless of what type it is. Otherwise, the Policy will search the last downloaded Config of the type selected.

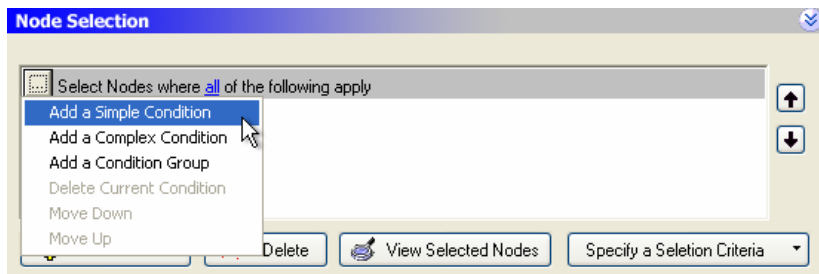
To assign Nodes to the Policy, use the associated buttons below the list of Nodes. To select a group of Nodes, choose the option **Select Nodes Directly** or **Specify a Selection Criteria**. Otherwise, select **All Nodes in the Database** to execute the Policy on every Node.



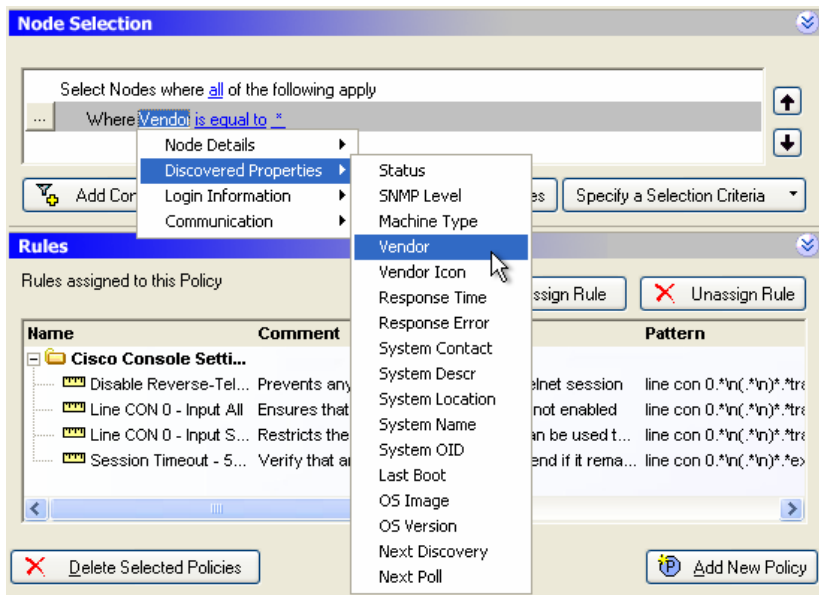
With the option **Select Nodes Directly** selected, click the **Add Devices** button and choose the Nodes and/or Groups that are to be applied to this Policy and then click the **OK** button.



To select a group of Nodes based on a specific set of conditions, select the option **Specify a Selection Criteria**. Add a condition by clicking the ... button and then click **Add a Simple Condition**.



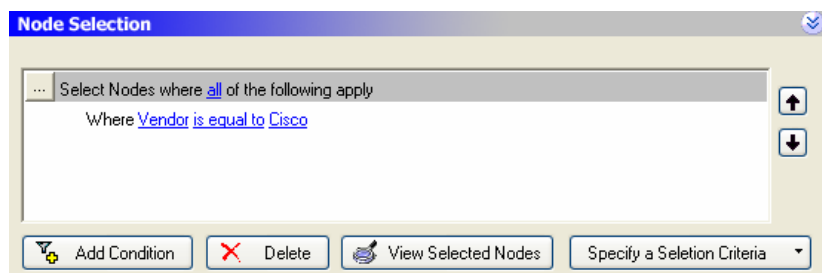
Click the first asterisk (*) and then select the desired field using the submenu.



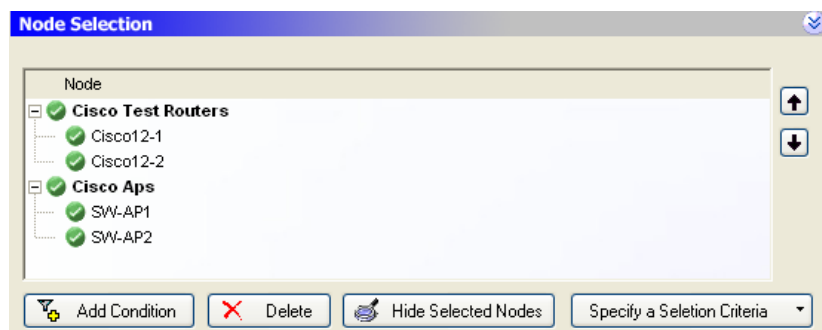
Select a condition (the default condition is “is equal to”) and then click the second asterisk (*) to assign a value for the condition. Type a value, or select one from the drop-down list.



When clicking the dropdown menu for the value, all values currently in the database for that field are displayed.

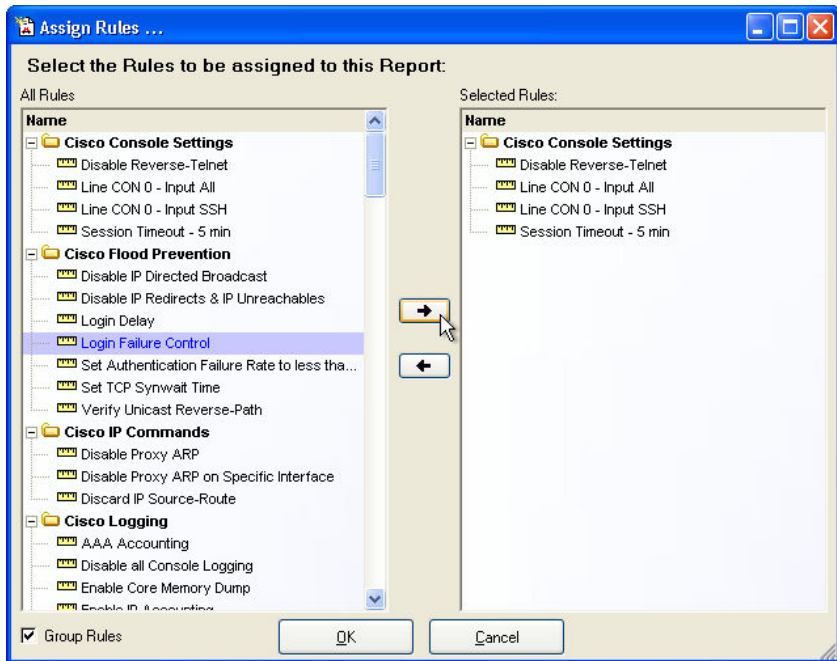


Click the  **View Selected Nodes** button to display a list of Nodes that match the selection criteria.



To display the selection criteria again, click the  **Hide Selected Nodes** button.

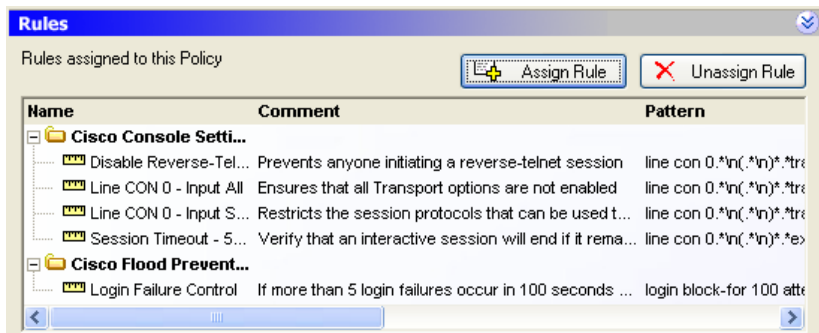
Now Rules need to be assigned to the Policy. Click the  **Assign Rule** button to display the **Assign Rules** dialog.



Select the Rule(s) from the left column and then click the  button to add them to the Selected Rules column on the right. Click the **OK** button to finish assigning the Rules to the Policy.



Check the **Group Rules** checkbox to list the Rules within their assigned Group names.



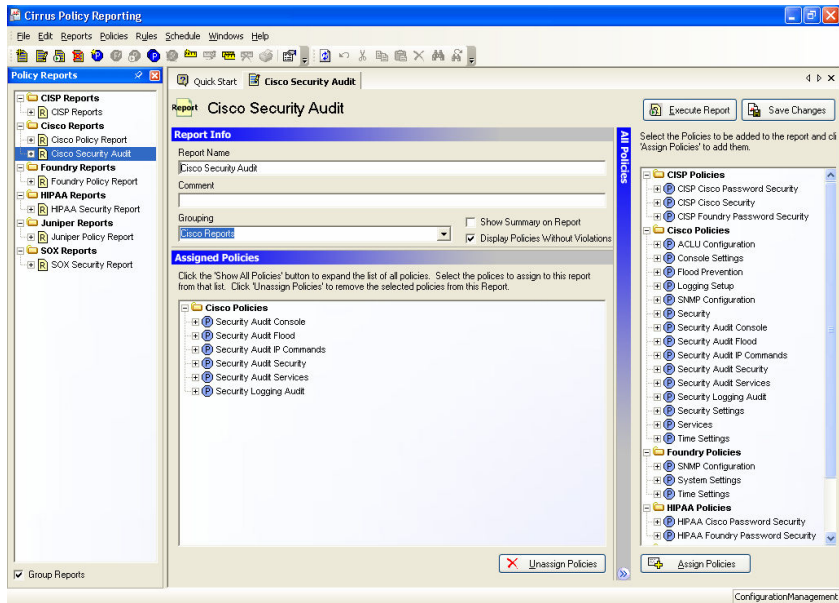
To remove a Rule from the Policy, select the Rule from the list, and then click the **Unassign Rule** button.

When making changes to a Policy, be sure to click the  **Save Changes** button before moving on to other tasks. To delete an existing Policy, select the Policy from the **All Policies** list and then click the **Delete Selected Policy** button.

Reports

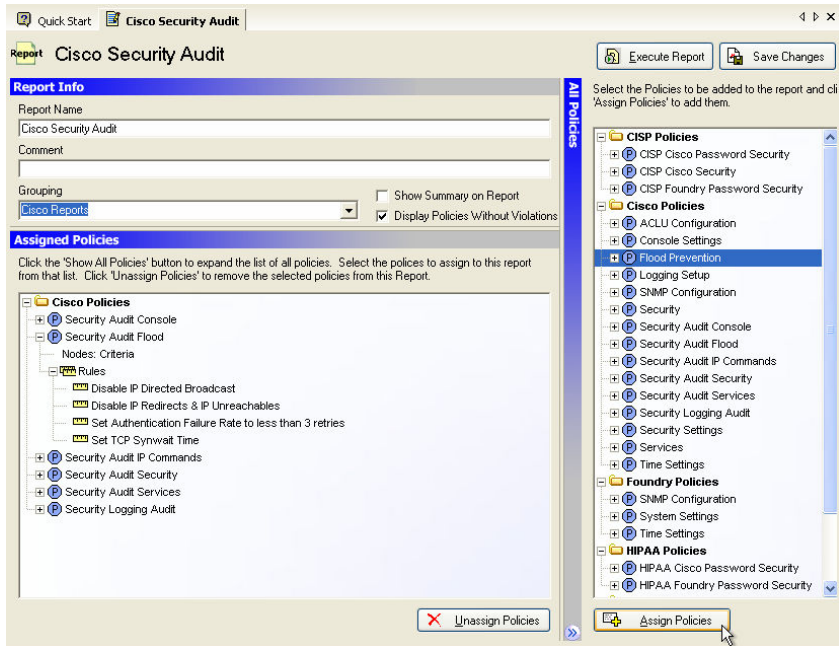
Reports provide a way to group Policies, either by the devices that they will be executed against, or by type of report (Security, Encryption, Access Lists, etc.). Report properties include Name, Comment, Grouping, and the Policies assigned to the Report.

To configure a Report, double-click the Report from the **Reports** list. Alternately, to create a new Report, click the  button on the toolbar, or select **New Report** from the **Reports** menu.



Check the **Show Summary on Report** option to view a summary of each Policy's violations on the Report. Check **Display Policies Without Violations** to show every Policy even if no Rules are violated within that Policy.

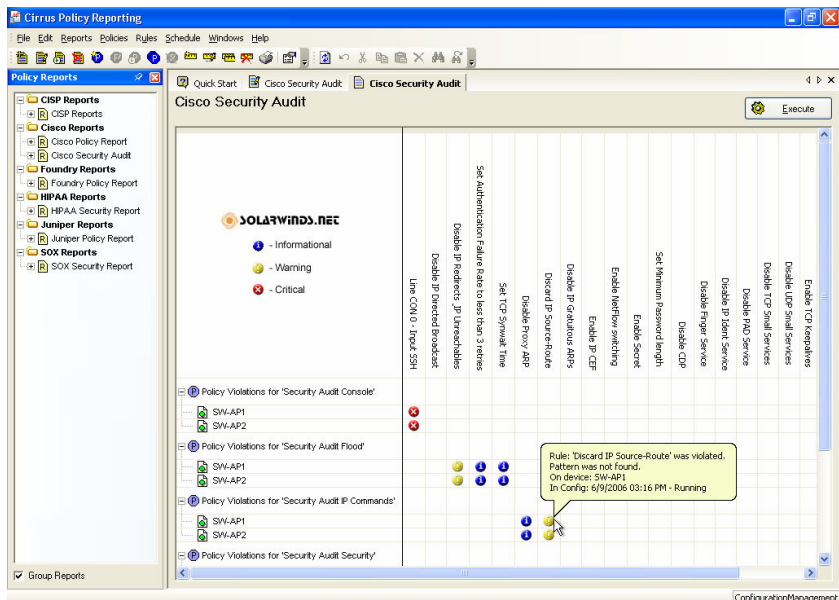
To add a Policy to the Report, the **All Policies** pane must first be displayed. To show the **All Policies** pane, click the  **Assign Policies** button within the **Assigned Policies** pane. Select the Policy or a group of Policies using the Ctrl key on the keyboard and then click the  **Assign Policies** button to add them to the Report.



To remove a Policy from the Report, select the Policy in the **Assigned Policies** pane, click the **Unassign Policies** button, and then click **Yes** to confirm.

Click the **Save Changes** button to save the Report, and then click the

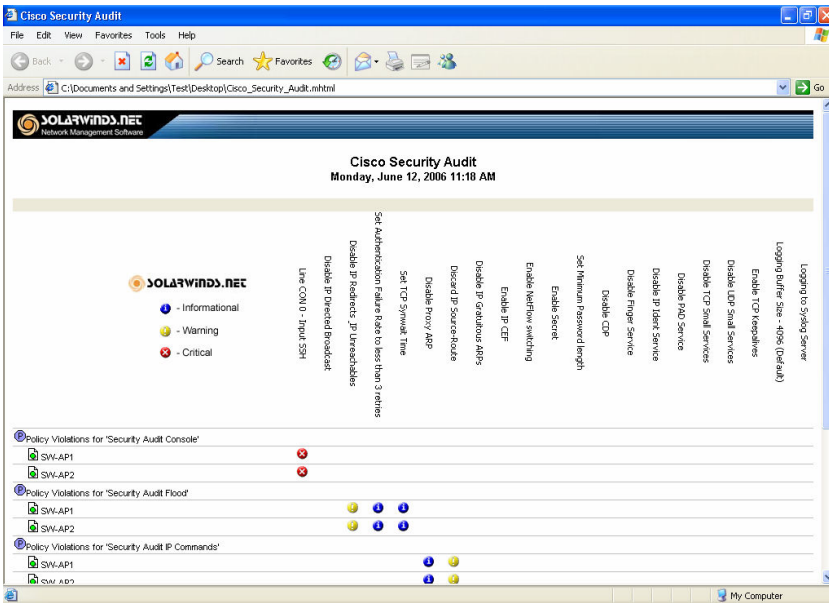
Execute Report button to run the Report and view the results.



Hover the mouse cursor over any Rule or Violation Icon to display a detailed description of that item. If no description is displayed, edit the Rule and add a description to the Comment field.

To display and make changes to Config that has violated a Rule, either double-click the Violation Icon, or right-click on the Violation Icon and select **View / Edit Config**.

The results of the Report can be printed or exported from the **File** menu to a number of different file formats such as Text, CSV, HTML, Excel, Adobe PDF, or an image file.



Scheduling a Report

A Report can be scheduled to run just like any other task in Cirrus. To schedule an existing Report, select **Schedule a Report** from the **Schedule** menu. Give the Job a name and then click **Next** → to continue.



A Policy Report Job can be created or edited directly within the Policy Reporting application, or within the primary Cirrus application.

Set the Job frequency, start time, and starting and ending dates. The options at the bottom change depending on the Job frequency (Daily, Weekly, Monthly, etc.).

SOLARWINDS.NET
Network Management Tools

Schedule Policy Report

When should this Job run ?

Schedule Job: Weekly
Start Time: 2:53:00 PM
Starting On: 4/13/2006
Ending On: 4/13/2016

Every 1 week(s) on :

☒ Monday ☒ Thursday ☐ Sunday
☒ Tuesday ☒ Friday
☒ Wednesday ☐ Saturday

<- Back Next -> Cancel

Enter the Windows User account information and then click **Finish** to move on to the Job options.



Be sure to use the domain name if the Windows User account is a domain account such as COMPANY\JSMITH.

SOLARWINDS.NET
Network Management Tools

Schedule Policy Report

Enter Windows User Information

Enter the name and password of the Windows Account that will run this Job. The Job will be run as if it were started by this user.

Enter the user name

Enter the password

Confirm the password

<-- Back Finish Cancel

On the **General** tab of the **Edit Job** dialog, select the Job and click the **Edit Schedule** button to make any changes to the time interval and frequency of this schedule. To schedule additional date/time intervals for this Job, click the **Add Schedule** button. This is useful if the Report needs to be run more than once per day, bimonthly, or if any additional date/time combinations are needed.

Edit 'Nightly Policy Report' Job

Nightly Policy Report

Generate a Policy Report

General | Policy Report | Notifications | Security

☒ Enable this Job

Run this Job on the following Schedules :

At 10:00 PM every day, starting 4/14/2006

Add Schedule Delete Schedule Edit Schedule

Comments

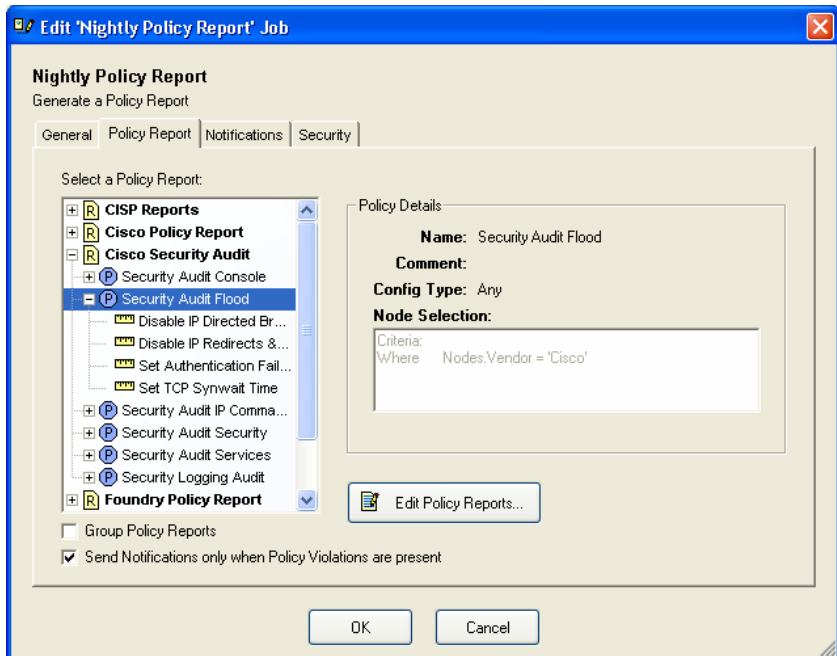
Job-367050.ConfigMgmtJob
Created by Test using Configuration Management at 4/13/2006 2:48:20 PM

OK Cancel

On the **Policy Report** tab, select the Report that is to be run. To make changes to a Report, select the Report, and then click the **Edit Policy Reports** button. To suppress Notifications when no violations are discovered, check the **Send Notifications only when Policy Violations are Present**.



Check the Group Policy Reports checkbox to list the Reports within their assigned group names.



The **Notifications** tab includes several different options to inform the user of the Job's results. For every notification option selected, an associated tab will be displayed below for configuration options. When selecting the E-Mail notification option, be sure to enter the necessary information on all three tabs (**Email To**, **Email From**, and **SMTP Server**).

Edit 'Nightly Policy Report' Job

Nightly Policy Report
Generate a Policy Report

General | **Policy Report** | Notifications | Security

☐ Print Results ☒ Save Results To File
☒ E-Mail Results ☒ Log Job steps to Job-367050.log

Email Settings | File Settings | [Test Notifications](#)

Email To | Email From | SMTP Server

E-Mail Recipients

To: NOC@company.com
 CC:
 BCC:
 Subject: Solarwinds.Net Cirrus Policy Report

☐ Only E-Mail results if this Job encounters an error during execution

OK Cancel

On the **Security** tab, enter the Windows User account information and click the Set Password button to verify the login credentials.

To see a list of scheduled Reports, select **Display Scheduled Reports** from the **Schedule** menu.

Quick Start | **Scheduled Policy Reports**

Actions

Enabled	Job Name	Status	Status	Job Type	Schedule
☒	Monthly Policy Reports		Scheduled	Generate a Policy Report	At 9:00 AM on day 1 of every month, starting 6/12/2006
☒	Weekly SOX Report		Scheduled	Generate a Policy Report	At 5:00 PM every Fri of every week, starting 6/12/2006
☒	Weekly HIPAA Report		Running	Generate a Policy Report	At 8:00 AM every Mon of every week, starting 6/12/2006
☒	Nightly Policy Reports		Scheduled	Generate a Policy Report	At 12:00 AM every day, starting 6/12/2006

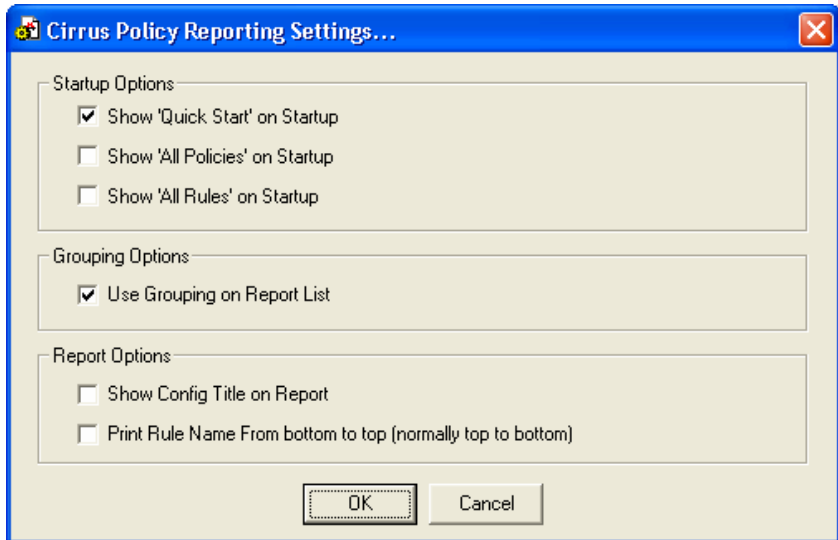
Right-click context menu options:
 Schedule a Policy Report ...
 Edit Job ...
 Start Job
 Stop Job
 Test Job ...
 View Selected Job's Log ...

Right-click on a Job to Edit, Start, Stop, or Test the Job. The Job's completion Log can also be accessed from the right-click menu.

For more information on Scheduled Tasks, see *Chapter 9: Scheduling Tasks* on page 101.

Cirrus Policy Reporting Settings

To view the Cirrus Policy Reporting Settings, click the  button on the toolbar, or select **Settings** from the **File** menu.



The **Startup Options** are used to establish what tabs are displayed when the Cirrus Policy Reporting application is started.

To group Reports by the Report Group, check the box in **Grouping Options**.

The **Report Options** are used to determine how Reports will be displayed and printed.

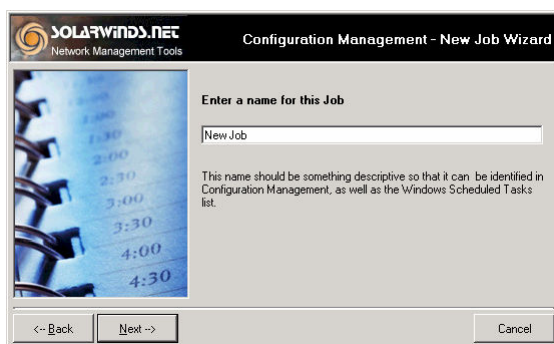
Chapter 9: Scheduling Tasks

With Cirrus's scheduled task feature, managing routers has never been easier. Some of these tasks include config uploads, config downloads, Node reboots, executing command scripts, and more.

Cirrus uses the Windows Task Scheduler to organize the scheduled operations. Any Job created with Cirrus can be viewed and modified with the Windows Task Scheduler. This can be opened by clicking on the Windows Start button and going to **Start → Programs → Accessories → System Tools → Scheduled Tasks**.

Creating a New Job

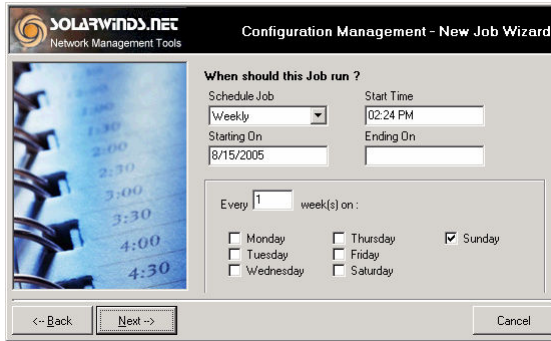
To start creating a new Job, select **Create New Job** from the **Schedule** menu. Type a name for the job and then click **Next →**.



Select the type of Job to be scheduled and then click **Next →**.

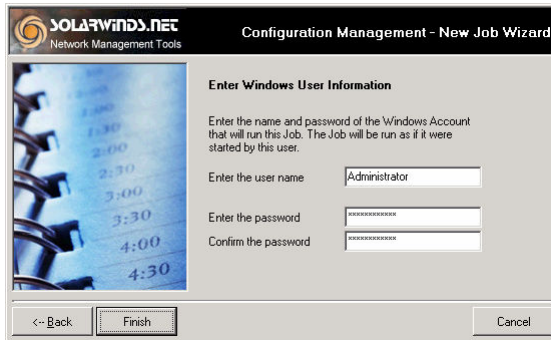


Set the Schedule Type, Start Time, Starting Date, and Ending Date. Depending on the schedule type (Daily, Weekly, Monthly, etc.), the area at the bottom of the dialog will display additional options.



To assign a Job to run with no End Date, leave the **Ending On** field blank.

Set the Windows User Information by assigning the Job a Windows user account and password to run as, and then click **Finish**.



After clicking **Finish**, the *Edit Job* dialog is displayed. Follow the steps listed in the following section, *Editing and Copying Jobs*, to finish configuring the Job.

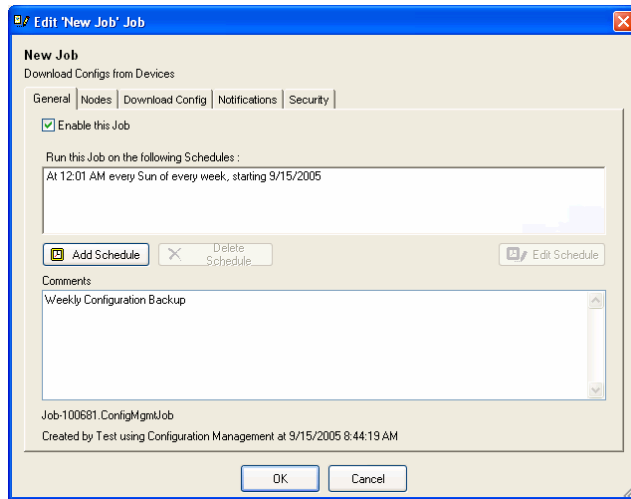
Editing a Job

After creating a Job schedule, the Job details need to be configured. If the *Edit Job* dialog is not already displayed, right-click on a Job and select **Edit Job**.



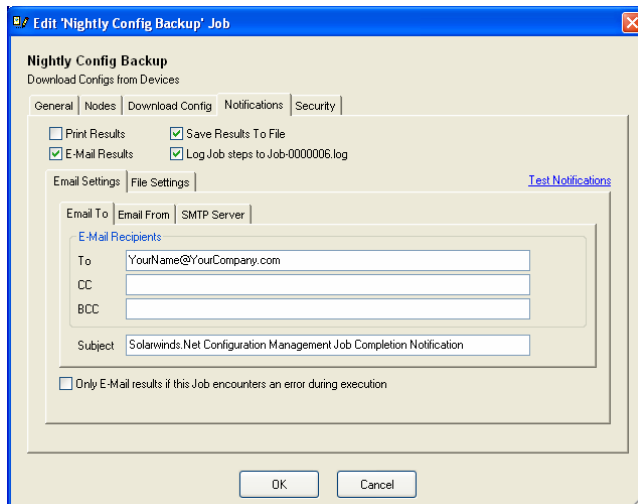
To display the list of Jobs, click the  button on the toolbar, or select **Display/Edit Jobs** from the **Schedule** menu.

On the **General** tab, the Job can be Enabled/Disabled, the schedule can be modified, and comments can be added.



The second tab, “Nodes” in this example, will be different based on the type of Job created. For details on the different settings displayed in this tab, please refer to the **Job Specific Settings** section on page 104.

When a Job completes, a notification can be sent along with the completion status details. Use the **Notifications** tab to setup printer or Email notifications. Recording the Job Status Details and Saving the Results to a File can also be enabled here.



Click **Test Notifications** to ensure all Notification settings are configured properly.

On the **Security** tab, set the Windows User Information by assigning the Job a Windows user account and password to run as, and then click the **Set Username and Password** button.

Edit 'New Job' Job

New Job
Download Configs from Devices

General | Nodes | Download Config | Notifications | Security

Enter Windows User Information

Enter the name and password of the Windows Account that will run this Job. The Job will be run as if it were started by this user.

Enter the user name:

Enter the password:

Confirm the password:

Job Specific Settings

Different settings will be displayed on additional tabs in the Edit Job dialog depending on the type of Job that is being configured.

Nodes Tab

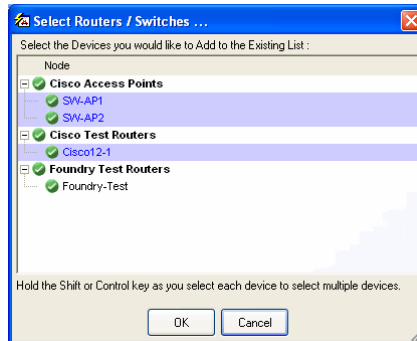
When editing a Job that with one of the following types, the **Nodes** tab will be displayed:

- Execute Command Script on Devices
- Download Configs from Devices
- Upload Changes to Devices
- Reboot Selected Devices
- Config Change Report

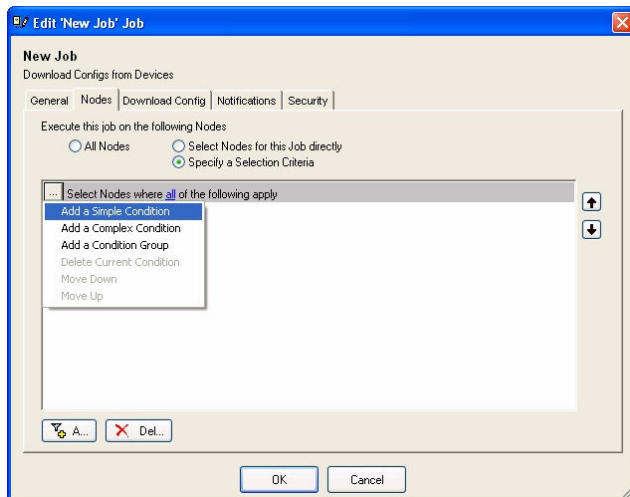
By default, the Job is assigned to **All Nodes**. To select a group of Nodes, choose the option **Select Nodes for this Job Directly** or **Specify a Selection Criteria**.

With the option **Select Nodes for this Job Directly** selected, click the

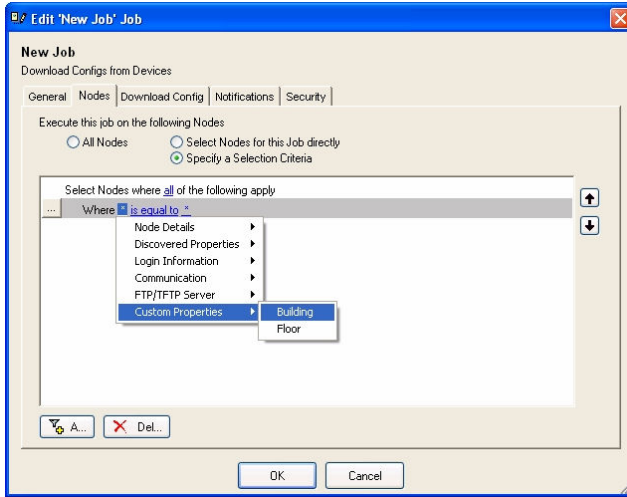
 button and choose the Nodes and/or Groups that are to be applied to this Job and then click **OK**.



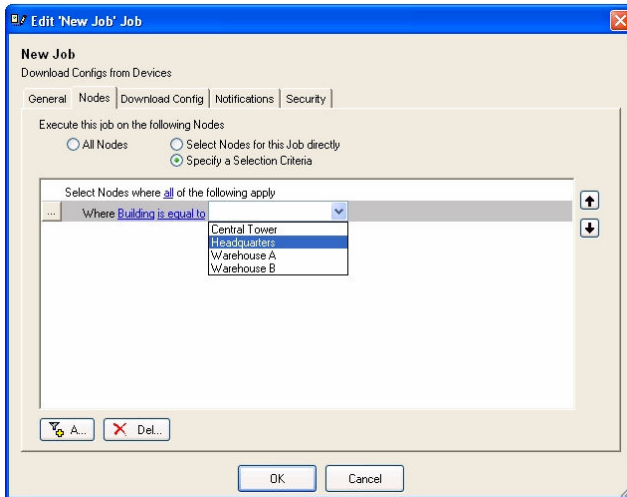
If, instead, the option **Specify a Selection Criteria** is selected, click the  button and select **Add a Simple Condition**.



Click the first asterisk (*) and select the desired field using the fly-out menu.



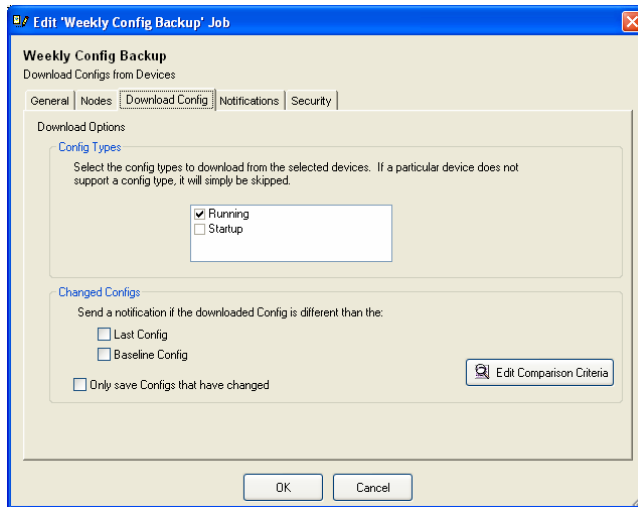
Select the condition (the default is “is equal to”) and then click the second asterisk (*) to assign a value for the condition.



When clicking the dropdown menu for the value, all values currently in the database for that field are displayed.

Download Config Tab

This tab is used to select which types of configs to download, and what actions are to be performed upon the completion of the downloads.

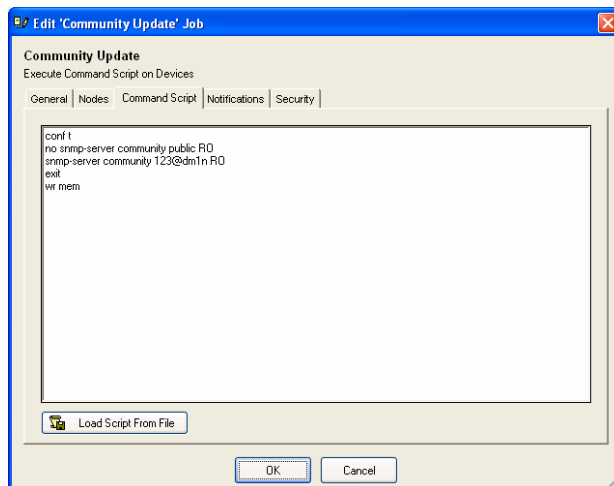


A notification E-mail can be sent when a downloaded config is different than the last config or different than the Baseline config. Check **Only save Configs that have changed** to discard any configs that have no changes.

Click the Edit Comparison Criteria to configure Cirrus to ignore specific lines of a configuration file. For more information on Comparison Criteria, see *Comparison Criteria and RegEx Patterns* in *Chapter 4: Managing Configs* on page 40.

Command Script Tab

When editing a Job that executes a command script, the **Command Script** tab will be displayed.

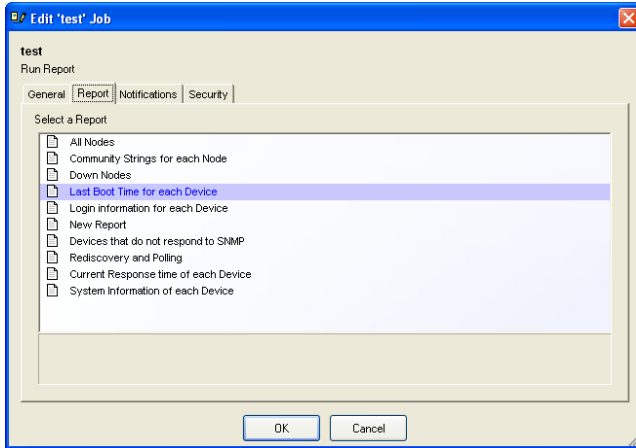


Type the command script that is to be executed in the text box provided. The

script can also be loaded from a file by clicking the  button, selecting a file, and then clicking **OK**.

Report Tab

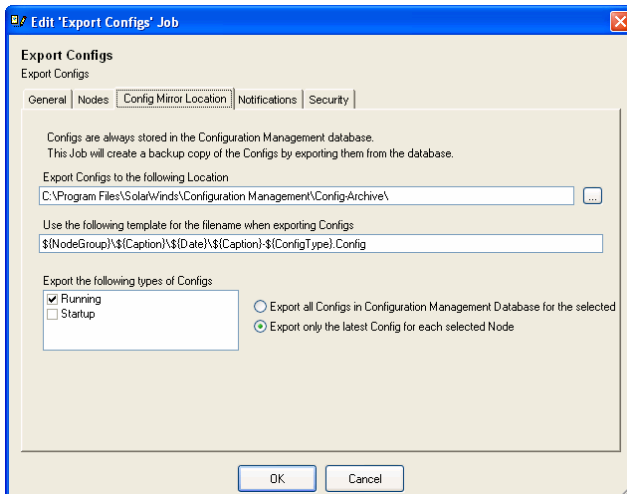
When editing a Job that runs a Report, the **Report** tab will be displayed.



On the **Report** tab, just select the Report that is to be executed. Only one Report can be executed at a time. To execute more Reports, a new Job will have to be created for each additional Report.

Config Mirror Tab

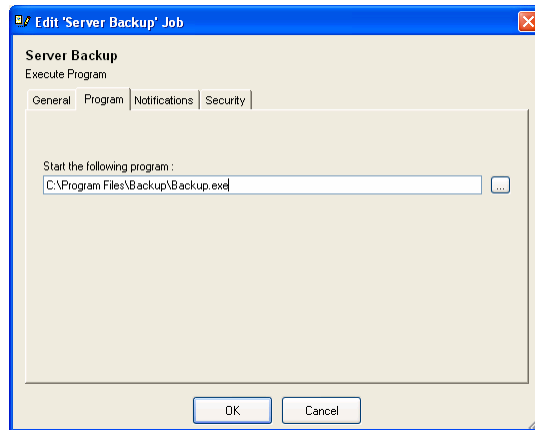
When editing a Job that exports configs, the **Config Mirror Location** tab will be displayed.



Select the path to export the configs to, and set the template for the filename structure. Select which configs (Running and/or Startup) to export, and choose whether to export all configs, or just the last downloaded for each node, and then click **OK** to save any changes.

Program Tab

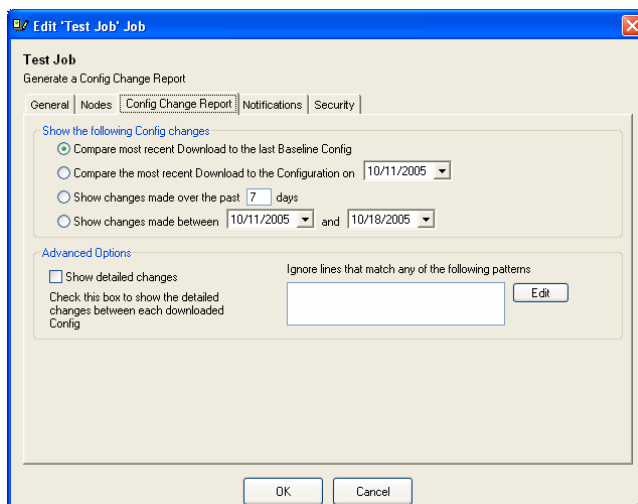
When editing a Job that executes a program, the **Program** tab will be displayed.



Click the Ellipsis button and browse to the application that needs to be executed. Select the application and click the **Open** button. Click **OK** to save the changes.

Config Change Report Tab

When editing a Job that executes a Report showing the changes between Configs, the **Config Change Report** tab will be displayed.



Select the type of Config Change Report to generate. The default selection (**Compare most recent Download the last Baseline Config**) will display all the differences between the last Baseline Config, and the most recent Downloaded Config.

The second option, **Compare the most recent Download to the Configuration on a specific Date**, will show all differences between the most recent Downloaded Config and a Configuration on the specified date.



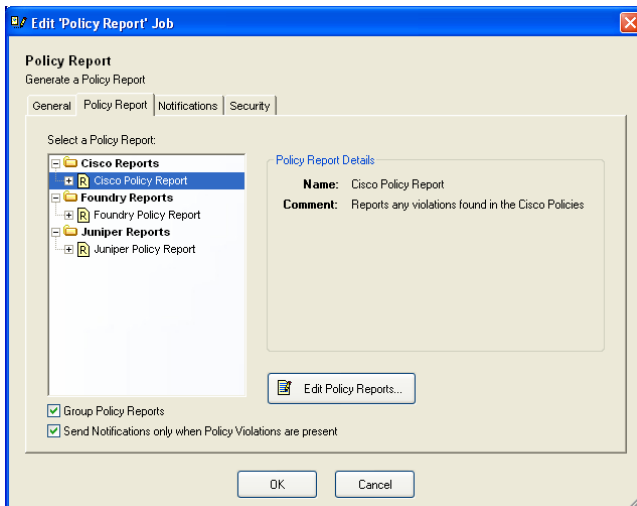
If there was no Config downloaded on the specified date, the next Config after that date will be used for the comparison.

The last two options will show all changes made to a device configuration that have occurred during a specific date range.

Check **Show detailed changes** to display the differences between each configuration file separately. This will show each change from one config to the next. For example, if there were 4 configuration changes made in a specific date range, the Report will show the differences in the first config compared to the second config, and then show the differences in the second config compared to the third, and so on. The Report will be grouped by date, showing all changes made on each day.

Policy Report tab

When editing a Job that executes a Policy Report, the **Policy Report** tab will be displayed.

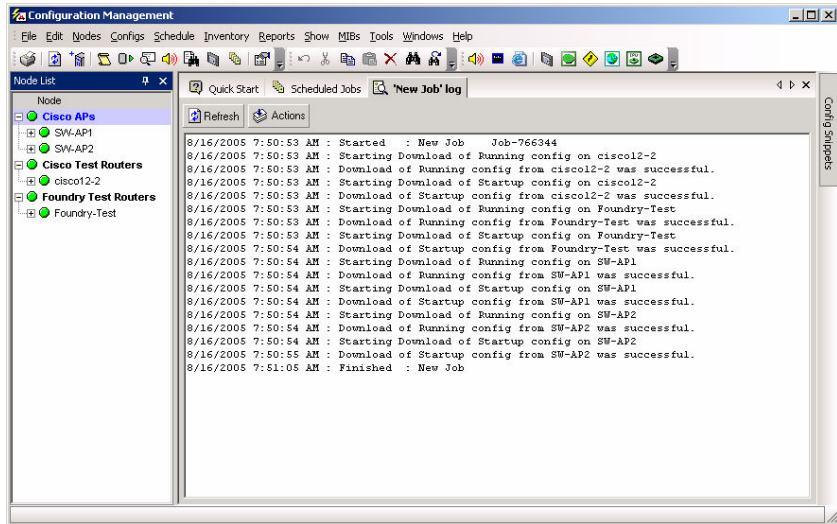


Select the Policy Report that is to be executed when the Job is run. Check **Send Notification only when Policy Violations are present** to suppress notifications if no

violations are found. Click the **Edit Policy Reports** button to launch the Policy Reporting application

Viewing Job Logs

To view a Job's log, the list of Job's must first be displayed. To display the list of Jobs, click the  button on the toolbar, or select **Display/Edit Jobs** from the **Schedule** menu. Right-click on a Job and select **View Selected Job's Log**.

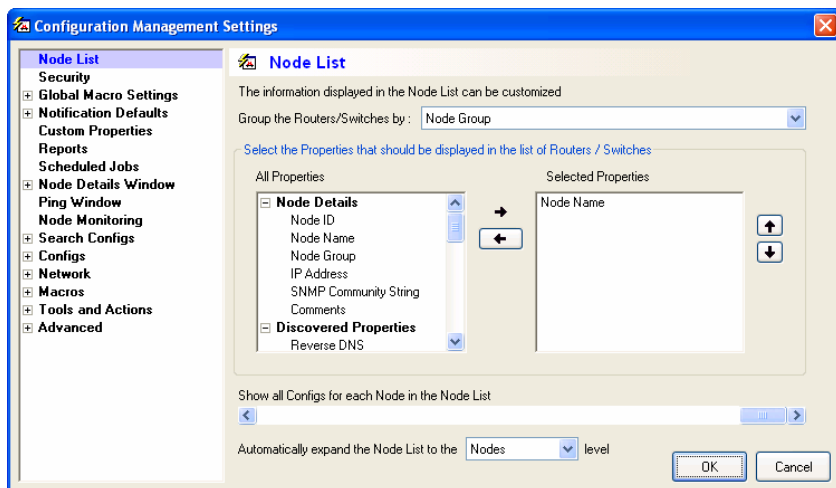


Chapter 10: Settings

SolarWinds Cirrus Configuration Management has a large amount of customizable settings. These settings range from how Nodes are listed, to how buttons and toolbars are displayed. To access the Configuration Management Settings, click the  button, or select **Settings** from the **File** menu.

Node List

The Node List settings appear first in the list, and are used to determine how the Nodes are grouped, and what properties are to be displayed in the Node List.



By default, only the Node Name is displayed in the list, but additional fields can be added such as IP Address, System Location, System Contact, and more. Custom Properties can also be displayed in the Node List.



For more information regarding Custom Properties, please refer to the *Custom Properties* section in *Chapter 3: Managing Nodes* on page 30.

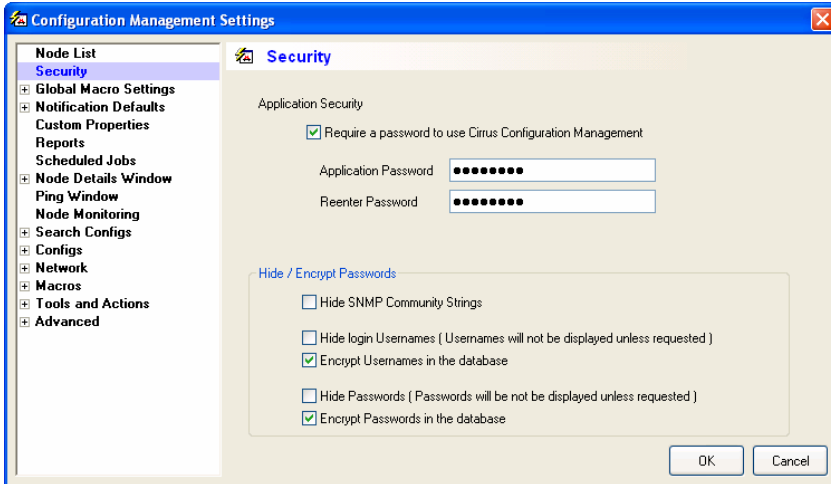
Adjusting the **Show all Configs for each Node in the Node List** slider will change how many configuration files appear under each node. With the slider all the way to the right, all configuration files will be displayed.



Adjusting the slider to show less than all Configs will not delete any files from the database.

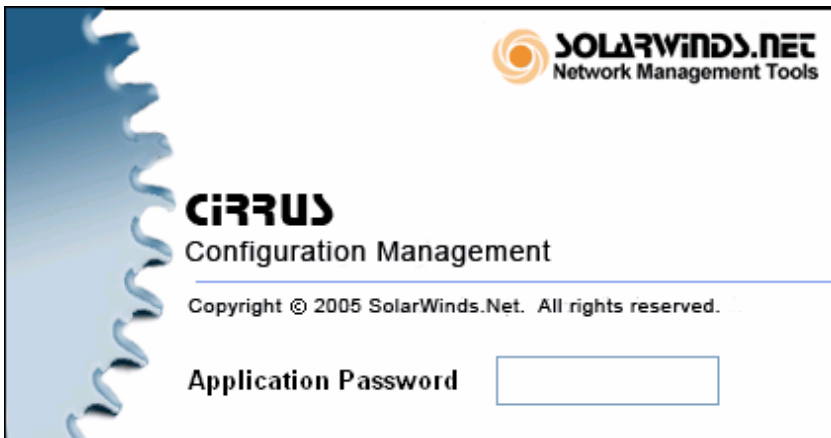
Use the last dropdown list to determine how to automatically expand the Node List when Cirrus is opened.

Security



The Security category is used to determine how to protect the data stored within Cirrus. To set a password to use Cirrus, check the box **Require a password to use Cirrus Configuration Management**. Enter a password on both lines to ensure it is typed correctly. In the **Hide / Encrypt Passwords** section, select the options needed to secure the data in the Cirrus database.

When a password is set for Cirrus, each time the application is launched, the user will be prompted to enter the password before being granted access to the program.



The Application Password is unique to each database. If Cirrus is installed on more than one machine, if each installation is sharing the same database, the password will be the same on each box.

Global Macro Settings

The Global Macro settings are used to set the default Community String, Login Information, and Transfer Protocol. When adding new Nodes, the default settings will be used unless otherwise specified.

Community String

The screenshot shows the 'Configuration Management Settings' dialog box with the 'Community String' tab selected. The left sidebar lists various settings categories, with 'Global Macro Settings' expanded to show 'Community String'. The main area is titled 'Community String' and contains the following text: 'SNMP Community strings can be set at a global level for all Devices.' Below this is a section labeled 'SNMP' with a text box for 'SNMP Community String' containing the value 'public'. To the right of the text box is the macro '\$(GlobalCommunity)'. Below the text box is a link that says 'Reset all Devices to \$(GlobalCommunity)'. Further down, there is explanatory text: 'Devices and Scripts can use the Global SNMP Community String by referring to the global macro \$(GlobalCommunity). You can still override the Global Settings for individual Devices by changing the Community String of each Device.' At the bottom right are 'OK' and 'Cancel' buttons.

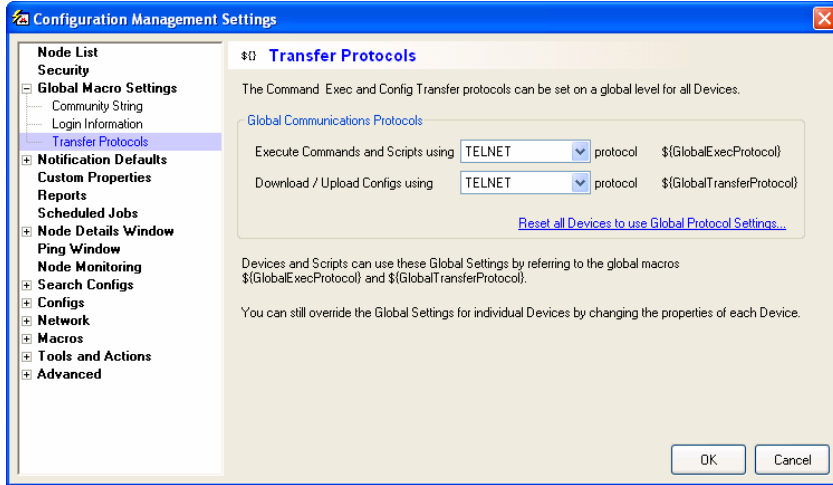
Enter the default SNMP Community String in the text box provided. To set all Nodes in the Cirrus database to the new default SNMP Community string, click **Reset all devices to \${GlobalCommunity}**.

Login Information

The screenshot shows the 'Configuration Management Settings' dialog box with the 'Login Information' tab selected. The left sidebar shows 'Global Macro Settings' expanded to 'Login Information'. The main area is titled 'Login Information' and contains the following text: 'Login information can be set at a global level for all Devices.' Below this is a section labeled 'Global Login Information' with four fields: 'Username' (text box with 'admin'), 'Password' (text box with 'admin'), 'Enable Level' (dropdown menu with '0'), and 'Enable Password' (text box with 'admin'). To the right of each field is a macro: '\$(GlobalUsername)', '\$(GlobalPassword)', '\$(GlobalEnableLevel)', and '\$(GlobalEnablePassword)'. Below the fields is a link that says 'Reset all Devices to use Global Login Settings...'. Further down, there is explanatory text: 'Devices and Scripts can use these Global Settings by referring to the global macros \$(GlobalUserName), \$(GlobalPassword), \$(GlobalEnableLevel), and \$(GlobalEnablePassword). You can still override the Global Settings for individual Devices by changing the properties of each Device.' At the bottom right are 'OK' and 'Cancel' buttons.

Enter the default Login Information using the text boxes provided. To set all Nodes in the Cirrus database to the new default Login Information, click **Reset all Devices to use Global Login Settings**.

Transfer Protocols



Enter the Global Communication Protocols using the text boxes provided. To set all Nodes in the Cirrus database to the new Global Communication Protocols, click **Reset all Devices to use Global Protocol Settings**.

Notification Defaults

The Notification Default settings are used to determine what email addresses and servers to use when sending Job completion notifications.

Email Defaults

The screenshot shows the 'Configuration Management Settings' dialog box with the 'Email Defaults' tab selected. The left sidebar lists various settings categories, with 'Email Defaults' highlighted. The main area contains a text box for 'From Name' (Solarwinds Configuration Mgmt), a text box for 'Reply Address' (Solarwinds@yourdomain.name), and a text box for 'Subject' (Solarwinds.Net Configuration Management Job Completion Notification). Below these are empty text boxes for 'To', 'CC', and 'BCC'. A note at the top states: 'To save time, the default Email Notification information can be entered here and will be placed in new scheduled jobs automatically. These defaults can easily be overridden in the individual scheduled jobs.' At the bottom right are 'OK' and 'Cancel' buttons.

Enter the From Name, Reply Address, and Subject lines in the text boxes provided. Enter any default email address in the appropriate boxes.

SMTP Server

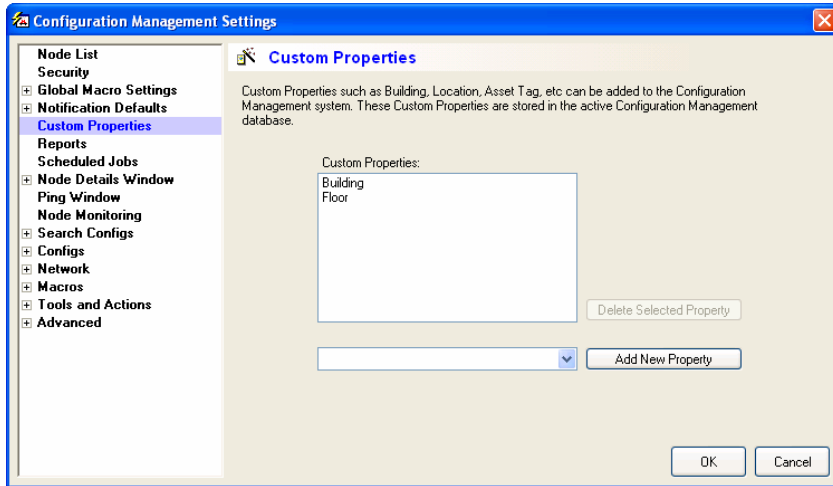
The screenshot shows the 'Configuration Management Settings' dialog box with the 'SMTP Server' tab selected. The left sidebar lists various settings categories, with 'SMTP Server' highlighted. The main area contains a text box for 'Hostname or Address of SMTP Server' (SMTP.MyDomain.Com), a text box for 'SMTP Port Number' (25), and a checkbox for 'Use SMTP Authentication' (unchecked). Below the checkbox are text boxes for 'SMTP Username' (SMTPUsername) and 'SMTP Password' (password field). A note at the top states: 'To save time, the default SMTP Server information can be entered here and will be placed in new scheduled jobs automatically. These defaults can easily be overridden in the individual scheduled jobs.' At the bottom right are 'OK' and 'Cancel' buttons.

Add the Hostname or IP Address of the email server for Cirrus to send email

messages to. Set the SMTP Port Number in the text box provided. Port 25 is the default port for SMTP.

If the email server requires authentication, check the **SMTP Authentication** box and enter a Username and Password.

Custom Properties



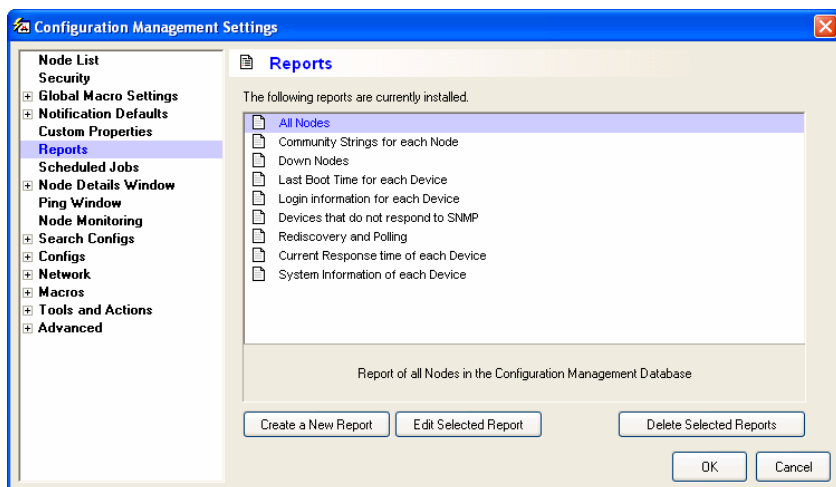
Cirrus includes the ability to add Custom Properties to each Node. Custom Properties are additional fields such as country, building, asset tag, serial number, etc. that can be defined and stored in the Cirrus database.

Cirrus provides a collection of the most commonly utilized properties to choose from, or new properties can be created. Once a custom property is defined, the properties can be edited in the Node Details of each device.

Select a property from the drop-down list or type in a new property, and then click the **Add New Property** button to create the Custom Property.

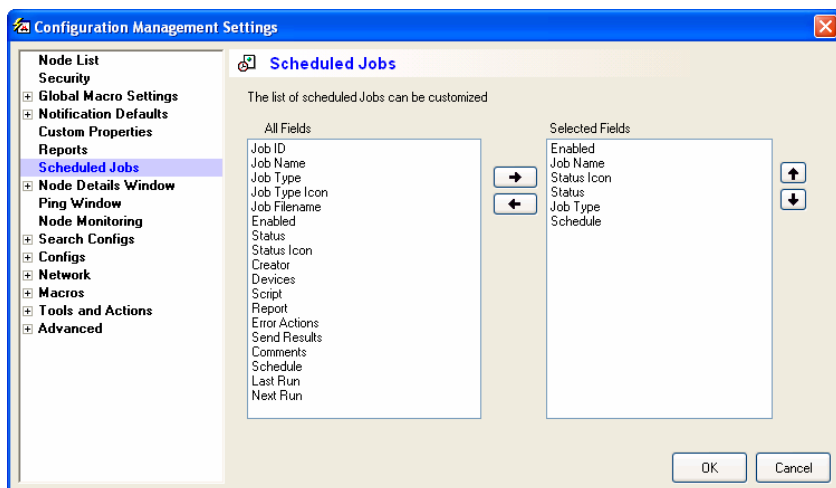
Once a Custom Property exists, the field will be displayed in Node Details. To edit the Custom Properties, right-click on a node or group of nodes and click **Edit Selected Nodes** or **Edit Multiple Nodes**. The new Custom Properties will be displayed at the bottom of the Node Details.

Reports



The Reports category is used to create a new Report, edit an existing Report, or delete a Report. To edit a Report, select the Report and click **Edit Selected Report**. For details on how to edit a Report, please refer to *Creating and Editing Reports* in *Chapter 7: Reports* on page 72.

Scheduled Jobs

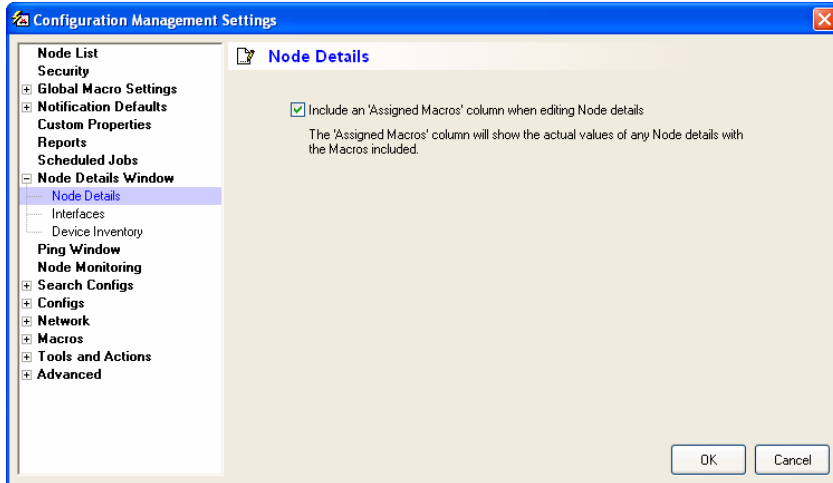


The Scheduled Jobs category is used to specify which columns are displayed when viewing the Scheduled Jobs list. Use the appropriate arrow buttons to add / remove fields, and to adjust the order of the layout.

Node Details Window

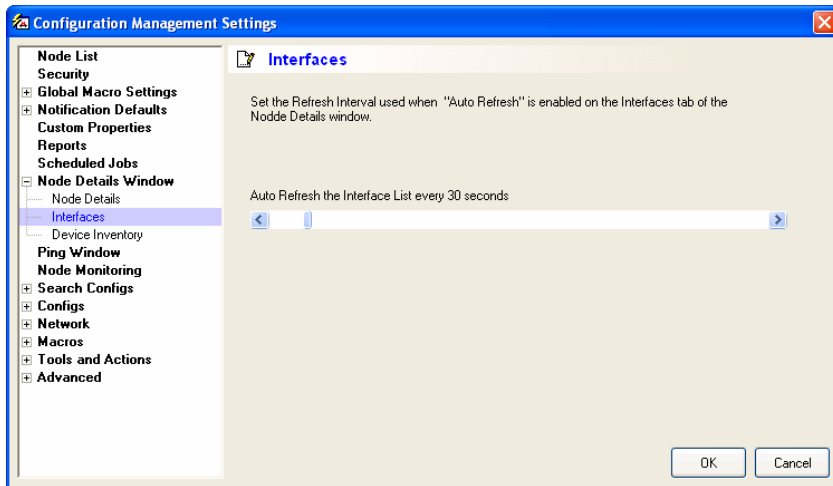
The Node Details Window settings are related to what is displayed when editing device details.

Node Details



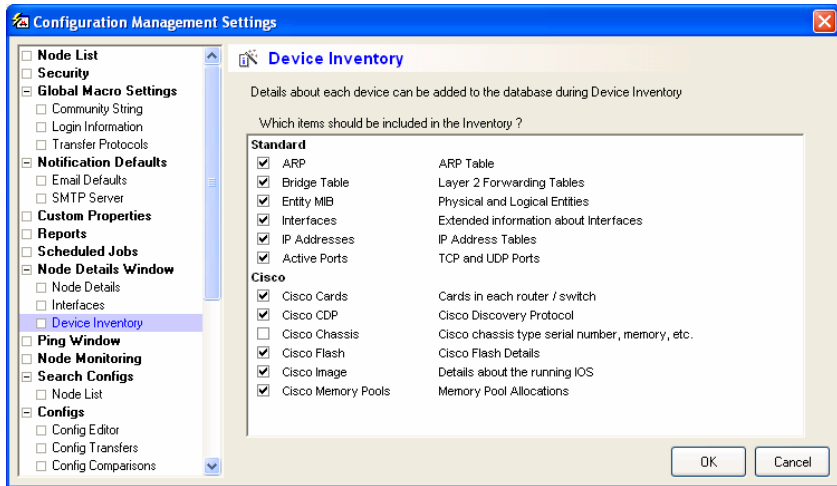
Check this box to display the Assigned Macros column in Node Details.

Interfaces



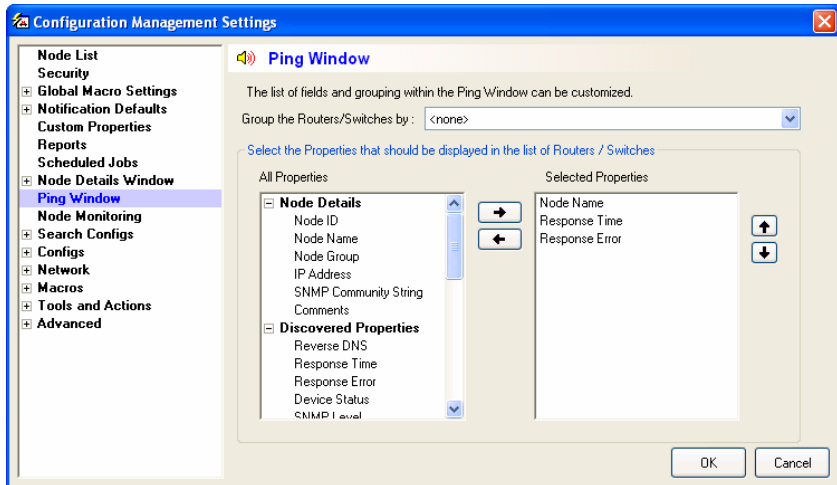
Use this slider to stipulate how often the Interface List is updated automatically when viewing Interface statistics on the Interfaces tab within Node Details.

Device Inventory



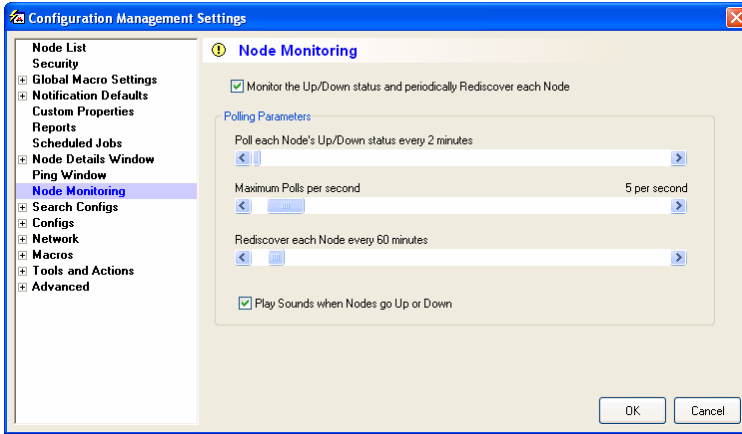
The Device Inventory category is used to establish which statistics will be collected when performing Inventory on Nodes.

Ping Window



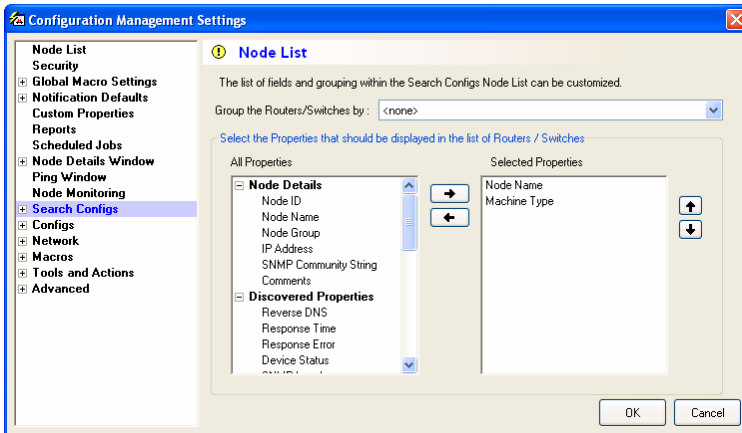
The Ping Window category is used to specify which columns are displayed when viewing the Ping results. To group the Nodes listed in the Ping Window, use the dropdown list at the top to select what to group the Nodes by. Use the appropriate arrow buttons to add / remove fields, and to adjust the order of the layout.

Node Monitoring



The Node Monitoring category is used to establish if and how nodes are polled for status. Check the box at the top to enable Node Status monitoring. Use the sliders to specify how often each Node is polled, Maximum polls per second, and how often each Node's details are rediscovered. To play sounds when a Node goes up or down, check the **Play Sounds when Nodes go Up or Down** box.

Search Configs

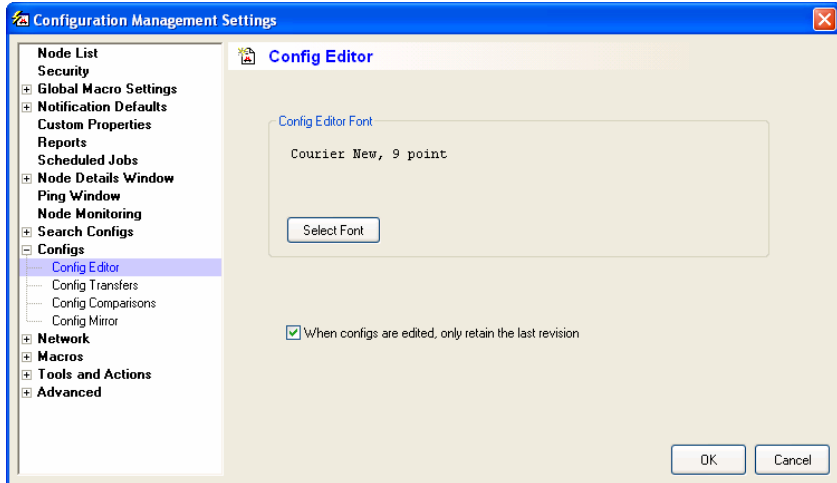


The Search Configs category is used to specify which columns are displayed when viewing the Search results. To group the Nodes listed in the Search Results Window, use the dropdown list at the top to select what to group the Nodes by. Use the appropriate arrow buttons to add / remove fields, and to adjust the order of the layout.

Configs

The Configs category is used to determine how configuration files are displayed when editing, and how the files are archived.

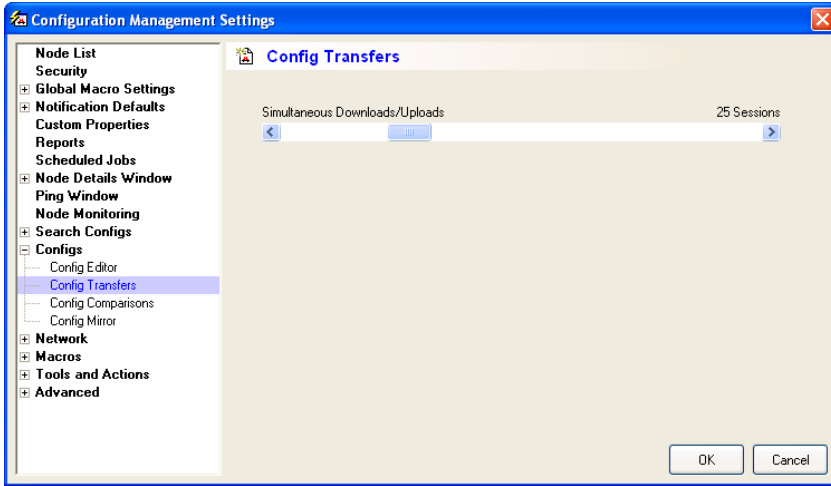
Config Editor



The Config Editor category is used to specify how the configuration files are displayed when editing. Click the **Select Font** button to select the preferred font style.

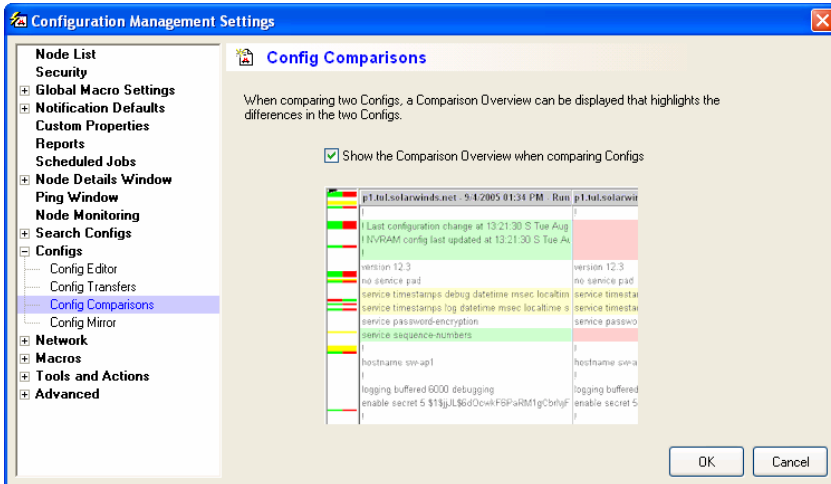
When saving changes to configuration files, only the last revision is saved by default. Alternately, to save all revisions, uncheck the **When configs are edited, only retain the last revision** box.

Config Transfers



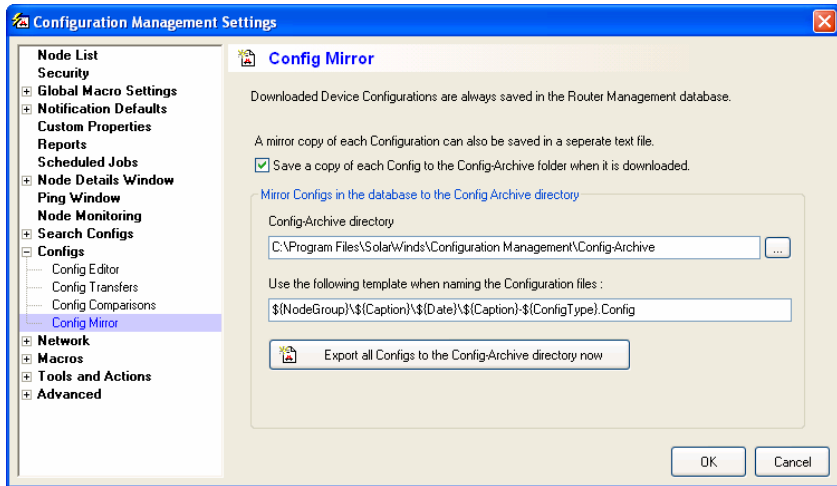
Adjust this slider to set how many simultaneous downloads and uploads can be executed.

Config Comparisons



Check this box to show the Comparison Overview when comparing to configuration files. The Comparison Overview scales to fit the size of the window allowing for an overview of the entire comparison. Click anywhere on the Comparison Overview to jump to the associated section of the configs being compared.

Config Mirror



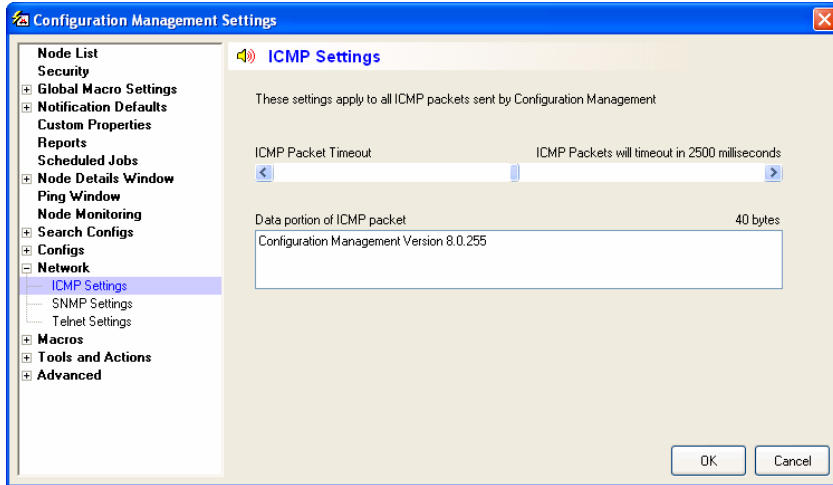
The Config Mirror category is used to determine if and where mirror copies of configuration files will be saved. Check the **Save a copy of each Config to the Config-Archive folder when it is downloaded** box to enable Config Mirror copies. Click the Ellipsis button next to the first text box to select a path to save the configuration files to. In the second text box, create a folder name template to organize the configs. Refer to *Appendix C: Macros* on page 173 for a full list of macros that can be used to create a folder structure.

Click the **Export all Configs to the Config-Archive directory now** button to copy all configs from the database to the mirror location.

Network

The Network settings are used to determine timeout and retry settings.

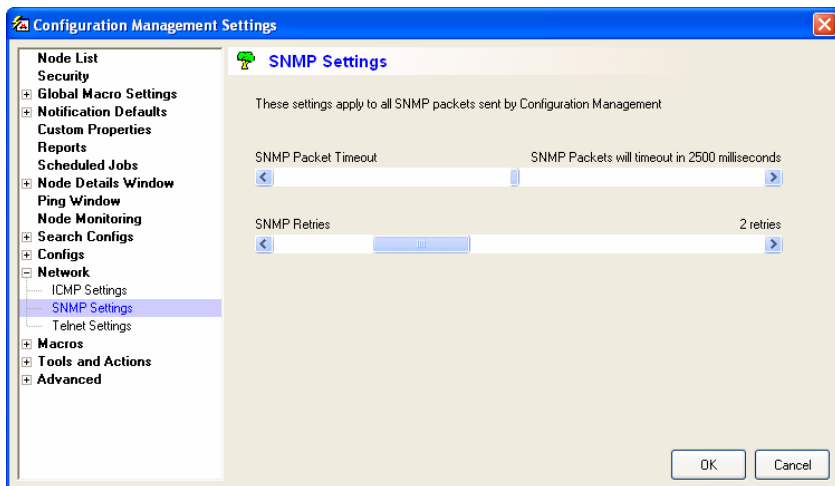
ICMP Settings



Adjust the **ICMP Packet Timeout** slider to establish how long Cirrus waits before determining an ICMP packet has been lost.

To change the Data portion of the ICMP packet, add or remove text from the text box provide. As text is added or removed, the number of bytes included in the packed is updated automatically.

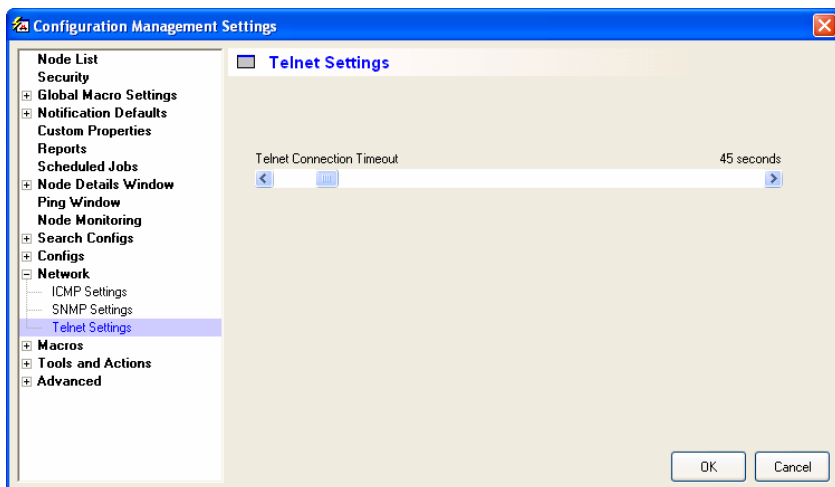
SNMP Settings



Adjust the **SNMP Packet Timeout** slider to establish how long Cirrus waits before determining an SNMP packet was not received.

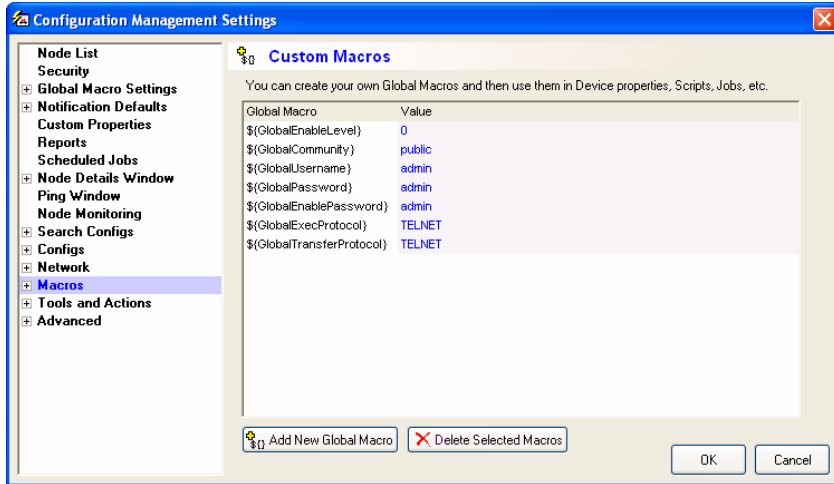
Adjust the **SNMP Retries** slider to determine how many times Cirrus will resend the SNMP request.

Telnet Settings

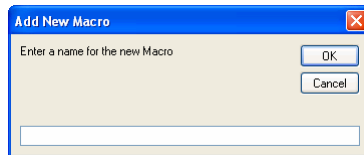


Adjust the **Telnet Connection Timeout** slider to establish how long Cirrus waits before timing out a Telnet connection.

Macros



Additional Global Macros can be created to use with device properties, scripts, Jobs and more. To edit a macro's value, click in the Value area of the macro and just start typing. To create a new macro, click the **Add New Global Macro** button.

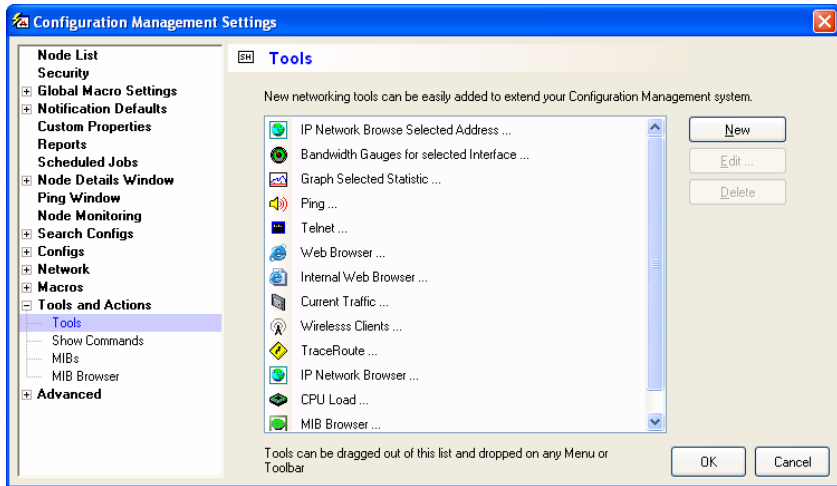


Give the macro a name and click **OK** to save the macro.

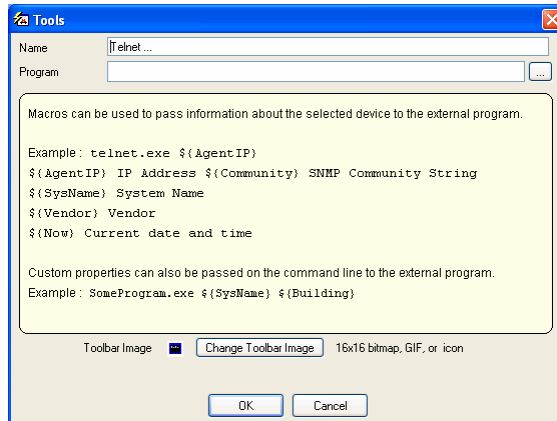
Tools and Actions

The Tools and Actions category is used to add or edit actions that can be accessed from the tool bar or right-click menus.

Tools



The Tools listed here appear in the right-click menu and in the **Tools** menu. To remove a Tool, select the Tool from the list and click **Delete**. To edit a Tool, select the Tool from the list and click **Edit**.

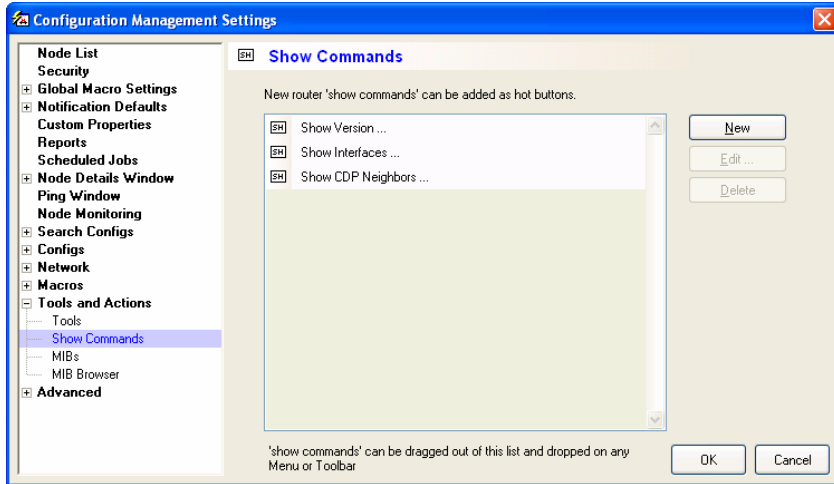


To create a new Tool, click the **New** button and then give the Tool a name. Select a Program using the ellipsis button to the right of the Program text box. Click the **Change Toolbar Image** button to select a different icon for the Tool. Check the **Add new tool to Tools menu** box to include the new Tool in the right-click and menu list. Click **OK** to save the changes.



Details on how to customize toolbars can be found in *Appendix B: Custom Toolbars*.

Show Commands



The Show Commands listed here appear in the right-click menu and in the **Show** menu. To remove a Show Command, select the command from the list and click **Delete**. To edit a Show Command, select the command from the list and click **Edit**.

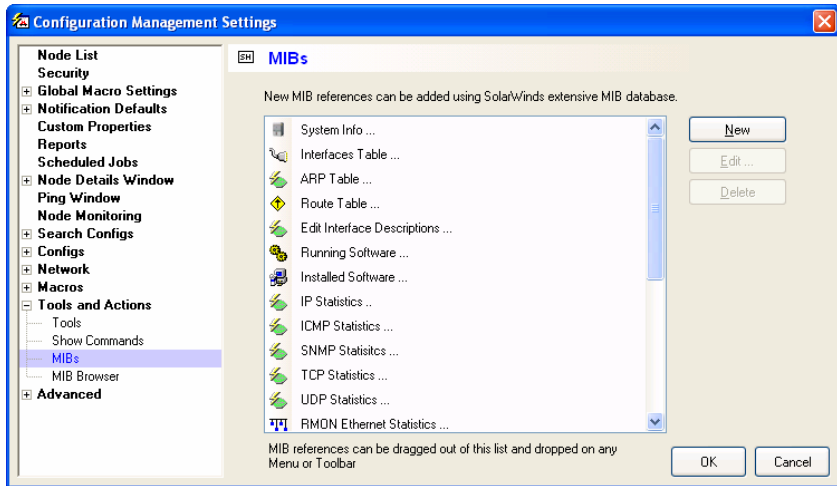


Type in the execute command and click the ellipsis button to select a different icon for the Show Command if necessary. Check the **Add to Show menu** box to include the new Show Command in the right-click and menu list. Click **OK** to save the changes.

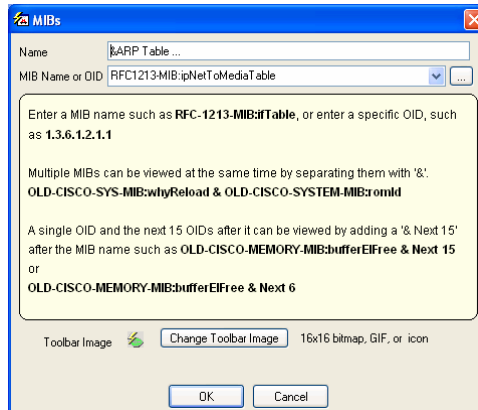


Details on how to customize toolbars can be found in *Appendix B: Custom Toolbars*.

MIBs



The MIBs listed here appear in the right-click menu, the **MIBs** menu, and on the toolbar when clicking the  button. To remove a MIB, select the MIB from the list and click **Delete**. To edit a MIB, select the MIB from the list and click **Edit**.



The *MIBs* dialog is displayed where a new OID can be selected, and / or the name of the MIB can be changed. Click the **Change Toolbar Image** button to select a different icon for the MIB. Click **OK** to save the changes.

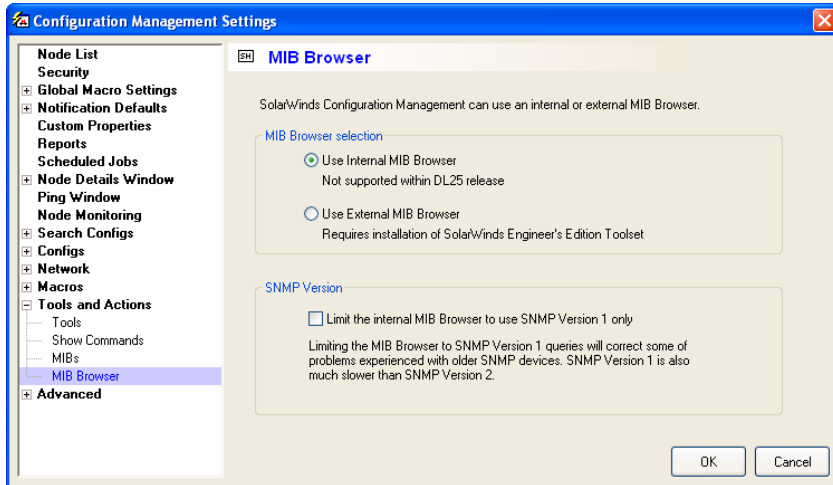
To create a new MIB, click the **New** button. Give the MIB a name and then type the MIB Name or OID into the second text box. There is a dropdown list of the most common used MIBs to choose from.

Click the **Change Toolbar Image** button to select a different icon for the MIB. Check the **Add this new item to MIBs menu** box to include the new MIB in the right-click and toolbar list. Click **OK** to save the changes.



Details on how to customize toolbars can be found in *Appendix B: Custom Toolbars*.

MIB Browser



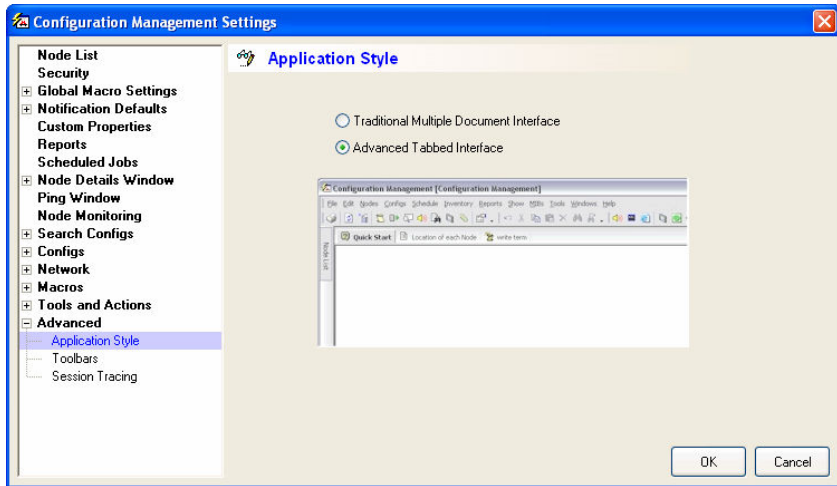
Use this category to select either the Internal or External MIB Browser. To use the External MIB Browser, a SolarWinds Engineer's Edition toolset must be installed on the same machine.

To limit the Internal MIB Browser to SNMP Version 1, check the box in the *SNMP Version* section. Limiting the MIB Browser to SNMP Version 1 queries will correct some of the problems experienced with older SNMP devices. However, SNMP Version 1 is much slower than SNMP Version 2.

Advanced

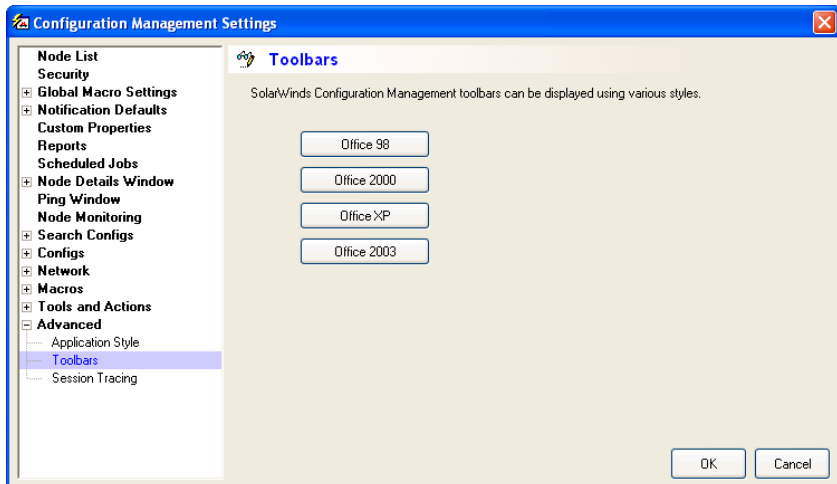
The Advanced options are used to determine how Cirrus is displayed. The Advanced Tabbed Interface allows the user to move tabs to different locations in the application, as well as creating new horizontal or vertical tab groups. The Advanced Tabbed Interface allows for considerably more complex displays.

Application Style



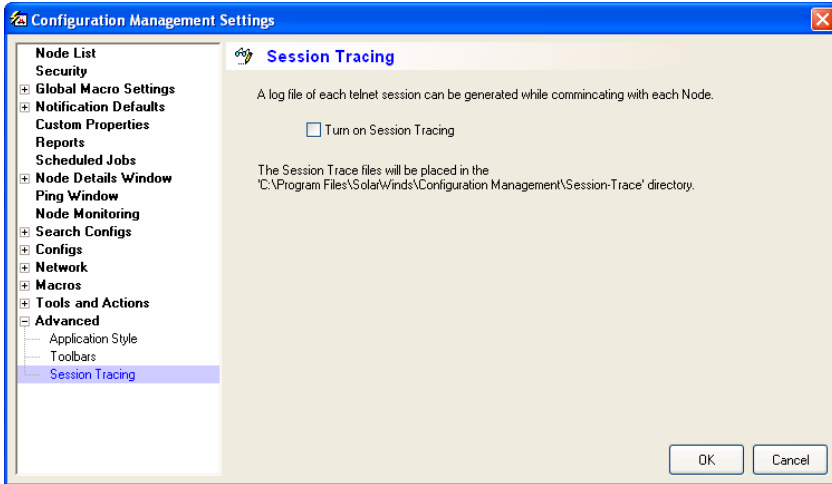
Choose either **Traditional Multiple Document Interface** or **Advanced Tabbed Interface** for the display preference, and click **OK** to save the changes.

Toolbars



The Toolbars category is used to select the style of toolbars to display. Simply click the button of the preferred style.

Session Tracing



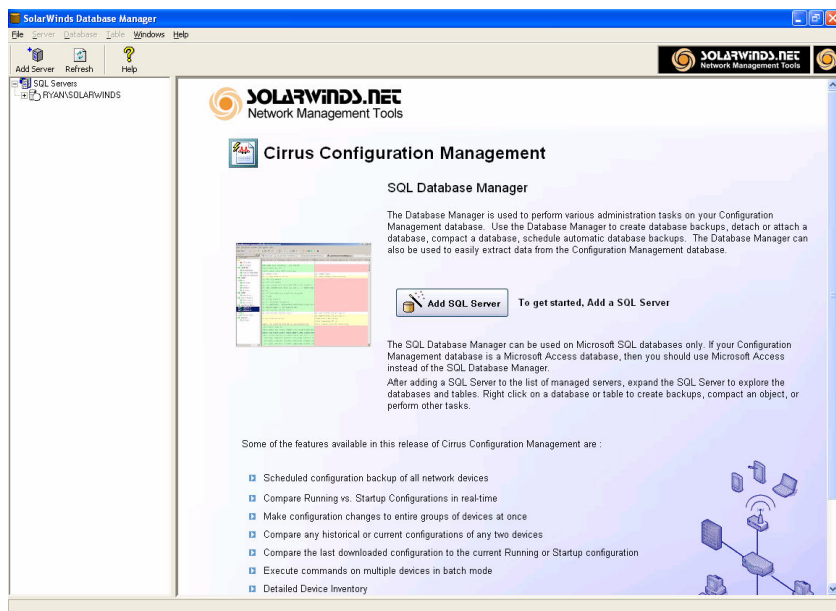
Session Tracing creates a log file of each telnet session and places the file in the Configuration-Management\Session-Trace folder. Check the **Turn on Session Tracing** box to enable logging of Session Traces.

Chapter 11: Database Manager

The Database Manager can be used to perform queries, view database and table details, export data, and edit database values. The Database Manager can also be used to repair, compact, restore, or backup the database.

Getting Started

The Database Manager is opened from the Windows Start Menu: **Start → SolarWinds Network Performance Monitor → Database Utilities → SQL Database Manager**. The SolarWinds Database Manager opens to display a splash screen depicted in the illustration that follows.

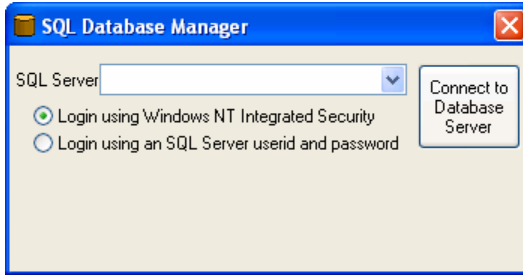


The Splash Screen provides additional application information and presents a collection of buttons that can be used to perform the software's most common functions. This functionality is also available from the application menu and toolbar.

Adding a Server

After installing Cirrus, the SQL server that is to be managed needs to be added to the Database Manager application. To do this, select Add Server from the toolbar

(or select **File → Add Server** from the menu). The *NetPerfMon Database Manager* dialog is displayed.



Select the SQL server from the drop down or enter the IP address of the SQL Server machine. Use the radio buttons provided to select the login style. Use Windows NT Integrated Security to automatically pass the windows user ID and password to the SQL server, or select to use a separate SQL Server user ID and password. Upon selecting the later option, the dialog will dynamically change to display text boxes for entry of the SQL Server user ID and password. After making the selections, click **Connect to Database Server**. The selected server and associated databases will be displayed in the tree structure of the Database Manager window.

Database Backup

It is very important to periodically back up the Cirrus database. To back up the database, right-click on the database name in the tree of the Database Manager window and choose **Backup Database**.

The *Backup Database* dialog prompts to enter a description of the database backup and specify a path and filename for the backup file. Enter the requested information, and give the backup a name, typically, C:\Program Files\SolarWinds\Data\ConfigurationManagement.BAK. Refer to *Creating a Database Maintenance Plan* on page 139, for details on how to schedule a regular database backup.



Ensure that the target location for the database backup has sufficient available disk space.

Restore a Database

To restore a database from backup, open the Database Manager and select **Database → Restore Database** (or right-click the SQL Server in the tree and select **Restore Database** from the list). The *Restore Database* dialog is displayed. Use the Ellipsis button to navigate to the location of the desired database, or enter a valid SQL Backup database name and complete path in the text box. Typically

C:\Program Files\SolarWinds\Data\ConfigurationManagement.BAK.



Use the Verify button to check that a valid SQL Backup database name has been specified.

Upon selecting a database, the remaining fields will be auto-filled. The Database Name field is populated with the name SQL will use to refer to the specified database. The remaining two fields displayed are the data files (.mdf is the data file and .ldf is the log file) that the database is comprised of. The values that are provided can be changed, noting that SQL does not create directories; therefore the specified path must already exist. Also keep in mind that a database that is currently in use cannot be restored. Click **OK** to restore the selected database.

Compact a Database

The database compact procedure can be run to remove white space, reindex, and shrink the database. SolarWinds recommends compacting the database as it approaches 1.5 -1.6 GB in size, as the max size of the SQL Desktop Engine that ships with Cirrus is 2GB. Database compaction can be performed within Database Manager by selecting **Database → Compact Database** (or by right-clicking the database name and selecting **Compact Database** from the list). Upon completion, a dialog listing the size of the database before and after compaction is displayed.



The same value displayed in the before and after size is an indicator that there is not enough free space in the database to rearrange data. Use the Compact/Rebuild Indexes option on individual tables in order to free up enough space for the database compaction to occur.

Compact Individual Tables

Individual tables within a database may be compacted from the Database Manager application. Right-click on the desired table and select **Compact/Rebuild Indexes** from the list. A dialog listing the before and after size of the table is displayed upon completion. Click **OK** to close the dialog.

View Database Details

Details pertaining to the selected database can be viewed in Database Manager by right-clicking the database name and selecting **Database Details** from the list (or by selecting **Database → Database Details** from the menu). The Database Details page is displayed with the **Properties** tab open. SolarWinds recommends monitoring the value in the Total Space Used field. When the database size approaches 1.5 or 1.6 GB, the Compact procedure outlined on page 137 should be run, as the maximum size of the SQL Desktop Engine that ships with Cirrus is 2GB. The Last Backup field should also be noted to ensure that a regular database maintenance plan is being adhered to. If this field is blank, a backup of the database should be created, and refer to *Creating a Database Maintenance Plan* on page 139.

View Table Details

Database Manager's Table Details page is comprised of three tabs used to display the table's property, column, and index information. View the Table Details by selecting **Table → Table Details** from the menu (or by right-clicking the table name in the tree and selecting **Table Details** from the list).

The **Properties** tab includes general statistics pertaining to the table size and creation date. The **Columns** tab describes the columns in the table, the keys, and field types, while the **Indexes** tab lists the indexes used within the table. The table may also be queried by selecting the **Query** button included on the top of the display. A default SQL statement is provided, as well as radio buttons for displaying the data in read or read/write view. Special care should be taken while editing database values as the integrity of the database could easily be compromised.

Exporting Data

The data displayed in the query view of the Database Manager can be exported to one of several formats. To export the query data, select **File → Export → Export to ***, substituting the desired format for *. Available formats include: Comma Delimited, Text, HTML, Excel, or PDF. The *Select Fields* dialog will be presented prompting for the data fields to be included in the export. Upon selection, the *Save As* dialog will be displayed. Navigate to the desired location, specify a name, and click **Save**.



The Export directly to Excel option saves the file with the .xls extension and opens the file in Excel for immediate use. The Export to Excel option saves the file with the .xls extension.

Editing Database Fields

Database fields may be edited within the Database Manager application from the query view. It is very important to exercise great care when editing database values, as the integrity of the database could be jeopardized. To edit a field, right-click on the desired table and select **Query Table** from the list. Use the provided SQL statement or enter a custom statement in the display. Click the **Refresh** button to display the query results in table view. Select the Read/Write radio button included at the top of the display to enable the ability to edit the fields.

Detach a Database

The database can be detached in order to leave the data files (.mdf is the data file and .ldf is the log file) that the database is comprised of in tact. Detaching a database removes the reference from the SQL Server allowing the files to be moved to different locations safely. Open Database Manager and select **Database** → **Detach Database** from the menu or right-click the database name and select **Detach Database** from the list.



SolarWinds does not recommend using the Detach Database option to move a database to a new SQL Server. Please use the Backup and Restore procedures described on page 136.

Creating a Database Maintenance Plan

A database maintenance plan can be created that will automatically compact and backup the database on a scheduled basis. To create a database maintenance plan for the Cirrus database, follow these steps:

1. In Database Manager, right-click on the database, and choose **Database Backup Schedule**.
2. The Database Maintenance Wizard will start.
3. Select the frequency with which to run the backup, set the time for it to run, and click **Next**.
4. Select the check box to compact and shrink the database before the backup (recommended).
5. Choose the location where the database backup files are to be created and the backup reports stored. Click **Finish** to continue.



SQL Server Agent must be running in order for the database maintenance plan to be executed.

Using Enterprise Manager

If a licensed copy of SQL Server 2000 Standard or Enterprise Edition already exists, Enterprise Manager can be used to maintain the Cirrus database instead of the SolarWinds Database Manager. SolarWinds recommends contacting a DBA and referencing the documentation that Microsoft provides on Enterprise Manager for instructions on using it to manage a SQL 2000 database.

If a DBA is not available, and would still like to use Enterprise Manager to set up a maintenance plan for the Cirrus database, follow these steps:

1. Open Enterprise Manager and select the **SQL Server** group in the left pane.
2. From the menu, choose **Action → New SQL Server Registration**.
3. Click **Next** to begin the SQL Server Register Wizard. Next, choose the Cirrus Server/Instance Name from the list and click **Add**. If the SQL Server does not show up in the list, it can be entered manually.
4. Choose the type of authentication that will be used to connect to the SQL server. Select the Server Group to which the SQL Server should be added and click **Finish**.
5. Expand the items on the left until the Cirrus database is visible.
6. Right-click on the database and choose **All Tasks → Maintenance Plan**.
7. The Maintenance Plan Wizard will walk through building a maintenance plan for the Cirrus database. Click **Next** to start the wizard.
8. Select the database to which the maintenance plan should apply and click **Next**. In most cases, the only database that needs to be selected is the Cirrus database (Configuration-Management).
9. Configure the database backup schedule. It is recommended that the database be backed up as a regular part of the maintenance plan and that the integrity of the backup is checked when complete. Normally, it is recommended that the backup job is run nightly. Click **Next** to continue.
10. Configure the directory where the database backups should be stored. Be sure to specify a location with sufficient free space. Also, be sure to specify how long to keep the database backups in the **Remove Files Older Than** section. Click **Next** to continue.

11. Configure the transaction log backup. It is not normally necessary to back up the transaction log as a part of the maintenance plan. Click **Next** to continue.
12. Configure the report to be generated during maintenance. These reports are especially important if there is a problem. Be sure to specify the length of time to keep reports in **Delete Text Report Files Older Than**. Click **Next** to continue.
13. Configure the maintenance plan history. It is not typically necessary to write a maintenance plan history. Click **Next** to continue.
14. Finally, choose a name for the maintenance plan and click **Finish**.

For additional help with using Microsoft's Enterprise Manager, please visit the Microsoft Support Website at <http://support.microsoft.com>.

Chapter 12: Cirrus Scenarios

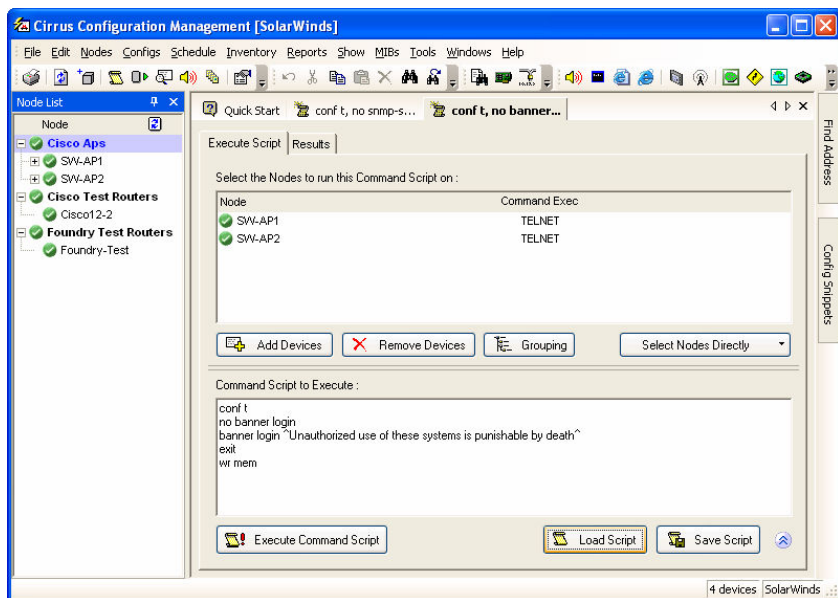
This chapter discusses several different scenarios that demonstrate how to use Cirrus in different network environments.

Updating the Login Banner

Various situations will arise prompting a change to the Login Banner for a router, switch, or firewall. With Cirrus, this can be performed on one Node, or even a group of Nodes all at once.

To update the Login Banner for a Node or group of Nodes, a command script must first be created. It is always a good idea to backup the running config prior to making any changes, so right-click on the Node or group of Nodes that are to be updated, and click **Download Configs**. Click the **Download** button to download and save the configuration files to the database.

Right-click on a Node or group of Nodes and select **Execute Command Script** to open the *Execute Script* dialog.



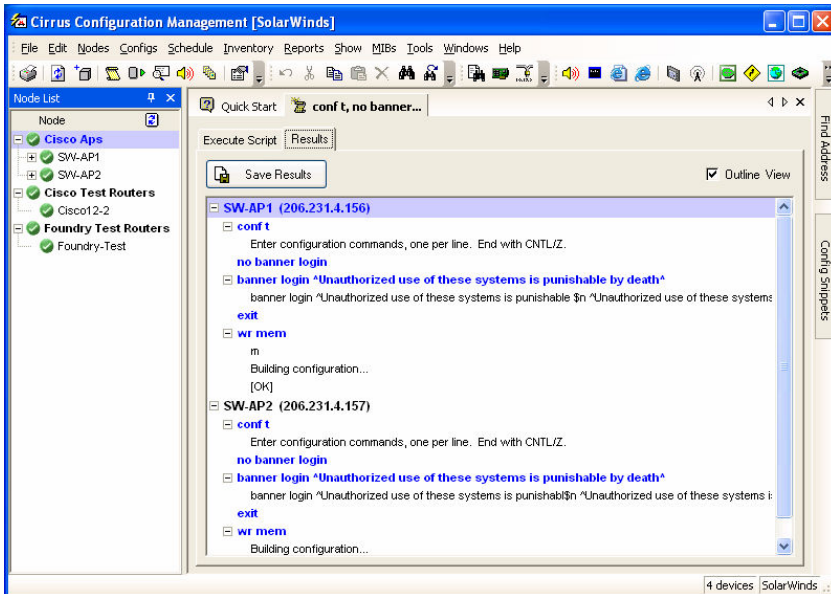
Ensure the Nodes that are to be updated are listed in the top window. If more Nodes need to be added, click the **Add Devices** button.

Type the command script that is to be executed or load an existing script by clicking the **Load Script** button. Once satisfied with the command script, click the **Execute Command Script** button.

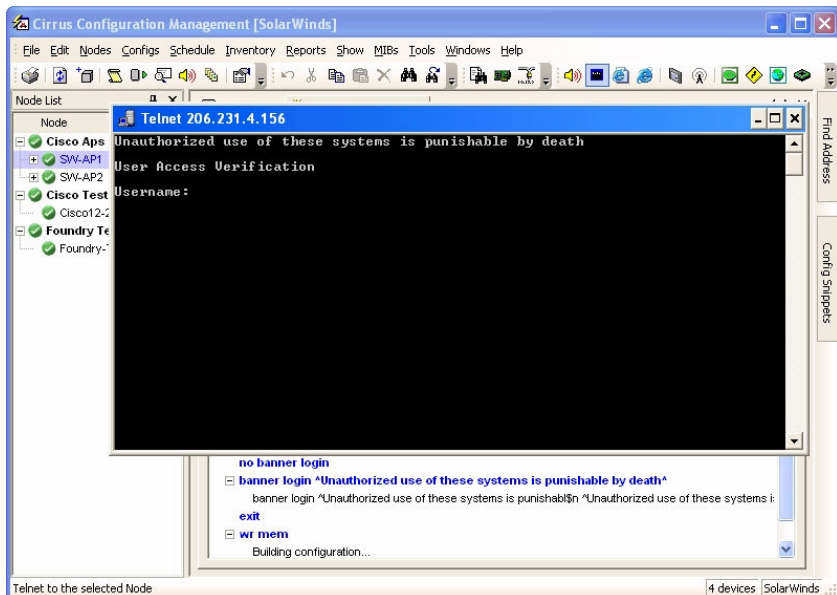
The script used in this scenario removes the current login banner and replaces it with "Unauthorized use of these systems is punishable by death." The script was typed as follows:

```
config t
no banner login
banner login ^Unauthorized use of these systems is
punishable by death^
exit
wr mem
```

The *Results* tab will be opened automatically and the results of the script will be displayed as the output is received.



To verify the script was executed successfully, open a Telnet session to one of the updated Nodes by selecting the Node in the Node List and clicking the  button on the toolbar. A new window with a command prompt Telnet session will be opened displaying the new Login Banner.



Another way to verify the script was executed successfully is to download the running config and compare it to the previous running config. Right-click on the Node or group of Nodes and download the running configs again, and check the box that says **Compare to last Config Downloaded**, then click the **Download** button.

When the download completes, a comparison window will open automatically, and the change to the Login Banner will be highlighted in Yellow if it is different than the previous Login Banner, or highlighted in Red and Green if there was no Login Banner previously.

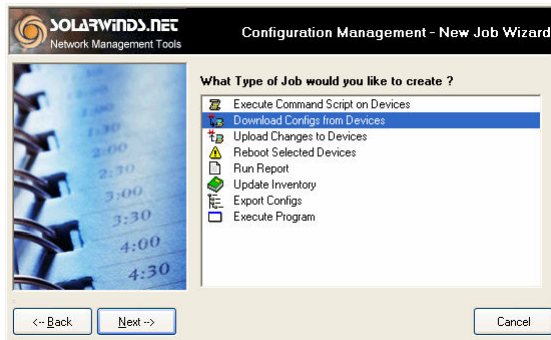
Scenario References

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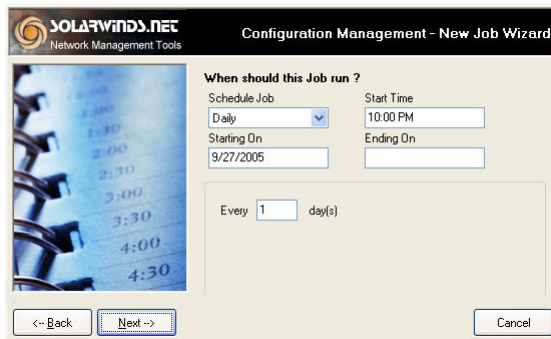
Configuring an Automated Nightly Backup

One of the great features of Cirrus is the ability to schedule daily backups of configuration files. SolarWinds has provided an Example Job with Cirrus that downloads the configuration files for all Nodes in the database every night. This Example Job can be modified to suit specific needs, or a new job can be created from scratch. This Scenario will demonstrate how to create the Nightly Backup Job from scratch.

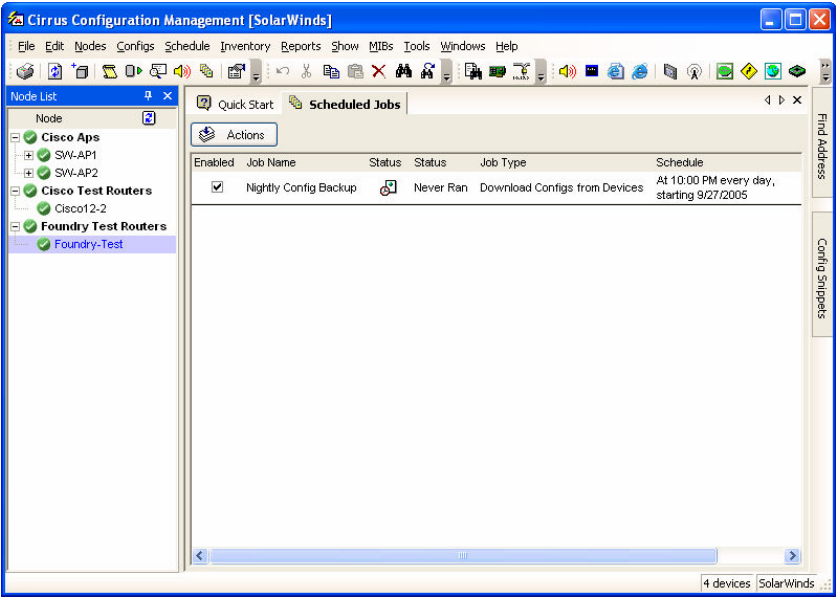
To setup an automatic Nightly Backup for all Configs, select **Create New Job** from the **Schedule** menu. Select **Download Configs from Devices** and then click **Next →**.



Give the Job a name, click **Next →**, then enter the time of day and choose the Job frequency, and then click **Next →**.



Enter the Windows User Information and then click Finish. The *Edit Job* dialog is now displayed. On the **Nodes** tab, All Nodes is selected by default. If this Job is only for a specific group of Nodes, click the **All Nodes in the Database** button to specify a list of Nodes or a Selection Criteria. Select what types of configuration files to download on the **Download Config** tab, and set any Notification actions on the Notification tab. Click **OK** to save the changes.



Scenario References

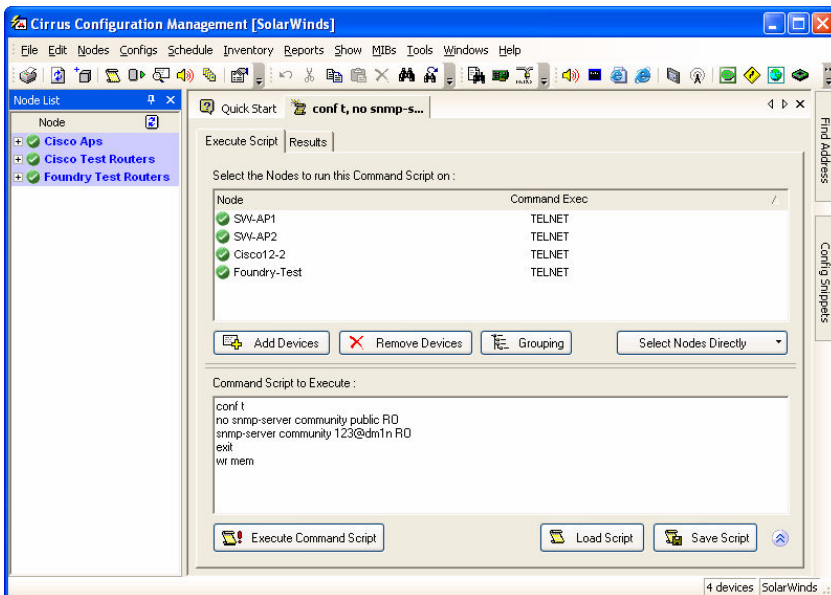
Chapter	Section	Page
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Changing Community Strings on Several Routers

This Scenario shows how to replace the public read-only community string with a new read-only community string on several routers at the same time.

To update the community string for a group of Nodes, a command script must first be created. It is always a good idea to backup the running config prior to making any changes, so right-click on the group of Nodes that are to be updated, and click **Download Configs**. Click the **Download** button to download and save the configuration files to the database.

Right-click on a Node or group of Nodes and select **Execute Command Script** to open the *Execute Script* dialog.



Ensure the Nodes that are to be updated are listed in the top window. If more Nodes need to be added, click the **Add Devices** button.

Type the command script that is to be executed or load an existing script by clicking the **Load Script** button. Once satisfied with the command script, click the **Execute Command Script** button.

The script used in this scenario removes the “public” read-only community string and adds the “123@dm1n” read-only community string. The script was typed as follows:

```
config t
no snmp-server community public R0
snmp-server community 123@dm1n R0
exit
wr mem
```

The *Results* tab will be opened automatically and the results of the script will be displayed as the output is received.

To verify the script was executed successfully, download the running config and compare it to the previous running config. Right-click on the group of Nodes and download the running configs again, and check the box that says **Compare to last Config Downloaded**, then click the **Download** button.

When the download completes, a comparison window will open automatically, and the change to the community string will be highlighted in Red and Green.

Scenario References

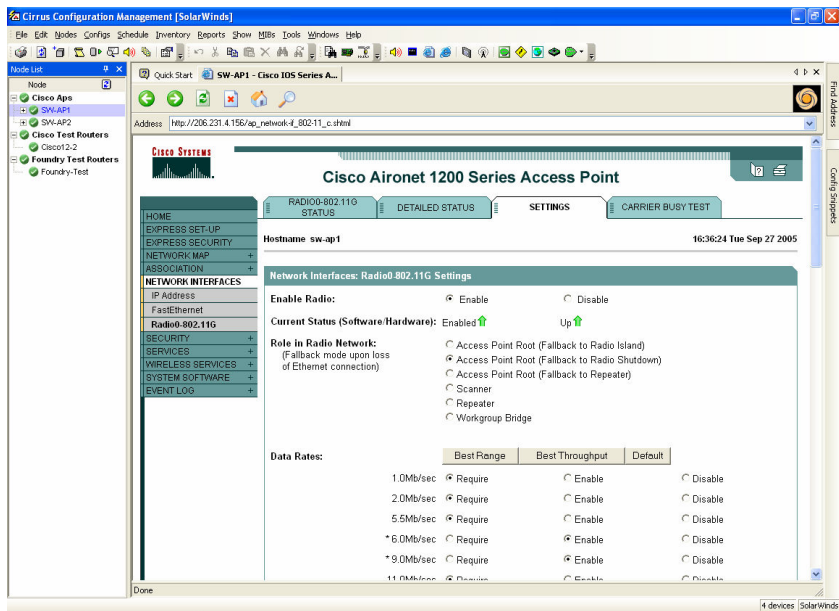
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Changing Wireless Settings on All Access Points

This Scenario shows how to make a change in a Wireless Access Point's web interface, and then push that same change to additional Access Points by uploading only the changed lines in the configuration file.

It is always a good idea to backup the running config prior to making any changes. To do this, right-click on the group of Access Points, and click **Download Configs**. Click the **Download** button to download and save the configuration files to the database.

To open an Access Point's web interface, right-click on the Node in the Node List and select **Browse Node**. Make the necessary changes in the web GUI, and then close the browser tab.

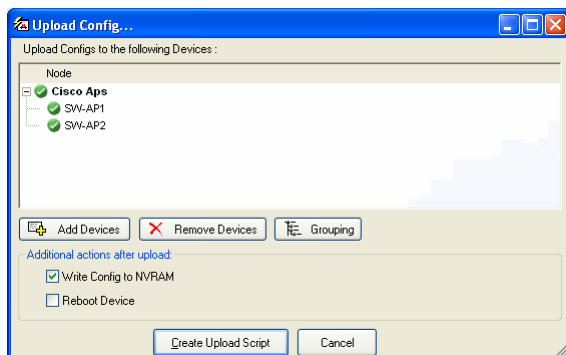


Next, download the new running config and compare it to the previous running config. Right-click on the Node and download the running config again, and be sure to check the box that says **Compare to last Config Downloaded**, then click the **Download** button.

When the download completes, a comparison window will open automatically, and the change to the configuration will be highlighted in Yellow if it is different than the previous configuration, or highlighted in Red and Green if the setting did not exist previously.

Highlight the line(s) that has changed, right-click and select **Create Snippet from Selection**. A new Config Snippet is created and added to the list of Config Snippets. Open the Config Snippets window by clicking on the *Config Snippets* tab located on the right side of the application by default.

Right-click on the Snippet and click **Upload to Devices**. Ensure the Nodes that are to be updated are listed here. If more Nodes need to be added, click the **Add Devices** button.



Click the **Create Upload Script** button to display the *Execute Script* dialog. Click the **Execute Command Script** button to upload the change to the remaining Access Points.

The *Results* tab will be opened automatically and the results of the script will be displayed as the output is received.

Once the script has finished executing, download the new running configs from all the updated Access Points to add the new configuration files to the Cirrus database.

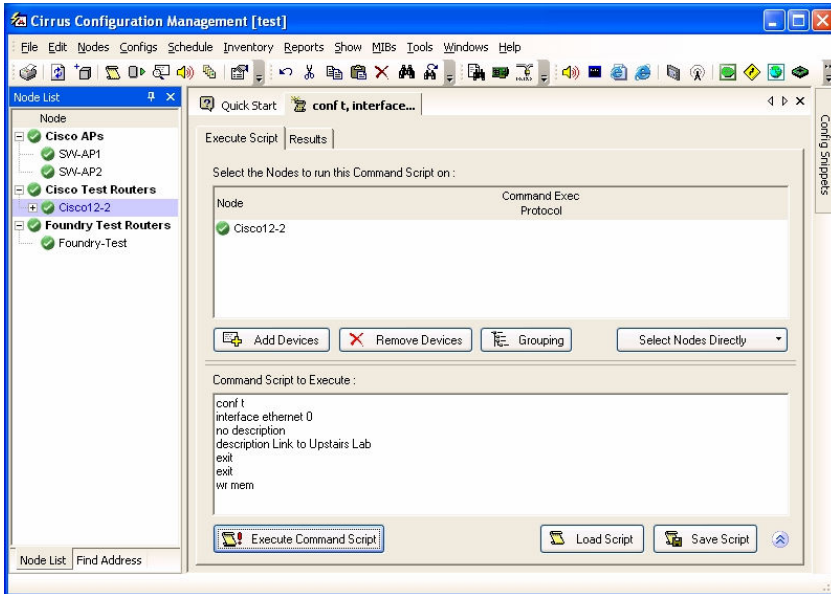
Scenario References

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Changing an Interface's Description

To update an Interface's description for a Node or group of Nodes, a command script must first be created. It is always a good idea to backup the running config prior to making any changes, so right-click on the Node or group of Nodes that are to be updated, and click **Download Configs**. Click the **Download** button to download and save the configuration files to the database.

Right-click on a Node or group of Nodes and select **Execute Command Script** to open the *Execute Script* dialog.



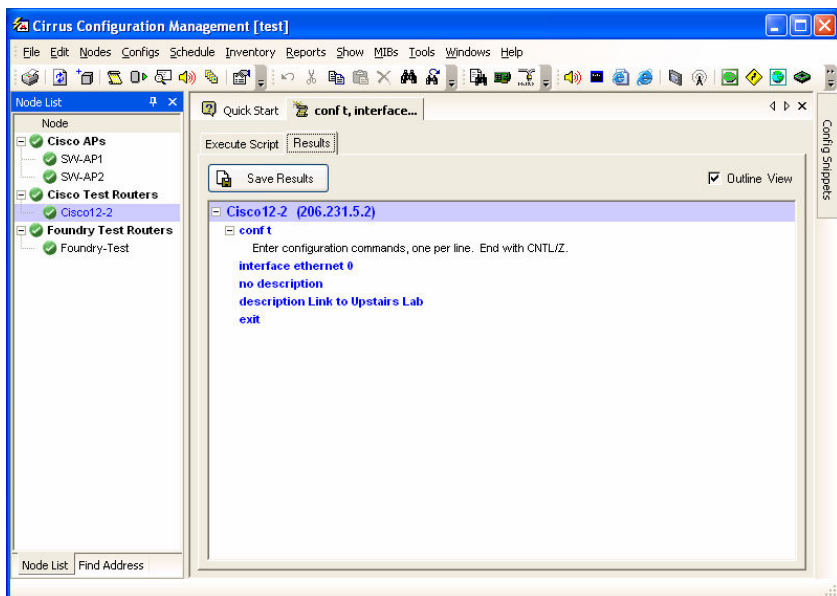
Ensure the Nodes that are to be updated are listed in the top window. If more Nodes need to be added, click the **Add Devices** button.

Type the command script that is to be executed or load an existing script by clicking the **Load Script** button. Once satisfied with the command script, click the **Execute Command Script** button.

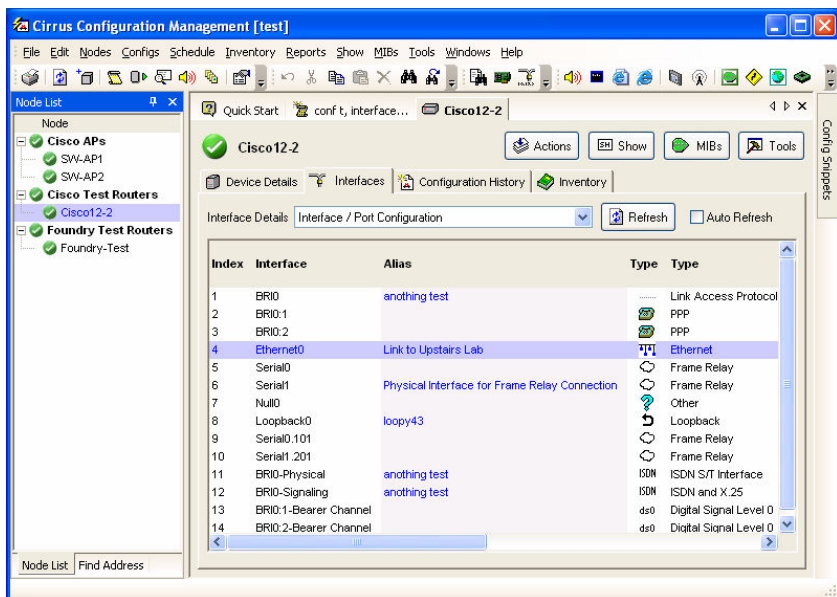
The script used in this scenario removes the current Interface description and replaces it with "Link to Upstairs Lab." The script was typed as follows:

```
config t
interface Ethernet0
no description
description Link to Upstairs Lab
exit
exit
wr mem
```

The *Results* tab will be opened automatically and the results of the script will be displayed as the output is received.



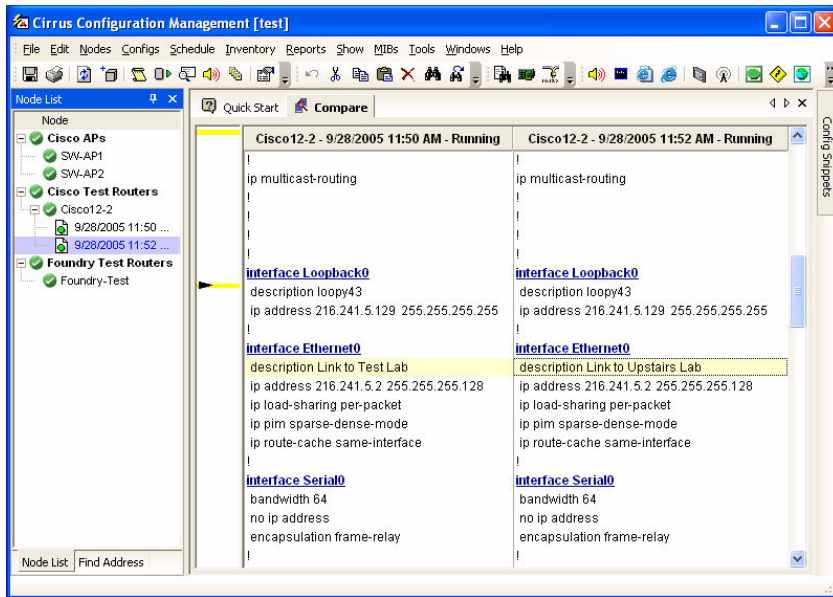
To verify the script was executed successfully, right-click on the Node in the Node List and select **Edit Selected Nodes**. Click the Interfaces tab and then select **Interface / Port Configuration** and then click the **Refresh** button to display the Interfaces along with their Interface Descriptions.



Another way to verify the script was executed successfully is to download the running config and compare it to the previous running config. Right-click on the

Node or group of Nodes and download the running configs again, and check the box that says **Compare to last Config Downloaded**, then click the **Download** button.

When the download completes, a comparison window will open automatically, and the change to the Interface Description will be highlighted in Yellow if it is different than the previous Interface Description, or highlighted in Red and Green if there was no Interface Description previously.



Scenario References

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IOS and Firmware Upgrades

IOS images can be uploaded using Cirrus's internal scripting engine. These image files can be transferred via TFTP, FTP, HTTP, or any other transfer protocol.

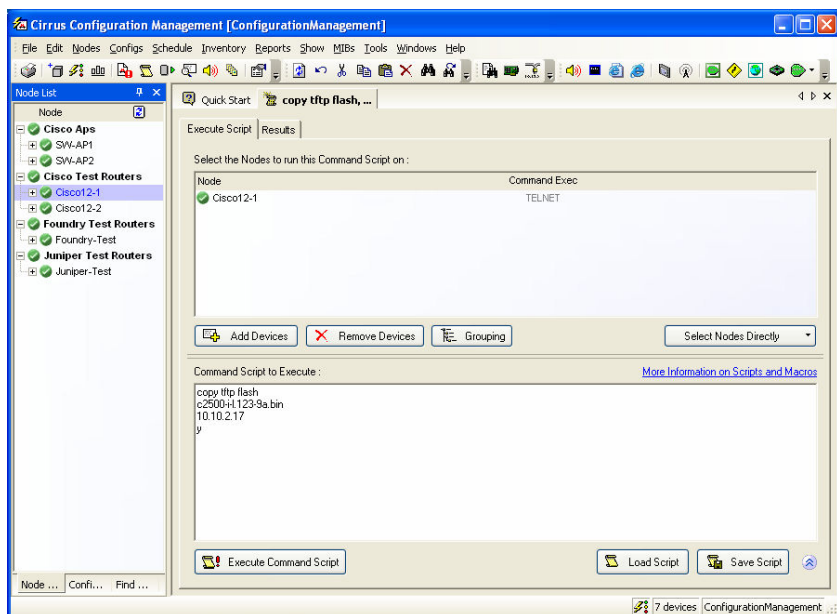


Because managing IOS images can be very complex, it is recommended that the user follow the upgrade guidelines outlined by the hardware manufacturer.

For this example, the SolarWinds TFTP Server (included with Cirrus) will be used to transfer the IOS image to the router. The TFTP Server must be running and configured to send and receive files. Also, the IOS image file must reside in the TFTP Root Directory.

To push an IOS image to a router, a command script must first be created. It is always a good idea to backup the running config prior to running any scripts, so right-click on the Node that is to be updated, and click **Download Configs**. Click the **Download** button to download and save the configuration to the database.

Right-click on the router and select **Execute Command Script** to open the *Execute Script* dialog.



Ensure the Nodes that are to be updated are listed in the top window. If more Nodes need to be added, click the **Add Devices** button.

Type the command script that is to be executed. The script should mirror commands entered when manually uploading an IOS image using the command prompt. For example, when uploading an IOS image via a TELNET session, the prompt requires the user to enter "y" to confirm the transfer. Add one line to the

script that simply has “y” (without quotes) with a carriage return (ENTER key) at the end of the line. Once satisfied with the command script, click the **Execute Command Script** button.

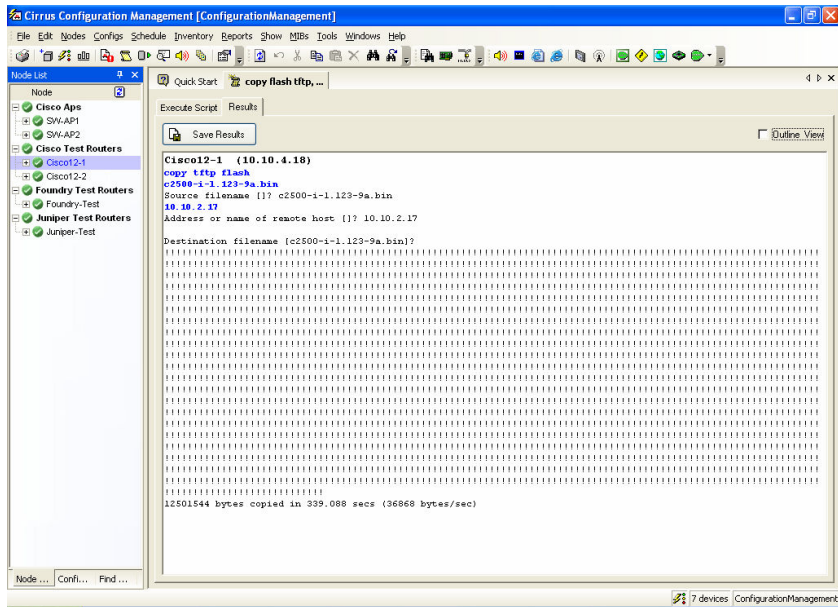


A previously saved script can be loaded by clicking the **Load Script** button.

The script used in this scenario copies an IOS image via TFTP from the 10.10.2.17 IP Address. The script was typed as follows:

```
copy tftp flash
c2500-i-1.123-9a.bin
10.10.2.17
y
```

The **Results** tab will be opened automatically and the outcome of the script will be displayed as the output is received.



This task can be scheduled to run at a later time/date. Save the script and then refer to *Chapter 9: Scheduling Tasks* for information on how to schedule a Job to Execute a Command Script. When creating the Job, load the script from the saved file.

Scenario References

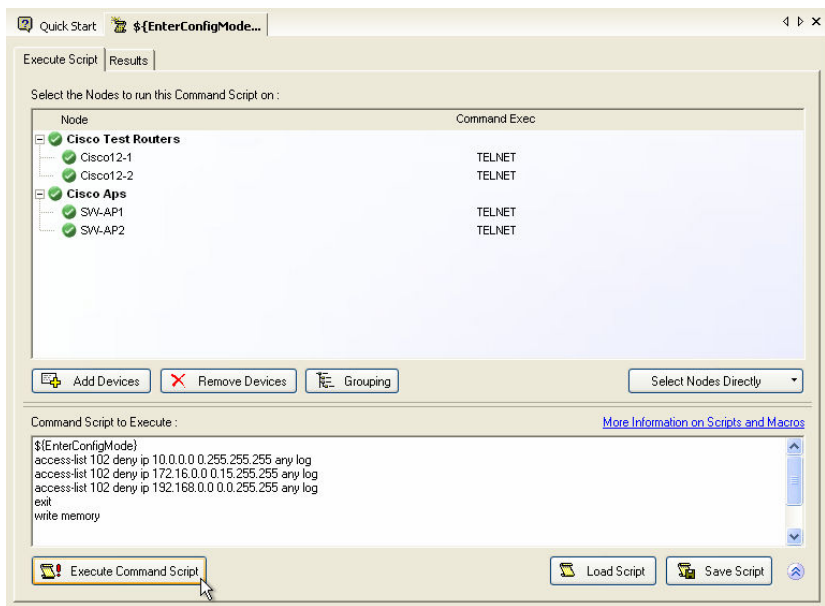
Chapter	Section	Page
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Blocking All Private Addresses with an Access List

This Scenario shows how to block all private IP Addresses using an Access Control List (ACL) on several devices at the same time.

To update an ACL for a group of Nodes, a command script must first be created. It is always a good idea to backup the running config prior to making any changes, so right-click on the group of Nodes that are to be updated, and click **Download Configs**. Click the **Download** button to download and save the configuration files to the database.

Right-click on a Node or group of Nodes and select **Execute Command Script** to open the *Execute Script* dialog.



Ensure the Nodes that are to be updated are listed in the top window. If more Nodes need to be added, click the **Add Devices** button.

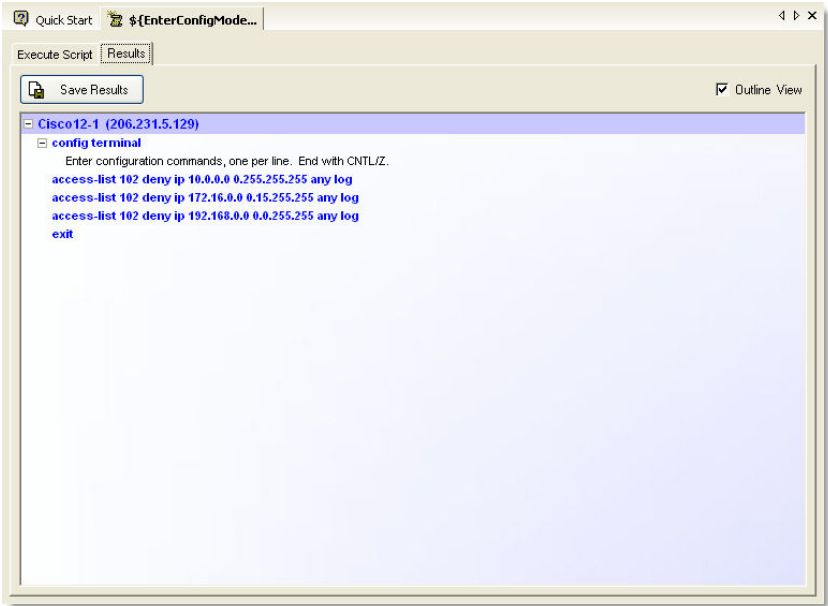
Type the command script that is to be executed or load an existing script by clicking the **Load Script** button. Once satisfied with the command script, click the **Execute Command Script** button.

The script used in this scenario blocks all private IP Addresses with the Access List named "102". The script was typed as follows:

```
$(EnterConfigMode)
access-list 102 deny ip 10.0.0.0 0.255.255.255 any log
access-list 102 deny ip 172.16.0.0 0.15.255.255 any log
access-list 102 deny ip 192.168.0.0 0.0.255.255 any log
exit
write memory
```

 `#{EnterConfigMode}` is a macro that is equivalent to "Config Terminal" on Cisco devices.

The *Results* tab will be opened automatically and the results of the script will be displayed as the output is received.



To verify the script was executed successfully, download the running config and compare it to the previous running config. Right-click on the group of Nodes and download the running configs again, and check the box that says **Compare to last Config Downloaded**, then click the **Download** button.

When the download completes, a comparison window will open automatically, and the change to the community string will be highlighted in Red and Green.

Scenario References

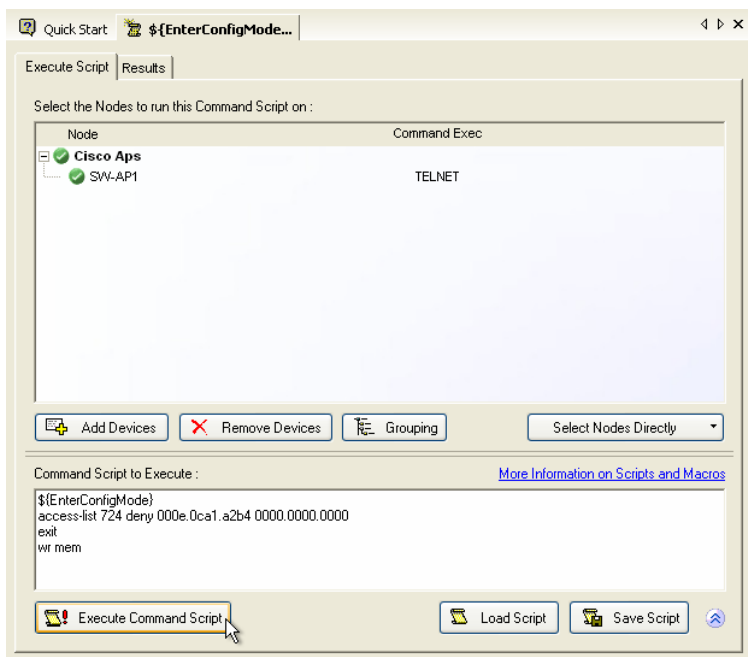
Chapter	Section	Page
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Blocking a MAC Address on a Wireless Access Point

This Scenario shows how to block a specific MAC Address using an Access Control List (ACL) on a Wireless Access Point.

To update an ACL for a Node, a command script must first be created. It is always a good idea to backup the running config prior to making any changes, so right-click on the Node that are to be updated, and click **Download Configs**. Click the **Download** button to download and save the configuration files to the database.

Right-click on the Node and select **Execute Command Script** to open the *Execute Script* dialog.



Ensure the Node that is to be updated is listed in the top window. If more Nodes need to be added, click the **Add Devices** button.

Type the command script that is to be executed or load an existing script by clicking the **Load Script** button. Once satisfied with the command script, click the **Execute Command Script** button.

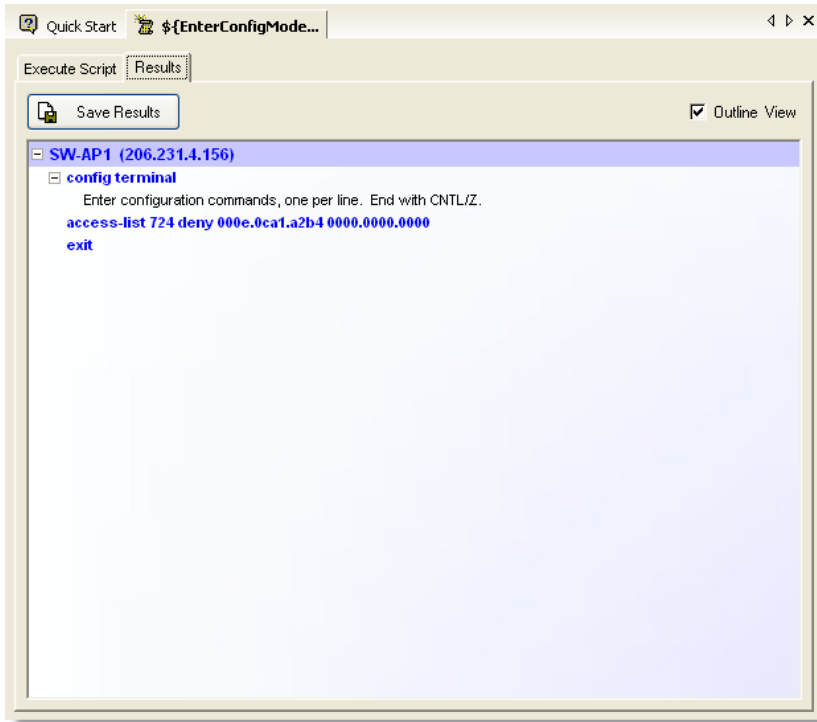
The script used in this scenario blocks the 000E.0CA1.A2B4 MAC Address with the Access List named "724". The script was typed as follows:

```
$(EnterConfigMode)
access-list 724 deny 000e.0ca1.a2b4 0000.0000.0000
exit
wr mem
```



`$(EnterConfigMode)` is a macro that is equivalent to "Config Terminal" on Cisco devices.

The *Results* tab will be opened automatically and the results of the script will be displayed as the output is received.



To verify the script was executed successfully, download the running config and compare it to the previous running config. Right-click on the group of Nodes and download the running configs again, and check the box that says **Compare to last Config Downloaded**, then click the **Download** button.

When the download completes, a comparison window will open automatically, and the change to the community string will be highlighted in Red and Green.

Scenario References

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Appendix A: Software License Key

During installation, a window with the *Install Software License Key* screen (illustrated below) will be displayed prompting for the user's name, E-mail address, phone number, Customer ID, and Password. If this is the case, follow the instructions below. Once the software has been registered, proceed with the installation.



The screenshot shows a window titled "SolarWinds Network Management Tools" with a sub-header "SOLARWINDS.NET Network Management Tools". The main heading is "Install Software License Key". Below this, there are input fields for "Your Name", "E-Mail Address", "Phone Number", "Your Customer ID and Password were E-Mailed to you when you purchased a license.", "Customer ID", and "Password". At the bottom, there are three buttons: "Skip This and Enter Software License Key Now", "Continue", and "Cancel". The footer text reads "Cirrus Configuration Management V2 Enterprise DLX".

Option 1 - Internet Connection: If the computer Cirrus is installed on is connected to the Internet and not behind a proxy server, enter the information on the *Install Software License Key* screen and click **Continue**. The SolarWinds license registration server will issue a license key that will allow Cirrus to operate.



The screenshot shows a window titled "SolarWinds Network Management Tools" with a sub-header "SOLARWINDS.NET Network Management Tools". The main heading is "Your Software License Key is Installed!". Below this, there is a "Continue" button. The footer text reads "Cirrus Configuration Management V2 Enterprise DLX".

Option 2 - No Internet Connection: If the computer Cirrus is installed on is not connected to the Internet, the system will be unable to be authenticated on SolarWinds' license registration server. Click the **Skip This and Enter Software**

License Key Now button on the *Install Software License Key* screen. The following screen will be displayed.



The screenshot shows a dialog box titled "SolarWinds Network Management Tools" with a sub-header "Install Software License Key". The text inside reads: "You will need to login to <http://SolarWinds.Net/Keys> using any web browser in order to generate a Software License Key. The Computer Name and Software Serial Number will need to be provided in order to obtain a Software License Key." Below this text are two input fields: "Computer Name" with the value "WIN-XP-SP2-TEST" and "Software Serial Number" with the value "SN-QB-R4DK-ZV8R-64WN-PL33-G992". There is also a text box labeled "Enter Software License Key ...". At the bottom right are "Continue" and "Cancel" buttons. The footer of the dialog box says "Cirrus Configuration Management V2 Enterprise DLX".

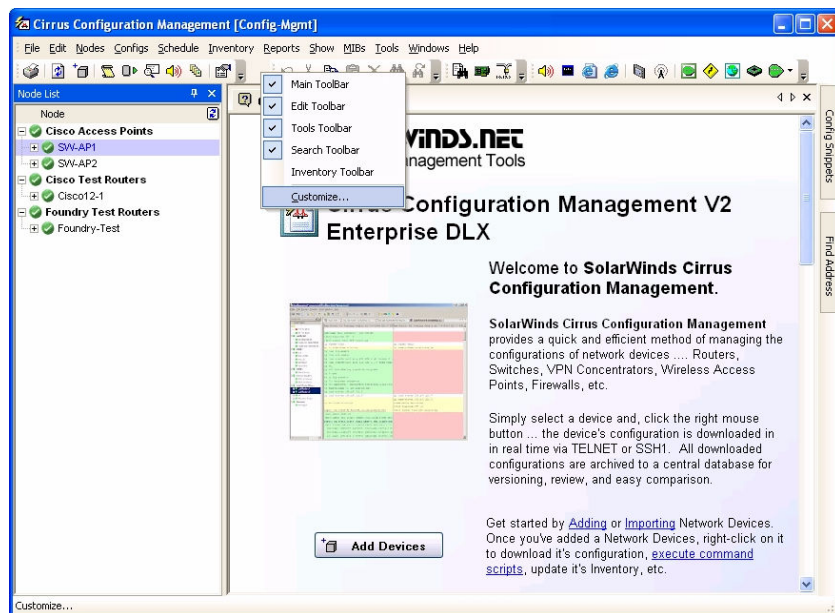
A license must be obtained using a computer that is connected to the Internet. Login to the customer area of the SolarWinds website at <http://solarwinds.net/Keys>, and then click Software Keys from the Customer Area menu. Choose the product that needs a key, and follow the instructions on the page to obtain a key. The key can then be entered in the **Enter Software License Key...** text box. Click **Continue** to complete the Software License Key installation.



The screenshot shows a dialog box titled "SolarWinds Network Management Tools" with a sub-header "Your Software License Key is Installed!". The background features a network diagram. At the bottom right is a "Continue" button. The footer of the dialog box says "Cirrus Configuration Management V2 Enterprise DLX".

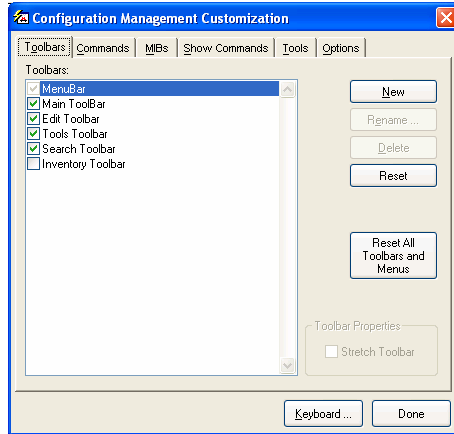
Appendix B: Custom Toolbars

The toolbars and menus can be customized to meet individual needs. To customize the toolbars or menus, right-click anywhere on the toolbar at the top of the application and select **Customize**.



The Configuration Management Customization dialog is displayed with five tabs; Toolbars, Commands, Show Commands, MIBs, Tools, and Options.

Toolbars Tab



This tab is used to determine which toolbars will be displayed. Also, toolbars can be created, edited or deleted.

To stretch a toolbar across the entire window, select the toolbar from the list and check the **Stretch Toolbar** box.

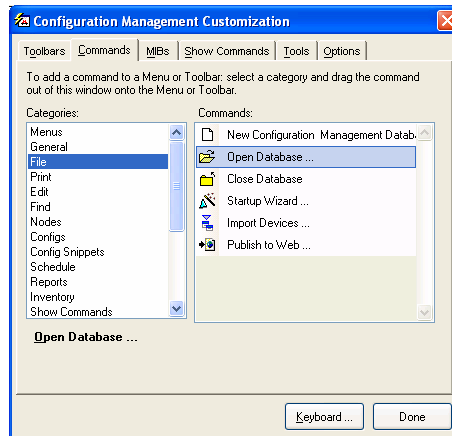
To reset an individual toolbar to its original state, select the toolbar from the list and then click the **Reset** button.

Click the **Reset All Toolbars and Menus** button to restore every toolbar and menu to its original state.

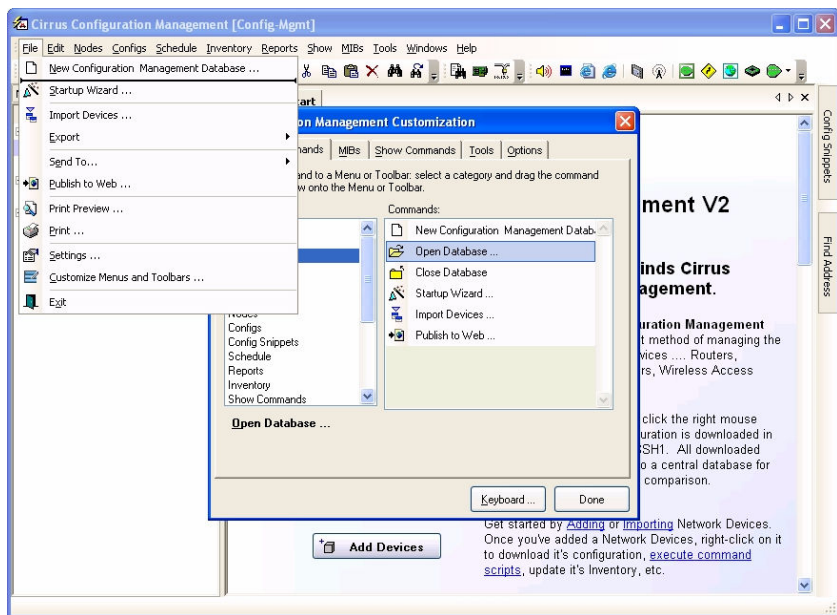
To create a new toolbar, click the **New** button and then give the toolbar a name. An empty toolbar will be added. Add commands, MIBs, Show Commands, and Tools as needed. Refer to each section in this Appendix for specific instructions on how to add actions and tools to the new toolbar.

Commands Tab

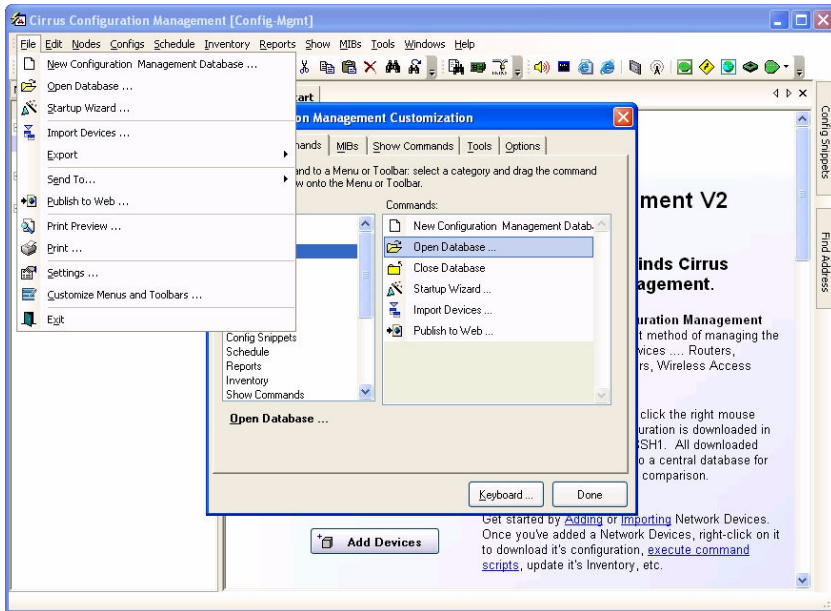
The Commands tab is used to add commands to a toolbar or menu.



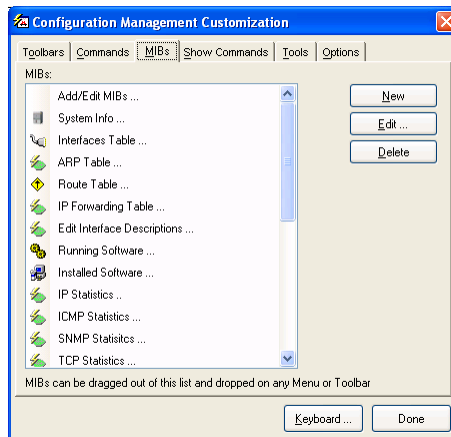
For example, there is no Open Database option in the default **File** menu. To add it, select the File Category on the left side and then drag the Command **Open Database** to a location on the **File** menu.



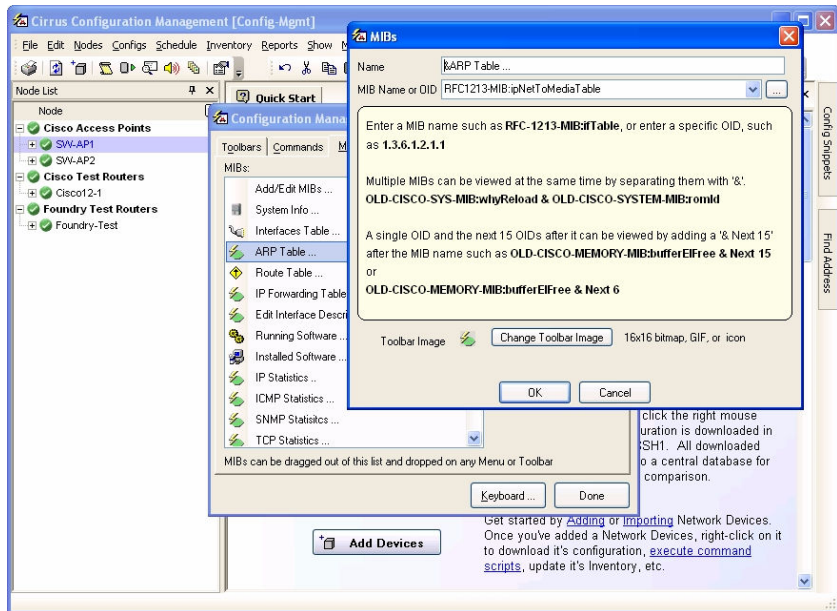
A black divider bar will show up between the menu items as the mouse cursor moves up and down the menu. Place the divider bar between *New Configuration Management Database* and *Startup Wizard* and release the mouse button. The Open Database Command now appears in the **File** menu.



MIBs Tab

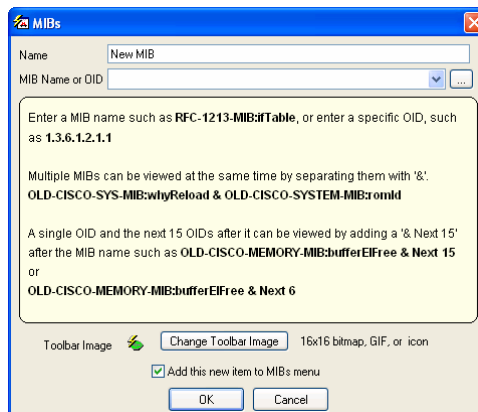


The MIBs listed here appear in the right-click menu, the **MIBs** menu, and on the toolbar when clicking the  button. To remove a MIB, select the MIB from the list and click **Delete**. To edit a MIB, select the MIB from the list and click **Edit**.



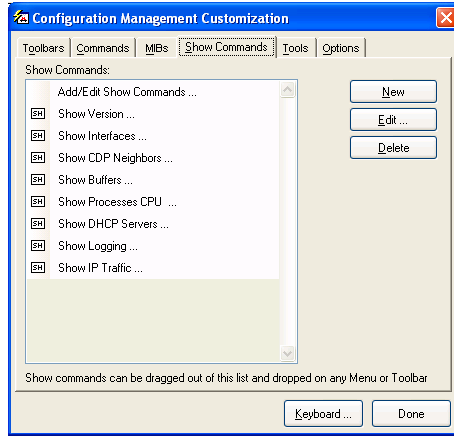
The *MIBs* dialog is displayed where a new OID can be selected, and / or the name of the MIB can be changed. Click the **Change Toolbar Image** button to select a different icon for the MIB. Click **OK** to save the changes.

To create a new MIB, click the **New** button. Give the MIB a name and then type the MIB Name or OID into the second text box. There is a dropdown list of the most common used MIBs to choose from.

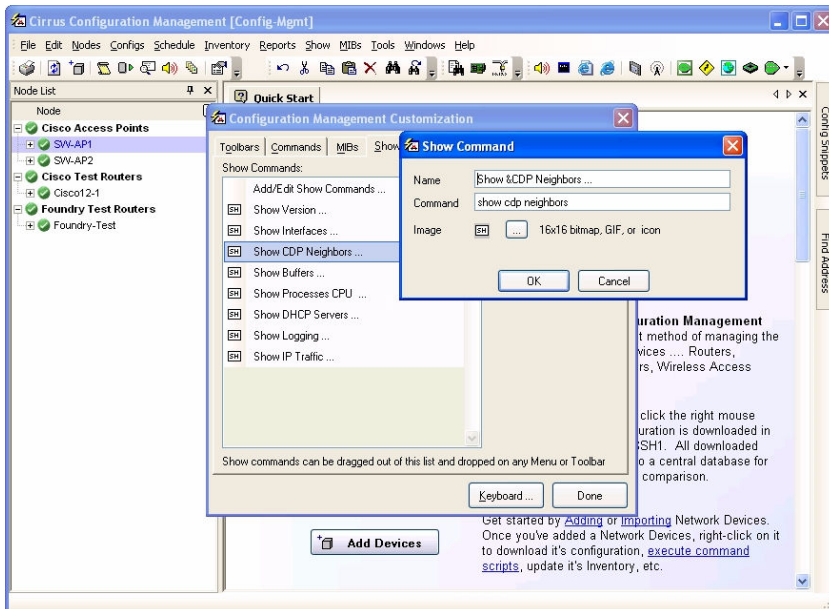


Click the **Change Toolbar Image** button to select a different icon for the MIB. Check the **Add this new item to MIBs menu** box to include the new MIB in the right-click and toolbar list. Click **OK** to save the changes.

Show Commands Tab

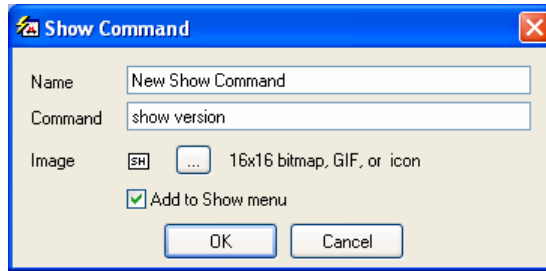


The Show Commands listed here appear in the right-click menu and in the **Show** menu. To remove a Show Command, select the command from the list and click **Delete**. To edit a Show Command, select the command from the list and click **Edit**.



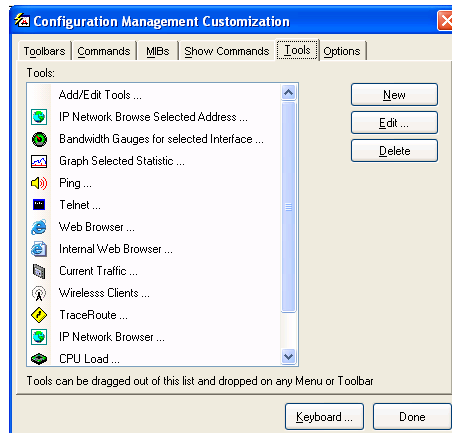
The Show Command dialog is displayed where the command and the name of the Show Command can be changed. Click the ellipsis button to select a different icon for the Show Command if necessary. Click **OK** to save the changes.

To create a new Show Command, click the **New** button and then give the command a name.

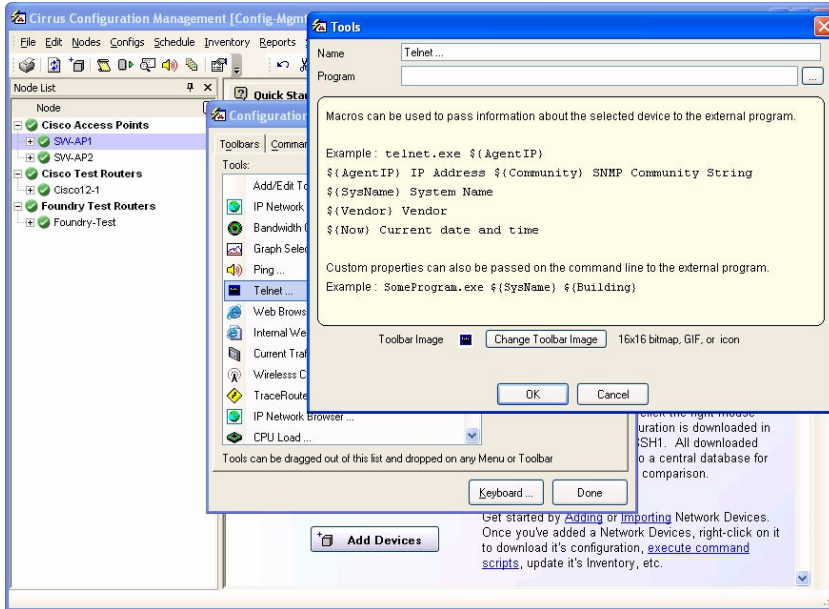


Type in the execute command and click the ellipsis button to select a different icon for the Show Command if necessary. Check the **Add to Show menu** box to include the new Show Command in the right-click and menu list. Click **OK** to save the changes.

Tools Tab

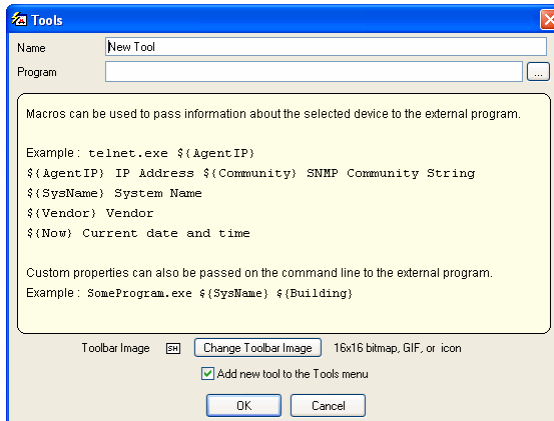


The Tools listed here appear in the right-click menu and in the **Tools** menu. To remove a Tool, select the Tool from the list and click **Delete**. To edit a Tool, select the Tool from the list and click **Edit**.



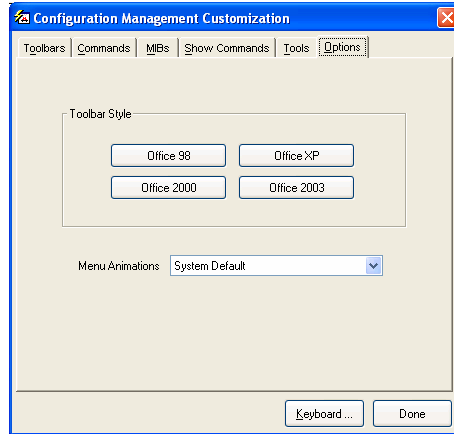
The **Tools** dialog is displayed where the Program and the name of the Tool can be changed. Click the **Change Toolbar Image** button to select a different icon for the Tool if necessary. Click **OK** to save the changes.

To create a new Tool, click the **New** button and then give the Tool a name.



Select a Program using the ellipsis button to the right of the Program text box. Click the **Change Toolbar Image** button to select a different icon for the Tool. Check the **Add new tool to Tools menu** box to include the new Tool in the right-click and menu list. Click **OK** to save the changes.

Options Tab



The Options tab is used to select the Toolbar Style and Menu Animations. To change the Toolbar Style, simply click the button of the Style desired. To select a Menu Animation, select a Style from the dropdown list to change how menus are displayed when accessed.

Appendix C: Macros

Cirrus Configuration Management uses a similar macro system as the one in Orion Network Performance Monitor. Macros always begin with a dollar sign and curly brace `${` and always end with a curly brace `}`.

Macros can be used within almost any custom property. They can also be used in any of the user editable system properties.

Macros can also be nested and recursive. In other words, a single macro can refer to a Node property that contains more macros that then contain more macros. The following example demonstrates nested macros.

Node Property	Value of Property
Location	Rack <code>\${Rack}</code> on <code>\${Floor}</code> floor of <code>\${Building}</code> - <code>\${SysLocation}</code>
Building	Building C
SysLocation	Data Center A
Rack	15
Floor	Second

The database value of **Location** is “Rack `${Rack}` on `${Floor}` floor of `${Building}` - `${SysLocation}`”, but the displayed value of **Location** would be “Rack 15 on Second floor of Building C – Data Center A”.

Node Macros

All fields in the Nodes table can be used as Macros. This includes any custom properties added to the Nodes table.

Nodes Table Field	Description
NodeID	Unique ID assigned to each Network Node
NodeCaption	Displayed name for the Node. The default for NodeCaption is a macro. “ <code>\${SysName}</code> ”
NodeGroup	Group that this Node belongs to. Some group examples might be ... “Routers”, “Accounting”, or simply “ <code>\${Building}</code> ”. The last example refers to a custom property named “Building”.
AgentIP	The IP address used when communicating with the Node. A router or server may have many IP Addresses. This IP address is the one used when making Configuration Management makes SNMP requests or transfers configs.

AgentIPSort	Numeric equivalent of the AgentIP. Used for sorting by IP Address in reports.
ReverseDNS	Reverse lookup of the AgentIP
ResponseTime	Current response time of the Node in milliseconds
ResponseError	"OK" if the Node is responding. An error message if the Node is not responding.
Status	Numeric status of the Node. 1 = Up 2 = Down
Community	SNMP Community string
SNMPLevel	The version of SNMP supported by the Node. 0 = SNMP not supported 1 = SNMP V1 2 = SNMP V2 3 = SNMP V3
SysName	System name of the Node.
SysDescr	System description of the Node.
SysContact	System contact information collected from the Node.
SysLocation	System location information collected from the Node.
SystemOID	System OID discovered from the Node.
Vendor	Hardware vendor of this network Node.
VendorIcon	Name of the Vendor icon used.
MachineType	Type of hardware. This information is discovered by SolarWinds Discovery Engine.
LastBoot	Last time the Node rebooted.
OSImage	Operating system running on the Node
OSVersion	Version of the Operating System running on the Node
ConfigTypes	Types of Configs supported by this Node
NodeComments	Any comments about this Node entered by the user.
NextDiscovery	Time the next complete discovery of this Node is scheduled
NextPoll	Time the next poll (up/down and response time) is scheduled
Username	Login username
Password	Login password
EnableLevel	Enable level used when transferring configs or running scripts
EnablePassword	Enable level password
ExecProtocol	The protocol used when executing scripts. This is set to \${GlobalExecProtocol} by default.
TransferProtocol	The protocol used when downloading configs. This is set to \${GlobalTransferProtocol} by default.

Config-Archive Macros

Cirrus Configuration Management stores all downloaded Configs in a database. It can also store a copy of them in the Config Archive directory structure. The directory structure can be specified using any of the previous macros.

Additional macros can also be used when specifying the Config Archive directory. Many of these macros use the system's localization settings for the current language and region.

Property	Description
DateTime	Local date and time in "short date" and local time format
Date	Date in "short date" format
LongDate	Date in "long date" format
MediumDate	Date in "medium date" format
Time	Time in "short time" format
LongTime	Time in "long time" format
MediumTime	Time in "medium time" format
ShortTime	Time in "short time" format
DOW	Day of the week (spelled out)
D	Day of the month
DD	Day of the month (with leading zero if needed)
ABREVIATEDDOW	Day of the week in abbreviated format
LocalDow	Day of the week in the local language
Month	Number of the current month
M	Number of the current month
MM	Number of the current month (with leading zeros if needed)
MMM	Abbreviated name of the month
MMMM	Name of the month
LocalMonthName	Name of the month in the local language
DAYOFYEAR	Day number of the year
YYYY	4 digit year
YY	2 digit year
YEAR2	2 digit year
YEAR4	4 digit year
H	Hour
HH	2 digit hour (with leading zero if needed)
N	Minute
NN	2 digit minute (with leading zero if needed)
S	Seconds
SS	2 digit seconds (with leading zero if needed)
AMPM	AM or PM
CRLF	Carriage return – linefeed combination
ConfigType	Type of Config (running, startup, etc)
Caption	Caption of the Node (NodeCaption)

Command Script Macros

Command Script Macros are used within Command Scripts as well as **Device Command Templates**. For information on creating Command Scripts, refer to *Chapter 5: Command Scripts* on page 59.

Property	Description
ConfigType	Value used to specify the type of Config
CR	Carriage Return
CRLF	Carriage Return – Linefeed combination
DownloadConfig	Series of commands used to download a Configuration from a device
EnableIdentifier	Only used when a device does not return the “#” symbol at the end of a prompt to indicate Enable Mode. Value that is displayed while in Enable Mode for a device.
EnterConfigMode	Series of commands used to enter the Configuration Mode of a device
ExitConfigMode	Series of commands used to exit the Configuration Mode of a device
IPAddress	The IP Address of the server Cirrus is installed on
Reboot	Series of commands used to reboot the device
RebootAt	Series of Commands used to reboot a device at a specified time. Use the macros listed in the <i>Config-Archive Macros</i> section of this Appendix to assign the date and time.
RESET	Series of commands used to set the length and pagination of the session
Running	Value used to specify a Running Config type
SaveConfig	Series of Commands used to write the Configuration to the devices memory
Startup	Value used to specify a Startup Config type
Version	Series of Commands used to display the software version of the device

Appendix D: Regular Expression Pattern Matching

When editing Comparison Criteria, the following Regular Expressions can be used for pattern matching. Examples are provided at the end of this appendix.

Characters

Character	Description	Example
Any character except <code>[\^\$.!?*+()</code>	All characters except the listed special characters match a single instance of themselves.	<code>a</code> matches <code>a</code>
<code>\</code> (backslash) followed by any of <code>[\^\$.!?*+()</code>	A backslash escapes special characters to suppress their special meaning.	<code>\+</code> matches <code>+</code>
<code>\xFF</code> where FF are 2 hexadecimal digits	Matches the character with the specified ASCII/ANSI value, which depends on the code page used. Can be used in character classes.	<code>\xA9</code> matches © when using the Latin-1 code page.
<code>\n</code> , <code>\r</code> and <code>\t</code>	Match an LF character, CR character and a tab character respectively. Can be used in character classes.	<code>\r\n</code> matches a DOS/Windows CRLF line break.

Character Classes or Character Sets `[abc]`

Character	Description	Example
<code>[</code> (opening square bracket)	Starts a character class. A character class matches a single character out of all the possibilities offered by the character class. Inside a character class, different rules apply. The rules in this section are only valid inside character classes. The rules outside this section are not valid in character classes, except <code>\n</code> , <code>\r</code> , <code>\t</code> and <code>\xFF</code>	
Any character except <code>^]</code> \ add that character to the possible matches for the character class.	All characters except the listed special characters.	<code>[abc]</code> matches <code>a</code> , <code>b</code> or <code>c</code>

\ (backslash) followed by any of ^_]\" data-bbox="112 55 294 125">	A backslash escapes special characters to suppress their special meaning.	[\^\\]] matches ^ or]
- (hyphen) except immediately after the opening [	Specifies a range of characters. (Specifies a hyphen if placed immediately after the opening [)	[a-zA-Z0-9] matches any letter or digit
^ (caret) immediately after the opening [	Negates the character class, causing it to match a single character not listed in the character class. (Specifies a caret if placed anywhere except after the opening [)	[^a-d] matches x (any character except a, b, c or d)
\d, \w and \s	Shorthand character classes matching digits 0-9, word characters (letters and digits) and whitespace respectively. Can be used inside and outside character classes	[\d\s] matches a character that is a digit or whitespace
\D, \W and \S	Negated versions of the above. Should be used only outside character classes. (Can be used inside, but that is confusing.)	\D matches a character that is not a digit

Dot

Character	Description	Example
. (dot)	Matches any single character except line break characters \r and \n. Most regex flavors have an option to make the dot match line break characters too.	. matches x or (almost) any other character

Anchors

Character	Description	Example
^ (caret)	Matches at the start of the string the regex pattern is applied to. Matches a position rather than a character. Most regex flavors have an option to make the caret match after line breaks (i.e. at the start of a line in a file) as well.	^ matches a in abc\ndef. Also matches d in "multi-line" mode.
\$ (dollar)	Matches at the end of the string the regex pattern is applied to. Matches a position rather than a character. Most regex flavors have an option to make the dollar match before line breaks (i.e. at the end of a line in a file) as well. Also matches before the very last line break if the string ends with a line break.	.\$ matches f in abc\ndef. Also matches c in "multi-line" mode.

<code>\A</code>	Matches at the start of the string the regex pattern is applied to. Matches a position rather than a character. Never matches after line breaks.	<code>\A</code> matches a in abc
<code>\Z</code>	Matches at the end of the string the regex pattern is applied to. Matches a position rather than a character. Never matches before line breaks, except for the very last line break if the string ends with a line break.	<code>\Z</code> matches f in abc\ndef
<code>\z</code>	Matches at the end of the string the regex pattern is applied to. Matches a position rather than a character. Never matches before line breaks.	<code>\z</code> matches f in abc\ndef

Word Boundaries

Character	Description	Example
<code>\b</code>	Matches at the position between a word character (anything matched by <code>\w</code>) and a non-word character (anything matched by <code>[^\w]</code> or <code>\W</code>) as well as at the start and/or end of the string if the first and/or last characters in the string are word characters.	<code>\b</code> matches c in abc
<code>\B</code>	Matches at the position between two word characters (i.e the position between <code>\w\w</code>) as well as at the position between two non-word characters (i.e. <code>\W\W</code>).	<code>\B</code> matches b in abc

Alternation

Character	Description	Example
<code> </code> (pipe)	Causes the regex engine to match either the part on the left side, or the part on the right side. Can be strung together into a series of options.	abc def xyz matches abc, def or xyz
<code> </code> (pipe)	The pipe has the lowest precedence of all operators. Use grouping to alternate only part of the regular expression.	abc(def xyz) matches abcdef or abcxyz

Quantifiers

Character	Description	Example
<code>?</code> (question mark)	Makes the preceding item optional. Greedy, so the optional item is included in the match if possible.	abc? matches ab or abc
<code>??</code>	Makes the preceding item optional. Lazy, so the	abc?? matches ab

	optional item is excluded in the match if possible. This construct is often excluded from documentation because of its limited use.	or abc
* (star)	Repeats the previous item zero or more times. Greedy, so as many items as possible will be matched before trying permutations with less matches of the preceding item, up to the point where the preceding item is not matched at all.	".*" matches "def" "ghi" in abc "def" "ghi" jkl
? (lazy star)	Repeats the previous item zero or more times. Lazy, so the engine first attempts to skip the previous item, before trying permutations with ever increasing matches of the preceding item.	".?" matches "def" in abc "def" "ghi" jkl
+ (plus)	Repeats the previous item once or more. Greedy, so as many items as possible will be matched before trying permutations with less matches of the preceding item, up to the point where the preceding item is matched only once.	".+" matches "def" "ghi" in abc "def" "ghi" jkl
+? (lazy plus)	Repeats the previous item once or more. Lazy, so the engine first matches the previous item only once, before trying permutations with ever increasing matches of the preceding item.	".+?" matches "def" in abc "def" "ghi" jkl
{n} where n is an integer ≥ 1	Repeats the previous item exactly n times.	a{3} matches aaa
{n,m} where $n \geq 1$ and $m \geq n$	Repeats the previous item between n and m times. Greedy, so repeating m times is tried before reducing the repetition to n times.	a{2,4} matches aa, aaa or aaaa
{n,m}? where $n \geq 1$ and $m \geq n$	Repeats the previous item between n and m times. Lazy, so repeating n times is tried before increasing the repetition to m times.	a{2,4}? matches aaaa, aaa or aa
{n,} where $n \geq 1$	Repeats the previous item at least n times. Greedy, so as many items as possible will be matched before trying permutations with less matches of the preceding item, up to the point where the preceding item is matched only n times.	a{2,} matches aaaaa in aaaaa
{n,}? where $n \geq 1$	Repeats the previous item between n and m times. So the engine first matches the previous item n times, before trying permutations with ever increasing matches of the preceding item.	a{2,}? matches aa in aaaaa

RegEx Pattern Matching Examples

The following examples illustrate some of the uses of Regular Expression Pattern Matching.

```
snmp-server community public
```

Finds any line that includes the text “snmp-server community public”. There can be text before and/or after the string on the same line.

```
service tcp-keepalives-in.*\n(.*\n)*.*service tcp-keepalives-out
```

Finds the first line “service tcp-keepalives-in” and then looks for “service tcp-keepalives-out” on any line after that. The RegEx string `.*\n(.*\n)*.*` is used to search any number of lines between strings.

```
access-list 105 deny.*tcp any any eq 139 log
```

Finds the line with “access-list 105 deny” followed by any number of characters of any type, followed by “tcp any any eq 139 log” on the same line. The RegEx string `.*` finds any character, and any number of characters on the same line. So, this could be used to find spaces, tabs, numbers, letters, or special characters.

```
ntp clock-period \d*
```

Finds any line that includes “ntp clock-period ” followed by any number. The RegEx string `\d*` will find any number at any length, such as “3”, “48”, or “2394887”.

```
user \x2a
```

Finds any line that includes “user *”. The RegEx string `\x` followed by a hexadecimal value specifies an individual character. In this example, `\x2a` represents the asterisk (*) character which has a hexadecimal value of `2a`.

Appendix E: Frequently Asked Questions

Q Can I download more than one configuration file at a time?

A Yes. Select multiple Nodes from the Node List by using the Shift and Ctrl keys, or selecting a group. Right-click and select **Download Configs**. Choose the type of configuration to download and any After Download actions, and then click **Download**. The configs will be downloaded from selected nodes simultaneously.

By default, up to 25 simultaneous downloads can be allowed. To change this, select **Settings** from the **file** menu, and then go to **Config Transfers** under the **Configs** category.

A job can also be created that downloads multiple configs on a scheduled basis.

Q Can I upload just a few lines of a configuration instead of the entire configuration file?

A Yes. To upload only one line or selection of lines, highlight the lines and then right-click and select **Upload Selected Lines**. For more detailed instructions, please refer to *Uploading Configs* in *Chapter 4: Managing Configs* on page 45.

Q Why do I receive a message prompting me to upgrade when I try to launch TraceRoute, IP Network Browser, or MIB Browser?

A These tools are part of the SolarWinds Toolset packages. These packages can be purchased and will need to be installed on the same system running Cirrus. For information regarding the toolsets, please visit this link: <http://www.solarwinds.net/Toolsets.htm>

Q How do I group Nodes so that I can roll out a config to part of the network?

A Nodes can be grouped a number of different ways. First, Nodes can be grouped by Node Group. To assign a group to a Node, edit the Node's details by double-clicking the Node in the Node List. Then edit the Node Group field to assign the group. The Node List can also be grouped by almost any other Node Detail such as Location. To group the Node List by another category, right-click anywhere in the Node

List and click **Select Fields and Grouping**. Change the Grouping dropdown to the category desired and click **OK** to save the changes.

Q What types of equipment does Cirrus work with?

A Cirrus Configuration Management supports many types of network Nodes from many hardware vendors. Device Command templates for Cisco, Foundry, Dell, HP Juniper, Motorola, Aruba, Nortel, Arris and many others are included.

Q How do I integrate Cirrus with Orion?

A As of Summer 2006, Cirrus does not directly integrate with Orion Network Performance Monitor. SolarWinds plans to release a version of Cirrus in the future that will integrate with Orion and Orion's website.

Q Can I import nodes from Orion into Cirrus?

A Yes. Select **Import Devices** from the **File** menu to start the import process. For detailed instructions on how to import Nodes from an Orion NPM database, please refer to *Importing a List of Nodes* in *Chapter 3: Managing Nodes* on page 23.

Q Can I import nodes from my Engineer's Edition toolset to Cirrus?

A Yes. Select **Import Devices** from the **File** menu to start the import process. For detailed instructions on how to import Nodes from an Engineer's Edition database, please refer to *Importing a List of Nodes* in *Chapter 3: Managing Nodes* on page 23.

Q What is the upgrade price from Professional Plus to Cirrus?

A The toolsets and Cirrus are two separate packages. An upgrade path from any of the toolsets is not available for Cirrus

Q Can Cirrus use an Oracle database?

A Cirrus supports both Microsoft Access and SQL database formats only.

Q Can Cirrus configure a router through the serial interface/console cable?

A Routers and all other Nodes can only be configured through Telnet and SSH using Cirrus.

Q How can I ensure that none of my devices' configurations include the 'public' community string?

A By using the Policy Reporting tool, a Rule can be created to check for a line that includes the 'public' community string. Add that Rule to a Policy, then run a Report that includes that Policy to see if any devices violate that Rule. For detailed instructions on how to use the Policy Reporting tool, please refer to *Chapter 8: Policy Reporting* on page 77.

Q Can Cirrus run on the same server as Orion?

A Yes. Cirrus is designed to be fully compatible with all SolarWinds software including Orion NPM.

Q Can Cirrus share a database with Orion?

A The Cirrus and Orion database structures are significantly different. However, Nodes can easily be imported from the Orion NPM database. For detailed instructions on how to import Nodes from an Orion NPM database, please refer to *Importing a List of Nodes* in *Chapter 3: Managing Nodes* on page 23.

Q Can the Cirrus database reside on the same SQL Server as Orion's?

A Yes. Cirrus and Orion both have the ability to use remote databases. This means that the same SQL server can host both the Orion and Cirrus databases assuming the server is capable of handling the load of multiple databases.

Q Can Cirrus run on UNIX?

A SolarWinds software is designed to run exclusively on Microsoft Windows platforms.

Q My domain password changed, now my jobs won't run and there is nothing in the job log, what do I need to do?

A To reassign the new password to all jobs, open the **New/Open Database Wizard** from the **File** menu, select **Continue Using the Current Database**, and click **Next**. Continue clicking **Next** until the **Scheduled Job Authentication** settings are displayed. Type the new username and password, and then click **Set Username and Password** to update the changes.

Appendix F: Glossary

Access Point (AP)	A Network Node that interconnects a wireless radio network to a wired LAN (Local Area Network).
Bandwidth	In digital communications, the rate at which data is communicated (usually in bits per second).
Community string	The “password” required for an SNMP client to request MIB information from an SNMP server.
Config	Short for configuration file. An Industry standard term referring to the configuration of a router, switch, firewall, or other network Node.
Config Snippet	A string of text that can be saved to a file allowing the user to merge sections of configs with ease. Config Snippets can be used to edit an existing config, or can even be uploaded directly to a Node or group of Nodes.
Custom Property	Additional fields (country, building, asset tag, serial number, etc.) that can be defined and stored in the Cirrus database. Custom Properties are used to help identify and group like Nodes.
DNS	An acronym for Domain Name Server. A system of computers that convert domain names into IP addresses.
Event	An unsolicited communication from a hardware device to an application driver. Events are generally attention-getting messages, allowing a person or process to know when a task is complete or when an external event occurs.
ICMP	An acronym for Internet Control Message Protocol. A network-layer Internet protocol that provides message packets to report errors and other information relevant to IP packet processing.
Interface	A port or logical connection on a node.
MAC Address	An abbreviation for Medium Access Control Address. A 48-bit unique number administered by the IEEE and assigned to LAN cards.
Macro	A statement in software code that is expanded into one or more identifiers or statements and can consist also of one or more parameters.

MIB	An acronym for Management Information Base. A MIB is a database of network performance information that is stored on a network Node for access by network management software.
Node	Any device with an IP address; a network device that is polled. A Node may contain many elements. An example of a Node would be a router or network server.
Node List	In the Cirrus Configuration Management application, the left-most pane of the program window that contains an expandable list of Nodes and configuration files.
PING	To test whether a particular network destination is online. By bouncing a “signal” off a specified IP destination address.
Purge	To remove records from a database.
SNMP	An acronym for Simple Network Management Protocol. An IP-based application layer protocol that is the industry standard way that network Nodes communicate with network management systems.
SSH	An Acronym for Secure Shell. A UNIX-based command interface and protocol for securely getting access to a remote computer. Network administrators use it to control Web and other kinds of servers remotely.
Telnet	A program that connects to other computers on the Internet. The process by which a person using one computer can sign on to a computer in another city, state or country.

Most definitions included in this Glossary were obtained from [Newton's Telecom Dictionary](#) by Harry Newton and published by [CMP Books](#).

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