Dell OpenManage Network Manager Version 5.3 Service Pack 2

Web Client Guide

Notes and Cautions

✎ A NOTE indicates important information that helps you make better use of your computer.

△ **A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

2014-6

Rev. A02

Contents

Dell OpenManage Network Manager can give you automated, consolidated configuration and control of your network's resources. It is customizable, unifying multiple systems while still communicating with other software systems (like billing) in generic WSDL, XML and SOAP.

OpenManage Network Manager's *first chapter of theUser Guide* describes security and some of the runtime features supporting these applications. Consult Release Notes for information about changes not covered in this *User Guide*.

Why Dell OpenManage Network Manager?

Dell OpenManage Network Manager's benefits:

Productive

Discovery and wizard-driven configuration features within minutes of installing Dell OpenManage Network Manager, you can monitor your network.

Easy

Dell OpenManage Network Manager provides the network information you need, and offers advanced capabilities with minimal configuration overhead.

Valuable

Dell OpenManage Network Manager often costs less to use and maintain than most other solutions.

Scalability

You can scale Dell OpenManage Network Manager to almost any size.

LinkLight Online Community

www.doradosoftware.com/thelinklight/ is a community site that OpenManage Network Manager developed to provide users with useful information, tools and valuable resources related to OpenManage Network Manager network management solutions.

Key Features

The following are some key features of Dell OpenManage Network Manager:

Customizable and Flexible Web Portal

You can customize the web portal, even providing custom designed views of your data assigned to individual users. You can even create web portal accounts for departments, geographic areas, or other criteria.

Automate and Schedule Device Discovery

Device discovery populates Dell OpenManage Network Manager's database and begins network analysis. You can also create network discovery schedules to automatically run Discovery whenever you need them.

Dell OpenManage Network Manager Administration

You can now conduct administrative tasks—adding devices, user accounts, and web portal displays—from a secure console on your network.

Open Integration

Dell OpenManage Network Manager supports industry standards. It comes with an open-source MySQL database, and supports using Oracle databases. It also uses industry-standard MIBs and protocols, and even lets you install open-source screen elements like Google gadgets to the web portal.

Topology

The OpenManage Network Manager topology screen lets you create multi-layered, fully customizable, web-based maps of your network to track devices wherever they are in your network.

Alarms

You can configure custom alarms to respond to hundreds of possible network scenarios, including multiple condition checks. Dell OpenManage Network Manager's alarms help you recognize issues before your network users experience productivity losses. Alarms can also trigger actions like email, executing Perl scripts, paging, SNMP traps, Syslog messaging, and external application execution.

Traps and Syslog

Dell OpenManage Network Manager lets you investigate network issues with traps and Syslog messages. You can use Dell OpenManage Network Manager to set up events / alarms and then receive, process, forward, and send syslog and trap messages.

Reports and Graphs

Dell OpenManage Network Manager comes with many pre-configured reports and graphs to display data from its database. You can archive and compare reports, or automate creating them with Dell OpenManage Network Manager's scheduler.

Modularity

With additional modules, Dell OpenManage Network Manager can analyze network traffic, manage services and IP address and subnet allocations. OpenManage Network Manager modules save time adding to existing Dell OpenManage Network Manager deployments to add feature functionality without requiring additional standalone software.

Networks with Dell OpenManage Network Manager

The beginning of network management with Dell OpenManage Network Manager is Discovery Profiles of the resources on a network. After that occurs, you can configure Visualize My Network (topology views), Resource Monitors and Performance Dashboards.

Once you have done these initial steps, Dell OpenManage Network Manager helps you understand and troubleshoot your network. For example: Suppose a OpenManage Network Manager Performance Dashboard displays something you want to troubleshoot. You can right-click the impacted device in the Visualize My Network topology view to access configuration and actions. The color of the icon in this view indicates the highest severity alarm on the device or its sub-components. For example, red indicates a *Critical* alarm.

Displays include right-click access to the Details screen (see Equipment Details on page 210), where you can examine each section of device information and right-click to see further applicable actions. For example right-click to Show Performance, and edit and/or save that view of performance as another Performance Dashboard. Performance can also display portlets that Show Top Talkers (the busiest devices) or Show Key Metrics.

From looking at Performance Dashboards or Top N [Assets] you may conclude some configuration changes made memory consumption spike. Right-click to access resource actions under File Management that let you see the current configuration files on devices, and compare current to previous. You can also back up devices (see Backup Configurations on page 274) and restore previously backed up files (see Restore Configurations on page 276). Finally, you may simply want to Resync (another right-click menu item) to insure the device and your management system are up-to-date.

NOTICE

Alternatively, the Alarms portlet also lets you right-click to expose Alarm Actions.

You can right click for Direct Access – Telnet or Direct Access – MIB Browser to display a command line telnetting to the device, or an SNMP MIB browser to examine SNMP possibilities for it.

The Managed Resources portlet can display the anatomy of a Resource with its right-click actions (see Equipment Details on page 210). Click the plus in the upper right corner to see Managed Resources Expanded. This displays detail or “Snap-in” panels with additional information about a selected resource.

Reports let you take snapshots of network conditions to aid in analysis of trends, and Audit Trail Portlets track message traffic between Dell OpenManage Network Manager and devices.

Additional Products

The following describes how to increase the power of your Dell OpenManage Network Manager installation. While the documents mentioned above describe everything available with Dell OpenManage Network Manager, your installation may provide only a limited subset of those features.

Updating Your License

If you have a limited license — for example OpenManage Network Manager may limit discovery to a certain number of devices— then your application does not function outside those licensed limits.

You can purchase additional capabilities, and can update your license for OpenManage Network Manager by putting the updated license file in a convenient directory. Then click *License Management* in the Quick Navigation portlet item to open a screen with a button leading to a file browser (*Register License: Select File*). Locate the license file, and click the *Register License* button. Your updated license should be visible in the *License Viewer* (See *License Viewer on page 81* for details.)

NOTE:

If you update your installation from a previous one where you upgraded license, you must also install new licenses.

Licenses now support three expiration formats: Never, Date certain, and a format that indicates the license will be valid for a number of days after registration.

Online Help / Filter

Access general online help by clicking *Help* in the The Dock at the top of the screen. Help appropriate to each portlet appears when you click question mark icon on the portlet title bar.

By default, this opens a separate browser window which is not necessarily always in front of the screen that calls it. Because it is separate, you can arrange the display so the help screen does not conceal the portlet it describes. Click the *Show* button to display the contents, index and search tabs (*Hide* conceals them again), and the *Prev* / *Next* buttons, or clicking table of contents topics moves to different topics within the helpset.

NOTICE

Sometimes your browser's cache may interfere with help's correct appearance. If you see a table of contents node without contents, you can often repair it by refreshing the panel or whole screen.

How To:

Use "How To"

Several sections of what follows contain the "How to" instructions for use. These are typically steps to follow to produce the desired result. For a look at all such steps available, refer to the *How to* section of the Index.

A Note About Performance

Dell OpenManage Network Manager is designed to help you manage your network with alacrity. Unfortunately, the devices managed or the networks that communicate with those devices are not always as fast as this software. If discovery takes a long time (it can), often network and device latency is the culprit. You can also optimize installations to be faster (see the recommendations in the first chapter of the *User Guide* and *first chapter of theUser Guide*s), and limit device queries with filters, but device and network latency limit how quickly your system can respond.

NOTICE

If you use management systems other than this one, you must perform a device level resync before performing configuration actions. Best practice is to use a single management tool whenever possible.

3

Getting Started with Dell OpenManage Network Manager

This chapter describes how to install and start Dell OpenManage Network Manager for basic network monitoring and management. For more detailed descriptions of all this software's features, consult its other manuals (the OpenManage Network Manager first chapter of the *User Guide*, *OMNM User Guide*, *first chapter of theUser Guide* and *User Guide*) or the online help.

NOTICE

If you want to find something but are unsure about which manual it is in, you can search all text in the Acrobat files in a single directory. You can also click on the blue cross-references to go to the target destination of cross-references in Acrobat, however for such electronic cross-references to the other documents to work, they must be in the same directory. Cross-document links do not work between documents for different versions of this software, but may provide an approximate location to consult.

If you are sure your hardware, software and network is correct and just want to get started immediately, go to Getting Started on page 28.

The Dell OpenManage Network Manager portal delivers powerful solutions to network problems, and, in addition to the OpenManage Network Manager technology documented in the following pages, Dell OpenManage Network Manager offers the following capabilities:

- Message Boards, Blogs, Wikis
- Shared Calendars
- Enterprise Chat / Messaging
- RSS Feeds
- Tagging, Ratings, Comments

Because many capabilities are only indirectly related to Dell OpenManage Network Manager's operation, this guide does not cover them comprehensively. The section Server on page 67 describes how to set up some of these features.

Troubleshooting

Suggested mini-troubleshooting steps:

1 Refresh the browser. If that doesn't work,

2 Stop and start the web server and/or application server. Command lines for this:

```
startappserver / stopappserver
```

For Windows, to start the web server manager: `oware\synergy\tomcat-X.X.X\bin\startsynergy.` For Linux.

```
/etc/init.d/synergy start / /etc/init.d/synergy stop
```

3 Clear the browser's cache (Firefox in particular loves persistent old pages), then refresh.

4 Stop and start the browser.

5 If all else fails: Reboot the host and re-start the application server, web server and browser.

When troubleshooting (or contacting technical support), you may find pertinent information in logs located in the following directories:

```
..\oware\jboss-3.0.8\server\oware\log
..\oware\temp\soniqmq.log
..\app_setup.log
..\db_setup.log
```

You can also run `getlogs` from a command line. The `getlogs` script packages relevant logs. This script creates a `logs.jar` file in the root installation directory, and moves any existing copy of `logs.jar` to `oware\temp`. `logs.jar` compresses all logs necessary for troubleshooting. Read the jar yourself, or forward this jar to technical support to help troubleshoot.

System Basics

System requirements depend on how you use the application and the operational environment. Your specific network and devices may require something different from the recommendations for typical installations.

Generally, base the minimum configuration of any system on its expected peak load. Your installation should spend 95% of its time idle and 5% of its time trying to keep pace with the resource demands.

Upgrading from a Previous Version

When you upgrade your OpenManage Network Manager installation from a previous version, keep the following in mind:

Operating System Upgrade

If your operating system is not supported in the upgrade version, upgrade to a supported operating system before upgrading Dell OpenManage Network Manager. The way to do this is to do the following:

- Back up the database.
- Upgrade the operating system.
- Install the original Dell OpenManage Network Manager on the new operating system.
- Restore the database.

- Proceed with the installation / upgrade of Dell OpenManage Network Manager.

See Database Backup on page 65 and Restoring Databases on page 66 for details.

General Advice

- Make sure you log out of the operating system between installations.
- Upgrading requires a new license to activate new features.
- Close any open browsers when upgrading.
- The following require manual migration (export, then import) from previous versions: SMTP settings, some scheduled items. Some schedules may require deletion / re-making. If you open them and they are blank, use this method.
- You must re-create topologies as Visualizations. (suggestion: take a screenshot)
- Group Operations have been deprecated, replaced by Adaptive CLI.
- The default password policy puts no restrictions on password length.
- Adaptive CLI with Perl scripts must contain valid Perl under the “strict” pragma (use strict;). If you import or migrate from a previous version a Perl script that does not pass this “strict” criterion, you must rewrite it for “strict” compliance before it can be successfully edited or copied.
- Any configured color changes to the portal may not persist and must be re-made manually. Similarly, customized page layouts or page order may not persist and you must typically re-arrange them manually.

Handling Missing Users

If you have upgraded your Dell OpenManage Network Manager installation, users and/or their role associations may not appear. You can fix this by going to one of the following screens:

Roles > Administrator > Actions > Assign members.

Roles > Power users > Actions > Assign members.

Roles > [ROLENAME] > Actions > Assign members.

Then click *Update associations*.

Supported Operating System Versions

The following are supported operating system versions:

Microsoft Windows—This application supports most 64-bit Windows operating systems from Windows Vista (Business or Ultimate) forward, with their latest service packs. The supported operating systems include: Windows 2008 (including R2), Enterprise Edition, Windows Vista, Windows 7 (Business or better) and Windows 2012.

To install on Windows 2012, click the win_install.exe file (not the shortcut, but the file in Disk1\instdata directory), and select the *Compatibility* tab. Check *Run this program in compatibility mode for* ... then select either Windows 7 or Vista. Command line installations are supported without any compatibility issues. Do likewise if you must uninstall (find the uninstall program and run it in compatibility mode).

NOTE:

Windows 2008 R2 Enterprise may indicate a PermGen size problem.**Workaround:** Increase PermGen size in the Synergy Network Management Properties' Java tab from the tray icon (XX:MaxPermSize=512m). Increase the specified memory from from 256m to 512m, then Stop Service and Start Service after right-clicking the tray icon. This is a known issue for Windows 2008, not Dell OpenManage Network Manager.

- Windows Terminal Server is not supported. The installer becomes non-responsive with Data Execution Prevention enabled. This option is disabled by default on Windows Server 2008, but is enabled on a Windows Server 2008 machine running Terminal Server.
- You must disable User Account Control if you are installing on Vista or Windows Server 2008. Alternatively, you can run application server as service. Another option is to run as administrator on startappserver. In Vista, right click the startappserver icon and select run as administrator.
- Installer may halt when pre-existing bash sessions or cmd sessions are left open. Close all such sessions before installing.

CAUTION:

The Dell OpenManage Network Manager's installer does not validate operating systems, so it allows installation on unsupported operating systems

Linux—This application supports Red Hat (Enterprise version 6.2) Linux, 64-bit only, and 64-bit CentOS (6.2). See Install on Linux on page 41 for more about how to improve your Linux experience.

CAUTION:

For Linux, you must install no more than a single instance of MySQL—the one installed with this software. Before you install, remove any MySQL if it exists on your Linux machine. Make sure to remove or rename the my.cnf file for that previous installation. If it is on the path, it can interfere with the correct operation of Dell OpenManage Network Manager. The origin of the configuration in the several my.cnf files on Linux is /opt/dorado/oware3rd/mysql/5.0.51-pc-linux-i686-64/my.cnf, so be sure to alter that one if you are reconfiguring OpenManage Network Manager's MySql.

NOTICE

To determine your Linux system's version, run the following at a command prompt:

```
cat /etc/redhat-release
```

VMware—Dell OpenManage Network Manager supports the above operating systems on VMware virtual machines. We test Dell OpenManage Network Manager primarily on Windows 2008R2 and Redhat on virtual machines. For a more extensive discussion of using VMware, see the first chapter of the *User Guide*.

NOTE:

Windows handles upgrading the Windows operating system. Best practice is to export the database, upgrade the operating system, then upgrade Dell OpenManage Network Manager. See Upgrading from a Previous Version on page 8 and Upgrade on Linux on page 35 for more details about such upgrades.

Supported Web Browsers

Supported web browsers include:

- Chrome (v 22 and above)
- Safari (v 6 and above)
- Firefox (v 12 and above)—Some pop-ups may not appear in v. 14 and later.
- Internet Explorer (v 9 and above)

  Internet Explorer versions 8 and older have display alignment issues, have slower JavaScript and Flash processing, and some transparencies do not work. Other anomalies include non-rounded corners, no alpha rendering, scroll bars in performance indicators, non-working multi-level menus, a too-large OS Images schedule form, and others. To fix these anomalies, install the Chrome plug-in you can download from the internet. After it installs, close IE and re-open it. The look and feel should improve.

  Internet Explorer 9 or above, if set up in compatibility mode with Internet Explorer 7 or Internet Explorer 8 has difficulties rendering the user interface.

Screen resolution must equal or exceed 1280 x 1024 pixels. Users running Safari on an Apple machine must modify Java preference to run applets as their own process. Java Preferences are under Applications > Utilities on OSX.

You can download and install updates if your browser or version varies from those supported. To have all Dell OpenManage Network Manager functionality, you must also install the latest version of Java (v.1.6 or later) Adobe's Flash and Adobe's Acrobat that works with these browsers. Flash for 64-bit browsers is currently a preliminary version, but you can typically run a 32-bit browser even in a 64-bit operating system, so Flash features will still be available even if you do not want to run Adobe's beta software. If Flash is installed, but the screen still requests it, reload the page in the browser. Install the latest Flash. Also: Your screen must be at least 1250 pixels wide.

NOTICE

When no cursor or focus is onscreen, some browsers interpret backspace as the *Previous* button. **Also**: Some browsers (Firefox) retain cached pages past their usefulness. To reload a page without cache, for Firefox, hold Shift while clicking the reload button. You can also use Ctrl+Shift+R or Ctrl+F5 to do this. That said, recent Firefox builds have still retained cache even after applying those remedies. Your mileage may vary, but Chrome (or Internet Explorer with the Chrome plug-in) functions correctly now.

Best practice/Web portal /Multitasking

You can open multiple tabs to different managers in OpenManage Network Manager. In most cases this does not cause any issues for read–only browsing of data. Opening multiple tabs is not recommend when creating, editing or deleting. In these scenarios there may be cases where

Web session information may not be reported back correctly and task completion may appear to never finish. One example is a job status updates. In this case a job may be submitted and it will appear to be stuck "running" when in reality it has already finished but the status has not updated in the browser session. When this occurs the user can manually click the refresh button on the job status window to manually force and update. It is not productive to watch a long running process in the job status. The recommended process is to close the job status window and move on to other tasks. The "My Alerts" feature will alert the user when they have a completed job status.

Single Server Hardware

The following describes hardware and sizing configuration for common Dell OpenManage Network Manager deployments. Before any deployment, best practice is to review and understand the different deployment options and requirements. Consider future growth of the network when estimating hardware sizes. You can often expand modern systems running Dell OpenManage Network Manager by adding more RAM to the host server(s). Selecting expandable hardware may also be critical to future growth. For ease of management, deployments selection best practice is to use the fewest possible servers.

Minimum Hardware

The minimum hardware specification describes the least of what Dell OpenManage Network Manager needs. In such minimum installations, traffic flowing from the network to OpenManage Network Manager may exceed the capacity of the hardware. When estimating the size of a deployment, it is important to understand the applications configurations in the target environment. For example, the most resource-intensive, demanding applications are typically Traffic Flow Analyzer (TFA), Event Management and Performance Monitoring.

REQUIRED Minimum hardware—6GB RAM, dual core CPU, 3.0GHz or better, 200 GB 7200 RPM Disk.

Supports:

- Standalone installations (Single Server) are supported when you use high-resource demand applications minimally.

RECOMMENDED Minimum hardware: 8GB RAM, quad core CPU (3.0GHz or better), 400 GB 10,000 RPM Disk

Supports:

- Standalone installations

△ **CAUTION:**

The above assumes you have dedicated a host to OpenManage Network Manager alone. Other applications may compete for ports or other resources and can impair the system's performance. Even OpenManage Essentials should not be on the same machine as Network Manager.

Sizing for Standalone Installations

The following are suggested sizing guidelines for your Dell OpenManage Network Manager system.

Operating System / Disks / RAM / Hardware	Network Size	Devices2	Application Constraints3	Installation Changes to Heap (RAM) Settings
64-bit OS with 6GB RAM **All below are 64-bit OS's:**	<5 Users	<20	<2Mbs Internet egress and a 1:1000 sample rate	Use defaults: (1 or 2GB application server heap (32 v. 64-bit) 512M database[4], 768M Synergy
8GB RAM, single disk, consumer level PC	Single-site, less than 10 concurrent users	<100	<2Mbs Internet egress and a 1:1000 sample rate	3GB application server heap, 2GB database, 1G Synergy
12GB RAM, single disk, business level PC	Single-site, less than 25 concurrent users.	< 500	< 10Gbs Internet egress and a sample rate of 1:1000	4GB application server heap, 3GB database, 3G Synergy
16GB RAM, multi-disk, server level PC	Medium-large network, up to 50 concurrent users	< 1,000	< 50Gbs Internet egress and a sample rate of 1:1000	5G application server heap, 4G database, 4.5G Synergy
32GB RAM, multi-disk, server level PC, recommend fast disk array or SSD drive array for the many database actions	Large network, up to 100 concurrent users	< 2,000	< 200Gbs Internet egress and a sample rate of 1:1000	10G application server heap, 8G database, 9G Synergy

[1] Assumptions: Servers have at least four cores (3.0GHz or better) and are no more than four years old. As memory and usage increases, the number of CPU cores needs to increase. Two cores can work for the most basic installations, but such configurations are not recommended.

[2] Each device mentioned here is equivalent to a L2 or L3 switch with a total of 48 interfaces per device being monitored. For each device not being monitored for 48 interfaces, you can add another 50 devices to the overall inventory for ICMP-only monitoring.

[3] Application Constraints are most relevant to Traffic Flow Analysis, Performance Management, and Event Management.

Traffic Flow Analysis ratings map to constant throughput divided by sample rate, as in bandwidth / sample rate. 20G / 2000 is easier to manage than 20G / 1000. 20G / 1 is a thousand times more demanding than 20G / 1000. Best practice is to avoid such high sample rates. The bandwidth the hardware your Dell OpenManage Network Manager installation can support is dramatically lower in such cases. Best practice is to sample a maximum of one traffic flow for every 1000 (1:1000). Higher sampling rates degrade database performance and increase network traffic without adding any significant statistical information.

Performance Management can support 600 inserts per second using a single disk (SSD) Drive. 1 insert = 1 monitored attribute. Expect better performance as you add more drives (and worse performance with slower drives).

Event Management can support a sustained 1200 traps /sec using a single (SSD) drive. Expect better performance as you add more drives (and worse performance with slower drives).

[4] Database memory settings increase as the number of database hits increases.   At the 32GB level best practice is to use an SSD drive or fast disk array because of the large number of database actions possible.

CAUTION:

Java JVM problems can generate over 10GB of thread dump in case of a memory error. To solve the problem of such files filling up your hard drive, delete the `*.hprof` files in the `/oware/jboss-5.1/bin` directory to free up the disk space. You can also clean out `temp` directories. Finally, ensure your hardware has enough RAM for the tasks it has been assigned. The Server Statistics portlet displays performance information.

If the network you manage exceeds the parameters outlined above, or your system is balky and unresponsive because, for one example, it monitors more devices than your hardware can handle, consult your sales representative about upgrading to a more robust or multi-server version of Dell OpenManage Network Manager. Also, see Performance and Monitors on page 291 for more about tuning monitor performance. You can also monitor the application server itself. See Application Server Statistics on page 295 and Self Management / Self Monitoring: Default Server Status Monitor on page 313.

Tablets and iPads

Dell OpenManage Network Manager detects mobile devices and pads. For smaller screens, the Navigation bar collapses to the left hand side and the page only displays a single column. Some limits apply:

- Since touch devices do not support right click, the first time clicking on a row selects it. A repeat click launches a menu displaying the available actions. Click the one you want.
- All major charts are rendered as HTML 5 which are mobile-friendly. These charts are Line, Pie, Donut, Bar and Column. Some Gauges and LED charts require flash which is not compatible with all mobile devices.
- Visualize / Topology is unavailable.

NOTE:

Apple products are most Dell OpenManage Network Manager-friendly. Android is only partly supported.

Network Basics

OpenManage Network Manager communicates over a network. In fact, the machine where you install it must be connected to a network for the application to start successfully. Firewalls, or even SNMP management programs using the same port on the same machine where this software is installed can interfere with communication with your equipment.

Dealing with any network barriers to communicating with OpenManage Network Manager, any required initial device configuration to accept management, and managing security measures or firewalls—all are outside the scope of these instructions. Consult with your network administrator to ensure this software has access to the devices you want to manage with the Protocols described below.

NOTICE

One simple way to check connectivity from a Windows machine to a device is to open a command shell with Start > Run `cmd`. Then, type `ping [device IP address]` at the command line. If the device responds, it is connected to the network. If not, consult your network administrator to correct this. No useful information comes from disconnected or powered-down devices.

Name Resolution

OpenManage Network Manager server requires resolution of equipment names to work completely, whether by host files or domain name system (DNS). The application server cannot respond to hosts with IP addresses alone. The application server might not even be in the same network and therefore the host would be unable to connect.

If your network does not have DNS, you can also assign hostnames in `%windir%\System32\drivers\etc\hosts` on Windows (`/etc/hosts` in Linux). Here, you must assign a hostname in addition to an IP address somewhere in the system. Here are some example hosts file contents (including two commented lines where you would have to remove the # sign to make them effective):

```
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host
127.0.0.1       localhost
```

Protocols

OpenManage Network Manager uses the following protocols: TCP/IP, SNMP, HTTP/S, UDP Multicast.

Overriding Properties

Dell OpenManage Network Manager lets you fine-tune various features of the application. Rather than lose those changes if and when you upgrade your application, best practice is to override changes. To do this for the web portal, first rename the provided file

\oware\synergy\conf\server-overrides.properties.sample to server-overrides.properties, and enable the properties within it by uncommenting them, and altering them to fit your needs. The comments in this file provide more information.

You can also override application server-related properties in \owareapps\installprops\lib\installed.properties.

Both of these properties files remain as configured if you install an upgrade, but upgrades overwrite the server-overrides.properties.sample, so keep a copy if it has anything you want to preserve.

Screen names—A new property requires a minimum length for user screen names. For the existing user base then any screen names that are shorter than the value must change to the required length on the next edit/save for that user.

Fixed IP Address

OpenManage Network Manager includes a web server and application server which must be installed to hosts with fixed IP addresses or permanently assigned Dynamic Host Control Protocol (DHCP) leases.

If you do change your host's IP address

1. Change the Virtual host IP to the new IP address in Manage > Control Panel > Portal.
2. Change the host IP address
3. Open a shell and run oware to set the environment
4. Run ipaddresschange -n in the shell followed by the new IP address
5. Restart the application server and the web server service.
6. Open a browser to see the web client at this URL: [new IP address]:8080.

To do this without the script:

1. Change the Virtual host IP to the new IP address in Manage > Control Panel > Portal.
2. Change the host IP address
3. Delete the contents of \oware\temp.
4. Change your local IP address anywhere it appears in \owareapps\installprops\lib\installed.properties.
5. Change the address on your web server. Change this in portal-ext.properties in \oware\synergy\tomcat-7.0.40\webapps\ROOT\WEB-INF\classes

   Change property:

```
jdbc.default.url=jdbc:mysql://[IP address]/
  lportal?useUnicode\=true&characterEncoding\=UTF-
  8&useFastDateParsing\=false
```

   and

```
oware.appserver.ip=[IP address]
```

6 Restart the application server and the web server service.

Open a browser to see the web client at this URL: `[new IP address]:8080`.**Portal Memory Settings**

To manually change Dell OpenManage Network Manager web portal heap settings, change the `setenv.sh` or `setenv.bat` file:

```
set "PORTAL_PERMGEN=256m"

set "PORTAL_MAX_MEM=3072m"

set "PORTAL_INIT_MEM=768m"

set "PORTAL_32BIT_MAX_MEM=768m"
```

These files are in the `Tomcat***/bin` directory. After you change their settings, run them, then re-start the portal service.

Authentication

For successful discovery of the resources on your network, this software requires authenticated management access to the device. To get this access, you must provide the correct SNMP community strings, WMI login credentials, and any other command-line (Telnet / SSH) or browser (HTTP/HTTPS) authentication, and SNMP must be turned on, if that is not the device's default. Some devices require pre-configuration to recognize this management software. Consult your network administrator or the device's manuals for instructions about how to enable those. See Authentication on page 177 for more.

△ **CAUTION:**
If you do not get access to the deepest level of authentications—for example the "enable" user's—you cannot access all of Dell OpenManage Network Manager's functionality.

Device Drivers

For complete communication with devices, Dell OpenManage Network Manager requires a device driver. For example, to communicate with Dell devices, you must have a Dell driver installed. That does not mean you cannot discover and communicate with devices without a driver installed. The Base Driver capabilities appear below. See .ocp and .ddp files on page 91 for driver installation instructions. The following sections include discussions of these drivers:

- Base Driver
- Windows Management Instrumentation (WMI) Driver
- Web-Based Enterprise Management (WBEM) Driver

Base Driver

If you have no driver installed, Dell OpenManage Network Manager still provides the following functionality. This functionality depends on devices supporting and providing data from the system group (sysDescr, sysObjectID, sysUpTime, sysContact, sysName, sysLocation) and the ifTable which provides list of device interface entries from the RFC1213-MIB. Dell OpenManage Network Manager also depends on the entPhysicalTable in the ENTITY-MIB which provides list of physical entities contained on device.

NOTE:

If device does not support ENTITY-MIB then Dell OpenManage Network Manager bases sub-component creation entirely on contents of the ifTable.

Top Level Resource—Dell OpenManage Network Manager creates top level resource for discovered devices with the following attributes: Equipment Name, Description, IP Address, Location, Contact, Vendor, Model, System Object Id, Date created, Creator, Discovery date, Last Modified.

Subcomponents—Dell OpenManage Network Manager creates subcomponents (modules, ports, interfaces, power supplies, fans, and so on) for discovered device based on contents of entPhysicalTable.

Port / Interface Attributes—Dell OpenManage Network Manager sets Port/Interface Attributes depending on port/interface type: Name, Port Description, MAC Address, Administrative State, Operational State, Port Type, Speed, Encapsulation, Operation Type, Switch Mode, CLI Name, If Index, Port Number, and Slot Number.

Direct Access—SNMP and Ping (ICMP) are enabled.

Monitors—Discovered device instances are automatically added to the Default ICMP Monitor for updating its Network Status. Support for SNMP based performance monitors using discovered ports and interfaces as targets. For example, Bandwidth Utilization.

Reports—You can execute reports like the Port Inventory Report or Device Inventory and results should include discovered device and device port entities.

Network View—Discovered devices and their sub-components appear.

Events—Dell OpenManage Network Manager supports standard MIB-II traps for discovered device and or sub-components. For example, linkUp, linkDown, coldStart, warmStart, and so on.

MIBs—Dell OpenManage Network Manager can import MIBs for use within MIB Browser so you can query device-specific OID values on the discovered device.

Containers—Depending on the licensing, device and or contained sub-components are selectable and manageable in filters and portlets like Containers.

Links—You can manually create Links using discovered device or device subcomponents as end points which are then visible in Network View.

Attributes—You can manually populate or modify device/port attributes. For example Serial Number, Firmware Version, Port Type, Notes etc. Attribute values should then be included in reports based on a given report template.

Supported PowerConnect Models

Refer to release notes for a list of supported devices. You can also look at the HTML files in the SupportedDevices directory of your installation source for information about supported devices and operating systems.

Windows Management Instrumentation (WMI) Driver

The Windows Management driver currently supports any Windows based operating system that supports the Windows Management Instrumentation (WMI).

Windows Management must always install on the Vista (Business) or later.

The login credentials must be for an administrator on the installation host for complete functionality. Both this and .NET installation are requirements for any installation managing devices supported by this driver.

This driver supports global group operations.

NOTE:

Discovery may display benign retry warning messages in the application server shell or log. You can safely ignore these.

Prerequisites

Before installing this software to manage other computers with a Windows Management Interface driver (assuming you are installing that driver), if you do not already have it installed, you must download and install the Microsoft .Net framework version 3.0 or later on the application server. For complete functionality, the WMI login for this software must be a login for a domain user who also belongs to the administrator group on the WMI device. Both are requirements for any installation managing WMI devices.

The following are common Windows Base prerequisites:

Credentials—You must use administrative credentials to manage the computer system.

Firewall— Some firewalls installed on the computer may block Windows Management requests. Allow those you want to manage. (See Firewall Issues below.)

License—Make sure you have the proper Windows Base driver license installed. If you have a Dell-only license and are discovering a non-Dell computer, discovery does not work. Or if you have a Dell license for desktop discover you cannot discover a server.

License come in the following types:

- Major Vendor by Name—For example: Dell, Compaq, HP, Gateway
- Server/Desktop individual license support
- Generic computers—Non-major vendors
- ALL—This gives the driver all capabilities for any computer system

Firewall Issues

Configure the firewall between your server and the Internet as follows:

- Deny all incoming traffic from the Internet to your server.
- Permit incoming traffic from all clients to TCP port 135 (and UDP port 135, if necessary) on your server.
- Open Port 445 (WMI)
- Permit incoming traffic from all clients to the TCP ports (and UDP ports, if necessary) on your server in the Ports range(s) specified above.
- If you are using callbacks, permit incoming traffic on all ports where the TCP connection was initiated by your server.”

WMI queries will succeed only if you add the User account to local admin group. Refer to the Microsoft knowledgebase articles for the way to do this. For example: Leverage Group Policies with WMI Filters: support.microsoft.com/kb/555253/en-us

For user rights for WMI access, see: www.mcse.ms/archive68-2005541196.html

See also: *Service overview and network port requirements for the Windows Server system* (support.microsoft.com/kb/832017/)

Web-Based Enterprise Management (WBEM) Driver

The Web-Based Enterprise Management driver currently supports operating systems supporting the Web-Based Enterprise Management interface (WBEM).

WBEM is always installed on the following operating systems versions (and later):

- Red Hat Linux 6.2.
- VM Ware (ESX) with WBEM installed.

You can install Web-Based Enterprise Management on some other systems if they do not already use it, but monitored devices must have this installed.

NOTE:

To verify WBEM is running on your system, run the following command: `ps-e | grep cim`. You should see a process labelled `cimserver`.

Installing WBEM on Red Hat

You can download and install WBEM support for Red Hat linux. For example, for Red Hat 5, a release for WBEM is `tog-pegasus-2.7.0-2.el5_2.1.i386.rpm`. This is what you need to download once you have logged into the Red Hat network.

Install this as follows:

Install: `rpm -ih tog-pegasus-2.7.0-2.el5_2.1.i386.rpm`

Upgrade: `rpm -Uh tog-pegasus-2.7.0-2.el5_2.1.i386.rpm`

To determine if wbem is running, run `ps -ef | grep cimserver` in a shell.

To start | stop | get status of the WBEM service:

```
tog-pegasus start | stop | status"
```

If the system is running Fedora, then you can access tog-pegasus updates at this site: https://admin.fedoraproject.org/pkgdb/packages/name/tog-pegasus

WBEM Prerequisites

The following are common prerequisites:

Credentials—WBEM credentials have a role in discovering the device. Your system must have access to the computer using Administrative only credentials. These are the same credentials as the user installing WBEM on the device.

Telnet / SSH credentials are necessary for other supported applications.

For full functionality, this WBEM device driver requires administrative (root) access. Many devices may only allow root logins on a local console.

In such cases, configure the Telnet/SSH authentication for these devices to login as a non-root user—and, in Authentication Manager, enter `su` in the *Enable User ID* field and enter the root user's password in *Enable User Password* in that same authentication. This enables full device management functionality with root access.

NOTE:

Credentials for Telnet / SSH should have a privilege level sufficient to stop services and to restart the computer system.

Firewall— Some firewalls installed on the computer may block Web-Based Enterprise Management requests. Allow those you want to manage.

License—Make sure you have the correct WBEM driver license installed. Licenses come in the following types:

- Major Vendor by Name - Such as Dell, Compaq, HP, Gateway.
- Server/Desktop individual license support.
- Generic computers - non-major vendors.

- ALL - this gives the driver all capabilities for any computer system.

CAUTION:
If you discover an Amigopod host that does not have its SNMP agent turned on, Dell OpenManage Network Manager labels it a WMI or WBEM host rather than an Amigopod host.

Secure WBEM Access

Some monitoring capabilities require root access, even if you securely log into the UNIX host. In this case, when configuring a secure (SSH) login, configure a telnet authentication with `su` as an *Enable User ID*, and the root user's password as the *Enable Password*. For other WBEM access, configure authentication as an HTTP/HTTPS login / password, and select WBEM as the protocol after you have selected the WBEM authentication.

Ports Used

Initial installation scans the following ports, and reports any conflicts for the following ports:

Database: 3306 or user-configured database host, if using MySQL server.

Application server: 8089, 8162, 8489 [HTTPS], 8082

Web Portal: 8080, 8443 [HTTPS]

SNMP: 161, 162

Syslog: 514

When installation encounters a conflict with any of the above ports, a panel appears displaying a warning and the ports in conflict. You can then elect to continue since you can change the application ports after installation. If your installation has no port conflicts, then no panel appears.

NOTE:

The installation scans TCP ports to detect potential conflicts. It does not scan UDP port conflicts including SNMP Ports 161 and 162. No SNMP or other applications should bind to UDP ports 161 and 162 since such bindings interfere with the application. If this conflict exists, the following error appears:

```
FATAL ERROR - Initializing SNMP Trap Listener
```

You may also sometimes configure port availability on firewalls. Sometimes, excluding applications from firewall interference is all that is required (see Ports and Application To Exclude from Firewall on page 27).

The following are some of the standard port assignments for installed components. These are often configurable (even for “standard” services like FTP or HTTP), so these are the typical or expected port numbers rather than guaranteed assignments. Also, see Protocol Flows on page 26 for more about network connections. The JBoss directory’s number may vary with your package’s version; *.* appears rather than actual numbers below

Destination Port(s)	**Service**	**File(s)**	**Notes**	**Used from Java Client**
HTTP/S (Web Client)				
8089[4]	oware.webservices.port	[user.root]\oware\lib\owweb services.properties	appserver. **Note:** this port was 80 in previous versions.	Yes
8489[4, 5, 7]	org.apache.coyote.tomcat4.CoyoteConnector (Apache)	[user.root]\oware\jboss-*.*\server\oware\deploy\jbossweb-tomcat41.sar\META-INF\ jboss-service.xml	app/medserver, jmx console, and web services, including Axis2	No
Other Ports				
n/a[5](ICMP)	ping		MedSrv -> NtwkElement, NtwkElement -> MedSrv, ICMP ping for connection monitoring.	
20[4, 5, 7] (TCP)	FTP Data Port	n/a	(Internally configurable), "MedSrv -> FTPSrv NtwkElement -> FTPSrv"	No
21[4, 5, 7] (TCP)	FTP Control Port	n/a	(Internally Configurable) "MedSrv -> FTPSrv NtwkElement -> FTPSrv"	No
22[4, 5, 7] (TCP)	SSH	n/a	MedSrv -> NtwkElement, secure craft access	No

Destination Port(s)	Service	File(s)	Notes	Used from Java Client
23[4, 5, 7] (TCP)	Telnet	n/a	MedSrv -> NtwkElement, non-secure craft access	Yes
25[4, 5, 7] (TCP)	com.dorado.mbeans.OWEmailMBean (mail)	[user.root]\oware\jboss-*.*\owareconf\oware-service.xml	AppSrv -> SmtpRelay, communication channel to email server from Appserver	No
69[4, 5, 7] (UDP)	TFTP	n/a	(Configurable internally), MedSrv -> TFTPSrv NtwkElement -> TFTPSrv	No
161[4, 5, 7] (UDP)	com.dorado.mediation.snmp.request.listener.port (SNMP), oware.mediation.snmp.trap.forwarding.source.port	[user.root]\owareapps\ezmediation\lib\owmediation.properties	MedSrv -> NtwkElement, SNMP request listener and trap forwarding source	No
162[4, 5] (TCP)	oware.mediation.snmp.trap.forwarding.des tination.port (SNMP)	[user.root]\owareapps\ezmediation\lib\ezmediation.properties change this property: com.dorado.snmp.trap.listener.binding=0.0.0.0/162	NtwkElement -> MedSrv, SNMP trap forwarding destination port,	No
514[4, 5] (UDP)	com.dorado.mediation.syslog.port (syslog) To change the syslog port, add com.dorado.mediation.syslog.port=[new port number] to owareapps\installprops\lib\installed.properties		NtwkElement -> MedSrv (mediation syslog port)	No

Destination Port(s)	Service	File(s)	Notes	Used from Java Client
1812[4, 7] (TCP)	RADIUS port (note, RADIUS is not supported in Dell OpenManage Network Manager)	[user.root]\oware\jboss-*.*\server\oware\conf\login-config.xml	AppSrv -> RADIUS Srv, Appserver (RADIUS client login enabled–optional)	No
5988, 5989	WBEM Daemon (5989 is the secure port) defaults		You can add ports and daemons in monitored services. These are only the default. WBEM requires one port, and only one, per daemon.	No
7800[2](TCP)	org.jboss.ha.framework.server.ClusterPartition (JBOSS)	[user.root]\oware\conf\cluster-service.xml	disabled - see UDP for same, (JBOSS HA frame work server cluster partition) TCP only	No
8009 (TCP)	org.mort bay.http.ajp.AJP13Listener	[user.root]\oware\jboss-*.*\server\oware\deploy\jbossweb-tomcat41.sar\META-INF\ jboss-service.xml	Obsolete — appserver	No
8083 (TCP)	org.jboss.web.WebService (JBOSS)	[user.root]\oware\jboss-*.*\owareconf\jboss–root-service.xml	not used (JBoss web services) appserver	No
8443[2,4, 5, 7]	org.apache.coyote.tomcat4.CoyoteConnector	[user.root]\oware\jboss-*.*\server\oware\deploy\jbossweb-tomcat41.sar\META-INF\ jboss-service.xml	user client -> AppSrv (Apache Coyote Tomcat4 Coyote connector), appserver. This is the default HTTPS port for the web portal.	No
9996, 6343	Traffic Flow Analysis	trafficanalyzer.ocp	You must configure the router to send flow reports to the OpenManage Network Manager server on 6343 for sflow by default.	No

[2] Unused in standard configuration.

[3] Client does not connect to medserver on this port.

[4] This port is configurable.

[5]Firewall Impacting

[7]Bidirectional

To operate through a firewall, you may need to override default port assignments.

NOTICE

To configure ports, open their file in a text editor and search for the default port number. Edit that, save the file and restart the application server and client. Make sure you change ports on all affected machines.

The mediation service also establishes a socket connection to client on ports 6500 to 6510 for cut through. Such connections are specified in the `ezmediation/lib/ezmediation.properties file`.

```
[user.root] = $OWARE_USER_ROOT
```

Protocol Flows

The following network protocol flows represent the application's interactions with Network Devices (for example: Dell Powerconnect). The (N) in these lines identifies dynamic port assignments. Often, several communication flows are established to a specified static port so N can represent several dynamic ports. This list also outlines alternative flows for JBoss and SONIC (clustered) JMS activation.

NOTE:

This does not identify time service flows like ntp that can manage the time on the servers.

The following were changes to a standard installation done for the sake of measuring the protocol flows. In the J2EE Naming Service: the RMIPort was changed to 31310. Also, `owappserver.properties` (turns off mediation v2 services on application server) was changed: mediation true->false. This essentially disables mediation on the application server.

Network Element to FTP/TFTP Server

FTP

Network Element (N) -> FTP/TFTP Svr (21)

Network Element (N) <-> FTP/TFTP Svr (21)

Network Element (N) <- FTP/TFTP Svr (20)

Network Element (N) <-> FTP/TFTP Svr (20)

Network Element (N) -> FTP/TFTP Svr (69)

Network Element (N) <-> FTP/TFTP Svr (M)

Devices should have connectivity to the external FTP/TFTP server. *M* means we recommend installing external file servers on mediation servers for a performance improvement. You can also use the internal FTP/TFTP server in Windows environments.

Email Network Element Config Differences

If email from the application server is turned on then the following port must be opened between the application and email server:

TCP App Svr (N) -> smtp relay (25)

TCP App Svr (N) <-> smtp relay (25)

JBoss Management Access

The J2EE server has port 8080 open to allow web browsers access to the JBoss Management console. If you want to access this capability then the system browsing the jmx console must have access.

Mgmt client (N) -> App Server (8080)

To access the Mediation Servers:

Mgmt client (N) -> Med Server (8080)

Ports and Application To Exclude from Firewall

Exclude `java.exe`, tcp port 21 and udp port 69 from firewall interference to let the application function. The java process to exclude from firewall blocking is `<Installdir>\oware3rd\jdk[version number]\jre\bin\java.exe`.

If you have distributed the database functions then you must allow the database process to communicate with your machine through your firewall as well. The embedded database process is `mysqld-max-nt.exe` (in Windows, the path is `<installdir>oware3rd\mysql\[version number]\bin\mysql-max-nt.exe). Consult your DBA for Oracle processes, if applicable.`

Installed Third Party Applications

This software includes the following applications:

- ant

- cygwin
- expect
- jboss (see directory name for version)
- JDK
- JLoox
- MySQL
- Open SSH (includes OpenSSL)
- TCL
- OpenLDAP
- Jasper Reports
- J Free Charts

Windows Management Instrumentation Ports

Windows Management Instrumentation uses the following ports:

Protocol or Function	Ports Used
RPC, TCP	135,139,445,593
SNMP, UDP	161,162
Optional:	
WINS, TCP	42
UDP	42, 137
PrintSpooler, TCP	139, 445
TCP/IP PrintServer, TCP	515

These are relevant only if you are using any Windows-based server device driver.

Getting Started

The following section outlines the steps in a typical installation and subsequent first use. Because the software described here is both flexible and powerful, this section does not exhaustively describe all the details of available installations. Instead, this Guide refers to those descriptions elsewhere in the OpenManage Network Manager first chapter of the *User Guide*, *OMNM User Guide*, *first chapter of theUser Guide*, *User Guide* or online help.

A typical installation means doing the following:

Installation and Startup below includes instructions for a basic installation. The Install on Linux on page 41 below for Linux-only instructions.

Administering User Permissions—You can also set up users, device access passwords, and groups for users, as you begin to use it. See Control Panel on page 43.

Discovering Resources—After you install the application, you must discover the equipment you want to manage, and model it in the Dell OpenManage Network Manager database. See Discovery Profiles on page 83.

Resource Management and Reports—See Managed Resources on page 87, and Chapter 6, Resource Management and Reports in this Guide.

Configuration Management—Use Dell OpenManage Network Manager to backup, restore, and compare configuration files. See Top Configuration Backups on page 331.

Problem Diagnosis—See Alarms on page 123 for information about Fault Management.

Network Troubleshooting—See Alarms on page 123, and Chapter 10, Monitoring for details of Dell OpenManage Network Manager's performance management capabilities.

Reports—Run reports to clarify the state of your network and devices. See Reports on page 231 for details.

Real-time Diagnosis through Collaboration—Collaborate with others about network issues, both by sending them messages that display the device conditions of concern, and with online chat within Dell OpenManage Network Manager. See Sharing on page 110, and Status Bar Alerts on page 98 for details.

Unified View—You can scale your Dell OpenManage Network Manager installation to handle the largest, most complex environments with distributed deployment.

Finally, after you begin using Dell OpenManage Network Manager, make sure you attend to what Common Setup Tasks on page 87 describes.

Installation and Startup

Application server produces the Dell OpenManage Network Manager information for web clients. It monitors devices, and produces the output which the web server then makes available for those web clients. See Install on Linux on page 41 for advice about installing to Linux only.

Typically, the installation wizard senses the default language of the operating system and installs Dell OpenManage Network Manager so its default language agrees. If you want Dell OpenManage Network Manager to install with English regardless of the installation platform's default, then remove the SynergyI8N.jar file from Synergy.zip before you install.

Initiate installation by executing shortcuts to `win_install.exe` [Windows][1] or `linux_install.sh`[2] [Linux] in the installation root directory of a local or mapped drive. If your download is a compressed (.zip) file, you must extract it before installing. Put any extracted zip files

[1] Windows installation sometimes installs Internet Information Services (IIS)—formerly called Internet Information Server. Typical installations do not turn IIS on by default. Do not enable IIS on the host(s) running Dell OpenManage Network Manager.

on your localhost for faster installation times. Using shared drive may introduce network latency issues during the installation. Click through the installation wizard, accepting the license and making the appropriate entries.

△ **CAUTION:**
Do not install if you are logged in as user “admin.”

During some installations, one screen lets you select the application’s memory size. Best practice is to select the largest available on your hardware while leaving sufficient memory for the operating system.

Heap

Heap settings let you, in effect, customize the number of devices being monitored by Dell OpenManage Network Manager and the number of concurrent users. The default settings typically support 100 devices or less and 25 concurrent users. See Single Server Hardware on page 12 for more about memory requirements.

Memory on a single machine installation serves the operating system, database and web server. You can configure the selected application server heap memory size any time, with the following properties in `\owareapps\installprops\lib\installed.properties`. For example:

```
oware.server.min.heap.size=4096m

oware.server.max.heap.size=4096m
```

To manually change Dell OpenManage Network Manager web portal heap settings, change the `setenv.sh` or `setenv.bat` file:

```
set "PORTAL_PERMGEN=256m"

set "PORTAL_MAX_MEM=3072m"

set "PORTAL_INIT_MEM=768m"

set "PORTAL_32BIT_MAX_MEM=768m"
```

These files are in the `Tomcat***/bin` directory.

Installation and startup include:

- Running the installer, responding to its prompts.

2. Linux installation can start in the following ways: a) type ./linux_install.sh in a shell. This lets application server, autostart function. b) Double click on the linux_install.sh file in the installation directory. This produces a screen with running options. if you click *Run* application server autostart functions. If you click on *Run in Terminal* it does not. Finally, follow the instructions in Install on Linux on page 41.

- **Starting application server**. In Windows, you can use the *Start* button (*Start* > OpenManage Network Manager > *Start application server*), or type `startappserver` in a command shell, or right-click the server manager tray icon and select *Start* (if you have installed Dell OpenManage Network Manager as a service and that icon is red, not green).

NOTICE

A message declares "Application server is now up" in *My Alerts* in the bottom left corner of the screen of the web client when application server startup is complete. You can also make server monitor appear with the `pmtray` command either in a shell or from a start menu icon.

- **Starting web server**. If this does not auto-start, you can use the *Start* button (*Start* > OpenManage Network Manager > *Synergy Manager*), or right click the web server's tray icon to start it. You can also double-click this icon and automate web server startup. From a command line, you can also start this manager with `[installation root]\oware\synergy\tomcat*\bin\startsynergy.`
  To start web server or Linux, in a shell type `/etc/init.d/synergy start.` Stop web server with `/etc/init.d/synergy stop.`

CAUTION:

If you are using Dell OpenManage Network Manager in an environment with a firewall, ports 8080 and 80 must be open for it to function correctly. If you want to use cut-thru outside of your network then ports 8082 – 8089 must be open. Dell OpenManage Network Manager uses the first one available, so typically 8082, but if another application uses 8082, Dell OpenManage Network Manager uses 8083 and so on. Web Services for Dell OpenManage Network Manager previously used port 80, but for this version, they use 8089.

Start using Dell OpenManage Network Manager as outlined in Getting Started on page 28, or below.Here are the various ways to start (and stop) Dell OpenManage Network Manager elements:

Windows Start Menu Program Shortcut	Windows Command Line	Linux Command Line
Server Monitor	pmtray	N/A
Start Application Server	startappserver	startappserver
Synergy Manager	startsynergy.com Note: this is in the oware\synergy\tomcat*\bin directory, and is not on the path.	While no monitor display appears, you can start the web server with these commands: startportal.sh start / startportal.sh stop These are in the oware/synergy/tomcat-x.x.x/bin directory, and are not on the path.

Windows Start Menu Program Shortcut	Windows Command Line	Linux Command Line
Synergy	http://[application server host IP]:8080	http://[application server host IP]:8080

See Starting Web Client on page 38 for more information.

See the Troubleshooting chapter of first chapter of the *User Guide* to solve Dell OpenManage Network Manager problems.

Install on Linux

To run Dell OpenManage Network Manager in Linux, rather than Windows, follow the Best Practices and steps below.

Linux Installation Best Practices

- This application can run on any Linux desktop environment (CDE, KDE, Gnome, and so on) but the installer will only install shortcuts for CDE. You can install Linux in its Desktop option, or if you select Basic Server (default) - choose additional packages: XWindows, Basic / Core Gnome Desktop without Gnome utilities, although we suspect any Gnome will work).
- Install your Linux distribution (example: CentOS) on the server, choosing *Basic Server* when prompted to select software. *CentOS* should be the only repository selected. Choose *Customize Later* to decline further customizing the installation.
- Xvfb must be running to have a web client work correctly. This is automated when application server starts automatically. You can manually start this process with root access using the following:

  ```
  [root@test X11]Xvfb :623 -screen 0 1152x900x8 2>/dev/null &
  ```

  Confirm xvfb is running as follows:

  ```
  >ps -ef | grep Xvfb
  root 25991 21329 0 16:28 tty2 00:00:00 Xvfb :623 -screen 0 1152x900x8
  qa 26398 26053 0 16:31 pts/3 00:00:00 grep Xvfb
  ```

  (The path may differ from this example.)

Create a user and prepare for installation:

1 Add your IP and hostname to `/etc/hosts.` For example (for host `Test`):

```
10.18.0.241 Test
```

Also: verify that `/etc/hosts` points to new name-use the following command and you should see similar output.

```
[qa@Test Desktop]$ cat /etc/hosts
10.18.0.241Test.localrh6Test# Added by NetworkManager
```

```
127.0.0.1localhost.localdomainlocalhost
::1 Test.localTestlocalhost6.localdomain6localhost6
```

2 Login as *root*, create a new user with a home directory, set the password and add the user to the proper group. Here are examples of the commands for this. configuring user *test*:

```
useradd -m test
passwd abcxyz
usermod -aG wheel test
```

3 Copy the installation files to the system.

4 After unzipping the installation file from the website, copy the folder with source files as a subdirectory of the `/home/test` directory on the server. Set permissions on the installation directory:

```
chown -R test /home/test
chmod -R 777 /home/test/MyInstallation
```

5 Make sure the installation script has permission to execute:

```
chmod +x /home/test/MyInstallation/linux_install.sh
```

6 Create the target installation directory structure and set permissions. The following are examples, not defaults:

```
mkdir /test
mkdir /test/InstallTarget
chown -R test /test
chmod -R 777 /test
```

7 Disable Firewall with System > Administration > Firewall, or disable the firewall, and configure the network interface card with a static IP address from a command shell with the following command(s):

```
setup
```

You may be prompted to enter the root password; the password dialog may also appear behind the Firewall Configuration Startup dialog.

8 By default the Network Interface Card (NIC) is not active during boot, configure it to be active and reboot:

```
nano /etc/sysconfig/networking/devices/ifcfg-eth0
```

Change `ONBOOT=no` to `ONBOOT=yes`

9 Disable SELINUX. Turn this off in `/etc/selinux/config`. Change `SELINUX=disabled`.

This and the previous step typically requires a reboot to take effect.

10 From a command line, type `reboot`.

11 Once reboot is complete, login as *root* update the system:

```
yum update -y
```

12 Linux (CentOS particularly) sometimes installs MySQL libraries by default, this interferes with Dell OpenManage Network Manager since it installs its own MySQL version. Remove mysql-libs from the system:

```
yum remove mysql-libs -y
```

Dell OpenManage Network Manager needs the compatibility libraries installed and reboot:

```
yum install compat-libstdc++-33.x86_64 -y
reboot
```

Alternatively, do these steps in the System > Administration > Add/Remove Software user interface.

13 Configure file handle maximums. Open `/etc/security/limits.conf` and ensure the following are at minimum 65535:

```
test soft nofile 65536
test hard nofile 65536
test soft nproc 65536
test hard nproc 65536
```

Here, `test` is the installing user login.

Set these limits higher for more heavily used systems. You can also check/set file handles temporarily using the `ulimit -H/Sn` command. For example:

```
$ ulimit -Hn
$ ulimit -Sn
```

CAUTION:

If you enter ulimit -a in a shell, open files should NOT be 1024, and User Processes should NOT be 1024. These are defaults that *must* be changed.

14 Restart Linux. (`reboot`)

Install Dell OpenManage Network Manager:

15 You cannot install as root user. Log out as root and login as the user (here, `test`) created in the previous steps and run the installation script:

```
cd /home/test/MyInstallation
./linux_install.sh
```

...or if you prefer a text-only installation:

```
./linux_install.sh -i console
```

16 Now follow the instructions in the installation wizard or text, making sure to specify the configured target directory (in this example `/test/InstallTarget`) as its installation root.

17 As part of the installation, you must run a specified installation script as root. When you run the setup script, among other things, it automatically re-routes event traffic from port 162 to port 8162.

18 If you did not elect to autostart them, start the web server and/or application server. The command line for application server:

```
startappserver
```

For web server.

```
/etc/init.d/synergy start
```

19 When application server and web server have completed their startup, open a browser to this URL: `[application server IP or hostname]:8080`

NOTE:

Upon Login, if you see the message "Credentials are needed to access this application." Add `oware.appserver.ip=[application server IP address]` to `/oware/synergy/tomcat-XXX/webapps/ROOT/WEB-INF/class/portal-ext.properties`.

Upgrade on Linux

The following are best practices for upgrading from a previous version of OpenManage Network Manager on a Linux machine (see also Upgrading from a Previous Version on page 8, if that applies):

1 Verify your previous version's installation application server starts without exceptions.

2 Back up the database, and any other resources that need manual installation. See Upgrading from a Previous Version on page 8 for more specifics.

3 Make sure your operating system does not include a MySql database (or remove the Linux MySql first). See step 12 in How to: Install on Linux on page 32.

4 Make sure to remove or rename the `my.cnf` file for that previous installation. The origin of the configuration in the several my.cnf files on Linux is `[installation target]/oware3rd/mysql/5.0.51-pc-linux-i686-64/my.cnf`, so be sure to alter that one if you are reconfiguring OpenManage Network Manager's MySql.

5 Ensure you have installed the 32-bit Linux Libraries, as described in step 12 of How to: Install on Linux on page 32.

6 If necessary, disable firewalls and create directories and permissions as in How to: Install on Linux on page 32.

The origin of the configuration in the several my.cnf files on Linux is `[installation root]/oware3rd/mysql/5.0.51-pc-linux-i686-64/my.cnf`, so be sure to alter that one if you are reconfiguring OpenManage Network Manager's MySql.

Linux Upgrade Procedure

The following are suggested upgrade steps, when you are installing a new version of Dell OpenManage Network Manager, *and* a new Linux operating system. See also Upgrading from a Previous Version on page 8. Essentially, this outlines backing up what you can, upgrading the operating system, then upgrading Dell OpenManage Network Manager:

1 Backup the MySQL database and copy the backup to another machine or network drive with the following command lines:

```
mysqldump -a -u root --password=dorado --routines owbusdb > owbusdb.mysql
mysqldump -a -u root --password=dorado  owmetadb > owmetadb.mysql
mysqldump -a -u root --password=dorado lportal > lportal.mysql
```

The password may be different than the default (`dorado`).

2 Install the upgraded Linux (in this example, 6.2).

a. Prepare ISO DVDs. For example, Centos-6.2-x86_64-bin-DVD1 and DVDBi2

b. Select boot from cd-rom in the Boot Menu

c. Install linux 6.2

d. Select your install type. For example: Desktop. Best practice is to use same settings for hostname, IP, and so on.

3 Install the Dell OpenManage Network Manager upgrade on the updated Linux installation. Make sure to look at How to: Install on Linux on page 32, including the following:

a. Remove package (if it exists) `"The shared libraries required for MySQL clients" = mysql-libs-5.1.52-1.el6_0.1 (x86_64)`

b. Install package `"Compatibility standard c++ libraries" = compat-libstdc++-33-3.2.3-69.el6 (x86_64)`

4 Import the MySQL database. Shutdown application server and webserver. Use `ps-ef | grep java` to confirm no running java process exists. Kill them if any exist.

a. Drop the database with the following command lines:

```
mysqladmin -u root --password=dorado drop owmetadb
mysqladmin -u root --password=dorado drop owbusdb
mysqladmin -u root --password=dorado drop lportal
```

b. Create a new database with the following command lines:

```
mysqladmin -u root --password=dorado create owmetadb
mysqladmin -u root --password=dorado create owbusdb
mysqladmin -u root --password=dorado create lportal
```

c. Import the backed up database:

```
mysql -u root --password=dorado owmetadb < owmetadb.mysql
mysql -u root --password=dorado owbusdb < owbusdb.mysql
mysql -u root --password=dorado lportal < lportal.mysql
```

To validate data:

d. Start the application server with: `#service oware start`

e. Start the webserver when the application server is ready: `#service synergy start`

f. Log in to confirm data were imported correctly

5 Upgrade Dell OpenManage Network Manager further, if needed.

Shutdown application server and webserver. Use `ps-ef | grep java` to confirm no Java process exists. Kill any such process if it lingers.

a. Go to the installation package's InstData directory, open a terminal and type `. /etc/.dsienv`.

b. Type `./linux_install.bin` to start installing (or include the `-i console` parameters for a text-based installation.

The servers autostart when they finish installing. You may need to reboot the server if your performance monitor data do not appear.

Uninstalling

Use Control Panel to uninstall in Windows. Uninstall by running the following on Linux:

```
$OWARE_USER_ROOT/_uninst/uninstall.sh
```

You must uninstall from Linux as root. No graphic wizard appears, and you must respond to the command-line prompts as they appear.

SNMP in Multi-Homed Environment

Trap listener, Inform listener and all outbound SNMP requests must bind to a specific interface in a multi-homed environment. This interface is considered appropriate to use for all network-facing SNMP activity. By default, this is localhost, interpreted as the application's local IP value (the NIC selected at installation time). The following text in installed.properties provides a specific IP address to control outbound SNMP interface binding on the local machine:

```
# specific interface used for all NMS initated
# communications to the network
com.dorado.mediation.outbound.address=localhost
```

Include the following text and provide a specific IP address to control inbound (listener) interface binding on the local machine:

```
#
# specific interface used for binding mediation
# listeners such as SNMP trap listener
com.dorado.mediation.listener.address=localhost
```

Events with no corresponding definition appear as alarms of indeterminate severity. The only way to change behavior of an unknown event in this version would be to locate the missing MIB and load it into the system. This creates the missing event definition(s) needed to specify explicit behaviors.

Perl

If you install Perl to take advantage of this application's use of Perl Scripting capabilities, you must install it on the path on the application server and mediation server host. Best practice is to use Perl version 5.10 or later because some applications also require Perl as well as the Perl module Net::Telnet.

This application does not package Perl. If you want to use the Perl scripting features, you must make sure your system has Perl installed. You can find information about Perl at www.perl.com. Follow the downloads link to find the recommended distribution for your specific platform. (See Adaptive CLI Script Language Syntax on page 418)

One of the recommended Perl packages is from ActiveState which can be found at: www.activestate.com/activeperl/

Starting Web Client

You can also open the client user interface in a browser[1]. The URL is

```
http://[application server hostname or IP address]:8080
```

The default login user is *admin*, with a password of *admin*. The first time you log in, you can select a password reminder. If you have forgotten your password, click the *Forgot Password* link in the initial screen to begin a sequence that concludes by mailing your user's e-mail address a password. (See Password Reset on page 87)

△ **CAUTION:**

For this forgotten password sequence to work, you must configure users' e-mails correctly, and the portal's SMTP server in Control Panel's Server > Server Administration > Mail settings. To configure a user's e-mail, click the link user name in the upper right corner of the portal to configure an account's settings for this and other things. The same configuration settings are available in Control Panel's tabs labeled as that user's login.

The *application server hostname* is the name of the system where OpenManage Network Manager is installed.

[1] See Supported Web Browsers on page 11

Secure Connections: SSL & HTTPS

The following describes how to turn on SSL support within Dell OpenManage Network Manager on single-server installations.

Enabling Secure SSL

The private key and certificate provides identity and browser verification against the CA signed root certificate. For testing and internal usage this step is needed to create a Private Key and Private Signed Certificate to enabled SSL encryption.

NOTE:

Some functions may fail using this approach as third party layers may expect a valid CA signed root.

Creating a Private Key (Linux / Windows)

1 Open a command prompt in Windows or a Terminal within Linux

2 Navigate to a `<INSTALL DIR>/oware/synergy/tomcat-XX/bin/certs`

3 Enter the command: `openssl`

NOTE:

If you do not find openssl, then enter the oware environment (in Windows type `oware`, in Linux, type ../etc/.dsienv

4 The OpenSSL prompt appears: `OpenSSL>`

5 Enter the command:

```
genrsa -des3 -out tomcatkey.pem 2048
```

6 OpenSSL then asks for a pass phrase for the key. Enter `changeit`.

7 OpenSSL then creates the private key and stores it in the current directory

Creating a Certificate (Linux / Windows)

Once you have the private key created, you must create a certificate.

8 Assuming you are still running the OpenSSL program from the previous step, enter the command:

```
req -new -x509 -key tomcatkey.pem -out tomcat.pem -days 1095
```

9 OpenSSL asks for the pass phrase defined for the private key. Enter the previous pass phrase of `changeit`. This command creates a self-signed certificate with a lifetime of 3 years, using the private key.

10 When asked the other questions such as Country Code, Organization you can enter any data you wish. When asked for the Common Name (FQN) you must enter the Hostname or IP Address of the server.

11 OpenSSL generates the `tomcat.pem` in the directory you were in from the previous steps.

12 Exit OpenSSL by typing `exit`

13 Two new files appear within the `//../tomcat-xx/bin/certs` directory: `tomcatkey.pem` and `tomcat.pem`

Turning on SSL Within Synergy's Web Portal

Windows: Changing the Environment:

First, update the `setenv.bat` with the SSL preferences. You must do this whether Dell OpenManage Network Manager's web server starts manually or runs as a service. if Dell OpenManage Network Manager runs as a service, this file automatically updates the service on the next portal service restart.

1 Stop Dell OpenManage Network Manager.

2 Navigate to the `<INSTALLDIR>/oware/synergy/tomcat-xx/bin` directory.

3 Edit the `setenv.bat` file in a text editor.

4 Change the property `ENABLE_SSL=false` to `ENABLE_SSL=true.`

5 If you used a pass phrase different from `changeit` then you can set it for the `SSL_PASSWORD=changeit` value.

6 Save `setenv.bat`

7 In a command prompt navigate to <INSTALLDIR>/oware/synergy/tomcat-xx/bin, and type: `service.bat update`

8 Settings take affect after the you restart the service.

You are now ready for a secure, SSL connection to Dell OpenManage Network Manager. After it has had a few minutes to start navigate to `https://[application server IP address]:8443.` (The HTTPS port is 8443.)

Linux: Changing the Environment

1 Stop Dell OpenManage Network Manager.

2 Navigate to the `<INSTALLDIR>/oware/synergy/tomcat-xx/bin` directory

3 Edit the `setenv.sh` file.

4 Change `ENABLE_SSL` to `true`.

5 If you used a different pass phrase than `changeit` then you can set it for the `SSL_PASSWORD` property here.

6 Save the file.

You are now ready for a secure, SSL connection to Dell OpenManage Network Manager. After it has had a few minutes to start navigate to `https://[application server IP address]:8443`

Changing the Session Timeout Period

The timeout for the web portal extends automatically if data is changing onscreen. Nevertheless, you can change the timeout period with (non-override-able) properties in some files, as follows:

You must modify two `web.xml` files with the same values to alter the session timeout. One controls the overall server and the other is the push servers for Async-based views. These `web.xml` files are in the following directories:

```
/dorado/oware/synergy/tomcat-XX/webapps/ROOT/WEB-INF/web.xml
```

And

```
/dorado/oware/synergy/tomcat-xx/webapps/netview/WEB-INF/web.xml
```

The xml element that contains the session timeout is

```
<session-config>
<session-timeout>30</session-timeout>
</session-config>
```

The `portal.properties` file is in `/portal/portal-impl/classes`. The property containing the session timeout (in minutes) is:

```
session.timeout=30
```

Install on Linux

To run Dell OpenManage Network Manager in Linux, rather than Windows, follow the steps below. Make sure you configure your host as described in Linux Installation Best Practices on page 32, too.

Installation

1 Install your Linux distribution (here CentOS) on the server, choosing *Basic Server* when prompted to select software. *CentOS* should be the only repository selected. Choose *Customize Later* to decline further customizing the installation.

Updates and Modification:

2 Once installation and initial reboot are complete, login as *root*.

3 Disable the firewall, and configure the network interface card with a static IP address.

```
setup
```

By default the Network Interface Card (NIC) is not active during boot, configure it to be active and reboot:

```
nano /etc/sysconfig/networking/devices/ifcfg-eth0
```

Change `ONBOOT=no` to `ONBOOT=yes`

```
reboot
```

4 Once reboot is complete, login as *root* update the system:

```
yum update -y
```

5 Linux (CentOS) installs MySQL libraries by default, this interferes with Dell OpenManage Network Manager since it installs its own version. Remove mysql-libs from the system:

```
yum remove mysql-libs -y
```

6 Dell OpenManage Network Manager needs the compatibility libraries installed and reboot:

```
yum install compat-libstdc++-33.x86_64 -y
reboot
```

Create a user and prepare for installation:

7 You cannot install Dell OpenManage Network Manager by the root user, so login as *root*, create a new user with a home directory, set the password and add the user to the proper group. Here are examples of the commands for this. configuring user *dell*:

```
useradd -m dell
passwd dell
usermod -aG wheel dell
```

8 Copy the installation files to the system.

9 After unzipping the installation file from the website on a client machine, copy the folder with source files as a subdirectory of the `/home/dell` directory on the server. Set permissions on the installation directory:

```
chown -R dell /home/dell
chmod -R 777 /home/dell/MyInstallation
```

10 Make sure the installation script has permission to execute:

```
chmod +x /home/dell/MyInstallation/linux_install.sh
```

11 Create the target installation directory structure and set permissions:

```
mkdir /dell
mkdir /dell/InstallTarget
chown -R dell /dell
chmod -R 777 /dell
```

Install Dell OpenManage Network Manager:

12 You cannot install as root user. Log out as root and login as the user (dell) created in the previous steps and run the installation script:

```
cd /home/dell/MyInstallation
./linux_install -i console
```

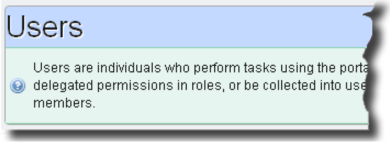
13 Now follow the instructions in the installation script, making sure to specify the configured target directory as its installation root.

Control Panel

To configure access to Dell OpenManage Network Manager, you must be signed in as a user with the permissions. (The default *admin* user has such permissions.) The *Go to > Control Panel* menu item opens a screen with the following tabs of interest:

- Admin / [My Account]
- [Domain]
- Portal > Users and Organizations
- Public / Private Page Behavior
- Portal > Roles
- Portal > Portal Settings
- Portal > [Other]
- Redcell > Permission Manager
- Redcell > Database Aging Policies (DAP))
- Redcell > Data Configuration
- Redcell > Filter Management
- Redcell > Application Settings
- Server

Tips describing these screens and fields appear when you hover the cursor over fields, or click the blue circle around a question mark next to them. This blue circle can also toggle the appearance / disappearance of the tip.



Users

Users are individuals who perform tasks using the porta delegated permissions in roles, or be collected into use members.

Users with less-than-Administrator permissions may not see all of the features described in this guide.

See Configuring Pages and User Access on page 71 for an example of using Control Panel capabilities[1].

Search Indexes

Sometimes Dell OpenManage Network Manager may display Control Panel objects like users, roles, and organizations inaccurately. This occurs because search Indexes need to be re-indexed every so often, especially when changes to roles, users and organizations are frequent.

[1] More Control Panel capabilities exist than Dell OpenManage Network Manager uses. These are largely self-explanatory, but are separate capabilities. For example, the Contacts portlet is not related to Control Panel's Contacts Center. Since Dell OpenManage Network Manager does not use capabilities like the Contacts Center on Control panel, and descriptions of how to use such capabilities do not appear here.

To re-index go to Control Panel > Server Administration and then click on the *Reindex all search indexes*. This takes little time.

Admin / [My Account]

To configure information for your login, look for the bar titled with your account login's name. It has the following lines beneath it:

My Account—This configures your information as a user, including your e-mail address, password, and so on.

Contacts Center—This configures contacts, in other words, people within your system that you are following. Click the *Find People* link to see a list of potential contacts within your system. You must click *Action > Follow* to see them listed in the *Contacts Home.* Use the *Action* button to explore other possibilities.

The contact has to approve you in their requests. To *Follow* means you want to receive the followed person's activity stream, blog postings, and so on. *Friend*ing means your friends can see your activity and you can see theirs. They have to accept any *Friend* request.

NOTICE

You can export vCards for all contacts in the system to use with other software that uses contacts. For example: e-mail clients.

[Domain]

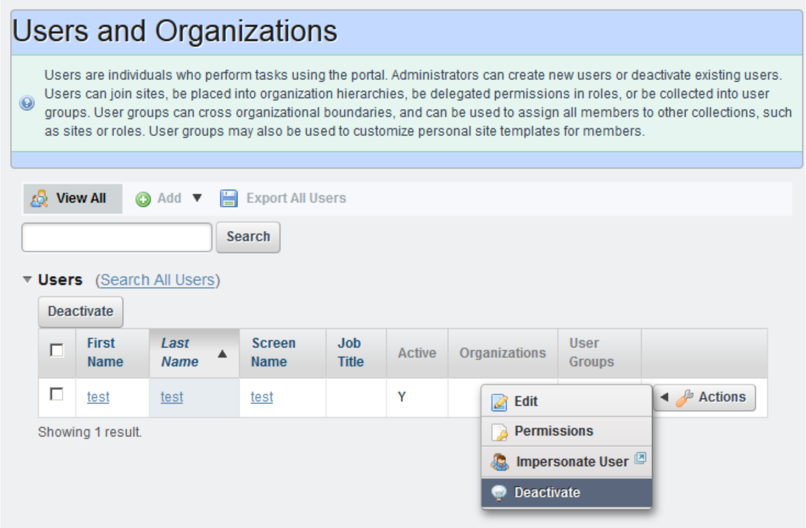
A default domain name (Dell OpenManage Network Manager) in *Control Panel*. *Global* and *Administrator's Personal Site* site configurations may appear as additional items to configure when you click the down arrow to the right of the default. The *Global* option is unrelated to Dell OpenManage Network Manager functionality. The items under this label configure the overall look and feel of the portal, reference information, and so on. See the tooltips for more complete descriptions. This also configures pages, documents, calendars, blogs, wikis, polls and so on.

Social Activity lets you alter measurements for user participation in organizations. Equity values determine the reward value of an action; equity lifespans determine when to age the reward of action.

Portal > Users and Organizations

Create Users you later assign to roles and locations with the appropriate permissions (roles for operators, administrators, and so on) in these screens. User Names are limited to 70 characters. Define the default password policy in the Control Panel under Portal > Password Policies.

Users perform tasks using the portal. Administrators can create new users or deactivate existing users. You can organize users in a hierarchy of organizations and delegate administrative rights.



Users and Organizations

Users are individuals who perform tasks using the portal. Administrators can create new users or deactivate existing users. Users can join sites, be placed into organization hierarchies, be delegated permissions in roles, or be collected into user groups. User groups can cross organizational boundaries, and can be used to assign all members to other collections, such as sites or roles. User groups may also be used to customize personal site templates for members.

□	First Name	Last Name ▲	Screen Name	Job Title	Active	Organizations	User Groups	
□	test	test	test		Y			Actions

Showing 1 result.

After creating them, add Users to roles which configure their permissions for access and action with the *Actions* menu to the right of a listed user, or during user creation.

NOTE:

Best practice is to spend some time designing your system's security before creating users, organizations and roles. Note also that By default, Dell OpenManage Network Manager makes every new user have the roles *Power User* and *User*. To assign a new user to specific permissions only, remove all rights on these roles, or confine their permissions to those that are universal first. You can remove users from *Power User*, but not from *User*.

When you are signed in, you can edit your user information by clicking the link with your username in the top right corner of the screen.

After upgrading from a previous versions, Users may not initially appear associated to their roles, but you can work around this apparent failure by clicking *Update Associations*. This is in the Roles portion of the Control Panel. *Click Actions > Assign Members*, then click the *Update Associations* button on the following screen. Alternatively, you can go to the Server Administration portion of the Control Panel and click *Execute* to Reindex all search indexes.

User Role

This role's description is *Portal Role: Portal users with view access*. To turn off most permissions from the User Role, go to Redcell > Permission manager and edit the User role. The *Advanced* button opens a screen where you can select / de-select permissions in larger groups. Power User is *Portal users with extended privileges*, and Administrator is *Portal users with system privileges*.

Default User Roles

To make new users *not* assigned as Power Users by default, go to the Portal > Portal Settings > Users > Default Associations Tab and remove the roles you do not want assigned by default. Notice that you can assign / unassign to existing users in this tab too. The role User appears in this default list, but removal does not have an impact. Dell OpenManage Network Manager automatically assigns all users to the User role.

Enabling Terms of Use

To Enable a "Terms of Use" statement required of each user use the following steps:

1. Login as Admin
2. Go to Control Panel
3. Click on Portal Settings and then the Users link on the right, and look in the Fields tab.
4. Check *Terms of Use Required* and save. You must then click *I Agree* to the Terms of Use document that appears.
5. Logout and attempt to login as another user to validate the Terms of Use appear.

To change the Terms of Use wording:

1. Login as Admin
2. Go to the Synergy Control Panel
3. Click on Web Content
4. Click on the TERMS-OF-USE article link which will take you to the editor where you can alter and save it.

NOTE:

Nothing prevents a user from deleting the Terms of Use article. If the Terms of Use seeded article is removed then the static Liferay Terms of Use appears until next Dell OpenManage Network Manager restart. The editable / delete-able article is a copy of the compiled static version but exposed as an article to make editing easier. The next time Dell OpenManage Network Manager restarts, if the TERMS-OF-USE article does not exist, it imports a new one.

How To:

Add Users and connect them to Roles

Add Users with the following steps:

1. Click *Go to > Control Panel* and navigate to Portal > Users and Organizations.
2. Click the *Add > User* menu item at the top of the *Users* screen.
3. Enter the details of the new user. If you are editing an existing user, more fields appear. *Screen Name*, and *Email Address* are required. Optionally, you can enter *Name*, *Job Title*, and so on.

4 After you click *Save* notice that the right panel expands to include additional information.

NOTE:

Make sure you specify a *Password* when you add a user. This is not optional.

The first time users log in, the application prompts them for a security question. E-mail for password reminders / resets requires setting up the fields in Control Panel > Server Administration > Mail, not the SMTP Configuration which is for Dell OpenManage Network Manager-originated e-mails. See Password Reset on page 87

5 Notice that if you are editing an existing user, or creating a new one, you can use the links on the right to configure connections with *Roles*. Roles, in particular, configure the OpenManage Network Manager functional permissions for that user. For example the *Operators* role's capabilities are typically more limited than A*dministrators*. See How to: Add and Configure User Roles / Permissions on page 50.

6 Click *Save* again, and the user you just configured should appear listed in the *Users* screen when you select *View > All Users*.

7 After you have configured roles as described in Add and Configure User Roles / Permissions on page 50, return to the Users and Organizations screen, edit the User, and click the *Roles* link to associate the User with the Role(s) you have configured.

The most dramatic evidence of permission changes appears when you first remove Default User Roles from your system in Portal > Portal Settings > Users > Default User Associations (check A*pply to Existing Users* if you have already configured your user). If you impersonate your user, and Go To > Control Panel, without User and Power User roles assigned, the impersonated user can only see *My Account* and *Sites*.

NOTICE

You can *Export Users* to a comma-separated value (CSV) file.

Once you have configured a user, you can click *Action* and to do the following:

Edit—Re-configure the selected user. Select the user's Role in the editor, too. Roles configure access and action permissions.

Permissions—Manage the user's access to and control over various parts of the portal.

Impersonate User (Opens New Window or tab)—This allows you to see the effect of any configuration changes you have made on a user. The new window (typically a new tab) also lets you click the *Sign Out* link in the upper right corner where you can return to your original identity impersonation concealed.

Manage Pages—Configure the *Public* or *Private* pages for a user, depending on the selected tab. Possible actions here include changing the look and feel of pages (for computers and mobile browsers), adding pages and child pages, and importing or exporting page configurations. Notice that you can configure meta tags, and javascript on these pages too.

Exports are in `.lar` format, and go to the download location configured in the browser you are using. The export screen lets you select specific features, and the date range of pages to export.

NOTICE

If you want to set up several pages already configured elsewhere for another user, or even for an entire community of users, export those pages from their origin, then *Manage* > *Pages* menu for the user or community.

Deactivate—Retires a user configured on your system. You can also check users and click the *Deactivate* button above the listed users. Such users are not deleted, but are in a disabled state. You can do an Advanced search for inactive users and A*ctivate* them or permanently delete them.

Your organization has a number of geographic locations and you plan to manage the network infrastructure for all these locations using RC7 Synergy. You can define the geographic locations to which devices can be associated. This will help you manage and view your network, grouped by location or branches. See Locations on page 171 for the specifics about the portlet where you can set up locations.

NOTICE

To edit your own information as a signed-in user, simply click your login name in the upper right corner of the portal screen.

Organizations

Create Organizations just as you would create Users. You can create a *Regular* or *Location* type of organization. You can do this only if your package includes the MSP option, so this capability is not available to all users.

NOTE:

You must first create a *Regular* organization to be the parent for a *Location*.

Public / Private Page Behavior

Despite the small *Public / Private* label next to the My Private / My Public pages listed in the *Go To* menu, both types of pages appear only for the user(s) who created them. Page Standard settings are *Max Items*, *Default Filter*, *Max Items per Page*, and *Column Configuration*. These persist for Admin users on the RCSynergy pages, or for users who have the portlet on their Public or Private pages (which makes them the owner of that instance). Without Dell OpenManage Network Manager portlets, URLs for pages labeled public are accessible even to users who do not log in.

Some portlets provide extra settings—for example Alarms portlet's the charting options, or the *Top N* portlets number of Top Items. These persist too.

NOTICE

Max Items, *Max Items Per Page* and *Columns* persist for both the summary and maximized portlets independently. For example: If Max Items is 50 in minimized mode it does not affect the Max Items in the Maximized window state. This lets you configure modes independently.

Dell OpenManage Network Manager remembers the default sort column and order per user, whether the user has Admin rights or not.   The Sort Column/Order (Descending/Ascending) is also shared between both summary and maximized portlets. A sort on IP Address in Resources persists if you expand the summary portlet to maximized mode.

See first chapter of the *User Guide* for more information about Multitenancy. In any case, the administrative user can re-arrange pages and portlets in a way that persists. Non-administrative users cannot do this.

Portal > Roles

Roles determine the applications permissions available to users assigned them; manage them in this screen. To configure functional permissions for the application, see Redcell > Permission Manager on page 52.

Click *Add* to create a *Regular Role*, *Site Role*, or *Organizational Role*. A *Regular Role* assigns its permissions to its members. A *Site* or *Organizational Role* assigns its permissions to a site or organization to which you can assign users.

Click the *Action* button to the right of a role to *Edit*, view or alter *Permissions*, *Assign Members* (this last works to see and assign users). You can also assign role members in the Portal > Users and Organizations user editor.

NOTE:

Owner Roles do not have an *Action* button. Owner implies something you have added or created and so actions do not apply.

Notice also that when you *Assign Members*, a screen appears with tabs where you can assign *Users*, *Sites*, *Organizations* and *User Roles*. Typical best practice is to assign users to one of these collective designations, then assign the collection to a role.

Notice also that you can view both *Current* and *Available* members with those sub-tabs. You can even *Search* for members.

Click *Back* (in the upper right corner) or the *View All* tab to return to the screen listing roles and their *Action* buttons.

How To:

Add and Configure User Roles / Permissions

Add and configure User Roles with the following steps:

1 Click *Go to* > *Control Panel* and navigate to Portal > Roles.

2 Click the *Add* tab under the heading at the top of the page, and select Regular *Roles*. Notice that you can also add roles that configure permissions for sites and organizations.

3 Enter the details of the new role (*Name*, *Title*, *Description*), then *Save* it.

4 Click Portal > Roles' *View All* button to see a list of available roles, including the one you added.

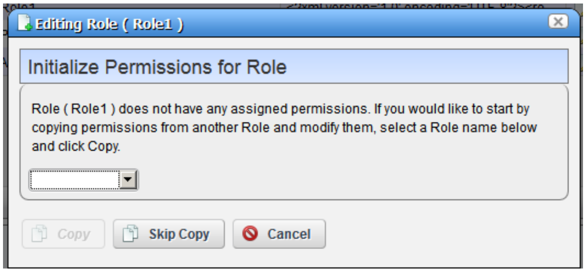
5 By clicking the *Action* icon to the right of any listed Role. Here, you can select the role's permissions to alter web portal access in the *Define Permissions* screen.

6 To configure Dell OpenManage Network Manager permissions, click *Define Permissions*. Alternatively, select or delete Dell OpenManage Network Manager permissions by editing the role in *Redcell* > *Permission Manager.*

NOTE:

If you are restricting permissions for new users, you must also remove the permissions from the *User* and *Power User* roles, automatically assigned to new users. The permissions available are the combination of those configured here and the User / Power User roles' permissions. You can remove users from the Power User role altogether, but not from the User role. You must remove permissions from that User role if you want users not to have them.

If you have eliminated all permissions from a role by removing the Default User Roles, an intervening screens lets you copy another Role's permissions so you do not have to enter all permissions from scratch.



Editing Role (Role1)

Initialize Permissions for Role

Role (Role1) does not have any assigned permissions. If you would like to start by copying permissions from another Role and modify them, select a Role name below and click Copy.

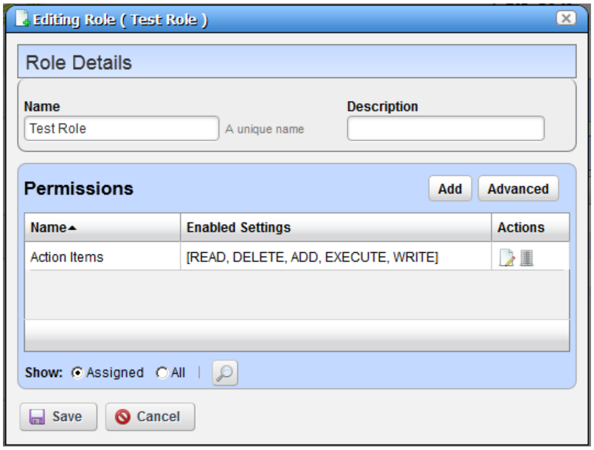
NOTICE

Defining a base role's permissions can provide the start for non-base role's permissions if you use this screen to copy them, then edit them later for the difference between the base role and non-base role.

7 When the permission editor appears, select the type of permission from the pick list under *Add Permissions*, then select the appropriate checkboxes to enable the desired permission.

8 To alter or enable more of Dell OpenManage Network Manager's functional permissions, click the Redcell > Permission Manager.

9 The Role to Permission mapping screen appears. Click the *Edit* button to the right of listed Roles to see and configure available permissions.



Editing Role (Test Role)

Role Details

Name: Test Role (A unique name)

Description:

Permissions

Name	Enabled Settings	Actions
Action Items	[READ, DELETE, ADD, EXECUTE, WRITE]	

Show: ● Assigned ○ All

The Editing Role dialog appears where you can click *Add* to select more permissions, and edit any existing permissions (with the Edit this entry icon to the right of the permission).

NOTICE

Notice that you can filter what appears in this screen with the *Show Assigned / Show All* radio buttons at its bottom.

10 Click *Advanced* to see available permissions organized by *Read*, *Write*, *Execute*, *Add* or *Delete* actions.

11 After you have selected permissions, click *Apply* to accept them and add them to the role. Click *Save* to preserve the permission configuration for the role, too.

Notice that you can revisit this role, manage it and its membership with the *Action* button to the right of the role. You can also add users to the group by selecting and editing that user with that same button.

Portal > Portal Settings

The *Settings* screens are where users who are administrators can configure the most basic global settings for Dell OpenManage Network Manager, including names, authentication, default user associations, and mail host names. These include the following:

- Mail host(s)

- Email notifications, who sends them, what the contents are for account creation notices, or password change / reset notices.
- Identification, including address, phone, email and web sites.
- The default landing page, and display settings like the site logo.
- Google Apps login / password.

CAUTION:
Checking *Allow Strangers to create accounts* may produce a defective login screen.

Portal > [Other]

Some of the remaining portal labels permit the following:

Sites—Configure sites. Sites are a set of pages that display content and provide access to specific applications. Sites can have members, which are given exclusive access to specific pages or content.

Site Template—Configures pages and web content for organizations.

Page Template—Configures a page and portlets, as well as permissions.

Password Policy—Configure the security policies you want, including user lockout and password expiration, and assign them to users. (See the Dell OpenManage Network Manager *first chapter of theUser Guide* for details)

Custom Fields—Lets you configure custom fields for Blog entries, Bookmarks or Bookmark Folders, Calendar Events, and so on.

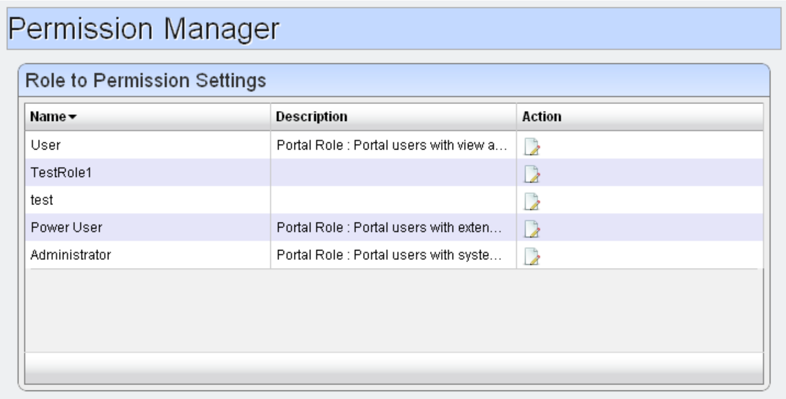
Monitoring—Lets you see all the live sessions on the portal. Click a session to see its details. This is usually turned off in production for performance reasons.

Plugins Configuration—Configure role access to portlets and features. By default, only administrators can add portlets / plugins to their pages.

Redcell > Permission Manager

Manage Permissions to manage user access to different features. These are configured as part of Roles, which aggregate users regardless of community affiliation. Create Roles with Portal > Roles.

The *Users* editor screen accessible from the *Action* menu for users listed in Portal > Users and Organizations lets you manage groups to which Users are assigned.

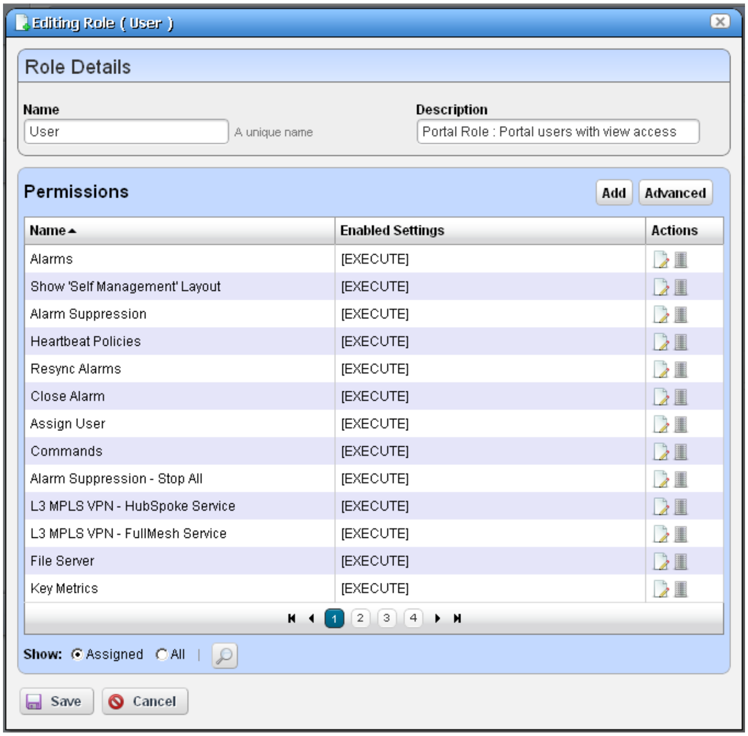


Permission Manager

Role to Permission Settings

Name	Description	Action
User	Portal Role : Portal users with view a...	✎
TestRole1		✎
test		✎
Power User	Portal Role : Portal users with exten...	✎
Administrator	Portal Role : Portal users with syste...	✎

Click the *Edit* button (the pencil and paper) to the right of a listed group to see and configure its permissions.



Editing Role (User)

Role Details

Name: User (A unique name)

Description: Portal Role : Portal users with view access

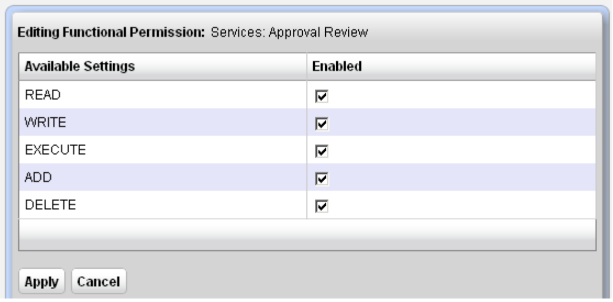
Permissions

Name	Enabled Settings	Actions
Alarms	[EXECUTE]	✎ 🗑
Show 'Self Management' Layout	[EXECUTE]	✎ 🗑
Alarm Suppression	[EXECUTE]	✎ 🗑
Heartbeat Policies	[EXECUTE]	✎ 🗑
Resync Alarms	[EXECUTE]	✎ 🗑
Close Alarm	[EXECUTE]	✎ 🗑
Assign User	[EXECUTE]	✎ 🗑
Commands	[EXECUTE]	✎ 🗑
Alarm Suppression - Stop All	[EXECUTE]	✎ 🗑
L3 MPLS VPN - HubSpoke Service	[EXECUTE]	✎ 🗑
L3 MPLS VPN - FullMesh Service	[EXECUTE]	✎ 🗑
File Server	[EXECUTE]	✎ 🗑
Key Metrics	[EXECUTE]	✎ 🗑

Show: ● Assigned ○ All

Notice that you can select *Assigned* or *All* permissions with the radio buttons at the bottom of this screen. The magnifying glass icon opens a search field where you can enter the permission you want to locate.

Edit permissions with the *Edit* button to the right of the listed permission.



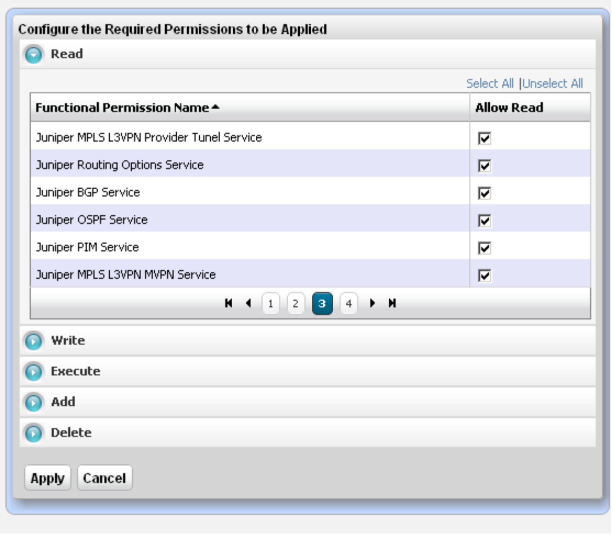
Editing Functional Permission: Services: Approval Review

Available Settings	Enabled
READ	☑
WRITE	☑
EXECUTE	☑
ADD	☑
DELETE	☑

The following describes the actions of the permissions, when checked:

Action	Default Behavior
read	Enables *Details*, *Visualize* and *View as PDF*
write	Enables the *Edit*, *Save*, and *Import / Export*.
execute	Lets you see the view altogether, launch from a portlet and query for elements. Alternatively this action can control a specific application function, (typically described by the permission name) like provisioning a policy.
add	Enables the *New* menu item, and *Save*. If you do not check this action, then the *New* menu item does not appear.
delete	Enables the *Delete* menu item.

The *Add* button on the *Permissions* panel lets you add permissions previously deleted, if they are available, and the *Advanced* button lets you configure permissions by type. For example, if you want to see all of the READ permissions.



Configure the Required Permissions to be Applied

Read

Select All |Unselect All

Functional Permission Name ▲	Allow Read
Juniper MPLS L3VPN Provider Tunel Service	☑
Juniper Routing Options Service	☑
Juniper BGP Service	☑
Juniper OSPF Service	☑
Juniper PIM Service	☑
Juniper MPLS L3VPN MVPN Service	☑

When you hover the cursor over a functional permission, tooltips provide a description. You can also click on the *Search* button at the bottom to find a phrase within the functional permissions.

Redcell > Data Configuration

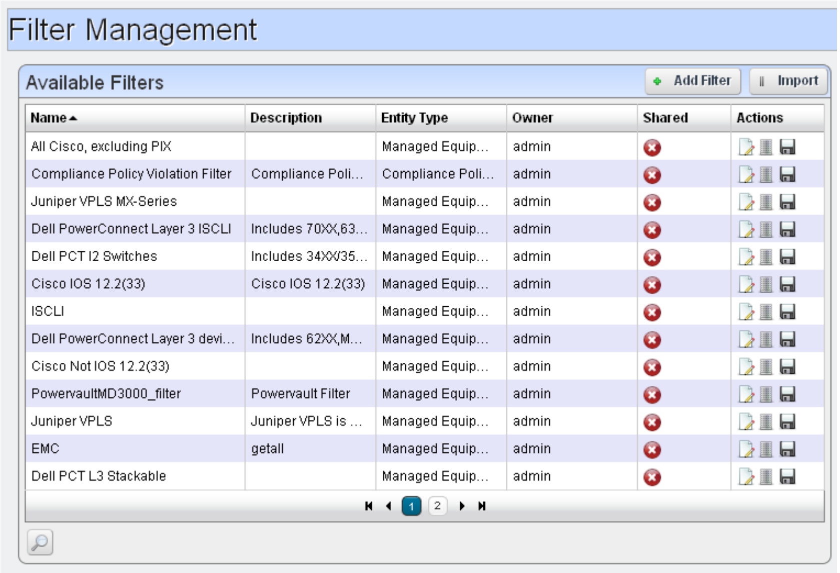
This panel configures custom attributes for Dell OpenManage Network Manager. Click the *Edit* button next to the *Entity Type* (Managed Equipment, Port, Contact, Vendor, or Location) for which you want to create custom attributes. This opens an editor listing the available custom attributes for the entity type. Edit Custom Attributes on page 112 describes right-clicking to access this directly from the portlet menu, and the details of how to edit custom attributes.

NOTE:

The custom fields configured here are for Dell OpenManage Network Manager. only.The Custom Fields editor in the *Portal* portion of Control Panel manages custom fields for the rest of the portal.

Redcell > Filter Management

This screen, accessible from *Go to* > *Control Panel* lets you manage the filters in OpenManage Network Manager.



Filter Management

Available Filters

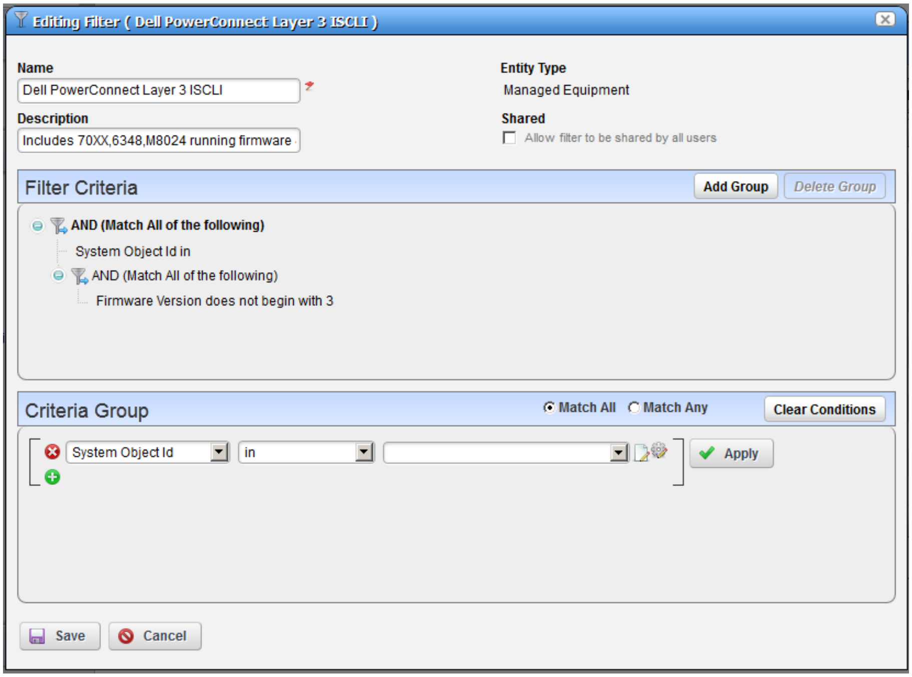
Name ▲	Description	Entity Type	Owner	Shared	Actions
All Cisco, excluding PIX		Managed Equip...	admin	✖	📝 🗑 💾
Compliance Policy Violation Filter	Compliance Poli...	Compliance Poli...	admin	✖	📝 🗑 💾
Juniper VPLS MX-Series		Managed Equip...	admin	✖	📝 🗑 💾
Dell PowerConnect Layer 3 ISCLI	Includes 70XX,63...	Managed Equip...	admin	✖	📝 🗑 💾
Dell PCT I2 Switches	Includes 34XX/35...	Managed Equip...	admin	✖	📝 🗑 💾
Cisco IOS 12.2(33)	Cisco IOS 12.2(33)	Managed Equip...	admin	✖	📝 🗑 💾
ISCLI		Managed Equip...	admin	✖	📝 🗑 💾
Dell PowerConnect Layer 3 devi...	Includes 62XX,M...	Managed Equip...	admin	✖	📝 🗑 💾
Cisco Not IOS 12.2(33)		Managed Equip...	admin	✖	📝 🗑 💾
PowervaultMD3000_filter	Powervault Filter	Managed Equip...	admin	✖	📝 🗑 💾
Juniper VPLS	Juniper VPLS is ...	Managed Equip...	admin	✖	📝 🗑 💾
EMC	getall	Managed Equip...	admin	✖	📝 🗑 💾
Dell PCT L3 Stackable		Managed Equip...	admin	✖	📝 🗑 💾

Click the *Delete* icon to the right of a listed filter to remove it from the system. Click the disk icon to export the filter. Clicking the *Import* button at the top of the screen lets you import previously exported filters.

NOTICE

To find a particular filter, click the *Search* (magnifying glass) icon in the lower left corner of this screen.

Clicking the *Edit* icon to the right of a listed filter, or clicking the *Add Filter* button opens the filter editor.



Editing Filter (Dell PowerConnect Layer 3 ISCLI)

Name: Dell PowerConnect Layer 3 ISCLI

Entity Type: Managed Equipment

Description: Includes 70XX,6348,M8024 running firmware

Shared: □ Allow filter to be shared by all users

Filter Criteria

- AND (Match All of the following)
  - System Object Id in
  - AND (Match All of the following)
    - Firmware Version does not begin with 3

Criteria Group: ● Match All ○ Match Any

System Object Id | in

Use this editor to configure filters. Enter a *Name* and *Description*, and use the green plus (+) to select an entity type from a subsequent screen. Checking *Shared* makes the filter available for all users, not just your user. You can add groups of filter criteria (click *Add Group*) that logical AND (*Match All*) or OR (*Match Any*) with each other. Click *Clear Conditions* to remove criteria. Configure the filter in the *Criteria Group* panel as described in the How to: Filter Expanded Portlet Displays on page 108. Delete filters with the *Delete this entry* icon next to the edit icon.

Redcell > Application Settings

This screen has several panels in two tabs:

- General > Entity Change Settings
- User Interface > Map Provider
- User Interface > Job Viewer
- User Interface > Performance

General > Entity Change Settings

This panel lets you override polling / refreshing for the minimized Managed Resources, Alarms, Container Tree, Visualizer and Map Context portlets. The valid range is 20 seconds -> 3600 (1 hour).   By default, these portlets poll at 40 seconds for changes in the data and automatically refresh. Times are configurable.

User Interface > Map Provider

The *Map Provider* panel lets you set whether Dell OpenManage Network Manager uses Google or Nokia maps by default, and sets the Initial Latitude and Longitude. Check *Use Secure API* if you want to load map APIs in secure SSL mode. Some browsers block non-secure external APIs if they are viewing a secure page, so use this if you view Dell OpenManage Network Manager through an HTTPS connection.

Follow the directions in Using Nokia Maps on page 253 to set the application to use those maps.

User Interface > Job Viewer

The *Job Viewer* panel lets you check the following checkboxes:

Show Job Viewer—Checking this displays the job viewer after Execution (most cases). Leaving it unchecked does not display it, although you can still view jobs with *My Alerts* in the lower left portion of the screen.

Always show Job Viewer for Actions—When checked, this displays the job viewer for execution of Actions or Action Groups.

Show Information Messages by Default—When checked, shows informational message nodes by default.

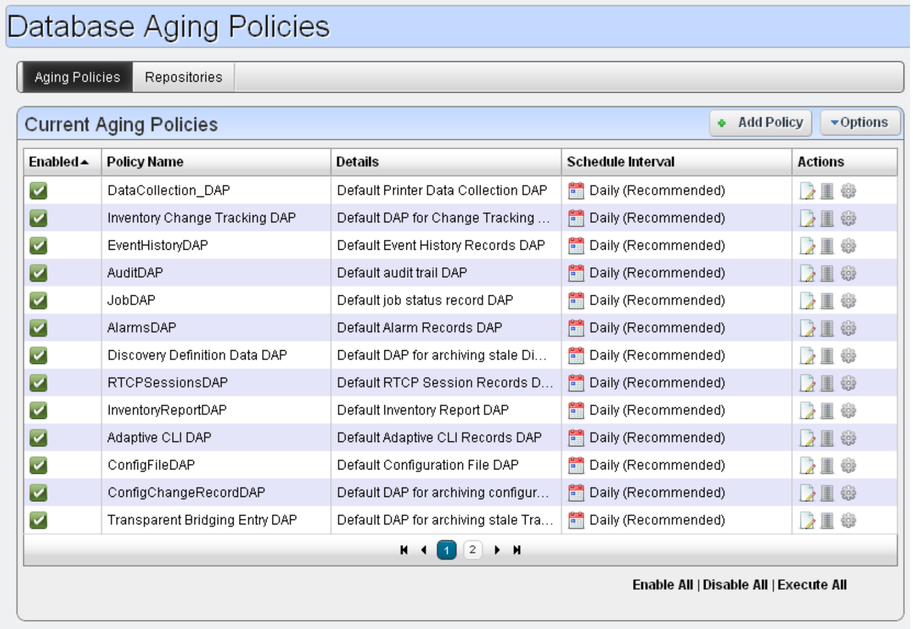
User Interface > Performance

This panel displays available options for Day and Minute Format in performance dashboards. The available options depend on the locale settings in the operating system running Dell OpenManage Network Manager. Select them in the pick lists that appear in this panel.

Redcell > Database Aging Policies (DAP)

Database Aging Policies prevent the Dell OpenManage Network Manager database from filling up by filling up by deleting old records. You can also save designated contents to an archive file on a specified cycle. Database Aging Policies configure which contents to archive, the archive location, and the configuration of that archive file.

To view and manage such policies, right click an item with them (for example, an alarm), or click *Manage > Control Panel*, and under *Redcell* click *Database Aging Policies*.



Database Aging Policies

Aging Policies | Repositories

Current Aging Policies

Add Policy | Options

Enabled▲	Policy Name	Details	Schedule Interval	Actions
✓	DataCollection_DAP	Default Printer Data Collection DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	Inventory Change Tracking DAP	Default DAP for Change Tracking ...	Daily (Recommended)	✎ 🗑 ⚙
✓	EventHistoryDAP	Default Event History Records DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	AuditDAP	Default audit trail DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	JobDAP	Default job status record DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	AlarmsDAP	Default Alarm Records DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	Discovery Definition Data DAP	Default DAP for archiving stale Di...	Daily (Recommended)	✎ 🗑 ⚙
✓	RTCPSessionsDAP	Default RTCP Session Records D...	Daily (Recommended)	✎ 🗑 ⚙
✓	InventoryReportDAP	Default Inventory Report DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	Adaptive CLI DAP	Default Adaptive CLI Records DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	ConfigFileDAP	Default Configuration File DAP	Daily (Recommended)	✎ 🗑 ⚙
✓	ConfigChangeRecordDAP	Default DAP for archiving configur...	Daily (Recommended)	✎ 🗑 ⚙
✓	Transparent Bridging Entry DAP	Default DAP for archiving stale Tra...	Daily (Recommended)	✎ 🗑 ⚙

1 2

Enable All | Disable All | Execute All

Policies appear in the *Aging Policies* tab of this screen, with columns that indicate whether the policy is *Enabled*, the *Policy Name*, *Details* (description), *Scheduled Intervals* and icons triggering three *Actions* (*Edit*, *Delete* and *Execute*). Notice that the bottom right corner of this page also lets you *Enable / Disable / Execute All* policies listed.

How To:

DAP Workflow

The following are steps typical for implementing DAP:

1. From the screen listing Database Aging Policies (DAP), click *Add Policy*, and select a policy from the displayed list of alternatives.
2. This opens Aging Policies Editor.
3. In the *Aging Policies > General* tab, specify the name, schedule interval, whether this policy is *Enabled*, and so on.
4. Specify the *Archive Location*. Those listed are the *Repositories* listed on the Repositories tab. You can manage those on that tab.

5 In the Aging Policies Options tab, specify either the archiving and retention you want, or further specify Sub-Policies that refine the items archived, and specify archiving and retention for those sub-policy elements. Which one you can specify depends on the type of DAP you are configuring.

6 Click *Apply* until the displayed screen is the DAP manager.

To View / Verify DAP

DAP archives information into the specified repository under the installation root. You can open archived .xml data with `dapviewer`. Launch this application from a command line after setting the environment with `oware` in Windows or `. ./etc/.dsienv` in Linux.

Archived data is deleted from Dell OpenManage Network Manager’s database. You can verify that by querying whether archived data still exist. You also can backup your database if you want to preserve records not yet archived.

How To:

Open an Archived in dapviewer.

1 First, make sure you have an archived file. One way to do this is to edit the Events DAP, make sure the archived events go to a directory you can access later, and retain them for zero days.

2 Manually run the Events DAP

3 Open a command shell. Type `oware` in Windows, or `. ./etc/.dsienv` in UNIX.

4 Type `dapviewer.`

5 Select the file with the ellipsis (...).

NOTE:

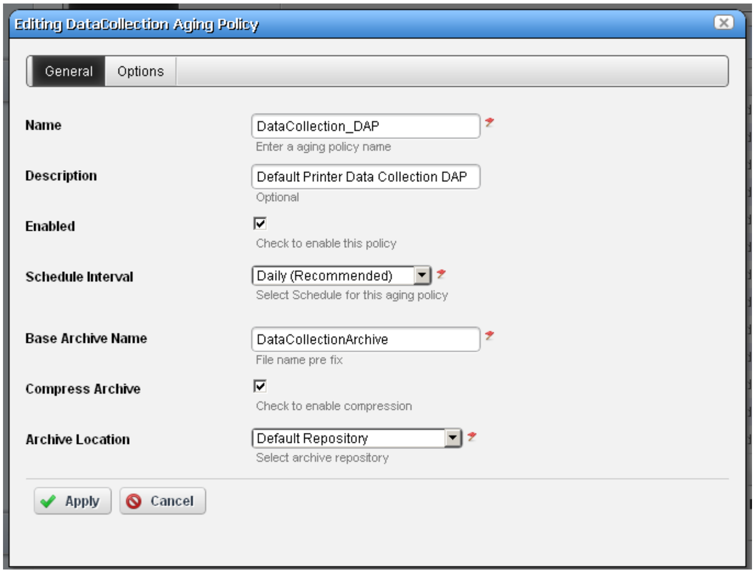
dapviewer opens both compressed and uncompressed files. It does not open empty files.

6 Click the *Load* button.

7 Examine the archived data.

Aging Policies Editor

When you click *Add Policy* in the upper right corner of the Redcell > Database Aging Policies (DAP) screen, first a selector appears where you can click on the kind of policy you want to create, then the editor appears. If you click the *Edit* icon to the right of a listed policy, the Aging Policies Editor appears with that policy's information already filled out, ready to modify.



Editing DataCollection Aging Policy

General | Options

Name: DataCollection_DAP
Enter a aging policy name

Description: Default Printer Data Collection DAP
Optional

Enabled: ☑
Check to enable this policy

Schedule Interval: Daily (Recommended)
Select Schedule for this aging policy

Base Archive Name: DataCollectionArchive
File name pre fix

Compress Archive: ☑
Check to enable compression

Archive Location: Default Repository
Select archive repository

The *General* screen has the following fields:

Name—An identifier for the policy

Description—A text description of the policy

Enabled—Check to enable the policy.

Schedule Interval—Use the pick list to select an interval. Once you have configured an interval here, you can re-configure it in the Schedules Portlet.

Base Archive Name—The prefix for the archived file.

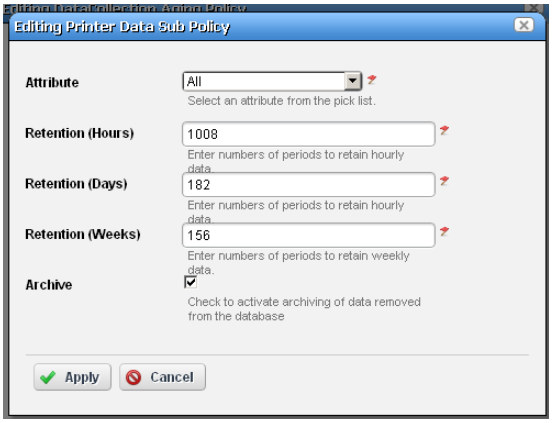
Compress Archive—Check to compress the archive file.

Archive Location—Select from the available Repositories in the pick list.

The contents of the *Options* tab depend on the type of DAP you are configuring. Typically, this tab is where you set the retention thresholds.

DAP SubPolicies

Some Options tabs include sub-policies for individual attribute retention.



Editing Printer Data Sub Policy

Attribute: All

Select an attribute from the pick list.

Retention (Hours): 1008

Enter numbers of periods to retain hourly data.

Retention (Days): 182

Enter numbers of periods to retain hourly data.

Retention (Weeks): 156

Enter numbers of periods to retain weekly data.

Archive: ☑

Check to activate archiving of data removed from the database

Click *Add SubPolicy* or click the *Edit* button to the right of listed policies to access the editor.

Editing Tips

Archiving options that appear in the Aging Policies Editor vary, based on type of policy selected. Inventory Change Tracking DAPs ask how long you would like to keep Config reports, Inventory Report DAPs ask how long you would like to keep your Historical Reports based on number of instances, days, and weeks, months or years.

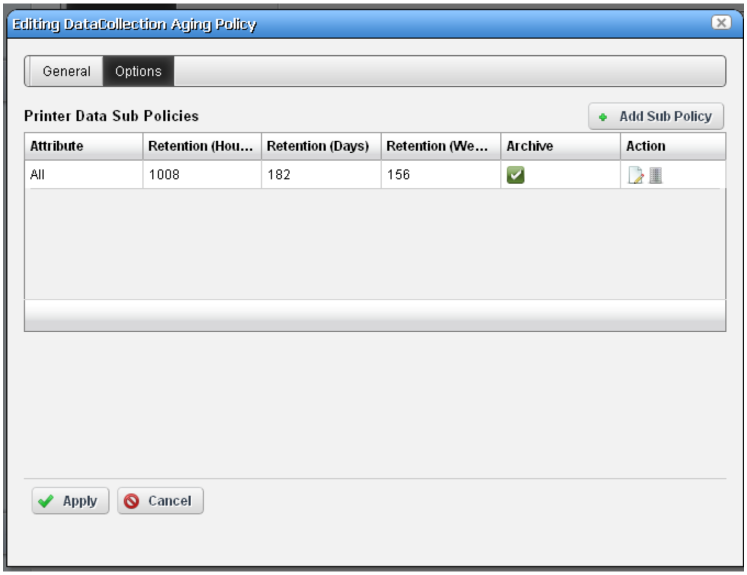
Set these thresholds in the *Options* tab. All DAPs require a Name and a record threshold. Check the *Enabled* checkbox to enable the policy.

DAPs run on a schedule. If the record threshold number is greater than or equal to the configured threshold then the DAP runs at the scheduled time. You may also manually click the gear icon to the right of a listed policy, and execute a DAP at any time to check that threshold figure. In either case, if the threshold is not crossed Dell OpenManage Network Manager creates no archives.

To verify when current DAPs are scheduled to run, open the Schedules portlet, and select the schedule on which it runs. For most DAPs, this is the Daily (recommended) DAP. Right-click to edit it. The Scheduled Aging Policies list should include all DAPs that have selected that schedule.

Aging Policies Options

The *Options* tab in this editor can vary, depending on the type of policy.



Editing DataCollection Aging Policy

Printer Data Sub Policies

Attribute	Retention (Hou...	Retention (Days)	Retention (We...	Archive	Action
All	1008	182	156	✓	

Fields can include the following:

Keep [Aged Item] for this many days—The number of days to keep the aged item before archiving it.

Archive [Aged Item]—Check this to activated archiving according to this policy.

Sub-Policies

Some types of Database Aging Policies can have sub-policies that further refine the aging for their type of contents.

These appear listed in the Aging Policies Options tab. Click *Add Sub Policy* to create them. Notice that you can *Edit* or *Delete* listed policies with the icons in the far-right *Action* column in this list.

Such sub-policies can contain the following types of fields:

Component—Select the component for the sub-policy from the pick list.

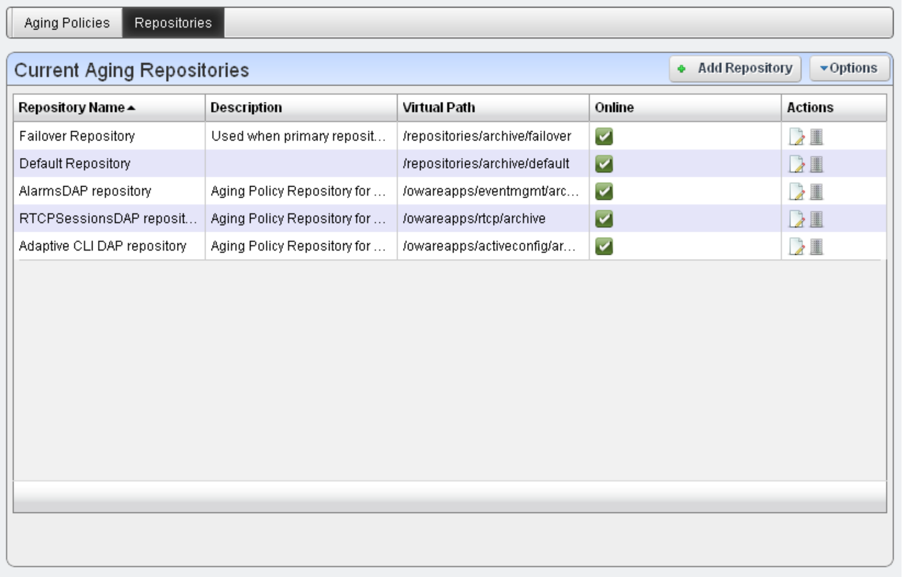
Action Type—This further sub-classifies the *Component*.

Retention (Days)—The number of days to keep the aged item before archiving it.

Archive—Check this to activated archiving according to this policy.

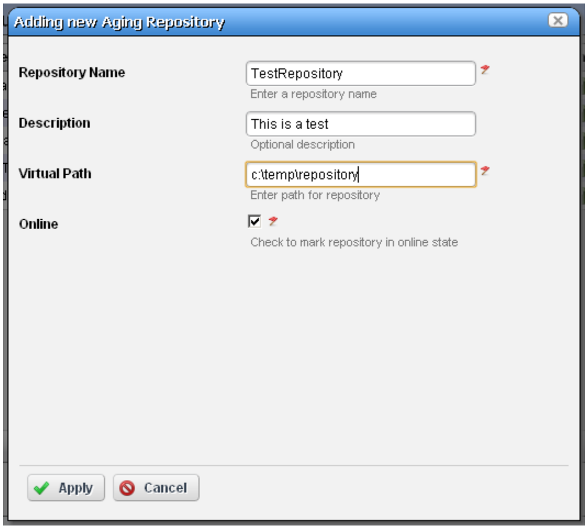
Repositories

When you select a repository in the Aging Policies Editor, the available policies come from what is configured in this tab of the editor.



Repository Name	Description	Virtual Path	Online	Actions
Failover Repository	Used when primary reposit...	/repositories/archive/failover	✓	
Default Repository		/repositories/archive/default	✓	
AlarmsDAP repository	Aging Policy Repository for ...	/owareapps/eventmgmt/arc...	✓	
RTCPSessionsDAP reposit...	Aging Policy Repository for ...	/owareapps/rtcp/archive	✓	
Adaptive CLI DAP repository	Aging Policy Repository for ...	/owareapps/activeconfig/ar...	✓	

Available repositories appear listed in the initial screen. Like the Aging Policies Editor, you can click *Add Repository* to create a new repository, and *Edit* or *Delete* selected, listed policies with the icons in the *Action* column. Notice the listed policies indicated whether the archiving destination is *Online* with a green icon (this is red, when the destination is offline).



Adding new Aging Repository

Repository Name: TestRepository
Enter a repository name

Description: This is a test
Optional description

Virtual Path: c:\temp\repository
Enter path for repository

Online: ☑
Check to mark repository in online state

When you *Add Repository* or *Edit* an existing one, the following fields appear in the editor:

Repository Name—An identifier for the archiving destination.

Description—A text comment.

Virtual Path—This is the path relative to the installation root directory. Any user with administrator permissions can specify or change the default archive path here.

Online—Check this to put this repository online.

Dell OpenManage Network Manager automatically writes to any configured failover repository if the primary repository is full or not writable.

NOTICE

To view any archived DAP file, use `dapviewer`. Type `oware` in a command shell, then, after pressing [Enter], type `dapviewer` to use this utility.

Database Backup

To back up your database, open a command shell (*Start > Run* `cmd`, in Windows), and then type the following at the prompt replacing USERNAME and owbusdb. By default, the database is `owbusdb`.

```
mysqldump -a -u USERNAME --password=[name] owbusdb > FILENAME.mysql
```

For example:

```
mysqldump -a -u oware --password=dorado owmetadb > owmetadb.mysql
```

If you have Performance monitors or Traffic Analyzer, you must also back up your stored procedures otherwise they do not get restored when you restore the database. The command line here adds `--routines`. For example:

```
mysqldump -a -u oware --password=dorado --routines owbusdb > owbusdb.mysql
```

This writes the owbusdb to a plain-text file called `FILENAME.mysql` (`owbusdb.mysql` in our examples). This file is a full backup with which you can fully restore your database in case of problems.

Defaults for the database are oware (login) and dorado (password). These are typically different from the login / password for the application.

NOTICE

To get a rough estimate of a database's size, looking at the size of the directory `\oware3rd\mysql\data.`

Restoring Databases

Restoring from `FILENAME.mysql` is a three step process. This occurs, again, in a command shell:

1 Drop the database:

```
mysqladmin -u USERNAME -p drop owbusdb
```

or

```
mysqadmin -u USERNAME --password=[password] drop owbusdb
```

2 Recreate the database

```
mysqladmin -u USERNAME -p create owbusdb
```

or

```
mysqadmin -u USERNAME --password=[password] create owbusdb
```

3 Import the backup data

```
mysql -u USERNAME -p owbusdb < FILENAME.mysql
```

or

```
mysql  -u USERNAME --password=[password] owbusdb < FILENAME.mysql
```

Here are the backup commands for all the Dell OpenManage Network Manager databases:

```
mysqldump -a -u root --password=dorado owbusdb > owbusdb.mysql
mysqldump -a -u root --password=dorado owmetadb > owmetadb.mysql
mysqldump -a -u root --password=dorado lportal > lportal.mysql
mysqldump -a -u root --password=dorado synergy > synergy.mysql
```

Portal Database Backup / Restore

The web portal itself has a MySQL database. Back it up as follows:

1 Open a command shell and type `oware.`

2 Then type the following command:

```
mysqldump -uroot --password=dorado lportal > mybackup.sql
```

3 The `mybackup.sql` file is the backup.

To restore the database, use another `oware` shell:

1 Drop the database:

```
mysqladmin -uroot --password=dorado drop lportal
```

2 Recreate the database

```
mysqladmin -uroot --password=dorado create lportal
```

3 Import the backup data

```
mysql -uroot --password=dorado lportal < mybackup.sql
```

Server

This portion of the *Control Panel* lets you manage the portal's web server, and maintain its smooth operation. Click the *Execute* buttons in this panel to do things like re-indexing the search indexes.

NOTICE

This panel is visible to administrators only, and contains helpful settings and resource information related to the server.

LDAP

You can integrate LDAP with your Dell OpenManage Network Manager installation in the Portal Settings > LDAP tabs. See LDAP Portal Settings for more about LDAP integration in addition to what follows. [1]

CAUTION:

Before enabling LDAP server in Portal, you must create and assign one user from LDAP server as Portal administrator. You will not be able to access control panel without administrator role. See How to:Make an LDAP Admin User on page 69 below for details.

[1] For more information about LDAP capabilities generally, consult Liferay's LDAP documents.

Make sure *Import at Startup* is turned off and in Password Policies, edit the default password policy and make sure that *Change Required* is off.

NOTICE

Notice that several test buttons appear in the LDAP screens, for example, *Test LDAP Connection*. Use these to validate your entries as you make them.

Click *Add* under LDAP Servers to add the specifications of your LDAP server. After configuring your LDAP server, restart the Dell OpenManage Network Manager server, and attempt to log in as an LDAP user.

LDAP Server Settings

The following settings are required (the values below are examples, only):

Connection

Base Provider URL : ldap://192.168.50.25:389

Base DN : dc=dorado-exchange,dc=oware,dc=net

Principal: dorado@dorado-exchange.oware.net

NOTE:

The Principal user must have the necessary administrator rights in Active Directory Server or any other LDAP server

Credentials: ********

Users

Authentication Search Filter:(sAMAccountName=@screen_name@)

Import Search Filter: (objectClass=person)

User Mapping

Screen Name: sAMAccountName

In the Portal Settings > Authentication > LDAP tab:

Authentication

Enabled

Import / Export

Import Enabled

Import on Startup Disabled

How To:
Make an LDAP Admin User

All users imported from an LDAP server default to the Poweruser role. The default Dell OpenManage Network Manager (login/password: admin/admin) cannot log into Dell OpenManage Network Manager once you enable authentication through LDAP. Therefore you must manually assign one user from the LDAP server as Portal administrator. Here is an example of an LDAP database user with Administrator privileges:

Screen name: ITAdmin

User password: ITPassword

First Name: Scott

Last Name: Smith

Email: scott@dellhardware.com

NOTE:

You cannot import users without these five attributes into Dell OpenManage Network Manager from an LDAP source.

Creating user ITAdmin with Administrator role:

1 As an Admin user, Go to > Control Panel.

2 Under the Portal category, click *Users*, then click the *Add* button.

3 Fill out the User form with name and email address and so on. Remember: screen name, first name, and email address are required. Dell OpenManage Network Manager LDAP import will not overwrite existing users.

4 When you are finished, click *Save*.

5 A message appears saying that the save was successful.

6 Select the *Password*, enter password: ITPassword then click *Save*.

7 Click the *Roles* link. A screen appears showing the roles to which your ID is currently assigned. By default, all users are assigned the Power User role.

8 Remove the default PowerUser role (optional), and add the administrator role for the user, then click *Save*.

Now you can enter LDAP server information. Please be patient, your changes may take a while to take effect.

Stopping LDAP Authentication

1 To stop authenticating through LDAP, log in as the admin user with ITAdmin/ITPassword.

2 In control panel go to Portal > Portal Setting > Authentication > LDAP and uncheck the *Enabled* then *Save*.

3 After your changes have taken effect, Users can login only with credentials that exist on the Dell OpenManage Network Manager database

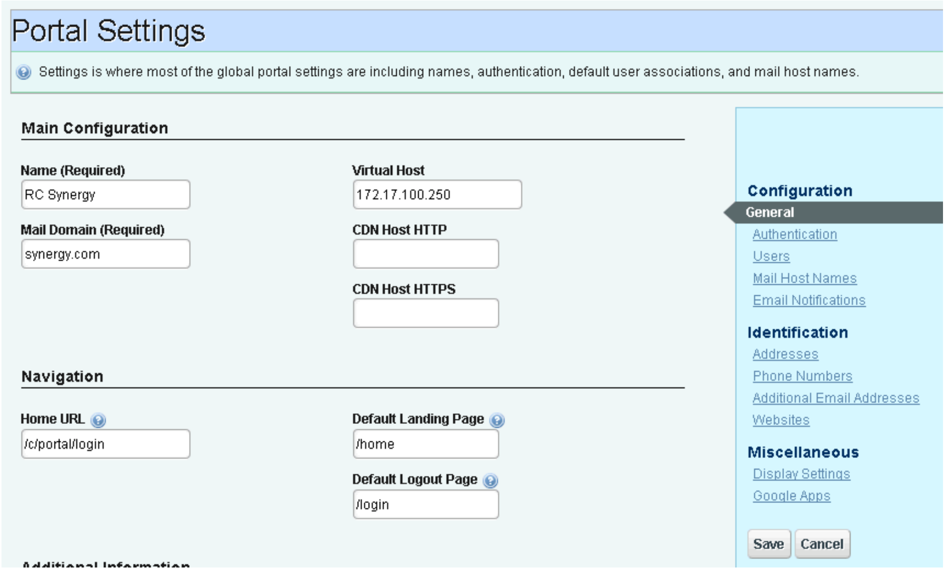
LDAP Portal Settings

To use LDAP, you must make some adjustments to your Dell OpenManage Network Manager installation. You must configure the following additional settings in the *Authentication* panel of Portal > Portal Settings in Control panel. This has two tabs:

- General
- LDAP

General

Fill in the *General* panel. The *Home URL* must be `/c/portal/login`.



Portal Settings

Settings is where most of the global portal settings are including names, authentication, default user associations, and mail host names.

Main Configuration

Name (Required): RC Synergy

Virtual Host: 172.17.100.250

Mail Domain (Required): synergy.com

CDN Host HTTP:

CDN Host HTTPS:

Navigation

Home URL: /c/portal/login

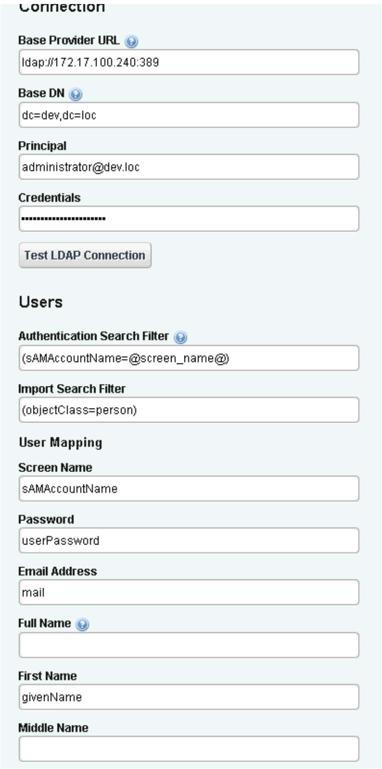
Default Landing Page: /home

Default Logout Page: /login

Additional Information

LDAP

In the LDAP tab of the Authentication screen, check the *Enabled* checkbox, then click *Add* under *LDAP Servers* and fill in that screen as appropriate.



Connection

Base Provider URL: ldap://172.17.100.240:389

Base DN: dc=dev,dc=loc

Principal: administrator@dev.loc

Credentials: ••••••••••••••••••••••

Users

Authentication Search Filter: (sAMAccountName=@screen_name@)

Import Search Filter: (objectClass=person)

User Mapping

Screen Name: sAMAccountName

Password: userPassword

Email Address: mail

Full Name:

First Name: givenName

Middle Name:

Configuring Pages and User Access

The following describes adding pages to your Dell OpenManage Network Manager installation, and configuring Role-based User Views. This is a way to manage user access to Dell OpenManage Network Manager's features in a more complex environment. This consists of the following configuration levels:

- Page Level Permissions
- Portlet Level Permissions
- Configure Resource Level Permissions

Pages display portlets in the following ways:

Summary / Minimized Mode

Any portlet's that have the *Settings* toolbar option (Filters and Max Results) can save/toggle the Current Filter, Max Results, Max Items Per Page, and column choices. See Portlet Toolbar on page 103.

NOTE:

The Max Results settings for summary portlets differ from those for maximized / expanded portlets.

If you are an Admin and are on the Main portal site, Dell OpenManage Network Manager saves these permanently. If you are a REGULAR user they are only saved temporarily unless the portlet is on your personal Public/Private pages. See Public / Private Page Behavior on page 48 for details.

Maximized / Expanded Mode

The *Settings* button in expanded portlets lets you configure displayed columns and their order, and the number of items to display. If the number of items in a list exceeds the maximum specified, a *[limit reached]* message appears next to the number of items listed in the bottom right corner of the page.

NOTICE

For large list, filters are a more efficient use of computing resources than large maximum settings. See How to: Filter Expanded Portlet Displays on page 108 for more about configuring filters.

Page Level Permissions

This level provides permission for a user/group/role/organization on a defined Dell OpenManage Network Manager page.

How To:

Create new Users:

1 As an admin user, go to the Control Pane

2 Under the Portal category, click *Users and Organizations*, then click the *Add > User* menu item.

3 Fill out the User form with name and email address and so on.

4 When you are finished, click *Save*.

5 A message appears saying that the save was successful.

NOTE:

The expanded form lets you fill out more information about the user.

6 Select the Password, enter password for the user and click *Save*.

7 Click the *Roles* link. A screen appears showing the roles to which your ID is currently assigned. By default, all users are assigned the Power User role, and to the role User.

8 (You may want to do this step after configuring roles. See Add and Configure User Roles / Permissions on page 50.) Remove the default PowerUser role, and add the appropriate new role for the user with the *+Select* link, then click *Save*. You can optionally fill out other details later.

9 In Control Panel's Redcell > Permission Manager, remove any permissions from the User role you do not want the user to have.

How To:

Create a new Page and Rearrange Pages

1 As an admin user, from the portal, not control panel, click *Add > Page*. That creates a new page with a blank title in the doc. Name, then click on that page to see it.

2 Click *Manage > Page* to reconfigure it, add child pages, and so on.

3 An editor appears that lets you further configure the page.

Click the triangles on the left to expand the tree of pages in this schematic.

4 To re-arrange the pages in the portal, drag-and-drop them in the tree on the left.

5 When the page is configured as desired, click *Save* and then click the X in the upper right corner of this editor. Your page should appear in the portal after you refresh it.

6 Click the page label to open any new page, and click *Add > Applications* to add portlets to that page. You can also drag and drop the portlets within the page to rearrange them. The applications under the *Portal* node are open source, and not documented here. The rest are Dell OpenManage Network Manager-connected, and are documented in this guide.

NOTICE

Use the *Search Applications* field at the top of the *Add > Applications* menu to find portlets nested within that menu's categories. The *Portal Applications* and *Global* categories includes generic portlets; the remaining categories are for Dell OpenManage Network Manager portlets.

How To:

Restrict Pages for a User

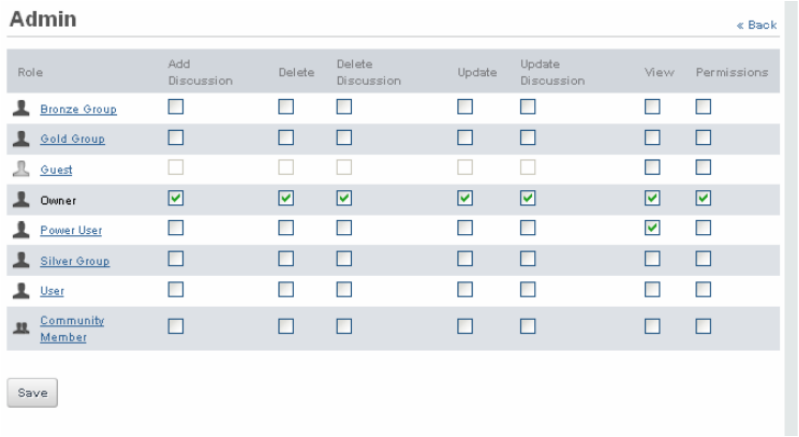
1 As an admin user click *Manage > Page*.

2 Expand the Page Layout tree. This represents the page layout as seen in the portal.

3 Select a page where you want to restrict access.

4 Click on the *Permissions* button at the top.

5 Uncheck the *View* permission for Guest and Community members. Make sure Owner and PowerUser can still view the page.



Admin

« Back

Role	Add Discussion	Delete	Delete Discussion	Update	Update Discussion	View	Permissions
Bronze Group	□	□	□	□	□	□	□
Gold Group	□	□	□	□	□	□	□
Guest	□	□	□	□	□	□	□
Owner	☑	☑	☑	☑	☑	☑	☑
Power User	□	□	□	□	□	☑	□
Silver Group	□	□	□	□	□	□	□
User	□	□	□	□	□	□	□
Community Member	□	□	□	□	□	□	□

Save

6 Now select *View* for any other roles you want to give access.

7 Click *Save*.

8 You can log out and log back in as the new user. That the user should not be able to see restricted pages.

Portlet Level Permissions

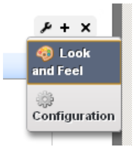
You can also provide permission for a user/group/role/organization on a defined portlet.

How To:

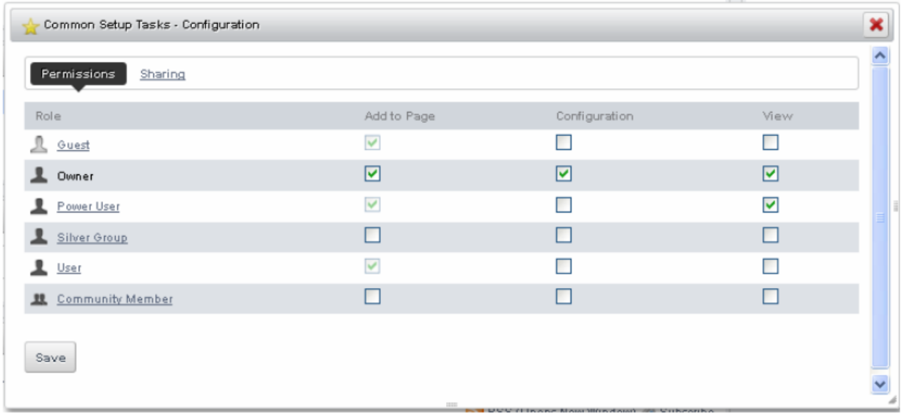
Configure Portlet Permissions

1 As an admin user, click on the Configuration icon (the wrench) in the top right corner of the portlet of interest.

2 Click on the *Configuration* and go to the Permissions tab in the next screen.



3 Uncheck the View permission for Guest and Community members. Make sure Owner and PowerUser still have View permissions.



Role	Add to Page	Configuration	View
Guest	☑	□	□
Owner	☑	☑	☑
Power User	☑	□	☑
Silver Group	□	□	□
User	☑	□	□
Community Member	□	□	□

4 Now check View for the relevant roles (for example, *Silver* Group).

5 Click *Save*.

6 You should now be able to log out as admin, and log in as Guest or other community members and confirm you cannot view the portlet you just configured.

How To:

Configure Resource Level Permissions

You can provide permission for a user/group/role/organization on a defined resource. The following outlines the steps:

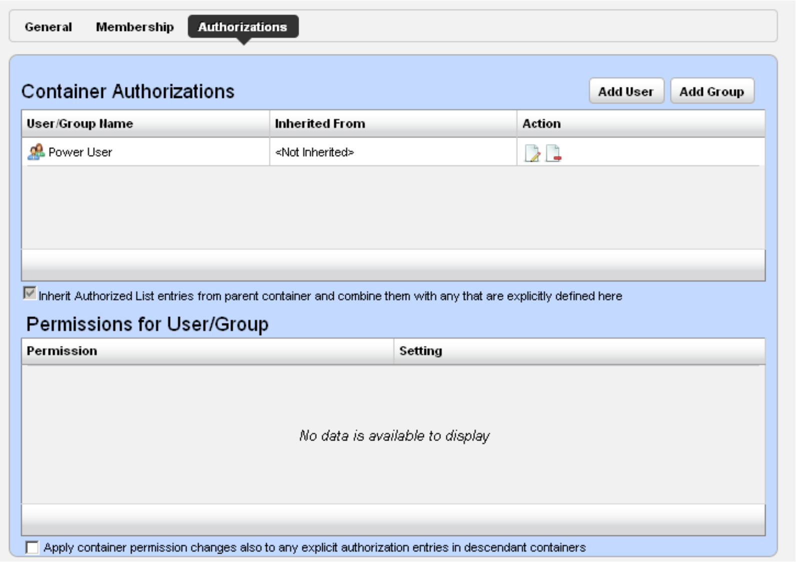
- Create a Container for each Customer
- Configure Membership for Container (resources that customer can access)
- Set Authorization for User Container
- Set up a Page for Device Level View

Create a Container for each Customer

1 In Container Manager Portlet, right-click to select *New*.

2 Create a container for the desired customer, naming and describing it.

3. In the *Authorizations* tab for this container, delete authorization for ALL (non-portal), Add authorization for Synergy Admin, Add authorization for Power User Role, and delete the *Vendors* Child Container.



Container Authorizations

User/Group Name	Inherited From	Action
Power User	<Not Inherited>	

☑ Inherit Authorized List entries from parent container and combine them with any that are explicitly defined here

Permissions for User/Group

Permission	Setting

No data is available to display

☐ Apply container permission changes also to any explicit authorization entries in descendant containers

Configure Membership for Container

4. Create Gold Customer as a Top Level Container.
5. Make it Shared, and configure its membership (Select and Add a group of devices)

Set Authorization for User Container

6. In the Authorizations tab, Add Gold Customer (with limited permission), and User Synergy Admin (with full permission).
7. Delete Group: User
8. Create a Gold Customer user as described above.

Set up a Page for Device Level View

9. Add a Container View to the page of interest with portlets for which you want to restrict access. Currently Container View is enabled for the following portlets: Managed Resources, Alarms, Ports, Audit Trails, Printers.
10. Log out as admin, and log back in as a user with Gold Customer permissions.
11. Confirm your permission configuration is operating on this page.

Quick Navigation

The Quick Navigation portlet lets you quickly perform some basic tasks:

Resource Discovery—Discover devices in your network with the Quick Discovery defaults, or lets you construct a Quick Discovery profile if none exists. See Resource Discovery on page 180 for details.

Link Discovery—After you have discovered resources, this discovers their connections. See Link Discovery on page 208.

Backup Config Files—This lets you back up discovered devices' configuration files. Before you can use this feature, you must have servers configured as described in Netrestore File Servers on page 90. See also File Management on page 271.

OS Image Upload—Upload firmware updates for devices. See Firmware Image Editor on page 283 for more about these capabilities.

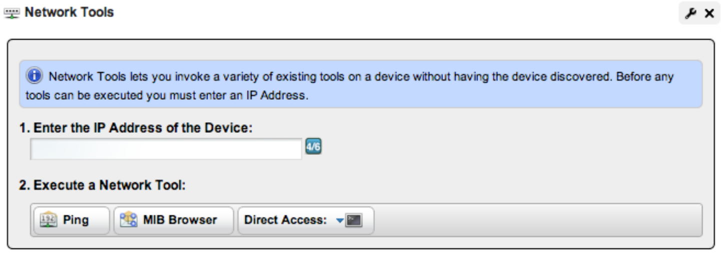
Deploy OS Image—This deploys firmware updates. To deploy images, you must have File Servers configured, as described above for Backup. See Deploy Firmware on page 287.

License Management—This lets you see and manage the licensed capabilities of Dell OpenManage Network Manager. See License Viewer below for details.

Admin user and Power User can see all the above menu items. The User role sees only sees four. Link discovery and OS image upload do not appear by default. To see them, you must give User 'write' permission.

Network Tools

The Network Tools portlet lets you invoke a variety of existing functions on a device without having the device currently discovered. When installed, the Network Tools application appears listed as an available Application to install as a portlet.



Network Tools

Network Tools lets you invoke a variety of existing tools on a device without having the device discovered. Before any tools can be executed you must enter an IP Address.

1. Enter the IP Address of the Device:

2. Execute a Network Tool:

Before you can use the tools you must enter an ip address in the ip address field. Once you have entered that address, 7you can use the following:

- Ping Tool
- MIB Browser Tool

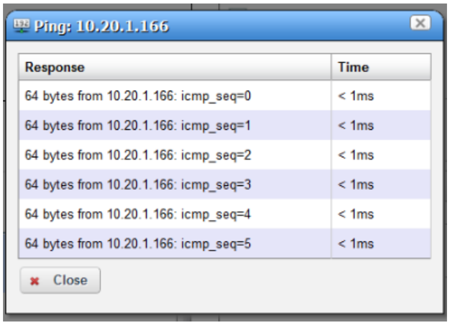
- Direct Access Tool

NOTICE

If you want to restrict access for some users so they do not automatically log in with direct access, then remove direct access permissions for users, and use Network Tools for direct access.

Ping Tool

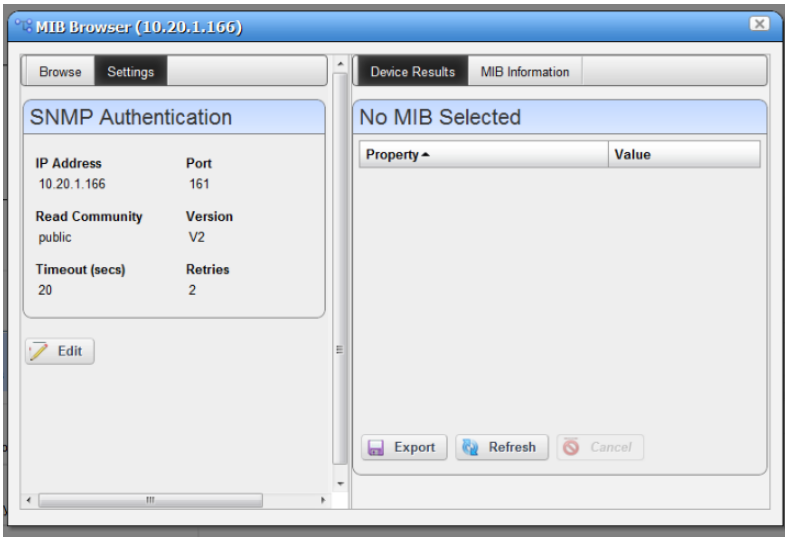
The second button is the Ping tool, which pings the selected device.



Response	Time
64 bytes from 10.20.1.166: icmp_seq=0	< 1ms
64 bytes from 10.20.1.166: icmp_seq=1	< 1ms
64 bytes from 10.20.1.166: icmp_seq=2	< 1ms
64 bytes from 10.20.1.166: icmp_seq=3	< 1ms
64 bytes from 10.20.1.166: icmp_seq=4	< 1ms
64 bytes from 10.20.1.166: icmp_seq=5	< 1ms

MIB Browser Tool

The first button displays the MIB browser with default SNMP settings. You can edit the settings to match the SNMP settings for the device and save them. The next time Network Tools invokes the MIB browser, it defaults to your previous settings.



SNMP Authentication

IP Address: 10.20.1.166
Port: 161
Read Community: public
Version: V2
Timeout (secs): 20
Retries: 2

No MIB Selected

Property	Value

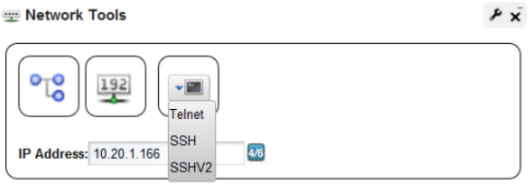
Once you are done editing the SNMP settings, click *Save*. Click the *Browse* tab to look through available MIBs as you would ordinarily do in MIB browser. See MIB Browser on page 214 for more about using the MIB browser. You can also browse MIBs in the attribute selection panel for the SNMP monitor. See SNMP on page 323.

NOTE:

MIB file locations are subject to change without notice, but generally are under the owareapps/[application name]/mibs directory for different application modules.

Direct Access Tool

The third button on the Network Tools portlet toolbar opens the Direct Access tool. It provides a command line interface terminal for Telnet, SSH and SSH V2 access to the device.



IP Address: 10.20.1.166

Click and select the type of direct access you want.

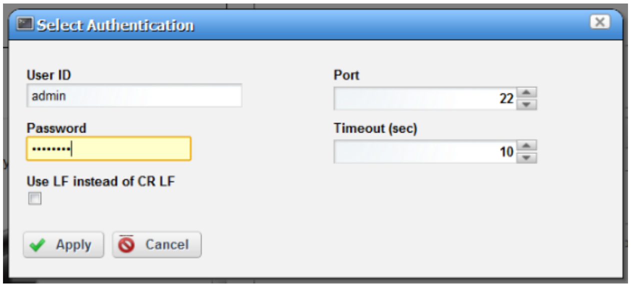
- Direct Access - Telnet
- Direct Access - SSH / SSH V2

Direct Access - Telnet

Telnet direct access connects to the device with telnet and displays the terminal session. You must login to the device manually. See Direct Access on page 213 for more about using this form of device access.

Direct Access - SSH / SSH V2

Direct Access for SSH or SSH V2 first prompts for a user name and password.


Select Authentication

User ID: admin

Port: 22

Password: ••••••••

Timeout (sec): 10

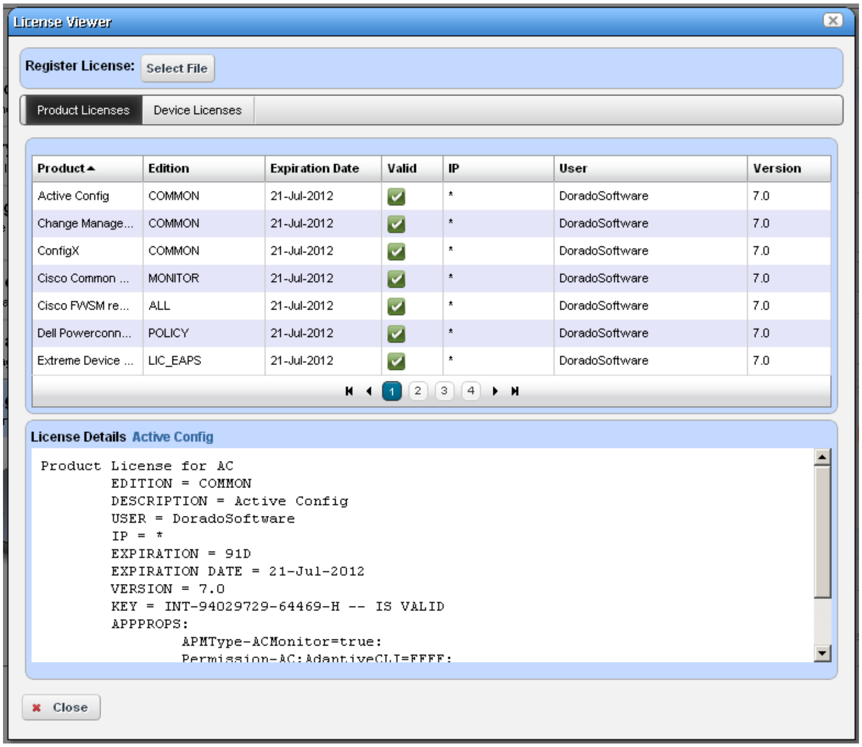
Use LF instead of CR LF
□

The *Use LF instead of CR LF* checkbox suppresses carriage returns when you click Enter key. This is necessary for some devices (for example: some Dell Power Connect devices).

Once you log in, Dell OpenManage Network Manager attempts to connect with SSH or SSH V2 using the user id and password provided. Some Dell Power Connect devices do not log when connected and prompt you to enter the user and password again.

License Viewer

This screen appears when you click *License Management* in the Quick Navigation portlet.



Product	Edition	Expiration Date	Valid	IP	User	Version
Active Config	COMMON	21-Jul-2012	✓	*	DoradoSoftware	7.0
Change Manage...	COMMON	21-Jul-2012	✓	*	DoradoSoftware	7.0
ConfigX	COMMON	21-Jul-2012	✓	*	DoradoSoftware	7.0
Cisco Common ...	MONITOR	21-Jul-2012	✓	*	DoradoSoftware	7.0
Cisco FWSM re...	ALL	21-Jul-2012	✓	*	DoradoSoftware	7.0
Dell Powerconn...	POLICY	21-Jul-2012	✓	*	DoradoSoftware	7.0
Extreme Device ...	LIC_EAPS	21-Jul-2012	✓	*	DoradoSoftware	7.0

License Details Active Config

```
Product License for AC
        EDITION = COMMON
        DESCRIPTION = Active Config
        USER = DoradoSoftware
        IP = *
        EXPIRATION = 91D
        EXPIRATION DATE = 21-Jul-2012
        VERSION = 7.0
        KEY = INT-94029729-64469-H -- IS VALID
        APPPROPS:
                APMType-ACMonitor=true:
                Permission-AC:AdaptiveCLI=FFFF:
```

Click *Close* to return to Dell OpenManage Network Manager. You may find Licenses in a name slightly different from the one you expect. For example, the *Reports* portlet is licensed as part of the Inventory Manager product.

License Expiration Warning Alarms

OpenManage Network Manager includes a critical event/alarm warning of a possible license expiration (emsAppServerLicenseWillExpireSoon). In typical packages, this alarm first appears 14 days from license expiration, then recurs daily. The alarm’s message changes to indicate how many days remain. Once expiration occurs, you can still log into OpenManage Network Manager, but portlets are disabled. Contact your sales representative to update or extend your license.

How To:

Register a License

To register a license click the *Select File* button at the top, and use the subsequent screen to select a license file.

NOTICE

To import a license when application server is not running, type `oware` then `licenseimporter [license file path]` on a command line.

You must restart application server or wait up to 15 minutes before a license modification takes effect.

Product Licenses

This portion of the License Viewer lists the products for which you have licenses already, displaying the *Product*, *Edition*, *Expire Date*, whether the license is *Valid*, any *IP* restrictions, the *User* who installed the product and/or license, and the *Version* of product for which the license is valid.

License Details: [Product]

This portion of the screen displays the details of a license selected in the *Registered Product Licenses* portion of the License Viewer screen. It is blank if you have not selected a license in the list above this panel.

Device Licenses

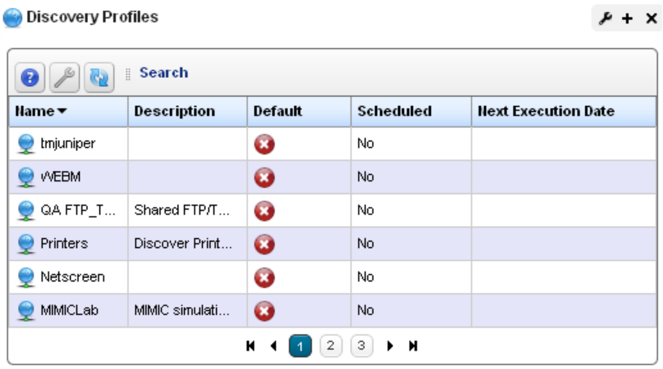
This tab displays the *Maximum Allowed* number of devices, the *Count Managed* the *Variance* between maximum and managed, and *Type* of license, along with sums of the maximum and count managed.

Discovery Profiles

Discovery profiles configure equipment discovery for Dell OpenManage Network Manager.

The summary view displays the *Name*, *Description*, *Default* (the green check indicates the default profile), whether the profile is *Scheduled* and *Next Execution Date* for scheduled discovery.

The Expanded portlet adds a Reference Tree snap panel that displays a tree of associations between selected profiles and authentication and tasks that they execute. See Discovery Profiles on page 181 for more about this portlet.



Name	Description	Default	Scheduled	Next Execution Date
tmjuniper		✗	No	
WEBM		✗	No	
QA FTP_T...	Shared FTP/T...	✗	No	
Printers	Discover Print...	✗	No	
Netscreen		✗	No	
MIMICLab	MIMIC simulati...	✗	No	

NOTICE

The date format follows the operating system's conventions for the location and language selected. Restarting the system changes system menus to the new language. If you want to revert back to the original language in Linux, you may also need to update the cache file under `/var/cache/gdm`.

How To:

Discover Your Network

1 Right click the Discovery Profiles list and select *New*.

NOTE:

If you have a multitenant environment, you can create

2 The Discovery Profile Editor appears, with a step-by-step set of screens to configure resource discovery. You can navigate through it by clicking the screen tab names at the top, or by clicking the *Next* button at the bottom of the page.

Discovery Profile Editor

Use this editor to configure discovery once you have started Discover Your Network. Baseline discovery is the initial discovery to compare to later discoveries. Follow these steps to discover equipment on your network:

General

3 **General Parameters**—Set the *Name*, *Description* and whether this profile is the baseline default.

4 **Profile Options**—Select the *Device Naming Format* (how the device appears in lists, once discovered), whether to *Manage by* IP address or hostname, and check whether to *Resolve Hostname(s)*, *ICMP Ping Device(s)*, *Manage ICMP-only Device(s)*, or *Manage Unclassified Device(s)*. This last checkbox determines whether Dell OpenManage Network Manager attempts to manage devices that have no device driver installed. Management may be possible, but more limited than for devices with drivers installed, provided this capability is one you have licensed.

NOTE:

Some packages disable ICMP ping by default.

The Filters (by *Location*, *Vendor*, or *Device Type*) let you narrow the list of devices discovered by the selected item(s). As the screen says, this filtering will not have any impact on the processing that occurs during the Inspection step.

Make sure you *Save* profiles you alter, or these selections have no impact when you execute discovery.

Network

5 After you click *Next*, the *Network* screen appears.

Network Type and Addresses—Select the type of entry in the pick list (*IP Address(es)*, *CIDR Address*, *Hostname*, *SNMP Broadcast*, *Subnet*).

NOTICE

You can specify an IP Address range by separating the beginning and end with a dash. For example: 192.168.1.1 - 192.168.1.240.

The tooltips in the data entry field describe what valid entries look like.

6 **Authentication**—You can *Create new*, or *Choose existing* authentications. (See Discovery Profiles on page 181 for details.) Notice that authentications appear with *Edit* / *Delete* icons and *Up* / *Down* arrows on their right. The *Up* / *Down* arrows order authentications, so Dell OpenManage Network Manager tries the top authentication first, then the next, and so on. If you have an authentication like
`admin/abc` and one that is identical with an enable-level login / password (`admin/abc/enable/enable`), make sure the enable authentication appears first in the list, otherwise, you will discover the device, but not access its enable functionality.

CAUTION:

If you do not get to the correct level of authentications—for example the “enable” user—then Dell OpenManage Network Manager’s full functionality is not available.

The *Edit* icon opens the authentication editor. Click the arrows to arrange the order in which credentials are tried (top first). Ordering only applies when two credentials are of the same type.

Actions

7 You can configure Actions to run as part of discovery. By default, the actions screen includes the *Resync* action. Use *Add Action* to select others to enter here. You can also edit parameters (if available), delete and re-order the actions listed here by clicking the icons to the right of them. Dell OpenManage Network Manager executes them in top-to-bottom order.

By default discovery now automatically updates monitor targets with discovered equipment. For example, if you have a monitor targeting the dynamic All Dell Devices group, and discover a Dell device, discovery automatically adds the discovered device to the monitor's target list.

Device discovery initiated by web services does not require an existing discovery profile, however, if a default discovery profile exists, then discovery initiated by web services uses it. If you have updated your system, you must add the Refresh Monitor Targets action to any existing discovery profiles you have created before this default behavior occurs in upgraded discovery profiles.

You can change this default by changing the settings in the `/owareapps/redcell/lib/redcell.properties` file's `redcell.discovery.taskactivity.order` property.See also Refresh Monitor Targets for Newly Discovered Devices on page 329

Inspection

8 **Inspect Network using your current settings**—This screen lets you preview the discovery profile's actions and access to devices. If you clicked *Next* rather than *Inspect* at the bottom of the previous screen, click *Start Inspection* to begin the inspection process for selected authentications that validates the device's credentials.

Notice that the *Inspection Status* fields below listed authentications indicates the success or failure of ping (if not disabled), Hostname resolution, and the listed Authentications.

If the device does not match all required authentications, you can click the *Fix it* icon (a wrench with a red or yellow dot) to edit them for the selected device. You can also click *Test Device*, *Create New*, or *Choose Existing* authentications while in the editor clicking the *Fix it* icon displays the authentication selection panel. The yellow dot on the *Fix it* icon means an optional authentication is missing. A red dot means a required one is missing.

When authentications are unsuccessful, you can remove or edit them in this editor too. Click the icons to the right of listed authentications to do this.

When they test successfully, the authentications appear in a nested tree under the *Discover* checkbox (checked when they test successfully).

9 **Save—**Click *Save* to preserve the profile. You can then right-click it to select *Execute* and begin discovery. If you select *Execute* from the profile editor, Dell OpenManage Network Manager does not save the profile to execute later.

Results

10 **Execute**—Clicking *Execute* begins discovery, confirm you do not mind waiting, and the message traffic between Dell OpenManage Network Manager and the device appears on the *Results* screen.

This is a standard *Audit* screen. See Audit Trail / Jobs Screen on page 114 for more about it.

11 A message (*Discovery Profile Execute is complete*) appears in the *Messages* at the bottom left of the status bar.

NOTICE

You can also schedule discovery profiles to run periodically, updating your Dell OpenManage Network Manager database with any network changes. For more, see Schedules on page 118.

12 The devices in your network now appear in the Managed Resources portlet, and elsewhere (in Topology, for example).

See Discovery Profiles on page 181 for more about these capabilities.

NOTE:

Dell OpenManage Network Manager automatically adds discovered devices to the default ICMP monitor.

Incomplete Discovery

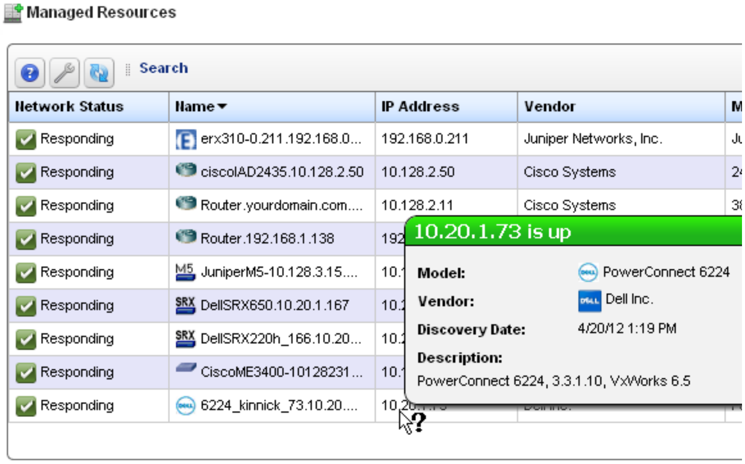
If the device is detected and responds to ping, but does not respond to Dell OpenManage Network Manager actions (for example: Adaptive CLI), you may have only partially discovered it. Right-click the device in the Managed Resources portlet and select *Direct Access > Telnet*. If that menu option does not exist, it is only partially discovered. Right-click to edit the device, and add a Telnet Management Interface and Authentication in those two tabs of the editor.

Managed Resources

This portlet displays all the devices you have discovered.

See Managed Resources on page 195 for the details of this screen's capabilities.

See also Managed Resource Groups on page 190.



Managed Resources

Search

Network Status	Name ▾	IP Address	Vendor	M
✓ Responding	erx310-0.211.192.168.0....	192.168.0.211	Juniper Networks, Inc.	Ju
✓ Responding	ciscoIAD2435.10.128.2.50	10.128.2.50	Cisco Systems	24
✓ Responding	Router.yourdomain.com....	10.128.2.11	Cisco Systems	38
✓ Responding	Router.192.168.1.138	192		
✓ Responding	JuniperM5-10.128.3.15....	10.1		
✓ Responding	DellSRX650.10.20.1.167	10.2		
✓ Responding	DellSRX220h_166.10.20...	10.2		
✓ Responding	CiscoME3400-10128231...	10.1		
✓ Responding	6224_kinnick_73.10.20....	10.2		

10.20.1.73 is up

Model: PowerConnect 6224

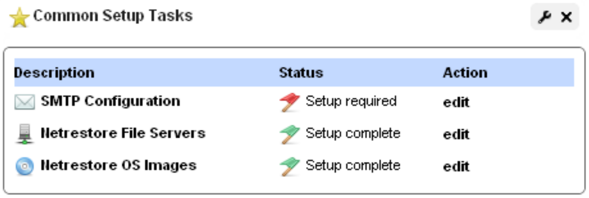
Vendor: Dell Inc.

Discovery Date: 4/20/12 1:19 PM

Description:
PowerConnect 6224, 3.3.1.10, VxWorks 6.5

Common Setup Tasks

By default this portlet usually appears on the first page after you sign in. If your package does not display it on that page, you can click *Add > Applications* and put it there. This portlet reminds you of the following common tasks:



Common Setup Tasks

Description	Status	Action
SMTP Configuration	Setup required	edit
Netrestore File Servers	Setup complete	edit
Netrestore OS Images	Setup complete	edit

- SMTP Configuration
- Netrestore File Servers
- Netrestore Image Repository

A red flag appears with the "Setup required" message in the *Status* column when these are not configured. Configuring them displays a green flag with the "Setup complete" message. Click the *edit* link in the *Action* column to open editors for each of these.

Password Reset

You can reset a user's password two ways. One is to login as admin and change the user's password in Portal Settings > Users and Organizations. For additional information please refer to Portal > Users and Organizations on page 44.

For the second method, users themselves can request an email be sent to them with instructions to set a new password. Follow the steps below.

1 Login fails. At the bottom of the login screen is the Forgot Password link.

2 A prompt appears for user to enter a Screen Name.

3 A prompt appears to enter the answer to the reminder question (their Father's middle name) that they set when logging in the first time.

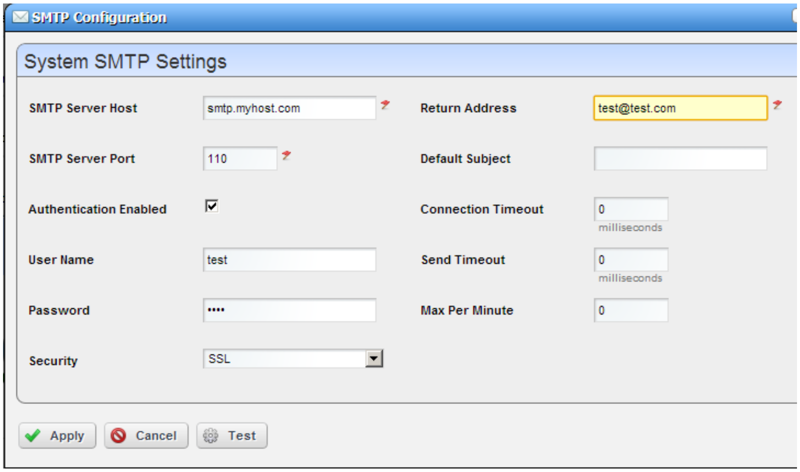
4 After entering the correct answer for their account, Dell OpenManage Network Manager sends an email to the user’s email address. E-mail for password reminders / resets requires setting up the fields in Control Panel > Server Administration > Mail, not the SMTP Configuration which is for Dell OpenManage Network Manager-originated e-mails.

After entering an incorrect answer, a request failed screen appears, with another chance for entering a correct answer.

5 The e-mail provides a link where the user can enter a new password and confirm it.

SMTP Configuration

You can use Dell OpenManage Network Manager’s messaging capabilities to communicate with other users, but if you want to receive e-mails automated by actions like configuration file backups, Dell OpenManage Network Manager must have a mail account. This screen configures the e-mail server so Dell OpenManage Network Manager can send such automated e-mails.



SMTP Server Host	smtp.myhost.com	Return Address	test@test.com
SMTP Server Port	110	Default Subject	
Authentication Enabled	☑	Connection Timeout	0 milliseconds
User Name	test	Send Timeout	0 milliseconds
Password	••••	Max Per Minute	0
Security	SSL		

The *Apply* button accepts your edits. *Test* tries them. *Cancel* abandons them and returns to Dell OpenManage Network Manager. This screen contains the following fields:

SMTP Server Host—The IP address or hostname of your SMTP server.

SMTP Server Port—The port for your SMTP server (110 is typical).

Authentication Enabled—Check this to enable authentication for this server. Checking enables the next two fields.

User Name—The login ID for the SMTP server, if authentication is enabled.

Password—The password for the SMTP server, if authentication is enabled.

Security—Enable Secure Sockets Layer (SSL) protocol to interact with your SMTP server, or Transport Layer Security (TLS).

Return Address—The return address for mail sent from Dell OpenManage Network Manager.

Default Subject—Text that appears by default in the subject line of mail sent by Dell OpenManage Network Manager.

Connection / Send Timeout—The time-outs for mail sent by Dell OpenManage Network Manager. If your SMTP server or network is slow, increase the default timeout.

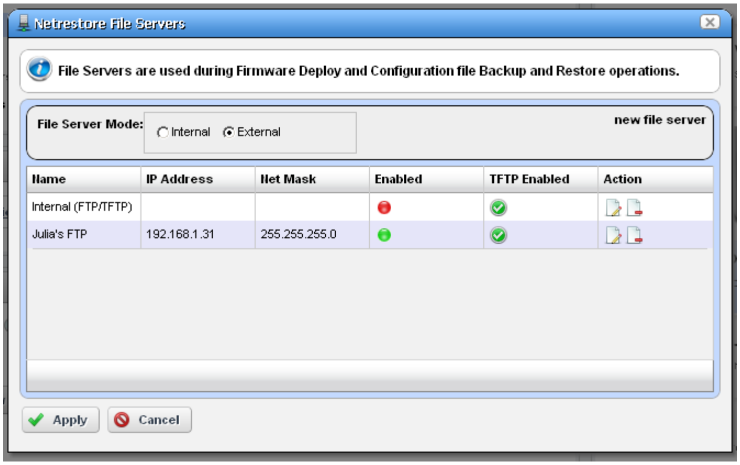
Max Per Minute—The maximum number of e-mails Dell OpenManage Network Manager can send per minute.

Two settings for e-mail servers appear in Control Panel, one in the Control Panel > Portal > Settings Mail Host Names edit screen, and another in Control Panel > Server Administration > Mail. These are for Liferay login and password reminders / resets (see Password Reset on page 87). The Portal-based e-mail settings help Administrators limit signups to e-mails only existing in their organization. The screen in that panel provides a list of allowed domain names, if that feature is enabled.

Control Panel > Server Administration > Mail is where to configure the Main server and authentication for routing mail

Netrestore File Servers

The Netrestore file servers provide FTP connections for retrieving and deploying devices' configuration files, and for deploying firmware updates to devices on your network. See Chapter 8, File Server / File Management for a description of the portlet that manages file servers. If you want to configure servers from the *Common Setup Tasks* portlet, a slightly different screen appears when you click *Edit*.



File Servers are used during Firmware Deploy and Configuration file Backup and Restore operations.

File Server Mode: ○ Internal ● External

Name	IP Address	Net Mask	Enabled	TFTP Enabled	Action
Internal (FTP/TFTP)			🔴	✓	
Julia's FTP	192.168.1.31	255.255.255.0	🟢	✓	

This displays configured file servers. Configure new servers by clicking the *new file server* link in the upper right corner. The editing process after that is as described in File Server Editor on page 270.

△ **CAUTION:**
If you select the internal file server, make sure no external file server is running on the same host. A port conflict prevents correct operation. Either turn off the external file server, or use it as the FTP server.. We strongly recommend using the internal file server only for testing, and external file server(s) for production.

Dell OpenManage Network Manager selects the file server protocol for backup, restore or deploy based on the most secure protocol the device supports.

Deploying and Extensions

You can get add-on capabilities in Dell OpenManage Network Manager in the following forms:

- Deploy Files
- Extensions
- .ocp and .ddp files

These add-on capabilities do not require a complete re-installation of the application. The following sections describe how to update your initial system with them.

Deploy Files

Updates to Dell OpenManage Network Manager can come in .war files—for example, a new helpset (`nvhelp.war`), that updates the information about the program. To deploy such files, copy them to the `[installation root]\oware\ synergy\deploy` directory. In the next few minutes, Dell OpenManage Network Manager will deploy them.

Extensions

Extended capabilities for Dell OpenManage Network Manager may appear in .jar files—for example `synergy-msp.jar`. To deploy these, copy the file into the `[installation root]\oware\synergy\extensions` directory.

.ocp and .ddp files

Device drivers and additional application capabilities come in files with the .ddp and .ocp extensions, respectively. These install automatically during installation when they are in the owareapps directory. To install them after your system is already up and running, use the following command line programs:

```
ocpinstall -x [filename.ddp or filename.ocp]
ocpinstall -l [filename.ddp or filename.ocp]
ocpinstall -s [filename.ddp or filename.ocp]
```

Localizing Message Files

A message file is essentially a property file. The file name dictates which locale(s) it applies to. The suggested naming convention is as follows:

<prefix>msgs[_languageCode[_countryCode[_variantCode]]].properties

Do not provide more precision than necessary. By default, all message files are named as:

```
<prefix>msgs_en.properties (English)
```

or

```
<prefix>msgs.properties (language independent)
```

No support exists for prepend or append operations.

All entries must follow this syntax: `category.number=message text`

NOTICE

To find all available message files, search the installation root and directories below it for *msg*.properties. You may also want to alter *.msgs files.

Finally, extract the `synergy-i18n.jar` in `oware/synergy/extensions`, edit the appropriate file(s) in the localization subdirectory, then re-compress the `.jar` file.

CAUTION:
If you take the time to translate these files, make sure you keep a copy any files you modify because any upgrade may return them to their original state. You must manually copy the localized files to their original positions to see those translations after any update.

The localization/language functionality comes from Liferay. You may find additional information regarding localization on www.liferay.com/documentation.

4

Portal Conventions

This section explains how to navigate and configure the Dell OpenManage Network Manager web portal. Because this portal is based on open source features, and can be so flexible, this is not a comprehensive catalog of all its features. The following discusses only features significant for using Dell OpenManage Network Manager.

The application's web Portal contains the following common elements:

- The Dock
- Status Bar Alerts
- Menu Bar
- Portlets

Because the elements that manage the Web portal are so flexible, and can be very detailed, only Dell OpenManage Network Manager's most important, or most-frequently-used features appear documented below.

NOTICE

Clicking *Go to* in the Dock and selecting *My Private Pages* to open pages not shared with others, unless you configure sharing. (See Sharing on page 110.)

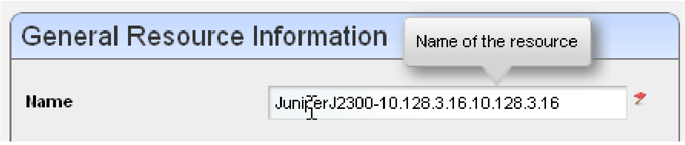
Because they are so fundamental to Dell OpenManage Network Manager's functioning, this section also describes the following portlets:

- Audit Trail Portlet
- Schedules

You can rename any portlet by clicking its title. You can also configure portlets' default filters to work in concert with the title. See Filtering / Settings on page 141.

Tooltips

Dell OpenManage Network Manager has help and tooltips that appear when you click the blue circle with a question mark, or when you hover the cursor over a field.



General Resource Information

Name of the resource

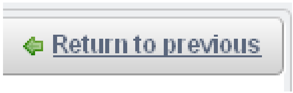
Name: JuniperJ2300-10.128.3.16.10.128.3.16

Tooltips also display the content most fields in portlets. If the screen does not allow a full field to appear, you can still find out what is in a field by letting the tooltip re-state what it contains.

Refresh

You may have to refresh your browser to see screen updates. One way to refresh without re-loading the entire window, however, is to click the *Refresh* button at the top of an individual portlet. (See Settings on page 104)

The Back Button



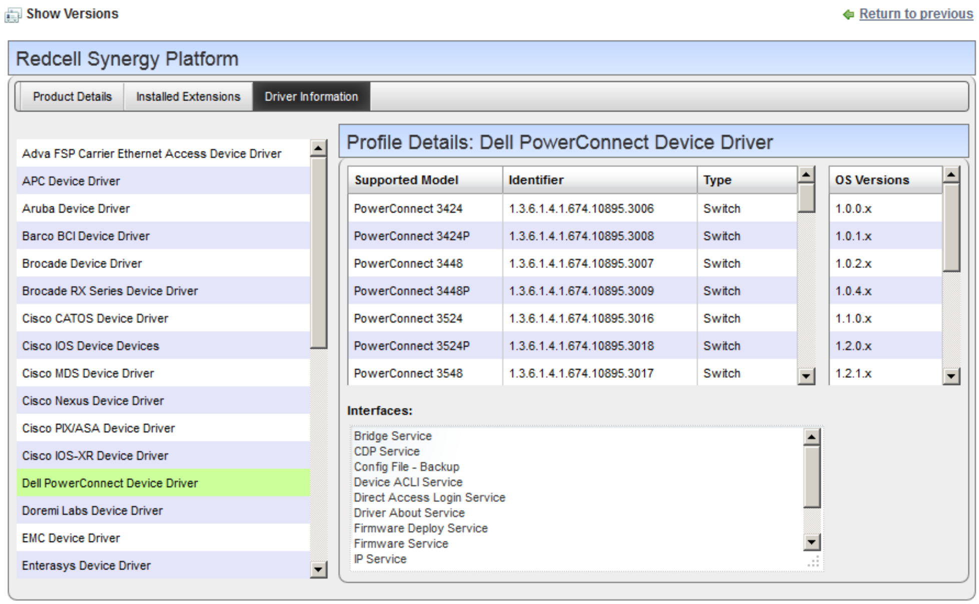
Although browsers have a *Back* button, this is not always the best way to return to a previous screen within the portal. For example, clicking *Back* within a breadcrumb trail of links returns to the root of that trail. If it is available, the *Return to previous* button in the upper right corner of a screen provides the most dependable way to return to a previous screen.

Shift+Click

When you Shift+Click the Details menu item, Dell OpenManage Network Manager opens a new window with that Details screen. See Equipment Details on page 210 for a commonly-used example.

Show Versions

To see which products are installed, and what versions, select the *Manage > Show Versions* menu item. This displays the installed package and modules, as well as their version numbers in the *Product Details* tab.



Show Versions

Return to previous

Redcell Synergy Platform

Product Details | Installed Extensions | Driver Information

- Adva FSP Carrier Ethernet Access Device Driver
- APC Device Driver
- Aruba Device Driver
- Barco BCI Device Driver
- Brocade Device Driver
- Brocade RX Series Device Driver
- Cisco CATOS Device Driver
- Cisco IOS Device Devices
- Cisco MDS Device Driver
- Cisco Nexus Device Driver
- Cisco PIX/ASA Device Driver
- Cisco IOS-XR Device Driver
- Dell PowerConnect Device Driver
- Doremi Labs Device Driver
- EMC Device Driver
- Enterasys Device Driver

Profile Details: Dell PowerConnect Device Driver

Supported Model	Identifier	Type
PowerConnect 3424	1.3.6.1.4.1.674.10895.3006	Switch
PowerConnect 3424P	1.3.6.1.4.1.674.10895.3008	Switch
PowerConnect 3448	1.3.6.1.4.1.674.10895.3007	Switch
PowerConnect 3448P	1.3.6.1.4.1.674.10895.3009	Switch
PowerConnect 3524	1.3.6.1.4.1.674.10895.3016	Switch
PowerConnect 3524P	1.3.6.1.4.1.674.10895.3018	Switch
PowerConnect 3548	1.3.6.1.4.1.674.10895.3017	Switch

OS Versions
1.0.0.x
1.0.1.x
1.0.2.x
1.0.4.x
1.1.0.x
1.2.0.x
1.2.1.x

Interfaces:

Bridge Service
CDP Service
Config File - Backup
Device ACLI Service
Direct Access Login Service
Driver About Service
Firmware Deploy Service
Firmware Service
IP Service

The *Installed Extensions* tab displays any installed presentation layer enhancements, and the *Driver Information* tab displays individual drivers (see Device Drivers on page 17). *Profile Details* outlines the supported device models, identifiers (OIDs), types and interfaces, and the OS *Versions* supported. This information can be important when you need technical support.

NOTICE

You can also produce an HTML version of this screen's information from a command line. Run `drvrpt` (`drvrpt.cmd` in Windows) from `\owareapps\ddbase\bin`. The HTML appears in `[installation root]\reports\drivers.`

While the focus is in the message board portlet, you cannot open the *Manage > Show Versions* screen. Select any of the other main menu options, and *Show Versions* becomes available.

Custom Debug

For more advanced users, any component under owareapps can define a `log4j.xml` file for each component matching the following pattern:

```
owareapps\<component-dir>\server\conf\*log4j.xml
```

Consult these files for categories you want to change, and copy those (altered) properties to the file you created in owareapps\installprops. The categories altered in this file override any others. Changing such properties can produce enhanced error output in server logs. See also Application Server Statistics on page 295.

The Dock

This menu bar appears at the top of portal pages. Its exact appearance depends on your package. With it, you can open online help, add, edit, and navigate to portal pages and content.

Click the down arrow to see menus for items on the dock. Here are its functions

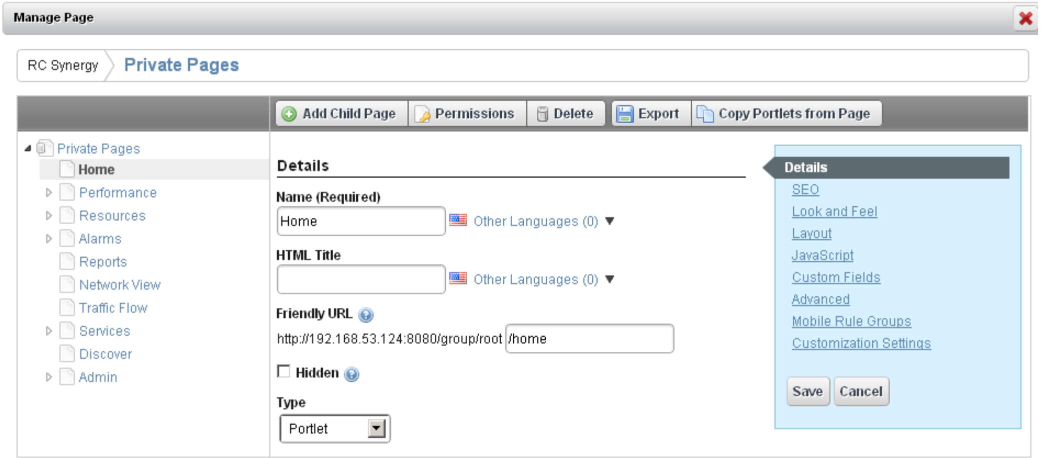
Help—Opens the online help.

Add—This menu lets you add *Pages*, or *Applications*.

> **NOTICE**
>
> The "breadcrumb" trail that appears near the top of pages lets you navigate directly through the hierarchy of parent / child pages directly by clicking links displayed there.
>
> The *More...* menu item contains Dell OpenManage Network Manager's content. Click a node to see available portlets. See Portlets on page 102.

Manage—This menu lets you alter the following:

Page (page order [note that you can drag-and-drop pages within the *Pages* tab] permissions, appearance and so on). You can create Children pages, and can Import / Export page configurations as described below.



Name (Required): Home

HTML Title:

Friendly URL: http://192.168.53.124:8080/group/root /home

☐ Hidden

Type: Portlet

Use the screen that appears after selecting *Manage* > *Page* to configure add or delete pages and to manage their appearance and permissions. You must refresh any altered page before edits take effect.

NOTICE

You can create a new page, then *Copy Portlets from Page* you can duplicate another page's portlets on the selected page.

Page Layout—Configure the page's columns. This menu item does not appear if you have an expanded portlet open, because the focus is not in the context of a page.

The *Freeform* page layout may stack portlets on top of one another. Toggle the *Fullscreen* icon in the upper right corner to see portlets so you can re-arrange them.

Site Settings—Configures page behavior, look and feel. See also Import / Export on page 109.

Show Versions—See Show Versions on page 95.

Go To—Makes the selected screen type appear. Select *My Public Pages* or *My Private Pages*, for example. When you add a new Community, its configured pages appear in this menu too. This also provides access to *Control Panel* (see Control Panel on page 43).

NOTICE

Best practice is to use multiple pages within Dell OpenManage Network Manager rather than multiple tabs.

Administrators can permanently configure *Public* pages, while users with fewer rights can only configure their *Private* pages. Any page changes persist after you make them, provided you have the rights to make changes on a page. See Public / Private Page Behavior on page 48 for the details.

[User Name] (sign out)—Opens the *Manage My Account* screen, where you can configure your name, job title, image, e-mail and so on. The *Sign out* link lets you log out of Dell OpenManage Network Manager.

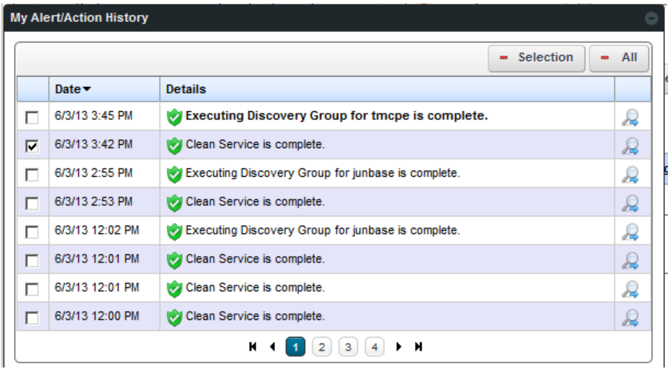
NOTICE

If you cannot see enough of the screen to use this editor as you like, manage your account from Go to > Control Panel > [User Name] > My Account

Toggle Full Screen—The icon on the far right of this bar toggles its appearance / disappearance so you can use more screen area for portlets if you need it. This toggle also impacts the Menu Bar.

Status Bar Alerts

The Status bar appears at the bottom of the portal. On the left, it catalogs messages and notifications you have received, including generated reports in *My Alerts*. Click the magnifying glass to the right of reports and Job Status notifications to open a separate viewing window. The panel includes *Current* and *Archived* messages tabs.



	Date	Details	
□	6/3/13 3:45 PM	✓ **Executing Discovery Group for tmcpe is complete.**	🔍
☑	6/3/13 3:42 PM	✓ Clean Service is complete.	🔍
□	6/3/13 2:55 PM	✓ Executing Discovery Group for junbase is complete.	🔍
□	6/3/13 2:53 PM	✓ Clean Service is complete.	🔍
□	6/3/13 12:02 PM	✓ Executing Discovery Group for junbase is complete.	🔍
□	6/3/13 12:01 PM	✓ Clean Service is complete.	🔍
□	6/3/13 12:01 PM	✓ Clean Service is complete.	🔍
□	6/3/13 12:00 PM	✓ Clean Service is complete.	🔍

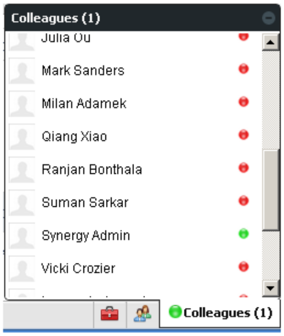
NOTICE

You can see the portal when web server is up, but application server is not. When application server runs after web server has started, and you have already started the portal, an alert appears letting you know application server is up.

Notice you can delete *Selection* items (checked on the left), or *All* items with the buttons at the top of this screen.

Chat / Conferencing

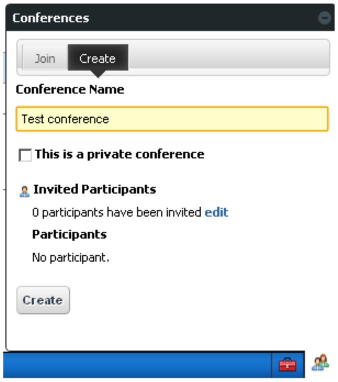
This portion of the message bar lets you send and receive messages to colleagues who are online at the same time you are.



Colleagues (1)

Julia Ou	●
Mark Sanders	●
Milan Adamek	●
Qiang Xiao	●
Ranjan Bonthala	●
Suman Sarkar	●
Synergy Admin	●
Vicki Crozier	●

● Colleagues (1)



Conferences

Join | Create

Conference Name

Test conference

□ This is a private conference

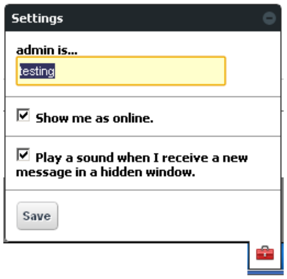
Invited Participants

0 participants have been invited edit

Participants

No participant.

Create



Settings

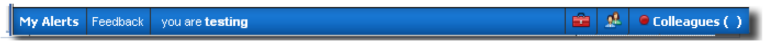
admin is...

testing

☑ Show me as online.

☑ Play a sound when I receive a new message in a hidden window.

Save



My Alerts | Feedback | you are **testing** | ● Colleagues ( )

Whatever item is of concern can be shared. So if a router is causing difficulties, you can share a link that opens the router's information and share it with other users with Dell OpenManage Network Manager’s internal instant messaging / chat system. With conferencing, you can invite more than one person to collaborate.

These capabilities have the following fields and other possibilities for you to configure:

[Saying]—Configure this text in the menu produced by the *Settings* icon (the next item).

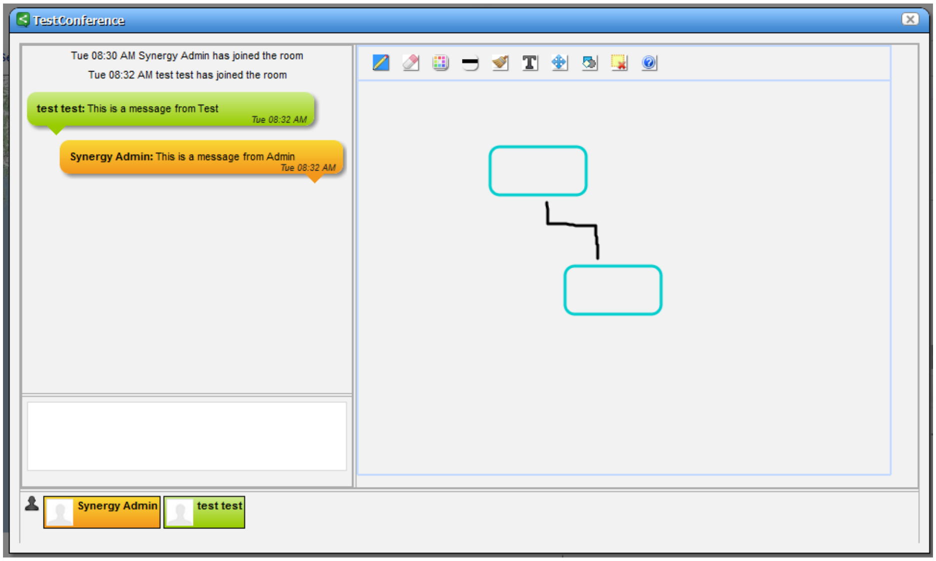
(Settings)—This configures your user settings for any online chat with your colleagues, including the saying, whether your online presence appears, and whether to play a sound when messages arrive.

NOTICE

When you have a message from another user, that user’s name appears on the status bar to the left of this icon.

(Conferences)—This configures your user settings for any online chat with multiple colleagues. The *Create* tab lets you *edit* to invite colleagues, configure an invitation message and check to make a private conference that only invites can attend. The *Join* tab becomes active when you are invited to a conference. An online chat window appears after you join.

Conferencing also opens a screen that both records text and provides a virtual white board where participants can draw.



Tue 08:30 AM Synergy Admin has joined the room

Tue 08:32 AM test test has joined the room

test test: This is a message from Test *Tue 08:32 AM*

Synergy Admin: This is a message from Admin *Tue 08:32 AM*

Hover the cursor over the white board tools at the top to see what they do. Enter text in the lower left corner, and it appears on the left after you click Enter. Conference participants appear with icons and colors keyed to their text in the lowest portion of the screen.

NOTE:

If appearance or performance concerns impede your conferencing, clear your browser's cache, then re-try conferencing.

Colleagues (n)— A green dot indicates others are online (it is red when you are alone), and *n* is the number of colleagues online. Click to open the chat screen. Click on a colleague and enter text at the bottom of the popup that appears to send messages. Previous chat history also appears above any current text on that chat popup.

Click the minus icon in the top right corner of these screens to close them.

Menu Bar

The Menu Bar appears on the left side of the screen. It consists of Menu items that lead to separate pages configured with *Manage* > *Page*.

The pages that appear on this bar can vary, depending on which Dell OpenManage Network Manager package you have installed.

The toggle on the right side of the The Dock makes this menu bar appear or disappear.

NOTICE

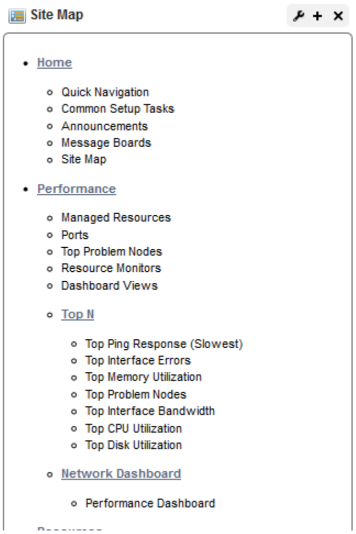
You can drag and drop the menu bar labels to different positions, and can click a label to rename the page, or delete it (with the “x”).

See How to: Create a new Page and Rearrange Pages on page 73 for more information

.Site Map

To see where pages sub-pages, and portlets are within your installation look at the Site Map portlet.

Click the link(s) to go to the pages. Use your browser’s search function to find portlet names within this Site Map.



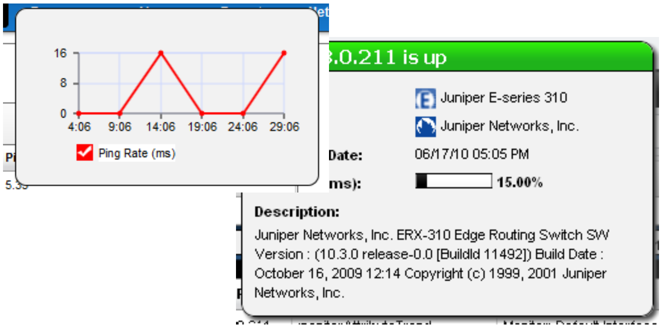
Site Map

- Home
  - Quick Navigation
  - Common Setup Tasks
  - Announcements
  - Message Boards
  - Site Map
- Performance
  - Managed Resources
  - Ports
  - Top Problem Nodes
  - Resource Monitors
  - Dashboard Views
  - Top N
    - Top Ping Response (Slowest)
    - Top Interface Errors
    - Top Memory Utilization
    - Top Problem Nodes
    - Top Interface Bandwidth
    - Top CPU Utilization
    - Top Disk Utilization
  - Network Dashboard
    - Performance Dashboard

Graphs / Tooltips

Graphs can appear in performance portlets. These display the real-time division of performance metrics, and you can change their appearance, or associated data lists display.

Hovering the cursor over a listed item in the column where a question mark appears indicates a “tooltip” with more information is available for this item. An informational popup screen appears after a brief wait to query the application server. These pop-ups can include graphs of recent activity too.



.0.211 is up

Juniper E-series 310

Juniper Networks, Inc.

Date: 06/17/10 05:05 PM

ms): 15.00%

Description:

Juniper Networks, Inc. ERX-310 Edge Routing Switch SW Version : (10.3.0 release-0.0 [BuildId 11492]) Build Date : October 16, 2009 12:14 Copyright (c) 1999, 2001 Juniper Networks, Inc.

Graphs can appear as lines, bars or pie graphs, depending on the portlet, device and activity monitored. For graphs like Top Talkers you can now see the port in the chart as a Legend tooltip.

NOTE:

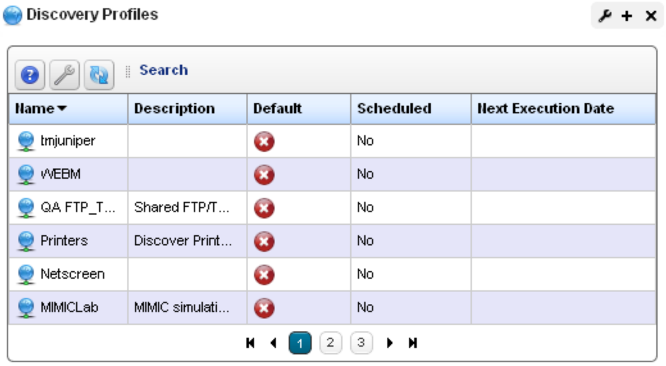
Install the latest Adobe Flash for graph functionality.

Portlets

Portlets are the elements of any page within the Dell OpenManage Network Manager web client. You can drag and drop them or add/delete them within pages to configure the portal's appearance. Initially, they appear in a small, summary screen format. Click *Add > More...* to add a portlet to a page you have created. See Portlet Instances on page 105 below for the distinction between portlets that display the same data, and portlets that can exist in more than one instance, displaying different data.

For a more specific look at available portlets, see the chapters following this one. The following describe common portlet features.

One of the first portlets typical users see is Discovery Profiles.



Discovery Profiles

Name ▾	Description	Default	Scheduled	Next Execution Date
tmjuniper		✖	No	
WEBM		✖	No	
QA FTP_T...	Shared FTP/T...	✖	No	
Printers	Discover Print...	✖	No	
Netscreen		✖	No	
MIMICLab	MIMIC simulati...	✖	No	

To act on listed items, right-click. A menu appropriate to the portlet appears.

The title bar for the portlet displays its name. To rename it, click on the name, and the field becomes editable. You can make changes, then click the green checkbox to accept them (or the red "X" to abandon them). The right portion of the title bar contains several editing controls. Clicking on the wrench icon produces a menu that leads to editors for the *Configuration* of this portlet (user permissions to view and configure, Sharing, and so on). [1]

The plus or minus (+ or -) icons *Minimize*, displaying only the title bar, or *Maximize*, displaying an Expanded Portlets, and X removes the portlet from the page.

NOTICE

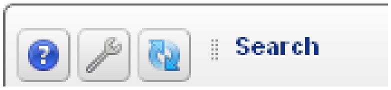
To see information about listed items in a portlet, hover your cursor over the row until a question mark appears. A mini-query about the selected item appears in a large tooltip. See Portlet Toolbar below for a description of the buttons at the top of portlets.

[1] Some portlets, like Site Map, let you import or export .lar files of their setup and user preferences.

Portlet summary screens support displaying up to 200 rows, the expanded portlet supports 1000. Using the portlets' filtering capability makes more sense than trying to see more rows. (See How to: Filter Expanded Portlet Displays on page 108.)

Portlet Toolbar

Buttons on portlet toolbars let you do the following:



?—The Question Mark icon accesses online Help, opening the page appropriate for the portlet.

Refresh—Isolates the browser's page refresh to the selected portlet

Settings—Configures the portlet's filter, size, and so on. In portlets like Alarms, this also can configure whether charts / graphs appear.

NOTICE

Even if the current filter is identical on summary and expanded portlets, the list of items may vary between the two views because they have different numeric limits for the number retrieved items. The workaround to make this difference irrelevant is to use the *Search* button to find items. It searches the entire database.

Search—Locates an item in the portlet. When you click this, the columns filtered in the database appear indented. For example, *Name* and *Model* appear indented in the Managed Resource portal.

This search function highlights the column header in columns searched. This search provides a generic string search, and may not be compatible with all fields. For example you must use advanced search available in Expanded Portlets to search IP addresses.

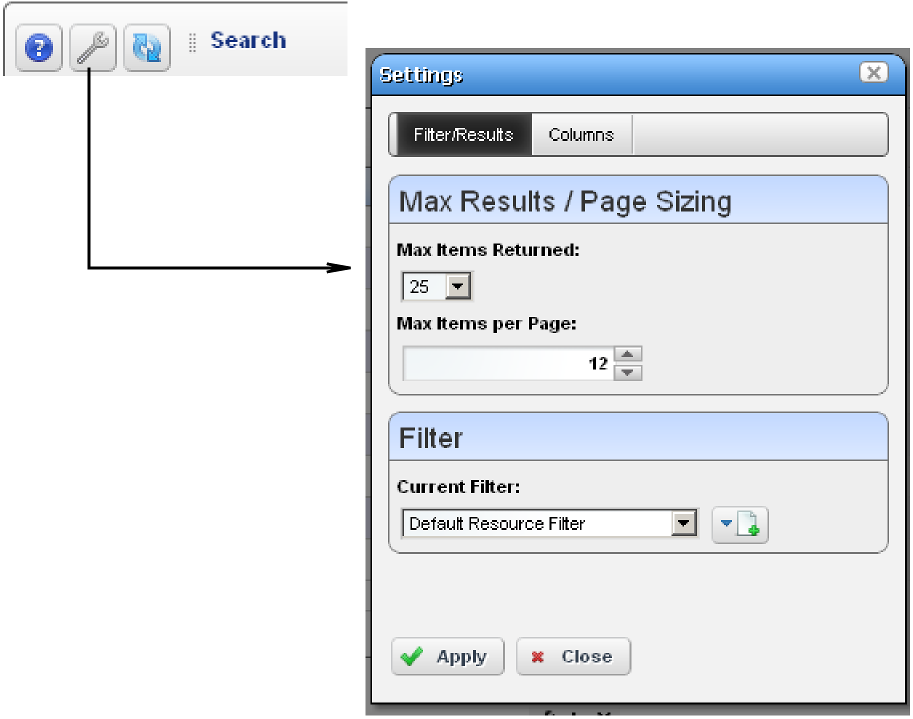
NOTICE

Search appears in the footer if the widget has pagination.

Similar functionality is available in Expanded Portlets when you click these buttons in the upper right corner. The *Settings* button also lets you configure the columns displayed and their order. See How to Show / Hide / Reorder Columns on page 107.

Settings

The *Settings* button opens a screen where you can configure the *Max Items* that appear in, and the *Filter* applied to the summary portlet with an *Apply* button to activate any changes you make there. The *Settings* screen also includes a tab where you can Show / Hide / Reorder Columns.



Max Items Returned: 25

Max Items per Page: 12

Current Filter: Default Resource Filter

For performance reasons, Max Items are often relatively low defaults.

Settings in expanded portlet does not include the *Filter* item where you can set the default filter for the portlet. See *Filter Expanded Portlet Displays on page* 108 for information about the alternative.

NOTICE

As an Administrator, you can configure a portlet's default display filter, then click the portlet name and rename it. For example, make the default filter in Managed Resources display only Dell Routers, then click Managed Resources in the upper left corner of the portlet to rename it *Dell Routers.*

If you are not an administrator, you must make a personal page for such portlets if you want the filter settings to persist.

Search

You can search by clicking *Search* at the top of portlets. This opens a search field where you can enter search terms for all the fields that appear in the list at the top of the portlet. The search is for what you enter, no wildcards are supported. To clear a search, clear the field.

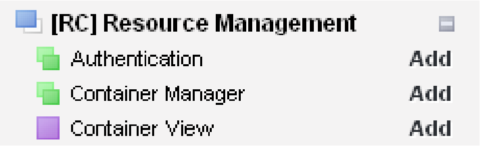
This searches all available items in the database, whether they appear listed or not.

NOTICE

Sort on a column by clicking on that column’s heading. Reverse the sort order by clicking it again. This only sorts what appears in the portlet, whether expanded or not. The application remembers each user’s choice saving the last Sort Column and Order on any page. Most portlets also “remember” settings for Max Items and the selected Filter.

Portlet Instances

When you add content to a page, some portlets (for example, the OpenManage Network Manager Container View portlet) appear with a purple icon and others (for example, the Authentication or Container Manager portlets) have green icons. The green-icon portlets are instanceable and the purple-icon portlets are non-instanceable.



[RC] Resource Management

🟩 Authentication Add

🟩 Container Manager Add

🟪 Container View Add

In other words, you can add only one instance of the (purple-icon) Container View portlet to a community; and it displays the same data, even if it appears on more than one screen.

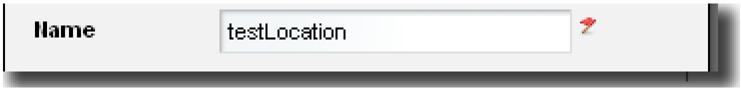
NOTE:

Once you have added a non-instanceable portlet to a page, its entry in the *Add* menu appears grayed out and disabled. You can add more than one non-instanceable portlets to different pages, but they display the same data. Instanceable portlets can appear multiple times on the same page, and can display different data.

The Authentication portlet, for one example, is different. You can add it many times to pages in the community, and can configure each instance of the portlet to display different authentication data.

Mandatory Fields

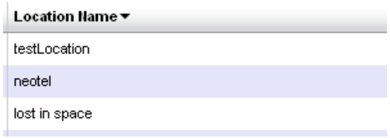
Some portlets include editors. These appear after you select an item, right-click, and select either *New* or *Open*. Mandatory fields in these editors appear with a red flag icon to their right. That flag may disappear once you fill in the field. Mandatory fields in an Action appear with a red flag icon to their right. That flag disappears once you add the action to an Action Group.



Name testLocation

Sorting Portlet Lists

Sorting tables that list items occurs when you click a column heading. The arrow to the right of that heading's text displays the direction of the sort (ascending or descending). When the arrow appears in a heading, the selected column is the basis for sorting.



Location Name ▾
testLocation
neotel
lost in space

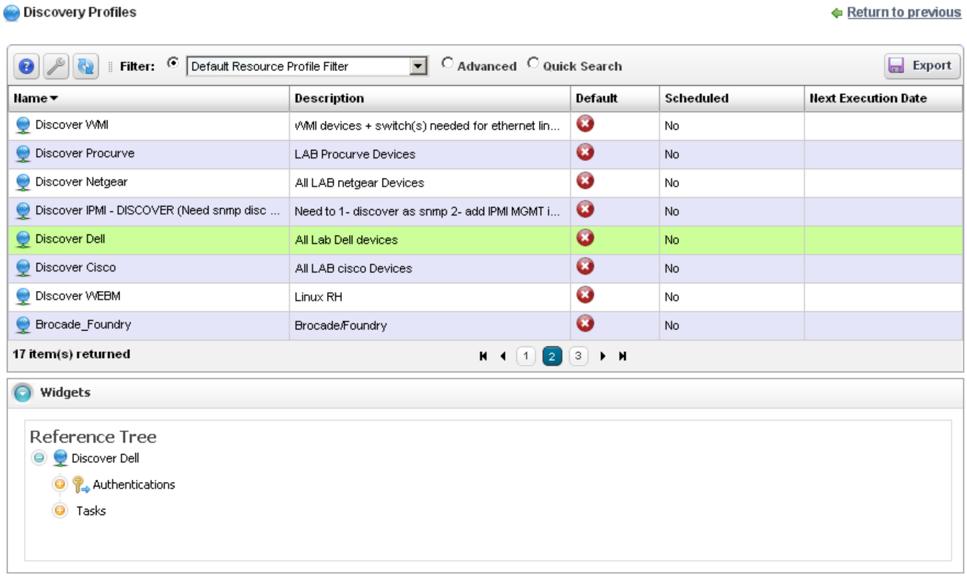
Expanded Portlets

Many portlets appear with a plus (+) icon in their upper-right corner, and can expand to display more information and permit multi-selection of listed items. Return to the smaller portlet by clicking *Return to Previous* in the expanded portlet's upper right corner.

NOTICE

If you want to multi-select within listed items in a portlet, you must typically expand it. One exception to this rule: the File Management portlet.

User permissions may limit access to the expanded portlets. For example, OpenManage Network Manager can have many communities and limit users' memberships. Such users can lightly browse other Communities' screens without full privileges[1]. See Control Panel on page 43 for more about setting up user privileges for portlets.



Discovery Profiles

Return to previous

Filter: ● Default Resource Profile Filter ○ Advanced ○ Quick Search Export

Name ▾	Description	Default	Scheduled	Next Execution Date
Discover WMI	WMI devices + switch(s) needed for ethernet lin...	✖	No	
Discover Procurve	LAB Procurve Devices	✖	No	
Discover Netgear	All LAB netgear Devices	✖	No	
Discover IPMI - DISCOVER (Need snmp disc ...	Need to 1- discover as snmp 2- add IPMI MGMT i...	✖	No	
Discover Dell	All Lab Dell devices	✖	No	
Discover Cisco	All LAB cisco Devices	✖	No	
Discover WEBM	Linux RH	✖	No	
Brocade_Foundry	Brocade/Foundry	✖	No	

17 item(s) returned 1 2 3

Widgets

Reference Tree

Discover Dell

Authentications

Tasks

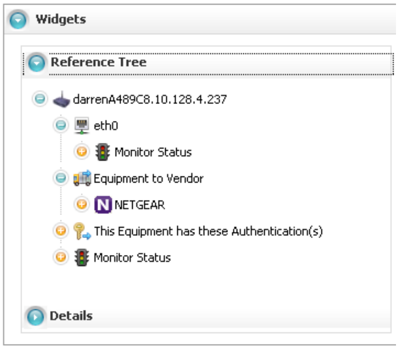
[1] Screen size limitations may require you to expand the browser to see expanded screens correctly. You must have at least 1250 pixels in width.

You can right-click to act on listed elements as in the basic, smaller portlet, but here you can also see details about a selected row in the Widgets / Snap Panels below the table list items in an expanded portlet. Click on the circle / triangle labeled *Widgets* to collapse the lower panel.

Widgets / Snap Panels

The widgets, or snap panels that appear below the expanded portlet's list can "stack" on top of each other, so several can appear simultaneously in each slot for Snap Panels. Click the title bar of the panel to toggle its expansion or collapse. In the Reference Tree snap panel, click the plus (+) to expand the tree of connections.

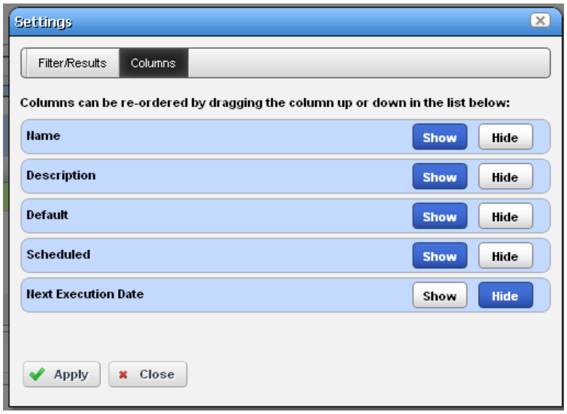
You can collapse the entire snap panel area by clicking the button next to *Widgets* at the top left of the bottom portion of expanded portlets. These panels re-appear when you click the button again.



How To:

Show / Hide / Reorder Columns

Click the *Settings* button in an expanded portlet, and screen appears with a *Columns* tab where you elect to show or hide columns. Click the appropriate buttons (they change color) to display the columns you want. You can also drag-and-drop the order in which columns appear to re-arrange the display. Click *Apply* to change the columns that appear on screen by default. Abandon any changes and *Close* this screen. The changes appear instantaneously when you return to the expanded portlet.

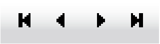


Columns can be re-ordered by dragging the column up or down in the list below:

Name	[✓ Show]	Hide
Description	[✓ Show]	Hide
Default	[✓ Show]	Hide
Scheduled	[✓ Show]	Hide
Next Execution Date	Show	[✓ Hide]

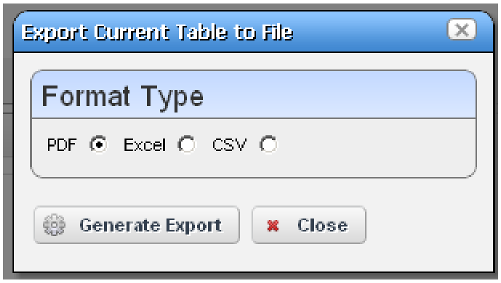
Pages

Most portlets use the "recorder" icons to page through a list that occupies more than one screen. The right/left arrows go forward and back one page. The icons at either end go to the beginning or end of the pages.



Exports

You can export from expanded portlets to Excel and Acrobat formats. Click the *Export* button in the upper right corner, and select the type of export. These selections download to the default download location you have configured on your browser. Some browsers display the pdf before you can save it.



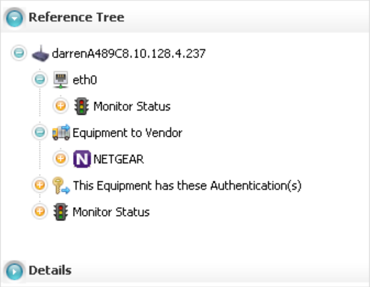
Export Current Table to File

Format Type

PDF ● Excel ○ CSV ○

Widgets / Snap Panels (Reference Tree)

These vary, depending on the portlet, but the convention of displaying a *Reference Tree* panel is common. This displays items related to the selected list item in tree form. Click the plus (+) to expand a node on the tree.



Reference Tree

- darrenA489C8.10.128.4.237
  - eth0
    - Monitor Status
  - Equipment to Vendor
    - NETGEAR
  - This Equipment has these Authentication(s)
  - Monitor Status

Details

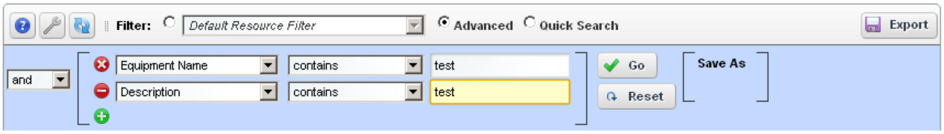
Click *Return to previous* in the upper right corner of the expanded portlet to return to the summary page where you started. If the page you are on has a “breadcrumb trail” of intervening detail pages (for example), you can click an intervening page’s breadcrumb if you do not want to return to the previous screen

How To:

Filter Expanded Portlet Displays

Among other places, filters appear at the top of expanded portlets. Many pre-installed filters come from drivers your installed package. Filters match entity types, but may not necessarily be sensible in the context of a particular portlet.

You can pick from already-configured filters with the drop-down on the left, or you can click *Advanced Filter* to create one of your own.

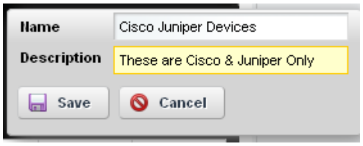


Filter: ○ Default Resource Filter ● Advanced ○ Quick Search

and | Equipment Name | contains | test
and | Description | contains | test

After you click the green plus (+), select *and* or *or* on the left to combine more than one filter. Click *Apply Filter* to see the list after the filter acts on it. Click *Reset* to return the list to its original state. This search function highlights the column header in columns searched if it looks in more than one.

Click *Save As* to preserve a filter you have configured for future use. The pick list in the upper left corner of this filter panel is where you would select it.



Name: Cisco Juniper Devices

Description: These are Cisco & Juniper Only

Create a name and description, then click *Save* on the next screen to preserve your filter configuration. See Redcell > Filter Management on page 56 for the screen that lists all such filters. When using a filter you must click the *Go* buttons to the right of the drop down list to make it take effect.

> **NOTICE**
>
> You can also filter what appears on a page with the Container View portlet. Select a container, and the rest of the portlets on that page confine displayed data to reflect the selected container's contents.

Locating Portlets

Portlet locations can depend on package configuration and user preferences. To find the current location of a portlet within the pages of your system, add the Site Map portlet to a page, locate the portlet you want in the list of portlets in the Site Map, then click the link above the listed portlet to go to that page.

Common Menu Items

Several (right-click) menu items appear in multiple portlets. In addition to editing commands (*New*, *Open*), such menus let you:

- **Import / Export** [All]
- **Share with User**—See Sharing, below.
- **Edit Custom Attributes**
- **View as PDF**

Import / Export

Menus often contain these options:

Import— Retrieve a file with an XML description of the listed items in the manager. Some imports can come from a URL.

Export Selection— Export a file with a text or XML description of the selected item(s) in the manager

Export All— Export a file with a text or XML descriptions of all listed items in the manager.

You must import into the correct portlet. You cannot import event processing rules into the Actions portlet, for example. You must import event processing rules into the Event Processing Rule portlet.

NOTICE

To Print a portlet's contents *Export* an expanded portlet into PDF, Excel or CSV format and print or open the exported file in another program. The filter applied to the portlet when you do this determines what appears in the exported file.

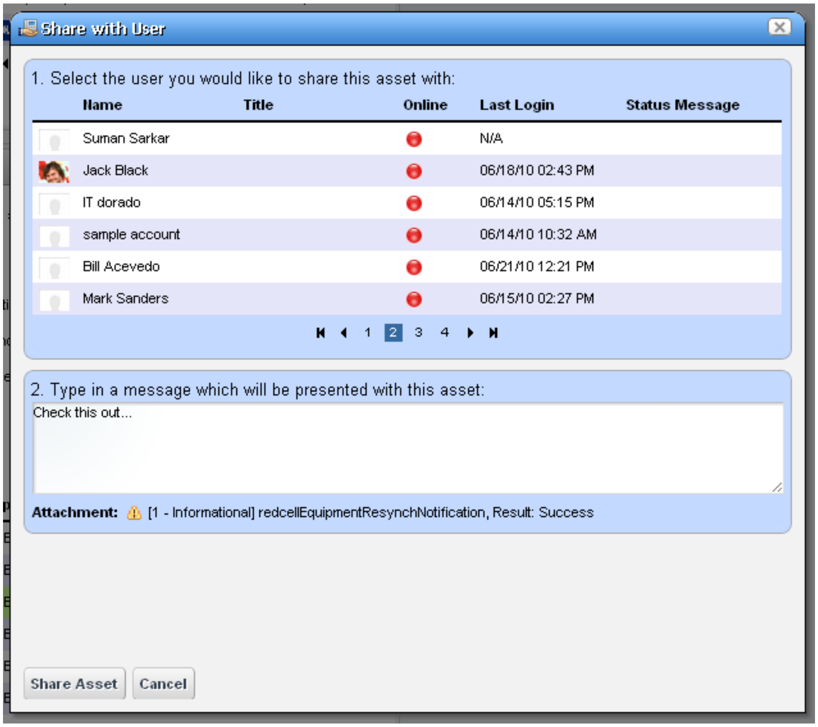
Sharing

You can share elements within Dell OpenManage Network Manager with colleagues when more than one user exists on your Dell OpenManage Network Manager system, and consult with them using the texting described in Status Bar Alerts on page 98.

How To:

Share a Resource

To share an something, first select it where it appears listed in the appropriate portlet. Right click and select *Share Asset*.



1. Select the user you would like to share this asset with:

Name	Title	Online	Last Login	Status Message
Suman Sarkar		●	N/A	
Jack Black		●	06/18/10 02:43 PM	
IT dorado		●	06/14/10 05:15 PM	
sample account		●	06/14/10 10:32 AM	
Bill Acevedo		●	06/21/10 12:21 PM	
Mark Sanders		●	06/15/10 02:27 PM	

2. Type in a message which will be presented with this asset:

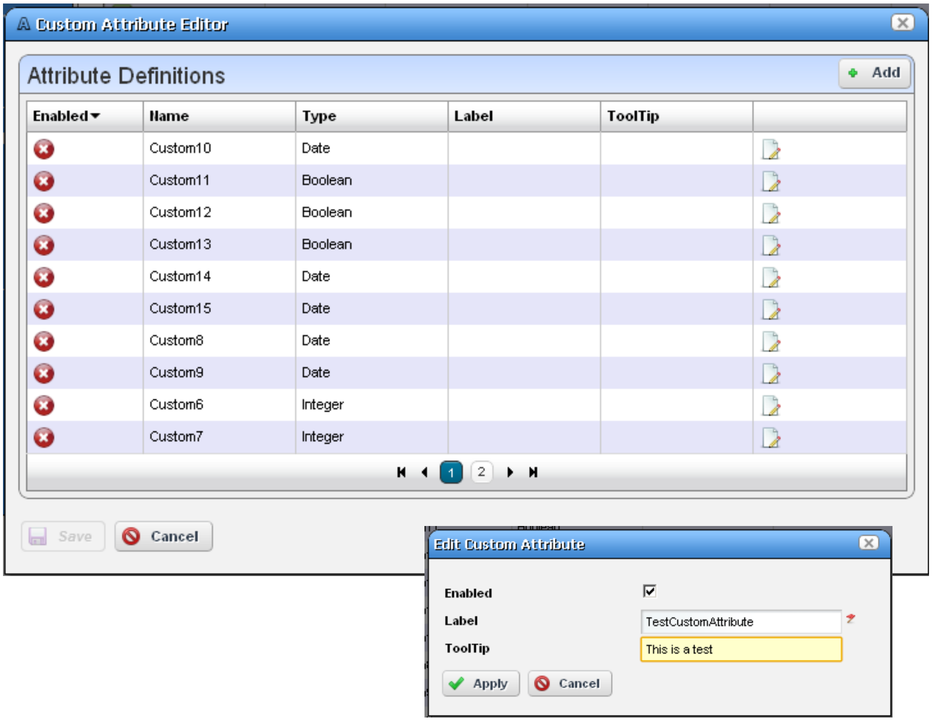
Check this out...

Attachment: ⚠ [1 - Informational] redcellEquipmentResynchNotification, Result: Success

In the subsequent screen, select a user with whom you want to share, type any message you want to include and click *Share Asset*. The chat message to the selected user includes your text and a link that opens to display the Snap Panels for the selected item. *Cancel* aborts sharing.

Edit Custom Attributes

In several right-click menus (Managed Equipment, Port, Contact, Vendor, or Location), the *Edit Custom Attributes* menu item lets you open the custom attribute editor appropriate for the device type listed in the portlet. See Redcell > Data Configuration on page 55 for another way to get to this editor.



Enabled▾	Name	Type	Label	ToolTip	
✗	Custom10	Date			✎
✗	Custom11	Boolean			✎
✗	Custom12	Boolean			✎
✗	Custom13	Boolean			✎
✗	Custom14	Date			✎
✗	Custom15	Date			✎
✗	Custom8	Date			✎
✗	Custom9	Date			✎
✗	Custom6	Integer			✎
✗	Custom7	Integer			✎

Enabled	☑
Label	TestCustomAttribute
ToolTip	This is a test

Clicking the *Edit* icon for a row in the editor lets you edit rows describing custom fields with the popup editor. The following are typical custom attribute properties you can alter:

Enabled — Check Enabled to activate the selected custom field.

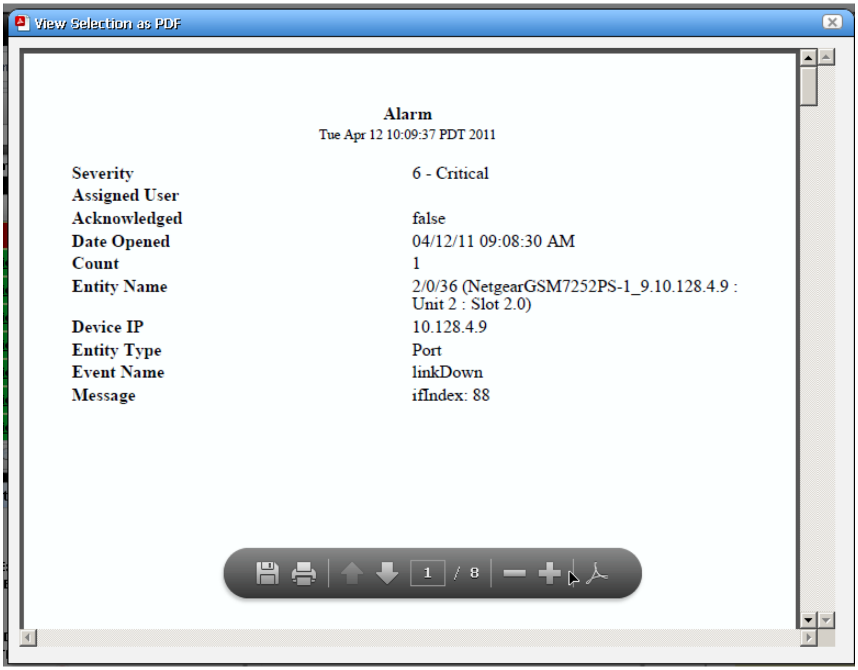
Label — This is a label for the tooltip identified in the *Name*. The Label is what you see in the portlets appropriate for the entity type you have selected. The *Type* column in the attribute describes the data type of the custom attribute (String, Integer, Date, Boolean–read only). When you select Boolean the field is a checkbox.

Tooltip — The tip that appears when you hover the cursor over the custom field.

Click *Save* to preserve any changes you have made, or *Cancel* to abandon them. Edit a resource and look in the Extended Details / Custom Attributes panel to see them.

View as PDF

This displays the selected asset's information as a PDF.



Alarm
Tue Apr 12 10:09:37 PDT 2011

Severity	6 - Critical
Assigned User	
Acknowledged	false
Date Opened	04/12/11 09:08:30 AM
Count	1
Entity Name	2/0/36 (NetgearGSM7252PS-1_9.10.128.4.9 : Unit 2 : Slot 2.0)
Device IP	10.128.4.9
Entity Type	Port
Event Name	linkDown
Message	ifIndex: 88

You can search, print or save this to file, and use any of the other Acrobat capabilities. Clicking the acrobat logo docks the floating / disappearing Acrobat toolbar within this screen.

NOTICE

To search the PDF produced, click the binocular icon in the docked toolbar. Dock the toolbar by clicking the Acrobat icon on the far right.

You can also create PDF reports containing descriptions of multiple selected assets, but you must open an expanded portlet to multi-select.

Tag

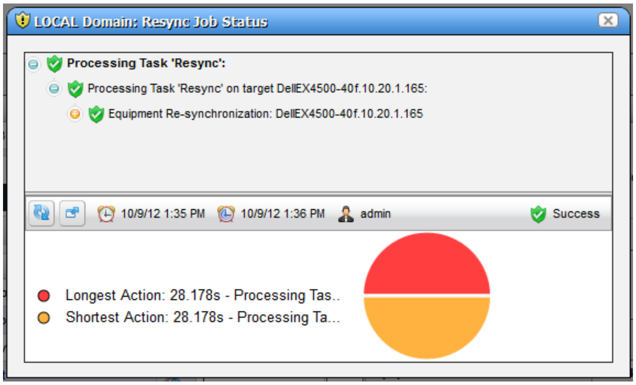
The right-click menu of many items lets you tag them, for example Managed Resources, Locations, Contacts, Customers, Services and Containers. When you select the *Tag* menu item, and *Coordinates*, a new Map popup appears (see Tag on page 173) and you can search for an address or click on the map to specify its coordinates. See Map Context on page 249 for more information about the uses of tagging.

NOTICE

If you want to enter the longitude and latitude of your Dell OpenManage Network Manager installation, this is one way to get it. Go to Control Panel's Redcell > Application Settings to enter the information.

Audit Trail / Jobs Screen

When you execute an action, for example when you resync network resources, an audit trail screen appears with a tree displaying the message traffic between Dell OpenManage Network Manager and the device(s) the action addresses.



LOCAL Domain: Resync Job Status

- Processing Task 'Resync':
  - Processing Task 'Resync' on target DellEX4500-40f.10.20.1.165:
    - Equipment Re-synchronization: DellEX4500-40f.10.20.1.165

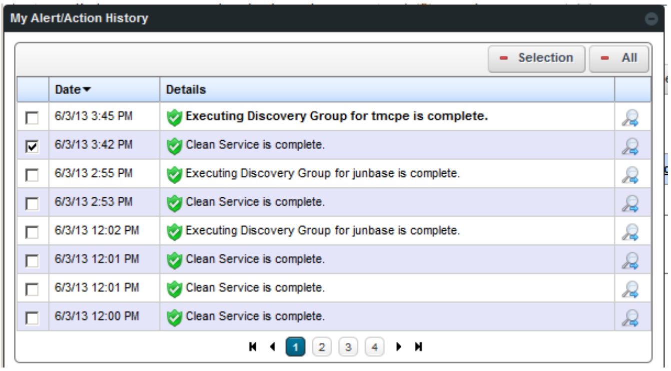
10/9/12 1:35 PM 10/9/12 1:36 PM admin ✓ Success

● Longest Action: 28.178s - Processing Tas..
● Shortest Action: 28.178s - Processing Ta...

To see the details of any message, click on it, and those details appear in the lowest panel of this screen. If you click on a summary message (not a "leaf" on the tree), a graph appears displaying the duration for its component messages. Hover your cursor over each portion of the graph for more details.

The time for messages and logged in user initiating the action appear on the bar between the upper and lower screen, and an icon summarizing the action appears on its right. Click the second icon from the left to configure the amount of detail displayed in audit messages. Click the first (*Refresh*) icon to re-display messages if you re-configure the type(s) displayed.

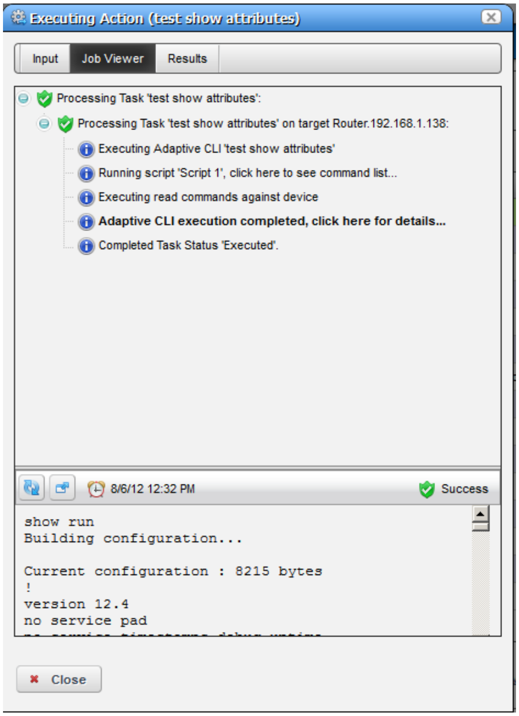
To review the audit trail for recently completed processing, open the *My Alerts* tab in the lower left corner of the portal, and click the magnifying glass to the right of the message.



My Alert/Action History

☐	Date ▾	Details
☐	6/3/13 3:45 PM	✓ **Executing Discovery Group for tmcpe is complete.**
☑	6/3/13 3:42 PM	✓ Clean Service is complete.
☐	6/3/13 2:55 PM	✓ Executing Discovery Group for junbase is complete.
☐	6/3/13 2:53 PM	✓ Clean Service is complete.
☐	6/3/13 12:02 PM	✓ Executing Discovery Group for junbase is complete.
☐	6/3/13 12:01 PM	✓ Clean Service is complete.
☐	6/3/13 12:01 PM	✓ Clean Service is complete.
☐	6/3/13 12:00 PM	✓ Clean Service is complete.

Some audit trails display as many as three tabs for the *Input* (the command variables sent to the device), the *Job Viewer* with the message traffic to the device, and finally the *Results* of sending the messages to a device[1]. This lists devices on the left, and message traffic for a selected device on the right.

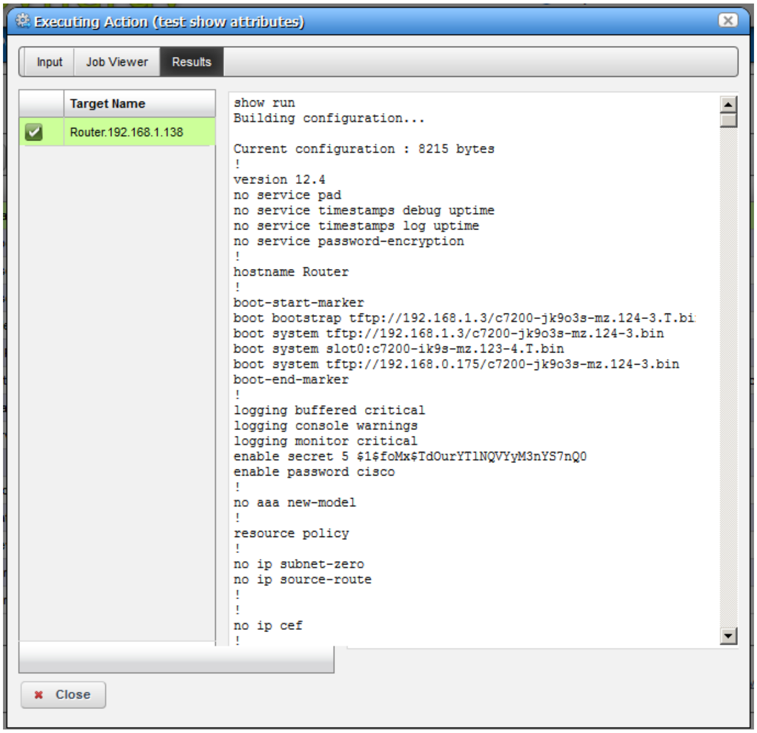


Executing Action (test show attributes)

- Processing Task 'test show attributes':
  - Processing Task 'test show attributes' on target Router.192.168.1.138:
    - Executing Adaptive CLI 'test show attributes'
    - Running script 'Script 1', click here to see command list...
    - Executing read commands against device
    - **Adaptive CLI execution completed, click here for details...**
    - Completed Task Status 'Executed'.

8/6/12 12:32 PM ✓ Success

```
show run
Building configuration...

Current configuration : 8215 bytes
!
version 12.4
no service pad
```



Executing Action (test show attributes)

	Target Name
✓	Router.192.168.1.138

```
show run
Building configuration...

Current configuration : 8215 bytes
!
version 12.4
no service pad
no service timestamps debug uptime
no service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot-start-marker
boot bootstrap tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.T.bi
boot system tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.bin
boot system slot0:c7200-ik9s-mz.123-4.T.bin
boot system tftp://192.168.0.175/c7200-jk9o3s-mz.124-3.bin
boot-end-marker
!
logging buffered critical
logging console warnings
logging monitor critical
enable secret 5 $1$foMx$TdOurYTlNQVYyM3nYS7nQ0
enable password cisco
!
no aaa new-model
!
resource policy
!
no ip subnet-zero
no ip source-route
!
!
no ip cef
!
```

Close the audit trail viewer any time, and the action continues in the background. The the audit trail is archived in the portlet described in Audit Trail Portlet on page 116.

Configuring Job Viewer's Appearance

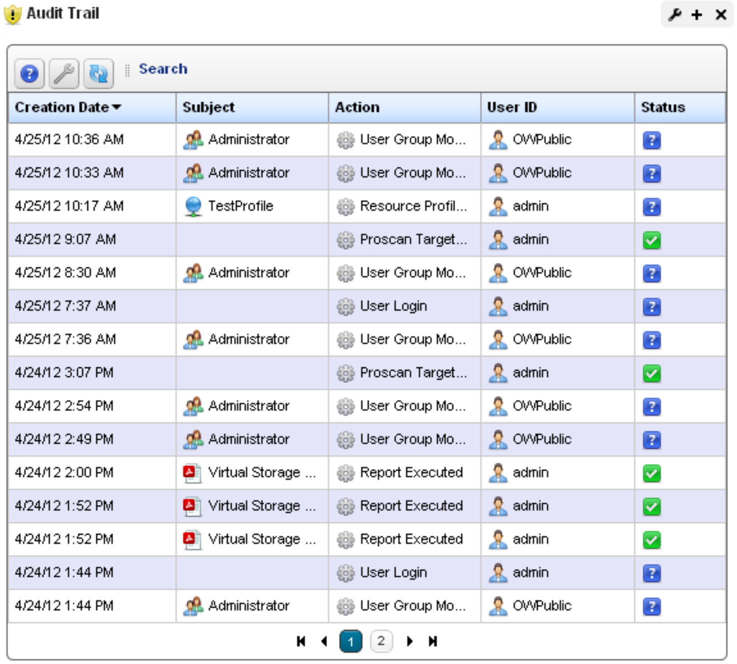
In Control Panel, the Redcell > Application Settings screen contains a Job Viewer panel where you can elect any of the following:

- Show Job Viewer after Execution
- Always show Job Viewer for Actions
- Show Information Messages by Default

Check the checkboxes next to these options to enable them.

Audit Trail Portlet

The audit trail summary portlet displays an archive of the message traffic between Dell OpenManage Network Manager and monitored devices, as well as OpenManage Network Manager's reaction to failed message transmission.



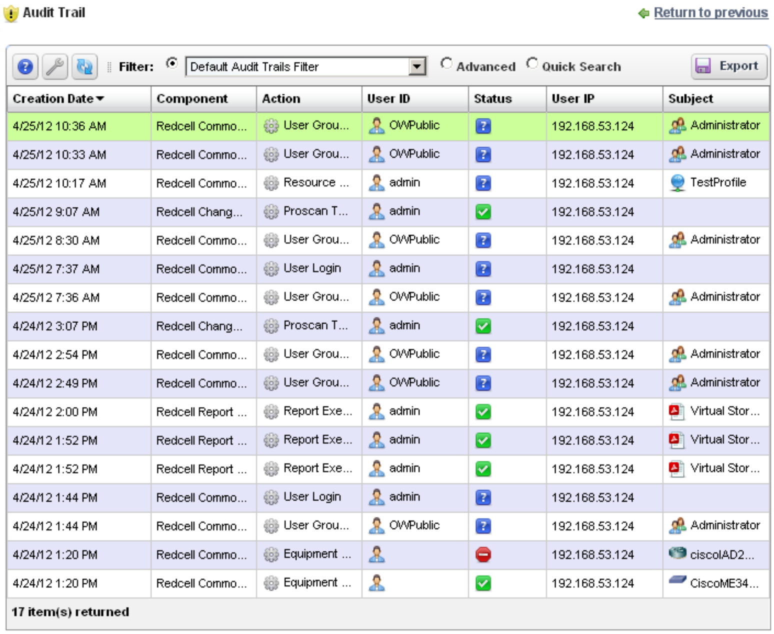
Creation Date	Subject	Action	User ID	Status
4/25/12 10:36 AM	Administrator	User Group Mo...	OWPublic	?
4/25/12 10:33 AM	Administrator	User Group Mo...	OWPublic	?
4/25/12 10:17 AM	TestProfile	Resource Profil...	admin	?
4/25/12 9:07 AM		Proscan Target...	admin	✓
4/25/12 8:30 AM	Administrator	User Group Mo...	OWPublic	?
4/25/12 7:37 AM		User Login	admin	?
4/25/12 7:36 AM	Administrator	User Group Mo...	OWPublic	?
4/24/12 3:07 PM		Proscan Target...	admin	✓
4/24/12 2:54 PM	Administrator	User Group Mo...	OWPublic	?
4/24/12 2:49 PM	Administrator	User Group Mo...	OWPublic	?
4/24/12 2:00 PM	Virtual Storage ...	Report Executed	admin	✓
4/24/12 1:52 PM	Virtual Storage ...	Report Executed	admin	✓
4/24/12 1:52 PM	Virtual Storage ...	Report Executed	admin	✓
4/24/12 1:44 PM		User Login	admin	?
4/24/12 1:44 PM	Administrator	User Group Mo...	OWPublic	?

1. This screen can, by default, conceal the info-level messages. To see them, click the icon next to the Refresh icon to open the message level selector and check the info circle level of reporting, then click *Refresh* to see those blue circles.

The *Creation Date*, *Subject*, *Action* (the summary message of the audit trail), *User ID* (the login ID of the user whose actions resulted in this trail), and *Status* of the messages appear in the table (hover the cursor over the icon for a text message describing status). Right click to *Delete* a message, manage its *Aging Policy* or *View as PDF.* See Redcell > Database Aging Policies (DAP) on page 58 for more about such policies.

Expanded Audit Trail Portlet

When you click the plus (+) in the upper right corner of the summary screen, the expanded portlet appears. Click the *Settings* button to configure the columns that appear in this screen and their order. Filter the appearance of the screen with the *Advanced Filter* capabilities at its top.



Creation Date	Component	Action	User ID	Status	User IP	Subject
4/25/12 10:36 AM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/25/12 10:33 AM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/25/12 10:17 AM	Redcell Commo...	Resource ...	admin	?	192.168.53.124	TestProfile
4/25/12 9:07 AM	Redcell Chang...	Proscan T...	admin	✓	192.168.53.124	
4/25/12 8:30 AM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/25/12 7:37 AM	Redcell Commo...	User Login	admin	?	192.168.53.124	
4/25/12 7:36 AM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/24/12 3:07 PM	Redcell Chang...	Proscan T...	admin	✓	192.168.53.124	
4/24/12 2:54 PM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/24/12 2:49 PM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/24/12 2:00 PM	Redcell Report ...	Report Exe...	admin	✓	192.168.53.124	Virtual Stor...
4/24/12 1:52 PM	Redcell Report ...	Report Exe...	admin	✓	192.168.53.124	Virtual Stor...
4/24/12 1:52 PM	Redcell Report ...	Report Exe...	admin	✓	192.168.53.124	Virtual Stor...
4/24/12 1:44 PM	Redcell Commo...	User Login	admin	?	192.168.53.124	
4/24/12 1:44 PM	Redcell Commo...	User Grou...	OWPublic	?	192.168.53.124	Administrator
4/24/12 1:20 PM	Redcell Commo...	Equipment ...		⛔	192.168.53.124	ciscoIAD2...
4/24/12 1:20 PM	Redcell Commo...	Equipment ...		✓	192.168.53.124	CiscoME34...

17 item(s) returned

In addition to the summary screen's columns, the following are available in this screen:

User IP—OpenManage Network Manager creates the Audit Entry for IP Address of the related user. If it cannot acquire the user's IP Address or if the audit entry occurred because of a Scheduled or System event then the IP address is for the related Application Server.

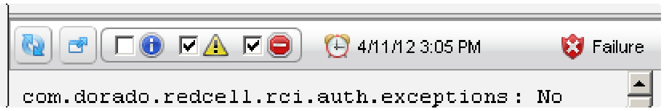
Subject—The equipment at the origin of the message traffic with Dell OpenManage Network Manager.

You can right-click a selected item and either *Delete* it, or *View Job*. This last option displays a screen with the details of the job itself.

View Job

The *Audit Job Viewer* displays the audit trail messages in tree form. To see the contents of an individual message that appears in the upper panel, select it and view its contents in the bottom panel. The divider has *Refresh* double-arrow, and screen/arrow icons in the left corner, and an icon indicating the status of the job on the right. Click *Refresh* to clear an old message so you can view a new one.

Click the screen/arrow icon to check (info, warning, error) filters that limit the types of visible messages. Notice that when you select a message, its date and time appears to the right of screen/arrow icon.



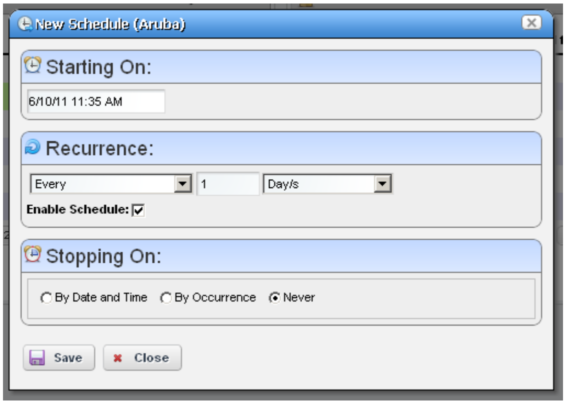
□ ☑ ☑ 4/11/12 3:05 PM Failure

```
com.dorado.redcell.rci.auth.exceptions : No
```

Schedules

To schedule an action, for example using a discovery profile, right click and select *Schedule*. The Schedule panel appears, where you can create a new schedule, entering a *Starting On* date and time, and *Stopping On* date and time or occurrence number. You can also configure recurrence in this screen.

Once you save the schedule, the action (for example Discovery Profile) it also appears in the Schedules Portlet as a scheduled item.



New Schedule (Aruba)

Starting On:

6/10/11 11:35 AM

Recurrence:

Every 1 Day/s

Enable Schedule: ☑

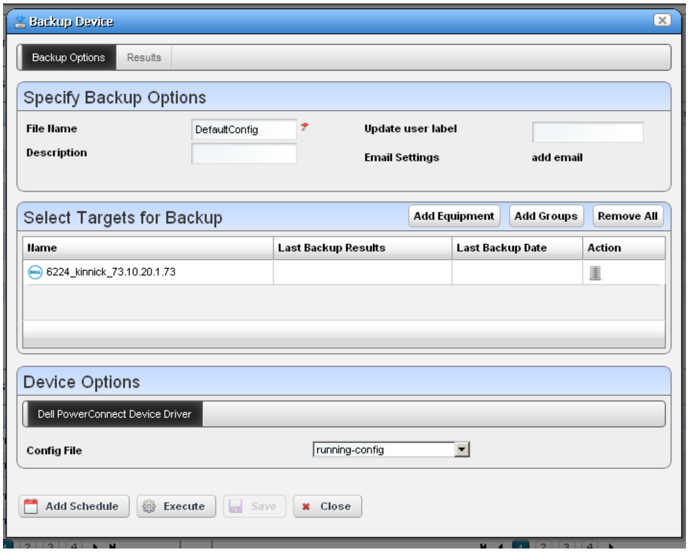
Stopping On:

○ By Date and Time ○ By Occurrence ● Never

How To:
Schedule Actions

To schedule an action triggered from a right-click menu (for example from Managed Resources or Schedules portlets) rather than execute it immediately, follow these steps.

1 Select the action in the right-click menu. For example: device Backup.



Backup Device

Backup Options | Results

Specify Backup Options

File Name: DefaultConfig

Description:

Update user label:

Email Settings: add email

Select Targets for Backup

Name	Last Backup Results	Last Backup Date	Action
6224_kinnick_73.10.20.1.73			

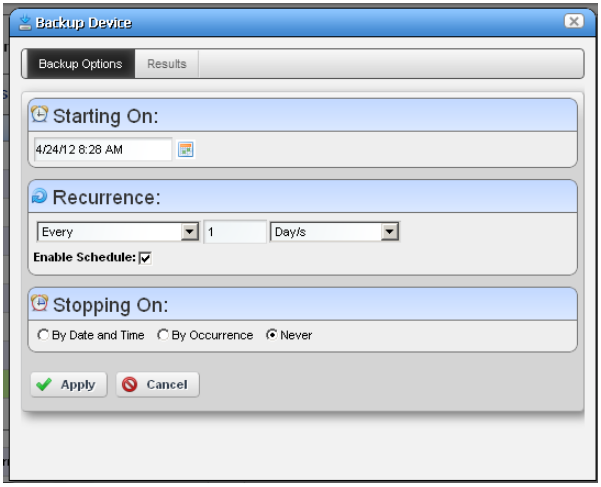
Device Options

Dell PowerConnect Device Driver

Config File: running-config

2 Rather than clicking *Execute*, click *Add Schedule*.

3 The schedule panel appears.



Backup Device

Backup Options | Results

Starting On:

4/24/12 8:28 AM

Recurrence:

Every | 1 | Day/s

Enable Schedule: ☑

Stopping On:

○ By Date and Time ○ By Occurrence ● Never

Configure the start time and date, recurrence, and stop parameters in this screen. The *Results* tab displays an audit trail when the action executes.

4 Once you click *Apply* on this panel, the previous panel returns, the *Add Schedule* button now appearing as *Edit Schedule*.

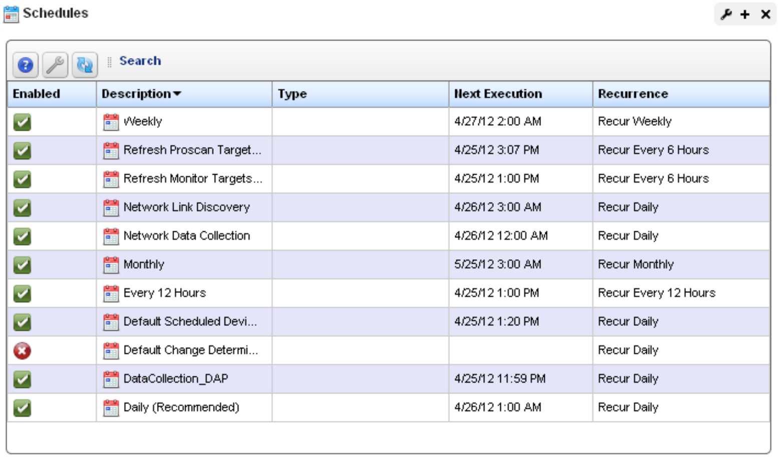
5 If you click *Save*, Dell OpenManage Network Manager creates a scheduled item around the activity and its data. A row also appears in the screen described in Schedules Portlet on page 120 for this schedule.

6 When you have scheduled something from the *Add Schedule* button, clicking *Apply* in the schedule panel returns you to the previous screen.

7 If you click *Execute* in that previous screen, the action begins, and audit trail panel appears, displaying the running job for the activity. If you have attached a Schedule, Dell OpenManage Network Manager also saves the activity as a scheduled item in the Schedules Portlet.

Schedules Portlet

You can view and modify schedules in the *Schedules* portlet, or the Expanded Schedules Portlet



Enabled	Description	Type	Next Execution	Recurrence
✓	Weekly		4/27/12 2:00 AM	Recur Weekly
✓	Refresh Proscan Target...		4/25/12 3:07 PM	Recur Every 6 Hours
✓	Refresh Monitor Targets...		4/25/12 1:00 PM	Recur Every 6 Hours
✓	Network Link Discovery		4/26/12 3:00 AM	Recur Daily
✓	Network Data Collection		4/26/12 12:00 AM	Recur Daily
✓	Monthly		5/25/12 3:00 AM	Recur Monthly
✓	Every 12 Hours		4/25/12 1:00 PM	Recur Every 12 Hours
✓	Default Scheduled Devi...		4/25/12 1:20 PM	Recur Daily
✗	Default Change Determi...			Recur Daily
✓	DataCollection_DAP		4/25/12 11:59 PM	Recur Daily
✓	Daily (Recommended)		4/26/12 1:00 AM	Recur Daily

This displays the *Enabled* status, a *Description*, the *Type* of schedule, its *Next Execution* and *Recurrence* in columns. You can do the following by right-clicking a scheduled item, and selecting the appropriate menu item:

New—This lets you initiate new schedules for a variety of actions, selected from a sub-menu. The subsequent screen's appearance depends on the action selected. See Managed Resources on page 195 for more about available actions. See Scheduling Actions on page 439 for the details of scheduling actions that require parameters. You can also schedule Action Groups, Alarm Suppression, Config File Backup / Restore, execution of a Database Aging Policy, and OS Image Deployment.

Action Groups are named combinations of actions. The subsequent editor screen lets you configure Actions, their targets, and the order in which they execute.

Edit—This appears for an activity-based scheduled items. It opens the activity editor, and lets you modify the activity's data/properties and schedule parameters.

To edit an existing schedule for an already scheduled action like a Discovery Profile, just right click the item in its portlet and select *Schedule*. This displays the schedule information for the discovery profile and lets you make modifications.

NOTICE

You can also schedule new actions from the portlet that ordinarily executes them, for example Resource Discovery on page 180.

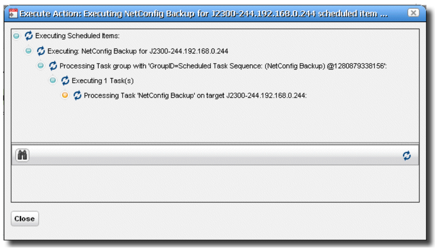
Delete—Deletes the selected scheduled item, displaying a confirming dialog box.

Enable Schedule—Appears on an already disabled scheduled item so you can change its status. To enable the schedule, you can also edit it and check the *Enabled* check box.

Disable Schedule—Appears on an already enabled scheduled item.

Execute—Executes the scheduled item. If the scheduled item is an activity-based or discovery-profile based scheduled item, an audit viewer appears progress of the selected item.

For other types of scheduled actions, a dialog appears saying *The scheduled item(s) has been sent to the application server for immediate execution.* You can monitor its progress in the audit trail portlet. (see Audit Trail / Jobs Screen on page 114)



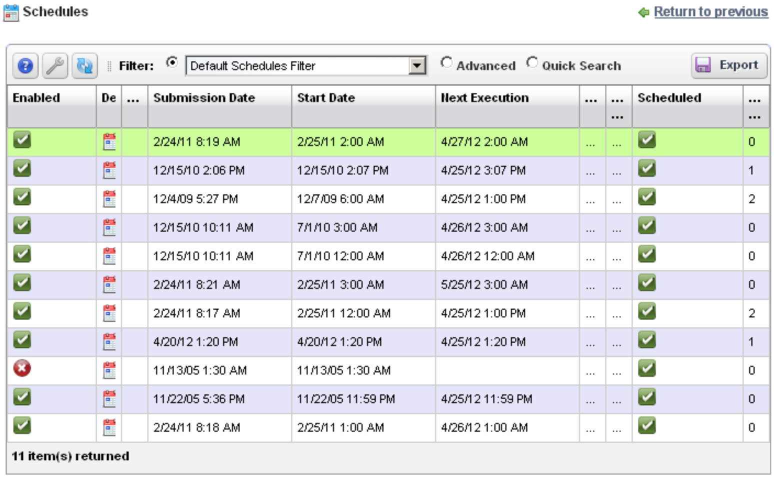
Execute Action: Executing NetConfig Backup for J2300-244.192.168.0.244 scheduled item ...

```
Executing Scheduled Items:
    Executing: NetConfig Backup for J2300-244.192.168.0.244
        Processing Task group with 'GroupID=Scheduled Task Sequence: (NetConfig Backup) @1280879338156':
            Executing 1 Task(s)
                Processing Task 'NetConfig Backup' on target J2300-244.192.168.0.244:
```

If you have Dell OpenManage Network Manager's Change Management / Proscan capabilities installed, you can use Schedules to initiate the Change Determination process. See Change Determination Process on page 382. It is disabled by default.

Expanded Schedules Portlet

When you expand this portlet, the additional columns that appear include *Submission Date*, *Start Date*, whether the schedule is still active (*Scheduled*), and the *Execution Count*.



Enabled	De	...	Submission Date	Start Date	Next Execution	...	... ...	Scheduled	... ...
✓	📅		2/24/11 8:19 AM	2/25/11 2:00 AM	4/27/12 2:00 AM	...	...	✓	0
✓	📅		12/15/10 2:06 PM	12/15/10 2:07 PM	4/25/12 3:07 PM	...	...	✓	1
✓	📅		12/4/09 5:27 PM	12/7/09 6:00 AM	4/25/12 1:00 PM	...	...	✓	2
✓	📅		12/15/10 10:11 AM	7/1/10 3:00 AM	4/26/12 3:00 AM	...	...	✓	0
✓	📅		12/15/10 10:11 AM	7/1/10 12:00 AM	4/26/12 12:00 AM	...	...	✓	0
✓	📅		2/24/11 8:21 AM	2/25/11 3:00 AM	5/25/12 3:00 AM	...	...	✓	0
✓	📅		2/24/11 8:17 AM	2/25/11 12:00 AM	4/25/12 1:00 PM	...	...	✓	2
✓	📅		4/20/12 1:20 PM	4/20/12 1:20 PM	4/25/12 1:20 PM	...	...	✓	1
✗	📅		11/13/05 1:30 AM	11/13/05 1:30 AM		...	...	✓	0
✓	📅		11/22/05 5:36 PM	11/22/05 11:59 PM	4/25/12 11:59 PM	...	...	✓	0
✓	📅		2/24/11 8:18 AM	2/25/11 1:00 AM	4/26/12 1:00 AM	...	...	✓	0

11 item(s) returned

If a green icon appears in the *Scheduled* column, it means the schedule will be executed on next start date. If the schedule has exceeded execution count or passed stop date (if specified), then a red icon appears there.

5

Key Portlets

This section describes some of the key Dell OpenManage Network Manager portlets. You may not have access to all of these in your installation, or you may not be able to use them with the user permissions you have been assigned by the portal administrator.

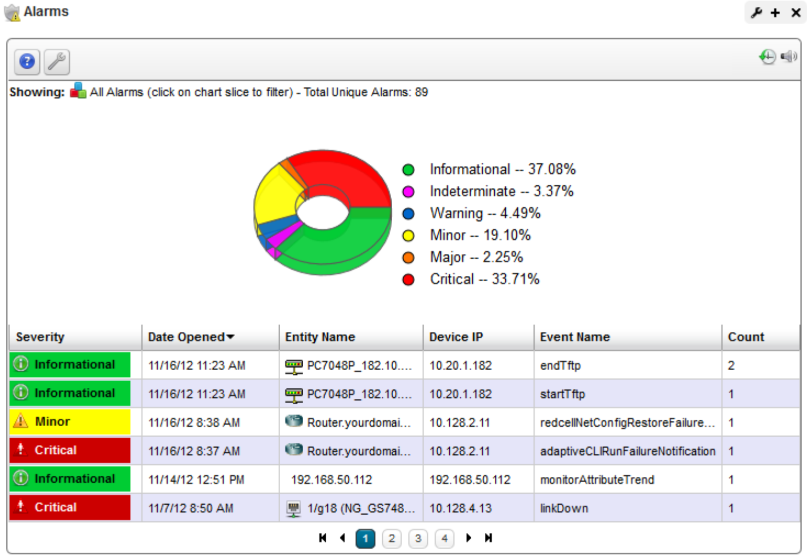
To see all available Dell OpenManage Network Manager portlets, click *Add > Applications* and use the field at the top of the menu to search for the portlet functionality you want to add. This limits the display to Dell OpenManage Network Manager portlets. The previous chapter discussed the Schedules Portlet on page 120.

Filter what appears on a page with the Container View portlet. Select a container, and the rest of the portlets on that page filter their data reporting to reflect that container's contents. The only caveat for this advice is that Container View is non-instanceable. In other words, you can only add one of them per page.

Alarms

In its summary form, this portlet displays alarms. See General > Entity Change Settings on page 58 for the way to set the summary portlet refresh interval. The default is 40 seconds. If this portlet is on the same page as the Container View portlet, or if it is in expanded mode, refresh does not occur automatically, but you can refresh it manually.

A small clock icon appears in the upper right corner of this portlet if auto-refresh is enabled. A small speaker icon appears if audible alerts are enabled. See Audible Alerts on page 132 for more about those.



Showing: All Alarms (click on chart slice to filter) - Total Unique Alarms: 89

- ● Informational -- 37.08%
- ● Indeterminate -- 3.37%
- ● Warning -- 4.49%
- ● Minor -- 19.10%
- ● Major -- 2.25%
- ● Critical -- 33.71%

Severity	Date Opened	Entity Name	Device IP	Event Name	Count
Informational	11/16/12 11:23 AM	PC7048P_182.10....	10.20.1.182	endTftp	2
Informational	11/16/12 11:23 AM	PC7048P_182.10....	10.20.1.182	startTftp	1
Minor	11/16/12 8:38 AM	Router.yourdomai...	10.128.2.11	redcellNetConfigRestoreFailure...	1
Critical	11/16/12 8:37 AM	Router.yourdomai...	10.128.2.11	adaptiveCLIRunFailureNotification	1
Informational	11/14/12 12:51 PM	192.168.50.112	192.168.50.112	monitorAttributeTrend	1
Critical	11/7/12 8:50 AM	1/g18 (NG_GS748...	10.128.4.13	linkDown	1

The chart can act as a filter, too. For example, clicking the *Critical* alarms slice means only *Critical* alarms appear listed. Notice also that the chart “explodes” to highlight the selected slice. Hover the cursor over a portion of the chart and a tooltip with information about that slice also appears. Click exploded slices to return the graph to its unexploded state, and it stops filtering the list by the selected slice.

NOTE:

If the legend appears below the Alarms graph, resize your browser (click and drag the right edge out, then in), and the legend should re-appear to the right of the graph.

NOTICE

Different tooltips appear when you hover the cursor over columns for Entity Name and Device IP.

By default, the chart appears only when there are alarms. See Configuring the Alarms Chart below for options available in configuring the display. See Menu on page 128 for details about menu items available when you right-click in the summary and expanded portlets. The following columns appear in this screen by default:

Severity—The alarm severity indicated by the color of the leftmost icon. The severity only has meaning for Alarms and Security Alarms. Informational Alarms get a severity level of Indeterminate. Closed alarms appear without color.

Date Opened—The date the alarm appeared.

Entity Name—The entity emitting this alarm (often within the Equipment).

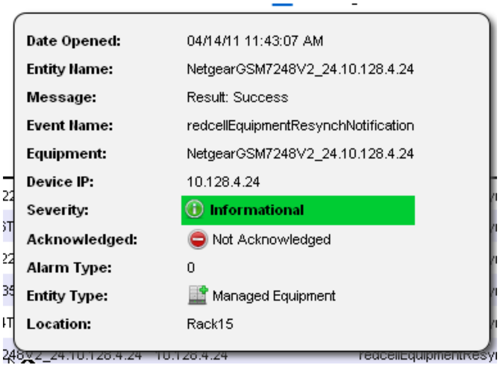
DeviceIP—The IP address of the equipment where the alarm appeared.

Event Name—The event associated with the alarm.

Open the *Settings >Columns* screen to see additional possibilities for columns.

NOTICE

If you hover the cursor over a row in the portlet display, a tooltip appears with information about the alarm. This can include the alarm's *Date Opened,* the *Entity Name,* any alarm *Message, Event Name, Alarm* and *Entity Type,* its status as *Service Affecting, Notification OID, Equipment, Severity,* whether the alarm was *Suppressed,* or *Acknowledged* and the *Device IP.*



Date Opened:	04/14/11 11:43:07 AM
Entity Name:	NetgearGSM7248V2_24.10.128.4.24
Message:	Result: Success
Event Name:	redcellEquipmentResynchNotification
Equipment:	NetgearGSM7248V2_24.10.128.4.24
Device IP:	10.128.4.24
Severity:	Informational
Acknowledged:	Not Acknowledged
Alarm Type:	0
Entity Type:	Managed Equipment
Location:	Rack15

If an alarm is **Service Affecting,** (reflect an impact on a service) it can propagate to appear as components of service- and customer-related alarms. Service-Affecting alarms are of indeterminate or greater severity. The Service Affecting alarm column in this portlet does not appear by default. To see an alarm's propagation, show that column in the Event Definitions portlet, where it is concealed by default.

NOTICE

Many other columns are available, including those related to suppression, region, any parent alarm, and so on.

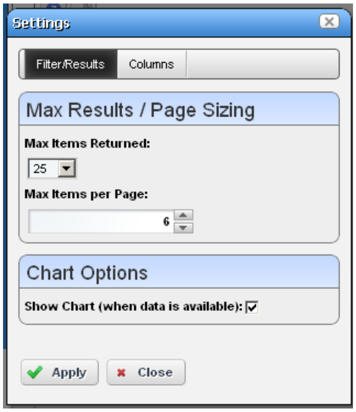
See Alarms in Visualizations / Topologies on page 267 for a description of how alarms appear in the topology portlet. The next section (Expanded Alarm Portlet) describes alarm actions and additional alarm capabilities.

Configuring the Alarms Chart

Turn the chart on or off in the *Settings* screen's *Chart Options* panel. If no data exists for the chart and the Chart option is on, the portlet returns to "no-chart" mode.

When you enable the chart Filtering is disabled since the chart, in effect, provides the filter. When the chart is disabled then filtering options are available.

Settings are saved if you have Admin rights or the Portlet is on your Public / Private pages (like standard behavior).


Settings

Filter/Results | Columns

Max Results / Page Sizing

Max Items Returned: 25

Max Items per Page: 6

Chart Options

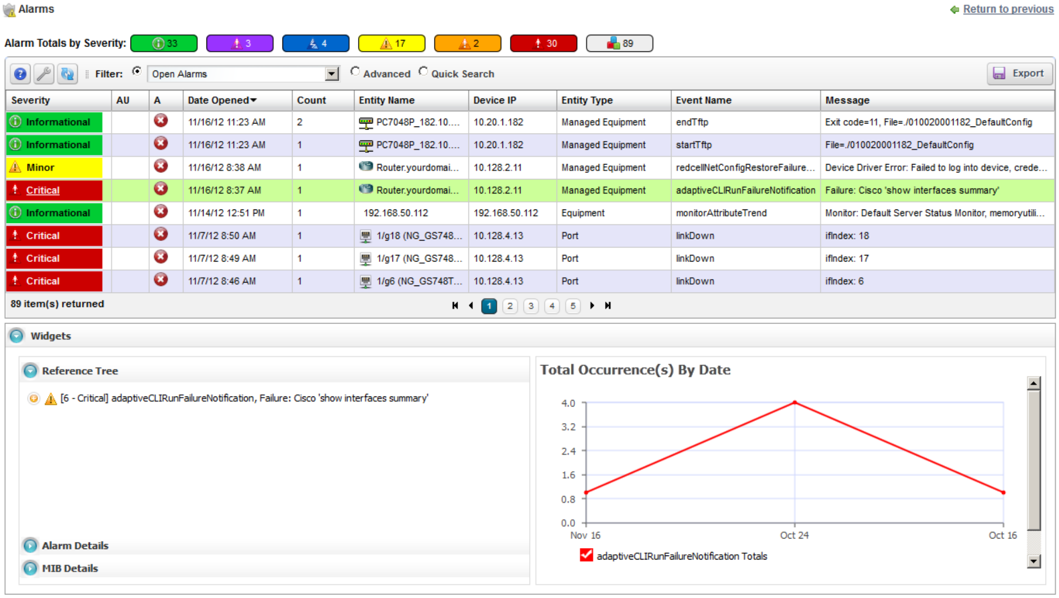
Show Chart (when data is available): ☑

NOTE:

Changes appear after you click *Apply*. The *Filter* panel disappears when you check the *Show Chart* checkbox.

Expanded Alarm Portlet

The expanded Alarm portlet appears when you click the plus (+) in the top right corner of the smaller screen.


Alarms

Return to previous

Alarm Totals by Severity: 33 | 3 | 4 | 17 | 2 | 30 | 89

Filter: ● Open Alarms ○ Advanced ○ Quick Search

Severity	AU	A	Date Opened	Count	Entity Name	Device IP	Entity Type	Event Name	Message
Informational		⊗	11/16/12 11:23 AM	2	PC7048P_182.10....	10.20.1.182	Managed Equipment	endTftp	Exit code=11, File=./010020001182_DefaultConfig
Informational		⊗	11/16/12 11:23 AM	1	PC7048P_182.10....	10.20.1.182	Managed Equipment	startTftp	File=./010020001182_DefaultConfig
Minor		⊗	11/16/12 8:38 AM	1	Router.yourdomai...	10.128.2.11	Managed Equipment	redcellNetConfigRestoreFailure...	Device Driver Error: Failed to log into device, crede...
Critical		⊗	11/16/12 8:37 AM	1	Router.yourdomai...	10.128.2.11	Managed Equipment	adaptiveCLIRunFailureNotification	Failure: Cisco 'show interfaces summary'
Informational		⊗	11/14/12 12:51 PM	1	192.168.50.112	192.168.50.112	Equipment	monitorAttributeTrend	Monitor: Default Server Status Monitor, memoryutili...
Critical		⊗	11/7/12 8:50 AM	1	1/g18 (NG_GS748...	10.128.4.13	Port	linkDown	ifIndex: 18
Critical		⊗	11/7/12 8:49 AM	1	1/g17 (NG_GS748...	10.128.4.13	Port	linkDown	ifIndex: 17
Critical		⊗	11/7/12 8:46 AM	1	1/g6 (NG_GS748T...	10.128.4.13	Port	linkDown	ifIndex: 6

89 item(s) returned

Widgets

Reference Tree

[6 - Critical] adaptiveCLIRunFailureNotification, Failure: Cisco 'show interfaces summary'

Alarm Details

MIB Details

Total Occurrence(s) By Date

This displays listed alarms, totals by severity for alarm types found, and Snap Panel details of a selected alarm. By default this screen adds the first of the following columns to those visible in the Event History's summary screen view. To add the others listed here, right click, and select *Add Columns* to change the screen appearance.

NOTE:

All severity totals appear in expanded view. This display updates automatically when alarms clear.

The following are available additional columns, besides those visible in the Alarms summary portlet:

Count—A count of the instances of the alarm. Multiples of the same alarm appear as a single row, but increment this count.

Entity Type—The type of monitored entity.

Message—Any message that accompanies the alarm / event.

Alarm State—The state (open / closed) of the alarm.

Date Cleared—The date and time that the alarm was closed.

UpdateDate Time—The time stamp for when this alarm was updated (for an additional count, the time the last duplicate was received).

Notification OID—The identifier of the notification displayed as an alarm.

Equipment—The name for the entity emitting the alarm.

Acknowledged—*True* or *False*.

Assigned User—The user who has been assigned this alarm (right click to do this). The assigned user can then look for alarms by consulting the Assigned User (AU) column in the display (concealed by default), or by filtering for his / her alarms in Advanced Filters. One can even create an alarm portlet that filters for a single user's assigned alarms.

Date Assigned—The date and time that the alarm was assigned.

Ack Time—The time the alarm was acknowledged.

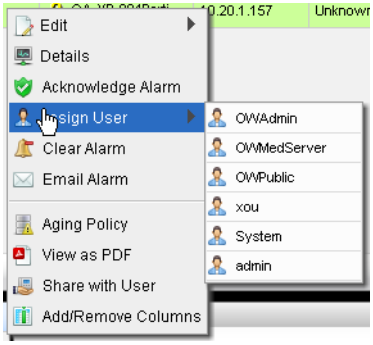
Cleared By—The user who cleared the alarm.

MIB Text—The alarm's MIB Text.

Rather than filtering with the pie graph, the expanded portlet lets you either the pick list at the top left, or create custom filtering by clicking *Advanced Filters*.

Menu

Right clicking an alarm lets you select from the following menu items:



Edit—Access the editors for the Alarm (see Alarm Editor on page 131) or *Event Definition* (see Event Definition Editor on page 158).

Details—Open a Details screen for the alarm itself, not the entity emitting it. (see Equipment Details on page 210 for an example of this type of screen). This contains information like the MIB text, any Event Processing Rules invoked, and a Reference Tree for the alarm.

Visualize—Display a topology map that includes the selected alarm(s). See Chapter 7, Display Strategies for more about these maps.

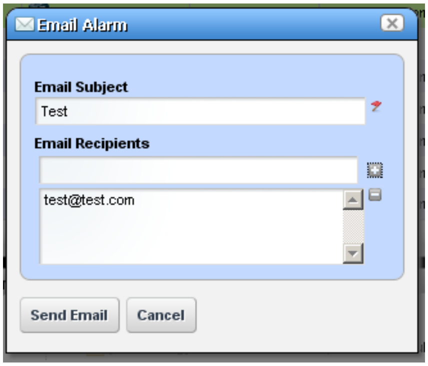
Acknowledge / Unacknowledge Alarm—Acknowledges the selected Alarm(s). The current date and time appear in the Ack Time field. Unacknowledges previously acknowledged alarm(s), and clears the entries in the Ack By and Ack Time fields. The red “unacknowledged” icon appears in the expanded portlet and turns to a green check “acknowledged” icon the alarm has been acknowledged.

Assign User—Assign this alarm to one of the users displayed in the sub-menu by selecting that user. An icon also appears in the expanded portlet indicating the alarm has been assigned to someone.

Clear Alarm—Clearing the alarm removes the alarm from the default alarm view and marks it as a candidate for the database archiving process (DAP). Essentially it is an indication to the system that the alarm has been resolved/addressed. If your system has enabled propagation policies, clearing recalculates dependent alarms.

Direct Access—Open an SNMP Mib Browser to the device alarmed, a CLI Terminal (Telnet window) to the device alarmed, or ICMP Ping the device alarmed. Only those available appear in the subsequent menu.

Email Alarm—E-mail the alarm. Enter a subject an e-mail address to which you want to mail the alarm’s content, and click the + to add to the list of addresses (the minus deletes them). Then click *Send Email*. Clicking *Cancel* ends this operation without sending e-mail. See SMTP Configuration on page 88 for instructions about setting up e-mail from Dell OpenManage Network Manager. See Alarm Email on page 129 for an example of what the content looks like.



Email Subject
Test

Email Recipients

test@test.com

Show Performance—If the equipment is monitored, this displays a performance dashboard for the alarmed equipment. See Dashboard Views on page 331 for more about these.

Aging Policy—This lets you select a policy that determines how long this alarm remains in the database. See Redcell > Database Aging Policies (DAP) on page 58 for information about configuring such policies.

View as PDF—Create an Acrobat PDF document containing this portlet's contents.

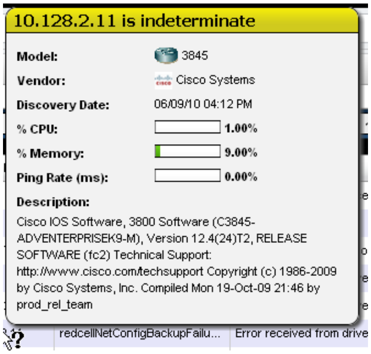
NOTE:

To resync alarms—that is, query the device for its alarm state—resync the device.

NOTICE

Hover your cursor over the *Device IP Address* column, and a tooltip appears with information about the alarm source's *Model, Vendor, Discovery Date,* and a *Ping Rate* bar graph. This can also include other device-dependent items. For example: bar graphs to display the *% CPU* [utilization], *% Memory,* and *Description.*

The convention indicating such tooltips are available is the question mark that appears next to the cursor when you hover it over the displayed field.



10.128.2.11 is indeterminate

Model: 3845

Vendor: Cisco Systems

Discovery Date: 06/09/10 04:12 PM

% CPU: 1.00%

% Memory: 9.00%

Ping Rate (ms): 0.00%

Description:

Cisco IOS Software, 3800 Software (C3845-ADVENTERPRISEK9-M), Version 12.4(24)T2, RELEASE SOFTWARE (fc2) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2009 by Cisco Systems, Inc. Compiled Mon 19-Oct-09 21:46 by prod_rel_team

redcellNetConfigBackupFailu... Error received from drive

Alarm Snap Panels

These include the following:

Alarm Details—The source, *Severity, Message, Date Opened*, and so on.

MIB Details—The *Notification OID*, and *MIB Text* for the selected alarm.

Reference Tree—The connection between the alarm and its source in tree form.

Total Occurrences by Date—A graph of the total occurrences of this alarm, by date.

Alarm Email

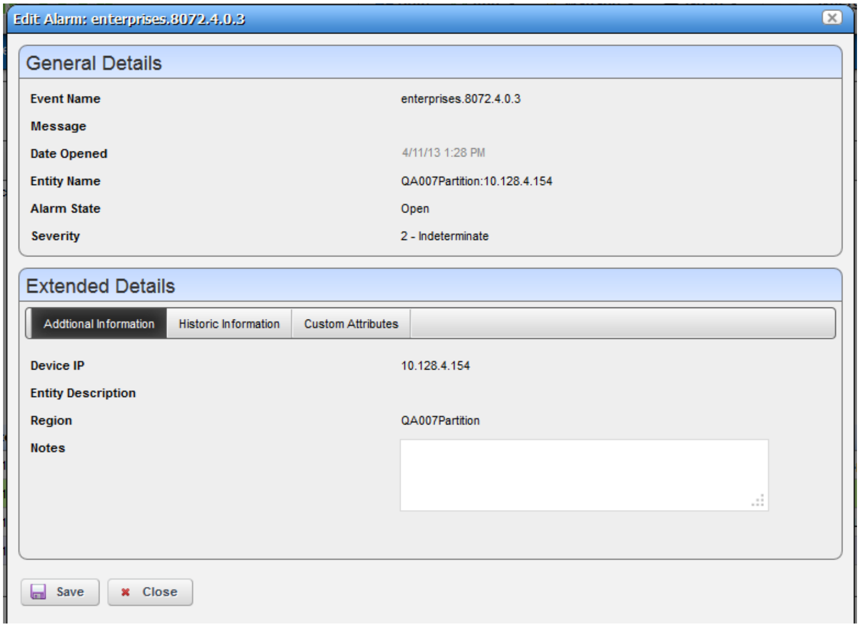
The e-mail sent by right-clicking an alarm has the subject specified when you send it, and contains the information within the alarm. For example:

```
Alarm: monitorIntervalSkip
Alarm Attributes:
================================
Device IP           =
Message             =
Alarm State         = Open
```

```
Severity           = 5 - Major
Count              = 1
Date Opened        = Tue Dec 14 22:01:30 PST 2010
Update Date/Time   = Tue Dec 14 22:01:36 PST 2010
Entity Name        =
Entity Type        =
Entity Description =
Equipment          =
Region             = SUPDEMOPartition
Location           =
Assigned By        = OWSystem
Date Assigned      = Thu Dec 16 10:40:24 PST 2010
Assigned User      = qatester
Acknowledged       = false
Ack By             =
Ack Time           =
Cleared By         =
Date Cleared       =
MIB Text           = Monitor session was skipped due to resource
   constraints.  Typically, this implies one or more monitors should run
   less frequently.  This may also be caused by a large number of timeouts
   which force executions to take longer to complete than normal.
Advisory Text      =
```

Alarm Editor

If you right-click and select *Edit Event* from an alarm in the Alarms portlet, this screen appears.



Edit Alarm: enterprises.8072.4.0.3

General Details

Event Name	enterprises.8072.4.0.3
Message	
Date Opened	4/11/13 1:28 PM
Entity Name	QA007Partition:10.128.4.154
Alarm State	Open
Severity	2 - Indeterminate

Extended Details

Device IP	10.128.4.154
Entity Description	
Region	QA007Partition
Notes	

These screens contain the following fields:

General Details

Event Name—The event that triggered the alarm.

Message—The event message.

Date Opened—The date the alarm occurred.

Entity Name—The entity emitting this alarm (often within the Equipment).

Alarm State—The state of the alarm (Open / Closed).

Severity—The alarm severity indicated by the color of the leftmost icon. The severity only has meaning for Alarms and Security Alarms. Informational Alarms get a severity level of Indeterminate. Closed alarms appear without color.

Extended Details: Additional Information

Equipment—The equipment (not subcomponent) that triggered the alarm.

DeviceIP—The IP address of the equipment where the alarm appeared.

Entity Description—A description of the triggering equipment.

Region—The partition / region for the alarm.

Notes—A field where you can enter text.

Extended Details: Historic Information

This panel contains primarily read-only fields describing the alarm, including whether it was *Acknowledged*, *Ack by*, *Ack Time*, *Count* and so on.

Extended Details: Custom Fields

If you have created any Custom Fields for Alarms, this panel appears in the editor. See Edit Custom Attributes on page 112 for instructions about these.

Audible Alerts

Audible Alerts produce a sound when a new alarm arrives in the (summary, not expanded) Alarms Portlet. The sound occurs when Dell OpenManage Network Manager's auto-refresh controller polls for state changes. If you enable Audible Alerts and new table rows appear in the view, then the preferred sound occurs.

If changes clear alarms, then no sound occurs. Only new Alarms added to the view trigger an audible alert during auto-refresh. To cut down on audio clutter, only a single Audible Alert sounds no matter how many alarms occur during an auto-refresh cycle.

Web Browsers and Sound

Each browser supports sound differently because of licensing for various sound formats. Audible alarm support exists for most browsers, so if issues occur with a particular browser the workaround is either to upgrade or use Chrome.

Browsers support MP3 the most, so this is the only format supported for Audible Alerts. Firefox only support OGG format natively and Internet Explorer has issues with most sounds. To support those browsers Dell OpenManage Network Manager plays the MP3 through a Flash Object, so browsers need no special plugins.

Turning on Audible Alerts

To turn on Audible Alerts, navigate to a page containing Alarms Portlet. The portlet must be on a page without Container View or other context broadcasting that can dynamically change the Alarms portlet's context. Auto refresh does not run when in this environment so as a result the Audible Alerts are not exposed. (See Display Rules on page 241.)

1. Click the Settings (Wrench Icon).
2. The settings popup appears. In the Audible Alerts section, by default, alerts are off.
3. Click the *Enable Audible Alerts* checkbox.

4 Select a desired sound to play with the up/down arrows. A play button appears next to the available alerts so you can preview the current selected sound.

By default Dell OpenManage Network Manager ships with four standard Sound Alerts: Alert, Bell, Chord and Ding. See Adding Custom MP3 Sounds below for the way to add custom sounds.

Click A*pply* and this Alarms Portlet instance on this page now has Audible Alerts enabled.

Adding Custom MP3 Sounds

To add custom MP3 sounds, follow these steps:

1 In Control Panel, click on the *Documents and Media* section.

2 Click the A*dd* button and Select *Basic Document*.

3 Under the *File* section click C*hoose File* and pick an MP3 file to upload.

Since this interface lets you add any type of media, no validation of the file occurs, however Audible Alerts only displays audio/MP3 mime-types.

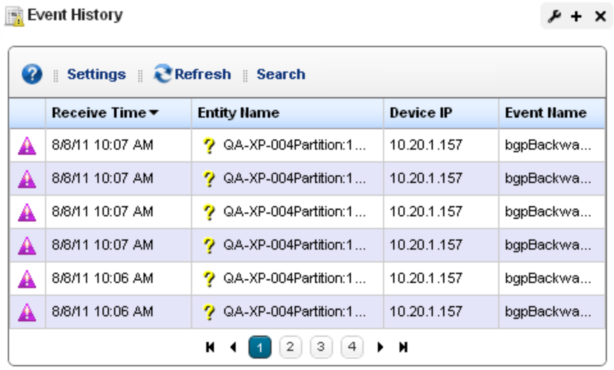
4 Give the new MP3 a short title. For example, if you upload cowsound.mp3, call it Cow Sound

5 Click *Publish*.

If you Navigate back to the Alarms Portlet and click the Settings button again you should now see your new Alert to select.

Event History

Not all events appear as alarms. Event History preserves all event information for your system.



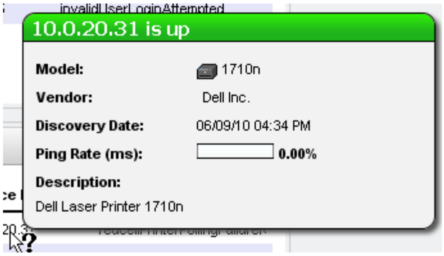
	Receive Time	Entity Name	Device IP	Event Name
⚠	8/8/11 10:07 AM	? QA-XP-004Partition:1...	10.20.1.157	bgpBackwa...
⚠	8/8/11 10:07 AM	? QA-XP-004Partition:1...	10.20.1.157	bgpBackwa...
⚠	8/8/11 10:07 AM	? QA-XP-004Partition:1...	10.20.1.157	bgpBackwa...
⚠	8/8/11 10:07 AM	? QA-XP-004Partition:1...	10.20.1.157	bgpBackwa...
⚠	8/8/11 10:06 AM	? QA-XP-004Partition:1...	10.20.1.157	bgpBackwa...
⚠	8/8/11 10:06 AM	? QA-XP-004Partition:1...	10.20.1.157	bgpBackwa...

The initial portlet view displays an icon whose color reflects any alarm state associated with the event. It also displays the *Receive Time*, *Entity Name*, *Device IP*, and *Event Name*. You can right-click to *Share with User* in this screen.

NOTICE

Hovering the cursor over the *DeviceIP* column produces a tooltip that lets you know the device's current state (*up / down*) and that contains *Model, Vendor, Discovery Date, Ping Rate (ms),* and the device's *Description* information.

The default filter for this portlet displays only recent events. If you do not see events, expand the period for which they appear.

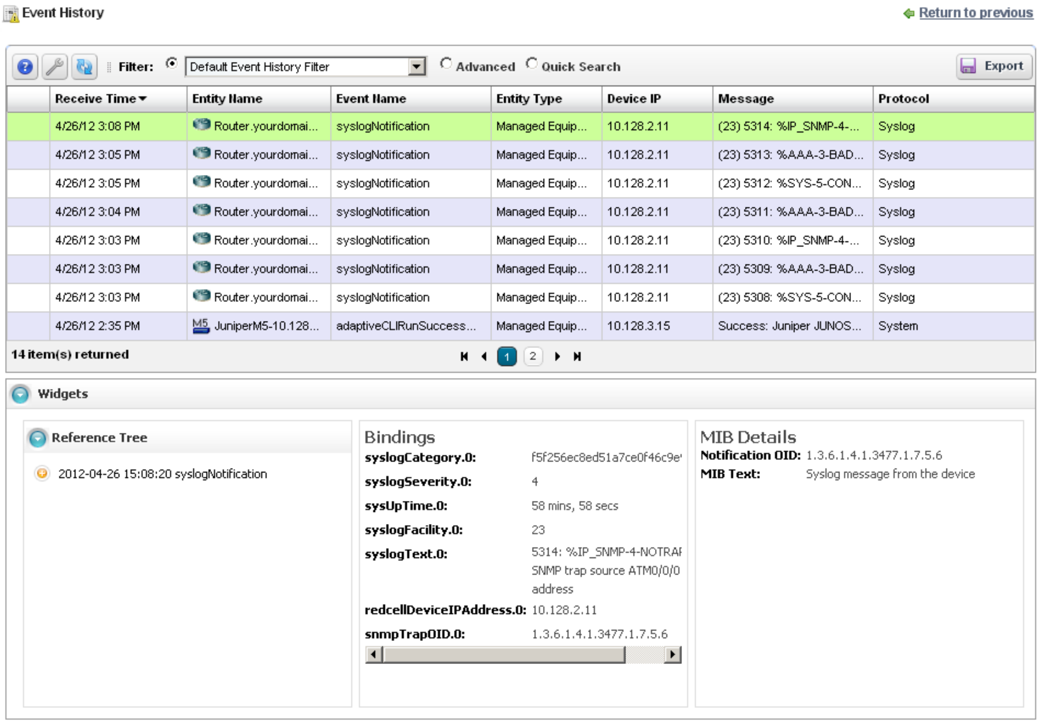


10.0.20.31 is up

Model: 1710n
Vendor: Dell Inc.
Discovery Date: 06/09/10 04:34 PM
Ping Rate (ms): 0.00%
Description:
Dell Laser Printer 1710n

Expanded Event History Portlet

Clicking the plus (+) in the upper right corner of the initial portlet view displays the expanded Event History. As in other expanded portlets, you can use the filtering capabilities at the top of the screen to further limit the default view of all events.



Event History

Return to previous

Filter: ● Default Event History Filter ○ Advanced ○ Quick Search

Export

	Receive Time	Entity Name	Event Name	Entity Type	Device IP	Message	Protocol
	4/26/12 3:08 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5314: %IP_SNMP-4-...	Syslog
	4/26/12 3:05 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5313: %AAA-3-BAD...	Syslog
	4/26/12 3:05 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5312: %SYS-5-CON...	Syslog
	4/26/12 3:04 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5311: %AAA-3-BAD...	Syslog
	4/26/12 3:03 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5310: %IP_SNMP-4-...	Syslog
	4/26/12 3:03 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5309: %AAA-3-BAD...	Syslog
	4/26/12 3:03 PM	Router.yourdomai...	syslogNotification	Managed Equip...	10.128.2.11	(23) 5308: %SYS-5-CON...	Syslog
	4/26/12 2:35 PM	JuniperM5-10.128...	adaptiveCLIRunSuccess...	Managed Equip...	10.128.3.15	Success: Juniper JUNOS...	System

14 item(s) returned

1 2

Widgets

Reference Tree

2012-04-26 15:08:20 syslogNotification

Bindings

syslogCategory.0:	f5f256ec8ed51a7ce0f46c9e'
syslogSeverity.0:	4
sysUpTime.0:	58 mins, 58 secs
syslogFacility.0:	23
syslogText.0:	5314: %IP_SNMP-4-NOTRAI SNMP trap source ATM0/0/0 address
redcellDeviceIPAddress.0:	10.128.2.11
snmpTrapOID.0:	1.3.6.1.4.1.3477.1.7.5.6

MIB Details

Notification OID:	1.3.6.1.4.1.3477.1.7.5.6
MIB Text:	Syslog message from the device

This screen has columns described in Alarms on page 123 or Expanded Alarm Portlet on page 126. Configure these as visible or hidden by clicking *Settings*. The following are some additional columns available.

Receive Time—The date the event was received.

Event Name—The event identifier.

Location—The location of the equipment emitting the event.

SubType—A classification for the event. For example: *Trap*.

Protocol—The protocol that delivered the event. Frequently: *System*, indicating Dell OpenManage Network Manager itself delivered it.

Notification OID—The object identifier (OID) for the event type.

Instance ID—The instance identifier for the event.

Event History Snap Panels

Click a listed alarm to display its details in the Snap Panels. The *Reference Tree* displays the event's relationship to any alarms, and to the source device. Click the plus (+) next to an item in the tree to unpack it.

The *Bindings* Snap Panel displays the event's varbind information, including the trap OID, the device's IP address, and other event-specific information.

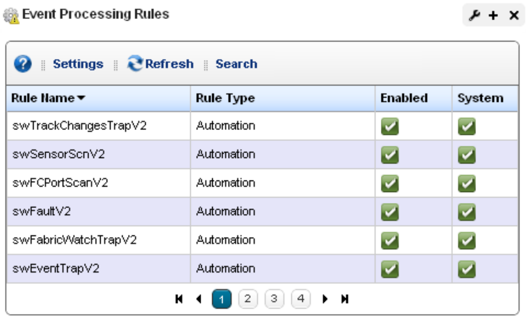
The *MIB Details* Snap Panel includes MIB information like the Notification OID and MIB Text.

You can right-click the listed events and *Share with User* (see *Sharing on page 110*), or (How to:) Show / Hide / Reorder Columns.

Event Processing Rules

This portlet manages Dell OpenManage Network Manager's response to events. By default it appears with seeded rules, but you can create your own (*New*), copy or modify (*Copy* or *Open*) or delete (*Delete*) existing rules by right-clicking in the portlet. You can also *Import* and *Export* rules to files.

The *Rule Type* column indicates whether rules are Pre-Processing (Correlation) or Post-Processing (Automation).



Rule Name	Rule Type	Enabled	System
swTrackChangesTrapV2	Automation	✓	✓
swSensorScnV2	Automation	✓	✓
swFCPortScanV2	Automation	✓	✓
swFaultV2	Automation	✓	✓
swFabricWatchTrapV2	Automation	✓	✓
swEventTrapV2	Automation	✓	✓

NOTICE

In this version, you can make a pre-processing Event Processing Rule that sets an event as service-affecting. These rules override the default service affecting field, which would otherwise be entirely determined by the notification type.

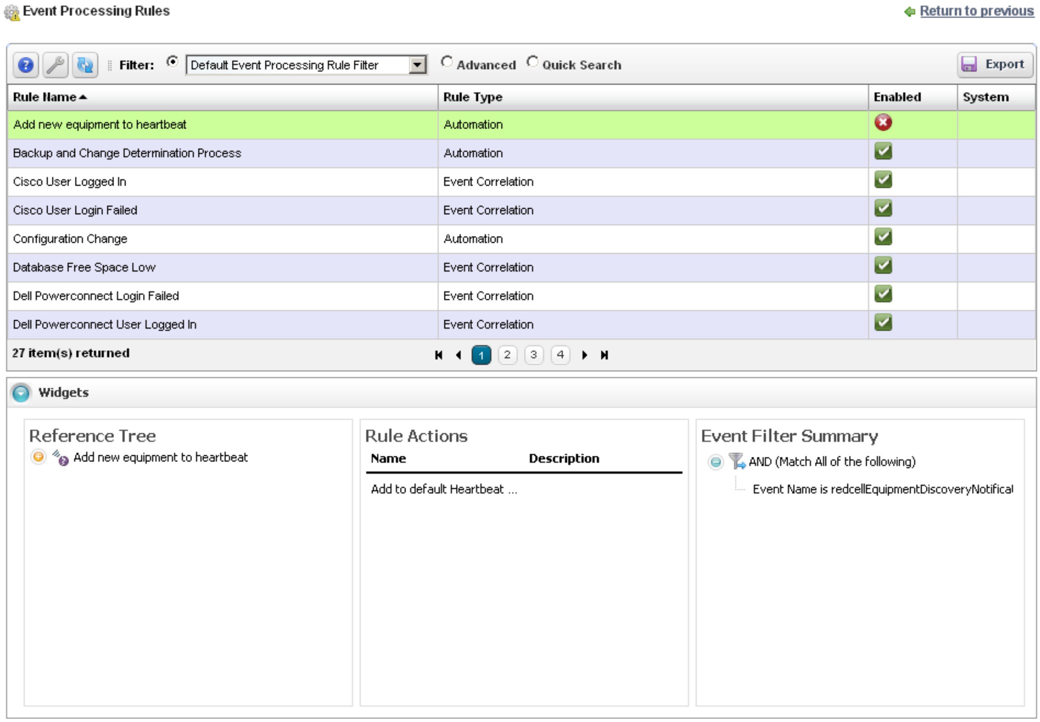
Icons in the *Enabled* and *System* columns indicate whether the rule is enabled—green is enabled, red is not—and whether it is a *System* rule, or a non-system (user-created) rule.

Modifying or creating rules opens Rule Editor. See How to: Create Event Processing Rules for steps to create these rules.

When you *Copy* an event processing rule, Dell OpenManage Network Manager generates a new name, but you must change that name before you save the event processing rule.

Expanded Event Processing Rules Portlet

The expanded portlet displays additional columns. Details about selected rules appear in the snap-in panels at the bottom of this screen.



Event Processing Rules

Return to previous

Filter: ● Default Event Processing Rule Filter ○ Advanced ○ Quick Search

Export

Rule Name ▲	Rule Type	Enabled	System
Add new equipment to heartbeat	Automation	☒	
Backup and Change Determination Process	Automation	✓	
Cisco User Logged In	Event Correlation	✓	
Cisco User Login Failed	Event Correlation	✓	
Configuration Change	Automation	✓	
Database Free Space Low	Event Correlation	✓	
Dell Powerconnect Login Failed	Event Correlation	✓	
Dell Powerconnect User Logged In	Event Correlation	✓	

27 item(s) returned

1 2 3 4

Widgets

Reference Tree

Add new equipment to heartbeat

Rule Actions

Name	Description
Add to default Heartbeat ...	

Event Filter Summary

AND (Match All of the following)

Event Name is redcellEquipmentDiscoveryNotifical

The *Reference Tree* panel displays the selected rule's connection to events. The *Rule Actions* list any configured actions associated with the rule. The *Event Filter Summary* summarizes any configured filter(s) for the selected rule.

How To:

Create Event Processing Rules

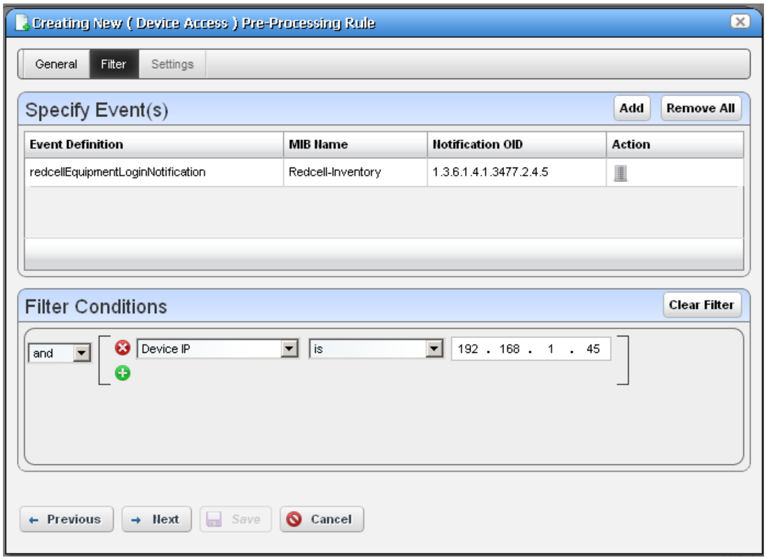
To create a rule in this portlet, follow these steps:

1 Right-click and select *New*, then select a rule type. These can be *Pre-Processing* (correlation) or *Post-Processing* (automation) rules.

If *Pre-Processing* is your selection, *Device Access*, *Frequency Throttle*, *Reject Event*, *Set Severity*, *Set Service Affecting* (overrides event's settings), *State Flutter*, *Suppress Alarm*, and *Syslog* are the types available. See *Filtering / Settings on page 141*, Syslog Escalation Criteria on page 144, and Actions on page 145 for more about the differences available between rule types.

2 For this example, we select Pre-Processing > Device Access. The Rule Editor screen appears. Enter a *Name* to identify the rule, an optional *Description*, and check *Enabled* if you want this rule to begin working immediately.

3 Click *Next* to open the Filtering / Settings tab.



Creating New (Device Access) Pre-Processing Rule

Specify Event(s)

Event Definition	MIB Name	Notification OID	Action
redcellEquipmentLoginNotification	Redcell-Inventory	1.3.6.1.4.1.3477.2.4.5	🗑

Filter Conditions

and [Device IP is 192 . 168 . 1 . 45]

Specify Event Filtering

In this panel select the *Event Definition*. Click pick list to find available events. Typing a letter goes to that letter in the list. You can then click to select from the pick list.

Click *Add Filter* to further filter the selected events. See Filter Expanded Portlet Displays on page 108 for more about this feature.

Specify Settings for: [Selected Rule Type]

This panel's appearance depends on the type of rule you selected when you clicked *New*. When you are editing an existing rule, it defaults to that rule's screen. For more about the available alternatives, see Filtering / Settings on page 141.

4 The *Device Access* example creates a specific device access event for user login, logout, login failure or configuration change. Select the *Access Type* (*Config Change*, *Login Failure*, *User Login*, *User Logout*) from the pick list for that field.

5 Enter the *User Name Variable* and/or *User Name RegEx* match string in those fields. This confines rule response to the selected users.

6 Check *Suppress Correlated* events if you do not want to see events correlated with this one.

7 Click *Save* to preserve the event processing rule.

Rule Editor

After you select between pre- and post-processing rules for new rules, the following screens manage the event processing described in brief in the Create Event Processing Rules on page 137. The following screens and fields appear in this editor.

- General
- Filtering / Settings
- Syslog Escalation Criteria (for pre-processing Syslog rules)
- Actions (for post-processing, automation rules)

Rules Referring to Subcomponents

Subcomponent names must cache on the server if you want to refer to them in rules. For example, if you want e-mail whenever a linkDown occurs on a port, then you must cache subcomponents. If you cache subcomponents, it impacts performance, which is why such caching is disabled by default.

To enable caching, set the following property in installed.properties:

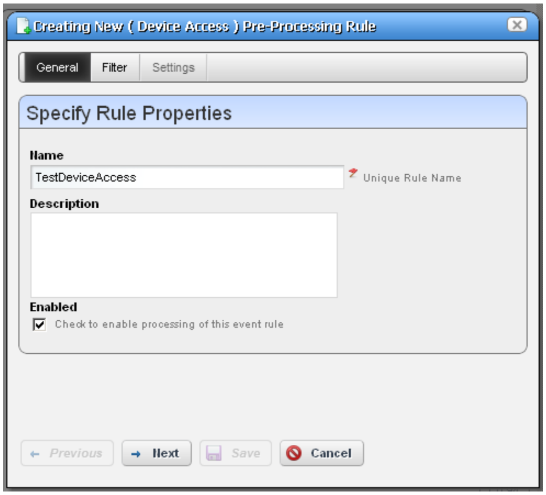
```
com.dorado.redcell.inventory.equipment.subcomponent.cache=true
```

...then restart application server.

The following sections describe editing rules in more detail.

General

The General screen is common to all rule types.



Creating New (Device Access) Pre-Processing Rule

General | Filter | Settings

Specify Rule Properties

Name

TestDeviceAccess — Unique Rule Name

Description

Enabled

☑ Check to enable processing of this event rule

It contains the following fields:

Name—A text identifier for the rule.

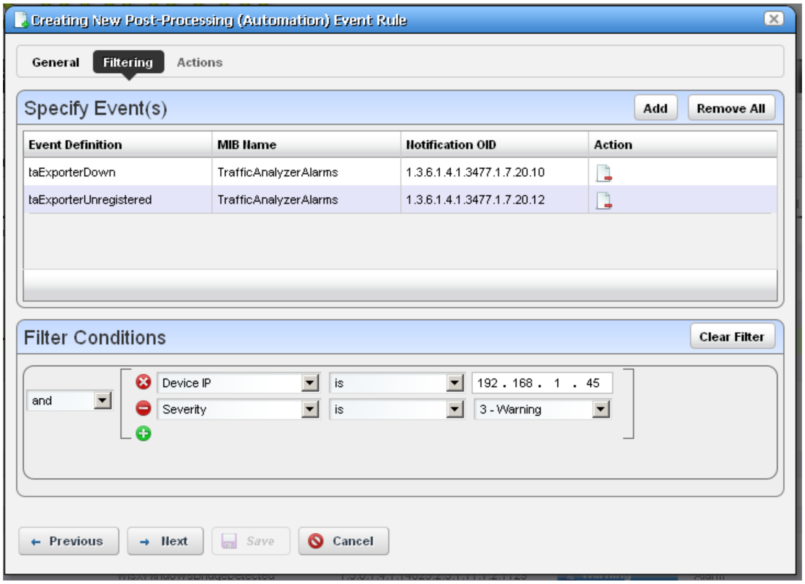
Description—An optional text description of the rule

Alarm Only—This is visible only in post-processing rules. Check this to enable the rule only if an alarm is generated, not suppressed.

Enabled—Check this to enable the rule.

Filtering / Settings

For all rule types, select the *Event Definition*. Click *Add* to open a screen where you can select events to include in the event you are creating. This incudes a filter at the top that you can use to search for specific events. For example: *Event Name Contains* ________. You can then click *Add Selection* to include selected items in this filter, or *Add All* to include all displayed events. After you finish event selection, click *Done* at the bottom of this selection screen.



Specify Event(s)

Event Definition	MIB Name	Notification OID	Action
taExporterDown	TrafficAnalyzerAlarms	1.3.6.1.4.1.3477.1.7.20.10	
taExporterUnregistered	TrafficAnalyzerAlarms	1.3.6.1.4.1.3477.1.7.20.12	

Filter Conditions

and
Device IP is 192 . 168 . 1 . 45
Severity is 3 - Warning

Click *Add Filter* to further filter the selected events. See Filter Expanded Portlet Displays on page 108 for more about this feature. After you *Add Filter* the button changes to *Clear Filter* so you can remove any filter from the event rule.

NOTICE

Dell OpenManage Network Manager supports multiple IP addresses per resource. During event processing, filters that include IP address criteria may behave incorrectly when Dell OpenManage Network Manager evaluates the filter. Best practice is using resource name(s) instead of IP addresses.

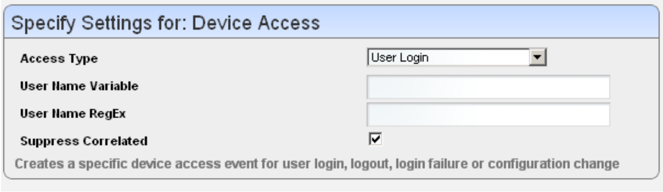
The following are processing rule types, and a description of their properties.

Pre-Processing—These rules either override the event definition, change the behavior of an event or generate another event. The following are the different subtypes. These are also called *Correlation* rules. See the descriptions below for additional information about the available types.

Post-Processing—Also called *Automation* rules, these execute specified actions for the rule after the event processing occurs.

The following are *Pre-Processing/ Correlation* rule subtypes:

Device Access—The Device Access example creates a specific device access event for user login, logout, login failure or configuration change. Select the *Access Type* (*Config Change*, *Login Failure*, *User Login*, *User Logout*) from the pick list for that field.



Specify Settings for: Device Access

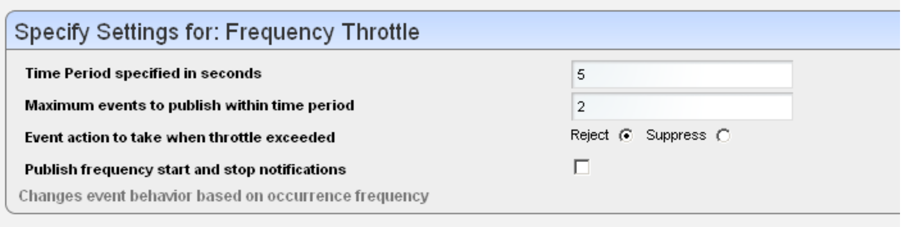
Access Type	User Login ▾
User Name Variable	
User Name RegEx	
Suppress Correlated	☑

Creates a specific device access event for user login, logout, login failure or configuration change

Enter the *User Name Variable* and/or *User Name RegEx* match string in those fields. This confines rule response to the selected users.

Check *Suppress Correlated* events if you do not want to see events correlated with this one.

Frequency Throttle—This rule type changes event behavior based on the frequency of the selected event.



Specify Settings for: Frequency Throttle

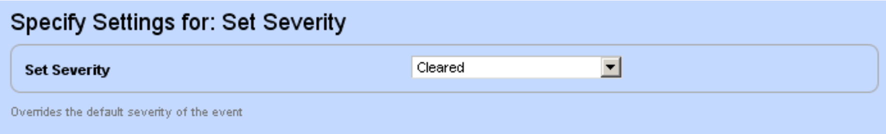
Time Period specified in seconds	5
Maximum events to publish within time period	2
Event action to take when throttle exceeded	Reject ● Suppress ○
Publish frequency start and stop notifications	□

Changes event behavior based on occurrence frequency

Enter the *Time Period* (seconds) and *Maximum events to publish within time period* for the event, then select an *Event Action to take when throttle exceeded* (*Reject* or *Suppress* the event) and check *Publish frequency start and stop notifications* if you want it to register for Dell OpenManage Network Manager. If you *Reject* an event, it does not appear in Event history; if you *Publish* it, however, listeners for that event will “hear” it.

Reject Event—This screen presents the *Specify Event Filtering* portion of the screen without any *Settings* in the lower screen. Specify events to reject with this selection and filtering.

Set Severity—This rule overrides the default alarm severity of an event selected and filtered in the upper screen.



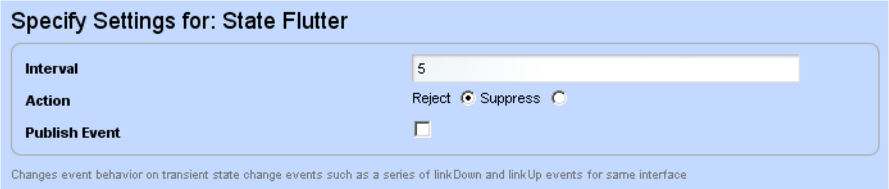
Specify Settings for: Set Severity

Set Severity	Cleared ▾

Overrides the default severity of the event

Set Service Affecting—Activate this by checking the checkbox in the *Settings* screen. This overrides any default service-affecting settings for the impacted event.

State Flutter—This type of rule changes event behavior on transient state change events like a series of LinkUp and LinkDown events for the same interface.



Specify Settings for: State Flutter

Interval 5

Action Reject ● Suppress ○

Publish Event □

Changes event behavior on transient state change events such as a series of linkDown and linkUp events for same interface

After you select the event and filtering, enter the *Interval* (seconds), the *Action* (*Reject* or *Suppress* the event) and check *Publish Event* if you want it to register for Dell OpenManage Network Manager. If you *Reject* an event, it does not appear in Event history; if you *Publish* it, however, listeners for that event will "hear" it.

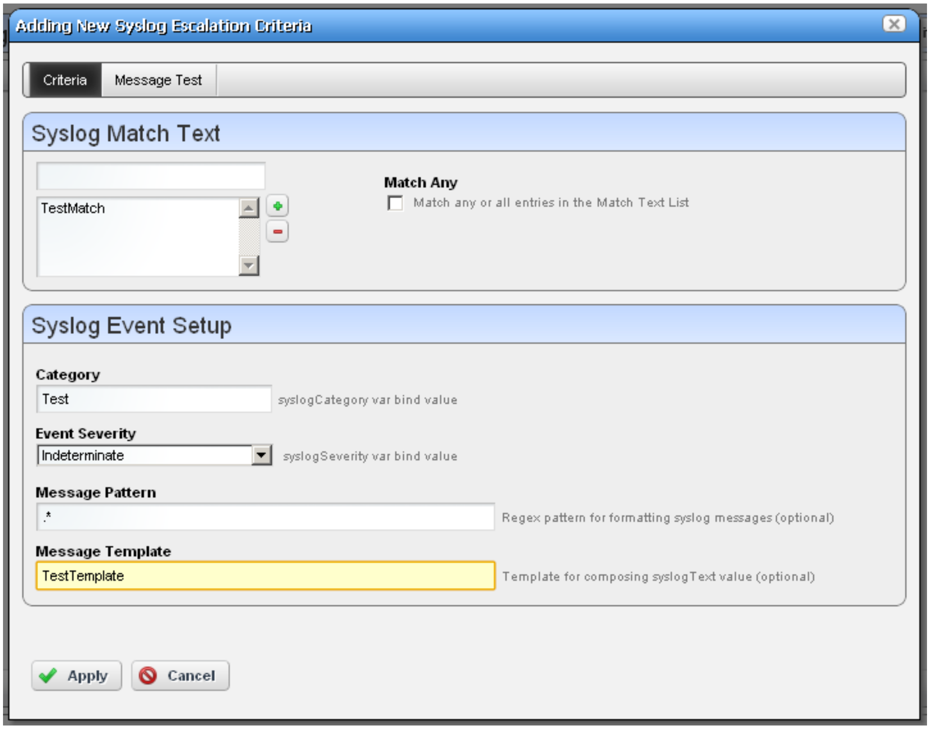
Suppress Alarm—This screen presents the *Specify Event Filtering* portion of the screen without any *Settings* in the lower screen. Specify events/alarms to suppress with this selection and filtering.

Syslog—This screen presents the *Specify Event Filtering* portion of the screen without any *Settings* in the lower screen. Specify events to select. Then click *Next* to go to the *Escalation* tab.

Post-processing (automation) rules let you modify the *Specify Event Filtering* portion of the screen without any *Settings* in the lower screen. Specify events to select. Then click *Next* to go to the *Actions* tab. See Actions on page 145 for more about that feature.

Syslog Escalation Criteria

This tab of Syslog Event Rules lets you manage events based on matching text, and configure messages in response to such matches.



Syslog Match Text

TestMatch

Match Any

☐ Match any or all entries in the Match Text List

Syslog Event Setup

Category: Test (syslogCategory var bind value)

Event Severity: Indeterminate (syslogSeverity var bind value)

Message Pattern: .* (Regex pattern for formatting syslog messages (optional))

Message Template: TestTemplate (Template for composing syslogText value (optional))

Criteria: Syslog Match Text

In this tab, enter the Syslog Match Text. Click the plus to add matching text to the list below the *Message Match Text* field. Check the *Match Any* to match any or all of the entered match text, rather than one or more specific strings.

Criteria: Syslog Event Setup

This portion of the Criteria screen sets up the event emitted when matching occurs. Here are the fields:

Category—The syslog category varbind value.

Event Severity—Select the alarm severity of the event emitted when a match occurs.

Message Pattern—An optional regular expression for the text to retrieve and transmit in the created event’s message.

Message Template—The configuration of the message when sent. For example: the template `%1 occurred on %3 for %2` creates a message with the first message pattern retrieved, followed by the third, then the second within the specified text.

Message Test

This screen lets you test your message against the pattern and/or template. Click the *Test* button to the right of the top field to activate this testing.

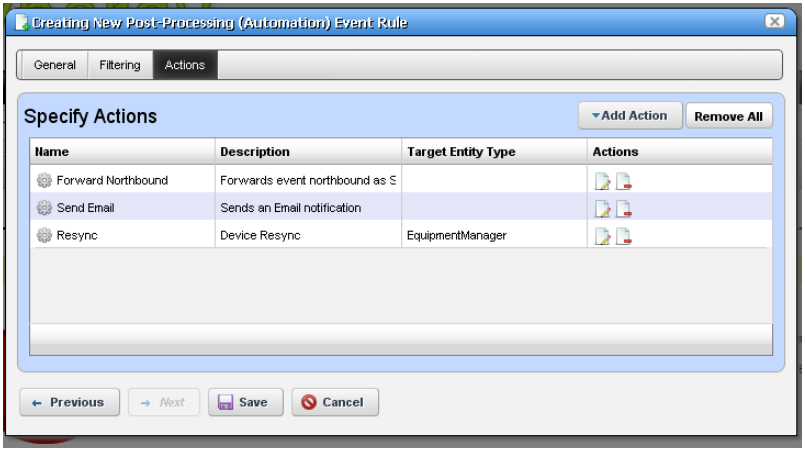
Test Message—Enter a message to test.

Test Message Result—The text extracted for the event as it appears in the template after you click the *Test* button.

Click *Apply* to accept these escalation criteria, or *Cancel* to abandon them without saving.

Actions

This screen catalogs the actions configured for the Post-Processing (Automation) rule you have configured in previous screens.



Name	Description	Target Entity Type	Actions
Forward Northbound	Forwards event northbound as S		
Send Email	Sends an Email notification		
Resync	Device Resync	EquipmentManager	

Click *Add Action* to create a new action in the editor. The *Actions* column lets you revise (*Edit this entry*) or *Delete* entries in this table. Click *Save* to preserve the action(s) configured here, or *Cancel* to abandon any edits.

Clicking *Add Action* lets you select from the following:

- Custom
- Forward Northbound
- Email

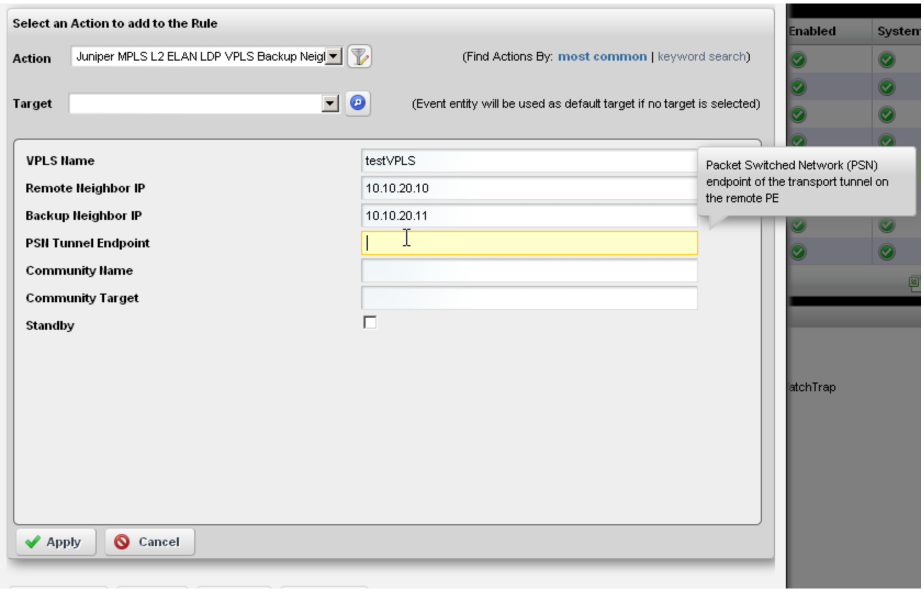
Click *Apply* to accept configured actions, or *Cancel* to abandon their editor and return to this screen.

NOTICE

Actions available here are like those for Discovery Profiles on page 181. You can also use actions to Execute Proscan. See Chapter 12, Change Management / ProScan.

Custom

This screen lets you configure *Action* based on Adaptive CLI actions available in the system. Notice that you can select by *most common* or by *keyword search*, depending on which of the links in the upper right corner of the screen you select.



Select an Action to add to the Rule

Action: Juniper MPLS L2 ELAN LDP VPLS Backup Neigl

(Find Actions By: most common | keyword search)

Target:

(Event entity will be used as default target if no target is selected)

VPLS Name: testVPLS

Remote Neighbor IP: 10.10.20.10

Backup Neighbor IP: 10.10.20.11

PSN Tunnel Endpoint:

Community Name:

Community Target:

Standby □

Packet Switched Network (PSN) endpoint of the transport tunnel on the remote PE

The *most common* actions include those you have used most recently. To search for actions, either enter a keyword, or click the search icon (the magnifying glass) to produce a pick list below the *Action* field. Select an action by clicking on its appearance in that list.

Select the device target of the custom action by selecting from the *Target* pick list. If you do not specify an explicit target, Dell OpenManage Network Manager uses the default entity for the event as the target.

If you want to select an action with additional parameters, those parameters appear in the screen below the *Target* field. To see definitions for such parameters, hover the cursor over the field and a tooltip describing the field appears.

You can specify parameter variables, dependent on the specifics of the event, rule, and selected targets. Do this with either NOTIFICATION or VARBIND.

The following are valid attributes to use in a phrase like [[NOTIFICATION: <attr name>]]:

- TypeOID
- AlarmOID
- EntityOID
- EquipMgrOID
- DeviceIP
- SourceIP

NOTICE

Consult the relevant portlet to find and verify an OID. For example, Event Definitions portlet has an OID column, and the varbind OIDs appear in the *Message Template* screen of the event editor.

Correct spelling is mandatory, and these are case sensitive. NOTIFICATION and VARBIND must be all caps, and within double brackets. The colon and space after the key word are also required.

Dell OpenManage Network Manager converts anything that conforms to these rules and then passes the converted information into the action before execution. Anything outside the double square brackets passes verbatim.

For example, the string:

```
This is the alarm OID [[NOTIFICATION: AlarmOID]] of notification type
   [[NOTIFICATION: TypeOID]] having variable binding [[VARBIND: 1.3.4.5.3]]
```

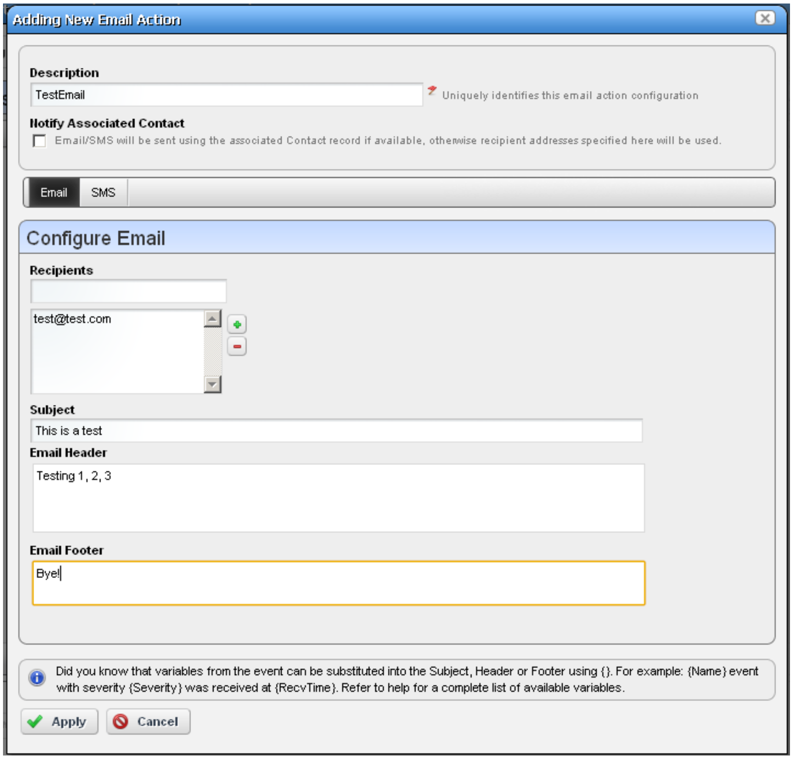
becomes something like...

```
This is the alarm OID 1OiE92tUjll3G03 of notification type
   1.3.6.1.4.1.3477.1.27.20.7 having variable binding 151.
```

Click *Apply* to accept your edits, or *Cancel* to abandon them.

Email

Email actions configure destinations and messages for e-mail and SMS recipients. You can include fields that are part of the event by using the variables described in Email Action Variables on page 152.



Description: TestEmail

Uniquely identifies this email action configuration

Notify Associated Contact

□ Email/SMS will be sent using the associated Contact record if available, otherwise recipient addresses specified here will be used.

Recipients: test@test.com

Subject: This is a test

Email Header: Testing 1, 2, 3

Email Footer: Bye!

Did you know that variables from the event can be substituted into the Subject, Header or Footer using {}. For example: {Name} event with severity {Severity} was received at {RecvTime}. Refer to help for a complete list of available variables.

Notice that below the Description of the e-mail action, you can check to send this mail (and/or SMS) to associated Contacts, if any are available, even if you specify no mail address destination. The SMS tab is similar to the e-mail tab, but limits the number of characters you can enter with a field at its bottom. You must send SMS to the destination phone carrier's e-mail-to-SMS address. For example sending text to 916-555-1212 when Verizon is the carrier means the destination address is 9165551212@vtext.com.

When enabled, notification emails go to the Contact associated with the Managed Equipment for the notification event. For the contact's email address, mail goes to the first specified address from either the *Work Email*, *Home Email* or *Other Email* fields in the Contact editor. SMS messages go to the *Pager Email* field for the contact. If a Contact was not found or the required addresses are not specified for the Contact, then Dell OpenManage Network Manager uses the Recipient addresses configured in the Email Action.

NOTICE

Programs other than Dell OpenManage Network Manager let you manipulate mail outside the scope of OpenManage Network Manager. For example IFTTT (If This Then That) lets you send SMS in countries whose providers do not provide e-mail equivalents to SMS addressing. You can also use such applications to save mail attachments like reports to Dropbox accounts.

This screen has the following fields:

Recipient Addresses—Enter an e-mail address in the field below this label, then click the plus (+) sign to add it to the list of recipients. The minus (-) removes selected recipients.

Subject—The e-mail subject.

Email Header / Footer—The e-mail's heading and footing.

SMS Body—The e-mail contents to be sent as text.

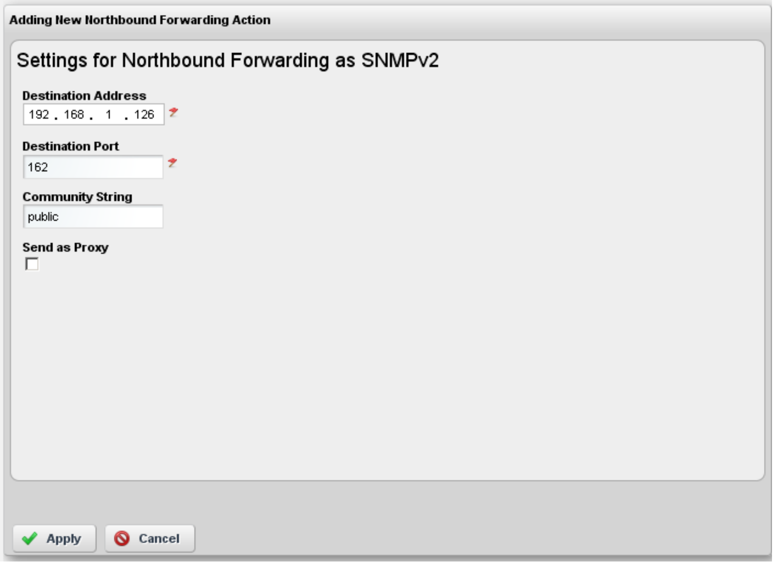
SMS Max Length—The maximum number of characters to send in the SMS. Typically this is 140, but the default is 0, so be sure to set to your carrier's maximum before saving.

Here is what Email looks like when it arrives:

```
Sent: Wednesday, March 02, 2011 2:37 PM
To: techpubs@doradosoftware.com
Subject: Web Test
Notification: redcellInventoryAttribChangeNotification
Notification Attributes:
===============================
sysUpTime.0                      = 5 hours, 16 mins, 43 secs
snmpTrapOID.0                    = 1.3.6.1.4.1.3477.2.2.1
redcellInventoryAttrName.0       = RedCell.Config.EquipmentManager_Notes
redcellInventoryAttrChangedBy.0 = admin
redcellInventoryAttrNewValue.0  = hello
world
severity
auto
redcellInventoryAttrOldValue.0  = hello
world
severity
```

Forward Northbound

When you want to forward an SNMP v2 event (trap) to another host, then configure automation in this screen to do that.



Adding New Northbound Forwarding Action

Settings for Northbound Forwarding as SNMPv2

Destination Address: 192 . 168 . 1 . 126

Destination Port: 162

Community String: public

Send as Proxy: □

Enter the following fields:

Destination Address—The IP address of the northbound destination.

Destination Port—The port on the northbound destination.

Community String—The SNMP community string for the northbound destination.

Send as Proxy—When checked, this sends the IP address of the application server as the source of the event. Unchecked, it sends the IP address of the source device. (See Send as Proxy on page 151 for more.)

For details of the Trap Forwarding Process, see the next section.

Trap Forwarding Process

SNMPv1 and SNMPv3 traps become SNMPv2 Traps

SNMPv1 traps are converted according to RFC 1908. SNMPv3 traps are already in SNMPv2 format and the application simply does not use SNMPv3 security when sending these northbound. The following is the relevant snippet from RFC 1908:

> 3.1.2. SNMPv1 -> SNMPv2
>
> When converting responses received from a SNMPv1 entity acting in an agent role into responses sent to a SNMPv2 entity acting in a manager role:

> (1) ...
>
> (2) If a Trap-PDU is received, then it is mapped into a SNMPv2-Trap-PDU. This is done by prepending onto the variable-bindings field two new bindings: sysUpTime.0 [6], which takes its value from the timestamp field of the Trap-PDU; and, snmpTrapOID.0 [6], which is calculated as follows: if the value of generic-trap field is `enterpriseSpecific`, then the value used is the concatenation of the enterprise field from the Trap-PDU with two additional sub- identifiers, ‘0', and the value of the specific-trap field; otherwise, the value of the corresponding trap defined in [6] is used. (For example, if the value of the generic-trap field is `coldStart`, then the application uses the coldStart trap [6]) Then, one new binding is appended onto the variable-bindings field: snmpTrapEnterprise.0 [6], which takes its value from the enterprise field of the Trap-PDU. The destinations for the SNMPv2-Trap-PDU are determined in an implementation-dependent fashion by the proxy agent.

Despite this description, many vendors defined a trap for SNMPv2 and then had to support sending as SNMPv1 protocol. The assembly of v2 OID from v1 enterprise and specific is supposed to include an extra ‘0'; enterpriseOID.0.specific. However, if a v2 trap is defined that has no '0' in it, so it cannot be sent as v1 and converted back following the specifications

Send as Proxy

This application can forward a trap as though it came from device (sourceIP spoofing) or act as an agent proxy according to the SNMP-COMMUNITY-MIB.

If not sending as proxy, we forward trap from application server cluster as an SNMPv2 notification as though it is coming directly from the originating agent (device). This is a common and desired behavior. Some operating systems prevent packet spoofing as a security measure so this behavior is necessarily optional.

If sending as proxy, the trap is forwarded from application server using the application server IP as sourceIP. The relevant snippet from SNMP-COMMUNITY-MIB is the following:

```
--
-- The snmpTrapAddress and snmpTrapCommunity objects are included
-- in notifications that are forwarded by a proxy, which were
-- originally received as SNMPv1 Trap messages.
--

snmpTrapAddress OBJECT-TYPE
        SYNTAX  IpAddress
        MAX-ACCESS accessible-for-notify
        STATUS current
        DESCRIPTION
                "The value of the agent-addr field of a Trap PDU which
                is forwarded by a proxy forwarder application using
                an SNMP version other than SNMPv1.  The value of this
                object SHOULD contain the value of the agent-addr field
                from the original Trap PDU as generated by an SNMPv1
                agent."
 -- 1.3.6.1.6.3.18.1.3 --  ::= { snmpCommunityMIBObjects 3 }


snmpTrapCommunity OBJECT-TYPE
        SYNTAX  OCTET STRING
        MAX-ACCESS accessible-for-notify
        STATUS current
        DESCRIPTION
                "The value of the community string field of an SNMPv1
                message containing a Trap PDU which is forwarded by a
                a proxy forwarder application using an SNMP version
                other than SNMPv1.  The value of this object SHOULD
                contain the value of the community string field from
                the original SNMPv1 message containing a Trap PDU as
                generated by an SNMPv1 agent."
 -- 1.3.6.1.6.3.18.1.4 --  ::= { snmpCommunityMIBObjects 4 }
```

Dell OpenManage Network Manager always adds `snmpTrapAddress` to every trap forwarded as proxy, (never adding `snmpTrapCommunity`). It does not keep track of the community string on the traps received.

Email Action Variables

The following are the Email Action variables you can use in customizing the content of action e-mail. These appear classified as follows:

- Basic Variables
- Managed Equipment Variables
- Entity Type: Port
- Entity Type: Interface, Logical interface

To successfully retrieve Custom attributes in e-mail, you must first create them. See Edit Custom Attributes on page 112.

You can also configure more limited variables that are slightly more efficient in performance, if not as detailed as those described in the following section.

For example, you can retrieve the following attributes:

```
{RedCell.Config.EquipmentManager_Custom1}
{RedCell.Config.EquipmentManager_Custom2}
{RedCell.Config.EquipmentManager_LastBackup}
{RedCell.Config.EquipmentManager_LastConfigChange} and
{RedCell.Config.EquipmentManager_HealthStatus}
```

NOTE:

If the entity does not contain/return these values, then the message [No data for <attribute name>] appears in the email instead.

Basic Variables

Attribute	Description	Email Action Variable
Name	The event / alarm name	{Name}
Message	Description from the event	{Message}
Entity Name	The entity (interface, card...) name	{EntityName}
Equipment Manager Name	The name of the equipment, parent or chassis.	{EquipMgrName}
Device IP address	the IP of the device in alarm	{DeviceIP}
Entity Type	Type of entity (Router, and so on)	{EntityType}
Instance ID	An identifier for the event	{InstanceID}
Protocol Type	Of originating alarm (SNMP, syslog, etc.)	{ProtocolType}
Protocol Sub Type	Inform, Trap, [blank] (for internal events)	{ProtocolSubType}
Receive Time		{RecvTime}
Region	The mediation server partition name.	{Region}
Severity	0 - cleared, through 6 - critical, from Alarm Definition	{Severity}
Source IP address	The IP of the component sending the alarm	{SourceIP}

The following section describe variables whose use may have a performance impact.

Managed Equipment Variables

Attribute	Description	Email Action Variable
Custom 1	Note that although you can re-name any Custom attribute, you must use the variable's original name. For example here, that is {RedCell.Config.EquipmentManager_Custom1}	{RedCell.Config.EquipmentManager_Custom1}
Custom 2		{RedCell.Config.EquipmentManager_Custom2}
Custom 3		{RedCell.Config.EquipmentManager_Custom3}
Custom 4		{RedCell.Config.EquipmentManager_Custom4}
Custom 5		{RedCell.Config.EquipmentManager_Custom5}

Attribute	Description	Email Action Variable
Custom 6		{RedCell.Config.EquipmentManager_Custom6}
Custom 7		{RedCell.Config.EquipmentManager_Custom7}
Custom 8		{RedCell.Config.EquipmentManager_Custom8}
Custom 9		{RedCell.Config.EquipmentManager_Custom9}
Custom 10		{RedCell.Config.EquipmentManager_Custom10}
Custom 11		{RedCell.Config.EquipmentManager_Custom11}
Custom 12		{RedCell.Config.EquipmentManager_Custom12}
Custom 13		{RedCell.Config.EquipmentManager_Custom13}
Description	Description of the equipment	{RedCell.Config.EquipmentManager_DeviceDescription}
DNS Hostname	Hostname of equipment	{RedCell.Config.EquipmentManager_Hostname}
Equipment Type	Equipment Type	{RedCell.Config.EquipmentManager_CommonType}
Firmware Version	Version of the equipment’s firmware	{RedCell.Config.EquipmentManager_FirmwareVersion}
Hardware Version	Version of the equipment’s hardware	{RedCell.Config.EquipmentManager_HardwareVersion}
Last Backup	Last Backup	{RedCell.Config.EquipmentManager_LastBackup}
Last Configuration Change	Last Configuration Change	{RedCell.Config.EquipmentManager_LastConfigChange}
Last Modified	Timestamp of Last Modified	{RedCell.Config.EquipmentManager_LastModified}
Model	Model number of the equipment	{RedCell.Config.EquipmentManager_Model}
Name	Component name	{RedCell.Config.EquipmentManager_Name}
Network Status	Network Status	{RedCell.Config.EquipmentManager_HealthStatus}
Notes	Equipment Notes	{RedCell.Config.EquipmentManager_Notes}

Attribute	Description	Email Action Variable
OSVersion	OSVersion	{RedCell.Config.EquipmentManager_OSVersion}
Serial Number	Unique identifier for the equipment	{RedCell.Config.EquipmentManager_SerialNumber}
Software Version	Version of the equipment’s software	{RedCell.Config.EquipmentManager_SoftwareVersion}
System Object Id	SNMP based system object identifier	{RedCell.Config.EquipmentManager_SysObjectID}

Entity Type: Port

Attribute	Description	Email Action Variable
Custom 1	Note that although you can re-name any Custom attribute, you must use the variable’s original name. For example here, that is {RedCell.Config.EquipmentManager_Custom1}	{RedCell.Config.Port_Custom1}
Custom 2		{RedCell.Config.Port_Custom2}
Custom 3		{RedCell.Config.Port_Custom3}
Custom 4		{RedCell.Config.Port_Custom4}
Encapsulation	Encapsulation	{RedCell.Config.Port_Encapsulation}
Hardware Version	Version of the port’s hardware	{RedCell.Config.Port_HardwareVersion}
If Index	SNMP If Index	{RedCell.Config.Port_IfIndex}
MAC Address	“Typically a MAC Address, with the octets separated by a space, colon or dash depending upon the device. Note that the separator is relative when used as part of a query.”	{RedCell.Config.Port_UniqueAddress}
Model	Model number of the port	{RedCell.Config.Port_Model}
MTU	Maximum Transmission Unit	{RedCell.Config.Port_Mtu}
Name	Port name	{RedCell.Config.Port_Name}
Notes	Port Notes	{RedCell.Config.Port_Notes}
Port Description	Description of the port	{RedCell.Config.Port_DeviceDescription}

Attribute	Description	Email Action Variable
Port Number	Port Number	{RedCell.Config.Port_PortNumber}
Slot Number	Slot Number	{RedCell.Config.Port_SlotNumber}
Speed	Speed	{RedCell.Config.Port_Speed}
Subnet Mask	SubMask	{RedCell.Config.Port_SubMask}

Entity Type: Interface, Logical interface

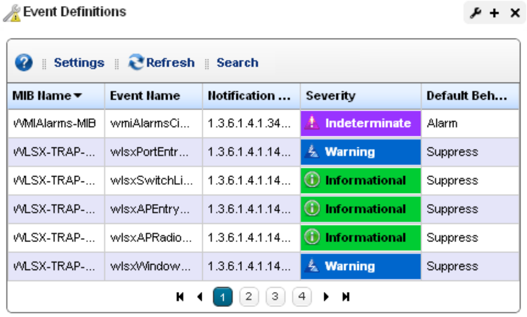
Attribute	Description	Redcell Email Action variable
Custom 1	Note that although you can re-name any Custom attribute, you must use the variable's original name. For example here, that is {RedCell.Config.EquipmentManager_Custom1}	{RedCell.Config.Interface_Custom1}
Custom 2		{RedCell.Config.Interface_Custom2}
Custom 3		{RedCell.Config.Interface_Custom3}
Custom 4		{RedCell.Config.Interface_Custom4}
Encapsulation	Encapsulation	{RedCell.Config.Interface_Encapsulation}
IfIndex	SNMP Interface Index	{RedCell.Config.Interface_IfIndex}
Interface Description	Description of the Interface	{RedCell.Config.Interface_DeviceDescription}
Interface Number	Interface Number	{RedCell.Config.Interface_InterfaceNumber}
Interface Type	Common Interface Type	{RedCell.Config.Interface_CommonType}
MTU	Maximum Transmission Unit	{RedCell.Config.Interface_Mtu}
Name	Interface name	{RedCell.Config.Interface_Name}
Notes	Interface Notes	{RedCell.Config.Interface_Notes}
Port Number	Port Number	{RedCell.Config.Interface_PortNumber}
Slot Number	Slot Number	{RedCell.Config.Interface_SlotNumber}
Subnet Mask	Subnet Mask of the Interface	{RedCell.Config.Interface_SubMask}

Best practice is to clarify such attributes by combining them with others that spell out their source.

Event Definitions

You can define how the Dell OpenManage Network Manager treats messages (events) coming into the system. Administrators can define event behavior deciding whether it is suppressed, rejected or generates an Alarm. Manage the definitions of events in this portlet.

In this screen, you can configure events that, when correlated as described in Event Processing Rules on page 136, trigger actions.



MIB Name	Event Name	Notification ...	Severity	Default Beh...
WMIAlarms-MIB	wmiAlarmsCi...	1.3.6.1.4.1.34...	Indeterminate	Alarm
WLSX-TRAP-...	wlsxPortEntr...	1.3.6.1.4.1.14...	Warning	Suppress
WLSX-TRAP-...	wlsxSwitchLi...	1.3.6.1.4.1.14...	Informational	Suppress
WLSX-TRAP-...	wlsxAPEntry...	1.3.6.1.4.1.14...	Informational	Suppress
WLSX-TRAP-...	wlsxAPRadio...	1.3.6.1.4.1.14...	Informational	Suppress
WLSX-TRAP-...	wlsxWindow...	1.3.6.1.4.1.14...	Warning	Suppress

Columns include the *MIB Name*, *Event Name*, *Notification OID*, *Severity* for associated alarms, and *Default Behavior.* See Event Definition Editor for how to alter these. Right-click a selected event definition for the following menu items:

Edit—Either open the selected event in Event Definition Editor, or open a details panel for the underlying equipment.

Set Behavior—This lets you select from the following options.

Reject–Every received message is rejected.

Suppress–The message is tracked in Event History and then ignored.

Alarm–The message is tracked in Event History and then processed, with Correlated events and Event Processing Rules of any type other than Syslog.

Set Severity—Set the alarm severity for the selected event.

MIB—This lets you upload a new MIB to your event definitions.

You can also configure an Aging Policy and View events as PDF in this menu. See Redcell > Database Aging Policies (DAP) on page 58, and View as PDF on page 113 for more about those options.

To see an event's propagation policy, you can view the editor panel described below. See also Alarm Propagation to Services and Customers: What Happens on page 167.

Event Definition Editor

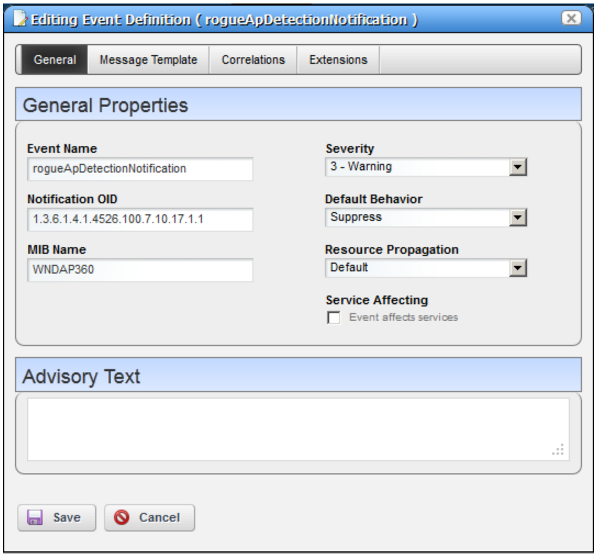
This editor lets you modify event definitions in the following tabs:

- General
- Message Template
- Correlations

Click *Save* to preserve any modifications you have made, or *Cancel* to abandon them.

General

This tab manages basics for Event Definitions.



Editing Event Definition (rogueApDetectionNotification)

General Properties

Event Name: rogueApDetectionNotification

Notification OID: 1.3.6.1.4.1.4526.100.7.10.17.1.1

MIB Name: WNDAP360

Severity: 3 - Warning

Default Behavior: Suppress

Resource Propagation: Default

Service Affecting: □ Event affects services

Advisory Text

It has the following fields:

Event Name—A text identifier for the event.

Notification OID—The object ID.

Severity—The severity of any associated alarm. If a new alarm is a clearing severity, then it closes any existing alarm to which it correlates. Otherwise, if a new alarm severity does not match the existing severity then the existing alarm is closed and a new alarm opened for the new severity.

MIB Name—The MIB with which this event is associated.

Default Behavior—The options for behavior (*Undefined*, *Alarm*, *Suppress*, *Reject*). *Alarm* means: Process at the mediation server, generate event history and an alarm. *Suppress* means: Process at the mediation server and generate an event (*not* an alarm). *Reject* means: Reject at the mediation server (do not process)

Resource Propagation—The hierarchical resource propagation behavior for any alarm based on this event definition (either *Default*, *Impacts subcomponents*, or *Impacts top level*). (See also Alarm Propagation to Services and Customers: What Happens on page 167 for more about how this impacts services and customers.)

An event definition configures “Resource Propagation” (distinct from “Alarm propagation”) based on the event type. Do alarms based on this event definition impact the overall device (*Impacts top level*), subcomponents (*Impacts subcomponents*), or just the correlated inventory entity (*Default*)?

Service Affecting—Check this if the event has an impact on services. Indicates whether the alarm has an impact on services. If this is checked then alarms based on this event definition propagate calculated alarm states across services and customers that depend on the (directly) alarmed resource.

For example: If a resource has a service affecting alarm, then Dell OpenManage Network Manager propagates the severity of this alarm across all associated services and customers. If the resource alarm is “clear” then all services depending on this resource are “clear” too. If the resource alarm is “critical,” then all services depending on that resource are “critical” too.

NOTE:

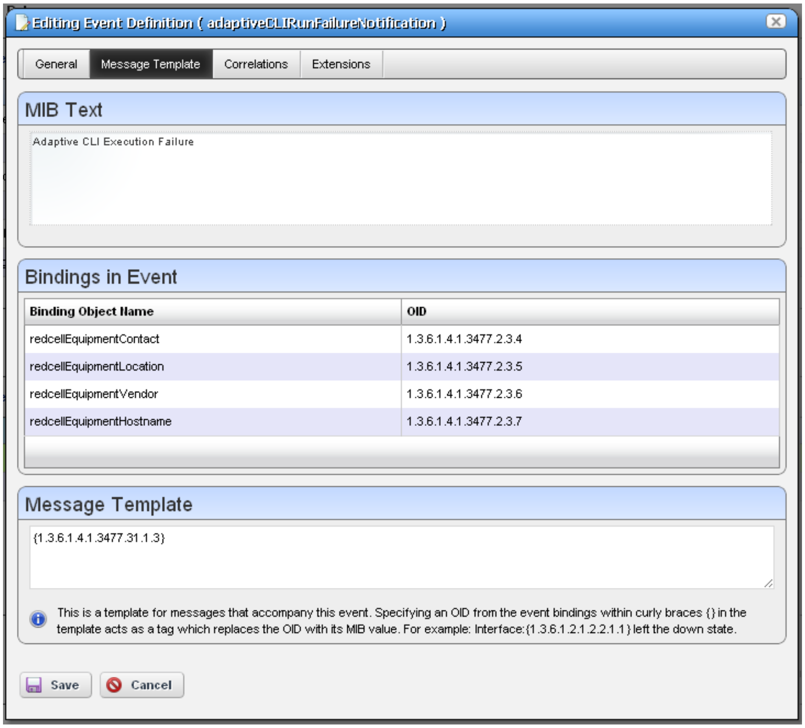
Alarms imported from previous versions appear as not service affecting, regardless of severity.

For more about propagation, see Alarm Propagation to Services and Customers: What Happens on page 167.

Advisory Text—The *Advisory Text* appears with the event. Configure it in the text box here.

Message Template

This panel lets you view or alter MIB Text, Bindings and the Message Template for the event selected.



Editing Event Definition (adaptiveCLIRunFailureNotification)
General
Message Template
Correlations
Extensions

MIB Text

Adaptive CLI Execution Failure

Bindings in Event

Binding Object Name	OID
redcellEquipmentContact	1.3.6.1.4.1.3477.2.3.4
redcellEquipmentLocation	1.3.6.1.4.1.3477.2.3.5
redcellEquipmentVendor	1.3.6.1.4.1.3477.2.3.6
redcellEquipmentHostname	1.3.6.1.4.1.3477.2.3.7

Message Template

{1.3.6.1.4.1.3477.31.1.3}

This is a template for messages that accompany this event. Specifying an OID from the event bindings within curly braces {} in the template acts as a tag which replaces the OID with its MIB value. For example: Interface:{1.3.6.1.2.1.2.2.1.1} left the down state.

This contains three sections:

MIB Text—A read-only reminder of the MIB contents for this OID.

Bindings in Event—A read-only reminder of the MIB bindings for this event. This displays the varbind contents of the event, matching the *Binding Object Name* and the *OID* (object identifier).

Message Template—A template for messages that accompany this event. Specifying an OID within the curly braces {} in the template acts as a tag which replaces the OID with its MIB value. For example: Interface: {1.3.6.1.2.1.2.2.1.1} left the down state.

You can also add optional messages surrounded by double brackets [[ ]]. if the event definition has the message "aindex: {1.2.3}[[, bindex: {1.2.4}]]" and {1.2.3} is defined as say "1" but {1.2.4} is not defined then this resolves to "aindex: 1". If they are both defined (say {1.2.4} is "2") then this resolves to "aindex: 1, bindex: 2"

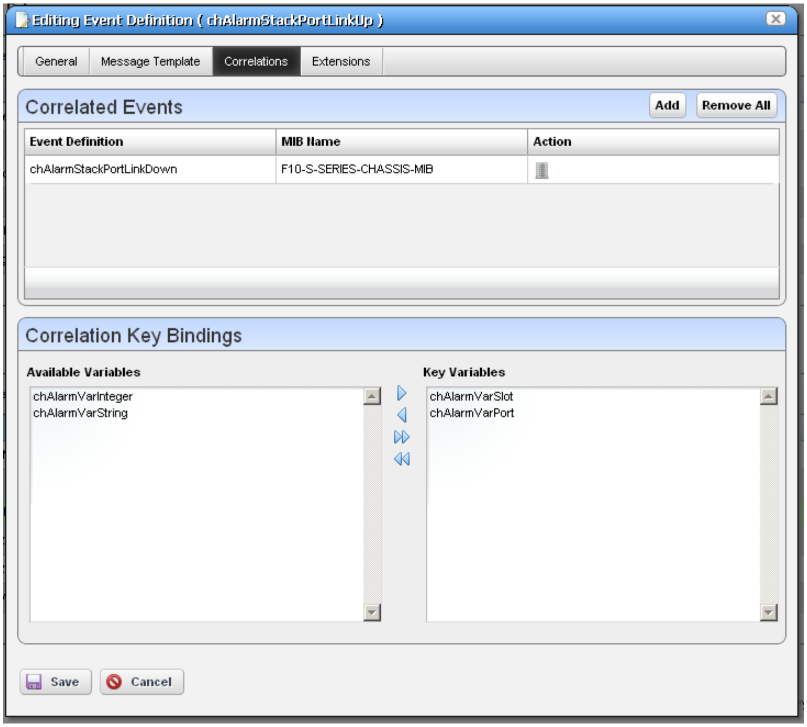
If a message template exists for an existing, correlated alarm and the generated text does not match the original alarm, then Dell OpenManage Network Manager closes the existing alarm, and generates a new one. Leaving this blank transmits the original message.

NOTICE

Putting an OID in curly brackets amounts to a tag replaced by the MIB text for that OID. Look for OIDs and messages in the MIB browser (as described in MIB Browser on page 214).

Correlations

This screen lets you configure Correlated Events and Correlation Key Bindings. For example, a link down event could correlate with a link up event, or an alarm with a clear alarm event.



Editing Event Definition (chAlarmStackPortLinkUp)

Correlated Events

Event Definition	MIB Name	Action
chAlarmStackPortLinkDown	F10-S-SERIES-CHASSIS-MIB	▯

Correlation Key Bindings

Available Variables

chAlarmVarInteger
chAlarmVarString

Key Variables

chAlarmVarSlot
chAlarmVarPort

In the Correlated Events panel, click *Add* to display a selector (with filter) to find events to correlate with the one you are editing.

In Correlation Key Bindings, use the right/left arrows to select *Key Variables* from *Available Variables*. The variables considered keys for correlation are the key bindings for the target alarm in the correlation process. This means that if event A is defined to include event B as a correlated event, comparison of the key bindings defined for event B is also considered when comparing a new alarm for event A to an existing alarm for event B.

Notification OID—As with parent event definitions, this is the object ID. Dell OpenManage Network Manager automatically generates this based on the Notification OID of the parent and key binding values entered. For example, if the parent event definition has a Notification OID of “1.2.3.4” and the key binding values of the extended definition are 5 and 6 (the parent must have previously been configured to have two extension bindings available) then the resulting Notification OID for this new extended event definition will be “1.2.3.4::5:6”.

Fine-Tuning Event Correlations

Dell OpenManage Network Manager's `eventdefs.xml` files configure event definitions that originate in installed MIBs. Dell OpenManage Network Manager's editor is typically a more convenient to configure them further.

No edit screen currently exists to configure variable binding objects. If you need to configure CorrelationType, you can do so by editing the `/owareapps/redcell/server/conf/bindobjectdefs.xml` file.

If an event definition does not correlate correctly for your system—for example the falling alarm does not clear the initial raising alarm—then you can use one or more of the OIDs for the binding objects on the Message Template tab, not the OID of the event definition itself, and create entries for them in this file. The technical help desk may assist in this process.

To customize Dell OpenManage Network Manager's standard bindings, edit the file. Here is an example of what appears in that file:

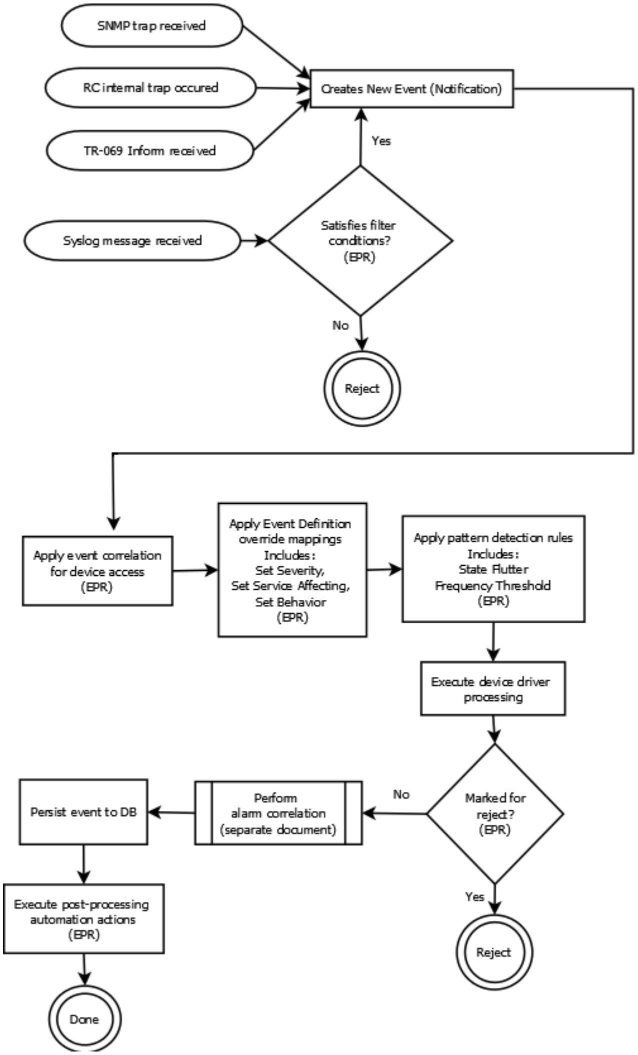
```
<?xml version="1.0" standalone="yes"?>


<ow:owdata xmlns:ow="urn:doradosoftware" xmlns:tns="urn:com/dorado/
   redcell/notifications" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
   instance">

<!-- ** Notification binding object definitions **

    This feature was added to allow for different ways of correlating
   notifications when the key bindings are structured differently.

    CorrelationType

    0 = On value, where all bindings have both an OID and a value, the value
   is used to correlate (this is default)

    1 = On index, e.g. OID of 1.4.5.3.4389.334 where no binding object
   exists with this exact OID but 1.3.5.3 does exist

    and is configured this way will use the remainder of the string
   (4389.334 in this example) to correlate

-->


  <!-- mplsTunnelAdminStatus -->

<bean xsi:type="tns:NotificationObjectDefNP">

    <ObjectOID>1.3.6.1.2.1.10.166.3.2.2.1.34</ObjectOID>

    <CorrelationType>1</CorrelationType>

</bean>


<!-- mplsLdpSessionState -->

<bean xsi:type="tns:NotificationObjectDefNP">
```

```
    <ObjectOID>1.3.6.1.2.1.10.166.4.1.3.3.1.2</ObjectOID>
    <CorrelationType>1</CorrelationType>
</bean>

  <!-- mplsTunnelAdminStatus -->
<bean xsi:type="tns:NotificationObjectDefNP">
    <ObjectOID>1.3.6.1.3.95.2.2.1.34</ObjectOID>
    <CorrelationType>1</CorrelationType>
</bean>

</ow:owdata>
```

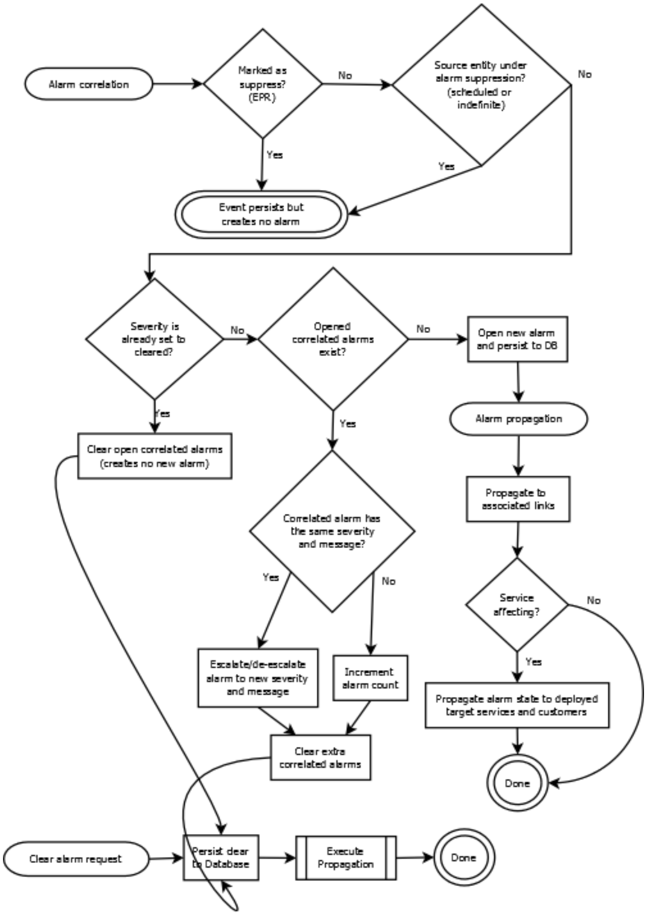
Event and Alarm Lifecycles

The following outline the logic Dell OpenManage Network Manager uses when processing events and alarms.

Events


SNMP trap received
RC internal trap occured
TR-069 Inform received
Creates New Event (Notification)
Yes
Syslog message received
Satisfies filter conditions? (EPR)
No
Reject
Apply event correlation for device access (EPR)
Apply Event Definition override mappings Includes: Set Severity, Set Service Affecting, Set Behavior (EPR)
Apply pattern detection rules Includes: State Flutter Frequency Threshold (EPR)
Execute device driver processing
Marked for reject? (EPR)
No
Yes
Reject
Perform alarm correlation (separate document)
Persist event to DB
Execute post-processing automation actions (EPR)
Done

Alarms


Alarm correlation
Marked as suppress? (EPR)
No
Source entity under alarm suppression? (scheduled or indefinite)
No
Yes
Yes
Event persists but creates no alarm
Severity is already set to cleared?
No
Opened correlated alarms exist?
No
Open new alarm and persist to DB
Yes
Clear open correlated alarms (creates no new alarm)
Yes
Alarm propagation
Propagate to associated links
Correlated alarm has the same severity and message?
Yes
No
Service affecting?
No
Yes
Escalate/de-escalate alarm to new severity and message
Increment alarm count
Propagate alarm state to deployed target services and customers
Clear extra correlated alarms
Done
Clear alarm request
Persist clear to Database
Execute Propagation
Done

Alarm Propagation to Services and Customers: What Happens

The following describes the use cases where you Alarm Propagation to services and customers occurs. This describes the sequence of events / alarms.

Alarm state must propagate to associated entities for each step and might take some time to reach all of them, so matching mentioned below may not be instantaneous, depending on the complexity of the associations. This propagation to services and customers occurs through a background process, running on regular intervals.

A resource can have several levels of services that depend on it, and then customers can depend on them, and so on. Potentially, several levels of dependency and a large database full of services and customers to propagate alarm states can exist, so propagation processing occurs in the background. By default, this process runs every 30 seconds, but you can configure this interval by setting the `com.dorado.assure.propagation.AlarmPropagationInterval` property. This value is in milliseconds. The following...

```
com.dorado.assure.propagation.AlarmPropagationInterval=60000
```

sets the interval at 60 seconds. Best practice is to put this property in `\owareapps\installprops\lib\installed.properties`, so upgrading your Dell OpenManage Network Manager package does not overwrite any change you make. After changing this property, you must restart the application server for the change to take effect.

NOTE:

Only services associated with the alarmed subcomponents are affected by alarms on the subcomponent, not services connected to the rest of the device. You can also override default service affecting alarm behavior with an Event Processing Rule. See Event Processing Rules on page 136 for more about them.

A New Alarm Arrives, then...

Service Affecting Alarm Changes Source Alarm State: The new alarm changes the alarm state (higher or lower) of the resource that is its source.

> **Dependencies:** If this resource has services or customers that depend on it, the alarm state matches for all such deployed, dependent services and their associated customers. Without such dependencies, no alarm state changes, besides that of the source.

Parent Resources: The alarm changes the alarm state of a child of the source and the alarm's Resource Propagation value is *Impacts Subcomponents*.

> **Dependencies:** Child equipment matches the top level’s alarm state. All deployed services and their related customers depending on this particular resource component match the resource component’s alarm state.

Child Resources: The alarm changes the alarm state of parent of the source and the alarm's Resource Propagation value is *Impacts Top Level*.

Dependencies: Parent equipment matches the child entities alarm state. All deployed services and associated customers depending on only this resource's alarmed component have their alarm state match the resource's component.

No Change to Alarm State: The new alarm does not change the alarm state of its source, so no services or customers have their alarm state changed

Alarm not Service Affecting: The new alarm is not service affecting. The result is that no change occurs to services' or customers' alarm state.

Cleared Existing Alarm

Clearing Service Affecting Existing Alarm Changes Alarm State: This changes the alarm state (higher or lower) of a resource.

Dependencies: All deployed services and associated customers depending on this resource have their alarm state match the resource.

No Dependencies: No services or customers change their alarm state

Clearing Non-Service Affecting Existing Alarm: No services or customers have their alarm state changed

User Actions

Resync the resource's alarm state: if the resource's displayed alarm state was incorrect, perhaps because it is a parent or child of a resource whose alarm state has changed, then this corrects it.

If this action changes the alarm state and this resource's most severe alarm is service affecting, then resync makes alarm states propagate to any associated services and customers. If the deployed services have the incorrect alarm state, then resync corrects that inaccuracy.

Viewing alarms associated with a service:

- If the service is deployed, and the target resource has open service affecting alarms, all open service affecting alarms for the target resource appear.
- If the service is deployed, but the target resource has only cleared or non-service affecting alarms against it, no alarms appear.
- If the service is deployed, and the target resource does not have open service affecting alarms, but at least one descendent entity of this resource has open service affecting alarms against it, those alarms propagate up to the resource. All open service affecting alarms that propagate up (Resource Propagation is *Impacts top level*) for the target resource's descendants appear
- If the target resource does not have service affecting alarms, and neither do any service affecting alarms exist for its descendent entities, no alarms appear.
- If the service is undeployed, no alarms appear.

Viewing alarms associated with a given customer:

- If at least one service associated with the customer has open, service affecting alarms, all open service affecting alarms for all services associated with this customer appear.

- If none of the services associated with this customer have open, service affecting alarms, so alarms appear

User views the services impacted by a particular alarm:

- If the alarmed resource has at least one deployed service that depends on it, all deployed services depending on the alarmed resource appear.
- If the alarmed resource does not have any deployed services that depend on it, no services appear.

Deploying a service whose target resource has service affecting alarms:

- Before deploying, no alarms appear for the service. After deploying, all open, service affecting alarms for the target resource appear.

Undeploying a service whose target resource has service affecting alarms:

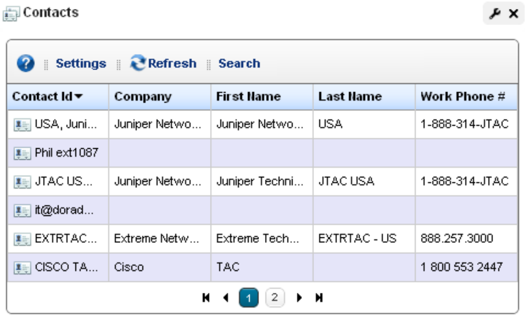
- Before undeploying, all open, service affecting alarms for the target resource should appear. After undeploying, no alarms appear.

Editing a deployed service to change the target from one resource to another:

- If the original resource has service affecting alarms but the new one does not, all open service affecting alarms for the original target resource should appear before the edit. After the edit, no alarms appear.
- If the original resource does not have service affecting alarms but the new one does, before editing, no alarms appear. After editing, all open service affecting alarms for the new target resource appear.

Contacts

The contact portlet displays available contacts for your system. There is no expanded version of this portlet, but you can Ctrl+click to multi-select.



Contact Id	Company	First Name	Last Name	Work Phone #
USA, Juni...	Juniper Netwo...	Juniper Netwo...	USA	1-888-314-JTAC
Phil ext1087				
JTAC US...	Juniper Netwo...	Juniper Techni...	JTAC USA	1-888-314-JTAC
it@dorad...				
EXTRTAC...	Extreme Netw...	Extreme Tech...	EXTRTAC - US	888.257.3000
CISCO TA...	Cisco	TAC		1 800 553 2447

You can right-click to act on the the selected contact with the following menu items.

New / Open—Displays the Contacts Editor, where you can create new contacts or alter existing ones.

Details—Displays a screen with contact-associated alarms, and the information entered in Contacts Editor.

Visualize—Displays a mapping of the selected contact’s association to devices. See Chapter 7, Display Strategies.

Delete—Displays a mapping of the selected contact’s association to devices.

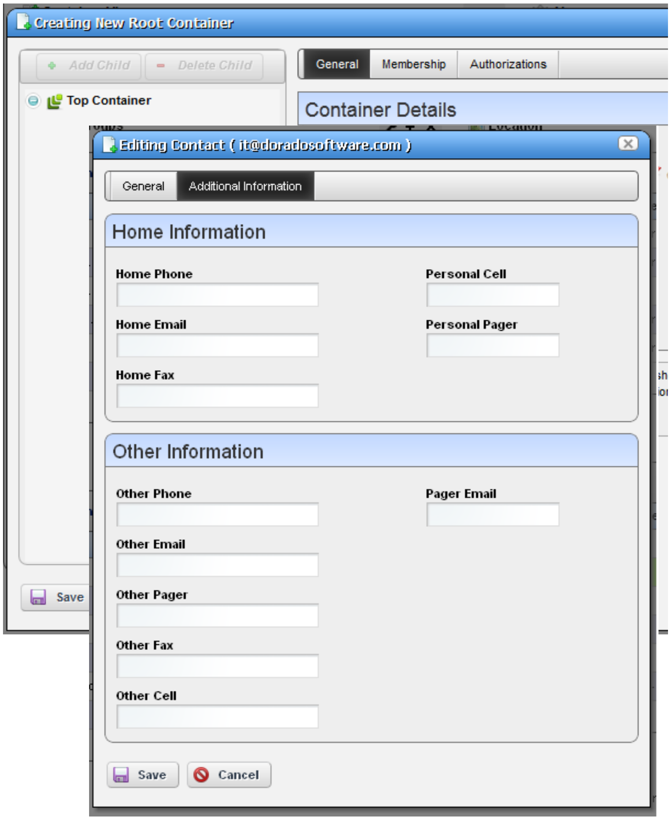
Visualize—Displays a mapping of the selected contact's association to devices.

Dell OpenManage Network Manager only retrieves Contact and Location information on initial discovery. You can modify these once the resource is under management, however doing so will not modify any system information on the device.

Contacts Editor

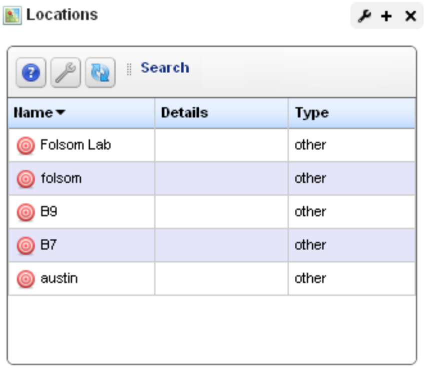
This editor has two panels where you can enter contact information (*Name*, *Address*, *Phone*, and so on). Click the tabs at the top of this screen to move between the panels. The *Contact ID*, a unique identifier for the contact in your system, is a required field at the top of the first page.

Click *Save* to preserve your new or modified contact information. Click *Cancel* to leave the contact unmodified.



Locations

In its summary form, the locations portlet displays configured locations in your system.



Locations

Name	Details	Type
Folsom Lab		other
folsom		other
B9		other
B7		other
austin		other

You can right-click to create, modify or remove (*New*, *Open*, *Delete*) the selected location. See Location Editor description below for more about editing or creating locations.

If you select *Visualize*, a map of the selected location's connection to equipment appears. See Chapter 7, Display Strategies for more.

The *Tag* option lets you record a location's longitude and latitude. See Tag on page 173 for more.

This screen has the following columns:

[Icon]—The icon for this location.

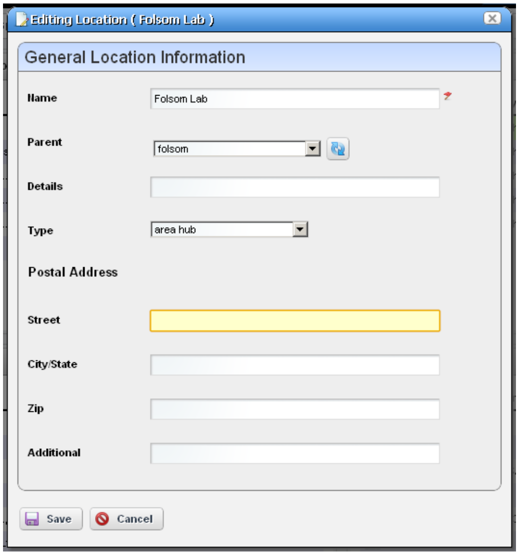
Name—The name for this location.

Details—A description for this location.

Type—A designated type for the location.

Location Editor

When you click *New* or *Open*, an editor appears. The *Name* field is mandatory.



Editing Location (Folsom Lab)

General Location Information

Name	Folsom Lab
Parent	folsom
Details	
Type	area hub

Postal Address

Street	
City/State	
Zip	
Additional	

Name—A unique name for the Location. If you alter the name of an existing location already in use by existing equipment, the editor creates a new location. If you change the name of a location, this change may take a short period to percolate to all managed objects that use it. You can do this, though.

Parent—The "parent" of this location (the location to which this location is subordinate). Select a Parent Location from the pick list. The maximum number of levels supported is 15.

Details—A text description of the location.

Type—Type of location, as selected from the drop-down menu. Available types are: Area Hub, Customer, National Hub, Other, Provider, Regional Hub, and State.

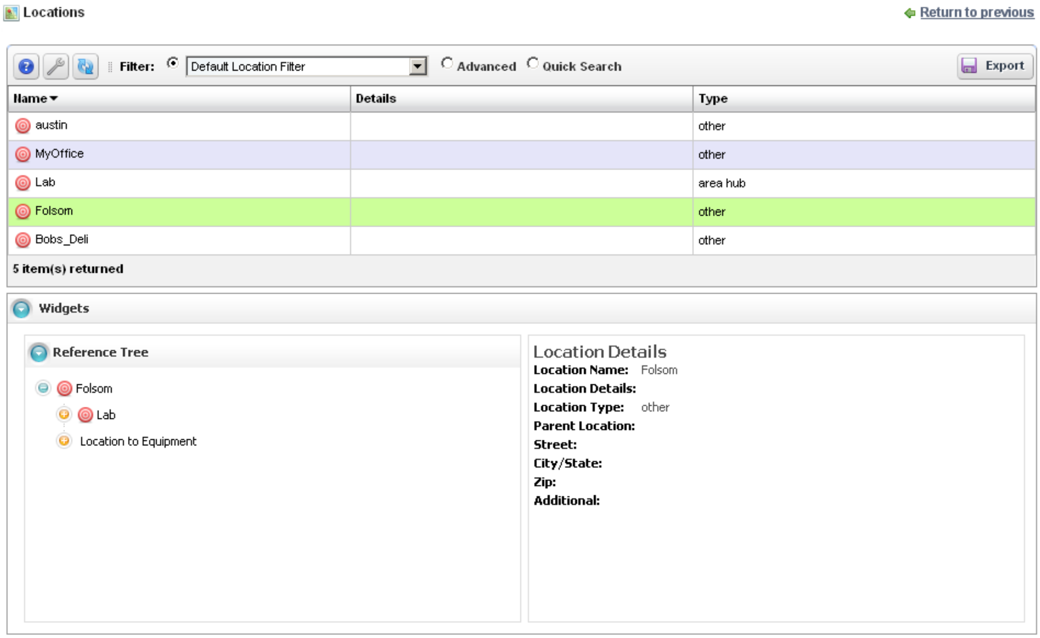
Postal Address—The *Street*, *City/State*, *Zip* address of the location.

Additional—Any optional notes.

Click *Save* save the Location, or any modifications you have made.

Expanded Location Portlet

The location portlet displays a list of all locations, with Snap Panels to display a selected location's connection to the network and details.



Filter: ● Default Location Filter ○ Advanced ○ Quick Search

Name	Details	Type
austin		other
MyOffice		other
Lab		area hub
Folsom		other
Bobs_Deli		other

5 item(s) returned

Reference Tree

- Folsom
  - Lab
  - Location to Equipment

Location Details

Location Name: Folsom
Location Details:
Location Type: other
Parent Location:
Street:
City/State:
Zip:
Additional:

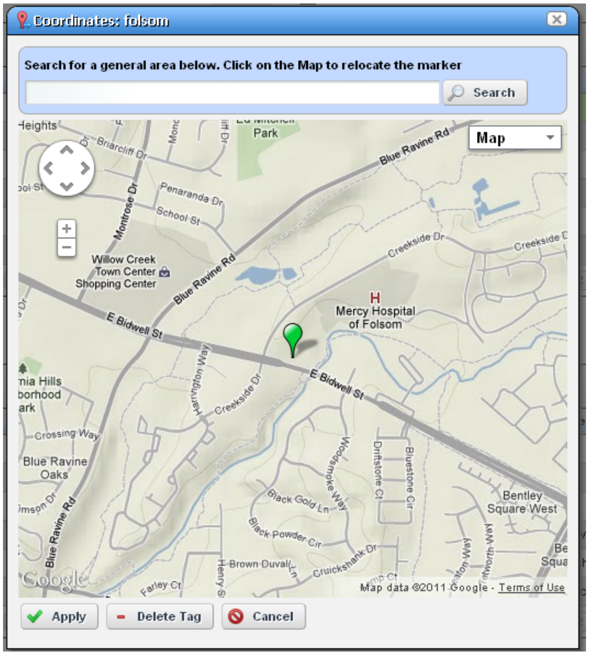
The *New* menu option appears in the expanded location portlet. Click *Settings* to change the column appearance (see Show / Hide / Reorder Columns on page 107). This has the same columns as Locations on page 171.

Locations Snap Panels

Selecting a location row displays the *Reference Tree* Snap Panel, with that location's connection to containers (see *Container View on page* 247) and equipment. Click the plus (+) icons to expand the tree. The *Location Details* panel displays what has been configured in the Location Editor.

Tag

When creating a location, Dell OpenManage Network Manager automatically selects the latitude and longitude of the address entered for a location. Tag a location by right-clicking it in the Locations portlet.



Coordinates: folsom
Search for a general area below. Click on the Map to relocate the marker
Search
Map
Willow Creek Town Center Shopping Center
Mercy Hospital of Folsom
E Bidwell St
Blue Ravine Rd
Map data ©2011 Google - Terms of Use
Apply
Delete Tag
Cancel

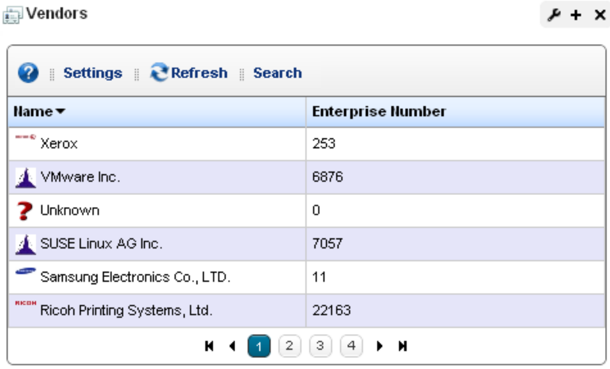
The location created by default is the address entered in the Locations editor. You can also enter the address in the Search field, or click and drag the marker that appears on this screen. Click *Apply* to accept the re-location. A *Delete Tag* button appears when you have created a tag, and lets you remove it. *Cancel* closes the screen.

NOTICE

You can zoom in or out on the displayed map with the + and - buttons in the upper left corner of this screen.

Vendors

In its summary form, this portlet displays the available vendors for network resources.



Name	Enterprise Number
Xerox	253
VMware Inc.	6876
Unknown	0
SUSE Linux AG Inc.	7057
Samsung Electronics Co., LTD.	11
Ricoh Printing Systems, Ltd.	22163

Right-clicking a row lets you do the following:

New / Edit—Opens the Vendor Editor where you can configure or re-configure a vendor.

Details—Displays a panel showing the alarms, registered models, and identifiers for the selected vendor.

Visualize—See a topology of the network filtered to display only the selected vendor, see Chapter 7, Display Strategies

Import / Export—Common menu capabilities described in *Import / Export on page* 109.

This screen has the following columns:

Vendor Icon—The icon for this vendor.

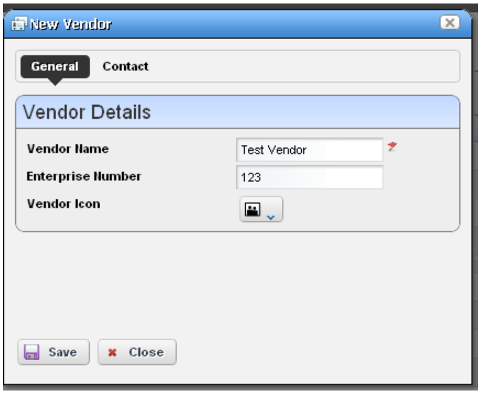
Enterprise Number—The enterprise number for this vendor.

Vendor Name—The name for this vendor.

Vendor Editor

This editor configures (or re-configures) vendors.

It has the following fields:



Vendor Details

Vendor Name	Test Vendor
Enterprise Number	123
Vendor Icon	

General

Vendor Name—A text identifier for the vendor.

Enterprise —A numeric identifier for the vendor.

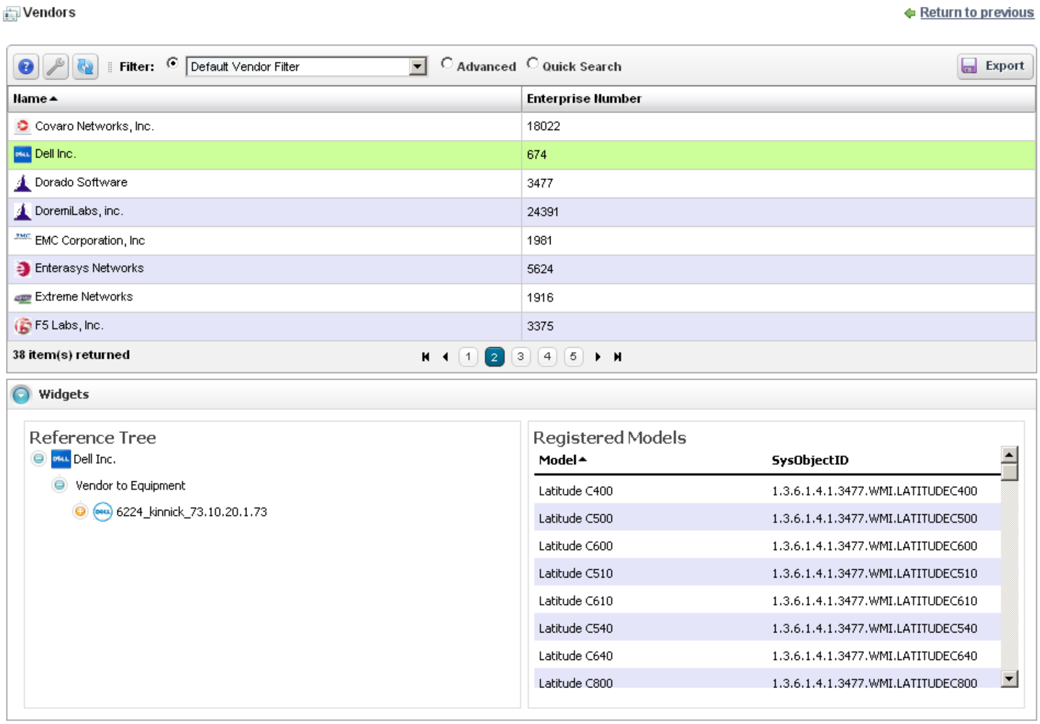
Vendor Icon—Select an icon from the pick list.

Contact

Click the *Add* button to select from contacts in Dell OpenManage Network Manager to associate with this vendor. See *Contacts on page 169* for instructions about configuring contacts.

Expanded Vendor Portlet

When you expand the Vendor portlet, besides sharing you can also click *Settings* to configure the columns that appear here (see Show / Hide / Reorder Columns on page 107). This screen has the same columns available as the summary screen.



Filter: ● Default Vendor Filter

Name ▲	Enterprise Number
Covaro Networks, Inc.	18022
Dell Inc.	674
Dorado Software	3477
DoremiLabs, inc.	24391
EMC Corporation, Inc	1981
Enterasys Networks	5624
Extreme Networks	1916
F5 Labs, Inc.	3375

38 item(s) returned

Reference Tree

- Dell Inc.
  - Vendor to Equipment
    - 6224_kinnick_73.10.20.1.73

Registered Models

Model ▲	SysObjectID
Latitude C400	1.3.6.1.4.1.3477.WMI.LATITUDEC400
Latitude C500	1.3.6.1.4.1.3477.WMI.LATITUDEC500
Latitude C600	1.3.6.1.4.1.3477.WMI.LATITUDEC600
Latitude C510	1.3.6.1.4.1.3477.WMI.LATITUDEC510
Latitude C610	1.3.6.1.4.1.3477.WMI.LATITUDEC610
Latitude C540	1.3.6.1.4.1.3477.WMI.LATITUDEC540
Latitude C640	1.3.6.1.4.1.3477.WMI.LATITUDEC640
Latitude C800	1.3.6.1.4.1.3477.WMI.LATITUDEC800

Vendors Snap Panel

The snap panel displays the icon for the selected vendor.

6

Resource Management and Reports

The Resource management portlets let you manage devices you have discovered or created on your network. Optional applications and device drivers may increase the basic functionality described here, so your screens may not exactly match those appearing on the following pages.

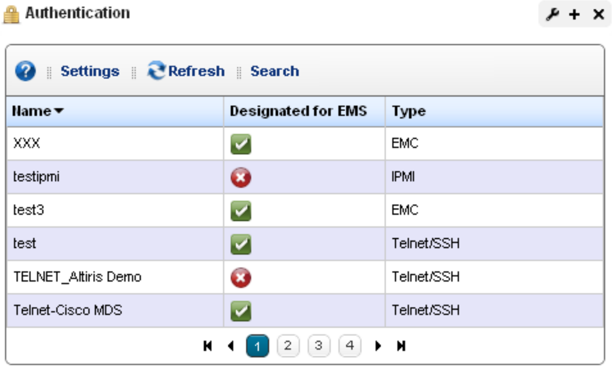
Resource Management portlets let you view device-specific information, both general (name, type, location, contact) and technical (vendor, subcomponents, and so on).

This chapter contains information about the following portlets:

- Authentication
- Discovery Profiles
- Managed Resources
- Ports
- Reports

Authentication

The authentication summary screen displays credentials used to communicate with and manage devices.



Name	Designated for EMS	Type
XXX	✓	EMC
testipmi	✗	IPMI
test3	✓	EMC
test	✓	Telnet/SSH
TELNET_Altiris Demo	✗	Telnet/SSH
Telnet-Cisco MDS	✓	Telnet/SSH

This portlet displays credentials used in discovery and communication with network resources. The *Name* column identifies the set of credentials, *Designated for EMS* means it is available for all users, and *Type* indicates the protocol for that authentication.

Functions common to many menus, in addition to the Import / Export and Sharing, include the following actions are available in the right-click menu:

New / Edit—Opens Authentication Editor, where you can create a new authentication or edit the selected authentication. You cannot change the Authentication Type when you edit an existing authentication.

Details—Displays a reference tree, associated equipment, and the configuration created or altered in Authentication Editor.

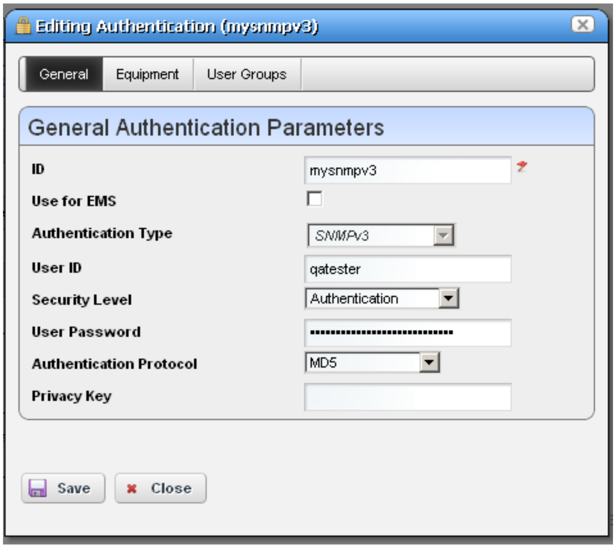
Audit—Opens an audit trail viewer for the selected authentication.

Delete—Deletes the selected authentication. If it is in use, an error message appears saying that deletion is not allowed.

Import / Export—Imports or exports authentications to your Dell OpenManage Network Manager system.

Authentication Editor

You can right-click and select *New* or *Open* to create or modify credentials for your system. You can also *Delete* and *Share with User* from that right-click menu.



Editing Authentication (mysnmpv3)

General Authentication Parameters

ID	mysnmpv3
Use for EMS	□
Authentication Type	SNMPv3
User ID	qatester
Security Level	Authentication
User Password	•••••••••••••••••••••••••••••
Authentication Protocol	MD5
Privacy Key	

The fields that appear in this editor vary, depending on the type of authentication. The *ID* (name) for the authentication is mandatory. If you *Add* an existing authentication, for example to Discovery Profiles, you can also configure the Management Interface Parameters like *Timeout*, *Retries*, and *Port* used. If you have an authentication that works for multiple protocols (for example SSH or Telnet), you can also select the *Protocol Type*.

NOTICE

Discovery can fail because of network latency / timeout issues. Increasing the timeout or retries for Dell OpenManage Network Manager authentications can circumvent that.

CAUTION:

If you do not get access to the deepest level of authentication—for example the “enable” user’s—you cannot access all of Dell OpenManage Network Manager’s functionality. Also: many devices require more than one authentication—for example SNMP and Telnet / SSH.

When attempting to access a device configured with SNMP v3, if you see an error message like `unable to read device serial number for selected credential`, discovery fails. This indicates the SNMP v3 credential is faulty. Correct it, and discovery and other access should be available.

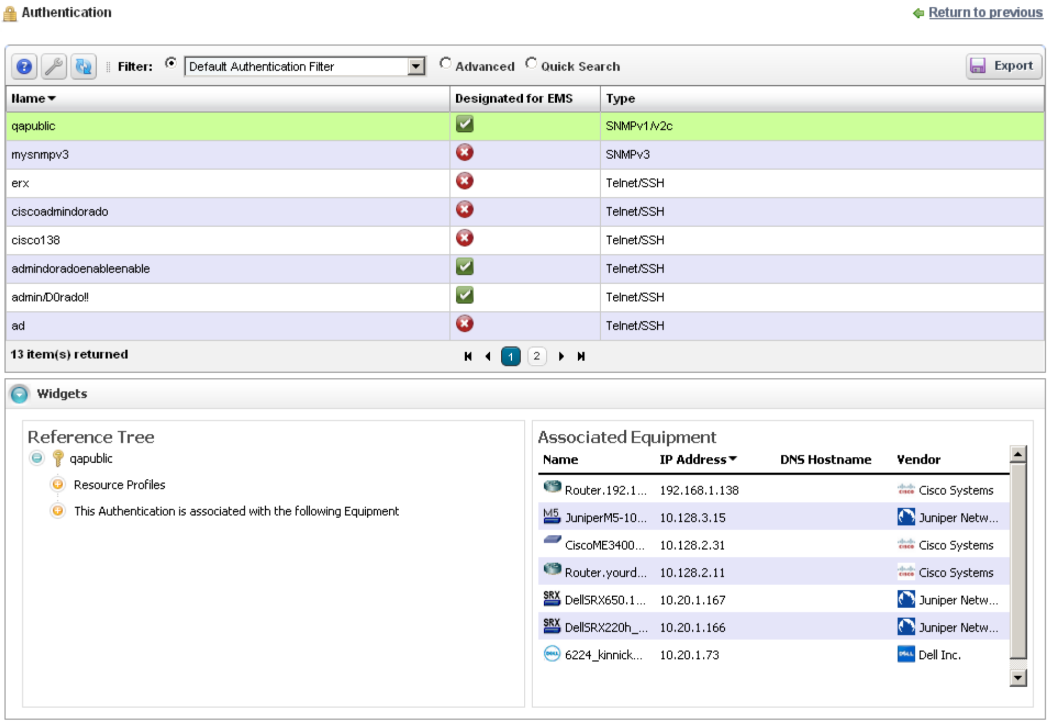
NOTE:

The standard for SNMP v3 passwords is eight characters or larger. Some devices may accept shorter passwords, but Dell OpenManage Network Manager requires eight characters or longer.

Use the *Equipment* and *User Groups* tabs to associate the authentication you configure here to devices or groups of users.

Expanded Authentication Portlet

The *Settings* button in the expanded Authentication portlet lets you configure column appearance (see Show / Hide / Reorder Columns on page 107). This offers the same column setup as the summary screen.



Authentication

Return to previous

Filter: ● Default Authentication Filter ○ Advanced ○ Quick Search

Export

Name	Designated for EMS	Type
qapublic	✓	SNMPv1/v2c
mysnmpv3	✗	SNMPv3
erx	✗	Telnet/SSH
ciscoadmindorado	✗	Telnet/SSH
cisco138	✗	Telnet/SSH
admindoradoenableenable	✓	Telnet/SSH
admin/D0rado!!	✓	Telnet/SSH
ad	✗	Telnet/SSH

13 item(s) returned

Widgets

Reference Tree

- qapublic
  - Resource Profiles
  - This Authentication is associated with the following Equipment

Associated Equipment

Name	IP Address	DNS Hostname	Vendor
Router.192.1...	192.168.1.138		Cisco Systems
JuniperM5-10...	10.128.3.15		Juniper Netw...
CiscoME3400...	10.128.2.31		Cisco Systems
Router.yourd...	10.128.2.11		Cisco Systems
DellSRX650.1...	10.20.1.167		Juniper Netw...
DellSRX220h_...	10.20.1.166		Juniper Netw...
6224_kinnick...	10.20.1.73		Dell Inc.

Authentication Snap Panel

When you select a listed authentication the *Reference Tree* Snap Panel displays a tree of that authentication's connections to Discovery profiles and equipment.

Resource Discovery

The following explains and demonstrates the features included in Resource Discovery. The guide assumes you have full access to all the features (full license) included in the web portal.

How To:

Discover Resources

Here are the steps:

1 Set up Discovery Profiles for the resources you want to discover.

NOTE:

Dell OpenManage Network Manager must be authorized to set CLI session parameters; permissions-related timeouts may occur during device access if it is not. For example, Cisco CLI access requires the command `set terminal length 0`.

2 Execute the profile

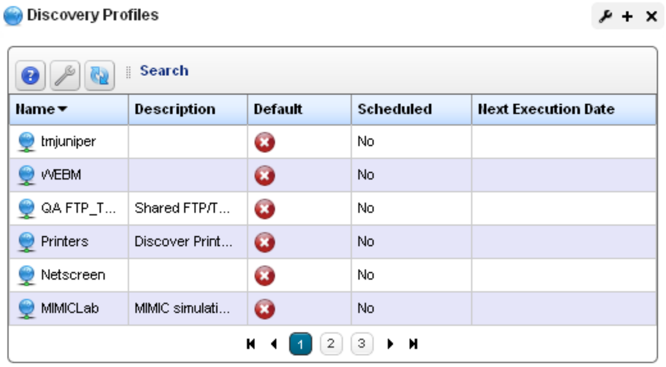
3 View the results in the Managed Resources portlet.

NOTICE

Quick Discovery executes the basics of the selected discovery profile without any following actions.

Discovery Profiles

The discovery profiles set up equipment discovery for Dell OpenManage Network Manager.



Name	Description	Default	Scheduled	Next Execution Date
tmjuniper		✖	No	
WEBM		✖	No	
QA FTP_T...	Shared FTP/T...	✖	No	
Printers	Discover Print...	✖	No	
Netscreen		✖	No	
MIMICLab	MIMIC simulati...	✖	No	

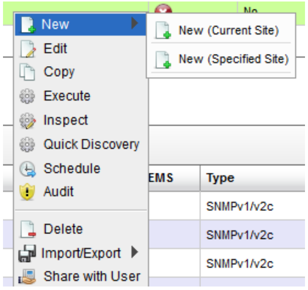
The summary view displays the *Name*, *Description*, *Default* (the green check indicates the default profile), whether the profile is *Scheduled* and *Next Execution Date* for scheduled discovery.

When Dell OpenManage Network Manager discovers unknown devices, it examines the RFC1213 MIB for hints of the device's capabilities, determining if it looks similar to a layer 3 router or a layer 2 switch. Since some device can do both, Dell OpenManage Network Manager classifies such ambiguous devices as routers.

Menu Options

When you right-click a profile, the following menu options appear (in addition to the Common Menu Items):

New—Opens Discovery Profile Editor in new profile mode. (see General on page 183)



Edit—Opens Discovery Profile Editor.

Copy—Opens Discovery Profile Editor, and renames the selected profile as "CopyOf[Original Name]".

Execute—Executes a discovery profile. This also produces an Audit trail (see Audit Trail / Jobs Screen on page 114). A message appears indicating the success or failure of discovery execution.

Discovery execution continues in the background even when you close the audit trail / jobs screen, but the message indicating success / failure still appears when the discovery process is done.

Inspect—Validate the profile's credentials, and that the device pings, and is licensed for discovery. Described in Inspection on page 188.

Quick Discovery—Opens discovery wizard displaying network and authentications, but without the *Actions* and *Inspection* panels. Quick Discovery does not execute actions, either. Click the *Execute* button once you open this screen to quickly discover equipment. (See Network on page 185 for more about the screen this displays.)

Schedule—Opens schedule editor where you can create and/or modify the schedule for a discovery profile's execution.

Audit—Displays audit trails for the selected profile. See Audit Trail / Jobs Screen on page 114.

Delete—Deletes a discovery profile, after you confirm deletion. A notification message appears when deletion is completed on the application server.

The remaining menu items include *Import*, *Export Selection*, *Export All* and (if other users exist in the system) *Share with User*.

NOTE:

Dell OpenManage Network Manager discovers Aruba Access points through the controllers to which they connect, discovery does not find stand-alone access points.

Discovery Profile Editor

This editor lets you create or modify profiles. It has the following sub-sections:

- General
- Network
- Actions
- Inspection
- Results

How To:

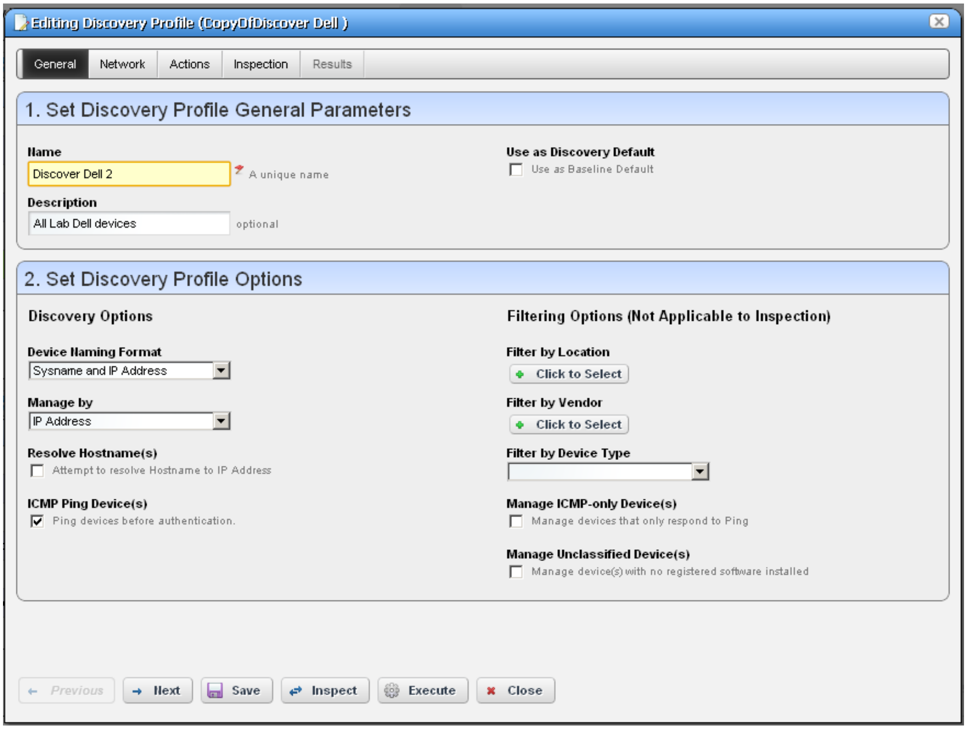
Edit Discovery Profiles

Here are the steps that appear in Discovery Profile Editor:

General

The General Panel collects all required data for a discovery profile. Dell OpenManage Network Manager validates each field, one at a time. Hints and tooltips appear if you hover your cursor near a field or label.

1 **General Parameters**—Set the *Name, Description* and a checkbox to indicate whether this profile is the discovery default.



Editing Discovery Profile (CopyOfDiscover Dell)

1. Set Discovery Profile General Parameters

Name
Discover Dell 2 — A unique name

Description
All Lab Dell devices — optional

Use as Discovery Default
□ Use as Baseline Default

2. Set Discovery Profile Options

Discovery Options

Device Naming Format
Sysname and IP Address

Manage by
IP Address

Resolve Hostname(s)
□ Attempt to resolve Hostname to IP Address

ICMP Ping Device(s)
☑ Ping devices before authentication.

Filtering Options (Not Applicable to Inspection)

Filter by Location
Click to Select

Filter by Vendor
Click to Select

Filter by Device Type

Manage ICMP-only Device(s)
□ Manage devices that only respond to Ping

Manage Unclassified Device(s)
□ Manage device(s) with no registered software installed

2 **Profile Options**—Select the *Device Naming Format* (how the device appears in lists, once discovered), whether to *Manage by IP* address or hostname, and check whether to *Resolve Hostname(s)*, *ICMP Ping Device(s)*, *Manage ICMP-only Device(s)*, or *Manage Unclassified Device(s)*. This last checkbox determines whether OpenManage Network Manager attempts to manage devices that have no OpenManage Network Manager device driver installed. If your system's license permits it, such management may be possible, but more limited than for devices with drivers installed.

If your license limits the number of devices you manage, discovering such "generic" devices may count against that limit.

The Filters (by *Location*, *Vendor*, or *Device Type*) let you narrow the list of devices discovered by the selected item(s). As the screen says, this filtering will not have any impact on the processing that occurs during the Inspection step.

NOTE:

Fields like *Location* query the database for current information, so even though its field may appear empty, Locations may exist. Click the Search button to the right of this field to populate it. Keeping such fields empty until you use them enhances performance.

The buttons at the bottom of the Profile Editor let you navigate through this series of panels. *Previous* / *Next* move back and forth between screens, *Save* lets you preserve whatever stage you have configured, and close the editor, *Inspect* moves directly to the Inspection screen (described below), and *Execute* triggers the discovery profile and opens the Results panel, displaying message traffic between Dell OpenManage Network Manager and the device(s). Click the “X” in the top right corner of these screens to close them without saving.

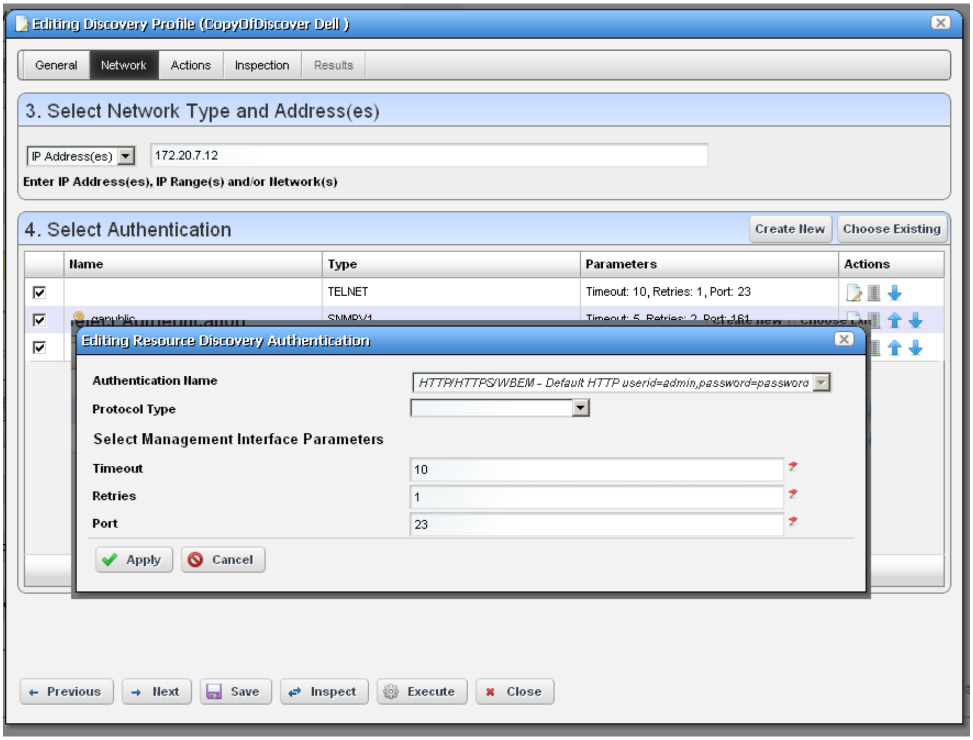
If you discover devices without retrieving their hostnames, and need that hostname later, you can re-run discovery after checking *Resolve DNS Hostnames*. This fetches the DNS hostname and resyncs the device.

Network

The Network Panel collects the network (IP range, hosts, and so on) and the authentication information for the discovery profile.

3 After you click *Next,* the *Network* panel appears.

Network Type and Addresses—Select the type of entry in the pick list *(IP Address(es)*, *CIDR Address*, *Hostname*, *SNMP Broadcast*, *Subnet)*.



Editing Discovery Profile (CopyOfDiscover Dell)

3. Select Network Type and Address(es)

IP Address(es): 172.20.7.12

Enter IP Address(es), IP Range(s) and/or Network(s)

4. Select Authentication

	Name	Type	Parameters	Actions
☑		TELNET	Timeout: 10, Retries: 1, Port: 23	
☑	public	SNMPV1	Timeout: 5, Retries: 2, Port: 161	
☑				

Editing Resource Discovery Authentication

Authentication Name: HTTP/HTTPS/WBEM - Default HTTP userid=admin,password=passwora

Protocol Type:

Select Management Interface Parameters

Timeout: 10

Retries: 1

Port: 23

The tooltips in the data entry field tell what valid entries look like.

NOTE:

Dell OpenManage Network Manager now discovers all IP addresses in a specified range, regardless of the specified base IP address is (middle, starting IP, or last in the range). IP addresses outside of range will not be discovered. You can use the CIDR specification of the network to discover rather that the subnet ID.

4 **Authentication**—You can create new, or add existing authentications. See Authentication on page 177 for the way to create such authentications outside the discovery process.

CAUTION:

If a device or its driver requires two authentications and you only enter one, it may not appear in inventory after discovery. To correct this, enter both authentications in the Discovery Profile or in Quick Discovery. If you discover a device partially with only one authentication—typically the SNMP community—you can re-discover with the correct authentications later, or *Edit* the resource to add that correct authentication *and* the management interface for it.

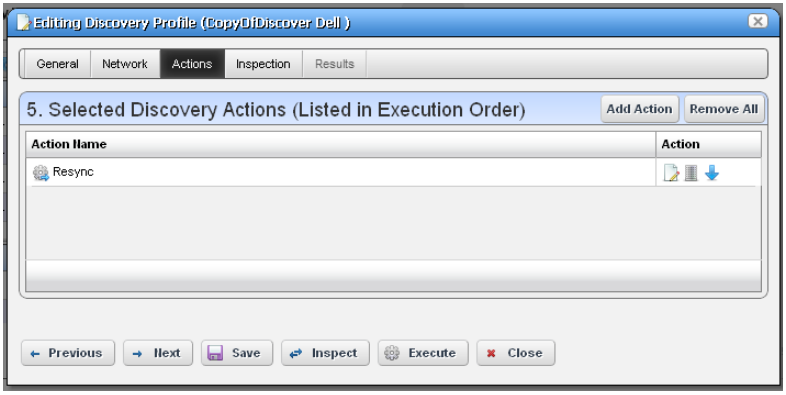
Notice that authentications appear with *Edit* / *Delete* icons and *Up* / *Down* arrows on their right. The *Edit* icon opens the authentication editor. Click the arrows to arrange the order in which the application tries credentials (top first). Ordering only applies when two credentials are of the same type.

If you have imported a discovery profile without importing or creating the authentications it uses, editing its authentications is not possible. If you cannot import authentications, or have not created them when you do attempt to edit them, the easiest solution is to delete the un-imported un-created authentication the profile refers to and create a new one.

If two similar authentications include one with a "deeper," enable login, and a "shallower" one without that additional login, arrange to try the deeper login first. If the device rejects it, discovery still tries the shallower one later.

Actions

5 When you click *Next*, the *Actions* panel appears.



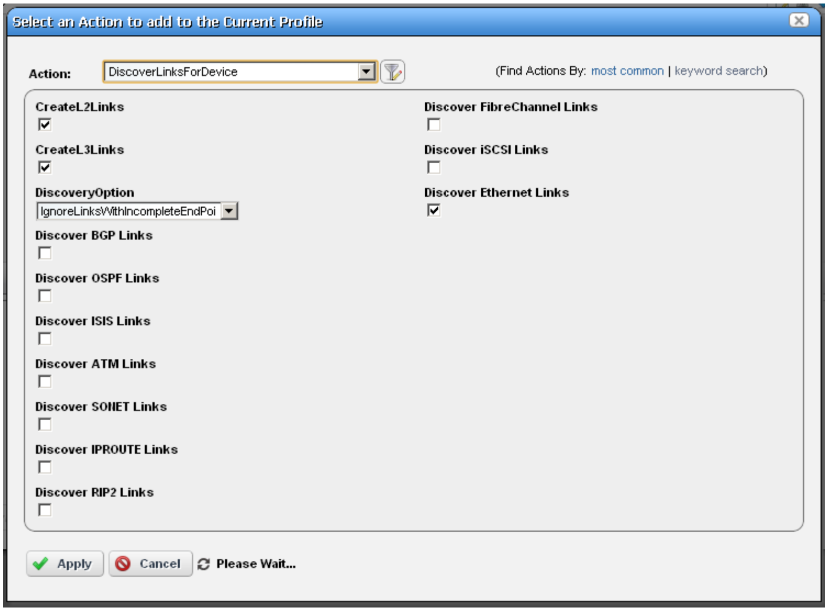
Editing Discovery Profile (CopyOfDiscover Dell)

5. Selected Discovery Actions (Listed in Execution Order)

Action Name	Action
Resync	

You can simply accept the default actions that appear here (like *Resync*, and *Learned* MAC discovery) by clicking *Next* to the Inspection portion of discovery, or you can do the following:

Add Action—This opens a screen with a selection list of available actions. Click *Apply* to select an action to add to the list for this profile.



Select an Action to add to the Current Profile

Action: DiscoverLinksForDevice

(Find Actions By: most common | keyword search)

CreateL2Links
☑

CreateL3Links
☑

DiscoveryOption
IgnoreLinksWithIncompleteEndPoi

Discover BGP Links
□

Discover OSPF Links
□

Discover ISIS Links
□

Discover ATM Links
□

Discover SONET Links
□

Discover IPROUTE Links
□

Discover RIP2 Links
□

Discover FibreChannel Links
□

Discover iSCSI Links
□

Discover Ethernet Links
☑

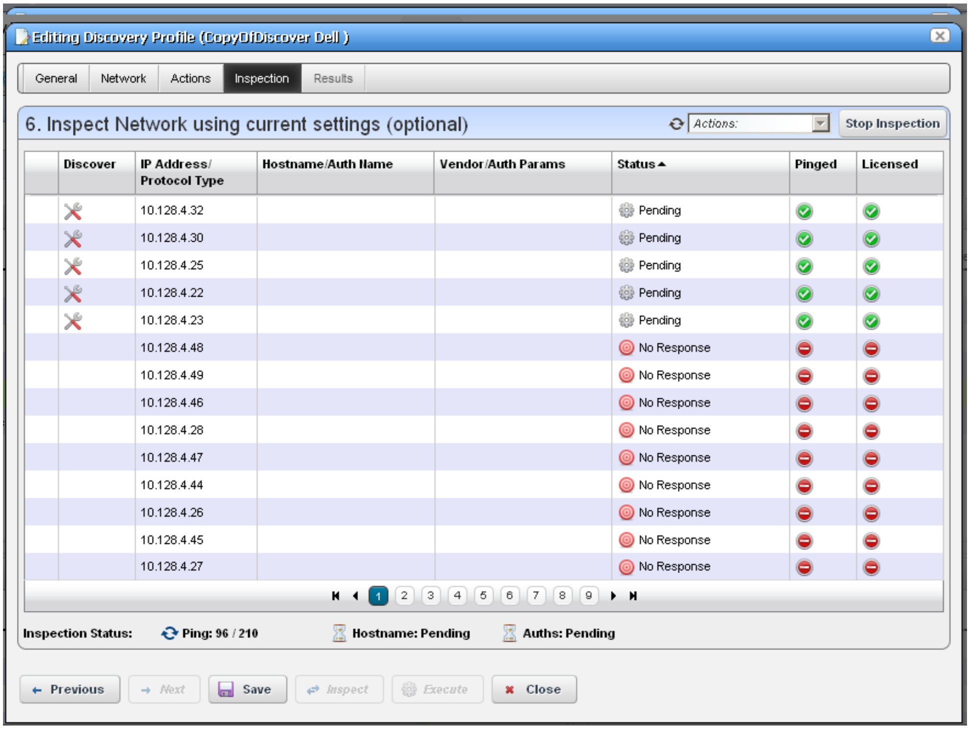
Notice the default for this screen displays the *most common* actions, but you can also click *keyword search* in the top right corner to display a search field instead of a pick list with the most common actions. The search results appear in the pick list. When you select an item, if it has parameters, they appear listed below that item. Use the checkbox(es) or pick list to configure these parameters, then click *Apply* to select this action as part of the profile. See Actions on page 145 for more about these.

Edit, Delete, Move—These icons appear to the right of each action. If you *Edit* a profile with parameters, you can change them. The screen looks like the one that appears when you *Add* actions. Deleting actions removes them from the list, and the *Move* arrows help arrange the order in which actions appear listed, and are executed. The list of actions the profile executes goes from top-to-bottom.

Inspection

Using the Inspection Panel is an optional step. If you want to execute the profile after entering the required information on the General and Network panels, you can skip this step, and just click *Execute* at the bottom of the panel.

6 **Inspection**—This screen lets you preview the discovery profile's actions and access to devices. If you clicked *Next* rather than *Inspect* at the bottom of the previous screen, click *Start Inspection* in the top right corner of this screen to begin the inspection process that validates the device's credentials.



6. Inspect Network using current settings (optional)

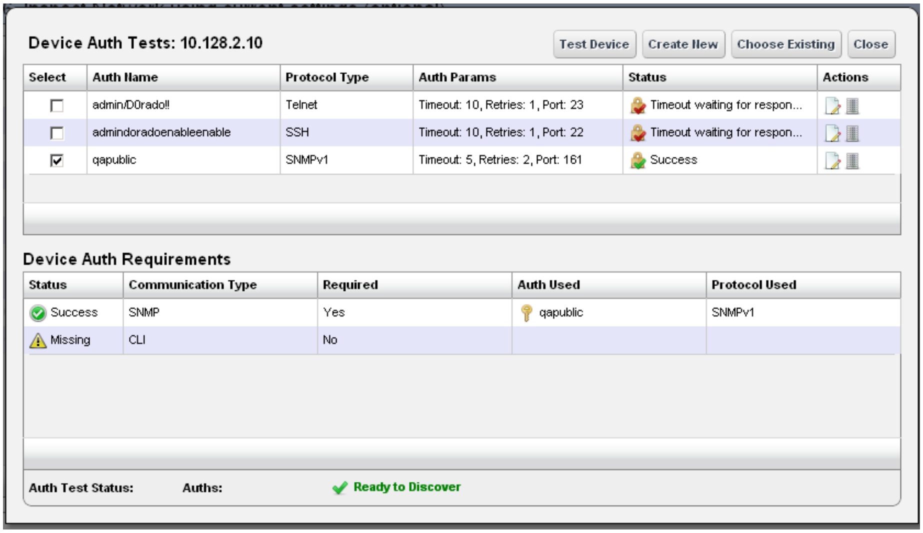
Discover	IP Address/ Protocol Type	Hostname/Auth Name	Vendor/Auth Params	Status ▲	Pinged	Licensed
🛠	10.128.4.32			Pending	✓	✓
🛠	10.128.4.30			Pending	✓	✓
🛠	10.128.4.25			Pending	✓	✓
🛠	10.128.4.22			Pending	✓	✓
🛠	10.128.4.23			Pending	✓	✓
	10.128.4.48			No Response	⊖	⊖
	10.128.4.49			No Response	⊖	⊖
	10.128.4.46			No Response	⊖	⊖
	10.128.4.28			No Response	⊖	⊖
	10.128.4.47			No Response	⊖	⊖
	10.128.4.44			No Response	⊖	⊖
	10.128.4.26			No Response	⊖	⊖
	10.128.4.45			No Response	⊖	⊖
	10.128.4.27			No Response	⊖	⊖

1 2 3 4 5 6 7 8 9

Inspection Status: Ping: 96 / 210 Hostname: Pending Auths: Pending

Notice that the *Inspection Status* fields at the bottom of the screen indicate the success or failure of Ping, Hostname resolution, and Authentications, and the *Status* column displays whether a valid authentication exists, whether it has been tested, and whether the test is successful.

When authentications are unsuccessful, click the icons to their right to remove or edit them. You can also click the wrench / screwdriver “fix it” icon in the *Discover* column to open an editor where you can revise the authentications for that device.



Device Auth Tests: 10.128.2.10

Select	Auth Name	Protocol Type	Auth Params	Status	Actions
☐	admin/D0rado!!	Telnet	Timeout: 10, Retries: 1, Port: 23	Timeout waiting for respon...	
☐	admindoradoenableenable	SSH	Timeout: 10, Retries: 1, Port: 22	Timeout waiting for respon...	
☑	qapublic	SNMPv1	Timeout: 5, Retries: 2, Port: 161	Success	

Device Auth Requirements

Status	Communication Type	Required	Auth Used	Protocol Used
✓ Success	SNMP	Yes	qapublic	SNMPv1
⚠ Missing	CLI	No		

Auth Test Status: Auths: ✓ Ready to Discover

Clicking *Create New* lets you create new authentications, *Choose Existing* lets you select from existing authentications, *Test Device* lets you try out the authentications you have selected, and *Close* closes this screen. Notice that you can configure new or existing authentications’ port, retry and timeout settings before you click *Apply* (or *Cancel*) in the authentication editor that appears after clicking the “Fix it” button.

7 **Save**—Click *Save* to preserve the profile. You can then right-click it to select *Execute.* If you select *Execute* from the profile editor, Dell OpenManage Network Manager does not save the profile to execute later.

Results

8 **Execute**—Clicking *Execute* begins discovery, and the message traffic between Dell OpenManage Network Manager and the device appears on the *Results* screen.

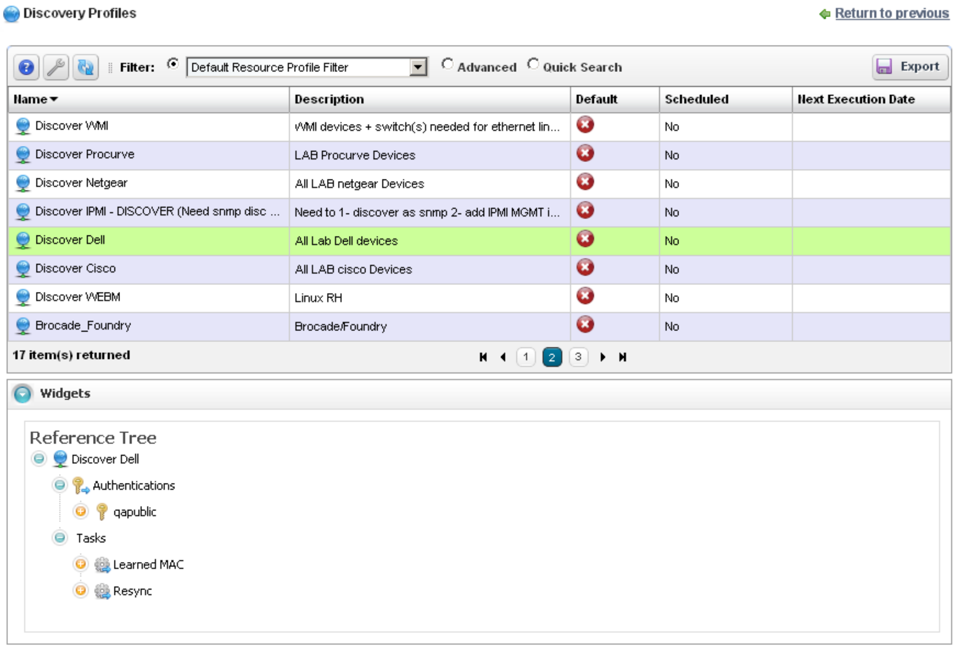
This produces a standard Audit Trail / Jobs Screen screen displaying the message traffic. See also Audit Trail / Jobs Screen on page 114 for more about retrieving archives of such screens.

9 A message (*Discovery Profile Execute is complete*) appears in the *Messages* at the bottom left of the status bar.

10 Click the X in the top right corner of the discovery profile editor to close it.

Discovery Profiles Expanded

This larger view offers a *Reference Tree* snap panel where you can see the connection between a selected profile and the authentications and discovery tasks it includes.



Discovery Profiles

Return to previous

Name ▾	Description	Default	Scheduled	Next Execution Date
Discover WMI	WMI devices + switch(s) needed for ethernet lin...	✗	No	
Discover Procurve	LAB Procurve Devices	✗	No	
Discover Netgear	All LAB netgear Devices	✗	No	
Discover IPMI - DISCOVER (Need snmp disc ...	Need to 1- discover as snmp 2- add IPMI MGMT i...	✗	No	
Discover Dell	All Lab Dell devices	✗	No	
Discover Cisco	All LAB cisco Devices	✗	No	
DIscover WEBM	Linux RH	✗	No	
Brocade_Foundry	Brocade/Foundry	✗	No	

17 item(s) returned

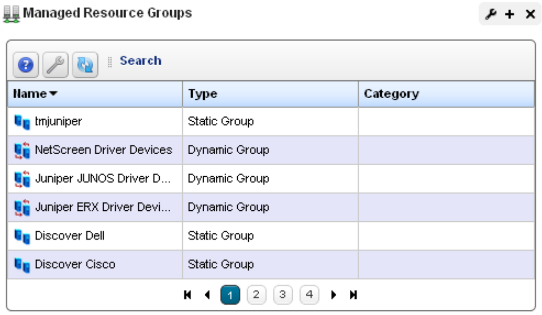
Widgets

Reference Tree

- Discover Dell
  - Authentications
    - qapublic
  - Tasks
    - Learned MAC
    - Resync

In addition to the right-click available in the summary screen, you can also click *Settings* to configure columns.

Managed Resource Groups



Managed Resource Groups

Name ▾	Type	Category
lmjuniper	Static Group	
NetScreen Driver Devices	Dynamic Group	
Juniper JUNOS Driver D...	Dynamic Group	
Juniper ERX Driver Devi...	Dynamic Group	
Discover Dell	Static Group	
Discover Cisco	Static Group	

These groups make acting on several devices at once more convenient, making management of groups of devices possible. The summary screen displays columns describing the group *Name*, *Type*, and *Icon*. You can also right-click to do the following:

New—Lets you make either a Static Group (one in which you select devices) or a Dynamic Group (one in which a filter selects devices). See details of these screens below.

Edit—This opens the same editors as *New*, populated with the information for the selected group.

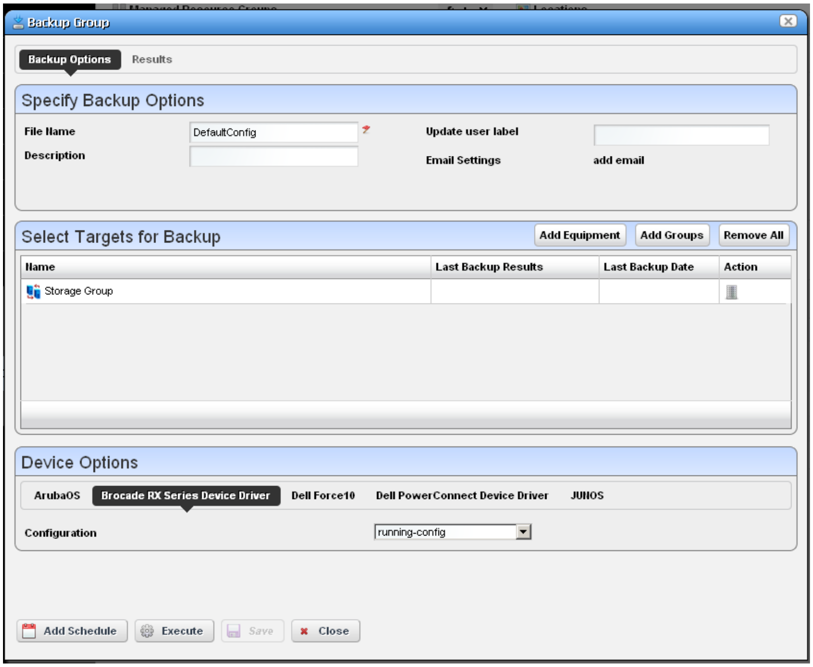
Edit Resources—Lets you edit resources associated with the selected group like its location, contact, or whether to manage it by hostname.

Visualize—Displays a topology map of the selected group. See Chapter 7, Display Strategies for more.

Actions—Select from a sub-menu of actions available for the group.

Adaptive CLI—Select from a sub-menu of Adaptive CLI

File Management > Backup, Restore, Deploy—Lets you call on Dell OpenManage Network Manager's NetConfig configuration file backup, restore and deploy capabilities. See Backup Configurations on page 274 for an example of the steps this follows. See also File Management on page 271 and more about deploying updates to the OS for the selected resource group. See Deploy Firmware on page 287 for details.



File Name: DefaultConfig

Description:

Name	Last Backup Results	Last Backup Date	Action
Storage Group			

Configuration: running-config

When you select a group backup, and the group contains devices of several types, the *Device Options* panel displays a tab for each device type. Select the backup parameters there before executing or scheduling backup.

Link Discovery—Discover links between members of the selected group, and others. See New Link on page 207 and Link Discovery on page 208 for details.

Resync Resources—Queries the devices in the group to update Dell OpenManage Network Manager's database. Resyncing also resyncs alarms on the selected device.

Delete—Remove the selected group from inventory. The devices remain in inventory, but this removes the grouping.

Import / Export—Lets you import from or export to file the group configuration.

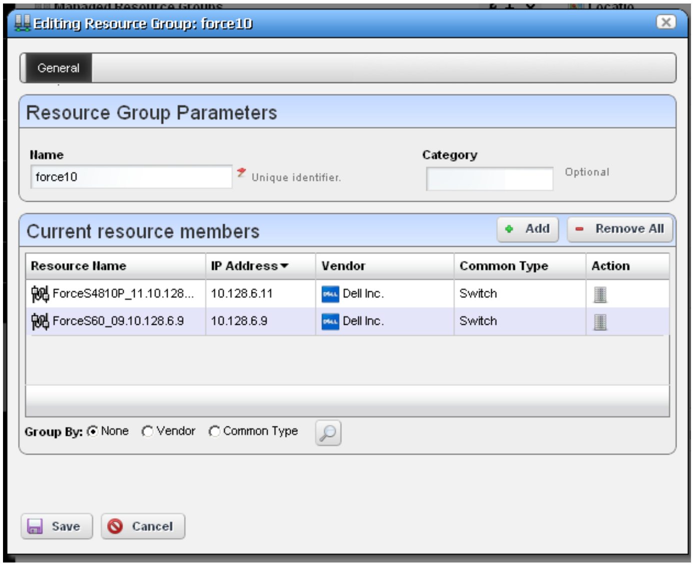
Share with User—Share the group with another user. See Sharing on page 110.

Dell OpenManage Network Manager does not supports static groups that include members retrieved by (dynamic) filters. You can configure membership with dynamic resource groups that include group memberships as filter criteria. For example you can create a filter for members of ResourceGroupABC or members of ResourceGroupXYZ.

Expanded Managed Resource Groups

The expanded Managed Resource Groups screen lets you see the summary screen's groups with a Reference Tree snap panel that displays a selected group's connection to its devices and any assigned monitors.

Static Group



Name: force10 Unique identifier.

Category: Optional

Resource Name	IP Address	Vendor	Common Type	Action
ForceS4810P_11.10.128...	10.128.6.11	Dell Inc.	Switch	
ForceS60_09.10.128.6.9	10.128.6.9	Dell Inc.	Switch	

Group By: ● None ○ Vendor ○ Common Type

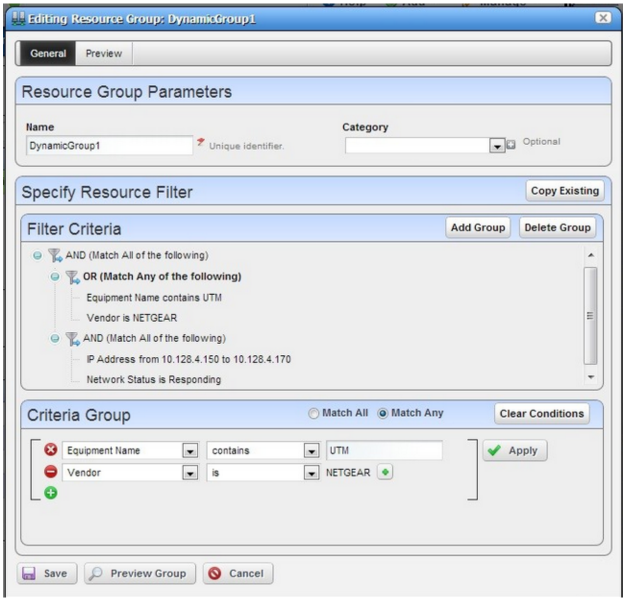
Selecting *Static Group* as the type to create displays a selector screen where you can *Name* and select a *Category* for the group, then search for available resources with a filter. Click *Apply Filter* after you have configured it, and a list of devices fitting its criteria appears. Select device(s) and click *Add Selected*, or simply click *Add All* to add the entire list to your static group. Notice that you can continue to re-use this filter to list devices, and continue to select them.

When you select a device, it no longer appears listed. When you click *Done* the subsequent screen displays all devices you have selected. You can click *Add* on this screen to return to the previous screen (or *Remove All* to delete the listed devices from the group). At the bottom of this screen, you can also elect to group devices by *None*, *Vendor* or *Common Type* (Switch, Router, and so on). These last two create "trees" with nodes for each vendor or type. You can also click the magnifying glass to search through listed devices. Clicking *Remove All* removes all devices in the group.

Click *Save* to preserve the group you have configured.

Dynamic Group

In contrast to Static Groups, Dynamic Groups do not let you select individual equipment. You simply configure a filter, and OpenManage Network Manager creates the group on the fly. After you enter the *Name* and *Category* for the group, create the filter. To see what the group would look like, click *Preview Group*. This opens the *Preview* tab, concealing the *General* tab. To return to *General*, click that at the top of the screen. Click *Save* to preserve the group configuration, or *Cancel* to exit without saving.



Editing Resource Group: DynamicGroup1

General | Preview

Resource Group Parameters

Name: DynamicGroup1 — Unique identifier.

Category: — Optional

Specify Resource Filter — Copy Existing

Filter Criteria — Add Group | Delete Group

- AND (Match All of the following)
  - OR (Match Any of the following)
    - Equipment Name contains UTM
    - Vendor is NETGEAR
  - AND (Match All of the following)
    - IP Address from 10.128.4.150 to 10.128.4.170
    - Network Status is Responding

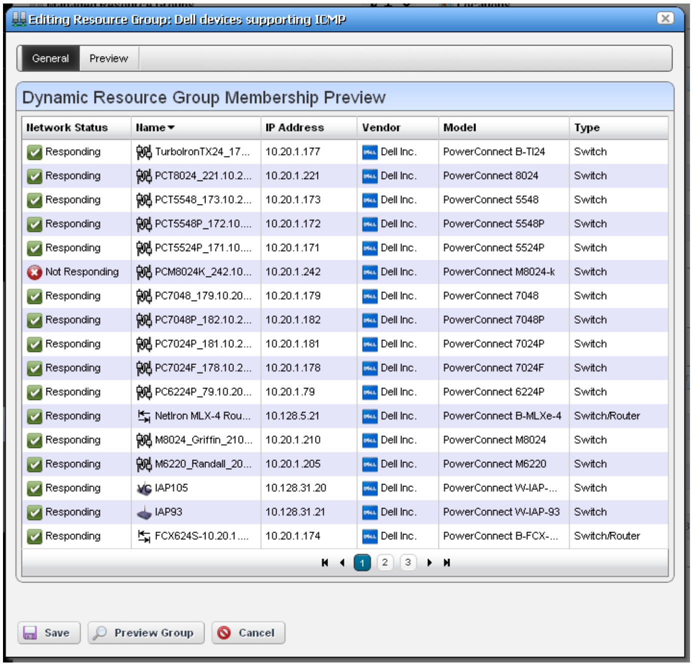
Criteria Group — ○ Match All ● Match Any — Clear Conditions

Equipment Name | contains | UTM

Vendor | is | NETGEAR

Apply

Save | Preview Group | Cancel



Editing Resource Group: Dell devices supporting ICMP

General | Preview

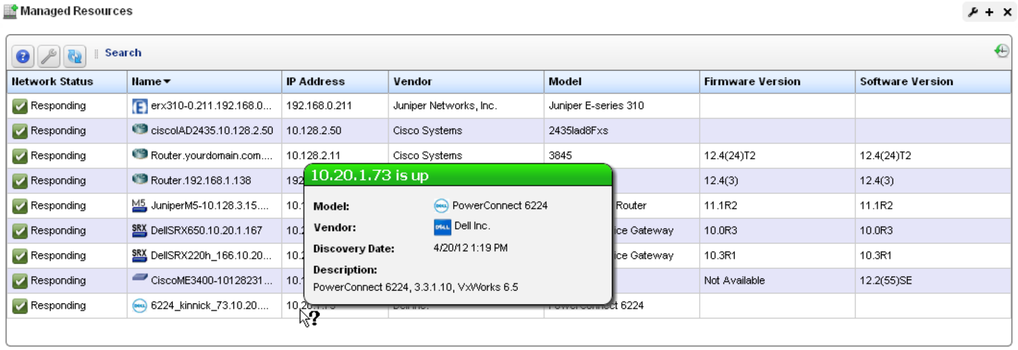
Dynamic Resource Group Membership Preview

Network Status	Name	IP Address	Vendor	Model	Type
✓ Responding	TurboIronTX24_17...	10.20.1.177	Dell Inc.	PowerConnect B-TI24	Switch
✓ Responding	PCT8024_221.10.2...	10.20.1.221	Dell Inc.	PowerConnect 8024	Switch
✓ Responding	PCT5548_173.10.2...	10.20.1.173	Dell Inc.	PowerConnect 5548	Switch
✓ Responding	PCT5548P_172.10....	10.20.1.172	Dell Inc.	PowerConnect 5548P	Switch
✓ Responding	PCT5524P_171.10....	10.20.1.171	Dell Inc.	PowerConnect 5524P	Switch
✕ Not Responding	PCM8024K_242.10...	10.20.1.242	Dell Inc.	PowerConnect M8024-k	Switch
✓ Responding	PC7048_179.10.20...	10.20.1.179	Dell Inc.	PowerConnect 7048	Switch
✓ Responding	PC7048P_182.10.2...	10.20.1.182	Dell Inc.	PowerConnect 7048P	Switch
✓ Responding	PC7024P_181.10.2...	10.20.1.181	Dell Inc.	PowerConnect 7024P	Switch
✓ Responding	PC7024F_178.10.2...	10.20.1.178	Dell Inc.	PowerConnect 7024F	Switch
✓ Responding	PC6224P_79.10.20...	10.20.1.79	Dell Inc.	PowerConnect 6224P	Switch
✓ Responding	NetIron MLX-4 Rou...	10.128.5.21	Dell Inc.	PowerConnect B-MLXe-4	Switch/Router
✓ Responding	M8024_Griffin_210...	10.20.1.210	Dell Inc.	PowerConnect M8024	Switch
✓ Responding	M6220_Randall_20...	10.20.1.205	Dell Inc.	PowerConnect M6220	Switch
✓ Responding	IAP105	10.128.31.20	Dell Inc.	PowerConnect W-IAP-...	Switch
✓ Responding	IAP93	10.128.31.21	Dell Inc.	PowerConnect W-IAP-93	Switch
✓ Responding	FCX624S-10.20.1....	10.20.1.174	Dell Inc.	PowerConnect B-FCX-...	Switch/Router

Save | Preview Group | Cancel

Managed Resources

The *Managed Resources* summary portlet displays the discovered devices on your network, their *Network Status*, *Severity* (of their highest recent alarm), *Equipment Name*, *IP Address*, and *Vendor Name*.



Managed Resources

Search

Network Status	Name ▾	IP Address	Vendor	Model	Firmware Version	Software Version
✓ Responding	erx310-0.211.192.168.0...	192.168.0.211	Juniper Networks, Inc.	Juniper E-series 310		
✓ Responding	ciscoIAD2435.10.128.2.50	10.128.2.50	Cisco Systems	2435Iad8Fxs		
✓ Responding	Router.yourdomain.com....	10.128.2.11	Cisco Systems	3845	12.4(24)T2	12.4(24)T2
✓ Responding	Router.192.168.1.138	192			12.4(3)	12.4(3)
✓ Responding	JuniperM5-10.128.3.15....	10.1		Router	11.1R2	11.1R2
✓ Responding	DellSRX650.10.20.1.167	10.2		ice Gateway	10.0R3	10.0R3
✓ Responding	DellSRX220h_166.10.20...	10.2		ice Gateway	10.3R1	10.3R1
✓ Responding	CiscoME3400-10128231...	10.1			Not Available	12.2(55)SE
✓ Responding	6224_kinnick_73.10.20....	10.20.1.73	Dell Inc.	PowerConnect 6224		

10.20.1.73 is up

Model: PowerConnect 6224

Vendor: Dell Inc.

Discovery Date: 4/20/12 1:19 PM

Description:

PowerConnect 6224, 3.3.1.10, VxWorks 6.5

Hovering the cursor over a listed device's IP address produces a popup with its alarm status in the headline (both severity name and color), the *% CPU*, *% Memory*, and *Ping*. See the Managed Resources Expanded section for a description of columns and additional capabilities in that version of the portlet. Icons that appear next to the equipment name have some significance. For example:

Icon	Device Type
	Switch
	Router or Switch/ Router
	Wireless Virtual Controller
	Wireless Access Point

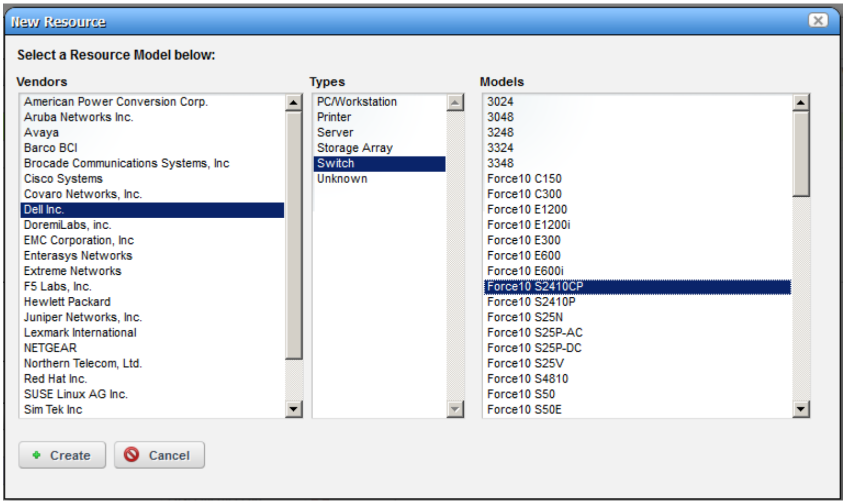
You can schedule actions selected here in addition to executing them immediately. See How to: Schedule Actions on page 118 for more. Right-clicking a listed resource can display the following menu items:

See General > Entity Change Settings on page 58 for the way to set the summary portlet refresh interval. The default is 40 seconds. If this portlet is on the same page as the Container View portlet, or if it is in expanded mode, refresh does not occur automatically, but you can manually refresh it.

NOTE:

A small clock icon in the upper right corner of the portlet indicates that auto refresh is enabled.

New—You can create a new device without discovering it with this menu item. Select the device vendor, model and type in the next screen, then fill in the information about the device in the editor that appears after that selection.



The editor description appears below.

Edit—This lets you use the following screens:

- General
- Authentication
- Management Interface
- Custom Attributes—This tab appears only if you have configured custom attributes. See Redcell > Data Configuration on page 55 for more about them.

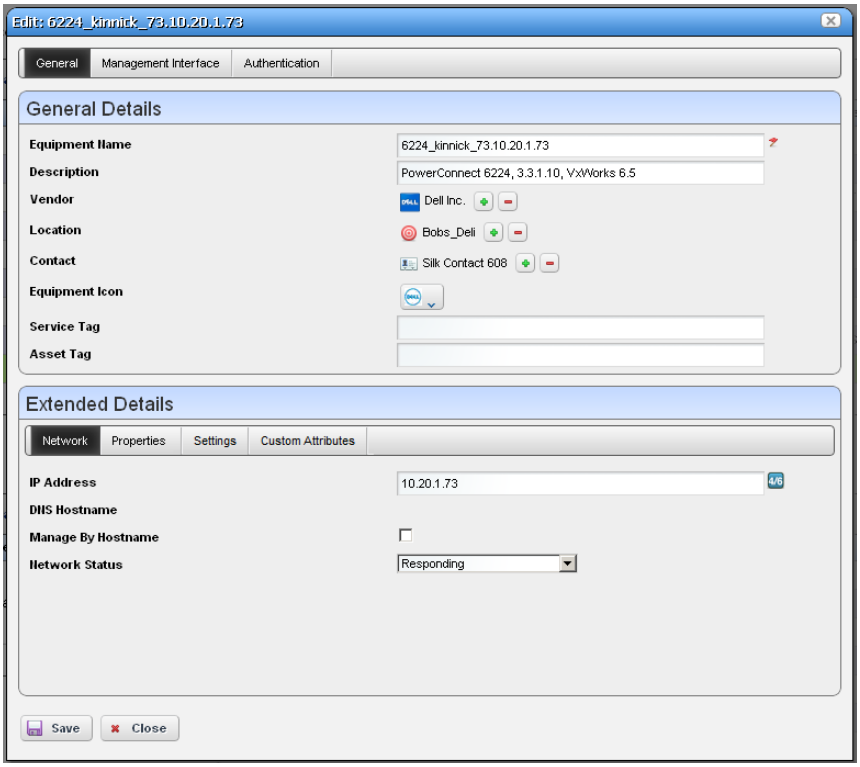
Click *Save* to preserve any changes made in these screens to Dell OpenManage Network Manager's database, or *Close* to abandon any changes made in editor screens. Unless the device is a printer, changes to these screens typically make database changes, not changes on the device.

NOTICE

You can edit fields like Notes and Description in subcomponent cards by right-clicking them in the resource tree.

General

This screen may vary for different kinds of devices. Its *General Details* panel displays the *Name*, *Description*, *Vendor*, *Location*, *Contact*, and *Equipment Icon* for the selected device.



Equipment Name: 6224_kinnick_73.10.20.1.73

Description: PowerConnect 6224, 3.3.1.10, VxWorks 6.5

Vendor: Dell Inc.

Location: Bobs_Deli

Contact: Silk Contact 608

Equipment Icon

Service Tag

Asset Tag

IP Address: 10.20.1.73

DNS Hostname

Manage By Hostname: □

Network Status: Responding

The *Extended Details* panel includes *Network*, *Properties* and *Settings* tabs. These let you view or alter things like *IP Address*, *DNS Hostname*, *Manage by Hostname*, *Network Status*, *Model* and *Equipment Type*, *Serial Number*, *Software Version Firmware* and *Hardware* versions. The *Settings* tab lists the *System Object ID*, *Date created* (the date this managed device entered the database), *Creator* (the user who discovered or created the device), *Install*

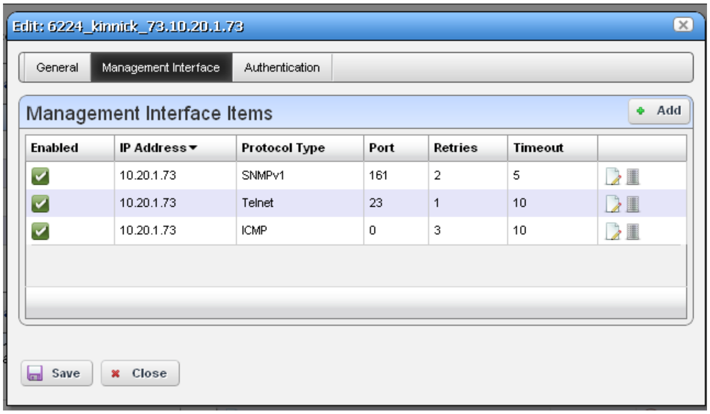
Date, *Administrative State* (see the *Manage > Administrative State* menu below), *Operational State*, and any *Notes* about the device.

NOTE:

Changing fields in the Editor screens like Network Status, Administrative State, Operational State (and MAC address for ports) do not change the device; they change only the Dell OpenManage Network Manager database. You can alter these fields to take notes or set aspirational values, but no change goes to the device, and resync eradicates changes made if the device has conflicting values.

Management Interface

This lists the management interfaces for the selected device, including the *IP Address*, *Port*, *Retries*, and *Timeout*.



Enabled	IP Address	Protocol Type	Port	Retries	Timeout
☑	10.20.1.73	SNMPv1	161	2	5
☑	10.20.1.73	Telnet	23	1	10
☑	10.20.1.73	ICMP	0	3	10

You can *Add* interfaces with the button in the upper right corner, delete them with the icon to the right of the listed interface.

NOTICE

If an operation produces an error saying the device lacks authentications, if none exists that corresponds to the authentication type, make sure that you add a management interface as well as authentication to remedy that problem.

Authentication

This lists the authentications for the selected device. You can *Add* authentications with the button in the upper right corner, delete them with the icon to the right of the listed authentication. These originate in the portlet described in Authentication on page 177.

Details—Displays several tabs with detailed resource information. A reminder of the selected device’s name appears above the tab bar. See Equipment Details on page 210 for more information about this screen.

Manage > Maintenance Log—View the maintenance log for the selected device. See Equipment Details on page 210 for more about maintenance logging capabilities.

Manage > Management State—This lets you select from the following alternatives:

Normal—The device is unconstrained by the other Administrative States. Changing from Suspended to Normal stops alarm suppression. Standard access, and inclusion in right-to-manage count.

Decommissioned—While this device is in inventory, it is not active. No device access allowed, no Monitor associations, no event processing, no Management Interfaces, no Authentication, no links, and no services are permitted.

Suspended—All device-related activities are suspended. No device access allowed, Monitoring Suspended, No event processing, Counts against right-to-manage.

Planned—Planned device. No device access allowed, no monitor associations, and no event processing.

Maintenance—Neither alarms or polling apply to the device. Does allow resync and Adaptive CLI. Standard device access.

NOTE:

Write functional permissions control whether the Management State menu item appears in this menu.

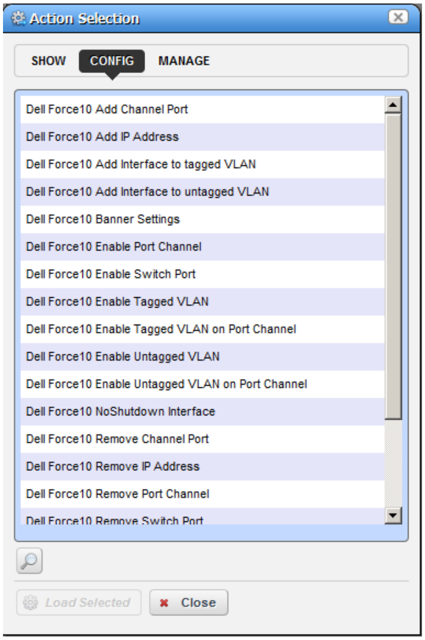
Visualize—Create a topology map of the selected resources. See Chapter 7, Display Strategies for more about such maps.

Actions—Actions you can initiate here can include things Adaptive CLI Actions (see Chapter 13, Actions and Adaptive CLI), and other actions specific to the selected device.

Actions (including Adaptive CLI) appear in *SHOW*, *CONFIG* and in some cases *MANAGE* categories. The list that appears depends on the device selected. You can also open search field by clicking the magnifying glass at the bottom of this screen. Using that field, the list narrows to actions matching your search string. Select one, and click *Load Selected* to run it manually.

See Actions Portlet on page 395 for more about configuring activities.

When you schedule an action (clicking the *Add Schedule* button) through these screens, click *Apply* to accept the schedule. Finally, you must click *Save* in the Action Selection screen after confirming the schedule, or no schedule applies.


Action Selection
SHOW
CONFIG
MANAGE
Dell Force10 Add Channel Port
Dell Force10 Add IP Address
Dell Force10 Add Interface to tagged VLAN
Dell Force10 Add Interface to untagged VLAN
Dell Force10 Banner Settings
Dell Force10 Enable Port Channel
Dell Force10 Enable Switch Port
Dell Force10 Enable Tagged VLAN
Dell Force10 Enable Tagged VLAN on Port Channel
Dell Force10 Enable Untagged VLAN
Dell Force10 Enable Untagged VLAN on Port Channel
Dell Force10 NoShutdown Interface
Dell Force10 Remove Channel Port
Dell Force10 Remove IP Address
Dell Force10 Remove Port Channel
Dell Force10 Remove Switch Port
Load Selected
Close

NOTE:

Since menu items appear in alphabetical order, this may be in a different location, depending on the device vendor name.

Change Management—Select from *Change Determination* to run that process (see *Change Determination Process on page* 382), *Execute Proscan*, to execute any Proscan policies connected to the selected device, or *Execute Proscan Policy* to execute any Proscan. See *ProScan Portlet on page* 362 for more about these.

Adaptive CLI—This displays *Adaptive CLIs* related to the selected device, and opens with a screen where you can enter any relevant parameters for those commands. See the previous *Action* menu item’s description, and Chapter 13, Actions and Adaptive CLI for more about these.

Direct Access—This opens a sub-menu where you can select the type of available direct cut-through access to the selected device, or ICMP ping that device. See MIB Browser on page 214 and Terminal on page 216 for more the about the available direct access options.

NOTE:

The client must have Java installed (and updated) for direct access to function correctly. See also: Java Security on page 217.

NOTICE

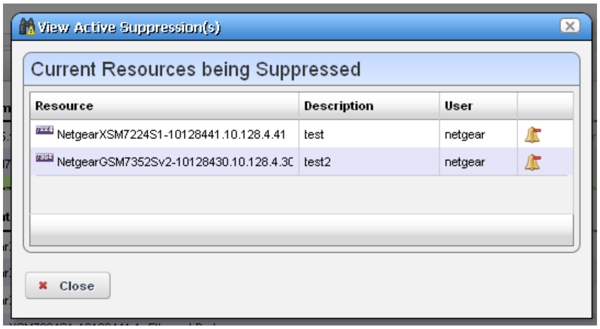
Your ability to open a telnet session with a device depends on having the correct telnet authentication. If you have only partially discovered a device with SNMP, but without telnet, then direct access telnet connection will not work, nor will Adaptive CLIs. To repair such partial discoveries, edit the device and add the correct telnet authentication and a telnet management interface.

Event Management—This lets you suppress or update alarms related to the selected resource. You can *Start Alarm Suppression* (*Stop* appears, once you have started suppression)*, Stop All Alarm Suppression*, *Schedule Alarm Suppression*, *View Active Suppression(s)*, and *Resync Alarms* (corrects Dell OpenManage Network Manager's display to match the latest information from the device already in the database; device resync does this too, for the selected device). Alarms resync for all devices. This corrects the display when the alarm color displayed, either here or in topologies, does not match the highest severity alarm for the device in the alarm portlet. Dell OpenManage Network Manager issues no alerts when resync occurs.

When you *Start* alarm suppression, first enter a description in a subsequent screen, then a Success / Failure message appears confirming suppression has started.

Schedule displays a *Parameters* screen where you can describe the scheduled suppression and select a duration and any additional suppression targets. The *Schedule* tab on this screen lets you start suppression at a specific time and configure any recurrence, and termination (*Stopping on*) for the scheduled suppression. The termination can either be a date, a number of occurrences or *Never.*

Deleting, stopping or disabling a schedule does not interrupt suppression, once it has started. You must right click selected devices and select *Stop All Alarm Suppression*. You can also delete suppressions after you select *Event Management > View Active Suppression(s)*.



Current Resources being Suppressed

Resource	Description	User	
NetgearXSM7224S1-10128441.10.128.4.41	test	netgear	🔔
NetgearGSM7352Sv2-10128430.10.128.4.3C	test2	netgear	🔔

The viewer lists devices for which alarm suppression is active, their description and configuring user. Click the *Stop Suppression* icon to the right of listed devices to terminate their alarm suppression.

Suppressed events / alarms do not appear in the Alarm display, but, unlike rejected events, the Event History screen can display a record of them.

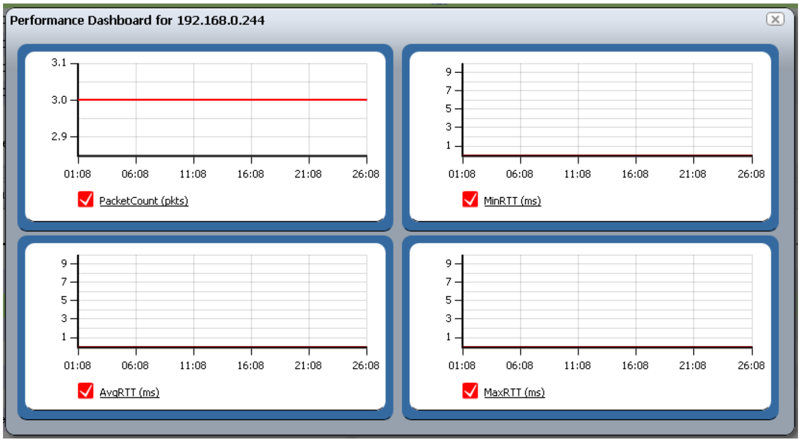
File Management—View a current configuration file, compare it to previous backups, backup, restore, import or export a configuration file. You can also deploy firmware to devices from this menu.

If you go to the Configuration Files portlet, you can also edit backed up configuration files. See File Management on page 271 for details.

Links—Create a new link or discover links between members of the selected group, and others. See New Link on page 207 and Link Discovery on page 208 for details.

Performance—Select from the following options:

Show Performance–This displays a dashboard with various performance metrics for the selected device. These can include packet counts, RTT (round-trip time) measurements, and CPU / Memory utilization graphs.



See Dashboard Views on page 331 and Show Performance Templates on page 342 for more about re-using and managing these capabilities.

Show Top Talkers–This displays a *Top Talkers Dashboard* of performance metrics for the selected resource. Use the icon in the top right corner to re-configure the default display. See Dashboard Views on page 331 and Top N [Assets] on page 330 for more information.

Show Key Metrics–This lets you see available key metrics for the selected resource, and configure their display.

Resource Groups—This lets you add the selected device to new Dynamic or Static groups, or to existing groups. See for Managed Resource Groups on page 190 more about this.

Resync—This re-queries the device for more current information, including alarms.

Traffic Analyzer—*Register* configures the selected device to appear in the Traffic Flows displays (see Chapter 11, Traffic Flow Analyzer).

Show Traffic displays the traffic flow information for registered devices in an expanded Traffic Flow portlet. This displays Traffic Flow Analysis data that contains the endpoint for the selected device IP (if available) whether or not it is a *Register*ed exporter.

Services—If you have the Service Center option installed, sub-menus let you *Redeploy* and *Undeploy* services for the device. A subsequent selector screen lets you pick the service.

Traffic Analyzer—*Register* or *Unregister* the selected resource for traffic analysis. You can also select *Show Traffic* to see a screen with traffic for the selected device. See Chapter 11, Traffic Flow Analyzer for more about Traffic Flow.

NOTICE

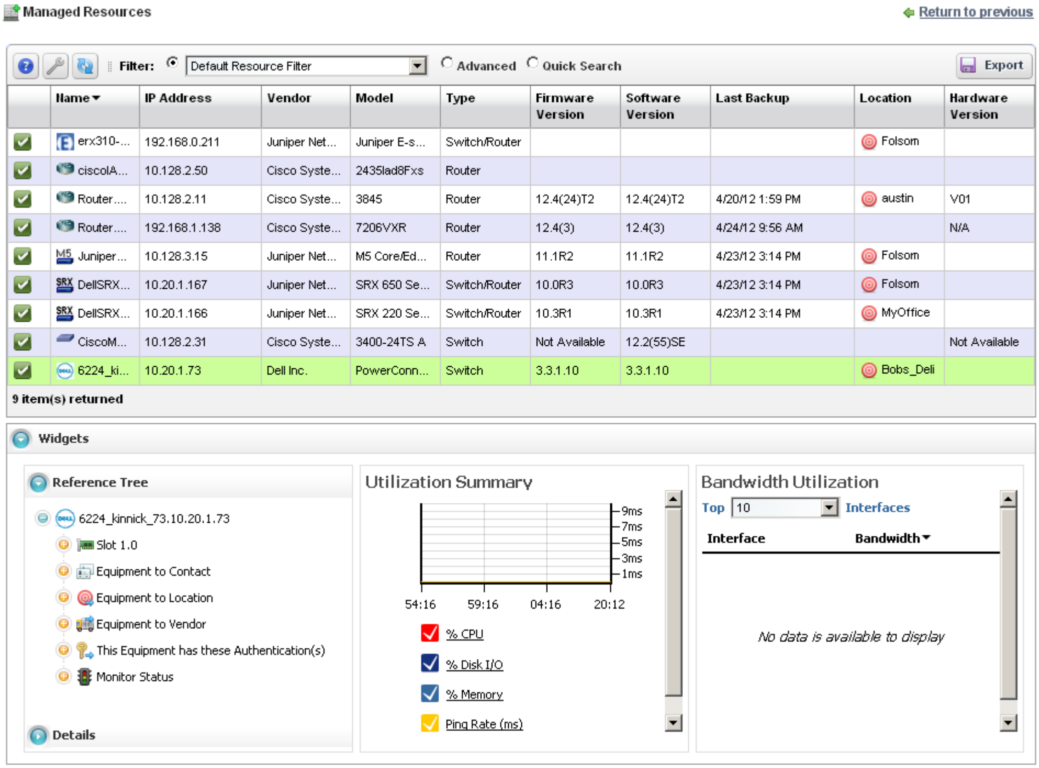
You can also display a *Registered* column in the Managed Resource portlet, and click the heading to sort the Flow exporters to the top of the display.

Delete—Remove the selected device from inventory.

View as PDF—Displays the selected device as an Acrobat pdf. See View as PDF on page 113.

Managed Resources Expanded

If you click the plus (+) in the upper right corner of the summary screen, this expanded screen appears. As in all such screens, you can limit what appears listed with the filters at the top of the screen. Select the filter from default, seeded filters with the pick list at the top left corner of the screen. You can also create your own custom filter by clicking *Advanced Filter* to the right of this pick list (see Filter Expanded Portlet Displays on page 108 for more).



Filter: ● Default Resource Filter ○ Advanced ○ Quick Search

	Name	IP Address	Vendor	Model	Type	Firmware Version	Software Version	Last Backup	Location	Hardware Version
☑	erx310-...	192.168.0.211	Juniper Net...	Juniper E-s...	Switch/Router				Folsom	
☑	ciscoIA...	10.128.2.50	Cisco Syste...	2435lad8Fxs	Router					
☑	Router....	10.128.2.11	Cisco Syste...	3845	Router	12.4(24)T2	12.4(24)T2	4/20/12 1:59 PM	austin	V01
☑	Router....	192.168.1.138	Cisco Syste...	7206VXR	Router	12.4(3)	12.4(3)	4/24/12 9:56 AM		N/A
☑	Juniper...	10.128.3.15	Juniper Net...	M5 Core/Ed...	Router	11.1R2	11.1R2	4/23/12 3:14 PM	Folsom	
☑	DellSRX...	10.20.1.167	Juniper Net...	SRX 650 Se...	Switch/Router	10.0R3	10.0R3	4/23/12 3:14 PM	Folsom	
☑	DellSRX...	10.20.1.166	Juniper Net...	SRX 220 Se...	Switch/Router	10.3R1	10.3R1	4/23/12 3:14 PM	MyOffice	
☑	CiscoM...	10.128.2.31	Cisco Syste...	3400-24TS A	Switch	Not Available	12.2(55)SE			Not Available
☑	6224_ki...	10.20.1.73	Dell Inc.	PowerConn...	Switch	3.3.1.10	3.3.1.10		Bobs_Deli	

9 item(s) returned

Reference Tree

- 6224_kinnick_73.10.20.1.73
  - Slot 1.0
  - Equipment to Contact
  - Equipment to Location
  - Equipment to Vendor
  - This Equipment has these Authentication(s)
  - Monitor Status

☑ % CPU
☑ % Disk I/O
☑ % Memory
☑ Ping Rate (ms)

Top 10 Interfaces

No data is available to display

The *Settings* button lets you configure the displayed columns and their order.

NOTICE

You can select multiple devices by Ctrl+clicking them in the expanded portlet. This lets you do these same tasks on more than one device. You can also perform such tasks on multiple devices with managed resource groups. See Managed Resource Groups on page 190.

The following are available columns:

Network Status—The network status of the device.

Alarm Severity—The highest open alarm for the device.

Equipment Name—The name of the device.

IP Address—The IP address of the device.

Vendor Name—The vendor for this device.

Model—The model of the device.

Equipment Type—The type of equipment.

Firmware Version—The firmware version of the device.

Software Version—The software version of the device.

Last Backup—The device's last backup date.

Location Name—The device's location.

Hardware Version—The hardware version for the device.

Backup Result—The result the device's last backup.

Restore Result—The result the device's last restoration.

This screen has several snap panels, some compressed "windowshade" style. Click the title bar for these snap panels to toggle expand / collapse. These display information about the device selected in the list at the top of the panel.

Reference Tree

This displays the device and connected components, tree style.

General: Details

This includes information about the *Equipment Name*, *Vendor*, *Location*, *Contact*, *Icon*, and *its Last Modified* and *Discovery Date.*

General: Properties

This tab includes the *IP Address*, *DNS Hostname*, *Firmware Version*, *Hardware Version*, *Model*, *Serial Number*, *Software Version*, *Managed by Hostname* (if active, this resolves a DNS name rather than use an IP address to manage this resources), and *Equipment Type* information.

General: Settings

This includes the *system Object Id*, *Date Created* (that is, discovered), *Creator* (the user who performed discovery), *Install Date*, *Administrative State* (Locked [Device use is prohibited] Shutting Down [Only existing users can use the device] Unlocked [Normal use of device is permitted]), *Operational State* (Disabled [Inoperable because of a fault, or resources are unavailable] Enabled [Operable and available for use] Active [Device is operable and currently in use with operating capacity available to support further services] Busy [Operable and currently in use with no operating capacity to spare])OpenManage Network Manager.

Network Details

This displays network information like *VLAN(s) by ID*, *VLAN(s) by Port* and *STP Data.* Use the pick list in the upper right corner of this snap panel to select which to display.

Utilization Summary

A graph of the device utilization, typically for CPU, Disk I/O, Memory and ping rate.

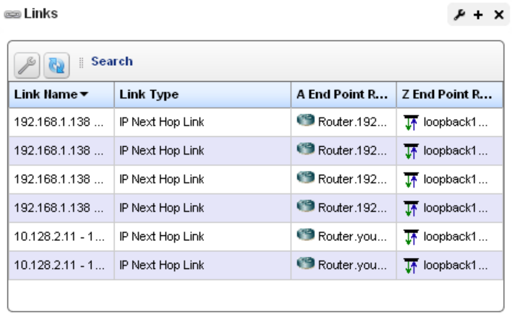
Bandwidth Utilization

A graph of the device's bandwidth utilization. Notice that you can change the number of top interfaces graphed, when this is applicable.

Links

The links portlet displays discovered or created links in your system. If information is truncated, hover the cursor over a column to see the contents of that column as a tooltip. The expanded portlet displays link contents in a Reference Tree snap panel.

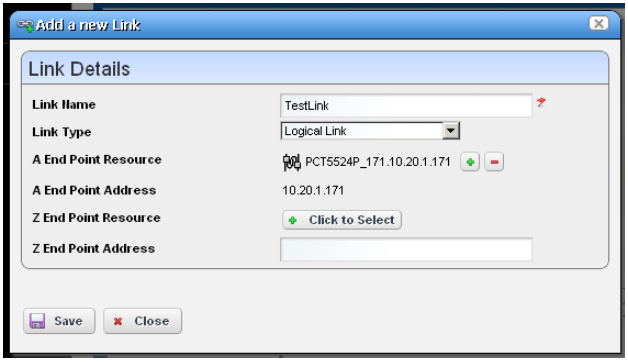
By right-clicking, you can create a *New* link, *Edit* an existing, selected one, or *Discover* links for specified devices. See New Link below, and *Link Discovery on page 208* for more about creating, editing and discovering links.



Link Name	Link Type	A End Point R...	Z End Point R...
192.168.1.138 ...	IP Next Hop Link	Router.192...	loopback1 ...
192.168.1.138 ...	IP Next Hop Link	Router.192...	loopback1 ...
192.168.1.138 ...	IP Next Hop Link	Router.192...	loopback1 ...
192.168.1.138 ...	IP Next Hop Link	Router.192...	loopback1 ...
10.128.2.11 - 1...	IP Next Hop Link	Router.you...	loopback1 ...
10.128.2.11 - 1...	IP Next Hop Link	Router.you...	loopback1 ...

New Link

When you create a new link or edit an existing one, the *Link Details* screen appears where you can configure the link.



Link Name	TestLink
Link Type	Logical Link
A End Point Resource	PCT5524P_171.10.20.1.171
A End Point Address	10.20.1.171
Z End Point Resource	Click to Select
Z End Point Address	

This screen has the following fields:

Link Name—A text identifier for the link.

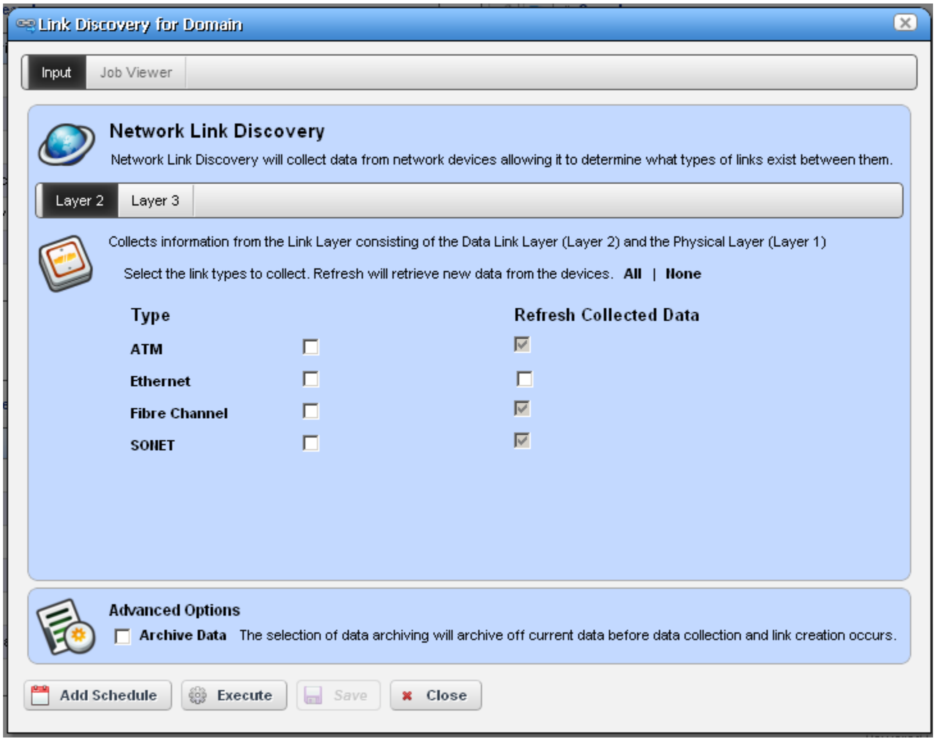
Link Type—Select the type of link from the pick list.

A End Point Resource / Address—Click the plus (+) to select a resource for one end of the link. When you right-click a selected resource, it automatically appears here. Click the minus (-) to remove it.

Z End Point Resource / Address—Click the plus (+) to select a resource for one end of the link. When you have selected two resources, they automatically appear as A and Z endpoints.

Link Discovery

This is an automated network link discovery feature that you can initiate from individual devices in the Managed Resources portlet, or with the *Link Discovery* button on the home screen. See Link Discovery Prerequisites on page 209 for a list of device features that provide link information. Links discovered can also appear in the screen described in Links in Visualization on page 267.



Network Link Discovery

Network Link Discovery will collect data from network devices allowing it to determine what types of links exist between them.

Collects information from the Link Layer consisting of the Data Link Layer (Layer 2) and the Physical Layer (Layer 1)

Select the link types to collect. Refresh will retrieve new data from the devices. **All** | **None**

Type		Refresh Collected Data
ATM	□	☑
Ethernet	□	□
Fibre Channel	□	☑
SONET	□	☑

Advanced Options

□ **Archive Data** The selection of data archiving will archive off current data before data collection and link creation occurs.

When you elect to discover links from a right-click menu, the *Network Link Discovery* screen appears. Check the type of links you want to discover or from which you want to refresh collected data. Other options available on this screen include the following:

Layer 2 / **Layer 3** [checkboxes]—Select the layer for which you want to discover links. Depending on the layer selected, the available types appear as checkboxes below this tab selection.

NOTICE

Click *All / None* to select all or none of the displayed types for each layer. Remember, selecting more link types consumes more time and processing power.

Advanced Options

Archive Data—Checking this archives current data before collecting information about and discovering links.

NOTE:

Links with incomplete endpoint information are not discovered

Click *Add Schedule* to schedule link discovery, or *Execute* to run it now (and confirm you are willing to wait for results in a subsequent screen). The *Job Viewer* tab in the link discovery screen displays the message traffic between Dell OpenManage Network Manager and the device(s). See Audit Trail Portlet on page 116 for more about Job Viewer screens.

Link Discovery Prerequisites

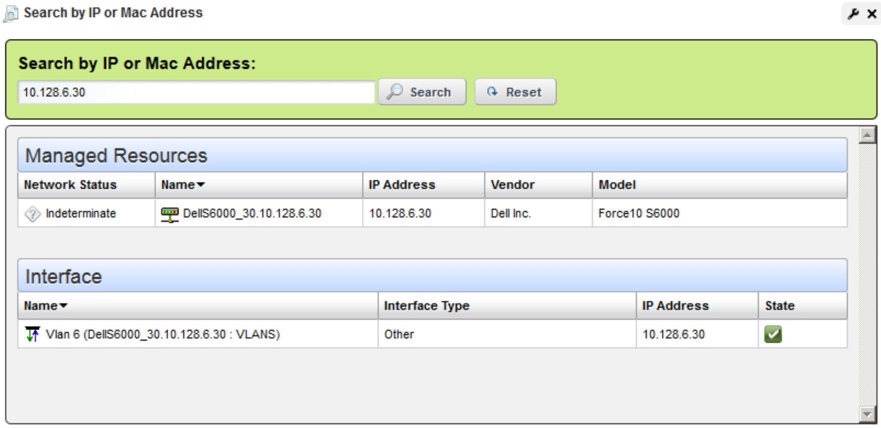
Although Dell OpenManage Network Manager automates link discovery, you must enable the sources for link discovery information on the devices where you do such discovery.

Supported data sources used to derive links appear listed below.

- IEEE Link Layer Discovery Protocol (LLDP) support
- Cisco Discovery Protocol (CDP) support

Search by IP or Mac Address

This portlet lets you find Managed Equipment, Ports and Interfaces for the IP or MAC address entered.



Search by IP or Mac Address

Search by IP or Mac Address: 10.128.6.30

Managed Resources

Network Status	Name	IP Address	Vendor	Model
Indeterminate	DellS6000_30.10.128.6.30	10.128.6.30	Dell Inc.	Force10 S6000

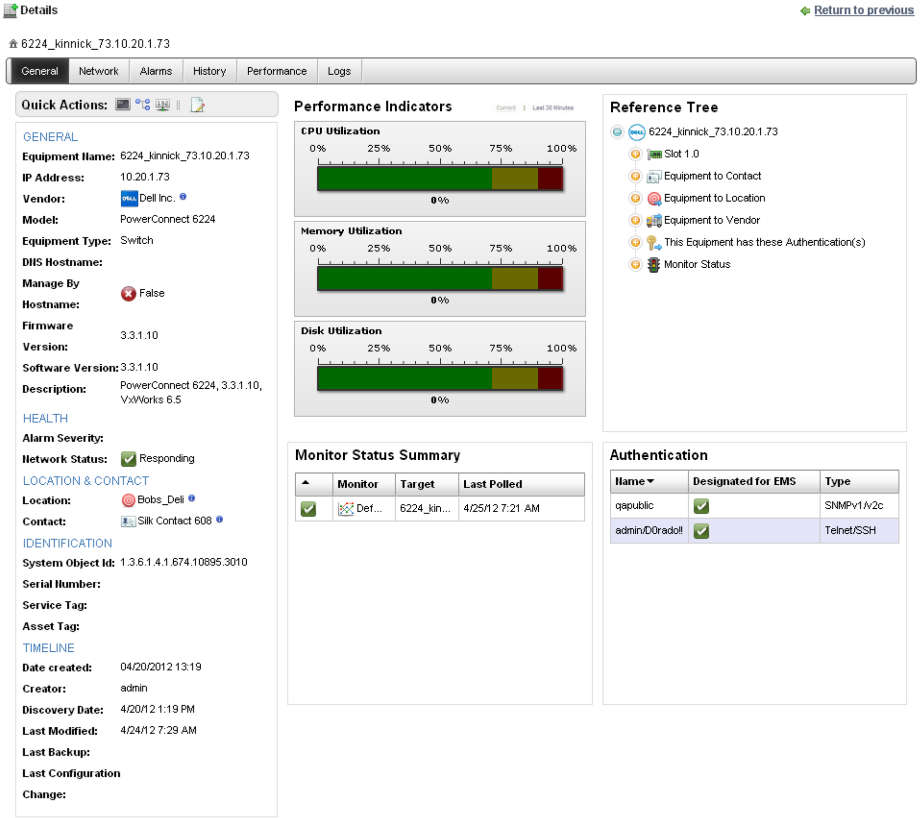
Interface

Name	Interface Type	IP Address	State
Vlan 6 (DellS6000_30.10.128.6.30 : VLANS)	Other	10.128.6.30	✓

The same right-click menus as appear in Managed Resources, Ports or Interfaces portlets appear in the search results. The display confines those results to what is found; if only ports satisfy the search criteria, then Managed Equipment and Interface do not appear.

Equipment Details

This screen lets you “drill down” to display equipment details for resources. You can see it by selecting *Details* in the right-click menu for the Managed Resources portlet. You can also install an Equipment Details portlet on a page and use the Container View portlet to select individual devices that appear in it. In that case, you must select an individual device before it displays data.



Details

Return to previous

6224_kinnick_73.10.20.1.73

GENERAL

Equipment Name: 6224_kinnick_73.10.20.1.73
IP Address: 10.20.1.73
Vendor: Dell Inc.
Model: PowerConnect 6224
Equipment Type: Switch
DNS Hostname:
Manage By Hostname: False
Firmware Version: 3.3.1.10
Software Version: 3.3.1.10
Description: PowerConnect 6224, 3.3.1.10, VxWorks 6.5

HEALTH

Alarm Severity:
Network Status: Responding

LOCATION & CONTACT

Location: Bobs_Deli
Contact: Silk Contact 608

IDENTIFICATION

System Object Id: 1.3.6.1.4.1.674.10895.3010
Serial Number:
Service Tag:
Asset Tag:

TIMELINE

Date created: 04/20/2012 13:19
Creator: admin
Discovery Date: 4/20/12 1:19 PM
Last Modified: 4/24/12 7:29 AM
Last Backup:
Last Configuration Change:

Performance Indicators

Reference Tree

6224_kinnick_73.10.20.1.73
- Slot 1.0
- Equipment to Contact
- Equipment to Location
- Equipment to Vendor
- This Equipment has these Authentication(s)
- Monitor Status

Monitor Status Summary

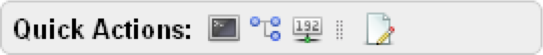
▲	Monitor	Target	Last Polled
✓	Def...	6224_kin...	4/25/12 7:21 AM

Authentication

Name ▾	Designated for EMS	Type
qapublic	✓	SNMPv1/v2c
admin/D0rado!!	✓	Telnet/SSH

Details screens are available for a variety of things besides equipment, too. Here are some highlights of the Equipment Details screen (and others):

The *Quick Actions* panel in the General tab also displays icons.



Click them direct access to the device (Terminal, MIB Browser, Ping (ICMP) or HTTP / HTTPS), or to the Edit screens described above.

Click the tab name to see the following:

General–In addition to Quick Action icons, this includes details about the selected equipment. This screen also includes performance indicators to report on the device's CPU, memory and disk utilization (flash memory) both currently and for the last 30 minutes (click the links above the panel), a Monitor Status Summary, and Reference Tree, and a list of the Authentications connected to the device. If disk utilization is less than one percent, an indication that the device is still active may appear in that graph.

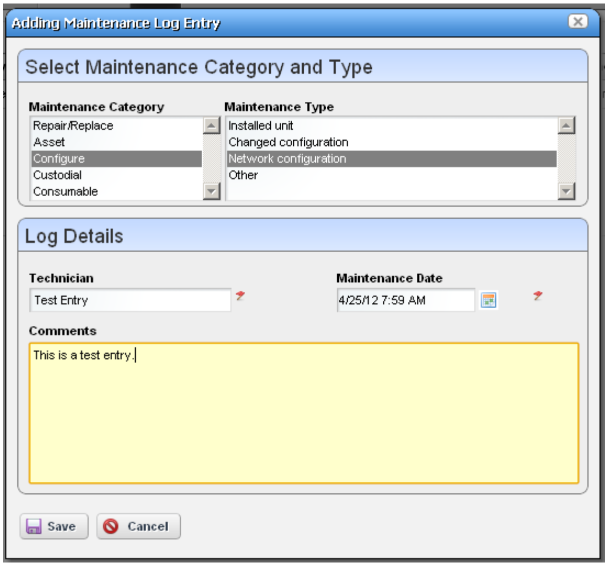
Network–This screen lists the Ports and Interfaces for the selected device (some devices have one, but not the other), VLANs and links associated with the device.

Alarms–Displays the alarms and events associated with the selected device.

History–Includes audit trails connected to the device, and any backed up configurations. Right-click to view or otherwise act on these.

Performance–This screen contains two links at its top. One displays a performance dashboard (template) related to the selected device. See Show Performance Templates on page 342 for how to configure these. The other displays any configured *Top Talkers* for the device. See Top N [Assets] on page 330.

Logs–Displays maintenance logs connected to the device to users with permissions to see this tab. Right-click to create or edit these.



Adding Maintenance Log Entry

Select Maintenance Category and Type

Maintenance Category: Repair/Replace, Asset, Configure (selected), Custodial, Consumable

Maintenance Type: Installed unit, Changed configuration, Network configuration (selected), Other

Log Details

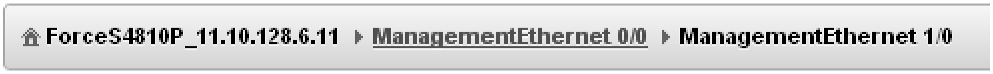
Technician: Test Entry

Maintenance Date: 4/25/12 7:59 AM

Comments: This is a test entry.

Notice that you can right-click listed interfaces, configuration files, and so on to perform more actions, or to see additional Detail screens.

You can also right-click to open further *Details* screens about some subcomponents like Interfaces and Ports. These display a *Reference Tree* (like Widgets / Snap Panels (Reference Tree) on page 108) too. You can even right-click nodes in that reference tree to drill down to additional details.



ForceS4810P_11.10.128.6.11 ▸ ManagementEthernet 0/0 ▸ ManagementEthernet 1/0

NOTICE

Notice the breadcrumb trail at the top of the Equipment Detail panel tracks the levels through which you drill down. You can click a level that appears in this trail to return to a previous screen. If you click *Return to previous* in the upper right corner of the screen, you will return to the original screen from which you selected the basic equipment.

Some fields may be truncated onscreen. Workaround: hover the cursor over the truncated field so the text appears as a tooltip or drill down to see the detail.

Some devices populate the ports panel, but not the interfaces panel. This panel is empty for such devices. Interfaces may appear for Force10. Force 10 devices interfaces details can display Port Channels (LAGs), VLANs (SVIs) and Loopbacks.

If the Ports portlet is on the same page as the Managed Resources portlet, selecting a device in Managed Resources makes its ports appear in the Ports portlet. The display can also get out of sync, but clicking the browser's *Refresh* restores the correspondence between a selected device and the ports displayed. To resync a port, resync the device that contains it.

Field Definitions

The meaning of most fields that appear in details screens are self-evident. Here is a little more information about some of them:

Operational State—One of following possible values describing the availability of the resource.

Disabled—Inoperable because of a fault, or resources are unavailable.

Enabled—Operable and available for use.

Active—Device is operable and currently in use with operating capacity available to support further services.

Busy—Operable and currently in use with no operating capacity to spare.

Administrative State—One of the following values:

Locked—Device use is prohibited.

Shutting Down—Only existing users can use the device.

Unlocked—Normal use of device is permitted.

Network Status—The status of the resource in the network. For example: *Responding* means this application can, via some network protocol, get the device to respond. *Not Responding* means the device does not respond to the protocol. *Indeterminate* means the monitoring software has not tried to reach the device or there was some other error which prevented us from determining one of the other two statuses.

The appearance of *Network Status* depends on the default ICMP monitor (see Resource Monitors on page 297. If you exclude this equipment from the monitor or disable it (for example, for performance reasons) then a status may appear, but it is not meaningful.

Direct Access

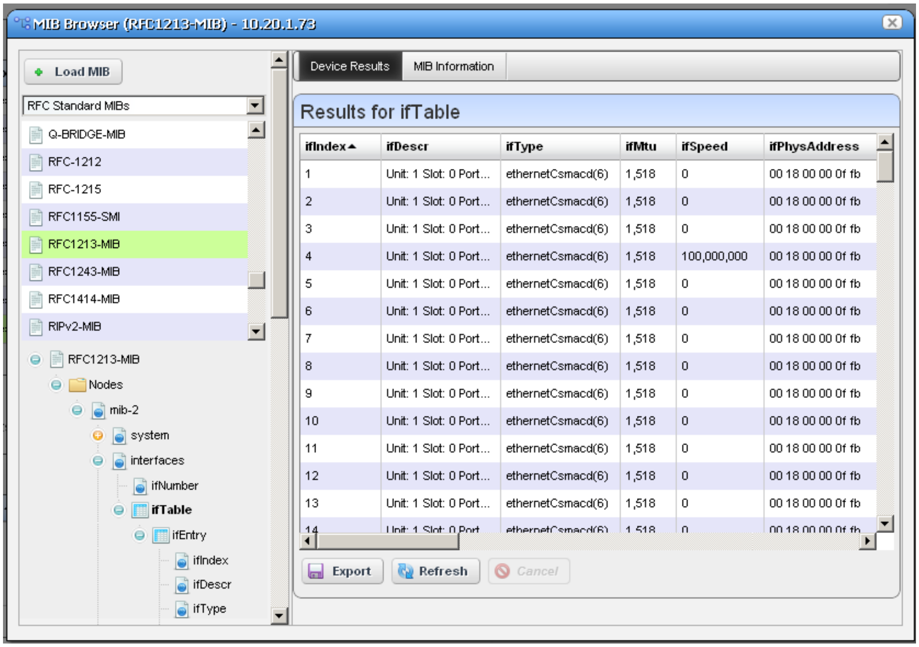
Direct access provides less-mediated access to the device in the following ways:

- MIB Browser
- Terminal
- Ping (ICMP)
- HTTP / HTTPS

The following sections describe those direct options in more detail.

MIB Browser

As part of the *Direct Access* menu, the *MIB Browser* lets you examine SNMP data available about devices.



Results for ifTable

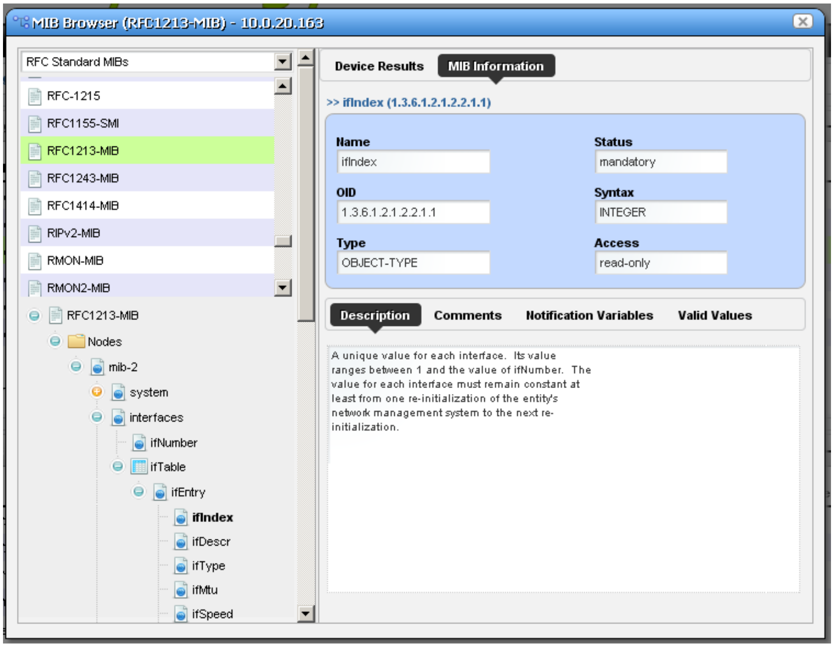
ifIndex	ifDescr	ifType	ifMtu	ifSpeed	ifPhysAddress
1	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
2	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
3	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
4	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	100,000,000	00 18 00 00 0f fb
5	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
6	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
7	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
8	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
9	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
10	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
11	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
12	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
13	Unit: 1 Slot: 0 Port...	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb
14	Unit: 1 Slot: 0 Port	ethernetCsmacd(6)	1,518	0	00 18 00 00 0f fb

The screen that opens when you select this option displays MIBs available in Dell OpenManage Network Manager in a tree on the left. Notice that a pick list at the top of the left column narrows what appears in the tree. A progress bar at the bottom of this screen indicates a query for the selected information is in progress.

Click *Load MIB* at the top left corner of the screen to load a new MIB. A file selection dialog opens after you click *Load MIB*. Click the *Refresh* button at the bottom of the browser to re-query the device for new information. Click the *Export* button at the bottom of the browser to export the screen contents to a spreadsheet (Excel-format) file.

Use the *Load MIB* button in the upper right corner, or the menu described in Event Definitions on page 158 for loading new MIBs.

Select a MIB and expand it to see the contents for a selected node appear on the right. In addition to the *Device Results* tab, which displays what the currently selected device uses from the MIB, the *MIB Information* tab displays the parameters available for the selected node.



>> ifIndex (1.3.6.1.2.1.2.2.1.1)

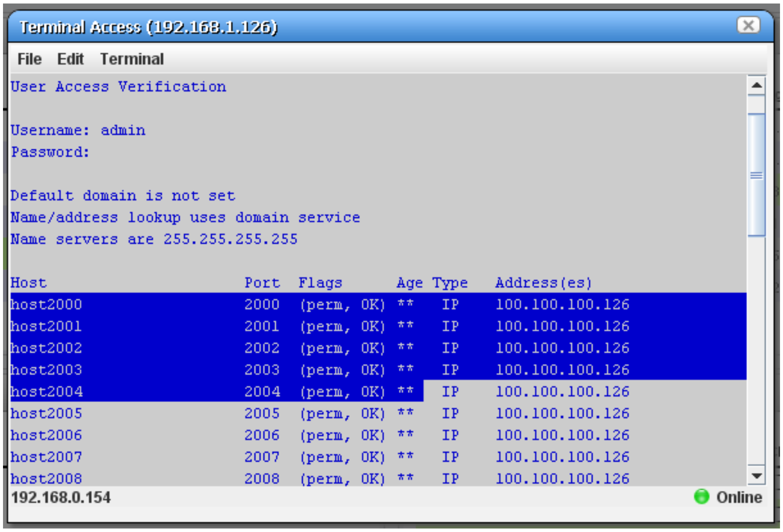
Name: ifIndex
Status: mandatory
OID: 1.3.6.1.2.1.2.2.1.1
Syntax: INTEGER
Type: OBJECT-TYPE
Access: read-only

A unique value for each interface. Its value ranges between 1 and the value of ifNumber. The value for each interface must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization.

Notice that the *Description*, *Comments*, *Notification Variables*, and *Valid Values* tabs appear at the bottom of this screen.

Terminal

This opens a terminal shell connected to the selected device.



```
User Access Verification

Username: admin
Password:

Default domain is not set
Name/address lookup uses domain service
Name servers are 255.255.255.255

Host                      Port  Flags      Age Type   Address(es)
host2000                  2000  (perm, OK) **   IP    100.100.100.126
host2001                  2001  (perm, OK) **   IP    100.100.100.126
host2002                  2002  (perm, OK) **   IP    100.100.100.126
host2003                  2003  (perm, OK) **   IP    100.100.100.126
host2004                  2004  (perm, OK) **   IP    100.100.100.126
host2005                  2005  (perm, OK) **   IP    100.100.100.126
host2006                  2006  (perm, OK) **   IP    100.100.100.126
host2007                  2007  (perm, OK) **   IP    100.100.100.126
host2008                  2008  (perm, OK) **   IP    100.100.100.126
```

A green icon in the lower right corner indicates the device is online, while the IP address of the device appears in title bar. The IP address of Dell OpenManage Network Manager's server also appears in the lower left corner, when the connection is active.

The following menus appear for your terminal session:

File—This menu lets you *Connect* or *Disconnect* to the device.

Edit—This menu lets you *Copy* or *Paste* text within the terminal session. Click and drag to select text.

Terminal—This menu lets you set *Foreground* and *Background* colors, as well as configuring the *Font* and *Buffer* sizes. *Reset Terminal* restores the defaults.

Terminal is an applet that requires a Java Runtime Environment be installed and associated to the browser as a plug-in on the client machine.

NOTICE

You can cut and paste from the Direct Access terminal.

Telnet sessions are synchronous. You cannot interrupt a command in progress with another command you send, unless you have enabled something that periodically prompts for additional commands (for example enabling line continuation prompts).

Logging Terminal Sessions

You can log terminal sessions if you like. Do the following:

1. Enable Java Console on the client. For Windows, do this in Control Panel. On Linux you must navigate to the install location of your JRE and run the Console script. Select the Advanced tab and change the Java Console setting to show the console.

   Java Control Panel > General tab > Settings displays the location where the logs are stored.

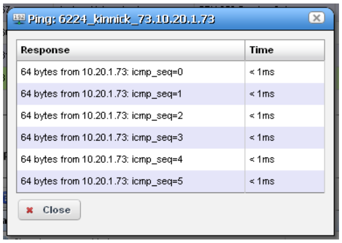
2. Open a *Direct Access* > *Terminal* session by right-clicking a device. The Java Console appears.
3. Configure the level of logging in the *Terminal* menu of the direct access screen. Levels, in increasing order of detail, include *None*, *Info*, *Debug*, and *Trace*, which echoes keystrokes.

Java Security

Some Java installations may block self-signed websites, interfering with Direct Access. The workaround is to provide a security exception for the application server, as follows:

1. Click Start
2. Type `configure java` and hit [Enter]
3. Select the *Security* tab.
4. Click *Edit Site List*
5. Click *Add*
6. Type the Dell OpenManage Network Manager URL (example: http://192.168.0.51:8080/
7. Click *OK* and *Continue*.
8. *Apply* this change, and/or click *OK*.

Ping (ICMP)



Response	Time
64 bytes from 10.20.1.73: icmp_seq=0	< 1ms
64 bytes from 10.20.1.73: icmp_seq=1	< 1ms
64 bytes from 10.20.1.73: icmp_seq=2	< 1ms
64 bytes from 10.20.1.73: icmp_seq=3	< 1ms
64 bytes from 10.20.1.73: icmp_seq=4	< 1ms
64 bytes from 10.20.1.73: icmp_seq=5	< 1ms

Select this option from the Direct Access menu to initiate ICMP ping, and to display a list of the selected device’s ping responses.

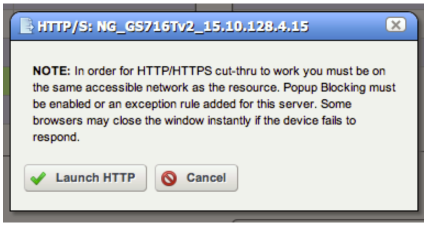
Alternatively, an error message can appear describing the device’s lack of response.

When ping responds in less than one millisecond, results appear in a table with <1ms entries.

HTTP / HTTPS

Selecting this menu item opens the default browser, connected to the selected device.

An intervening dialog appears advising you about the required network conditions for a successful connection.

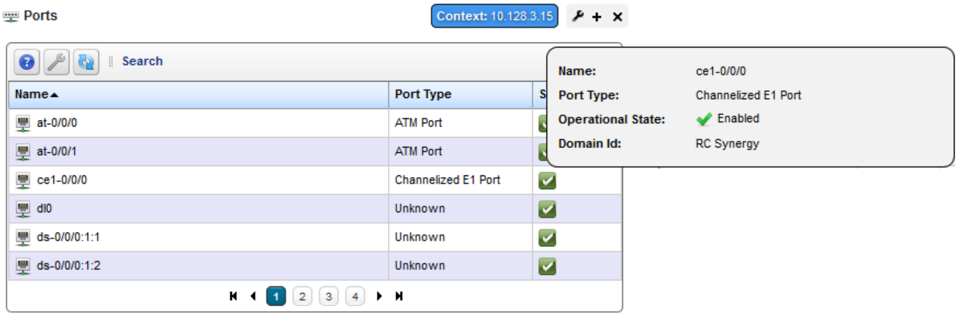


HTTP/S: NG_GS716Tv2_15.10.128.4.15

NOTE: In order for HTTP/HTTPS cut-thru to work you must be on the same accessible network as the resource. Popup Blocking must be enabled or an exception rule added for this server. Some browsers may close the window instantly if the device fails to respond.

Ports

This summary portlet displays discovered device ports.



Name ▲	Port Type	S
at-0/0/0	ATM Port	✓
at-0/0/1	ATM Port	✓
ce1-0/0/0	Channelized E1 Port	✓
dl0	Unknown	✓
ds-0/0/0:1:1	Unknown	✓
ds-0/0/0:1:2	Unknown	✓

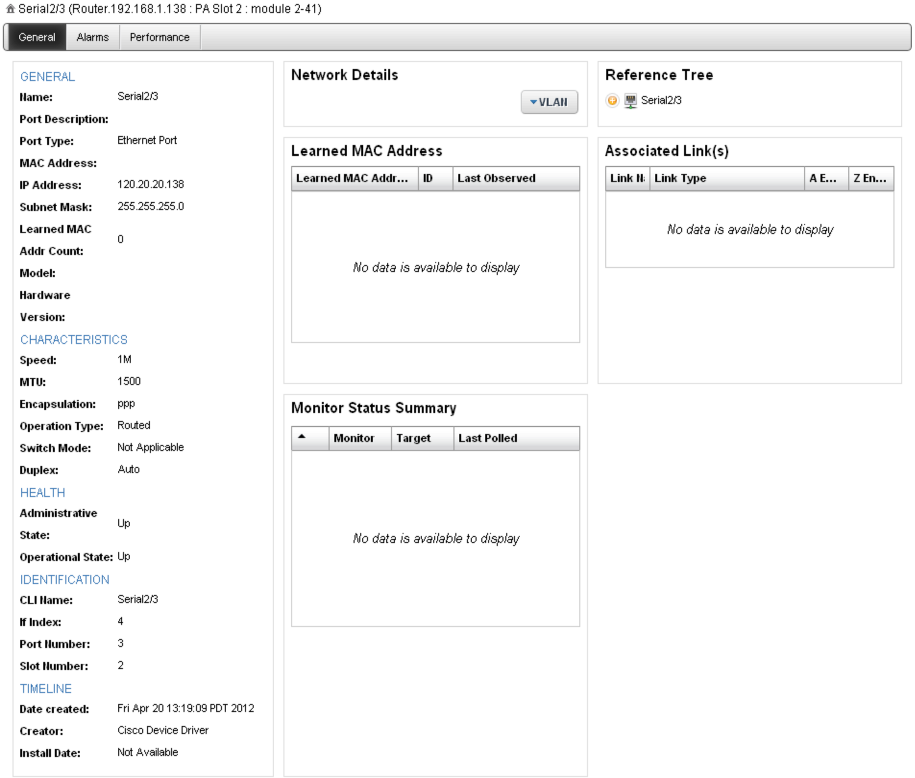
Name:	ce1-0/0/0
Port Type:	Channelized E1 Port
Operational State:	✓ Enabled
Domain Id:	RC Synergy

This displays a list of ports, with columns for *Port Icon*, *Equipment Name*, *Name*, *Type* and *Encapsulation*. Hover the cursor over the *State* column, and a popup appears to display the port's *Name*, *Type* and *Operational State* information. Right-clicking offers a subset of the actions listed in Managed Resources on page 195. You can also create links. See Links on page 206. See Port Editor on page 221 for details of the editor specifically for ports.

If the Ports summary portlet appears on the same page as the Managed Resources portlet, then a selection made in Managed Resources makes the Ports portlet display only ports for the selected resource. This "filter" through Managed Resources disables filters configured through the settings menu. See Display Rules on page 241 and Context on page 242 for more about this feature and the Context icon that appears with the portlet when it applies.

Port Details

This screen displays all the port's settings that have been retrieved, including a Reference Tree of logical interfaces below the port, a Learned MAC Address panel, Alarms related to the port, and other Details.



Serial2/3 (Router.192.168.1.138 : PA Slot 2 : module 2-41)

GENERAL

Name: Serial2/3

Port Description:

Port Type: Ethernet Port

MAC Address:

IP Address: 120.20.20.138

Subnet Mask: 255.255.255.0

Learned MAC Addr Count: 0

Model:

Hardware Version:

CHARACTERISTICS

Speed: 1M

MTU: 1500

Encapsulation: ppp

Operation Type: Routed

Switch Mode: Not Applicable

Duplex: Auto

HEALTH

Administrative State: Up

Operational State: Up

IDENTIFICATION

CLI Name: Serial2/3

If Index: 4

Port Number: 3

Slot Number: 2

TIMELINE

Date created: Fri Apr 20 13:19:09 PDT 2012

Creator: Cisco Device Driver

Install Date: Not Available

Network Details

Reference Tree

Serial2/3

Learned MAC Address

Learned MAC Addr...	ID	Last Observed
No data is available to display		

Associated Link(s)

Link N	Link Type	A E...	Z En...
No data is available to display			

Monitor Status Summary

▲	Monitor	Target	Last Polled
No data is available to display			

This screen displays the following tabs, accessed by clicking their name in the top of the screen. Just above their names, a reminder appears of the name of the selected port.

General—In this tab, fields appear describing attributes for the selected port. For example *Date Created* (typically, this is the date discovered).

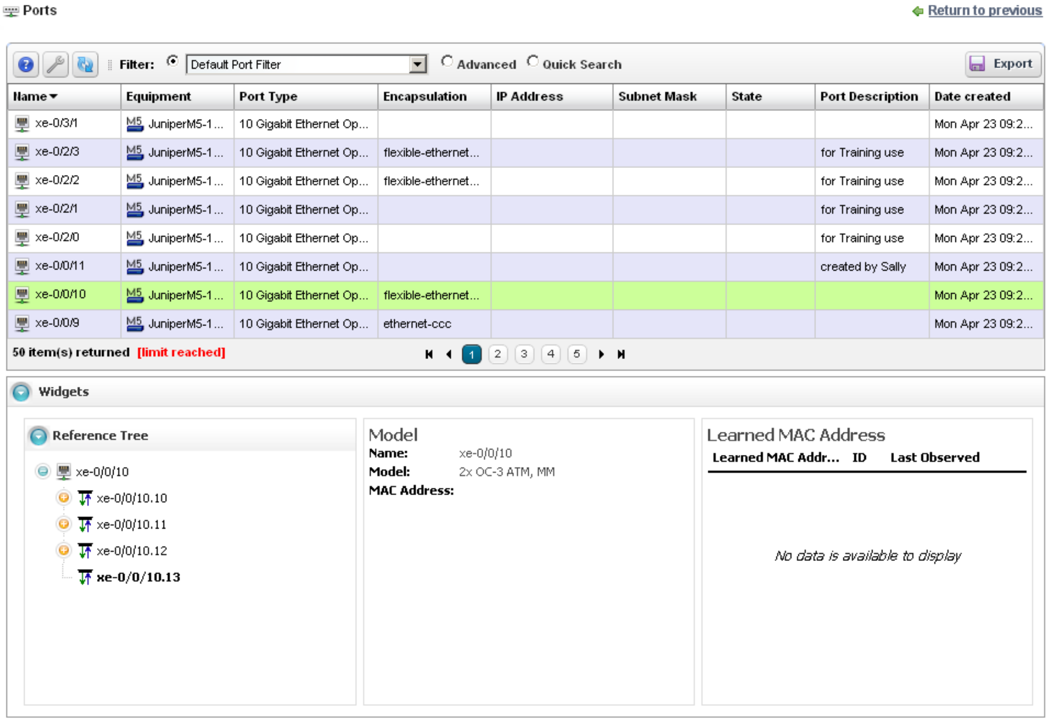
Alarms—This tab displays alarms and the Event History connected to the selected port. See Alarms on page 123 and Event History on page 134 for more about that information.

Performance—Displays monitor information connected to the selected port.

See also Equipment Details on page 210 and Managed Resources Expanded on page 204 for an explanation of some of these fields.

Ports Expanded

Clicking the plus (+) in the upper right corner of the summary screen displays this expanded view of available ports.



Ports

Return to previous

Filter: ● Default Port Filter ○ Advanced ○ Quick Search

Export

Name	Equipment	Port Type	Encapsulation	IP Address	Subnet Mask	State	Port Description	Date created
xe-0/3/1	JuniperM5-1...	10 Gigabit Ethernet Op...						Mon Apr 23 09:2...
xe-0/2/3	JuniperM5-1...	10 Gigabit Ethernet Op...	flexible-ethernet...				for Training use	Mon Apr 23 09:2...
xe-0/2/2	JuniperM5-1...	10 Gigabit Ethernet Op...	flexible-ethernet...				for Training use	Mon Apr 23 09:2...
xe-0/2/1	JuniperM5-1...	10 Gigabit Ethernet Op...					for Training use	Mon Apr 23 09:2...
xe-0/2/0	JuniperM5-1...	10 Gigabit Ethernet Op...					for Training use	Mon Apr 23 09:2...
xe-0/0/11	JuniperM5-1...	10 Gigabit Ethernet Op...					created by Sally	Mon Apr 23 09:2...
xe-0/0/10	JuniperM5-1...	10 Gigabit Ethernet Op...	flexible-ethernet...					Mon Apr 23 09:2...
xe-0/0/9	JuniperM5-1...	10 Gigabit Ethernet Op...	ethernet-ccc					Mon Apr 23 09:2...

50 item(s) returned [limit reached]

1 2 3 4 5

Widgets

Reference Tree

- xe-0/0/10
  - xe-0/0/10.10
  - xe-0/0/10.11
  - xe-0/0/10.12
  - **xe-0/0/10.13**

Model

Name: xe-0/0/10

Model: 2x OC-3 ATM, MM

MAC Address:

Learned MAC Address

Learned MAC Addr...	ID	Last Observed

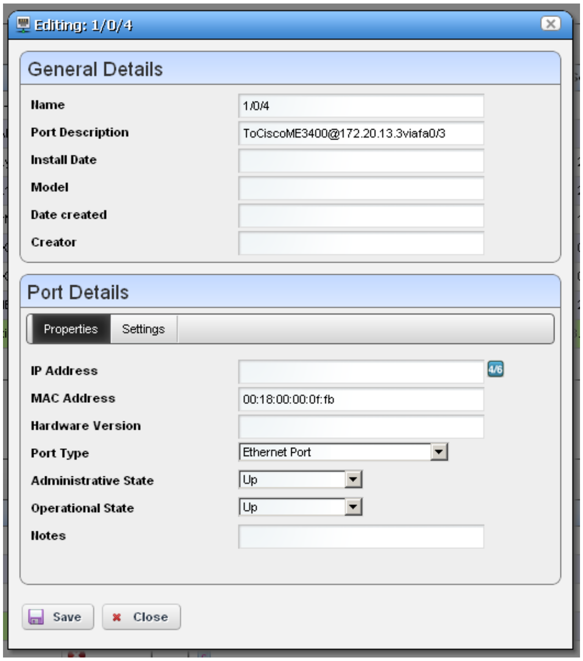
No data is available to display

The *Settings* button lets you configure columns that appear and their order. The available columns for this view include many related to the attributes that appear in Port Details on page 219, above. This screen also includes a *Reference Tree* displaying a tree of the selected port's relationship to logical interfaces and monitors.

Port Editor

When you right-click a port, and select *Edit* this screen appears.

It has the following fields:



Editing: 1/0/4

General Details

Name	1/0/4
Port Description	ToCiscoME3400@172.20.13.3viafa0/3
Install Date	
Model	
Date created	
Creator	

Port Details

IP Address	
MAC Address	00:18:00:00:0f:fb
Hardware Version	
Port Type	Ethernet Port
Administrative State	Up
Operational State	Up
Notes	

General Details

Name—An identifier for the port.

Port Description—A text description for the port.

Install Date—The date this port was installed.

Model—The port's model.

Date created—The date this port was created.

Port Details - Properties

IP Address—The IP address for the port.

MAC Address—The port's Media Access Control (MAC) address.

Hardware Version—The port's hardware version.

Port Type—The type of port.

Administrative State—One of three descriptive values. The options are:

Locked—Device use is prohibited.

Shutting Down—Only existing users can use the device.

Unlocked—Normal use of device is permitted.

Operational State—One of the following values:

Down—Inoperable because of a fault, or resources are unavailable.

Dormant—The port is dormant.

Not Present—The port is absent.

Up—Operable and available for use.

Unknown—Status is unknown.

Testing—Status is testing.

Notes—Any notes recorded about the device.

Port Details - Settings

Encapsulation—An identifier for the port.

MTU—The size of the maximum transmission unit.

Speed—The port's speed.

Subnet Mask—Any subnet mask associated with the port.

In Use —Checked if the port is in use.

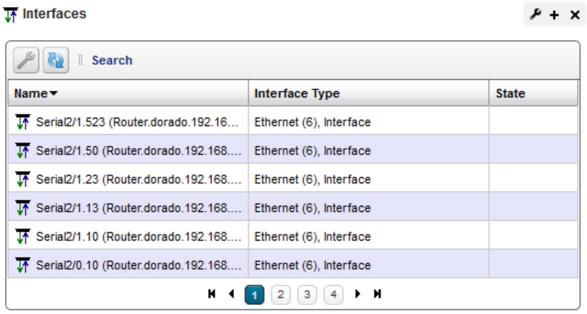
IF Index—The port's SNMP If Index number.

NOTE:

Changing fields in the Editor screens like Network Status, Administrative State, Operational State and MAC address do not change the device; they change only the Dell OpenManage Network Manager database. You can alter these fields to take notes or set aspirational values, but no change goes to the device, and resync eradicates changes made if the device has conflicting values.

Interfaces

This portlet, like Ports, displays subcomponents of discovered resources. Unlike Ports, however, it is not driven by a Managed Resources portlet selection on the same page where it appears. Also, unlike Ports, it does not display snap panels in its expanded form, just more columns.



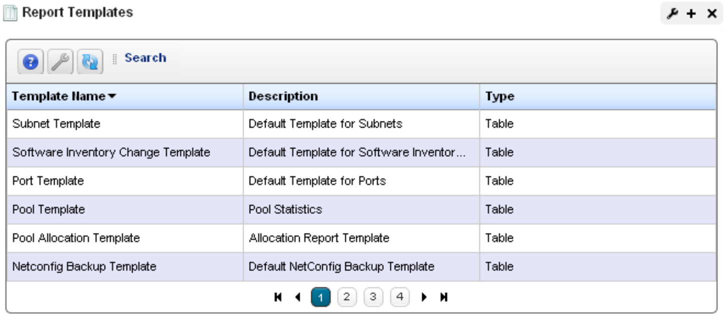
Name	Interface Type	State
Serial2/1.523 (Router.dorado.192.16...	Ethernet (6), Interface	
Serial2/1.50 (Router.dorado.192.168....	Ethernet (6), Interface	
Serial2/1.23 (Router.dorado.192.168....	Ethernet (6), Interface	
Serial2/1.13 (Router.dorado.192.168....	Ethernet (6), Interface	
Serial2/1.10 (Router.dorado.192.168....	Ethernet (6), Interface	
Serial2/0.10 (Router.dorado.192.168....	Ethernet (6), Interface	

Right-clicking lets you use the following menu items: *Details*, *Visualize*, *Domain Access Control*, *Actions*, *Event Management*, *Links* and *Show Performance*. See *Managed Resources on page 195* for details about what those menu items do.

Report Templates

Report Templates are the basis of reports. This portlet displays the *Template Name*, *Description*, *Inventory Entity*, and *Type* in columns.

Right-clicking in this portlet lets you create a *New* template, *Edit* a selected template (see Report Template Editors for information about subsequent screens), view *Details* or *Delete* a selected template. You can also *Import / Export* report templates to files.



Report Templates

Template Name	Description	Type
Subnet Template	Default Template for Subnets	Table
Software Inventory Change Template	Default Template for Software Inventor…	Table
Port Template	Default Template for Ports	Table
Pool Template	Pool Statistics	Table
Pool Allocation Template	Allocation Report Template	Table
Netconfig Backup Template	Default NetConfig Backup Template	Table

The expanded Report Templates portlet also includes a Reference Tree snap panel displaying a tree for selected templates connecting them to Report Groups and specific reports.

How To:

Create a Report Template

The following steps create a report template:

1. In the Report Templates portlet, right-click and select *New* Table template.
2. Name the template (for example: Test Amigopod Report)
3. In the *Source* tab, select an inventory source (for example: Inventory resources [A - DD] Amigopod).
4. Select *Inventory Columns* by clicking the arrow(s) between *Available* and *Selected* columns. (for example: Amigopod: Administrative State, Amigopod: DNS Hostname, Amigopod: Equipment Name, Amigopod:IP Address)
5. In the *Layout* tab, configure the column order (top is first, bottom is last).
6. Notice you can also configure the font size, color, alignment, and so on when you select a column in this tab.

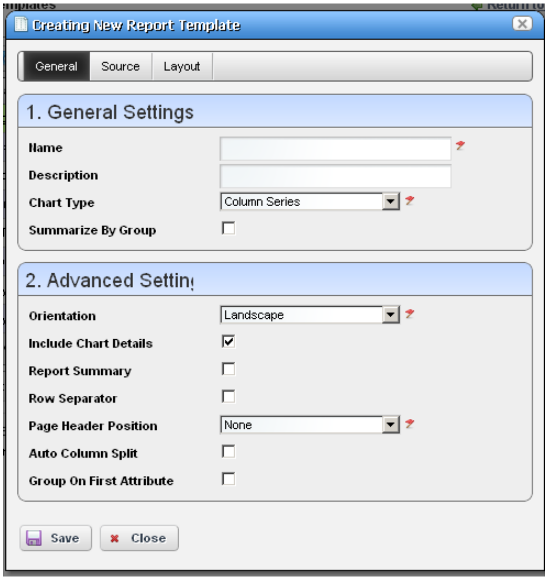
7 Click *Save*. You have successfully created a template.

NOTICE

Formatting counts in making reports useful. Sometimes the limitations of the output need to inform the formatting you select. For example, PDF output does not handle large numbers of columns well, while CSV (import-able into Excel) output has no problem with it. Best practice is to test reports you configure before putting them into production.

Report Template Editors

Dell OpenManage Network Manager has several report template editors. Creating a *New* template, can make *Comparison*, *Table* and *Trend* templates.



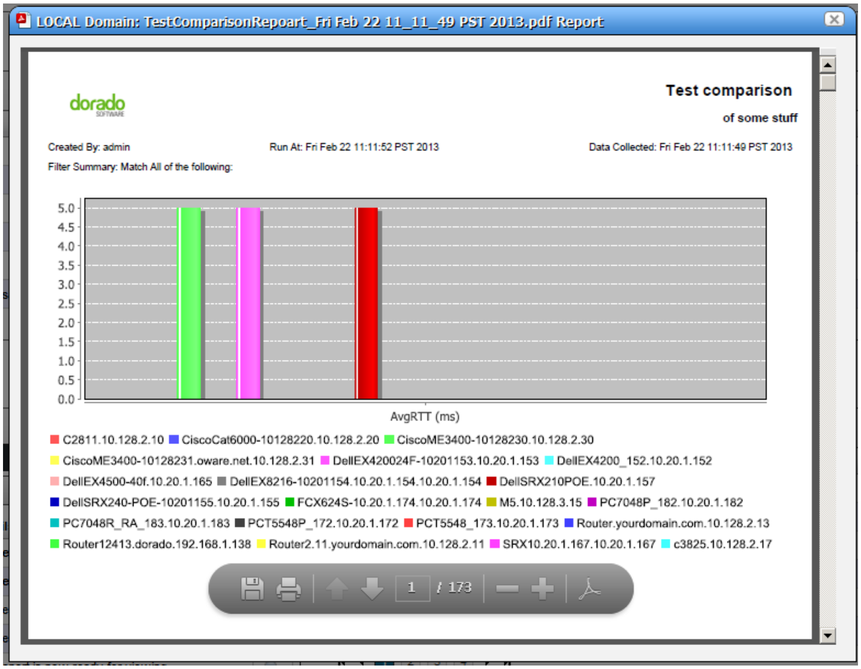
1. General Settings

Name	
Description	
Chart Type	Column Series
Summarize By Group	□

2. Advanced Settin

Orientation	Landscape
Include Chart Details	☑
Report Summary	□
Row Separator	□
Page Header Position	None
Auto Column Split	□
Group On First Attribute	□

Table reports simply report the configured data in tabular form as you have configured the columns. Comparison reports display selected attributes comparing reporting devices, for example a summary graph then a list of devices' ICMP monitor RTT in the following pages.



LOCAL Domain: TestComparisonRepoart_Fri Feb 22 11_11_49 PST 2013.pdf Report

dorado SOFTWARE

Test comparison

of some stuff

Created By: admin

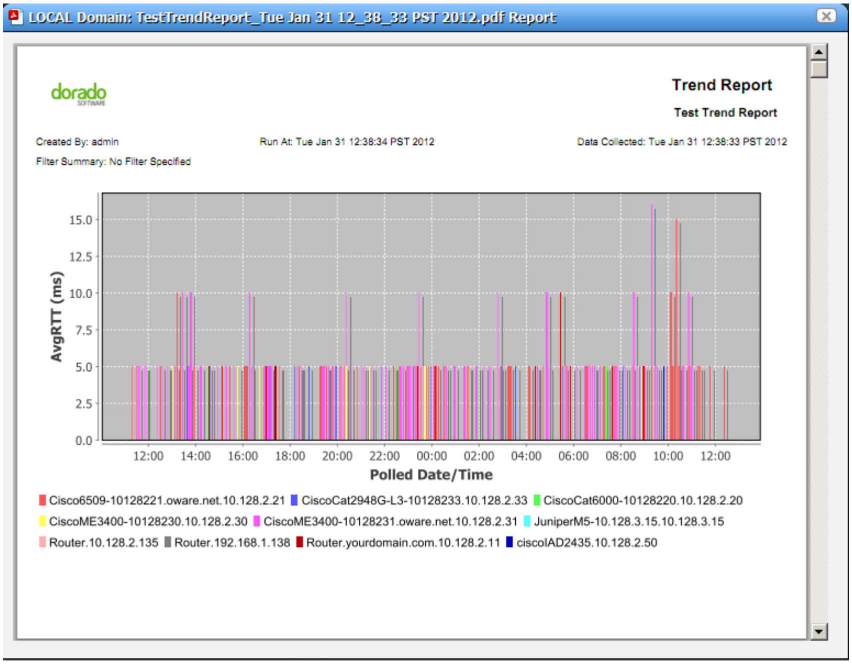
Run At: Fri Feb 22 11:11:52 PST 2013

Data Collected: Fri Feb 22 11:11:49 PST 2013

Filter Summary: Match All of the following:

5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
AvgRTT (ms)
C2811.10.128.2.10
CiscoCat6000-10128220.10.128.2.20
CiscoME3400-10128230.10.128.2.30
CiscoME3400-10128231.oware.net.10.128.2.31
DellEX420024F-10201153.10.20.1.153
DellEX4200_152.10.20.1.152
DellEX4500-40f.10.20.1.165
DellEX8216-10201154.10.20.1.154.10.20.1.154
DellSRX210POE.10.20.1.157
DellSRX240-POE-10201155.10.20.1.155
FCX624S-10.20.1.174.10.20.1.174
M5.10.128.3.15
PC7048P_182.10.20.1.182
PC7048R_RA_183.10.20.1.183
PCT5548P_172.10.20.1.172
PCT5548_173.10.20.1.173
Router.yourdomain.com.10.128.2.13
Router12413.dorado.192.168.1.138
Router2.11.yourdomain.com.10.128.2.11
SRX10.20.1.167.10.20.1.167
c3825.10.128.2.17
1
/ 173

A Trend Report displays a data graph with data reported over a polled period.



LOCAL Domain: TestTrendReport_Tue Jan 31 12_38_33 PST 2012.pdf Report

Trend Report

Test Trend Report

Created By: admin

Run At: Tue Jan 31 12:38:34 PST 2012

Data Collected: Tue Jan 31 12:38:33 PST 2012

Filter Summary: No Filter Specified

dorado
SOFTWARE
AvgRTT (ms)
15.0
12.5
10.0
7.5
5.0
2.5
0.0
12:00
14:00
16:00
18:00
20:00
22:00
00:00
02:00
04:00
06:00
08:00
10:00
12:00
Polled Date/Time
🟥 Cisco6509-10128221.oware.net.10.128.2.21
🟦 CiscoCat2948G-L3-10128233.10.128.2.33
🟩 CiscoCat6000-10128220.10.128.2.20
🟨 CiscoME3400-10128230.10.128.2.30
🟪 CiscoME3400-10128231.oware.net.10.128.2.31
🟦 JuniperM5-10.128.3.15.10.128.3.15
🟥 Router.10.128.2.135
■ Router.192.168.1.138
🟥 Router.yourdomain.com.10.128.2.11
🟦 ciscoIAD2435.10.128.2.50

You can now select more than one attribute for trend reports. Chart generation depends on the number of attributes selected and the number of targets:

- 1 target, n attributes produces 1 chart with all attributes (line series graph only)
- n targets, 1 attribute produces 1 chart with all the targets
- x targets, n attributes produces n charts with x targets on each

This editor has General, Source, and Layout tabs.

You can edit any but pre-existing templates, whether they have reports attached to them or not. Consider this example:

Template T has three columns; A, B and C. Someone creates a report R against Template T, executes the report, saves the data as a historical report H1. Two weeks later, someone modifies the Template T, removing column C, adding column D.

When executing report R against the revised Template T’, the report now shows columns A, B and D. User saves the report as historical report H2. Here, H1 only has data for columns A, B and C. H2 has data for columns A, B and D.

If you view H1 you see Template T' is in use and this template creates a report with columns A, B and D. Unfortunately, H1 only has data for columns A, B and C, so the report created has data for columns A and B only. Column D is empty. When viewing H2 you can see Template T' is in use and can create a report with columns A, B and D. H2 has data for columns A, B and D, so all data appears.

General

The following are fields that appear on these screens. Not all screens have all fields.

General Settings

Name—An identifier for the template.

Description—An optional description of the template.

Chart Type—Select from the available alternatives (*column*, *line*).

Summarize by Group—Group similar results together.

Advanced Settings

Orientation—Select from *Portrait* and *Landscape*

Include Chart Details—Enables the following fields

Report Summary—Enable a report summary

Row Separator—Display a row separator.

Page Header Position—Select *none*, *top*, *bottom* or *both*.

Auto Column Split—Enable automatic column splitting. This automatically aligns the columns equally on the report providing the column widths that are most proportional.

Group on First Attribute—Create a report that groups rows based on the first reported attribute. This creates groups of items in the report whenever the left most column's value changes.

For example, with disabled, a report looks like this:

Device Name	Gig/e Port Name	Health Status
M5	ge/0/0/1	Up
M5	ge/0/0/2	Down
M5	ge/0/0/3	Up
M5	ge/0/0/4	Unknown
M18	ge/0/1/1	Up
M18	ge/0/1/2	Starting
M18	ge/0/1/3	Up

M18	ge/0/1/4	Down

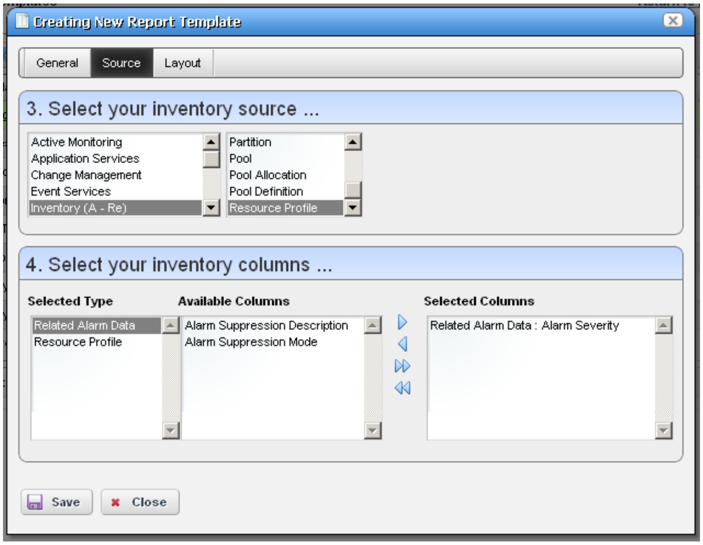
The same report looks like this with *Group on First Attribute* enabled:

Device Name	Gig/e Port Name	Health Status
M5		
	ge/0/0/1	Up
	ge/0/0/2	Down
	ge/0/0/3	Up
	ge/0/0/4	Unknown
M18		
	ge/0/1/1	Up
	ge/0/1/2	Starting
	ge/0/1/3	Up
	ge/0/1/4	Down

The Source and Layout tabs are common to all editors.

Source

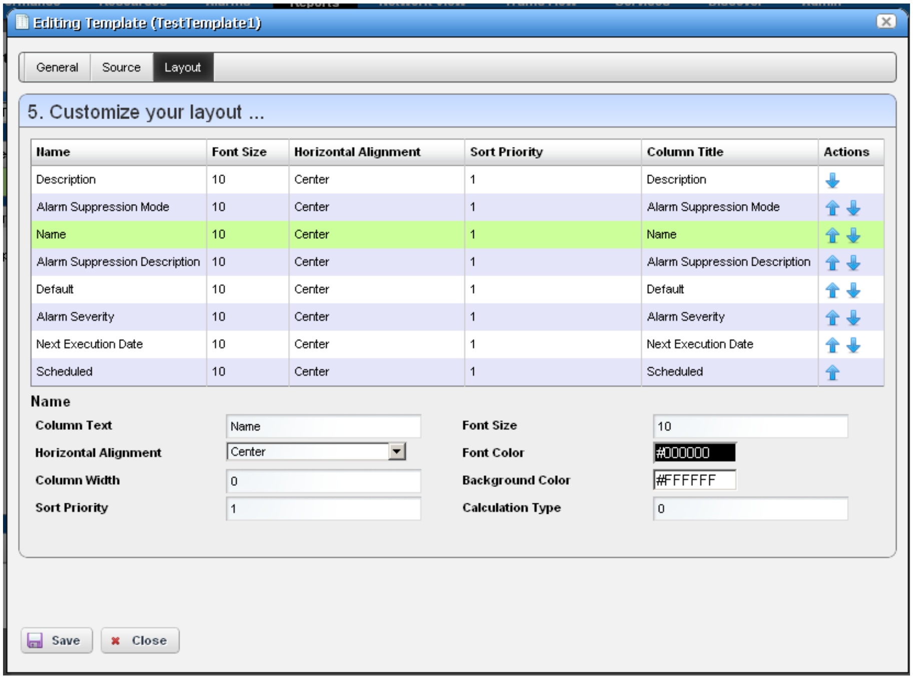
Select the source inventory for a report, and its data types in this screen.



Click the green plus (+) to select the *Inventory Type*. The types of data available for that inventory type appear in the leftmost column in this screen. Click on a *Selected Type* to see its *Available Columns.* Click the arrows to move columns from *Available* to *Selected*. The *Selected Columns* appear in the template's report.

Layout

This tab outlines the column layout for the template.



5. Customize your layout ...

Name	Font Size	Horizontal Alignment	Sort Priority	Column Title	Actions
Description	10	Center	1	Description	↓
Alarm Suppression Mode	10	Center	1	Alarm Suppression Mode	↑ ↓
Name	10	Center	1	Name	↑ ↓
Alarm Suppression Description	10	Center	1	Alarm Suppression Description	↑ ↓
Default	10	Center	1	Default	↑ ↓
Alarm Severity	10	Center	1	Alarm Severity	↑ ↓
Next Execution Date	10	Center	1	Next Execution Date	↑ ↓
Scheduled	10	Center	1	Scheduled	↑

Name

Column Text	Name	Font Size	10
Horizontal Alignment	Center	Font Color	#000000
Column Width	0	Background Color	#FFFFFF
Sort Priority	1	Calculation Type	0

Click on the up/down arrows on the right of each row to re-order data columns. Click to select a row, and the editor panel at the bottom of the screen appears. It has the following fields:

Column Text—The column label.

Horizontal Alignment—*Right*, *Left*, *Center* (the default).

Column Width—The column width in characters.

Sort Priority—Configures report sorting. Define the attribute sort order here. You can sort within a sort, so you can sort on Name and then by Location and then by IP Address, and so on. The number configures the sort group, so 1 sorts, then 2 within 1, then 3, and so on.

Font Size—The data's font size.

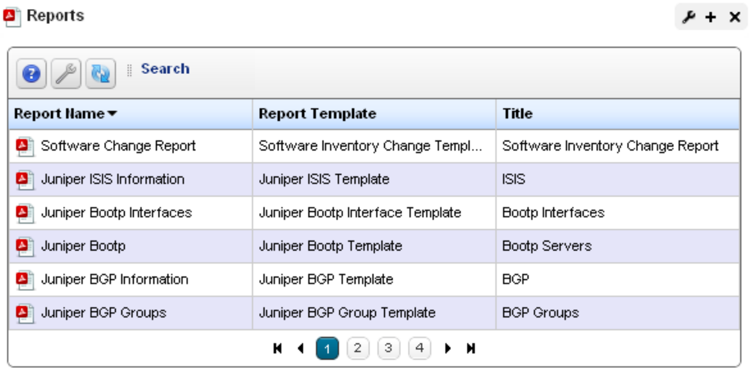
Font / Background Color—The color for the text/background. Click the field to open a color chooser.

Calculation Type—How to calculate for summarizing the numeric data. Select from the available options (*Average*, *High*, *Low*, *Sum*).

Click *Save* to preserve any template you have configured, or *Close* to close the editor screens without saving.

Reports

This portlet's summary screen lists the available reports that you can run with Dell OpenManage Network Manager.



Report Name	Report Template	Title
Software Change Report	Software Inventory Change Templ...	Software Inventory Change Report
Juniper ISIS Information	Juniper ISIS Template	ISIS
Juniper Bootp Interfaces	Juniper Bootp Interface Template	Bootp Interfaces
Juniper Bootp	Juniper Bootp Template	Bootp Servers
Juniper BGP Information	Juniper BGP Template	BGP
Juniper BGP Groups	Juniper BGP Group Template	BGP Groups

The report *Icon*, *Name*, *Template*, and *Subtitle* appear in the columns in this summary screen. Generally speaking, the report selects the target equipment, and the template configures the layout and attributes reported. If the Interface details panel is empty, then the Interface reports will have no contents. Some devices have ports, but no interfaces. Use the Ports report for such devices.

Dell OpenManage Network Manager generates reports with only the first 5,000 records by default. Larger reports warn that they have reached the maximum, and have only those first 5,000 records.

You can change the maximum with the property
`com.dorado.redcell.reports.max.report.query.size=5000`

Larger numbers have an impact on the performance of the report and database.

NOTE:

You must have Adobe's Acrobat reader installed to view reports.

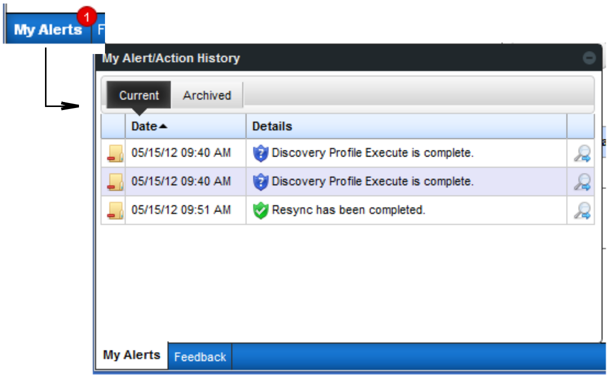
Right-click a selected report to do the following:

New / Edit / Copy —This opens the Report Editor, described below, to configure a new report, edit or copy an existing, selected report. *Copy* automatically renames the selected report.

New Group— Creates a collection of reports. See Group Reports on page 238 for details about how to configure these.

Schedule— Opens a scheduler screen to automate report creation.

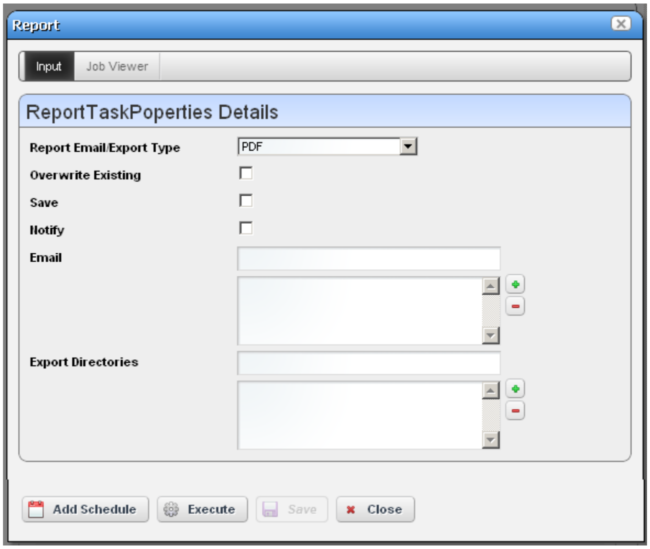
Execute Report— When you execute a report, a numbered message notification appears, and a link to the report appears in the *Messages* panel to notify you the report is ready for viewing. Click the magnifying glass to the right of the notification to view either the audit trail or the report.



Date ▲	Details
05/15/12 09:40 AM	Discovery Profile Execute is complete.
05/15/12 09:40 AM	Discovery Profile Execute is complete.
05/15/12 09:51 AM	Resync has been completed.

Lengthy Reports may take a some time to appear onscreen without much indication that they are in process. This is an artifact of the Acrobat plug-in, and outside the scope of Dell OpenManage Network Manager to influence. Acrobat also produces an error if a report has too much data to display meaningfully.

Execute Report (Advanced)—Also lets you schedule configure a few other things with reports.



ReportTaskPoperties Details

Report Email/Export Type	PDF
Overwrite Existing	□
Save	□
Notify	□
Email	
Export Directories	

When you *View or Execute Report (Advanced)*, by right clicking either a listed report or a historical instance of that report, a configuration screen appears that lets you select several parameters.

These include the following:

Report Email / Export Type—Select the export file type from the pick list. Options include *CSV, HTML,* and *PDF.*

NOTICE

Programs other than Dell OpenManage Network Manager let you manipulate mail outside the scope of OpenManage Network Manager. For example IFTTT (If This Then That) could save mail attachments like reports to Dropbox accounts.

Overwrite Existing—Check to activate overwriting any existing report.

Save—Check to activate saving the report to the database.

Notify—Check to activate emitting a notification event.

Email Address—Enter an e-mail destination for the generated report, and click the plus (+) to list it. You can enter several such e-mails.

Export Directory—Enter directory destinations for saved reports as you would e-mail destinations.x

Click *Add Schedule* to schedule the report for future or repeated execution, *Execute* to run the report immediately, or *Save* to preserve this report's configuration. The *Job Viewer* tab displays the report's progress if you click *Execute*.

CAUTION:

Reports can be large. Typically the limitations on e-mail within your system are what limit the size of deliverable reports. Best practice is to use filters and a limited number of targets to make reports succinct rather than comprehensive.

Aging Policy—If you automate report generation, you may also want to configure a Database Aging Policy to insure the volume of reports does not overwhelm your storage capacity. See Redcell > Database Aging Policies (DAP) on page 58 for more about doing that.

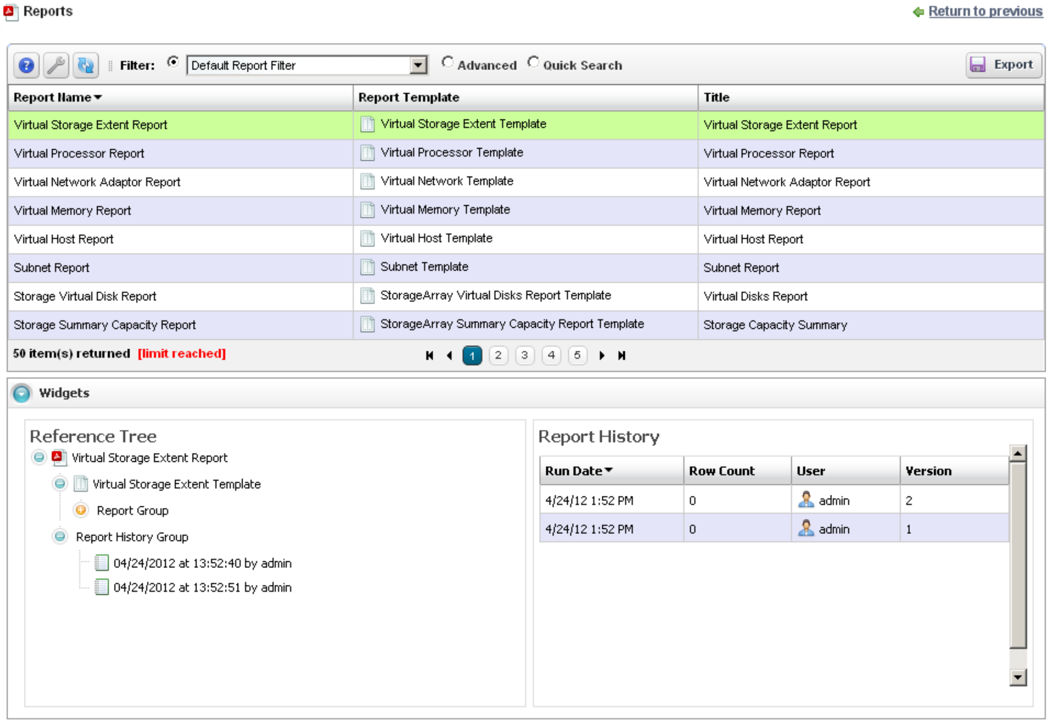
Delete—Removes the selected report from the list display

Delete History— Removes the selected report's history.

To change reports' appearance and contents, you must configure their Report Templates. Also, see Branding Reports on page 237 for instructions about changing the default report logo.

Expanded Reports Portlet

Clicking the plus (+) icon displays the expanded portlet. the expanded portlet adds *Add / Remove Column* to the menu options available in the summary screen.



Filter: ● Default Report Filter ○ Advanced ○ Quick Search

Report Name	Report Template	Title
Virtual Storage Extent Report	Virtual Storage Extent Template	Virtual Storage Extent Report
Virtual Processor Report	Virtual Processor Template	Virtual Processor Report
Virtual Network Adaptor Report	Virtual Network Template	Virtual Network Adaptor Report
Virtual Memory Report	Virtual Memory Template	Virtual Memory Report
Virtual Host Report	Virtual Host Template	Virtual Host Report
Subnet Report	Subnet Template	Subnet Report
Storage Virtual Disk Report	StorageArray Virtual Disks Report Template	Virtual Disks Report
Storage Summary Capacity Report	StorageArray Summary Capacity Report Template	Storage Capacity Summary

50 item(s) returned [limit reached] 1 2 3 4 5

Reference Tree

- Virtual Storage Extent Report
  - Virtual Storage Extent Template
    - Report Group
  - Report History Group
    - 04/24/2012 at 13:52:40 by admin
    - 04/24/2012 at 13:52:51 by admin

Report History

Run Date	Row Count	User	Version
4/24/12 1:52 PM	0	admin	2
4/24/12 1:52 PM	0	admin	1

Available columns are the same as the summary screen's. The *Reference Tree* snap panel displays the selected report's connection to devices, historical reports and any report template. Right-click to view the reports in the Historical Reports node.

Reports Snap Panels

The Snap Panels for reports display a Reference Tree of connections between the selected report and target equipment, and between the report and any Report Template.

The *Report History* Snap Panel displays the selected report's *Run Date*, *Row Count* and the *User* who ran the report. Right-click a row in this panel, and you can *Delete*, *Print* (the report history) or *Export* (the report history), *View* (the report) or *View (Advanced)*. If you *View* the report, a message with a link to the report appears in the bottom left of the screen.

How To:

Generate a Report

The following steps configure, then generate, a report.

1 In the Reports portlet, right-click and select *New.*

2 *Name* the report (for example: Test Juniper Router Report)

3 Enter a title / subtitle for the report (“Juniper Routers”)

4 Select a template for the report in the pick list. (For example, the template configured in How to: Create a Report Template.)

NOTICE

If you create a template, the first report you create after making that template automatically selects the newly created template.

5 In the *Filters* tab, you can create a filter to confine the reports input to certain devices, locations, and so on. (Here, select the existing All Juniper Routers filter)

6 Click *Save*.

7 Locate the newly created report in the Reports portlet.

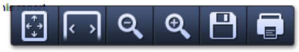
8 Right-click and select *Execute*.

9 Click the *My Alerts* panel in the lower left corner of the portal.

10 Click the magnifying glass icon to the right of the *Report is now ready for viewing* message.

11 The report appears onscreen.

12 Hover your cursor over the lower right corner of the report to see a set of icons that let you expand, zoom out and in, save, or print the report.



For an example of a standard system report, see User Login Report on page 239.

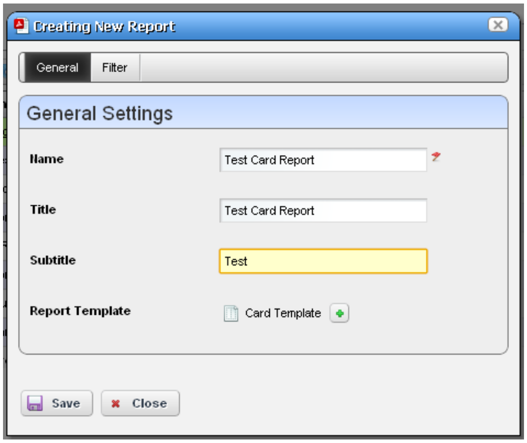
Report Editor

This editor configures reports, and their targets. It has the following screens and fields:

- General
- Filter

General

This screen configures the *Name*, *Title* (displayed text in the report), *Subtitle*, and lets you select the *Report Template* for the report (see Report Templates on page 223 for more about them)


Creating New Report

General Settings

Name: Test Card Report

Title: Test Card Report

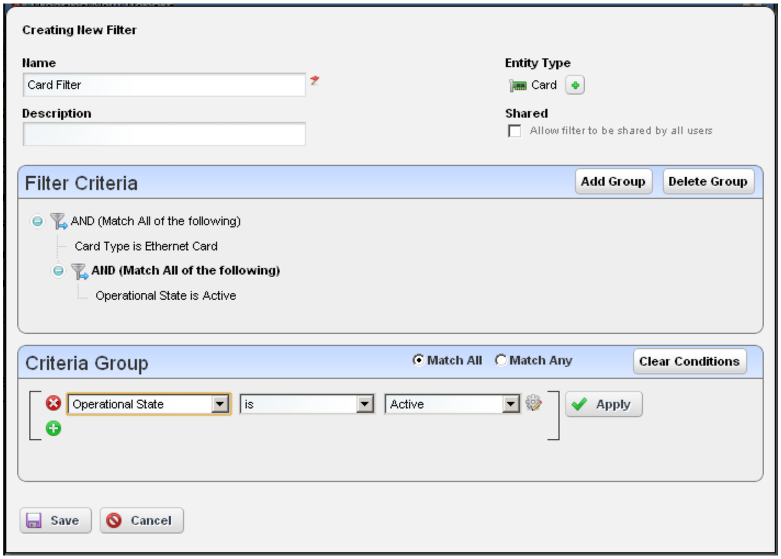
Subtitle: Test

Report Template: Card Template

Filter

This screen configures a filter to retrieve devices that are the source of the report.

Click *Add Filter* in the filter panel to select an existing filter, create a new filter, or copy an existing filter. When you create a new filter, you must enter a *Name* and optionally a *Description* for it, select an *Entity Type* with the green plus (+), and elect whether this filter is available to other users *(Shared)*. See How to: Filter Expanded Portlet Displays on page 108 for instructions about configuring the filter itself in the lower portion of this screen.


Creating New Filter

Name: Card Filter

Description:

Entity Type: Card

Shared: □ Allow filter to be shared by all users

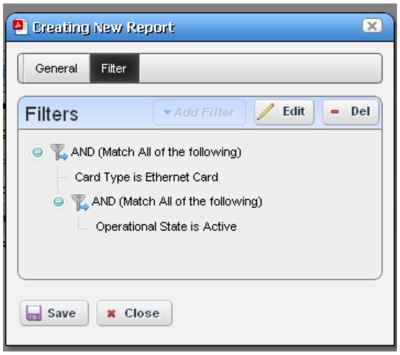
Filter Criteria

- AND (Match All of the following)
  - Card Type is Ethernet Card
  - **AND (Match All of the following)**
    - Operational State is Active

Criteria Group ● Match All ○ Match Any

Operational State | is | Active

Once you have configured or selected a filter, the *Filter* panel displays its characteristics in tree form. Click *Edit* to re-open the editor, or *Del* to remove the filter. Filters appear only for the entity type of your Report template.



AND (Match All of the following)
Card Type is Ethernet Card
AND (Match All of the following)
Operational State is Active

Branding Reports

Reports come with a default logo, but you can change that, as is illustrated in the above screen. Put the `.png`, `.jpg` or `.gif` graphic file with your desired logo in a directory on the application server. In the `owareapps\installprops\lib\installed.properties` file, alter this property:

```
    redcell.report.branding.image=<filename_here>
```

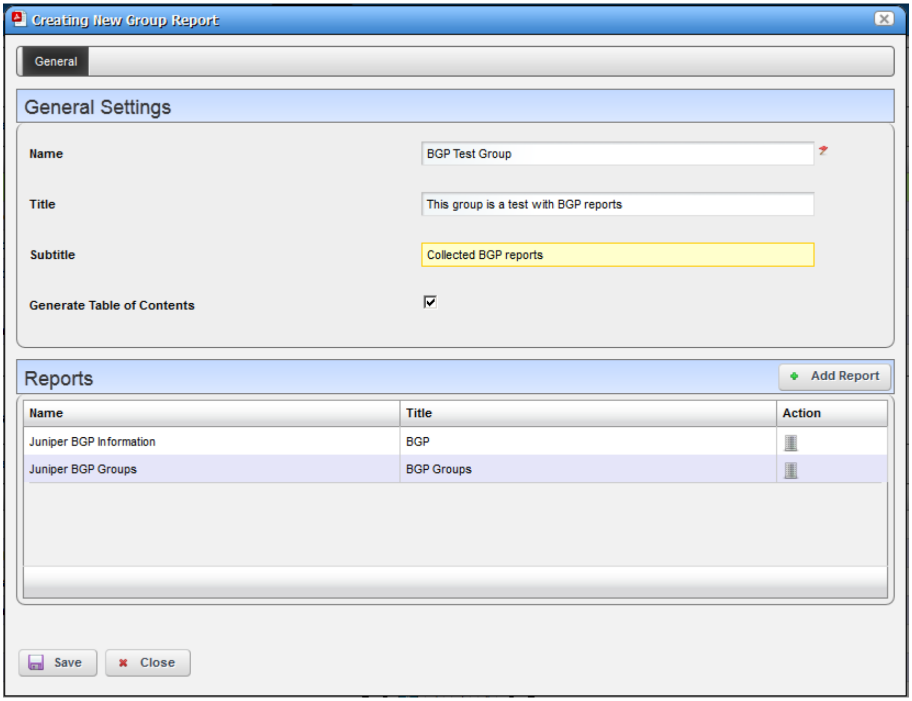
For example:

```
    redcell.report.branding.image=C:/Dorado/owareapps/redcell/images/
      Doradov3bar50.GIF
```

Create images that are no taller than 50 pixels, and no wider than 50 pixels. Notice that you must use the forward-slanting slashes, not backslashes as is typical of Windows, if you specify the path.

Group Reports

You can print a collection of several reports and generate a table of contents if the collection is large enough to warrant it.



General Settings

Name	BGP Test Group
Title	This group is a test with BGP reports
Subtitle	Collected BGP reports
Generate Table of Contents	☑

Reports

Name	Title	Action
Juniper BGP Information	BGP	🗑
Juniper BGP Groups	BGP Groups	🗑

When you right-click in the Reports portlet, and select *New Group*, the Group Reports editor appears. It has the following fields and panels:

Name—Identify the report group.

Title—Optionally provide a title.

Subtitle—Optionally provide a subtitle.

Generate Table of Contents—Check this box to generate a table of contents listing the reports grouped together by this group.

Reports

Click *Add Report* (the green plus) to open a selector with the available reports. Select reports to appear in this group. Each report has an entry in the table of contents, if you elect to generate that.

User Login Report

In addition to reports about inventory, devices, and so on, Dell OpenManage Network Manager lets you create a report documenting user logins.

This report can include the following attributes: Login Date, Status [SUCCESS, AUTH FAILURE, IP RESTRICTION], UserID, User Name, User IP, Proxy IP (if going through a Load Balancer/ Proxy), AppServer IP, Browser [CHROME, FIREFOX, and so on], Operating System [WINDOWS, LINUX, MAC, IPHONE, IPAD, and so on.]

The following attributes are available, but not in default seeded report to conserve Column space: Portal IP and Browser Version.

When authentication fails, this report does not record the IP address from which the user made the attempt, unless such users are behind a proxy or load balancer.

Browser ID, Version and Client appear only by best effort. Browsers do not always send the user-agent and can change standard messaging with extra plugins.

NOTICE

A Default User Sign-On Log DAP is seeded which by default keeps the last 30 days.

7

Display Strategies

You can display devices and network arrangements in a variety of ways. The following sections describe those display strategies.

- Container Manager
- Map Context
- Visualize My Network

Containers manage what appears in other portlets on the same page, including Visualize and Maps. If a page with Visualize has no Containers, then clicking a node in Visualize limits other portlets on that page to only that node's information (for example Alarms). Maps does similar filtering.

Display Rules

Here are the rules for how portlets manage each others' displays:

Rule 1—If Container View is on the Screen its selections drive all portlets that accept context.

If it is not on a Page:

Rule 2—If Visualize My Network portlets is on a page it acts like Container View and drive all portlets' appearance.

Rule 3—If Rule 1 and 2 are not in effect, then Managed Resources drives Ports and Links portlets' appearance.

Rule 4—If Rule 1 is not in effect and Visualizer Views are on the same page as the Visualize My Network portlet, the selected view appears in the Visualizer.

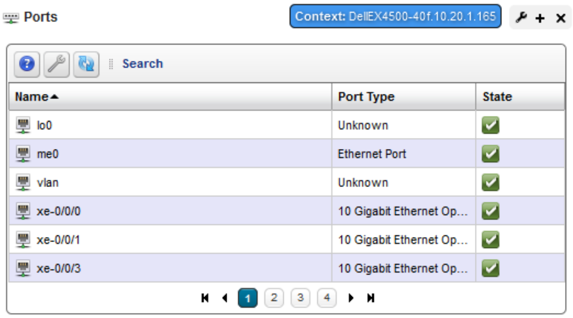
When a page with a container loads, the container typically loads first and starts polling. If it is on the same page, Visualizer starts its polling after the page loads, so some lag may occur between the container and Visualize screens, depending on your settings. Clicking Context or drilling or expanding nodes in the Visualize screen resets the refresh timer since it may poll different nodes. This can also offset refresh timing for different page elements. You can change refresh timing (see General > Entity Change Settings on page 58 for the way to portlet refresh intervals), but synchronizing such portlets absolutely is unlikely.

NOTE:

Some portlets may display a selected context without operating as though it was selected. For example if you put Managed Resources

Context

When other portlets determine the appearance of a portlets—as spelled out in Display Rules above—a *Context* icon often appears in the right corner of the driven portlets.



Name▲	Port Type	State
lo0	Unknown	✓
me0	Ethernet Port	✓
vlan	Unknown	✓
xe-0/0/0	10 Gigabit Ethernet Op...	✓
xe-0/0/1	10 Gigabit Ethernet Op...	✓
xe-0/0/3	10 Gigabit Ethernet Op...	✓

The contents of the icon spell out what is selected in the portlet driving its appearance.

Container Manager

Container manager lets you create, edit and delete Container tree models displayed in Container Views (described in the next section). These containers filter what appears in other portlets on the page with the Container View portlet.

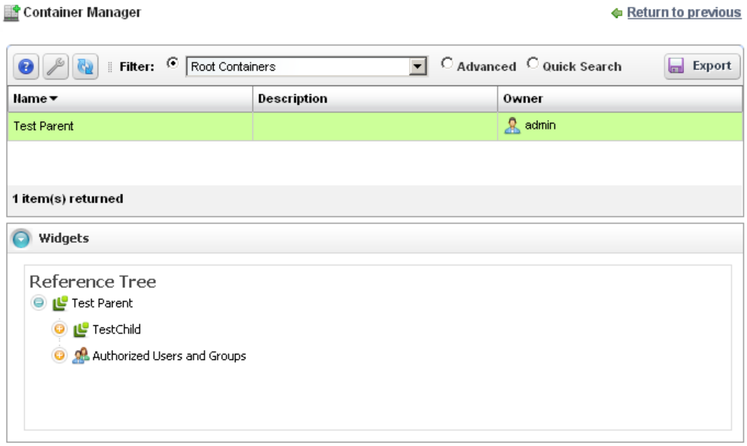
The relationship to users and devices appears in Container Manager Expanded.

Right-click to select from a menu with *New, Edit* and *Delete,* and *Refresh Members / Alarm State. Refreshing* re-queries the database for members fitting the dynamic filter, or for new alarms for members. Selecting *New,* or *Edit* displays the Container Editor, described below.

You can also *Tag* containers so Map views reflect container selections. See *Tag on page 114* for more about how that works.

Container Manager Expanded

The expanded view displays the same information as the summary view, but displays the selected container's authorized users, creator, owner, and membership in the Reference Tree snap panel.



Name	Description	Owner
Test Parent		admin

1 item(s) returned

How To:

Use Containers

1 Create the containers you would like for filtering views of resources. For example, you can create a container for each customer or location.

CAUTION:
By default containers are configured without any authorizations. Make sure you configure authorizations so you can see the container once it is configured, otherwise it will be invisible.

2 Create a page with Managed Resources or other container-filtered portlets (Ports, Alarms and so on).

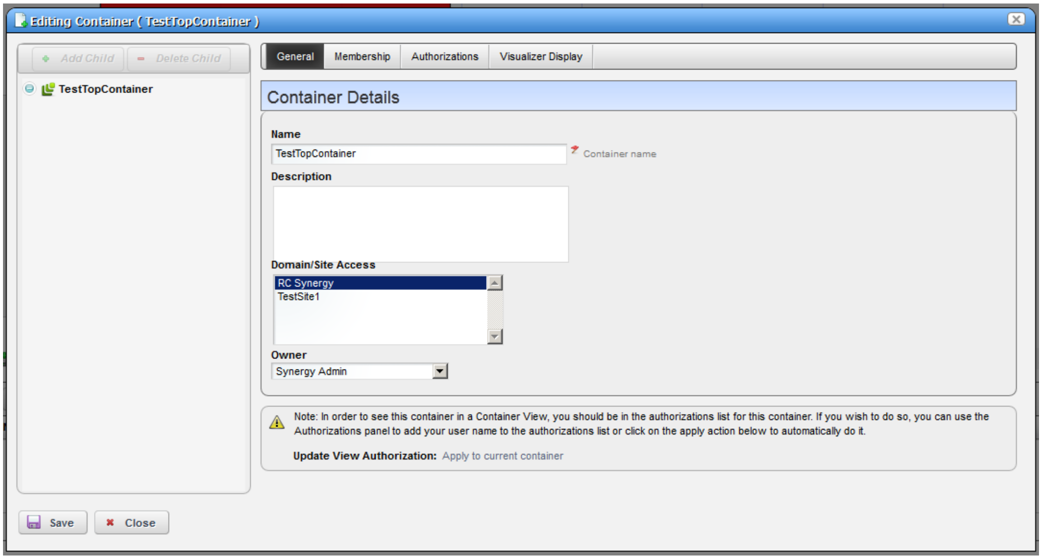
3 Add the Container View portlet to that page.

4 Click the container to filter by.

5 Observe the other portlets to see resources assigned to the selected container, for example, customer or location.

Container Editor

This editor lets you create and manage containers. You can also associate user authorizations with container models to specify which groups or users have access to contained items.



Name: TestTopContainer (Container name)

Description

Domain/Site Access: RC Synergy, TestSite1

Owner: Synergy Admin

Note: In order to see this container in a Container View, you should be in the authorizations list for this container. If you wish to do so, you can use the Authorizations panel to add your user name to the authorizations list or click on the apply action below to automatically do it.

Update View Authorization: Apply to current container

In this editor, a tree panel on the left lets you build and navigate the container tree. Click *Add Child* (or *Delete Child*) to create (or remove) a node to / from the node you have selected in the tree. Clicking a node in the tree displays the tabbed panel on the right where you can edit it.

The *Container Details* panel has the following tabs:

- General
- Membership
- Authorizations
- Visualizer Display

Click the labels at the top of the screen to access these. Alarm states and severities are recalculated and propagated for containers as they are for Visualize My Network.

General

This panel has the following fields:

Name—The container identifier.

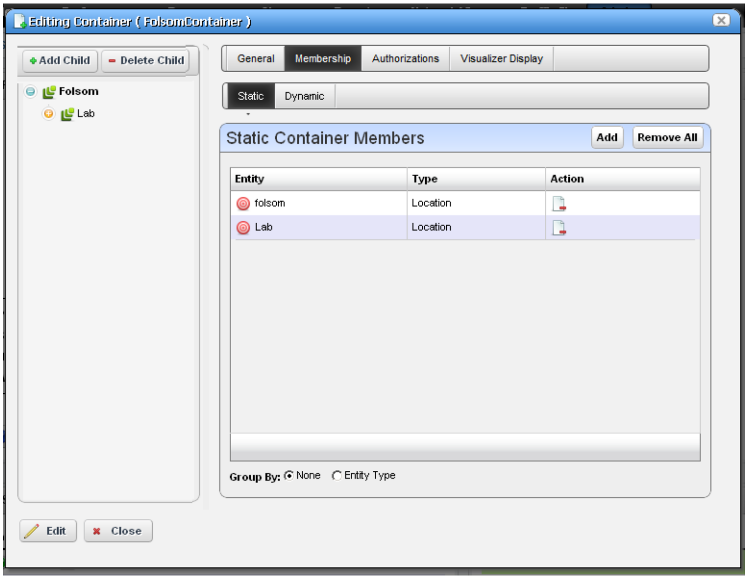
Description—A text description of the container.

Owner—Select an owner for the container. The owner of a container can also change the ownership of the container

Update View Authorizations—Clicking the link here automatically includes the creating user in those authorized to view the container. See Authorizations below for more about them.

Membership

Container membership defines the inventory items that are in a container. You can select either a *Static* membership, which cannot change, or a *Dynamic* one, based on a filter. When Dell OpenManage Network Manager evaluates the filter it adds the resulting items as members in the container.



Entity	Type	Action
folsom	Location	
Lab	Location	

Group By: ● None ○ Entity Type

The sub-tabs at the top of the screen let you edit these types. You can add individual items with the *Static* tab, or the results of a *Dynamic* filter with that tab. See Managed Resource Groups on page 190 for more about the specifics of editing these dynamic groups.

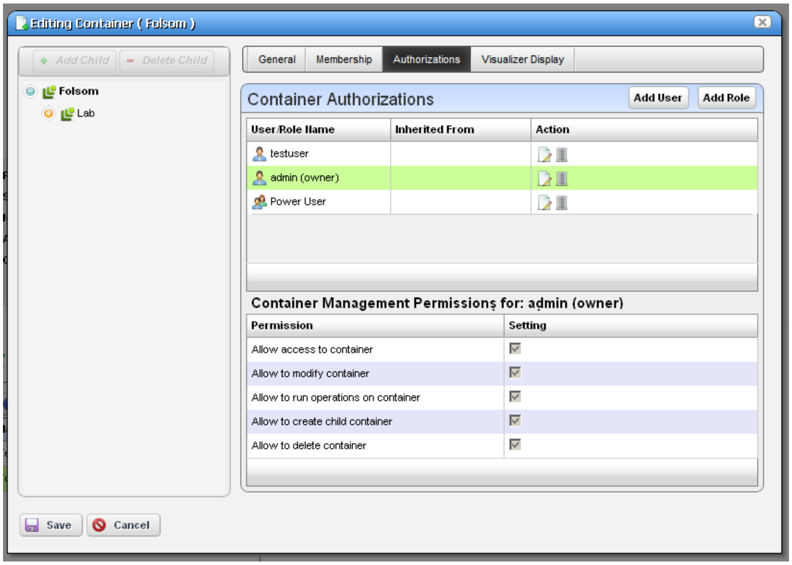
When you add an item or filter to your container, notice that the subsequent screen contains a pick list *Select an entity of the following type*. The contents of that list can contain several types of managed objects, including Contact, Equipment and Subcomponent, Interface, Location, Managed Equipment, Port, Service, and Vendor. Select the type appropriate for your container.

Click *Save* to preserve the membership you have configured. If you *Group By Entity Type* (at the bottom of the screen) rather than *None*, the list of devices appears in a tree, with each node as an entity type. Click the plus (+) to the left of the entity label to expand the tree.

Authorizations

This tab configures user or role access to the container you are editing. By default, no authorization exists to see a container or its contents, so you must permit specified users and roles to have access before any containers or their contents are visible in Container View.

Click *Add User* or *Add Role* to select the users or groups with permission to access the container you are configuring. By default containers are accessible to everyone.



Container Authorizations

User/Role Name	Inherited From	Action
testuser		
admin (owner)		
Power User		

Container Management Permissions for: admin (owner)

Permission	Setting
Allow access to container	☑
Allow to modify container	☑
Allow to run operations on container	☑
Allow to create child container	☑
Allow to delete container	☑

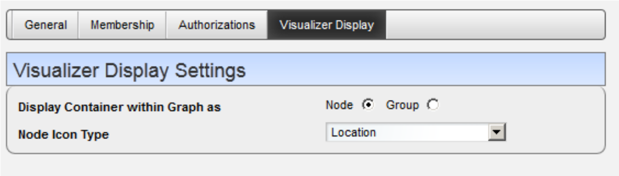
Each entry in the Container Authorizations list specifies the name of the user or role, and whether the entry is inherited or not. A child container by default inherits the authorizations from parent hierarchy, no explicit authorizations for child containers are necessary. Edit any authorizations in the parent.

When editing a child container, click a listed authorized user or role and its permissions appear in the panel at the bottom of this screen.

Clicking *Save* preserves any alterations you have made. Confirm the container is configured as you like by examining it in a Container View portlet.

Visualizer Display

This tab configures how the container appears in the Visualize My Network portlet.



Visualizer Display Settings

Display Container within Graph as Node ● Group ○

Node Icon Type Location

Selected containers' labels appear in the Visualizer's title bar. Configure the following display settings in this panel:

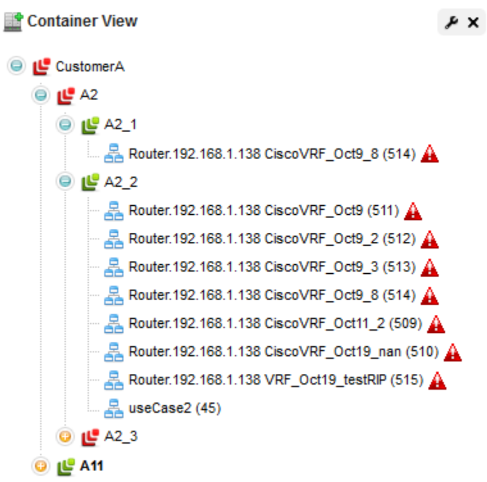
Display Container within Graph as—Select either *Node* or *Group*.

Node Icon Type—This appears if you select *Node*. Use the pick list to select among the various icon types as is appropriate for your group.

Group Style—Select either *Default (Rectangle Shaded Group)* or *Cloud (Cloud Background Image)*. The group is like the Expand Grouped capability described in *Configuring Views on page* 255. The Cloud is a cloud icon like the one you can add to views as described in *Design Tools on page* 259.

Display Container Name within Group—This appears if you select *Group*. Check it to display the container name as a label within the group.

Container View



Container View

- CustomerA
  - A2
    - A2_1
      - Router.192.168.1.138 CiscoVRF_Oct9_8 (514)
    - A2_2
      - Router.192.168.1.138 CiscoVRF_Oct9 (511)
      - Router.192.168.1.138 CiscoVRF_Oct9_2 (512)
      - Router.192.168.1.138 CiscoVRF_Oct9_3 (513)
      - Router.192.168.1.138 CiscoVRF_Oct9_8 (514)
      - Router.192.168.1.138 CiscoVRF_Oct11_2 (509)
      - Router.192.168.1.138 CiscoVRF_Oct19_nan (510)
      - Router.192.168.1.138 VRF_Oct19_testRIP (515)
      - useCase2 (45)
    - A2_3
  - A11

This (non-instanceable) container portlet displays configured containers authorized for the logged-in user, in the color of the most severe alarm for equipment within that container. Because it is non-instanceable, only one can appear on a page.

Expand the container tree by clicking the plus to each container's left. Container contents sort alphabetically, and alarms appear to the right of equipment displayed.

The container selected acts as a filter for a screen's other Dell OpenManage Network Manager portlets. If you select "Folsom" as a location in the container portlet, then only items related to Folsom devices appear in the other portlets on the page. If you select a parent container, that expands the selection to include all child containers' selections. It does not, however select everything. You can configure containers in Container Editor, described in the next section. You may have to wait a few moments to see a container's contents accurately.

Portlets that respond to Container or Map Context "filtering" include the following: Audit Trail, Event History, Locations, Vendors, Contacts, Managed Resources, Ports, Authentications, Discovery Profiles, Monitors, Services.

See General > Entity Change Settings on page 58 for the way to set the summary portlet refresh interval. The default is 40 seconds. If this portlet is in expanded mode, refresh does not occur automatically, but you can refresh it manually.

NOTICE

If a container displays unexpected results, right-click it to refresh its membership or alarm severity / state.

Right-clicking a container displays the following menu items:

Refresh Members—Re-query the database to populate any dynamic filter that is part of the container.

Details—Opens a details panel with a list of the container's contents (*Members*) as well as container members' *Alarms* (Alarms and Event History) and *History* (Audit trails and Configurations).

Refresh Alarm State—Re-query the database to update the container's alarm state based on its contents.

Edit Resources—Open an editor screen for the container that lets you change common attributes within it.

Visualize—Display a container in the Visualize screen where you can drill in to see its contents (see Visualize My Network on page 254).

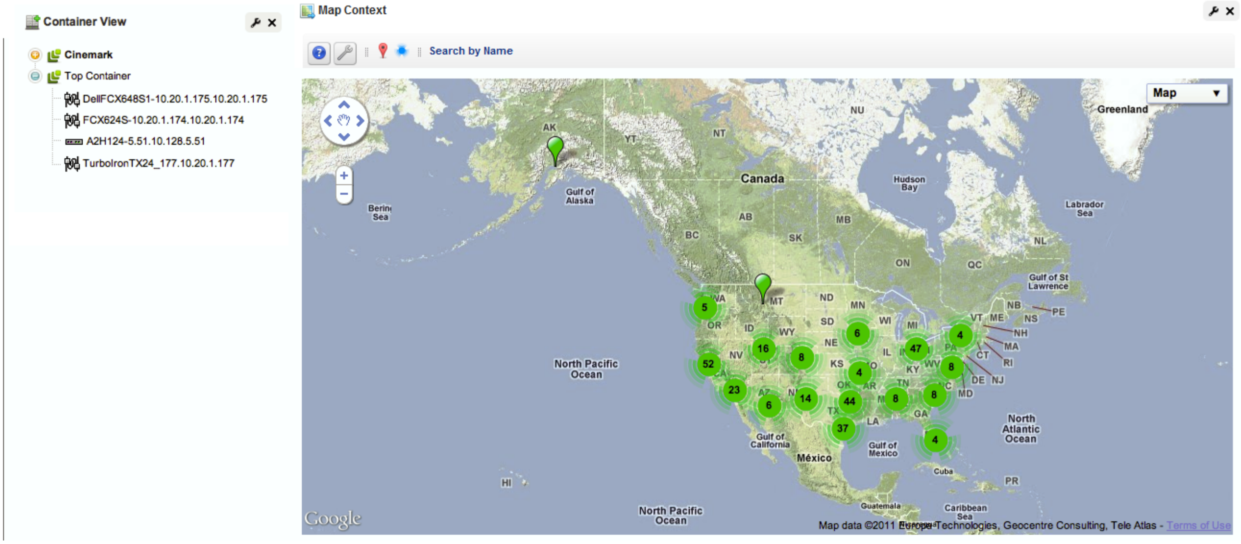
Tag—Enter map location coordinates for the container.

Container View in Tenant Sites

Within a Multitenant environment, only containers configured to appear in tenant sites appear there. If that container contains equipment only visible on the master site, those devices will appear below the container node, but will have no impact in filtering other portlets, like Alarms, for example.

Map Context

In addition to displaying filtered-by-container portlets, you can view discovered devices in the *Map Context* portlet, automatically placed by location.



Container View

- Cinemark
- Top Container
  - DellFCX648S1-10.20.1.175.10.20.1.175
  - FCX624S-10.20.1.174.10.20.1.174
  - A2H124-5.51.10.128.5.51
  - TurboIronTX24_177.10.20.1.177

Map Context

Search by Name

Map

Notice that you can move the center of the map with the arrows in its upper left corner above the zoom in / out (+/-) buttons. The menu in the upper right corner lets you select a *Map* or *Satellite* views, and fine-tune them to include labels, terrain and so on.

In addition to the *Help* and *Settings* icons at the top of this portlet, you can also *Toggle Marker Style* (pushpins or triangles), *Toggle Marker Clustering* (combine markers into cluster marker when they are near each other), or *Search by Name* for a location. Clustered markers display the number of separate markers combined within them.

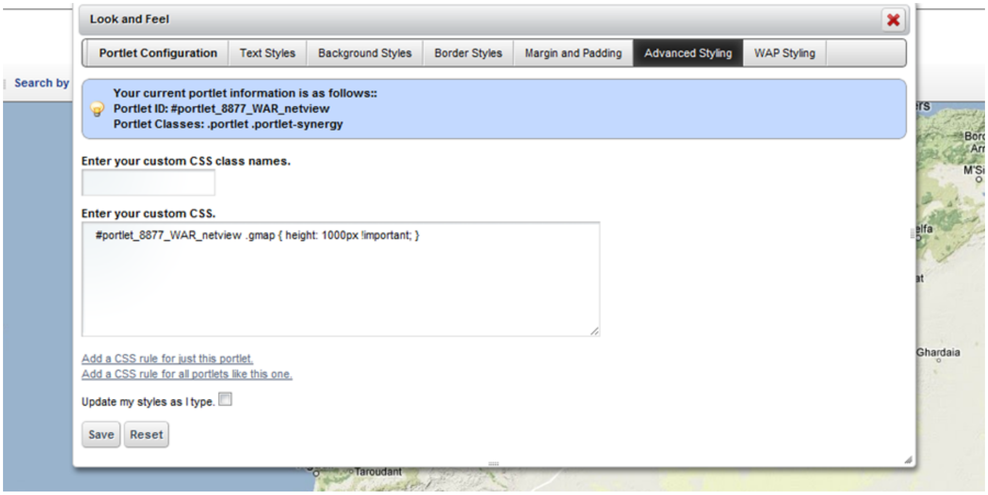
NOTE:

The Search function is case-sensitive. Omit the initial letter if you are uncertain about capitalization for a tagged location.

Clicking the *Settings* icon produces a screen where you can configure the default marker style, whether clustering is enabled, and where you can save the current map boundaries (*Save Current Bounds*), which appear, read-only, below that option.

See General > Entity Change Settings on page 58 for the way to set the summary portlet refresh interval. The default is 40 seconds.

The page layout controls the width of the map. However you can control the height of the map with the *Look and Feel* configuration in the *Advanced Styling* tab.



Look and Feel

Your current portlet information is as follows::
Portlet ID: #portlet_8877_WAR_netview
Portlet Classes: .portlet .portlet-synergy

Enter your custom CSS class names.

Enter your custom CSS.

```
#portlet_8877_WAR_netview .gmap { height: 1000px !important; }
```

Add a CSS rule for just this portlet.
Add a CSS rule for all portlets like this one.

Update my styles as I type. □

Add the following line to the custom CSS settings in this tab:

```
#portlet_8877_WAR_netview .gmap { height: 1000px !important; }
```

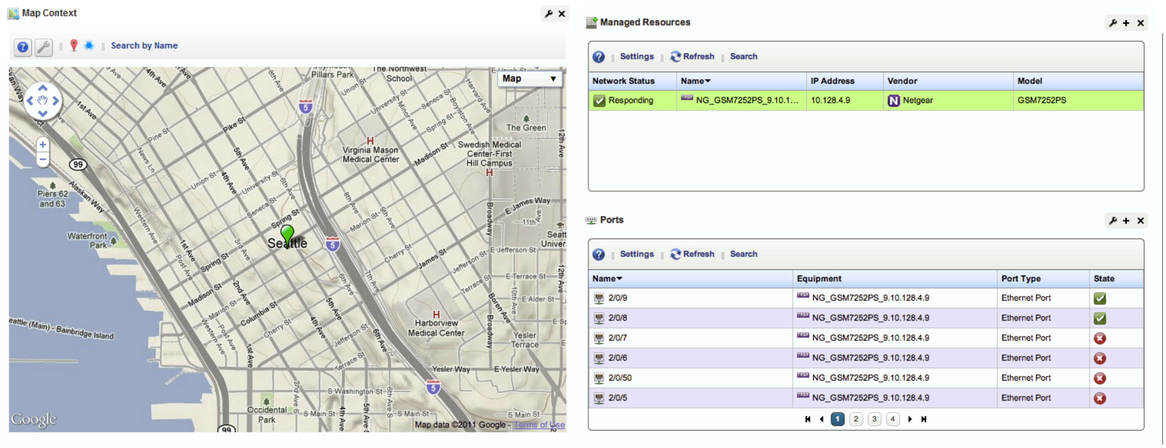
This sets the height of the map context portlet to the configured number of pixels, here, 1000.

Access this tab from the drop-down originating with the word *Map* in the top right corner of the portlet.

Configure locations on the map with the *Tag* menu item. See *Tag on page 114* for an explanation. See Maps and Containers Together below for more about their joint capabilities.

Map Context without Containers

If a page has no containers then the Map Context can act like a container too. It displays all tagged resources within the system (see Tag on page 114). Clicking on a tagged item behaves like clicking a Container, confining displayed resources, alarms, and so on, to those for the selected tag.


Map Context
Search by Name
Map
Seattle
Virginia Mason Medical Center
Swedish Medical Center-First Hill Campus
Harborview Medical Center
Piers 62 and 63
Waterfront Park
Seattle (Main) - Bainbridge Island
Occidental Park
The Green
Yesler Terrace
Google
Map data ©2011 Google - Terms of Use

Managed Resources

Settings | Refresh | Search

Network Status	Name	IP Address	Vendor	Model
✓ Responding	NG_GSM7252PS_9.10.1...	10.128.4.9	Netgear	GSM7252PS

Ports

Settings | Refresh | Search

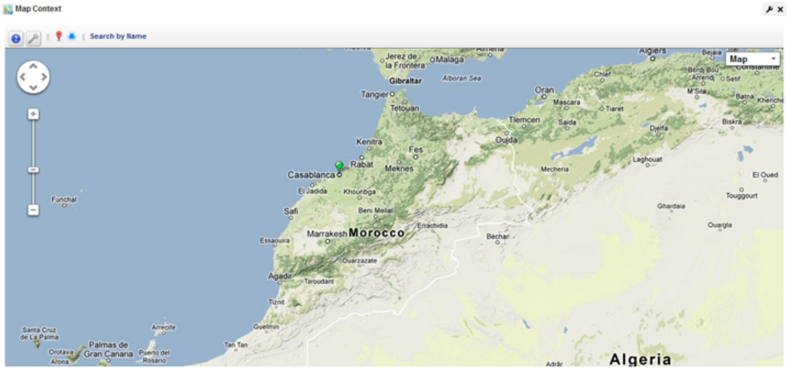
Name	Equipment	Port Type	State
2/0/9	NG_GSM7252PS_9.10.128.4.9	Ethernet Port	✓
2/0/8	NG_GSM7252PS_9.10.128.4.9	Ethernet Port	✓
2/0/7	NG_GSM7252PS_9.10.128.4.9	Ethernet Port	☒
2/0/6	NG_GSM7252PS_9.10.128.4.9	Ethernet Port	☒
2/0/50	NG_GSM7252PS_9.10.128.4.9	Ethernet Port	☒
2/0/5	NG_GSM7252PS_9.10.128.4.9	Ethernet Port	☒

1 2 3 4

Each tagged coordinate is cross-correlated with the Alarm severity table (if there are alarms against it) and its color reflects the current Alarm severity.

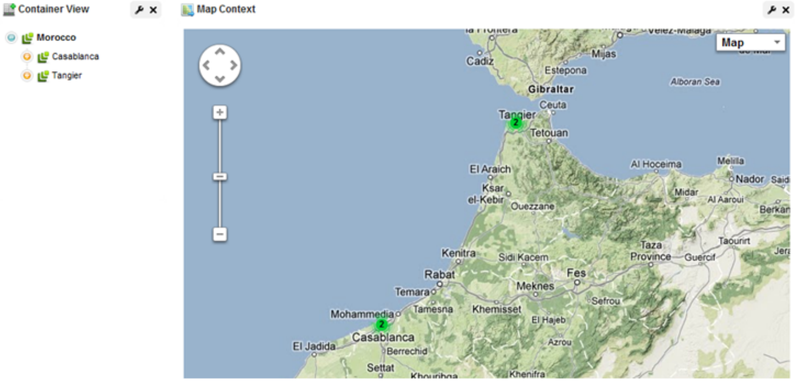
Maps and Containers Together

A map context portlet is in *Standalone* mode when no Container View portlet is on the same page.

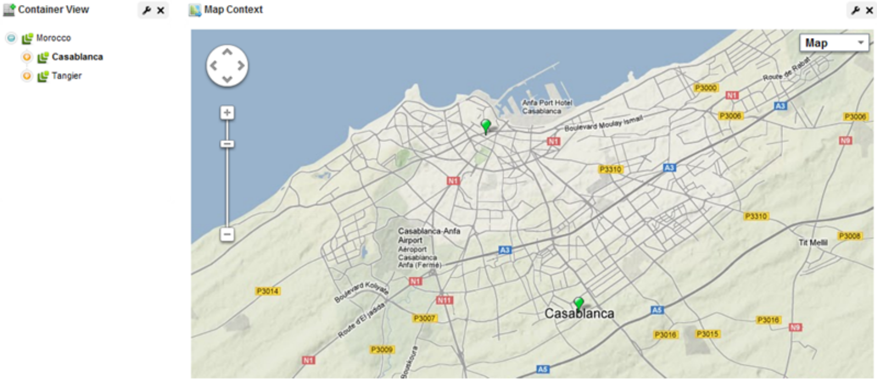


In Standalone mode you can determine exactly what portion of the map appears through the *Settings* option (the wrench icon).

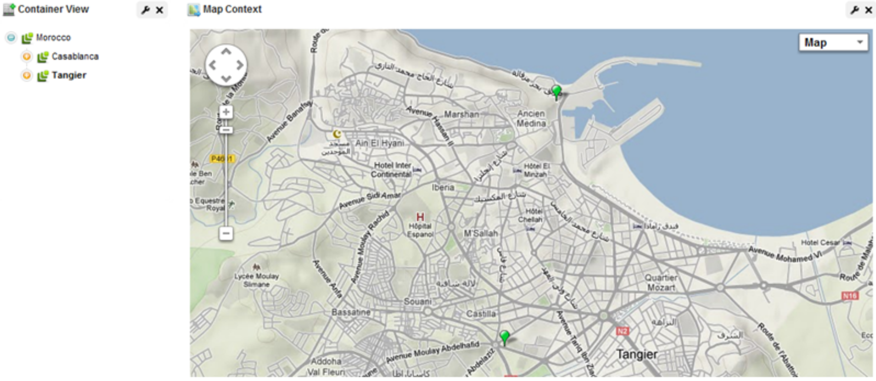
The map context portlet is in *Container Context* mode when a Container View portlet is on the same page. In these Container Context configurations, the Container View determines what appears in the Map portlet, so the Map Context portlet resets its boundaries based upon the geographic position of the selected container's members. For example, you can select a container (Morocco) resulting in two clustered pin for both Casablanca and Tangier.



However if you select Casablanca from the container view the map automatically changes its presentation and boundaries based upon the members of the new selection. The view zooms to the street level in Casablanca.



If you select Tangier and map presents the container's sites in a street-level view of Tangier.



Using Nokia Maps

By default, Dell OpenManage Network Manager uses Google maps. To use Nokia's maps, follow these steps:

1 You need App ID and App token to use Nokia map service. Get an ID and token on http://developer.here.net.

2 At top of page, click *Sign In*

3 Click on *Register* at bottom of page, and create Your Nokia Account.

4 Click *Register*

5 Click on *Create app*, and provide and app name. For example: Dell OpenManage Network Manager

6 Click *Get Started*

7 Then click *Done*

8 Copy the App ID and App token.

9 Go to Control Panel's Redcell > Application Settings, and select Nokia Maps with the pick list.

10 Enter both Application ID and Application Token in the appropriate fields, then *Save*.

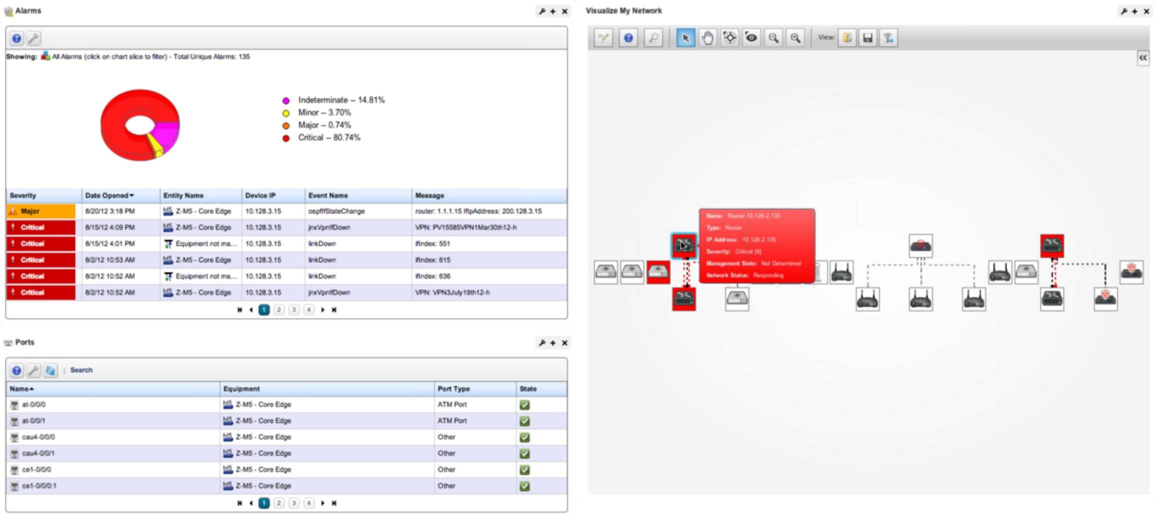
Visualize My Network

The Visualize My Network portlet displays discovered devices, mapping them in relationship to each other. It also lets you store and retrieve views you have arranged, as well as configure the default view (see View on page 261 for more about these capabilities).

See General > Entity Change Settings on page 58 for the way to set the summary portlet refresh interval. The default is 40 seconds.

The color displayed in these topologies indicates the alarm severity of the node or link ("edge") only. No color or icon indicates a device's network status or availability, although hovering the cursor over a node displays that information.

Visualize can act like a filter, too. Portlets like Alarms and Ports respond to clicking a node in Visualize, displaying information relevant to only that node.



Showing: All Alarms (click on chart slice to filter) - Total Unique Alarms: 135

Severity	Date Opened	Entity Name	Device IP	Event Name	Message
Major	8/20/12 3:18 PM	Z-M5 - Core Edge	10.128.3.15	ospfIfStateChange	router: 1.1.1.15 IfIpAddress: 200.128.3.15
Critical	8/15/12 4:09 PM	Z-M5 - Core Edge	10.128.3.15	jnxVpnIfDown	VPN: PV15585VPN1Mar30th12-h
Critical	8/15/12 4:01 PM	Equipment not ma...	10.128.3.15	linkDown	ifIndex: 551
Critical	8/2/12 10:53 AM	Z-M5 - Core Edge	10.128.3.15	linkDown	ifIndex: 615
Critical	8/2/12 10:52 AM	Equipment not ma...	10.128.3.15	linkDown	ifIndex: 636
Critical	8/2/12 10:52 AM	Z-M5 - Core Edge	10.128.3.15	jnxVpnIfDown	VPN: VPN3July19th12-h

1 2 3 4

Ports

Search

Name	Equipment	Port Type	State
at-0/0/0	Z-M5 - Core Edge	ATM Port	✓
at-0/0/1	Z-M5 - Core Edge	ATM Port	✓
cau4-0/0/0	Z-M5 - Core Edge	Other	✓
cau4-0/0/1	Z-M5 - Core Edge	Other	✓
ce1-0/0/0	Z-M5 - Core Edge	Other	✓
ce1-0/0/0:1	Z-M5 - Core Edge	Other	✓

1 2 3 4

Name: Router 10.128.2.135
Type: Router
IP Address: 10.128.2.135
Severity: Critical [6]
Management State: Not Determined
Network Status: Responding

How To:

Create a Visualization

Creating a topology map of devices or services is as simple as right-clicking the item(s) you want to map, and selecting *Visualize*.

You can also save different topologies after you configure them. See View on page 261 for more about that.

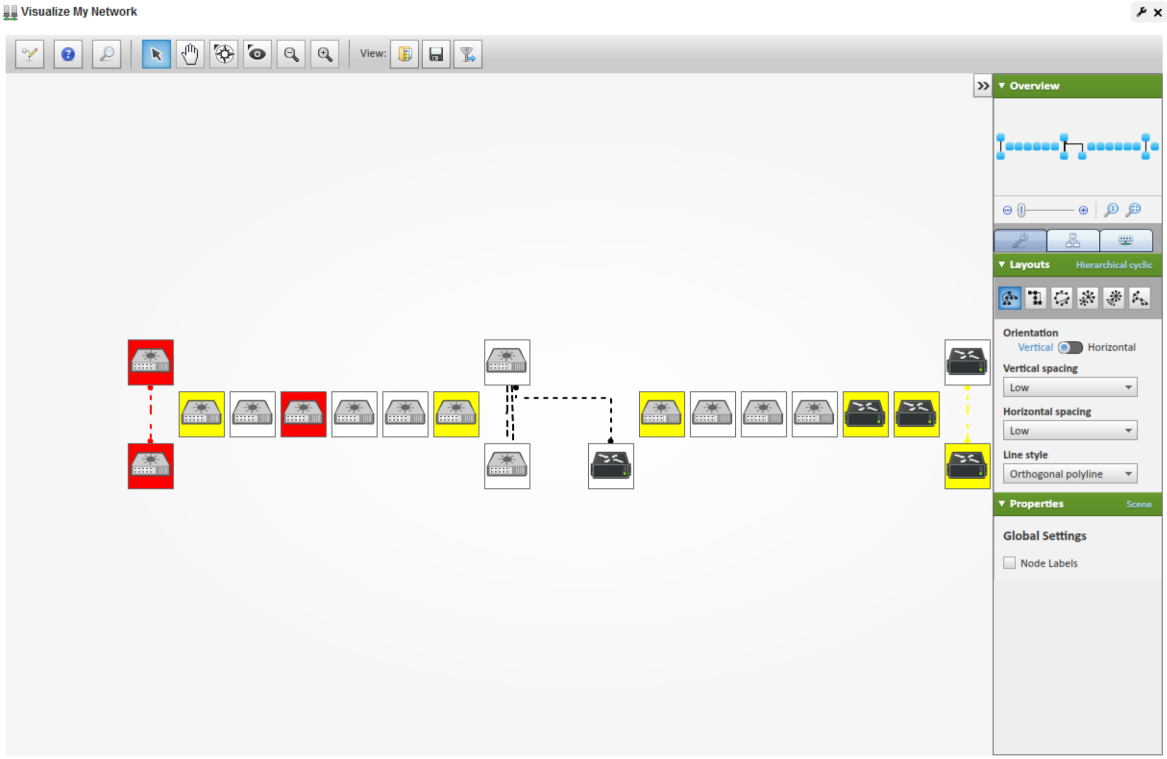
You can fine-tune the appearance of what you see with the tools described in Configuring Views and what follows.

NOTICE

If you do not see what you expect, make sure you have refreshed your browser so cached images do not interfere with current ones.

Configuring Views

Click and drag displayed portions of this screen to see other parts of the topology. To move the display more, click in the Overview panel. You can also expand / collapse the panels on the left of the screen by clicking their title bars. (Figures below display them expanded.)



Layouts: Hierarchical cyclic

Orientation: Vertical / Horizontal

Vertical spacing: Low

Horizontal spacing: Low

Line style: Orthogonal polyline

Properties: Scene

□ Node Labels

Nodes appear colored according to the alarm severity on the device, and white if no alarm exists for the device. Hover the cursor over an icon or link between icons to see a small screen describing its device (*Name, Type, IP address*), network status (*Responding / Not Responding*) and alarm severity.

Click an icon to highlight it (or click its name in the Top-Level Nodes Tab tab list) and its connections to the network. See Alarms in Visualizations / Topologies on page 267 for more about the alarm severities indicated by icons in topology.

CAUTION:

If you have installed a firewall on the application server, ports 80 and 8080 must both be open for topology to work.

NOTICE

If you have a Container View portlet on the same page as Visualize My Network, the selected container filters what appears in the view. Without containers, Visualize My Network can configure what appears in other portlets on its page (for example Ports).

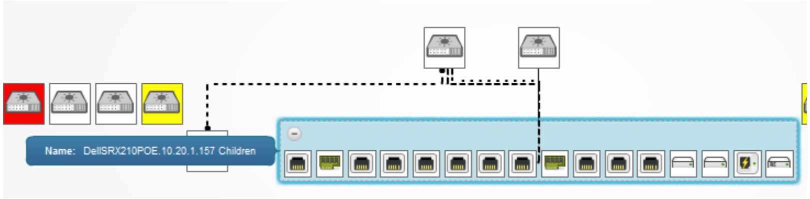
Click the Legend Tab to see the meaning of lines, links and alarm colors. Hover the cursor over a link to see its type described.

The screen to the right of the Visualize My Network screen displays the following panels:

- Overview
- Properties and Settings > Layouts Tab
- Properties and Settings > Properties
- Legend Tab
- Top-Level Nodes Tab

Click the triangles to the left of these panels' labels to collapse or expand them.

In addition to the screen components immediately displayed, you can right-click an icon or component, and *Drill in* or *Expand* a device to see its subcomponents. If you expand, then its subcomponents appear with the rest of the topology. If you *Expand Grouped*, then the subcomponents appear in a minimize-able block (hover your cursor to see the block in color, and click the circled minus to minimize the group).



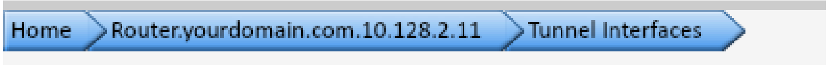
If you drill in, other components do not appear. Finally, you can select the *Details* menu option to open another browser window with the Details screen of the selected node.

NOTICE

If you want to initiate Actions on a node or its components, do so by right-clicking the *Details* screen's Reference Tree.

The Properties and Settings > Layouts Tab selections determine the arrangement of such expansions or drill-ins.

When you drill in, the path back to the top level appears below the topology.



Click the level where you want to "drill out," or click *Home* to go to the top level.

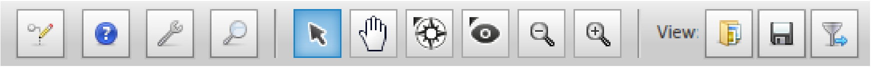
If you right click the blank area of the screen, you can *Export* it as either a .png image or GML (graphic markup language), or print the displayed topology.

NOTE:

Because Topology uses Adobe Flash, menu items appear for that software when you right-click nodes. This includes *Settings, Global Settings* and *About Flash* menu items. The text below does not discuss these.

Tools

A toolbar at the upper left corner of the Visualize My Network to help navigate through the topology onscreen.

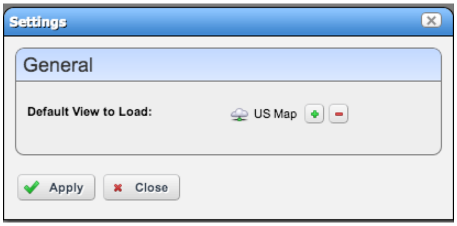


These are the tools:

Toggle Design Mode—Click this to turn on Design Tools, described below.

Help—Click this to turn access the online help for this screen.

Default—Click the wrench icon to configure the default view. If the Visualizer Portlet is on a page not driven by another Context—for example, Containers—and you have write permission for Visualizer, then this icon appears. Clicking this lets you associate the Visualizer portlet on the current page to a selected view. To return to the default network view click the red minus (-)

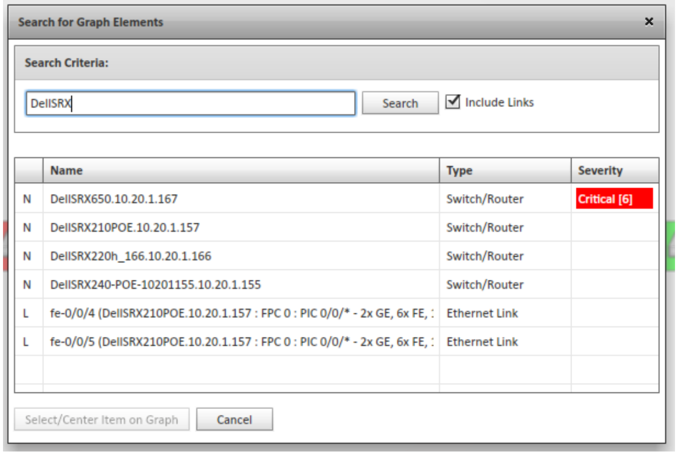

Settings

General

Default View to Load: US Map

button in the settings. Any view change requires a page refresh after applying the revised setting.

Search Node Elements within this Graph—Search for a particular node. This opens a screen displaying the search results, name, type of node and the node’s alarm severity. Click Select / Center Item on Graph to select a listed item.



Search Criteria: DellSRX

☑ Include Links

	Name	Type	Severity
N	DellSRX650.10.20.1.167	Switch/Router	Critical [6]
N	DellSRX210POE.10.20.1.157	Switch/Router	
N	DellSRX220h_166.10.20.1.166	Switch/Router	
N	DellSRX240-POE-10201155.10.20.1.155	Switch/Router	
L	fe-0/0/4 (DellSRX210POE.10.20.1.157 : FPC 0 : PIC 0/0/* - 2x GE, 6x FE, :	Ethernet Link	
L	fe-0/0/5 (DellSRX210POE.10.20.1.157 : FPC 0 : PIC 0/0/* - 2x GE, 6x FE, :	Ethernet Link	

NOTICE

Search also finds links or “edges” between devices, and saving a view preserves displayed links’ appearance.

Selection Tool—The cursor selects nodes. Click and drag around nodes to select several.

Pan Tool—The hand moves the background.

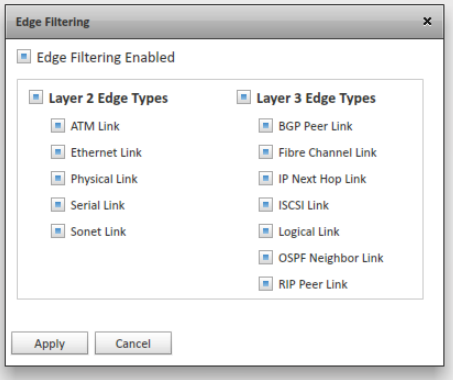
Shortest Path Tool—Click two nodes to highlight the shortest path between them.

Bifocal Effect—Move the cursor to magnify nodes under it. Handy in a crowded view.

Zoom In / Out—These magnifying glass icons change the magnification for the view.

Open / Save View—Open a saved view or save the current one. Views include visible nodes and links, but you cannot save the location of these nodes. (See Map Context on page 249 for a possible alternative.)

Edge Filtering—Configure the type of links that appear onscreen (by default all appear). Click the checkbox in the screen that appears after clicking this icon, then check/uncheck to configure what links appear in the topology. You can also save views with different filtering.



Edge Filtering ×

☑ Edge Filtering Enabled

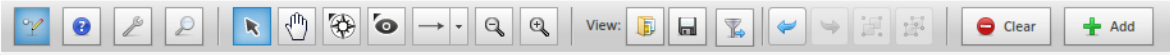
☑ **Layer 2 Edge Types**
- ☑ ATM Link
- ☑ Ethernet Link
- ☑ Physical Link
- ☑ Serial Link
- ☑ Sonet Link

☑ **Layer 3 Edge Types**
- ☑ BGP Peer Link
- ☑ Fibre Channel Link
- ☑ IP Next Hop Link
- ☑ ISCSI Link
- ☑ Logical Link
- ☑ OSPF Neighbor Link
- ☑ RIP Peer Link

Apply Cancel

Design Tools

When you click the *Toggle Design Mode* icon on the left, several additional tools appear that let you manipulate the Visualize My Network screen.



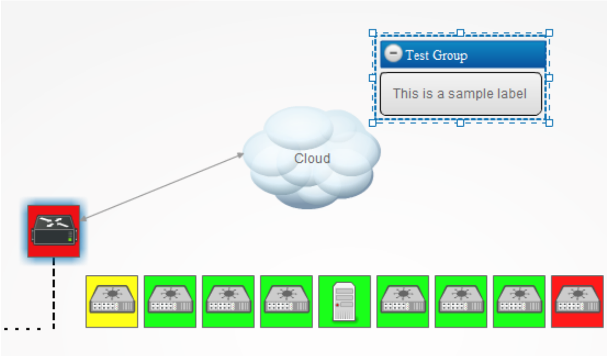
These tools include the following, in addition to those described above in Tools:

Line Drawing—Click to select the type of line to draw, then shift+click two icons onscreen to draw the line.

Group / Ungroup—These two icons group or ungroup selected icons labels and lines together so you can move them in tandem. Ctrl+click to multi-select icons.

Notice that when you create a group, the *Properties* panel provides additional configuration parameters. These include the *Header* panel where you can configure whether the group header is *Visible*, its *Label* the *Background* and *Text Color*. Click the minus in the header to minimize the group (and plus to expand a minimized group).

The *Content* panel lets you configure whether the group appears as a *Panel* or *Cloud*, and its *Background* and *Stroke* colors.



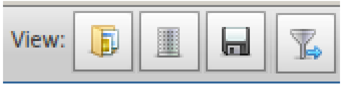
Undo / Redo—These two arrows undo and redo the last action(s).

Clear—Clears the Visualize My Network screen.

Add—Adds a *Label*, a *Cloud* or a *Linked View* to the Visualize My Network screen. use the *Properties* panel at the bottom right of the screen to configure the font, background color, label contents, and so on, when you have selected the added element.

NOTICE

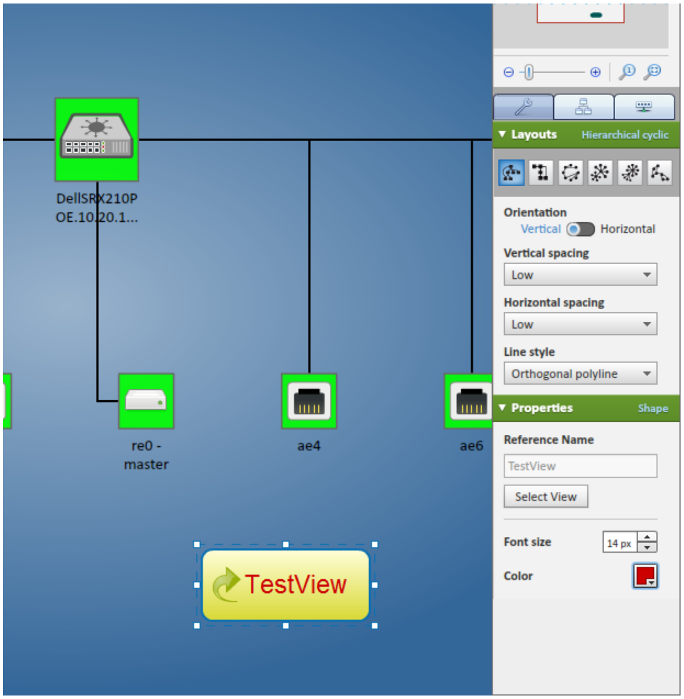
If you configure and save a Drill-in view with Design Tools, then that view persists for all drill-ins from that device until you remove it an icon that appears between view Open and Save when it is enabled. Deleting such a drill-in view restores the default settings



When you add these elements, you can elect to check *Static Placement* and they will not move with graphic elements when they are automatically re-arranged. You can, however, click and drag them.

Linked View

When you Add Element to a Linked View, the shortcut that appears onscreen provides a clickable link to the view you select when you add it.



Layouts Hierarchical cyclic

Orientation Vertical Horizontal

Vertical spacing: Low

Horizontal spacing: Low

Line style: Orthogonal polyline

Properties Shape

Reference Name: TestView

Select View

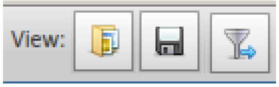
Font size: 14 px

Color

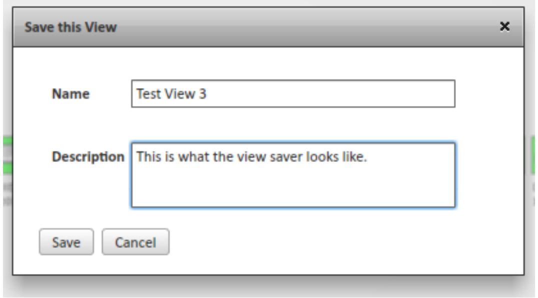
Use the *Properties* panel in the lower right corner of the screen to select the view, and configure the font on the link. The label is the linked view's title. You must create and save views before they are available to link.

View

These icons let you save views you have configured, and has buttons to let you *Load a View, Save this view,* or activate *Edge Filtering* (links filtering).



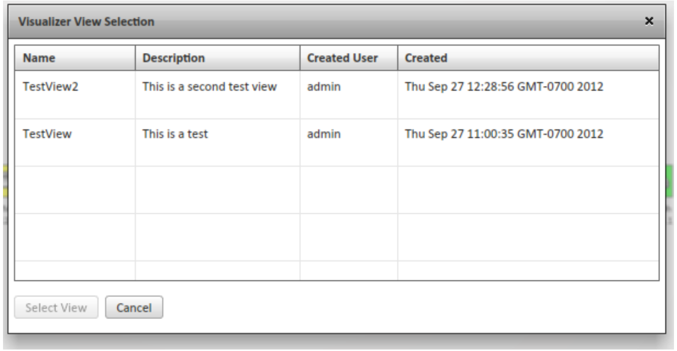
Clicking *Save this view* displays a screen where you can *Name* and enter a *Description* for the view you are saving. Saving preserves node coordinates, background colors or graphics, and node sizes. The name of the current view appears on the right of the title bar for the Visualize My Network screen.


Save this View

Name: Test View 3

Description: This is what the view saver looks like.

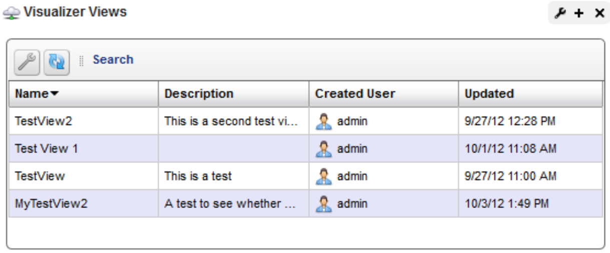
Clicking *Load a view* loads saved views selected from a screen. Users who do not own the retrieved view can save a copy.


Visualizer View Selection

Name	Description	Created User	Created
TestView2	This is a second test view	admin	Thu Sep 27 12:28:56 GMT-0700 2012
TestView	This is a test	admin	Thu Sep 27 11:00:35 GMT-0700 2012

Visualizer Views

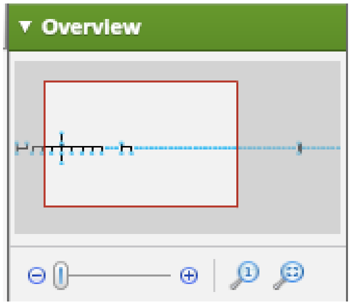
To see a catalog of available views, you can add this portlet to a page.



Name	Description	Created User	Updated
TestView2	This is a second test vi...	admin	9/27/12 12:28 PM
Test View 1		admin	10/1/12 11:08 AM
TestView	This is a test	admin	9/27/12 11:00 AM
MyTestView2	A test to see whether ...	admin	10/3/12 1:49 PM

This lets you Edit the name and description of available views, and delete those you no longer need. You must open them in the Visualize My Network portlet.

Overview



This displays a thumbnail of the entire topology that appears in the larger screen to the left, framed by the zoom level of the view. Click a location to move the larger view to center on it.

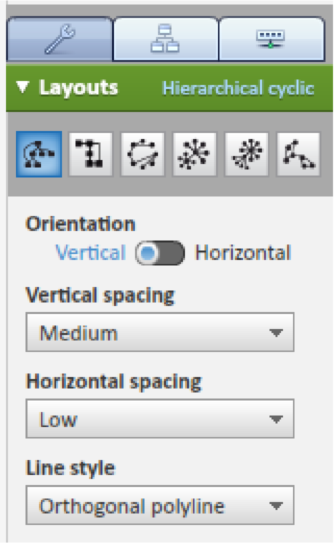
Use the slider at the bottom of this panel to change the magnification of your view. The icons to the right of the slider let you click them to fit visible icons vertically and both vertically and horizontally. You can also click and drag the cursor within this overview to change the magnification.

Properties and Settings > Layouts Tab

The layout tab lets you select and configure the type of automated node layout that appears in the topology display.

Use the icons below the Layouts label to select the type of layout. The fields and selectors that appear below depend on the selection. Here are the available layouts, and the fields that go with them:

- Hierarchical-Cyclic
- Orthogonal
- Circular
- Radial
- Organic



▼ Layouts Hierarchical cyclic

Orientation

Vertical ● Horizontal

Vertical spacing

Medium ▼

Horizontal spacing

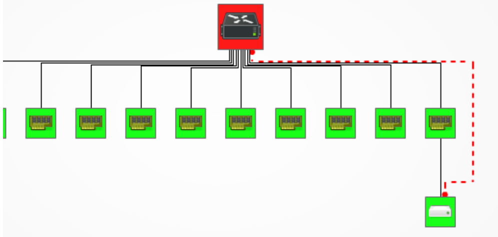
Low ▼

Line style

Orthogonal polyline ▼

Hierarchical-Cyclic

This arranges connections in a hierarchy. Use the following settings to alter its appearance.



Orientation– Select from *Vertical* or *Horizontal*.

Vertical Spacing– Select from *High*, *Medium*, or *Low*.

Horizontal Spacing– Select from *High*, *Medium*, or *Low*.

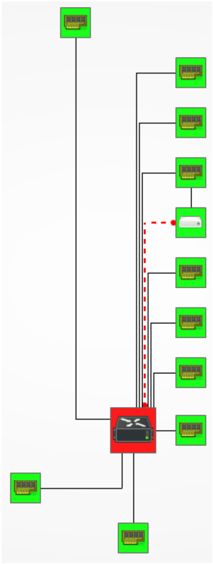
Line Style –Select from *Orthogonal polyline*, *Straight*, *Straight polyline*, *Curved polyline*, or *Orthogonal curved*.

Orthogonal

Orthogonal connections include right angles. You can specify the following settings for such layouts

Grid Spacing–Select from *High*, *Medium*, or *Low*.

Use Diagonal Edges–Enable edges that have non-right angles.

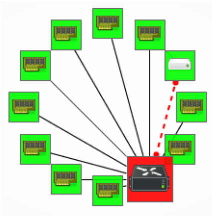


Circular

Circular layouts arrange all nodes in a circle.

Layout Angle–Choose from *360* or *180*.

Nodes spacing–Select from *High*, *Medium*, or *Low*.

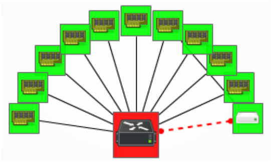


Balloon

Balloon layouts display links between managed objects in a balloon tree structure. The root is typically whatever device you have expanded or drilled into.

You can specify the following in the settings for this layout:

Root / Child wedge angle sector–Use the radio buttons determine the angle (*360*, *180*). The root sector determines how much of an arc around that root the child nodes fill, and the child sector determines the orientation around the child nodes.

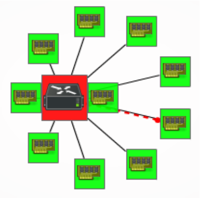


Root selection policy—Select the item you want at the center of this view (*Directed* [a pop-up appears with the remaining selections], *Most closed / surrounded / weighted*).

Equal angle distribution—Select whether to distribute nodes at equal angles.

Radial

Radial layouts arrange nodes in concentric rings.

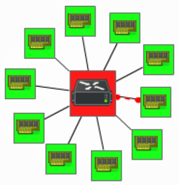


Layout angle –Use the radio buttons determine the angle (*360*, *180*).

Root selection policy—Select the item you want at the center of this view (*Directed* [a pop-up appears with the remaining selections], *Most closed / surrounded / weighted*).

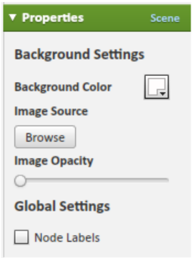
Organic

This produces a static GEM layout, without any parameters to tune.



Properties and Settings > Properties

This panel configures the view properties in the Visualize My Network panel. This panel has the following fields (you must click the *Design Mode* icon in the upper left corner to see all of them):



▾ Properties Scene

Background Settings

Background Color

Image Source

Browse

Image Opacity

Global Settings

□ Node Labels

Background Settings

Background Color—Click the icon to see a color selector where you can select the background color for the Visualize My Network panel.

Image Source—Click the *Browse* icon to select a graphic for the background.

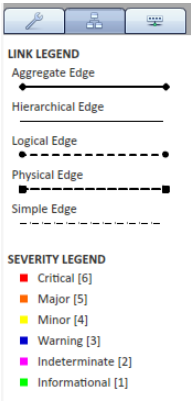
Image Opacity—Use the slider to set the background opacity.

Global Settings

Node Labels—Check to label nodes in the Visualize My Network panel.

Legend Tab

This displays the meaning of various link types and alarm severity colors in Visualize My Network screens. It describes only the type of links that appear onscreen in the Visualizer.



LINK LEGEND

Aggregate Edge

Hierarchical Edge

Logical Edge

Physical Edge

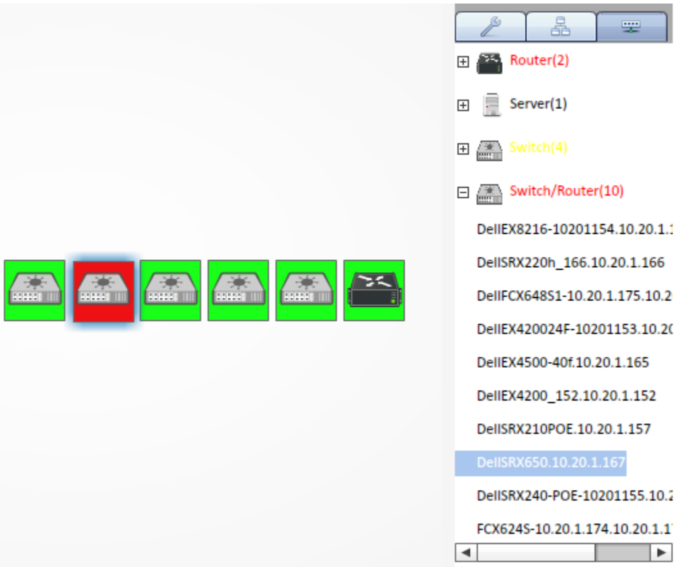
Simple Edge

SEVERITY LEGEND

- 🟥 Critical [6]
- 🟧 Major [5]
- 🟨 Minor [4]
- 🟦 Warning [3]
- 🟪 Indeterminate [2]
- 🟩 Informational [1]

Top-Level Nodes Tab

This displays a legend of icon types followed by a count (in parentheses) of how many of each appear in the topology. The switch at the bottom of this panel centers the display around the selected icon.



⊞ Router(2)

⊞ Server(1)

⊞ Switch(4)

⊟ Switch/Router(10)

DellEX8216-10201154.10.20.1.

DellSRX220h_166.10.20.1.166

DellFCX648S1-10.20.1.175.10.2

DellEX420024F-10201153.10.2(

DellEX4500-40f.10.20.1.165

DellEX4200_152.10.20.1.152

DellSRX210POE.10.20.1.157

DellSRX650.10.20.1.167

DellSRX240-POE-10201155.10.2

FCX624S-10.20.1.174.10.20.1.1

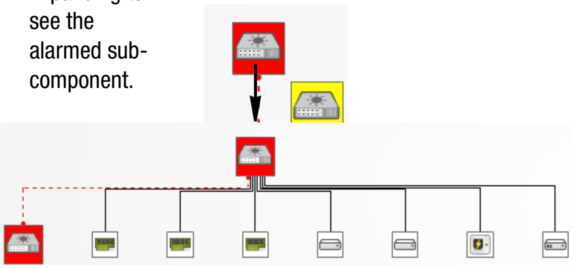
Click the plus (+) to the left of the inventory category icons to display a list of devices in that category in the topology. Click on a list item to highlight that device and its network connection in the topology view. A colored glow highlights it and its network connection(s). The listed inventory changes if you drill in.

The listed text appears in the alarm color of the device. See Alarms in Visualizations / Topologies on page 267.

Alarms in Visualizations / Topologies

Colored rectangles appear around topology nodes to indicate the highest alarm on them. Expand or drill in to see alarms on the sub-components.

For information about the alarm, hover your cursor over the device or subcomponent, and a tooltip appears describing the alarm's severity appears. The alarms indicated are like alarms described in the portlet Alarms on page 123.



Expanding to see the alarmed sub-component.

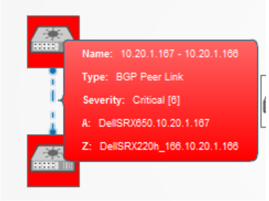
By default, un-alarmed nodes appear clear / white. You can alter this so they appear green instead. To change this behavior, uncomment the `nodes.display.clear.severity.as.green=true` property in the `server-overrides.properties.sample` file in `\oware\synergy\conf`, and save the file as `serveroverrides.properties` in that directory.

Links in Visualization

When you have discovered links between devices in your network (see Link Discovery on page 208), they appear in the visualization.

Hover the cursor over a link, and a panel the color of the link's alarm severity, appears with the link information (*Name*, *Type* (for example: Ethernet), *Severity*, and A / Z *Names* for the endpoints).

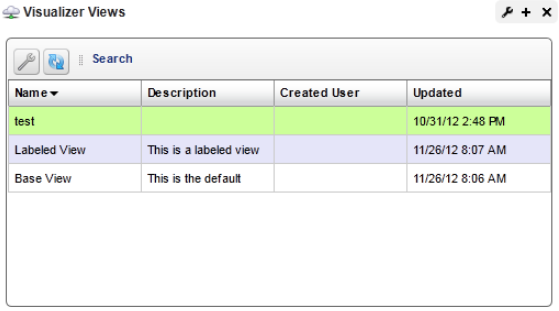
Dell OpenManage Network Manager currently does not support displaying one-ended links.



Name: 10.20.1.167 - 10.20.1.166
Type: BGP Peer Link
Severity: Critical [6]
A: DellSRX650.10.20.1.167
Z: DellSRX220h_166.10.20.1.166

Visualizer Views

This portlet displays saved views, and when it is on the same page as the Visualize My Network portlet, filters that portlet so it displays the selected, saved visualization.



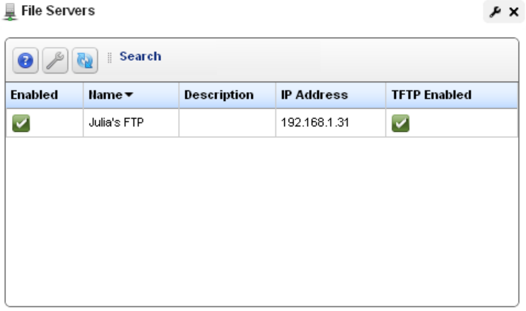
Name	Description	Created User	Updated
test			10/31/12 2:48 PM
Labeled View	This is a labeled view		11/26/12 8:07 AM
Base View	This is the default		11/26/12 8:06 AM

Right-clicking selected views, lets you *Edit* the title of the view, or its description, or *Delete* the selected view.

8

File Server / File Management

You must configure FTP and/or TFTP file servers to push and pull configuration files to and from devices, or to deploy firmware updates. With this portlet you can enable file servers you have configured.



Enabled	Name	Description	IP Address	TFTP Enabled
✓	Julia's FTP		192.168.1.31	✓

Columns in this manager identify the server, and describe whether it is enabled, and has TFTP enabled. Right clicking a file server, or the empty list space lets you do the following:

New—Displays the File Server Editor screen.

Edit—Displays the selected File Server in the File Server Editor screen.

Disable—Disables the selected file server. When file servers are disabled, they are not used in a Backup, Restore or Deploy operation. This too appears only for External File Servers.

Enable—Activates the selected file server. Again, exposed for External file Servers only.

Test—Tests the selected file server by sending and retrieving a file.

Delete—Removes the selected file server from the list. This appears for External File Servers only.

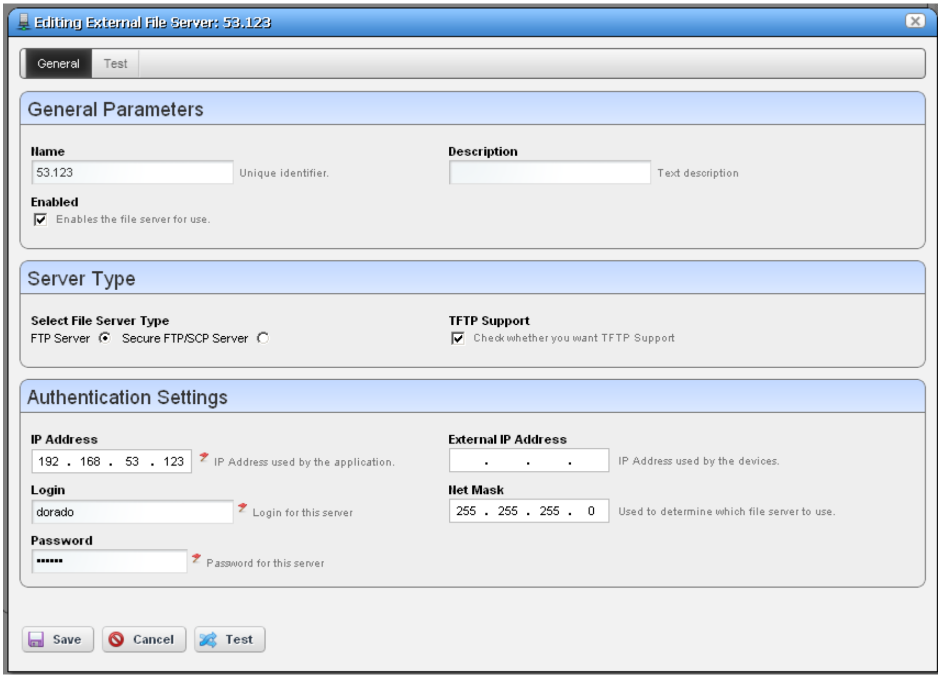
Port conflicts prevent having an external file server and internal file server operate on the same machine.

NOTE:

If you have installed a TFTP server on a Windows machine, you may see an error noting “FTP umask / permissions of file on server are incorrect.” This is an artifact of Windows permission structure, and may be safely ignored (it never hurts to test your TFTP server to be sure, though).

File Server Editor

This editor lets you configure new and existing file servers.



Editing External File Server: 53.123

General Test

General Parameters

Name
53.123 Unique identifier.

Description
Text description

Enabled
☑ Enables the file server for use.

Server Type

Select File Server Type
FTP Server ● Secure FTP/SCP Server ○

TFTP Support
☑ Check whether you want TFTP Support

Authentication Settings

IP Address
192 . 168 . 53 . 123 IP Address used by the application.

External IP Address
. . . IP Address used by the devices.

Login
dorado Login for this server

Net Mask
255 . 255 . 255 . 0 Used to determine which file server to use.

Password
•••••• Password for this server

This is where you specify the *Name*, whether the server is *Enabled*, whether the connection is secure (*Secure FTP/SCP Server*), supports TFTP, internal and external (optional) IP addresses, and Net Masks, and the login and password for the file server. Once you have configured a server, you can test the file server credentials by clicking on the *Test* button at the bottom of the screen. Click *Save* to preserve your changes.

FTP servers typically must be on the same side of the firewall as the devices with which they communicate. If you have several such servers, the specified *Net Mask* also determines which server communicates with devices in which portion of the network.

The OpenManage Network Manager file server uses an internal, local LAN address (192.168.100.100 example), however the routers with which it communicates often cannot communicate to such internal addresses. This is why an external/reachable address is necessary.

Notice that you can now configure an IP address used by Dell OpenManage Network Manager, and another *External IP Address* used by the devices. If you configure multiple file servers, Dell OpenManage Network Manager selects the server with the *Net Mask* whose subnet is closest to the device(s) with which it communicates.

Recommended Windows File Servers

You can install the Open Source Filezilla FTP and FTPS server as a service on Windows machines. Any login / password access to these goes in the File Server Editor login/ password fields.To support TFTP, install the Open Source Tftpd32 or Tftpd64 (for 32-bit or 64-bit machines).

These servers must read / write from/to the same directory. Also, make sure the directory offers open read/write permissions so you can retrieve files put there temporarily.

File Management

In addition to letting you back up and restore configuration files, and deploy firmware updates to devices, this menu manages viewing and comparing configuration files backed up from the selected devices. Details about these capabilities appear below.

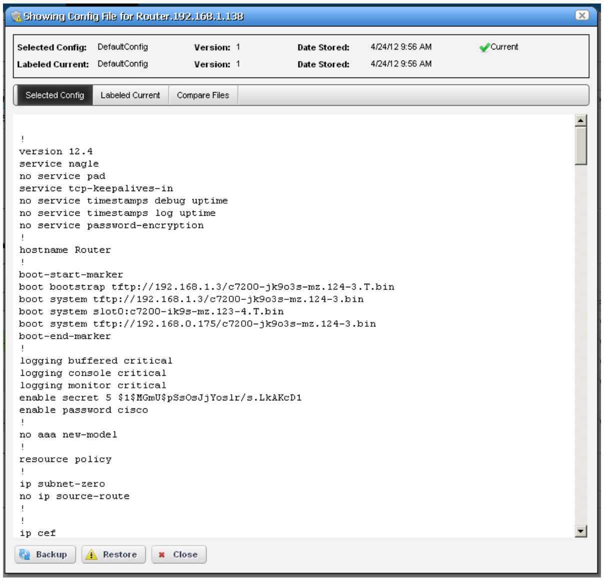
Compare and *View* options have the following limitations:

- If you select a config file that is a single file, without any historical precedent, no comparison option appears on the menu since the selected version does not have a prior version.
- If you select a single config file of version two or higher, comparison is an option. When selected, OpenManage Network Manager automatically compares against the prior version for that device and file name.
- If you select two config files of any version, compares is between those two versions.
- If you select three or more config files, no comparison option appears.
- The *View* option appears for a single selection only, and only lets you view files that are not binary.

The icon to the left of the *File Name* listed in the portlet lets you know whether a configuration file is binary (01 10), and not viewable, or text (🗎), and viewable.

The file management menu contains the following:

View / Edit—This opens a panel displaying the configuration file's contents. Use the browser's *Find* function (as demonstrated on the right) to locate specific text within the Config File. You can also select and copy text within this screen.



Selected Config:	DefaultConfig	**Version:**	1	**Date Stored:**	4/24/12 9:56 AM	✓ Current
Labeled Current:	DefaultConfig	**Version:**	1	**Date Stored:**	4/24/12 9:56 AM	

```
!
version 12.4
service nagle
no service pad
service tcp-keepalives-in
no service timestamps debug uptime
no service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot-start-marker
boot bootstrap tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.T.bin
boot system tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.bin
boot system slot0:c7200-ik9s-mz.123-4.T.bin
boot system tftp://192.168.0.175/c7200-jk9o3s-mz.124-3.bin
boot-end-marker
!
logging buffered critical
logging console critical
logging monitor critical
enable secret 5 $1$MGmU$pSsOsJjYoslr/s.LkAKcD1
enable password cisco
!
no aaa new-model
!
resource policy
!
ip subnet-zero
no ip source-route
!
!
ip cef
```

Notice that *Selected Config* and *Live Config* (current) version and storage dates appear at the top of this screen. When you perform a backup that differs from the config that is *Labeled Current*, that label changes to *Live Config* if changes are detected.

Selected Config appears when you open this screen from the Configuration Files Portlet, but *Live Config / Current Config* appear side-by-side when you open this screen from the Managed Resources portlet.

You can also compare two different configurations (*Selected Config* and *Labeled Current / Live Config*) in the tabs that appear on this screen. with the *Compare Files* tab at the top.

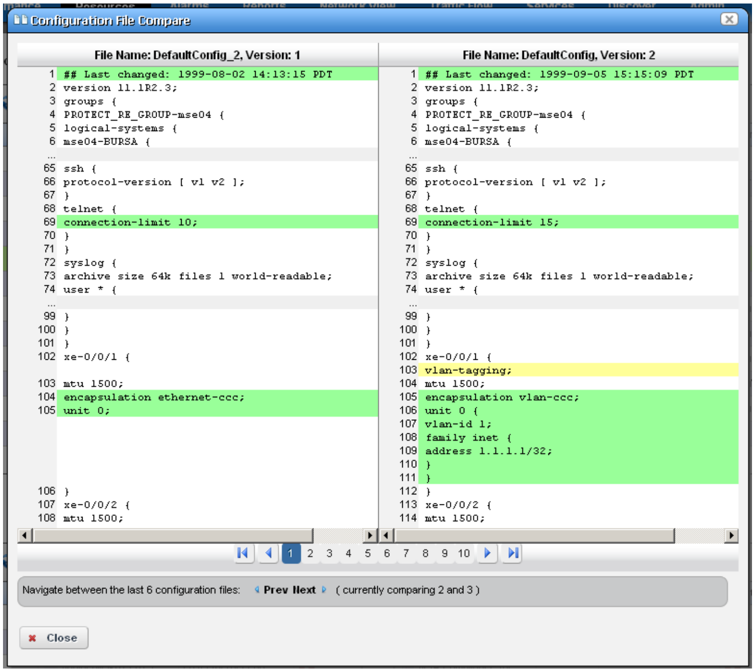
Close the screen with the buttons at its bottom. Notice you can also *Backup* or *Restore* what you are viewing with buttons at the bottom of the screen.

Assign Labels—Use this option to select an existing label or create a new one. You cannot assign System labels (*Current*, *Compliant*, and so on).

Compare Current v. Previous / to Label / Selected—You can compare configurations by right-clicking a device, or two devices then selecting *Compare*. If you right click a single device with a previous backup, then the comparison is between the latest and next-to-latest backup. If it does not have a previous backup, then the menu offers to compare to a designated label. You can compare two different *Selected* devices too. Ctrl+click to select two different devices before you *Compare*.

Notice that the *Prev / Next* buttons at the bottom of this screen cycle through as many as five previous configuration files.

The comparison screen appears with the configurations side-by-side (note the file names in the title bar of this screen).



Configuration File Compare

File Name: DefaultConfig_2, Version: 1

```
## Last changed: 1999-08-02 14:13:15 PDT
version 11.1R2.3;
groups {
PROTECT_RE_GROUP-mse04 {
logical-systems {
mse04-BURSA {
...
ssh {
protocol-version [ v1 v2 ];
}
telnet {
connection-limit 10;
}
}
syslog {
archive size 64k files 1 world-readable;
user * {
...
}
}
}
xe-0/0/1 {

mtu 1500;
encapsulation ethernet-ccc;
unit 0;






}
xe-0/0/2 {
mtu 1500;
```

File Name: DefaultConfig, Version: 2

```
## Last changed: 1999-09-05 15:15:09 PDT
version 11.1R2.3;
groups {
PROTECT_RE_GROUP-mse04 {
logical-systems {
mse04-BURSA {
...
ssh {
protocol-version [ v1 v2 ];
}
telnet {
connection-limit 15;
}
}
syslog {
archive size 64k files 1 world-readable;
user * {
...
}
}
}
xe-0/0/1 {
vlan-tagging;
mtu 1500;
encapsulation vlan-ccc;
unit 0 {
vlan-id 1;
family inet {
address 1.1.1.1/32;
}
}
}
xe-0/0/2 {
mtu 1500;
```

Navigate between the last 6 configuration files: ◂ Prev Next ▸ (currently comparing 2 and 3)

NOTE:

Colors: Lines that differ between the two configurations appear highlighted green. Lines missing in one, but that appear in another appear highlighted red. Added lines are yellow.

Use the right/left arrows to page through the side-by-side comparison. The page numbers and beginning / forward / back / end arrows help you navigate between pages of pairs of files. Notice also that if you have more than two such files, a panel appears at the bottom that lets you navigate between adjacent pairs of such files (1 and 2, 2 and 3, 3 and 4, and so on). Click the Prev / Next links to move between pairs of files.

Tip

Use the browser's "Find" function (typically initiated by Ctrl+F) to locate text within these views.

Backup / Restore—Select these to backup or restore a configuration file. See How to: Backup Configurations on page 274 or Restore Configurations on page 276 for step-by-step instructions.

Deploy—Select this option to deploy an OS Image (firmware). See Deploy Firmware on page 287 for more.

Some devices, including the Dell Force10 C-Series and E-Series, first permit then drop telnet connections during deployment or file restoration when you select restart as part of the process. This can take from six to eight minutes, though it can take as long as fifteen minutes for a fully populated chassis. During that time, ping detects the device; however, Dell OpenManage Network Manager cannot log in to the device until the reboot is complete.

Restoring configurations to Dell Force 10 devices may produce errors when individual commands already exist in the running config and cannot be overwritten. Dell OpenManage Network Managerignores such errors and reports success by default since the errors indicate a command was not applied, not that restoration was unsuccessful. Best practice is to restore to startup config to avoid these errors, especially when scheduling backup or backing up a group on such devices.

Export / Import —Export lets you save a local copy of the selected config file. Import opens a screen that lets you select a locally-accessible file to store, view, compare and deploy.

View configuration files in the *History > Latest Configurations* portion of the Equipment Details screen for a device or in the Configuration Files or Top Configuration Backups portlets.

How To:

Backup Configurations

Dell OpenManage Network Manager simplifies backing up devices so you always have their configuration files, even if the one on the device becomes corrupted or out-of-date.

You can back up several devices at once for what amounts to a “group operation.” Select more than one device by Ctrl+clicking in the expanded portlet, then right-click as outlined below. You must expand portlets to multi-select.

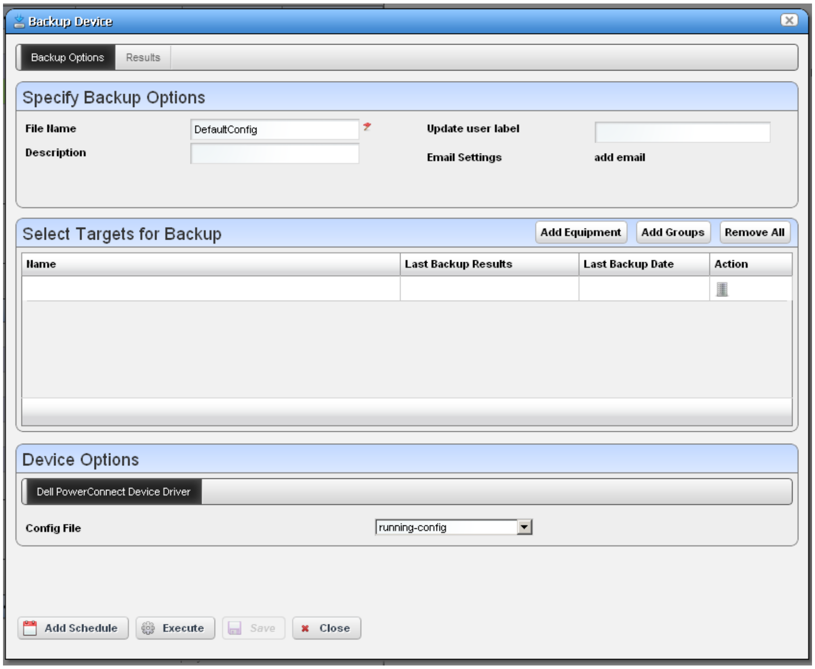
Here are the steps to back up a device:

1 Make sure you have configured an FTP or TFTP server to handle the backup. See Netrestore File Servers on page 90.

2 Right-click a device in the *Managed Resources* portlet.

3 Select *File Management > Backup*.

4 Configure the subsequent *Backup Device* screen.



Backup Device

Specify Backup Options

File Name: DefaultConfig

Description:

Update user label:

Email Settings: add email

Select Targets for Backup

Name	Last Backup Results	Last Backup Date	Action

Device Options

Dell PowerConnect Device Driver

Config File: running-config

This screen lets you configure the following:

File Name—A text identifier for the file

Description—A text identifier for the file

Update User Label—A text identifier for the file. Entering such a label creates it, and makes it available for later restoration, comparison, and so on.

Email Settings—Click *add email* to configure an email notification about this backup.

Select Targets for Backup—This screen defaults to the device you selected in *Managed Resources*. You can also click the *Add Equipment* to add individual devices, or *Add Groups* to add groups, or *Remove All* to manage devices that appear in this list of targets.

Device Options—This portion of the *Backup Options* screen displays detailed configuration options available for the selected target. For example, you could select between backing up the running-config and the startup-config.

5 Click one of the buttons at the bottom of the screen to initiate the next backup action.

Add Schedule opens the scheduling screen to let you automate the backup you have configured on a specified date, time, or repetition.

Execute performs the backup immediately. The *Results* tab in this screen opens, displaying the message traffic between Dell OpenManage Network Manager and the device(s). See Audit Trail Portlet on page 116.

Save preserves this configuration without scheduling or executing it.

Close closes this screen without saving the configured restoration.

How To:

Restore Configurations

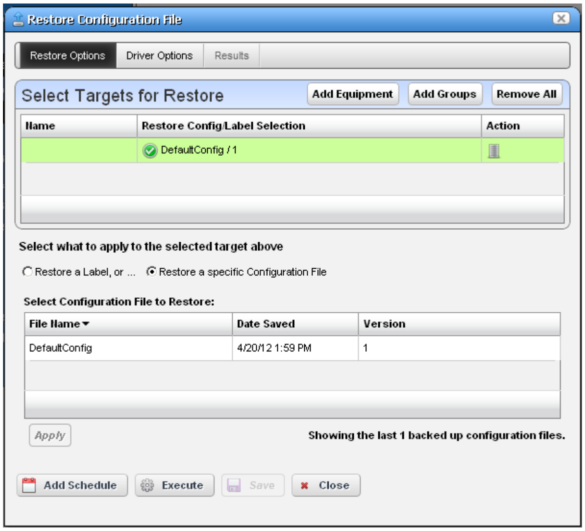
The following are the steps to restore a config file to a device:

1 Make sure you have configured an FTP or TFTP server to handle the backup. See Netrestore File Servers on page 90.

2 Right-click a device in the *Managed Resources* portlet.

3 Select *File Management > Restore*.

4 Configure the subsequent *Restore Device* screen.



Name	Restore Config/Label Selection	Action
	✓ DefaultConfig / 1	

Select what to apply to the selected target above

○ Restore a Label, or ... ● Restore a specific Configuration File

Select Configuration File to Restore:

File Name	Date Saved	Version
DefaultConfig	4/20/12 1:59 PM	1

Showing the last 1 backed up configuration files.

This screen's tabs lets you configure the following:

Select Targets for Restore—This portion of the screen lets you *Add Equipment*, *Add Groups*, or *Remove All* target devices. Listed targets and their *Restore Config / Label Selection*. Click the icon in the *Action* column to remove the listed target.

Select what to apply to the selected targets above —This panel lets you select either a label (like *Current*, *Compliant* and so on—a selector listing available labels appears onscreen once you click this option), or *Restore a specific Configuration File*. The latter lists available files and lets you click to select. Click *Apply* to configure the selected target, or *Apply to All* to configure all targets.

Select Device Options based on selected targets—The Driver Options tab lets you select device-specific restoration options.

5 Click one of the buttons at the bottom of the screen to initiate the next backup action.

Add Schedule opens the scheduling screen to let you automate the restoration you have configured on a specified date, time, or repetition.

Execute performs the restoration immediately. The *Results* tab in this screen opens, displaying the message traffic between Dell OpenManage Network Manager and the device(s). See Audit Trail Portlet on page 116.

Save preserves this configuration without scheduling or executing it.

Close closes this screen without saving the configured restoration.

How To:

Troubleshoot File Backup, Restore or Deployment

Here are some steps to troubleshoot issues you may encounter with these capabilities. The following example describes troubleshooting backup, but the steps apply in all three cases:

1 Make sure the FTP / TFTP server you are using is correctly set up, and still active. Use the *Test* button on the File Server Editor to confirm the server(s) work.

2 If, for example, backup fails, look in the Audit Trail for the failed job, and copy the contents of the informational message *Executing read commands against the device*.

Example:
```
copy running-config tftp://192.168.0.138/
010128030139_DefaultConfig
```

3 Use Direct Access to get to a Telnet / SSH command line on the device having backup issues. If you cannot get to a command line, then see Incomplete Discovery on page 86 for the way to remedy that.

4 Paste the command you have copied in step 2 after the prompt.

5 Press [Enter], and observe whether the device executes this command.

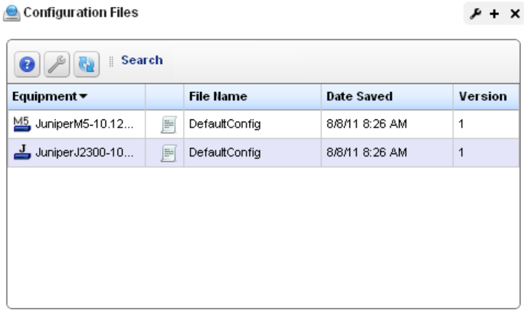
6 If the device does not successfully execute the command, then either the authentication you have used does not have permission to do such commands, or the device is configured to prohibit their execution.

Consult with your network administrator to get the correct authentication, and either revise the Discovery Profile that discovered this device, delete the device from OpenManage Network Manager and re-discover it, or right-click to Edit the device, and enter the revised authentication / management interface combination.

If the device is configured to prohibit this command’s execution, then consult the device’s documentation and revise that.

Configuration Files

One place backed up configuration files can appear is in this portlet. Right-clicking offers you the following options (all options listed may not be available):



Equipment		File Name	Date Saved	Version
JuniperM5-10.12...		DefaultConfig	8/8/11 8:26 AM	1
JuniperJ2300-10...		DefaultConfig	8/8/11 8:26 AM	1

View / Edit—See or edit the backed up configuration file, if it is not a binary file. See File Management on page 271 and Configuration File Editor on page 280 for a description of these capabilities.

Compare to Label / Compare Selected—Compare labeled configuration files to the current selection. See File Management on page 271 for a description of this capability. You can create labels when you back up a config file, or you can compare to the default labels *(Change Determination*, *Current*, *Compliant)*. If you select two configuration files in t he expanded portlet, you can also *Compare Selected*.

Promote—Makes the selected config file available for mass deployment. This is a useful way to make a “pattern” configuration file to deploy to several devices. See the description of the screen for Configuration on page 285 for additional information about how to do this.

Backup / Restore—Back up the device (again) related to the selected file, or restore the selected file.

NOTE:

Dell OpenManage Network Manager automatically assigns the most recently restored file the *Current* label.

Archive—Save the selected file to disk, and optionally delete it from this list.

Import / Export—Export the selected config file to disk, or import it from disk.

Delete—Removes the file from the Dell OpenManage Network Manager database without exporting it.

Aging Policy—Opens the Aging Policy selector. See Redcell > Database Aging Policies (DAP) on page 58 for more about these.

You can also import and export a selected config file.

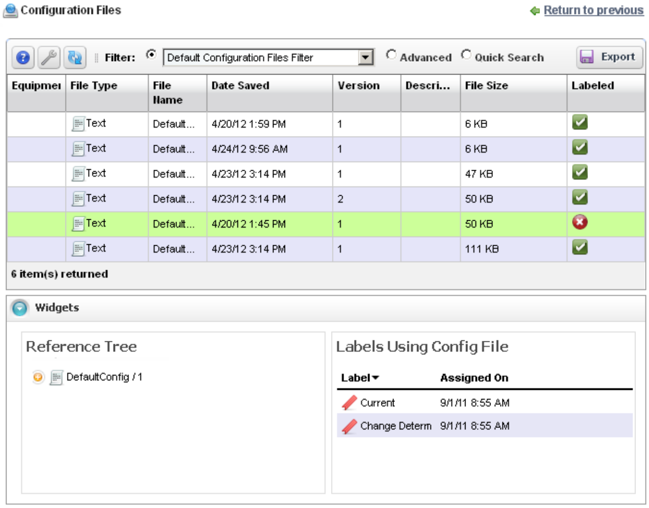
Tip

You cannot select multiple lines with Ctrl+click in most summary portlets. Configuration Files is an exception.

Configuration Files Expanded

The Expanded portlet lets you filter the list of displayed configuration files, and displays the *File Type*, *Description*, *File Size* and whether the configuration file is *Labeled* in columns.

The Labeled column appears with green or red icons depending on whether the config file has a label. When a label applies to a configuration, you cannot *Delete* or *Archive* it.



Filter: ● Default Configuration Files Filter ○ Advanced ○ Quick Search

Equipmer	File Type	File Name	Date Saved	Version	Descri...	File Size	Labeled
	Text	Default...	4/20/12 1:59 PM	1		6 KB	✓
	Text	Default...	4/24/12 9:56 AM	1		6 KB	✓
	Text	Default...	4/23/12 3:14 PM	1		47 KB	✓
	Text	Default...	4/23/12 3:14 PM	2		50 KB	✓
	Text	Default...	4/20/12 1:45 PM	1		50 KB	✗
	Text	Default...	4/23/12 3:14 PM	1		111 KB	✓

6 item(s) returned

Reference Tree

DefaultConfig / 1

Labels Using Config File

Label	Assigned On
Current	9/1/11 8:55 AM
Change Determ	9/1/11 8:55 AM

The *Labels Using Config File* snap-in displays all labels connected to the selected configuration file, and the date on which that connection was made. The *Reference Tree* displays the configuration file name, and lets you right-click it to access the available operations it supports.

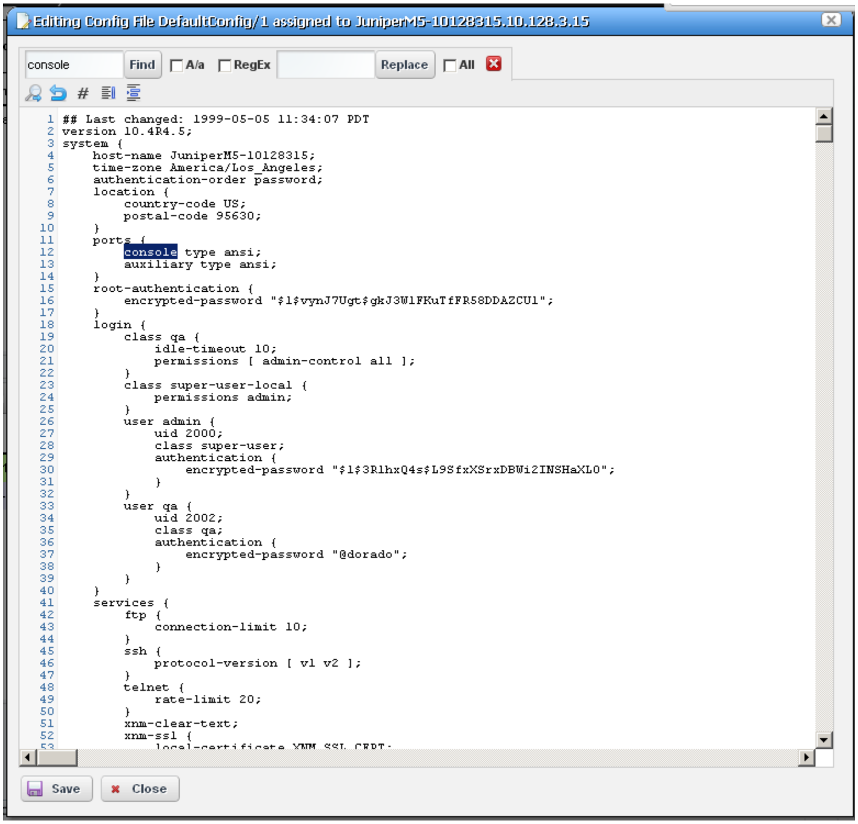
To see the most recent configuration files, see Top Configuration Backups on page 331.

For advanced search in the expanded Configuration File portlet, enter the file size in bytes to search using File size function. We suggest searching in range (between) to work around any rounding error in the KB/MB conversion.

Dell OpenManage Network Manager converts from bytes to KB/MB and presents the file size in terms of KB/MB after some rounding. For instance, 1484 bytes / 1024 = 1.44921875 KB; Dell OpenManage Network Manager rounds it to 1.45 KB.

Configuration File Editor

This editor lets you manually edit configuration files, and save them to the Dell OpenManage Network Manager database.



Editing Config File DefaultConfig/1 assigned to JuniperM5-10128315.10.128.3.15

```
## Last changed: 1999-05-05 11:34:07 PDT
version 10.4R4.5;
system {
    host-name JuniperM5-10128315;
    time-zone America/Los_Angeles;
    authentication-order password;
    location {
        country-code US;
        postal-code 95630;
    }
    ports {
        console type ansi;
        auxiliary type ansi;
    }
    root-authentication {
        encrypted-password "$1$vynJ7Ugt$gkJ3W1FKuTfFR58DDAZCU1";
    }
    login {
        class qa {
            idle-timeout 10;
            permissions [ admin-control all ];
        }
        class super-user-local {
            permissions admin;
        }
        user admin {
            uid 2000;
            class super-user;
            authentication {
                encrypted-password "$1$3RlhxQ4s$L9SfxXSrxDBWi2INSHaXL0";
            }
        }
        user qa {
            uid 2002;
            class qa;
            authentication {
                encrypted-password "@dorado";
            }
        }
    }
    services {
        ftp {
            connection-limit 10;
        }
        ssh {
            protocol-version [ v1 v2 ];
        }
        telnet {
            rate-limit 20;
        }
        xnm-clear-text;
        xnm-ssl {
            local-certificate XNM_SSL_CERT;
```

When you select a file in the Configuration Files portlet, and right-click to select *Edit*, this screen appears with the following features.

Find / Replace—Click the magnifying glass icon to open a text search feature. Notice that you can check *A/a* to make your search case-sensitive, or *RegEx* to use regular expressions to search.

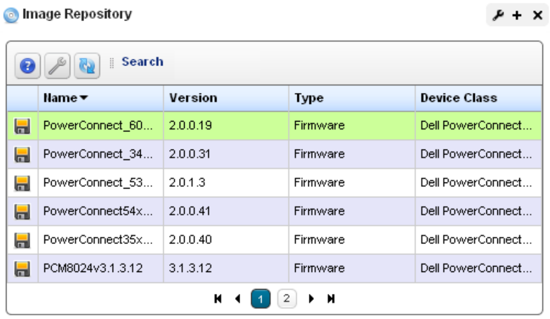
Click the *Find* button to locate text in the config file. Click *Replace* to replace found text, once it is located. Check the *All* checkbox and click *Replace* to bulk replace all instances of the *Find* text.

Click *Save* to preserve your edits, or *Close* to abandon them. Notice that the edited configuration appears listed with the other Configuration Files in the portlet as a different version than the original (the version increments by one every time you edit and save a configuration).

Image Repository

The Image repository manages firmware updates to deploy to devices in your network, or configurations you want to deploy to several devices.

You must add such files to your Dell OpenManage Network Manager system before you can deploy them. The summary screen listing these images displays their *Name*, *Description*, *File Name*, *Image Type* and *Installed Date*. Right-clicking this screen displays the following menu items:



Name	Version	Type	Device Class
PowerConnect_60...	2.0.0.19	Firmware	Dell PowerConnect...
PowerConnect_34...	2.0.0.31	Firmware	Dell PowerConnect...
PowerConnect_53...	2.0.1.3	Firmware	Dell PowerConnect...
PowerConnect54x...	2.0.0.41	Firmware	Dell PowerConnect...
PowerConnect35x...	2.0.0.40	Firmware	Dell PowerConnect...
PCM8024v3.1.3.12	3.1.3.12	Firmware	Dell PowerConnect...

New—Select either *Firmware Image*, or *Configuration Image*. Firmware Image displays the Firmware Image Editor screen. Configuration Images originate from Configuration Files that are promoted to mass restore. See the Configuration Image Editor on page 284 for its functionality.

Edit—Displays the selected Firmware image in the Firmware Image Editor screen, or the Configuration Image Editor if the selected line is a configuration image.

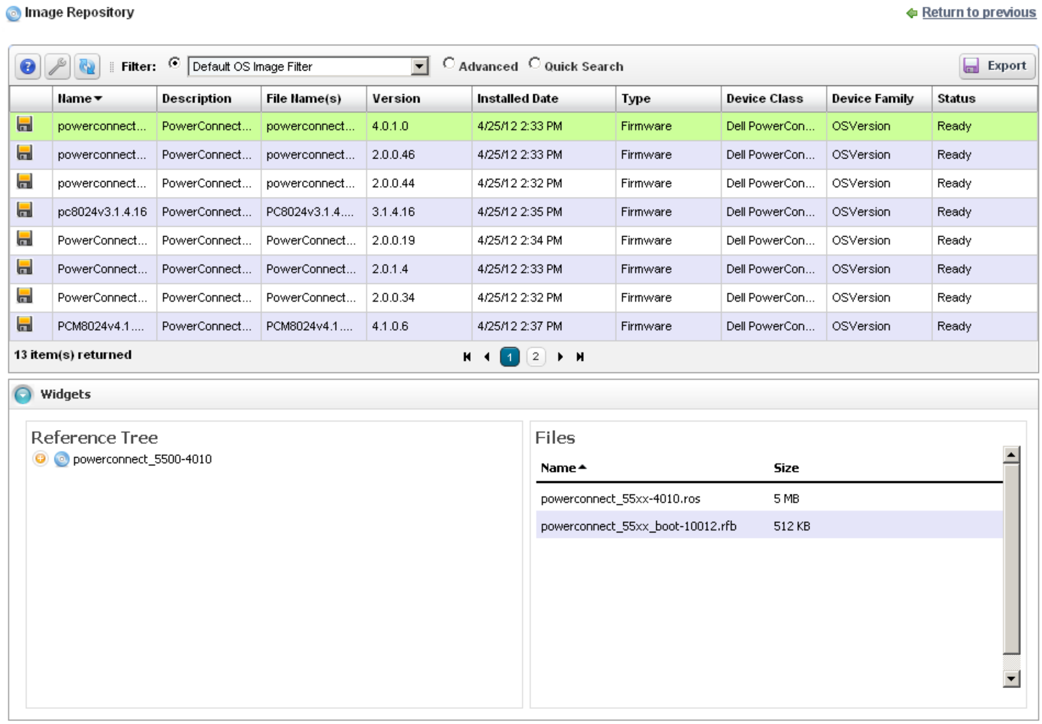
Deploy—Deploys the selected file to devices, and with the options you select in a subsequent selection screen. For this to function, you must have enabled a server, as described in File Management on page 271.

Download Firmware For—Some devices (typically Dell) support downloading firmware from the internet. These devices appear listed in a sub-menu. Select the type for which you want to download OS images, and Dell OpenManage Network Manager automatically downloads them.

Delete—Removes the selected OS image / configuration from the list.

Expanded Image Repository portlet.

When you click the plus, this portlet expands to display the OS images list, a snap panel Reference tree of the connections to devices, and another panel listing the files within the selected image.



Filter: ● Default OS Image Filter ○ Advanced ○ Quick Search

	Name ▾	Description	File Name(s)	Version	Installed Date	Type	Device Class	Device Family	Status
	powerconnect...	PowerConnect...	powerconnect...	4.0.1.0	4/25/12 2:33 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	powerconnect...	PowerConnect...	powerconnect...	2.0.0.46	4/25/12 2:33 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	powerconnect...	PowerConnect...	powerconnect...	2.0.0.44	4/25/12 2:32 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	pc8024v3.1.4.16	PowerConnect...	PC8024v3.1.4....	3.1.4.16	4/25/12 2:35 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	PowerConnect...	PowerConnect...	PowerConnect...	2.0.0.19	4/25/12 2:34 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	PowerConnect...	PowerConnect...	PowerConnect...	2.0.1.4	4/25/12 2:33 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	PowerConnect...	PowerConnect...	PowerConnect...	2.0.0.34	4/25/12 2:32 PM	Firmware	Dell PowerCon...	OSVersion	Ready
	PCM8024v4.1....	PowerConnect...	PCM8024v4.1....	4.1.0.6	4/25/12 2:37 PM	Firmware	Dell PowerCon...	OSVersion	Ready

13 item(s) returned 1 2

Reference Tree

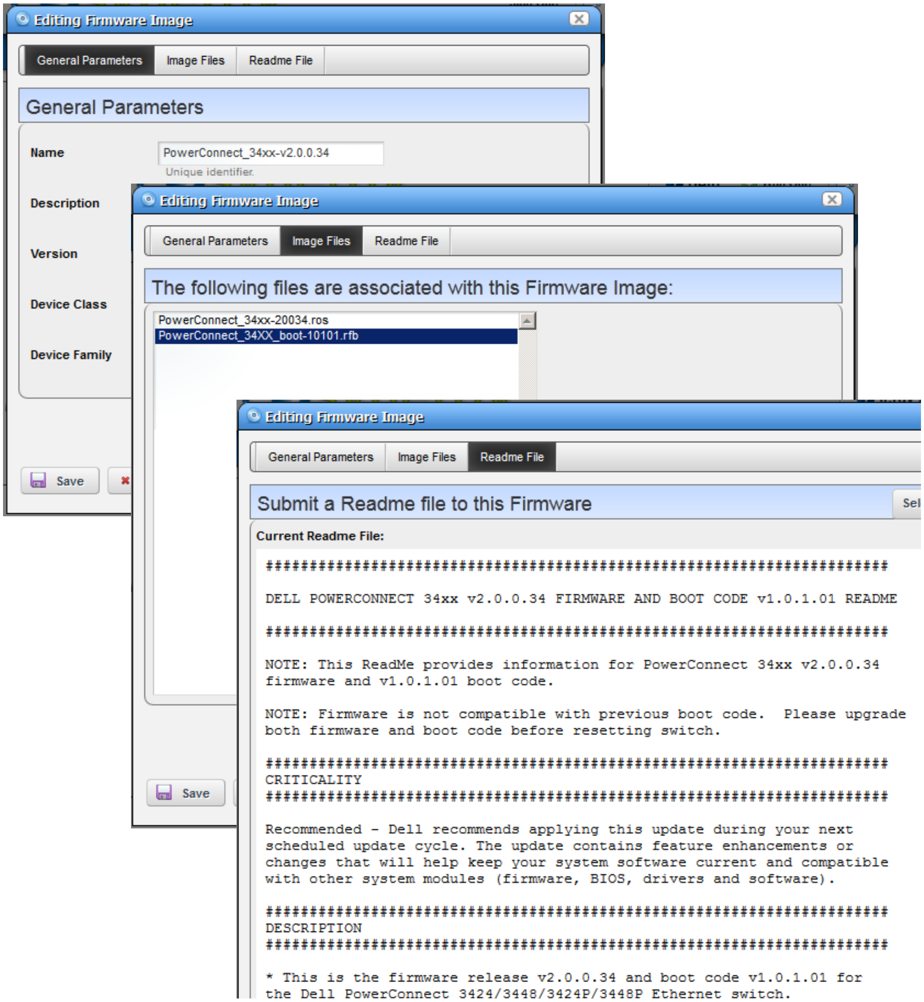
powerconnect_5500-4010

Files

Name ▴	Size
powerconnect_55xx-4010.ros	5 MB
powerconnect_55xx_boot-10012.rfb	512 KB

Firmware Image Editor

When you open or create an OS image, its configuration appears in this editor. The *General Parameters* tab contains its *OS Image Name*, *Description*, *Version*, and the *Device Class* and *Device Family*. The *Image Files* tab displays a selector that lets you create new OS Images, retrieving files from the local file system (*Import from Disk*) or a URL (*Import from URL*). Because such images can consist of multiple files, you can import multiple files here. Finally, you can also import a *Readme File* to accompany this image, and view it in that tab.



Name: PowerConnect_34xx-v2.0.0.34

Unique identifier.

The following files are associated with this Firmware Image:

PowerConnect_34xx-20034.ros
PowerConnect_34XX_boot-10101.rfb

Submit a Readme file to this Firmware

Current Readme File:

```
#######################################################################

DELL POWERCONNECT 34xx v2.0.0.34 FIRMWARE AND BOOT CODE v1.0.1.01 README

#######################################################################

NOTE: This ReadMe provides information for PowerConnect 34xx v2.0.0.34
firmware and v1.0.1.01 boot code.

NOTE: Firmware is not compatible with previous boot code.  Please upgrade
both firmware and boot code before resetting switch.

#######################################################################
CRITICALITY
#######################################################################

Recommended - Dell recommends applying this update during your next
scheduled update cycle. The update contains feature enhancements or
changes that will help keep your system software current and compatible
with other system modules (firmware, BIOS, drivers and software).

#######################################################################
DESCRIPTION
#######################################################################

* This is the firmware release v2.0.0.34 and boot code v1.0.1.01 for
the Dell PowerConnect 3424/3448/3424P/3448P Ethernet switch.
```

Click *Save* to preserve the OS Image you have configured, or *Cancel* to exit these screens without saving.

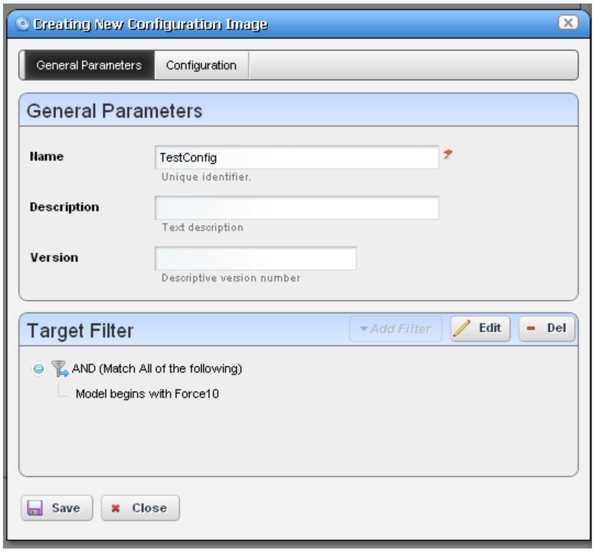
Configuration Image Editor

This editor appears for new configuration images, or for configurations you *Promote* in the Configuration Files portlet for mass restoration. This screen has the following tabs:

- General Parameters
- Configuration

General Parameters

In this screen you can name and describe the configuration file, and configure a filter to screen restoration targets.



Name: TestConfig
Unique identifier.

Description:
Text description

Version:
Descriptive version number

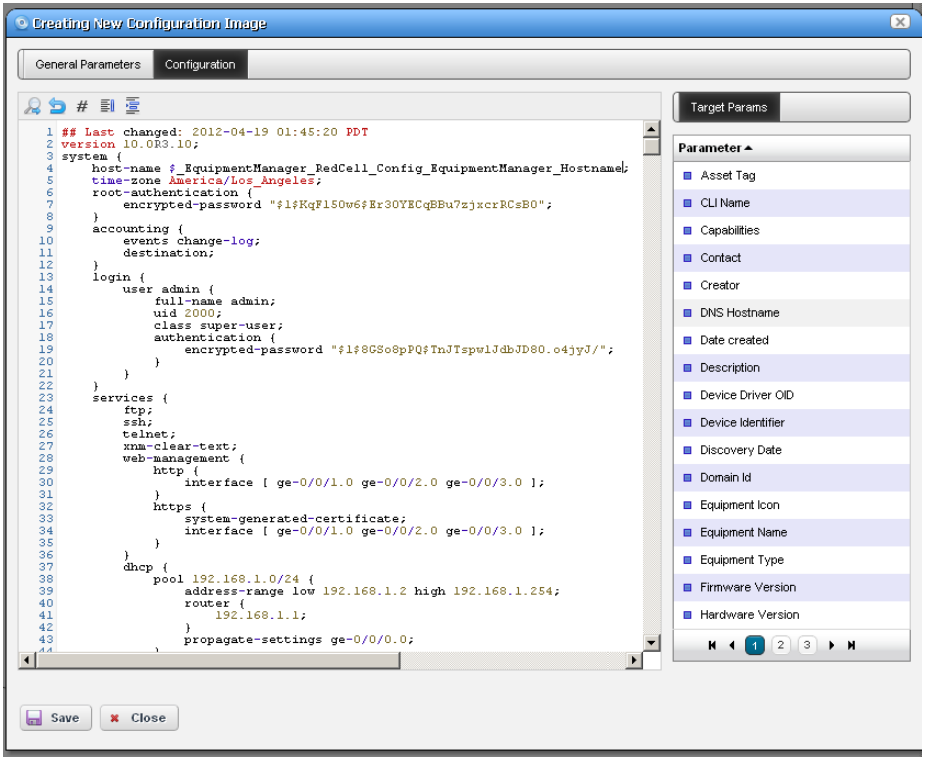
AND (Match All of the following)
Model begins with Force10

The *Version* field automatically tracks changes to the original.

The *Target Filter* panel lets you configure how this configuration decides which devices to target. When targets fail, restoration skips them.

Configuration

This panel lets you configure what is restored, and what is variable in mass deployments.



```
## Last changed: 2012-04-19 01:45:20 PDT
version 10.0R3.10;
system {
    host-name $_EquipmentManager_RedCell_Config_EquipmentManager_Hostname;
    time-zone America/Los_Angeles;
    root-authentication {
        encrypted-password "$1$KqF150w6$Er30YECqBBu7zjxcrRCsB0";
    }
    accounting {
        events change-log;
        destination;
    }
    login {
        user admin {
            full-name admin;
            uid 2000;
            class super-user;
            authentication {
                encrypted-password "$1$8GSo8pPQ$TnJTspwlJdbJD80.o4jyJ/";
            }
        }
    }
    services {
        ftp;
        ssh;
        telnet;
        xnm-clear-text;
        web-management {
            http {
                interface [ ge-0/0/1.0 ge-0/0/2.0 ge-0/0/3.0 ];
            }
            https {
                system-generated-certificate;
                interface [ ge-0/0/1.0 ge-0/0/2.0 ge-0/0/3.0 ];
            }
        }
        dhcp {
            pool 192.168.1.0/24 {
                address-range low 192.168.1.2 high 192.168.1.254;
                router {
                    192.168.1.1;
                }
                propagate-settings ge-0/0/0.0;
```

This screen appears without contents when you create a new Configuration Image, but appears with data from any *Promoted* configuration file, if it originated as a promoted config file.

Target Param

The panel of parameters that appears to the right of this screen lets you insert a value retrieved from Dell OpenManage Network Manager's database into the restored configuration file.

For example, if a Contact appears in the file, delete the specifics retrieved from a particular device's config and double-click the *Target Param* "Contact." Dell OpenManage Network Manager inserts `$_EquipmentManager_RedCell_Config_EquipmentManager_Contact` (a unique identifier for the database's Contact field) wherever you put the cursor.

Now, when you deploy this config file to the devices that pass the filter in the General Parameters editor screen, Dell OpenManage Network Manager first updates this parameter with discovered data retrieved from the device before restoring the configuration. This facilitates deploying the same config to many devices while retaining individual Target Params like contacts, DNS Hostname, and so on.

NOTE:

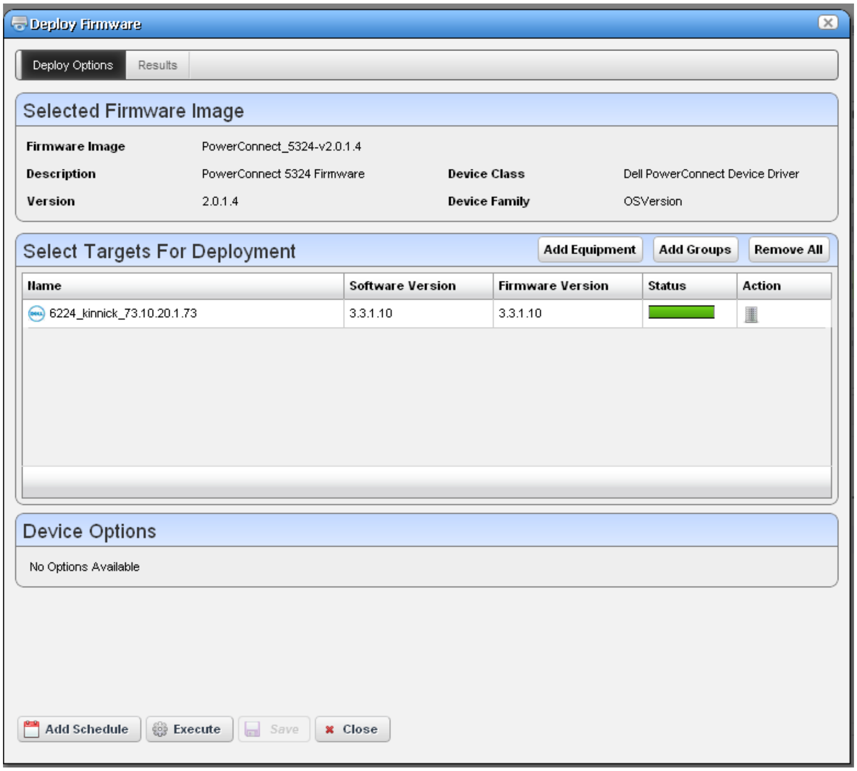
Target Params include all available discover-able parameters. Some may not apply to the specific device or configuration file.

CAUTION:

Firefox requires you click in the editor after double-clicking a variable to include it in a promoted configuration. Otherwise, the inserted variable does not persist.

Deploy Firmware

This screen lets you configure a deployment, whether triggered from resource groups, individual resources, or the Image Repository screen. Deployment validates the selected image is appropriate for the selected devices, or appropriate devices within a group.



Selected Firmware Image

Firmware Image	PowerConnect_5324-v2.0.1.4		
Description	PowerConnect 5324 Firmware	**Device Class**	Dell PowerConnect Device Driver
Version	2.0.1.4	**Device Family**	OSVersion

Select Targets For Deployment

Name	Software Version	Firmware Version	Status	Action
6224_kinnick_73.10.20.1.73	3.3.1.10	3.3.1.10	🟩	

Device Options

No Options Available

Notice you can *Add Schedule* to schedule this deployment rather than *Execute* it immediately. Click *Save* if you schedule this deployment, or *Close* to abandon your edits.

NOTE:

When you add firmware to the Image Repository for 35xx and 55xx devices, you must add both the boot image and firmware image together to deploy to these devices.

You may see multiple options for selecting the configuration file to backup for PowerConnect (not Force10) devices. Layer 2 Powerconnect switches have just running and startup options while the Layer 3 router has running, startup and backup options, so different options appear for the two sets of switches. When you do file backup for a group of devices, all those options are combined. Select only the top entry selection for execution.

How To:

Deploy Firmware

To deploy firmware, follow these steps:

1 Make sure you have an FTP / TFTP server correctly configured. See File Management on page 271.

2 Right click a device in *Managed Resources* or the groups or Image Repository pages and select *File Management > Deploy.*

3 The *Deploy Firmware* screen appears.

You can *Select OS Image* in the top panel, and configure deployment with the following fields:

OS Image—Select an image. It must already have been uploaded in the Image Repository.

Description—A text description of the image.

Version—The image version.

Device Driver—The device driver associated with this image.

Image Type—A read-only reminder of the type of image.

Select Targets for Deployment—Select targets for deploying the image. This defaults to the device right-clicked in *Managed Resources* to initiate this action, or devices that match the selected file you want to deploy. You can then click the *Add Equipment* button (again, restricted to devices that match the deploy file's type). You can also remove devices from the target list with the *Remove All* button. Notice the *Status* column in the table of targets shows whether the OS deployment is supported or not.

NOTE:

You can also select devices, then change the OS selection so a potential mismatch will occur. This will likely trigger rejection of the deployment by the device, but is not a recommended experiment.

Device Options—The appearance of the *Device Options* panel, at the bottom of this screen, depends on the device selected in the *Targets* panel. These vendor-specific fields let you fine-tune the deployment.

4 Click one of the buttons at the bottom of the screen to initiate the next backup action.

Add Schedule opens the scheduling screen to let you automate the backup you have configured on a specified date, time, or repetition. See How to: Schedule Actions on page 118.

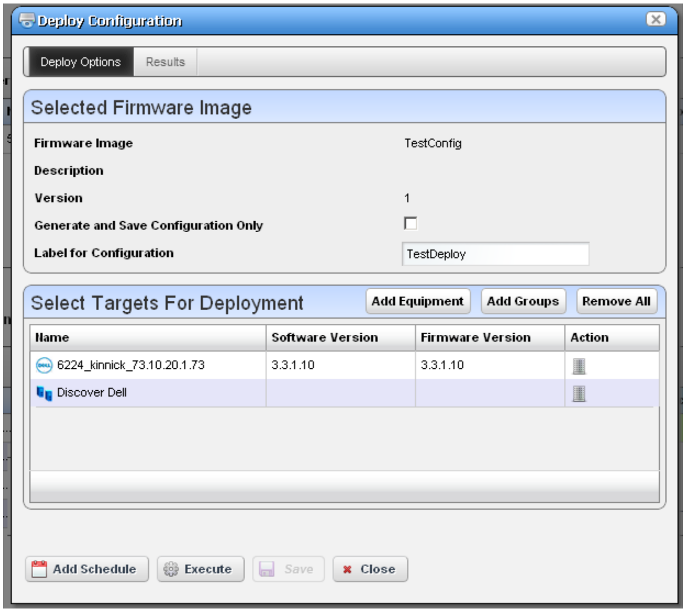
Execute performs the backup immediately. The *Results* tab in this screen opens, displaying the message traffic between Dell OpenManage Network Manager and the device(s). See Audit Trail Portlet on page 116.

Save preserves this configuration without scheduling or executing it.

Close closes this screen without saving the configured backup.

Deploy Configuration

When you deploy a configuration, a screen appears to configure how that occurs.



Deploy Configuration

Deploy Options | Results

Selected Firmware Image

Firmware Image	TestConfig
Description	
Version	1
Generate and Save Configuration Only	□
Label for Configuration	TestDeploy

Select Targets For Deployment

Name	Software Version	Firmware Version	Action
6224_kinnick_73.10.20.1.73	3.3.1.10	3.3.1.10	
Discover Dell			

It has the following fields:

Select Firmware Image

Firmware Image—The identifier for the image

Description—The description for the image

Version—The version for the image

Generate and Save Configuration Only—Check this if you simply want to configure for later restoration.

Label for Configuration—Enter a label name, if applicable.

Select Targets for Deployment

Use the *Add Equipment* or *Add Groups* buttons to select individual devices or groups of devices (both are possible together). Use *Remove All* to delete all targets, or use the delete icon in the *Action* column to delete individual equipment or groups.

NOTE:

The listed targets must still pass the filter set in the editor's General Parameters.

How To:

Restore a single configuration to many target devices

The following steps describe restoring a single configuration to many discovered devices without overwriting those devices' essential information.

1. Back up a single device's configuration that is nearest to the kind you would like to see generally.
2. Right-click this backed up file in the File Management portlet, and *Promote* it so it appears in the Image Repository portlet.
3. Right-click > Edit the promoted configuration in the Image Repository.
4. Name the file, and, if necessary, configure a filter In the General Parameters tab of the editor.
5. In the Configuration tab, locate the parameters you want to preserve in discovered devices when you restore this file. This can include items like the device's DNS Hostname, IP Address, and so on. Delete the file's specifics and double-click to insert the *Target Params* in place of these variables.
6. Save the configuration.
7. Right-click to deploy this configuration.
8. You can check *Generate and save for configuration only* if you simply want to configure deployment for later, and save for now. You can also optionally name a label for the deployed files.
9. Select the devices, or groups of devices to which you want to deploy.
10. Click *Save*, *Execute* or *Add Schedule* depending on your desired outcome.
11. If you click *Execute*, you will have to confirm this action.

    When Dell OpenManage Network Manager performs the restoration (deploy), it reads the Target Params from those discovered for each device, inserts those in the config file, then restores it, device by device, skipping any that do not pass the filter set up in step 4.

Monitoring

This section describes Resource Monitors as they appears in Dell OpenManage Network Manager's web portal. The following describes these monitors:

- Application Server Statistics
- Resource Monitors
- Top N [Assets] (pre-configured monitors that come with your installation by default.

Finally, this chapter contains a reminder about scheduling refreshes of monitor target groups. See Scheduling Refresh Monitor Targets on page 328.

Monitors and Discovery

Not all monitors are enabled for devices discovered by default. Typically discovery adds devices only to ICMP (ping) monitoring. If you enable an SNMP monitor during discovery, for example, performance degrades if discovery finds devices with many interfaces that the monitor attempts to process.

To improve performance such behavior is disabled by default so processing occurs only for the ICMP Monitors. To re-enable processing for other monitors during discover (assuming they are enabled), set/create the following property in `owareapps/installprops/lib/installed.properties`:

```
pm.monitor.process.implicits=true
```

By default, this is set to `false`. Monitors automatically refresh all implicit targets when a rule executes independently of discovery in roughly six hour intervals. Alternatively you can select the monitor(s), right mouse click and select *Refresh Monitor* to manually refresh the target.

Performance and Monitors

Monitoring can impact system performance. Monitors with many targets, many attributes per target and frequent polling intervals are most likely to slow system performance. The following are the primary considerations when configuring monitors to get the desired performance from your system:

Database Insertion Rate — How many rows can your hardware realistically insert per second?

> Every system has a maximum data insertion rate. This rate depends on the system's hardware configuration. A standard 7200 RPM disk can typically manage 300 insertions per second per disk. 10000-15000 RPM disk can have as many as 600 insertions per second per disk. Your experience may vary depending on your drive's controller and configuration.

The sum of all monitors' insertion rate should not exceed the system's maximum data insertion rate. To calculate the insertion rate of a monitor apply the following formula:

<# of monitor targets> x <# of retained attributes> / <polling interval in seconds> = inserts /second.

So a monitor with 100 targets, retaining 10 attributes once a minute would have an insertion rate of 17 rows per second (100 * 10 / 60 = 16.67 inserts per second).

Example:

Monitor A: 1000 targets * 10 retained attributes each / 120 = 83 insert per second

Monitor B: 100 targets * 25 retained attributes each / 600 = 4 insert per second

Monitor C: 10000 targets * 10 retained attributes each / 60 = 1667 insert per second

System total insertion rate (A+B+C): 1754 insertions per second

This configuration would be too aggressive for a system with a 7200 RPM disk since it dramatically exceeds the 300 insertions per second that the disk can support.

The following alternatives could resolve this:

- Upgrade to disk hardware that can keep up with the insertion rate. If the target insertion rate is 1754 inserts per second, add a disk to the array. If 1754 inserts / 300 insertions per second on a 7200 rpm disk amounts to 5.84 disks, use 6 disks (or more). If using 15000 RPM disks at 600 inserts per second, 1754/600 means you need 2.92 (3 discs) minimum.
- Modify the monitors to achieve a lower insertion rate. If you only have one 7200 RPM disk, it can only support 300 insertions per second. You have the option of lowering the target count, reducing what is retained or lengthening the polling interval.
  So from the example above if we changed the polling interval from once a minute to once every 10 minutes, Monitor C's insertion rate would drop to 167 inserts per second. The overall system would then only have an insert rate of 254 per second well below the hardware's limitation.

NOTE:

Traffic flow analysis can process and retain even larger amounts of information. Flows that correlate 50%, polled every minute for a day require roughly 109G of database, and require 4500 insertions per second.

CAUTION:

These numbers and sample calculations represent best case scenarios. Any disk or disk array typically serves other applications and processes besides monitors. Make sure to take account of that when calculating how to accommodate your monitors. The system admin or system user should assist in making that assessment.

Storage Requirements (Database Size) — How much disk space do you need, based on your retention policy? See Retention Policies on page 300 for more about configuring those.

OpenManage Network Manager stores performance data in three different forms Detail, Hourly and Daily data. It collects Detail metrics directly from the device or calculates these from the collected data with each poll. Hourly data summarizes the detail data collected during the hour. Daily data summarizes the hourly data collected during that day. The retention policy associated to the monitor describes how long OpenManage Network Manager retains each of these data types within the system.

OpenManage Network Manager stores a performance metric as a single row within a database table. Each row in that database consumes roughly 150 bytes of disk space. The sum of each monitor's disk space required determines the amount of disk space. For each monitor add the disk space required for the Detail, Hourly and Daily data using the following formula:

<Detail disk space> + <Hourly disk space> + <Daily disk space> = Monitor disk space in bytes

where...

<# of metrics retained per poll> = <# of monitor targets> x <# of retained attributes>.

<# of metrics retained per day> = <# of metrics retained per poll> x <# of polls per day>.

<Detail disk space> = <# of metrics retained per day> x <# of days to retain Detail data> x 150.

<Hourly disk space> = <# of metrics retained per poll> x <# of days to retain Hourly data> x 24 x 150.

<Daily disk space> = <# of metrics retained per poll> x <# of days to retain Hourly data> x 150.

If the system does not have sufficient disk space consider the following options:

- Add more hardware to increase the available disk space.
- Reduce the retention period of one or more monitors to lower the overall disk space requirements. Of the three data forms Detail data will consume the most disk space per day of retention.

Table size — Based on your monitor configuration how large will database tables get? Each monitor has a series of dedicated performance tables that store the Detail, Hourly and Daily performance metrics. The number of tables depends on the retention policy associated with the monitor.

A single table stores the monitor's detail data for a 24 hour period. Detail data are individual performance metrics collected and/or calculated during each poll. After that initial 24 hours, OpenManage Network Manager creates a new table to store the next 24 hours' of detail data and so on.

Because of the resulting table size, the number of performance metrics generated by a single monitor in a 24 hour period impacts performance. Best practic is to configure each monitor to produce less than 10 million rows per day. When monitors exceed that number noticeable delays result when retrieving performance data. To determine the number of metrics retained by monitors per day please refer to <# of metrics retained per day> calculation from the previous section.

△ **CAUTION:**
These numbers depend entirely upon the system hardware, available memory and processor speed.

If a monitor does exceed the target maximum rows per day consider the following options singly or in combination to change that:

- Reduce the number of retained attributes per poll.
- Reduce the polling frequency.
- Reduce the number of monitor targets per monitor. Notice that you can still have the same number of targets if you split the targets among multiple monitors.

How To:
Instructions for Monitoring

This chapter contains the following step-by-step instructions for these features:

- Create a Server Status Monitor Dashboard
- Create an SNMP Interface Monitor
- Create an ICMP Monitor
- Create a Monitor Report
- Create a Simple Dashboard View
- Create A Performance Template

You can see Performance Options from a variety of locations by right-clicking in Dell OpenManage Network Manager. For example:

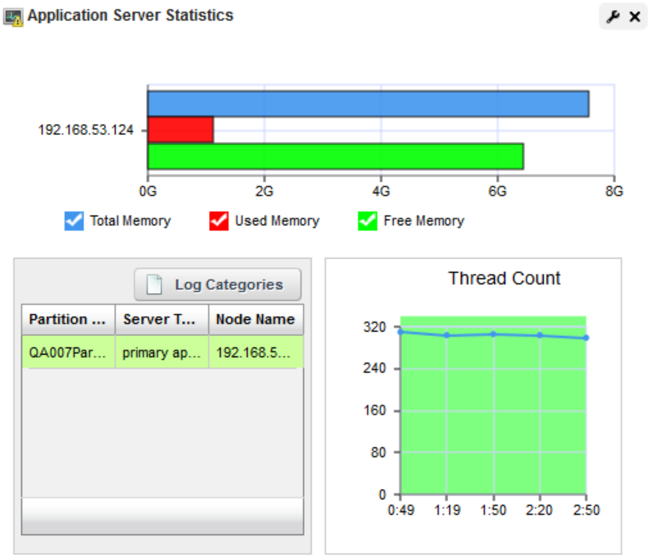
- Ports in the Ports portlet
- Interfaces
- Ports / Interfaces in the Details panels lets you *Show Performance*
- Right clicking on any of the above within a Reference tree displays Performance Options.
- All Top N [Assets] right click to offer Performance options.

Monitoring Strings

Monitors do not directly monitor string attributes, but you can create an extractive Adaptive CLI monitor that responds to string values in devices. See Example 5: Monitor Text Values on page 433 for an example.

Application Server Statistics

This summary screen has no expanded view. It displays the statistics for the OpenManage Network Manager application server and provides access to set logging levels for a variety of categories on the application server.



Application Server Statistics

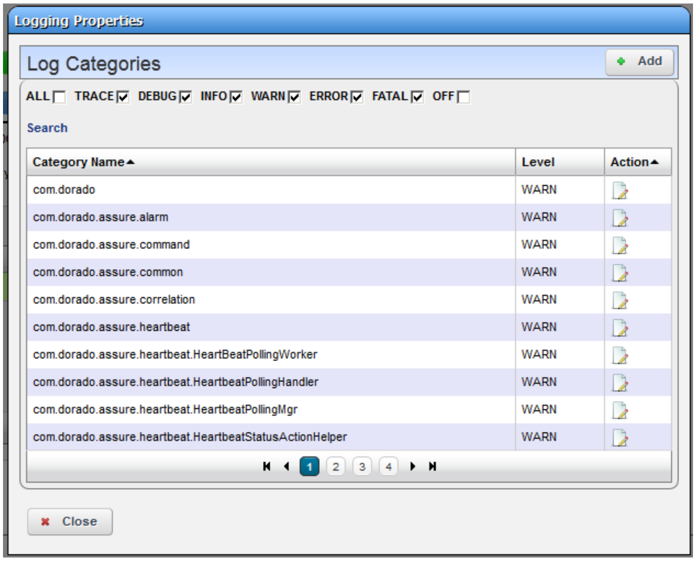
Partition ...	Server T...	Node Name
QA007Par...	primary ap...	192.168.5...

The bar graph displays *Total*, *Used*, and *Free* memory on the server. One such graph appears per server monitored. Hover your cursor over a bar to see its reading in a tooltip. Hover your cursor over the bar graphs related to the server you want to monitor, and its information appears in a tooltip.

The Thread Count graph displays information for as long as this portlet is open, restarting when you revisit it or refresh the page.

Logging Categories

The Application Server Statistics portlet also displays a table that catalogs servers' *Partition Name*, *Server Type* and *Node Name*. This includes a button the upper right corner where you can access *Log Categories*—`log4j.xml` items—without having to text edit that file. See *Custom Debug on page* 95 for more about `log4j.xml`.

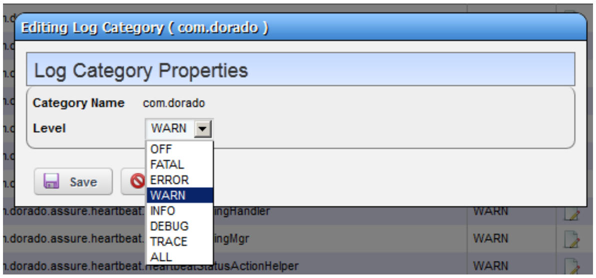


Category Name ▲	Level	Action ▲
com.dorado	WARN	
com.dorado.assure.alarm	WARN	
com.dorado.assure.command	WARN	
com.dorado.assure.common	WARN	
com.dorado.assure.correlation	WARN	
com.dorado.assure.heartbeat	WARN	
com.dorado.assure.heartbeat.HeartBeatPollingWorker	WARN	
com.dorado.assure.heartbeat.HeartbeatPollingHandler	WARN	
com.dorado.assure.heartbeat.HeartbeatPollingMgr	WARN	
com.dorado.assure.heartbeat.HeartbeatStatusActionHelper	WARN	

The `log4j.xml` items appear listed with their default log levels. Altering log levels for the listed items can provide more information for troubleshooting. Log levels determine the detail of server log output.

Notice that you can sort these by clicking the table headers, and can look for items with the *Search* link below the checkboxes. You can check or uncheck categories at the top of this screen to confine the display to only desired categories.

These self-monitoring capabilities let you tune Application Server logs to produce meaningful output. Clicking the Edit icon to the right of an item lets you change its log level.



Editing Log Category (com.dorado)

Log Category Properties

Category Name	com.dorado
Level	WARN

NOTICE

This simplifies setting log levels, and does not require editing the log4j.xml file.

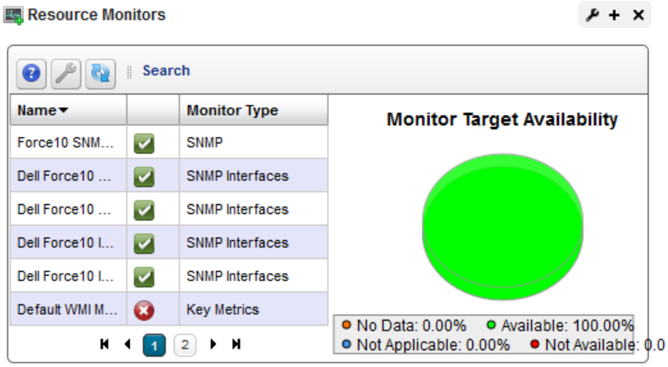
CAUTION:

More, and more detailed logging can require more processing.

Resource Monitors

This summary screen displays currently, active performance monitors in brief.

The *Name* column displays the identifier for each monitor instance, *Enable* displays a green check if it is currently enabled, or a red minus if it is disabled.



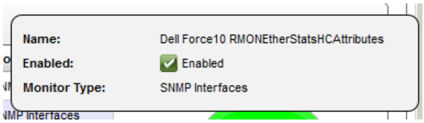
Resource Monitors

Name▾		Monitor Type
Force10 SNM...	✓	SNMP
Dell Force10 ...	✓	SNMP Interfaces
Dell Force10 ...	✓	SNMP Interfaces
Dell Force10 I...	✓	SNMP Interfaces
Dell Force10 I...	✓	SNMP Interfaces
Default WMI M...	✕	Key Metrics

Monitor Target Availability

● No Data: 0.00% ● Available: 100.00%
● Not Applicable: 0.00% ● Not Available: 0.0

The *Monitor Type* column typically displays what the monitor covers. Hover your cursor over this column to see a popup with the selected monitor's properties. The popup that appears after this query displays the relevant information for the monitor, including whether it is *Name*, *Enabled*, and *Monitor Type*.



Name:	Dell Force10 RMONEtherStatsHCAttributes
Enabled:	✓ Enabled
Monitor Type:	SNMP Interfaces

The graph that appears to the right of the monitors displays the aggregate availability information for the enabled monitors. Topics graphed include, *Available*, *Not Available*, *No Data* and *Not Applicable*.

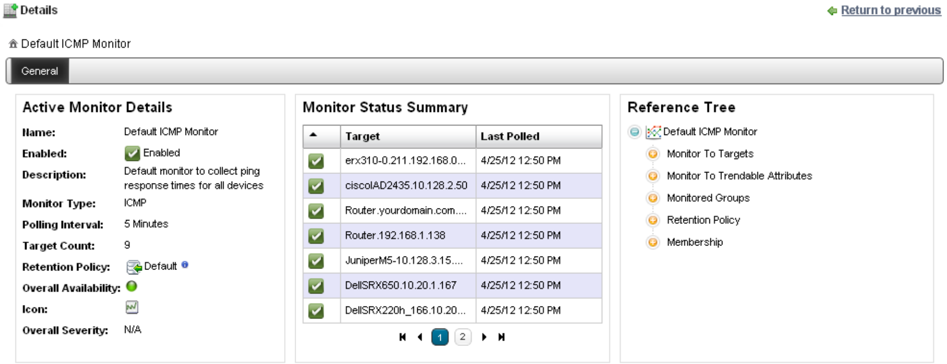
Right-click a listed monitor to do the following (not all menu items appear for all types of monitors):

New Monitor—Lets you either create a new monitor of the type you select in the sub-menu, or edits the monitor selected in the portlet. See Monitor Editor on page 302 for details.

New (from Template)—Opens the Monitor Editor, where you can configure the equipment targets for template monitors, selected in the sub-menu. These templates already have selected attributes and calculations. You can examine exactly what these are in the editor that appears when you select one.

Edit Monitor—Opens the Monitor Editor, where you can modify the selected monitor.

Details—Opens a Detail panel, with a reference tree, status summary, and general information about the selected monitor.



Details

Return to previous

Default ICMP Monitor

General

Active Monitor Details

Name:	Default ICMP Monitor
Enabled:	✓ Enabled
Description:	Default monitor to collect ping response times for all devices
Monitor Type:	ICMP
Polling Interval:	5 Minutes
Target Count:	9
Retention Policy:	Default
Overall Availability:	●
Icon:	
Overall Severity:	N/A

Monitor Status Summary

▲	Target	Last Polled
✓	erx310-0.211.192.168.0...	4/25/12 12:50 PM
✓	ciscoIAD2435.10.128.2.50	4/25/12 12:50 PM
✓	Router.yourdomain.com....	4/25/12 12:50 PM
✓	Router.192.168.1.138	4/25/12 12:50 PM
✓	JuniperM5-10.128.3.15....	4/25/12 12:50 PM
✓	DellSRX650.10.20.1.167	4/25/12 12:50 PM
✓	DellSRX220h_166.10.20...	4/25/12 12:50 PM

Reference Tree

- Default ICMP Monitor
  - Monitor To Targets
  - Monitor To Trendable Attributes
  - Monitored Groups
  - Retention Policy
  - Membership

Enable / Disable Monitor—Enables or disables the monitor. Only one of these options appears. Only enabled monitors report data (and demand resources), while disabled monitors do not.

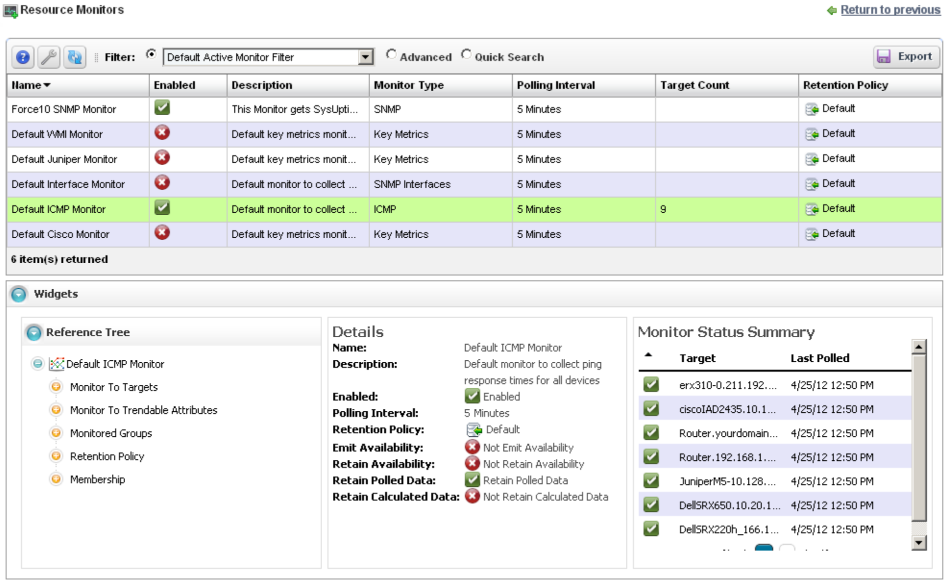
Refresh Monitor— Re-query to update any targets for the current monitor. See Scheduling Refresh Monitor Targets on page 328 for instructions about automating this.

Manage Retention Policies—Select this to manage the data retention policies for the selected monitor. See Retention Policies on page 300 for details.

Delete—Removes the selected monitor.

Expanded Resource Monitor

This screen appears when you click the plus in the upper right corner of the summary screen.



Resource Monitors

Return to previous

Filter: ● Default Active Monitor Filter ○ Advanced ○ Quick Search Export

Name	Enabled	Description	Monitor Type	Polling Interval	Target Count	Retention Policy
Force10 SNMP Monitor	✓	This Monitor gets SysUpti...	SNMP	5 Minutes		Default
Default WMI Monitor	✗	Default key metrics monit...	Key Metrics	5 Minutes		Default
Default Juniper Monitor	✗	Default key metrics monit...	Key Metrics	5 Minutes		Default
Default Interface Monitor	✗	Default monitor to collect ...	SNMP Interfaces	5 Minutes		Default
Default ICMP Monitor	✓	Default monitor to collect ...	ICMP	5 Minutes	9	Default
Default Cisco Monitor	✗	Default key metrics monit...	Key Metrics	5 Minutes		Default

6 item(s) returned

Widgets

Reference Tree

- Default ICMP Monitor
  - Monitor To Targets
  - Monitor To Trendable Attributes
  - Monitored Groups
  - Retention Policy
  - Membership

Details

Name: Default ICMP Monitor
Description: Default monitor to collect ping response times for all devices
Enabled: ✓ Enabled
Polling Interval: 5 Minutes
Retention Policy: Default
Emit Availability: ✗ Not Emit Availability
Retain Availability: ✗ Not Retain Availability
Retain Polled Data: ✓ Retain Polled Data
Retain Calculated Data: ✗ Not Retain Calculated Data

Monitor Status Summary

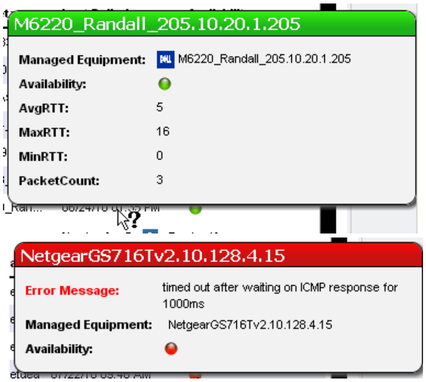
	Target	Last Polled
✓	erx310-0.211.192....	4/25/12 12:50 PM
✓	ciscoIAD2435.10.1...	4/25/12 12:50 PM
✓	Router.yourdomain...	4/25/12 12:50 PM
✓	Router.192.168.1....	4/25/12 12:50 PM
✓	JuniperM5-10.128....	4/25/12 12:50 PM
✓	DellSRX650.10.20.1...	4/25/12 12:50 PM
✓	DellSRX220h_166.1...	4/25/12 12:50 PM

As in most expanded views, this one displays a list ordered by the *Name* of the monitor. Click *Settings* to configure the column display. Available columns include those on the summary screen (*Name*, *Enabled*, *Monitor Type*) as well as *Description*, *Poling Interval*, *Target Count* and *Retention Policy*.

Resource Monitor Snap Panels

When you select a monitor, the Snap Panels at the bottom of the screen display details about it. The *Reference Tree* shows the selected monitor's connection to attributes, groups, retention policies and its membership (the devices monitored).

The *Details* Snap Panel displays the attributes the popup shows when you hover the cursor over the *Monitor Type* column in the summary screen, and adds *Emit Availability* (events), *Retain Availability*, *Retain Polled Data*, and *Retain Calculated Data* parameters.



M6220_Randall_205.10.20.1.205

Managed Equipment: M6220_Randall_205.10.20.1.205
Availability: 🟢
AvgRTT: 5
MaxRTT: 16
MinRTT: 0
PacketCount: 3

NetgearGS716Tv2.10.128.4.15

Error Message: timed out after waiting on ICMP response for 1000ms
Managed Equipment: NetgearGS716Tv2.10.128.4.15
Availability: 🔴

The *Monitor Status Summary* Snap Panel displays the status of each individual member (*Target*) of the monitor, showing the *Last Polled* time and date, and a title bar and icon indicating *Availability* (green is available, red is not).

Hover the cursor over the Availability icon, and a popup appears with details about availability. If the device is available, the *RTT* (round-trip time) for communication appears in *Avg* (average), *Max* (maximum), and *Min* (minimum) amounts, along with the *PacketCount*. If it is not, an *Error Message* appears instead of the *RTT* and *PacketCount* parameters.

To edit more performance settings and targets than are available here, use the features described in Dashboard Views on page 331. You can create and display dashboards by right-clicking items in Managed Resources, selecting *Show Performance*.

Excluding Attributes from Display

The `show.perf.exclude` property in the `portal-ext.properties` file contains a comma delimited list of the attribute display names to exclude from display. Remember, best practice is to override properties as described in Overriding Properties on page 15.

For example,

show.perf.exclude=CPU Utilization,AvgRTT

If you define this property, the *Show Performance* command creates charts for the listed attributes. This has no impact on manually created dashboards.

NOTE:

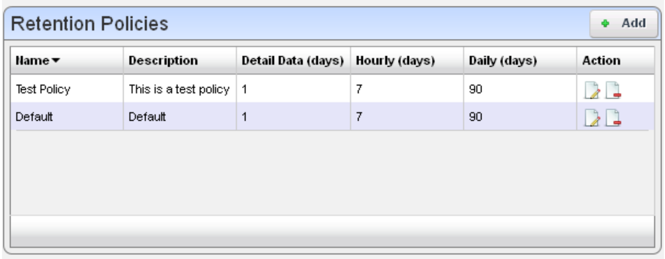
You must restart tomcat after changing the properties file for the changes to take effect.

Retention Policies

The basis of all reporting and dashboard presentations is retained data from established monitors. In other words, each monitor provides a simple schema from which you can produce a chart, graph or report.

To reduce resource impacts, the scope of retained data may exclude some of the collected data. A monitor may have no retained data and only emit events based on transient results in the execution/calculation.

For example, the application can derive a metric from several collected values and you may opt to retain only the derived result.



Retention Policies

Name	Description	Detail Data (days)	Hourly (days)	Daily (days)	Action
Test Policy	This is a test policy	1	7	90	
Default	Default	1	7	90	

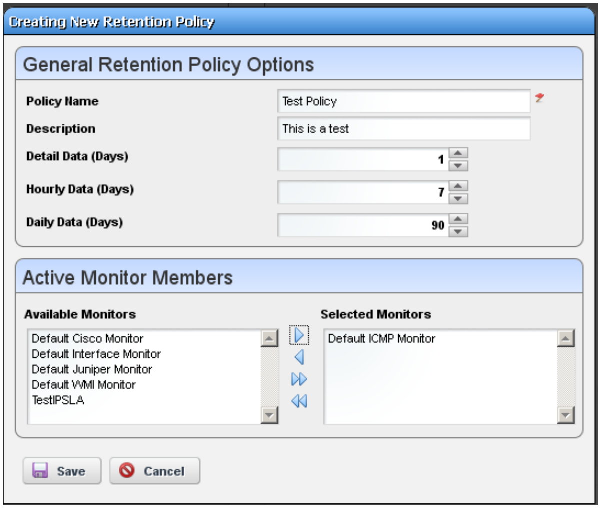
All monitors rely on a polling engine which provides runtime mediation activities for distributed device interaction at regular intervals. Monitors may share a retention policy. Data is rolled up hourly and daily into summary data. The retention policy controls how long data is held per roll-up period. You must select the correct period see what has been collected.

When you manage these policies, you configure how monitored data is retained. When you select *Manage Retention Policies* in the Monitors portlet, first a list of available policies appears.

Clicking the *Add* button at the top of the screen lets you create a new policy, while clicking the *Edit* button to the right of selected, listed policies lets you modify existing policies. The *Delete* button to the right of listed policies removes them from the list.

Editor

Monitors may share a retention policy. The retention policy controls how long data is held per roll-up period. The editor for Retention policies lets you assign characteristics and monitors to them.



Creating New Retention Policy

General Retention Policy Options

Policy Name	Test Policy
Description	This is a test
Detail Data (Days)	1
Hourly Data (Days)	7
Daily Data (Days)	90

Active Monitor Members

Available Monitors	Selected Monitors
Default Cisco Monitor Default Interface Monitor Default Juniper Monitor Default WMI Monitor TestIPSLA	Default ICMP Monitor

The editor contains the following fields:

General Retention Policy Options

Policy Name—A text identifier for the policy.

Description—An optional description for the policy.

Detail / Hourly / Daily Data (Days)—How many days to retain the selected data.

> The amount retained has both a performance and data storage impact. For example, retaining day's information from an active performance SNMP monitor configured with one target's worth of data, retrieved on one minute intervals can consume 0.7 G of database, and require 21 inserts per second.
>
> Traffic flow analysis can process and retain even larger amounts of information. Flows that correlate 50%, polled every minute for a day require roughly 109G of database, and require 4500 inserts per second.

Active Monitor Members

Select from *Available Monitors* on the left, and click arrows to move the desired monitor(s) to the *Selected Monitors* on the right.

Click *Save* to preserve your edits, and include the monitor as listed among existing Retention Policies, or click *Cancel* to abandon any changes.

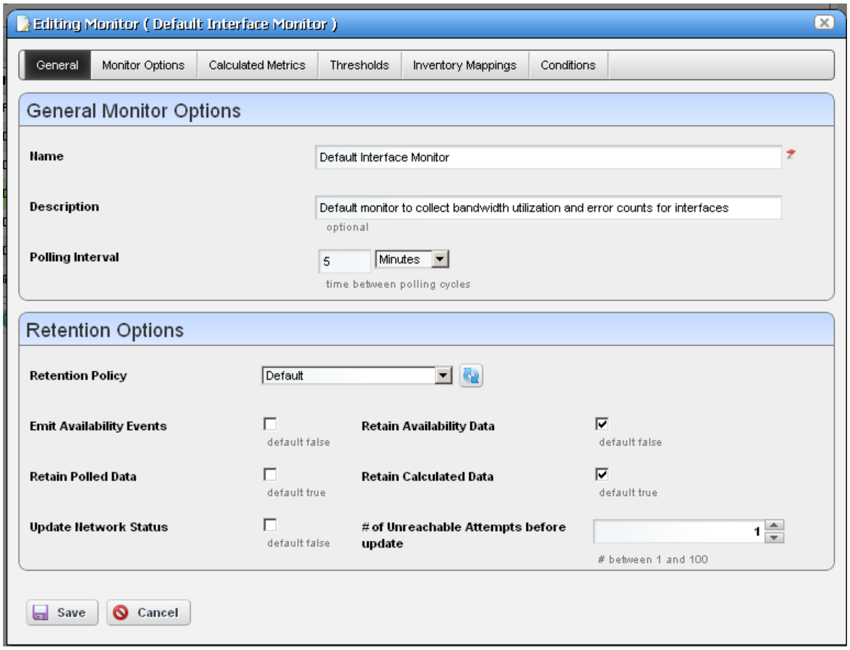
Monitor Editor

This editor lets you fine-tune the monitor you selected and right-clicked to open the editor. It includes the following panels and fields:

- General
- Monitor Options
- Calculated Metrics
- Thresholds
- Inventory Mappings
- Conditions

General

The General panel is common to all different monitor types.



General Monitor Options

Name: Default Interface Monitor

Description: Default monitor to collect bandwidth utilization and error counts for interfaces (optional)

Polling Interval: 5 Minutes (time between polling cycles)

Retention Options

Retention Policy: Default

Emit Availability Events: □ (default false)

Retain Availability Data: ☑ (default false)

Retain Polled Data: □ (default true)

Retain Calculated Data: ☑ (default true)

Update Network Status: □ (default false)

# of Unreachable Attempts before update: 1 (# between 1 and 100)

General Monitor Options

Name—The identifier for this monitor.

Description—A text description for this monitor.

Polling Interval—Use these fields to configure how often the monitor polls its target(s).

Retention Options

Retention Policy—This configures how long Dell OpenManage Network Manager retains the monitor’s data. Manage these by right-clicking in the Resource Monitors portal, and selecting *Retention Policies*. You must make retention policies before you can select them here.

Enabled—Check to enable.

Emit Availability Events—Check to activate emitting availability events. The monitor does not emit an event until the monitored entity’s state has changed. All monitors can generate events on failure to contact the monitored device, port, and so on. For example, by default ICMP monitor updates the network status after a selected number of consecutive failures.

You can configure the monitor to generate an event in addition to updating network status, but Dell OpenManage Network Manager does not like the polling interval to be very small especially when monitoring many devices.

Example: poll every 10 secs for 10,000 devices with Packet Size = 64 bytes, Packet Count = 3 Timeout (secs) = 1, and configure Unreachable attempts = 1 with polling interval = 10 seconds. This polls the device every 10 seconds and emits a “down” event on the first failed attempt.

Retain Availability Data—Check to activate. You must Retain availability data to enable alarms. If you define thresholds, you should retain availability data. *Retain availability data* stores the Boolean values of whether availability data was in the range your defined metrics.

Retain Polled Data—Check to activate. If you uncheck *Retain polled data* only calculated data remains, you cannot view data retrieved from monitored entities. Turning off *Retain polled data* discards the data as it arrives from the device.

Retain Calculated Data—Check to activate. *Retain calculated data* complements *Retain polled data*. If checked, it stores the calculated results which came from the raw poll data received from the device.

Update Network Status—Check to activate reporting the network status of the target device(s). The results of this monitor's activity then appear in the Network Status column of the Managed Resources portlet. Only one monitor—and no monitors on interfaces or child components—should ever update networks status. Any monitors on child components or interfaces are rolled up to the top level device, so status may be erroneously reported. For example the top level device is not necessarily down if the interlace is down.

If two monitors report the network status of a single device on different intervals, they must both agree it is down before that state appears in Managed Resources. As long as one monitor says a device is *Responding*, then that is the state displayed.

If ping fails (an endpoint is down) and update network status is configured, then Dell OpenManage Network Manager tries to ping the switch/router in front of the endpoint to determine if that device is reachable. If that device also failed, then the endpoint’s status becomes *indeterminate*.

NOTICE

For clarity’s sake, best practice has only one monitor per device updating network status. By default ICMP monitoring enables *Update Network Status*, and monitors all discovered devices.

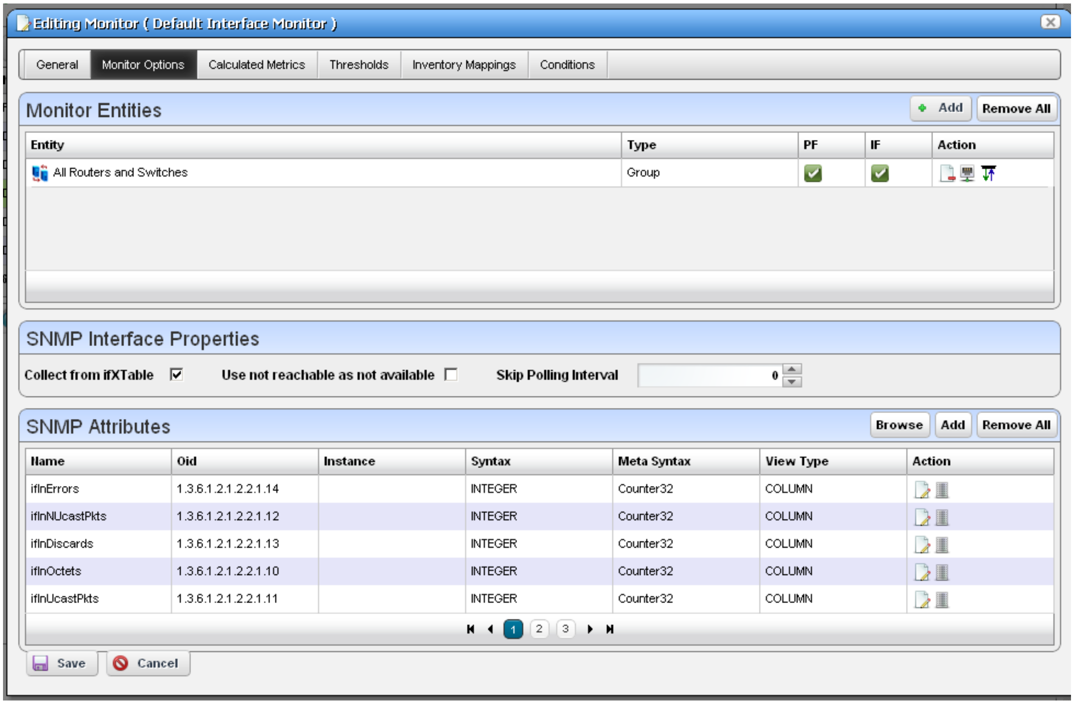
Migrating from previous Dell OpenManage Network Manager versions automatically replaces any configured Heartbeats with ICMP monitors with *Update Network Status* enabled. If your previous system had HTTP or SNMP heartbeats, you must manually configure monitors to provide equivalent monitoring in this version.

# of Unreachable Attempts before update—The number of attempts to reach the device before Dell OpenManage Network Manager updates the displayed network status of the device. (1-100)

Click *Save* to preserve any edits you make, or *Cancel* to abandon them.

Monitor Options

Monitor options contains two panels. The entity panel lets you select the monitor targets. The types of monitor entities allowed varies depending on the type of monitor. The second panel contains options specific to the monitor type being edited.



Entity	Type	PF	IF	Action
All Routers and Switches	Group	✓	✓	

Collect from ifXTable ☑ Use not reachable as not available □ Skip Polling Interval 0

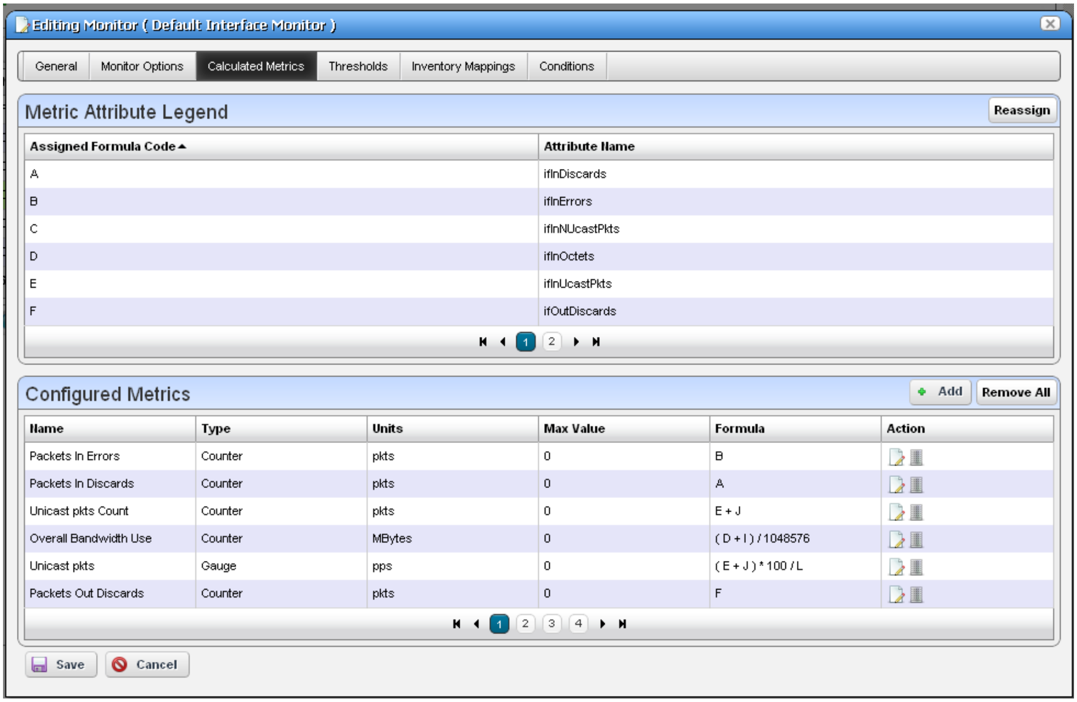
Name	Oid	Instance	Syntax	Meta Syntax	View Type	Action
ifInErrors	1.3.6.1.2.1.2.2.1.14		INTEGER	Counter32	COLUMN	
ifInNUcastPkts	1.3.6.1.2.1.2.2.1.12		INTEGER	Counter32	COLUMN	
ifInDiscards	1.3.6.1.2.1.2.2.1.13		INTEGER	Counter32	COLUMN	
ifInOctets	1.3.6.1.2.1.2.2.1.10		INTEGER	Counter32	COLUMN	
ifInUcastPkts	1.3.6.1.2.1.2.2.1.11		INTEGER	Counter32	COLUMN	

The entity and options panels for the various types of monitors appear below in Monitor Options Type-Specific Panels on page 317.

Calculated Metrics

The calculated metrics panel lets you create attributes that are calculated from existing monitor attributes. The metric attribute legend assigns a letter value to each monitor attribute. The *Reassign* button reassigns the letters. This is useful if some attributes have been deleted and their letters are no longer used.

The *Configured Metrics* table lists the calculated metrics. An edit and delete action appears to the right of each row. The *Add* button creates a new calculated metric and the *Remove All* button deletes all the calculated metrics.



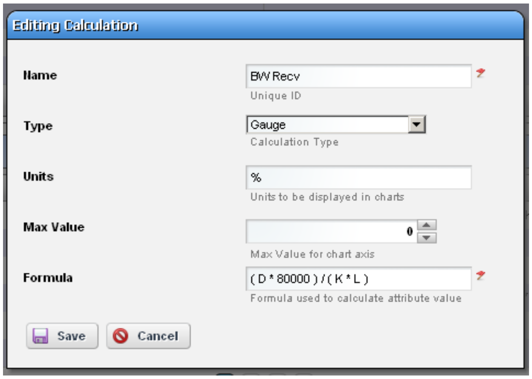
Metric Attribute Legend

Assigned Formula Code ▲	Attribute Name
A	ifInDiscards
B	ifInErrors
C	ifInNUcastPkts
D	ifInOctets
E	ifInUcastPkts
F	ifOutDiscards

Configured Metrics

Name	Type	Units	Max Value	Formula	Action
Packets In Errors	Counter	pkts	0	B	
Packets In Discards	Counter	pkts	0	A	
Unicast pkts Count	Counter	pkts	0	E + J	
Overall Bandwidth Use	Counter	MBytes	0	(D + I) / 1048576	
Unicast pkts	Gauge	pps	0	(E + J) * 100 / L	
Packets Out Discards	Counter	pkts	0	F	

Clicking on the Add button or edit button displays the calculation editor.



Name	BW Recv Unique ID
Type	Gauge Calculation Type
Units	% Units to be displayed in charts
Max Value	0 Max Value for chart axis
Formula	(D * 80000) / (K * L) Formula used to calculate attribute value

This panel contains the following properties:

Name—The attribute name to be displayed for the calculation

Type—Calculation Type - Gauge or Counter

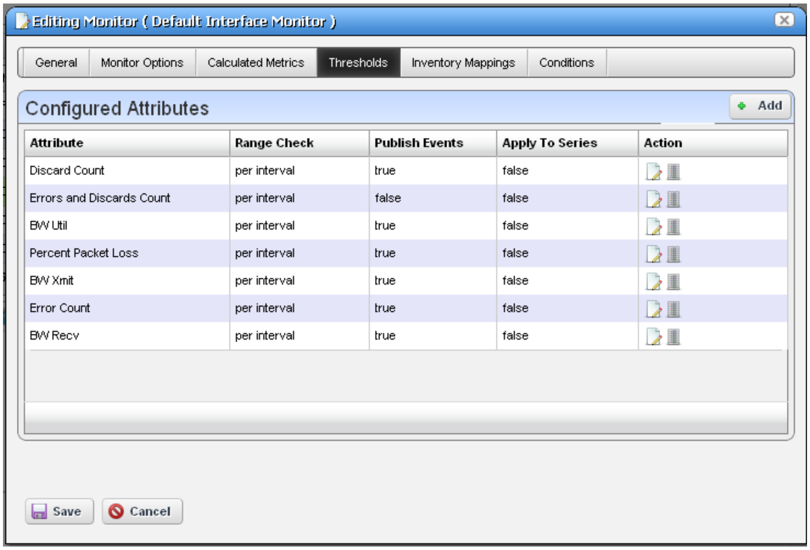
Units—Units string to appear in graphs

Max Value—Maximum value to be used in graphing (0 = no max)

Formula—The formula for the calculation using the assigned formula codes from the metric attribute legend.

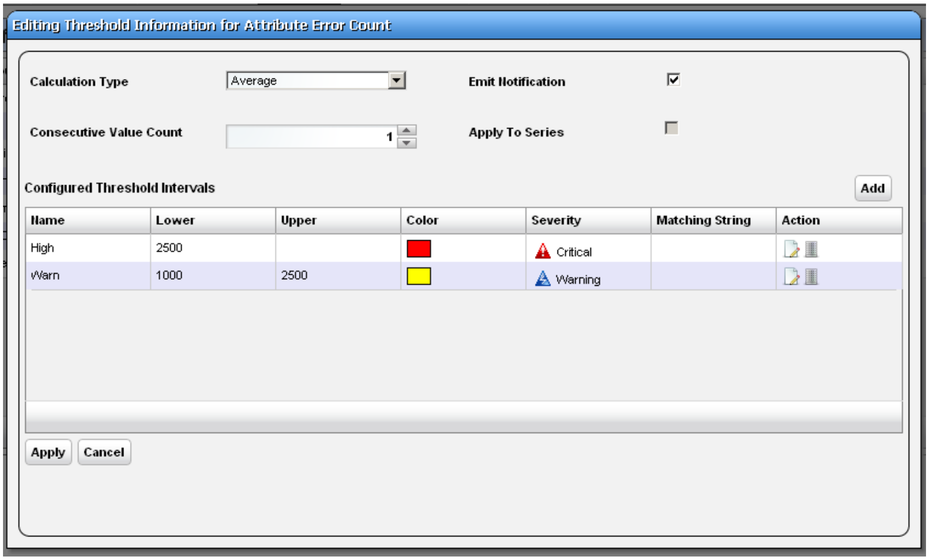
Thresholds

The thresholds panel allows the user to set threshold intervals on attributes in the monitor. The table lists the attributes for which attributes have been configured. Each row has an edit action and delete action. The Add button allows thresholds to be specified for another attribute. If all monitor attributes have thresholds defined for them the Add button will be disabled.



Attribute	Range Check	Publish Events	Apply To Series	Action
Discard Count	per interval	true	false	
Errors and Discards Count	per interval	false	false	
BW Util	per interval	true	false	
Percent Packet Loss	per interval	true	false	
BW Xmit	per interval	true	false	
Error Count	per interval	true	false	
BW Recv	per interval	true	false	

The *Add* or *Edit* buttons open a threshold editor (blank or with existing, configured thresholds, respectively).



Editing Threshold Information for Attribute Error Count

Calculation Type: Average

Emit Notification ☑

Consecutive Value Count: 1

Apply To Series □

Configured Threshold Intervals

Name	Lower	Upper	Color	Severity	Matching String	Action
High	2500		🟥	Critical		
Warn	1000	2500	🟨	Warning		

Configure threshold intervals you *Add* at in the editor screen according to the following parameters.

Attribute Name—Appears when you click *Add* rather than *Edit*ing a selected threshold. Use the pick list that appears in this screen to select the attribute for which you are specifying threshold information. When you *Edit*, the name of the attribute appears as a title within the editor screen.

Calculation Type—Select from the pick list. Specifies whether the range calculation is to be done based on *Average* or *Consecutive* values.

Consecutive Value Count—Select how many consecutive values to consider at once for a range calculation. Typically the larger the number here, the less "flutter" in reporting threshold crossings.

Emit Notification—Check to emit an event if the device crosses the configured threshold(s). The notification event contains the threshold-crossing value, as well as which threshold was crossed, and is an alarm at the severity selected when you configure the threshold.

You can make a set of thresholds for each monitored attribute, so a single monitor can throw different alarms for different attributes. To see available events and their descriptions, view the contents of the RedcellMonitor-MIB in \owareapps\performance\mibs.

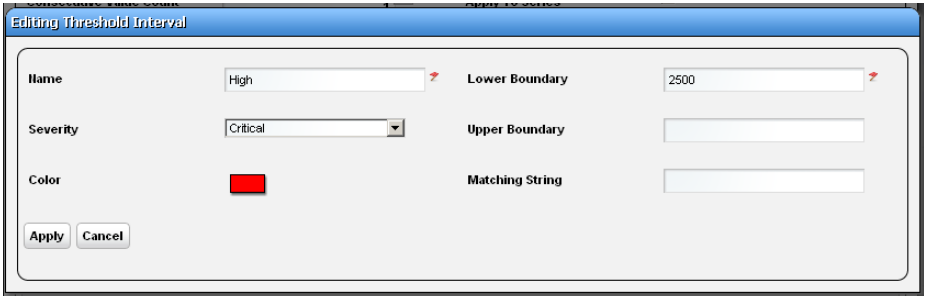
Apply to Series—Check to enable on composite attributes only. Checking this applies the threshold to individual elements within the series. When it is unchecked, the threshold applies only to aggregate measurements (the overall value of the series), not individual elements within the series.

For example; a Key Metric monitor for CPU utilization on a device with two CPUs actually monitors both CPUs.   When unchecked, the threshold applies to the average of both CPUs, when checked, the threshold applies to each individual CPU.

You can also apply thresholds to regular expressions. This is useful to monitor components within components, for example cores within a CPU.

Click *Apply* to preserve your edits, or *Cancel* to abandon them.

The threshold interval editor pops up when you select the *Add* button or the *Edit* icon to the right of a threshold's row in the threshold attribute editor.



Name	High	Lower Boundary	2500
Severity	Critical	Upper Boundary	
Color	🟥	Matching String	

This screen contains the following fields:

Name—The identifier for the threshold interval.

Severity—The event severity for crossing this threshold interval (*informational/indeterminate/ warning/minor/major/critical*)

Color—The color to display threshold interval on graphs.

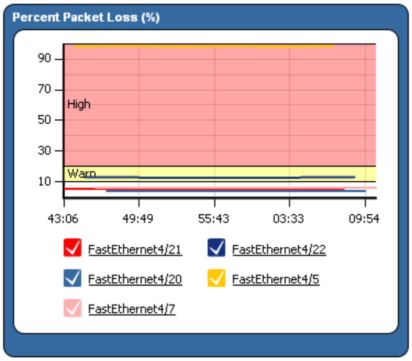
Lower Boundary—The interval's lower boundary.

Upper Boundary—The interval's upper boundary. May be blank.

Matching String—A Regex matching string.

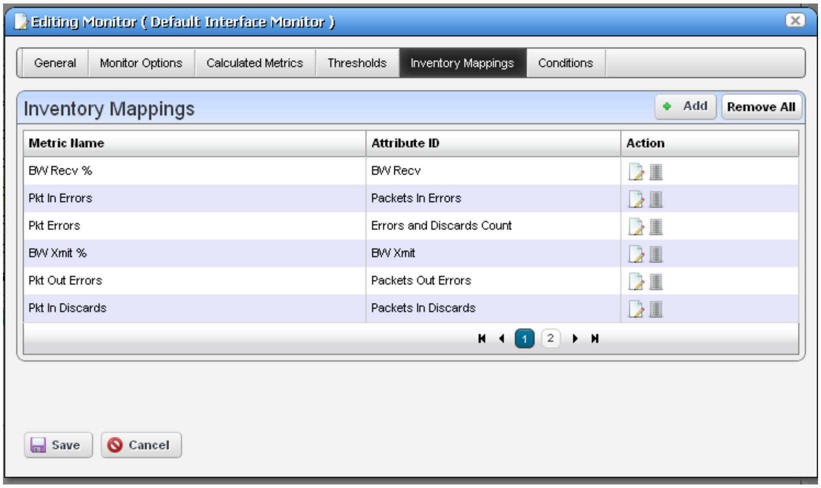
Threshold Graph Background

If you configure a set of thresholds, the dashboard graph displaying the data monitored displays the threshold colors in the background. When an upper or lower threshold has no upper or lower bound, then those background colors may appear as white.



Inventory Mappings

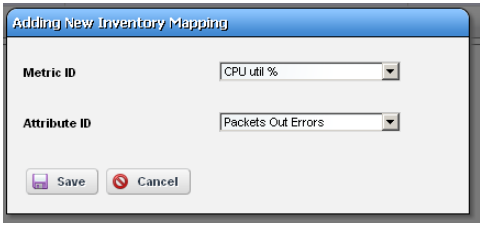
The inventory mappings panel lets you associate predefined inventory metrics with a monitored attribute to normalize the attribute if a device does not report metrics in a way that matches the monitored attribute's name or format. Available metrics include *CPU Utilization %*, *Memory Utilization %*, *ICMP Round Trip Time*, *ICMP packet errors*, and *Bandwidth utilization %*.



Metric Name	Attribute ID	Action
BW Recv %	BW Recv	
Pkt In Errors	Packets In Errors	
Pkt Errors	Errors and Discards Count	
BW Xmit %	BW Xmit	
Pkt Out Errors	Packets Out Errors	
Pkt In Discards	Packets In Discards	

Common attributes include those for Top N. For example, service A may call it "Disk % Utility" and Service B may call it "% Disk Utility". We can map them to a common name and can display them as Top N.

You can *Add* a new mapping with that button, or *Remove All* listed mappings with that button. You can also edit or delete listed mappings with the *Action* icons to the right of each row. Adding or editing opens the Inventory Mapping Editor.



Adding New Inventory Mapping

Metric ID: CPU util %

Attribute ID: Packets Out Errors

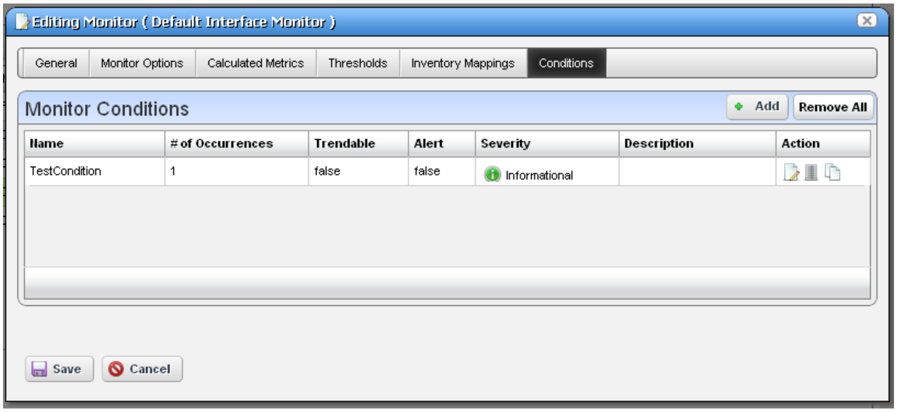
This lets you configure the following:

Metric ID—Inventory metric name

Attribute ID— Attribute to associate with the inventory metric

Conditions

This panel lets you add multiple conditions to the monitor you are editing.



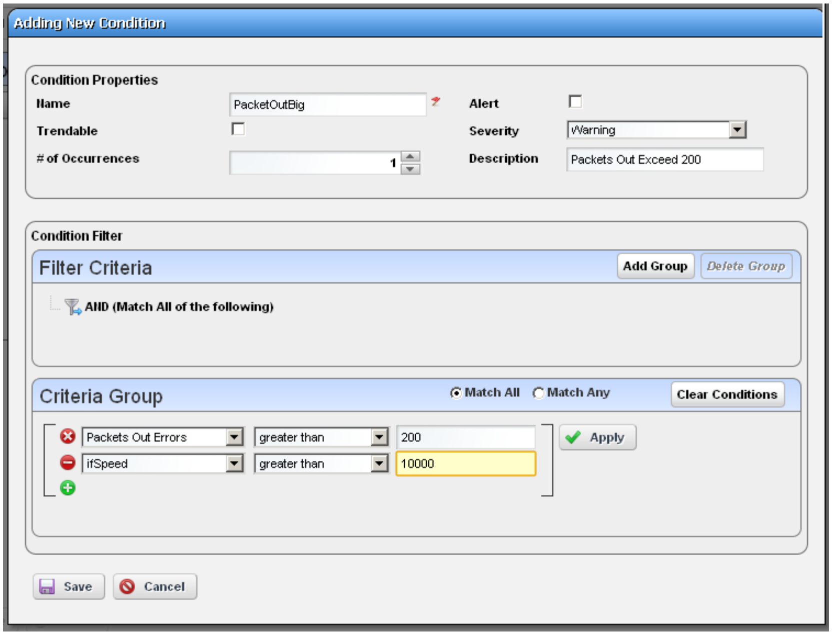
Editing Monitor (Default Interface Monitor)

Monitor Conditions

Name	# of Occurrences	Trendable	Alert	Severity	Description	Action
TestCondition	1	false	false	Informational		

Click the *Add* button to enter a new set of conditions, or click the *Edit this entry* button to the right of a listed Monitor Condition to open the editor. Click the *Delete* button to remove a listed set of conditions. Click the *Copy* icon to duplicate the listed condition.

The editor has the following fields and settings to configure:



Name	PacketOutBig	Alert	□
Trendable	□	Severity	Warning
# of Occurrences	1	Description	Packets Out Exceed 200

AND (Match All of the following)

● Match All ○ Match Any

Packets Out Errors	greater than	200
ifSpeed	greater than	10000

Condition Properties

Name—Enter a text identifier for the conditions.

Alert—Check this if you want Dell OpenManage Network Manager to emit an alert when the monitor satisfies the conditions.

Trendable—Check if the conditions specified are trendable. If this is true, the database retains qualifying conditions (or thresholds) for later reporting / dashboards.

Severity—Specify the severity of the emitted alert, if any.

# of Occurrences—Enter the number of occurrences of what is specified in the Condition Filter to satisfy the Conditions.

Description—A text description for the conditions.

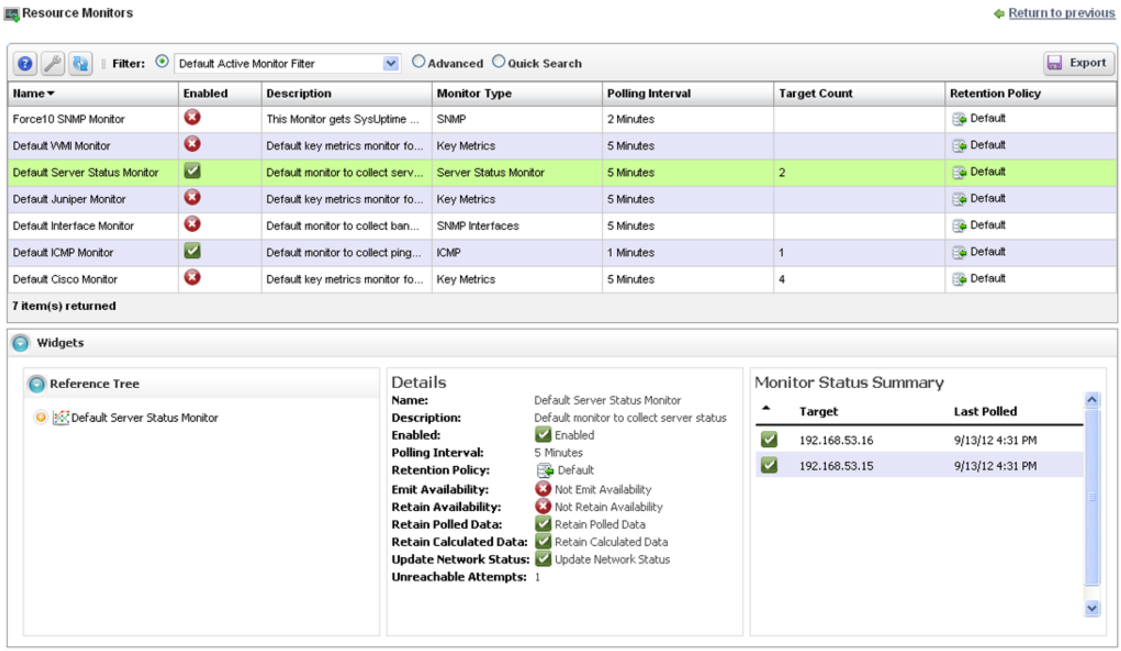
Condition Filter

Minimally, use this panel to select a condition, an operator and a value. If you want to use the logical AND or OR operators with a second condition, click the green plus (+), and select a second condition, operator and value. For example, *Packet Out Errors greater than* 200 AND *ifSpeed greater than* 10000 can be a set of conditions that only has to occur once to satisfy this monitor's condition.

Click *Save* to accept your edits, or *Cancel* to abandon them.

Self Management / Self Monitoring: Default Server Status Monitor

Dell OpenManage Network Manager also includes a Default Server Status Monitor that monitors its own serverYou can edit this monitor to alter polling intervals, and make different calculations for the monitored attributes. Those attributes include TotalMemory, FreeMemory, MemoryInUse, ThreadCount and TrapCount for Application Server and Mediation Server processes. You cannot modify the targets for this monitor.



Resource Monitors

Return to previous

Filter: ● Default Active Monitor Filter ○ Advanced ○ Quick Search

Export

Name	Enabled	Description	Monitor Type	Polling Interval	Target Count	Retention Policy
Force10 SNMP Monitor	✗	This Monitor gets SysUptime ...	SNMP	2 Minutes		Default
Default WMI Monitor	✗	Default key metrics monitor fo...	Key Metrics	5 Minutes		Default
Default Server Status Monitor	✓	Default monitor to collect serv...	Server Status Monitor	5 Minutes	2	Default
Default Juniper Monitor	✗	Default key metrics monitor fo...	Key Metrics	5 Minutes		Default
Default Interface Monitor	✗	Default monitor to collect ban...	SNMP Interfaces	5 Minutes		Default
Default ICMP Monitor	✓	Default monitor to collect ping...	ICMP	1 Minutes	1	Default
Default Cisco Monitor	✗	Default key metrics monitor fo...	Key Metrics	5 Minutes	4	Default

7 item(s) returned

Widgets

Reference Tree

Default Server Status Monitor

Details

Name:	Default Server Status Monitor
Description:	Default monitor to collect server status
Enabled:	✓ Enabled
Polling Interval:	5 Minutes
Retention Policy:	Default
Emit Availability:	✗ Not Emit Availability
Retain Availability:	✗ Not Retain Availability
Retain Polled Data:	✓ Retain Polled Data
Retain Calculated Data:	✓ Retain Calculated Data
Update Network Status:	✓ Update Network Status
Unreachable Attempts:	1

Monitor Status Summary

	Target	Last Polled
✓	192.168.53.16	9/13/12 4:31 PM
✓	192.168.53.15	9/13/12 4:31 PM

You must create your own Dashboard to view the data in this monitor. create a custom dashboard

How To:

Create a Server Status Monitor Dashboard

1 Create a custom dashboard.

2 Click the edit icon on one of the dashboard components and set the data source as the Default Server Status Monitor, and the target as the server monitored.

3 Save the monitor

See Dashboard Views on page 331 and How to: Create a Simple Dashboard View on page 333 for more about configuring dashboards.

How To:

Create an SNMP Interface Monitor

To set up a typical performance monitor, follow these steps:

1 In the *Resource Monitors* portlet, and create a new monitor by right-clicking and selecting *New*.

2 Select the type of monitor from the submenu—for this example, an *SNMP Interfaces* monitor.

NOTE:

Some devices have ports rather than interfaces. This monitor works for them too, even though it is an “interface” monitor.

3 In the *General* screen, enter a polling interval (5 minutes is the default). For this example, check *Retain polled data* and accept the remaining defaults for checkboxes and the retention policy.

4 Select an entity to monitor by clicking the *Add* button in the top portion of the *Monitor Options* screen. For an interface monitor, select *Interface* as the Type at the top of the screen. You can also filter the list of interfaces that appear further by selecting *Interface Type* as *ge* (gigabit ethernet), for example.

NOTICE

Notice that you can add refinements like filtering on *Administrative State* and *IP Address* to the filter.

5 Select interfaces (Ctrl+click to add more than one), then click *Add Selection* then *Done* to confirm your entity. Hover your cursor over a line describing an interface to have a more complete description appear as a popup.

6 Click *Browse* to display the MIB Browser. For the sake of this example, we elect to monitor ifInErrors (in RFC Standard MIBs, RFC1213-MIB > Nodes > mib-2 > interfaces > ifTable > ifEntry > ifInErrors).

7 In the *Thresholds* screen, configure thresholds by first clicking *Add*.

8 Click *Add* above the threshold levels list for each threshold you want to add.

9 In the threshold editor, enter a name (Examples: *Low*, *Medium*, *Overload*), an upper and lower boundary, (0 - 10, 10 - 100, 100+), a severity (*Informational*, *Warning*, *Critical*) and color (BLUE, YELLOW, RED). In this case, no string matching is necessary. When the data crosses thresholds, the monitor reacts.

Attributes available depend on the type of monitor you are creating. Notice that you can also check to make crossing this threshold emit a notification (an alarm that would appear on the

Alarm panel). You can also configure the type of calculation, and so on. You can even alter existing thresholds by selecting one then clicking *Edit* to the right of the selected threshold.

10 Click A*pply* for each threshold interval you configure, then A*pply* for the entire threshold configuration.

If a threshold's counter is an SNMP Counter32 (a 32-bit counter) monitoring can exceed its capacity with a fully utilized gigabit interface in a relatively short period of time. The defaults configured in this monitor account for this, but if you know that this is an issue, you can probably configure the monitor to account for it too.

After taking a look at Thresholds no more configuration is required. Notice, however, that you can also configure *Calculated Metrics*, *Inventory Mappings* and *Conditions* on other screens in this editor to calculate additional values based on the monitored attributes, to map them, and to make conditional properties based on monitored behavior.

NOTICE

Calculated Metrics is particularly valuable if you want to monitor a composite like ifInErrors + ifOutErrors or want to calculate a parameter like errors per minute when the monitor's interval is 5 minutes.

11 Click *Save* and the monitor is now active.

Notice that the *Availability* icon appears at the top of a *Monitor Status Summary* snap panel in the Expanded Resource Monitor next to a time/date stamp of its last polling. Right-click the monitor and select *Refresh Monitor* to manually initiate polling.

Values displayed in the Overall Availability column of the Monitor Manager do not automatically refresh and may be out of date. The *Reference Tree* snap panel maps the monitor's relationship to its target(s) attribute(s) and other elements. The *Details* snap panel summarizes the monitor's configuration.

12 For information about having the monitor's results appear in the a *Dashboard* portlet, see *Dashboard Views on page 331*.

How To:

Create an ICMP Monitor

The following steps create an ICMP (ping) monitor.

1 In the *Resource Monitors* portlet, and create a new monitor by right-clicking and selecting *New*.

2 Select the type of monitor from the submenu—for this example, an *ICMP* monitor.

3 In the *General* screen, enter a name (Test ICMP Monitor), and a polling interval (5 minutes is the default). For this example, check *Retain polled data* and accept the remaining defaults for checkboxes and the retention policy.

4. Select an entity to monitor by clicking the *Add* button in the top portion of the *Monitor Options* screen.
5. Select devices you want to ping, (Ctrl+click to add more than one), then click *Add Selection* then *Done* to confirm your entity.
6. Define packets in the ICMP Monitor Options panel, including Packet Size, Packet Count and timeout. You can accept the defaults here, too.
7. In the Thresholds tab, select an attribute (MaxRTT, or maximum round trip time) and add the following thresholds by clicking *Add*:

   Name *High* color red, Lower Boundary 15 and Upper Boundary [blank] Severity *Critical*

   Name *Fine* color green, Lower Boundary 0 and Upper Boundary 15 Severity *Cleared*.

   Notice that this example does not emit a notification. If you checked that checkbox, an alarm of the configured severity would accompany crossing the threshold.
8. Accept the other defaults and click *Apply*
9. Click *Save*.
10. Test ICMP Monitor now appears in the portlet.
11.
12.

How To:
Create a Monitor Report

You can create reports based on your monitors. The following example creates a report based on How to: Create an SNMP Interface Monitor above.

1. Create a new Report Template by right-clicking the Report Templates portlet, selecting *New > Table Template*.
2. Name the report (here: Test SNMP Interface Report).
3. Select a source in the *Source* tab. Here: *Active Monitoring > SNMP Interfaces*.
4. Notice that the *Select your inventory columns* panel displays the attributes available based on your monitor selection.
5. Select *Available* columns and click the right arrow to move them to *Selected*. In this case we select SNMP Interfaces: Monitor Target, Polled Date / Time, ifInErrors.
6. Arrange the columns and fonts as you like in the *Layout* tab.
7. *Save* the template.
8. Right-click, and select *New* in the Reports portlet.
9. Enter a *Name* and *Title* for the report.

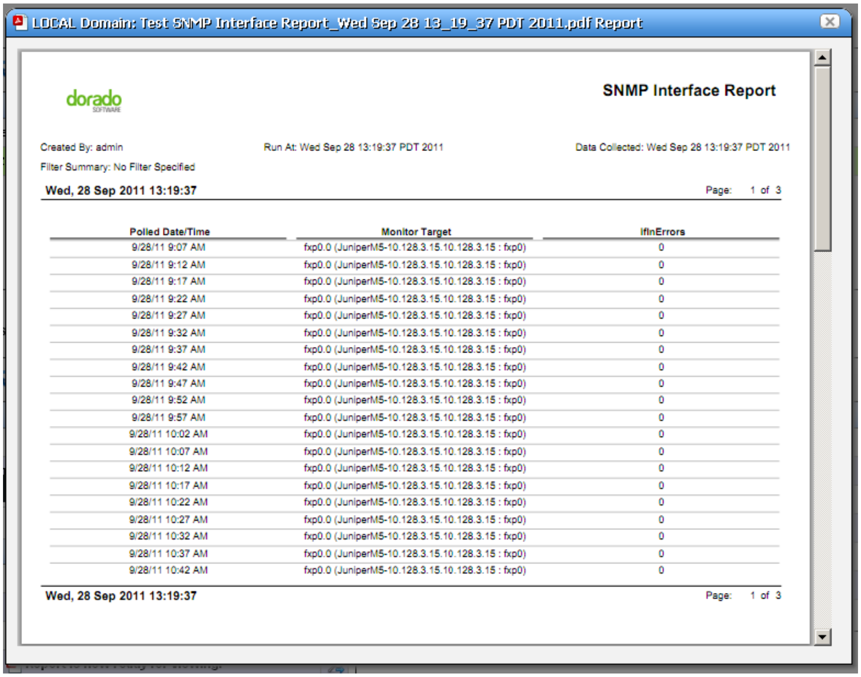
10 Notice that since this is the first report created since you made the Test SNMP Interface Report template, that it is the *Report Template* already selected.

11 Since the monitor already filters devices, we add no filter in the Report, although you could add one to further filter the monitored devices.

12 Test SNMP Interface Report should appear in the Reports portlet.

13 Right-click and select *Execute* (noticing that you can also schedule such reports, even repeatedly).

14 Click the magnifying glass to the right of the Report Completed message in My Alerts to see the report.



LOCAL Domain: Test SNMP Interface Report_Wed Sep 28 13_19_37 PDT 2011.pdf Report

dorado SOFTWARE

SNMP Interface Report

Created By: admin   Run At: Wed Sep 28 13:19:37 PDT 2011   Data Collected: Wed Sep 28 13:19:37 PDT 2011

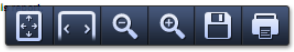
Filter Summary: No Filter Specified

Wed, 28 Sep 2011 13:19:37   Page: 1 of 3

Polled Date/Time	Monitor Target	IfInErrors
9/28/11 9:07 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:12 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:17 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:22 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:27 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:32 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:37 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:42 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:47 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:52 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 9:57 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:02 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:07 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:12 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:17 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:22 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:27 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:32 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:37 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0
9/28/11 10:42 AM	fxp0.0 (JuniperM5-10.128.3.15.10.128.3.15 : fxp0)	0

Wed, 28 Sep 2011 13:19:37   Page: 1 of 3

15 Hover your cursor over the lower right corner of the report to see a set of icons that let you expand, zoom out and in, save, or print the report.



Monitor Options Type-Specific Panels

The following describes the panels associated with the following Monitor Options types.

- ICMP
- Proscan
- SNMP

- SNMP Interfaces
- SNMP Table Monitor

IPSLA OIDS

The following are the object IDs for IPSLA, all found in CISCO-RTTMON-MIB

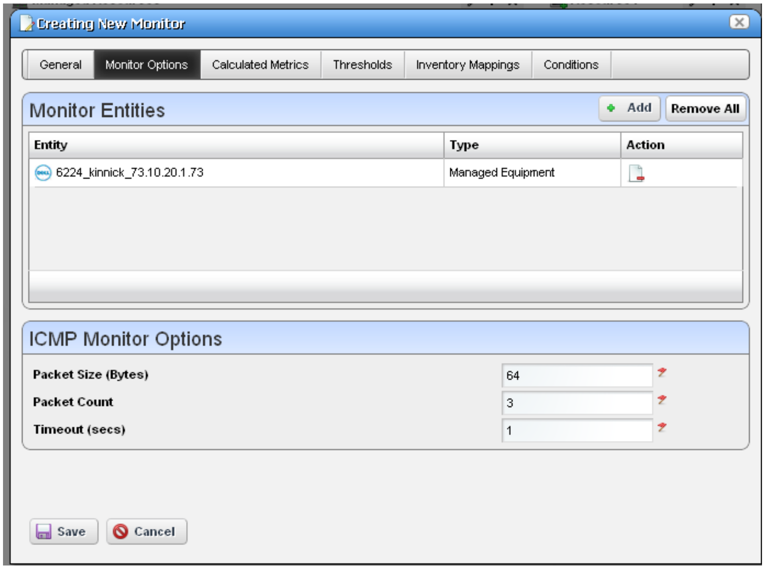
Monitor Attribute Name	Mib Attribute name	OID
NumOfPositvesDS	rttMonEchoAdminNumPackets	1.3.6.1.4.1.9.9.42.1.2.2.1.18
NumOfRTT	rttMonLatestJitterOperNumOfRTT	1.3.6.1.4.1.9.9.42.1.5.2.1.1
RTTSum	rttMonLatestJitterOperRTTSum	1.3.6.1.4.1.9.9.42.1.5.2.1.2
RTTSum2	rttMonLatestJitterOperRTTSum2	1.3.6.1.4.1.9.9.42.1.5.2.1.3
MinRTT	rttMonLatestJitterOperRTTMin	1.3.6.1.4.1.9.9.42.1.5.2.1.4
MaxRTT	rttMonLatestJitterOperRTTMax	1.3.6.1.4.1.9.9.42.1.5.2.1.5
MinOfPositivesSD	rttMonLatestJitterOperMinOfPositivesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.6
MaxOfPositvesSD	rttMonLatestJitterOperMaxOfPositivesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.7
NumOfPositivesSD	rttMonLatestJitterOperNumOfPositivesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.8
NumOfPositivesDS	rttMonLatestJitterOperSumOfPositivesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.9
Sum2PositivesSD	rttMonLatestJitterOperSum2PositivesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.10
MinOfNegativesSD	rttMonLatestJitterOperMinOfNegativesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.11
MaxOfNegativesSD	rttMonLatestJitterOperMaxOfNegativesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.12
NumOfNegativesSD	rttMonLatestJitterOperNumOfNegativesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.13
SumOfNegativesSD	rttMonLatestJitterOperSumOfNegativesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.14
Sum2NegativesSD	rttMonLatestJitterOperSum2NegativesSD	1.3.6.1.4.1.9.9.42.1.5.2.1.15
MinOfPositivesDS	rttMonLatestJitterOperMinOfPositivesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.16
MaxOfPositivesDS	rttMonLatestJitterOperMaxOfPositivesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.17
NumOfPositivesDS	rttMonLatestJitterOperNumOfPositivesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.18

Monitor Attribute Name	Mib Attribute name	OID
SumOfPositivesDS	rttMonLatestJitterOperSumOfPositivesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.19
Sum2PositivesDS	rttMonLatestJitterOperSum2PositivesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.20
MinOfNegativesDS	rttMonLatestJitterOperMinOfNegativesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.21
MaxOfNegativesDS	rttMonLatestJitterOperMaxOfNegativesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.22
NumOfNegativesDS	rttMonLatestJitterOperNumOfNegativesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.23
SumOfNegativesDS	rttMonLatestJitterOperSumOfNegativesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.24
Sum2NegativesDS	rttMonLatestJitterOperSum2NegativesDS	1.3.6.1.4.1.9.9.42.1.5.2.1.25
PacketLossSD	rttMonLatestJitterOperPacketLossSD	1.3.6.1.4.1.9.9.42.1.5.2.1.26
PacketLossDS	rttMonLatestJitterOperPacketLossDS	1.3.6.1.4.1.9.9.42.1.5.2.1.27
PacketOutOfSequence	rttMonLatestJitterOperPacketOutOfSequence	1.3.6.1.4.1.9.9.42.1.5.2.1.28
PacketMIA	rttMonLatestJitterOperPacketMIA	1.3.6.1.4.1.9.9.42.1.5.2.1.29
PacketLateArrival	rttMonLatestJitterOperPacketLateArrival	1.3.6.1.4.1.9.9.42.1.5.2.1.30
OWSumSD	rttMonLatestJitterOperOWSumSD	1.3.6.1.4.1.9.9.42.1.5.2.1.33
OWSum2SD	rttMonLatestJitterOperOWSum2SD	1.3.6.1.4.1.9.9.42.1.5.2.1.34
OWMinSD	rttMonLatestJitterOperOWMinSD	1.3.6.1.4.1.9.9.42.1.5.2.1.35
OWMaxSD	rttMonLatestJitterOperOWMaxSD	1.3.6.1.4.1.9.9.42.1.5.2.1.36
OWSumDS	rttMonLatestJitterOperOWSumDS	1.3.6.1.4.1.9.9.42.1.5.2.1.37
OWSum2DS	rttMonLatestJitterOperOWSum2DS	1.3.6.1.4.1.9.9.42.1.5.2.1.38
OWMinDS	rttMonLatestJitterOperOWMinDS	1.3.6.1.4.1.9.9.42.1.5.2.1.39
OWMaxDS	rttMonLatestJitterOperOWMaxDS	1.3.6.1.4.1.9.9.42.1.5.2.1.40

Monitor Attribute Name	Mib Attribute name	OID
NumOfOW	rttMonLatestJitterOperNumOfOW	1.3.6.1.4.1.9.9.42.1.5.2.1.41
MOS	rttMonLatestJitterOperMOS	1.3.6.1.4.1.9.9.42.1.5.2.1.42
ICPIF	rttMonLatestJitterOperICPIF	1.3.6.1.4.1.9.9.42.1.5.2.1.43
InterArrivalJitterOut	rttMonLatestJitterOperIAJOut	1.3.6.1.4.1.9.9.42.1.5.2.1.44
InterArrivalJitterIn	rttMonLatestJitterOperIAJIn	1.3.6.1.4.1.9.9.42.1.5.2.1.45
AvgJitter	rttMonLatestJitterOperAvgJitter	1.3.6.1.4.1.9.9.42.1.5.2.1.46
AvgJitterSD	rttMonLatestJitterOperAvgSDJ	1.3.6.1.4.1.9.9.42.1.5.2.1.47
AvgJitterDS	rttMonLatestJitterOperAvgDSJ	1.3.6.1.4.1.9.9.42.1.5.2.1.48
OWAvgSD	rttMonLatestJitterOperOWAvgSD	1.3.6.1.4.1.9.9.42.1.5.2.1.49
OWAvgDS	rttMonLatestJitterOperOWAvgDS	1.3.6.1.4.1.9.9.42.1.5.2.1.50
LatestHTTPOperRT	rttMonLatestHTTPOperRTT	1.3.6.1.4.1.9.9.42.1.5.1.1.1
LatestHTTPOperDNSRTT	rttMonLatestHTTPOperDNSRTT	1.3.6.1.4.1.9.9.42.1.5.1.1.2
LatestHTTPOperTCPConnectRTT	rttMonLatestHTTPOperTCPConnectRTT	1.3.6.1.4.1.9.9.42.1.5.1.1.3
LatestHTTPOperTransactionRTT	rttMonLatestHTTPOperTransactionRTT	1.3.6.1.4.1.9.9.42.1.5.1.1.4
LatestHTTPOperMessageBodyOctets	rttMonLatestHTTPOperMessageBodyOctets	1.3.6.1.4.1.9.9.42.1.5.1.1.5
LatestHTTPOperSense	rttMonLatestHTTPOperSense	1.3.6.1.4.1.9.9.42.1.5.1.1.6
LatestHTTPErrorSenseDescription	rttMonLatestHTTPErrorSenseDescription	1.3.6.1.4.1.9.9.42.1.5.1.1.7
LatestRttOperCompletionTime	rttMonLatestRttOperCompletionTime	1.3.6.1.4.1.9.9.42.1.2.10.1.1

ICMP

The ICMP Monitor Options panel contains the following properties:



Creating New Monitor

Monitor Entities

Entity	Type	Action
6224_kinnick_73.10.20.1.73	Managed Equipment	

ICMP Monitor Options

Packet Size (Bytes): 64

Packet Count: 3

Timeout (secs): 1

Packet Size—Size of packet for ICMP transmission

Packet Count—Number of packets to send.

Timeout—Number of seconds without a response before a timeout is issued

The ICMP Entity Panel lets you select resource groups and Resource manager objects. Clicking *Add* button displays a selector panel for these.

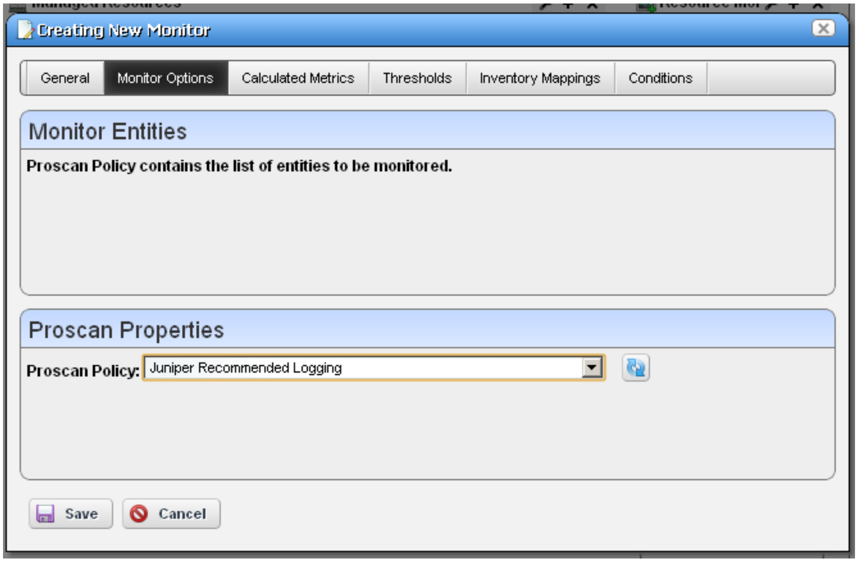
Select the type of entity you want to add, then select any desired filter attributes, then click *Apply Filter*. Select from the entities that appear and add them to the monitor.

NOTE:

Migrating from previous versions updates the Network Status check box to true and redeploys the monitor.

Proscan

In this screen, you simply select the Proscan policy to monitor. In the Thresholds tab, you can set thresholds for both in and out of compliance numbers.



Proscan Policy contains the list of entities to be monitored.

Proscan Policy: Juniper Recommended Logging

The Proscan policy contains the target network assets.

Execute the Proscan only *after* creating the monitor. The Proscan monitor displays data when you create it and its supporting Proscan policy in the following order:

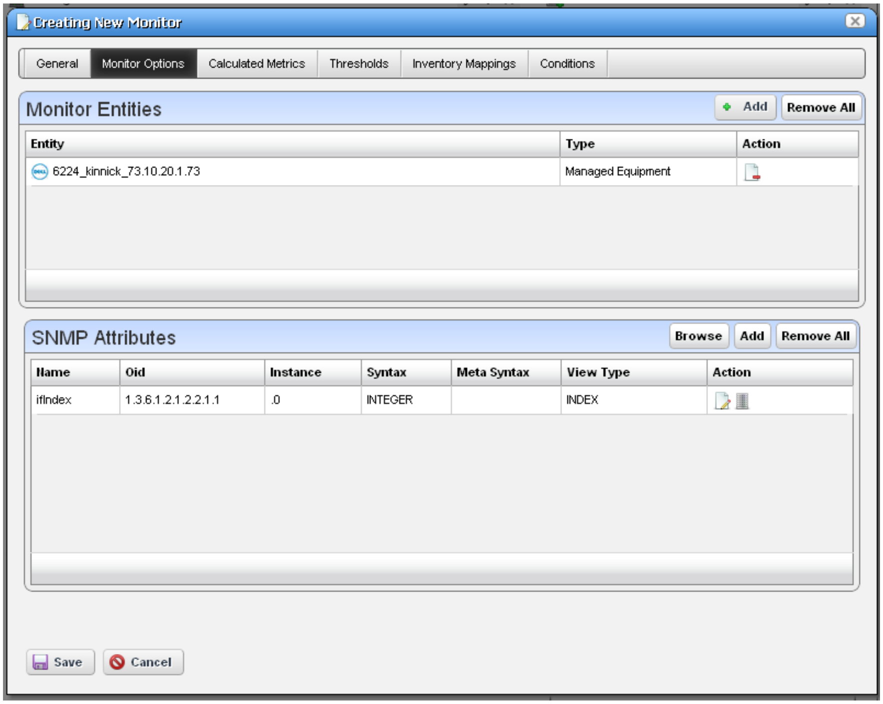
1 Create Proscan policy X that has explicit targets.

2 Create a Proscan monitor referring to Proscan policy X, and modify polling to the desired interval.

3 Execute Proscan X.

SNMP

The SNMP attributes panel lets you specify which SNMP attributes are to be monitored.



Monitor Entities

Entity	Type	Action
6224_kinnick_73.10.20.1.73	Managed Equipment	

SNMP Attributes

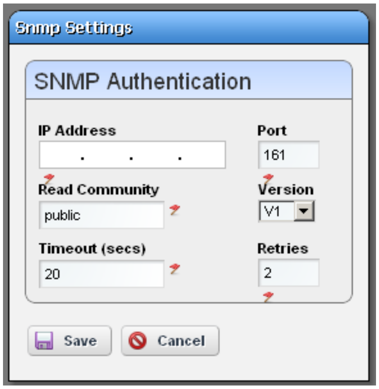
Name	Oid	Instance	Syntax	Meta Syntax	View Type	Action
ifIndex	1.3.6.1.2.1.2.2.1.1	.0	INTEGER		INDEX	

You can specify the SNMP attributes the following ways:

- With the SNMP browser, or
- Entering the SNMP attribute properties explicitly.

The *Browse* button launches the SNMP MIB browser. (See MIB Browser on page 214) You can also click the *Device Results* tab to open an SNMP authentication screen and log into any device you specify, even undiscovered devices. Specify the IP address, SNMP Read Community, port, SNMP version, timeout and retries.

Click on the desired SNMP nodes and then click on the *Add Selection* button to add an SNMP attribute. When done selecting, click the *Done* button to add selected attributes to the monitor or *Cancel* to abandon the operation and close the browser.



SNMP Authentication

IP Address: . . .

Port: 161

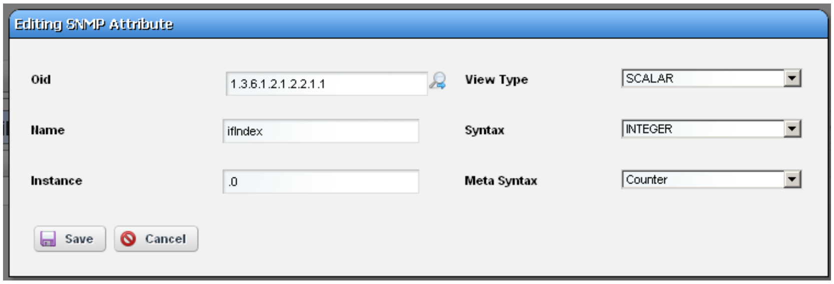
Read Community: public

Version: V1

Timeout (secs): 20

Retries: 2

The Add and Edit buttons in the SNMP attribute panel launch the SNMP Attribute editor.



Editing SNMP Attribute

Oid	1.3.6.1.2.1.2.2.1.1	View Type	SCALAR
Name	ifIndex	Syntax	INTEGER
Instance	.0	Meta Syntax	Counter

This panel contains the following properties:

Oid—The object identifier for this attribute

Name—This attribute's name

Instance—SNMP instance. 0 for scalar or the ifIndex value for an SNMP column.

View Type—*Scalar* or *Column*.

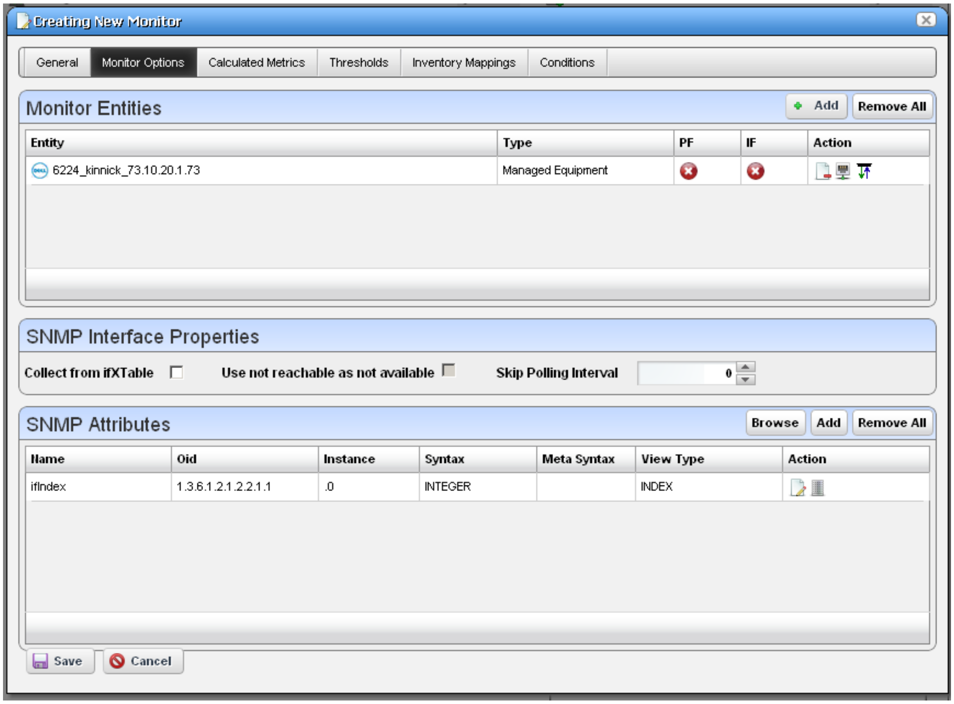
Syntax—*Integer, Boolean, DisplayString*, and so on.

Meta Syntax—*Counter, Gauge*, and so on.

If you type in an OID and click the search button next to the OID field, the browser searches the MIB for the OID and fills in the other values if it finds the OID.

SNMP Interfaces

The SNMP Interface Monitor Entity editor supports the following entity types: group, equipment manager, port and interface. It also supports port and interface filters on groups and equipment manager objects.



Entity	Type	PF	IF	Action
6224_kinnick_73.10.20.1.73	Managed Equipment	✗	✗	

Collect from ifXTable ☐ Use not reachable as not available ☐ Skip Polling Interval 0

Name	Oid	Instance	Syntax	Meta Syntax	View Type	Action
ifIndex	1.3.6.1.2.1.2.2.1.1	.0	INTEGER		INDEX	

If you check the *Collect from ifXTable* checkbox, then OpenManage Network Manager attempts to fetch attributes from the ifXTable. These attributes are ifHighSpeed, ifHCInOctets, ifHCInUcastPkts, ifHCOutOctets and ifHCOutUcastPkts. If any of these attributes are not available, then it fetches from ifTable.

If an interface does not support ifxTable, SNMP get typically retrieves an error and Dell OpenManage Network Manager uses the ifTable instead. Some ATM ports do not send errors from the ifxTable oids, so Dell OpenManage Network Manager also uses the ifTable values if ifHighSpeed is 0.

NOTE:

The SNMP V1 protocol does not support 64bit counters located in ifXtable. This means Dell OpenManage Network Manager monitors only collect performance data from ifTable when a device is discovered using the SNMP V1 protocol. Best practice: Discover devices using snmpV2c or snmpV3 protocols to collect performance data located in ifXtable.

Even with this checked, Dell OpenManage Network Manager defaulting to 32-bit counters if 64-bit is not available.

Dell OpenManage Network Manager now supports multiple indexes in the SNMP Interface monitor. Specify them in the instance field, separated by dots. For `sfpTxPowerValue 1.3.6.1.4.1.28458.7.2.4.6.7.1.22.Y.Z`, where `Y` is the slot and `Z` is the @ifindex, specify `@slotNumber.@ifIndex` as the instance. You can also specify a constant string. For `sonetLineIntervalUASs 1.3.6.1.2.1.10.39.1.3.2.1.5. X.16` Where `X` is the @ifindex and 16 is the last record, specify `@ifIndex.16`.

The variable name following the "@" must correspond to an attribute in the port or interface bean.

When determining the "not available" status of a device, SNMP AdminStatus and OperationalStatus messages both have to indicate a device is Available before a monitor determines it is available.

Certain devices that do not support ifTable availability indicators. For the sake of these devices, a *Skip availability check* checkbox appears.

The *Skip Polling Interval* configures skipped availability checks when polling, so you can check availability, for example, every fourth polling interval (skipping three). This helps the monitor avoid flutter artifacts

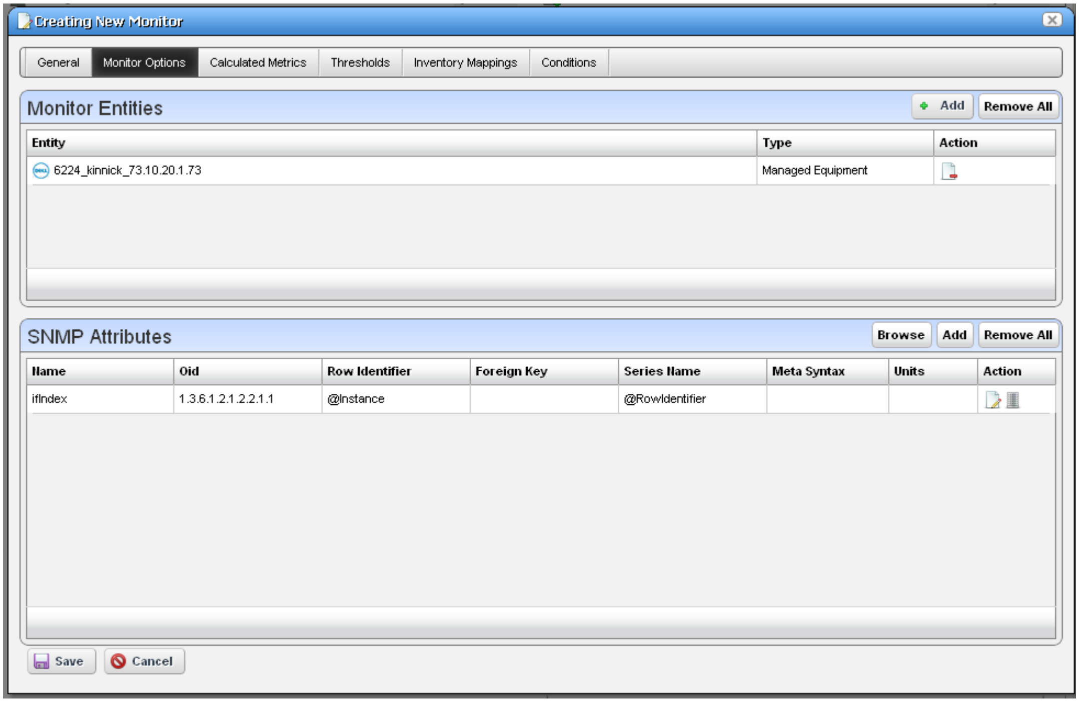
The PF and IF table columns indicate if a port filter or interface filter is configured for the entity. Click the icons on the right side of the list of Monitor Entities to configure filters. Clicking these buttons displays an interface configuration panel.

This panel lets you specify filter attributes for the port or interface filters you want to monitor. For example, if you select a device but only want to monitor active interfaces created by a particular user, then these filters do the job.

The SNMP Attributes panel is the same as described in SNMP on page 323.

SNMP Table Monitor

This panel appears if you are editing an SNMP Table monitor. The application stores not absolute numbers from counters but the counter's change since its last measurement.



Entity	Type	Action
6224_kinnick_73.10.20.1.73	Managed Equipment	

Name	Oid	Row Identifier	Foreign Key	Series Name	Meta Syntax	Units	Action
ifIndex	1.3.6.1.2.1.2.2.1.1	@Instance		@RowIdentifier			

Columns include the SNMP Attribute Name, OID, Row Identifier, Foreign Key, Series Name, Meta Syntax, Units, and Action.

NOTICE

If you select one of the 64-bit counters in ifXTable, make sure the Meta Syntax is 64-bit.

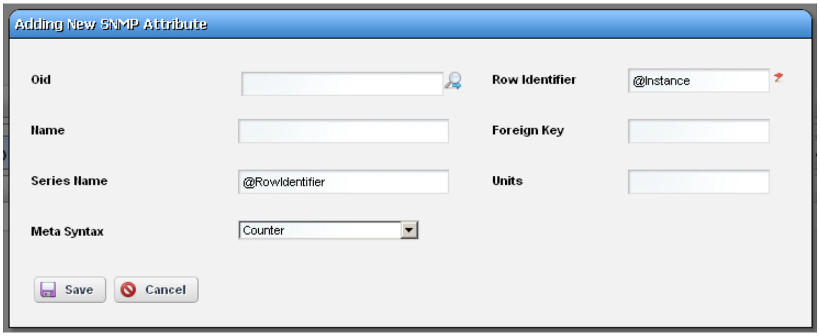
Clicking the *Add* or the *Edit* button to the right opens either a MIB Browser where you can retrieve these attributes, or an Add / Edit SNMP Attributes editor at the bottom of the screen, See the following sections for details.

MIB Browser

This lets you select attributes to monitor as described in MIB Browser on page 214. The SNMP table monitor lets you pick a table column, not the entire table.

Add / Edit SNMP Attributes

This screen lets you specify individual attributes.



Adding New SNMP Attribute

Oid		Row Identifier	@Instance
Name		Foreign Key	
Series Name	@RowIdentifier	Units	
Meta Syntax	Counter		

It has the following fields:

Oid— A field where you can enter the object identifier. This also has an integrated search function. Click the magnifying glass icon on the right to activate it. A successful search populates the rest of the fields for the object identifier.

Row Identifier—This mandatory field defaults to @instance (The OID instance).

Name—The text identifier for the OID

Foreign Key—Enter the foreign key, if any.

Series Name—This defaults to @RowIdentifier.

Units—Enter the units of measurement.

Meta Syntax—Further refine the variable type with the pick list. For example, you can select *Counter32* (a 32-bit counter). For Counter types, the monitor computes change from previous readings, and for Gauges it does not.

NOTE:

If a message appears saying: “Device fault: Return packet too big” in the Monitor Status Summary, then you have selected too many SNMP attributes to poll in a single request. Please modify your monitor to request smaller numbers of attributes

Scheduling Refresh Monitor Targets

Because monitors can address targets that are members of dynamic groups, refreshing these ensures that group memberships are up-to-date. To do this, you can create or alter the schedule for Monitor Target Refresh (in most packages, such a scheduled item appears by default). When executed, this updates monitors with groups as targets based on current memberships. This removes targets no longer members of a monitored group and adds new group members. A seeded schedule refreshes these every six hours, by default.

Refresh Monitor manually by right-clicking in the Resource Monitors table.

Refresh Monitor Targets for Newly Discovered Devices

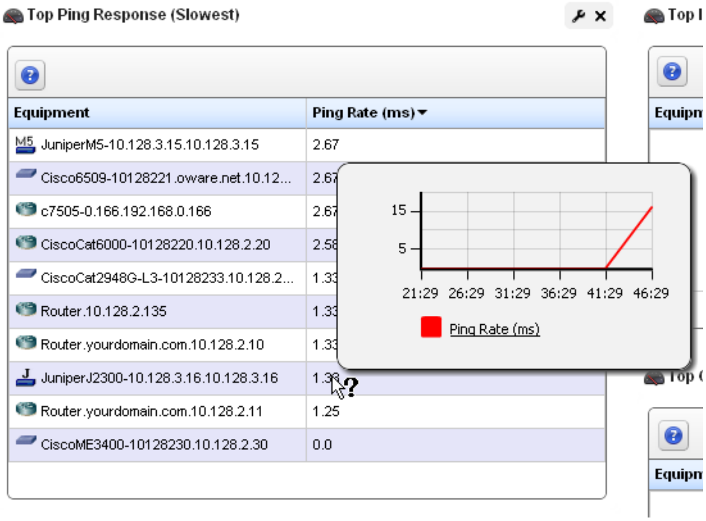
If you discover a new device that is part of a monitored dynamic group, it may take some time before monitoring includes that device. To provide immediate monitoring, as soon as discovery finds the device, add the *Refresh Monitor* action to the discovery profile. See *Actions on page 100* for more about that Discovery Profile capability.

To make sure this refresh occurs, do *not* override the following in `redcell.properties` (This section defines the actions executed when no default discovery profile exists):

```
#This shows the default order of Task Activities within Resource Discovery
   Options

#The TaskDefOid will be used for identification and true/false will
   determine if they are

#on by default

#format: <TaskDefOid>&&true,<TaskDefOid2>&&false,<TaskDefOid3>&&true

redcell.discovery.taskactivity.order=Resync&&true,\

DataCollectionForGroupOfDevices&&false,\

Discover_Links_for_a_Group_of_Devices&&false,\

Scheduled_Resync&&false,\

Refresh_Monitor_Targets&&true
```

Top N [Assets]

Dell OpenManage Network Manager uses seeded, default Active Performance Monitors (APM) to display performance data in several categories. These portlets display the summary results of device monitoring, for example, Top Ping Response (Slowest) displays the devices slowest to respond to ping.



Top Ping Response (Slowest)

Equipment	Ping Rate (ms)
JuniperM5-10.128.3.15.10.128.3.15	2.67
Cisco6509-10128221.oware.net.10.12...	2.67
c7505-0.166.192.168.0.166	2.67
CiscoCat6000-10128220.10.128.2.20	2.58
CiscoCat2948G-L3-10128233.10.128.2...	1.33
Router.10.128.2.135	1.33
Router.yourdomain.com.10.128.2.10	1.33
JuniperJ2300-10.128.3.16.10.128.3.16	1.33
Router.yourdomain.com.10.128.2.11	1.25
CiscoME3400-10128230.10.128.2.30	0.0

Devices appear, ranked by the monitored parameter. Hover the cursor over the Ping Rate column, and a row’s a popup graph of recent activity over time appears.

If you right-click a monitored item, you can select from menu items like those that appear in the portlet described in Managed Resources on page 195.

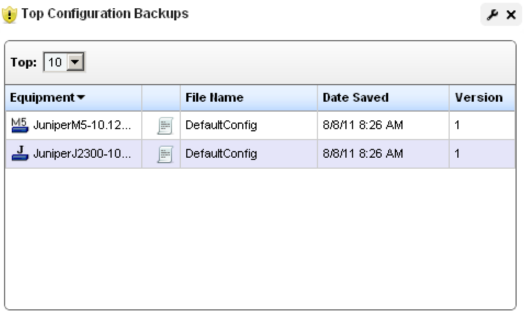
For some portlets (for example Top CPU / Disk / Memory Utilization, Top Interface Bandwidth / Errors), the right-click Performance menu items include Key Metrics. The menu can include *Performance* which displays Dashboard Views related to the selected monitor.

For some packages, these can also include IP SLA statistics like the following: Top Bandwidth Received / Transmitted, Top CPU / Disk Utilization, Top Ingress / Egress Packet Loss, Top Jitter, and Top RT Delay. To see all available *Top* portlets, click *Add > Applications* and look below *Top N* on the subsequent panel.

Top Configuration Backups

This panel lists the most recent configurations backed up from devices. The pick list in the upper right corner lets you select not just the top 10 such backups, but the top 5, 10, 15, 20, and 25.

Right-clicking a backup offers the same options as the portlet described in Configuration Files on page 278.



Top Configuration Backups

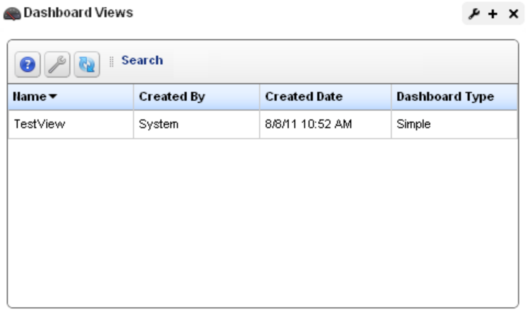
Top: 10

Equipment		File Name	Date Saved	Version
JuniperM5-10.12...		DefaultConfig	8/8/11 8:26 AM	1
JuniperJ2300-10...		DefaultConfig	8/8/11 8:26 AM	1

Dashboard Views

The Dashboard Views portlet lets you assemble several monitors into a single display, or dashboard. You can create and display dashboards by right-clicking items in Managed Resources, selecting *Show Performance*, or by selecting *New* in the *Dashboard Views* portlet.

Right-click the listed dashboards, and a menu appears that lets you *Rename*, *Delete*, *Edit*, create a *New* simple or custom dashboard, or *Launch* a Dashboard View (either *Maximize*—a larger view—or as a *Popup*). See Dashboard Editor on page 335 for information about creating or modifying dashboards. For an explanation of *Convert*, see *Convert Simple Dashboards to Custom Dashboards on page* 342.



Dashboard Views

Search

Name	Created By	Created Date	Dashboard Type
TestView	System	8/8/11 10:52 AM	Simple

The Performance Dashboard on page 334 and Dashboard Editor on page 335 describe configuring simple dashboards. See the How to: Create a Custom Dashboard View on page 337 section for a description of custom dashboard view creation.

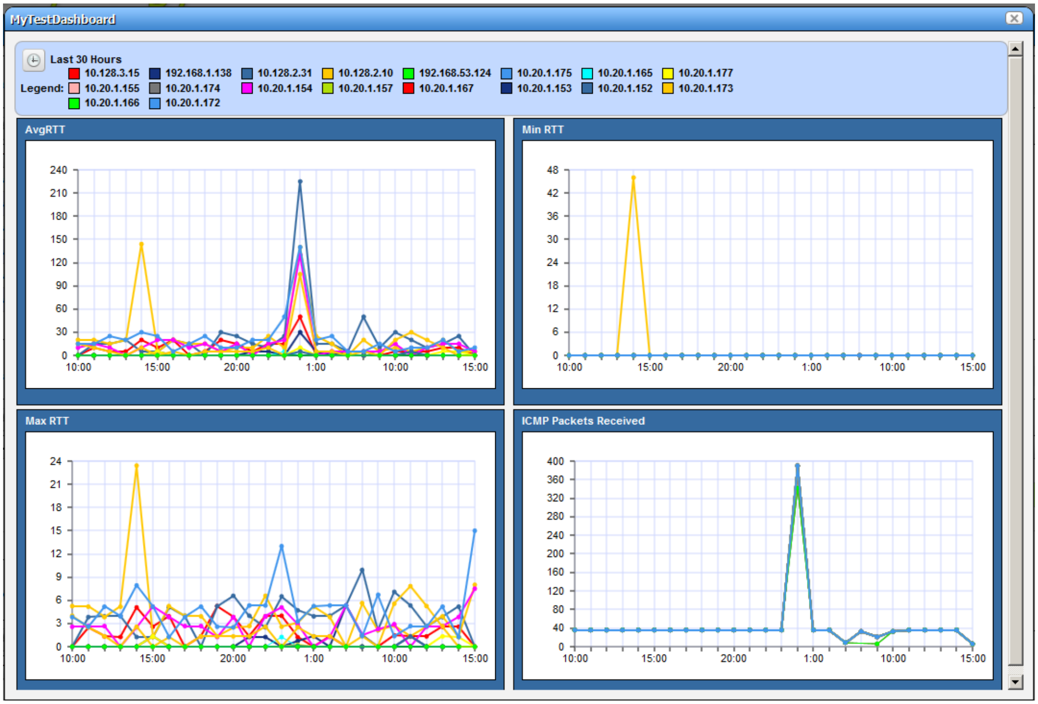
You can also Convert Simple Dashboards to Custom Dashboards, as described below. When you *Edit* a view, Dashboard Editor appears. It lets you select which monitors appear in the dashboard, the monitored entities, and attributes.

The expanded portlet offers similar capabilities.To make a monitor appear on a page, use the portlet described in Performance Dashboard on page 334.

When you create dashboards, data rollup is part of what the display shows. If, for example, the monitor displays the results from a boolean (0 or 1 output), rollup may average values for a duration, and values less than one will appear in the graph.

Launch a Dashboard View

Launching a view lets you view the monitors active for a Dashboard view.



Some packages display a *Network Dashboard* by default. If the Network Dashboard portlet is blank, you can create a dashboard, then click the *select new* text in the upper right corner of the portlet to select an alternative, already configured view from those in Dashboard Views portlet. Click the *edit* button in that same corner to alter the configuration of any existing dashboard. See Dashboard Editor on page 335 for more about altering views.

You can configure Dashboards appear by configuring them in the Dashboard Views portlet, or by selecting a device or devices in Managed Resources portlet, right-clicking and choosing *Show Performance*. To select more than one device, use the expanded Managed Resources portlet.

The first time you create a default template dashboard for a single device, Dell OpenManage Network Manager saves it in the Dashboard Views manager. Invoking *Show Performance* for that device subsequently displays its default view.

The icons in the dashboard's upper right corner let you edit *Dashboard Properties* with the Dashboard Editor, or *Save* the dashboard with the other icon.

Displaying Values

Hovering the cursor over the individual points displays the charted attribute value(s) as popup tooltips. If a graph has multiple lines, the data points for different lines are charted at different times (Dell OpenManage Network Manager distributes polling to balance the load on its mediation service). Hover the cursor over the time when a line's data point appears, and that line's value appears as a tooltip. It may seem a device reporting the same value as others is not graphed properly, but mousing over the graph displays the value.

The legend of devices and/or attributes that appear in each graph also provides interactive features. Hover your cursor over a device or attribute color in the legend and only that device or attribute appears onscreen. By default all such legend color squares contain checks. Uncheck the ones you do not want to see. The legend can appear consolidated or for each chart, as is appropriate to the distribution of charted devices and attributes.

If no data is available for an attribute in a dashboard, no panel appears for that data.

Changing Dashboard Time / Date Format

Control panel's Redcell > Application Settings screen has a *Performance Chart Settings* panel where you can set the *Day Format* and *Minute Format* so dashboards display time (the x axis) in a meaningful way. If you want european date formats (day/month/year rather than month/day/year), this is available if the language / location settings of the operating system on the computer running Dell OpenManage Network Manager makes it available.

How To:

Create a Simple Dashboard View

Follow these steps to create a simple dashboard view. See How to: Create a Custom Dashboard View on page 337 for more complex monitor creation.

1 In the Dashboard Views portlet, right click to select *New > Simple Dashboard.*

2 Select a name (for example SNMP Interface, to display the monitor configured in How to:Create an SNMP Interface Monitor on page 314).

3 Click *Add Entity* in the Entities panel.

4 In the filter that appears, select the type: Interface.

5 Filter for the IP address of the entity monitored in the previous SNMP interface monitor creation, select it and click *Add Selection* and *Done.*

6 Select the ifInErrors attribute, and click the right arrow in the Dashboard View Attributes panel.

7 Click *Save*. The dashboard view you have configured should appear in the portlet.

8 To launch it, right-click and either *Launch (Popup)* or *Launch (Maximize)*

9 If you want to convert this simple dashboard to a custom dashboard so you can alter it further, right-click and click *Convert*.

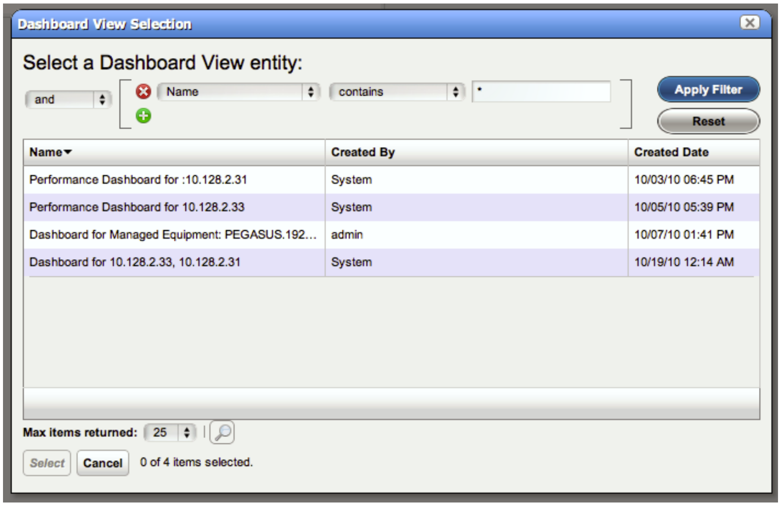
10 Notice that you can also change the time/date format as described in Changing Dashboard Time / Date Format above.

Performance Dashboard

This portlet lets you install and configure Dashboard Views as permanent displays rather than portlets. When you initially install this portlet, it appears empty. The message “No Dashboard View has been set:” appears with a *Select* button. Click that button to open the Dashboard View Selection screen.

Dashboard View Selection

This screen displays any existing dashboards so you can select one for the Performance Dashboard you want to appear on a page in Dell OpenManage Network Manager.



Dashboard View Selection

Select a Dashboard View entity:

and | Name | contains | *

Name	Created By	Created Date
Performance Dashboard for :10.128.2.31	System	10/03/10 06:45 PM
Performance Dashboard for 10.128.2.33	System	10/05/10 05:39 PM
Dashboard for Managed Equipment: PEGASUS.192...	admin	10/07/10 01:41 PM
Dashboard for 10.128.2.33, 10.128.2.31	System	10/19/10 12:14 AM

Max items returned: 25

0 of 4 items selected.

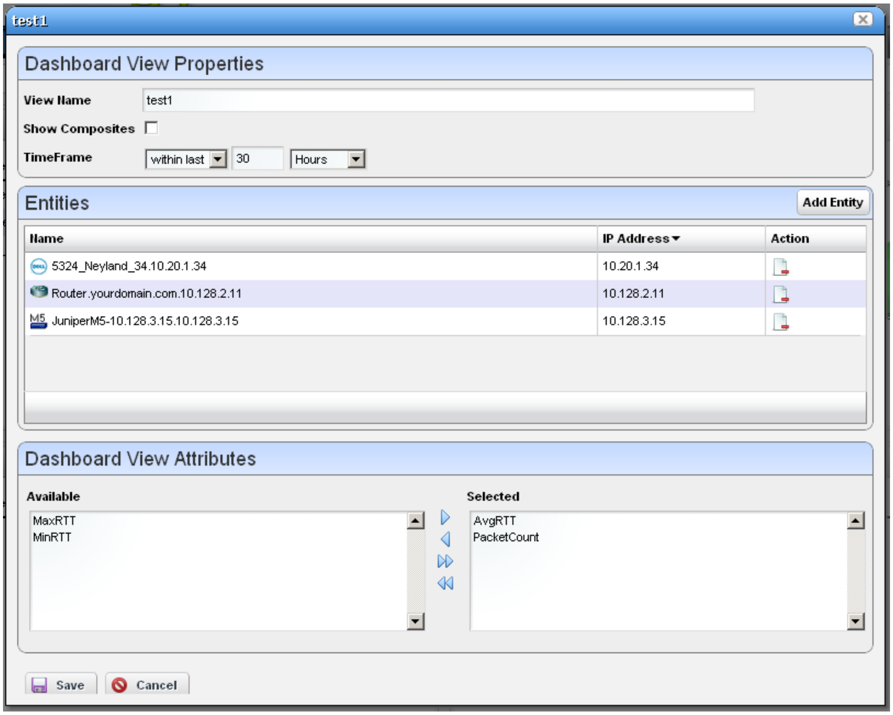
Use the filter at the top of this selector to limit the listed dashboards from which you can select. See Dashboard Views on page 331 for more about creating and configuring the views from which you select.

NOTICE

If you delete the Network Status Dashboard can put it back by adding the Performance Dashboard portlet to the desired page, then select the desired Dashboard View you would like to display as your Network Dashboard.

Dashboard Editor

When you *Edit* dashboard by right-clicking a resource in Managed Resources and selecting *Show Performance*, or create (select *New*) a dashboard from the Dashboard Views portlet, an editor appears that lets you select and rearrange the monitor components of the dashboard.



test1

Dashboard View Properties

View Name: test1

Show Composites □

TimeFrame: within last 30 Hours

Entities

Name	IP Address	Action
5324_Neyland_34.10.20.1.34	10.20.1.34	
Router.yourdomain.com.10.128.2.11	10.128.2.11	
JuniperM5-10.128.3.15.10.128.3.15	10.128.3.15	

Dashboard View Attributes

Available: MaxRTT, MinRTT

Selected: AvgRTT, PacketCount

This screen has the following fields:

View Name—The identifier for the dashboard. The default is “Performance dashboard for [IP address],” but you can edit this. This is what appears in the Dashboard Views list.

Show Composites—Show attributes that are constructed from other attributes. Composites attributes are special attributes that consist of the attribute name and the instance name. For example: CPU Utilization:cpu1. Some KPI metrics are composite. If you use SNMP Table monitor, then pretty much all values retrieved are composite.

TimeFrame—Use the selectors to configure the time frame for the performance measurement displayed.

Entities—Select the equipment you want to monitor. When you right-click to *Show Performance* with resource(s) selected, those resources appear in this list.

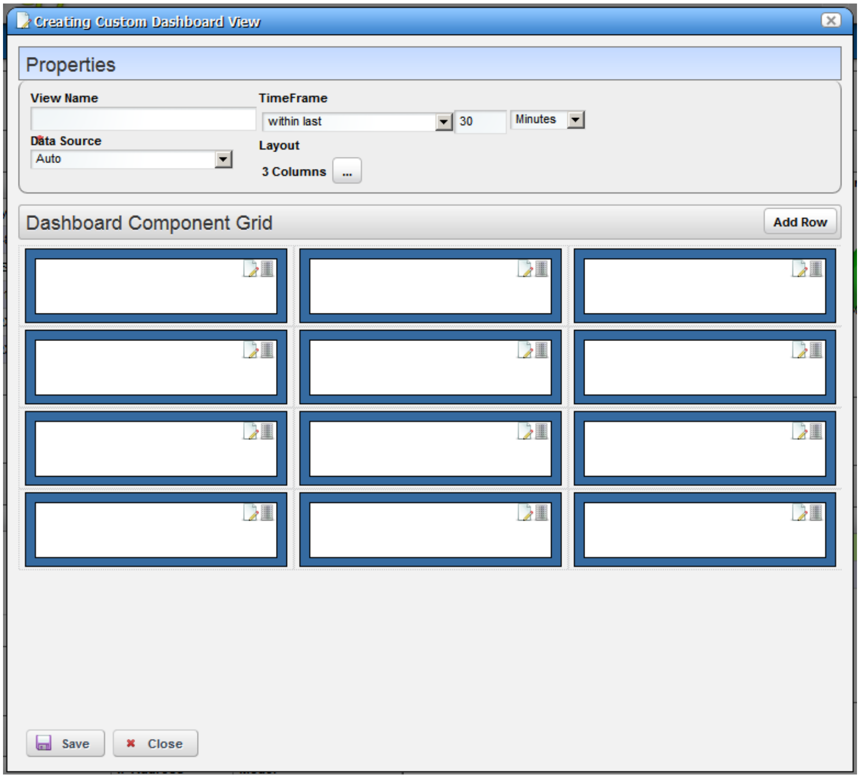
Dashboard View Attributes—Click the arrows between *Available* and *Selected* panels to select monitors for the dashboard. The Available Attributes list shows all the available attributes for that device based on its monitor affiliations. If you select none, a chart appears for each attribute that has data. This is the default. If the user moves some attributes to the *Selected* list then only charts for those attributes appear.

How To:

Create a Custom Dashboard View

The following steps create a custom dashboard view:

1 In the Dashboard Views portlet, select the *New Custom Dashboard* command. An empty default view with twelve components appears.



Creating Custom Dashboard View

Properties

View Name:

TimeFrame: within last 30 Minutes

Data Source: Auto

Layout: 3 Columns

The Properties panel contains the following controls:

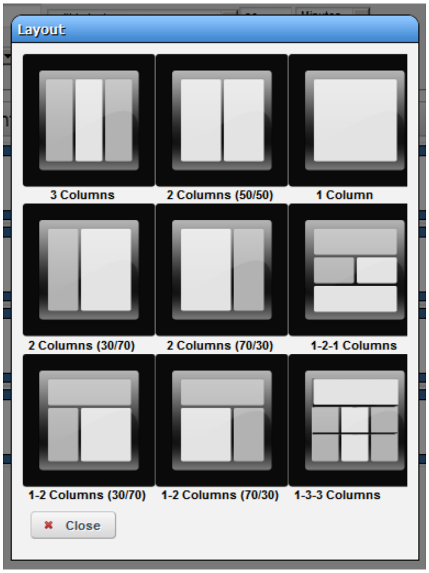
View Name—The name of the dashboard view (Required)

Time Frame—The period over which to display the data. May be either relative (like *last 30 minutes*) or absolute (between specific dates and times). The specified frame applies to all charts in the dashboard.

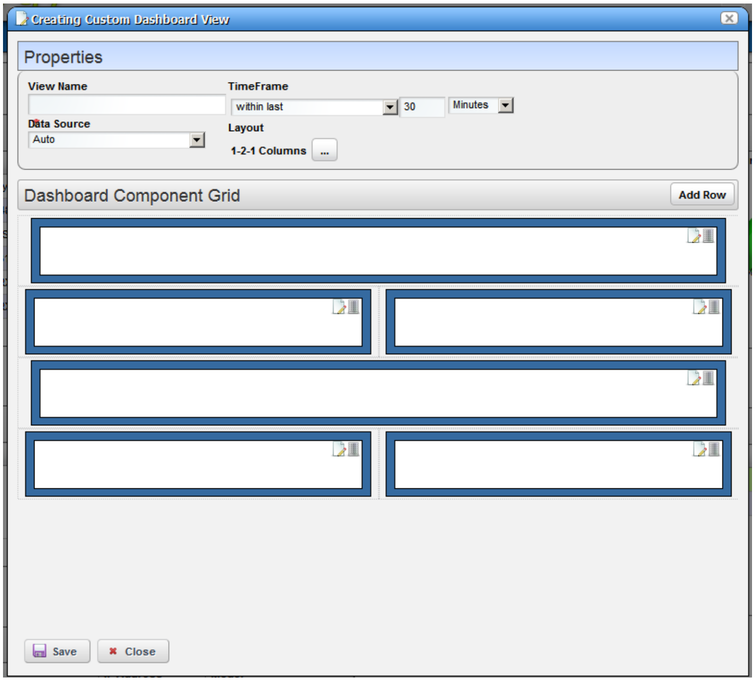
Data Source—Source for the data. *Current* displays current (raw) data. *Hourly* displays rolled up hourly data. *Daily* displays rolled up daily data. *Auto* (default) determines which data source to use based on the selected time frame.

Layout—Select the desired layout style used to display the dashboard components.

2 To select a layout style, click on the ... button next to the current layout. The layout chooser appears.



3 Click on the desired layout or click *Close* to keep the current layout. The components displayed to reflect the selected new layout.



Creating Custom Dashboard View

Properties

View Name:

TimeFrame: within last 30 Minutes

Data Source: Auto

Layout: 1-2-1 Columns

Dashboard Component Grid

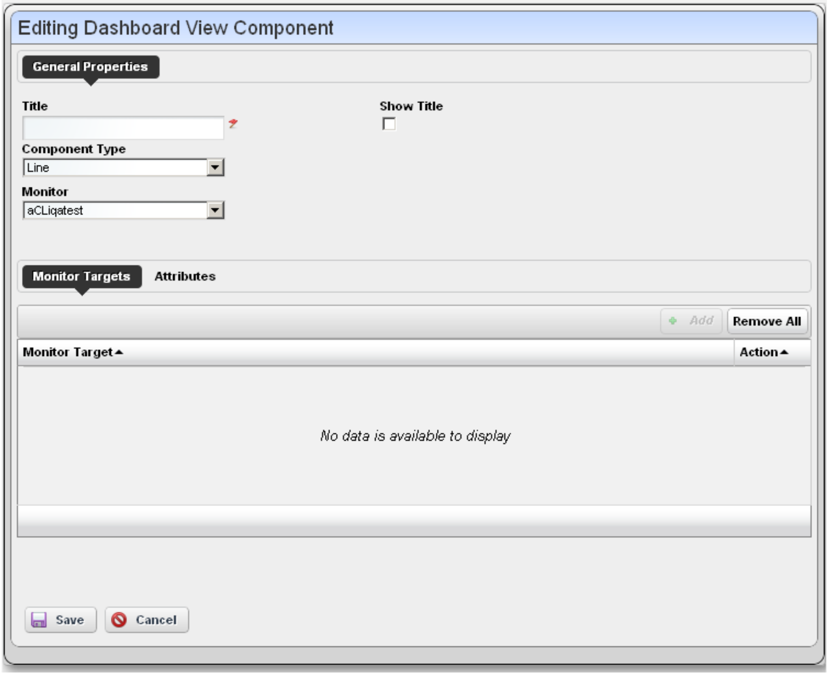
If no dashboard components have been configured yet a default configuration appears with three or four rows depending on the dashboard style. If the dashboard components have been configured it will create at least enough rows to display all the configured dashboard components. Add more rows by clicking on the *Add Row* button. An individual dashboard component can be deleted by clicking on the delete button on the component.

Moving Dashboard Components

4 To move a dashboard component to another location, click and drag it over another component. When you release the mouse, the components exchange places.

Configuring Dashboard Components

5 To configure a dashboard component, click the *Edit* button in the upper right corner of the component. The component editor appears.



Editing Dashboard View Component

General Properties

Title

Show Title □

Component Type: Line

Monitor: aCLiqatest

Monitor Targets | Attributes

Monitor Target▲	Action▲

No data is available to display

The following properties appear in the General Properties section:

Title—Title of this component (required)

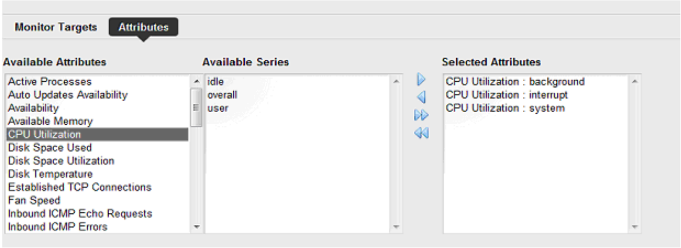
Show Title—Check to display this title above the chart for this component. This overrides the default title that is shown for some charts.

Component Type—Combo Box which specifies what type of component to create. These include the following chart types, *Line*, *Dial*, *Bar*, *Top Talkers* (a line chart showing the top [or bottom] n components for a specific attribute on a specific monitor) *Top Subcomponents* (a line chart showing the top [or bottom] n subcomponents belonging to a specific device for a specific attribute. See

Other controls appear depending on the component type selected. These components also have a *Monitor* control, a pick list where you can select from which monitor the charted data originates. See Dial Chart Properties, Top Talkers Properties and Top Subcomponents Properties below for specifics about those.

The line and bar components have two tabs under the general properties section: *Monitor Targets* and *Attributes*. The Monitor Targets section lets you select the devices that are sources of data. Click the *Add* button displays the monitor target selector.

6 The Attributes tab selects the attribute(s) that appear in the chart. If an attribute is a composite, then its series appears in the Available Series listbox.



CPU Utilization : background
CPU Utilization : interrupt
CPU Utilization : system

Select the desired series and click the right arrow to move them to the Selected Attributes listbox.

If the attribute is not a composite, then nothing appears in the Available Series listbox. Here, click the right arrow to move the attribute to the *Selected Attributes* listbox.

Dial Chart Properties

Dial charts have the following additional properties

Monitor—Select which monitor the charted data comes from in the pick list.

Attribute—The attribute to get data for.

Min / Max Value—The minimum / maximum value on the dial.

Entity—The monitor target to get the data for. Clicking on the + button brings up the entity selector.

Top Talkers Properties

Top Talkers components have the following properties.

Monitor—Select which monitor the charted data comes from in the pick list.

Attribute—The attribute to get data for.

Max # of Entities—The number of entities to display

Order—Select either *Ascending* (Bottom n), or *Descending* (Top n).

Top Subcomponents Properties

Top Subcomponents components have the following properties.

Entity—The parent entity for the found subcomponents. Clicking on the + button brings up the entity selector.

Attribute—The attribute to get data for.

Max # of Entities—The number of entities to display

Order—Select either *Ascending* (Bottom n), or *Descending* (Top n).

Convert Simple Dashboards to Custom Dashboards

To convert a simple dashboard to a custom dashboard use the *Convert* command on the *Dashboard Views* menu. You cannot convert custom dashboards to simple dashboards.

Show Performance Templates

By default, the Show Performance command displays data for the first twelve attributes it finds. You can control which attributes appear when you select Show Performance by creating a performance template. A performance template lets you set dashboard parameters and associate them to one or more device models. Then, when you execute Show Performance on a device of that type, those dashboard parameters display the dashboard for that device.

How To:

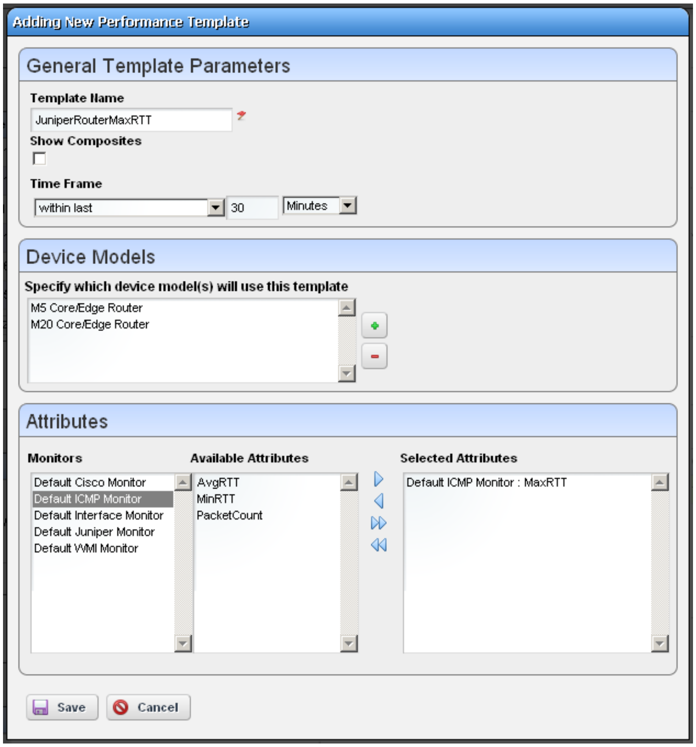
Create A Performance Template

To create a performance template, follow these steps:

1 Right click in the Dashboard Views portlet and click on the *Performance Templates* menu item.

2 The Performance Templates manager appears.

3 To create a new performance template, click on the Add button. The Performance Template Editor appears.



Adding New Performance Template

General Template Parameters

Template Name: JuniperRouterMaxRTT

Show Composites: □

Time Frame: within last 30 Minutes

Device Models

Specify which device model(s) will use this template

M5 Core/Edge Router
M20 Core/Edge Router

Attributes

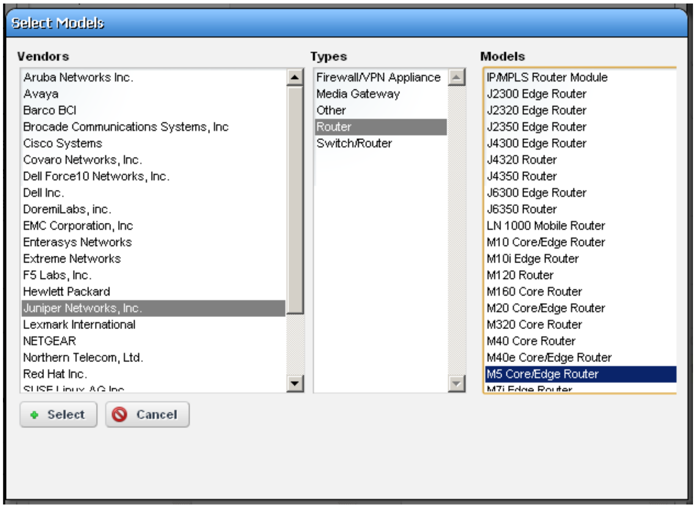
Monitors: Default Cisco Monitor, Default ICMP Monitor, Default Interface Monitor, Default Juniper Monitor, Default WMI Monitor

Available Attributes: AvgRTT, MinRTT, PacketCount

Selected Attributes: Default ICMP Monitor : MaxRTT

4 Name your template. The Show Composites and Time Frame fields are the same as in the dashboard (see Dashboard Editor on page 335).

5 To specify which device model(s) this template will apply to, click on the + button in the Device Models panel. The model selector appears.

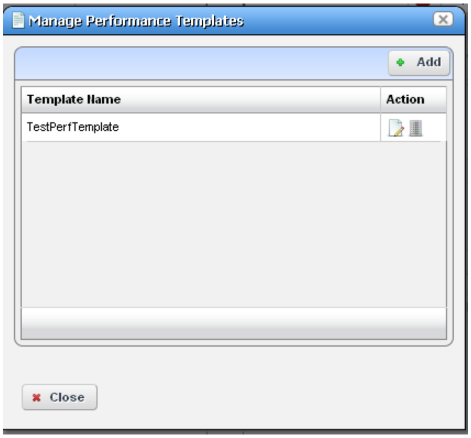


Select multiple devices by clicking + repeatedly, selecting a single device each time. You can also make several templates for each device. See Multiple Performance Templates on page 345 for the way that works.

6 Click on a vendor to see the device types for that vendor. Then click on a device type to see the models available for that vendor and device type. Select the model you want and click on the select button.

7 To select the attributes that you want to appear by default in a performance dashboard for the selected device, click on a monitor to see the attributes available for that monitor. Click on the right arrow button to move the selected attributes from *Available* to *Selected*. Those are the attributes that will appear by default in dashboards for the selected device.

8 When you have selected all the parameters you want, click *Save*. It then appears in the template list.

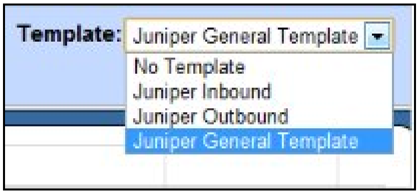


Template Name	Action
TestPerfTemplate	

To edit or delete your template, use the buttons in the action column of the table.

Now when you click on show performance, Dell OpenManage Network Manager checks whether a template for that device type exists. If one exists, then that template guides what appears in the performance view for the device.

Multiple Performance Templates



The template name appears in the upper right corner of dashboards that appear when you select Show Performance.

If other templates for that device type exist they also appear in a template pick list in the upper right corner. You can pick another template to display its attribute selection. The *No Template* selection displays the default dozen attributes that would appear if you selected Show Performance without a template defined for the device.

11

Traffic Flow Analyzer

OpenManage Network Manager's Traffic Flow Analyzer listens on UDP ports for sFlow, datagrams. A flow is a unidirectional stream of packets between two network nodes. The following key parameters appear in flows:

- Source IP address
- Destination IP address
- Source port number
- Destination port number
- Layer 3 protocol type
- ToS byte (Type of Service)
- Input logical interface

Using that data, Traffic Flow Analyzer can help you visualize network traffic, troubleshoot and anticipate bottlenecks.

NOTE:

Typical packages come with a default limit to the number of monitored devices. Upgrade your license if you want to exceed the package limit.

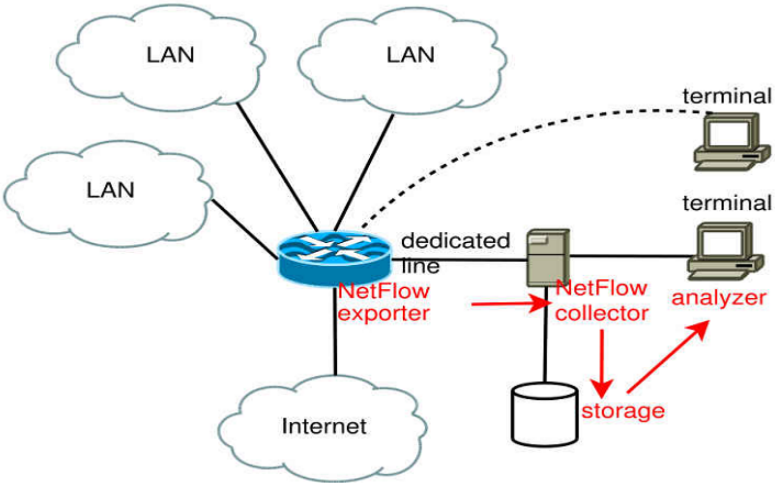
Supported versions include sFlow v5.

Parse errors can appear in the application server log for some flow data.

```
Parse error: Unable to process non IP type flow. Type: <Number>
```

`<Number>` represents an Sflow packet type. This application only parses data of type `IP`. When Dell OpenManage Network Manager receives non-IP packets, it drops packets and this error appears.

How does it work?



- The sFlow exporting router monitors traffic traversing it
- ...and the router becomes an Exporter of sFlow data.
- It forwards information to the sFlow Collector
- Collector stores, correlates and presents the information about
- Traffic bottlenecks in networks.
- Applications responsible for bandwidth utilization.

Definitions

sFlow—For Delldevices.

Collector—Application listening on a UDP port for sFlow datagram.

Exporter—Network element that sends the sFlow datagram.

Conversations— IP communications between two network nodes.

Flow—A flow is a unidirectional stream of packets between two network nodes.

NOTE:

Counter sFlows do not appear as Traffic Flows, but essentially duplicate Performance metrics for interfaces. Flows how data traverses between *two* endpoints. You can monitor interfaces with Performance monitors. See Chapter 10, Monitoring.

Setup

If they are not already set up to emit flow information, set up devices themselves to emit flow data. Consult the manuals for your devices for instructions about how to do this. Make sure your setup does not overwhelm Dell OpenManage Network Manager with information.

Set up Dell OpenManage Network Manager with the following:

Exporter Registration—To register a device, right-click in Resources portlet, after you select the router and choose *Traffic Analyzer > Register*. The system should then be ready to accept flow data from the device.

Router Configuration—You must configure the router to send flow reports to the OpenManage Network Manager server on port 6343 for sflow by default.

Resolving Autonomous System (AS) Numbers—OpenManage Network Manager provides local resolution of autonomous system numbers (ASN) based on static mapping of AS number registrations. It also supports user overrides to the default mappings. To do this, configure properties you can find in the `\owareapps\trafficanalyzer\lib\ta.properties` file. Remember, best practice is to override properties as described in Overriding Properties on page 15.

NOTE:

Dell Powerconnect devices allow only one collector per port.

How To:

Use Traffic Flow Analyzer

1 Register the device(s) you want to analyze. (As in Exporter Registration). A message confirms registration's success.

NOTICE

You can also display a *Registered* column in the Managed Resources portlet, and click the heading to sort the registered Flow exporters to the top of the display.

2 Look in the Traffic Flow Portlet for the flows captured.

3 Remember, you can Drill Down to specific data, and Search for specific devices monitored.

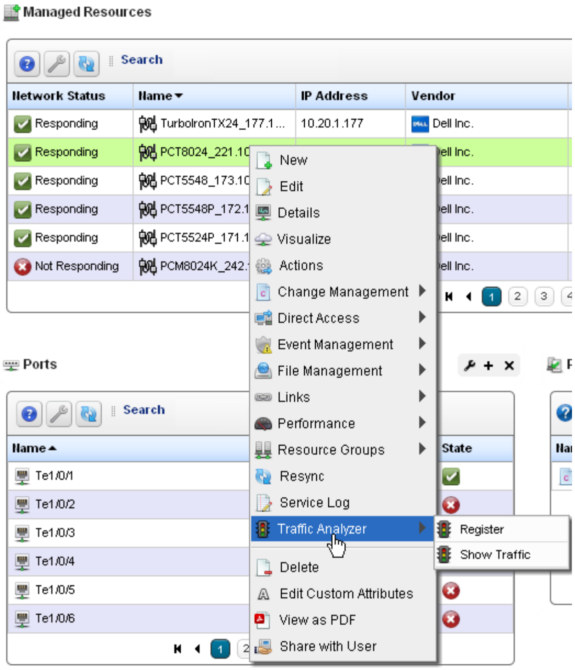
For more about Traffic Flow in context of network management, see Traffic Flow Analyzer - Example on page 356.

Exporter Registration

Before you can collect traffic data from a device, you must *Register* it as a traffic flow exporter. If a device is not registered, the *Register* command appears in the menu. If it is registered the *Unregister* command appears. When you successfully register an eligible device, a success message appears; otherwise, a failure message appears, and no registration occurs.

The *Show Traffic* menu option opens a drop-in (full screen) Traffic Flow Portlet with a pick list of available information types.

This displays the *Exporters Detail*, *Top 5 Applications*, *Top 5 Autonomous Systems*, *Top 5 Conversations*, *Top 5 Endpoints*, *Top 5 Protocols*, *Top 5 Receivers*, and *Top 5 Senders* related to the device selected before right-clicking. Select a type and click the *Refresh* double arrow to the right of the selector.



Managed Resources

Network Status	Name	IP Address	Vendor
Responding	TurboIronTX24_177.1...	10.20.1.177	Dell Inc.
Responding	PCT8024_221.10		ell Inc.
Responding	PCT5548_173.10		ell Inc.
Responding	PCT5548P_172.1		ell Inc.
Responding	PCT5524P_171.1		ell Inc.
Not Responding	PCM8024K_242.1		ell Inc.

Ports

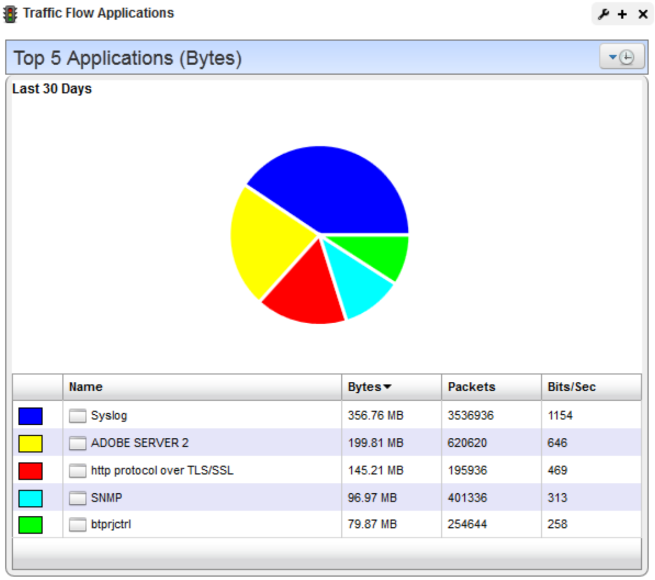
Name	State
Te1/0/1	✓
Te1/0/2	✗
Te1/0/3	
Te1/0/4	
Te1/0/5	✗
Te1/0/6	✗

The screen that then appears has the features of the Expanded Traffic Flow Portlet described below. See also How to: Use Traffic Flow Analyzer on page 349.

Traffic Flow Portlet

Traffic Flow Analyzer uses several types of portlets, one for each of the types of objects on which it reports. These are Applications, Autonomous Systems, Conversations, Endpoints, Exporters, Protocols, Receivers and Senders.

When you add one of the traffic analyzer portlets to a page, its summary, or minimized form appears. This displays a simple view containing a pie chart and a table showing the summarized collected data over the configured time period. The only thing that can be changed in this view is the period. Change this by clicking the clock dropdown button in the upper right corner of the portlet.



	Name	Bytes▾	Packets	Bits/Sec
🟦	□ Syslog	356.76 MB	3536936	1154
🟨	□ ADOBE SERVER 2	199.81 MB	620620	646
🟥	□ http protocol over TLS/SSL	145.21 MB	195936	469
🟦	□ SNMP	96.97 MB	401336	313
🟩	□ btprjctrl	79.87 MB	254644	258

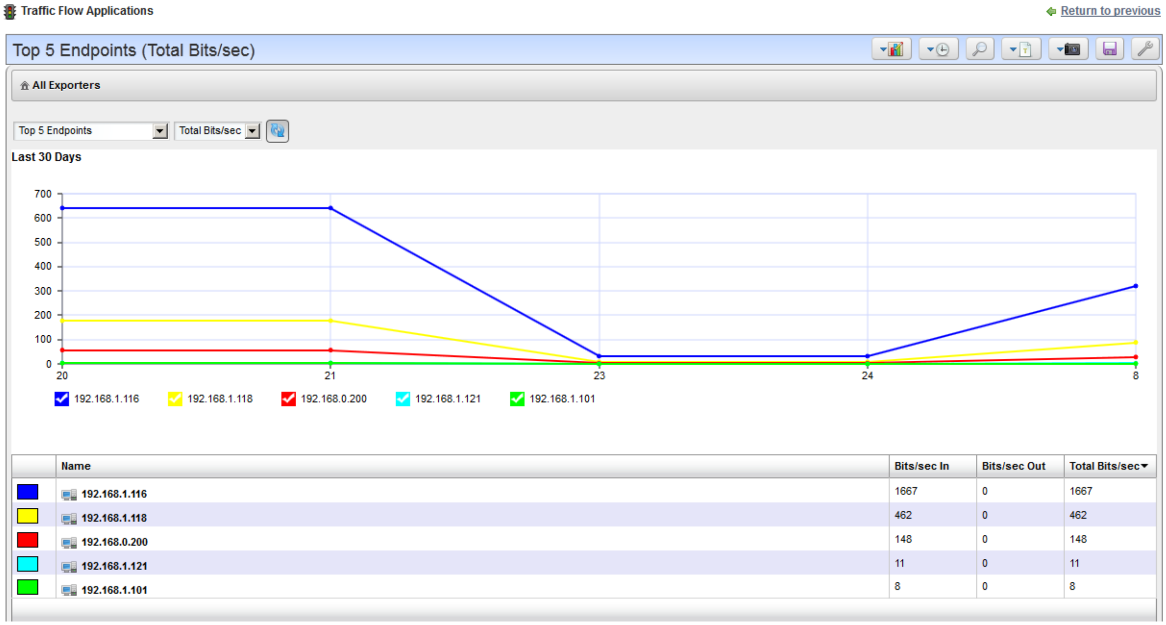
The Expanded Traffic Flow Portlet displays an interactive graph. You can also Drill Down to details about components within this portlet by clicking on one of the links in the table below the graph.

NOTE:

The selected period determines whether data is present, especially if you have just started monitoring Traffic Flow. Choose the shortest period to see data immediately (it still takes a few minutes to appear), and select longer periods only after monitoring has run for longer periods.

Expanded Traffic Flow Portlet

When you expand the portlet, a more complex interactive view appears. Initially, it displays a line graph for the selected period.



Traffic Flow Applications

Return to previous

Top 5 Endpoints (Total Bits/sec)

All Exporters

Top 5 Endpoints | Total Bits/sec

Last 30 Days

	Name	Bits/sec In	Bits/sec Out	Total Bits/sec▼
🟦	192.168.1.116	1667	0	1667
🟨	192.168.1.118	462	0	462
🟥	192.168.0.200	148	0	148
■	192.168.1.121	11	0	11
🟩	192.168.1.101	8	0	8

It may seem a device reporting the same value as others is not graphed properly, but mousing over the graph displays the value.

The following controls appear in its title bar:

Select Chart Type—Lets you change the chart type. Available chart types include *Pie*, *Line*, *Bar*, *Stacked Bar* and *Column*.

Select Timeframe—Lets you change the period between *Last 15 Minutes*, *Last Hour*, *Last 24 Hours*, *Last 5 Days* and *Last 30 Days*. Data “rolls up” in a summary for each period to the next longest period, so you must select the correct period to see what has been collected.

Data for last 15 minutes typically appears after about 5-10 minutes of collection. At least one point of rollup data appears for the longer periods after the next shorter duration has passed. This means you need a minumum of 5 minutes collecting data to show chart data for the 15 minute interval. A minumum of 15 minutes collecting data needs to occur to show chart data for the last hour, and a minumum of an hour collecting data needs to occur for 24 hour chart data to appear. Finally, a minumum of 24 hours collecting data needs to occur for 30-day chart data to appear.

These figures assume a maximum 256 bytes of data export at 15 second intervals, minimum. If the interval is too much longer then only one flow appears per interval and less data appears. If the flow size is too large it takes more time to accumulate the flow data before the device can send it.

Search—Displays a search dialogue to find specific traffic data.

Select Report Type—Lets you change the report type between Top 5, 10 or 25 and Bottom 5, 10 or 25.

Traffic Flow Snapshots— Load or save a snapshot (preserved views) of traffic flow.

Export to PDF—Saves the current view to a pdf file. You can retrieve the report in the *My Alerts* area at the lower left corner of the portal.

Settings—Configures how to retain data, based on collection / rollup intervals. Minutes rollup to 10-minute intervals, which rollup to hourly, which rollup to daily, which rollup to weekly data. You can also set the maximum number of rows per rollup table.

Below the title bar a navigation bar displays the context path. See Drill Down on page 354, below, for more about this.

Below that navigation bar a row containing the following controls appear:

Entity Type—Selects the type of entity to report on (Applications Detail, Conversations, End points, and so on).

Attribute—Selects which attribute to graph (Bytes, Packets, Bits/Sec).

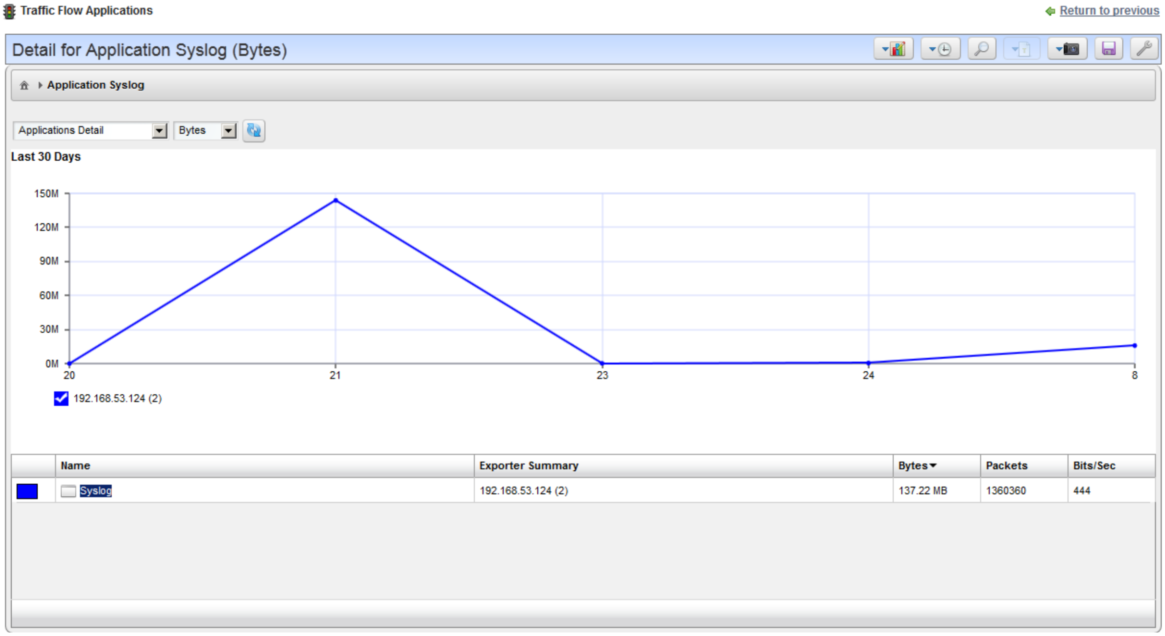
Refresh—Refreshes the screen (runs the report) applying any new settings.

NOTICE

You can check / uncheck by clicking on the colored squares in the legend below these graphs. This reveals / conceals lines connected to the labelled item.

Drill Down

you can “drill down” into a report by clicking on one of the links in the table. This displays a detail view of the selected entity and the name of the entity appears in the navigation bar.



Traffic Flow Applications

Return to previous

Detail for Application Syslog (Bytes)

Application Syslog

Applications Detail | Bytes

Last 30 Days

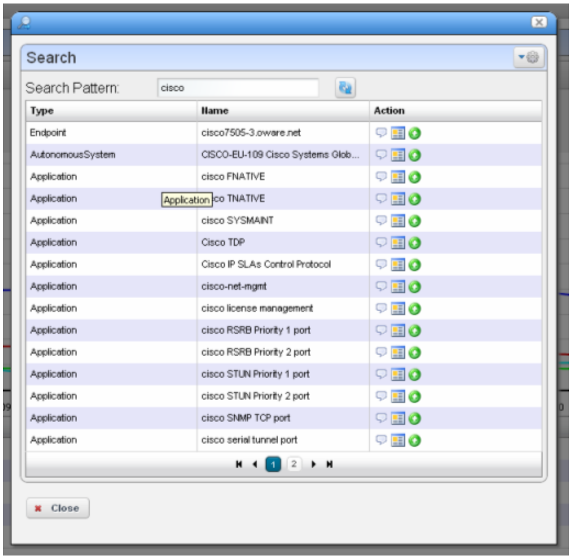
	Name	Exporter Summary	Bytes▾	Packets	Bits/Sec
🟦	Syslog	192.168.53.124 (2)	137.22 MB	1360360	444

When a detail view appears, the entity type appears as in the title bar. You can change to a “Top / Bottom n” report of a different type, then click refresh to display a report of the top entities that apply to the current detailed entity. This process can continue until the conversation detail view is reached. This is the end of the line.

To return to the root view, for the drill-down, click the house icon in the upper left corner of the expanded portlet.

Search

Search by clicking on the Search (magnifying glass) icon in the title bar. Type any string in the next screen to search through the traffic data. A list of all entities found matching the string appears below it.



Search Pattern: cisco

Type	Name	Action
Endpoint	cisco7505-3.oware.net	🗨 ▦ ●
AutonomousSystem	CISCO-EU-109 Cisco Systems Glob...	🗨 ▦ ●
Application	cisco FNATIVE	🗨 ▦ ●
Application	Application co TNATIVE	🗨 ▦ ●
Application	cisco SYSMAINT	🗨 ▦ ●
Application	Cisco TDP	🗨 ▦ ●
Application	Cisco IP SLAs Control Protocol	🗨 ▦ ●
Application	cisco-net-mgmt	🗨 ▦ ●
Application	cisco license management	🗨 ▦ ●
Application	cisco RSRB Priority 1 port	🗨 ▦ ●
Application	cisco RSRB Priority 2 port	🗨 ▦ ●
Application	cisco STUN Priority 1 port	🗨 ▦ ●
Application	cisco STUN Priority 2 port	🗨 ▦ ●
Application	cisco SNMP TCP port	🗨 ▦ ●
Application	cisco serial tunnel port	🗨 ▦ ●

Entity found in the search support the following actions:

View Top Conversations—Displays the top n conversations for the selected entity.

Show Detail View—Displays a top level detail view of the selected entity.

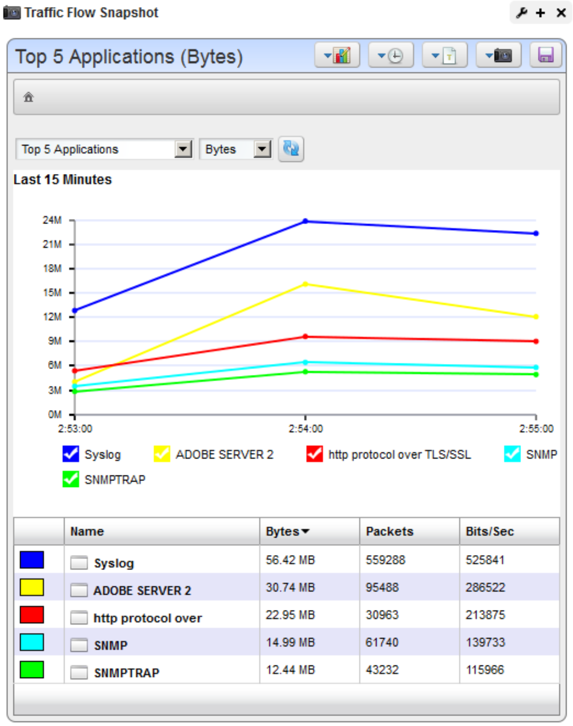
Add to Current View—Adds the entity to the current view and drills down to it.

NOTICE

The *Settings* button (the gear in the upper right corner) lets you confine the search by types (*All, Applications, Protocols,* and so on).

Traffic Flow Snapshot

This portlet lets you display Traffic Flow you configure and save as a snapshot in a portlet visible on any Dell OpenManage Network Manager page. It is, in effect, a portlet that permanently displays the Expanded Traffic Flow Portlet, beginning with the selected snapshot.



	Name	Bytes▾	Packets	Bits/Sec
🟦	□ Syslog	56.42 MB	559288	525841
🟨	□ ADOBE SERVER 2	30.74 MB	95488	286522
🟥	□ http protocol over	22.95 MB	30963	213875
🟦	□ SNMP	14.99 MB	61740	139733
🟩	□ SNMPTRAP	12.44 MB	43232	115966

After adding this portlet to a page, use the selector to choose which snapshot you want to appear. Refresh the portlet with the double arrows to the right of the units displayed. You can also change what appears, the units, the time interval, and so on, just as described in Expanded Traffic Flow Portlet on page 352.

Traffic Flow Analyzer - Example

The following describes typical situations where flow is useful. When ports are over-utilized because of intermittent performance problems diagnosis of the problem sometimes difficult. Turn on flow traffic data collection to evaluate who, what applications, and so on, are responsible for the traffic on the affected ports. This avoids getting overwhelmed with collection of traffic going in all directions. Follow these steps to do this:

1 From the Resources monitor, select a desired router that has support for Flow

2 Enable sFlow on most impacted routers that support sFlow. Also, register a number of exporters to enable an efficient and scalable data collection environment.

NOTE:

You can disable sFlow and unregister exporters.

3 After sFlow has been running for a while, verify that bandwidth utilization is within expectation. This will help insure optimum performance of critical business applications.

4 Select the Top 5 Applications portlet (or add it to the page).

5 From the list of the Top 5 Applications, you'll typically see most bandwidth is being consumed by the key applications in our organization.

Alternative 1

6 To ensure bandwidth is not being hijacked by unauthorized or unwanted video or music streaming applications, select the Top 5 Conversations.

7 Often the top conversation is video streaming software.

8 To answer "Where and who is running this rogue application?," drill down into the conversation to see End points involved in the conversation. This identifies the user running the streaming application. You could now go and stop (or block) this rogue application.

Alternative 2

An alarm indicates port X is surpassing its threshold. If the port has become a bottleneck in the overall network bandwidth, we want to identify what applications are at cause, and who is responsible for running them.

1 Look in the Top 5 Traffic Flow Endpoints portlet.

2 From the list of the Top 5 Endpoints, you will typically see that port X is high on the list.

3 Expand the portlet and drill down into the port X endpoint to see what are the top conversations going through port X.

4 Drill down into conversations to identify any unauthorized applications.

5 Drill down further to identify users of any unauthorized applications

6 Now, go stop them!

12

Change Management / ProScan

Dell OpenManage Network Manager's change management utility is ProScan, which lets you scan stored configurations to verify managed devices compliance with company, department or industry standards. This application automatically tracks all changes occurring to managed devices. You can report on user-specified values found in persisted backup configuration files for a group of devices. This lets network managers, security officers and external auditors generate detailed audit trail documents to validate compliance with both internal standards (ISO 17799, NSA Guidelines) as well as industry regulations (Sarbanes-Oxley, GLBA, HIPAA).

Compliance reporting lets you specify a text string, regular expression, or optionally the generated configlet from File Management (NetConfig) for matching. Group results must be separated by device like Adaptive CLI Manager. When ProScan policies run, the application emits notifications whose contents depend on whether compliance was or was not maintained.

NOTICE

Your system may have several ProScan examples. You can use these as provided, or alter them to suit your network.

How To:

Use ProScan / Change Management

The following outlines common use cases for this software, and the steps to achieve the goals of each case:

Goal: Verify configurations are compliant on a scheduled / recurring basis.

1 Create ProScan policy(ies) based on what indicates compliance. Right-click *New > Policy* in the ProScan portlet.

2 Specify the Name and Input source (based on Device Backup, Current Config, Configuration Label, By Date and Adaptive CLI Results)

3 Add Targets > Filter Option available for selecting Equipment/Group

NOTICE

The advantage of selecting dynamic device groups is that newly discovered devices of the selected type are automatically members of the group, so they are scanned too. A benign warning ("No proscan policies have target group(s)") lets you know you have not selected groups when you execute a ProScan policy without them.

4 Specify Proscan Compliance Criteria. Add Criteria. For example, SNMP communities *Do not contain* the following:

```
snmp {
   community public {
```

5 Save.

6 Execute or schedule your created ProScan policies.

7 Any out-of-compliance devices throw an alarm, which you can email, or configure to trigger other actions (see the next use case).

Goal:...And if not compliant restore compliant configuration

In addition to the steps in the previous section:

8 In the Actions portlet, create an action to restore the labelled compliant configuration.

The Action here is *Netconfig Restore*. To find it in the Action panel, click *Add Action*, and select *Custom*. Click the *Keyword Search* link on the right side of the screen, and notice the magnifying glass appears in the *Action* field. Enter *Netconfig* in that field and click the magnifying glass. The available Netconfig actions, including *Restore* appear in the drop-down combo box.

9 Create event processing rule that says when ProScan fails execute the restore action in 7.

If you have multiple device types you do not need to assign actions for each device, or even each device type. OpenManage Network Manager supports the assigned policies, so it knows which actions to do to that device based on which device sent the trap.

How To:

Configure ProScan Groups

If you have different ProScans for different device type, then you can run a ProScan Group and automatically scan even different types of devices. For more about this, see Creating or Modifying ProScan Policy Groups on page 381.

1 Right-click and select *New > Group*.

2 Specify the Proscan Policy Group Parameters.

3 Add ProScan Policies. These policies can be in multiple groups.

4. Add Targets. Notice that group targets appear in the “child” policies, grayed out. Child policies can add more targets.
5. Save.
6. Execute or schedule the group policies to run against the selected targets.

How To:

Do Change Management (Example)

The following describes an example use of Change Manager. This backs up a configuration file, modifies it, then scans the file for the modified text, and acts according to the result. The following steps describe how to do this:

1. Back up a device configuration. Select a device and click the *File Management > Backup* right-click menu in Managed Resources portlet.
2. Right click, and Export this backup to a file in the Configuration Files portlet.
3. Edit this config file, adding the word “MyTestContact” somewhere in its text that has no impact. For example, the snmp-server contact, or in comments. Some devices let you create descriptions within their configurations so you can enter a word without impact there.
4. Now import this edited file from the Managed Resources portlet after you have right-clicked on the same device from which you exported it. Renaming it something distinctive is helpful.
5. Right-click this file and *Restore* to the device. Since the name is a comment or description, it should not interfere with the device’s operations.
6. Right-click the device and select *File Management > Backup*. This makes the MyTestContact file label Current.

   To confirm MyTestContact is labeled Current, you can use an Advanced filter in the expanded Configuration Files portlet to view only Current labels.
7. Now, create a ProScan policy by right-clicking in the ProScan portlet, selecting *New > Policy.*
8. In the General tab, name this policy MyTestContactScan, and as an input, select the *Configuration Label > Current* label as the Input Source.
9. In the Targets tab, select the equipment from which you exported the config file.
10. In the Criteria tab, click *Add Criteria* enter *contains* MyTestContact as the *Match All of the following criteria*.
11. Click *Save*.
12. Right-click the new policy and select *Execute Compliance*.
13. The audit screen that appears should indicate *Success*.
14. Right-click and *Open* the MyTestContactScan policy, and change the Criteria to “does not contain” MyTestContact.

15 *Save*

16 Re-execute the policy.

17 The audit screen that appears should indicate *Failure*.

Alarms / Events

Once you have a ProScan policy that has failed, the redcellProScanFailureNotification alarm appears in the Alarms portlet. Success produces an event, not an alarm (visible in the Event History portlet) called redcellProScanClearNotification.

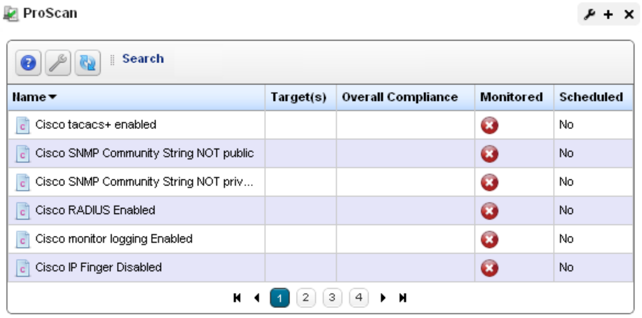
To create a response, create processing rules for the event / alarm (see Event Processing Rules on page 136). For example, you could restore the Compliant-labeled configuration file if redcellProScanFailureNotification occurs, or send an e-mail to a technician, among many other responses.

Some Limitations in this Example

Note that this example does not change authentication, either for telnet or SNMP. If it did alter the SNMP authentication, you would have to create an SNMP authentication alternative before scanning could occur.

ProScan Portlet

This portlet lets you configure compliance requirements. You can use filtering in the Expanded ProScan Portlet to limit the visible policies.



Name	Target(s)	Overall Compliance	Monitored	Scheduled
Cisco tacacs+ enabled			✖	No
Cisco SNMP Community String NOT public			✖	No
Cisco SNMP Community String NOT priv...			✖	No
Cisco RADIUS Enabled			✖	No
Cisco monitor logging Enabled			✖	No
Cisco IP Finger Disabled			✖	No

The *Icon* and *ProScan Type* columns indicate whether the policy is a single policy or a group. Columns also display the *Overall Compliance* of a policy, and the *Target(s)* (number of devices to scan), and whether the policy is *Monitored* (red means no, green means yes. See Proscan on page 322 in Chapter 10, Monitoring for details). Finally, you can see whether a policy's execution is scheduled (and whether the schedule has occurred). To execute a policy manually, go to the Managed Resources portlet, and right-click the targeted device to find the *Change Management* menu item. You can *Execute ProScan* policies that target the device with that menu item. If you want to execute a ProScan policy not already associated with the device or group, then select *Execute Proscan Policy*. A selection screen appears where you can select a policy and either execute or schedule it.

Overall Compliance

Overall Compliance can have the following values and flag icon colors:

All Compliant—Icon: Green. All selected equipment is in compliance with the policy.

None Compliant—Icon: Red. None of the selected equipment is in compliance with the policy.

None Determined—Icon: blank. None of the equipment has been tested for compliance.

Partial Compliance—Icon: Yellow. Not all equipment complies with the policy but all equipment has been tested.

Compliance Varies—Icon: Yellow Not all equipment has been tested for compliance. The tested equipment might be compliant or not compliant.

Portlet Menu

This screen also has the following right-click menu items:

New— Select either a new policy or group. Creating a new policy opens the ProScan Policy Editor, through which you can define one. See Creating or Modifying a ProScan Policy on page 365 for more information about the Editor. See Creating or Modifying ProScan Policy Groups on page 381 for the group editor.

Edit—Opens the selected policy or group for modification. See Creating or Modifying a ProScan Policy on page 365 for more information. See Creating or Modifying ProScan Policy Groups on page 381 for the group editor.

Refresh Targets—Queries to check targets, particularly those in dynamic groups, are up-to-date.

NOTICE

Best practice is to Refresh ProScan Targets before running a scan particularly if your network has changed since the last scan. You can also schedule this. See Schedules on page 118.

Modify Targets—Lets you modify and/or select target equipment for the policy.

Schedule—Configure a policy to run on a schedule.

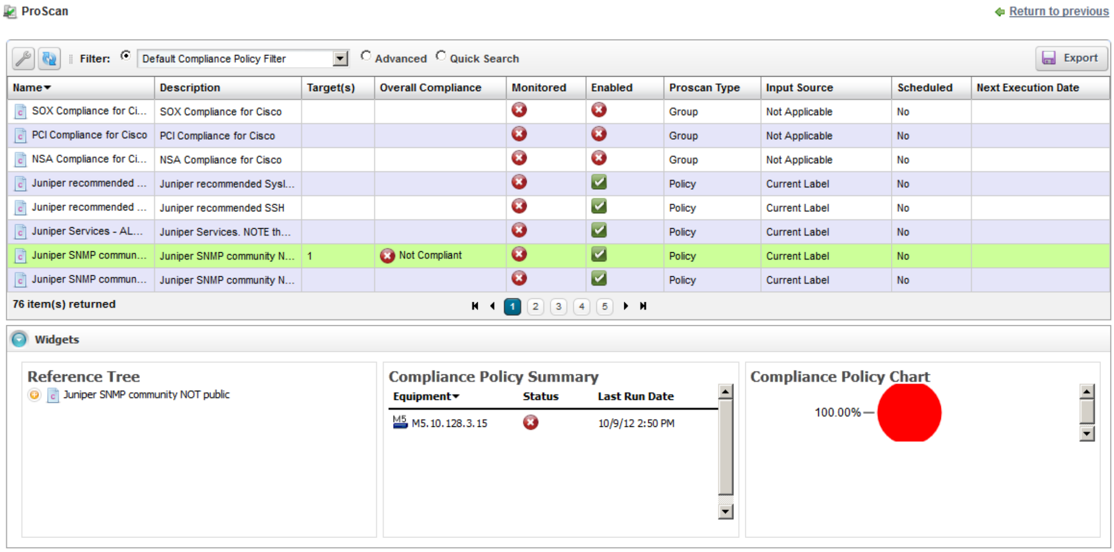
Audit—Opens an Audit Viewer with the results of a selected policy's runs. This is one way to see the historical results of proscan policy runs. Another is to consult the Compliance Policy Summary snap-in in the Expanded ProScan Portlet.

Delete—Deletes the selected policy. Select the item to remove and click *Delete*. The application prompts you for confirmation.

Import / Export—Lets you import policies or export the selected policy.

Expanded ProScan Portlet

The expanded ProScan portlet lets you see the Compliance Policy Summary, a reference tree of the connections between a policy and its targets, and a Compliance Policy Chart snap panel.



ProScan

Return to previous

Filter: ● Default Compliance Policy Filter ○ Advanced ○ Quick Search

Export

Name	Description	Target(s)	Overall Compliance	Monitored	Enabled	Proscan Type	Input Source	Scheduled	Next Execution Date
SOX Compliance for Ci...	SOX Compliance for Cisco			☒	☒	Group	Not Applicable	No	
PCI Compliance for Cisco	PCI Compliance for Cisco			☒	☒	Group	Not Applicable	No	
NSA Compliance for Ci...	NSA Compliance for Cisco			☒	☒	Group	Not Applicable	No	
Juniper recommended ...	Juniper recommended Sysl...			☒	☑	Policy	Current Label	No	
Juniper recommended ...	Juniper recommended SSH			☒	☑	Policy	Current Label	No	
Juniper Services - AL...	Juniper Services. NOTE th...			☒	☑	Policy	Current Label	No	
Juniper SNMP commun...	Juniper SNMP community N...	1	☒ Not Compliant	☒	☑	Policy	Current Label	No	
Juniper SNMP commun...	Juniper SNMP community N...			☒	☑	Policy	Current Label	No	

76 item(s) returned

Widgets

Reference Tree

Juniper SNMP community NOT public

Compliance Policy Summary

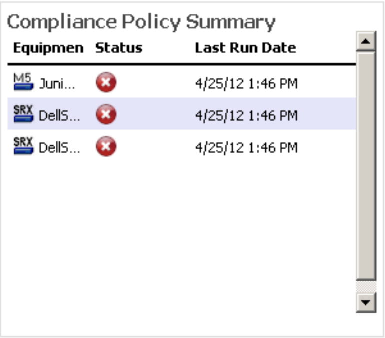
Equipment	Status	Last Run Date
M5.10.128.3.15	☒	10/9/12 2:50 PM

Compliance Policy Chart

See Compliance Policy Summary on page 364 for a description of the snap panel that appears below the listed policies in this manager.

Compliance Policy Summary

This snap panel appears at the bottom of the expanded portlet described in *ProScan Portlet on page* 362. It catalogs the compliance policy's history and lists the *Equipment* scanned, a status icon indicating whether the run discovered equipment *in* (green) or *out* (red) of compliance. If you added equipment to a policy before it has run, you may also see a *Not Executed* (blue) status. Each run date for the policy and equipment combination selected in the list at the top of the detail panel screen appears as a row in this panel. You can also see compliance failure messages in OpenManage Network Manager's audit trails.



Compliance Policy Summary

Equipmen	Status	Last Run Date
Juni...	☒	4/25/12 1:46 PM
DellS...	☒	4/25/12 1:46 PM
DellS...	☒	4/25/12 1:46 PM

Compliance scans do not stop the first time they fail. They continue so all failures of compliance in the entire device configuration appear cataloged in the result.

Each time OpenManage Network Manager executes a compliance policy it stores a history record in the database. Similarly, edits to these policies update history records. When you edit a compliance policy to add/remove equipment, OpenManage Network Manager creates or deletes the corresponding history record. Every time OpenManage Network Manager executes the compliance policy, it updates the Last Run Date, Status and Details on the history record.

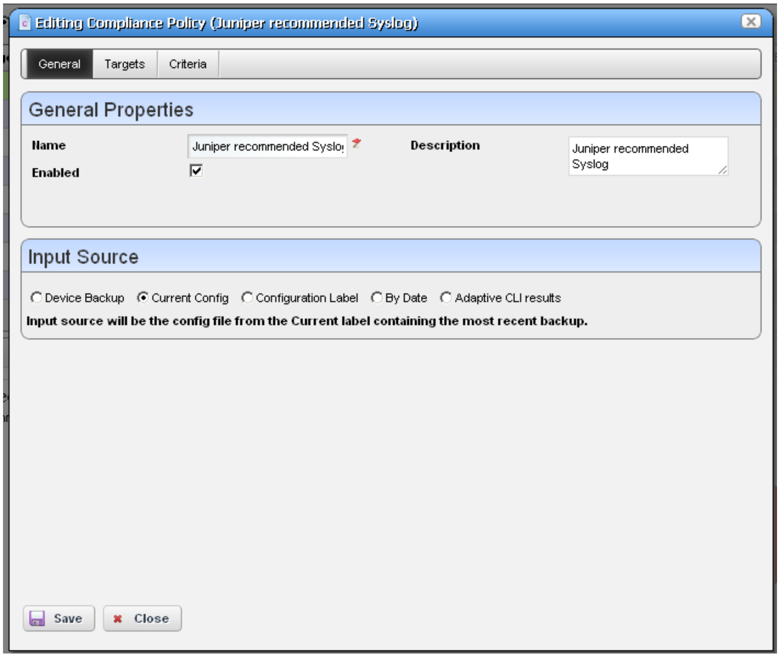
Groups

When you run a ProScan group policy, the history for the group appears in this detail panel just as it would for a single policy. History concatenates the results of the component policies, as does reporting. See Compliance and Change Reporting on page 388.

To see the Compliance Policy History, print a *Compliance Policy Violation* report from Report Manager.

Creating or Modifying a ProScan Policy

This series of screens lets you configure ProScan policies.



Editing Compliance Policy (Juniper recommended Syslog)

General Properties

Name: Juniper recommended Syslo

Description: Juniper recommended Syslog

Enabled ☑

Input Source

○ Device Backup ● Current Config ○ Configuration Label ○ By Date ○ Adaptive CLI results

Input source will be the config file from the Current label containing the most recent backup.

This screen has the following tabs:

- General
- Targets
- Criteria

The Compliance Policy Job Status screen displays progress of a ProScan policy as it executes.

CAUTION:
ProScan works only with text files; it does not work with binary configuration files.

If you have more than one type of device, you must typically have more than one ProScan policy to address each device type. To run more than one ProScan, so you can address multiple types of devices, create a ProScan group. See Creating or Modifying ProScan Policy Groups on page 381.

General

This tab has the following fields:

General Properties

Name—A unique identifier for the policy (editable only when you click *New*, not on existing policies).

Enabled—Check to enable this policy.

Description—A text description of the policy. This also appears when the policy is listed in the manager.

Input Source

Use the radio buttons to select a source. Select from among the following options:

Device Backup—Retrieve the configuration from the device and scan it for compliance.

Current Config—The scan the current configuration backed up from the device.

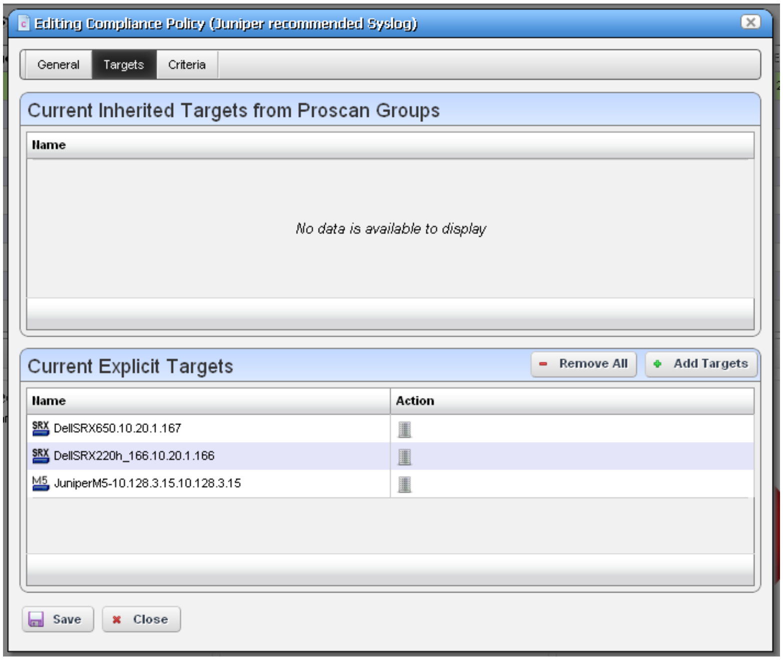
Configuration Label—Select the configuration to run against based on a label. This software automatically updates the *Current* label so it points to the most recently backed up configuration files.

By date—When you click this radio button, you can then select a configuration file backed up that precedes a specified date most closely in a selector that appears below the radio button. You can scan even historic configurations for compliance, with the *Based on Date* field. No validation ensures this date is the current one.

Adaptive CLI—Select a desired *Show* Adaptive CLI to scan the target device below the radio button. The policy configured scans the show results, and that show appears in the Audit screen.

Targets

The top of this screen (*Current Inherited Targets*) displays any targets inherited from already-configured ProScan Groups. Click *Add Targets* in the *Current Implicit Targets* panel at the bottom to select equipment that are targets to scan with this policy. You can also select listed equipment click the *Remove* icon to delete it from the list.



Current Inherited Targets from Proscan Groups

Name
No data is available to display

Current Explicit Targets

Name	Action
SRX DellSRX650.10.20.1.167	🗑
SRX DellSRX220h_166.10.20.1.166	🗑
M5 JuniperM5-10.128.3.15.10.128.3.15	🗑

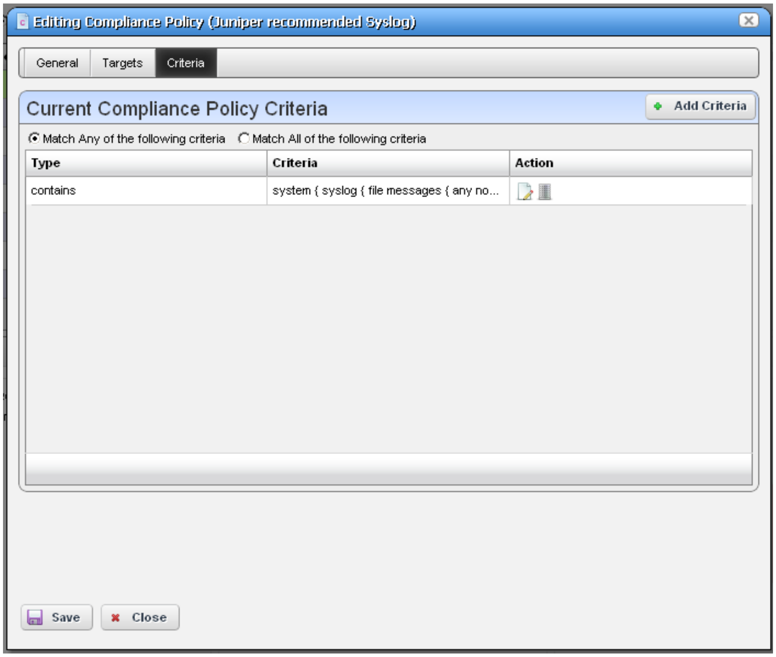
NOTE:

Use filtering in the subsequent selector screen to make individual selection easier, but do not forget this is *not* dynamic selection. You must assign policies whenever your managed environment adds new equipment.

To provide information for individual policies that are part of groups, this screen displays inherited group targets grayed out. See Creating or Modifying ProScan Policy Groups on page 381 for more about groups.

Criteria

This screen lets you filter configuration files based on text, or Regular Expressions. Click *Add* to open an editor line.



Editing Compliance Policy (Juniper recommended Syslog)

Current Compliance Policy Criteria

● Match Any of the following criteria ○ Match All of the following criteria

Type	Criteria	Action
contains	system { syslog { file messages { any no...	

This screen ultimately determines whether the configuration file(s) for the selected equipment complies with the applicable policy. To create a policy, first select whether you want to *Match Any* (logical OR), or *All* (logical AND) of the criteria you configure with the radio buttons at the top of this screen.

See these sections for more about criteria:

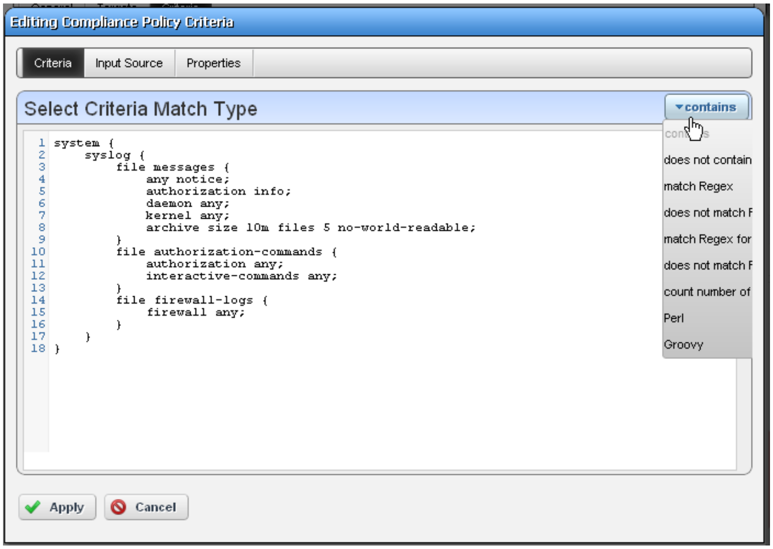
- Editing Compliance Policy Criteria
- Match Regex for each line
- Count number of occurrences
- Input Source Grouping
- Properties

For additional criteria information consult these sections:

- Create Source Group Criteria
- Regular Expressions
- Perl / Java (Groovy) Language Policies

Editing Compliance Policy Criteria

After clicking *Add Criteria*, use the pick list on the upper right to select an operation to select a criteria match type (*Contains*, *Doesn't contain*, *[does not] match Regex* (see *Regular Expressions on page* 375), *[does not]* Match Regex for each line, Count number of occurrences, Perl or Java (Groovy)). Specify the match string or regular expression (Regex) in the text editor below the pick list.



```
system {
    syslog {
        file messages {
            any notice;
            authorization info;
            daemon any;
            kernel any;
            archive size 10m files 5 no-world-readable;
        }
        file authorization-commands {
            authorization any;
            interactive-commands any;
        }
        file firewall-logs {
            firewall any;
        }
    }
}
```

With the *Add Criteria* button, you can configure multi-criteria policies with several lines. For example, configure one saying a maximum of four lines containing `name-server` can appear (<5), in any order (Match Regex for each line), and another that says the configuration must contain `no ip domain lookup [domain]`.

Notice the radio buttons *Match Any of the following* and *Match all of the following*. Selecting *Any* means that if either of the lines matched the policy would succeed. Selecting *All* says that both lines must pass before the policy is successful.

For more complex scans, you can also enter Perl or Java (Groovy) language policies. See Perl / Java (Groovy) Language Policies on page 377 for details about these. The does not operators are just the negative of the match without does not.

Click the *Apply* green check button to accept your term, or the *Cancel* button to abandon your edits.

You can edit already listed compliance tests by clicking the *Edit* button (pencil and paper) in the list row. You can delete them by clicking the *Delete* button next to the criterion.

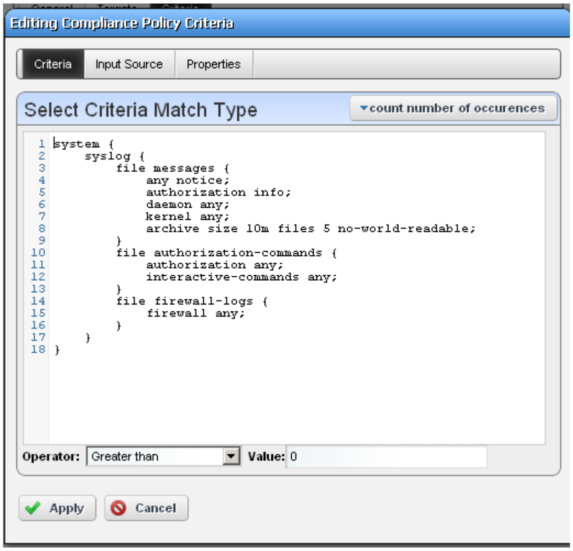
Match Regex for each line

In using this type of term, OpenManage Network Manager processes each line separately, comparing the input source to the match criteria. This returns a true value only if the criteria find a match in the source. The order of matching is not important since OpenManage Network Manager processes each line separately.

Count number of occurrences

This operator lets you specify a less than, greater than, or equal mathematical operator (<, >, =) and a number of lines after you provide regex or string criteria with the operator and count value.

This returns true if the criteria (as a whole) match the input source count and operator combination. On the other hand, for example, if you choose a match criterion that includes =9 lines as the operator, and the scanned configuration has ten lines that match, the scan returns *false*.


Editing Compliance Policy Criteria
Criteria
Input Source
Properties
Select Criteria Match Type
Apply
Cancel

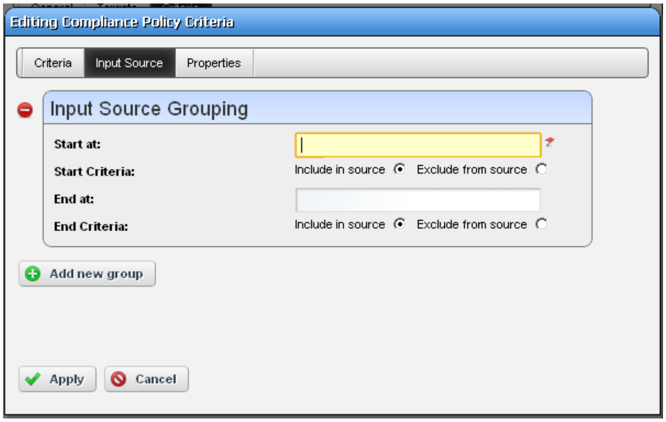
count number of occurences

```
system {
    syslog {
        file messages {
            any notice;
            authorization info;
            daemon any;
            kernel any;
            archive size 10m files 5 no-world-readable;
        }
        file authorization-commands {
            authorization any;
            interactive-commands any;
        }
        file firewall-logs {
            firewall any;
        }
    }
}
```

Operator: Greater than Value: 0

Input Source Grouping

Adaptive CLI show commands and configuration files often have repeating sections or groups of parameters. OpenManage Network Manager scan configurations by section using *Start Criteria* and *End Criteria* Regex group criteria patterns. A configuration can contain multiple start and stops. This is especially useful when the criteria provided might occur multiple times in the input source but you want to find only the instances which are preceded by a particular line in the source.


Editing Compliance Policy Criteria

Input Source Grouping

Start at:

Start Criteria: Include in source ● Exclude from source ○

End at:

End Criteria: Include in source ● Exclude from source ○

Click *Add new group* in the *Input Source* panel in the Criteria editor, and the grouping editor appears. (Click the red icon to the source grouping's left to delete it.)

Enter the starting and ending regular expressions (*Start at / End at*), and elect whether the beginning or end of the source group includes or excludes what that expression matches. Click *Apply* to accept your edits, or *Cancel* to abandon them. You can create multiple group criteria. OpenManage Network Manager applies the group criteria in order, from top to bottom.

When you have defined a *Start* and *Stop*, OpenManage Network Manager finds the information between these. OpenManage Network Manager logically extracts the data from the main config (essentially creating sections) and then does the audit.

For example, if your configuration has one section of *router bgp* and multiple sections for each bgp neighbor, you can specify matches within each neighbor. Your policy can audit each router bgp section and each neighbor within each router bgp.

See Create Source Group Criteria below for an example of how to use these capabilities. Also, see Regular Expressions below for more about what match criteria are supported.

Properties

Checkboxes on this page configure whether the proscan match is *Case Sensitive*, or has *Multi-Line Support*. By default they are disabled. Check to enable them. If (upper / lower) case matters in what you are scanning for, check *Case Sensitive*. If you want to scan for a target phrase or regular expression that spans more than one line, check *Multi-Line Support*. Lines do not have to be consecutive. For example: .*LINE1.*LINE2, where the target source has multiple lines, first line containing the text LINE1, subsequent line containing the text LINE2.

How To:

Create Source Group Criteria

Here is an example of how you can use source group criteria. Suppose you want to scan for the following text:

```
neighbor 2.3.4.5 activate
neighbor 2.3.4.5 route-map allanRM01
```

This is within the following configuration:

```
router ospf 888
 log-adjacency-changes
 redistribute bgp 88 metric 10010 metric-type 1 subnets tag 334 route-map
   allanRM02
 network 2.3.4.0 0.0.0.255 area 123
 network 2.3.5.0 0.0.0.255 area 124
 network 2.3.6.0 0.0.0.255 area 125
!
router isis
!
router rip
 version 2
 network 175.92.0.0
 no auto-summary
!
address-family ipv4 vrf VPN_PE_A
no auto-summary
 no synchronization
 exit-address-family
!
router bgp 88
 bgp log-neighbor-changes
 neighbor 2.3.4.5 remote-as 22
 neighbor description "This is Test"
 neighbor test-parameter xxx
 neighbor 4.5.6.7 remote-as 66
 neighbor description "This is Test"
neighbor test-parameter xxx
 !
 address-family ipv4
 redistribute connected route-map map-12
 redistribute static route-map hjlhjhjhjk
 redistribute ospf 888 metric 500 match internal external 2 nssa-external 1
   nssa-external 2 route-map allanRM03
 neighbor 2.3.4.5 activate
 neighbor 2.3.4.5 route-map allanRM01 in
 neighbor 4.5.6.7 activate
 neighbor 4.5.6.7 route-map allanRM02 in
 default-information originate
 no auto-summary
 no synchronization
 exit-address-family
 !
 address-family ipv4 vrf VPN_PE_A
 redistribute ospf 10 vrf VPN_PE_A match internal external 1 external 2
 no auto-summary
 no synchronization
 exit-address-family
!
```

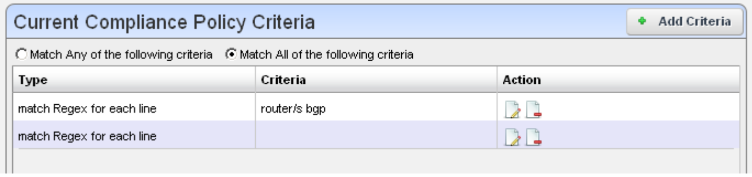
In addition, within this configuration, you want to check if the target lines are present under each address-family in the *router bgp* section. To scan for this, follow these steps:

1 Select the *Match All of the following* radio button and enter both of the above lines as match criteria. Select the *Config Term* as *match Regex for each line*, so the order in which these lines appears does not matter.

2 *Add* a source group criterion to search for a section that begins with “routers bgp”—in regex: `routers\sbgp`. No end match criterion is needed. Click *Apply*.

3 Click *Add* to make another criterion. This time, the start is `address-family\s`, and the end is `exit-address-family`. Click *Apply*.

4 You should see both criteria listed in the editor



Current Compliance Policy Criteria

○ Match Any of the following criteria ● Match All of the following criteria

Type	Criteria	Action
match Regex for each line	router/s bgp	
match Regex for each line		

5 Applying the first group criterion finds the match (underlined) in the following:

```
router bgp 88
 bgp log-neighbor-changes
 neighbor 2.3.4.5 remote-as 22
 neighbor description "This is Test"
 neighbor test-parameter xxx
 neighbor 4.5.6.7 remote-as 66
 neighbor description "This is Test"
neighbor test-parameter xxx
 !
 address-family ipv4
 redistribute connected route-map map-12
 redistribute static route-map hjlhjhjhjk
 redistribute ospf 888 metric 500 match internal external 2 nssa-external 1
   nssa-external 2 route-map allanRM03
neighbor 2.3.4.5 activate
neighbor 2.3.4.5 route-map allanRM01 in
 neighbor 4.5.6.7 activate
 neighbor 4.5.6.7 route-map allanRM02 in
 default-information originate
 no auto-summary
 no synchronization
 exit-address-family
 !
 address-family ipv4 vrf VPN_PE_A
 redistribute ospf 10 vrf VPN_PE_A match internal external 1 external 2
 no auto-summary
 no synchronization
 exit-address-family
!
```

6 Applying the second group criterion on the above result divides the source:

Source 1:

```
address-family ipv4
 redistribute connected route-map map-12
 redistribute static route-map hjlhjhjhjk
 redistribute ospf 888 metric 500 match internal external 2 nssa-external 1
   nssa-external 2 route-map allanRM03
neighbor 2.3.4.5 activate
neighbor 2.3.4.5 route-map allanRM01 in
 neighbor 4.5.6.7 activate
 neighbor 4.5.6.7 route-map allanRM02 in
 default-information originate
 no auto-summary
 no synchronization
 exit-address-family
```

Source 2:

```
address-family ipv4 vrf VPN_PE_A
 redistribute ospf 10 vrf VPN_PE_A match internal external 1 external 2
 no auto-summary
 no synchronization
 exit-address-family
```

This creates two sources sections.

7 Now OpenManage Network Manager applies the regex in the criteria field to each of the sources. It returns *true* only if both sources pass (we selected the *Match All* radio button). In this case “Source 2" does not have those lines, so OpenManage Network Manager returns a false value.

8 The error details appear in the audit trail panel.

Regular Expressions

Regular expressions include metacharacters to instruct the program how to treat characters it encounters. These include the following: ^ , $, . , | , { , } , [,] , (,), *, +, ? , \. If you want to match one of these metacharacters, you must prepend a backslash (\). So to match a literal question mark, rather than instructing regular expression matching to match 0 or 1 of a previous expression, you must enter \?.

The following table outlines standard, supported regular expressions.

Label	Pattern
Single digit	\d
Two digits	\d{2}
Three digits	\d{3}
Four digits	\d{4}
Five digits	\d{5}
Number	[0-9]+ One or more [0-9]* Zero or more
Decimal	.[0-9]+
Float	[0-9]+.[0-9]+
IP Address	(\d{1,3}.){3}\d{1,3}
IP Address/Mask	(\d{1,3}.){3}\d{1,3}/\d+

Label	**Pattern**
Domestic phone number with extension	1?[\s\-\/\.]*\(?([1-9]\d{2})\)?[\s\-\/\.]*([0-9]{3})[\s\-\/\.]*([09]{4})[\s\-\/\.x]*([0-9]{3,4})?
MAC Address	([0-9a-fA-F]{1,2}:){5}[0-9a-fA-F]{1,2}
MAC Address	([0-9a-fA-F]{1,2}.){5}[0-9a-fA-F]{1,2}
MIB2 OID	(1.3.6.1.6.1.2.1.(\d+\.)+\d)
Enterprise OID	(1.3.6.1.4.1.(\d+\.)+\d)
Time	[0-1][0-3]:[0-5][0-9]:[0-5][0-9]
All	.*
Ending Number	\d+$
Character	\w
Word	\w+ One or more. \w* Zero or more.
Whitespace	\s+One or more. \s* Zero or more.
String w/o space	\S+One or more. \S* Zero or more.
New Line	\n
FormFeed	\f
Tab	\t
Carriage Return	\r
Backspace	\b
Escape	\e
Backslash	\B
URL	(?:^|")(http|ftp|mailto):(?://)?(\w+(?:[\.:@]\w+)*?)(?:/|@)([^"\?]*?)(?:\?([^\?"]*?))?(?:$|")
HTML Tag	<(\w+)[^>]*?>(.*?)<\/\1>

Here are some examples of such expressions:

Label	**Pattern**
Email address (U.S.)	^[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,4}$
MAC Address	([0-9a-fA-F]{1,2}:){5}[0-9a-fA-F]{1,2}
Time hh:mm:ss	(0[0-9]|1[0-2]):[0-5][0-9]:[0-5][0-9]
IP Address	(\d{1,3}.){3}\d{1,3}

<table>
<tr><th>Label</th><th>Pattern</th></tr>
<tr><td>Validated IP Address (restricts what matches better than the previous example)</td><td>(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9?])\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9?])\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9?])\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)</td></tr>
<tr><td>MIB2 OID</td><td>(1.2.6.1.6.1.2.1.(\d+\.)+\d</td></tr>
</table>

The following are examples of the kinds of matching possible:

△ **CAUTION:**
Cutting and pasting from notepad into OpenManage Network Manager may cause carriage return or line-feed issues. Best practice is to compose these within OpenManage Network Manager.

Perl / Java (Groovy) Language Policies

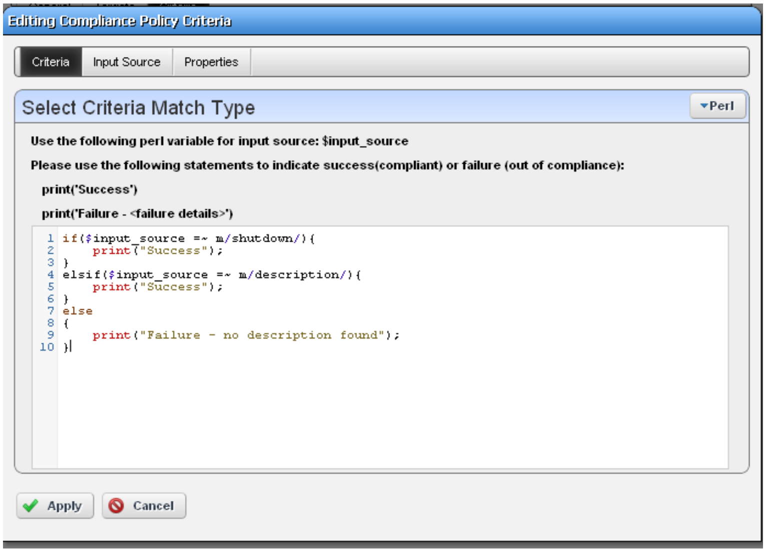
In addition to regular expressions, you can enter Config Terms that use either Perl or Java (Groovy) language capabilities for scans. The following sections describe these.

- Perl
- Java (Groovy)

These scans are compiled at runtime, and the Java scan uses the Groovy libraries, included with OpenManage Network Manager. As always, you must install Perl on Windows application servers if you want to use that type of Config Term (it typically comes with other supported operating systems).

Perl

When you select Perl as the type of Config term, an editor appears that lets you enter Perl scans.


Editing Compliance Policy Criteria
Criteria
Input Source
Properties
Select Criteria Match Type
Perl
Apply
Cancel

Use the following perl variable for input source: $input_source

Please use the following statements to indicate success(compliant) or failure (out of compliance):

print('Success')

print('Failure - <failure details>')

```
if($input_source =~ m/shutdown/){
    print("Success");
}
elsif($input_source =~ m/description/){
    print("Success");
}
else
{
    print("Failure - no description found");
}
```

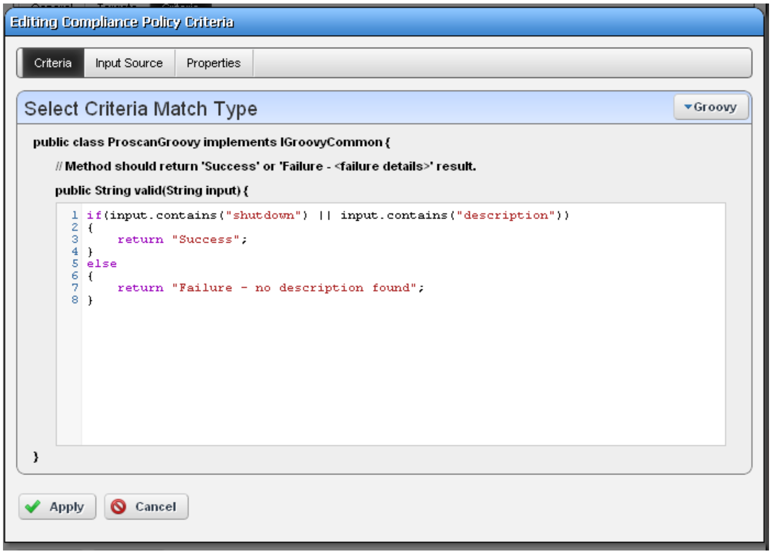
As the screen says `$input_source` is what the code scans. The following is example of the type of Perl you can enter that scans for contents like `description` in shut down interfaces, and prints output “Success” visible in the Audit viewer when it finds a matching term like `description` in whatever source you select:

```
if($input_source =~ m/shutdown/){
    print("Success");
}
elsif($input_source =~ m/description/){
    print("Success");
}
else
{
    print("Failure - no description found");
}
```

Notice that you can also combine these scans with the *Edit Source Group Criteria* regular expressions to streamline them.

Java (Groovy)

When you select Groovy as the type of Config term, an editor appears that lets you enter that type of scans.


Editing Compliance Policy Criteria
Criteria
Input Source
Properties
Select Criteria Match Type
Groovy
Apply
Cancel

```
public class ProscanGroovy implements IGroovyCommon {
    // Method should return 'Success' or 'Failure - <failure details>' result.
    public String valid(String input) {
if(input.contains("shutdown") || input.contains("description"))
{
    return "Success";
}
else
{
    return "Failure - no description found";
}
}
```

As the screen says this implements ProScanGroovy or Groovy Java classes. The method should return ‘Success or ‘Failure -’ results, and assumes `public String validate (String input) {` precedes what you enter in the text editor. The following is example of the type of Java code you can enter that scans for contents like `description` in shut down interfaces, and prints output “Success” visible in the Audit viewer when it finds a matching term like `description` in whatever source you select:

```
if(input.contains("shutdown") || input.contains("description"))
{
    return "Success";
}
else
{
    return "Failure - no description found";
}
```

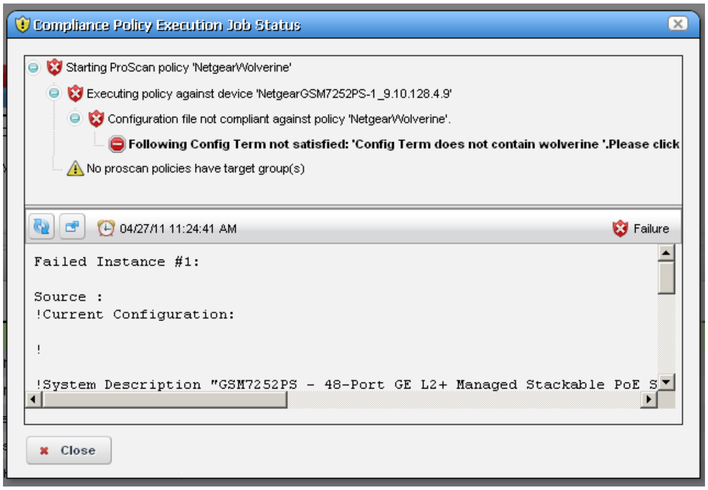
NOTICE

Notice that you can also combine these scans with the *Edit Source Group Criteria* regular expressions to streamline them.

Click *Save* to preserve the policy you have configured in these screens, or click *Close* (in the tool bar) to abandon your edits.

Compliance Policy Job Status

This screen displays the progress of compliance scanning you have configured.



```
Starting ProScan policy 'NetgearWolverine'
    Executing policy against device 'NetgearGSM7252PS-1_9.10.128.4.9'
        Configuration file not compliant against policy 'NetgearWolverine'.
            Following Config Term not satisfied: 'Config Term does not contain wolverine '.Please click
    No proscan policies have target group(s)
```

04/27/11 11:24:41 AM   Failure

```
Failed Instance #1:

Source :
!Current Configuration:

!

!System Description "GSM7252PS - 48-Port GE L2+ Managed Stackable PoE S
```

You can the revisit history of this policy's use in the Audit portlet (see Audit Trail Portlet on page 116). Select an audit trail in this portlet to review details.

When you see the *Success* indicator, then the scanned item is compliant. If you also see a warning message that no policies have target groups, this does not have an impact on compliance.

Success

When you see the *Failure* indicator, then the scanned item is *Not* compliant. Select the "Following Config Term not satisfied" message to see the contents of the failed file at the bottom of this screen.

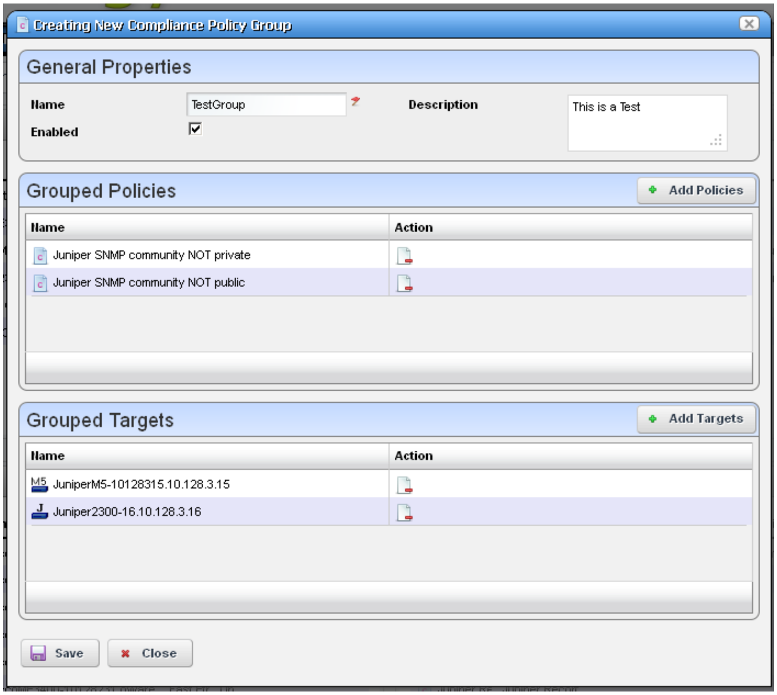
Failure

Executing Proscan policies may trigger a benign warning that "No proscan policies have target group(s)." You can safely ignore this warning message.

The advantage of selecting dynamic device groups is that newly discovered devices of the selected type automatically become members of the group, so ProScan scans them too.

Creating or Modifying ProScan Policy Groups

When you create or modify a ProScan Policy Group after right-clicking *New > Group* or *Open* when you have selected a group, the ProScan Policy Group editor appears.



Creating New Compliance Policy Group

General Properties

Name: TestGroup

Enabled: ☑

Description: This is a Test

Grouped Policies

Name	Action
Juniper SNMP community NOT private	
Juniper SNMP community NOT public	

Grouped Targets

Name	Action
JuniperM5-10128315.10.128.3.15	
Juniper2300-16.10.128.3.16	

This has the following to configure:

Name—A text identifier for the group.

Enabled—Check to enable this grouping.

Grouped Policies —Click *Add Policy* to select ProScan policies in a selector screen. Click the *Remove* icon to delete a selected policy. You can use individual policies in several groups. Individual policies that are part of groups display inherited group targets grayed out.

Grouped Targets—Click *Add Targets* to select targets for the scans.

Executing a group executes all the member policies and update the history records of the group and member policies. Any policy execution also update its parent group history records.

Change Determination Process

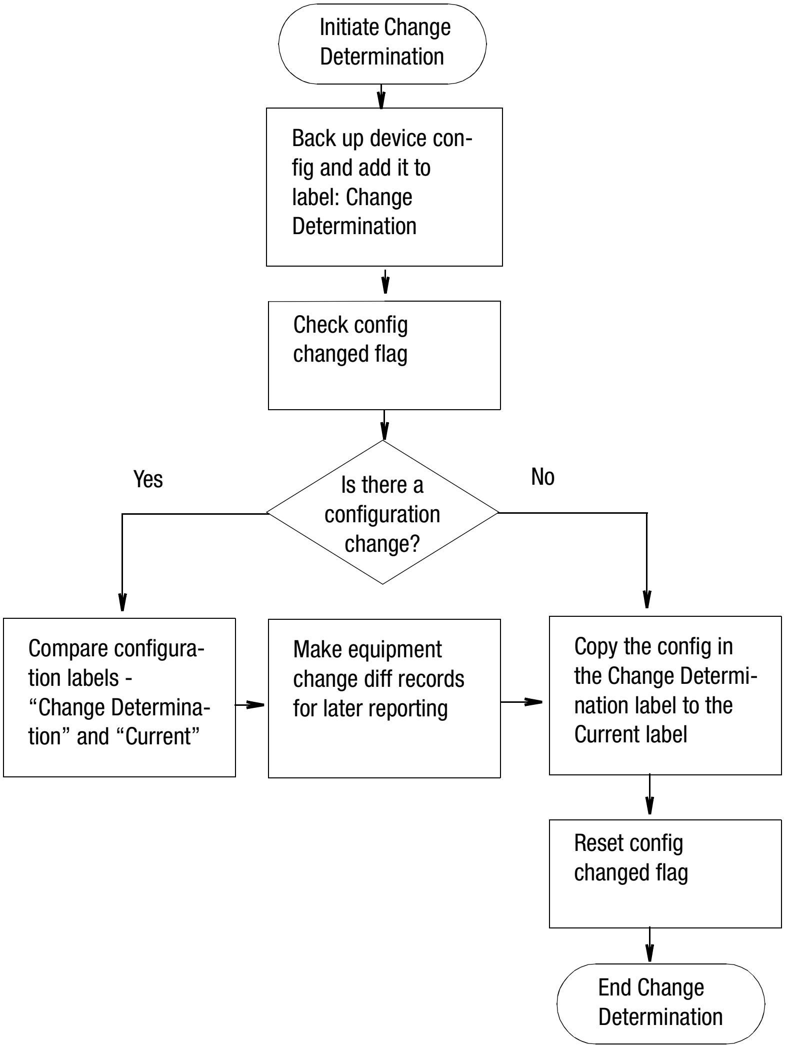
If you run the *Change Determination (CD) Process*, it collects all the configuration changes that occurred on the target resources since the last time the CD process ran. It also associates these changes with the date and time when the CD process runs. After running CD, you can then produce a report (see *Compliance and Change Reporting on page* 388), outlining all such changes by date and time. This report comes seeded with installation.

Dell OpenManage Network Manager stores incremental changes as *RedcellConfigChangeRecords* by device/timestamp. The *ConfigChangeRecordsDAP* Database Aging Policy (DAP) manages how long the OpenManage Network Manager database retains these records. This DAP's default setting stores incremental records for 30 days, then archives or purges them. Reporting shows only records in the database; therefore, by default, the *Configuration Change Report* shows only resource changes made in the last 30 days, but no older. Change this default by changing the number of days to retain such records with the DAP.

The next section describes Change Determination Process Workflow.

Change Determination Process Workflow

Change Manager seeds Change Determination Process and ProScan group operations. You can configure this to run on groups of your choosing if you create a new Change Determination Process group operation.


Initiate Change Determination
Back up device config and add it to label: Change Determination
Check config changed flag
Yes
Is there a configuration change?
No
Compare configuration labels - “Change Determination” and “Current”
Make equipment change diff records for later reporting
Copy the config in the Change Determination label to the Current label
Reset config changed flag
End Change Determination

This process records what is removed, updated or added since it last ran on a scanned device’s configuration. If you run the Change Determination Process, it first backs up the devices’ configuration(s), and stores those with the Change Determination label.

Change Determination Process then looks for Config Changed Flags, and if it finds such flags, indicating a change occurred on the device and/or Change Determination has not run on it, the process then compares the device's changed configuration (in the Change Determination label) to the one in the Current label, storing the difference for future reporting.

At its end, the Change Determination Process re-labels the configuration with the Change Determination label to the Current label, and it un-sets the Config Changed Flag on scanned resources so the flag will not signal change occurred when Change Determination runs again.

After running the Change Determination Process, you can run the Configuration Change report to display what changed for a defined period. The contents of that report depends on the report filter, and the specified period. This report lists changed attributes in the configurations.

Triggering Change Management and ProScan

To trigger the Change Management for a device, right-click it in the Managed Resources portlet and select *Change Management > Change Determination*. You can also schedule Change Determination to run repeatedly, on regular intervals in the Schedules portlet.

You can similarly trigger ProScan by right-clicking a device, and selecting *Change Management > Execute ProScan* or *Execute ProScan Policy*. The former execute all policies connected with the selected device, while the latter allows you to select policy (or policies) to run. Creating a ProScan Group, lets you run all ProScan policies for each device within the selected group, scanning groups even if they consist of devices from different vendors. In ProScan, you can scan device configurations (of specified labels) or Adaptive CLI command output. (See How to: Use ProScan / Change Management on page 359).

How To:
Run the Change Determination Process

The following describes an exercise for the Change Determination process based on manually running it. To run the process as a response to events devices must transmit traps to OpenManage Network Manager. The next sections describe using Change Determination in the following ways:

- Change Determination Confirmation
- Event/Trap-Based Change Determination

Change Determination Confirmation

The following steps confirm change determination is working.

1 Initialize the Change Determination Report and let it do a configuration backup. The first time this runs, Dell OpenManage Network Manager creates no diffs. It just initializes the Change Determination label.

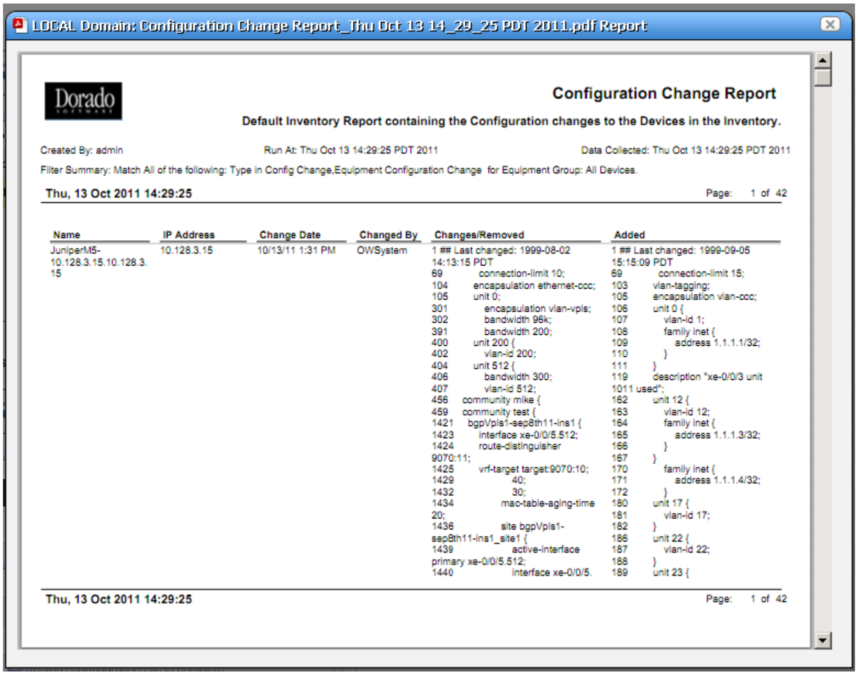
2 Edit a configuration to make a change. For example, make a change in a device you have discovered. One benign change is to add a contact or a description to an interface.

3 Restore it to the device.

4 Execute the Change Determination process on the device by right-clicking it in the Managed Resources Portlet, and selecting *Change Management* > *Change Determination*.

This then backs up the device, compares the original and altered configurations, and writes the difference to report later (see How to: Report on Change Determination on page 390 for the steps to run the report to see such changes).

Since we have initialized the report in step 1, the updated report shows the changes made to the config file.



LOCAL Domain: Configuration Change Report_Thu Oct 13 14_29_25 PDT 2011.pdf Report
Dorado SOFTWARE

Configuration Change Report

Default Inventory Report containing the Configuration changes to the Devices in the Inventory.

Created By: admin   Run At: Thu Oct 13 14:29:25 PDT 2011   Data Collected: Thu Oct 13 14:29:25 PDT 2011

Filter Summary: Match All of the following: Type in Config Change,Equipment Configuration Change for Equipment Group: All Devices.

Thu, 13 Oct 2011 14:29:25   Page: 1 of 42

Name	IP Address	Change Date	Changed By	Changes/Removed	Added

JuniperM5-10.128.3.15.10.128.3.15	10.128.3.15	10/13/11 1:31 PM	OWSystem	1 ## Last changed: 1999-08-02
				14:13:15 PDT
				69 connection-limit 10;
				104 encapsulation ethernet-ccc;
				105 unit 0;
				301 encapsulation vlan-vpls;
				302 bandwidth 96k;
				391 bandwidth 200;
				400 unit 200 {
				402 vlan-id 200;
				404 unit 512 {
				406 bandwidth 300;
				407 vlan-id 512;
				456 community mike {
				459 community test {
				1421 bgpVpls1-sep8th11-ins1 {
				1423 interface xe-0/0/5.512;
				1424 route-distinguisher
				9070:11;
				1425 vrf-target target:9070:10;
				1429 40;
				1432 30;
				1434 mac-table-aging-time
				20;
				1436 site bgpVpls1-
				sep8th11-ins1_site1 {
				1439 active-interface
				primary xe-0/0/5.512;
				1440 interface xe-0/0/5.
					1 ## Last changed: 1999-09-05
					15:15:09 PDT
					69 connection-limit 15;
					103 vlan-tagging;
					105 encapsulation vlan-ccc;
					106 unit 0 {
					107 vlan-id 1;
					108 family inet {
					109 address 1.1.1.1/32;
					110 }
					111 }
					119 description "xe-0/0/3 unit
					1011 used";
					162 unit 12 {
					163 vlan-id 12;
					164 family inet {
					165 address 1.1.1.3/32;
					166 }
					167 }
					170 family inet {
					171 address 1.1.1.4/32;
					172 }
					180 unit 17 {
					181 vlan-id 17;
					182 }
					186 unit 22 {
					187 vlan-id 22;
					188 }
					189 unit 23 {

Thu, 13 Oct 2011 14:29:25   Page: 1 of 42

5 Repeat step 2 through 5 if you like after you have made further changes.

NOTICE

Best practice in production is to schedule a recurring run for Change Determination in the Schedules portlet. Notice that you can also disseminate the report by e-mail, or view previous reports in the web client, as described in the Reports portion of the *User Guide*.

Event/Trap-Based Change Determination

The following steps to trigger Change Determination based on events received by OpenManage Network Manager. Your devices must transmit traps to the OpenManage Network Manager installation, and must emit traps when changes occur, or this does not work.

1 Back up the configuration file for a device you have discovered.

2 Make a change to that device with the Managed Resources editor, or from a Direct Access command line.

3 Such changes make the device emit an event that may have further consequences. For example, for Juniper devices, the Juniper JUNOS Configuration Changed event is a correlation event.

4 To provite a response (and to normalize the emitted event), create an automation rule that emits a `redcellEquipmentConfigChangeNotification` event when Dell OpenManage Network Manager receives creates a event in response to events like the `jnxCmCfgChange` event that occurs when Juniper devices change.

5 Create a rule to respond to `redcellEquipmentConfigChangeNotification` by running the Change Determination process. You do not have to back up the configuration after the change. See How to: Create Event Processing Rules to Trigger Change Determination Process below.

6 To see the change itself, run the Change Determination Report (see Compliance and Change Reporting on page 388 and How to: Report on Change Determination on page 390). The report displays the changes made.

How To:
Create Event Processing Rules to Trigger Change Determination Process

This exercise creates an Event Processing rule that has Change Determination respond to an event. The steps to configure such an event processing rule are as follows:

1 Create a new event processing rule by right-clicking in Event Processing Rules > *New* > *Post Processing* rule in the Event Processing Rule portlet.

2 Enter the name in the field labeled *Name.* (Example: Update Config Change Flag)

3 Click *Next* to go to the *Filter* tab.

4 For the *Specify Events* panel, click on the A*dd* button to select the event to which this rule responds. A selector listing available events appears.

NOTICE

Notice you can limit the selector’s displayed events by entering text in the filter at the top of the selector screen.

5 In the selector, click the event definition (here: `redcellEquipmentConfigChangeNotification`), and confirm your selection.

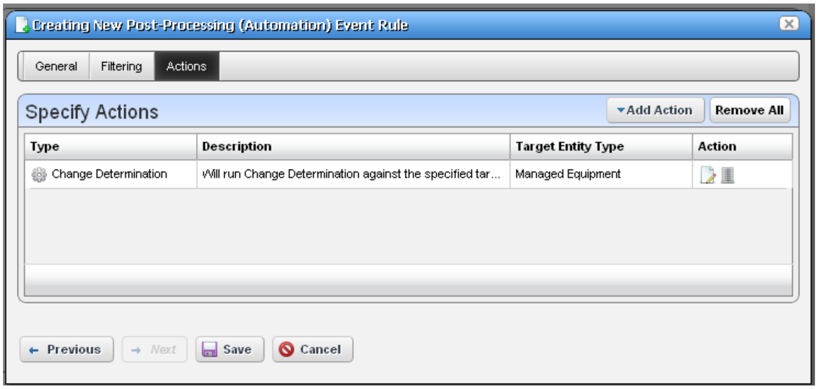
6 Click *Done* to accept the *Event(s)* you have configured.

7 Notice you can further filter which events this rule responds to with the lowest panel in this screen's *Filter Conditions* panel by clicking *Add Filter*. For example, you could create a rule that responds only to events from a particular IP address. For now, we will not configure additional filters.

8 Click *Next* to open the *Actions* tab.

9 Click *Add Action*, and click the *Custom* action alternative, then click Keyword Search and select Change Determination. That action appears in the drop-down combo box. Notice you can also select a target in the action selector. By not selecting one, we run change determination against all Managed Equipment.

10 Click *Apply* and view the Change Determination action listed in the Actions screen.



Type	Description	Target Entity Type	Action
Change Determination	Will run Change Determination against the specified tar...	Managed Equipment	✎ 🗑

Notice that you can add more actions, and edit or delete existing ones with the icons to the right. Click *Apply* once you have selected Change Determination.

11 Click *Save* to preserve this event processing rule. The rule should now respond to the configured event, triggering the action you configured.

NOTE:

Backup and Change Determination automates backing up target devices.
Also: Change Determination's current default is to compare files even if the "Config Change" flag has not been modified. See the OpenManage Network Manager *User Guide* for instructions about how to change this default.

Change Determination Defaults

By default, Change Determination can run against all devices without requiring the config change update flag be set or updated based on events tied to the Update Config Change Flag event processing rule/action.

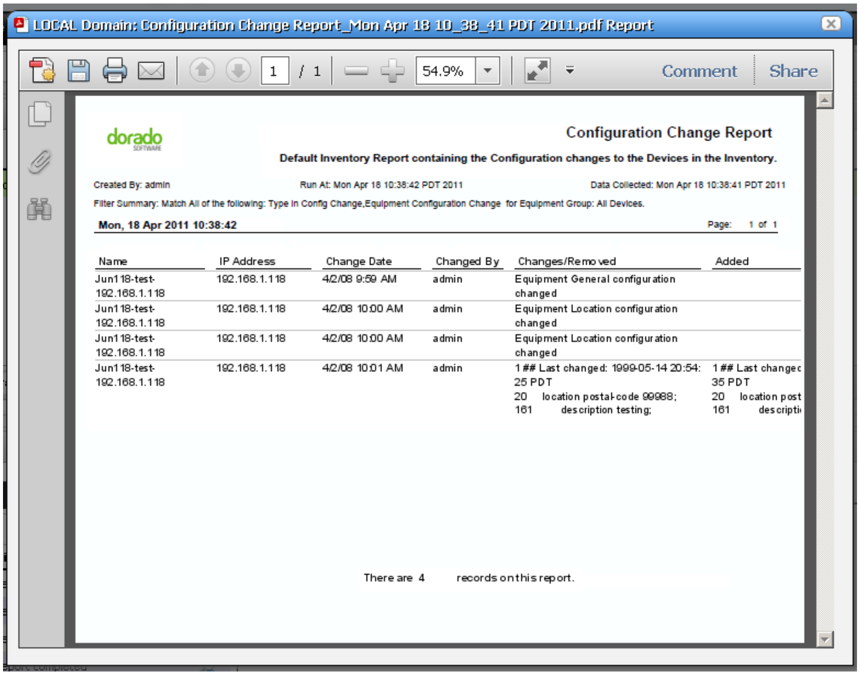
To disable the manual run-ability of the Change Determination process, uncomment the property in \owareapps\changemgmt\lib\cm.properties (or add it to \owareapps\installprops\lib\installed.properties).

```
#############################################
# Change Determination Flag
# Allows system to be flagged to only run
# change determination against devices we
# have received Config Change Event for.
# Default Behavior is to run change determination
# for All targets (the same as setting the below property = false)
#com.dorado.changemgmt.change.determination.require.config.events=true
```

Compliance and Change Reporting

The Compliance Policy Violation report is seeded when you have ProScan / Change Management in Dell OpenManage Network Manager. Inventory Compliance Attributes for reporting can also appear in report templates when you install ProScan. These report in-compliance or out-of-compliance, the last compliance date (when last compliant or not compliant), last config date (when configuration last changed), last checked date (when change was last determined).

You can also run the Change Determination Report that displays changes made to configurations.


LOCAL Domain: Configuration Change Report_Mon Apr 18 10_38_41 PDT 2011.pdf Report
1 / 1
54.9%
Comment
Share
dorado
SOFTWARE

Configuration Change Report

Default Inventory Report containing the Configuration changes to the Devices in the Inventory.

Created By: admin   Run At: Mon Apr 18 10:38:42 PDT 2011   Data Collected: Mon Apr 18 10:38:41 PDT 2011

Filter Summary: Match All of the following: Type In Config Change,Equipment Configuration Change for Equipment Group: All Devices.

Mon, 18 Apr 2011 10:38:42   Page: 1 of 1

Name	IP Address	Change Date	Changed By	Changes/Removed	Added
Jun118-test-192.168.1.118	192.168.1.118	4/2/08 9:59 AM	admin	Equipment General configuration changed	
Jun118-test-192.168.1.118	192.168.1.118	4/2/08 10:00 AM	admin	Equipment Location configuration changed	
Jun118-test-192.168.1.118	192.168.1.118	4/2/08 10:00 AM	admin	Equipment Location configuration changed	

Jun118-test-192.168.1.118	192.168.1.118	4/2/08 10:01 AM	admin	1 ## Last changed: 1999-05-14 20:54:25 PDT
				20 location postal-code 99988;
				161 description testing;
					1 ## Last changec
					35 PDT
					20 location post
					161 descripti

There are 4 records on this report.

See Reports on page 231 for more about reporting capabilities.

The Change Determination Report report displays detected changes based on a configuration change flag set when OpenManage Network Manager detects a change made to the device. To successfully execute this report, you must enable a scheduled Change Determination Process. The process must run before the reports has any contents. To run the process, go to the Schedules portlet, and schedule that change determination process.

Reporting Limitations

The Configuration Change Report only reports on incremental configuration changes discovered in the CD process. Simply making changes to configurations and backing them up in OpenManage Network Manager does *not* ensure these appear in *Configuration Change Reports*. They appear in reports only after running the CD process.

The *Configuration Change Report* includes a Filter that you can alter at runtime. By default, the report filters on *Type* only. If you want more filter criteria—like device IP, and/or date ranges—you must edit the Report filter. To edit the filter, in the Reports manager, right click the *Configuration Change Report*, and select *Open*, then edit the filter in the *Filter* screen by selecting that node on the left.

NOTICE

A recommended best practice is to execute the CD process as an operation run against multiple resources following a scheduled group backup of these resources. If you run backups every day, the *Configuration Change Report* then shows the daily changes, until they are purged from the database.

The application stores the specifics of what changed for future reporting.

How To:

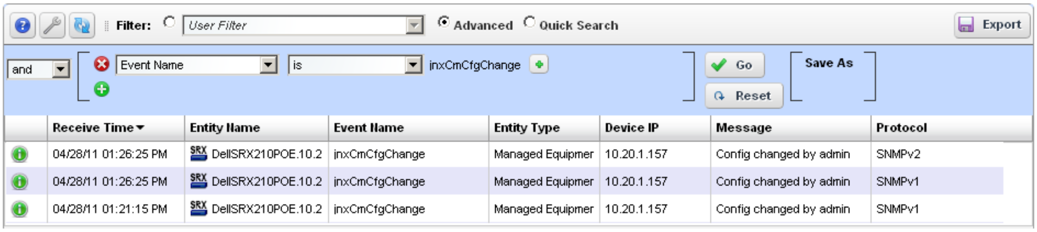
Report on Change Determination

Follow these steps to produce regular change determination reports:

1 First, insure the devices you want to scan are discovered, and send change notifications to the application server.

Check your vendor's manuals to determine how to forward configuration change information to Dell OpenManage Network Manager for your system.

2 When Dell OpenManage Network Manager receives a configuration change notification, the device transmits an event to the OpenManage Network Manager mediation server. When received, this event automatically generates an event called OpenManage Network ManagerEquipmentConfigChangeNotification. Event history displays that notification.



Filter: ○ User Filter ● Advanced ○ Quick Search

and | Event Name | is | inxCmCfgChange

	Receive Time	Entity Name	Event Name	Entity Type	Device IP	Message	Protocol
	04/28/11 01:26:25 PM	DellSRX210POE.10.2	inxCmCfgChange	Managed Equipmer	10.20.1.157	Config changed by admin	SNMPv2
	04/28/11 01:26:25 PM	DellSRX210POE.10.2	inxCmCfgChange	Managed Equipmer	10.20.1.157	Config changed by admin	SNMPv1
	04/28/11 01:21:15 PM	DellSRX210POE.10.2	inxCmCfgChange	Managed Equipmer	10.20.1.157	Config changed by admin	SNMPv1

3 When OpenManage Network Manager receives the OpenManage Network ManagerEquipmentConfigChangeNotification event, it can initiate (if enabled) an event processing rule called *Configuration Change*.

This processing rule triggers a flag in the OpenManage Network Manager database saying a change has occurred in the device's configuration and that OpenManage Network Manager should run change determination against the device when requested.

4 When you run OpenManage Network Manager's change determination process, it reviews the flag setting in the database and backs up a managed device if the flag indicates a change. This backup updates the OpenManage Network Manager system label *Current* which is then compared to the OpenManage Network Manager system *Change Determination* label. OpenManage Network Manager then writes the differences between the two labelled configurations to its database, where it is available for reporting purposes.

5 Once this occurs, the *Change Determination* label moves to point to the same configuration which is reflected by the *Current* label.

6 The report which can run to display these changes is OpenManage Network Manager's *Configuration Change Report*. It displays the name of the device in question, the IP address, date/time of change, who made the change, what was removed and what was added. You can schedule this report to run immediately after an Change Determination process too, so you can capture a history of changes.

13

Actions and Adaptive CLI

The Actions Manager lets you manage actions like enabling monitors, file backups, resyncs and so on. These actions are typically limited in scope, and not that complex. On the other hand, it also manages Adaptive CLI (command-line interface) commands to run against devices which can be complex.

These commands amount to “mini-scripts” to query and configure those devices. In it, you can create commands to run against devices after the device driver has opened a connection to the devices. The driver handles logins, and general connection management. You can even initiate these actions with the application’s actions that target groups (see Discover Links for a Group of Devices, for example)—although if you delete a target group, such operations fail. Many drivers seed pre-configured command that appear listed when you first open this manager. For a brief overview of creating and using these, see How to: Create Adaptive CLI Examples on page 420.

Adaptive CLI’s Attributes capabilities let you insert variables in scripts. See Attributes on page 402 for the details. You can also assemble configurations made here as component Tasks to execute with other component Tasks. You can even use this capability to include Perls scripts within OpenManage Network Manager. See Perl Scripts on page 419.

NOTICE

You can have Actions maintain lists like ACLs, and when these change, in the Adaptive CLI script, push the updated list out to the appropriate devices.

Adaptive CLI commands let you map several vendor-specific commands to a single action, so you could, for example, query two types of devices throughout the network for their MAC addresses with a single action. Adaptive CLI actions can also help you debug more complex scripts that either query or configure devices.

The Adaptive CLI manager displays a list of *Configure* and *Show* commands (the *Command Type*) with a *Name*, *Description* and the *Last Run Date*. You can filter what appears in this manager with the fields at its top.

NOTE:

The contents of the Action Portlet vary, depending on the various options you have installed.

CAUTION:

Particularly for Adaptive CLI, and possibly for other Dell OpenManage Network Manager capabilities, the level of access to devices must match the desired effect. If Dell OpenManage Network Manager’s login to a device permits only read access, then Adaptive CLI configuration commands which require write capabilities will not be effective.

Using Adaptive CLI

You can quickly take a set of commands or configuration file snippet from a device, copy it directly into the Script editor, mark it up, and save it as a working CLI.

When using the CLI Format, The Adaptive CLI tool will prompt you to create new attributes based upon your script markup. This lets you quickly create a script and schema to create an ACLI. If you have attributes that are mainly simple String attributes, this is a very quick and automated approach.

Using Perl in Adaptive CLI

If you need conditional logic that goes beyond simple scripting, you can use Perl in Adaptive CLI. The example below checks to see if a String Attribute is empty (null) or not. If the String attribute (`ShowCmdString`) has content, the show command with `ShowCmdString` as a parameter goes to the device. Otherwise, the Perl script skips or excludes this statement.

Embedded CLI Example:

```
[IF ShowCmdString]
    Show [ShowCmdString]
[ENDIF ShowCmdString]
```

You could use the CLI format for the above example, but if you need to check attributes of other types, besides String, then you must switch to Perl. For example:

Boolean `myFlag` equals True:

```
if ($myFlag)
{
      …
}
```

Integer `myInt` greater than zero:

Example:

```
if ($myInt > 0)
{
      …
}
```

To check whether a string is a particular value—like from a valid values list entry assigned to the String attribute—then you must also use Perl. The CLI format only can test if the String exists. It cannot validate its value when populated. For example: EncapsulationType = “VLAN-CCC”, “VLAN-TCC”, … You can not do this check with the CLI Format: `[IF EncapsulationType = “VLAN-TCC”].` Instead, use a Perl script with a statement like this:

```
If ($EncapsulationType  eq  “VLAN-TCC”)
```

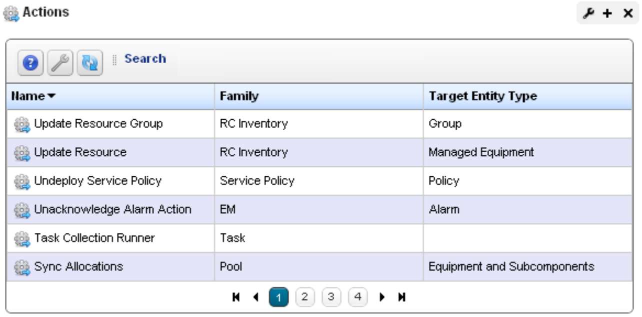
```
{
     print “set encapsulation $EncapsulationType\n”;
}
```

If any attributes in your script are a List (Collection), the only way to loop through the list’s items during the Adaptive CLI execution is to use Perl. For example: Processing a List of Strings:

```
$count = 0;
foreach @MyCommandList)
{
   print (“$MyCommandList[$count]\n”);
   $count++
}
```

Actions Portlet

The Actions Portlet lets you manage actions like Adaptive CLI, backups, change management actions, and so on. The list of actions available to your system depends on the exact configuration you have installed. This portlet is the primary access point for Adaptive CLI editing.



Name	Family	Target Entity Type
Update Resource Group	RC Inventory	Group
Update Resource	RC Inventory	Managed Equipment
Undeploy Service Policy	Service Policy	Policy
Unacknowledge Alarm Action	EM	Alarm
Task Collection Runner	Task	
Sync Allocations	Pool	Equipment and Subcomponents

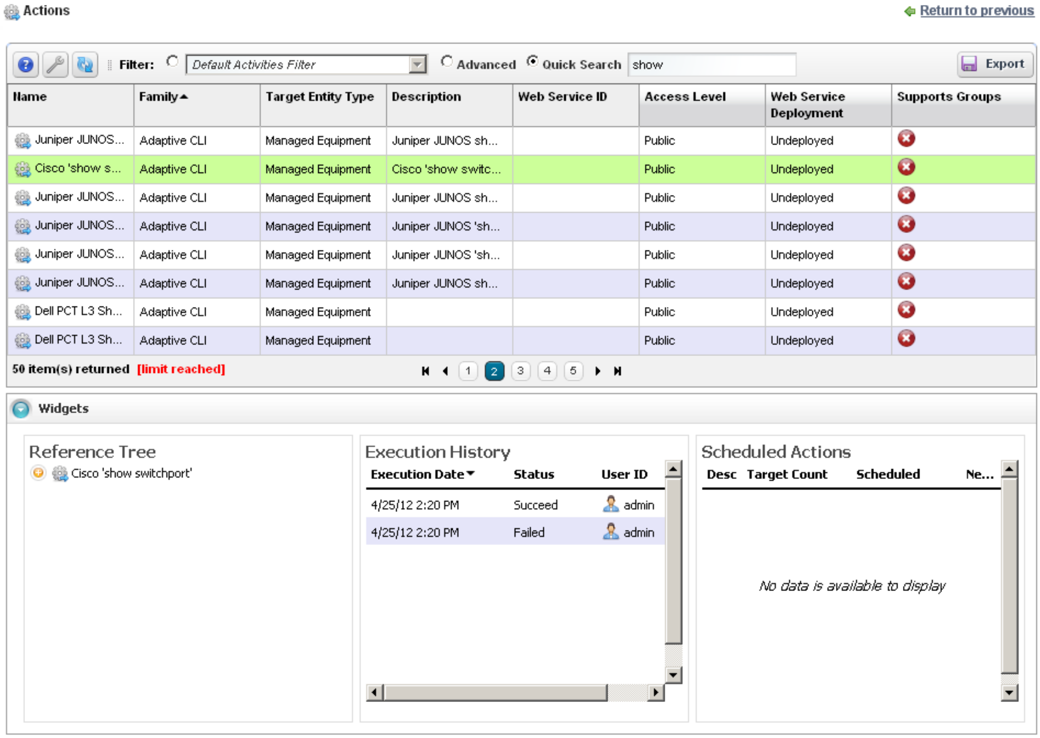
The summary portlet displays columns with the *Name*, *Family*, and *Target Entity Type* for the listed Action. The Family column describes the type of Action.

△ **CAUTION:**
For Adaptive CLI to be fully functional, you must install Perl on your application server. See Perl on page 38 for more about this.

To configure and schedule groups of actions, right-click in the Schedules portlet, and create an *Action Group*. This lets you run several actions, and configure their order and targets.

Expanded Actions Portlet

The expanded portlet adds columns for *Description*, *Last Web Service ID*, *Access Level*, *Web Service Deployment*, and *Supports Groups*.



Actions

Return to previous

Filter: ○ Default Activities Filter ○ Advanced ● Quick Search show

Export

Name	Family ▲	Target Entity Type	Description	Web Service ID	Access Level	Web Service Deployment	Supports Groups
Juniper JUNOS...	Adaptive CLI	Managed Equipment	Juniper JUNOS sh...		Public	Undeployed	✗
Cisco 'show s...	Adaptive CLI	Managed Equipment	Cisco 'show switc...		Public	Undeployed	✗
Juniper JUNOS...	Adaptive CLI	Managed Equipment	Juniper JUNOS sh...		Public	Undeployed	✗
Juniper JUNOS...	Adaptive CLI	Managed Equipment	Juniper JUNOS 'sh...		Public	Undeployed	✗
Juniper JUNOS...	Adaptive CLI	Managed Equipment	Juniper JUNOS 'sh...		Public	Undeployed	✗
Juniper JUNOS...	Adaptive CLI	Managed Equipment	Juniper JUNOS sh...		Public	Undeployed	✗
Dell PCT L3 Sh...	Adaptive CLI	Managed Equipment			Public	Undeployed	✗
Dell PCT L3 Sh...	Adaptive CLI	Managed Equipment			Public	Undeployed	✗

50 item(s) returned [limit reached]

1 2 3 4 5

Widgets

Reference Tree

Cisco 'show switchport'

Execution History

Execution Date ▼	Status	User ID
4/25/12 2:20 PM	Succeed	admin
4/25/12 2:20 PM	Failed	admin

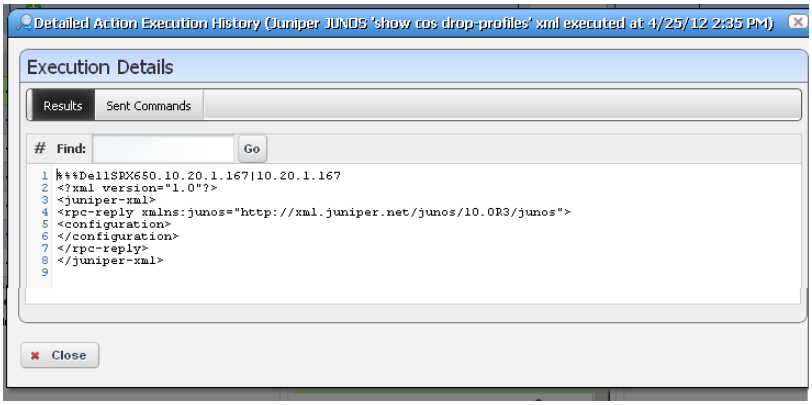
Scheduled Actions

Desc	Target Count	Scheduled	Ne...

No data is available to display

The expanded portlet also has snap panels to display Reference Tree connections between the selection and other elements within Dell OpenManage Network Manager, as well as an Execution History panel listing *Device Name*(s), *Execution Date* and *Status* for the selected Action, and a Scheduled Actions panel cataloging any Schedules for the selected Action. Right-click a Schedule to edit, execute or delete it.

The Execution History snap panel displays history by device. Right-click to see the details of what occurred when the selected action ran against a particular device (*Execution Details*).



Detailed Action Execution History (Juniper JUNOS 'show cos drop-profiles' xml executed at 4/25/12 2:35 PM)
Execution Details
Results
Sent Commands
# Find:
Go
Close

```
%%%DellSRX650.10.20.1.167|10.20.1.167
<?xml version="1.0"?>
<juniper-xml>
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/10.0R3/junos">
<configuration>
</configuration>
</rpc-reply>
</juniper-xml>
```

The Execution Details panel displays tabs showing the *Results* of running an Adaptive CLI, and the *Sent Commands*.

You can also *View Job* to see a screen like *the Audit Trail / Jobs Screen on page 114*, or *Delete* to remove a listed Action record from the list.

Right-click menus on the Actions portlet can include the following items (these vary, depending on the Action's family):

New / Edit —Lets you create or modify a selected action in the Adaptive CLI Editor, described below.

Execute—Execute the selected Action. This typically displays a target equipment selector screen, and a screen where you can configure any parameters necessary for execution, then a screen like the Audit Trail / Jobs Screen on page 114. Dell OpenManage Network Manager validates the parameters before executing the Adaptive CLI. If a parameter is invalid Dell OpenManage Network Manager logs a validation error to the audit trail. In this case the Adaptive CLI is not executed and leaves behind no history record.

Some Adaptive CLI scripts also let you *Preview* what is sent the device in a subsequent screen. This does not appear in the execution of Targetless, and Multi-target Adaptive CLIs. Some actions are configured to target groups, too.

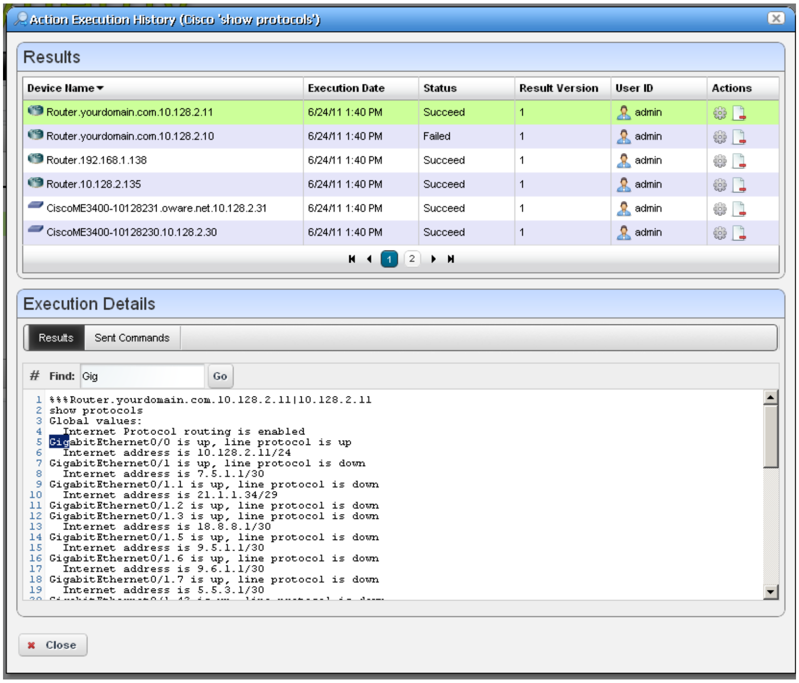
Details—Opens a screen displaying the Reference Tree, Execution History, and Action Details for the selected Action.

Web Services—You can elect to *Deploy / Undeploy* or *Export WSDL* to create a web service from the selected Action.

Deploy / Undeploy Web Service–Deploy or undeploy the selected activity as a web service.

Export WSDL–This exports the WSDL for the selected activity. You must select the file name and location. Web Services Description Language (WSDL) is an XML format for the description of network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information.

History—Displays the history of the selected action.



Device Name	Execution Date	Status	Result Version	User ID	Actions
Router.yourdomain.com.10.128.2.11	6/24/11 1:40 PM	Succeed	1	admin	
Router.yourdomain.com.10.128.2.10	6/24/11 1:40 PM	Failed	1	admin	
Router.192.168.1.138	6/24/11 1:40 PM	Succeed	1	admin	
Router.10.128.2.135	6/24/11 1:40 PM	Succeed	1	admin	
CiscoME3400-10128231.oware.net.10.128.2.31	6/24/11 1:40 PM	Succeed	1	admin	
CiscoME3400-10128230.10.128.2.30	6/24/11 1:40 PM	Succeed	1	admin	

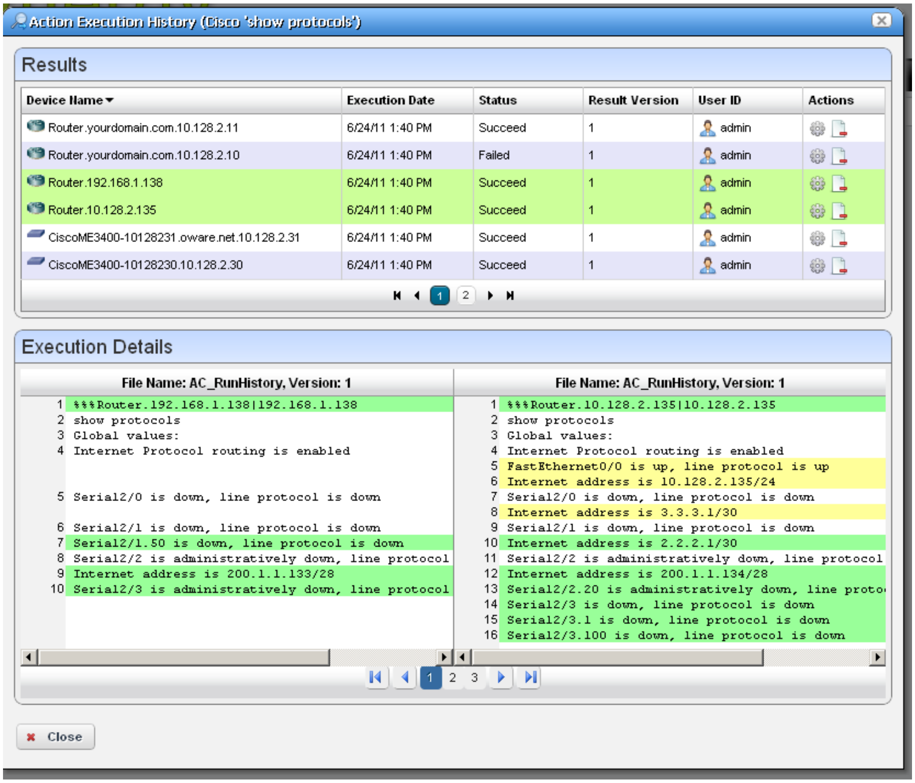
Find: Gig

```
%%%Router.yourdomain.com.10.128.2.11|10.128.2.11
show protocols
Global values:
  Internet Protocol routing is enabled
GigabitEthernet0/0 is up, line protocol is up
  Internet address is 10.128.2.11/24
GigabitEthernet0/1 is up, line protocol is down
  Internet address is 7.5.1.1/30
GigabitEthernet0/1.1 is up, line protocol is down
  Internet address is 21.1.1.34/29
GigabitEthernet0/1.2 is up, line protocol is down
GigabitEthernet0/1.3 is up, line protocol is down
  Internet address is 18.8.8.1/30
GigabitEthernet0/1.5 is up, line protocol is down
  Internet address is 9.5.1.1/30
GigabitEthernet0/1.6 is up, line protocol is down
  Internet address is 9.6.1.1/30
GigabitEthernet0/1.7 is up, line protocol is down
  Internet address is 5.5.3.1/30
```

In the *Results* (top of screen panel) click to select the device for which you want additional information, and the *Execution Details* panel displays the *Results* of execution in one tab and the *Sent Commands* in another.

Notice that you can *Find* text within a result (click *Go* to repeat the find). You can also see the bottom panel if you right-click a single execution within the *Execution History* snap panel in the Expanded Actions Portlet.

If you select two executions in the top panel (or in the *Execution History* snap panel and right-click), a comparison appears.



Device Name	Execution Date	Status	Result Version	User ID	Actions
Router.yourdomain.com.10.128.2.11	6/24/11 1:40 PM	Succeed	1	admin	
Router.yourdomain.com.10.128.2.10	6/24/11 1:40 PM	Failed	1	admin	
Router.192.168.1.138	6/24/11 1:40 PM	Succeed	1	admin	
Router.10.128.2.135	6/24/11 1:40 PM	Succeed	1	admin	
CiscoME3400-10128231.oware.net.10.128.2.31	6/24/11 1:40 PM	Succeed	1	admin	
CiscoME3400-10128230.10.128.2.30	6/24/11 1:40 PM	Succeed	1	admin	

File Name: AC_RunHistory, Version: 1

```
%%%Router.192.168.1.138|192.168.1.138
show protocols
Global values:
Internet Protocol routing is enabled


Serial2/0 is down, line protocol is down

Serial2/1 is down, line protocol is down
Serial2/1.50 is down, line protocol is down
Serial2/2 is administratively down, line protocol
Internet address is 200.1.1.133/28
Serial2/3 is administratively down, line protocol
```

File Name: AC_RunHistory, Version: 1

```
%%%Router.10.128.2.135|10.128.2.135
show protocols
Global values:
Internet Protocol routing is enabled
FastEthernet0/0 is up, line protocol is up
Internet address is 10.128.2.135/24
Serial2/0 is down, line protocol is down
Internet address is 3.3.3.1/30
Serial2/1 is down, line protocol is down
Internet address is 2.2.2.1/30
Serial2/2 is administratively down, line protocol
Internet address is 200.1.1.134/28
Serial2/2.20 is administratively down, line proto
Serial2/3 is down, line protocol is down
Serial2/3.1 is down, line protocol is down
Serial2/3.100 is down, line protocol is down
```

This has the same color coding as you would see comparing configuration files. Lines that differ between the two Adaptive CLI results appear highlighted green. Lines that are missing in one, but that appear in another appear highlighted red. Added lines appear highlighted in yellow. Use the right/left arrows or the page numbers at the bottom of the screen to page through the side-by-side comparison.

Audit—Opens an Audit Trail Viewer for the selected Action. See Audit Trail / Jobs Screen on page 114 for details.

Show Last Results—Show the last execution details (like history for a single run).

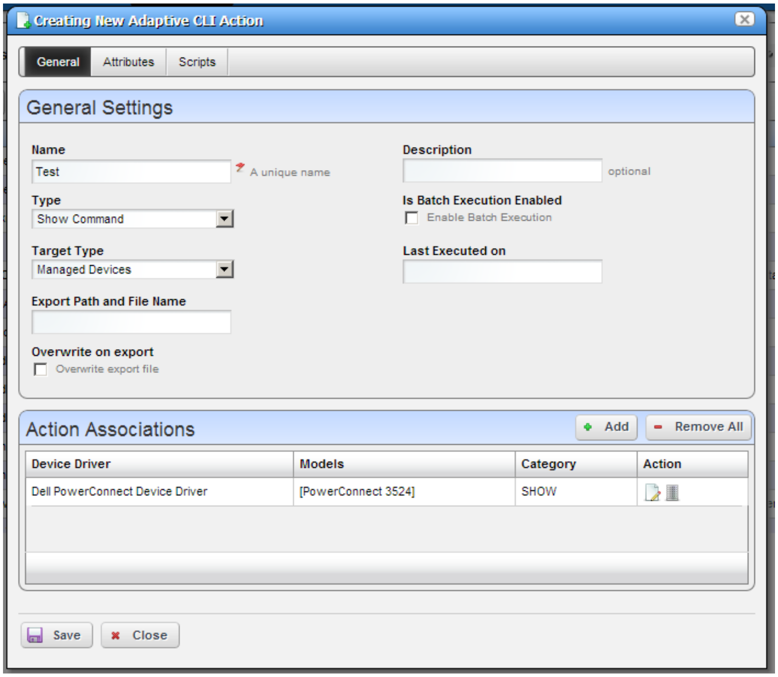
Schedule—Schedule the selected Action. See Scheduling Actions on page 439 for details.

Delete—Remove the selected Action from the list.

Import / Export—Import or Export a file representations of the ACLI action selected. Dell OpenManage Network Manager supports ACLI import / export only.

Adaptive CLI Editor

This editor creates new Adaptive CLIs When you click *New*, or *Edit* after, selecting an existing command, the command editor screen opens. You can create *Configure Commands*, *External Commands*, and *Show Commands*.



General Settings

Name: Test (A unique name)

Description: (optional)

Type: Show Command

Is Batch Execution Enabled: □ Enable Batch Execution

Target Type: Managed Devices

Last Executed on:

Export Path and File Name:

Overwrite on export: □ Overwrite export file

Action Associations

Device Driver	Models	Category	Action
Dell PowerConnect Device Driver	[PowerConnect 3524]	SHOW	

The editor screen has the following tabs (the ones that appear depend on the type of command you are editing):

- General
- Attributes
- Scripts

The Adaptive CLI Manager logs into devices in enable mode by default. For most configuration commands (and even some show commands), you must typically first set the device to its configuration mode. Dell OpenManage Network Manager also validates entries. If saving fails, a red "X" appears next to required omitted entries.

Click *Save* to preserve the Adaptive CLI you have configured. Clicking *Close* does not save your configuration.

General

The following are parameters to configure in this panel:

Name—A unique identifier for this action. For example: "Retrieve MyDevice MAC addresses."

For a new action to appear on the right-click Action menu, begin its name with the vendor name. For example, *Force10-showversion* would appear under Actions in that menu. Otherwise, it appears under and Adaptive CLI classification.

Description—A text description of the action.

Type—Select a type from the pick list (*Configure*, *External* or *Show Command*).

NOTICE

You can use Dell OpenManage Network Manager's optional Proscan policies to scan the results of Adaptive CLI show commands for compliance, and trigger actions (alarms, e-mail, and so on) based on their contents. See Chapter 12, Change Management / ProScan.

The *External* command refers to a script. Making this an ACLI means Dell OpenManage Network Manager can schedule such scripts or include them in a workflow. See External Commands on page 413 for more about these.

Target Type—Select a type of target from the pick list (*Card*, *Equipment and Subcomponents*, *Interfaces*, *Managed Devices*, *Ports*). Adaptive CLI targets can also be *None* (*Targetless*). On execution, if you create an Adaptive CLI type with port target, then the selection view panel lets you choose ports. When the Adaptive CLI type is *External* then Target Type can be *None*; otherwise it is not an option

Export File Location—This is a file name and path (`C:\mypath\myfile.txt`) where you elect to store the result of an adaptive CLI execution. You must specify an extension for the file, and may specify the variable `$IPAddress` in the filename for pattern substitution.

Overwrite on Export—Check to overwrite the result file. This overwrites any existing results file with new results (if checked). If it is unchecked, any new results append to the exported file, with a time / date stamp and target-identifying information.

Is Batch Execution Enabled—Check to allow consolidation of related Adaptive CLI scripts, provided the associated device driver supports such consolidation when provisioning a service.

Batching is valuable for instances like the following: if an Adaptive CLI-provisioned service has 10 sub-services, OpenManage Network Manager runs commands for the first service, then if it's successful, commits, and logs off. Then OpenManage Network Manager repeats this procedure nine times more, logging on, committing and logging off for each command. If batching is turned on, then OpenManage Network Manager sends the 10 Adaptive CLIs to the device as a single unit before committing and logging off. (This logic does not apply if you are running a procedure against 10 devices.)

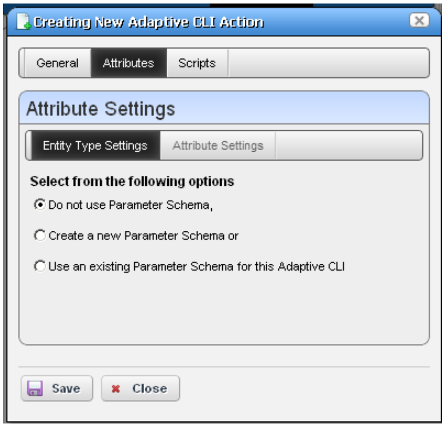
Batching is best practice, since if one line of a command fails, the device rolls back the entire block of commands. Cisco devices typically skip and do not commit failing lines.

Last Executed On—Displays the last execution date. This is blank for *New* Adaptive CLIs.

Action Associations

Click the *Add* button to add associations to vendors and device models. For example, you can confine an Adaptive CLI to Dell devices, even to certain Dell models. When you right-click your discovered Dell device in the Managed Resource portlet, the associated Adaptive CLIs appear listed among the available actions you can request.

Attributes



Select from the following options

● Do not use Parameter Schema,

○ Create a new Parameter Schema or

○ Use an existing Parameter Schema for this Adaptive CLI

Adaptive CLI commands let you configure modifiable *Attributes* as part of the command you send to the selected equipment.

Use the radio buttons to select from the following options:

- Do not use Parameter Schema
- Create a new Parameter Schema
- Use an existing Parameter Schema for this Adaptive CLI

Sharing a schema rather than creating a new one with each Adaptive CLI lets you use the same attributes in complementary scripts. For example one script may create an entity, while another removes it. In this case, the valid values, labels, and so on for the attributes are always going to be the same in both create and delete Adaptive CLIs; therefore, sharing the same schema is both safe and easy. Either script can mark unused attributes as “Not applicable.”

Do not use Parameter Schema

This option does not save a set of standard attributes to re-use later. Go directly to the Scripts tab to create this type of Adaptive CLI.

Create a new Parameter Schema

Click the *New* button and the schema screens appear.

Entity Type Settings

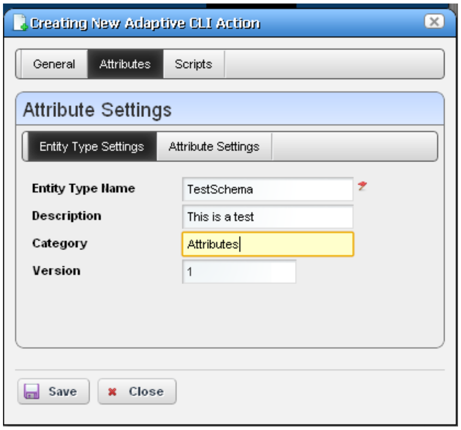
The *Entity Type Settings* tab has the following fields:

Entity Type Name—An identifier for the schema.

Description—A text description for the schema.

Category—A category for the schema.

Version—An automatically-created version number.



Entity Type Name: TestSchema

Description: This is a test

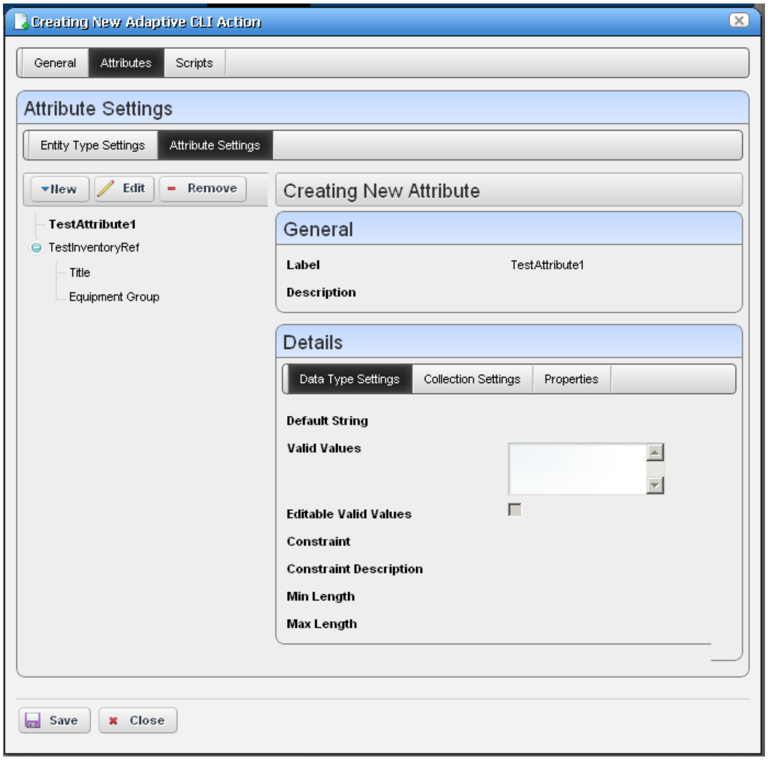
Category: Attributes

Version: 1

Attribute Settings

Click the *New Attribute* button and select the attribute type and open editor panel and configure the attribute. Configured attributes appear in a tree to the left of the editor panel. Click a listed attribute to edit it after it has been created.

The editor panel has the following fields:



Label: TestAttribute1

Description

Label—An identifier for the attribute. These can have spaces, but not underscores.

Description—A text description for the attribute.

The following tabs may appear, depending on the type of attribute you are configuring (some are absent). Additional fields may appear, depending on the attribute type you are configuring:

Datatype Settings

Default Value—An optional default value for the attribute.

Collection Settings

Is Collection?—Check to classify this attribute as a collection.

Allow Duplicate Values—Check to enable allowing duplicates.

Allow Reordering—Check to enable allowing reordering.

Collection Min / Max Length—Enter the minimum/maximum number of characters in this attribute.

Properties

Upper / Lower Case—Check to validate on case.

Case Insensitive—Validation ignores case.

Multi Line Text—Check to enable multiline text.

One Way Encrypt—Check to encrypt.

Truncate—Truncate the attribute.

Attribute Settings

You can create new attribute schemas. See Attribute Editor Panels below for information about different datatypes' fields. Once you create a set of attributes, they remain available for re-use as a schema, or collection of attributes. To identify schemas, enter the following fields:

Label—A unique, mandatory identifier for the collection of attributes.

Description—A text description of the entity.

Click *New* to create or select an attribute in the displayed tree and click *Edit* to open an editor where you can create or modify attributes. Select an attribute and click *Remove* to delete it from the list.

Attribute Editor Panels

The following panels appears, depending on the attribute type selected from the pick list. The fields in the editor depend on this selection. Available types include *Boolean*, *Coded Value*, *Date*, *Decimal*, *IP Address*, *Integer*, *Long*, *Inventory Reference*, and *String*. The following fields appear for each of these types (omitting redundant fields):

NOTE:

Configure the data type of an attribute before you save a task. After attributes are in Scripts, you cannot change the data type.

Boolean

Default Value—Check for *True*.

Coded Value

Default Coded Value—Enter the default coded value. If an attribute a Coded Value then enter valid values in the format of NUMBER:Display Label. For example:

10:Hello World

20:Hello Moon

Without this pattern a validation error appears. Coded values become a Drop Down (Combo Selection) at runtime containing the Display labels within it (like Hello World, Hello Moon). Selecting one gives the script the numeric value (If users select Hello World, the value the script gets is 10)

The default appears by default in this list of alternatives. Enter any other alternatives below this field in the *Valid Values*.

Valid Values—Enter a valid value in the line above the table of valid values, then click the green + to add the value entered to the list. Click the *Remove* icon (the red -) to delete a selected value. These must be formatted like the *Default Coded Value*.

Date

Default Value—Enter a default date, or use date icon to display a calendar where you can select one. Click off the calendar to make it disappear.

Valid Values—Enter valid date values above the list, and click the green plus to add them to the list.

Decimal

Default Value—Enter a single or range of default decimal values.

Constraints—Enter a range of acceptable numbers separated by a colon. For example, Constraints = 2:4096. At runtime, a field where you can enter numbers. validates that entered numbers are between 2 and 4096 when running the Adaptive CLI. If you enter a number outside this range, a validation message appears and the attribute name turns red. You can also include several numbers or ranges separated by the pipe (|) character. If you specify a range, the lowest number must be to the left of the highest number. For example 9:99|999:1010.

Valid Values—Enter valid decimal range values, and click the green + (the red - removes them). You can manage these as described in Coded Value above.

IP Address

See also Validating IP Address Variables on page 407.

Default Value—Enter a default IP Address.

Valid Values—Enter valid values as described in Coded Value above. Check *IP Mask*, *Subnet*, *Allow 32 Bit Mask*, and *Allow Any Valid Ip* in the *Properties* tab if you want the values entered to be those.

Editable Valid Values—Check to enable editing of default or entered IP addresses.

Integer

Default Value—Enter a default integer.

Constraints—Enter a range of acceptable numbers separated by a colon. You can also include several numbers or ranges separated by the pipe (|) character. If you specify a range, the lowest number must be to the left of the highest number. For example 9:99|999:1010.

Valid Values—Enter ranges of valid values as described in Decimal above.

Editable Valid Values—Check to enable editing of default or entered integer.

Long

Default Value—Enter a default long.

Constraints—Enter a range of acceptable numbers separated by a colon. You can also include several numbers or ranges separated by the pipe (|) character. If you specify a range, the lowest number must be to the left of the highest number. For example 9:99|999:1010.

Valid Values—Enter ranges of valid values as described in Decimal above.

Inventory Reference

Select the *Reference Type* entity with the list that appears when you click the green plus (+), then use the side-by-side widget's arrows to move available attributes from *Available* to *Selected*. You can change the *Reference Type* by deleting it with the red minus (-), then selecting a new type with the green plus.

String

Default String—Enter a default string.

Valid Values—Enter valid values as described in Coded Value above.

Editable Valid Values—Check to enable editing valid values.

Constraint—Enter the regular expression constraints, if any, on the string attribute.

Constraint Description—Enter the message to appear if the regular expression constraints are not met.

Min / Max Length—Enter the minimum / maximum number of characters in a valid string.

Click A*pply* to accept your edits for the attribute, or *Cancel* to abandon them.

Use an existing Parameter Schema for this Adaptive CLI

Select this, and a *Select Existing* button appears. Clicking this button opens a selector where you can select from previously-configured attribute schemas (collections of attributes) to use in the Adaptive CLI you are configuring.

Validating IP Address Variables

Programatically, IP address attributes support four extended properties: IP_MASK, SUBNET, ALLOW_32_BIT_MASK, and ALLOW_ANY_VALID_IP. The state of the first two largely defines Dell OpenManage Network Manager's responses.

IP_MASK—Determines whether Dell OpenManage Network Manager accepts an IP address OR a subnet/subnet mask. The value accepted is an IP address attribute when false, subnet/ subnet mask when true.

SUBNET—This property determines whether a subnet value must be provided or not, and controls display of the subnet portion of the widget. Valid subnet values are 1-31.

By default, when both of the above are false, the attribute only accepts valid IPv4 addresses. For example: 10.10.10.4

If IP_MASK is false and SUBNET is true then Dell OpenManage Network Manager accepts any valid IP address with a subnet specified. The address must be an IP within the specified subnet. For example, 10.10.10.4/24 is a valid entry whereas 10.10.10.0/24 is invalid since it represents the subnet id, not an actual address within the subnet.

If IP_MASK is true and SUBNET is false, then OpenManage Network Manager accepts one of the 32 valid subnet masks. The widget displays pick list for user to choose from. For example 255.255.255.0

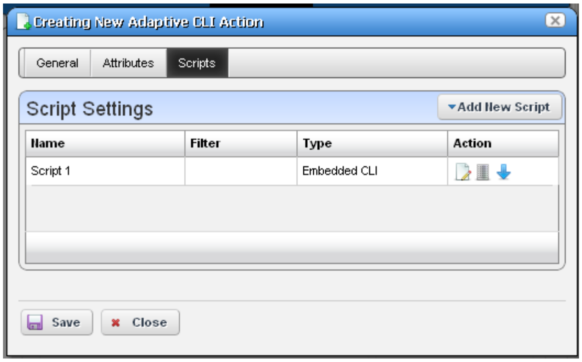
If IP_MASK is true and SUBNET is true, then OpenManage Network Manager accepts a subnet id (the first IP address within a subnet). For example 10.10.10.0/24, with 10.10.10.0 as the first address within the subnet spanning 10.10.10.0 to 10.10.10.254. Entering an IP address within the subnet, say 10.10.10.4/24, the attribute would convert that to 10.10.10.0/24

ALLOW_32_BIT_MASK—Valid subnet values are between 1 and 31. To extend this to support a 32-bit subnet, which is essentially a single IP address (10.10.10.4/32), set the ALLOW_32_BIT_MASK property.

ALLOW_ANY_VALID_IP—To accept either an IP address, IP address and subnet or subnet, then IP_MASK remains false, SUBNET is true. With the ALLOW_ANY_VALID_IP true, the subnet field is optional and OpenManage Network Manager disables any requirement that a subnet id be specified. Basically the only validation is that a valid IP address is entered. For example, in this configuration, 10.10.10.4, 10.10.10.4/24 and 10.10.10.0/24 would all be valid.

Scripts

This screen manages the Adaptive CLI scripts created to query (show) devices or configure them. Dell OpenManage Network Manager runs only one script per target.



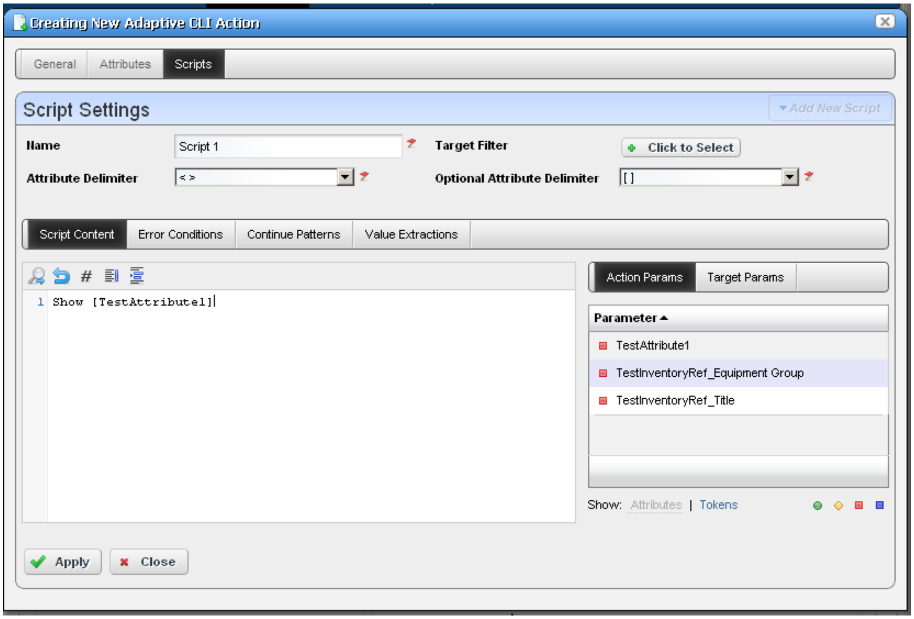
Name	Filter	Type	Action
Script 1		Embedded CLI	

Notice you can order multiple scripts with the arrow(s) to the right of a listed script. Only one schema of attributes exists for each Adaptive CLI, so the same attribute(s) appear when you construct each script.

Dell OpenManage Network Manager uses the script’s filter to match the target. For example, imagine two scripts for which the first has filter = target.type = SWITCH, and the second has no filter. Then only SWITCH devices run the first script and quit. All remaining targeted devices do not run first script. Instead they run the second script since that script has no filter. Only one script runs on the selected target equipment. The ordering lets you to make the most efficient use of that one-run-per-target pattern.

Script Settings

Click *Add New Script* to create a new item in those listed at the top of this screen, or select and item and click the *Edit* icon to its right to alter it. When you create a new script, you must select either *Embedded CLI* or *Perl*. Embedded CLI scripts are command-line interface (CLI) interactions. See Perl Scripts on page 419 for more about using Perl.



Name: Script 1

Target Filter: Click to Select

Attribute Delimiter: < >

Optional Attribute Delimiter: [ ]

```
Show [TestAttribute1]
```

Parameter
TestAttribute1
TestInventoryRef_Equipment Group
TestInventoryRef_Title

Show: Attributes | Tokens

Clicking the *Delete* icon removes a selected item. Notice that the up/down buttons to the right of the list allow you to re-order selected items (they run from top first to bottom last).

See Attribute Appearance and Validation for a description of what constitutes a valid attribute.

Name—Enter an identifier for the script you are creating or altering.

Target Filter—Click the plus (+) to create a filter that describes the target for this script. For example, this filter could confine the action of the configured script to devices from a certain vendor, or only devices with an operating system version later than a certain number. Since you can have several scripts, those Adaptive CLIs with a single label ("Show Users," for example) could therefore contain several scripts with syntax appropriate to a variety of devices and operating systems.

△ **CAUTION:**
Adaptive CLI supports only filters that select the Managed Equipment type of device.

Attribute Delimiter—The delimiter(s) you select from the pick list here surround the attributes you designate as mandatory. See Adaptive CLI Script Language Syntax on page 418 for more about these.

Optional Attribute Delimiter—The delimiter(s) you select from the pick list here surround the attributes you designate as optional. See Adaptive CLI Script Language Syntax on page 418 for more about these.

All but *Delete* open a script editor with the following panels:

- Script Content
- Error Conditions
- Continue Pattern
- Attributes Extraction

Script Content

On the left, you can enter text, *Search* by clicking the magnifying glass, and use *Cut*, *Copy*, *Paste*, *Undo*, *Jump to Line #*, *reformat*. The *Attributes* appear under *Target Params* on the right of this text entry screen. Double-click an attribute to insert it unless you are writing a Perl script; this feature does not work for Perl. Right-click the previously-configured attributes in this panel to designate them as *Mandatory*, *Optional*, *Not Applicable* or *Non Configuration* in a context menu that appears when you right-click.

NOTICE

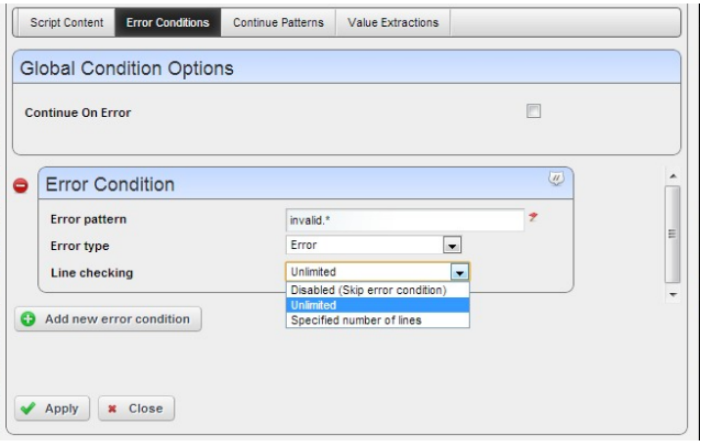
Dell OpenManage Network Manager does not send *Non Configuration* attributes to the device with the script. These are comments that can serve to remind users of critical information. For example, you can make *Non Configuration* boolean attributes into a checklist for someone executing a script, and the history of this script can record whether Dell OpenManage Network Manager made these checks when the script ran.

Notice that the *Search* also permits Regular expressions.

You can also enter two types of script language here. See Adaptive CLI Script Language Syntax on page 418 for a description of the internal *If* capabilities. If you need more elaborate scripting, you can also use Perl scripts to send text to devices. See *Perl Scripts on page 419* for a description of those capabilities.

Error Conditions

The error condition lets you configure errors for your script.



Global Condition Options

Continue On Error □

Error Condition

Error pattern: invalid.*

Error type: Error

Line checking: Unlimited

Check *Continue on Error* under the Global Condition Options, if you want the script to not stop when it encounters an error. Click *Add new error conditions* to configure a condition at the bottom of this screen with the following fields:

Error Pattern—Enter a regular expression for the error.

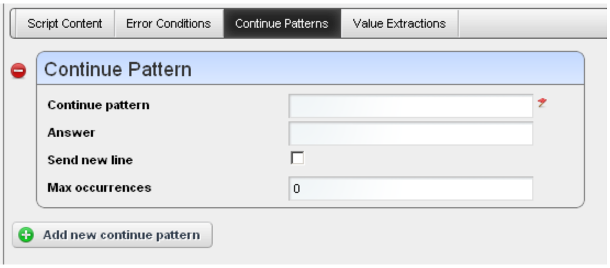
Error Type—Select from the pick list of options (*Error, Warning, Ignore*).

Line checking—Select from the pick list (*Unlimited, Disabled (Skip error condition), Specific number of lines*). If you select a specific number of lines, enter the number of lines of the script output to check for the pattern specified, after each command execution. An error message is most likely to appear immediately right after the command is invoked.

Continue Pattern

Like Error Conditions, this screen lets you enter conditions to which script execution can respond.

The Continue Pattern editor operates like the Error Conditions editor, but has slightly different fields.



Continue Pattern

Continue pattern:

Answer:

Send new line □

Max occurrences: 0

Continue Pattern—If you expect the device output of a script to prompt to continue, you may add a *Continue Pattern* with a regular expression to parse.

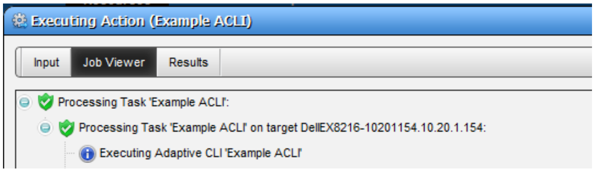
Answer—This field specifies the *Answer* to the *Continue Pattern* prompt.

Send New Line—For some devices, a single key response without a new line would be sufficient; in such cases, you may need to uncheck the *Send New Line* option.

Max Occurrences—Indicates the maximum number of times respond to a prompt. The default value zero (0) indicates no limit.

Attributes Extraction

To support Adaptive Service and Active Monitor functions, Adaptive CLI provides a way for the user to define output schema attributes. This tab is active only if you have configured schema attributes to store values previously in the Attributes portion of this editor.

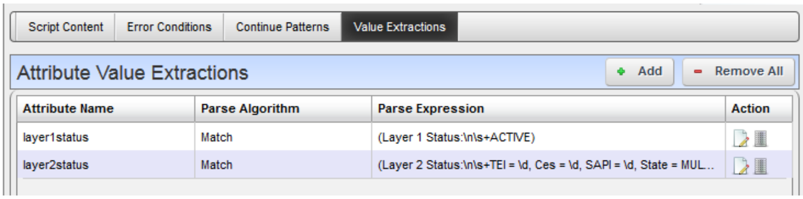


Processing Task 'Example ACLI':

Processing Task 'Example ACLI' on target DellEX8216-10201154.10.20.1.154:

Executing Adaptive CLI 'Example ACLI'

This lets you *Add*, *Edit* or *Delete* extracted attributes, like Error Conditions's editor. To clarify configured *Attributes*, *Parse Algorithms*, and *Parse Expressions* accompany scripts, they appear in a table. Use the *Add* button to create more Value Extractions, and the *Edit* or *Delete* buttons to the right of listed patterns to alter or remove them.



Attribute Value Extractions

Attribute Name	Parse Algorithm	Parse Expression	Action
layer1status	Match	(Layer 1 Status:\n\s+ACTIVE)	
layer2status	Match	(Layer 2 Status:\n\s+TEI = \d, Ces = \d, SAPI = \d, State = MUL...	

Configure Value Extractions with the following fields:

Attribute Name—This field specifies the name of the extracted attribute. To specify the output value of an attribute, select it from the provided list.

Attribute Type—The data type of the attribute extracted. Only schema attributes of simple type String, Integer, Long, Float, Double, and Boolean are available to choose from.

Parse Algorithm—Select from the pick list (*Extract*, *Match*). For match algorithm, the result is either *true* or *false* for the Boolean attribute type, 0 or 1 for numeric types, or "*true*" or "*false*" for String type.

NOTE:

Currently, Active Performance Monitor supports only numeric types.

Parse Expression—Enter a regular expression for Parse Expression and the Parse Algorithm (Extract or Match) used when evaluating the device output on a given script execution. OpenManage Network Manager matches the regular expression for sub-strings, so no need to provide a leading and trailing "match all" regular expression. (.*).

See *Regular Expressions on page* 375 for more information about what is these expressions can do.

Click A*pply* to accept your edits, or *Cancel* to abandon them. Click A*dd new attribute extraction* to add more such patterns to your script.

Attribute Appearance and Validation

Invalid schema attribute names appear in the script in red italics. This indicates that you cannot use such attributes in the script.

Valid attribute names contain alphanumeric characters and underscore (_). They must begin with either an underscore or a letter [A-Za-z].

All blank space characters in the schema attribute name are converted to underscore (_) by default.

A schema attribute name that is invalid in Adaptive CLI may still be valid in other entities, so you can specify them in the schema but they are not usable by Adaptive CLI.

Click A*pply* to accept your edits for the script, or *Cancel* to abandon them.

Comparison

Selecting (ctrl+clicking) two Adaptive CLI runs within the *Execution History* portlet lets you compare the two execution results. Right-click and select C*ompare*.

Lines that differ between the two configurations appear highlighted green. Lines that are missing in one, but that appear in another appear highlighted red. Added lines appear highlighted in yellow. Use the right/left arrows at the bottom of this screen to page through the side-by-side comparison.

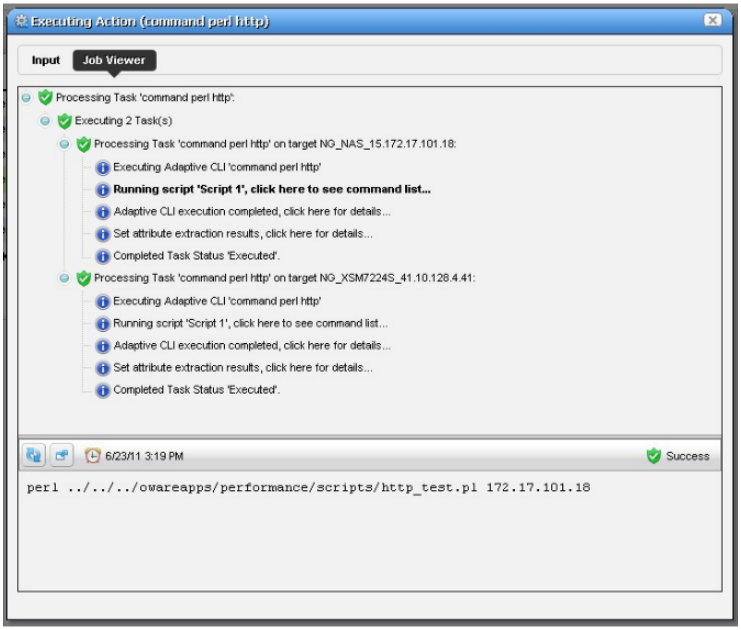
External Commands

External commands are essentially scripts that run in the Dell OpenManage Network Manager environment. For example, you could run the DOS `dir` command (and schedule its execution). Make sure you select External Command as the Type of Adaptive CLI in the editor when you create an Adaptive CLI that refers to an external command. Also, make sure the `Net::Telnet` package is installed with Perl.

You can execute external commands with a device as target, using device attributes as input parameters to the Adaptive CLI script. See some of the Seeded External Scripts on page 416.

Audit Trail

When you execute a script, the audit screen displays information about it.



```
Processing Task 'command perl http':
  Executing 2 Task(s)
    Processing Task 'command perl http' on target NG_NAS_15.172.17.101.18:
      Executing Adaptive CLI 'command perl http'
      Running script 'Script 1', click here to see command list...
      Adaptive CLI execution completed, click here for details...
      Set attribute extraction results, click here for details...
      Completed Task Status 'Executed'.
    Processing Task 'command perl http' on target NG_XSM7224S_41.10.128.4.41:
      Executing Adaptive CLI 'command perl http'
      Running script 'Script 1', click here to see command list...
      Adaptive CLI execution completed, click here for details...
      Set attribute extraction results, click here for details...
      Completed Task Status 'Executed'.
```

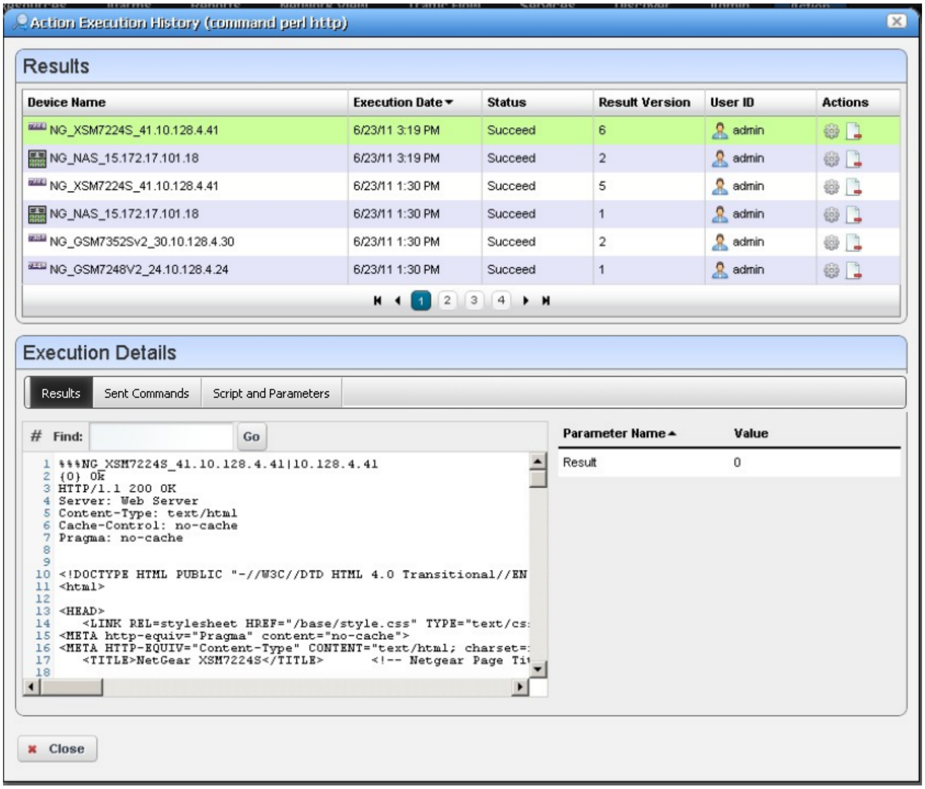
6/23/11 3:19 PM ✓ Success

```
perl ../../../owareapps/performance/scripts/http_test.pl 172.17.101.18
```

By default, this screen often conceals the *info* circles in this screen. To see them, click the icon next to the refresh icon to open the message level selector and check the *info* circle level of reporting, then click *Refresh* to see those blue circles.

Results

Dell OpenManage Network Manager stores the results of running a script as lines the Execution Details snap panel. Right click the particular command run in the snap panel at the bottom of the Expanded Actions Portlet. Tabs show the Results, Sent Command, and Script and Parameters. When viewing a script run the results of running it appear target device-by-device.

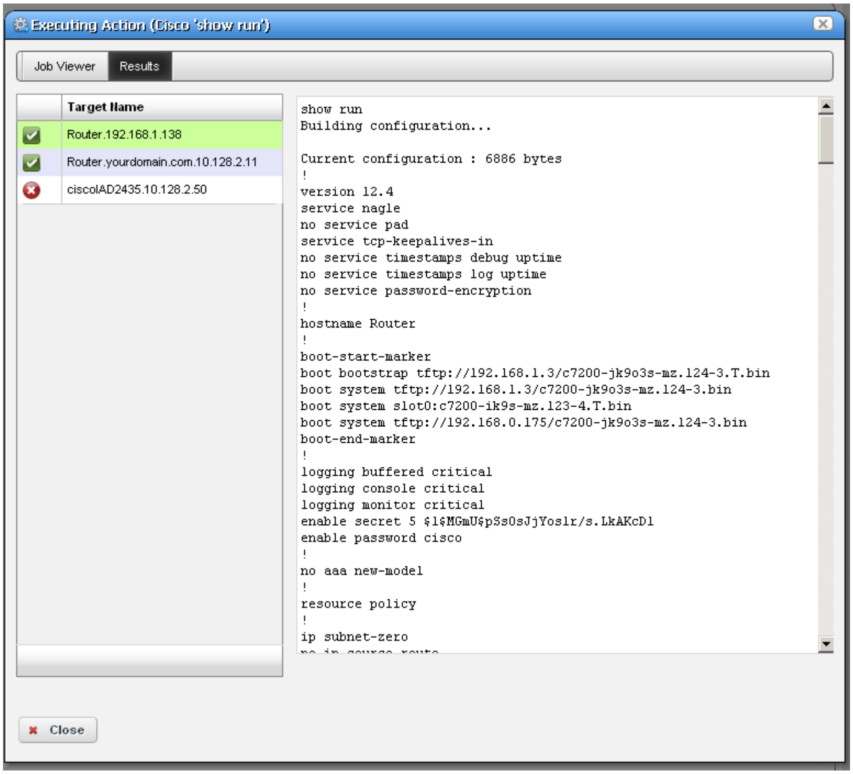


Device Name	Execution Date	Status	Result Version	User ID	Actions
NG_XSM7224S_41.10.128.4.41	6/23/11 3:19 PM	Succeed	6	admin	
NG_NAS_15.172.17.101.18	6/23/11 3:19 PM	Succeed	2	admin	
NG_XSM7224S_41.10.128.4.41	6/23/11 1:30 PM	Succeed	5	admin	
NG_NAS_15.172.17.101.18	6/23/11 1:30 PM	Succeed	1	admin	
NG_GSM7352Sv2_30.10.128.4.30	6/23/11 1:30 PM	Succeed	2	admin	
NG_GSM7248V2_24.10.128.4.24	6/23/11 1:30 PM	Succeed	1	admin	

```
%%%NG_XSM7224S_41.10.128.4.41|10.128.4.41
{0} Ok
HTTP/1.1 200 OK
Server: Web Server
Content-Type: text/html
Cache-Control: no-cache
Pragma: no-cache


<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN
<html>

<HEAD>
   <LINK REL=stylesheet HREF="/base/style.css" TYPE="text/cs
<META http-equiv="Pragma" content="no-cache">
<META HTTP-EQUIV="Content-Type" CONTENT="text/html; charset=
   <TITLE>NetGear XSM7224S</TITLE>      <!-- Netgear Page Ti

```

Parameter Name	Value
Result	0

Results can also appear in the audit screen messages and in the *Results* panel of the *Action* job viewer screen.



	Target Name
✓	Router.192.168.1.138
✓	Router.yourdomain.com.10.128.2.11
✗	ciscoIAD2435.10.128.2.50

```
show run
Building configuration...

Current configuration : 6886 bytes
!
version 12.4
service nagle
no service pad
service tcp-keepalives-in
no service timestamps debug uptime
no service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot-start-marker
boot bootstrap tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.T.bin
boot system tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.bin
boot system slot0:c7200-ik9s-mz.123-4.T.bin
boot system tftp://192.168.0.175/c7200-jk9o3s-mz.124-3.bin
boot-end-marker
!
logging buffered critical
logging console critical
logging monitor critical
enable secret 5 $1$MGmU$pSsOsJjYoslr/s.LkAKcDl
enable password cisco
!
no aaa new-model
!
resource policy
!
ip subnet-zero
no ip source-route
```

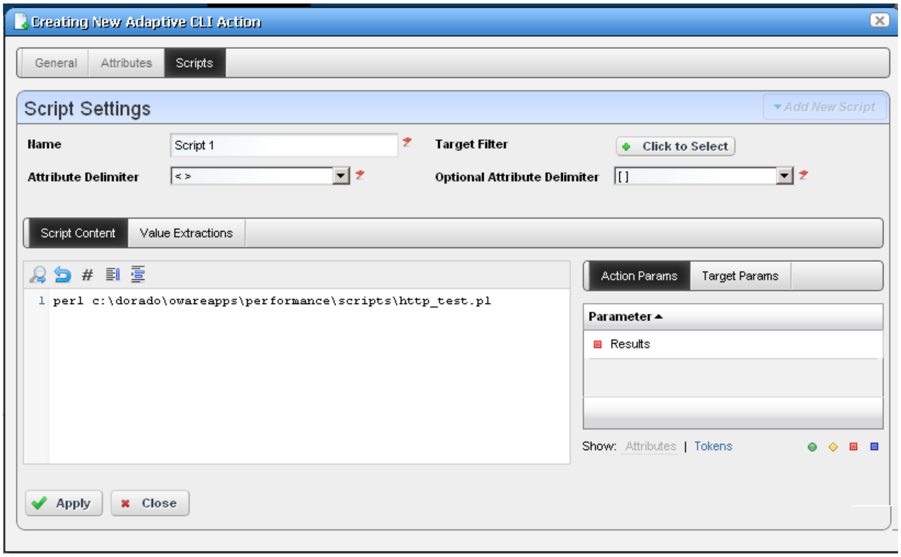
You can also extract parameters for these external commands as is described in Attributes Extraction on page 412.

Seeded External Scripts

Several external perl scripts come with Dell OpenManage Network Manager as examples of the kind of commands you can execute. These are in `\owareapps\performance\scripts` under the installation root.

To run these, the scripts panel in the Adaptive CLI editor should contain something like the following:

```
perl ../../../owareapps/performance/scripts/http_test.pl
```



Creating New Adaptive CLI Action

Script Settings

Name: Script 1

Attribute Delimiter: < >

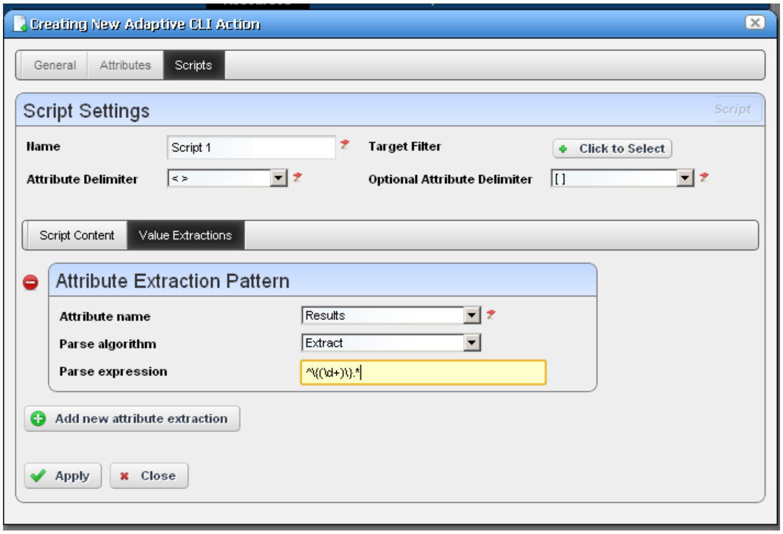
Target Filter: Click to Select

Optional Attribute Delimiter: [ ]

```
perl c:\dorado\owareapps\performance\scripts\http_test.pl
```

Parameter ▲
🟥 Results

Notice that these also include a parameter (*Result*) that contains values extracted.



Creating New Adaptive CLI Action

Script Settings

Name: Script 1

Attribute Delimiter: < >

Target Filter: Click to Select

Optional Attribute Delimiter: [ ]

Attribute Extraction Pattern

Attribute name: Results

Parse algorithm: Extract

Parse expression: ^\{(\d+)\}.*

Set up attribute extraction in the *Values Extraction* tab of the script editor.

Script Names and Functions

common.pl—Common functions defined for scripts in this directory.

dns_test.pl—Check if DNS can resolve the specified host name.

finger_test.pl—Check if the finger service is running on a specified host.

ftp_test.pl—Check the FTP service is running on a specified host.

http_test.pl—Check the HTTP service is running on a specified host.

nntp_test.pl—Check if the NNTP service is running on a specified host. (Public NNTP server to test: news.aioe.org)

peping_test.pl—Check if a target is pingable from the specified remote host.

pop3_test.pl—Check if the POP3 service is running on a specified host.

smtp_test.pl—Check if the SMTP service is running on a specified host.

telnet_test.pl—Check if the TELNET service is running on a specified host.

Adaptive CLI Script Language Syntax

Here's the Adaptive CLI scripting language syntax:

- CLI script is a line-based syntax. In other words, each line's syntax has to be completed.
- CLI script supports primarily two features: Attributes and Conditional Blocks.

Attributes

Each attribute in the script is marked by a delimiter. The following delimiters are supported:

```
<>  []  {}  ()  $  %  @  #
```

Think of Attribute delimiters as a pair of open/close markers surrounding a variable name. For single character Attribute delimiters, there is no closing marker (the close marker is empty).

Examples of Attributes are:

```
<var>, [var], {var}, (var), $var, %var, #var, @var
```

The default mandatory delimiters are <>, and the default optional delimiters are `[]`, but you can change those default settings. That means an Attribute variable like <var> may represent a mandatory or an optional Attribute depending on what are set as delimiters.

NOTE:

Single delimiter symbols require a space after the attribute. These do allow values immediately before the symbol. Perl requires a space after the attribute, or the attribute's closing delimiter, but values immediately before single delimiters works.

Here is an example of a command line with a mandatory and optional Attribute:

```
show <mandatory> [optional]
```

If you set the `<mandatory>` Attribute to *interface* and do not set the `[optional]` one, then the resulting command would be this:

```
show interface
```

If you set the `<mandatory>` Attribute to *interface* and set `[optional]` to *brief* then the resulting command would be:

```
show interface brief
```

Conditional Blocks

Every line in the script is presumably a command to be sent to the device, except for lines that denote either a beginning or ending of a conditional block.

The begin conditional block marker is tied to a Attribute and has the following syntax:

```
<optional-open-delimiter> IF optional-attribute <optional-close-delimiter>
```

The end conditional block marker has the following syntax:

```
<optional-open-delimiter> ENDIF optional-text < optional-close-delimiter>
```

Here is an example of a conditional block, where the Attribute delimiters are <>, optional delimiter is `[]`, and the conditional Attribute variable is `set`:

```
[IF set]
  execute this command
  and execute this command
[ENDIF set]
```

If the Attribute set has a value then the block is evaluated; otherwise, it is ignored. The text after `ENDIF`., that is `set` or whatever is not required and it is ignored.

Nested conditional blocks are allowed.

Perl Scripts

This section describes the details of using Perl scripts within Adaptive CLI. See Using Perl in Adaptive CLI on page 394 for more about why to use Perl.

The Perl output goes to the selected target device. Typically, this means creating lines like the following:

```
println("show $param");
```

or

```
print("show $param\n");
```

You must specify parameters within the script (like `$param`) in the screen described in Attributes on page 402. Unlike its internal scripts, Adaptive CLI does not automatically create attributes. You must also manually configure created attributes to be *Mandatory*, or *Optional* in that screen.

A few things to remember when using Perl:

- The normal output of your Perl scripts (to stdout) are the commands sent to a device by this application.

- If your script produces an error message (to stderr), the job fails with that message and all script outputs are ignored. You can validate a script before sending any command to the device by using die(...) and warn(...) functions in Perl to produce error messages to stderr. Such messages trigger the script's failure.
- For such scripts to operate correctly, you must have Perl installed on the directory path for all OpenManage Network Manager servers.
- Perl does not come with OpenManage Network Manager and must be installed on the server system independently for it to work with Adaptive CLI.
- You can install your version of Perl and set the PATH environment variable accordingly so that one can run `perl -v` from the command line (where the OpenManage Network Manager server is to be started). Adaptive CLI invokes that same `perl` command.

  If for some reason Adaptive CLI, fails to invoke the default `perl` command, it reads the setting of `activeconfig.perl.exe=...` inside `owareapps/activeconfig/lib/ac.properties`, and uses that alternative command.

  Note that the default `activeconfig.perl.prefix=` setting in `ac.properties` is prepended to every Perl script. It basically forces the script to `use strict` mode and provides a convenient `println` method for the user. Knowledgeable Perl users can change this default behavior setting but should be careful about it. Remember, best practice is to override properties as described in Overriding Properties on page 15.
- The standard output (using `println`) of the Adaptive CLI Perl script represents the command set that is to be sent to the device. For convenience, a `println` subroutine is embedded with the script.
- Adaptive CLI with Perl scripts must contain valid Perl under the "strict" pragma (use strict;). If you import or migrate from a previous version a Perl script that does not pass this "strict" criterion, you must rewrite it for "strict" compliance before it can be successfully edited or copied.

NOTE:

When you import a Perl Adaptive CLI that doesn't pass strict, you can execute it without problems. However, you *cannot* edit it at all, unless you first edit it to pass strict (or it won't even let you save the changes).

How To:

Create Adaptive CLI Examples

The following describes the basics of creating and using Adaptive CLIs.

Example 1 - Existing Show Run uses an existing, seeded Adaptive CLI to show protocols.

Example 2 - New Adaptive CLI describes making and using a new Adaptive CLI.

Example 3 - Adaptive CLI with Reboot shows you how to make an Adaptive CLI that requires rebooting the target device(s).

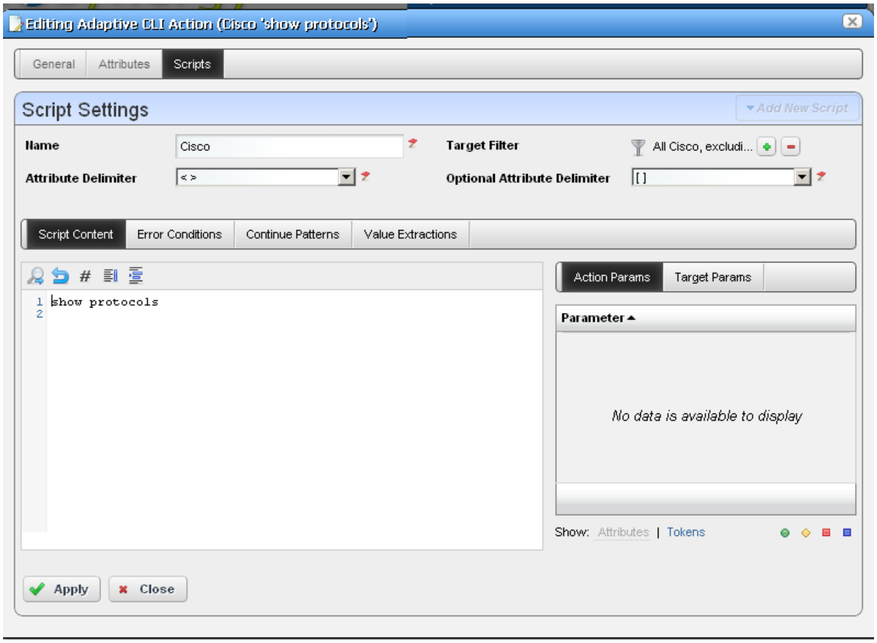
Example 4 - Adaptive CLI To Extract Upload / Download Speeds demonstrates Adaptive CLI that extracts information from the target device, then displays the results on a dashboard.

Example 5: Monitor Text Values demonstrates using and Adaptive CLI configured to monitor attributes with strings that indicate their status.

Some devices do not respond to commands unless they are in the correct state. For example, some Dell devices must not be in “Simple” mode to respond to Adaptive CLIs. Take account of this as you create Adaptive CLIs.

Example 1 - Existing Show Run

1 Adaptive CLI Manager has pre-seeded tasks and diagnostic commands based upon the drivers you have installed. For example: the *Cisco* '*show protocols*' command. Right-click and Select *Edit* to view and / or alter this Adaptive CLI.



Editing Adaptive CLI Action (Cisco 'show protocols')

Script Settings

Name: Cisco

Target Filter: All Cisco, excludi...

Attribute Delimiter: < >

Optional Attribute Delimiter: [ ]

```
show protocols
```

Parameter ▲

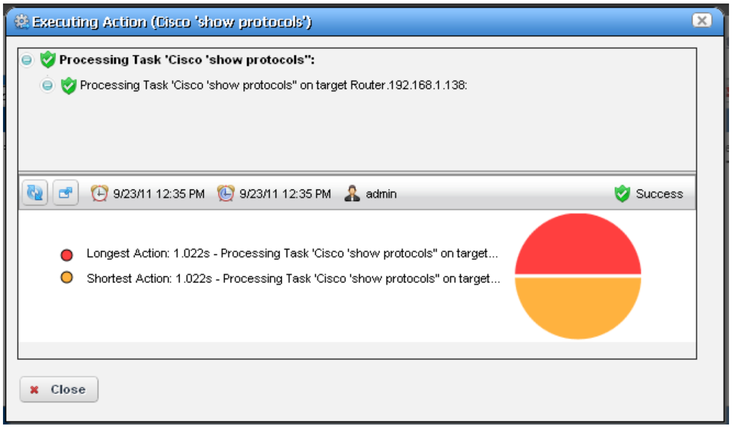
No data is available to display

2 Click the *Edit* icon next to the Cisco script. The *Scripts* tab in this editor appears above, displaying the `show protocols` command to be sent target devices. Notice (in the upper right corner) that this Adaptive CLI filters so it applies to all Cisco devices excluding PIX.

3 Close the editor(s), and select this Adaptive CLI.

4 Right click to *Execute*, and select the target equipment for this run in the next screen. The screen that appears is a standard Dell OpenManage Network Manager equipment selector. The Adaptive CLI is valid only on devices that pass the Target Filter mentioned in step 2, but the selection here narrows the target devices for the Adaptive CLI.

5 An Audit trail screen tracks the execution progress



Processing Task 'Cisco 'show protocols'':

Processing Task 'Cisco 'show protocols'' on target Router.192.168.1.138:

9/23/11 12:35 PM 9/23/11 12:35 PM admin Success

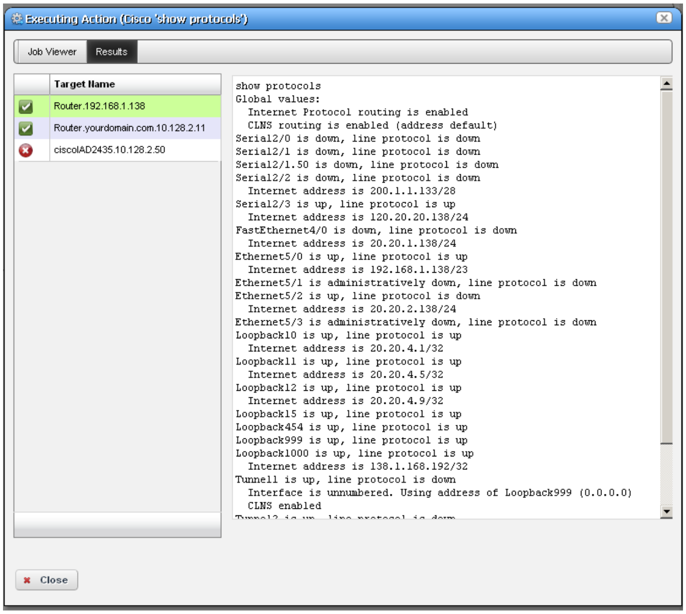
● Longest Action: 1.022s - Processing Task 'Cisco 'show protocols'' on target...

● Shortest Action: 1.022s - Processing Task 'Cisco 'show protocols'' on target...

6 Select the Adaptive CLI you ran in the Expanded Portal, and right-click the execution run that appears in the *Execution History* snap panel at the bottom of the screen.

7 Right-click and select *Execution Details*.

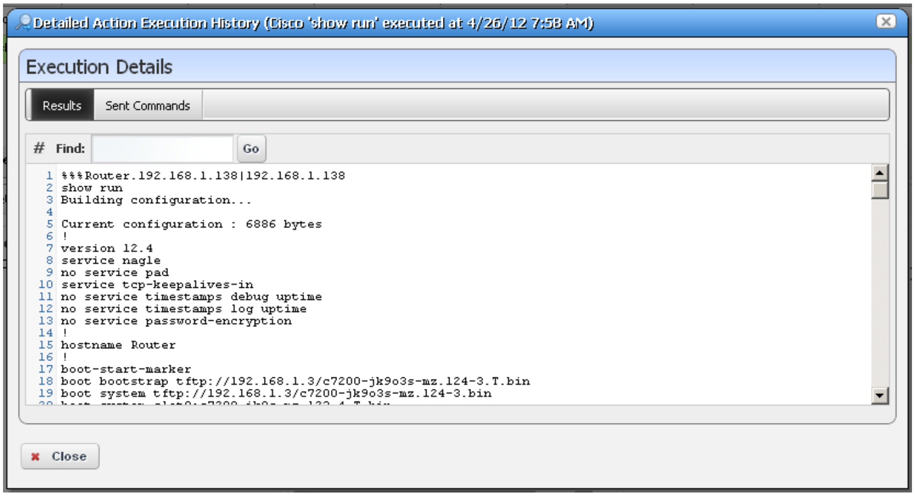
8 View latest results classified by the device you select on the left.



	Target Name
✓	Router.192.168.1.138
✓	Router.yourdomain.com.10.128.2.11
✗	ciscoIAD2435.10.128.2.50

```
show protocols
Global values:
  Internet Protocol routing is enabled
  CLNS routing is enabled (address default)
Serial2/0 is down, line protocol is down
Serial2/1 is down, line protocol is down
Serial2/1.50 is down, line protocol is down
Serial2/2 is down, line protocol is down
  Internet address is 200.1.1.133/28
Serial2/3 is up, line protocol is up
  Internet address is 120.20.20.138/24
FastEthernet4/0 is down, line protocol is down
  Internet address is 20.20.1.138/24
Ethernet5/0 is up, line protocol is up
  Internet address is 192.168.1.138/23
Ethernet5/1 is administratively down, line protocol is down
Ethernet5/2 is up, line protocol is down
  Internet address is 20.20.2.138/24
Ethernet5/3 is administratively down, line protocol is down
Loopback10 is up, line protocol is up
  Internet address is 20.20.4.1/32
Loopback11 is up, line protocol is up
  Internet address is 20.20.4.5/32
Loopback12 is up, line protocol is up
  Internet address is 20.20.4.9/32
Loopback15 is up, line protocol is up
Loopback454 is up, line protocol is up
Loopback999 is up, line protocol is up
Loopback1000 is up, line protocol is up
  Internet address is 138.1.168.192/32
Tunnel1 is up, line protocol is down
  Interface is unnumbered. Using address of Loopback999 (0.0.0.0)
  CLNS enabled
Tunnel2 is up, line protocol is down
```

9 View latest results by right-clicking in the *Execution History* snap-in of the expanded Action portlet. You can use the *Find* search box to find matches to strings within the results.



Detailed Action Execution History (Cisco 'show run' executed at 4/26/12 7:58 AM)
Execution Details
Results
Sent Commands
# Find:
Go
Close

```
%%%Router.192.168.1.138|192.168.1.138
show run
Building configuration...

Current configuration : 6886 bytes
!
version 12.4
service nagle
no service pad
service tcp-keepalives-in
no service timestamps debug uptime
no service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot-start-marker
boot bootstrap tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.T.bin
boot system tftp://192.168.1.3/c7200-jk9o3s-mz.124-3.bin
```

Click *Go* to see the next match.

10 You can also look in the *Sent Commands* tab to see what actually went to the device.

Example 2 - New Adaptive CLI

1 Create a new Adaptive CLI. Right-click and select *New*.

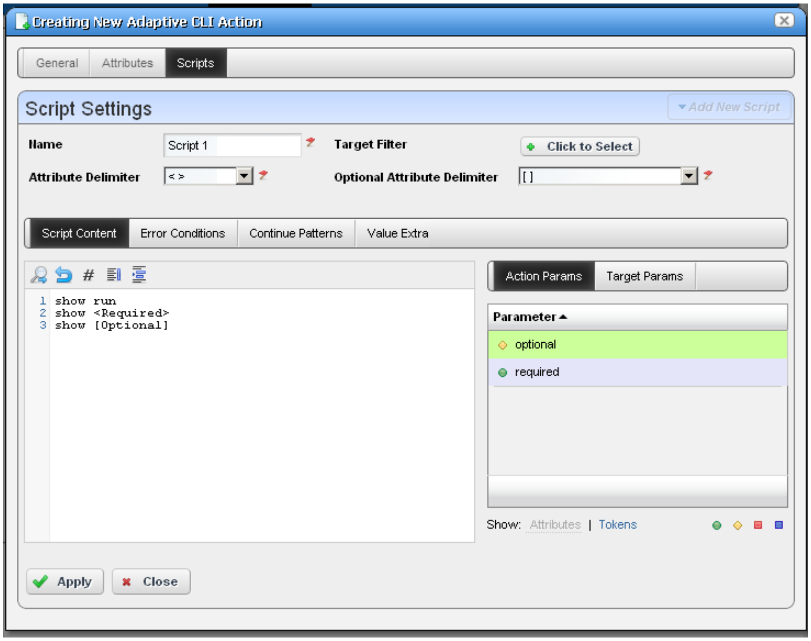
2 Name this (for example “Test ACLI”)

3 In the *Attributes* panel, create string attributes named *required* and *optional* after creating a new Parameter Schema (for example “test123”).

4 In the *Script* panel define the Attribute Delimiter (< >) and Optional Attributes Delimiter ([ ]) and enter the following three scripts:

```
show run

show <required>

show [optional]
```

Notice that the created attributes appear in the panel on the right of this screen.



Name: Script 1

Attribute Delimiter: < >

Optional Attribute Delimiter: [ ]

```
show run
show <Required>
show [Optional]
```

Parameter:
- optional
- required

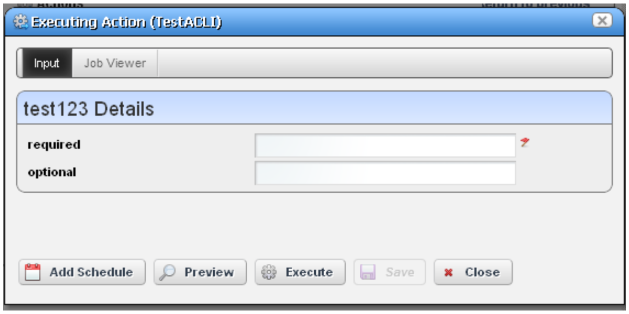
5 Select the attribute “required,” then click the *Required* icon (the green circle) in the lower right corner to of this screen to associate this icon with the Required attribute. Similarly, associate the *Optional* icon with the attribute “optional.”

Notice that you can double-click the attributes listed in the panel on the right, and they appear in the script editor at the cursor.

6 Save this Adaptive CLI

7 Execute it with *action* > *Execute*.

8 Notice that the attributes entered now are visible as inputs.



required:

optional:

When you enter values for these, they accompany the `show run` sent to the target devices. Notice that you *must* enter the required variable, or execution fails.

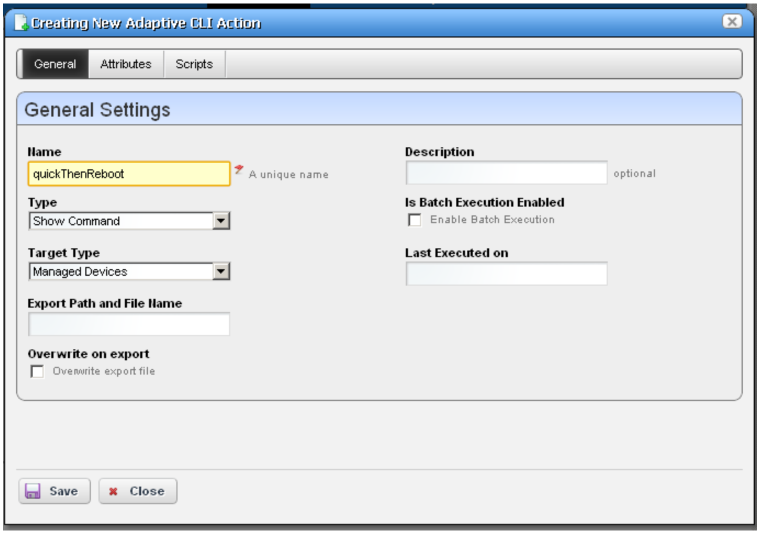
9 Select a target.

10 Click *Execute*. The `show run`, and any other required / optional run commands' results appear. These are searchable with the results screen.

Example 3 - Adaptive CLI with Reboot

The following describes how to set up multi-line ACLI with error / success tracking for a command sequence that requires reboot.

1 Create an example configure Adaptive CLI command (here *quickThenReboot*).



Creating New Adaptive CLI Action

General Settings

Name: quickThenReboot (A unique name)

Description: (optional)

Type: Show Command

Is Batch Execution Enabled: □ Enable Batch Execution

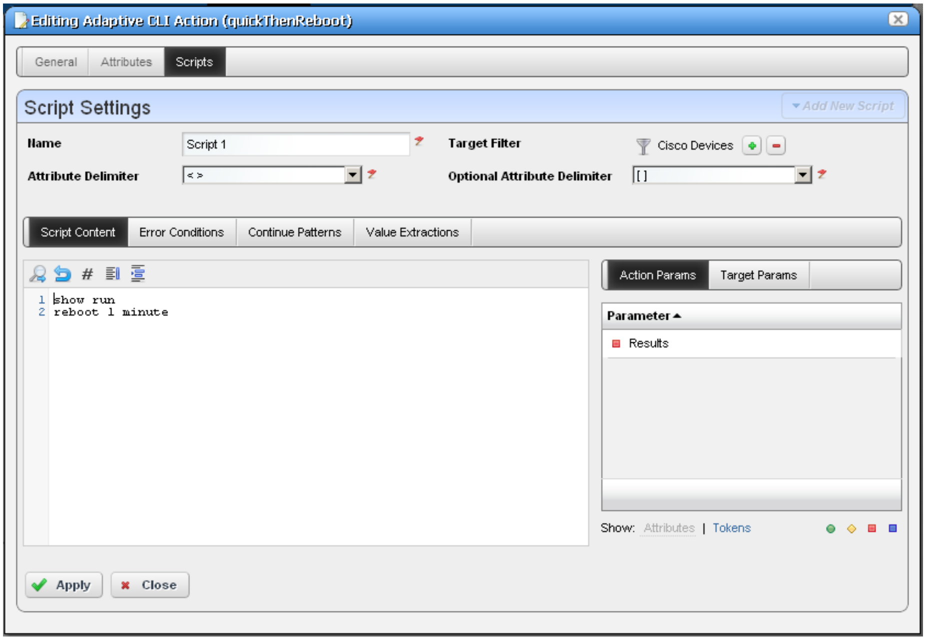
Target Type: Managed Devices

Last Executed on:

Export Path and File Name:

Overwrite on export: □ Overwrite export file

2 Separate commands into parts. First issue the command (here `show run`), then issue the reboot command with a parameter that allows a prompt return before actual reboot (a delay, for instance). If the first command fails the ACLI doesn't continue, so that makes using the reboot command second the solution.



Editing Adaptive CLI Action (quickThenReboot)

Script Settings

Name: Script 1

Target Filter: Cisco Devices

Attribute Delimiter: < >

Optional Attribute Delimiter: [ ]

```
show run
reboot 1 minute
```

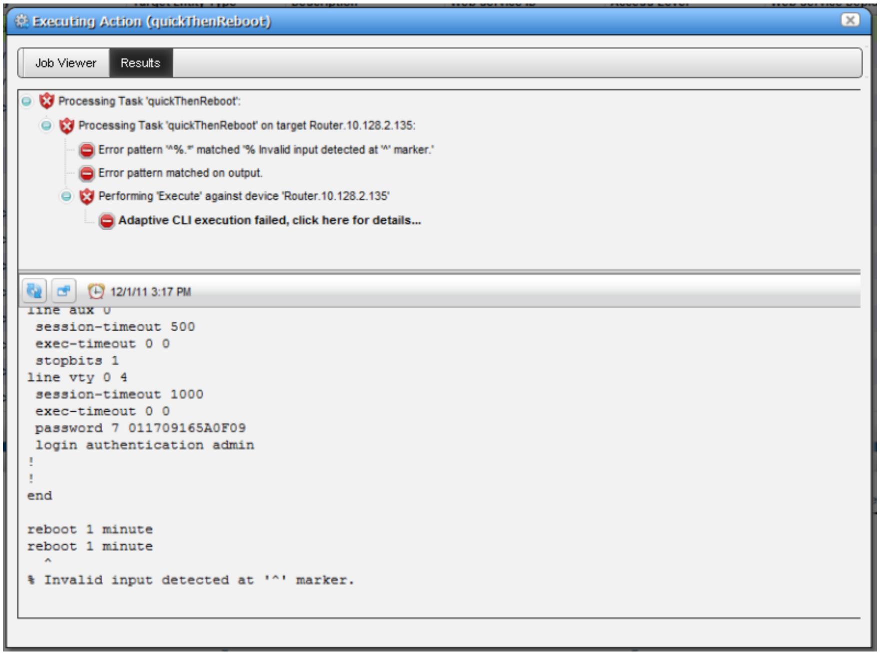
Parameter: Results

In our example:

```
show run
reboot 1 minute
```

3 Dell OpenManage Network Manager assumes commands are successful if a prompt appears without an error return. Default error tracking for most drivers provides all the error pattern matching you might need (testing the Adaptive CLI lets you know whether the device is addressed by a driver in “most”).

Use specific error pattern matching for cases where the driver does not detect the typical errors by default. , erroneous output appears if the error occurs on the reboot command.



Processing Task 'quickThenReboot':

Processing Task 'quickThenReboot' on target Router.10.128.2.135:

Error pattern '^%.*' matched '% Invalid input detected at '^' marker.'

Error pattern matched on output.

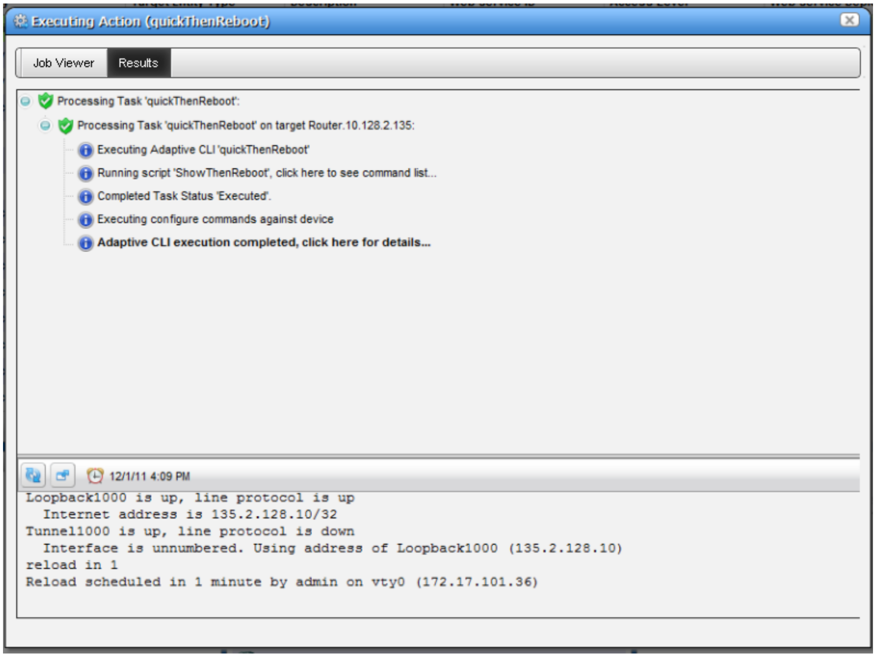
Performing 'Execute' against device 'Router.10.128.2.135'

Adaptive CLI execution failed, click here for details...

12/1/11 3:17 PM

```
line aux 0
 session-timeout 500
 exec-timeout 0 0
 stopbits 1
line vty 0 4
 session-timeout 1000
 exec-timeout 0 0
 password 7 011709165A0F09
 login authentication admin
!
!
end

reboot 1 minute
reboot 1 minute
  ^
% Invalid input detected at '^' marker.
```

4 When reboot is successful with a proper command sequence, the job screen displays the successful execution.



Processing Task 'quickThenReboot':

Processing Task 'quickThenReboot' on target Router.10.128.2.135:

Executing Adaptive CLI 'quickThenReboot'

Running script 'ShowThenReboot', click here to see command list...

Completed Task Status 'Executed'.

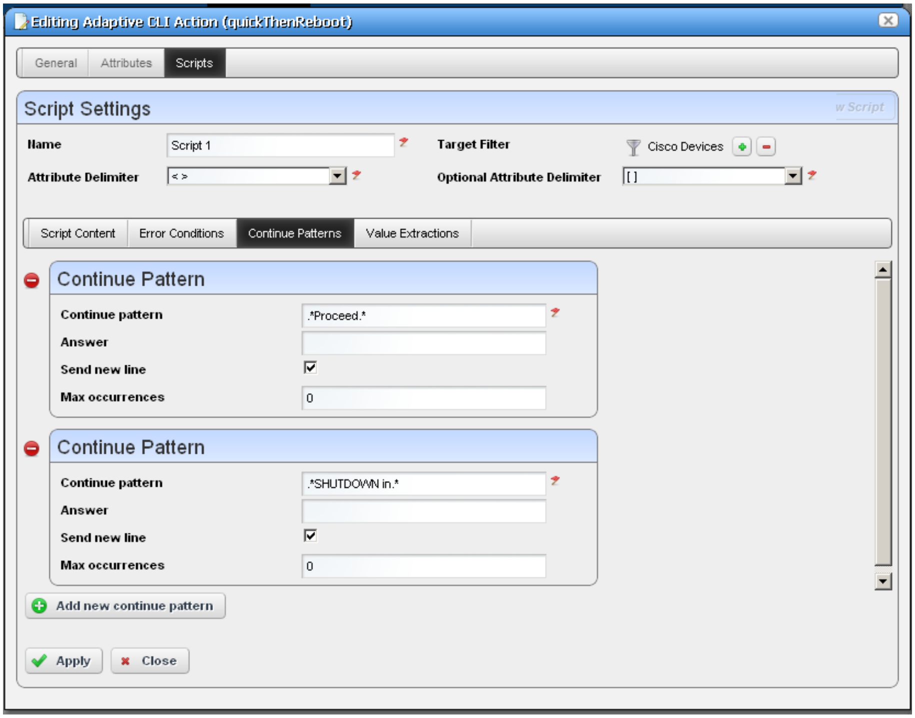
Executing configure commands against device

Adaptive CLI execution completed, click here for details...

```
Loopback1000 is up, line protocol is up
  Internet address is 135.2.128.10/32
Tunnel1000 is up, line protocol is down
  Interface is unnumbered. Using address of Loopback1000 (135.2.128.10)
reload in 1
Reload scheduled in 1 minute by admin on vty0 (172.17.101.36)
```

5 **Continue Patterns**—The following Continue Patterns section is an addition to the above example. It looks for the `Proceed` prompt so the Adaptive CLI can issue a new line to force the reboot. But the shutdown command follows the next prompt, so the shutdown command

must be in another continue pattern to force the last line before a pause in output to be the router's prompt. The patterns are `.*Proceed.*` and `.*SHUTDOWN in.*` allowing any characters before and after the keywords to match.



Editing Adaptive CLI Action (quickThenReboot)

General | Attributes | Scripts

Script Settings

Name: Script 1
Target Filter: Cisco Devices
Attribute Delimiter: < >
Optional Attribute Delimiter: [ ]

Script Content | Error Conditions | Continue Patterns | Value Extractions

Continue Pattern

Continue pattern: .*Proceed.*
Answer:
Send new line: ☑
Max occurrences: 0

Continue Pattern

Continue pattern: .*SHUTDOWN in.*
Answer:
Send new line: ☑
Max occurrences: 0

Alternatively, this example could have a third command after `reboot` to force a new router prompt, but managing this problem with the continuation set seemed more straightforward.

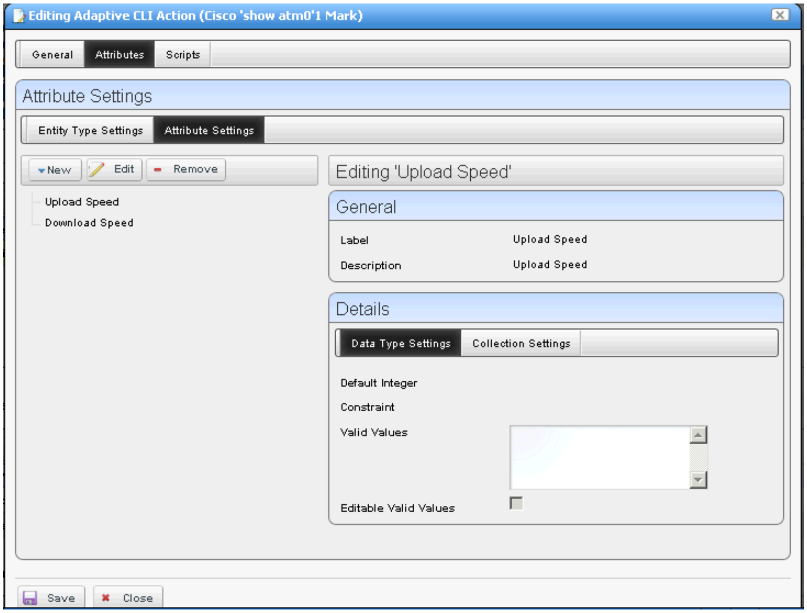
Example 4 - Adaptive CLI To Extract Upload / Download Speeds

The following describes an example Adaptive CLI configured to extract upload and download ADSL speeds from a Cisco Router. To create this example, follow these steps:

1 Right-click to create a new Adaptive CLI in the Actions portlet.

2 Name it and configure the Adaptive CLI in the General screen. Since these are generic settings described elsewhere, the details do not appear here.

3 Create attributes to extract. In this case, we configure Upload Speed, and Download Speed as integer attributes, with a name, description, and nothing else.



Editing Adaptive CLI Action (Cisco 'show atm0'1 Mark)

Attribute Settings

Editing 'Upload Speed'

General

Label Upload Speed

Description Upload Speed

Details

Default Integer

Constraint

Valid Values

Editable Valid Values □

Notice, however, that you could configure validation for extracted attributes if you liked in this screen.

4 Create a new schema for these attributes. Schemas are helpful if you are creating several Adaptive CLIs (create, destroy, update, and so on) with the same set of attributes. With schemas, you are sure the attributes are configured exactly the same.

5 *Save* the configured attributes, click the *Script* panel

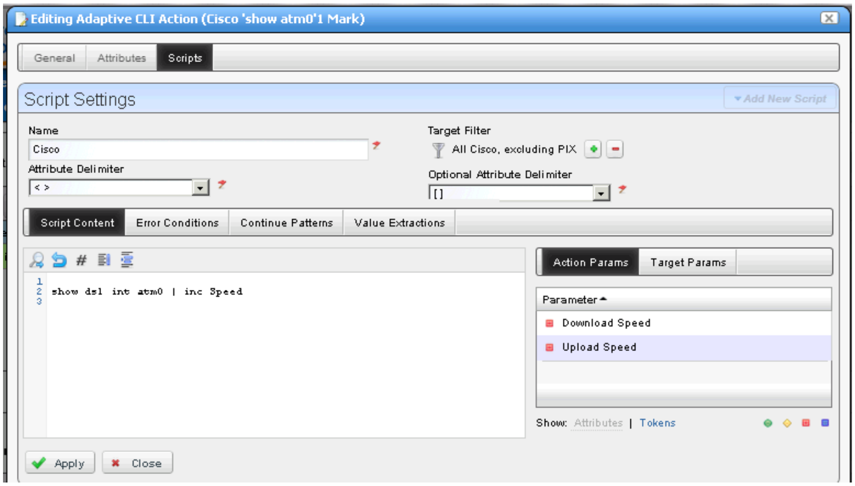
6 Enter the script. This extracts upload and download speeds from a Cisco device based on the output from this command (the script's contents):

```
show dsl int atm0 | inc Speed
```

This command shows dsl, grepping (`inc`) for the unique line beginning with `Speed`. The line for which this script searches looks like this:

```
Speed (kbps):          544               0           256                0
```

The attributes configured previously appear beside the script panel, but are not part of the script, even though that possibility might be useful for another Adaptive CLI. The current attributes are for extraction from the script results.



Editing Adaptive CLI Action (Cisco 'show atm0'1 Mark)

Script Settings

Name: Cisco

Attribute Delimiter: < >

Target Filter: All Cisco, excluding PIX

Optional Attribute Delimiter: [ ]

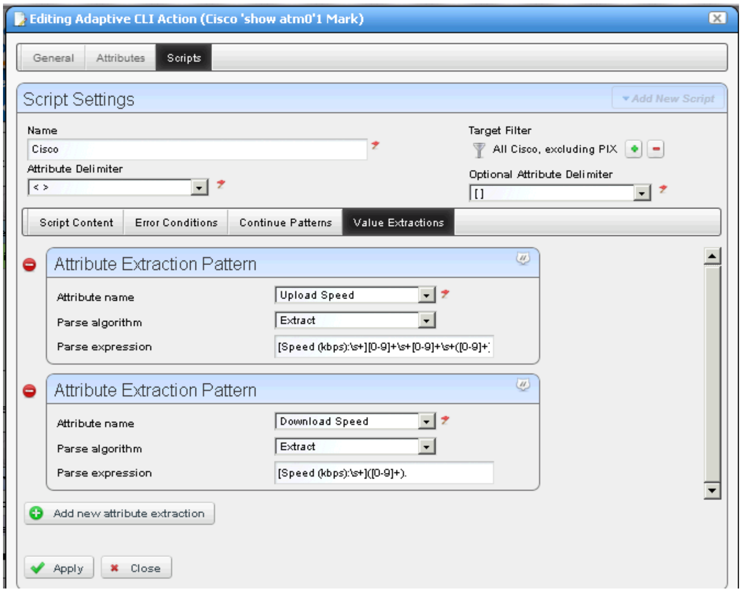
```
show dsl int atm0 | inc Speed
```

Parameter
Download Speed
Upload Speed

NOTICE

The filter at the top of this panel can limit the devices scanned by the Adaptive CLI to extract data. If you have a specific device or group of devices against which you plan to test this script, it would be a time saver to create the filter first.

7 Click the *Value Extractions* panel within the Scripts screen, and configure an extraction regular expression for each of the two values.



Name: Cisco

Attribute Delimiter: < >

Target Filter: All Cisco, excluding PIX

Optional Attribute Delimiter: [ ]

Attribute name: Upload Speed
Parse algorithm: Extract
Parse expression: [Speed (kbps):\s+][0-9]+\s+[0-9]+\s+([0-9]+

Attribute name: Download Speed
Parse algorithm: Extract
Parse expression: [Speed (kbps):\s+]([0-9]+).

Click the green plus to add the second attribute.

With the pick lists, select an attribute, and that you want to extract (that is, within which you plan to store a value), then enter the regular expression to match its target value. Here are those attribute / regular expression pairs:

- Download Speed (the first integer in the output)

  ```
  [Speed (kbps):\s+]([0-9]+).
  ```

- Upload Speed (the third integer in the output)

  ```
  [Speed (kbps):\s+][0-9]+\s+[0-9]+\s+([0-9]+).
  ```

NOTICE

You can use free regular expression testers to debug these expressions. See Regular Expression Testing on page 438.

8 Apply the edits you have made to script and extractive regular expressions, then *Save* the Adaptive CLI.

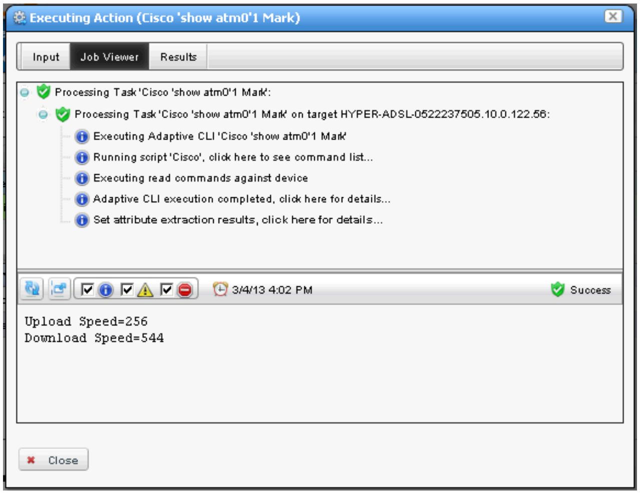
9 Right-click the Adaptive CLI and *Execute* it.

10 Select the target device(s).

11 Confirm the execution. The screen that appears before you click *Execute* again would have fields if you had a script with input parameters.

12 The *Results* panel appears to advise whether the script ran successfully, displaying its output.

13 Click *Job Viewer*, and arrange that panel so it displays informational messages by clicking the icon next to the date / time display. Check the checkbox next to the blue informational circle, and click the *Refresh* icon to the far left.



Processing Task 'Cisco 'show atm0'1 Mark':
Processing Task 'Cisco 'show atm0'1 Mark' on target HYPER-ADSL-0522237505.10.0.122.56:
Executing Adaptive CLI 'Cisco 'show atm0'1 Mark'
Running script 'Cisco', click here to see command list...
Executing read commands against device
Adaptive CLI execution completed, click here for details...
Set attribute extraction results, click here for details...

☑ ☑ ☑ 3/4/13 4:02 PM Success

```
Upload Speed=256
Download Speed=544
```

14 Click the last informational message (*Set attribute extraction results...*) and the extracted attribute values appear in the data panel at the bottom of the screen.

Example 5: Monitor Text Values

Create an Adaptive CLI with the following to monitor layer 1 and layer 2 status:

- integer attributes: layer1status, layer2status
- Script to produce the output: `show isdn status`

  Here is the output to match:

```
Layer 1 Status:

   ACTIVE

Layer 2 Status:

   TEI = 0, Ces = 1, SAPI = 0, State = MULTIPLE_FRAME_ESTABLISHED
```

- Attribute Extraction Pattern:

```
   layer1status / Match / (Layer 1 Status:\n\s+ACTIVE)
```

- For layer2status, the regular expression is like

```
(Layer 2 Status:\n\s+TEI = \d, Ces = \d, SAPI = \d, State =
  MULTIPLE_FRAME_ESTABLISHED)
```

Create a monitor to display the result of regularly running this Adaptive CLI on selected targets, and display its result in a dashboard.

NOTICE

Don’t forget to enable the attributes in the monitor!

Monitoring Upload / Download Speeds

Once you have configured this Adaptive CLI, you can monitor its operation. Follow these steps to configure the monitor for the How to: Create a Monitor for the External Script Adaptive ACLI:

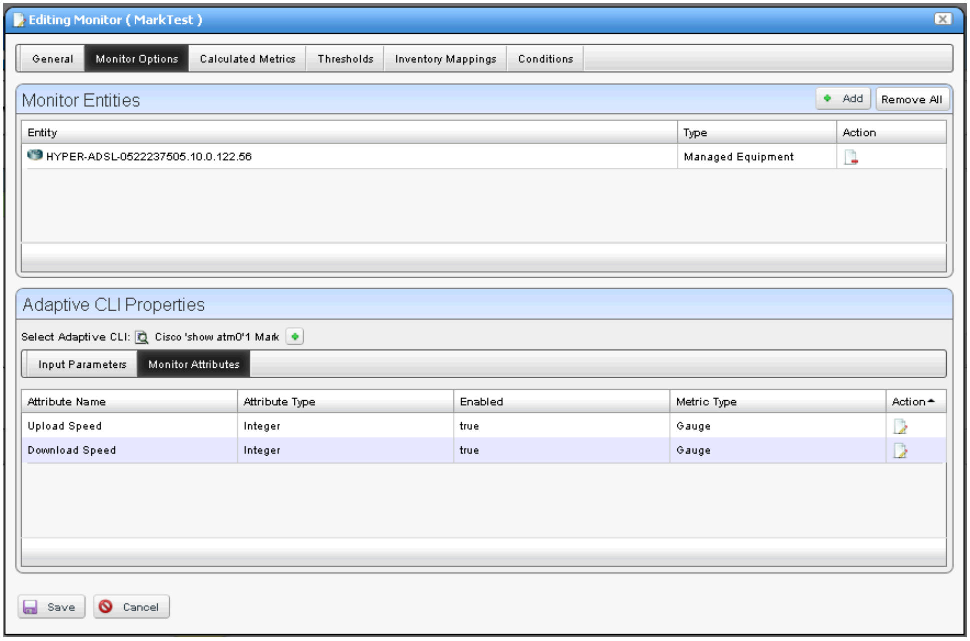
NOTICE

If you are testing, make the monitoring more frequent than you might in a production system so you can see if the data is available as expected. You can always change this after you have successfully tested the monitor.

1 Right-click in the Resource Monitors portlet to create a new monitor.

2 Enter the default name, and interval for the monitor in the *General* panel.

3 In *Monitor Options*, select the Monitor Entities (target devices) with the green plus, and subsequent screen.



Entity	Type	Action
HYPER-ADSL-0522237505.10.0.122.56	Managed Equipment	

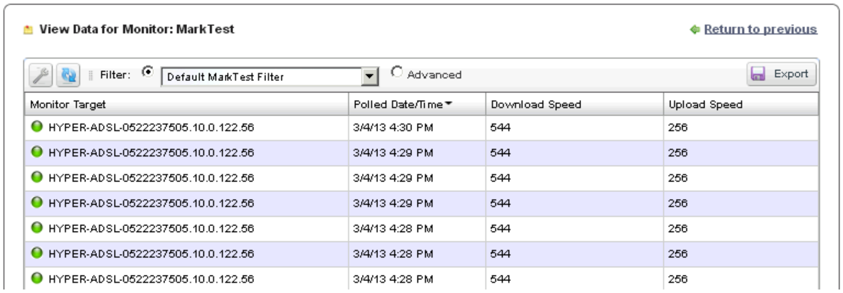
Select Adaptive CLI: Cisco 'show atm0'1 Mark

Attribute Name	Attribute Type	Enabled	Metric Type	Action
Upload Speed	Integer	true	Gauge	
Download Speed	Integer	true	Gauge	

4 In the same screen, elect to *Enable* the extracted Monitor Attributes with the editor icon to the right of the listed attribute. Notice you can also elect to report the attribute as a Gauge, Counter or Boolean. We selected Gauge.

5 Click *Save*.

6 Right-click the saved monitor to *View Monitor Data*.



View Data for Monitor: MarkTest

Filter: ● Default MarkTest Filter ○ Advanced

Monitor Target	Polled Date/Time	Download Speed	Upload Speed
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:30 PM	544	256
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:29 PM	544	256
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:29 PM	544	256
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:29 PM	544	256
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:28 PM	544	256
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:28 PM	544	256
● HYPER-ADSL-0522237505.10.0.122.56	3/4/13 4:28 PM	544	256

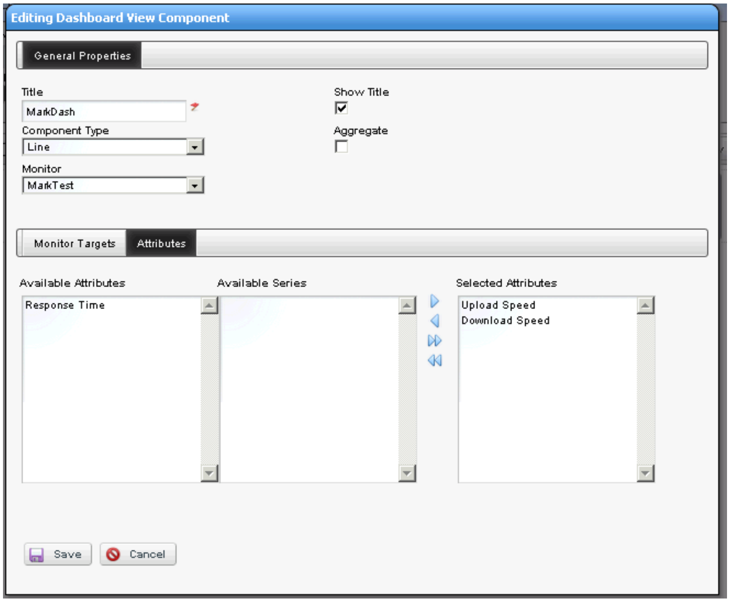
You may have to click the wrench icon to configure the columns that appear so this screen displays the extracted attribute information. You should see the extracted values displayed in a table.

Configure a Dashboard for Your Monitor

Finally, if you want to configure a dashboard to display your monitored data graphically, follow these steps:

1 Go to the Dashboard portlet, and right-click to create a Custom dashboard.

2 Enter the default data (name, retention policy, and so on) and configure the device and monitor selection by editing the panel(s) you want to display with its editor icon in the upper right corner.



Editing Dashboard View Component

General Properties

Title: MarkDash

Show Title: ☑

Component Type: Line

Aggregate: □

Monitor: MarkTest

Monitor Targets | Attributes

Available Attributes: Response Time

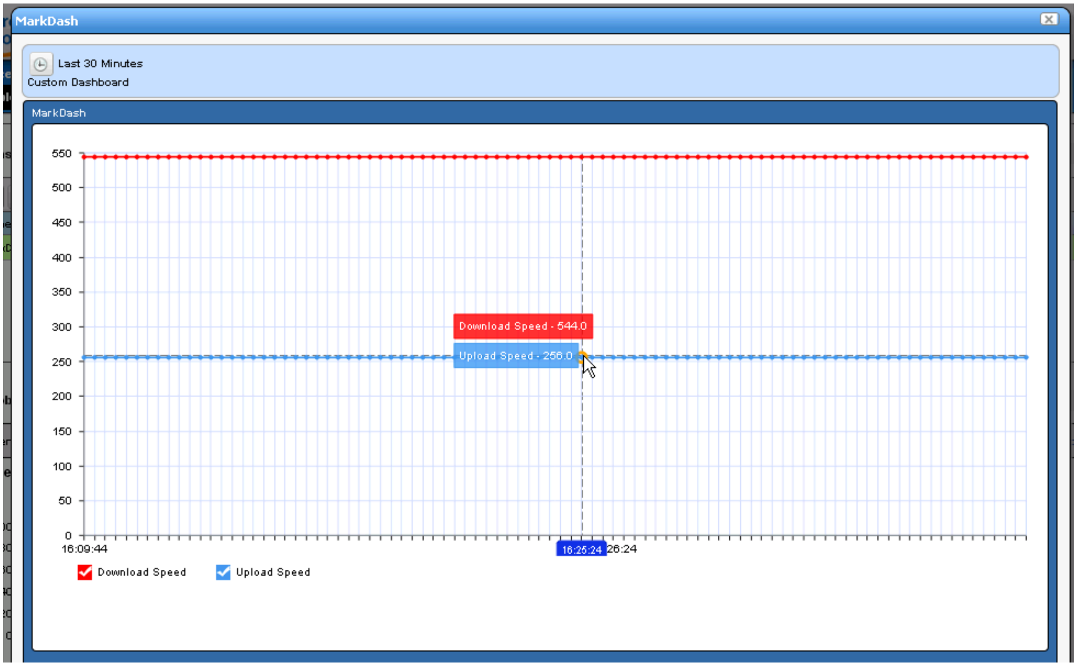
Available Series:

Selected Attributes: Upload Speed, Download Speed

Notice that you can select not only the monitor, but also the target(s) and attribute(s) to display. Here, we have selected the Upload / Download Speed attributes configured in the How to: Create a Monitor for the External Script Adaptive ACLI.

3 *Save* the configured dashboard.

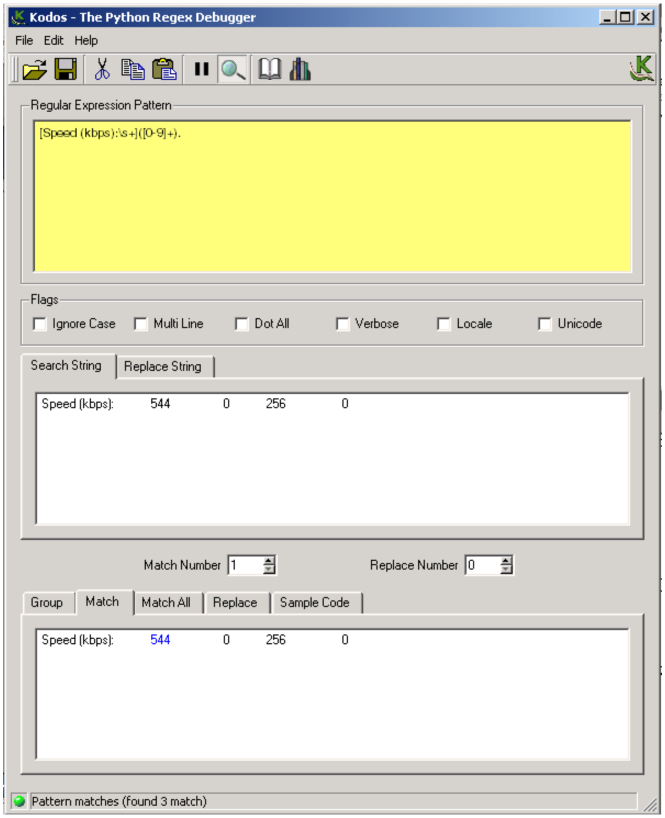
4 Right-click the dashboard in the Dashboard Views portlet and view it in one of the options available (Full Screen / Popup).



Notice that you can hover your cursor over a node in the graph and see all reported values for that node.

Regular Expression Testing

Several applications, some free, are helpful to validate regular expressions. These are helpful when trying to match a particular number and phrase in the Adaptive CLI and other output. In this example, we used Kodos to test various iterations of our regular expressions.



Regular Expression Pattern

```
[Speed (kbps):\s+]([0-9]+).
```

Flags

☐ Ignore Case ☐ Multi Line ☐ Dot All ☐ Verbose ☐ Locale ☐ Unicode

```
Speed (kbps):      544        0      256        0
```

Match Number 1   Replace Number 0

```
Speed (kbps):      544        0      256        0
```

Pattern matches (found 3 match)

Enter the regular expression in the top panel (note the helpful hints from the online help), the output to scan in the middle panel, and the match appears in the bottom panel.

Regular expressions include metacharacters to instruct the program how to treat characters it encounters. These include the following: ^ , $, . , | , { , } , [,] , (,), *, +, ? , \. If you want to match one of these metacharacters, you must prepend a backslash (\). So to match a literal question mark, rather than instructing regular expression matching to match 0 or 1 of a previous expression, you must enter \?.

Scheduling Actions

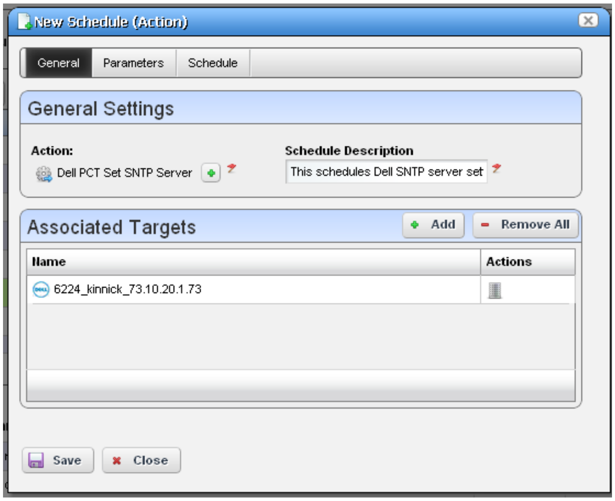
You can schedule actions with a right-click in the Actions Portlet or the Schedules Portlet. This opens an editor with the following screens:

- General
- Parameters
- Schedule

See Schedules Portlet on page 120 for more scheduling actions with that portlet. Schedules created in the Actions Portlet also appear in the Schedules Portlet.

General

This screen lets you identify the scheduled item and its targets.



Action: Dell PCT Set SNTP Server

Schedule Description: This schedules Dell SNTP server set

Name	Actions
6224_kinnick_73.10.20.1.73	

This has the following fields:

General Settings

Action—Identifies the action being scheduled.

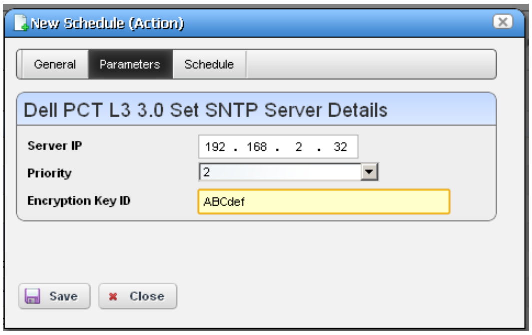
Schedule Description—Identifies the schedule.

Associated Targets

Click the *Add* button to select target equipment. You can remove listed equipment with the icon to the right of listed items or with the *Remove All* button.

Parameters

This screen's configuration depends on the selected action you are scheduling. Many actions have no parameters, so this tab is disabled. Enter the parameters for the action you are scheduling.



Dell PCT L3 3.0 Set SNTP Server Details

Server IP: 192 . 168 . 2 . 32

Priority: 2

Encryption Key ID: ABCdef

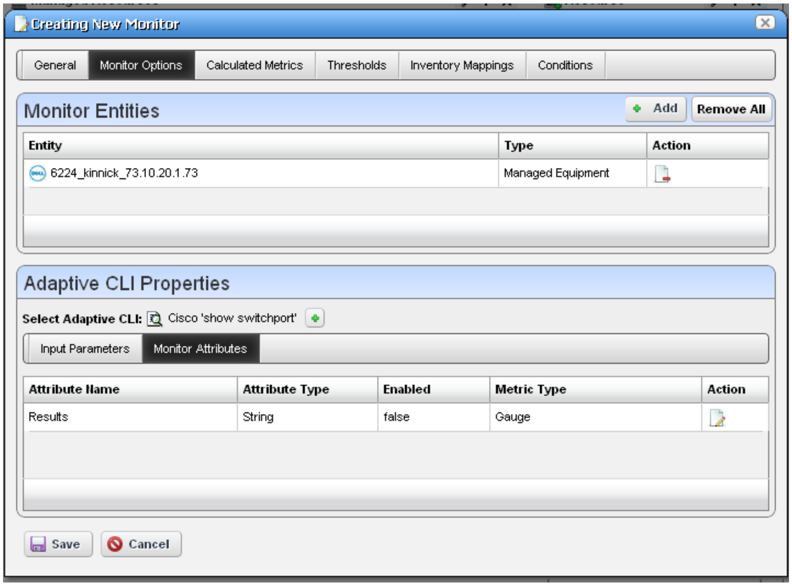
Hover the cursor over fields to make their description appear in a tooltip.

Schedule

This screen is a standard scheduler screen, as described in Schedules on page 118.

Active Performance Monitor Support

You can monitor Adaptive CLI execution results with Active Performance Monitor. To do this, you must select Adaptive CLI as the monitored type when creating a new performance monitor (see Resource Monitors on page 297), then select a target entities (with the *Add* button in the top panel) and a particular Adaptive CLI (with the green plus [+] in the Adaptive CLI Properties panel at the bottom of this screen. Click the *Edit* (page) icon to select the *Input Parameters* to monitor once you have selected an Adaptive CLI.



Monitor Entities

Entity	Type	Action
6224_kinnick_73.10.20.1.73	Managed Equipment	

Adaptive CLI Properties

Select Adaptive CLI: Cisco 'show switchport'

Attribute Name	Attribute Type	Enabled	Metric Type	Action
Results	String	false	Gauge	

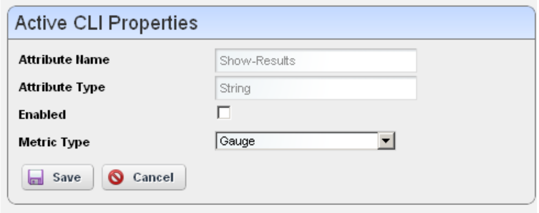
The user can choose an Adaptive CLI to monitor and may have to configure both its input values and metric type for each output attribute. The Input data depends on what is configured in the Adaptive CLI attributes.

Input Parameters

In Active Monitoring, all attributes of the schema appear in the *Input Data* for user-entered values. You must enter the data necessary for all selected targets' scripts. To enter data, click *Edit* and then enter values. Clicking *Apply* switches the panel back to read-only mode. You must click Save to preserve input or output data configurations.

Monitor Attributes

Configure Adaptive CLI output attributes for monitoring in this tab in the lower panel of the Monitor Editor screen. You can monitor only exposed attributes of numeric or boolean types. To change metric type, select the row and click the *Edit* button to its right.



Active CLI Properties

Attribute Name	Show-Results
Attribute Type	String
Enabled	□
Metric Type	Gauge

An Adaptive CLI Properties screen appears that reminds you of the *Attribute Name*, and *Attribute Type*, where you can *Enable* the attribute monitoring, and select *Gauge*, *Counter* or *Boolean* buttons to the right of this panel to configure the metric type of the selected output data.

These attributes default to the metric type *Gauge*. Adaptive CLI is where you define these attributes, but you must select their metric type settings on this screen if it is something other than the default.

Click *Save* to preserve your configuration, or *Cancel* to abandon it and close the editor screen.

How To:

Create a Monitor for an External Script

The following steps describe creating a monitor for an external command configured as an Adaptive CLI (ACLI). Several Perl scripts appear in this performance\scripts directory by default. You can try others in addition to the `http_test.pl` script in the example.

Create the Adaptive CLI

1 Right click in the Actions portlet, and create a new *External Command* ACLI

2 Make a new attribute schema with attribute: Status (integer)

3 In Scripts, enter the following as Script Content:

```
perl
    "C:\Dorado\owareapps\performance\scripts\http_test.pl"[_EquipmentManage
    r_IP_Address]
```

The variable [_EquipmentManager_IP_Address] provides the target device's IP address, and comes from the *Target Params* tab, where you can find other such variables. If you want to test this script on an HTTP process on a device not under management, just to see the outcome, enter a known URL instead of that variable (like www.doradosoftware.com), and run the script to see its output. (You will still have to select a target managed object to run the script, even though it is not part of the command line.)

4 In the Value Extraction panel enter the following:

```
^\{(\d+)\}.*
```

5 Click Apply

6 Click Save

7 Right click and *Execute* the ACLI to test it.

How To:

Create an Advanced Script Monitor Example

The following monitors an external Adaptive CLI example of setting up a simple process monitor using ACLI:

1 Make sure Perl is installed (and Windows has restarted after installing it), and check that the required libraries (`Info.pm` and `WMI.pm`) are in place. Your directory may vary; with 64-bit Strawberry Perl the locations are:

   For Info.pm:

   ```
   C:\strawberry\perl\vendor\lib\Win32\Process
   ```

   and for WMI.pm:

   ```
   C:\strawberry\perl\vendor\lib\Win32\Process\Info
   ```

   The process folder is attached to this document with proper structure. Put it in `C:\strawberry\perl\vendor\lib\Win32` and you are ready to go.

   NOTICE

   Here are the URLs where you can download these libraries:
   http://search.cpan.org/~wyant/Win32-Process-Info-1.018/lib/Win32/Process/Info.pm
   http://search.cpan.org/~wyant/Win32-Process-Info-1.019/lib/Win32/Process/Info/WMI.pm

2 Put `process_check.pl` in the proper directory. For Windows the default is

   ```
   C:\Dorado\owareapps\performance\scripts.
   ```

3 In your actions portlet, import TEST_ACTION.xml.

4 In your monitors portlet, import PROCESS_UPTIME_MONITOR.xml.

5 Even though the monitor and Adaptive CLI do not need one, select any target a dashboard can track.

6 In your dashboard views portlet, create a new custom Monitor Dashboard for whatever device(s) you decided to monitor, you will see Status as one of the tracked metrics (1 for up, 0 for down). You can use it as you would any other metric in Dell OpenManage Network Manager to track, graph, and so on.

By default this script and monitor track whether `notepad.exe` is running, but you can have it track anything by editing the monitor. Go to Monitor Options > Adaptive CLI Properties, and you can edit the *Process Name* variable to be any other process.

Extra credit: Modify the script to track multiple applications.

process_check.pl

```
#!/usr/bin/env perl

use Win32::Process::Info;
```

```
$processname=$ARGV[0];
$found = 0;
$pi = Win32::Process::Info->new ();
@info = $pi->GetProcInfo ();   # Get the max
@info = grep {
    print $_->{Name};
    print "\n";
    if ($_->{Name})
    {
       if ($_->{Name} eq $processname)
       {
       $found = 1;
       }
    }
} $pi->GetProcInfo ();
if ($found == 1)
{
   print "Process " . $processname . " is running! 1";
}
else
{
   print "Process " . $processname . " is not running! 0";
}
```

TEST_ACTION

This action's name is *TestExternalScript*. It has two attributes, *Process Name*, a string, and *Status*, an integer. It stores the retrieved process' status in the *Status* integer, and takes *Process Name* as a required input. It refers to the process_check.pl script as an external command in its *Scripts* tab. Here is the syntax:

```
perl C:\Dorado\owareapps\performance\scripts\process_check.pl
   <Process_Name>
```

In addition to referring to the script, this Adaptive CLI extracts the status from the script's run. Essentially it looks for 0 (down) or 1 (up) with the following regular expression in the *Value Extractions* tab:

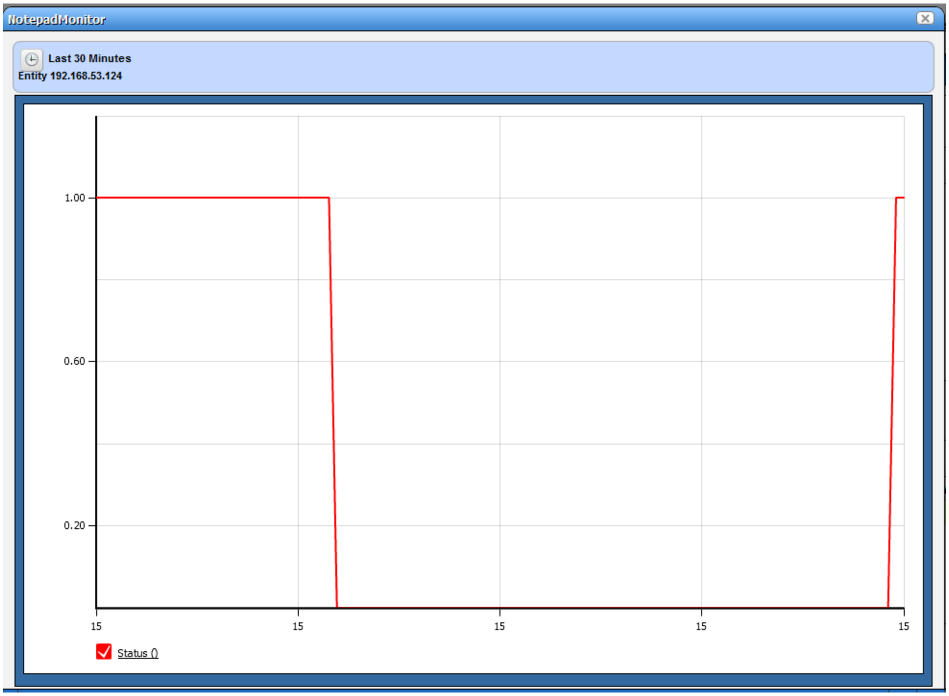
```
(\d)$
```

PROCESS_UPTIME_MONITOR

This monitor's name is *ProcessUptimeMonitor.* It refers to the TestExternalScript (TEST_ACTION) Adaptive CLI. Notice that the *Process Name* attribute defaults to notepad.exe, and the Monitor Attributes tab contains the *Status* attribute.

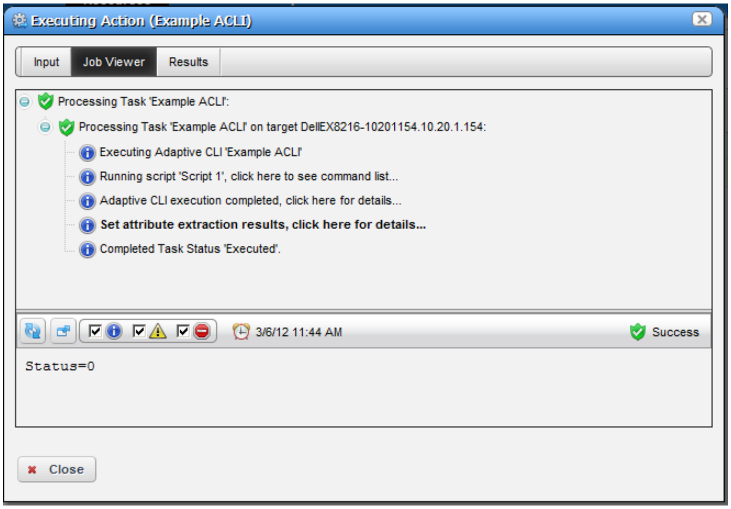
Monitor Dashboard

To see the result of your monitoring, create a custom monitor dashboard with the PROCESS_UPTIME_MONITOR as its target monitor, and the desired target device as its target device.



You can then see the process' activity over time when you launch the dashboard.

7 Look in Job Viewer for the results.



```
Processing Task 'Example ACLI':
  Processing Task 'Example ACLI' on target DellEX8216-10201154.10.20.1.154:
    Executing Adaptive CLI 'Example ACLI'
    Running script 'Script 1', click here to see command list...
    Adaptive CLI execution completed, click here for details...
    Set attribute extraction results, click here for details...
    Completed Task Status 'Executed'.
```

☑ ☑ ☑ 3/6/12 11:44 AM Success

```
Status=0
```

Click *Set attribute extraction results, click here* to see the results appear in the bottom panel. Notice also that you must check informational messages for all these to appear, and that several additional sets of messages besides the extraction results appear.

Create a Monitor for the External Script Adaptive ACLI

Now that you have verified the script is working, you can create a monitor to see how this attribute is doing.

1 In the Monitors portlet, create a new ACLI Monitor

2 Uncheck *Update Network Status* (recommended since the ICMP monitor is already doing this)

3 You may want to test your monitor, in which case, change the monitoring interval to 30 seconds. Re-edit it to configure it with the interval needed for your production system.

4 In *Monitor Options* select your example monitor configured previously.

5 Confirm that *Monitor Attributes* displays the Status attribute configured previously.

6 In the *Conditions* tab of the Monitor Editor, create “Status Up” condition, with the severity of *Informational*, and check *Alert*.

7 Create a criterion which is Status = 0.

8 Save this condition

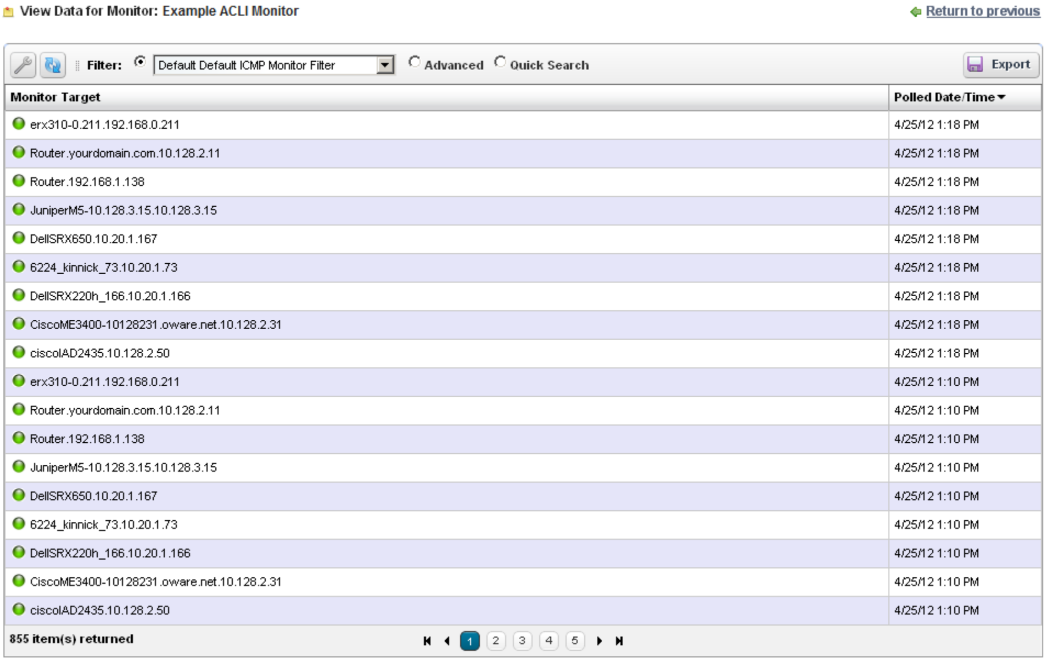
9 Create a new Condition called “Status Down”

10 The criterion is Status = 1

11 Apply and Save

12 Save your monitor.

13 Right-click to select *View Monitor Data*, and you can see the results of your efforts.

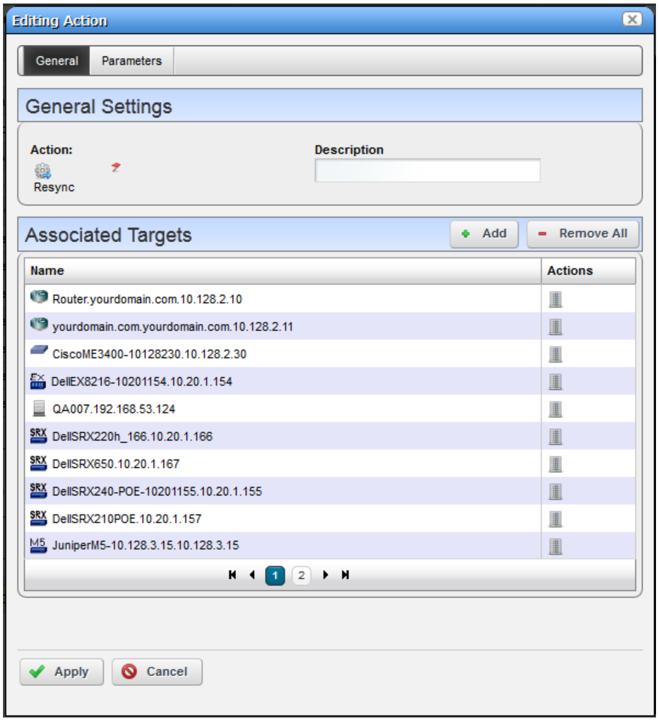


Filter: ● Default Default ICMP Monitor Filter ○ Advanced ○ Quick Search

Monitor Target	Polled Date/Time ▾
● erx310-0.211.192.168.0.211	4/25/12 1:18 PM
● Router.yourdomain.com.10.128.2.11	4/25/12 1:18 PM
● Router.192.168.1.138	4/25/12 1:18 PM
● JuniperM5-10.128.3.15.10.128.3.15	4/25/12 1:18 PM
● DellSRX650.10.20.1.167	4/25/12 1:18 PM
● 6224_kinnick_73.10.20.1.73	4/25/12 1:18 PM
● DellSRX220h_166.10.20.1.166	4/25/12 1:18 PM
● CiscoME3400-10128231.oware.net.10.128.2.31	4/25/12 1:18 PM
● ciscoIAD2435.10.128.2.50	4/25/12 1:18 PM
● erx310-0.211.192.168.0.211	4/25/12 1:10 PM
● Router.yourdomain.com.10.128.2.11	4/25/12 1:10 PM
● Router.192.168.1.138	4/25/12 1:10 PM
● JuniperM5-10.128.3.15.10.128.3.15	4/25/12 1:10 PM
● DellSRX650.10.20.1.167	4/25/12 1:10 PM
● 6224_kinnick_73.10.20.1.73	4/25/12 1:10 PM
● DellSRX220h_166.10.20.1.166	4/25/12 1:10 PM
● CiscoME3400-10128231.oware.net.10.128.2.31	4/25/12 1:10 PM
● ciscoIAD2435.10.128.2.50	4/25/12 1:10 PM

855 item(s) returned

Add Action—This opens an Action Editor where you can select the Action that is to be a member of the group, its Target devices and any Parameters associated with the Action.



General Settings

Action: Resync

Description

Associated Targets

Name	Actions
Router.yourdomain.com.10.128.2.10	
yourdomain.com.yourdomain.com.10.128.2.11	
CiscoME3400-10128230.10.128.2.30	
DellEX8216-10201154.10.20.1.154	
QA007.192.168.53.124	
DellSRX220h_166.10.20.1.166	
DellSRX650.10.20.1.167	
DellSRX240-POE-10201155.10.20.1.155	
DellSRX210POE.10.20.1.157	
JuniperM5-10.128.3.15.10.128.3.15	

1 2

Use the *Add* button to add Associated Targets, and the *Delete this entry* icon to delete any added by mistake. Click *Apply* to accept an added (or edited) Action.

Remove All—Delete all Actions.

Click *Save* to create the Action Group. Once you have saved the group, you can right-click to *Execute* it manually. You can also click *Add Schedule* to schedule its execution. Clicking *Close* ends your editor session without saving any new Action Group, or changes you may have made to an existing one.

Troubleshooting Adaptive CLI

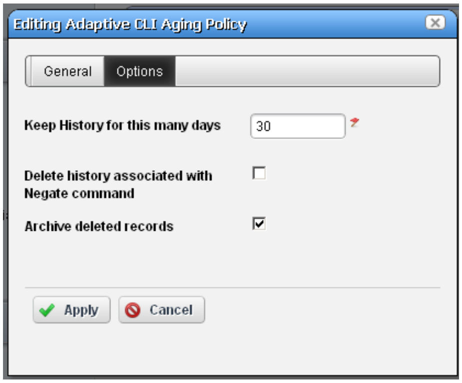
The following issues can prevent the correct completion of Adaptive CLI execution.

Connectivity—The device can be offline. To detect whether this is true, right-click the device in the Managed Resources portlet and *Direct Access > Ping* it.

Incomplete Discovery—If the device is online and still does not respond to Adaptive CLI, you may have only partially discovered it. Right-click the device in the Managed Resources portlet and select *Direct Access > Telnet*. If that menu option does not exist, it is only partially discovered. Right-click to edit the device, and add a Telnet Management Interface and Authentication in those two tabs of the editor.

Adaptive CLI Records Aging Policy

You can use OpenManage Network Manager's aging feature to preserve Adaptive CLI information. Click the Redcell > Database Aging Policy (DAP) node of the Control panel, and click the default *Adaptive CLI DAP* and click the edit button on its right.I



Keep History for this many days: 30

Delete history associated with Negate command ☐

Archive deleted records ☑

After filling in the *General Info* tab, the *Parameters* screen lets you configure the following:

Keep History—Enter the number of days to retain the history in the database.

Delete history associated with Negate command—Check to remove archived records associated with *Negate* (described under General on page 400).

Archive Deleted Records—Check to have deleted archived records saved as a file (configured in the *General Info* parameters too).

NOTICE

You can see deployed Axis2 web services listed in the screen at http://[application server IP address]:8089/axis2/services/listServices. These may take a little time to appear, so be patient. If you have been patient, and they still do not appear listed, you may have to clear your browser's cache. Clicking the *Activity* link once they appear displays the WSDL.

Glossary

ACCESS CONTROL — Refers to mechanisms and policies that restrict access to computer resources. An access control list (ACL), for example, specifies what operations different users can perform on specific files and directories.

ALARM — A signal alerting the user to an error or fault. Alarms are produced by events. Alarms produce a message within the Alarm Window.

API — Application Programing Interface—A set of routines used by the application to direct the performance of procedures by the computer's operating system.

AUTHENTICATION — The process of determining the identity of a user that is attempting to access a network. Authentication occurs through challenge/response, time-based code sequences or other techniques. See CHAP and PAP.

AUTHORIZATION — The process of determining what types of activities or access are permitted on a network. Usually used in the context of authentication: once you have authenticated a user, they may be authorized to have access to a specific service.

COS — Class of Service—Describes the level of service provided to a user. Also provides a way of managing traffic in a network by grouping similar types of traffic.

DATABASE — An organized collection of Dell OpenManage Network Manager objects.

DEPLOYMENT — The distribution of solution blades throughout the domain.

DIGITAL CERTIFICATE — A digital certificate is an electronic "credit card" that establishes your credentials when doing business or other transactions on the Web. It is issued by a certification authority (CA). It contains your name, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting and decrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real.

DOMAIN — A goal-oriented environment that can include an industry, company, or department. You can use Dell OpenManage Network Manager to create solutions within your particular domain.

ENCRYPTION — Scrambling data in such a way that it can only be unscrambled through the application of the correct cryptographic key.

EQUIPMENT — A network device managed by the system.

ETHERNET TRUNK — An Ethernet Trunk service represents a point-to-point connection between two ports of two devices. Ethernet frames transported by the connection are encapsulated according to IEEE 802.1Q protocol. The each tag ID value in 802.1Q encapsulated Ethernet frames distinguishes an Ethernet traffic flow. Thus, an Ethernet trunk can aggregate multiple Ethernet VLANs through a same connection which is why "trunk" describes these.

ETHERNET TRUNK PORT — An Ethernet trunk port is a port that terminates a point-to-point Ethernet trunk. Since Ethernet trunk is a point-to-point connection, each Ethernet trunk contains two Ethernet trunk ports.

ETHERNET SERVICE — An Ethernet service represents a virtual layer broadcast domain that transports or transmits Ethernet traffic entering from any one endpoint to all other endpoints.

Often, this is a VLAN service across multiple devices.

An Ethernet service may or may not use Ethernet trunk, depending on the desired connection between two neighboring devices. If the connection is exclusively used for this Ethernet service, no Ethernet trunk is needed. On the other hand, if the connection is configured as an aggregation which can be shared by multiple Ethernet services, an Ethernet trunk models such a configuration.

Each Ethernet service can have multiple Ethernet Access Ports through which Ethernet traffic flows get access to the service.

ETHERNET ACCESS SERVICE — Since an Ethernet trunk can be shared by multiple Ethernet Services, each Ethernet Service relates to a shared trunk via a unique Ethernet Access component.

Because Ethernet trunk is a point-to-point connection, there are two Ethernet Access Services per trunk per Ethernet service instance.

ETHERNET ACCESS POINT — These represent the access points through which Ethernet frames flow in and out of an Ethernet service.

For an Ethernet Service that uses an Ethernet Trunk Service, an Ethernet Access Port must be associated with either one of the two Ethernet Access Services.

EVENT — Notification received from the NMS (Network Management System). Notifications may originate from the traps of network devices or may indicate an occurrence such as the closing of a form. Events have the potential of becoming alarms.

EVENT DEFINITION — Parameters that define what an event does. For example, you can tell Dell OpenManage Network Manager that the event should be to wait for incoming data from a remote database, then have the Dell OpenManage Network Manager application perform a certain action after it receives the data.

EVENT INSTANCE — A notification sent between two Dell OpenManage Network Manager components. An event instance is the action the event performs per the event definition.

EVENT TEMPLATE — Defines how an event is going to be handled.

EVENT THRESHOLD — Number of events within a given tomfooleries that must occur before an alarm is raised.

EXPORTING — Saving business objects, packages, or solution blades to a file for others to import.

Filter — In network security, a filter is a program or section of code that is designed to examine each input or output request for certain qualifying criteria and then process or forward it accordingly.

GUI — Graphical User Interface

Key — In cryptography, a key is a variable value that is applied using an algorithm to a string or block of unencrypted text to produce encrypted text. The length of the key generally determines how difficult it will be to decrypt the text in a given message.

Key Management — The establishment and enforcement of message encryption and authentication procedures, in order to provide privacy-enhanced mail (PEM) services for electronic mail transfer over the Internet.

Managed Object — A network device managed by the system.

Mediation — Communication between this application and external systems or devices, for example, printers. Mediation services let this application treat these devices as objects.

Mediation Agent — Any communication to and from equipment is handled by the Mediation Agent. This communication includes SNMP requests, ASCII requests, and unsolicited ASCII messages. In addition, the Mediation Agent receives and translates emitted SNMP traps and converts them into events.

MIB — Management Information Base. A database (repository) of equipment containing object characteristics and parameters that can be monitored by the network management system.

OAM — Operation, Administration and Maintenance

OID — Object ID.

OSPF — Open Shortest Path First routing protocol.

Policy — A rule made up of conditions and actions and associated with a profile. Policy objects contain business rules for performing configuration changes in the network for controlling Quality of Service and Access to network resources. Policy can be extended to perform other configuration functions, including routing behavior, VLAN membership, and VPN security.

Policy Enforcement Points (PEP) — In a policy enforced network, a policy enforcement point represents a security appliance used to protect one or more endpoints. PEPs are also points for monitoring the health and status of a network. PEPs are generally members of a policy group.

Policy routing — Routing scheme that forwards packets to specific interfaces based on user-configured policies. Such policies might specify that traffic sent from a particular network should be routed through interface, while all other traffic should be routed through another interface.

Policy Rules — In a policy enforced network (PEN), policy rules determine how the members and endpoint groups of a policy group communicate.

PPTP (POINT-TO-POINT TUNNELING PROTOCOL) — Point-to-Point Tunneling Protocol (PPTP) is a network protocol that enables the secure transfer of data from a remote client to a private enterprise server by creating a virtual private network (VPN) across TCP/IP-based data networks. PPTP supports on-demand, multi-protocol, virtual private networking over public networks, such as the Internet.

PRIVATE KEY — In cryptography, a private or secret key is an encryption/decryption key known only to the party or parties that exchange secret messages. In traditional secret key cryptography, a key would be shared by the communicators so that each could encrypt and decrypt messages. The risk in this system is that if either party loses the key or it is stolen, the system is broken. A more recent alternative is to use a combination of public and private keys. In this system, a public key is used together with a private key.

PROFILE — A profile is an abstract collection of configuration data that is utilized as a template to specify configuration parameters to be applied to a device as a result of a policy condition being true.

PUBLIC KEY — A public key is a value provided by some designated authority as a key that, combined with a private key derived from the public key, can be used to effectively encrypt and decrypt messages and digital signatures. The use of combined public and private keys is known as asymmetric encryption. A system for using public keys is called a public key infrastructure (PKI).

QOS — Quality of Service. In digital circuits, it is a measure of specific error conditions as compared with a standard. The establishment of QoS levels means that transmission rates, error rates, and other characteristics can be measured, improved, and, to some extent, guaranteed in advance. Often related to Class of Service (CoS).

RADIUS — RADIUS (Remote Authentication Dial-In User Service) is a client/server protocol and software that enables remote access servers to communicate with a central server to authenticate dial-in users and authorize their access to the requested system or service. RADIUS allows a company to maintain user profiles in a central database that all remote servers can share.

RIP — Routing Information Protocol

SELF-SIGNED CERTIFICATE

A self-signed certificate uses its own certificate request as a signature rather than the signature of a CA. A self-signed certificate will not provide the same functionality as a CA-signed certificate. A self-signed certificate will not be automatically recognized by users' browsers, and a self-signed certificate does not provide any guarantee concerning the identity of the organization that is providing the website.

SMTP — Simple Mail Transfer Protocol.

SNMP — Simple Network Management Protocol. Network management protocol used almost exclusively in TCP/IP networks. SNMP provides the means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security.

Spanning Tree Protocol (STP) — The inactivation of links between networks so that information packets are channeled along one route and will not search endlessly for a destination.

SSH (Secure Shell) — A protocol which permits secure remote access over a network from one computer to another. SSH negotiates and establishes an encrypted connection between an SSH client and an SSH server.

SSL (Secure Sockets Layer) — A program layer created by Netscape for managing the security of message transmissions in a network. Netscape's idea is that the programming for keeping your messages confidential ought to be contained in a program layer between an application (such as your Web browser or HTTP) and the Internet's TCP/IP layers. The "sockets" part of the term refers to the sockets method of passing data back and forth between a client and a server program in a network or between program layers in the same computer.

Trap (SNMP Trap) — A notification from a network element or device of its status, such as a server startup. This notification is sent by an SNMP agent to a Network Management System (NMS) where it is translated into an event by the Mediation Agent.

Trap Forwarding — The process of re-emitting trap events to remote hosts. Trap Forwarding is available from the application through Actions and through the Resource Manager.

VLAN — A virtual local area network (LAN), commonly known as a VLAN, is a group of hosts with a common set of requirements that communicate as if they were attached to the Broadcast domain, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same network switch. Network reconfiguration can be done through software instead of physically relocating devices.

Index