

Administration Guide

Sentinel 7.0.1

April 2012



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About This Guide

This guide contains the administration information and tasks required to manage a Sentinel deployment.

Audience

This guide is intended for Sentinel administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comments feature at the bottom of each page of the online documentation.

Additional Documentation

Sentinel technical documentation is broken down into several different volumes. They are:

- ♦ [Sentinel Overview Guide](http://www.novell.com/documentation/sentinel70/s701_overview/data/bookinfo.html) (http://www.novell.com/documentation/sentinel70/s701_overview/data/bookinfo.html)
- ♦ [Sentinel Quick Start Guide](http://www.novell.com/documentation/sentinel70/s701_quickstart/data/s701_quickstart.html) (http://www.novell.com/documentation/sentinel70/s701_quickstart/data/s701_quickstart.html)
- ♦ [Sentinel Installation Guide](http://www.novell.com/documentation/sentinel70/s701_install/data/bookinfo.html) (http://www.novell.com/documentation/sentinel70/s701_install/data/bookinfo.html)
- ♦ [Sentinel User Guide](http://www.novell.com/documentation/sentinel70/s701_user/data/bookinfo.html) (http://www.novell.com/documentation/sentinel70/s701_user/data/bookinfo.html)
- ♦ [Sentinel Link Overview Guide](http://www.novell.com/documentation/sentinel70/sentinel_link_overview/data/bookinfo.html) (http://www.novell.com/documentation/sentinel70/sentinel_link_overview/data/bookinfo.html)
- ♦ [Sentinel Internal Audit Events](http://www.novell.com/documentation/sentinel70/s701_auditevents/data/bookinfo.html) (http://www.novell.com/documentation/sentinel70/s701_auditevents/data/bookinfo.html)
- ♦ [Sentinel SDK](http://www.novell.com/developer/develop_to_sentinel.html) (http://www.novell.com/developer/develop_to_sentinel.html)

The Sentinel SDK site provides information about building your own plug-ins.

Contacting Novell and NetIQ

Sentinel is now a NetIQ product, but Novell still handles many support functions.

- ♦ [Novell Web site](http://www.novell.com) (<http://www.novell.com>)
- ♦ [NetIQ Web site](http://www.netiq.com) (<http://www.netiq.com>)
- ♦ [Technical Support](http://support.novell.com/contact/getsupport.html?sourceidint=suplnav4_phonesup) (http://support.novell.com/contact/getsupport.html?sourceidint=suplnav4_phonesup)
- ♦ [Self Support](http://support.novell.com/support_options.html?sourceidint=suplnav_supportprog) (http://support.novell.com/support_options.html?sourceidint=suplnav_supportprog)

- ◆ Patch download site (<http://download.novell.com/index.jsp>)
- ◆ Sentinel Community Support Forums (<http://forums.novell.com/netiq/netiq-product-discussion-forums/sentinel/>)
- ◆ Sentinel TIDs (<http://support.novell.com/products/sentinel>)
- ◆ Sentinel Plug-in Web site (<http://support.novell.com/products/sentinel/secure/sentinel61.html>)
- ◆ **Notification Email List:** Sign up through the Sentinel Plug-in Web site

Contacting Sales Support

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Worldwide: [NetIQ Office Locations \(http://www.netiq.com/about_netiq/officelocations.asp\)](http://www.netiq.com/about_netiq/officelocations.asp)

United States and Canada: 888-323-6768

Email: info@netiq.com

Web site: www.netiq.com

1 Administration Tools

There are different administration tools to help you take advantage of all of the features Sentinel has to offer.

- ♦ [Section 1.1, “Sentinel Web Interface,” on page 11](#)
- ♦ [Section 1.2, “Sentinel Control Center,” on page 13](#)
- ♦ [Section 1.3, “Event Source Management,” on page 20](#)
- ♦ [Section 1.4, “Solution Designer,” on page 38](#)
- ♦ [Section 1.5, “Command Line Utilities,” on page 46](#)

1.1 Sentinel Web Interface

Sentinel is a Security Information and Event Management (SIEM) that receives information from many sources throughout an enterprise, standardizes it, prioritizes it and presents it to you to make threat, risk and policy related decisions. The Sentinel Web interface is the main user interface for viewing and interacting with this data.

- ♦ [Section 1.1.1, “Accessing the Sentinel Web Interface,” on page 11](#)
- ♦ [Section 1.1.2, “Introducing the Sentinel Web Interface,” on page 12](#)

1.1.1 Accessing the Sentinel Web Interface

- 1 Launch a supported Web browser. (Internet Explorer 8 or Firefox 5).
- 2 Specify the URL of the Sentinel Web interface:

`https://<IP_Address/DNS_Sentinel_server:8443>`

IP_Address/DNS_Sentinel_server is the IP address or DNS name of the Sentinel server and *8443* is the default port for the Sentinel server.

- 3 Log in as a user with permissions to access the desired feature.

or

If it is your first time logging in, log in with the administrator name and password specified during the installation.

For information on the various roles and permissions, see [Chapter 2, “Configuring Users and Roles,” on page 55](#).

By default, the username is admin. The password is specified during the installation of Sentinel. For more information, see [“Interactive Installation”](#) in the *NetIQ Sentinel 7.0.1 Installation and Configuration Guide*.

1.1.2 Introducing the Sentinel Web Interface

The Sentinel Web interface allows you to configure your Sentinel system and administer features. There are two different types of options displayed in the Web interface:

- ♦ [“Administration Options” on page 12](#)
- ♦ [“User Options” on page 12](#)

Administration Options

The administration options are displayed in the toolbar if you are logged in as a user with an administrative role. The following are the administration options:

Collection: Allows you to configure data collection through event sources. For more information, see [Chapter 6, “Configuring Data Collection,” on page 111](#).

Storage: Allows you to configure how Sentinel stores all of the data it gathers. For more information, see [Chapter 5, “Configuring Data Storage,” on page 83](#).

Routing: Allows you to configure how events are automatically routed through the Sentinel system to rules or Actions. For more information, see [Chapter 8, “Configuring Event Routing Rules,” on page 141](#).

Users: Allows you to configure users and roles for managing Sentinel. For more information, see [Chapter 2, “Configuring Users and Roles,” on page 55](#).

Search Setup: Allows you to configure Sentinel to search other Sentinel and Sentinel Log Manager systems for events. For more information, see [Chapter 13, “Searching and Reporting Events in a Distributed Environment,” on page 181](#).

Downloads: The location where you can download the stand-alone installers for remote Collector Managers and Correlation Engines. For more information, see [“Installing Additional Collector Managers”](#) or [“Installing Additional Correlation Engines”](#) in the *NetIQ Sentinel 7.0.1 Installation and Configuration Guide*.

User Options

The user options are displayed on the left and at the end of the toolbar for users with the rights to the different features. If you log in as a user without the rights to a feature, the feature is not displayed. The following are the user options:

Logged in User Name: Displays the name of the user that you used to log in to Sentinel. You can edit information about the user, change the user’s password, or see additional information about the user in this link.

Help: Provides link to the Sentinel 7.0 documentation Web site, Sentinel API, Sentinel Help Portal, and Sentinel Database Schema.

About: Displays the version, copyright information, and license information for Sentinel.

Application: The location where you launch the Sentinel Control Center (SCC) and the Solution Designer. For more information about the SCC, see [Section 1.2, “Sentinel Control Center,” on page 13](#). For more information about the Solution Designer, see [Section 1.4, “Solution Designer,” on page 38](#).

New Search: Allows you to perform a search of events in the Sentinel system. For more information, see [“Searching Events”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

Security Intelligence: Allows you to perform statistical analysis for trends in the data gathered by Sentinel. For more information, see “[Analyzing Trends in Data](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Reports: Allows you to run reports on the data gathered by Sentinel. For more information, see “[Reporting](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

People: Integrates Sentinel with Novell Identity Manager to track each user’s account identity information and the status of the account. A user account can have one or more identities per system in the IT environment. For more information, see “[Integrating Identity Information with Sentinel Events](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Event Actions: Allows you to perform actions on selected events. For more information, see “[Manually Performing Actions on Events](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Correlation: Allows you to correlate a set of similar or comparable events in a given period with the rules you create and deploy in the Correlation Engine so you can take appropriate action to mitigate any situation. For more information, see “[Correlating Event Data](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Tags: Allows you to tag all data collection objects such as Event sources, Servers, Collector Managers, Collector plug-ins, report templates, and report results. Tags are user-defined values that can be used to logically group data collection objects within the Sentinel system. You can search for events, report templates, and report definitions based on tags. For more information, see “[Configuring Tags](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Filters: Allows you manage the amount of data that Sentinel gathers. Filters help you reduce the scope of searches, what data is stored, and what data is analyzed. For more information, see “[Configuring Filters](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

1.2 Sentinel Control Center

Sentinel gathers and correlates security and non-security information from across an organization's networked infrastructure, as well as third-party systems, devices, and applications. Sentinel presents the collected data in the Sentinel Web interface as well as the Sentinel Control Center (SCC).

- ♦ [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13
- ♦ [Section 1.2.2, “Using the Sentinel Control Center,”](#) on page 14
- ♦ [Section 1.2.3, “Navigating in the Sentinel Control Center,”](#) on page 18
- ♦ [Section 1.2.4, “Changing the Appearance of the Sentinel Control Center,”](#) on page 18
- ♦ [Section 1.2.5, “Saving User Preferences,”](#) on page 19
- ♦ [Section 1.2.6, “Configuring the Attachment Viewer,”](#) on page 19

1.2.1 Accessing the Sentinel Control Center

The SCC is accessed through the Sentinel Web interface.

- 1 Log in to the Sentinel Web interface:

`https://<IP_Address>/DNS_Sentinel_server:8443>`

IP_Address/DNS_Sentinel_server is the IP address or DNS name of the Sentinel server and 8443 is the default port for the Sentinel server.

- 2 In the toolbar, click *Applications*.

- 3 Click *Launch Control Center*.
- 4 Click *Yes* to accept the security certificate.
- 5 Specify a username and password of a user that has rights to access the SCC, then click *Login*.
- 6 Click *Accept* or *Accept Permanently* to accept the security certificate.

The Sentinel Control Center launches in a new window.

1.2.2 Using the Sentinel Control Center

The Sentinel Control Center (SCC) provides you a “dockable” framework that allows you to move the pieces of the interface from their default location to user-specific locations for ease of use. The SCC consists of the following components:

- ♦ [“Menu Bar” on page 14](#)
- ♦ [“Tabs” on page 14](#)
- ♦ [“Toolbar” on page 16](#)
- ♦ [“Frames” on page 17](#)

Menu Bar

The menu bar has the menus required to navigate, perform activities, and change the appearance of Sentinel Control Center.

The *File*, *Options*, *Tools*, *Window*, *Event Source Management*, and *Help* menus are always available. The availability of other menus depends on your location in the console and the permissions you have.

Tabs

Depending on your access permissions, Sentinel Control Center displays the following tabs:

- ♦ [“Active Views” on page 14](#)
- ♦ [“Incidents” on page 15](#)
- ♦ [“iTRAC” on page 15](#)
- ♦ [“Advisor” on page 15](#)
- ♦ [“Configuration” on page 15](#)

Active Views

The Active Views tab presents events in near-real time.

In the Active Views tab, you can:

- ♦ View events occurring in near real-time
- ♦ Investigate events
- ♦ Graph events
- ♦ Perform historical queries to collect data for a specified period
- ♦ Invoke right-click functions
- ♦ Initiate manual incidents and remediation workflows

For more information, see [“Viewing Events”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

Incidents

An incident is a set of events that requires attention (for example, a possible attack). Incidents centralize the data and typically include a correlated event, the associated events that triggered a Correlation rule, asset details of the affected systems, the vulnerability state of the affected systems, and any remediation information. Incidents can be associated with a remediation workflow in iTRAC, if specified. An incident associated to an iTRAC workflow allows users to track the remediation state of the incident.

In the *Incidents* tab, you can:

- ◆ Manage incident views
- ◆ View and manage incidents and their associated data
- ◆ Switch between existing incident views

For more information, see [“Configuring Incidents”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

iTRAC

iTRAC’s stateful incident remediation workflow capability allows you to incorporate your organization’s incident response processes into Sentinel.

In the *iTRAC* tab, you can:

- ◆ Create custom workflow templates
- ◆ Edit workflow templates
- ◆ Create custom activities
- ◆ Edit activities
- ◆ Associate activities with workflow steps
- ◆ Initiate and execute Processes

For more information, see [“Configuring iTRAC Workflows”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

Advisor

Advisor is an optional module that provides real-time correlation between detected intrusion detection system attacks and vulnerability scan output in order to immediately indicate increased risk to an organization. For more information, see [Chapter 11, “Configuring Advisor,”](#) on page 165.

Configuration

In the *Configuration* menu, you can:

- ◆ Configure Events
For more information, see [Chapter 7, “Mapping Events,”](#) on page 129.
- ◆ Configure Event Actions
For more information, see [“Configuring Event Actions”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.
- ◆ Configure the mapping service
For more information, see [Chapter 7, “Mapping Events,”](#) on page 129.

- ◆ Configure dynamic lists
For more information, see [“Configuring Dynamic Lists”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.
- ◆ Configure Solution Packs
For more information, see [Chapter 17, “Using Solution Packs,”](#) on page 199.
- ◆ Configure Integrators
For more information, see [Chapter 10, “Configuring Integrators,”](#) on page 155.
- ◆ Configure Actions
For more information, see [Chapter 9, “Configuring Actions,”](#) on page 145.
- ◆ Configure the Download Manager
For more information, see [Chapter 12, “Using the Download Manager,”](#) on page 175.

Toolbar

The toolbar allows you to perform the tab-specific functions. There are system-wide toolbar buttons that are always displayed. The availability of other toolbar buttons depends on your location in the console and the permissions you have.

- ◆ [“System-Wide Toolbar”](#) on page 16
- ◆ [“Tab-Specific Toolbar Buttons”](#) on page 16

System-Wide Toolbar

The system-wide toolbar buttons are always displayed. You use them to perform the following tasks:

Undo layout: Undoes any changes made to the layout of the frames in the UI.

Reset layout: Resets the layout of the frames in the UI to the default layout.

Redo layout: Redoes any changes made to the layout of the frames in the UI.

Help: Launches help.

Till all display windows: Arranges all open windows in a tile configuration.

Cascaded all display windows: Cascades all open windows.

Save user preferences: Saves any user preferences you have defined.

Action debugging: Debugs actions performed by rules.

People Browser: Allows you to search and view user profiles of the identities that have been synchronized from the Identity Management system.

Tab-Specific Toolbar Buttons

Tab-specific toolbar buttons allow you to perform the functions related to each tab.

Active Views > Create Active view: Creates a new Active View of the data.

Active Views > Snapshot: Takes a snapshot of the information displayed in the Active View.

Active Views > Manage columns: Allows you to manage the columns displayed in the Active View.

Incidents > Display incident view manager: Displays the Incident Manager that allows you to view incidents.

Incidents > Create incident: Creates a new incident.

iTRAC > Display process manager: Displays the Process Manager.

iTRAC > Activity manager: Launches the Activity Manager.

iTRAC > Template manager: Launches the Template Manager.

iTRAC > iTRAC role manager: Launches the iTRAC Role Manager.

Advisor > Advisor configuration: Launches a wizard to help configure Advisor.

Configuration > Event configuration: Allows you to configure events.

Configuration > Event actions configuration: Allows you to configure actions that are performed on events.

Configuration > Map data configuration: Allows you to configure enhancements for the data coming into Sentinel.

Configuration > Dynamic lists: Allows you to create dynamic lists that are used within a Correlation Rule.

Configuration > Solution Packs: Launches the Solution Pack Manager.

Configuration > Integrator Manager: Launches the Integrator Manager.

Configuration > Action Manager: Launches the Action Manager.

Configuration > Download Manager: Launches the Download Manager.

Frames

Sentinel provides a framework that allows you to drag frames on the screen to place them in preferred locations. The following buttons display, so you can drag or hide frames:

- ◆ Toggle floating
- ◆ Toggle auto-hide

To drag a frame to any location:

- 1 Click the *Toggle floating* icon on the frame or hold the frame and drag it to the desired location.

To hide a frame:

- 1 Click the *Toggle auto-hide* icon.

You can undo dragging or reset the location to the default position using the toolbar buttons.

1.2.3 Navigating in the Sentinel Control Center

To navigate by using the toolbar:

- 1 Click the desired tab.
- 2 Click the toolbar buttons to perform the actions.

To navigate by using the menus:

- 1 Click the desired tab.
If you do not click the desired tab, the menu option is dimmed.
- 2 Click the menu relevant to the selected tab.
- 3 Select an action you need to perform.

This procedure is generic for all the tabs in SCC. Specific procedures for tabs are discussed in the relevant sections later in this document.

1.2.4 Changing the Appearance of the Sentinel Control Center

You can change the Sentinel Control Center's look by:

- ♦ [“Changing the Positions of the Tabs” on page 18](#)
- ♦ [“Changing How the Windows Are Displayed” on page 18](#)

Changing the Positions of the Tabs

You can change whether the tabs are displayed at the top of the tab frames or at the bottom of the tab frames.

- 1 In the Sentinel Control Center menu, click *Options > Tab Placement*.
- 2 Select either *Top* or *Bottom*.

Changing How the Windows Are Displayed

You can change how the windows in the SCC are displayed.

Cascading Windows: In the Sentinel Control Center menu, click *Windows > Cascade All*. All open windows in the right panel cascade.

Tiling Windows: In the Sentinel Control Center menu, click *Windows > Tile All*, then select the option that meets your requirements:

- ♦ Tile Best Fit
- ♦ Tile Vertical
- ♦ Tile Horizontal

Minimizing Windows: In the Sentinel Control Center menu, click *Windows > Minimize All*. All open windows in the right panel minimize.

Restoring Windows: In the Sentinel Control Center menu, click *Windows > Restore All*. All open windows in the right panel are restored to their original size.

Use the Minimize and Restore options provided on the top right corner of the tab to minimize individual tabs.

Closing all Open Windows: In the Sentinel Control Center menu, click *Windows > Close All*.

1.2.5 Saving User Preferences

If users have permissions to save their workspaces, they can save the following preferences:

- ♦ Permanent windows that are not dependent on data that was available at the time of their original creation.
- ♦ Active Views
- ♦ Summary displays
- ♦ Window positions
- ♦ Window sizes, including the application window
- ♦ Tab positions
- ♦ Whether the Navigator docked or floating, and whether it is showing or hidden

The following preferences are not saved when the user logs out:

- ♦ Snapshots
- ♦ Historical event queries
- ♦ Secondary windows opened from a primary window
- ♦ Column widths in Active Views

To save your preferences:

- 1 In the menu, click *File > Save Preferences*

or

Click *Save User Preferences*  in the toolbar.

If you make display changes in the SCC but do not save them, you are prompted to save the changes when you log out of the SCC.

1.2.6 Configuring the Attachment Viewer

The Attachment Viewer allows you to specify which applications open the files attached to Solution Packs.

- ♦ [“Adding Applications to the Attachment Viewer” on page 19](#)
- ♦ [“Editing Entries in the Application Viewer” on page 20](#)
- ♦ [“Deleting Entries in the Application Viewer” on page 20](#)

Adding Applications to the Attachment Viewer

- 1 In the Sentinel Control Center menu, click *Options > Attachment Viewer Configuration*.
- 2 Click *Add*.
- 3 Use the following information to identify the attachment in the Attachment Viewer Configuration window:

Extension: Specify the extension type, such as `.doc`, `.xls`, `.txt`, `.html`.

Type: Specify the type of attachment. The default value is `DEFAULT`.

Subtype: Specify the subtype of attachment. The default value is `DEFAULT`.

Application: Click *Browse* or type the path and the application to launch the file type, such as `notepad.exe` for Notepad.

Parameter: Specify a parameter to pass to the application. The default value is `%File%`.

- 4 Click *OK*.
- 5 Repeat [Step 2](#) through [Step 4](#) for each additional application you want to add.
- 6 Click *OK* to close the Attachment Viewer.

Editing Entries in the Application Viewer

- 1 In the Sentinel Control Center menu, click *Options > Attachment Viewer Configuration*.
- 2 Select an item in the Attachment Viewer, then click *Edit*.
- 3 Make any desired changes, then click *OK* to save the changes.
- 4 Click *OK* to close the Attachment Viewer.

Deleting Entries in the Application Viewer

- 1 In the Sentinel Control Center menu, click *Options > Attachment Viewer Configuration*.
- 2 Select the item you want to delete in the Attachment Viewer, then click *Delete*.
- 3 Click *OK* to close the Attachment Viewer.

1.3 Event Source Management

The Event Source Management (ESM) interface in the Sentinel Control Center (SCC) monitors and configures advanced data collection capabilities beyond the settings currently available in the Web interface. Some Connectors and Collectors must be configured in the Event Source Management interface.

- ♦ [Section 1.3.1, "Accessing Event Source Management," on page 21](#)
- ♦ [Section 1.3.2, "Viewing Data in Event Source Management," on page 21](#)
- ♦ [Section 1.3.3, "Searching for Event Sources," on page 26](#)
- ♦ [Section 1.3.4, "Installing Plug-Ins," on page 27](#)
- ♦ [Section 1.3.5, "Updating a Connector or a Collector Plug-In," on page 28](#)
- ♦ [Section 1.3.6, "Adding Components to Sentinel," on page 28](#)
- ♦ [Section 1.3.7, "Connecting to Event Sources," on page 30](#)
- ♦ [Section 1.3.8, "Exporting Configurations," on page 34](#)
- ♦ [Section 1.3.9, "Importing Configurations," on page 34](#)
- ♦ [Section 1.3.10, "Debugging," on page 35](#)
- ♦ [Section 1.3.11, "Troubleshooting," on page 38](#)

1.3.1 Accessing Event Source Management

- 1 Log in to the Sentinel Web interface as a user in the administrator role.

`https://<IP_Address>/DNS_Sentinel_server:8443>`

IP_Address/DNS_Sentinel_server is the IP address or DNS name of the Sentinel server and *8443* is the default port for the Sentinel server.

2 In the toolbar, click *Applications > Launch Control Center*.

or

In the toolbar, click *Collection > Launch Control Center*.

3 Log in to the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

4 In toolbar, click *Event Source Management > Live View*.

1.3.2 Viewing Data in Event Source Management

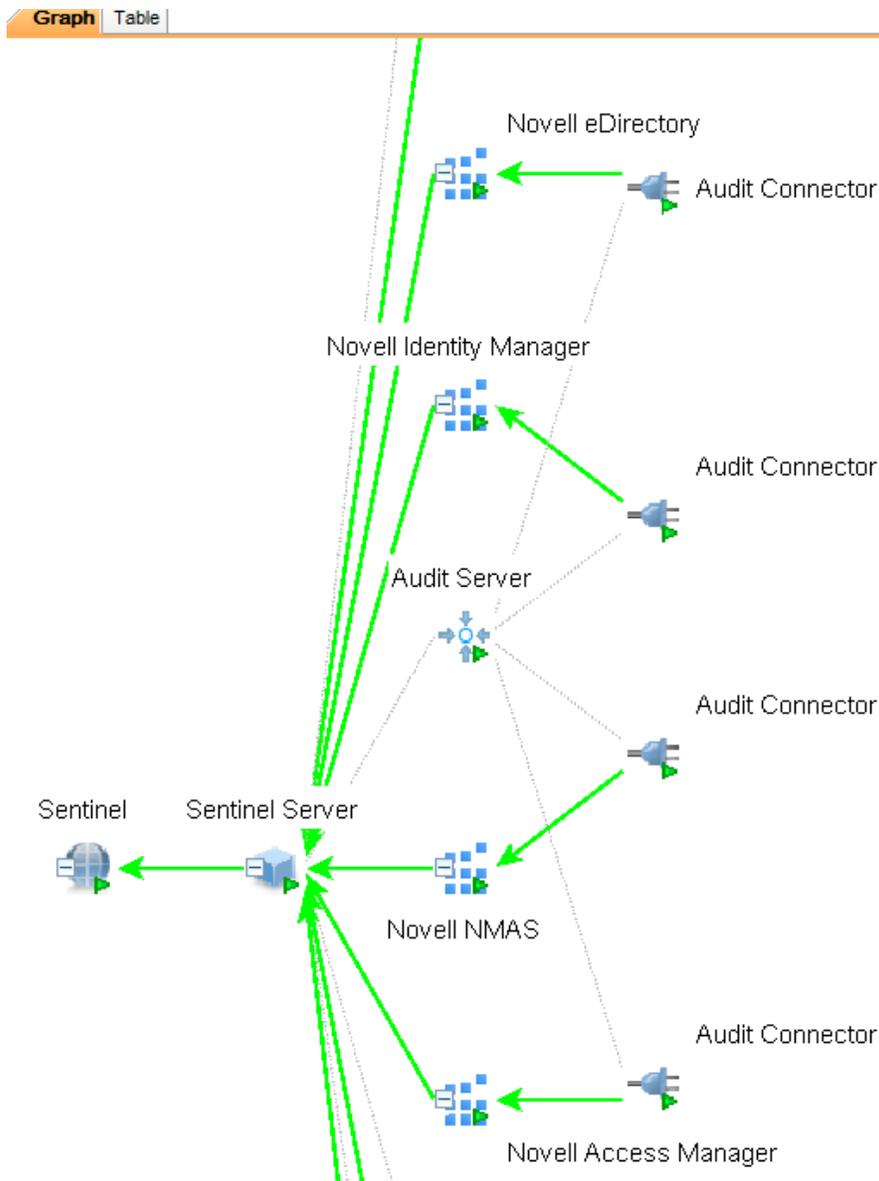
In the Event Source Management, you can view configuration data in different views:

- ♦ [“Graphical ESM View”](#) on page 21
- ♦ [“Table ESM View”](#) on page 23
- ♦ [“How the Components Are Displayed”](#) on page 24
- ♦ [“Component Status Indicators”](#) on page 25
- ♦ [“Right-Click Menus”](#) on page 25

Graphical ESM View

The graphical view is the default view in Event Source Management. In the graphical view, you can view the status of a Collector and access the configuration settings of Collectors and Collector objects as a graph of connected nodes.

Figure 1-1 Graphical View



By default, the Health Monitor Display frame displays in the graphical view. The data can be displayed in several different layouts. The default layout in graph is the Hierarchic Left to Right layout. You can change between these layouts by selecting the layout format from the drop-down list in the toolbar.

TIP: Click in the graphical ESM view and use the “+” or “-” sign to zoom in or zoom out, or use the mouse wheel to zoom in and zoom out.

In the graphical view, the lines connecting the components are color-coded to indicate data flow.

Green Line: Indicates that data is flowing between the components.

Grey Line: Indicates that the connection is not live and there is no data flow.

Blue dashed Line: Indicates the logical relation of Event Source Servers to their associated Collector Managers and event sources.

To improve the manageability and performance of the graphical display, Sentinel automatically collapses any node with 20 or more immediate children. This is especially useful for Connectors such as Syslog or Novell Audit that have the ability to automatically configure a large number of event sources.

In collapsed state, a node displays the number of immediate children next to the node, such as WMI Connector (3) [Collector name (Number of immediate children)]. The Children panel of a collapsed node shows the immediate children of that node, each of which can be managed in the same way as nodes in the tabular ESM view.

NOTE: Event Source Server node do not have the plus or minus sign after their names even if they contain children.

Double-clicking a parent node changes the state from collapsed to expanded and vice versa. Double-clicking a node with no children displays the status details for that node. If an additional node is added to an expanded parent with more than 20 children, the node is collapsed automatically. If an additional node is added to a manually expanded parent with over 20 children the node is not collapsed automatically.

The parent node can take several minutes to expand if it has a large enough number of child nodes to potentially cause the UI to become unresponsive. An alert message appears to warn you about the delay in response.

If you choose not to show this message again, the preferences are saved on the machine, and any user logging into Sentinel from that machine does not see an alert again.

Table ESM View

The components visible in the graphical view of ESM can also be viewed in a table. You can view the status of a Collector in the table and access the configuration settings of Collectors and Collector related objects.

Figure 1-2 Event Source Management Table View

Name	Configured Status	Actual Status
Sentinel	On	On
Sentinel Server	On	On
Syslog Server TCP	On	On
Syslog Server UDP	On	On
Generic Event	On	On
Audit Server	On	On
Novell Access Manager	On	On
Cisco Firewall 6.1r2	On	On
Syslog Connector	On	On

The columns in the ESM table view are:

Configured Status: The On state the object is configured to be in. This is the state that is stored in the database, which does not necessarily match the actual On state of the object. For example, the two states do not match if a parent object is turned off or if there is an error.

Actual Status: The On state of the object as reported by the actual running Collector Manager.

Connection Info (populated for Event Sources only): A text description of the event source connection.

Error: A text description of an error that occurred in the running object.

TIP: Use the *Table* and *Graph* tabs to change to tabular and graphical views.

How the Components Are Displayed

ESM displays the information on the Collectors and other components in a hierarchy specific to ESM.

Table 1-1 Components of the ESM Hierarchy

	Sentinel	<p>The single Sentinel icon represents the main Sentinel Server that manages all events collected by the Sentinel system.</p> <p>The Sentinel object is installed automatically through the Sentinel installer.</p>
	Collector Manager or the Sentinel Server	<p>The Collector Manager display name in the ESM is Sentinel Server.</p> <p>Each icon represents another instance of a Collector Manager process. Multiple Collector Manager processes can be installed throughout the enterprise. As each Collector Manager process connects to Sentinel, the objects are automatically created in ESM.</p>
	Collector	<p>Collectors instantiate the parsing logic for data from a particular event source. Each Collector icon in ESM refers to a deployed Collector script as well as the runtime configuration of a set of parameters for that Collector.</p>
	Connector	<p>Connectors are used to provide the protocol-level communication with an event source, using industry standards like Syslog, JDBC, and so forth. Each instance of a Connector icon in ESM represents the Connector code as well as the runtime configuration of that code.</p>
	Event Source Server	<p>An Event Source Server (ESS) is considered part of a Connector, and is used when the data connection with an event source is inbound rather than outbound. The ESS represents the daemon or server that listens for these inbound connections. The ESS caches the received data, and one or more Connectors connect to the ESS to retrieve a set of data for processing. The Connector requests only the data from its configured event source (defined in the metadata for the event source) that matches additional filters.</p>
	Event Source	<p>The event source represents the actual source of data for Sentinel. Unlike other components, this is not a plug-in, but is a container for metadata, including runtime configuration about the event source. In some cases a single event source can represent many real sources of event data, such as if multiple devices are writing to a single file.</p>

Component Status Indicators

Indicators are used to represent various states as follows:

Table 1-2 *Component Status Indicators*

	Stopped	Indicates that the component is stopped.
	Running	Indicates that the component is running.
	Warning	Indicates that a warning is associated with the component. At this time, this warning indicator is primarily used to show when the configured state and actual state of a component differ. (That is, a component is configured to be running, but the actual state of the component is stopped.)
	Error	Indicates that an error is associated with the component. See the individual component's status display for details about the error.
	Reporter Time is Skewed	Indicates when the time of a component differs from the main server's time. (The difference is greater than a predefined time threshold.)
	Debug	Indicates that the component is in Debug mode. Only a Collector can be in Debug mode.
	Unknown	Indicates that the status of the object in the ESM panel is not yet known.

Right-Click Menus

The Health Monitor Display View provides a set of right-click menus that helps you execute a set of actions, as described below:

The right-click actions available depend on the object you click.

Status Details: View all information known about the status of the selected object.

Start: Run an object.

The selected object starts only after the parent nodes starts and is running.

Stop: Stops the running object.

Edit: Modifies the editable information (Filter information, Object name and so on).

Debug: Debugs the Collector. You must stop the running Collector before you debug it.

Move: Moves the selected object from its current parent object to another parent object. You can move objects from a Live View to the scratch pad and vice versa.

Clone: Creates a new object that has its configuration information prepopulated with the settings of the currently selected object. This allows you to quickly create a large number of similar event sources without retyping the same information over and over again. You can clone objects from Live View to the scratch pad and vice versa. Cloning an object copies all the settings except the Run status. New objects created using the Clone command are always in the Stopped state after creation.

Remove: Deletes a selected object from the system.

Contract: Collapses the child nodes into this node. This option is only available on parent nodes that are currently expanded.

Expand: Expands the child nodes of this node. This option is only available on parent nodes that are currently collapsed.

Add Collector: Opens an Add Collector Wizard that guides you through the process of adding a Collector to the selected Collector Manager.

Add Connector: Opens an Add Connector Wizard that guides you through the process of adding a Connector to the selected Collector.

Add Event Source: Opens an Add Event Source Wizard that guides you through the process of adding an event source to the selected Connector.

Open Raw Data Tap: Lets you view the live stream of raw data from an event source or flowing through the selected object.

Open Active View: Opens an Active View window that displays only events that have been generated by data from or flowing through the selected object.

Zoom: In the graphical view, zoom in on the selected object.

Show in Tabular/Graphical View: Lets you switch between the graphical view and the tabular view and automatically selects the object that is selected in the current view. When switching to the graphical view, it also zooms in on the selected object.

Raw Data Filter: Filters the raw data flowing through the selected node. The raw data filter is available on Collectors, Connectors, and event sources. If a filter specifies to drop data, the data to be dropped is not passed to the parent node and is not converted into events.

Import Configuration: Imports the configuration of ESM objects.

Export Configuration: Exports the configuration of ESM objects

Add Event Source Server: Adds an Event Source Server to the selected Collector Manager

Add Collector Manager: In Scratch pad mode, you can add a Collector Manager to the scratch pad by using this option. In the Live view, Collector Manager objects are created automatically as each Collector Manager connects to the Sentinel system.

When you select multiple objects in the ESM panel and right-click, the following options are available:

Start: Starts all objects

Stop: Stops all objects

Remove selected objects: Removes the selected objects along with their children.

1.3.3 Searching for Event Sources

You can use the Attribute Filter panel to search for event sources.

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, "Accessing Event Source Management," on page 21.](#)

- 2 In the Attribute Filter panel, use the following information to display objects you want:

Search: Specify the name of the objects you want displayed.

Limit to: Select the types of objects to display.

Status: Select the status of the objects to display.

As you define each filter, the display is automatically updated.

1.3.4 Installing Plug-Ins

Although some Sentinel components are preinstalled with the Sentinel system, you should also check the [Sentinel Plug-ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html) to download the latest versions on the plug-ins.

- ♦ “Installing a Connector Plug-In” on page 27
- ♦ “Installing a Collector Plug-In” on page 27

Installing a Connector Plug-In

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21.](#)

- 2 In the toolbar, click *Tools > Import plug-in*.
- 3 Select *Import Collector Script or Connector plug-in package file (.zip, .clz, .cnz)*.
- 4 Click *Next*.
- 5 Click *Browse*.
- 6 Browse to and select the Connector plug-in package file, then click *Open*.
- 7 Click *Next*.
- 8 (Conditional) If the Connector already exists in the plug-in repository, select to replace the existing plug-in with the new plug-in by clicking *Next*.
- 9 (Conditional) In the plug-in details window, select *Deployed Plug-ins* to deploy the plug-in from this window.

For more information, see [“Access Event Source Management.” on page 31.](#)

- 10 Click *Finish*.

When you add a plug-in to Sentinel, it is placed in the plug-in repository, which enables Sentinel components on other machines to start using the plug-in without adding the plug-in separately.

Installing a Collector Plug-In

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21.](#)

- 2 In the toolbar, click *Tools > Import plug-in*.
- 3 Select *Import Collector Script or Connector plug-in package file (.zip, .clz, .cnz)*.
or
Select *Import Collector Script from directory*.

- 4 Click *Next*.
- 5 Click *Browse*.
- 6 Browse to and select the Collector script from a file or directory, then click *Open*.

- 7 Click *Next* to display the plug-in details window.
- 8 Select *Deploy Plug-in* to deploy the plug-in from this window.
For more information on the deployment procedure, see [“Access Event Source Management.” on page 31.](#)
- 9 Click *Finish*.

1.3.5 Updating a Connector or a Collector Plug-In

If a new version of a Connector or Collector is released, you can update the Sentinel system and any deployed instances of the Connector or Collector.

- 1 Access Event Source Management.
For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21.](#)
- 2 In the toolbar, click *Tools > Import plug-in*.
- 3 Select *Import Collector Script or Connector plug-in package file (.zip, .clz, .cnz).*
or
Select *Import Collector Script from directory*.
- 4 Click *Next*.
- 5 Click *Browse*.
- 6 Browse to and select the Connector or Collector plug-in package file, then click *Open*.
- 7 Click *Next*.
- 8 Click *Next* to update an already-imported Connector or Collector.
- 9 In the plug-in details window, select *Update Deployed Plug-ins* to update any currently deployed plug-ins that use this Connector or Collector.
- 10 Click *Finish*.

When you add a plug-in to Sentinel, it is placed in the plug-in repository, which enables Sentinel components on other machines to start using the plug-in without adding the plug-in separately.

1.3.6 Adding Components to Sentinel

After the plug-ins are installed in the Event Source Management, you must add the different components to your Sentinel solution.

- ♦ [“Adding a Collector” on page 28](#)
- ♦ [“Adding a Connector” on page 29](#)
- ♦ [“Adding an Event Source” on page 29](#)
- ♦ [“Adding an Event Source Server” on page 29](#)

Adding a Collector

- 1 Access Event Source Management.
For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21.](#)
- 2 In the main ESM display, locate the Collector Manager where the Collector will be associated.
- 3 Right-click the Collector Manager, then select *Add Collector*.

- 4 Follow the prompts in the Add Collector Wizard.

These prompts are unique for each Collector. For details, see the specific Collector documentation at the [Sentinel Plug-ins Web page \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).

- 5 Click *Finish*.

The Collector Script enables the ESM panel to prompt you for parameter values as well as enable Event Source Management to automatically select supported connection methods that work well with the Collector script.

Adding a Connector

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).

- 2 In the main ESM display, locate the Collector where the new Connector will be associated

- 3 Right-click the Collector, then select *Add Connector*.

- 4 Follow the prompts in the Add Connector Wizard.

These prompts are unique for each Connector. For details, see the specific Connector documentation at the [Sentinel Plug-ins Web page \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).

- 5 Click *Finish*.

Adding an Event Source

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).

- 2 In the main ESM display, locate the Connector where the new event source will be associated.

- 3 Right-click the Connector, then select *Add Event Source*.

These prompts are unique for each event source that is associated with the Connector. For details, see the specific Connector documentation at the [Sentinel Plug-ins Web page \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).

- 4 Follow the prompts in the Add Event Source Wizard.

- 5 Click *Finish*.

Adding an Event Source Server

Certain event source Connectors (such as the Syslog Connector) require a process to collect data from the actual data source. These processes are called Event Source Servers. They collect data from the data source and then serve it to the event source Connector. Event Source Servers must be added and associated to any event source Connectors that require a server.

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).

- 2 Right-click the Collector Manager, then select *Add Event Source Server*.

- 3 Select a Connector that supports your device, then click *Next*.

If you do not have any connectors in the list that supports your device, click *Install More Connectors*. For more information on installing a Connector plug-in, see “[Installing a Collector Plug-In](#)” on page 27.

- 4 Configure the various parameters for the server that is associated with the selected Connector. For example, Syslog Connector, NAudit Connector, and so on.

These parameters are unique for each Connector. For details, see the specific Connector documentation at the [Sentinel Plug-ins Web page](http://support.novell.com/products/sentinel/secure/sentinelplugins.html) (<http://support.novell.com/products/sentinel/secure/sentinelplugins.html>).

- 5 Click *Next*.
- 6 Specify a name for the Event Source Server.
- 7 (Optional) If you want this server to run, select *Run*.
- 8 Click *Finish*.

In the Health Monitor Display frame, the Event Source Server is displayed with a dashed line showing which the Collector Manager it is associated with.

This Add Event Source Server Wizard can also be initiated from within the Add Connector Wizard if a compatible Event Source Server has not yet been added.

1.3.7 Connecting to Event Sources

There are many different ways to add an event source. The following procedures walk you through the process.

- ♦ “[Prerequisites](#)” on page 30
- ♦ “[Connecting to the Event Source](#)” on page 31
- ♦ “[Creating a New Collector and Connector](#)” on page 32
- ♦ “[Using an Existing Collector](#)” on page 33
- ♦ “[Using an Existing Connector](#)” on page 33

Prerequisites

Make sure you have the following prerequisites:

Collector Script: Collector scripts can be downloaded from the [Sentinel Plug-ins Web site](http://support.novell.com/products/sentinel/secure/sentinelplugins.html) (<http://support.novell.com/products/sentinel/secure/sentinelplugins.html>) or built with the Collector Builder.

Connector: Connectors can be downloaded from the [Sentinel Plug-ins Web site](http://support.novell.com/products/sentinel/secure/sentinelplugins.html) (<http://support.novell.com/products/sentinel/secure/sentinelplugins.html>). There are also some Connectors included in the installed Sentinel system, but there might be more recent versions on the Web site.

Documentation: Check the documentation for each Connector and Collector, because they have different configuration steps for the event source. The documentation is located on the [Sentinel Plug-ins Web site](http://support.novell.com/products/sentinel/secure/sentinelplugins.html) (<http://support.novell.com/products/sentinel/secure/sentinelplugins.html>). Make sure you download the documentation when you download the Connector and Collector.

Event Source Configuration: You must have configuration information for the event source.

Connecting to the Event Source

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).

- 2 In the toolbar, click *Tools > Connect to Event Source*.

The event source types for the compatible Collector parsing scripts are listed here.

- 3 Select the desired Event Source.

You can click *Add More* to import an event source not listed.

- 4 After the event source is selected, click *Next*.

- 5 Select a Collector script from the list.

You can click *Install More Scripts* to install additional Collector scripts that support your Event Source.

For more information on installing a Collector script, see [“Installing a Collector Plug-In” on page 27](#).

- 6 Click *Next*.

- 7 Select a connection method from the list.

There are many different types of Connectors. Depending on the type of Connector you select, there are additional configuration screens.

You can click *Install More Connectors* to install additional Connectors.

For more information, see [“Installing a Connector Plug-In” on page 27](#) to install connectors.

- 8 Click *Next*.

- 9 Use the following information to select how to manage the event source connection, then proceed to [Step 10](#).

- ◆ [“Creating a New Collector and Connector” on page 32](#)
- ◆ [“Using an Existing Collector” on page 33](#)
- ◆ [“Using an Existing Connector” on page 33](#)

Based on the existing Collectors and Connectors in your system that are compatible with your new event source, one or more of these options might be unavailable.

- 10 Use the following information to configure the event source:

Name: Specify a unique name for the event source.

Run: Select *Run* if you want the event source to run automatically.

Details: Allows you to see the details of the plug-in.

Alert if no data received in specified time period: Select this option to receive notifications if no data is received during the specified time period.

Limit Data Rate: Use this option to limit the maximum number of records the Connector receives per second.

Trust Event Source Time: (Optional) Select this option to set the event time to the time the event occurred, rather than the time Sentinel received the data.

You can also set this option while configuring an event source. If the *Trust Event Source Time* option is selected, all data flowing through the Collector has the event time set to the time the event occurred, even if the event sources do not have this option selected.

Set Filters: Allows you to set filters on the data in the event source.

- 11 Click *Next*.
- 12 Click *Test Connection* to test the event source.
 - 12a Click the *Data* tab to view the data in the event source.

It takes a few seconds for the raw data to be displayed in the *Data* tab.
 - 12b Specify the maximum number of rows to control the number of raw data records obtained at one time.
 - 12c Click the *Error* tab to view if there are any errors in the configuration of the event source.
 - 12d Click *Stop* to stop the test.
- 13 Click *Finish*.

The Collector parsing script is executed on the same system as the Collector Manager that you select here.

Creating a New Collector and Connector

Use the following information to create a new Collector and Connector to manage the event source connection. This procedure is a continuation of [Step 9 on page 31](#).

- 1 Select *Create a new Collector and Connector*, then click *Next*.
- 2 Select the Collector Manager you want to use, then click *Next*.
- 3 Change any of the Collector properties, then click *Next*.
- 4 Use the following information to configure the Collector:
 - Name:** Specify a unique name for the Collector.
 - Run:** Select *Run* if you want to run the Collector automatically.
 - Details:** Allows you to view the details of the plug-in.
 - Alert if no data received in specified time period:** Select this option to receive notifications if no data is received during the specified time period.
 - Lime Data Rate:** Use this option to limit the maximum number of records the Collector receives per second.
 - Trust Event Source Time:** (Optional) Select this option to set the event time to the time the event occurred, rather than the time Sentinel received the data.

You can also set this option while configuring an event source. If the *Trust Event Source Time* option is selected, all data flowing through the Collector has the event time set to the time the event occurred, even if the event sources do not have this option selected.
 - Set Filters:** Allows you to set filters on the data in the Collector.
- 5 Click *Next*.

There is a different configuration page displayed depending on the type of Connector you selected in [Step 7 on page 31](#). For the Connector-specific documentation, see the [Sentinel Plugins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).
- 6 Use the following information to configure the Connector:
 - Name:** Specify a unique name for the Connector.
 - Run:** Select *Run* if you want to run the Connector automatically.
 - Details:** Allows you to view the details of the plug-in.

Alert if no data received in specified time period: Select this option to receive notifications if no data is received during the specified time period.

Limit Data Rate: You can limit the maximum number of records the Connector receives per second.

Set Filters: Allows you to set filters on the data in the Connector.

Copy Raw Data to a file: Select this option, then specify a location where you want to copy the raw data coming from the event source.

- 7 Click *Next*, then continue with [Step 10 on page 31](#).

Using an Existing Collector

If you are using an existing Collector, but want to create a new Connector to manage the Event Source connection, use the following information to complete the procedure from [Step 9 on page 31](#).

- 1 Select *Use an Existing Collector*, then click *Next*.
- 2 Select the Collector you want to use, then click *Next*.

There is a different configuration page displayed depending on the type of Connector you selected in [Step 7 on page 31](#). For the Connector-specific documentation, see the [Sentinel Plugins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).

- 3 Use the following information to configure the Connector:

Name: Specify a unique name for the Connector.

Run: Select *Run* if you want to run the Connector automatically.

Details: Allows you to view the details of the plug-in.

Alert if no data received in specified time period: Select this option to receive notifications if no data is received during the specified time period.

Limit Data Rate: Use this option to limit the maximum number of records the Connector receives per second.

Set Filters: Allows you to set filters on the data in the Connector.

Copy Raw Data to a file: Select this option, then specify a location where you to want copy the raw data coming from the event source.

- 4 Click *Next*, the continue with [Step 10 on page 31](#).

Using an Existing Connector

If you are using an existing Connector, but want to create a new Collector to manage the event source connection, use the following information to continue the procedure from [Step 9 on page 31](#).

- 1 Select *Use an Existing Connector*, then click *Next*.
- 2 Select the Collector Manager you want to use, then click *Next*.
- 3 Change any of the Collector properties, then click *Next*.
- 4 Use the following information to configure the Collector:

Name: Specify a unique name for the Collector.

Run: Select *Run* if you want to run the Collector automatically.

Details: Allows you to view the details of the plug-in.

Alert if no data received in specified time period: Select this option to receive notifications if no data is received during the specified time period.

Lime Data Rate: Use this option to limit the maximum number of records the Collector receives per second.

Trust Event Source Time: (Optional) Select this option to set the event time to the time the event occurred, rather than the time Sentinel received the data.

You can also set this option while configuring an event source. If the *Trust Event Source Time* option is selected, all data flowing through the Collector has the event time set to the time the event occurred, even if the event sources do not have this option selected.

Set Filters: Allows you to set filters on the data in the Collector.

- 5 Click *Next*, then continue with [Step 10 on page 31](#).

1.3.8 Exporting Configurations

Event Source Management allows you to export the configuration of Event Source Management objects along with the associated Collector scripts and the Connector plug-ins.

- 1 Access Event Source Management.
For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).
- 2 Click *File > Export Configuration*.
or
Right-click an object, then click *Export Configuration*.
- 3 Select which nodes you want to export, then click *Next*.
- 4 Select the Collector scripts to export, then click *Next*.
- 5 Select the Connector plug-ins to export, then click *Next*.
- 6 Click *Browse*, then browse to a location to save the export.
- 7 Specify a file name, then click *Save*.
The export information is saved as a .zip file.
- 8 Click *Next*.
- 9 Review the items to be exported, then click *Finish*.

1.3.9 Importing Configurations

Event Source Management allows you to import the configuration files that you export. The configuration files contain configuration information for Event Source Management objects along with the associated Collector scripts and Connector plug-ins.

- 1 Access Event Source Management.
For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).
- 2 Click *File > Import Configuration*.
- 3 Click *Browse* and browse to and select the configuration file, then click *Open*.
The configuration files are .zip files.
- 4 Click *Next*.
- 5 Select the nodes to import, then click *Next*.

- 6 Select the Collector scripts to import, then click *Next*.
- 7 Select the Connector plug-ins to import, then click *Next*.
- 8 Review the items to import, then click *Finish*.

1.3.10 Debugging

Sentinel's Collectors are designed to be easily customizable and to be created by customers and partners. The debugging interface analyzes the Collector code running in place on the Collector Manager.

For more information on customizing or creating new Collectors, obtain the Developer's Kit for Sentinel at the [Sentinel SDK Web site \(http://www.novell.com/developer/develop_to_sentinel.html\)](http://www.novell.com/developer/develop_to_sentinel.html).

- ♦ “Collector Workspace and Collector Directory” on page 35
- ♦ “Debugging JavaScript Collectors” on page 35
- ♦ “Generating a Flat File using the Raw Data Tap” on page 38

Collector Workspace and Collector Directory

Collectors are simple text scripts that are run by a Collector Manager. The handling of these scripts is a bit complex:

1. The code for all Collectors is stored in a plug-in repository on the central Sentinel server when the Collectors are imported.

Location: `sentinel/data/plugin_repository` on the Sentinel server.

2. The runtime configuration for the Collector (when it is configured to run on a particular Collector Manager) is stored separately in the Sentinel database.
3. When a Collector is actually started in the Collector Manager, the Collector plug-in is deployed to the Collector Manager, the runtime configuration is applied, and the code is started. Any pre-existing instance of the Collector code on that Collector Manager is overwritten.

Location: `sentinel/data/collector_mgr.cache/collector_instances` on each Collector Manager.

4. In order to edit a Collector, you need to use the ESM Debugger *Download* button, which copies the Collector to the local Collector workspace on the client machine (the machine where you are running SCC). Edits are made against that local copy and then uploaded back into the central plug-in repository.

Location: `sentinel/data/collector_workspace` on the client application machine.

Debugging JavaScript Collectors

The debugger for JavaScript Collectors can be used to debug any JavaScript Collector.

- 1 Access Event Source Management.

For more information, see [Section 1.3.1, “Accessing Event Source Management,” on page 21](#).

- 2 Select a Collector to debug in the Live View.

- 3 Select the debug mode:

Live Mode: Requires that the Collector Manager is currently running. For more information, see [“Live Mode” on page 36](#).

Stand-alone Mode: Allows you to run the Collector in debug mode without a Collector Manager running. For more information, see [“Stand-alone Mode” on page 37](#).

- 4 Right-click the Collector and select *Stop*, then click *Debug*.

The following describe how to use the JavaScript debug window:

Debug: Launches the JavaScript file in this window.

Upload/Download: Upload or download a JavaScript file here. You can download an existing JavaScript file, edit it, and upload it again to continue debugging.

Context: Displays the variable that the debugger is pointing to and its value.

Expression: Watch the values of a selected parameter here.

You can use the following options when debugging a Collector:

Run	Starts debugging.
Pause	Pauses debugging.
Step Into	Steps to the next line in the script.
Step Over	Steps over a function.
Step Out	Steps out of a function.
Stop	Stops debugging.

- ♦ [“Hot Keys” on page 36](#)
- ♦ [“Live Mode” on page 36](#)
- ♦ [“Stand-alone Mode” on page 37](#)

Hot Keys

When the source code window has the focus in the debugger, you can use the following hot keys:

- ♦ Ctrl+F to find a string in the source code
- ♦ Ctrl+G to go to a line number
- ♦ Ctrl+M to find the parenthesis or brace that matches the selected parenthesis or brace

You can also open a script file, set break-point, step through the script code, and watch variables and methods values at each step.

Live Mode

- ♦ Live debug mode requires that the Collector Manager associated with the Collector is running.
- ♦ In Live debug mode, Input to the script comes from actual event sources connected to the Collector. To get data from a specific event source, you must right-click and start the desired event source via the Event Source Management display. Starting or stopping event sources can be done any time during the debug session.

If no event source is started during the debug session, no data is available in the buffer for the Collector and you see the Collector script’s `readData` method blocking.

- ♦ In Live debug mode, output from the script is via live Sentinel Events. The Events can be viewed on the Active Views display.

When you are in Live debug mode, the script engine is executed on the local computer rather than the actual computer that the associated Collector Manager is running on. The Connectors and event sources still runs on the same box as the Collector Manager. When you are running debug mode, data is automatically routed from the event sources to the script engine running in debug on the local box.

Stand-alone Mode

- ♦ Stand-alone debug mode allows you to debug a Collector even if the associated Collector Manager is not running.
- ♦ For stand-alone mode, input to the script comes from an input file rather than a live event source. Specify the path to a raw data file that is used as input. For Collectors that use a DB Connector, the input file is a text file with log data in nvp format and for a Collector that uses the File Connector, the input file is a text file with log data in CSV format.
- ♦ For stand-alone mode, Output from the script is to an output file rather than to live events. You must specify the path to the output file that the script uses for output. If you specify an output file that does not exist, the system creates the file for you.

To debug in Stand-alone mode:

- 1 In Event Source Management, right-click the Collector to debug.
- 2 Select *Stop*.
- 3 Select *Debug*.
- 4 Select *Stand-alone Mode*, then specify a path for the input and output files.
If you specify an output file that does not exist, the system creates the file for you.
- 5 Click *OK* to display the Debug Collector window.
- 6 In the Debug Collector window, click *Run*.
In the Source text area, the source code of the Collector appears and stops at the first line of the text script.
- 7 Click the left side bar to toggle a breakpoint in the script code.
- 8 Click *Step Into* to go to the next breakpoint.
- 9 Click *Pause* to pause debugging whenever you want.
- 10 After debugging is complete, click *Stop* to stop debugging.
- 11 Click the *Upload/Download* tab in the debugger window.
- 12 Click *Download*, then specify a location to download the script file.
- 13 Open the file with any JavaScript editor, then make your edits.
- 14 Save the file, then click *Upload*.
- 15 Debug the uploaded script to have a Collector Script ready to use.

Generating a Flat File using the Raw Data Tap

Occasionally when debugging, it might be helpful to view Connector output data. In addition to the *Raw Data Tap* right-click option for nodes in the Sentinel Control Center, Sentinel also includes an option to save the raw data from a Connector to a file for further analysis.

To save raw data from a deployed Connector to a file:

- 1 Access Event Source Management.
For more information, see [Section 1.3.1, “Accessing Event Source Management,”](#) on page 21.
- 2 Right-click the Connector node, then click *Edit*.
- 3 Click the *Configure Connector* tab.
- 4 Select the *Copy Raw Data* to a file.
- 5 Specify (or browse to and select) a path on the Collector Manager machine where the raw data is saved.

IMPORTANT: The account running the Sentinel service on the Collector Manager machine must have permissions to write to the file location.

1.3.11 Troubleshooting

If the help does not launch, there is a cache file on the local machine that is running the Event Source Management that must be deleted.

- 1 Exit Event Source Management and the Sentinel Control Center.
- 2 On the local machine running Event Source Management, search for the `.novell` directory.
- 3 Delete the `sentinel` subdirectory in the `.novell` directory.
- 4 Launch Event Source Management, then click *Help*.

For more information, see [Section 1.3.1, “Accessing Event Source Management,”](#) on page 21.

1.4 Solution Designer

You can use the Solution Designer to package and export different contents, such as a Correlation rule with associated actions and dynamic lists. The content can be selected and packaged with its configuration in a ZIP file. You can then view or select the content of the ZIP file by using the Solution Manager. For more information on the Solution Manager, see [Chapter 17, “Using Solution Packs,”](#) on page 199.

To use the Solution Designer, you must have the correct permission. All roles contain the permission for the Solution Designer except for the PCI Compliance Audit role and the Search Proxy User role. For more information, see [Chapter 2, “Configuring Users and Roles,”](#) on page 55.

- ♦ [Section 1.4.1, “Accessing the Solution Designer,”](#) on page 39
- ♦ [Section 1.4.2, “Solution Designer Interface,”](#) on page 39
- ♦ [Section 1.4.3, “Creating a Solution Pack,”](#) on page 39
- ♦ [Section 1.4.4, “Adding Content to a Solution Pack,”](#) on page 40
- ♦ [Section 1.4.5, “Documenting a Solution Pack,”](#) on page 42

- [Section 1.4.6, “Editing a Solution Pack,”](#) on page 43
- [Section 1.4.7, “Synchronizing Content,”](#) on page 44
- [Section 1.4.8, “Managing a Solution Pack,”](#) on page 44

1.4.1 Accessing the Solution Designer

- 1 Log in to the Sentinel Web interface as a user with permissions to access the Solution Designer.
- 2 In the toolbar, click *Applications*.
- 3 Click *Launch Designer*.
- 4 Click *Yes* to accept the security certificate.
- 5 Specify a username and password of a user with permission to access the Solution Designer.
- 6 Click *Login*.
- 7 Click *Accept* or *Accept Permanently* to accept the security certificate.

1.4.2 Solution Designer Interface

The Solution Designer is divided into several frames. Each frame has its own function and multiple sub-functions in that specific frame.

Content Palette: Displays the content of the Solution Pack. The Content Palette contains multiple sections that can be expanded.

The sections that can be expanded are Correlation, Event Enrichment, iTRAC, and Jasper Reports. These are items on the Sentinel server that can be exported into a Solution Pack.

Content Description: Displays a description of the content selected in the Solution Pack panel.

Solution Pack: Displays all of the items contained in a Solution Pack.

Documentation: Displays the documentation specific for the Solution Pack. The documentation explains how to install, configure, and deploy the components of the Solution Pack.

1.4.3 Creating a Solution Pack

You can use the Solution Designer to create a Solution Pack with existing content objects (for example, Correlation Rules, Dynamic Lists, or iTRAC workflow templates) from Sentinel. The Solution Designer analyzes the dependencies for a content object and include all necessary components in the Solution Pack. For example, a Correlation Rule deployment includes a Correlation Rule definition, one or more actions, and the ability to create an incident using a workflow. The Solution Designer includes the Correlation Rule, the associated correlation actions, the iTRAC template, and the roles associated with the iTRAC template in the Solution Pack.

IMPORTANT: To add a content object to a Solution Pack, it must already exist in Sentinel. Content objects cannot be created in the Solution Designer.

To create a new Solution Pack:

- 1 Access the Solution Designer.
For more information, see [Section 1.4.1, “Accessing the Solution Designer,”](#) on page 39.
- 2 Click *File > New*.

An empty Solution Pack is displayed in the Solution Pack panel.

- 3 Add Categories, Controls, Content Groups, and content placeholders.

For detailed instructions, see [Section 1.4.4, “Adding Content to a Solution Pack,” on page 40](#).

- 4 Add file attachments to the hierarchy nodes as desired.

For detailed instructions, see [“File Attachments” on page 41](#).

- 5 Click *File > Save*.

- 6 Browse to and select a location to save the Solution Pack, then specify a name for the Solution Pack.

- 7 Click *Save* to save the Solution Pack.

The Solution Pack is saved in a `.zip` format.

Although you can save a Solution Pack with empty placeholders, you cannot install controls in the Solution Manager unless all placeholders have been filled with content.

1.4.4 Adding Content to a Solution Pack

A vital part of creating a Solution Pack is adding content to the controls. Each control can have one or more types of content associated with it.

- ♦ [“Sentinel Content” on page 40](#)
- ♦ [“Using Placeholders” on page 41](#)
- ♦ [“File Attachments” on page 41](#)

Sentinel Content

The same general procedure is used to add all types of Sentinel content to a Solution Pack. The Sentinel content options include the following:

- ♦ Correlation Rule deployments, including their deployment status (enabled or disabled) and associated Correlation rules, Correlation Actions, and Dynamic Lists
- ♦ Reports
- ♦ iTRAC workflows, including associated roles
- ♦ Event enrichment, including map definitions and event metatag configuration
- ♦ Other associated files added when the Solution Pack is created, such as documentation, example report PDFs, or sample map files.

NOTE: Because dynamic list elements and map data are often highly dependent on the system environment, this data is not included as part of the dynamic list or map definition in the Solution Pack. However, this data can be attached to the Solution Pack as a `.csv` file.

To add Sentinel content to a control:

- 1 Access the Solutions Designer.

For more information, see [Section 1.1.1, “Accessing the Sentinel Web Interface,” on page 11](#).

- 2 Open or create a Solution Pack.

- 3 Click the appropriate panel to display the available content:

- ♦ Correlation

- ◆ Event Enrichment
 - ◆ iTRAC
 - ◆ Jasper Reports
- 4 Drag the item and drop it into the control.

If you try to drag and drop pre-existing content in the Solution Designer, the existing content is highlighted. After you drop the content, a message prompt indicates that similar content exists.

Using Placeholders

If the user is not ready to associate content with a control, an empty placeholder can be used instead.

- 1 Click the *Correlation*, *Event Enrichment*, *iTRAC*, or *Jasper Report* button in the Content Palette to open the panel for the type of placeholder you want to add.
- 2 Drag and drop the placeholder to the appropriate control in the Solution Pack panel.
- 3 Rename the placeholder, if desired.

To replace a placeholder with content:

- 1 Click the *Correlation*, *Event Enrichment*, *iTRAC*, or *Jasper Report* button in the Content Palette to open the panel for the type of placeholder you want to add.
- 2 Drag and drop the appropriate Content Group from the Content Palette to the placeholder in the Solution Pack panel or select the appropriate Content Group, then click *Add Selected Content*.

You can set properties for placeholders to indicate whether a placeholder is designed for specific Sentinel platforms. Placeholders that are designed in newer versions of Sentinel might not be supported in older versions because of changes in the Sentinel schema. If you try to install a placeholder on an unsupported Sentinel platform, the install does not proceed and shows an “Out of date” error.

To set the properties:

- 1 Right-click the placeholder, then select *Properties*.
- 2 Select *Minimum Required Versions*, then specify the Sentinel versions.
- 3 Click *Apply*.

File Attachments

You can attach a file or files to any node in the hierarchy. The content in the attachment is included in the Solution Pack. These files can include anything useful for a user who must deploy the Solution Pack, such as a PDF view of a report, sample map data for event enrichment, or a script for an Execute Command Correlation Action. These files can be added, deleted, viewed, renamed, or saved to the local machine.

- ◆ [“Adding an Attachment” on page 42](#)
- ◆ [“Viewing an Attachment” on page 42](#)
- ◆ [“Editing an Attachment” on page 42](#)
- ◆ [“Saving an Attachment” on page 42](#)
- ◆ [“Deleting an Attachment” on page 42](#)

Adding an Attachment

You can add an attachment to a node. The system prompts you for another file if you attempt to add one that is already attached.

- 1 Select a node, then click the *Add a new attachment*  icon in the Attachment panel.
- 2 Browse to and select the file you want to attach.
- 3 Specify a description of the file, then click *Save*.

Viewing an Attachment

- 1 Select a node, then select the attachment in the Attachment panel.
- 2 Click the *View selected attachment* icon  .
The file displays in the associated application through the Attachment Viewer.

Editing an Attachment

- 1 Select a node, then select the attachment in the Attachment panel.
- 2 Click the *Edit Attachment* icons.
- 3 Make the desired changes to the attachment, then click *OK*.

Saving an Attachment

You can save a copy of the attachment to the local system.

- 1 Select a node, then select the attachment in the Attachment panel.
- 2 Click the *Save selected attachment file as* icon  to save the attachment to the local file system.
- 3 Browse to and select the desired location for the attachment, then click *Save*.

Deleting an Attachment

- 1 Select a node, then select the attachment in the Attachment panel.
- 2 Click the *Remove selected attachment* icon  .
- 3 Click *Yes* to confirm that you want to delete the attachment.

1.4.5 Documenting a Solution Pack

The Solution Designer provides three different categories of documentation to help you create the documentation for the Solution Pack you are creating.

- ♦ [“Description” on page 42](#)
- ♦ [“Implementation Steps” on page 43](#)
- ♦ [“Testing Steps” on page 43](#)

Description

Allows you to provide a detailed description about the Solution Pack for your users.

Implementation Steps

Lets you add the steps required to implement the content in the target Sentinel system to the *Implementation* tab of the Documentation panel. The steps might include instructions for the following types of implementation actions:

- ♦ Populating a .csv file that is used by the mapping service for event enrichment.
- ♦ Scheduling automatic report execution
- ♦ Enabling auditing on source devices.
- ♦ Copying an attached script for an Execute Command Correlation Action to the appropriate location on the correlation engines.

After the content implementation, the content should be tested to verify that it is working as expected.

Testing Steps

Lets you add the steps required to test the content in the target Sentinel system to the *Testing* tab of the Documentation panel. The steps can include instructions for the following types of testing activities:

- ♦ Running a report and verifying that data is returned.
- ♦ Generating a failed login in a critical server and verifying that a correlated event is created and assigned to an iTRAC workflow.

1.4.6 Editing a Solution Pack

A saved Solution Pack can be edited with the Solution Designer. For information about deploying the changes into an existing system, see [Section 17.6, “Installing an Edited Solution Pack,” on page 212](#).

To edit a Solution Pack:

- 1 Access the Solution Designer.
For more information, see [Section 1.4.1, “Accessing the Solution Designer,” on page 39](#).
- 2 Click *File > Open*, then browse to and select the existing Solution Pack .zip file.
- 3 Click *Open*.
- 4 To update the Solution Pack with modified content from the source Sentinel system, drag and drop the content from the Content Palette to the appropriate control.
- 5 Add or delete controls as necessary.
- 6 Save the changes by selecting the options you want:
 - File > Save:** Saves the Solution Pack with the same name.
 - File > Save As:** Saves the Solution Pack with a different name.
 - File > Save As New:** Saves the Solution Pack with a different name and as a different Solution Pack.

If you selected Save or Save As and some of the content is out of sync, you are prompted to synchronize.

1.4.7 Synchronizing Content

If the content in the source system is modified, the content in the source system and the content in the original Solution Pack can be out of synchronization.

- ♦ You can drag and drop the content from the Content Palette onto the control.
- ♦ For simple content with no dependencies, the modified content is immediately updated. For example, a report has no dependencies.
- ♦ For content with dependencies, the dependencies are checked and updates are made when you click the *Synchronize All Content* icon or when you save the Solution Pack.

When an action uses the Send Email action, this action always appears as Out of Synchronization. This is expected and does not cause an error.

1.4.8 Managing a Solution Pack

All content in a Solution Pack is hierarchically organized into categories, controls, and content groups.

- ♦ [“Adding a Node to a Control” on page 44](#)
- ♦ [“Renaming a Control” on page 44](#)
- ♦ [“Deleting a Control” on page 45](#)
- ♦ [“Viewing or Editing the Properties of the Solution Pack” on page 45](#)
- ♦ [“Expanding or Collapsing Nodes” on page 45](#)
- ♦ [“Moving Nodes” on page 45](#)

Adding a Node to a Control

- 1 Select a node in the Solution Pack panel.
- 2 Right-click the node, then select *Create*
or
Click *Create* in the Solution Pack panel heading.

Renaming a Control

- 1 Select a control in the Solution Pack panel.
- 2 Right-click the node, then select *Rename*
or
Click *Rename* in the Solution Pack panel heading.
If *Rename* is not displayed, click the button in the panel heading, then select *Rename* from the list of options.
- 3 Specify the new name, then click *OK* to save the change.

Deleting a Control

- 1 Select a control in the Solution Pack panel.
- 2 Right-click the node, then select *Delete*.
or
Click the button in the Solution Pack panel heading, then select *Delete*.
- 3 Click *Yes* to confirm the deletion of the control.

Viewing or Editing the Properties of the Solution Pack

- 1 Select *File > Properties*.
or
Right-click the Solution Pack in the Solution Pack panel, then click *Properties*.
- 2 View the details, or change the information displayed.
Type: Specify the type of Solution Pack.
Author: Specify the author of the Solution Pack.
Version: Specify the version of the Solution Pack.
Supported OS Platforms: Specify the platforms where the Solution Pack is supported.
Supported Platforms And Versions: Select *All Platforms And Versions* or *Minimum Required Versions*.
If you select *Minimum Required Versions*, you must specify the following information:
 - ♦ **Sentinel:** Specify the minimum version of Sentinel that the Solution Pack supports.
 - ♦ **Sentinel RD:** Specify the minimum version of Sentinel Rapid Deployment (RD) that the Solution Pack supports.
 - ♦ **Sentinel Log Manager:** Specify the minimum version of Sentinel Log Manager that the Solution Pack supports.
- 3 Click *Apply* to save any changes you made.

Expanding or Collapsing Nodes

You can expand or collapse all nodes at one time, instead of doing it node by node.

- 1 In the Solution Pack panel, select the Solution Pack, category, control, or content group.
- 2 Right-click the selected item, then select *Expand All* or *Collapse All*.

Moving Nodes

Category, control, and content group nodes can be created in any order and then reordered or moved to a different parent in the hierarchy.

To move a node to another branch in the hierarchy, drag and drop a node to its new parent node. A control can be moved to a new category. A content group can be moved to a new control.

To reorder a node, drag and drop it on top of the node it should appear after in the Solution Pack.

1.5 Command Line Utilities

The command line utilities included with Sentinel are useful for managing and configuring many lower level functions of the system.

- ♦ [Section 1.5.1, “Managing the Sentinel Services,” on page 46](#)
- ♦ [Section 1.5.2, “Sentinel Scripts,” on page 47](#)
- ♦ [Section 1.5.3, “Running the Report Development Utility,” on page 48](#)
- ♦ [Section 1.5.4, “Getting the .jar Version Information,” on page 49](#)
- ♦ [Section 1.5.5, “Changing the Hostname of a Sentinel Server,” on page 49](#)
- ♦ [Section 1.5.6, “Importing or Exporting Event Association Data,” on page 49](#)
- ♦ [Section 1.5.7, “Managing the Internal Database,” on page 51](#)
- ♦ [Section 1.5.8, “Cleaning Up the Internal Database,” on page 52](#)
- ♦ [Section 1.5.9, “Managing the Sentinel Server,” on page 53](#)
- ♦ [Section 1.5.10, “Configuring Memory for the Sentinel Server,” on page 54](#)

1.5.1 Managing the Sentinel Services

There is a command line utility included with Sentinel is useful for managing and configuring many lower level functions of the system. The utility is located in `/usr/sbin/rcsentinel`.

The utility has the following options to manage the Sentinel services:

rcsentinel -start: Starts the Sentinel service.

rcsentinel -stop: Stops the Sentinel service.

rcsentinel -status: Displays the status of the Sentinel service.

rcsentinel -restart: Restarts the Sentinel service.

rcsentinel -try-restart: Restarts the Sentinel service if the Sentinel service is running.

rcsentinel -force-reload: Forces the Sentinel service to reload the Sentinel configuration.

rcsentinel -startdb: Starts the PostgreSQL database.

rcsentinel -stopdb: Stops the PostgreSQL database.

rcsentinel -version: Displays the version of the Sentinel service.

rcsentinel -p, --priority=<integer>: Specifies the process priority.

rcsentinel -h, --help: Displays all options for the rcsentinel utility.

rcsentinel -l, --log-flie=FILE: Sends log messages to a file.

rcsentinel -q, --quiet: Displays fewer messages.

rcsentinel -v, --verbose: Displays more messages.

rcsentinel -startSIdb: Starts the Security Intelligence database.

rcsentinel -stopSIdb: Stops the Security Intelligence database.

1.5.2 Sentinel Scripts

Sentinel provides operational scripts that are appropriate for use during normal operations. These scripts are located in the following directories:

- ♦ /opt/novell/sentinel/bin
- ♦ /opt/novell/sentinel/setup

For most scripts that require arguments, running the scripts without arguments provides details about how to use the arguments.

- ♦ [Table 1-3, “Operational Scripts in /opt/novell/sentinel/bin,” on page 47](#)
- ♦ [Table 1-4, “Operational Scripts in /opt/novell/sentinel/setup,” on page 48](#)

Table 1-3 *Operational Scripts in /opt/novell/sentinel/bin*

Script File	Description
backup_util.sh	Use this script to back up and restore Sentinel event data and configuration data. For more information, see Appendix A, “Backing Up and Restoring Data,” on page 213 .
db.sh	Allows you to manage the PostgreSQL database without Sentinel running. For more information, see Section 1.5.7, “Managing the Internal Database,” on page 51 .
clean_db.sh	Allows you to clean up data from the PostgreSQL database without Sentinel running. For more information, see Section 1.5.8, “Cleaning Up the Internal Database,” on page 52 .
softwarekey.sh	Use this script to add and view a license key through the command line. For more information, see “ License Information ” in the <i>NetIQ Sentinel 7.0.1 Installation and Configuration Guide</i> .
event_assoc_data.sh	Use this script to import or export the event association data. For more information, see Section 1.5.6, “Importing or Exporting Event Association Data,” on page 49 .
server.sh	Use this script to manually manage the Sentinel server with this script. For more information, see Section 1.5.9, “Managing the Sentinel Server,” on page 53 .
report_dev_setup.sh	Use this utility to set up the report development environment. For more information, see Section 1.5.3, “Running the Report Development Utility,” on page 48 .
updateServerLocale.sh	This utility provides an option to change the language of Sentinel server process. The Sentinel server messages that are displayed on the user interface appear in the language selected by this script. If the appliance language is changed through WebYast, you can use this script to change the language of the Sentinel process in the server.
versionreader.sh	Displays the version of the .jar files for Sentinel. For more information, see Section 1.5.4, “Getting the .jar Version Information,” on page 49 .

Table 1-4 Operational Scripts in `/opt/novell/sentinel/setup`

Script File	Description
<code>configure.sh</code>	This utility runs on a remote Correlation Engine or Collector Manager if you change the hostname of the Sentinel server. For more information, see Section 1.5.5, “Changing the Hostname of a Sentinel Server,” on page 49.
<code>ldap_auth_config.sh</code>	This utility helps you configure Sentinel to receive LDAP authentications. For more information, see Chapter 3, “Configuring LDAP Authentication,” on page 63.
<code>ssl_certs</code>	This utility helps with the certificate signing process to configure an SSL connection to the Sentinel server. For more information, see Section 4.3.7, “Using CA Signed Certificates,” on page 74.

1.5.3 Running the Report Development Utility

You can use the `/opt/novell/sentinel/bin/report_dev_setup.sh` utility to set up the report development environment. This utility does the following:

- ◆ Opens the PostgreSQL database port so that other systems can connect to the database.
- ◆ Updates the firewall to allow connection on the PostgreSQL database port.
- ◆ Modifies the database configuration files (`postgresql.conf` and `pg_hba`) so that other applications can connect to the database. The database configuration files are located at `/var/opt/novell/sentinel/3rdparty/postgresql/data`.
- ◆ Changes the `rptuser` password, if necessary, and saves it in an encoded format in the `obj-component.JasperReportingComponent.properties` file. This password can also be changed in the database.
- ◆ Collects the required Sentinel jar files, xml files, and the keystore file for report development and creates a tar file `sentineljarsforireport.tar` file in the `/opt/novell/sentinel/bin` directory.

To run this utility:

1 Log in as novell user.

2 Change to the following directory:

```
cd /opt/novell/sentinel/bin/
```

3 Run the following command:

```
./report_dev_setup.sh
```

A warning message is displayed, indicating that the Sentinel server will be restarted after the script is executed.

4 To continue running the script, press 1.

5 Specify the `root` password when prompted.

The script opens the database port, updates the firewall configuration files, and modifies the configuration files and database files.

6 When you are prompted to change the `rptuser` password, continue without changing the password.

or

Specify a password for `rptuser` and reconfirm the password.

The `rptuser` password is randomly generated during the installation of Sentinel. It is a recommended practice to change it here.

The Sentinel server restarts.

For information or help on commands, use the following command:

```
./report_dev_setup.sh -h
```

1.5.4 Getting the .jar Version Information

You can gather version information for Sentinel `.jar` files for troubleshooting purposes:

- 1 Log in to the Sentinel server as a user in the administrator role.
- 2 Go to the `/opt/novell/sentinel/bin` directory.
- 3 At the command line, specify the `./versionreader.sh <path/jar file name>`.

Running the script without any arguments gives the version of the installed Sentinel server. For more information on the arguments that can be used, use the `--help` command.

1.5.5 Changing the Hostname of a Sentinel Server

If the hostname of the Sentinel server changes, you must update any remote Correlation Engines or Collector Managers to point to the updated hostname. To do this, you run the `configure.sh` script on each remote machine.

The `configure.sh` script is located in `/opt/novell/sentinel/setup`. Run this script on each remote machine to update the hostname and IP address of the Sentinel server in the remote machine's configuration files.

The `configure.sh` file also allows you to change the password of the `appuser`. The `appuser` is an internal Sentinel identity that is used to establish a connection and interact with the PostgreSQL database.

1.5.6 Importing or Exporting Event Association Data

Sentinel provides the `event_assoc_data.sh` script that allows you to export event association data from the database to the file system, as well as import previously exported event association data from the file system back into the database. The script is `event_assoc_data.sh` located in the `/opt/novell/sentinel/bin` directory.

There are two types of event association data:

Incident events: There is a record in the database for every event that is associated with an incident, including what partition the event came from. When a partition is deleted, all incident events records for the partition are exported to a file on the file system, and the records are then deleted from the database. The file name is `incidents_events.json`.

Correlated events: There is a record in the database for every trigger event that is associated with a correlated event. The record also indicates what partition the correlated event belongs to. When a partition is deleted, all correlated event records for the partition are exported to a file on the file system, and the records are then deleted from the database. The file name is `correlated_events.json`.

When you export event association data, it is saved to the files in the following default directory structure `/var/opt/novell/sentinel/data/eventdata/exported_associations/<partition name>/*.json`

When a partition is restored from backup, the system automatically attempts to import the event association records for the partition. The `.json` file must be restored to the correct directory structure when the event association records are restored. If these files are not restored, the event association records are not imported, but the partitions are restored without this information. The event association records for the partitions are not available.

You can use the following options with for the `event_assoc_data.sh` file:

-i, --import: Imports event association data. This option works only on partitions that are currently in the restored state, but have not yet imported the event association data.

-x, --export: Exports event association data. This option works only on partitions that are currently in the deleted state, but have not exported their event association data.

-d, --days=<integer>: Specify the last number of days of the partitions.

-s, --startdate=<date>: Specify a start date and end date to select partitions in the specified date range.

-e, --enddate=<date>: Specify an end date and start date to select partitions in the specified date range.

--date=<date>: The utility selects the partitions with the specified date. You can use this option multiple times to select multiple dates.

-u, --user=<user name>: Specify the name of the user with administrative privileges to the Sentinel server.

-p, --password=<user password>: Specify the password of the administrative user.

--host=<host name>: Specify the host name or IP address of the Sentinel server.

--port=<port>: Specify the port number for communication to the Sentinel server. If this option isn't specified, the default port of 8443 (HTTPS) or 8000 (HTTP) is used.

--https: If this option is used, the utility communicates over HTTPS.

--http: If this option is used, the utility communicates over HTTP.

-h, --help: Displays the help options.

-l, --log file=FILE: Logs messages from the utility to the file name specified in the parameter.

--no-banner: Suppresses banner messages.

-q, --quiet: Displays fewer messages.

-v, --verbose: Displays more messages.

1.5.7 Managing the Internal Database

Sentinel provides a `db.sh` script that allows you to manage the internal database. You can use this script if you need to start the database without starting Sentinel so you can perform maintenance tasks. You can also use this script to run SQL commands against the internal database.

The script `db.sh` is located in the `/opt/novell/sentinel/bin` directory. The script has commands and options. You must be logged in as the user that installed Sentinel for the script to work. The command must come first, followed by the option.

For example: `./db.sh status --log-file=sentinel_status.txt`

This command writes the status of the internal database to the log file named `sentinel_status.txt`.

- ♦ [“Commands” on page 51](#)
- ♦ [“Options” on page 51](#)

Commands

You can use the following commands with the `db.sh` script.

start: Starts the internal database without starting the Sentinel server.

stop: Stops the internal database.

force_stop: Forces the database to stop when the Sentinel service is still running.

status: Displays the status of the internal database.

sql <db name> <user name> <sql statement>: Allows you to send SQL commands to the internal database.

restart: Restarts the internal database.

force_restart: Forces the database to restart when the Sentinel service is still running.

try-restart: Tries to restart the internal database.

reload: Reloads the internal database.

force-reload: Forces a reload of the database.

Options

You can use the following options with the `db.sh` script. The options must start with a `-` or `--` to be executed.

-w, --wait=<seconds>: Allows you to specify the amount of time to wait for the database to start or stop.

-h, --help: Displays help information for the script.

-l, --log-file=FILE: Logs messages to the specified file name.

--no banner: Suppresses banner messages.

-q, --quiet: Displays fewer messages.

-v, verbose: Displays more messages.

1.5.8 Cleaning Up the Internal Database

Sentinel provides a `clean_db.sh` script that allows you to clean up redundant data from the Sentinel database. You can delete data such as incidents, identities, assets, Advisor data, and vulnerabilities individually. You can run this script even without Sentinel running. For example, an improperly configured correlation rule might create hundreds of unwanted incidents in the database. Or, the identity information might encounter an error when someone attempts to delete the `IdentityAccountMap.csv` file. In such a situation, you can use this script to remove the unusable identity information.

The script `clean_db.sh` is located in the `/opt/novell/sentinel/bin` directory.

WARNING: Because this script is designed to delete information from your database, it should be used carefully and only after understanding the implications.

- ♦ [“Prerequisites” on page 52](#)
- ♦ [“Using the clean_db.sh Script” on page 52](#)

Prerequisites

- ♦ Ensure that you have permission to run the script. Only the user who installed Sentinel has permission to run this script.
- ♦ Ensure that the database is started and is running.

Using the clean_db.sh Script

- 1 In the Terminal mode, log in to Sentinel by using the credentials that were used to install Sentinel.

This script cannot be run by the `root` user.

- 2 Go to `<install_directory>/bin`, then specify `clean_db.sh` to run the script.

The following menu is displayed:

```
Which objects would you like to cleanup?
(1) Incidents
(2) Identities
(3) Assets
(4) Advisor
(5) Vulnerabilities
(6) Incidents and Identities
(7) All
(q) Quit without action
```

- 3 At the prompt, indicate which objects you want to remove from the database.
- 4 Specify the following information to connect to the PostgreSQL database:

```
Database server hostname (Press ENTER for default localhost)=>
Database name (Press ENTER for default SIEM) =>
Database username (press ENTER for default dbauser) =>
```

The database connection is verified before proceeding to the next step. If the connection was not successful, the script exits.

5 (Conditional) If you select 1 to delete Incidents data, several options are displayed. Select one of the options and specify the required information:

- ♦ **Delete Incidents By Query:** Specify a custom SELECT query. For example:

```
select inc_id from incidents where inc_id=500
```

Ensure that SELECT statement does not include quotation marks.

- ♦ **Delete Incidents By Id:** Specify the ID of the Incident that you want to delete. For example:

```
101
```

- ♦ **Quit without action:** Specify q to exit from the script.

6 You are prompted to confirm data cleanup. Specify `start` to start the data cleanup or specify `abort` to quit without performing the data cleanup.

The results of the data cleanup are written to the log file. You should review the log file for any errors and retry.

If Identities data is being cleaned up, the script cleans up the Identities information from the database tables, and deletes the Identity Account Map file (`identityAccountMap.csv`).

NOTE: If you have a distributed Sentinel install, you might need to manually connect to the main Sentinel server to delete the `identityAccountMap.csv` file.

1.5.9 Managing the Sentinel Server

You can use the `server.sh` script to manually manage the Sentinel server. This script is located in the default directory of `/opt/novell/sentinel/bin`. The script has commands and options. The command must come first, followed by the option.

- ♦ [“Commands” on page 53](#)
- ♦ [“Options” on page 54](#)

Commands

You can use the following commands with the `server.sh` script:

start: Starts the Sentinel server.

stop: Stops the Sentinel server.

status: Displays the status of the Sentinel server.

restart: Restarts the Sentinel server.

try-restart: Tries to restart the Sentinel server.

force-reload: Forces a reload of the Sentinel server.

startdb: Starts the internal Sentinel database.

stopdb: Stops the internal Sentinel database.

force_stopdb: Forces the internal database to stop.

version: Displays the version of the Sentinel server.

Options

You can use the following options with the `server.sh` script:

- p, --priority=<integer>**: Specifies the process priority for the Sentinel server.
- h, --help**: Displays the help options.
- l, --log-file=FILE**: Logs messages to a file you specify.
- no-banner**: Suppresses banner messages.
- q, --quiet**: Displays fewer messages.
- v, --verbose**: Displays more messages.

1.5.10 Configuring Memory for the Sentinel Server

Sentinel provides a `setmemory.sh` script that allows you to change the default memory settings for the Sentinel server. The `setmemory.sh` script is located in the `/etc/opt/novell/sentinel/bin` directory.

To make changes to the default memory settings, you must create a `setmemory.properties` file. The default location for this file is `/etc/opt/novell/sentinel/config/setmemory.properties`.

You can set the following configuration parameters in the `setmemory.properties` file:

- ♦ **JAVA_MEM_SERVER**: The maximum heap memory (Xmx in MB) allocated to the process.
- ♦ **JAVA_MEM_PERMGEN**: The maximum permanent generation memory (in MB) allocated to the process.
- ♦ **JAVA_MEM_BROKER**: The maximum amount of memory allocated for the message bus broker. This affects how many connections the message bus broker can accept.
- ♦ **BROKER_MAX_CON**: The maximum number of connections the message bus broker can accept.
- ♦ **CORRELATION_INPUT_BUFFER_MAX_SIZE**: The memory allocated to hold the Correlation events. By default, 10% of the memory is allocated to hold the Correlation events.

When the server starts these memory settings in the `setmemory.properties` file override the default settings.

2 Configuring Users and Roles

With Sentinel, you can add, edit, and delete roles. You can also grant different permissions at the role level, and you can edit the details of user and role profiles.

The roles you can create can contain any number of users. Each role can be assigned a different set of permissions and the users of the role inherit the permissions of the role they are in.

- ♦ [Section 2.1, “Overview,” on page 55](#)
- ♦ [Section 2.2, “Creating Roles,” on page 57](#)
- ♦ [Section 2.3, “Creating Users,” on page 59](#)
- ♦ [Section 2.4, “Viewing Roles and User Details,” on page 60](#)
- ♦ [Section 2.5, “Viewing All Users,” on page 60](#)
- ♦ [Section 2.6, “Modifying Roles and Users,” on page 60](#)
- ♦ [Section 2.7, “Moving Users to Another Role,” on page 62](#)
- ♦ [Section 2.8, “Deleting Roles and Users,” on page 62](#)

2.1 Overview

You can create different user roles and assign them different permissions. Each role can contain any number of users. Users belonging to the same role inherit the permissions of the role they belong to. You can set multiple permissions for a role.

Sentinel has the following roles by default:

Administrator: A user in this role has administrative rights in the Sentinel system. You cannot delete a user with this role. Administrative rights include the ability to perform user administration, data collection, data storage, search operations, and rules, report, dashboard, and license management.

You cannot modify or delete the administrator role.

Database Administrator: A user in this role has access to events coming from database event sources. The type of the event source (DB) is determined by the collector parsing the data from the event source. A user with this role can view data that matches filter `rv32: "DB"` and search remote targets.

Incident Administrator: A user in this role can manage incidents in the system and control incidents being handled by other users.

Network Administrator: A user in this role can administer network infrastructure devices, such as routers, switches, and VPNs. This role has access to events coming from devices in the category `NETD` or `VPN` (as determined by the Collector parsing the data) or from event sources with the `Network` tag. Set the `Network` tag on network infrastructure event sources to allow users in this role to view the events. A user with this role can view data that matches filter `rv32: "NETD" OR rv32: "VPN" OR rv145: "Network"`, and can search remote targets.

Network Security Administrator: A user in this role can administer network security infrastructure devices, such as firewalls, IDSs, and Web proxies. This role has access to events coming from devices in the category AV, FW, or IDS (as determined by the Collector parsing the data) or from event sources with the `NetworkSecurity` tag. Set the `NetworkSecurity` tag on network infrastructure event sources to allow users in this role to view the events. A user with this role can view data that matches filter `rv32:"AV" OR rv32:"FW" OR rv32:"IDS" OR rv145:"NetworkSecurity"`, and can search remote targets

PCI Compliance Auditor: A user in this role has access to view events that are tagged with at least one of the regulation tags such as PCI, SOX, HIPAA, NERC, FISMA, GLBA, NISPOM, JSOX, and ISO/IEC_27002:2005, and can view system events, view the Sentinel configuration data, and search remote targets.

Report Administrator: A user in this role can run reports, view, rename and delete report results, add and delete report templates and report results, run reports on configuration database, export all reports, and save search results as a report. A Report Administrator can also tag report templates and report results. The Report Administrator can search report templates and report results based on these tags.

Search Proxy User: This is a system role for proxy users. This role allows other systems to search the local system.

Security Policy Administrator: A user in this role can implement the security policies within the system for users to access anomaly detection, correlation, incident remediation, and iTRAC workflows.

System Event Monitor: A user in this role can monitor the Sentinel system for errors or outages. This role has access only to events coming from Sentinel systems. A user in this role can also access data coming from event sources that Sentinel is dependent on. For example, you can tag operating systems on which Sentinel and the Collector Managers are running with a Sentinel event source tag so that the users in this role can monitor problems with operating systems. A user with this role can view data that matches filter `rv145:"Sentinel"`, view system events, and search remote targets.

Unix Administrator: A user in this role has access to events from operating system event sources that are not Windows machines. The type of the event source is determined by verifying the Collector parsing data and also by verifying if a `Windows` tag is present. A user in this role can view data that matches filter `(rv32:"OS" NOT (("Microsoft?Active?Directory*" NOT msg:"Microsoft?Active?Directory*") OR ("Microsoft?Windows*" NOT msg:"Microsoft?Windows*"))) NOT rv145:"Windows"` and search remote targets.

User: A user with this role can manage dashboards, run reports, view and rename reports, and delete report results.

Windows Administrator: A user with this role can administer Windows machines. This role has access to data generated by Windows event sources. The type of the event source is determined by verifying the Collector parsing the data. If data from a Windows event source is not being processed by the Active Directory or the Windows Collector, add the `Windows` tag to event sources to indicate that Windows data is being collected from the event source. This enables the Windows administrator to access the data. A user in this role can view data that matches filter `(rv32:"OS" AND (("Microsoft?Active?Directory*" NOT msg:"Microsoft?Active?Directory*") OR ("Microsoft?Windows*" NOT msg:"Microsoft?Windows*"))) OR rv145:"Windows"` and search remote targets.

2.2 Creating Roles

Roles allow you define what a user can manage and what data they can view. Permissions are granted to the role, and then the user is assigned to the role.

2.2.1 Creating a Role

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Users* in the toolbar.
- 3 Click *Create* in the *Roles* section to create a new role.
- 4 Use the following information to create the role:

Role name: Specify a unique name for the role. A role name can not exceed 40 characters.

Description: Specify a description of the role. This description is displayed in the interface when a user selects the role.

Users with this role can: Select the permissions that a role grants to any user object assigned to the role.

- ♦ **View all data:** Select this option to allow users to view all the data in the Sentinel system. If you select this option, you must select one or more of the following permissions:
 - ♦ **Manage Correlation Engine/Rules:** Allows users to manage Correlation rules and all data associated with these rules. The Correlation option is not displayed in the Web interface if this permission is not selected.
 - ♦ **Manage Reports:** Allows users to view and manage the data in reports.
 - ♦ **Manage and View Security Intelligence Dashboards:** Allows user to view, create, and manage the Security Intelligence dashboards as well as all of the data displayed in the dashboards. The Security Intelligence option is not displayed in the Web interface if this permission is not selected.
 - ♦ **View Security Intelligence Dashboards:** Allows user to view the Security Intelligence dashboards as well as all of the data displayed in the dashboards. The Security Intelligence option is not displayed in the Web interface if this permission is not selected.
- ♦ **View the following data:** Select this option to allow users to view only selected data in the Sentinel system.
 - ♦ **Only events matching the filter:** Specify the Lucene search query in the text box. You can click the *Tips* link to understand how to construct a valid Lucene search query. For example, if you set the filter value to `sev:5`, the user can view only events of severity five in a search.

For more information about using filters, see “[Configuring Filters](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Select one or more of the following permissions to use when viewing the filtered data:

- ♦ **Search Remote Targets:** When this permission is set on a role, all members of that role can perform searches on event sources that are in a distributed location.

For more information on distributed searching and reporting, see [Chapter 13, “Searching and Reporting Events in a Distributed Environment,”](#) on page 181.
- ♦ **View asset data:** Allows users to view asset data.
- ♦ **View asset vulnerability data:** Allows users to view vulnerability data.

- ♦ **View data in the embedded database:** Allows users to view the data in the embedded database.
- ♦ **View people browser:** Allows users to view the data through the Identity Browser.
- ♦ **View system events:** Allows users to view the Sentinel system events.
- ♦ **Incidents:** Select one of the followings permissions that enable users to manage incidents:
 - ♦ **View incidents assigned to user:** Allows a user to view any incident that is assigned to them.
 - ♦ **View or create incidents and add events to incidents:** Allows users to create incidents and add events to the incidents.
 - ♦ **Create, modify and execute actions on assigned incidents:** Allows users to create, modify, and execute actions on incidents that are assigned to them.
 - ♦ **Manage all aspects of incidents: create, modify and delete:** Allows the users to manage all incidents.
- ♦ **Miscellaneous:** Assign miscellaneous permissions as necessary:
 - ♦ **Create and use Active Views:** When this permission is set on a role, all members of this role can access and use the *Active Views* tab in the Sentinel Control Center. For more information about Active Views, see “[Viewing Events](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ **Manage Tags:** When this permission is set on a role, all members of this role can create, delete, and modify tags, and associate tags to different event sources. For more information on tags, see “[Configuring Tags](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ **Proxy for Authorized Search Initiators:** When this permission is set on a role, the members of this role can accept searches from remote targets. For more information, see [Chapter 13, “Searching and Reporting Events in a Distributed Environment,”](#) on page 181.
 - ♦ **Share search filters:** When this permission is set on a role, all members of this role can share search filters that they have created. For more information about sharing filters, see “[Configuring Filters](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ **Solution Designer access:** When this permission is set on a role, all members of this role can access the Solution Designer. For more information, see [Section 1.4, “Solution Designer,”](#) on page 38.
 - ♦ **View and execute event actions:** When this permission is set on a role, all members of this role can view events and execute actions on the selected events. For more information, see “[Manually Performing Actions on Events](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ **View detailed internal system state data:** When this permission is set on a role, all members of this role can view detailed internal system state data by using a JMX client. For more information, see [Section 1.3.10, “Debugging,”](#) on page 35.

5 Click *Save*.

To create users for this role, continue with [Section 2.3, “Creating Users,”](#) on page 59.

2.3 Creating Users

Adding a user in the Sentinel system creates an application user who can then log in to Sentinel. You also assign roles when you create the user.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 In the toolbar, click *Users*.
- 3 Click *Create* in the *Users* section.

The new user creation form is displayed.

- 4 Specify the name and e-mail address of the user. The e-mail address format is validated.

The fields with an asterisk (*) are mandatory, and the username must be unique. If user already exists with the specified name, a `Username taken` message is displayed.

A user name cannot exceed 30 characters, and you can use extended characters when you create it.

- 5 Select a role for the user.
- 6 Select the authentication type:

Local: Select this option for the server to authenticate the user login against the internal database. By default, the *Local* option is selected.

Directory: The *Directory* option is enabled only if you have configured the Sentinel server for LDAP authentication. Select this option for the server to authenticate the user login against an LDAP directory.

- 7 (Conditional) If you specified Local for the authentication type in [Step 6](#), specify any user name in the Username field and continue with [Step 9](#).
- 8 (Conditional) If you specified Directory for the authentication type in [Step 6](#), specify the username according to the settings you used when you configured LDAP, then continue with [Step 11](#).

- ♦ **If you selected Yes for Anonymous Search:** The username must be the same as the LDAP directory username.
- ♦ **If you selected No for Anonymous Search and did not specify the domain name:** The username does not need to be the same as the LDAP directory username.

You must also specify the *LDAP User DN*. If Base DN was set, the Base DN is appended to the relative user DN to construct the absolute user DN.

For example, if the Base DN was set to `o=netiq` and the absolute user DN is `cn=sentinel_ldap_user,o=netiq` only the relative user DN for example, `cn=sentinel_ldap_user` can be specified.

When some reserved special characters are used as literals in an *LDAP User DN*, they must be escaped with a backslash (\). The following characters must be escaped:

- ♦ A space or '#' character occurring at the beginning of the string
- ♦ A space character occurring at the end of the string
- ♦ Any one of the characters, +, ", \, <, > or ;

For more information, see [LDAPv3 Distinguished Names \(http://www.ietf.org/rfc/rfc2253.txt\)](http://www.ietf.org/rfc/rfc2253.txt).

For example, if the *LDAP User DN* contains a ',' (comma) as a literal, specify the LDAP User DN as follows:

CN=Test\,User,CN=Users,DC=netiq,DC=com

eDirectory or Active Directory might require additional characters to be escaped. Refer the eDirectory or Active Directory documentation for any additional characters to be escaped.

- ♦ **If you selected No for Anonymous Search and specified the domain name:** The username must be the same as the LDAP directory username.
- 9 Specify a password in the *Password* field.
 - 10 Re-enter the password in the *Verify* field.
 - 11 The *Title*, *Office #*, *Ext*, *Mobile #*, and *Fax* fields are optional. The phone number fields allow any format. Make sure you enter a valid phone number so that the user can be contacted directly.
 - 12 Click *Save*.

2.4 Viewing Roles and User Details

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *user* in the upper left corner of the page.
The *Users* tab is displayed in the right pane.
- 3 Do one of the following:
 - ♦ To view information of a role, select the role. The detailed information for that role is displayed on the right pane.
 - ♦ To view information for a role, select the user. The information for that user is displayed on the right pane. Click the link in *Has Role* list to get more information on the role.

2.5 Viewing All Users

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *user* in the upper left corner of the page.
The *Users* tab is displayed in the right pane.
- 3 To view all users at the same time, click *All Users* in the *Roles* section.
All the users are displayed in the *Users* section.

2.6 Modifying Roles and Users

- ♦ [Section 2.6.1, “Modifying Roles,” on page 60](#)
- ♦ [Section 2.6.2, “Modifying User Details,” on page 61](#)

2.6.1 Modifying Roles

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click the *users* link in the upper left corner of the page.
The *Users* tab is displayed in the right pane of the page.
- 3 Select the role that you want to modify from the *Roles* section.
- 4 Click *Edit* in the *Role Info* section.

The Edit Role form is displayed.

- 5 Modify the information that you want to change.
- 6 Click *Save*.

2.6.2 Modifying User Details

Administrators can edit user information for a user in the system. Users can edit their own profiles except for the username and administrative privileges.

- ♦ [“Modifying Your Own Profile” on page 61](#)
- ♦ [“Modifying Your Own Password” on page 61](#)
- ♦ [“Modifying Another User’s Profile \(admin only\)” on page 61](#)

Modifying Your Own Profile

- 1 Click the name of the logged-in user in the upper left corner of the page.
The *Users Info* tab is displayed on the right pane of the page.
- 2 Modify the information in the *Edit User* pane.
- 3 Click *Save*.

Modifying Your Own Password

- 1 Click the name of the logged-in user in the upper left corner of the page.
The *User Info* tab is displayed on the right pane of the page.
- 2 Specify your current password.
- 3 Specify your new password.
- 4 Confirm your new password.
- 5 Click *Save*.

Modifying Another User’s Profile (admin only)

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *users* in the upper left corner of the page.
The *Users* tab is displayed in the right pane.
- 3 Select the User whose profile you want to change.
- 4 Click *Edit* in the *User Info* section.
- 5 Modify the information.
You cannot modify the name of a user.
- 6 Click *Save*.

2.7 Moving Users to Another Role

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *user* in the upper left corner of the page.
The *Users* tab is displayed in the right pane.
- 3 Select the user that you want to move to another role.
- 4 Click *Edit*.
- 5 From *Role* drop-down list, select the role that you want to move the user to.
- 6 Click *Save*.

2.8 Deleting Roles and Users

- ♦ [Section 2.8.1, “Deleting a Role,” on page 62](#)
- ♦ [Section 2.8.2, “Deleting a User,” on page 62](#)

2.8.1 Deleting a Role

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *users* in the upper left corner of the page.
The *Users* tab is displayed in the right pane.
- 3 Select the role that you want to delete.
- 4 Select *Delete* from the *Role Info* section.
You are prompted to confirm deletion.
- 5 Click *Delete* to confirm deletion.

IMPORTANT: If you attempt to delete a role that has one or more users, you are prompted the confirm deletion. If you proceed with deletion, the role and the users belonging to that role are permanently deleted.

2.8.2 Deleting a User

If you delete users who are already logged in, the users can continue to use Sentinel until they log out.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *user* in the upper left corner of the page.
The *Users* tab is displayed in the right pane.
- 3 Select the user that you want to delete.
- 4 Click *Delete* in the upper right corner of the *User Info* section.
You are prompted to confirm deletion.
- 5 Click *Delete* to confirm deletion.

3 Configuring LDAP Authentication

Sentinel supports LDAP authentication in addition to database authentication. You can configure a Sentinel server for LDAP authentication to enable users to log in to Sentinel with their LDAP directory credentials.

NOTE: Sentinel LDAP authentication has been tested with Novell eDirectory and Microsoft Active Directory. Other LDAP compliant directories might be used, but have not been tested. If an issue is encountered with a directory that has not been tested, support will be provided to the extent that the issue can be reproduced on one of the tested directories.

- ♦ [Section 3.1, “Overview,” on page 63](#)
- ♦ [Section 3.2, “Prerequisites,” on page 64](#)
- ♦ [Section 3.3, “Setting Up LDAP Authentication,” on page 64](#)
- ♦ [Section 3.4, “Logging in by Using LDAP User Credentials,” on page 67](#)
- ♦ [Section 3.5, “Configuring Multiple LDAP Servers for Failover,” on page 67](#)

3.1 Overview

LDAP authentication can be performed either using an SSL connection or an unencrypted connection to the LDAP server.

You can configure the Sentinel server for LDAP authentication either with or without using anonymous searches on the LDAP directory.

NOTE: If anonymous search is disabled on the LDAP directory, you must not configure the Sentinel server to use anonymous search.

- ♦ **Anonymous:** When you create Sentinel LDAP user accounts, the directory username must be specified and the user distinguished name (DN) does not need to be specified.

When the LDAP user logs in to Sentinel, the Sentinel server performs an anonymous search on the LDAP directory based on the specified username, finds the corresponding DN, then authenticates the user login against the LDAP directory by using the DN.

- ♦ **Non Anonymous:** When you create Sentinel LDAP user accounts, the user DN must be specified along with the username.

When the LDAP user logs in to Sentinel, the Sentinel server authenticates the user login against the LDAP directory by using the specified user DN and does not perform any anonymous search on the LDAP directory.

There is an additional approach applicable only for Active Directory. For more information, see [“Domain Name:” on page 65](#).

3.2 Prerequisites

- ♦ Section 3.2.1, “Exporting the LDAP Server CA Certificate,” on page 64
- ♦ Section 3.2.2, “Enabling Anonymous Search in the LDAP Directory,” on page 64

3.2.1 Exporting the LDAP Server CA Certificate

If you want to connect to the LDAP server by using an SSL connection and the LDAP server certificate is not signed by a well-known certificate authority (CA), you must export the LDAP server CA certificate to a Base64-encoded file.

- ♦ **eDirectory:** See “Exporting an Organizational CA’s Self-Signed Certificate” (<http://www.novell.com/documentation/edir88/edir88/?page=/documentation/edir88/edir88/data/a7elxuq.html>).

To export an eDirectory CA certificate in iManager, the Novell Certificate Server plug-ins for iManager must be installed.

- ♦ **Active Directory:** See “How to enable LDAP over SSL with a third-party certification authority” (<http://support.microsoft.com/kb/321051>).

3.2.2 Enabling Anonymous Search in the LDAP Directory

To perform LDAP authentication using anonymous search, you must enable anonymous search in the LDAP directory. By default, anonymous search is enabled in eDirectory and is disabled in Active Directory.

- ♦ **eDirectory:** See `ldapBindRestrictions` in section [Attributes on the LDAP Server Object](http://www.novell.com/documentation/edir88/edir88/data/agq8auc.html) (<http://www.novell.com/documentation/edir88/edir88/data/agq8auc.html>).
- ♦ **Active Directory:** Enabling anonymous binds for Active Directory requires two steps. These steps are the same for both Windows 2003 and Windows 2008 Active Directory.

- ♦ **Enable Anonymous LDAP Operations:** By default, anonymous LDAP operations are disabled in Active Directory. You must enable anonymous LDAP operations in Active Directory by setting the `dsHeuristics` attribute to an appropriate value.

For more information, see [Anonymous LDAP operations in Windows 2003 AD](http://www.petri.co.il/anonymous_ldap_operations_in_windows_2003_ad.htm) (http://www.petri.co.il/anonymous_ldap_operations_in_windows_2003_ad.htm).

- ♦ **Assign Permissions to the ANONYMOUS LOGON User:** The Read and List Contents permissions must be assigned to the ANONYMOUS LOGON user.

For more information, see [Granting anonymous read access](http://www.petri.co.il/anonymous_ldap_operations_in_windows_2003_ad.htm) (http://www.petri.co.il/anonymous_ldap_operations_in_windows_2003_ad.htm).

3.3 Setting Up LDAP Authentication

- 1 Log in to Sentinel Web interface as a user in the administrator role.
- 2 Click *Users* in the toolbar.
- 3 On the Users page, click the *LDAP Settings* tab.
- 4 Specify the following to configure LDAP authentication:
 - Host:** Specify the hostname or the IP address of the LDAP server.

This is a required field if you select the SSL option.

SSL: Select this option if you want to connect to the LDAP server by using a Secure Socket Layer (SSL) connection.

Port: Specify the port number for the LDAP connection. The default SSL port number is 636 and the default non-SSL port number is 389.

Certificate File Path: Specify the path of the CA certificate file for the LDAP server.

This field should be used only if you selected the SSL option and if the LDAP server certificate is not signed by well-known CA and is not trusted by default.

Anonymous Search: Select *Yes* to perform anonymous searches or select *No* if you do not want to perform anonymous searches on the LDAP directory.

Base DN: Specify the root container to search for users, such as `o=netiq` for eDirectory or `cn=users,dc=example,dc=co` for Active Directory.

- ◆ **If Anonymous Search is Yes:** Specify the root container in the LDAP directory to search for users.

This is optional for eDirectory, and mandatory for Active Directory. For eDirectory, if the Base DN is not specified, the entire directory is searched to locate the users.

- ◆ **If Anonymous Search is No:** Specify the root container in the LDAP directory that contains the users.

This is mandatory if you are using Active Directory and if you set a domain name. For all other cases, this is optional.

Search Attribute: Specify the LDAP attribute holding the user login name. This is used to search for users.

For example:

- ◆ eDirectory:

`uid`

- ◆ Active Directory:

`sAMAccountName`

This field is available only if you selected *Yes* for Anonymous Search.

Domain Name: Specify the name of the Active Directory domain.

This is an additional approach applicable only for Active Directory for performing LDAP authentication without using anonymous search.

When you specify the Domain Name, `username@domainname` (`userPrincipalName`) is used to authenticate the user before searching for the LDAP user object.

For example, `test.example.com`

This field is applicable only for Active Directory and is available only if you selected *No* for Anonymous Search.

NOTE: If *Base DN* is set and *Domain Name* is not set, the *Base DN* is appended to the relative user DN to construct the absolute user DN.

For example, if the Base DN is set to `o=netiq` and the absolute user DN is `cn=sentinel_ldap_user,o=netiq` when the LDAP user account is created, only the relative user DN of `cn=sentinel_ldap_user` can be specified.

5 Click *Test Connection* to test whether the LDAP connection is successful.

5a Specify the test credentials to connect to the LDAP server:

If Anonymous Search is Yes: Specify the username and password.

If you selected No for Anonymous Search and did not specify the Domain Name:

Specify the user DN and password. The user DN can be relative to the Base DN.

The *User DN* is based on the RFC 2253 standard. According to RFC 2253, when some reserved special characters are used as literals in a *User DN*, they must be escaped with a backslash (\). The following characters must be escaped:

- ♦ A space or # character occurring at the beginning of the string
- ♦ A space character occurring at the end of the string
- ♦ One of the characters , + , " , \ , < , > or ;

For more information, see [RFC 2253 \(http://www.ietf.org/rfc/rfc2253.txt\)](http://www.ietf.org/rfc/rfc2253.txt).

For example, if the *User DN* contains a comma (,) as a literal, specify the *User DN* as follows:

```
CN=Test\,User,CN=Users,DC=netiq,DC=com
```

eDirectory or Active Directory might require additional characters to be escaped. Refer the eDirectory or Active Directory documentation for any additional characters to be escaped.

If you selected No for Anonymous Search and specified the Domain Name: Specify the username and password.

5b Click *Test* to test the LDAP connection.

A message is displayed that indicates whether the connection is successful.

If there is an error, review the configuration details you provided and test the connection again. You can determine the cause of the failure by examining the `/var/opt/novell/sentinel/log/server0.0.log` file. You must ensure that the test connection is successful before saving the LDAP settings.

6 Click *Save* to save the LDAP settings.

On successful configuration:

- ♦ The `LdapLogin` section of the `/etc/opt/novell/sentinel/config/auth.login` file is updated. For example:

```
LdapLogin {
    com.sun.security.auth.module.LdapLoginModule required
    java.naming.ldap.factory.socket="com.esecurity.common.communication.ProxyL
dapSSLSocketFactory"
    userProvider="ldap://10.0.0.1:636/o=netiq"
    userFilter="( &(uid={USERNAME})(objectclass=user))"
    useSSL=true;
};
```

- ♦ The LDAP server CA certificate, if provided, is added to a keystore named `/etc/opt/novell/sentinel/config/.ldapkeystore.jks`.

After saving the LDAP settings successfully, you can create LDAP user accounts to enable users to log in to Sentinel by using their LDAP directory credentials.

NOTE: You can also configure the Sentinel server for LDAP authentication by running the `ldap_auth_config.sh` script in the `/opt/novell/sentinel/setup` directory.

The script also supports command line options. To view the command line options, run the script as follows:

3.4 Logging in by Using LDAP User Credentials

After you successfully configure the Sentinel server for LDAP authentication, you can create Sentinel LDAP user accounts. For more information on creating LDAP user accounts, see [Section 2.3, “Creating Users,”](#) on page 59.

After you create the LDAP user account, you can log in to the Sentinel by using your LDAP username and password.

3.5 Configuring Multiple LDAP Servers for Failover

To configure one or more LDAP servers as failover servers for LDAP authentication:

- 1 Log in to the Sentinel server as root user.

- 2 Switch to the novell user:

```
su - novell
```

- 3 Change to the `/etc/opt/novell/sentinel/config` directory:

```
cd /etc/opt/novell/sentinel/config/
```

- 4 Open the `auth.login` file for editing:

```
vi auth.login
```

- 5 Update the `userProvider` in the `LdapLogin` section to specify multiple LDAP URLs. Separate each URL by a blank space.

For example:

```
userProvider="ldap://primary_server_IP:port/BaseDN ldap://failover_server_IP:port/BaseDN"
```

For Active Directory, ensure that the BaseDN in the LDAP URL is not blank.

For more information on specifying multiple LDAP URLs, see the description of the `userProvider` option in “Class `LdapLogin Module`” (<http://java.sun.com/javase/6/docs/jre/api/security/jaas/spec/com/sun/security/auth/module/LdapLoginModule.html>).

- 6 Save the changes.

If you are using an SSL connection to the LDAP server and if the LDAP server certificate is not signed by a well-known CA, you must perform the following additional steps:

- 1 Export the certificate of each failover LDAP server and copy the certificate file to the `/etc/opt/novell/sentinel/config` directory on the Sentinel server.

For more information, see [Section 3.2.1, “Exporting the LDAP Server CA Certificate,”](#) on page 64.

- 2 Ensure that you set the necessary ownership and permissions of the certificate file for each LDAP server.

```
chown novell:novell /etc/opt/novell/sentinel/config/<cert-file>
```

```
chmod 600 /etc/opt/novell/sentinel/config/<cert-file>
```

- 3 Add each LDAP server certificate to the keystore named `.ldapkeystore.jks`.

```
/opt/novell/sentinel/jre/bin/keytool -importcert -noprompt -trustcacerts -file
<certificate-file> -alias <alias_name> -keystore /etc/opt/novell/sentinel/
config/.ldapkeystore.jks -storepass password
```

Replace `<certificate-file>` is the LDAP certificate filename and `<alias_name>` with the alias name for the certificate to be added.

IMPORTANT: Ensure that you specify the alias. If no alias is specified, the keytool takes `mykey` as the alias by default. When you import multiple certificates into the keystore without specifying an alias, the keytool reports an error that the alias already exists.

In some environments, the Sentinel server might not connect to the failover LDAP server if the Sentinel server times out before it finds that the primary LDAP server is down. In such cases, perform the following additional steps to ensure that the Sentinel server connects to the failover LDAP server without timing out:

- 1 Open the `sysctl.conf` file for editing:

```
vi /etc/sysctl.conf
```

- 2 Ensure that the `net.ipv4.tcp_syn_retries` value is set to 3. If the entry does not exist, add the entry. Save the file:

```
net.ipv4.tcp_syn_retries = 3
```

- 3 Execute the following commands for the changes to take effect:

```
/sbin/sysctl -p
/sbin/sysctl -w net.ipv4.route.flush=1
```

- 4 Open the `server.conf` file for editing:

```
vi /etc/opt/novell/sentinel/config/server.conf
```

- 5 Set the Sentinel server time out value to 60 seconds by appending a new parameter in the *Java Additional Parameters* section as follows:

```
wrapper.java.additional.53=-Dsecurity.remote.timeout=60
```

- 6 Restart the Sentinel server:

```
/etc/init.d/sentinel restart
```

4 Security Considerations

This section provides additional information on how to securely install, configure, and maintain Sentinel.

- ♦ [Section 4.1, “Securing Sentinel Data,” on page 69](#)
- ♦ [Section 4.2, “Basic Security Considerations,” on page 69](#)
- ♦ [Section 4.3, “Best Practices,” on page 70](#)
- ♦ [Section 4.4, “Network Communication Options,” on page 77](#)
- ♦ [Section 4.5, “Sensitive Data Locations,” on page 80](#)
- ♦ [Section 4.6, “Applying Updates for Security Vulnerabilities in Embedded Third-Party Products,” on page 81](#)

4.1 Securing Sentinel Data

Because of the highly sensitive nature of the data in Sentinel, you must keep the machine physically secure and in a secure area of the network. To collect data from event sources outside the secure network, use a remote Collector Manager. For more information on remote Collector Managers, see [“Installing Additional Collector Managers”](#) in the *NetIQ Sentinel 7.0.1 Installation and Configuration Guide*.

Sentinel is compatible with disk encryption technologies. These technologies provide a higher level of data privacy when they are used on the file systems where Sentinel stores its data. However, software-based encryption technologies, such as dm-crypt, have a significant CPU overhead, and they can dramatically reduce the performance of Sentinel by 50% or more. On the other hand, hardware-based encryption technologies have a much lower impact on the performance of the rest of the system and are available from leading hard drive manufacturers.

4.2 Basic Security Considerations

There are certain basic security measures you should use to protect the Sentinel application and the appliance:

- ♦ [Section 4.2.1, “Sentinel Application,” on page 69](#)
- ♦ [Section 4.2.2, “Sentinel Appliance,” on page 70](#)

4.2.1 Sentinel Application

- ♦ All unnecessary ports must be turned off.
- ♦ Whenever possible, a service port must listen only for local connections and not allow remote connections.

- ♦ Install files with the least privileges so that the least number of users can read the files.
- ♦ Default passwords must not be used.
- ♦ Reports against the database must be run as a user that only has select permissions on the database.
- ♦ All Web interfaces require HTTPS.
- ♦ A Nessus scan must be run against the application and all potential security problems must be addressed.
- ♦ All communication over the network must use SSL by default and must be configured for authentication.
- ♦ User account passwords must be encrypted by default when they are stored on the file system or in the database.

4.2.2 Sentinel Appliance

In addition to the points mentioned in [“Sentinel Application” on page 69](#), you must also do the following:

- ♦ Install only the required packages.
- ♦ Do not use any default passwords for the appliance operating system or the control center.
- ♦ Ensure that the firewall is enabled by default and close all unnecessary ports in the firewall configuration.
- ♦ Run a Nessus scan against the appliance and address all potential security problems.

Sentinel is automatically configured to monitor the local operating systems syslog messages.

4.3 Best Practices

Use the following best practices to secure your Sentinel server:

- ♦ [Section 4.3.1, “Changing Passwords,” on page 70](#)
- ♦ [Section 4.3.2, “Enforcing Password Policies for Users,” on page 71](#)
- ♦ [Section 4.3.3, “Securing Communication with Collector Managers and Event Sources,” on page 72](#)
- ♦ [Section 4.3.4, “Securing Communication with Networked Storage,” on page 72](#)
- ♦ [Section 4.3.5, “Auditing Sentinel,” on page 72](#)
- ♦ [Section 4.3.6, “Determining if Raw Data Files Were Tampered With,” on page 73](#)
- ♦ [Section 4.3.7, “Using CA Signed Certificates,” on page 74](#)

4.3.1 Changing Passwords

To increase security, you can change the passwords of the system users created during the installation of Sentinel. There are two different types of users:

- ♦ [“Operating System Users” on page 71](#)
- ♦ [“Application and Database Users” on page 71](#)

Operating System Users

The Sentinel server installation creates a `novell` system user and `novell` group that owns the installed files within the `install_directory`. The user's home directory is set to `/home/novell`. By default, if a new user is created, the password for the user is not set in order to maximize security. If you want to log in to the system as the `novell` user, you must set a password for the user after installation.

Application and Database Users

Sentinel application users are native database users and their passwords are protected by the native database platform, unless LDAP authentication is used. These users have only read access to certain tables in the database so that they can execute queries against the database. Users authenticated by LDAP do not have read access on the database.

The `admin` user is the administrator user for Sentinel user applications.

By default, the following database users are created during installation:

dbauser: The `dbauser` is created as a superuser who can manage the database and is typically the user who can log in to the `pgAdmin`. The password for the `dbauser` is the same as the `admin` user password during installation. This password is stored in the `user home directory/.pgpass` file. The system follows the PostgreSQL database password policies.

appuser: The `appuser` is the non-superuser used by Sentinel to connect to the database. The password for the `appuser` is the same as the password for the `admin` user during installation. This password is stored encrypted in the `/etc/opt/novell/sentinel/config/server.xml` file. To modify the password for `appuser`, in the database use the following command:

```
db.sh sql SIEM dbauser "ALTER ROLE appuser WITH password 'new_password'"
```

Update the `server.xml` file by using the using the `/opt/novell/sentinel/bin/dbconfig` utility.

For more information, see [Section 1.5, "Command Line Utilities," on page 46](#).

NOTE: There is also a PostgreSQL database user that owns the entire database, including system database tables. By default, the `postgres` database user is set to `NOLOGIN`, so that no one can log in as the PostgreSQL user.

4.3.2 Enforcing Password Policies for Users

The Sentinel utilizes standards-based mechanisms to make it easier to enforce password policies.

The installer creates and configures a PostgreSQL database with the following users.

dbauser: The database owner (database administrator user). The password is set during the installation process.

appuser: A user that is used by the Sentinel server process (the `ConnectionManager`) to log in to the database. The password is same password you entered for the `admin` user during installation.

admin: The administrator credentials can be used to log in to the Sentinel Web interface. The password is set during the installation process.

By default, user passwords are stored within the PostgreSQL database embedded in Sentinel. PostgreSQL provides the option to utilize a number of these standards-based authentication mechanisms, as described in “Client Authentication” (<http://www.postgresql.org/docs/8.3/static/client-authentication.html>)

Utilizing these mechanisms affects all user accounts in Sentinel, including users of the Web application and accounts used only by back-end services, such as `dbauser` and `appuser`.

A simpler option is to use an LDAP directory to authenticate Web application users. To enable this option by using the Sentinel Web interface, see [Chapter 3, “Configuring LDAP Authentication,” on page 63](#). This option has no affect on accounts used by back-end services, which continue to authenticate through PostgreSQL unless you change the PostgreSQL configuration settings.

You can achieve robust Sentinel password policy enforcement by using these standards-based mechanisms and the existing mechanisms in your environment, such as your LDAP directory.

4.3.3 Securing Communication with Collector Managers and Event Sources

You can configure Sentinel to securely collect data from various event sources. However, secured data collection is determined by the specific protocols supported by the event source. For example, the Check Point LEA, Syslog, and Audit Connectors can be configured to encrypt their communication with event sources.

For more information on the possible security features that can be enabled, see the [Sentinel Plug-ins Web site](http://support.novell.com/products/sentinel/secure/sentinelplugins.html) (<http://support.novell.com/products/sentinel/secure/sentinelplugins.html>).

4.3.4 Securing Communication with Networked Storage

You must consider the security implications before deciding the type of networked storage location to use. If you are using CIFS or NFS servers as networked storage locations to store the Sentinel event data and raw data, remember that these protocols do not offer data encryption. An alternative is to use direct attached storage (local or SAN), which does not have the same security vulnerabilities. If you choose to use CIFS or NFS, it is important to configure the CIFS or NFS server to maximize the security of your data.

For more information about configuring the networked storage location server settings, see [Section 5.2.3, “Configuring Networked Storage,” on page 91](#).

4.3.5 Auditing Sentinel

Sentinel generates audit events for many actions performed by users and also for actions performed internally for system activities. These events are tagged with the `Sentinel` tag and can be included within a report by selecting *include system events* and searching by using the `rv145:Sentinel` query. However, you must have the necessary permissions to view system events. For more information, see [Chapter 2, “Configuring Users and Roles,” on page 55](#).

Sentinel includes reports that are preconfigured to include only the events tagged with the `Sentinel` tag.

A well-audited Sentinel system not only audits the events occurring within Sentinel, but also the infrastructure that Sentinel is running on top of. You can set up data collection from the machines and the devices that make up the Sentinel infrastructure and tag them with the `Sentinel` tag to enable a complete auditing of the systems that can affect the behavior of Sentinel.

4.3.6 Determining if Raw Data Files Were Tampered With

The raw data files are stored in one of the following locations:

- ◆ Local storage location: `<Sentinel data directory>/rawdata/online`
- ◆ Networked storage location: `<Sentinel networked storage directory>/rawdata_archive`

If your networked storage is NFS or CIFS, then the NFS/CIFS share is automatically mounted to the `/var/opt/novell/sentinel/data/archive_remote` directory on the Sentinel server. If the networked storage is SAN, then the NFS/CIFS share is mounted to the directory configured by you.

Each raw data file is either a `.zip` file or a `.log` file. A `.zip` file contains the `.log` files in a compressed format. For more information on raw data files, see [Section 5.1.1, “Raw Data,” on page 83](#).

You can check the integrity of raw data files present in local or networked storage by using `Collection > Raw Data UI`.

To determine if the deleted raw data files were tampered with:

- ◆ Verify the sequence number of JSON records. All JSON records have same `ChainID` with a monotonically increasing `ChainSequence` number starting with zero. There are no gaps or missing numbers in the `ChainID` sequence. If a new `ChainID` is present, then its `ChainSequence` begins with zero. If there are gaps in the sequence of numbers, the records were either tampered with or were manually deleted.
- ◆ Verify the `RawDataHash` against the `RawData`. To do this, convert the `RawData` value to a sequence of bytes in UTF-8 format. Calculate a 256 SHA digest against those bytes. Convert the digest to a HEX string, and compare the string with the value in `RawDataHash`. If they are not identical, either the `RawData` or the `RawDataHash` file was tampered with.

If, for example, you want to compute the hash of a file on the file system on Linux, specify a command similar to the following:

```
sha256sum F6673C60-573A-102D-ADE0-003048306A7C/2010-06/15-1600.zip
```

For example, if, you want to query the database for the hash of a file, you can specify a command similar to the following:

```
db.sh sql SIEM dbauser "select FILE_HASH from RAW_DATA_FILES_INFO where FILE_NAME= '/F6673C60-573A-102D-ADE0-003048306A7C/2010-06/15-1600.zip' ;"
```

However, there is a possibility that a person tampered with the files in such a way that the tampering cannot be detected, because the person also recomputed the sequence number or the `RawDataHash`. To determine if the raw data files were tampered with, there is another method by using the hash key values of each raw data file stored in the database. The Sentinel server calculates a hash key value for every raw data file and stores it in the `RAW_DATA_FILES_INFO` table in the database.

The table has the following columns:

- ◆ **FILE_NAME:** This column contains the relative file name in the following format:
`<Event Source UUID>/<Date>/<RawDataFile>`
- ◆ **STATE:** This column indicates if the raw data file is in the local storage location or the networked storage location. If the value is `ARCHIVED`, the raw data file is in the networked storage location. If the value is `ONLINE` or `COMPRESSED`, the raw data file is in the local storage location. If the value is `DELETED`, it indicates that the file is deleted from the disk and was not present either in local or in networked storage location.

- ♦ **FILE_HASH:** The hash value is computed after the file is compressed and placed in a .zip file. Therefore, only files in the COMPRESSED or ARCHIVED state have a hash value. The FILE_HASH column contains a SHA256 hash key value computed over the contents of the file. The file is treated as a stream of binary bytes in order to compute the hash. The hash is stored as a HEX string (lowercase).

To determine if a file is tampered with, compute the SHA-256 hash, convert it to a HEX string (lowercase), then compare this computed value with the hash value stored in the RAW_DATA_FILES_INFO table. If the values are different, it indicates that either the file or the database has been tampered with.

To determine if the files were deleted in an unauthorized way, you can scan the records in the RAW_DATA_FILES_INFO table and look for files whose STATE value is ARCHIVED, ONLINE, or COMPRESSED. You can ignore those marked DELETED. If the STATE value is ARCHIVED, the raw data file should be in the networked storage location. If the STATE value is ONLINE or COMPRESSED, the raw data file should be in the local storage location or the networked storage location.

4.3.7 Using CA Signed Certificates

Sentinel uses several digital, public-key certificates as part of establishing secure TLS/SSL communications. During the initial configuration of Sentinel, these certificates are self-signed. In some circumstances, it might be necessary to obtain certificates digitally signed by a certificate authority (CA).

You can replace the self-signed certificate with a certificate signed by a well-known CA, such as VeriSign, Thawte, or Entrust. You can also replace the self-signed certificate with a certificate digitally signed by a less common CA, such as a CA within your company or organization.

NOTE: There are many well-known CAs and identifying which CAs are most commonly used varies with the country.

This section provides information on various certificates used in Sentinel and also provides instructions on configuring the TLS/SSL certificates to get them digitally signed by CA and then importing the digitally signed certificates into Sentinel:

- ♦ [“Types of Certificates” on page 74](#)
- ♦ [“Configuring the TLS/SSL Certificates” on page 75](#)
- ♦ [“Using a Signed Certificate on a Remote Collector Manager or Remote Correlation Engine” on page 77](#)

Types of Certificates

- ♦ [“Web Server Certificate” on page 75](#)
- ♦ [“Java Messaging Service Certificates” on page 75](#)
- ♦ [“SSL Proxy Server Certificate” on page 75](#)

Web Server Certificate

The Web server certificate is used for the following purposes:

- ♦ It is used with Web browsers to connect to the Sentinel Web user interface.
- ♦ It is used to establish trust relationships for the REST API calls between Sentinel instances. For example, it is used when configuring Distributed Search.

If the Web server certificate is not signed by a well-known CA and you connect to the Sentinel Web user interface, the `Connection is Untrusted` message is displayed.

Java Messaging Service Certificates

The Java Messaging Service (JMS) certificates include the following:

- ♦ Broker Certificate
- ♦ Client Certificate

The JMS certificates are used to establish secure communications between various components of Sentinel, including the Sentinel server and remote Collector Managers.

SSL Proxy Server Certificate

The Client Proxy Server certificate is used to establish secure communication between the Sentinel server and client applications, such as the Sentinel Control Center or the Solution Designer. This certificate is not used with the Sentinel Web interface.

Configuring the TLS/SSL Certificates

Sentinel provides the `ssl_certs` command line tool that helps with the certificate signing process. This tool is available at:

```
<installation_root>/opt/novell/sentinel/setup/ssl_certs
```

The tool can be run in an interactive mode or with the command line specifications and options. To see the command line options, change to the directory that contains `ssl_certs`, then run the `-help` command.

Configuring the TLS/SSL certificates involves the following steps:

- ♦ [“Generating a Certificate Signing Request” on page 75](#)
- ♦ [“Getting the Certificate Signing Requests Signed by the CA” on page 76](#)
- ♦ [“Importing the Digitally Signed Certificates into Sentinel” on page 76](#)

Generating a Certificate Signing Request

To obtain a digitally signed certificate, you must first generate a certificate signing request, which is presented to the CA. To generate one or more certificate signing requests, perform the following steps on the Sentinel server:

- 1 Log in as the `novell` user, or switch to the `novell` user.
- 2 Change to the `setup` directory:

```
cd $APP_HOME/setup
```

- 3 Run the `./ssl_certs` script

The following options are displayed:

1. Generate certificate signing requests
2. Import Certificate Authority root certificate
3. Import certificates signed by Certificate Authority
4. Exit

4 Enter 1.

The following options are displayed if you are running tool on the Sentinel server:

1. Web Server
2. Java Messaging Service
3. Client Proxy Service
4. All
5. Done

or

If you run this tool on a remote Collector Manager or remote Correlation engine you are only presented with two options:

1. Java Messaging Service
2. Done

5 Specify the service for which you want to obtain the signed certificates.

6 Specify a filename where the certificate signing request must be saved.

The default filename is based on the internal name of the certificate entry.

7 Select another service if necessary, or enter 5 to select Done to exit from the service option.

8 Enter 4 to exit from the TLS/SSL certificate configuration.

The certificate signing requests are now saved in the specified files.

Getting the Certificate Signing Requests Signed by the CA

1 Submit the certificate signing requests to the CA for signature.

2 Obtain the signed certificate files from the CA.

The details of how this is done depend on the CA. For more information, consult your CA.

Importing the Digitally Signed Certificates into Sentinel

Copy the files that contains the digital certificates signed by the CA to the Sentinel server. If the files are signed by an enterprise or organizational CA rather than a well-known CA, you must copy the CA's self-signed root certificate to the Sentinel server.

To import the certificate files to the Sentinel server:

1 Log in as the novell user, or switch to the novell user.

2 Change to the setup directory:

```
cd $APP_HOME/setup
```

3 Run the `.ssl/certs` command.

The following options are displayed:

1. Generate certificate signing requests
2. Import Certificate Authority root certificate
3. Import certificates signed by Certificate Authority
4. Exit

- 4 (Conditional) For certificates that are signed by the enterprise or organizational CAs, enter 2, then specify the name of the file that contains the CA root certificates.
- 5 (Conditional) For certificates that are signed by a well-known CA such as Verisign or Entrust, enter 3.
- 6 Select the service for which you obtained the signed certificates.
- 7 Specify the name of the file that contains the CA's signed digital certificate.
- 8 Select another service if necessary, or enter 5 to select Done and exit from the service option.
- 9 Enter 4 to exit from the TLS/SSL certificate configuration.
- 10 Restart Sentinel.

Using a Signed Certificate on a Remote Collector Manager or Remote Correlation Engine

There can be conflicts with the certificates on the remote Collector Manager and remote Correlation Engine, depending on the order products are installed and certificates are generated. A common cause of conflicts occurs if you installed products in the following order:

1. You installed the server Sentinel server.
2. You installed a remote Collector Manager or Correlation Engine.
3. You obtained and imported a digitally signed certificate into the first Sentinel server.

If you do things in this order, the certificates on the remote Collector Manager and Correlation Engine don't match the certificates on the Sentinel server. This causes errors when trying to access the Sentinel Web interface and other Sentinel services.

To fix this issue you must import the digitally signed certificate into the remote Collector Manager and Correlation Engine.

4.4 Network Communication Options

The various components of Sentinel communicate across the network, and there are different types of communication protocols used throughout the system. All of these communication mechanisms affect the security of your system.

- ♦ [Section 4.4.1, "Communication between Sentinel Processes," on page 78](#)
- ♦ [Section 4.4.2, "Communication between Sentinel and the Sentinel Control Center and Solution Designer Client Applications," on page 79](#)
- ♦ [Section 4.4.3, "Communication between the Server and the Database," on page 79](#)
- ♦ [Section 4.4.4, "Communication with Web Browsers," on page 79](#)
- ♦ [Section 4.4.5, "Communication between the Database and Other Clients," on page 79](#)

4.4.1 Communication between Sentinel Processes

Sentinel processes include the Sentinel server, Correlation Engine, and Collector Manager. They communicate with each other by using ActiveMQ.

The communication between these server processes is by default over SSL via the ActiveMQ message bus. The processes use SSL by reading the following information in `/etc/opt/novell/sentinel/config/configuration.xml`:

```
<jms brokerURL="failover://(ssl://localhost:${activemq.port.userapps}?wireFormat.maxInactivityDuration=30000)?randomize=false" interceptors="compression" keystore="${esecurity.config.home}/etc/opt/novell/sentinel/config/.activemqclientkeystore.jks" keystorePassword="password" password-file="${esecurity.config.home}/etc/opt/novell/sentinel/config/activemqusers.properties" username="system"/>
```

The `jms` strategy shown in this XML snippet defines how the Sentinel process connects to the server. This snippet defines the client-side settings of the connection.

Table 4-1 XML Entries in the `configuration.xml` File

XML Entry	Description
<code>ssl://</code>	Indicates that SSL is used for secure connection. You should not modify this value.
<code>localhost</code>	The hostname or IP address where the Java message service (JMS) server is running.
<code>61616</code>	The port that the JMS server is listening on.
<code>?wireFormat.maxInactivityDuration=0&jms.copyMessageOnSend=false</code>	This is where ActiveMQ configuration parameters are passed to the transport mechanism. These entries should be modified only if you are an expert in ActiveMQ.
<code>interceptors="compression"</code>	Enables compression over the connection. You should not modify this value.
<code>keystore="/etc/opt/novell/sentinel/config/.activemqclientkeystore.jks"</code>	The path to the Java keystore, which is used to check if the server is trusted.
<code>keystorePassword="password"</code>	The password to the Java keystore file.
<code>password="1fef3bccd3fbc5cd795346a9f04ddc"</code>	The password to present to ActiveMQ for authenticating the connection. This corresponds to a password in the <code>/etc/opt/novell/sentinel/config/activemqusers.properties</code> file.
<code>username="system"</code>	The username to present to ActiveMQ for authenticating the connection. This corresponds to a username in the <code>/etc/opt/novell/sentinel/config/activemqusers.properties</code> file.

The server-side settings are defined in the `/etc/opt/novell/sentinel/config/activemq.xml` file. For instructions on how to edit the `activemq.xml` file, see the [ActiveMQ Web site \(http://activemq.apache.org/\)](http://activemq.apache.org/). However, NetIQ does not support modifying of the server-side settings.

4.4.2 Communication between Sentinel and the Sentinel Control Center and Solution Designer Client Applications

The Sentinel Control Center and Solution Designer client applications use SSL communication through the SSL proxy server by default.

The client applications uses SSL by reading the following information in `/etc/opt/novell/sentinel/config/configuration.xml`:

```
<strategy active="yes" id="proxied_client"
location="com.esecurity.common.communication.strategy.proxystrategy.ProxiedClients
strategyFactory">
  <transport type="ssl">
    <ssl host="10.0.0.1" port="10013" keystore="./novell/sentinel/
.proxyClientKeystore" />
  </transport>
</strategy>
```

4.4.3 Communication between the Server and the Database

The protocol used for communication between the server and the database is defined by a JDBC driver.

Sentinel uses the PostgreSQL driver (`postgresql-version.jdbc3.jar`) to connect to the PostgreSQL database, which is a Java (Type IV) implementation. This driver supports encryption for data communication. To download the driver, refer to the [PostgreSQL Download Page \(http://jdbc.postgresql.org/download.html\)](http://jdbc.postgresql.org/download.html). To configure the encryption, refer to [PostgreSQL Encryption Options \(http://www.postgresql.org/docs/8.1/static/encryption-options.html\)](http://www.postgresql.org/docs/8.1/static/encryption-options.html).

NOTE: Turning encryption on has a negative impact on the performance of the system. Therefore, this security concern needs to be weighed against your performance needs. The database communication is not encrypted by default for this reason. Lack of encryption is not a major concern because communication with the database occurs over the localhost network interface.

4.4.4 Communication with Web Browsers

The Web server is by default configured to communicate via HTTPS. For more information, see the [Jetty documentation \(http://wiki.eclipse.org/Jetty/Howto/Configure_SSL\)](http://wiki.eclipse.org/Jetty/Howto/Configure_SSL).

4.4.5 Communication between the Database and Other Clients

You can configure the PostgreSQL SIEM database to allow connections from any client machine that uses pgAdmin or another third-party application.

The PostgreSQL database is compiled with the `--with-openssl` flag. You can configure it to use encrypted communication, although that is not the default setting. Typically all database communication in Sentinel is performed locally and not over the network.

To allow pgAdmin to connect from any client machine, add the following line in the `/var/opt/novell/sentinel/3rdparty/postgresql/data/pg_hba.conf` file:

```
host all all 0.0.0.0/0 md5
```

If you want to limit the client connections that are allowed to run and connect to the database through pgAdmin, specify the IP address of the host in the above line.

The following line in the `pg_hba.conf` file is an indicator to PostgreSQL to accept connections from the local machine so that pgAdmin is allowed to run only on the server.

```
host all all 127.0.0.1/32 md5
```

To allow connections from other client machines, you can add additional `host` entries in the `pg_hba.conf` file.

To provide maximum security, by default, PostgreSQL only allows connections from the local machine.

4.5 Sensitive Data Locations

For certain components, passwords must be stored so that they are available to the components when the system needs to connect to a resource such as a database or an event source. In this case, the password is first encrypted to avoid unauthorized access to the clear-text password.

Even if the password is encrypted, you must ensure that the access to the stored password data is protected in order to avoid password exposure. For example, you can set permissions to ensure that files with sensitive data are not readable by other users.

Database credentials are stored in the `/etc/opt/novell/sentinel/config/server.xml` file.

```
<class>esecurity.base.ccs.comp.dataobject.ConnectionManager</class>
  <property name="username">appuser</property>
  <property name="password">7fA+ogBMeK7cRbJ+S6xJ/
InLBui+sRVGK5qYycDxfIqGDHVX9FApWg==</property>
```

The following database tables store passwords (/certificate) in encrypted format. You must limit access to these tables.

- ♦ **EVT_SRC:** column: `evt_src_config` column data
- ♦ **evt_src_collector:** column: `evt_src_collector_props`
- ♦ **evt_src_grp:** column: `evt_src_default_config`
- ♦ **md_config:** column: data
- ♦ **integrator_config:** column: `integrator_properties`
- ♦ **md_view_config:** column: `view_data`
- ♦ **esec_content:** column: `content_context`, `content_hash`
- ♦ **esec_content_grp_content:** column: `content_hash`
- ♦ **sentinel_plugin:** column: `content_pkg`, `file_hash`

Sentinel stores both configuration data and event data in the following locations:

Table 4-2 Locations for Configuration Data and Event Data

Components	Location for Configuration Data	Location for Event Data
Sentinel server	<p>The database tables and file system at <code>/etc/opt/novell/sentinel/config</code>.</p> <p>This configuration information includes the encrypted database, event source, integrators, and passwords.</p>	<p>The database (for example, <code>CORRELATED_EVENTS</code> and <code>EVT_RPT_*</code> tables) and the file system at <code>/var/opt/novell/sentinel/data/eventdata</code>, <code>/var/opt/novell/sentinel/data/rawdata</code>, <code>/var/opt/novell/sentinel/data/server.cache</code>, <code>/var/opt/novell/sentinel/data/map_data</code>, and <code>/var/opt/novell/sentinel/3rdparty/mongodb</code>.</p>
Collector Manager	<p>The file system at <code>/etc/opt/novell/sentinel/config</code>. The most sensitive configuration information is the client key pair used to connect to the message bus.</p>	<p>Event data might be cached on the file system during error conditions such as the message bus being down or event overflow. This event data is stored in the <code>/var/opt/novell/sentinel/data/collector_mgr.cache</code> directory.</p>

4.6 Applying Updates for Security Vulnerabilities in Embedded Third-Party Products

Sentinel contains embedded third-party products such as the Sun JRE, Jetty, PostgreSQL, and ActiveMQ. Sentinel includes patches to address the security vulnerabilities (CVE) for these products when updates for Sentinel are released.

However, each of these products has its own release cycle, which means that there might be CVEs that are discovered before a Sentinel update is released. You need to separately review the CVEs for each embedded third-party product, and decide whether to apply these updates to your Sentinel system outside of the Sentinel updates.

If you decide to apply patches to address these CVEs outside of a Sentinel update, use the instructions in TID 7008820 in the [Novell Support Knowledge Base \(http://www.novell.com/support/\)](http://www.novell.com/support/).

5 Configuring Data Storage

Sentinel stores raw data and compressed event data on the local file system. You can configure Sentinel to store the data in a networked location for long-term storage.

The data files are deleted from the local and networked storage locations on a configured schedule. Raw data retention is governed by a single raw data retention policy. Data retention is governed by a set of event data retention policies. All of these policies are configured by the Sentinel administrator.

- ♦ [Section 5.1, “Types of Data,” on page 83](#)
- ♦ [Section 5.2, “Configuring Networked Storage Locations,” on page 89](#)
- ♦ [Section 5.3, “Configuring Disk Space Usage,” on page 95](#)
- ♦ [Section 5.4, “Verifying and Downloading Raw Data Files,” on page 95](#)
- ♦ [Section 5.5, “Configuring Data Retention Policies,” on page 96](#)
- ♦ [Section 5.6, “Configuring Data Synchronization,” on page 99](#)
- ♦ [Section 5.7, “Viewing Local and Networked Storage Capacity,” on page 104](#)
- ♦ [Section 5.8, “Using Sequential-Access Storage for Long Term Data Storage,” on page 104](#)
- ♦ [Section 5.9, “Data Expiration Policy,” on page 108](#)

5.1 Types of Data

Sentinel receives two separate but similar data streams from the Collector Managers: the event data and the raw data. The data is moved from the local, compressed, file-based storage to a user-configured, compressed networked storage location on a regular basis.

- ♦ [Section 5.1.1, “Raw Data,” on page 83](#)
- ♦ [Section 5.1.2, “Event Data,” on page 88](#)

5.1.1 Raw Data

The raw data files are unprocessed events that are received by the Connector and sent directly to the Sentinel message bus. This data is written to the Sentinel server. When the event is sent to the message bus, the following additional information is also sent without altering the original event:

- ♦ SHA-256 hash of the event
- ♦ Chaining indicator (which is reset to 0 whenever the Sentinel event source is restarted)
- ♦ Raw Data ID (in `s_RV25`)
- ♦ Event source, Connector, Collector, and Collector Manager node IDs

All raw data is sent to Sentinel without filtering. Because the raw data is not searched or used to generate reports, the data is not indexed.

- ♦ [“Raw Data Storage” on page 84](#)
- ♦ [“Raw Data Representation” on page 85](#)
- ♦ [“Disabling Raw Data Collection” on page 88](#)

Raw Data Storage

In Sentinel, raw data is always stored. Raw data is stored in partitions that are based on the time and the event source. Raw data partitions are individual files. They are created every hour, and are closed within 10 minutes after the elapsed time. Older, inactive partitions are compressed.

The raw data files are stored in one of the following locations:

- ♦ Local storage location: `<Sentinel data directory>/rawdata/online`
- ♦ Networked storage location: `<Sentinel archive directory>/rawdata_archive`

When a raw data file is closed, it is renamed to identify the closed files. Files in the open state have a `.open` extension. When they are closed, they are renamed with a `.log` extension. At the configured interval, after they are closed, they are compressed and given a `.zip` extension. The compressed raw data files are moved from the local storage to the networked storage location.

The following table describes the directory structure of the raw data in the local storage under the installation directory:

Table 5-1 Raw Data Directory Structure

Directory Structure	Description
<code>/data</code>	The primary directory for all data storage.
<code>/data/rawdata</code>	The subdirectory where all raw data is stored.
<code>/data/rawdata/online</code>	The directory where all the raw data in the local storage is stored.
<code>/data/rawdata/ EventSource UUID</code>	There is one subdirectory for each event source under the <code>online</code> subdirectory. That subdirectory contains all raw data received from that event source. The subdirectory name is the universally unique identifier (UUID) of the event source (for example, E20D0840-1E0A-102C-9F30-000C2949BA91).
<code>/data/rawdata/ EventSource UUID/ Month</code>	Data in the event source subdirectory is partitioned by month. Each month has its own subdirectory. The subdirectory name is in the <code>yyyy-mm</code> format. For example, 2009-05 indicates May 2009.

Directory Structure	Description
/data/rawdata/ EventSource UUID/ Month/1 Hour Data Files	<p>Each file in the <code>Month</code> directory contains data received during a specific one-hour period. Most data in the file has a time stamp that is within the one-hour period.</p> <p>The name of the file indicates the day of the month and the one-hour period that is represented.</p> <p>The filename format is <code>dd-hhmm.extension</code>.</p> <p><i>dd</i> is the day of the month.</p> <p><i>hh</i> is the hour of the day.</p> <p><i>mm</i> is the minute of the hour.</p> <p>The extension is either <code>.open</code> or <code>.log</code> or <code>.zip</code> (compressed).</p> <p>For example:</p> <p>A filename of <code>08-1300.open</code> indicates that the file contains uncompressed data received on the 8th day of the month between 01.00 p.m. and 02.00 p.m.</p> <p>A filename of <code>08-0900.log</code> indicates that the file contains uncompressed data received on the 8th day of the month between 09.00 a.m. and 10.00 a.m. The file is closed, but not yet compressed.</p> <p>A filename of <code>08-0000.zip</code> indicates that the file contains compressed data received on the 8th day of the month between 12.00 a.m. and 01.00 a.m.</p>

If the raw data files are stored in the local storage location, the full path name of the file is in the following format:

```
<Sentinel data directory>/rawdata/online/<event source UUID>/<Date>/<RawDataFile>
```

For example:

```
/var/opt/novell/sentinel/data/rawdata/online/A75CF6A0-4948-102D-A615-000C29A9C3DB/  
2010-05/24-0600.zip
```

In this example, `/var/opt/novell/sentinel/data` is the data directory for Sentinel.

If the raw data files are stored in the networked storage location, the full path name would be as follows:

```
<Sentinel archive directory>/rawdata_archive/<event source UUID>/<Date>/  
<RawDataFile>
```

For example:

```
/sentinel_archive_data/rawdata_archive/A75CF6A0-4948-102D-A615-000C29A9C3DB/2010-  
05/24-0600.zip
```

In this example, `/sentinel_archive_data` is the networked storage directory configured by the user.

Raw Data Representation

Each raw data event is represented as a single line in a raw data file. Each line is a JSON object with the following format:

```

{
  "EventDate": "<date>",
  "EventRecordID": "<event record uuid>",
  "RawData": "<raw data>",
  "RawDataHash": "<SHA256 hash of raw data, in hex format>",
  "EventSourceManagerID": "<uuid of event source manager>",
  "CollectorID": "<uuid of collector>",
  "EventSourceID": "<uuid of event source>",
  "ChainID": "<chain ID>",
  "ChainSequence": "<Sequence number>"
}

```

The following table describes each of the fields in the raw data event:

Table 5-2 Raw Data Representation

Field Name	Description
EventDate	<p>The date and time when Sentinel received this event and not the date and time when the event occurred.</p> <p>Example: "05/07/2009 05:23.790"</p>
EventRecordID	<p>The unique ID identifying the raw data record.</p> <p>Example: "595829C0-1C8F-102C-A922-000C2949BA91"</p> <p>If an event was generated as a result of parsing a raw data record, this ID is set in the event RecordID field. Because of filtering, not all raw data records result in an event.</p>
RawData	<p>The original raw data received by the event source.</p>
RawDataHash	<p>The SHA-256 hash of the RawData value represented as a HEX string. The hash is calculated by converting the RawData value to a UTF-8 string and then performing the hash over that string.</p> <p>To detect tampering, each raw data event is stored with a SHA-256 hash value.</p> <p>Example: cc661009e2f3dc565c0c7fe25b705219004dcd8132c0b0a7e987bfdcb55e49cf</p>
EventSourceID	<p>The UUID of the event source from which the raw data originated.</p> <p>Example: A2A0C600-1C6C-102C-A781-000C2949BA91</p>
EventSourceGroupID	<p>The UUID of the event source group (Connector) to which the event source was connected when the raw data was received.</p> <p>Example: A2A0C600-1C6C-102C-A77A-000C2949BA91</p> <p>Different raw events from the same event source can have different event source group IDs, because event sources can be moved from one Connector to another.</p>
CollectorID	<p>The UUID of the Collector that the Connector and event source were connected to when the raw data was received.</p> <p>Different raw events from the same event source can have different Collector IDs, because event sources and event source groups can be moved from one Collector to another.</p> <p>Example: A2A0C600-1C6C-102C-A779-000C2949BA91</p>

Field Name	Description
EventSourceManagerID	<p>The UUID of the Event Source Manager (Collector Manager) object where this raw data was received.</p> <p>Example: C76D2820-C395-1029-BB86-001321B5C0B3</p>
ChainID	<p>A random number that identifies a raw data chain. Whenever an event source is stopped and restarted between generation of raw data events, a new ChainID number is generated.</p> <p>To detect tampering, each raw data event is stored with a ChainID and a ChainSequence number.</p> <p>Example: 1241630654754</p>
ChainSequence	<p>A sequence number within a particular raw data chain.</p> <p>The raw data events in a given raw data chain must have an uninterrupted sequence of numbers starting with 0. In addition, all raw data events in a given raw data chain must appear sequentially in the files, with no other chains intermixed. If a raw data chain can span files, the sequence should continue uninterrupted into the file that represents every hour during which raw data was received.</p> <p>Example: 4</p> <p>If no raw data is received for the one-hour period, the file records only from the next arrival of raw data. Nonetheless, the raw data chain sequence should continue uninterrupted until a new raw data chain begins. A new raw data chain is signaled by a changed ChainID value, and a ChainSequence value of zero (0).</p>

The following examples show three raw data records:

```
{
  "EventDate": "05\24\2010 06:15:06.676",
  "EventRecordID": "A75CF6A0-4948-102D-A61C-000C29A9C3DB",
  "RawData": "Sep 22 10:22:00 testhost Message #100",
  "RawDataHash": "7003c0e0be4ddf43a3b49026a37483f59c7f839950f581ec9fde5dea43da90f5",
  "EventSourceManagerID": "C76D2820-C395-1029-BB86-001321B5C0B3",
  "CollectorID": "A75CF6A0-4948-102D-A613-000C29A9C3DB",
  "EventSourceGroupID": "A75CF6A0-4948-102D-A614-000C29A9C3DB",
  "EventSourceID": "A75CF6A0-4948-102D-A615-000C29A9C3DB",
  "ChainID": "1274696106664",
  "ChainSequence": "0"
}
{
  "EventDate": "05\24\2010 06:15:07.358",
  "EventRecordID": "A75CF6A0-4948-102D-A624-000C29A9C3DB",
  "RawData": "Sep 22 10:22:00 testhost Message #99",
  "RawDataHash": "f5681ba965144d2d22b13188767d94540b5fe57904afcee5821854bde2afca72",
  "EventSourceManagerID": "C76D2820-C395-1029-BB86-001321B5C0B3",
  "CollectorID": "A75CF6A0-4948-102D-A613-000C29A9C3DB",
  "EventSourceGroupID": "A75CF6A0-4948-102D-A614-000C29A9C3DB",
  "EventSourceID": "A75CF6A0-4948-102D-A615-000C29A9C3DB",
  "ChainID": "1274696106664",
}
```

```

    "ChainSequence": "1"
  }
  {
    "EventDate": "05\24\2010 06:15:07.988",
    "EventRecordID": "A75CF6A0-4948-102D-A62A-000C29A9C3DB",
    "RawData": "Sep 22 10:22:00 testhost Message #98",
    "RawDataHash": "98435b5dba95633699b88d07782109876e8ceb4169d567602f2c92657118645d",
    "EventSourceManagerID": "C76D2820-C395-1029-BB86-001321B5C0B3",
    "CollectorID": "A75CF6A0-4948-102D-A613-000C29A9C3DB",
    "EventSourceGroupID": "A75CF6A0-4948-102D-A614-000C29A9C3DB",
    "EventSourceID": "A75CF6A0-4948-102D-A615-000C29A9C3DB",
    "ChainID": "1274696106664",
    "ChainSequence": "2"
  }
}

```

Disabling Raw Data Collection

By default, raw data collection is enabled on the Sentinel server. Collecting raw data can impact the performance of the server. Perform the following procedure on each Collection Manager where you want to disable raw data collection:

- 1 Open the `/etc/opt/novell/sentinel/config/event-router.properties` file in a text editor.
This is the default location of the file.
- 2 Change `esecurity.router.event.rawdata.send=true` to `esecurity.router.event.rawdata.send=false`.
- 3 Save the file, then restart the Collector Manager.

5.1.2 Event Data

Event data is created as a result of a Collector parsing and normalizing raw data. For more information about event processing and parsing, see [Chapter 6, “Configuring Data Collection,” on page 111](#). Raw data is subject to filtering rules set up on the event source, Connector, and Collector, so event data can be dropped, if necessary. Event data is dropped when you define the event routing rules. For more information, see [Chapter 8, “Configuring Event Routing Rules,” on page 141](#).

The event data partitions are closed after two days, and no more events are written to them. Even though the duration of the partition is only for one day, partitions are closed after two days to accommodate events arriving late. After the partitions are closed, a compressed copy of the partition is moved to networked storage. When the local storage reaches its maximum usage, the copy in the local storage is deleted and the copy in the network storage remains.

When the local copy remains, the search engine uses it for higher performance instead of using the copy on the network storage. Only when the local copy is deleted does the system then use the copy on the network storage.

Local storage partitions are stored in the `/var/opt/novell/sentinel/data/eventdata` directory, which is on the local file system. Partitions are created based on the dates and retention policies.

A central partition index is maintained in the database that keeps track of all the existing partitions and their location.

The following table describes the directory structure under the installation directory where event data is stored:

Table 5-3 Event Data Directory Structure

Directory Structure	Description
/data	The primary directory for all data storage.
/data/eventdata	The subdirectory where all event data is stored.
/data/eventdata/ YYYYMMDD_<classid>	A partition consists of the events for a single day (midnight-midnight UTC) within a given data retention class and is held within a subdirectory named YYYYMMDD_<class-id>. YYYYMMDD: is the UTC date stamp. <class_id>: is a UUID identifier associated with the data retention class.
/data/eventdata/ YYYYMMDD_<class_id>/ events.evt	events.evt contains the binary event data for the partition. The format of the binary event data is stored as a Reliable Persistent Random Access Compressed Stream.
/data/eventdata/ YYYYMMDD_<class_id>/ index	The index directory contains the Lucene index for the partition.

5.2 Configuring Networked Storage Locations

All closed event data files are copied from the local storage location to the networked storage location. The original files are retained on Sentinel to facilitate faster searches. However, if the Sentinel server disk space usage nears a user-defined threshold, duplicate data files on the local storage area are deleted from the Sentinel server.

- ◆ [Section 5.2.1, “Supported Storage Options,” on page 89](#)
- ◆ [Section 5.2.2, “Types of Networked Storage,” on page 90](#)
- ◆ [Section 5.2.3, “Configuring Networked Storage,” on page 91](#)
- ◆ [Section 5.2.4, “Enabling or Disabling Networked Storage,” on page 93](#)
- ◆ [Section 5.2.5, “Unmounting a Networked Storage Location,” on page 94](#)
- ◆ [Section 5.2.6, “Changing the Networked Storage Location,” on page 94](#)

5.2.1 Supported Storage Options

Sentinel supports the following types of storage options:

- ◆ **Local Storage or SAN:** The local storage or Storage Area Network (SAN) option includes storage that is attached directly to the Sentinel machine. This option provides the best combination of performance, security, and reliability.
- ◆ **CIFS:** The Common Internet File System (CIFS) is a native Windows protocol. It is also known as the Server Message Block (SMB) protocol in later implementations. The latest implementation from Microsoft is referred to as SMB 2.

- ♦ **NFS:** The NFS protocol requires significant configuration to improve performance and security, and it is recommended only if you already have a well-established NFS infrastructure in your environment.

If the networked storage is an NFS server, additional configuration is necessary to ensure that the Sentinel server has the necessary permissions. See [“Exporting the Networked Storage Volume” on page 92](#) for more information.

WARNING: Only one Sentinel server should be configured to use a particular networked storage directory (remote share). Configuring the same networked storage location across multiple Sentinel servers can cause system failure.

The local storage must use a different partition than the partition that what is used for the networked storage.

- ♦ The system monitors the disk usage of both local storage and networked storage, freeing space on local storage when it fills up. If both storage locations share the same underlying file system partition, the way in which the partition usage changes as a result of deleting data confuses the system and could result in undesirable behavior.
- ♦ The event data is first copied to networked storage rather than moved, because there is an assumption that these are two different disk partitions. If they are in different disk partition instead of being on the same disk partition, the storage usage monitoring is confused by how the usage is changing and could result in undesirable behavior.

5.2.2 Types of Networked Storage

You can enable and configure networked storage for raw data and event data stored on the Sentinel server.

- ♦ [“Raw Data Storage” on page 90](#)
- ♦ [“Event Data Storage” on page 90](#)

Raw Data Storage

A raw data file can be in the `.open` state when the data is currently being written, in the `.log` state when the data is no longer being written to the file but the file is not yet compressed, or in the `.zip` state when the file is compressed. The file compression process runs every 10 minutes, by default. These compressed files appear in both the local storage and networked storage locations if networked storage is configured and enabled.

If networked storage is configured and enabled, compressed raw data files are copied to the configured networked storage location every 15 minutes.

For more information on raw data storage, see [“Raw Data Storage” on page 84](#).

Event Data Storage

If networked storage is enabled, the closed files are moved to networked storage every midnight UTC and also whenever the server starts. These files are compressed in the local storage location, but the file indexes are compressed before moving to the networked storage. If the networked storage location is not configured or if there is any problem while moving the closed files, attempts are made every 60 seconds to move the files to networked storage until it succeeds.

5.2.3 Configuring Networked Storage

The NFS, CIFS/SMB, and SAN must be configured so that Sentinel has read and write permissions.

For CIFS/SMB and NFS, if multiple Sentinel instances are moving the closed partitions to the same networked storage location, ensure that each Sentinel instance has its own unique directory on that networked storage location.

- ♦ [“Configuring a SAN/Local Directory as a Networked Storage Location” on page 91](#)
- ♦ [“Configuring an CIFS/SMB Server as a Networked Storage Location” on page 91](#)
- ♦ [“Configuring an NFS Server as a Networked Storage Location” on page 92](#)

Configuring a SAN/Local Directory as a Networked Storage Location

This is the preferable configuration for the best performance, security, and reliability.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
The configuration page is displayed.
- 4 From the Data Storage Location section, select *SAN (locally mounted)* as the networked storage location.
- 5 In the *Location* field, specify the local directory path or the location on which the storage area network (SAN) is mounted.
The SAN partition must be manually mounted before the location is specified.
- 6 Click *Test* to check if the write permissions for the specified location are available.
If the location is configured properly, a message is displayed confirming that the test is successful.
If the location is not configured, the test fails, and the reason for failure is displayed.
- 7 Click *Save* to configure the specified networked storage location.

Configuring an CIFS/SMB Server as a Networked Storage Location

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
- 4 In the Data Storage Location section, select *CIFS*.
- 5 Specify the following information:
Server: Specify the IP address or hostname of the machine where the CIFS server, also known as the SMB server, is configured.
Share: Specify the share name of the SMB or CIFS server. The mounted shares are unmounted when the server stops and are mounted again when the server starts. If the configured share unmounts, the Sentinel server detects this and mounts it again.
Username: Specify the username (if one is assigned) to access the share.
Password: Specify the password (if one is assigned) to access the share.

Mount Options: Specifies the options that are used while mounting the networked storage location of the SMB or the CIFS server.

You can specify new mount options. For more information about the available NFS mount options, see the [mount.cifs \(8\) - Linux man page \(http://linux.die.net/man/8/mount.cifs\)](http://linux.die.net/man/8/mount.cifs).

The default mount options are `file_mode=0660,dir_mode=0770`.

- 6 (Optional) Click *Restore Defaults* to restore the default mount options.
- 7 Click *Test* to mount the SMB or CIFS server and to check the write permissions on the server. If the CIFS server is configured properly, a message is displayed that the test was successful. If the CIFS server is not configured, the test fails, and the reason for failure is displayed.
- 8 Click *Save* to configure the specified networked storage location.

Configuring an NFS Server as a Networked Storage Location

The NFS protocol requires significant configuration to improve performance and security, and it is recommended only when you already have a well-established NFS infrastructure in your environment.

- ♦ “Exporting the Networked Storage Volume” on page 92
- ♦ “Configuring NFS as a Networked Storage Location” on page 93

Exporting the Networked Storage Volume

The NFS server needs to export (share) the networked storage volume to the Sentinel server so that the networked storage is readable by the `root` user on the Sentinel server. The settings described in this section indicate one method to achieve this readability:

- ♦ The NFS server must have a user and a group with a UID and a GID that correspond to the `novell` user and group on the Sentinel server.

In the following examples, the user on the NFS server is `novell` with `UID=5555` and the group is `novell` with `GID=5555`. The Sentinel server has the hostname `log-manager-server`, which can be resolved by the NFS server.

- ♦ The networked storage destination directory on the NFS server must be owned by the `novell` user and group. In the following examples, the networked storage destination is `/archive`.
- ♦ The `root` user on the Sentinel server must be mapped to the `novell` user and group on the NFS server.

- ♦ **Linux:** Add the following line to the `/etc/exports` file:

```
/archive sentinel=server(rw,root_squash,anonuid=5555,anongid=5555)
```

- ♦ **Solaris:** Add the following line to the `/etc/dfs/dfstab` file:

```
/usr/bin/share -F nfs -o sec=sys,rw=sentinel-server,anon=5555 -d "/archive"  
/archive
```

- ♦ **HP-UX:** Add the following line to the `/etc/exports` file:

```
archive -access=sentinel-server,anon=5555
```

You can speed up the archiving process by adding the `async` option. However, this might increase the risk of lost or corrupt networked storage if the NFS server crashes. The following examples demonstrate using the `async` option:

- ♦ **Linux:** Add the following line to the `/etc/exports` file:

```
/archive sentinel=server(rw,root_squash,anonuid=5555,anongid=5555),async
```

- ♦ **HP-UX:** Add the following line to the `/etc/exports` file:

```
archive -access=sentinel-server,anon=5555,async
```

For information on security recommendations for NFS, see [Chapter 4, “Security Considerations,”](#) on page 69.

Configuring NFS as a Networked Storage Location

You must configure networked storage in the Sentinel administrator interface as follows:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
- 4 In the Data Storage Location section, select the *NFS* option.
- 5 Specify the following information:

Server: Specify the IP address or hostname of the machine where the NFS server is configured.

Share: Specify the share name of the NFS server.

The mounted shares are unmounted when the server stops and are mounted again when the server starts. If the configured share unmounts, the Sentinel server detects this and mounts it again.

Mount Options: Specifies the options that are used while mounting the networked storage location of the NFS server.

You can also specify a new mount options. For more information about the available NFS mount options, see [NFS \(5\) Linux Programmer’s Manual \(http://unixhelp.ed.ac.uk/CGI/man-cgi?nfs+5\)](http://unixhelp.ed.ac.uk/CGI/man-cgi?nfs+5).

The default mount options are `soft,proto=tcp,retrans=1,timeo=60`.

- 6 (Optional) Click *Restore Defaults* to restore the default mount options.
- 7 Click *Test* to verify the configuration of the NFS server and to check the write permissions on the server. If the NFS server is configured properly, a message is displayed that the test was successful.

If the NFS server is not configured, the test fails and the reason for failure is displayed.

This procedure tests a subset of all of the settings that are necessary for the NFS server and client.

- 8 Click *Save* to configure the specified networked storage location.

5.2.4 Enabling or Disabling Networked Storage

The options to enable and disable networked storage appear only when the data storage location is configured. However, event search and reporting work even when the data storage is disabled.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
- 4 To enable writing to the data storage location, select *Enabled*.

If you use this option, you can write both the raw data and event data to the configured networked storage location. To configure the networked storage locations, refer to [“Configuring Networked Storage” on page 91](#).

- 5 To disable writing to the data storage location, select *Disabled*.

This selection disables the writing of the raw data and event data storage.

If you use this option, you cannot write to the data storage location, but you can still read the stored data. Search shows the events that are stored, and you can also download the stored raw data.

- 6 Click *Save*.

5.2.5 Unmounting a Networked Storage Location

If the networked storage location is unmounted, data storing is disabled and searches and reports results include only the local storage data. The *Unmount Networked Storage* option appears only if the data storage location is configured.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
- 4 To unmount the data storage location, select *Unmount Networked Storage*.

A confirmation message is displayed, asking if you really want to unmount the networked storage.

If you unmount networked storage, Sentinel can no longer access the data in the networked storage. If the networked storage location is configured to a remote location such as NFS or SMB/CIFS, the networked storage location is unmounted.

- 5 Click *Unmount Networked Storage*.

5.2.6 Changing the Networked Storage Location

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
- 4 In the Data Storage Location section, select *Change Location*. The *Change Location* option is displayed only if the networked storage location is configured.

A confirmation message is displayed, asking if you want to change the networked storage location.

- 5 Click *Change Location*.
- 6 Select the option to disable data collection.

You can select this option to avoid filling the local storage before data is moved to the new location. If this option is not selected and if the local storage is filled before the new data storage location is configured, the oldest data is deleted to make space for the incoming data.

- 7 Configure the new data storage location.

For more information about configuring the NFS or SMB/CIFS or local/SAN networked storage locations, see [“Configuring Networked Storage” on page 91](#).

- 8 Click *Save* to save the changes and configure the new networked storage location.

- 9 Manually copy the files from the old networked storage location to the new networked storage location.
- 10 After copying the files, select the *Copy Done* option to start data storage at the new location.
- 11 (Optional) Click *Cancel* to return to the previous networked storage configuration.

5.3 Configuring Disk Space Usage

If networked storage is enabled, the data is copied to the networked storage location after two days, and a local copy remains until space is available. Raw data is moved to the networked storage location after approximately one hour.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.

In the *Disk Space Usage* section, the *Local storage size* field displays the total storage size currently used by Sentinel.

- 4 Specify the local storage utilization value:
 - ◆ Specify a value to start deleting the data storage from local storage when the specified value is reached.
 - ◆ Specify a value to stop deleting the data storage from local storage when the specified value is reached.

These settings are the settings at which Sentinel starts (and stops) deleting the duplicate data files that are in local storage. The copies are kept in the local storage until this disk usage threshold is reached in order to speed up searches and reports. When the threshold is reached and files are deleted, the networked storage becomes the sole location for the data.

The *Networked storage size* field specifies the value of the networked storage space.

- 5 Specify the maximum archive size to be used as part of the total available archive size.

5.4 Verifying and Downloading Raw Data Files

The raw data files for each event source are compressed and moved to networked storage every hour and the file hash is computed for networked storage files. The file hash is used to check the integrity of the files in the networked storage.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 In the toolbar, click the *Storage*.
- 3 Click the *Raw Data* tab.
- 4 In the *Event source hierarchy* field, select the desired Collector and Connector combination from the drop-down list.
- 5 In the *Event Source* field, select the event source from the drop-down list.

The *Event Source* field displays the list of associated event sources (hostnames or IP addresses) after the *Event source hierarchy* field is populated.

- 6 In the table, click *Select All* to select all the files in the table.

or

Select each file separately.

The table displays the list of local and networked storage raw data files for the selected event source. The *Verify Integrity* and *Download* options are enabled only when you select a file from the table.

- 7 Click *Verify Integrity* to verify the integrity of the selected files in the networked storage by comparing the hash values for the selected files in the networked storage.

If integrity verification is successful, a green icon is displayed next to the filename in the *Integrity OK?* column. If verification fails, a red icon is displayed.

The hash is computed and updated in database for the files in the networked storage, but not for the local raw data files. Because the raw data files are updated until they are moved to networked storage, the hash value cannot be computed or updated for these files. It is not possible to check the integrity of the local raw data files.

- 8 Select the raw data file, then click *Download* to download the selected networked storage and local raw data files.

The selected files are downloaded in the form of a zip file that contains a .csv (comma separated values) file. If the networked storage files are selected, the zip file also contains a hash file corresponding to each of the networked storage files downloaded.

The SHA-256 algorithm is used to generate the file hash and the generated hash is Base64 encoded.

- 9 Select *Save File*, then click *OK*.

5.5 Configuring Data Retention Policies

The data retention policies control when data is deleted from the system. A retention policy contains a filter that is used to identify the events for which the retention policy applies and the minimum and maximum number of days these events should be kept in the system.

You can configure one or more data retention policies to control the duration for which specific types of events are retained in Sentinel. Except for the Raw Data Retention policy, all of the configured policies apply to the event data.

The configured retention policies are displayed in the data retention policy table. By default, the data retention policy table is refreshed every 30 seconds to reflect the changes made by multiple administrators.

- ♦ [Section 5.5.1, “Raw Data Retention Policy,” on page 96](#)
- ♦ [Section 5.5.2, “Event Data Retention Policies,” on page 97](#)
- ♦ [Section 5.5.3, “Rules for Applying a Retention Policy,” on page 99](#)

5.5.1 Raw Data Retention Policy

The Raw Data Retention policy controls the duration for which the raw data is kept in the system before it is deleted. The Raw Data Retention policy cannot be deleted or disabled. However, you can modify the *Keep at most* and *Keep at Least* values, which determine the maximum and minimum number of days to keep the raw data file.

The process to delete raw data files runs every time the server is started, every hour because that is when the raw data files are closed, and whenever the *Keep at most* value is changed. All the files exceeding the retention time are removed permanently from the local and networked storage locations.

5.5.2 Event Data Retention Policies

The event data retention policies control the duration for which different types of event data are kept in the system before being deleted.

- ♦ [“Creating a Data Retention Policy” on page 97](#)
- ♦ [“Activating or Deactivating a Data Retention Policy” on page 98](#)
- ♦ [“Modifying a Data Retention Policy” on page 98](#)
- ♦ [“Deleting a Data Retention Policy” on page 98](#)

Creating a Data Retention Policy

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click the *Storage* link in the toolbar.
- 3 Click the *Configuration* tab.
- 4 In the Data Retention section, click the *Create* option located at the top right corner of the policy table.
- 5 Use the following information to create the data retention policy.

Policy name: Specify a name for the retention policy.

The policy name must be unique and must contain alphanumeric characters. If a duplicate policy name is specified, an error message is displayed when you save the policy.

Filter: Click the *Filter* icon to select a saved or shared filter.

or

Specify a filter value. The filter value uses the same syntax as searches.

For example, assume that the *Filter* field contains a filter such as *sev:[3 TO 5] AND (evt:"SyslogNICListener")*. This filter value matches all the events with a severity of 3, 4 or 5 and event name *SyslogNICListener*.

For more information, see [“Configuring Filters”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

For example, use *sev:[0 TO 1]* to define a retention policy that applies to all events with a severity of 0 or 1.

Keep at least: Specify the minimum number of days to retain the events in the system. The value must be a valid positive integer.

Keep at most: (Optional) Specify the maximum number of days for which the events should be retained in the system.

The value must be a valid positive integer and must be greater than or equal to the *Keep at least* value. If no value is specified, the system retains the events in the system until the space is available.

- 6 Click *Save*. The newly created policy is displayed in the data retention table.

The table also contains the following additional columns:

Size: Displays the amount of space used to store the events for each retention policy.

Events: Displays the number of events for the selected retention policy.

The policies are sorted in alphabetical order by policy name. The default retention policy is always shown as the last policy in the list.

If there is any error when saving a retention policy, an error message is displayed at the top of the policy table.

For more information, see [Section 5.9, “Data Expiration Policy,” on page 108](#).

Activating or Deactivating a Data Retention Policy

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
The data retention policy table is displayed in the Data Retention section.
- 4 To activate a retention policy, select the check box in the *Active* column.
- 5 To deactivate the retention policy, deselect the check box next to the policy.
You cannot deactivate the default data retention policy.

Modifying a Data Retention Policy

You cannot modify the name of the default data retention policy. You can only modify the *Keep at Least* and *Keep at Most* values for a data retention policy.

You can edit only one policy at a time. If you try to modify a second policy while you are in the process of modifying the first, the first policy opened for modification is closed without saving the changes.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click the *storage* link in the upper left corner of the page.
- 3 Click the *Configuration* tab.
The data retention policy table is displayed in the *Data Retention* section.
- 4 To edit the retention policy, click the *Edit* link next to the configured policy.
The policy editor opens within the policy table.
- 5 Specify the minimum and maximum days to store events.
- 6 Click *Save* to save the changes to the existing policy.

Deleting a Data Retention Policy

You can delete only those policies that you configure. You cannot delete the default data retention policy or the Raw Data Retention policy.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Configuration* tab.
The data retention policy table is displayed in the Data Retention section.
- 4 To delete the retention policy, click the *Edit* link next to the configured policy.
The policy editor opens within the policy table.
- 5 Click *Delete*. A confirmation message is displayed.

6 Click *Delete*.

The selected data retention policy is deleted from the data retention table.

5.5.3 Rules for Applying a Retention Policy

You can apply multiple data retention policies, including the default data retention policy, to event data.

To determine how long an event can be retained before deleting it from the local and networked data stores, apply the following rules:

1. If an event meets the criteria of only one data retention policy filter, that data retention policy is applied to the event.
2. If an event does not meet the criteria for any of the data retention policies, the default data retention policy is applied to that event.
3. If an event meets the criteria for more than one of the data retention policies, the following guidelines are used to determine which data retention policy should be applied:
 - ♦ If the maximum retention period of a policy is shorter than the others, that policy is applied. (If the maximum retention period is not specified for a policy, the policy is considered to have a long maximum retention period.)
 - ♦ If multiple matching policies have the same shortest maximum retention period, the policy with the longest minimum retention period is applied.
 - ♦ If multiple matching policies have the same shortest maximum retention period and the same longest minimum retention period, the system arbitrarily applies one of the policies.

NOTE: Events that are received a long time after they were originally generated are updated with a current time stamp and stored in the current file. This affects how long they stay in the system before they are deleted.

5.6 Configuring Data Synchronization

Sentinel provides the ability to synchronize data to an external database, so that you can use third-party or custom reporting systems to search the data in the external database with more advanced tools than what are provided in Sentinel.

- ♦ [Section 5.6.1, “Overview,” on page 99](#)
- ♦ [Section 5.6.2, “Creating a Data Synchronization Policy,” on page 102](#)
- ♦ [Section 5.6.3, “Managing Data Synchronization,” on page 104](#)

5.6.1 Overview

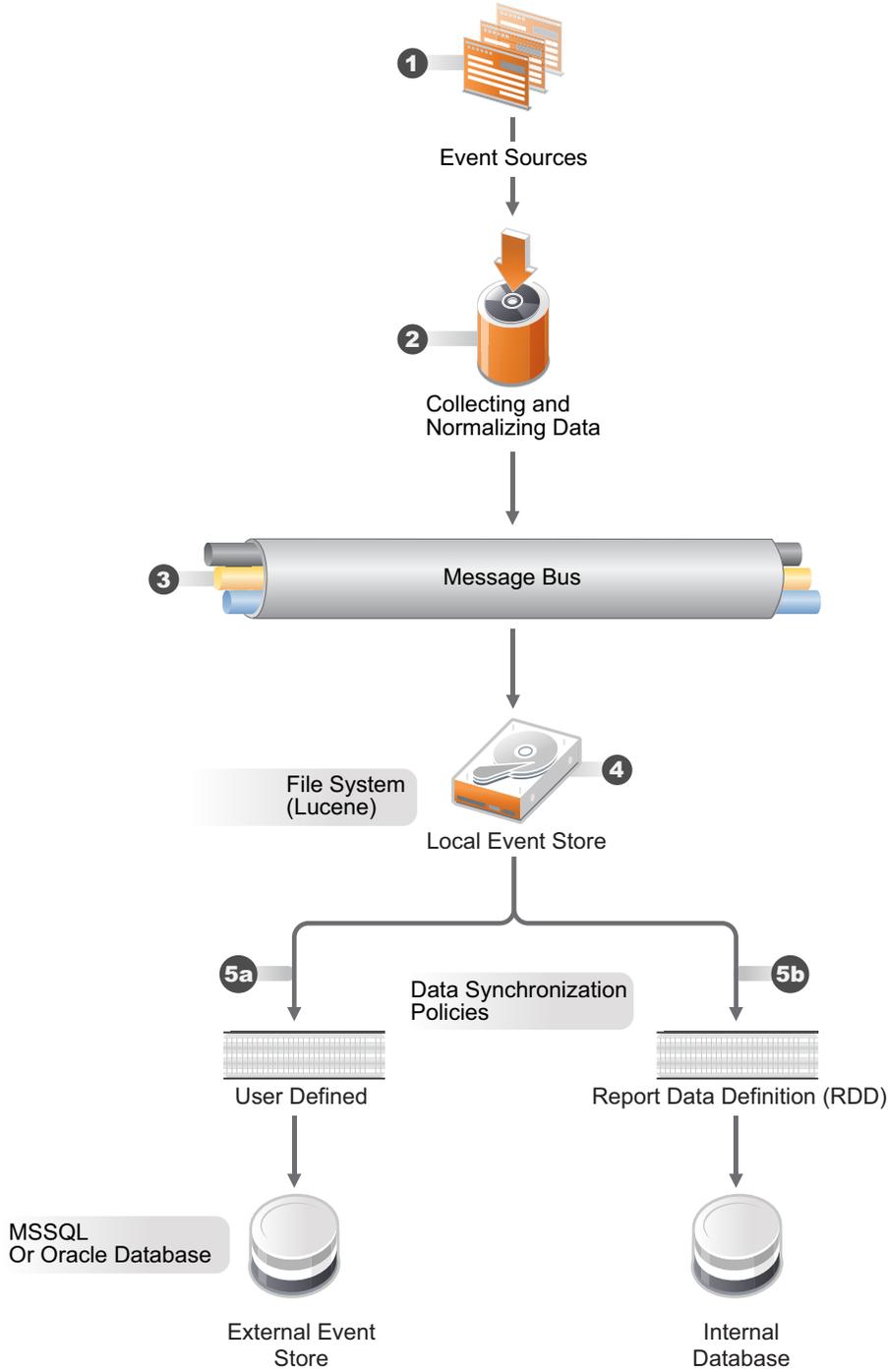
Sentinel can store the data in an external database by synchronizing a subset of the data that Sentinel gathers.

Sentinel uses the following process to synchronize data:

1. Sentinel gathers the events from the Event Sources through the Connectors.
2. Sentinel uses Collectors to normalize the event data.

3. The normalized event data is then sent to the Sentinel message bus.
4. The event data is then stored in the file system in the local event store and indexed by Lucene.
5. The data synchronization policies allow events in the local event store to be copied and stored in external SQL databases.
 - a. User-defined data synchronization policies synchronize the filtered event data to an external SQL database. The external SQL database can be either MSSQL 2008 or Oracle 11.
 - b. Report Data Definitions (RDD) generate system data synchronization policies that are used to copy event data into tables in the internal PostgreSQL database. These data synchronization policies cannot be edited or deleted. Reports that rely on an RDD will search internal database tables for events instead of the local event store. These kinds of reports search internal tables instead of the event store because they utilize more complex SQL SELECT statements that need to join event data to the data in other tables in the internal database.

Figure 5-1 Data Synchronization



Sentinel allows you to partition tables if they are in the internal PostgreSQL database. When you choose to partition a table in the internal PostgreSQL database, a new table partition is created for each days worth of data.

Partitions are only used with RDD data sync policies. Partitioning has advantages and disadvantages:

Advantages

- ♦ If a retention period is in force, old data can be deleted quickly. When data has aged, it is much quicker to drop a partition than it is to delete individual table records.
- ♦ Reports that query on the event time field might be quicker, because it is only necessary to search the partitions that have the specified event times.

Disadvantages

- ♦ Reports that do not query on event time might be slower where there are multiple of partitions, because every partition must be searched.
- ♦ Each partition causes one or more schema items to be created and managed by the database system. If there is no retention period, the number of partitions just keeps growing.

5.6.2 Creating a Data Synchronization Policy

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.
- 3 Click the *Data Synchronization* tab.
- 4 Click the *Create* link to create a new data synchronization policy.
- 5 Use the following information to create the data synchronization policy:

Filter query: Select a saved filter to use in the data synchronization policy.

This filter determines which events are stored in the external database. For more information, see “[Configuring Filters](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

Policy name: Specify a name for the data synchronization policy.

Retention period: Specify how many days to retain the events in the external database.

Start data synchronization time: Specify when to start synchronizing events to the external database.

Batch size: Specify how many events are sent to the external database at one time.

Sleep period: Specify the length of time that the data synchronization process sleeps before checking to see if there are more events to process.

Schedule: Select when the data is synchronized to the external database.

- ♦ **All the time:** This options synchronizes events to the external database constantly.
- ♦ **Custom:** This option allows you to configure specific time periods to perform data synchronization so that it does not occur when the system is busy.

If you select *Custom*, fill out the following fields to set the custom synchronization time:

- ♦ **Day of the Week:** Select the day of the week, or select *Everyday*.
- ♦ **Start time:** Specify the time to start the synchronization process. You can enter 24:00 hour time and it is converted to 12:00 hour time.
- ♦ **Duration:** Specify the synchronization period in minutes.

If you do not see the data in the database tables immediately, you need to wait for the next synchronization cycle.

- 6 Use the following information to define the connection to the external database:

Database type: Select the type of external database. The options are:

- ◆ Microsoft SQL 2008
- ◆ Oracle 11G

Host name: Specify the host name of the server where the external database is installed.

Port: Specify the port used to connect to the external database.

User name: Specify the name of the user that authenticates to the external database.

Password: Specify the password of the database user.

Database: Specify a unique name for the external database.

Field Mapping: Allows you to map fields in the event to fields in the external database.

- ◆ [“Creating a Table for Field Mapping” on page 103](#)
- ◆ [“Using an Existing Table for Field Mapping” on page 103](#)

7 Click *Save* to create the data synchronization policy.

Creating a Table for Field Mapping

1 Complete [Step 1](#) through [Step 2](#) in [Section 5.6.2, “Creating a Data Synchronization Policy,” on page 102](#).

2 Select *Create table*.

3 Use the following information to create the table:

Table name: Specify a name for the table.

Table Space (Optional): Specify a tablespace for the table.

Index Space (Optional): Specify a tablespace for the index.

Summarize Events: Select this option if you want a summary of events during a specific period.

Summary Period (Minutes): If you selected *Summarize Events*, you must specify the amount of time in minutes to summarize events.

4 Map the fields in the table to the desired fields.

5 Click *Save*.

Using an Existing Table for Field Mapping

NOTE: Starting from Sentinel 7.0.1 version, the `InitiatorServiceName (sp)` and `TargetServiceName (dp)` fields size is increased from 32 to 256 characters to accommodate more characters in these fields. If you have created a Data Sync policy in Sentinel 7.0 that synchronizes either or both of the event fields, you need to modify the target column size in the external database table to reflect the increased size of the fields.

1 Complete [Step 1](#) through [Step 2](#) in [Section 5.6.2, “Creating a Data Synchronization Policy,” on page 102](#).

2 Select *Select existing table*.

3 Browse to a select an existing table you want to use, then click *OK*.

4 (Optional) Select the *Summarize Events* option if you want a summary of events during a specific period.

- 5 (Optional) If you selected *Summarize Events*, specify the amount of time in minutes to summarize events.
- 6 Change the field mappings for the desired fields.
- 7 Click *Save*.

5.6.3 Managing Data Synchronization

You can edit, delete, and view the status of each data synchronization policy you create on the Data Synchronization page. If your policy is a custom synchronization policy and you perform a resynchronization, the data synchronizes during the next synchronization cycle.

5.7 Viewing Local and Networked Storage Capacity

The Health page, which is available only to administrators, displays local and networked data capacity. For more information on configuring networked storage, see [Section 5.2, “Configuring Networked Storage Locations,” on page 89](#).

To view the local storage and networked storage capacity:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Storage* in the toolbar.

The Storage Health page is displayed. The gray color indicates the free data space and the green color indicates used data storage space.

The Health page of Sentinel also displays forecasts about the local storage capacity. If the networked storage location is not configured, a message is displayed on the Health page:

The *Click here* link displays the Data Storage Location page, where you can configure the networked storage location. For more information, see [“Configuring Networked Storage Locations” on page 89](#).

If Sentinel is configured to show the networked storage location, the Health page displays the networked storage capacity as well as the forecasted networked storage capacity.

WARNING: When the system is running out of local disk storage space, a warning message is displayed and a system audit event is logged. To avoid data loss, you must increase the local disk storage space.

5.8 Using Sequential-Access Storage for Long Term Data Storage

Sentinel requires data to be on a storage system that supports random access, such as data on your typical hard drive. It does not support directly interfacing with the data stored on tape.

You can search the raw data directly by using tools such as `egrep` or a text editor, but this search might not be sufficient for your requirements. The search mechanism provided by Sentinel on event data is much more powerful than these tools.

The high-level approach to configure Sentinel is to retain data for a longer duration so you can perform searches and run reports on the data you regularly need to access, and to copy the data to tape before Sentinel deletes it. To search or run reports on data that was copied to tape, but deleted from Sentinel, copy the data from the tape back to Sentinel.

- ♦ [Section 5.8.1, “Determining What Data You Need to Copy to Tape,” on page 105](#)
- ♦ [Section 5.8.2, “Backing Up Data,” on page 105](#)
- ♦ [Section 5.8.3, “Configuring Storage Utilization,” on page 106](#)
- ♦ [Section 5.8.4, “Configuring Data Retention,” on page 106](#)
- ♦ [Section 5.8.5, “Copying Data to Tape,” on page 106](#)
- ♦ [Section 5.8.6, “Restoring Data,” on page 107](#)

5.8.1 Determining What Data You Need to Copy to Tape

There are two types of data in Sentinel:

- ♦ **Raw Data:** For more information on raw data, see [Section 5.1.1, “Raw Data,” on page 83](#).
- ♦ **Event Data:** For more information on event data, see [Section 5.1.2, “Event Data,” on page 88](#).

If you want to perform searches or reports on the data, copy both the raw data and the event data to tape so that you can copy both sets of data back into Sentinel when the data is needed. If you want to store data only to comply with legal requirements, copy only the raw data to the tape.

5.8.2 Backing Up Data

Events should be moved to networked storage regularly. The following types of data can be backed up in Sentinel:

Configuration Data: This option includes non-event or raw data backup. It is faster because it contains small amount of data, including all the installation directories except the `data` directory.

Data: This option backs up all the data in the local storage and networked storage directories. This option takes a longer time to finish.

Networked storage directories can be located on a remote machine.

Best practices for data backup include the following:

- ♦ Periodically export all the Event Source Management configurations and save them. When the environment is relatively stable, you can generate a full Event Source Management export including the entire tree of the Event Source Management components. This action captures the plug-ins as well as the configuration of each node. The resulting `.zip` file should be backed up and moved to networked storage as a normal file.

If changes such as updating plug-ins or adding nodes are made to Event Source Management later, you must export the configuration and save it again.

- ♦ Back up the entire installation directory, instead of particular sections, so there is no risk of manual mistakes and the process is quicker.

5.8.3 Configuring Storage Utilization

You should configure local and networked storage space to store data before the data is deleted from the Sentinel server. While configuring the storage space, ensure that your storage system is not 100% utilized to avoid undesirable behaviors such as data corruption. Additionally, you should also have additional space in your networked storage to copy data from tape back into Sentinel. You do this by decreasing the archive utilization setting.

5.8.4 Configuring Data Retention

You can configure the duration for the data to remain on the disk before it is deleted. If your hard drive storage space is not sufficient to store data long enough to meet your legal requirements, you can use tape storage to store data beyond the specified duration.

You must configure data retention policies so that the data that you want to search and report is retained within the Sentinel server until you no longer need it. Additionally, a data retention policy should ensure that Sentinel is not prematurely deleting the data because of storage utilization limits. If the storage utilization limit is exceeded and you notice that the data is being prematurely deleted, change the data retention policy to expand the data storage space.

5.8.5 Copying Data to Tape

You can set up a process to copy raw data and event data to tape, depending on the data that you need.

The following sections describe how each type of data is stored in Sentinel so that you can set up copy operations to copy the data out of Sentinel onto tape.

- ♦ [“Copying Raw Data to Tape” on page 106](#)
- ♦ [“Copying Event Data to Tape” on page 107](#)

Copying Raw Data to Tape

Raw data partitions are individual files. They are created every hour, and are closed within 10 minutes after the elapsed time. When a raw data file is closed, it is renamed to identify it as a closed file. Files in the open state have a `.open` extension. When they are closed, they are renamed to have a `.log` extension. At a configured interval after they are closed, they are compressed and stored in a `.zip` file. After the files are compressed, they are moved to networked storage from the local storage.

The directory hierarchy in which the raw data files are placed is organized by the event source and the date of the raw data. You can use this hierarchy to periodically copy a batch of raw data files to tape. For more information on raw data directory hierarchy, see [Table 5-1, “Raw Data Directory Structure,” on page 84](#).

You cannot copy files that are in the process of being compressed. You must wait until the raw data files are compressed and moved to networked storage before copying them to tape. The presence of a `.log` file with the same name as the zip file indicates that the file is still in the process of being compressed. You must also ensure that the raw data files are copied to the tape before the interval configured in the Raw Data Retention policy expires so that the data is not lost.

Copying Event Data to Tape

Event data partitions are created every 24 hours, but they are not closed for roughly 48 hours (in case some data arrives late). Event data is stored in the `data/eventdata` directory with subdirectory names prefixed with the year, month, and day when the partition was created (yyyymmdd). For example, the path to a complete event data partition, relative to the installation directory, is `data/eventdata/20090101_408E7E50-C02E-4325-B7C5-2B9FE4853476`. You can use this hierarchy to know when a partition is closed. Subdirectories whose date is at least 48 hours old should be in the closed state.

For more information on the event data directory hierarchy, see [Table 5-3, “Event Data Directory Structure,”](#) on page 89.

You should wait until event data partitions have been copied to networked storage before copying them to tape. Before you copy, make sure that the directory is not currently being copied from local storage. To do this, see if there is a local storage directory partition of the same name. If the corresponding local storage directory partition is not present, the networked storage directory partition is not being copied. If the corresponding local storage directory partition is still present, make sure that all of the files in the local storage directory partition are also in the networked storage directory partition and that they are all of the same size. If they are all present and of the same size, it is highly likely that they are not currently being copied.

5.8.6 Restoring Data

The event data restoration feature of Sentinel enables you to restore old, lost, or deleted event data. You can also restore the data from other systems. You can select and restore the event partitions by using the Sentinel Web interface. You can also control when these restored event partitions expire.

NOTE: The Data Restoration feature is a licensed feature. This feature is not available with the free or trial licenses. For more information, see “[License Information](#)” in the *NetIQ Sentinel 7.0.1 Installation and Configuration Guide*.

- ♦ “[Enabling Event Data for Restoration](#)” on page 107
- ♦ “[Viewing Event Data Available for Restoration](#)” on page 107
- ♦ “[Restoring Event Data](#)” on page 108
- ♦ “[Configuring Restored Event Data to Expire](#)” on page 108

Enabling Event Data for Restoration

To enable event data for restoration, you must copy the event directories that you want to restore to one of the following locations:

- ♦ The local storage data directory on the Sentinel server. For example, `/var/opt/novell/sentinel/data/eventdata`
- ♦ The `eventdata_archive` directory of the configured networked storage directory of the Sentinel server.

Viewing Event Data Available for Restoration

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click the *Storage* link in the toolbar, then click the *Configuration* tab.

The Data Restoration section does not initially display any data.

- 3 Click *Find Data* to search and display all event data partitions available for restoration.

The Data Restoration table chronologically lists all the event data that can be restored. The table displays the date of the event data, the name of event directory, and the location. The *Location* column indicates whether the event directory was found in the local data directory of Sentinel or in the configured networked storage directory.

- 4 Continue with [“Restoring Event Data” on page 108](#) to restore the event data.

Restoring Event Data

- 1 Select the check box in the *Restore* column next to the partition that you want to restore.

Click *Select All* to select all partitions listed.

Click *Clear All* to deselect all the selected partitions.

The *Restore Data* button is enabled when the Data Restoration section is populated with the restorable data.

- 2 Click *Restore Data* to restore the selected partitions.

The selected events are moved to the *Restored Data* section. It might take approximately 30 seconds for the *Restored Data* section to reflect the restored event partitions.

- 3 (Optional) Click *Refresh* to search for more restorable data.

- 4 To configure the restored event data to expire according to data retention policy, continue with [“Configuring Restored Event Data to Expire” on page 108](#).

NOTE: You cannot restore the network storage data if the novell user ID (UID) and the group ID (GID) are not the same on both the source (server that has the network storage data) and destination (server where the network storage data is being restored). In such a scenario, you need to unsquash and squash the squash file system. For more information, see [Appendix B, “Troubleshooting,” on page 219](#).

Configuring Restored Event Data to Expire

The restored partitions do not expire by default, according to any data retention policy checks. To enable the restored partitions to return to the normal state and also to allow them to expire according to the data retention policy, select *Set to Expire* for data that you want to expire according to the data retention policy, then click *Apply*.

The restored partitions that are set to expire are removed from the Restored Data table and returned to normal processing.

It might take about 30 seconds for the Restored Data table to reflect the changes.

5.9 Data Expiration Policy

Sentinel deletes the data types in their listed order until the required space is available.

1. All partitions (both local storage and networked storage) are deleted as soon as the *keep at most* time limit of their retention policy is reached.
2. Partitions that are successfully moved to networked storage. The oldest is moved first until none are left or until the desired amount of space is available.

3. Partitions that are not yet moved to networked storage, but have reached their retention policy's *keep at most* time limit. The partitions that are close to the *keep at most* limit are deleted first, until none are left or until the desired amount of space is available.

If at least half of the desired space is not yet free, partitions are deleted early, on the assumption that incoming data is more important than old data.

4. Partitions that are not yet moved to networked storage that have reached their policy's *keep at most* time limit. The partitions that are close to the *keep at most* limit are moved first, until none are left or at least half of the desired amount of space is available, but the current UTC day partitions are not deleted.

6 Configuring Data Collection

Sentinel can collect data from a wide range of event sources, such as intrusion detection systems, firewalls, operating systems, routers, databases, switches, mainframes, antivirus applications, and Novell applications. A modular architecture divides the task of protocol-level connections (Connectors) and the parsing logic (Collectors) for specific event sources.

Sentinel supports a wide variety of Connectors and also includes a variety of Collectors. The configuration required to integrate a new event source with Sentinel varies, depending on the type of event source and the communication method selected.

You should review the Collector and Connector documentation for any new event source integration to ensure that all available features are enabled. Collector plug-ins also come with Collector packs. For more information, see “[Extracting Reports from Collector Packs](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

The configuration required to integrate a new event source with Sentinel varies depending on the type of event source and the communication method selected.

- ♦ [Section 6.1, “Before You Begin,”](#) on page 111
- ♦ [Section 6.2, “Configuring Data Collection for Syslog Event Sources,”](#) on page 112
- ♦ [Section 6.3, “Configuring Data Collection for the Novell Audit Server,”](#) on page 116
- ♦ [Section 6.4, “Configuring Data Collection for Other Event Sources,”](#) on page 120
- ♦ [Section 6.5, “Managing Event Sources,”](#) on page 120
- ♦ [Section 6.6, “Viewing Events Per Second Statistics,”](#) on page 127

6.1 Before You Begin

- ♦ For a list of supported Connectors and event sources packaged with this release, see “[Meeting System Requirements](#)” in the *NetIQ Sentinel 7.0.1 Installation and Configuration Guide*.
- ♦ To download the new and updated Collector and Connector plug-ins, and for documentation on Collectors and Connectors, see the [Sentinel Plug-ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).
- ♦ For more information on editing Collectors that are already included in Sentinel and about adding new Collectors, refer to the [Sentinel Plug-Ins SDK Web site \(http://www.novell.com/developer/develop_to_sentinel.html\)](http://www.novell.com/developer/develop_to_sentinel.html).

NOTE: Sentinel 7.0 and later do not support legacy Collectors. When you run a legacy Collector, an error is displayed in the *Status* field of the Collector and the Collector does not start. You must use an equivalent JavaScript Collector, then move the legacy Collector event source nodes to the newly added JavaScript Collector.

- ◆ Every Collector has its own associated Collector packs. The new Collector packs include reports that can be uploaded and used in the Sentinel interface. For more information on extracting the reports, see [“Extracting Reports from Collector Packs”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

6.2 Configuring Data Collection for Syslog Event Sources

Sentinel is preconfigured to accept Syslog data from Syslog event sources that send data over TCP (port 1468), UDP (port 1514), or SSL (port 1443). You can also configure Sentinel to listen on additional ports.

To get started with Syslog data collection, configure your Syslog event sources to send their data to one of these ports. When Sentinel receives data from configured event sources, it automatically chooses the most suitable Collector to parse the data, parses the data into events, and stores the data in the configured networked storage location.

The following sections describe how you can configure the event sources to send data to Sentinel and how you can configure new Syslog ports to receive data:

- ◆ [Section 6.2.1, “Parsing Logic for Syslog Messages,”](#) on page 112
- ◆ [Section 6.2.2, “Configuring Syslog Servers,”](#) on page 113
- ◆ [Section 6.2.3, “Configuring Client Authentication for the SSL Syslog Server,”](#) on page 113

6.2.1 Parsing Logic for Syslog Messages

Sentinel can receive, store, and search against events from any Syslog source. If the data source is recognized, Sentinel automatically chooses the most suitable Collector to parse the data, parses the data into events, and stores the data in the configured networked storage location.

You can filter the collected data to drop any unwanted events. Messages from recognized data sources are parsed into fields such as `target IP address` and `source username`. Messages from unrecognized data sources are placed in a single field for storage, searching, and reporting.

The Generic Event Collector collects and processes data from unrecognized event sources that have suitable connectors. If the data was generated by a supported event source, the Generic Event Collector analyzes the received data and attempts to parse the information. If the Generic Event Collector does not understand the message, it does minimal parsing and places the bulk of the text in the *Message (Msg)* field.

6.2.2 Configuring Syslog Servers

When you point your Syslog event sources to Sentinel, Sentinel automatically creates an event source entry to track data received from the event source. An entry is created for each unique IP address or hostname that appears in the header portion of the Syslog messages. This entry enables you to identify the machines generating the Syslog messages, regardless of whether they are being aggregated by a Syslog relay or not. It also enables you to manage how the data is processed.

To add or remove Syslog servers, use the Event Source Management interface. For more information, see [“Configuring Data Collection for Other Event Sources” on page 120](#).

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar.
- 3 Select the *Event Source Servers* tab.
- 4 In the *Syslog Server* section, specify the SSL, TCP, and UDP port numbers for the Syslog servers. The default ports for SSL, TCP, and UDP are 1443, 1468, and 1514.
- 5 To start or stop the data collection for each of the Syslog servers, select the On or Off options next to them.
- 6 To change the port values, specify a valid port value.

The following table shows the status messages you see after entering the valid or non-valid port values.

Status Icon	Message
Green Check Mark Icon	If the specified port is valid and is not in use, a <code>port is valid and open</code> message is displayed.
Red Cross Icon	If the specified port is not valid (non-numeric or not between 1 to 65535), a <code>port is not valid</code> message is displayed.
Red Cross Icon	If the specified port is valid but it is already in use, or if the Syslog server does not have permission to use it, a <code>port is valid but not open</code> message is displayed.

- 7 Set the appropriate client authentication and server key pairs settings for the SSL Syslog server. For more information on setting the client authentication, see [“Configuring Client Authentication for the SSL Syslog Server” on page 113](#). The SSL Syslog server is automatically restarted if any changes are made here.
- 8 (Optional) Click *Reset* to restore the previous settings.
- 9 Click *Save* to save the new settings.

The *Save* button is disabled until a valid port is specified for all of the servers.

6.2.3 Configuring Client Authentication for the SSL Syslog Server

The client authentication settings determine how strictly the SSL Syslog server verifies the identity of Syslog event sources that are attempting to send their data. You should use a strict client authentication policy that is applicable in your environment to prevent rogue Syslog event sources from sending undesired data into Sentinel.

Open: No authentication is required. Sentinel does not request, require, or validate a certificate from the event source.

Loose: A valid X.509 certificate is required from the event source, but the certificate is not validated. It does not need to be signed by a certificate authority.

Strict: A valid X.509 certificate is required from the event source, and it must be signed by a trusted certificate authority. If the event source does not present a valid certificate, Sentinel does not accept its event data.

- ♦ [“Creating a Trust Store” on page 114](#)
- ♦ [“Importing a Certificate into the Trust Store” on page 114](#)
- ♦ [“Server Key Pair” on page 115](#)

Creating a Trust Store

For strict authentication, you must have a trust store that contains the public certificate of the certificate authority (CA) that signed the event source certificate. After you have a DER or PEM certificate, you can create the trust store by using the `TruststoreCreator` utility that comes with Sentinel.

- 1 Log in to the Sentinel server as `novell`.
- 2 Go to `/var/opt/novell/sentinel/data/updates/done`.
- 3 Use the following command to extract the `syslog_connector.zip` file:

```
unzip syslog_connector.zip
```
- 4 Copy the `TruststoreCreator.sh` or `TruststoreCreator.bat` file to the machine that has the certificates.

or

Copy the certificates to the machine with the `TruststoreCreator` utility.
- 5 Run the `TruststoreCreator.sh` utility as follows:

```
TruststoreCreator.sh -keystore /tmp/my.keystore -password password1 -certs /tmp/cert1.pem,/tmp/cert2.pem
```

In this example, the `TruststoreCreator` utility creates a keystore file called `my.keystore` that contains two certificates (`cert1.pem` and `cert2.pem`). It is protected by the password `password1`. The keystore file must be imported into the trust store.

Importing a Certificate into the Trust Store

For strict authentication, the administrator can import a certificate by using the *Import* button. This helps ensure that only authorized event sources are sending data to Sentinel. The trust store must include public certificate of the certificate authority (CA) that signed the event source certificate.

The following procedure must be run on the machine that has the trust store on it. You can open a Web browser on the machine with the trust store or move the trust store to any machine with a Web browser.

NOTE: If the CA is signed by another CA, you must import the chain of CA certificates until the root CA.

To import a trust store:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar.
- 3 Click the *Event Source Servers* tab.
- 4 In the Syslog Server section, select the *Strict* option under *Client authentication*.
- 5 Click *Browse* and browse to the trust store file (for example, *my.keystore*)
- 6 Specify the password for the truststore file.
- 7 Click *Import*.
- 8 (Optional) Click *Details* to see more information about the trust store.
- 9 (Optional) Click *Reset* to restore the previous settings.
- 10 Click *Save*.

After the trust store is successfully imported, you can click *Details* to see the certificates included in the trust store.

Server Key Pair

Sentinel is installed with a built-in certificate, which is used to authenticate the Sentinel server to the event sources. This certificate can be overridden with a certificate signed by a public certificate authority (CA).

To replace the built-in certificate:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar.
- 3 Select the *Event Source Servers* tab.
- 4 In the Syslog Server section, under *Server key pairs*, select *Custom*.
- 5 Click *Browse* and browse to the trust store file.
- 6 Specify the password for the trust store file.
- 7 Click *Import*.
- 8 (Optional) If there is more than one public-private key pair associated with the file, select the desired key pair, then click *OK*.
- 9 Click *Details* to see more information about the server key pair.
- 10 Click *Reset* to restore the previous settings.
- 11 Click *Save*.

6.3 Configuring Data Collection for the Novell Audit Server

Many Novell products send data to Sentinel by using a Platform Agent. The data is received by an Event Source Server called the Audit Server, which is packaged with Sentinel. The Audit Server is similar in many ways to a Syslog server.

The following sections describe the procedure to configure the Audit Server port to receive data and also to set the Audit Server options:

- ♦ [Section 6.3.1, “Specifying the Audit Server Settings,” on page 116](#)
- ♦ [Section 6.3.2, “Setting the Audit Server Options,” on page 117](#)

6.3.1 Specifying the Audit Server Settings

To specify the data collection settings for the Audit Server:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar.
- 3 Select the *Event Source Servers* tab.
- 4 In the *Audit Server* section, select the *On* or *Off* options to start or stop the data collection for the Audit Server.
- 5 In the Audit Server section, specify the port on which the Sentinel server listens to messages from the event sources.

For more information about setting the port, see [“Port Configuration and Port Forwarding for the Audit Server” on page 117](#).

- 6 Set the appropriate client authentication and server key pairs settings.

For more information about client authentication, see [“Client Authentication for the Audit Server” on page 118](#).

The Audit server and all related Audit Connectors are automatically restarted if any changes are made here.

- 7 Select the Sentinel server behavior when the number of events received exceeds the buffer capacity.

WARNING: If you select *Drop oldest messages*, there is no supported method for recovering dropped messages,

- 8 Select *Idle Connection* to disconnect event sources that have not sent data for a certain period of time.

The event source connections are automatically re-created when they start sending data again.

- 9 Specify the number of minutes before an idle connection is disconnected.

- 10 (Optional) Select *Event Signatures* to receive a signature with the event.

To receive a signature, the Platform Agent on the event source must be configured properly.

- 11 (Optional) Click *Reset* to restore the previous settings.

- 12 Click *Save* to save the new settings.

The *Save* button is disabled until a valid port is specified for the server.

These settings might affect data collection for several servers (for example, multiple eDirectory instances). However, they do not start or stop services on the event source machines.

Changes on this page take effect immediately.

To view the health of the Audit Server and its event sources, see [Section 6.5, “Managing Event Sources,”](#) on page 120.

6.3.2 Setting the Audit Server Options

Administrators can change the settings for how Sentinel listens for data from the event source applications, set the port on which Sentinel listens, and select the type of authentication between the event source and Sentinel.

- ♦ [“Port Configuration and Port Forwarding for the Audit Server”](#) on page 117
- ♦ [“Client Authentication for the Audit Server”](#) on page 118

Port Configuration and Port Forwarding for the Audit Server

By default, Sentinel listens on port 1289 for messages from the server. When the port is changed, the system checks whether the specified port is valid and open.

Binding to ports lower than 1024 requires root privileges, so you should use a port higher than 1024. You can change the source devices to send data to a higher port or use port forwarding on the Sentinel server.

To change the Platform Agent to send data to a different port:

- 1 Log in to the event source machine.
- 2 Open the `logevent` file for editing. The file location depends on the operating system:
 - ♦ Linux: `/etc/logevent.conf`
 - ♦ Windows: `C:\WINDOWS\logevent.cfg`
 - ♦ NetWare: `SYS:\etc\logevent.cfg`
 - ♦ Solaris: `/etc/logevent.conf`
- 3 Set the `LogEnginePort` parameter to the desired port.
- 4 Save the file.
- 5 Restart the Platform Agent.

The method varies by operating system and application. Reboot the machine or refer to the application-specific documentation on the [Novell Documentation Web site \(http://www.novell.com/documentation\)](http://www.novell.com/documentation) for more instructions.

To configure port forwarding on the Sentinel server:

- 1 Log in to the Sentinel server operating system as root (or `su` to root).
- 2 Open the `/etc/init.d/boot.local` file for editing.
- 3 Add the following command at the end of the bootup process:

```
iptables -A PREROUTING -t nat -p protocol --dport incoming port -j DNAT --to-destination IP:rerouted port
```

Replace *protocol* with `tcp` or `udp`, *incoming port* with the port where the messages are arriving, and *IP:rerouted port* with the IP address of the local machine and an available port above 1024.

- 4 Save the changes.
- 5 Reboot. If you cannot reboot immediately, run the `iptables` command in [Step 3](#) from a command line.

Client Authentication for the Audit Server

The event sources send their data over an SSL connection, and the Client authentication setting for the Sentinel server determines what kind of authentication is performed for the certificates from the Audit Server on the event sources.

Open: No authentication is required. Sentinel does not request, require, or validate a certificate from the Event Source.

Loose: A valid X.509 certificate is required from the Event Source, but the certificate is not validated. It does not need to be signed by a certificate authority.

Strict: A valid X.509 certificate is required from the Event Source, and it must be signed by a trusted certificate authority. If the Event Source does not present a valid certificate, Sentinel does not accept its event data.

- ♦ [“Creating a Trust store” on page 118](#)
- ♦ [“Importing a Certificate into the Trust Store” on page 119](#)
- ♦ [“Server Key Pair” on page 119](#)

Creating a Trust store

For strict authentication, you must have a trust store that contains the public certificate of the certificate authority (CA) that signed the event source certificate. After you have a DER or PEM certificate, you can create the trust store by using the `CreateTrust store` utility that comes with Sentinel.

- 1 Log in to the Sentinel server as `novell`.
- 2 Go to `/var/opt/novell/sentinel/data/updates/done`.
- 3 Unzip the `audit_connector.zip` file:

```
unzip audit_connector.zip
```
- 4 Copy `TruststoreCreator.sh` or `TruststoreCreator.bat` to the machine with the certificates
or
Copy the certificates to the machine with the `TruststoreCreator` utility
- 5 Run the `TruststoreCreator.sh` utility:

```
TruststoreCreator.sh -keystore /tmp/my.keystore -password password1 -certs /tmp/  
cert1.pem,/tmp/cert2.pem
```

In this example, the `TruststoreCreator` utility creates a keystore file called `my.keystore` that contains two certificates (`cert1.pem` and `cert2.pem`). It is protected by the password `password1`.

Importing a Certificate into the Trust Store

For strict authentication, the administrator can import a certificate. This helps ensure that only authorized event sources are sending data to Sentinel. The trust store must include public certificate of the certificate authority (CA) that signed the event source certificate.

The following procedure must be run on the machine that has the trust store on it. You can open a Web browser on the machine with the trust store or move the trust store to any machine with a Web browser.

NOTE: If the CA is signed by another CA, then you must import the chain of CA certificates until the root CA.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Source Servers* tab.
- 3 In the Audit Server section, select the *Strict* option under *Client authentication*.
- 4 Click *Browse* and browse to the trust store file (for example, *my.keystore*)
- 5 Specify the password for the trust store file.
- 6 Click *Import*.
- 7 (Optional) Click *Details* to see more information about the trust store.
- 8 (Optional) Click *Reset* to restore the previous settings.
- 9 Click *Save*.

After the trust store is imported successfully, you can click *Details* to see the certificates included in the trust store.

Server Key Pair

Sentinel is installed with a built-in certificate, which is used to authenticate the Sentinel server to the event sources. This certificate can be overridden with a certificate signed by a public certificate authority (CA).

To replace the built-in certificate:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar.
- 3 Select the *Event Source Servers* tab.
- 4 In the Audit Server section, under *Server key pairs*, select *Custom*.
- 5 Click *Browse* and browse to the trust store file.
- 6 Specify the password for the trust store file.
- 7 Click *Import*.
- 8 (Optional) If there is more than one public-private key pair in the file, select the desired key pair and click *OK*.
- 9 (Optional) Click *Details* to see more information about the server key pair.
- 10 (Optional) Click *Reset* to restore the previous settings.
- 11 Click *Save*.

6.4 Configuring Data Collection for Other Event Sources

The *Advanced* tab in Sentinel Web interface is used to launch the Event Source Management interface, which monitors and configures advanced data collection capabilities beyond the settings currently available in the Web interface. Some Connectors and Collectors must be configured in Event Source Management, such as the WMS connector for Windows, Database connectors, and SDEE connectors for Cisco devices.

You can perform the following tasks through the Event Source Management window:

- ◆ Add or modify connections to event sources by using Configuration wizards.
- ◆ View the real-time status of the connections to event sources.
- ◆ Import or export configuration of event sources to or from the Live View.
- ◆ View and configure Connectors and Collectors that are installed.
- ◆ Import or export Connectors and Collectors from or to a centralized repository.
- ◆ Monitor data flowing through the Collectors and Connectors.
- ◆ Design, configure, and create the components of the event source hierarchy, and execute required actions by using these components.

Java 1.6 Web Start is required to launch the Event Source Management Web application.

NOTE: If you are using openSUSE11.1, update your JRE to latest JRE 1.6 update. Then use the Java Web Start (`javaws`) launcher command to launch the Event Source Management.

Use the following procedure to launch the Event Source Management (Live View) window:

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar, then click the *Advanced* tab.
- 3 Click the *Launch Control Center* to launch the Sentinel Control Center.
- 4 Specify the username and password to log in to Sentinel Control Center, then click *Login*.
Only users with the administrator role are allowed to log in to SCC.
- 5 In the toolbar, click *Event Source Management > Live View*.

The Event Source Management (Live View) interface provides a set of tools to manage and monitor connections between Sentinel and the event sources that are providing data to Sentinel. The graphical interface shows the current event sources and the software components that are processing data from that event source. Each component can be easily deployed to integrate the devices in the enterprise, and it can be monitored in real time within the Event Source Management interface. For more information, see [Section 1.3, “Event Source Management,” on page 20](#).

6.5 Managing Event Sources

The Event Sources interface displays the health of the event source and the volume of data being received from it in events per second. The event sources page lists all the event sources, such as Syslog, Audit, File, and Database, that are configured in the Event Source Management interface.

You can refine the displayed event sources by selecting Collector Managers, Event Source Servers, and Collector plug-ins. You can also specify a filter on the event source name and select particular event source health states you want to view. All of these selections and filters are stored on a per-user

basis, so that each time you log into the Sentinel server you can view event sources that match your last selections. You can also perform filtering based on tags. For more information, see “[Configuring Tags](#)” in the *Legal Notices*.

- ◆ [Section 6.5.1, “Viewing the Event Sources Page,” on page 121](#)
- ◆ [Section 6.5.2, “Filtering Event Sources,” on page 124](#)
- ◆ [Section 6.5.3, “Changing the Data Logging Status of Event Sources,” on page 126](#)
- ◆ [Section 6.5.4, “Changing the Associated Collector Plug-In for Event Sources,” on page 126](#)
- ◆ [Section 6.5.5, “Changing the Time Zone Setting for Event Sources,” on page 126](#)

6.5.1 Viewing the Event Sources Page

The Event Sources page consists of different sections that allow you to perform different functions.

Collector Managers: Lists all the Collector Managers associated with the Sentinel system. It also displays the state and details about the Collector Managers.

Event Source Servers: Lists all the Event Source Servers associated with the Sentinel system. It also displays the state of the Event Source Servers.

Collector Plug-ins: Lists all the Collector plug-ins associated with the Sentinel system. You can also view the details about the installed plug-ins.

The Event Sources section in the right pane lists the event sources based on the options selected from the left pane.

NOTE: The Event Sources page shows event sources that were already configured or automatically detected. To manually configure additional event sources, use the Event Source Management user interface described in “[Configuring Data Collection for Other Event Sources](#)” on page 120.

- ◆ [“Viewing Event Sources” on page 121](#)
- ◆ [“Viewing Collector Managers” on page 122](#)
- ◆ [“Viewing Event Source Servers” on page 123](#)
- ◆ [“Viewing Collector Plug-Ins” on page 123](#)

Viewing Event Sources

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.

The Event Sources page is displayed.

Each column in the Event Source section has different information:

Health Icon: The colored icon indicates the event source health.

- ◆ **Green:** Indicates that the event source is healthy and Sentinel has received data from it.
- ◆ **Red:** Indicates that the Sentinel server is reporting an error about connecting to or receiving data from this event source.
- ◆ **Gray:** Indicates that the event source is turned off. Sentinel is not processing any data from it.
- ◆ **Orange:** Indicates that the event source is running with some warnings.

You can sort the event sources based on their health status.

Name: Displays the name given to the Event Source by the system (if it was auto-created) or by a user. For Syslog Event Sources, if the Event Source was auto-created by the system, the name is a combination of the hostname/IP address and the Collector connection mode the event source is using.

You can rename any Event Source at any time through the Event Source Management interface.

You can sort the Event Sources in alphabetical order based on their names.

Collector Plug-in: Displays the name of the Collector plug-in that the event source is connected to.

This is the name of the Collector plug-in, not the name of the Collector instance. You can sort the event sources based on Collector plug-in name.

Drop: Indicates whether data from the associated event source should be dropped.

- ◆ **YES:** If *Drop Data* is set to YES, all data received from the event source is dropped. This means that the data is not saved and events are not generated.
- ◆ **NO:** If *Drop Data* is set to NO, all data from the event source is saved and events are generated. When it is set to NO, data is always saved, regardless of whether a filter is set on the event source using the Event Source Management user interface. However, if a filter is set, events might not be generated if the filter causes the data to be ignored.

You can sort the event sources based on the drop data status.

Create Date: Specifies the date and time when the event source was created. You can sort the event sources based on when they were created.

EPS: Displays the events per second value received from the event source. You can sort the event sources based on their events per second value.

If you see a value of less than one (<1) in this column, it indicates that the EPS rate is greater than zero, but less than one.

- 3 To select or deselect an event source, select the check box next to the event source.
To select all the available event sources, select the check box at the top of the column.
- 4 To sort the event sources by *Health*, *Name*, *Collector Plug-in*, *Drop Data*, *Create Date*, and *EPS* values, click the column header. The selected column header is displayed in bold.

When you first click a column header, the event sources are arranged in ascending order. A blue down-arrow is displayed to indicate that the sort order is ascending. When you click the column header for the second time, the sort order is changed to descending, and a blue up-arrow is displayed to indicate that the sort order is descending.

- 5 To view additional information about an event source, click the *Name* or *EPS* value of an event source. A dialog box displays the additional information.

Viewing Collector Managers

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.

The Collector Manager section is displayed in the Event Sources page.

Health: Indicates the health of the Collector Managers. You can sort the Collector Managers based on their health status.

Name: Displays the names of the Collector Managers. You can sort the Collector Managers in alphabetical order based on their names.

EPS: Displays the events per second value received from the event sources. You can sort the Collector Managers based on the events per second value.

- 3 To select or deselect a Collector Manager, select the check box next to the Collector Manager. To select all the available Collector Managers, select the check box located at the top of the column.

The right pane displays the list of event sources connected to the selected Collector Managers.

If none of the Collector Managers are selected, the event sources table displays all the configured event sources.

- 4 To sort the Collector Managers by *Health*, *Name*, and *EPS* values, click the column header. The selected column header displays in bold text.
- 5 To get additional information about the Collector Managers, click the *Name* or *EPS* value column. A dialog box displays the additional information.

Viewing Event Source Servers

- 1 Log in to the Sentinel server as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.

The Event Source Servers section is displayed.

Health: Indicates the health of the Event Source Server. You can sort the Event Source Servers based on their health status.

Name: Displays the names of the Event Source Server used to parse the data from the event sources (for example, Syslog Server SSL). You can sort the event source server in alphabetical order based on their names.

EPS: Displays the events per second value received from the event sources. You can sort the event source servers based on the events per second value.

- 3 To sort the Event Source Servers by *Health*, *Name*, and *EPS* values, click the column header. The selected column header displays in bold text.
- 4 To view additional details, click the *Name* or *EPS* value column. A dialog box displays the additional information.

Viewing Collector Plug-Ins

- 1 Log in to the Sentinel server as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.

Health: Indicates the aggregate health of all event sources that are connected to the Collector plug-in.

With the exception of the green icon (healthy state), the icon does not necessarily mean that all event sources connected to the Collector plug-in are in the state indicated by the icon.

The red icon (error state) indicates that one or more event sources connected to the Collector plug-in are in an error state. To get a detailed information, click the *Name* or *EPS* column value to view help information.

Name: Displays the names of the Collector plug-in used to parse the data from the event sources (for example, Cisco Firewall 6.1r1).

This is the name of the Collector plug-in, not the name of the Collector instance. You can sort the event sources based on Collector plug-in name.

EPS: Displays the events per second value received from the event sources. You can sort the Collector based on the events per second value.

3 To select or deselect the Collector plug-ins, select the check box next to the Collector plug-in. To select all the available Collector plug-ins, select the check box at the top of the column.

4 To sort the Collector plug-ins by *Name* or *EPS* values, click the appropriate column header. The selected column header displays in bold text.

The *Collector Instances* field displays the number of instances of the Collector plug-in. Clicking the *Collector Instances* field displays a *Collectors* window with a list of Collector instances associated with the Collector plug-in:

5 Click the *Collector Plug-in* column to display a dialog box with additional information about the Collector plug-in.

6.5.2 Filtering Event Sources

1 Log in to the Sentinel server as a user in the administrator role.

2 Select *Collection* in the toolbar, then click the *Event Sources* tab.

3 Select the desired criteria to filter event sources.

You can use one or more of the following options to filter the event sources:

- ♦ [“Filtering Event Sources by Name” on page 124](#)
- ♦ [“Filtering Event Sources by Tags” on page 125](#)
- ♦ [“Filtering Event Sources by Health Status” on page 125](#)
- ♦ [“Filtering by Event Sources Event Search Results” on page 125](#)
- ♦ [“Filtering Event Sources by Collector Managers” on page 125](#)
- ♦ [“Filtering Event Sources by Event Source Servers” on page 125](#)
- ♦ [“Filtering Event Sources by Collector Plug-Ins” on page 126](#)

Filtering Event Sources by Name

To filter the event sources by name, type a name value in the filter text box, then click *Filter*.

Matching is case insensitive. The name value can contain wildcard characters. Use *** to match zero or more characters and use *?* to match one character. If no wildcard characters are specified in the name value, it is assumed that the name value is intended to mean *contains <name value>*, or **<name value>**.

For example, an event source value of *abc* is interpreted as **abc**. Some examples of common filter types are:

- ♦ If the event source name starts with *abc*, enter the filter value as *abc**.
- ♦ If the event source name ends with *abc*, enter the filter value as **abc*.
- ♦ If the event source name contains *abc*, enter the filter value as *abc* or **abc**.

The Event Source table displays the list of event sources whose names match the value entered in the filter input box.

Filtering Event Sources by Tags

To filter event sources based on tags, do one of the following:

- ◆ Click , then select the tags to use for searching the events.
- ◆ Specify the following search criteria:

@<tag_name>

For example, @HIPAA displays all events tagged with the HIPAA tag.

Filtering Event Sources by Health Status

To view the event sources based on the health status, select the *Healthy*, *Warning*, *Error*, or *Offline* check boxes.

The Event Source table displays the list of event sources with the selected health states.

If none of the health states are selected, health state filtering is not performed. It is essentially equivalent to selecting all four health states.

In the Event Source section, click the *Next*, *Previous*, *First*, and *Last* arrow links to scroll through all the event sources. The event source section displays 30 Event Sources per page.

Filtering by Event Sources Event Search Results

To view the event search result for an event source, select the event source from the list and click the *Search* link.

A search is performed using the universally unique identifier (UUID) of the event source (for example, `rv24:"2CBFB8A0-F24B-102C-A498-000C"`).

If multiple event sources are selected for search, the `rv24:<UUID>` expressions are combined with the OR operator in the search filter expression.

Filtering Event Sources by Collector Managers

To display the event sources connected to particular Collector Managers, select one or more Collector Managers from the Collector Managers section.

If none of the Collector Managers are selected, event source filtering is not performed based on the Collector Managers. This is not the same as selecting all Collector Managers, because it also includes event sources that are not connected to any Collector Manager.

To select or deselect Event Source Servers, select the check boxes next to the Event Source Servers.

Filtering Event Sources by Event Source Servers

To display only event sources connected to particular Event Source Servers, select one or more Event Source servers from the Event Source Servers section.

If none of the Event Source Servers are selected, event source filtering is not performed based on the Event Source servers. This is not the same as selecting all Event Source Servers, because it also includes event sources that are not connected to any Event Source Server.

To select or deselect Event Source Servers, select the check boxes next to the Event Source Servers.

Filtering Event Sources by Collector Plug-Ins

To display only those event sources connected to particular Collector plug-ins, select one or more Collector plug-ins from the *Collectors Plug-ins* section.

If none of the Collector plug-ins are selected, event source filtering is not performed based on the Collector plug-in. It is essentially equivalent to selecting all of the Collector plug-ins.

6.5.3 Changing the Data Logging Status of Event Sources

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.
- 3 To change the data logging status for one or more event sources, select the event sources from the list.
- 4 Click the *Configure* button in the table, then select either *Drop Data* or *Allow Data*,

Drop Data: If *Drop Data* is selected, the selected event sources drop all the events received. Messages are not sent to the Collectors the selected event sources are connected to.

Allow Data: If *Allow Data* is selected, the selected event sources forward events received to the Collectors they are connected to.

If you select a large number of event sources to change, it might take some time to complete. The Event Sources list does not show the Drop state (*YES* or *NO*) until after the changes are complete and the display is refreshed from the database.

6.5.4 Changing the Associated Collector Plug-In for Event Sources

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.
- 3 Select the event sources from the list, then click the *Configure* button in the toolbar.
- 4 Select the *Collector Plug-in* option.

The Set Collector Plug-in window is displayed with the *Collector Plug-in Name* and *Supported Devices* information.

- 5 Select a new Collector plug-in, then click *Set*.

The event sources are connected to the selected Collector plug-in.

If you select a large number of event sources to change, it might take some time to complete. The Event Sources list does not show the new Collector plug-in until after the changes are complete and the display is refreshed from the database.

6.5.5 Changing the Time Zone Setting for Event Sources

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Select *Collection* in the toolbar, then click the *Event Sources* tab.
- 3 To change the time zone setting for one or more event sources, select the event sources from the list, then click the *Configure* button in the toolbar.

- 4 Select the *Time Zone* option.

The *Set Time Zone* window is displayed.

- 5 Select a new time zone, then click *Set*.

The selected event sources are set to the new time zone setting.

If you select a large number of event sources to change, it might take some time to complete. The Event Sources list does not show the new time zone until after the changes are complete and the display is refreshed from the database.

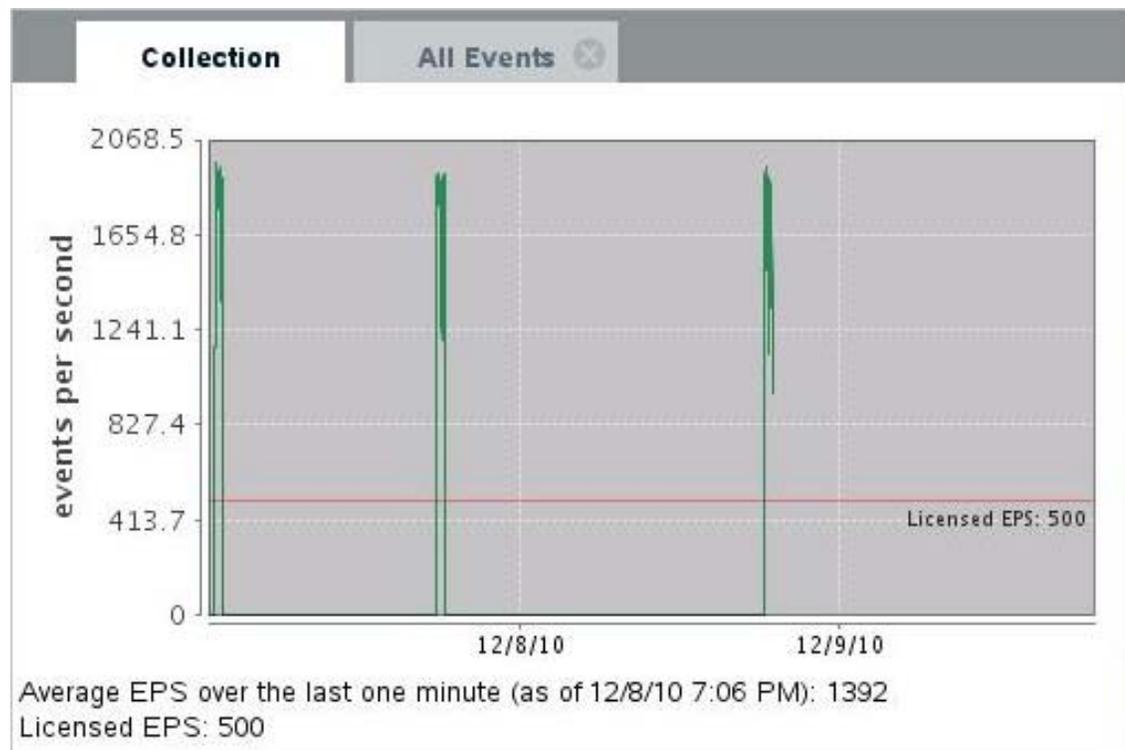
6.6 Viewing Events Per Second Statistics

- ♦ [Section 6.6.1, "Viewing a Graphical Representation of the Events Per Second Value," on page 127](#)
- ♦ [Section 6.6.2, "Viewing the Events Per Second Value of Event Source Servers," on page 128](#)

6.6.1 Viewing a Graphical Representation of the Events Per Second Value

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar.
- 3 In the *Overview* section, view the events per second (eps) value of the incoming events in the last one minute.

The graph shows the 90-day statistics of all the events coming to the Sentinel server. The graph also includes an EPS indicator that enables you to determine whether the current EPS rate is exceeding the licensed EPS rate or is close to the licensed EPS rate.



6.6.2 Viewing the Events Per Second Value of Event Source Servers

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Collection* in the toolbar, then click the *Event Sources* tab.

The *EPS* column of the *Event Source Servers* section specifies the events per second value received from all the Event Source Servers.

7 Mapping Events

Sentinel provides the ability to use mapping to inject additional information into events. This increases Sentinel's ability to analyze events, execute correlation rules, or provide detailed reports.

- ♦ [Section 7.1, "Overview," on page 129](#)
- ♦ [Section 7.2, "Default Maps," on page 132](#)
- ♦ [Section 7.3, "Accessing Map Definitions," on page 133](#)
- ♦ [Section 7.4, "Adding Map Definitions," on page 133](#)
- ♦ [Section 7.5, "Adding a Number Range Map Definition," on page 134](#)
- ♦ [Section 7.6, "Editing Map Definitions," on page 137](#)
- ♦ [Section 7.7, "Deleting Map Definitions," on page 137](#)
- ♦ [Section 7.8, "Updating Map Data," on page 137](#)
- ♦ [Section 7.9, "Using Maps for Event Configuration," on page 138](#)
- ♦ [Section 7.10, "Renaming Event Fields," on page 139](#)

7.1 Overview

There are two major components of mapping:

- ♦ [Section 7.1.1, "Maps," on page 129](#)
- ♦ [Section 7.1.2, "Mapping Events," on page 130](#)

7.1.1 Maps

A map is a collection of keys and associated values defined in a simple text CSV (comma-separated value) file format. You can enrich your event data by using maps to add additional information such as host and identity details to the incoming events from your source devices. This additional information can be used for advanced correlation and reporting. The system supports several built-in maps as well as custom user-defined maps. For more information, see [Section 7.9, "Using Maps for Event Configuration," on page 138](#).

Maps that are defined in Sentinel are stored in two ways:

- ♦ Built-in maps are stored in the database, updated via APIs in Collector code, and automatically exported the Mapping service.
- ♦ Custom maps are stored as CSV files and can be updated on the file system or via the Map Data Configuration UI, then loaded by the Mapping service.

In both cases, the CSV files are kept on the central Sentinel server but changes to the maps are distributed to each Collector Manager and applied locally. This distributed processing ensures that mapping activity does not overload the main server.

7.1.2 Mapping Events

Event Mapping is a mechanism that allows you to add data to an event by using data already in the event to reference and pull in data from an outside source.

Because virtually any data set can be made into a map, Event Mapping is useful for incorporating data from elsewhere in your organization into the event stream. Some opportunities that Event Mapping provides are:

- ◆ Regulatory compliance monitoring
- ◆ Policy compliance
- ◆ Response prioritization
- ◆ Enabling security data to be analyzed related to business operations
- ◆ Enhancing accountability

When an Event Mapping is defined, it is applied system-wide to all events from all Collectors. Sentinel automatically distributes map data to all processes that perform event mappings and also keeps the map data in these processes up-to-date.

Event Mapping has four main parts:

- ◆ **Controller:** Stores all map information
- ◆ **Distributor:** Automatically redistributes modified maps to those processes that register for the map
- ◆ **Monitor:** A monitor to detect changes in map source data
- ◆ **Generator:** Generates maps from source data

One application of Event Mapping is Sentinel's Asset Data functionality. Asset information is collected and stored in the Sentinel database asset schema and is represented by a Physical Asset entry. Soft assets, such as services and applications, are represented by an entry that is linked to a Physical Asset. The primary automated update mechanism for asset data is through an asset Collector reading data from a scanner such as Nmap. The asset Collector automates the retrieval of asset information by reading asset data from the scanner and populating the asset schema tables with this data. For Event Mapping, asset information is mapped from the destination IP and source IP.

There are two types of data sources:

- ◆ **External:** A Collector populates that value in the event ID.
- ◆ **Referenced from Map:** Data is retrieved from a map to populate the event ID.

Figure 7-1 Data Sources

Map Key Field	Event Tag
PhysicalAssetName	SourceIP

In the above illustration, the SourceAssetName tag is populated from the map called Asset (which has asset.csv as its map data source file). The specific value for SourceAssetName is taken from the AssetName column from the Asset map. The PhysicalAssetName column is set as the key. When the InitIP tag of the event matches one of the source IP values in the PhysicalAssetName column of the map, the row with the matching key is used to intersect the AssetName Column. For instance, in the following example the IP address corresponds to AssetName Finance35.

Table 7-1 Populating an Event ID with Data from a Map

PhysicalAssetName	CustomerID	MacAddress	AssetName
10.0.0.1			Marketing0
10.0.0.2			Marketing02
10.0.0.3			ProgramMgmt03
10.0.0.4			Finance34
10.0.0.5			Finance35

You can have more than one column set as a key if you do not want the map to be a Range Map (Range Maps can only have one key column, with that column type set to NumberRange). For instance, with column type set to String, the AttackId tag has the DeviceName (name of the security device) and DeviceAttackName columns set as keys and uses the NormalizedAttackID column in the AttackNormalization map for its value. In a row where the DeviceName event ID matches the data in Device map column and the DeviceAttackName matches the data in the AttackSignature map column, the value for AttackId is the value in the NormalizedAttackID column. The configuration for the Event Mapping just described is:

Figure 7-2 Event Mapping Configuration

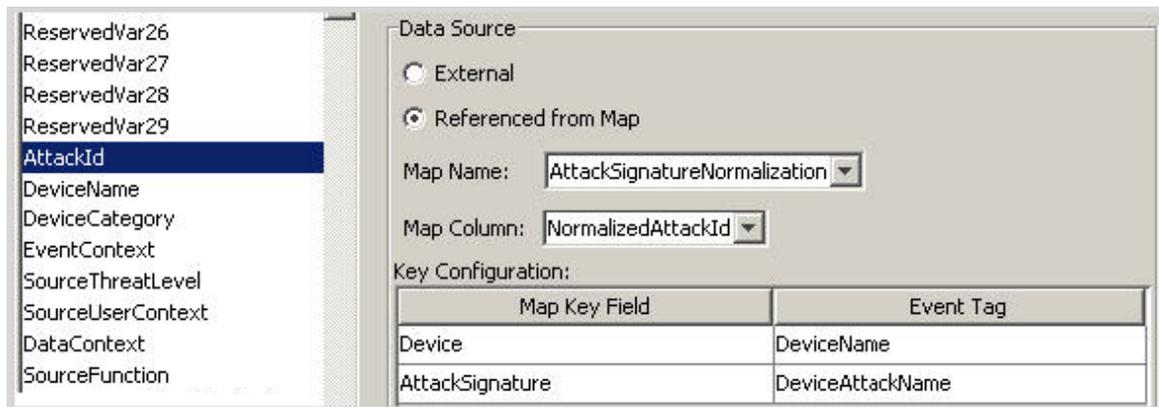


Table 7-2 Device and Attack Signature Corresponds to Asset Name

Device	Attack Signature	Normalized Attack ID	
Secure	BackDoorProbe (TCP 1234)	3	Trojan: Backdoor.Subeven
Secure	BackDoorProbe (TCP 1999)	3	Trojan: Backdoor.Subeven
Dragon	RWALLD: SYSLOG-FORMAT	4	Sun Microsystems Solaris rwall Elevated
Snort	RPC TCP rwalld request	4	Sun Microsystems Solaris rwall Elevated
Snort	RPC UDP rwalld request	4	Sun Microsystems Solaris rwall Elevated
Snort	WEB-IIS foxweb.dll access	12	Microsoft Exchange Server Arbitrary Code
RealSecure	SMTP_Exchange_Verb_DoS	12	Microsoft Exchange Server Arbitrary Code

7.2 Default Maps

Maps defined in this tool work together with the *Referenced from Map* data source setting for individual fields. The following built-in maps are available:

- ♦ **Identity:** Contains information about identities and the accounts associated with them. Data is added to the Identity map through a [Collector API \(http://www.novell.com/developer/develop_to_sentinel.html\)](http://www.novell.com/developer/develop_to_sentinel.html), Identity Tracking Module for Sentinel, and Generic Identity Collector. Data is then extracted to the `identityAccountMap.csv` file.
 - ♦ **Keys:** User name and domain, TenantName (mapped to both Initiator and Target users).
 - ♦ **Data added to event:** User identity (an internal GUID), full name, department, workforce ID, and e-mail address.
- ♦ **Asset:** Contains information about hosts in the environment. Data is added to the Asset map using a [Collector API \(http://www.novell.com/developer/develop_to_sentinel.html\)](http://www.novell.com/developer/develop_to_sentinel.html) and Collectors such as the Generic Asset Collector, stored in the database, and then extracted to the `asset.csv` file.
 - ♦ **Keys:** IP address and TenantName (mapped to Initiator, Target, Observer, and Reporter hosts).
 - ♦ **Data added to event:** Host identity (an internal GUID), function, class, department, and criticality.
- ♦ **Country:** Contains information about which physical location hosts reside in, including country, latitude, and longitude. Data is downloaded from a commercial IP location database and added to the `IpToCountry.csv` file using the Generic IP Geolocation Collector.
 - ♦ **Keys:** IP address and TenantName (mapped to Initiator, Target, and Observer hosts).
 - ♦ **Data added to event:** Country, latitude, and longitude.
- ♦ **Exploit:** Contains information about vulnerabilities present in and attacks on enterprise hosts. Information is added to the Exploit map by the Advisor service, stored in the database, and extracted to the `exploitDetection.csv` file.
 - ♦ **Keys:** Target IP address, IDSAttackName, IDSName, and TenantName.
 - ♦ **Data added to event:** Vulnerability flag.

- ♦ **CustomerHierarchy:** Contains a hierarchical list of tenants that are generating event data. This can be used by security providers that collect data for multiple third parties or departments to provide a hierarchic namespace for users and hosts. Data is added to the `customerhierachy.csv` file manually.
 - ♦ **Keys:** TenantName.
 - ♦ **Data added to event:** TenantHierarchy fields.

7.3 Accessing Map Definitions

- 1 Access the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Click the *Configuration* tab.
- 3 In the menu bar, click *Configuration > Map Data Configuration*.

The main Mapping GUI displays a list of the maps that have been defined for the system. Default Sentinel maps cannot be edited or deleted.

7.4 Adding Map Definitions

- 1 Access the map definitions.
For more information, see [Section 7.3, “Accessing Map Definitions,”](#) on page 133.
- 2 Click *Add*, then use the following information to create the map definition:

Name: Specify the name of the map definition.

File Name: Select whether the file is local or remote, then browse to and select your map definition.

- ♦ **Local File:** Allows you to browse for your file on your local file system (on the machine where Sentinel Control Center was launched).
- ♦ **Remote File:** Allows you to select from existing map source data files on the Sentinel server. The remote file points to `/var/opt/novell/sentinel/data/map_data`.

Map Definition: Use the following information to define the map. As you configure each setting and filter, the data preview is automatically updated to allow you to preview your data and ensure your data is being parsed as expected.

- ♦ **Delimiter:** Character used to separate the data into rows in the map data source file. Usually a comma, but other delimiters such as pipe, tab, and semicolon are supported. You can also specify other delimiters in the *Other* field.
- ♦ **Start at row:** Some input map files contain header rows that do not contain real data. This option specifies the number of rows to skip from the top of the map data source file.
- ♦ **Column names:** Specify the column names. These names are used later to configure which columns are matched against event fields and which columns are injected into event data.
- ♦ **Key columns:** A key is a unique identifier for the row of data in the map data. If more than one column is selected as a key, then all event fields must match each of the corresponding selected key columns.

When a column is set as a key, it does not appear in the *Column* drop-down field.

- ♦ **Column types:** Specify the data type for the column. The currently supported data types are:
 - ♦ **String:** A string is treated as a simple sequence of characters, and can include any characters except the specified delimiter. Use strings for any data including numeric fields.
 - ♦ **Number Range:** A number range (NumberRange) is a range of numbers. For example, 10 through 200 is represented as 10-200. To use the range map functionality, a map definition must have only one key column and the key column must be of type NumberRange. If there are any other key columns, or if the key column is of a different type, the mapping service does not consider the map to be a range map. For more information, see [Section 7.5, “Adding a Number Range Map Definition,” on page 134](#).
 - ♦ **Active columns:** When a column is marked as active, the data in the column is distributed to processes using maps. All key columns must be active. Only active columns (but not key columns) can be selected as the Map Column under the *Event Configuration* tab.
 - ♦ **Column filtering:** A row can be explicitly included or excluded based on matching criteria for a particular column. This can be used to exclude rows from the map source data that are not needed or that interfere with your mapping.
- 3 After you finish configuring all parameters and filters for the definition, click *Finish*.
- 4 (Conditional) If you selected *Local File* above, you are prompted to upload your file. Specify a file name, then click *OK*.

You can have more than one column set as a key if you do not want the map to be a Range Map (Range Maps can only have one key column, with that column type set to NumberRange). For instance, with column type set to String, the AttackId tag has the DeviceName (name of the security device) and DeviceAttackName columns set as keys and uses the NormalizedAttackID column in the AttackNormalization map for its value. In a row where the DeviceName event ID matches the data in Device map column and the DeviceAttackName matches the data in the AttackSignature map column, the value for AttackId is the value in the NormalizedAttackID column.

7.5 Adding a Number Range Map Definition

To use the range map functionality, a map definition must have only one key column and the key column must be of type NumberRange. If there are any other key columns, or if the key column is of a different type, the mapping service does not consider the map to be a range map.

To create a range map, select a single column to be the key of the map and select NumberRange as the type of the column. The format of the data in a column of type NumberRange must be “m-n”, where m is the minimum number in the range and n is the maximum number in the range (for example, 10-200). The maximum number in the range is not included in the range (m, n). This means a range of 10-200 only uses numbers equal to 10 to 199. An example set of data has the first column defined as the key column:

```
1-2, AA
2-4, AA
4-12, BB
10-20, BB
30-31, BB
100-200, AA
110-120, CC
```

When the source CSV file is loaded into the system, any common or overlapping number ranges are collapsed into a single entry as follows:

Table 7-3 Transformation

FROM	TO
1-2, AA	1-4, AA
2-4, AA	4-20, BB
4-12, BB	30-31, BB
10-20, BB	100-110, AA
30-31, BB	110-120, CC
100-200, AA	120-200, AA
110-120, CC	

Figure 7-3 Number Range Map Definition

The first 500 rows are shown

	Column 1	Column 2
Name:	Range	Value
Type:	NumberRange	String
Key:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Active:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Row 0	1-4	AA
Row 1	4-20	BB
Row 2	30-31	BB
Row 3	100-110	AA
Row 4	110-120	CC
Row 5	120-200	AA

An example event configuration on the above map might look like this:

Figure 7-4 Event Configuration

CustomerVar82	<p>Data Source</p> <p><input type="radio"/> External</p> <p><input checked="" type="radio"/> Referenced from Map</p> <p>Map Name: <input type="text" value="Maps/RangeMap"/></p> <p>Map Column: <input type="text" value="value"/></p> <p>Key Configuration:</p> <table border="1"> <thead> <tr> <th>Map Key Field</th> <th>Event Tag</th> </tr> </thead> <tbody> <tr> <td>Range</td> <td>CustomerVar97</td> </tr> </tbody> </table>	Map Key Field	Event Tag	Range	CustomerVar97
Map Key Field		Event Tag			
Range		CustomerVar97			
CustomerVar83					
CustomerVar84					
CustomerVar85					
CustomerVar86					
CustomerVar87					
CustomerVar88					
CustomerVar89					
SARBOX					
HIPAA					
GLBA					
FISMA					

In the scenario above, CustomerVar97 must contain a numeric value. That value is compared against each NumberRange defined in the RangeMap until a match is found. The corresponding row from the map is returned and used to set CustomerVar89, as follows:

CustomerVar97 = 1; CustomerVar89 will be set to AA
CustomerVar97 = 4; CustomerVar89 will be set to BB
CustomerVar97 = 300; CustomerVar89 will not be set

For Sentinel event fields that are defined as having an IP address or Date datatype, Sentinel internally converts those fields to an integer representation of the values of that field.

Fields that are defined as IP address fields are:

- ◆ SourceIP (sip)
- ◆ TargetIP (dip)
- ◆ SourceTranslateIP (sxiip)
- ◆ TargetTranslateIP (dxiip)
- ◆ ObserverIP (obsip)

Fields that are defined as Data fields are:

- ◆ EventTime (dt)
- ◆ ObserverEventTime (det)
- ◆ SentinelProcessTime (spt)
- ◆ BeginTime (bngt)
- ◆ EndTime (endt)
- ◆ CustomerVar11 to CustomerVar20 (cv11 to cv20)
- ◆ ReservedVar11 to ReservedVar20 (rv11 to rv20)

The conversions for IP address are simple octet mappings to decimal integers, which you can calculate using any server online calculator. The following example shows a numerical range equivalent to an IP range of 10.0.0.0 to 10.0.2.255.

```
167772160-167772415,AAA  
167772416-167772671,BBB  
167772672-167772927,CCC
```

Using the same setup as the previous example, if:

- ◆ In Key Configuration, the Event ID used for comparison is set to TargetIP for the range Map Key field.
- ◆ The Map column returned from the map to set CustomerVar89 is defined as a value, as displayed in the second column below.

If an event contains a target IP of 10.0.1.14 (equivalent to numerical value of 167772430), the output for column CustomerVar89 within the event is BBB.

Dates are represented as an integer number of seconds since midnight January 1, 1970. Data and time ranges can be used in maps in a similar fashion as the IP address sample above.

Sentinel supports the following number ranges:

- ◆ Range from negative number to negative number (for example, -234-34)
- ◆ Range from negative number to positive number (for example, -234-34)
- ◆ Range from positive number to positive number (for example, 234-236)
- ◆ Single number range (negative) (for example, -234). In this case, the min and the max will both be -234.

- ♦ Single number range (positive) (for example, 234). In this case, the min and the max will both be 234.
- ♦ Range from negative number to max number (for example, -234-). In this case, the min will be -234 and the max will be $(2^{63} - 1)$.
- ♦ Range from positive number to max number (for example, 234-). In this case, the min will be 234 and the max will be $(2^{63} - 1)$.

NOTE: In all cases, the min must be less than or equal to the max (for example, “-234- -235” is NOT valid).

7.6 Editing Map Definitions

Default Sentinel maps cannot be edited or deleted.

- 1 Access a map definition.
For more information, see [Section 7.3, “Accessing Map Definitions,”](#) on page 133.
- 2 Expand the folder of interest.
- 3 Select a map definition, then click *Edit*.
- 4 Make your desired changes.
 - ♦ Set delimiters
 - ♦ Set which row to start the map
 - ♦ Rename the columns
 - ♦ Activate or deactivate a column
 - ♦ Set the column keys
 - ♦ Set a column filter
- 5 After making your changes, click *OK*.

7.7 Deleting Map Definitions

Default Sentinel maps cannot be edited or deleted.

- 1 Access a map definition.
For more information, see [Section 7.3, “Accessing Map Definitions,”](#) on page 133.
- 2 Expand the folder of interest.
- 3 Select the map definition, then click *Delete*.

7.8 Updating Map Data

Updating allows you to replace the map source data file of a map on the server with another file. Your new map source data file must have the same delimiter, number of columns, and overall structure as the existing map data source file in order for the map to function properly after the

update. The new map source data file should differ from the existing file only by the values that appear in the columns. If the new map source data file has a different structure than the existing file, use the Edit feature to update the map definition.

Map updates can be performed on demand from the Sentinel Control Center. To set up an automated process to update map data, you can run an equivalent process from the command line using `map_updater.sh`.

There are two map locations: the location referenced by the Event Map Configuration (which is a user-defined location) and the location where Sentinel stores its internal representation of the map (`/var/opt/novell/sentinel/data/map_data`). The internal representation of the map should never be manually updated.

To update the map data from the Sentinel Control Center:

- 1 If you haven't already done so, create a CSV file containing the new map source data.

This file can be generated (for example, from a data dump script), created manually, or be an edited version of the existing map data source file. If necessary, you can obtain the existing map data source file from `/var/opt/novell/sentinel/data/map_data`.

- 2 Access a map definition.

For more information, see [Section 7.3, "Accessing Map Definitions,"](#) on page 133.

- 3 Expand the folder of interest and select the mapping, then click *Update*.

- 4 Select the new map data source file by clicking *Browse* and selecting the file with the new map data.

After you select the file, the data from the new map data source file displays under the *New* tab. The map data you are replacing is under the *Current* tab.

- 5 Deselect or leave the default setting for *Backup Existing Data On Server*.

Enabling this option puts a backup of the existing map data source file in the `/var/opt/novell/sentinel/data/map_data` folder. The prefix of the name of the backup map data source file is the name of the existing map data source file. The end of the filename includes a set of random numbers followed by the `.bak` suffix. For example: `vuln_attacks10197.bak`.

- 6 Click *OK*.

The data from the new map data source file is uploaded to the server, replacing the contents of the existing map data source file. After the source data is completely uploaded, the map data is regenerated and distributed to map clients such as, Collector Manager.

7.9 Using Maps for Event Configuration

After you have created a map, you must decide where the mapped data is injected into the event. You must configure each Event to use mapping:

- 1 Access the *Configuration* tab in the Sentinel Control Center.

For more information, see [Section 1.2.1, "Accessing the Sentinel Control Center,"](#) on page 13.

- 2 Click *Event Configuration* in the navigation pane.

or

In the toolbar, click *Configuration > Event Configuration*.

- 3 Select an entry from the Event Columns, then use the following information to configure the event using a map:

Name: Displays the name of the event ID selected in the *Event Columns* field.

Referenced from Map: Click *Referenced from Map* to configure the event ID to be populated with data from a map.

The default option of *External* keeps the value the Collector put in the event ID (if any).

Map Column: Click the *Map Name* drop-down list, then select one of the available maps.

The maps listed are the default maps or a map you have created.

Map Column: Click the *Map Column* field drop-down list, then select a *Map Column* name.

Depending on your Map Name choice in the previous step, these values vary.

- ♦ **All other choices:** Names of active columns within the map definition that are not set as a key (for example, *CustomerId* column in *Asset* or *NormalizedAttackId* column in *AttackNormalization*)
- ♦ **_EXIST_ :** This is a special Map Column that exists in every map. If this Map Column is selected, a 1 is placed in the event ID if the key is in the map data. If the key is not in the map data, a 0 is placed in the event ID.

Key Configuration: For each row in the table, select the event ID in the *Event ID* column that is matched against the map key column specified in the corresponding *Map Key Field* column. The rows in the Key Configuration table depend on the Map Name selected.

A key is a unique identifier for the row of data in the map data.

4 Click *Apply*.

Clicking *Apply* saves the changes you made for the currently selected event column in a temporary buffer. If you don't click *Apply*, the changes you made to the previously selected event column are lost when you select a different event column. Changes aren't be saved to the server until you click *Save*.

5 If you want to edit the event mapping of another event column, repeat the steps above. Remember to click *Apply* after editing the event mapping of each event column.

6 Click *Save*.

Clicking *Save* saves your changes to the server. The save function saves all changes stored in the temporary buffer when you clicked *Apply*.

7.10 Renaming Event Fields

The Event Configuration window allows you to rename the event field. When you do this, the event names are changed in the Sentinel Control Center and the Sentinel Web interface.

Renaming event fields does not change the event ID in Collector scripts or in internal Sentinel representations of the event. For example, if you rename the event name *BeginTime* to *StartTime*, the ID will still remain as *bgnt*. Any references to this ID in Correlation or Filters still work, even if they were originally written using *bgnt*.

To rename an event field:

1 Access the Configuration tab in the Sentinel Control Center.

For more information, see [Section 1.2.1, "Accessing the Sentinel Control Center,"](#) on page 13.

2 Click *Event Configuration* in the navigation pane.

or

In the menu bar, click *Configuration > Event Configuration*.

- 3 Select an entry in the *Event Fields* column.
- 4 Specify a new value for the event name in the *Name* field.
- 5 Click *Apply*, then click *Save*.
- 6 Close and launch Sentinel Control Center for the changes to be visible.

8 Configuring Event Routing Rules

You can configure event routing rules to evaluate and filter all incoming events and deliver selected events to designated output actions. For example, each severity 5 event can be logged to a file.

You can configure event routing rules to filter events based on one or more of the searchable fields. Each event routing rule can be associated with one or more of the configured actions.

The event routing rules are evaluated on a first-match basis in top-down order and the first matched event routing rule is applied to the events that matches the filter criteria.

- ◆ [Section 8.1, “Creating an Event Routing Rule,” on page 141](#)
- ◆ [Section 8.2, “Editing an Event Routing Rule,” on page 142](#)
- ◆ [Section 8.3, “Ordering Event Routing Rules,” on page 143](#)
- ◆ [Section 8.4, “Deleting an Event Routing Rule,” on page 143](#)
- ◆ [Section 8.5, “Activating or Deactivating an Event Routing Rule,” on page 143](#)

8.1 Creating an Event Routing Rule

You can create a filter-based event routing rule and then assign one or more configured actions that are executed to handle or output the events that meet the event routing rule criteria.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Routing* in the toolbar.

The *Event Routing Rules* tab is displayed.

- 3 Click *Create*, then use the following information to create a new event routing rule:

Name: Specify a unique name for the event routing rule.

Filter: Select a saved filter to use in creating event routing rule. This filter determines which events are stored in the event store. For more information, see [“Configuring Filters”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

Select tag: (Optional) Select a tag for tagging the filter. The tag makes the filter more specific. For more information, see [“Configuring Tags”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

Route to the following services: Select where the information is routed. The options are:

- ◆ **All:** Routes the event to all services including Correlation, Security Intelligence, and Anomaly Detection.
- ◆ **Event store only:** Routes the event to the event store only.
- ◆ **None (drop):** Drops or ignores the events.

Perform the following actions: (Optional) Select an action to be performed on every event that meets the filter criteria. The following default actions are available for event routing rules:

- ◆ **Log to File:** For configuration information, see [“Configuring the File Integrator” on page 156.](#)
- ◆ **Log to Syslog:** For configuration information, see [“Configuring the Syslog Integrator” on page 159](#)
- ◆ **Send Events via Sentinel Link:** For configuration information, see [“Configuring the Sentinel Link Integrator” on page 157.](#)
- ◆ **Send SNMP Trap:** For configuration information, see [“Configuring the SNMP Integrator” on page 158.](#)

For the actions to work, you must have configured the Integrator associated with each action for your environment.

The actions listed here are different than the actions displayed in the *Event Actions* tab in the Sentinel Web interface, and are distinguished by the `<EventRouting>` attribute in the `package.xml` file created by the developer.

Adding or Removing Actions: You can add more than one action to perform on the events that meet the filter criteria:

- ◆ Click  to select additional actions to be performed.
- ◆ Click  to remove the selected action for this event routing rule.

- 4 Click *Save* to save the event routing rule.

The newly created event routing rule appears at the end of the rules list under the *Event Routing Rules* tab. By default, this new event routing rule is active.

8.2 Editing an Event Routing Rule

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Routing* in the toolbar.
The *Event Routing Rules* tab is displayed.
The existing event routing rules appear on the page.
- 3 Click the *Edit* next to the event routing rule to change its definition.
- 4 Make the changes you want.
- 5 Click *Save* to save the changes.

When the event routing rules settings are changed, a success message is displayed.

8.3 Ordering Event Routing Rules

When there is more than one event routing rule, the event routing rules can be reordered by dragging them to a new location. Events are evaluated by event routing rules in the specified order until a match is made, so you should order the event routing rules accordingly. More narrowly defined event routing rules and more important event routing rules should be placed at the beginning of the list.

The first routing rule that matches the event based on the filter is processed. For example, if an event passes the filter for two routing rules, only the first rule is applied. The default routing rule cannot be reordered. It always appears at the end.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.

- 2 Click *Routing* in the toolbar.

The *Event Routing Rules* tab is displayed.

Existing event routing rules appear on the page.

- 3 Mouse over the icon to the left of the event routing rule numbering to enable drag-and-drop.

The cursor changes.

- 4 Drag the event routing rule to the correct place in the ordered list.

When the event routing rules are ordered, a success message is displayed.

8.4 Deleting an Event Routing Rule

- 1 Log in to the Sentinel Web interface as a user in the administrator role.

- 2 Click *Routing* in the toolbar.

The *Event Routing Rules* tab is displayed.

Existing event routing rules appear on the page.

- 3 Click the *Delete* link next to the event routing rule to delete an event routing rule definition.

- 4 Click the *Delete* button to delete the selected event routing rule.

When the event routing rule is deleted, a success message is displayed.

8.5 Activating or Deactivating an Event Routing Rule

New event routing rules are activated by default. If you deactivate an event routing rule, incoming events are no longer evaluated according to that event routing rule. If there are already events in the queue for one or more actions, it might take some time to clear the queue after the event routing rule is deactivated. If the *On* check box next to the event routing rule is selected, the event routing rule is activated. If the *On* check box is not selected, the event routing rule is deactivated.

- 1 Log in to the Sentinel Web interface as a user in the administrator role.

- 2 Click *Routing* in the toolbar.

The *Event Routing Rules* tab is displayed.

Existing event routing rules appear on the page.

- 3 To activate the event routing rule, select the check box next to each event routing rule in the

Enabled column.

If the event routing rule is activated, a success message is displayed.

- 4 To deactivate the event routing rule, select the check box next to each event routing rule in the *Enabled* column.

When the event routing rule is deactivated, a success message is displayed.

9 Configuring Actions

An Action is a configured instance of an Action plug-in. Actions are used to execute some type of action in Sentinel, either manually or automatically. Actions can be triggered by routing rules, by manually executing an event or incident operation, and by correlation rules.

- ♦ [Section 9.1, “Overview,” on page 145](#)
- ♦ [Section 9.2, “Understanding the Action Manager Interface,” on page 146](#)
- ♦ [Section 9.3, “Managing Actions,” on page 147](#)
- ♦ [Section 9.4, “Managing Action Plug-Ins,” on page 150](#)

9.1 Overview

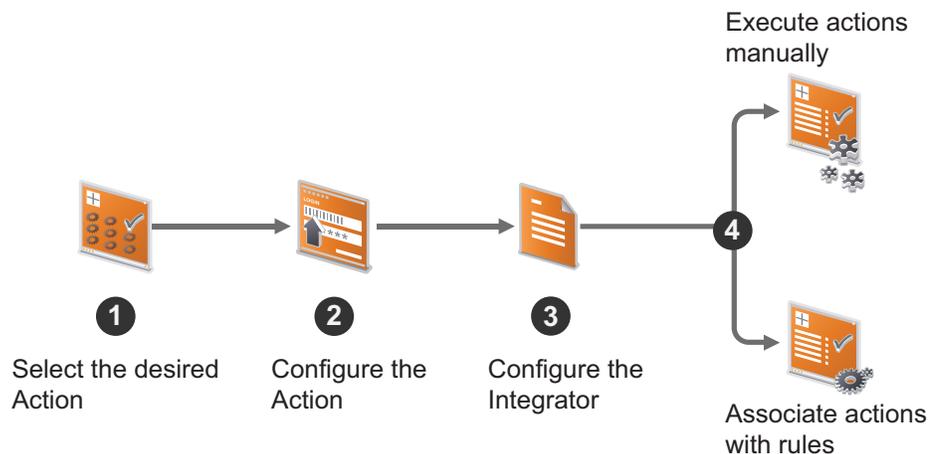
Sentinel provides a list of preconfigured Actions that should be useful in most standard situations. You can use the default Actions and reconfigure them as necessary, or you can add new Actions.

NOTE: Only users in the administrator role can configure and manage Actions.

An Action can be executed on its own, or it can make use of an Integrator instance configured from an Integrator plug-in. Integrators provide the ability to connect to an external system, such as an LDAP, SMTP, or SOAP server, to execute an action.

The general process for using an Action to perform remediation is shown in the following figure:

Figure 9-1 Actions Workflow



1. Determine the best type of Action plug-in that should be used to perform your desired action.
2. Configure the appropriate Action plug-in with appropriate parameter settings for your environment.

For more information, see [Section 9.3.1, “Adding an Action,”](#) on page 148.

3. If the Action requires an Integrator, configure the appropriate Integrator.

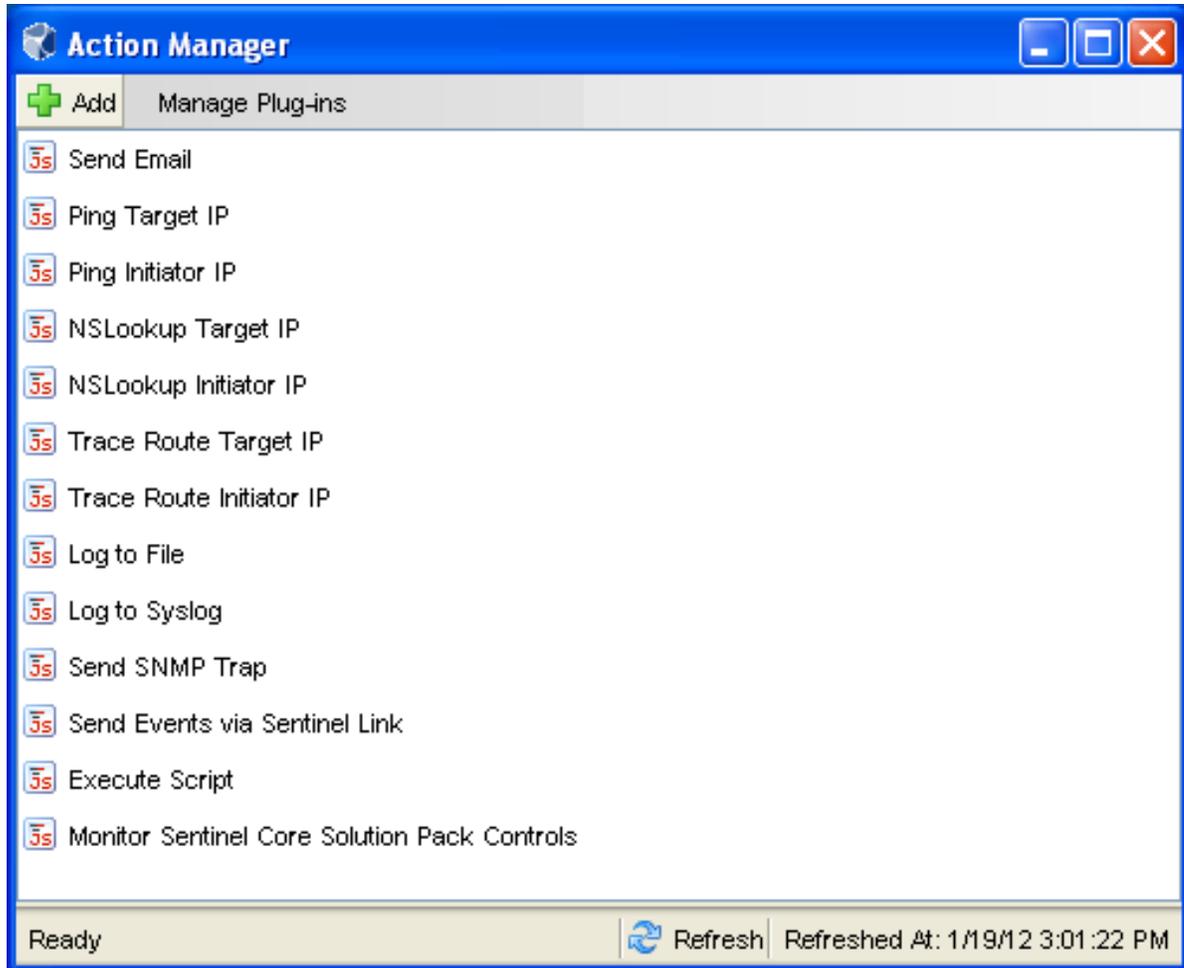
To determine the required Integrators for an Action, see the documentation that is available with the Action on the [Sentinel Plug-ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html). Alternatively, you can view a specific Action’s documentation by clicking the *Help* button while configuring that Action in the Action Manager.

4. For information on configuring the Integrator, see [Section 10.2, “Managing Integrators,”](#) on page 156.
5. Execute actions manually or associate actions to rules for the action to fire automatically when the rule fires:
 - ♦ For information on executing an action in an Incident, see “[Executing Incident Actions](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ For information on executing an action on events that meet the event routing rule criteria, see [Section 8.1, “Creating an Event Routing Rule,”](#) on page 141.
 - ♦ For information on executing an action on events in Active Views, see “[Executing Actions on Events](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ For information on executing actions on events in Search results, see “[Executing Actions](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ For information on associating an action to a Correlation rule, see “[Associating Actions to a Rule](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

9.2 Understanding the Action Manager Interface

The Action Manager allows you to configure actions that can be executed in various contexts throughout the Sentinel system. You can also use the Action Manager to manage Actions and Action plug-ins

Figure 9-2 Action Manager



The Action Manager window lists the preconfigured actions. You can configure these Actions further as necessary.

- ♦ **Actions:** To configure an Action, select the desired action, then click *View/Edit*.
- ♦ **Add:** Allows you to add an action. For more information, see [Section 9.3.1, “Adding an Action,” on page 148](#).
- ♦ **Manage Plug-ins:** Allows you to import new and updated action plug-ins, and manage the action plug-ins. For more information, see [Section 9.4, “Managing Action Plug-Ins,” on page 150](#).

9.3 Managing Actions

An Action is a configured instance of an Action plug-in. There can be one or more instances of an Action plug-in with different parameters or settings. A few Actions are available by default. You can also add additional actions as required.

- ♦ [Section 9.3.1, “Adding an Action,” on page 148](#)
- ♦ [Section 9.3.2, “Debugging Actions,” on page 149](#)

- ♦ [Section 9.3.3, “Editing an Action,”](#) on page 149
- ♦ [Section 9.3.4, “Deleting an Action,”](#) on page 150

9.3.1 Adding an Action

1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Action Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.

3 Click .

4 To create an Action, select an existing Action plug-in from the available action types in the *Action* drop-down. Alternatively, you can import another plug-in by clicking the *Add Action Plug-in* button.

The parameters for the selected plug-in are displayed. For Actions provided by NetIQ, more information about configuration and the available parameters are available in the help file for the Action.

5 (Conditional) If the selected Action plug-in requires an Integrator, the *Add Integrator* button is displayed to allow you to add the Integrator for this action. Click *Add Integrator* and select the appropriate Integrator for the action.

6 Specify the attribute values for the type of action selected.

7 Click *Save*.

8 Execute actions manually or associate actions to Correlation rules for the action to fire automatically when the rule fires:

- ♦ For information on executing an action in an Incident, see [“Executing Incident Actions”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.
- ♦ For information on executing an action on events that meet the event routing rule criteria, see [Section 8.1, “Creating an Event Routing Rule,”](#) on page 141.
- ♦ For information on associating an action to a Correlation rule, see [“Associating Actions to a Rule”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.
- ♦ To execute actions on events in Active Views or Search results, you must first add the action in the Event Actions Configuration. For more information, see [“Assigning Actions to Events”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ For information on executing an action on events in Active Views, see [“Executing Actions on Events”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.
 - ♦ For information on executing actions on events in search results, see [“Executing Actions”](#) in the *NetIQ Sentinel 7.0.1 User Guide*.

Each individual Action plug-in defines where it can be used and what data it requires as input. Every Action plug-in has certain performance characteristics relating to how quickly it can execute, reset, and be ready for the next event. When an Action instance is created, it inherits the characteristics of the selected Action plug-in. For better performance, not all Actions are available for all the different

Action modes in Sentinel. For example, Actions based on the Send E-mail Action plug-in do not appear in Event Routing rules because you might not want to receive messages with a large event stream every time the rule fires.

For information on where an Action plug-in can be used, refer to the Action Modes section in the specific Action plug-in document.

9.3.2 Debugging Actions

You can debug the Action files from the Sentinel Control Center by using the Action debugging option. The debugger is a local debugger that executes scripts on which the Sentinel Control Center is running. The debugger instantiates a debug session from the Sentinel server machine.

Only actions that are executed in an Incident can be debugged. Therefore, a prerequisite to debug an action is to execute that action in an Incident. For more information, see “[Executing Incident Actions](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

The Action debugger has the following controls:

Table 9-1 *Debugger Controls*

Action	Description
Run	Runs the script until the next breakpoint is encountered.
Step In	Steps into a function, one line at a time.
Pause	Pauses the running script.
Stop	Stops the script.
Step Over	Steps over a function to the next line in the script.
Step Out	Steps out of the function to the next line in the script.

To debug an action:

- 1 Execute an action in an Incident.
For more information, see “[Executing Incident Actions](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.
- 2 In the Sentinel Control Center toolbar, click the *Action Debugging*  icon.
- 3 Click  to start the debugging process. The debugger panel displays the source code and positions the cursor on the first line of the script.
You can debug the script as many times as needed. To debug the script by using a different incident, close the Debug JavaScript Correlation Action window and repeat the debugging process.

9.3.3 Editing an Action

If you edit an action that is associated with a deployed correlation rule, the changes take effect the next time the correlation rule fires.

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Action Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.

3 Select the action you want to edit, then click *View/Edit*.

4 Make the necessary changes, then click *Save*.

For information on the configuration settings, see the specific Action documentation by clicking the *Help* button.

9.3.4 Deleting an Action

You cannot delete an action if the action is associated to any of the following:

- ♦ A deployed correlation rule
- ♦ Event Actions configuration
- ♦ Event routing rules

1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Action Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.

3 Select the action instance you want to delete, then click *Delete*.

4 Click *Yes* to confirm deletion.

9.4 Managing Action Plug-Ins

The Sentinel system includes several Action plug-ins by default, but you can download updates, documentation, and additional Actions from the [Sentinel Plug-ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html). For more information on specific Actions, see the documentation that is available with the Action. Alternatively, you can view a specific Action’s documentation by clicking the *Help* button while configuring that Action in the Action Manager.

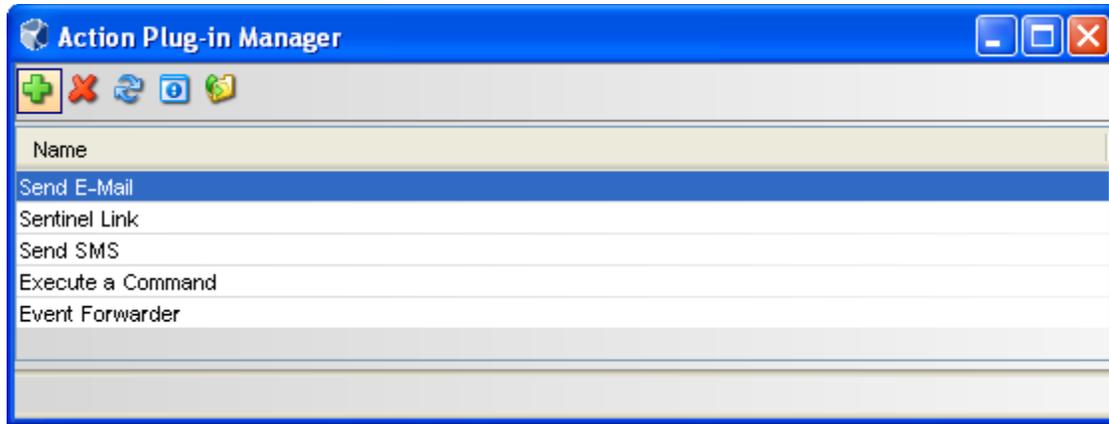
Although common Action plug-ins can be obtained from NetIQ, you can create and manage your own Action plug-ins. New Action plug-ins can be developed by using the [Sentinel Plug-in SDK \(http://www.novell.com/developer/develop_to_sentinel.html\)](http://www.novell.com/developer/develop_to_sentinel.html).

- ♦ [Section 9.4.1, “Understanding the Action Plug-In Manager Interface,”](#) on page 151
- ♦ [Section 9.4.2, “Importing an Action Plug-In,”](#) on page 151

9.4.1 Understanding the Action Plug-In Manager Interface

The Action Plug-in Manager window lists the available Action plug-ins and allows you to import and manage action plug-ins.

Figure 9-3 Action Plug-In Manager



The Action Plug-in Manager window includes the following options:

- ◆ **Add** : Allows you to import or update an Action plug-in.
- ◆ **Delete** : Allows you to delete an Action plug-in.

NOTE: You can delete an Action plug-in only if there are no Action instances configured to use it. For example, if an Action is referenced by an Integrator, the Action cannot be deleted.

- ◆ **Refresh** : Refreshes the list of plug-ins.
- ◆ **View Details** : Displays the plug-in details such as the version number, release date, and a brief description of the Action.
- ◆ **Add Auxiliary file** : Allows you to add an auxiliary file to the Action plug-in. Auxiliary files are occasionally required if NetIQ cannot ship a specific file within the plug-in for licensing reasons, or if users want to customize or extend the Action in some way.

9.4.2 Importing an Action Plug-In

You can download and import an action plug-in package file or you can import an action plug-in file that is in a directory.

When you import a file from a directory, it is important to define the required objects correctly so that the Actions are available for the appropriate Sentinel features.

- ◆ “[Downloading and Importing an Action Plug-In](#)” on page 151
- ◆ “[Importing an Action Plug-In File from a Directory](#)” on page 152

Downloading and Importing an Action Plug-In

- 1 Download the appropriate Integrator plug-in from the [Sentinel Plug-Ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).
- 2 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

3 Launch the Action Manager:

- ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.
- ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.

4 Click *Manage Plug-ins*, then click the *Import*  icon.

5 To import an Action plug-in package file, select *Import an Action plug-in file (.zip, acz)*, then click *Next*.

6 Click *Browse* to select the location of the package file.

The file must be in .zip or acz format.

7 (Conditional) If you have selected an Action file that already exists, the *Replace Existing Plug-in* window is displayed. Click *Next* to replace the existing plug-ins.

8 Review the plug-in details, then click *Finish*.

Importing an Action Plug-In File from a Directory

1 Download the appropriate Integrator plug-in from the [Sentinel Plug-Ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).

2 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

3 Launch the Action Manager:

- ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.
- ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Action Manager* or click the  icon in the toolbar.

4 Click *Manage Plug-ins*, then click the *Import*  icon.

5 Select *Import an Action plug-in from directory*.

6 Click *Browse* to select the location of the directory, then click *Next*.

7 Review the details and make changes as necessary.

If you have selected an Action file that already exists, the *Replace Existing Plug-in* window is displayed. Click *Next* to replace the existing plug-ins.

8 Select the objects you want to associate with the action, then click *Next*.

This affects where the Action is available in the Sentinel interface.

9 (Optional) Customize the plug-in by adding or editing the parameters.

For example, if you want to include the attachment option for the Send E-mail action, you can add a parameter named “Attachment” and configure it appropriately. Also, you must modify the code in the action script to handle the new parameter.

10 Click *Add* to add parameters that can be set when an Action is configured.

This option should be used for any file that expects to receive information as parameters.

10a Specify the parameter name.

The name used here should be identical to the one used in the JavaScript API method `scriptEnv.getParameter("<name>")` in the script that is being imported.

10b Select the parameter type from the *Type* drop-down list.

- ◆ **String:** Passes the string value to the parameter.
- ◆ **Boolean:** The parameter can take a True or False value.
- ◆ **Integrator:** Select an Integrator for the action.
- ◆ **Event Tag:** Select an Event Tag for the parameters.
- ◆ **Severity:** Select a severity for the parameters.

NOTE: The *Options* area is available only for the String type parameters.

10c (Optional) Specify a description.

10d Click *Next*.

11 Review the plug-in details, then click *Finish*.

10 Configuring Integrators

- ◆ [Section 10.1, “Overview,” on page 155](#)
- ◆ [Section 10.2, “Managing Integrators,” on page 156](#)
- ◆ [Section 10.3, “Managing Integrator Plug-Ins,” on page 162](#)

10.1 Overview

Integrators are plug-ins that can be used in Sentinel to extend the features and functionality of Sentinel remediation actions. Integrators allow Sentinel to connect to external systems, such as an LDAP server, SMTP server, or SOAP server. Actions use Integrators to interact with other systems. For example, you can set an attribute in Novell eDirectory, an LDAP server, to enable or disable a user, edit details, and so on. You can also start an Identity Manager workflow, such as a provisioning request, by using SOAP calls.

The general process for using an Integrator to perform remediation actions involves the following steps:

1. Determine the best type of Integrator to access the external system with which you want to interact.
2. Import and configure the appropriate Integrator to connect to the external system. Or, you can use the Integrators that are configured by default.
3. Configure the appropriate Action. Or, you can use the Actions that are configured by default. For more information, see [Chapter 9, “Configuring Actions,” on page 145](#).
4. Perform additional configuration, if desired, to associate the action with a deployed correlation rule or an event menu action.
5. The action is executed:
 - ◆ When an associated correlation rule fires.
 - ◆ When you execute actions on the selected events in the Sentinel Web interface > *Event Actions* tab.
 - ◆ When you execute actions on the selected Incident in the Sentinel Control Center > *Incidents > Actions > Execute Incident Action*.
 - ◆ When you select an action for the selected event in the Sentinel Control Center > *Active View > right-click menu*.

For more information on specific Integrators, see the documentation that is available with the Integrators. Alternatively, you can view a specific Integrator’s documentation by clicking the *Help* button in the Integrator Manager after configuring that Integrator.

NOTE: Only users in the administrator role can configure and manage Integrators.

10.2 Managing Integrators

An Integrator is a configured instance of an Integrator plug-in. There can be one or more instances of an Integrator plug-in with different parameters or settings. A few Integrators are available by default. You can also add additional Integrators as required.

- ◆ [Section 10.2.1, “Configuring the Default Integrators,” on page 156](#)
- ◆ [Section 10.2.2, “Adding an Integrator,” on page 159](#)
- ◆ [Section 10.2.3, “Editing an Integrator,” on page 159](#)
- ◆ [Section 10.2.4, “Deleting an Integrator,” on page 160](#)
- ◆ [Section 10.2.5, “Verifying the Integrator Connection Status,” on page 160](#)
- ◆ [Section 10.2.6, “Viewing Integrator Health Details,” on page 160](#)
- ◆ [Section 10.2.7, “Viewing Integrator Events,” on page 162](#)

10.2.1 Configuring the Default Integrators

The default Integrators installed with Sentinel are not configured. To use these default Integrators with the actions in your Sentinel system, you must configure the Integrators for your environment.

- ◆ [“Configuring the File Integrator” on page 156](#)
- ◆ [“Configuring the Sentinel Link Integrator” on page 157](#)
- ◆ [“Configuring the Sentinel Mail Integrator” on page 158](#)
- ◆ [“Configuring the SNMP Integrator” on page 158](#)
- ◆ [“Configuring the Syslog Integrator” on page 159](#)

Configuring the File Integrator

The File Integrator is used with the *Log to File* action.

- 1 Access the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,” on page 13](#).
- 2 Launch the Integrator Manager:
 - ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
 - ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- 3 Select *File* in the Integrators column, then click the *File Configuration* tab.
- 4 Change the default filename and location where the events are stored.
By default, the location is `../data/log_to_file_events.txt`.
- 5 Click *Save*.

Configuring the Sentinel Link Integrator

The Sentinel Link Integrator is used to connect multiple Sentinel systems. For more information, see [Chapter 16, “Linking to External Sentinel Systems,”](#) on page 197.

1 Access the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Integrator Manager:

- ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.

3 Select *Sentinel Link* in the Integrators column, then click the *Sentinel Link Connector* tab.

4 Use the following information to configure the Sentinel Link Integrator:

Host Name: Specify the hostname or IP address of the destination Sentinel system where a Sentinel Link Connector is configured.

Port Number: Specify the port number for the destination Sentinel system. The default port is 1290.

Encrypted (HTTPS)/Not Encrypted (HTTP): Select whether the connection to the destination Sentinel system is encrypted or not encrypted. If you selected Encrypted, there are additional fields to configure:

- ◆ **Server Validation Mode:** Select one of the following:

- ◆ **None:** The Integrator does not validate the receiver's certificate.
- ◆ **Strict:** The Integrator always verifies the receiver's certificate when connecting to the receiver. If this option is selected, the Integrator immediately attempts to retrieve the receiver's certificate over the network and validate that it is issued by an authorized CA.

If the certificate is not validated, it is still presented to the user to accept or reject. The certificate is considered to be valid if the user accepts it. When a validated certificate is acquired, it is stored in the Integrator's configuration. From now on, the Integrator allows communication only with a receiver that provides that certificate during the initial connection setup.

- ◆ **Integrator Key Pair:** Select one of the following:

- ◆ **None:** The receiver system does not validate the sender certificates. Select this option if the receiver's client authentication type is configured to *Open*.
- ◆ **Custom:** The receiver system validates the sender certificates. Select this option if the receiver's client authentication type is configured to *Strict*. If the receiver system performs a strict validation, it imports a trust store, which contains all the sender certificates that it trusts.

After selecting this option, click the *Import Key Pair* button to import a key pair. The key pair you import must match one of the certificates that is included in the trust store that is imported by the receiver system.

5 Click *Save*.

Configuring the Sentinel Mail Integrator

All Sentinel events that meet the filter criteria for which the *Send an E-mail* action is defined are sent to the associated SMTP relay and e-mail addresses by the Sentinel Mail Integrator.

To configure the Sentinel Mail Integrator:

- 1 Access the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

- 2 Launch the Integrator Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.

- 3 Select *Sentinel Mail* in the Integrators column, then click the *Connection* tab.

- 4 Use the following information to configure the Sentinel Mail Integrator:

Host: Specify the hostname or IP address of an available SMTP server.

Port: Specify the port number of an available SMTP server. The default port is 25.

From (default): Specify an address to using or sending the e-mail messages are sent. The default value is `siem@yourcompany.com`.

User: If the SMTP server requires authentication, specify a username.

Password: Specify the password for authentication to the SMTP server.

- 5 Click *Save*.

Configuring the SNMP Integrator

All Sentinel events that meet the filter criteria for which the *Send SNMP Traps* action is defined are sent to the specified SNMP addresses.

To configure the SNMP Integrator:

- 1 Access the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

- 2 Launch the Integrator Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.

- 3 Select *snmp* in the Integrators column, then click the *Server Configuration* tab.

- 4 Use the following information to configure the SNMP server:

Host: Specify the IP address or hostname of the SNMP server you want to send the trap to.

Port: Specify the port number for the SNMP server. The default port is 162.

Community String (Password): Specify the community string (password) to access the SNMP management system. If no community string is specified, the Integrator sets the default value to public.

OID: Specify the desired ASNL object ID you want to associate with this message. If no object ID is specified, the Novell Audit internal OID is used (2.16.840.1.113719.1.347.3.1).

5 Click *Save*.

Configuring the Syslog Integrator

All Sentinel events that meet the filter criteria for the *Send to Syslog* action are sent to the specified syslog server.

To configure the Syslog Integrator:

1 Access the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Integrator Manager:

- ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.

3 Select *Syslog* in the Integrators column, then click the *Server Configuration* tab.

4 Use the following information to configure the syslog Integrator.

Host: Specify the host name or IP address of the syslog server.

Protocol: Select the protocol used to connect to the syslog server.

Port: Specify the port number used to connect to the syslog server.

Default Facility: Select the default facility for the syslog server from the drop-down list. The facility allows you to classify the syslog messages.

Stream Encoding: Select the encoding standard for the syslog Integrator.

5 Click *Save*.

10.2.2 Adding an Integrator

The specific steps to configure an Integrator depend on the type of Integrator. The steps are described in detail in documents that come with the Integrators. Documentation for installed plug-ins can be viewed by selecting an Integrator in the Integrator Manager and clicking *Help*. Or, you can refer to the document that comes with the Integrator plug-in.

10.2.3 Editing an Integrator

1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Integrator Manager:

- ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.

- 3 In the Integrator Manager window, select an Integrator from the left panel, then make the necessary changes.
- 4 Click *Save*.

10.2.4 Deleting an Integrator

An Integrator cannot be deleted if it is currently associated with an action. To delete an Integrator, you must first delete or modify any actions that are associated with it.

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Launch the Integrator Manager:
 - ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
 - ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- 3 In the Integrator Manager window, select an Integrator from the left panel, then click the  icon.

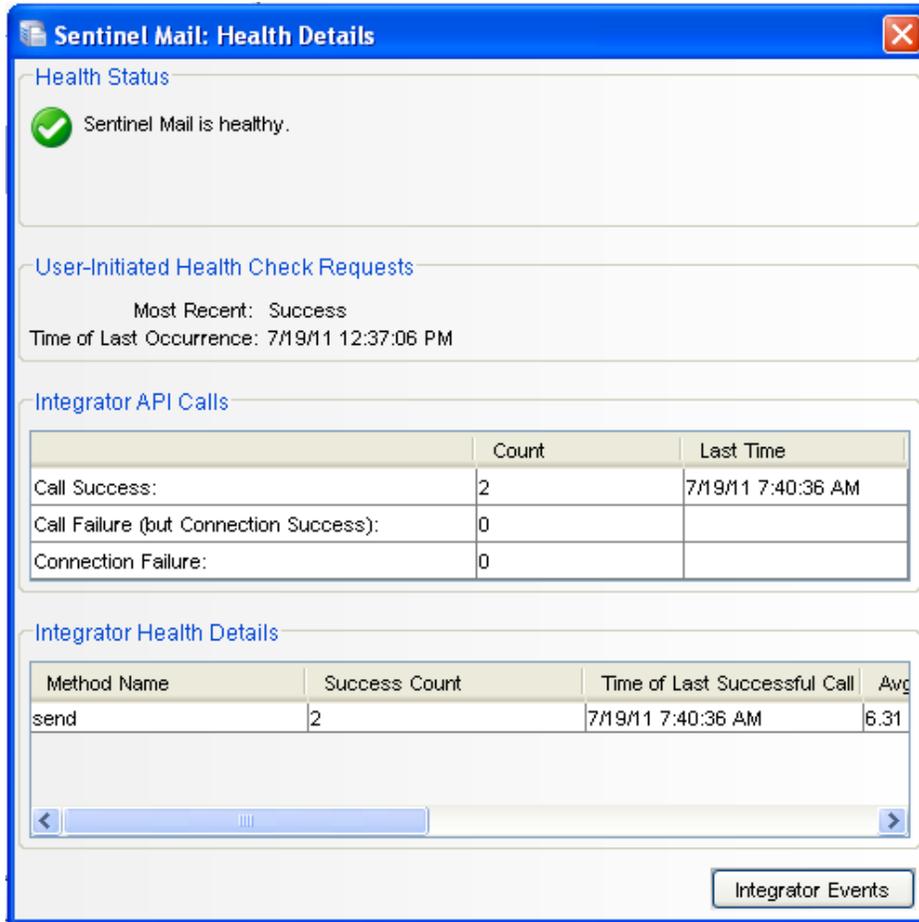
10.2.5 Verifying the Integrator Connection Status

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Launch the Integrator Manager:
 - ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
 - ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- 3 In the Integrator Manager window, click *Refresh health of all Integrators*. The Integrator Connection Status window displays the status of all the Integrators.
The server performs a test of the Integrators in the actual service where the Integrators are used when actions are executed.
- 4 Click *OK*.

10.2.6 Viewing Integrator Health Details

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Launch the Integrator Manager:
 - ♦ (Conditional) If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
 - ♦ (Conditional) If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- 3 In the Integrator Manager window, select an Integrator from the left pane.

4 Click *see details*.



The Health Details window displays the Refresh Health State, time of last occurrence, its method calls and the related events of the selected Integrator configuration.

- ♦ **Integrator API Calls:** Indicates the status of the connection and the method calls used from the API of the selected integrator. For more information on the JavaScript plug-in, see [Chapter 9, “Configuring Actions,”](#) on page 145.
 - ♦ **Call Success Count:** Displays the number of times the connection was established successfully and the methods were called successfully from the API. Time of Last Occurrence displays the time when the connection and the method call were successful.
 - ♦ **Call Failure (but Connection Success) Count:** Displays the number of times the connection was established successfully but the method call failed. Time of Last Occurrence displays the last time when the connection was successful and the method call failed.
 - ♦ **Connection Failure Count:** Displays the number of times the connection failed. Time of Last Occurrence displays the last time when the connection and method call failed.

NOTE: The most recent success or failure time is shown in the overall health status for the configured Integrator.

- ♦ **Integrator Health Details:** Provides information about the success of the API methods called in the JavaScript action files associated with the Integrator. It provides information specific to the methods called.
 - ♦ **Method Name:** Name of the API method used in the JavaScript.
 - Success Count:** Number of times the API method executed successfully.
 - Time of Last Successful Call:** The time at which the method was last successfully executed.
 - Average Successful Run Time:** Average time to make a successful method call.
 - Error Count:** Number of times the API method failed.
 - Time of Last Error Call:** The time at which the method call failed.
 - Average Error Run Time:** Average time to make a failed method call.

NOTE: The most recent success or failure time is shown in the overall health status of the method.

10.2.7 Viewing Integrator Events

When an Integrator has connection failures, it generates internal audit events. You can use the Sentinel Control Center to view information about the events. You can use Integrator Events to automatically create a filter for the selected Integrator and process a query.

- 1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

- 2 Launch the Integrator Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.

- 3 Click *see details*.

- 4 Click *Integrator Events*.

All the events related to the configured integrator are displayed in the Search results page.

10.3 Managing Integrator Plug-Ins

Sentinel includes several Integrators plug-ins by default, but you can download updates and additional Integrators from the [Sentinel Plug-ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).

- ♦ [Section 10.3.1, “Importing an Integrator Plug-In,”](#) on page 163
- ♦ [Section 10.3.2, “Deleting an Integrator Plug-In,”](#) on page 163

10.3.1 Importing an Integrator Plug-In

- 1 Download the appropriate Integrator plug-in from the [Sentinel Plug-Ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html).
- 2 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 3 Launch the Integrator Manager:
 - ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
 - ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- 4 Click *Manage Plug-Ins*.
- 5 In the Integrator Plug-in Manager window, click the  icon.
- 6 In the Plug-in Import Type window, select *Import an Integrator plug-in file (.zip)*, then click *Next*.
- 7 In the Choose Plug-in Package File window, click *Browse* to locate the Integrator zip file you want to import to the plug-in repository, then click *Open*.
- 8 (Conditional) If you have selected an Integrator file that already exists, the *Replace Existing Plug-in* window is displayed. Click *Next* to replace the existing plug-ins.
- 9 Click *Next*.
- 10 In the Plug-in Details window, select *Launch Integrator Configuration Wizard* to deploy the plug-in after importing it.
- 11 Click *Finish*.

After importing the Integrator plug-in, you must configure the Integrator plug-in for your environment. For more information, see [Section 10.2.1, “Configuring the Default Integrators,”](#) on page 156.

10.3.2 Deleting an Integrator Plug-In

You can delete an Integrator plug-in only if there are no Integrators configured to use it. For example, if an Integrator is referenced by an Action, you cannot delete the Integrator.

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Launch the Integrator Manager:
 - ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
 - ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Integrator Manager* or click the  icon in the toolbar.
- 3 In the Integrator Manager window, click *Manage Plug-Ins*.
- 4 In the Integrator Plug-in Manager window, select the Integrator plug-in, then click the *Delete*  icon.
- 5 Click *Yes* to confirm deletion.

11 Configuring Advisor

Sentinel Advisor, powered by Security Nexus, is an optional data subscription service that provides device-level correlation between real-time events, from intrusion detection and prevention systems, and from enterprise vulnerability scan results. Advisor acts as an early warning service and detects attacks against vulnerable systems by providing normalized attack information. It also provides the associated remediation information.

The Advisor subscription is optional. However, it is necessary if you want to use the Sentinel Exploit Detection or the Advisor Reporting features.

- ♦ [Section 11.1, “Understanding Advisor,” on page 165](#)
- ♦ [Section 11.2, “Understanding Exploit Detection,” on page 166](#)
- ♦ [Section 11.3, “Introduction to the Advisor Interface,” on page 168](#)
- ♦ [Section 11.4, “Processing the Advisor Feed,” on page 170](#)
- ♦ [Section 11.5, “Configuring the Advisor Products for Exploit Detection,” on page 171](#)
- ♦ [Section 11.6, “Downloading the Advisor Feed,” on page 171](#)
- ♦ [Section 11.7, “Viewing the Advisor Status,” on page 172](#)
- ♦ [Section 11.8, “Viewing the Advisor Data,” on page 173](#)
- ♦ [Section 11.9, “Resetting the Advisor Password,” on page 174](#)
- ♦ [Section 11.10, “Deleting the Advisor Data,” on page 174](#)
- ♦ [Section 11.11, “Advisor Audit Events,” on page 174](#)

11.1 Understanding Advisor

The Advisor service and its corresponding Exploit Detection feature depend on the mappings between the attacks against enterprise assets and the known vulnerabilities of those assets. The Advisor and the Exploit Detection features require the following data to work with the Advisor products:

- ♦ **Vulnerability scan data:** The vulnerability scanners check enterprise assets for known vulnerabilities. The scanned data can then be loaded into the Sentinel database to serve as referential information, by using the Collectors that support Advisor.
- ♦ **Advisor mapping data:** The Advisor data contains information about known threats, including attacks and vulnerabilities. The Advisor service gathers information from various vulnerability and intrusion detection vendors, and creates mappings between abstract vulnerabilities and attacks.

Security Nexus provides the Advisor feed data that contains information about known security vulnerabilities and threats, and also provides normalization of intrusion detection signatures and vulnerability scans. The Advisor data feed is updated on a regular basis as new attacks and vulnerabilities are reported. The updates are available at the [Novell download Web site \(https://secure-www.novell.com/sentinel/download/advisor/\)](https://secure-www.novell.com/sentinel/download/advisor/).

NOTE: The initial Advisor data feed is installed by default on the Sentinel server at `/var/opt/novell/sentinel/data/updates/advisor`. However, you must purchase an additional license from Novell to download the updated Advisor feed.

- ♦ **Real-time attack data:** Intrusion detection systems report real-time attacks against enterprise assets. However, this data does not indicate the impact of the attacks.

The real-time attacks that are generated as events are loaded into the Sentinel database by using the intrusion detection systems or vulnerability type Collectors.

11.2 Understanding Exploit Detection

- ♦ [Section 11.2.1, “How Exploit Detection Works,” on page 166](#)
- ♦ [Section 11.2.2, “Generating the Exploit Detection File,” on page 168](#)
- ♦ [Section 11.2.3, “Viewing the Events,” on page 168](#)

11.2.1 How Exploit Detection Works

Exploit detection instantly sends notification when an attack is attempting to exploit a vulnerable system. The Exploit Detection feature depends on the following:

- ♦ Both vulnerability scanners and the intrusion detection systems must report vulnerabilities and attacks against the same set of systems. In Sentinel, systems are identified by their IP addresses and their tenant name. The tenant name is a namespace identifier that prevents overlapping IP ranges from matching incorrectly. The tenant name can be the name of the customer, division, department, and so forth that owns this event data.
- ♦ The vulnerability scanner and intrusion detection system products must be supported by the Advisor service. This data uses specific product identifiers to ensure proper matching.
- ♦ The specific reported attacks and vulnerabilities must be known to the Advisor service and Exploit Detection.

All Collectors shipped by NetIQ meet these requirements, as long as they are declared as being supported by Advisor. To write your own vulnerability or intrusion detection Collector, or to modify one of the shipped Collectors, refer to the [Sentinel Plug-in SDK \(http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel\)](http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel) for specific information about which event and vulnerability fields must be filled in to support this service.

The following table lists the supported products with their associated device type (IDS for intrusion detection system, VULN for vulnerability scanners, and FW for firewall).

Table 11-1 Supported Products and the Associated Device Types

Supported Products	Device Type	RV31 Value
Cisco Secure IDS	IDS	Secure

Supported Products	Device Type	RV31 Value
Enterasys Dragon Host Sensor	IDS	Dragon
Enterasys Dragon Network Sensor	IDS	Dragon
Intrusion.com (SecureNet_Provider)	IDS	SecureNet_Provider
ISS BlackICE PC Protection	IDS	XForce
ISS RealSecure Desktop	IDS	XForce
ISS RealSecure Network	IDS	XForce
ISS RealSecure Server	IDS	XForce
ISS RealSecure Guard	IDS	XForce
Sourcefire Snort/Phalanx	IDS	Snort
Symantec Network Security 4.0 (ManHunt)	IDS	ManHunt
Symantec Intruder Alert	IDS	Intruder
McAfee IntruShield	IDS	IntruShield
TippingPoint	IPS	TippingPoint
eEYE Retina	VULN	Retina
Foundstone Foundscan	VULN	Foundstone
ISS Database Scanner	VULN	XForce
ISS Internet Scanner	VULN	XForce
ISS System Scanner	VULN	XForce
ISS Wireless Scanner	VULN	XForce
Nessus	VULN	Nessus
nCircle IP360	VULN	nCircle IP360
Qualys QualysGuard	VULN	QualysGuard
Cisco IOS Firewall	FW	Secure

To enable exploit detection, the Sentinel Collectors must populate several variables as expected. Collectors built by NetIQ populate these variables by default. The Collectors are available for download on the [Sentinel Plug-ins Web site \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html). For information on configuring the Collectors, Connectors, and Event Sources, see [Section 1.3, “Event Source Management,” on page 20](#).

- ◆ In intrusion detection systems and vulnerability Collectors, the RV31 (IDSName) variable in the event must be set to the value in the RV31 column in [Table 11-1](#). This string is case sensitive.
- ◆ In the intrusion detection systems Collector, the DIP (TargetIP) must be populated with the IP address of the machine that is being attacked.

- ♦ In the intrusion detection systems Collector, RT1 (IDSAttackName) must be set to the attack name or attack code for that intrusion detection system.
- ♦ In the intrusion detection systems and vulnerability Collectors, the RV39 (TenantName) value must be populated. For a standard corporation, the value can be anything. For a Managed Security Service Provider (MSSP), the tenant name should be set for the individual customer. For either type of company, the value in the intrusion detection systems Collector must exactly match with the value in the vulnerability Collector.

These values are used by the Mapping Service to populate the VULN field in the event. This value is used to evaluate the incoming events to determine whether a vulnerability is exploited or not. When the vulnerability field (VULN) equals 1, the asset or destination device is exploited. If the vulnerability field equals 0, the asset or destination device is not exploited.

11.2.2 Generating the Exploit Detection File

When you run the intrusion detection system or vulnerability type Collectors, events from all the selected products are scanned for possible attacks and vulnerabilities, and the product name and the tenant name are mapped to the Advisor product name and the tenant name. If the events match successfully, the exploit information (IP address, device name, attack name, and tenant name) is updated in the `exploitdetection.csv` file in the `/var/opt/novell/sentinel/data/map_data` directory.

The initial mapping time might take up to 30 minutes. However, you can modify the time by changing the value of the `minregenerateinterval` property in the `ExploitDetectDataGenerator` component of the `server.xml` file. The time is given in milliseconds. For example, you can change the time from 1800000 (30 minutes) to 180000 (3 minutes).

NOTE: You must restart the Sentinel service for the changes to take effect.

11.2.3 Viewing the Events

To view events that indicate a possible exploitation, search for events whose Vulnerability value is 1.

The value in the Vulnerability field conveys the following:

- ♦ **1:** The asset or destination device is possibly exploited.
- ♦ **0:** The asset or destination device is not exploited.

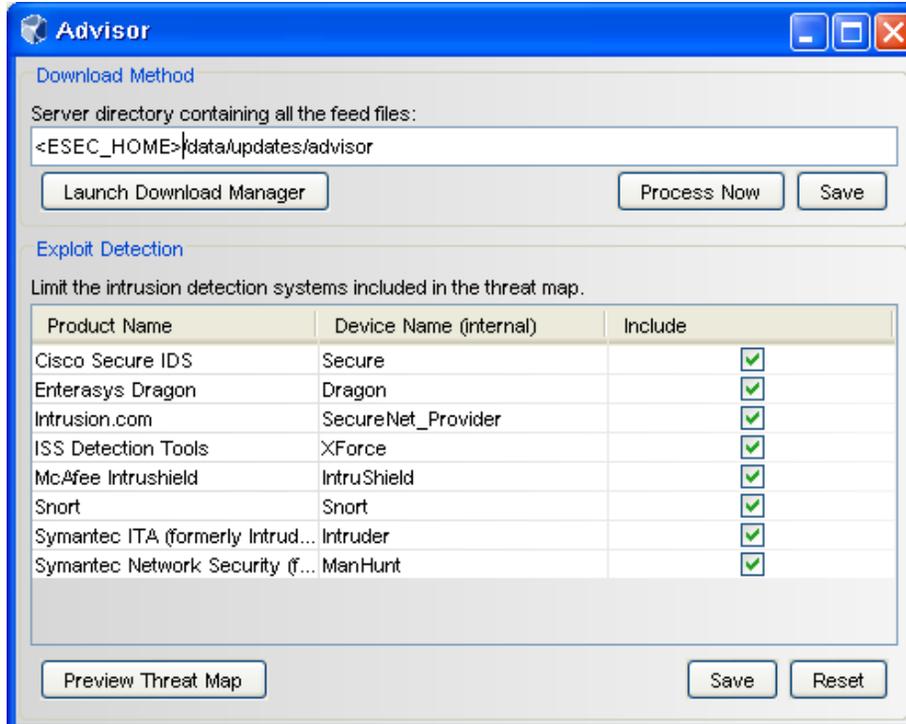
NOTE: If the Vulnerability field is blank, the `exploitdetection.csv` file is not generated.

For more information on viewing events, see [Section 11.8, “Viewing the Advisor Data,” on page 173](#).

11.3 Introduction to the Advisor Interface

The Advisor feature is available in the Sentinel Control Center. You can access Advisor either by clicking the *Advisor* tab or by clicking the Advisor icon  in the toolbar. The Advisor configuration interface is available only for users in the administrator role.

Figure 11-1 Advisor Window



- ♦ **Download Method:** Enables you to process the Advisor feed files manually and launch the Download Manager feature to configure the Sentinel server for automated processing of the feed files. For more information on processing the Advisor feed, see [Section 11.4, “Processing the Advisor Feed,”](#) on page 170.
- ♦ **Exploit Detection:** Lists the vulnerable products that are included in the feed files, and enables you to configure the products for exploit detection. For more information, see [Section 11.5, “Configuring the Advisor Products for Exploit Detection,”](#) on page 171.

NOTE: The Exploit Detection section initially displays a blank list unless you process the initial Advisor feed that was loaded during Sentinel installation. For more information, see [Section 11.4, “Processing the Advisor Feed,”](#) on page 170.

- ♦ **Preview Threat Map:** The Preview Threat Map window lists the top 5000 entries of the `exploitdetection.csv` file. This list displays the attacks that attempt to exploit your machine. To view the threat map: click *Preview Threat Map*.

Figure 11-2 Viewing the Threat Map

TargetIP	IDSName	IDSAAttackName	TenantName
10.22.81.145	XForce	17889	unknown
10.22.81.145	XForce	2358	unknown
10.22.81.145	XForce	3992	unknown
10.22.81.145	TippingPoint	2176:SMB:Null S...	unknown
10.22.81.145	TippingPoint	2176:SMB:Null S...	unknown
10.22.81.145	TippingPoint	2176:SMB:Null S...	unknown
10.22.81.145	SecureNet_Provi...	FTP Client[STAF ...	unknown
10.22.81.145	SecureNet_Provi...	FTP Client[STAF ...	unknown
10.22.81.145	Snort	FTP EXPLOIT ST...	unknown
10.22.81.145	Snort	FTP EXPLOIT ST...	unknown
10.22.81.145	ManHunt	HTTP MS IE Malf...	unknown
10.22.81.145	IntruShield	NETBIOS-NS:Se...	unknown
10.22.81.145	IntruShield	NETBIOS-SS:\PI...	unknown

NOTE: This list is blank unless the `exploitdetection.csv` file has been generated.

11.4 Processing the Advisor Feed

You can process the Advisor feed files manually or you can configure the Sentinel server to automatically process the feed files at scheduled time intervals.

- ◆ [Section 11.4.1, “Processing the Feed Files Manually,”](#) on page 170
- ◆ [Section 11.4.2, “Processing the Feed Files Automatically,”](#) on page 171

11.4.1 Processing the Feed Files Manually

1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Click *Advisor*, then click *Advisor Configuration* in the *Navigator* panel.

3 In the Advisor window, select the directory where you downloaded the latest Advisor feed files.

The initial Advisor feed is loaded at `/var/opt/novell/sentinel/data/updates/advisor`.

4 Click *Process Now* to process and load the feed files into the Sentinel database.

After the feed files are processed, the products included in the feed files are displayed in the Exploit Detection section.

5 (Optional) Click *Save* to save the location of the Advisor directory.

11.4.2 Processing the Feed Files Automatically

You can use the Download Manager to configure the Sentinel server to automatically process the feed files after they are downloaded. For more information on the Download Manager, see [Chapter 12, “Using the Download Manager,”](#) on page 175.

11.5 Configuring the Advisor Products for Exploit Detection

The Exploit Detection section of the Advisor window lists the names of the Advisor products and the device names that are included in the feed files.

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Click *Advisor*, then click *Advisor Configuration* in the *Navigator* panel.
- 3 In the Exploit Detection section, select the products that need to be included for Exploit Detection by selecting the corresponding check boxes.
- 4 (Conditional) To remove any product from the list, deselect the corresponding check box.
- 5 Click *Save* to save the changes made to the Advisor products list.
After the product list is saved, the `exploitdetection.csv` file is updated. For more information on exploit detection, see [“Generating the Exploit Detection File”](#) on page 168.
- 6 (Optional) Click *Reset* to undo the changes made to the Exploit Detection products list.

For more information on exploit detection, see [Section 11.2, “Understanding Exploit Detection,”](#) on page 166.

11.6 Downloading the Advisor Feed

To access the updated Advisor feed, you must download the feed and process it into the Sentinel database. You can download the Advisor feed manually or you can configure the Sentinel server for automated downloads at fixed intervals.

NOTE: To download Advisor updates, you must purchase the Advisor Data Subscription and obtain the credentials.

- ♦ [Section 11.6.1, “Configuring the Sentinel Server for Automated Downloads,”](#) on page 171
- ♦ [Section 11.6.2, “Downloading the Advisor Feed Manually,”](#) on page 172

11.6.1 Configuring the Sentinel Server for Automated Downloads

You can use the Download Manager to configure the Sentinel server for automated Advisor feed downloads. For more information on the Download Manager, see [Chapter 12, “Using the Download Manager,”](#) on page 175.

11.6.2 Downloading the Advisor Feed Manually

- 1 Log in to the Novell download Web site (<https://secure-www.novell.com/sentinel/download/advisor/>) (<https://secure-www.novell.com/sentinel/download/advisor/>) by using your Novell eLogin username and password.

The Novell eLogin username and password must be associated with the Advisor license.

- 2 Download all the .zip and .md5 files.
- 3 Copy the downloaded feed files to the Sentinel server.

To process the downloaded feed, you must provide the location where you have saved the feed in the Advisor window. The default location is `/var/opt/novell/sentinel/data/updates/advisor`.

11.7 Viewing the Advisor Status

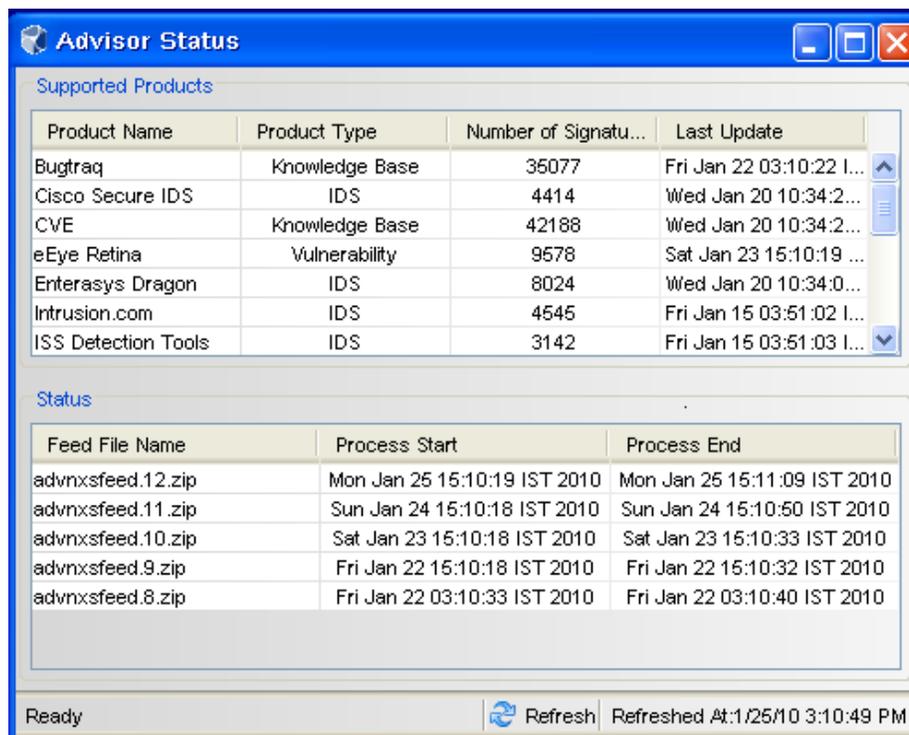
The Advisor Status window lists the products NetIQ supports for Advisor and also displays the status of the last five feed files that have been processed or are being processed.

The Advisor Status window displays the Advisor information only if the feed files are processed and loaded into the database.

To view the Advisor status:

- 1 Launch the Sentinel Control Center.
For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.
- 2 Click *Advisor* or click *Advisor Status* in the *Navigator* panel.

Figure 11-3 *Advisor Status*



The screenshot shows the 'Advisor Status' window with two main sections: 'Supported Products' and 'Status'.

Supported Products

Product Name	Product Type	Number of Signatu...	Last Update
Bugtraq	Knowledge Base	35077	Fri Jan 22 03:10:22 I...
Cisco Secure IDS	IDS	4414	Wed Jan 20 10:34:2...
CVE	Knowledge Base	42188	Wed Jan 20 10:34:2...
eEye Retina	Vulnerability	9578	Sat Jan 23 15:10:19 ...
Enterasys Dragon	IDS	8024	Wed Jan 20 10:34:0...
Intrusion.com	IDS	4545	Fri Jan 15 03:51:02 I...
ISS Detection Tools	IDS	3142	Fri Jan 15 03:51:03 I...

Status

Feed File Name	Process Start	Process End
advnxsfeed.12.zip	Mon Jan 25 15:10:19 IST 2010	Mon Jan 25 15:11:09 IST 2010
advnxsfeed.11.zip	Sun Jan 24 15:10:18 IST 2010	Sun Jan 24 15:10:50 IST 2010
advnxsfeed.10.zip	Sat Jan 23 15:10:18 IST 2010	Sat Jan 23 15:10:33 IST 2010
advnxsfeed.9.zip	Fri Jan 22 15:10:18 IST 2010	Fri Jan 22 15:10:32 IST 2010
advnxsfeed.8.zip	Fri Jan 22 03:10:33 IST 2010	Fri Jan 22 03:10:40 IST 2010

Ready Refresh Refreshed At:1/25/10 3:10:49 PM

Table 11-2 *Advisor Status*

Fields	Description
Product Name	Name of the product supported by NetIQ for Advisor. For example: Cisco Secure IDS and Enterasys Dragon Host Sensor.
Product Type	Shows whether the product type is a Vulnerability, Intrusion Detection System (IDS), or Firewall.
Number of Signatures	Shows the number of signatures for the product by Nexus.
Last Update	Time stamp indicating when the product was last updated.
Feed File Name	Shows the name of the feed files that have been processed and are currently being processed.
Process Start	Time stamp indicating when processing the feed file started.
Process End	Time stamp indicating when processing the feed file finished. The process end time is blank if there is an error that halts processing or if processing is still in progress.

11.8 Viewing the Advisor Data

Make sure you have completed the following prerequisites to view the Advisor data:

- ♦ The Advisor feed must be up-to-date, processed, and loaded into the Sentinel database.
- ♦ The selected event is from a product supported by Advisor and has the Vulnerability field value set to 1.

You can view the Advisor data from the following options:

- ♦ [Section 11.8.1, “Active Views,” on page 173](#)
- ♦ [Section 11.8.2, “Search results in the Web Interface,” on page 173](#)

11.8.1 Active Views

- 1 In the Sentinel Control Center, click *Active Views*.
- 2 In the real-time events table, right-click an event that has the Vulnerability field value set to 1.
- 3 Click *Analyze > Advisor Data*.

11.8.2 Search results in the Web Interface

- 1 In the Sentinel Web interface, click *Filters > Exploit Detected Events* or specify `vu1:1` in the *Search* field, then click *Search*.

All events that are likely to have exploited a known vulnerability are displayed.

You can also view the report for these events by selecting the desired events, then clicking *Event Operations > View Advisor report*.

11.9 Resetting the Advisor Password

If you have configured automated downloads for Advisor and if your Novell eLogin password changes, you need to also change your Advisor password. You can change your Advisor eLogin password by using the Download Manager feature.

- 1 Open the Download Manager by doing one of the following:
 - ♦ Click *Configuration > Download Manager*.
 - ♦ Click the Download Manager  icon on the toolbar.
 - ♦ In the Advisor window, click *Launch Download Manager*.

The Download Manager window is displayed.

For more information on the Download Manager, see [Chapter 12, “Using the Download Manager,” on page 175](#).

- 2 Select the download configuration for which you want to change the password, then click *Edit*.
The Edit window is displayed.
- 3 Specify the new password in the *Password* field.
- 4 (Optional) Click *Validate* to validate the URL and the login credentials.
The URL and its credentials are validated and a confirmation message is displayed. If the validation fails, you must provide a valid URL and the login credentials.
- 5 Click *Save* to save the configuration settings.

11.10 Deleting the Advisor Data

You can delete the Advisor data from the Sentinel database by running the `clean_db` script. For more information on running the `clean_db` script, see [Section 1.5, “Command Line Utilities,” on page 46](#).

11.11 Advisor Audit Events

For information on Advisor audit events, see [“NetIQ Sentinel 7.0.1 Internal Audit Events.”](#)

12 Using the Download Manager

The Download Manager enables you to configure the Sentinel server for automated downloading and processing of the Advisor feed files at fixed intervals. The Download Manager notifies the Sentinel processes to process the downloaded feed whenever a feed is downloaded.

For example, you can configure the Sentinel server to download the Advisor feed at fixed intervals. After the feed is downloaded, the Download Manager notifies the Advisor processes to process the downloaded feed and load it into the Sentinel database.

- ♦ [Section 12.1, “Understanding the Download Manager Interface,” on page 175](#)
- ♦ [Section 12.2, “Creating a Download Configuration,” on page 176](#)
- ♦ [Section 12.3, “Editing a Download Configuration,” on page 178](#)
- ♦ [Section 12.4, “Downloading the Feed Instantly,” on page 178](#)
- ♦ [Section 12.5, “Deleting a Download Configuration,” on page 179](#)
- ♦ [Section 12.6, “Audit Events for the Download Manager,” on page 179](#)

12.1 Understanding the Download Manager Interface

NOTE: Only users in the administrator role can access the Download Manager feature.

The Download Manager window lists the download configurations and displays the status of the previous download for each download configuration. By default, a download configuration is available that is partially configured for Advisor. You can use the same configuration to download an Advisor feed, by specifying the login credentials and other details, and activating the download configuration.

Figure 12-1 Download Manager

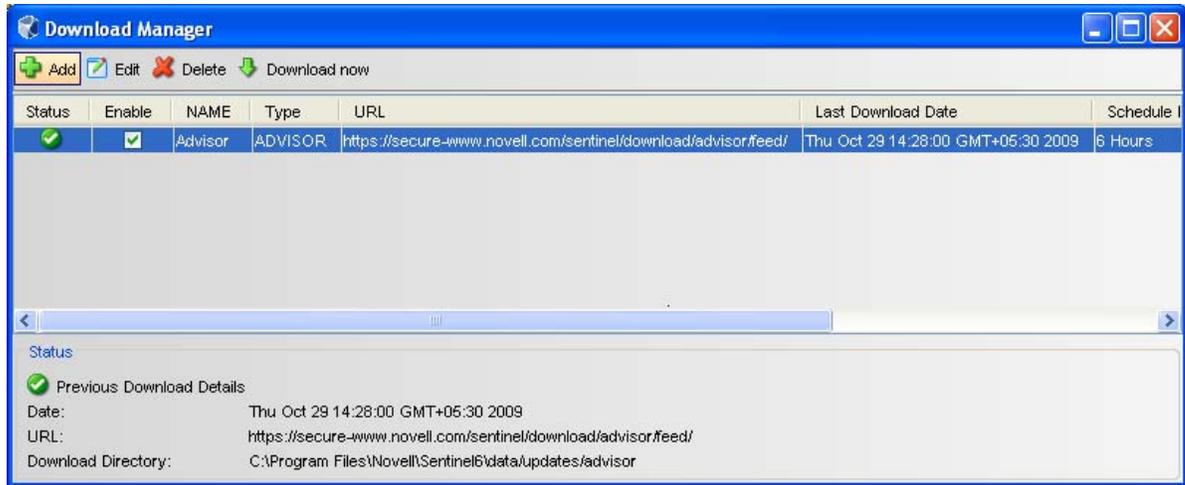


Table 12-1 Download Configuration Status

Status	Icon	Description
Download in progress		Indicates that the download is in progress.
Download successful		Indicates that the latest download was successful.
Download not initiated		Indicates that a download has never been initiated. This status does not display any icon.
Download failure		Indicates that all or some of the files were not downloaded. This might be because of a faulty or failed internet connection.

The status bar displays the previous download details of the selected download configuration, such as the status, date, time, URL, download directory, and errors. If there are any errors, click *Error* to view the error details.

12.2 Creating a Download Configuration

- 1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

- 2 Launch the Download Manager:
 - ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Download Manager* or click the icon on the toolbar.
 - ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Download Manager* or click the icon on the toolbar.

- 3 Click *Add* to configure the download feed.

4 Specify the following information:

- ♦ **Repository Name:** Name of the repository from which you are downloading the data. The repository name must be unique and meaningful to the feed that you are downloading. For example, to download Advisor data, specify the repository name as NetIQ Advisor.
- ♦ **URL:** URL where the download feed is located.
For example, to download Advisor data, specify the Advisor URL ([https://secure-
www.novell.com/sentinel/download/advisor/feed/](https://secure-
www.novell.com/sentinel/download/advisor/feed/)) ([https://secure-
www.novell.com/sentinel/download/advisor/feed/](https://secure-
www.novell.com/sentinel/download/advisor/feed/)).

NOTE: The Advisor feed can also be manually downloaded from the Novell Download Web site ([https://secure-
www.novell.com/sentinel/download/advisor/](https://secure-
www.novell.com/sentinel/download/advisor/)) ([https://secure-
www.novell.com/sentinel/download/advisor/](https://secure-
www.novell.com/sentinel/download/advisor/)). However, the manual download URL does not work in Download Manager.

- ♦ **Authentication:** Specify the authentication details.
 - ♦ **Anonymous:** Select the check box to download the information as an anonymous user. If *Anonymous* is selected, the *Username* and *Password* fields are disabled. You can only access the URLs that do not require authentication.
 - ♦ **Username and Password:** Specify valid credentials to log in to the URL of the repository.
- ♦ **Network:** If you do not have direct access to the server where the download feed is located, you can download the advisor feed through a proxy server.
 - ♦ **Use a proxy server:** Select the check box if you are using a proxy server to download the feed.
The proxy server through which you are connecting should have access to the server where the download feed is located.
 - ♦ **Address:** Specify the proxy server name or server IP address.
 - ♦ **Port:** Specify the port number through which you connect to the proxy server.
 - ♦ **Username and Password:** Specify valid credentials to log in to the proxy server.
- ♦ **Download Directory:** Specify the location and name of the directory where you want to save the feed. Ensure that you specify the absolute path.
The directory is created on the Sentinel server at the specified path while downloading the feed.
If the specified directory already has existing files that are not in sync with the Sentinel server files, these files are deleted when the new download starts.
- ♦ **Enable:** Select this check box to activate the configuration to download the feed.
- ♦ **Schedule Interval:** Specify the time interval for the download by selecting one of the following options from the drop-down list:
 - ♦ **6 Hours:** Schedules the download for every six hours.
 - ♦ **12 Hours:** Schedules the download for every 12 hours.
 - ♦ **Daily:** Schedules the download every day.
 - ♦ **Weekly:** Schedules the download once a week.
 - ♦ **Monthly:** Schedules the download once a month.
- ♦ **Feed Type:** Select Advisor from the drop-down list to notify the Advisor processes on the Sentinel server that the Advisor feed is downloaded.

- 5 (Optional) Click *Validate* to validate the URL and the login credentials.

The URL and its credentials are validated and a confirmation message is displayed. If the validation fails, you must provide a valid URL and login credentials.

- 6 Click *Save* to save the configuration settings.

The specified directory path is validated and the download configuration that you created is displayed in the Download Manager window. If the directory path is invalid, you are prompted to specify a valid directory path.

12.3 Editing a Download Configuration

- 1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

- 2 Launch the Download Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Download Manager* or click the  icon on the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Download Manager* or click the  icon on the toolbar.

- 3 Select the download configuration that you want to edit, then click *Edit*.

- 4 Make the necessary changes.

- 5 (Optional) Click *Validate* to validate the URL and the login credentials.

- 6 Click *Save* to save the configuration settings.

The configuration settings are updated and displayed in the Download Manager window. If the download status is changed to Enable, the Advisor feed is downloaded at the specified time interval.

12.4 Downloading the Feed Instantly

You can immediately download the feed for a selected download configuration, regardless of the time interval scheduled for the selected download configuration.

- 1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

- 2 Launch the Download Manager:

- ♦ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Download Manager* or click the  icon on the toolbar.
- ♦ If the *Configuration* menu is enabled, click the *Configuration* menu > *Download Manager* or click the  icon on the toolbar.

- 3 Click *Download Now*.

The Advisor data feed is downloaded if you have specified the appropriate URL.

The *Download Now* button is disabled when the download is in progress for the selected configuration.

12.5 Deleting a Download Configuration

1 Launch the Sentinel Control Center.

For more information, see [Section 1.2.1, “Accessing the Sentinel Control Center,”](#) on page 13.

2 Launch the Download Manager:

- ◆ If the *Configuration* menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Download Manager* or click the  icon on the toolbar.
- ◆ If the *Configuration* menu is enabled, click the *Configuration* menu > *Download Manager* or click the  icon on the toolbar.

3 Select the download configuration that you want to delete, then click *Delete*.

A message is displayed to confirm whether you want to delete the selected configuration.

4 Click *Yes* to confirm deletion.

The selected configuration is deleted.

12.6 Audit Events for the Download Manager

The Download Manager generates an audit event whenever you perform any of the following actions:

- ◆ Create a download configuration
- ◆ Edit a download configuration
- ◆ Delete a download configuration
- ◆ Download the feed

NOTE: An audit event is generated regardless of whether the download status indicates success or failure.

For more information on the audit events for the Download Manager, see “[NetIQ Sentinel 7.0.1 Internal Audit Events](#).”

You can create appropriate correlation rules to receive notifications of these audit events through e-mail. For more information on creating correlation rules, see “[Correlating Event Data](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

13 Searching and Reporting Events in a Distributed Environment

The Sentinel Distributed Search feature enables you to search for events and run reports not only on your local Sentinel server, but also on other Sentinel servers distributed across the globe.

- ♦ [Section 13.1, “Overview,” on page 181](#)
- ♦ [Section 13.2, “Configuring Servers for Distributed Searching and Reporting,” on page 183](#)
- ♦ [Section 13.3, “Searching for Events,” on page 186](#)
- ♦ [Section 13.4, “Managing the Distributed Search Results,” on page 186](#)
- ♦ [Section 13.5, “Viewing the Search Activities,” on page 187](#)
- ♦ [Section 13.6, “Running Reports,” on page 188](#)
- ♦ [Section 13.7, “Managing the Distributed Setup Configuration,” on page 188](#)
- ♦ [Section 13.8, “Troubleshooting,” on page 190](#)

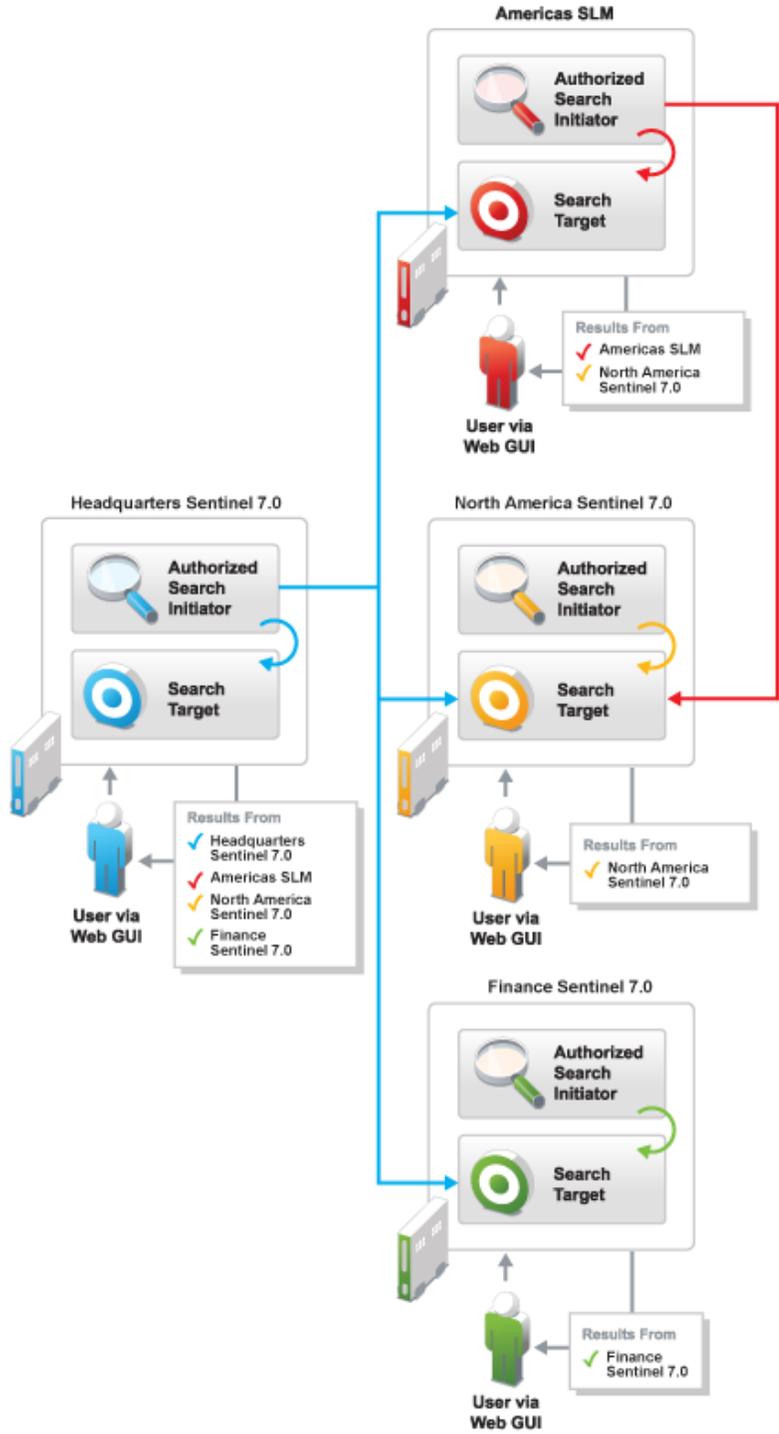
13.1 Overview

The Distributed Search feature facilitates searching events and reporting event data from local and remote Sentinel servers. When you are working with multiple servers, you can perform a search or run a report on just one server and have it automatically run a search or report across the selected remote servers. The server on which the search is initiated is referred to as the search initiator, and the remote servers are referred to as the search targets or target servers.

When you run a search or report on the search initiator, search queries are sent to each selected target server. The target server authenticates the search initiator server, using a password that is exchanged during configuration. Event data is returned to the search initiator, where it is merged, sorted, and consolidated for presentation. Individual search results display the target servers from which they were received. The search status for each server is available for viewing and troubleshooting.

[Figure 13-1](#) shows how you can set up the Sentinel servers across the globe for distributed searching and reporting.

Figure 13-1 Distributed Search



13.2 Configuring Servers for Distributed Searching and Reporting

To configure a search initiator for distributed search, you must first enable distributed searching on the search initiator server.

After you enable distributed search, you need to add target servers to the search initiator server. If you know the administrator username and password for the target server, you can add the target server directly from the search initiator.

If you do not know the administrator username and password for a target server, you can set up the search initiator with an opt-in password that allows administrators of target servers to add their target servers to the search initiator. When you do this, administrators of target servers do not need to share their usernames and passwords with you. You must share the opt-in password with the target server administrator.

- ♦ [Section 13.2.1, “Enabling Distributed Search,” on page 183](#)
- ♦ [Section 13.2.2, “Using the Administrator Credentials to Add a Search Target Server,” on page 183](#)
- ♦ [Section 13.2.3, “Using the Opt-in Password to Add a Search Target Server,” on page 184](#)

13.2.1 Enabling Distributed Search

- 1 Log in to the Sentinel Web interface as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar, then click *Search Targets*.
- 3 Select *This local server and other search targets*.
- 4 Do one of the following to add target servers to your search initiator:
 - ♦ If you are the administrator of the search initiator and you know the administrator username and password on the target server, continue with [Section 13.2.2, “Using the Administrator Credentials to Add a Search Target Server,” on page 183](#).
 - ♦ If you are the administrator of the search initiator and you do not know the administrator username and password on the target server, you can set an opt-in password to allow administrators of target servers to add their target servers to the search initiator. Continue with [Section 13.2.3, “Using the Opt-in Password to Add a Search Target Server,” on page 184](#).

13.2.2 Using the Administrator Credentials to Add a Search Target Server

If you are the administrator of the search initiator and you know the administrator username and password on the target server, you can add the target server while you are logged in to your search initiator server.

IMPORTANT: You should ensure that the target server that you add is able to communicate with the search initiator. The target server should be able to communicate through TCP/IP. The IP address or host name of the target server must be accessible through firewalls, NATs, etc. You can use the ping

command to ensure that there is communication from both ways. If there is a communication failure between the servers, an error is displayed in the extended status page. For more information, see [Section 13.4, “Managing the Distributed Search Results,” on page 186](#).

- 1 If you are continuing from [Section 13.2.1, “Enabling Distributed Search,” on page 183](#), skip to [Step 5](#); otherwise, continue to [Step 2](#).
- 2 Log in to the Sentinel Web interface as a user in the administrator role.
- 3 Click *Search Setup* in the toolbar, then click *Search Targets*.
- 4 Select *This local server and other search targets*.
- 5 Click the *Create Search Target* link.
- 6 Specify the following information:
 - IP Address/DNS Name:** IP address or the DNS name of the target server.
 - Port:** Port number of the target server. The default port number is 8443. The target server and search initiator do not need to be on the same port.
 - User Name:** User name to log in to the target server. This must be a user with administrator privileges.
 - Password:** Password associated with the user name.
- 7 Click *Login*, then click *Accept* after verifying that the certificate information is correct.
- 8 Use the following information to configure the target server:
 - The Create Search Target page displays a lists of the various proxy roles on the target server.
 - Name:** Specify a descriptive name that you want to give to the search target.
 - This helps you to easily identify the target server by a name instead of by its IP address or DNS name.
 - Search Proxy Role:** Select a search proxy role that you want to assign to the search initiator.
 - When the search initiator makes search requests to the target server, the proxy role's security filter is used when performing the search. Only events that pass the proxy role's security filter are returned to the search initiator server.
 - Only roles that have the `Proxy for Authorized Search Initiators` permission are listed. This permission is required for the target server to accept and process incoming search requests from the search initiator server.
- 9 Click *OK*.
 - The server information is listed in the *Search Targets* list.

You can now search events or view event reports from the target server. For more information, see [Section 13.3, “Searching for Events,” on page 186](#) and [Section 13.6, “Running Reports,” on page 188](#).

13.2.3 Using the Opt-in Password to Add a Search Target Server

In organizations where administrative control of Sentinel servers is decentralized, it might violate the security policy to share administrator passwords. However, Sentinel allows you to share a limited-purpose opt-in password to add target servers, which is more secure than requiring full

administrator credentials. If you are not the administrator of the target server, you can set an opt-in password in the search initiator server, then provide the opt-in password to the target server administrators to allow them to opt in to the search initiator server.

When a target server opts in to the search initiator, a message is sent to the search initiator server requesting that it be added to the list of target servers maintained by the search initiator server. The request authorizes the search initiator to access event data on the target server. The search initiator requires an opt-in password to verify that the opt-in request has originated from a valid target server. During the opt-in process, the search initiator and the target server exchange the appropriate password, which allows the target server to authenticate the search requests from the search initiator.

This procedure is similar to adding a target server, but it is done from the target server instead of the search initiator server.

- ♦ [“Setting the Opt-In Password” on page 185](#)
- ♦ [“Authorizing a Search Initiator Server” on page 185](#)

Setting the Opt-In Password

- 1 Log in to the search initiator server as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.
The Search configuration page that is displayed has two tabs: *Search Targets* and *Authorized Search Initiators*. Ensure that the *Search Targets* tab is selected.
- 3 Select *This local server and other search targets*.
- 4 Click *Set Opt-in Password*.
- 5 Specify the opt-in password, then click *Set Password*.
- 6 Continue with [“Authorizing a Search Initiator Server” on page 185](#) to add the target server to the search initiator.

Authorizing a Search Initiator Server

- 1 Log in to the target server as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.
The Search configuration page that is displayed has two tabs: *Search Targets* and *Authorized Search Initiators*. The *Search Targets* tab is selected by default.
- 3 Select the *Authorized Searcher Initiators* tab.
- 4 Check the *Allow these authorized search initiators to search this server as a search target* box.
- 5 Click the *Create* link.
The Create Authorized Search Initiator page is displayed.
- 6 Specify the following information:
 - IP Address/DNS Name:** The IP address or the DNS name of the search initiator.
 - Port:** Port number of the search initiator. This is the port number on which the search initiator listens for incoming opt-in requests. The default port number is 8443.
 - Opt-in Password:** The opt-in password that you configured on the search initiator. You must obtain this password from the administrator of the search initiator.
- 7 Click *OK*.

The Confirm Certificate page is displayed.

- 8 Verify the certificate information, then click *Accept*.

The Create Authorized Search Initiator page is displayed that lists the various proxy roles on the search target servers.

- 9 In the *Name* field, specify a descriptive name that you want to give to the search initiator server.

This helps you to easily identify the search initiator server by a name instead of by its IP address or DNS name.

- 10 Select a proxy role that you want to assign to the search initiator.

When the search initiator makes search requests to the target server, the proxy role's security filter is used when performing the search. Only events that pass the proxy role's security filter are returned to the search initiator.

Only roles in the target server that have the `Proxy for Authorized Search Initiators` permission are listed. This permission is required for the target server to accept and process incoming search requests from the search initiator.

- 11 Click *OK*.

The search initiator is added to Authorized Search Initiators list and is enabled by default.

The target server gets is also added under the Search Targets list in the search initiator server. Alternatively, you can click the *Refresh* link to see the target server in the Search Targets list.

13.3 Searching for Events

Searching for events in a distributed environment is similar to how you perform a search on your local server, except that you perform the search on the selected target servers and can also include your local server.

- 1 Log in to the search initiator server as a user with Search Remote Targets permission.

- 2 Click *New Search*.

- 3 Click the *Targets* link under the *Search* field.

A page is displayed that lists the target servers that you have added, including the local server. The target servers that are disabled are also displayed, but they are dimmed.

- 4 Select the check boxes next to the target servers on which you want to perform a search, then click *OK*.

- 5 Specify the search criteria in the search field, then click *Search*.

If you do not specify any search criteria, the search initiator server runs a default search for all events with severity 3 to 5.

The Search Results page displays the events from the selected target servers and the local server (if it selected). The search results are filtered through the combination of the security filter and permissions of the logged-in user and the security filter and permissions of the search proxy role on the target servers. For information on the distributed search results, see [Section 13.4, "Managing the Distributed Search Results,"](#) on page 186.

13.4 Managing the Distributed Search Results

The Search Results page displays the events from the selected target servers and the local server, based on the search criteria you specified. Each event displays the target server information from which the event is being retrieved.

You can expand the event results to see the details by clicking the *All details++* link.

For non-internal events, the *get raw data* link is displayed. You can view the raw data only if your role's security filter is set to view all event data.

NOTE: For search results that come from the target servers, the role that is used to retrieve raw data is not the role of the logged-in user that is performing the search on the search initiator server, but the role that is assigned to the search initiator server on the target server.

You can view the status of the search in the extended status page while a search is in progress as well as when the search has finished. To access the extended status page, click the *Displaying N of M events from X targets* link that appears at the top of the refinement panel.

The extended status page displays the following information:

- ◆ **Target Name:** The descriptive name of the target server. If you did not specify a descriptive name for the target server, this field displays the IP address or DNS name of the target server.
- ◆ **Events Available:** Indicates the number of events that have actually been retrieved from the target server. The value is displayed as *N of M events available*, where *N* is the number of events that have been retrieved so far and *M* is the total number of events on the target server that match the search criteria.
- ◆ **Retrieval Rate (EPS):** An approximate rate of how fast the events were retrieved from a specific target server.
- ◆ **Status:** Displays the error messages, if any (generally in red). In addition to error messages, this field also displays the status of the search.
 - ◆ **Running:** Indicates that the search is still running on the search target server.
 - ◆ **Buffering events for display:** Indicates that the search is finished on the target server, but the search initiator server is retrieving events from the target server and buffering them for display.
 - ◆ **Paused buffering events for display:** Indicates that the search is finished on the target server, and the search initiator has paused while retrieving events from the search target. The search initiator reads ahead a few pages from the last page that you scrolled down to. When it has buffered enough pages ahead, it pauses so that events are not buffered unnecessarily.
 - ◆ **Searching, paused buffering events for display:** This is similar to pausing and buffering events for display, except that the search is not yet complete on the target server.
 - ◆ **Done buffering:** Indicates that the search is complete on the target server, and all of the results are retrieved by the search initiator and queued for display.

You can further refine the distributed search results and perform various actions based on your requirements. For more information, see “[Searching Events](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

13.5 Viewing the Search Activities

You can view the search activities that are being done on the target server by the search initiator server. You can see what queries are being done and how frequently they are being done. Based on the search activity, you might want to assign a more/less restrictive proxy role or even disable access to the target server.

You can also refine the search activity query. For example, you can change the date range to see what queries have been performed today or yesterday or in the last hour, or you can drill down to see the queries that were made by particular users on the search initiator.

- 1 Log in to the target server as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.

The Search configuration page that is displayed has two tabs: *Search Targets* and *Authorized Search Initiators*. The *Search Targets* tab is selected by default.

- 3 Select the *Authorized Searcher Initiators* tab.

A list of search initiator servers is displayed under the Authorized Search Initiators list.

- 4 Click the *Search Activities* link for the search initiator server for which you want to view the search activities.

The search activities page is displayed that lists the audit events that are retrieved from all of the distributed search requests the target server has received from that particular search initiator.

13.6 Running Reports

Running reports in a distributed environment is similar to running reports on your local server, except that you select the target servers from which you want view the reports while specifying the report parameters.

- 1 Log in to the search initiator as a user with Search Remote Targets permission.
- 2 From the Reports section, select the report you want to run, then click *Run*.

The Run Report page is displayed.

- 3 Click the link for *Targets*.

A page is displayed that lists the target servers that you have added, including the local server. The target servers that are disabled are also displayed, but they are dimmed.

- 4 Select the target servers from which you want to view the reports, then click *OK*.
- 5 Specify the other parameters for the report.

For more information on these parameters, see “[Reporting](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

- 6 Click *Run*.

A report results entry is created and listed under the selected report. For more information on managing reports, see “[Reporting](#)” in the *NetIQ Sentinel 7.0.1 User Guide*.

13.7 Managing the Distributed Setup Configuration

- ♦ [Section 13.7.1, “Editing the Search Target Server Details,”](#) on page 188
- ♦ [Section 13.7.2, “Disabling or Deleting a Search Target Server,”](#) on page 189

- ♦ [Section 13.7.3, “Editing the Search Initiator Server Details,”](#) on page 189
- ♦ [Section 13.7.4, “Disabling or Deleting a Search Initiator Server,”](#) on page 189

13.7.1 Editing the Search Target Server Details

- 1 Log in to the search initiator as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.
- 3 Select the *Search Targets* tab.

A list of search target servers is displayed under the Search Targets list.

- 4 Click the *Edit* link for the search target server for which you want to modify the details., then edit the information.

Do not change the IP address unless the IP address of the search target server has actually changed. The *Edit* page is not intended to allow you to change this target server entry to be a different search target server. To add a new target server, see [Section 13.2.2, “Using the Administrator Credentials to Add a Search Target Server,”](#) on page 183. If you accidentally change the IP address or DNS name to a different server, change it back to the correct server, or authentication of search requests fails.

- 5 (Optional) To change the proxy role on the target server as necessary:
 - 5a Click *View/Change*.
 - 5b Log in to the target server.
 - 5c Select a proxy role, then click *OK*.
- 6 Click *Save*.

13.7.2 Disabling or Deleting a Search Target Server

- 1 Log in to the search initiator server as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.
- 3 Select the *Search Targets* tab.

A list of target servers is displayed under the Search Targets list.

- 4 To disable searching events on the target server, deselect the *Enabled* check box next to the server you want to disable as a search target.
- 5 To delete a server from the list, click the *Delete* link for the target server that you want to delete.

A message is displayed, asking you to confirm whether you want to delete the selected configuration.
- 6 Click *Delete* to confirm deletion.

13.7.3 Editing the Search Initiator Server Details

- 1 Log in to the target server as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.
- 3 Select the *Authorized Searcher Initiators* tab.

A list of authorized search initiators is displayed.

- 4 Click the *Edit* link for the target server for which you want to modify the details, then edit the information.
- 5 Click *Save*.

13.7.4 Disabling or Deleting a Search Initiator Server

- 1 Log in to the target server as a user in the administrator role.
- 2 Click *Search Setup* in the toolbar.
- 3 Select the *Authorized Searcher Initiators* tab.
A list of authorized search initiators is displayed.
- 4 Click the *Delete* link for the search initiator that you want to delete.
A message is displayed, asking you to confirm whether you want to delete the selected configuration.
- 5 Click *Delete* to confirm deletion.

13.8 Troubleshooting

You can perform some basic troubleshooting to ensure that you have successfully configured the search initiator for distributed search. This section lists the most common issues and the probable causes for these issues.

- ♦ [Section 13.8.1, “Permission Denied,” on page 190](#)
- ♦ [Section 13.8.2, “Connection Down,” on page 190](#)
- ♦ [Section 13.8.3, “Unable to View Raw Data,” on page 191](#)
- ♦ [Section 13.8.4, “Problems Adding Search Target,” on page 191](#)
- ♦ [Section 13.8.5, “Certain Events Are Only Visible from the Local System,” on page 191](#)
- ♦ [Section 13.8.6, “Cannot Run Reports on the Target Servers,” on page 191](#)
- ♦ [Section 13.8.7, “Different Users Get Different Results,” on page 191](#)
- ♦ [Section 13.8.8, “Cannot Set the Admin Role as the Search Proxy Role,” on page 191](#)
- ♦ [Section 13.8.9, “Error Logs,” on page 191](#)

13.8.1 Permission Denied

After doing a distributed search, check the extended status page to view the search status. If the search is not successful, check the following possible causes:

- ♦ The target server administrator might have disabled distributed searching on the target server. To enable distributed search on the target server, see [Step 4 in “Authorizing a Search Initiator Server” on page 185](#).
- ♦ The target server administrator might have disabled the search initiator server for distributed searching. Ensure that the search initiator server is enabled in the target server. For more information, see [“Authorizing a Search Initiator Server” on page 185](#).
- ♦ The role that you used for connecting might not have the `Search Remote Targets` permission.

13.8.2 Connection Down

- ♦ Network issues in your organization.
- ♦ Sentinel servers or Sentinel services might be down.
- ♦ Connection time-out.
- ♦ The IP address or the port number of the target server has changed, but the search initiator configuration might not be updated.

13.8.3 Unable to View Raw Data

The Proxy group that is assigned to the search initiator might not have the `view all events` permission to view the raw data.

13.8.4 Problems Adding Search Target

The search initiator server and target server might not be communicating with each other. Ensure that the firewall and NAT are set up properly to allow communication in both directions. Ping both ways to test.

13.8.5 Certain Events Are Only Visible from the Local System

You might not be able to view the events from the target servers for one of the following reasons:

- ♦ The trial license might be expired. You must purchase an enterprise license to reactivate this feature to view the events from the target servers.
- ♦ The user who has logged in to the search initiator has one set of permissions on the local data such as view all data, view system events, security filter settings, and so on. The search proxy group has another set of permissions, possibly more restrictive. Therefore, certain types of data, such as raw data, system events, and PCI events, might be returned only from the local system and not the target server.

13.8.6 Cannot Run Reports on the Target Servers

The trial license might be expired. You must purchase an enterprise license to reactivate this feature to run the reports from the target servers.

13.8.7 Different Users Get Different Results

Different users might have different security filters or other permissions and therefore get different results from a distributed search.

13.8.8 Cannot Set the Admin Role as the Search Proxy Role

This is by design, for security reasons. Because the data viewing rights for the admin are unrestricted, it is not desirable to allow the admin role to be the search proxy role.

13.8.9 Error Logs

You can also determine the cause of a search failure by examining the log file on the search initiator server. The default location for the log file is `/var/opt/novell/sentinel/log`. For example, you might see one of the following messages:

```
Invalid console host name 10.0.0.1
```

```
Error sending target request to console host 10.0.0.1
```

```
Error getting certificate for console host 10.0.0.1
```

```
Authentication credentials in request to opt-in to console 10.0.0.2 were rejected
```

```
Request to opt-in to console 10.0.0.2 was not authorized
```

```
Error sending target request to console host 10.0.0.1
```

14 Managing Active Search Jobs

Sentinel provides an option to monitor and manage active event search jobs on the Sentinel server for the purpose of resource management. You can view all the search jobs currently active on the Sentinel server, determine which long-running search jobs are no longer needed, and stop search jobs as necessary.

- ♦ [Section 14.1, “Overview,” on page 193](#)
- ♦ [Section 14.2, “Managing Active Searches,” on page 193](#)

14.1 Overview

The Active Search Jobs feature in Sentinel lists all the active event search jobs running in the system, including searches that are initiated when users perform activities, such as:

- ♦ Run a search in the Search interface.
- ♦ View events that fire a correlation rule.
- ♦ View events processed when testing a correlation rule.
- ♦ Generate a report or drill down into report results.
- ♦ Select filters to view events that match the filter criteria.
- ♦ Select tags to view the events that are tagged with the specified criteria.
- ♦ View events from the dashboard, anomaly, continuation breakdown, and so forth.
- ♦ Analyze, investigate, or view triggered events in Active Views.

The Active Search Jobs feature helps you monitor search activities and determine whether a search is not retrieving events as expected or whether a search is retrieving more than the expected events, which might indicate that the search needs to be tuned. It also helps you determine if too many searches are running and helps identify long-running searches that might slow down the system. Searches that consume a lot of memory are a potential liability to a healthy system and should be carefully reviewed to ensure that the search query is specified properly. You can also stop the searches that are no longer needed and thereby free up system resources.

14.2 Managing Active Searches

- 1 Log in to the Sentinel Web interface as a user in the administrator role.

`https://<IP_Address/DNS_Sentinel_server>:8443`

The `IP_Address/DNS_Sentinel_server` is the IP address or DNS name of the Sentinel server and `8443` is the default port for the Sentinel server.

- 2 Click *Search Setup* in the toolbar, then click *Active Search Jobs*.

<input type="checkbox"/>	Duration	Status	Owner	Type	Start	Accessed	More
<input type="checkbox"/>	1 second	Finished	admin	User	2012-01-20 08:20	0 seconds ago	More
<input type="checkbox"/>	0.588 seconds	Running	admin	User	2012-01-20 08:20	1 seconds ago	More
<input type="checkbox"/>	2 seconds	Finished	admin	User	2012-01-20 08:14	5:56 minutes ago	More
<input type="checkbox"/>	1 second	Finished	admin	User	2012-01-20 08:20	8 seconds ago	More
<input type="checkbox"/>	1 second	Finished	admin	User	2012-01-20 08:20	35 seconds ago	More
<input type="checkbox"/>	2 seconds	Finished	admin	User	2012-01-20 08:20	8 seconds ago	More
<input type="checkbox"/>	2 seconds	Finished	admin	User	2012-01-20 08:20	13 seconds ago	More

[Refresh now](#) [Kill selected](#)

The Active Search Jobs page refreshes every 30 seconds.

You can view the following search details. Mouse over each field for information on what the field indicates:

- ◆ **Duration:** The time spent to search events in the event store.
- ◆ **Status:** Whether a search job is pending, running, finished, finished with errors, or canceled.
- ◆ **Owner:** The user who initiated the search. For search jobs initiated by the system, the owner is indicated as "System."
- ◆ **Type:** Indicates the following:
 - ◆ **System:** Search jobs that are run for maintenance purposes. For example, to clean up invalid references to events from the database.
 - ◆ **User:** Search jobs started by users either through the Search interface or through the REST API.
 - ◆ **Reports:** Search jobs started by users, but used for getting event results for reports.
 - ◆ **Data sync:** Search jobs started to support the Data Synchronization feature.
 - ◆ **Distributed:** Search jobs initiated by a remote server (distributed search.)
- ◆ **Start:** The time the search started searching for events.
- ◆ **Accessed:** The time elapsed since the search was initiated.
- ◆ **More:** Provides detailed information such as the IP address of the machine that initiated the search, events processed, search criteria, and so forth.

- 3 (Conditional) To stop any active search jobs, select the search jobs you want to stop, then click *Kill selected*.

15 Monitoring the Events Per Second Received by Sentinel

Sentinel helps you monitor the events per second (EPS) received for processing. You can use this information to generate reports for auditing purposes, such as verifying license compliance and EPS trends.

- ♦ [Section 15.1, “Overview,” on page 195](#)
- ♦ [Section 15.2, “Viewing the Operational EPS,” on page 195](#)

15.1 Overview

Sentinel provides an Operational EPS graph that displays the average EPS rate received by Sentinel before applying filters at the event source, Connector, or Collector level. You can monitor the EPS rate reaching a single Sentinel server or multiple Sentinel servers distributed across your organization. You can also view the EPS rate in day or hour granularity.

NOTE: To view the EPS rate received by other systems, you need to configure other Sentinel servers as search targets. For more information, see [Chapter 13, “Searching and Reporting Events in a Distributed Environment,” on page 181](#).

Understanding the operational EPS rate helps you determine whether the EPS rate is as expected and in compliance with the license. You can also generate reports to analyze the EPS rate over a specified time period and from specific Sentinel servers in your organization.

15.2 Viewing the Operational EPS

- 1 Log in to the Sentinel Web interface with a user account that is a member of the administrator role.
- 2 Click *About > Licenses*.
- 3 (Optional) To view the consolidated EPS rate received by other Sentinel servers distributed across your organization, select the IP address or hostname of the desired systems.
- 4 (Optional) Click *Day* or *Hour* to view the EPS rate for the last 7 days or for the last 24 hours.
- 5 (Optional) To export the data to a CSV file, click *Export Report*.
 - 5a Specify the time period for which you want to view the EPS rate, then click *OK*.
- 6 (Optional) To view the EPS rate of events filtered and processed by Sentinel, click *Collection > Overview*.

The Overview graph displays the EPS rate of events filtered and processed by Sentinel, and that actually make it to the event store. For more information, see [Section 6.6, “Viewing Events Per Second Statistics,” on page 127](#).

16 Linking to External Sentinel Systems

Sentinel Link is a mechanism that provides the ability to hierarchically link multiple Sentinel systems, including Sentinel Log Manager, Sentinel, and Sentinel Rapid Deployment. You can hierarchically link two or more Sentinel systems to forward filtered events from one Sentinel system to another for further evaluation.

- ♦ [Section 16.1, “Benefits,” on page 197](#)
- ♦ [Section 16.2, “Supported Platforms,” on page 197](#)
- ♦ [Section 16.3, “Prerequisite,” on page 197](#)
- ♦ [Section 16.4, “Configuring Sentinel Link,” on page 198](#)

16.1 Benefits

- ♦ Multiple Sentinel servers, local or distributed, can be linked in a hierarchical manner. In this setup, Sentinel servers can manage a large volume of data, retaining raw data and event data locally, while forwarding important events to a central Sentinel server for consolidation.
- ♦ One or more Sentinel servers can forward important data to either a Sentinel server, Sentinel Log Manager server, or a Sentinel Rapid Deployment server. These systems provide real-time visualization of data, advanced correlation and actions, workflow management, and integration with identity management systems.
- ♦ Multiple Sentinel, Sentinel Log Manager, or Sentinel Rapid Deployment servers can be hierarchically linked to monitor the consolidated event information.
- ♦ One or more Sentinel, Sentinel Log Manager, or Sentinel Rapid Deployment servers can forward important events to a Sentinel server for event consolidation.

16.2 Supported Platforms

- ♦ Sentinel 7.0
- ♦ Sentinel 6.1 Rapid Deployment Hotfix 2 or later
- ♦ Sentinel 6.1 Service Pack 1 Hotfix 2 or later
- ♦ Sentinel Log Manager 1.2 or later

16.3 Prerequisite

Before you forward events from the sender machine, ensure that the Sentinel Link server is up and running on the receiver machine.

16.4 Configuring Sentinel Link

In a Sentinel Link Solution setup, the Sentinel system that forwards the events is called the sender and the Sentinel system that receives the events is called the receiver. You can simultaneously link multiple Sentinel systems to a single receiver system.

To configure a Sentinel link, you need to configure at least two systems: the sender machine and the receiver machine. For further details on configuring Sentinel Link, see the [Sentinel Link Overview Guide \(http://www.novell.com/documentation/sentinel70/sentinel_link_overview/data/bookinfo.html\)](http://www.novell.com/documentation/sentinel70/sentinel_link_overview/data/bookinfo.html).

17 Using Solution Packs

Solution Packs allow NetIQ partners and customers to create and easily manage solutions to specific business problems.

- ◆ [Section 17.1, “Overview,” on page 199](#)
- ◆ [Section 17.2, “Solution Pack Components,” on page 200](#)
- ◆ [Section 17.3, “Using the Import Plugin Wizard to Import a Solution Pack,” on page 201](#)
- ◆ [Section 17.4, “Using the Solution Manager,” on page 202](#)
- ◆ [Section 17.5, “Installing and Managing Solution Packs,” on page 205](#)
- ◆ [Section 17.6, “Installing an Edited Solution Pack,” on page 212](#)
- ◆ [Section 17.7, “Solution Designer,” on page 212](#)

17.1 Overview

Solution Packs provide a framework within which sets of content can be packaged into controls, each of which is designed to enforce a specific business or technical policy. The control can use any of the detection, filtering, alerting, and response features of Sentinel, as well as provide documentation on control status and enforcement. By managing the set of content as a unit within the control, the Solution Pack solves dependency problems and simplifies implementation.

Controls within a Solution Pack can include the following types of content:

- ◆ Correlation rule deployments, including deployment status and associated Correlation rules, Correlation actions, JavaScript plug-ins and integrators, and Dynamic Lists
- ◆ Reports
- ◆ iTRAC workflows, including associated roles
- ◆ Event enrichment, including map definitions and event meta tag configuration
- ◆ Other associated files added when the Solution Pack is created, such as documentation, example report PDFs, or sample map files.

For example, a Solution Pack can package content related to governance and regulatory compliance into a comprehensible and easily enforceable framework that is easy to deploy. NetIQ and its partners offer extended Solution Packs for such regulations or other customer needs.

Solution Packs are created with the Solution Designer application. Using this tool, a user creates the Solution Pack, associated controls and documentation, and then associates Sentinel content with each control. The entire package is then exported as a ZIP file. For more information on creating a Solution Pack and adding content to it, see [Section 1.4, “Solution Designer,” on page 38](#).

The ZIP file containing the Solution Pack is first imported into an existing Sentinel system by using the Solution Packs Manager in the Sentinel Control Center. You then use the Solution Manager to install the imported Solution Pack.

The Solution Manager also displays the implementation and testing steps in the Solution Pack and tracks the status of each control. At any time, users can generate a detailed document with the implementation status for each control. You can also use the Solution Manager to install the predefined Sentinel Core Solution Pack.

NOTE: Only users in the administrator role can access the Solution Packs Manager.

17.2 Solution Pack Components

Solution Packs consist of categories, controls, content, and content groups, all in a hierarchy of related components.

The table below describes each level in a Solution Pack hierarchy.

Table 17-1 *Solution Pack Hierarchy Levels*

	Solution Pack	A Solution Pack is the root node in the content hierarchy. Each Solution Pack can contain one or multiple Category nodes.
	Category	A category is a conceptual classification. Each Category can contain one or multiple controls.
	Control	A control is another level of classification, which often corresponds to a particular control defined by a set of regulations. Each control can contain one or multiple content groups.
N/A	Content Group	A content group is a set of related content. There are several types of content groups, such as reports, Correlation rules, and event configurations, each with its own icon.

The table below describes the types of content groups and what the content that they contain:

Table 17-2 *Table 14-2: Content Groups*

	Event Configuration	A content group that contains a map definition and the configuration of one or more related Sentinel meta tags. This icon is also used for the meta tag configuration definition.
	Map	A map definition instance.
	Workflow	An iTRAC Workflow template and any associated roles. This icon is also used for the iTRAC workflow template itself.
	Role	A role used in a workflow.
	Correlation Rule	A Correlation rule, the namespace in which it is stored, and any associated Correlation actions or Dynamic Lists. This icon is also used for the Correlation rule definition.

	Namespace	A namespace instance in which the Correlation rule is stored
	JavaScript Action Plugin	A JavaScript action plug-in.
	JavaScript Action	A configured JavaScript action instance.
	Integrator Plugin	An Integrator plug-in.
	Integrator	A configured Integrator instance.
	Action	An action configuration for a Correlation action.
	Correlation Rule Deployment	The Correlation rule deployment.
	Report	A report. This icon is also used for the <code>.rpt</code> report file.
	Dynamic List	A Dynamic List.

17.3 Using the Import Plugin Wizard to Import a Solution Pack

Solution Packs are available from several sources. They can be downloaded from the [Sentinel Plugins download Web page \(http://support.novell.com/products/sentinel/secure/sentinelplugins.html\)](http://support.novell.com/products/sentinel/secure/sentinelplugins.html). They can be provided by a NetIQ partner, or they can be created from content in your own Sentinel system.

The first step in using a Solution Pack is to import the `.zip` file into the system through the Import Plugin Wizard. When a Solution Pack is imported, the `.zip` file is copied to the server. The actual contents of the Solution Pack are not available in the target Sentinel system until the controls are installed through the Solution Manager. For more information, see [Section 17.5.2, “Installing Content from Solution Packs,” on page 205](#).

If you import an updated version of a Solution Pack, you are prompted to replace the existing plug-in.

- 1 Launch the Sentinel Control Center as a user who has the administrator role.
- 2 Launch the Solution Packs Manager.
 - ♦ (Conditional) If the Configuration menu is not enabled, click the *Configuration* tab, then click the *Configuration* menu > *Solution Packs* or click the icon in the toolbar.
 - ♦ (Conditional) If the *Configuration* menu is enabled, click the *Configuration* > *Solution Packs* or click the icon in the toolbar.

The Solution Packs Manager window is displayed.

- 3 Click the *Import* icon in the Solution Packs Manager window to open the Import Plugin Wizard.
- 4 Select *Import Solution package plugin file (.zip)*, then click *Next* to display the Choose Plugin Package File window.
- 5 Use the *Browse* button to locate the Solution Pack to import to the plug-in repository. Select a `.zip` file and click *Open*.

6 Click *Next*.

If you selected a solution pack that already exists, the Replace Existing Plugin window displays.

7 If you want to replace the existing plug-in, click *Next*.

The Plug-in Details window displays the details of the plug-in to be imported.

8 Select the *Launch Solution Manager* check box if you want to install the plug-in after importing the Solution Pack.

If you select the *Launch Solution Manager* check box, the Solution Manager displays the Solution Pack that is imported.

9 Click *Finish*.

17.4 Using the Solution Manager

You can use the Solution Manager for several different tasks:

- ♦ Installing a control and the child content for the control into the Sentinel system. When the content is initially installed, its status is Not Implemented.
- ♦ Implementing a control by configuring event source systems and Sentinel to use the content associated with the control. Solution Packs include detailed documentation describing implementation steps.
- ♦ Testing a control to verify the content associated with the control. Solution Packs include detailed documentation describing testing steps.
- ♦ [Section 17.4.1, “Launching the Solution Manager,” on page 202](#)
- ♦ [Section 17.4.2, “Solution Manager Interface,” on page 202](#)

17.4.1 Launching the Solution Manager

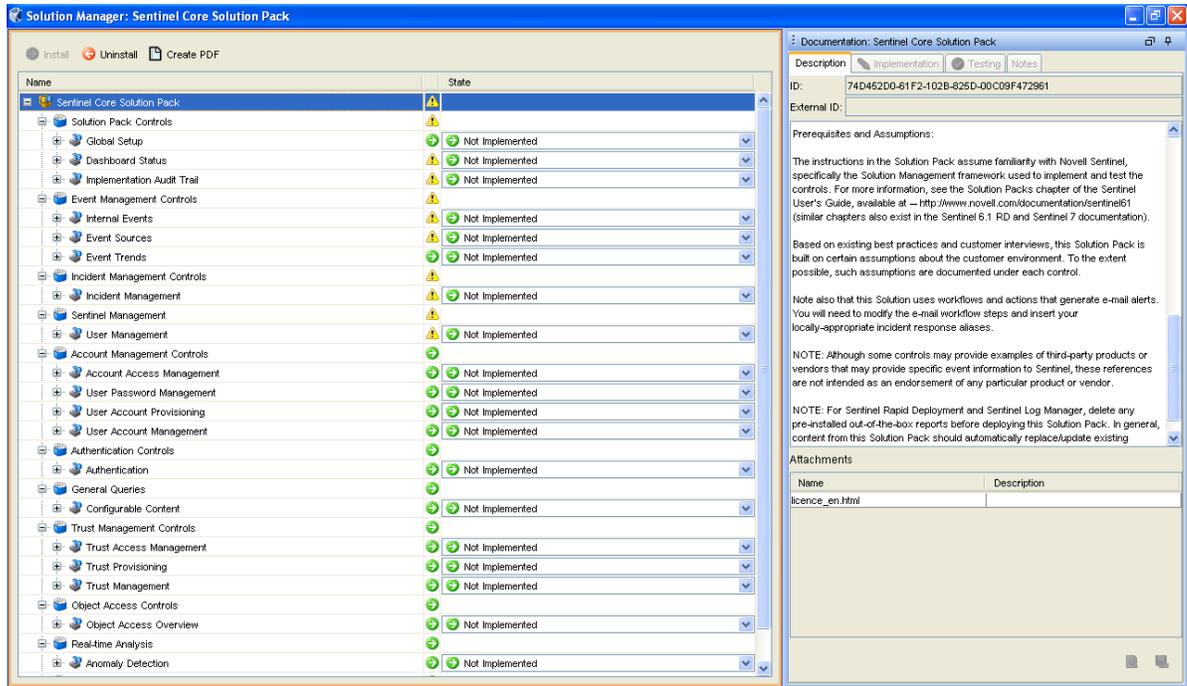
You can launch the Solution Manager by:

- ♦ Selecting *Launch Solution Manager* in the Import Plugin Wizard.
- ♦ Double-clicking the imported Solution Pack in the Solution Packs Manager.
- ♦ In the Solution Packs Manager window, select a Solution Pack and then click the *Open with Solution Manager* icon.

17.4.2 Solution Manager Interface

The Solution Manager window is divided into two panels that contain information about the extracted Solution Pack, along with comparison information, status information, and documentation:

Figure 17-1 Solution Manager



- ◆ “Content Panel” on page 203
- ◆ “Content Comparison” on page 204
- ◆ “Out Of Sync Status” on page 204
- ◆ “Documentation Panel” on page 204

Content Panel

The Content panel provides information about the extracted Solution Pack files. This panel displays a hierarchical view of the category, control, content group, and various types of content. All parent nodes reflect the overall state of the controls they contain. This means that parent nodes have an inherited status based on their child content.

The Content panel has the following columns:

- ◆ **Name:** Displays the name of the node.
- ◆ **Installed:** Indicates whether the content is installed in the target Sentinel system. If not, this column is blank.
- ◆ **State:** This column is available for the control node. This column contain a list with the following values:
 - ◆ **Not Implemented:** The default state when the control is first imported.
 - ◆ **Implemented:** Indicates that you have fully implemented the content by using the associated documentation.
 - ◆ **Tested:** Indicates that you have fully tested the content for this control by using the associated documentation.

NOTE: Because of the regulatory significance of implementing controls, status changes for each control are tracked for auditing purposes.

Content Comparison

When the Solution Pack is opened, the Solution Manager compares the contents of the Solution Pack to other Solution Pack content from different Solution Packs or previous versions of the same Solution Pack.

Table 17-3 Content Status

	Installed	Indicates that the content is already installed in the target Sentinel system. The version is the same in the opened Solution Pack and the previously installed Solution Pack.
	Out of Sync	Indicates that a different version of the content is already installed in the target Sentinel system. A difference in name, definition, or description could trigger an Out of Sync status.

Out Of Sync Status

The Out of Sync icon indicates that content in the newly opened Solution Pack differs from a version that was previously installed by another Solution Pack (either a different Solution Pack or a previous version of the same Solution Pack). The name, definition, or description of the content might be different.

NOTE: The Solution Manager only compares content from different Solution Packs (or different versions of the same Solution Pack) for installed content. It does not compare content that has not yet been installed. It also does not compare Solution Pack content to content in the target system, so manual changes to content in the Sentinel Control Manager are not reflected in Solution Manager.

Documentation Panel

The Documentation panel displays descriptive information provided to describe the Solution Pack when it was created in the Solution Designer. For more information on the Solution Designer, see [Section 1.4, "Solution Designer," on page 38](#).

The following informational tabs, populated and edited in the Solution Designer, are available:

- ◆ **Description:** A description of the selected node. You can view attachments and their descriptions in the *Description* tab.

You can add text to the *External ID* field to refer to specific regulations or corporate IDs.
- ◆ **Implementation:** Instructions for implementing the selected control.
- ◆ **Testing:** Instructions for testing the selected control.
- ◆ **Notes:** Use this tab for any notes related to the control, including user comments on the testing or implementation process.

17.5 Installing and Managing Solution Packs

- ◆ [Section 17.5.1, “Viewing the Contents of a Solution Pack,” on page 205](#)
- ◆ [Section 17.5.2, “Installing Content from Solution Packs,” on page 205](#)
- ◆ [Section 17.5.3, “Configuring Controls,” on page 206](#)
- ◆ [Section 17.5.4, “Implementing a Control,” on page 208](#)
- ◆ [Section 17.5.5, “Testing a Control,” on page 209](#)
- ◆ [Section 17.5.6, “Uninstalling a Control,” on page 209](#)
- ◆ [Section 17.5.7, “Viewing Solution Pack Status,” on page 210](#)
- ◆ [Section 17.5.8, “Deleting a Solution Pack,” on page 211](#)

17.5.1 Viewing the Contents of a Solution Pack

To use the Solution Manager and view the contents of a Solution Pack, a user must belong to the administrator role.

- 1 Click the *Configuration* menu and select *Solution Packs* to display the Solution Packs Manager window:
- 2 Double-click a Solution Pack in the Solution Packs window to display the Solution Manager.

17.5.2 Installing Content from Solution Packs

To use the content of a Solution Pack in the Sentinel Control Center, you must install the Solution Pack or selected controls in a Sentinel System (also known as the “target” Sentinel system).

When you install either a Solution Pack or an individual control, all of the child nodes are installed. Only fully defined controls can be installed. For controls that contain placeholders, the Install option is disabled.

- 1 In the Solution Packs Manager window, double-click a Solution Pack to open the Solution Manager.
Alternatively, you can select a Solution Pack that you want to install and click *Open with Solution Manager* icon.
For more information, see [Section 17.4.1, “Launching the Solution Manager,” on page 202](#).
- 2 Select a Solution Pack or a control that you want to install. Click *Install*.
Alternatively, right-click a Solution Pack or control and select *Install*.
The Install Control Wizard opens. If you select a Solution Pack, all the controls in that Solution Pack display. If you select an individual control, then that control is displayed in the Install Control Wizard window.
- 3 Click *Next* to display the Install Content window.
If Correlation rules and actions are included in the Solution Pack, you need to proceed through several additional screens until you reach the Install Content window. For more information, see [“Correlation Rules and Actions” on page 206](#).
- 4 Click *Install*.
- 5 After the installation is complete, click *Finish*.

If the installation fails for any content item in the control, the Solution Manager rolls back all the content in that control to Uninstalled. In this situation, create a new content or Solution Pack using the Solution Designer, import it and then try installing it

- 6 Configure the control, then implement it according to the instructions in the documentation for the control.
 - ♦ For information on configuring the controls or content you just installed, continue with [Section 17.5.3, “Configuring Controls,” on page 206](#).
 - ♦ For information on implementing the control in order to use the content, continue with [Section 17.5.4, “Implementing a Control,” on page 208](#).

Correlation Rules and Actions

Correlation rules are deployed to a specific Correlation Engine. During the control installation, a screen shows the Correlation Engines in the target Sentinel system and the rules that are already running on those engines. Based on the number and complexity of the rules running on the engines, you can decide where you will deploy the Correlation rule.

Correlation rules deploy in an Enabled or Disabled state, depending on their status in the source Sentinel system when the Solution Pack was created.

If an Execute Script Correlation action is associated with the Correlation rule, the Solution Manager attempts to install the associated JavaScript code on all Correlation Engines. If a Correlation Engine is offline, you can still deploy the rule. However, the status of the rule will be disabled in the Sentinel Web interface after importing.

If an Execute Command Correlation action is associated with the Correlation rule, the Solution Manager installs the command and its arguments, but the script or utility must be manually configured on the Correlation Engine. This might require installing the utility, configuring permissions, or manually copying a script file to the proper directory on the Correlation Engine.

In a default installation, the proper directory for the script file is `/opt/novell/sentinel/bin/actions`.

If a JavaScript Action is associated with the Correlation rule, the Solution Manager installs the Action configuration, the Action plug-in, and the associated integrator configuration and Integrator plug-in (if it is needed).

17.5.3 Configuring Controls

- ♦ [“Duplicate Content within a Solution Pack” on page 207](#)
- ♦ [“Content with the Same Name in the Target Sentinel System” on page 207](#)
- ♦ [“Resolving Out of Sync Content” on page 207](#)
- ♦ [“Copying a Map File” on page 208](#)

Duplicate Content within a Solution Pack

If two separate controls contain identical content and one control is installed successfully, the status of the duplicate content in the other control is changed to Installed. The remaining child nodes in the second control stay uninstalled.

Each content item is only installed once. If the same content item (for example, an iTRAC workflow or a Correlation rule) is included in more than one control, it is only installed once. Therefore, if you install one of those controls, the content displays with an installed status in the other control. In this scenario, the Solution Manager might show that the content for the second control is only partially installed.

Content with the Same Name in the Target Sentinel System

If the Solution Manager detects content with the same name but a different unique identifier in the target Sentinel system, the Solution Manager installs the content with a unique ID appended to the name. For example, the rule from the Solution Pack might be named Unauthorized Firewall Change (1). The existing rule in the Sentinel system is unchanged.

NOTE: To prevent confusion for end users, NetIQ recommends that one of these rules be renamed.

Resolving Out of Sync Content

Out of Sync status indicates that a different version of the content in the Solution Pack has been installed in the Sentinel target system by another Solution Pack or a previous version of the same Solution Pack. The Solution Manager only compares content from different Solution Packs (or different versions of the same Solution Pack) for installed content. Before you implement a control, you need to resolve this out of sync status.

- 1 Open the Solution Pack in the Solution Manager for which you want to resolve the out of sync content.
- 2 Select the out of sync content (not the control or category) in the Solution Manager.
- 3 Select the content, right-click, then select *Out of synchronization content detail*.
A message displays information about which Solution Pack is the source of the out of sync content.
- 4 Compare the content in the two Solution Packs to determine which version you want to keep.
- 5 Uninstall the control from the Solution Pack that you do not want to keep. For more information, see [Section 17.5.6, “Uninstalling a Control,”](#) on page 209.
Resolve the out of sync issue before installing the new Solution Pack.
- 6 Reinstall the control with the content you want to keep.
- 7 Implement and test as necessary.

Copying a Map File

If the Solution Pack that you install contains a Map control, you need to copy the associated `.csv` file to the system where you are importing and installing the Solution Pack. This file is used by the mapping service for event enrichment. Data from this `.csv` file is used to populate the tag when specified conditions are met for all incoming events.

When you create a Solution Pack using a Map control, the map definition file (`.csv`) that is used to create the Map is not bundled in the Solution Pack. Therefore, when you install this Solution Pack on any other Sentinel server, you do not get the expected behavior. This is because this Map looks for the required information in the map definition file (`.csv`) in the `var/opt/novell/sentinel/data/map_data` folder of the Sentinel Server to populate the tag. If the correct `.csv` file is not there, the Map control does not work properly.

You must copy the map definition file that you used to create the Map to the `var/opt/novell/sentinel/data/map_data` folder whenever you install any Solution Pack that has a Map control.

17.5.4 Implementing a Control

The steps on how to implement a control is added when the Solution Pack is created in the Solution Designer. The steps might include instructions for the following types of implementation actions:

- ◆ Scheduling automatic report execution.
- ◆ Enabling auditing on source devices.
- ◆ Copying an attached script for an Execute Command Correlation Action to the appropriate location on the correlation engines.

You only need to follow the instructions that are in the Implementation tab for the control.

To implement a control:

- 1 Open a Solution Pack in Solution Manager.
For more information, see [Section 17.4.1, “Launching the Solution Manager,”](#) on page 202.
- 2 Select a control.
- 3 Click the *Implementation* tab in the Documentation panel.
- 4 Follow all of the instructions in the *Implementation* tab.
- 5 Add notes to the *Notes* tab of the Documentation panel as necessary to document progress or necessary changes from the recommended implementation steps.
- 6 When the implementation is complete, select the control and change the status drop-down to *Implemented*.
- 7 An audit event is generated and sent to the Sentinel Control Center.

Because of potential legal and regulatory implications, the status for a control should only be changed after all of the implementation steps have been successfully completed.

17.5.5 Testing a Control

After a control is implemented, the content should be tested to verify that it is working as expected. Testing might require steps such as running a report or generating a failed login. The testing instructions for each control are added when the Solution Pack is created in the Solution Designer.

To test a control:

- 1 Open a Solution Pack in Solution Manager.
For more information, see [Section 17.4.1, “Launching the Solution Manager,” on page 202](#).
- 2 Select a control.
- 3 Click the *Testing* tab in the Documentation panel.
- 4 Follow all of the instructions in the *Testing* tab.
- 5 Add notes to the *Notes* tab of the Documentation panel as necessary to document progress or necessary changes from the recommended testing steps.
- 6 When the testing is complete, select the control and change the status drop-down to *Tested*.
- 7 An audit event is generated and sent to the Sentinel Control Center.

Because of potential legal and regulatory implications, the status for a control should only be changed after all of the testing steps have been successfully completed.

17.5.6 Uninstalling a Control

Controls are often used to meet legal or regulatory requirements. After they are implemented and tested, controls can be uninstalled after careful consideration.

When a control is uninstalled, the status for the control reverts to Not Implemented and child content is deleted from the Sentinel system. There are a few exceptions and special cases:

- ♦ Dependencies are checked to ensure that no content that is still in use is deleted. Some examples of this include a Dynamic List that is used by a Correlation rule created in the target Sentinel system, a report that is used in a control that is still installed, an iTRAC workflow template that is used in a Solution Pack that is still installed, or a folder that still contains other content.
- ♦ Reports (.rpt files) copied to a local system cannot be removed if the uninstall is performed from a Sentinel Control Center on a different machine.
- ♦ JavaScript files associated with Execute Script Correlation actions remain on the Correlation Engines.
- ♦ Maps (.csv files) and the data they contain are not deleted.
- ♦ Roles associated with workflows are not deleted.
- ♦ iTRAC workflow processes that are already in progress continue until completion even if the iTRAC workflow is uninstalled.

To uninstall a control:

- 1 Open a Solution Pack in Solution Manager.
For more information, see [Section 17.4.1, “Launching the Solution Manager,” on page 202](#).
- 2 Right-click the control you want to uninstall and select *Uninstall*.
Alternatively, click the *Uninstall* icon. The Controls To Uninstall window appears.
- 3 Click *Next*.

If the control you are uninstalling includes one or more reports, you are prompted whether to uninstall the reports from the server. Ideally, this information was recorded on the *Notes* tab when the reports were installed.

4 Click *Next* to display the Uninstall Content window.

5 Click *Uninstall*. The selected contents are uninstalled.

Local reports cannot be uninstalled from a different Sentinel Control Center machine than the one that was used for the installation, or if the files were copied to a new location after installation. If the Solution Manager cannot find the `.rpt` files in the expected location, a message is logged in the Sentinel Control Center log file.

6 Click *Finish*.

17.5.7 Viewing Solution Pack Status

There are several sources of information about the status of a Solution Pack.

- ♦ [“Viewing the Status in the Solution Manager” on page 210](#)
- ♦ [“Generating Status Documentation” on page 210](#)
- ♦ [“Audit Events in the Sentinel Control Center” on page 211](#)

Viewing the Status in the Solution Manager

You can view the status of Solution Pack contents in the Solution Manager. For more information, see [Section 17.4.1, “Launching the Solution Manager,” on page 202](#).

- ♦ **None/Blank:** No status indicator for a control indicates that the associated content has not been installed yet.
- ♦ **Not Implemented:** When none or some of the contents of a control are installed, the control is in the Not Implemented state. If the same content is installed by another control, a control might be Not Implemented even if some of its child content is Installed.
- ♦ **Implemented:** Indicates that a user has completed all of the implementation steps and manually set the control status to Implemented. For more information, see [Section 17.5.4, “Implementing a Control,” on page 208](#).
- ♦ **Tested:** Indicates that a user has completed all of the testing steps and manually set the control status to Tested. For more information, see [Section 17.5.5, “Testing a Control,” on page 209](#).
- ♦ **Out of Sync:** Indicates that a different version of the content in the Solution Pack has been installed in the Sentinel target system by another Solution Pack or a previous version of the same Solution Pack. For more information, see [“Out Of Sync Status” on page 204](#)

Generating Status Documentation

The information about the Solution Pack can be exported in PDF format. The report contains details about every node in the Solution Pack, including the category, control, and content group.

To generate Solution Pack status documentation:

- 1 Open a Solution Pack in the Solution Manager for which you want to generate a status report.
- 2 Click *Create PDF*. The Report Options window displays.
 - ♦ **Show status information:** Select this option to show deployment status for each control (Not Installed, Not Implemented, Implemented, or Tested) and whether it’s Out of Sync.

- ♦ **Include content nodes:** Select this option to include information about the child content for each control in the documentation.
- 3 Select Show status and Show individual content if desired.
 - 4 To view the documentation, click *Preview*.
(Conditional) If this is the first time a PDF has been opened from the Sentinel Control Center, you might need to locate Acrobat Reader.
 - 5 (Conditional) Click *Browse*, and locate the Acrobat Reader, then click *OK*.
The report is opened in the PDF format.
 - 6 To save the PDF, click *Browse*. Navigate the location where you want to save the PDF and specify a filename.
 - 7 Click *Save*.

Audit Events in the Sentinel Control Center

All major actions related to Solution Packs and controls are audited by the Sentinel system, with information about which user performed the action. The following events are visible in the Sentinel Control Center and are stored in the Sentinel database:

- ♦ Solution Pack is imported.
- ♦ Control is installed.
- ♦ Control status is changed to Implemented.
- ♦ Control status is changed to Tested.
- ♦ Control status is changed to Not Implemented.
- ♦ Control is uninstalled.
- ♦ Notes are modified for a control.
- ♦ Solution Pack is deleted.

17.5.8 Deleting a Solution Pack

Solution Packs are often used to meet legal or regulatory requirements. After they are implemented and tested, Solution Packs can be deleted after careful consideration. All deletions are audited by the Sentinel system and sent to both the Sentinel Control Center and the Sentinel database.

You cannot delete a Solution Pack without uninstalling the controls first. For more information, see [Section 17.5.6, “Uninstalling a Control,” on page 209](#). If you do not uninstall the controls and try to delete a solution pack, you are notified that content is still deployed.

- 1 Open the Solution Packs Manager.
- 2 Select the Solution Pack that you want to remove, then click *Remove*.
You are prompted to delete the Solution Pack.
- 3 Click *Yes* to delete.

17.6 Installing an Edited Solution Pack

When a Solution Pack is modified and saved through the *Save* or *Save As* options in the Solution Designer, it is considered to be a new version of the original Solution Pack. When the new version is imported, it replaces any older versions of the original Solution Pack. There is no immediate impact on any installed content in the target Sentinel system.

After the new Solution Pack is installed, its behavior varies, depending on the status of the original Solution Pack's content.

- ◆ If the content from the original Solution Pack was not installed yet, the content is simply replaced. When a user installs content, the new content is installed to the target Sentinel system.
- ◆ If the content from the original Solution Pack was installed (Not Implemented), Implemented, or Tested, the original content is compared to the new content.
- ◆ If the content version is the same, the original content is still valid and no action is necessary.
- ◆ If the content version is different, the content status is set to Out of Sync. You must decide how to resolve the synchronization issue. For more information, see [“Out Of Sync Status” on page 204](#).
- ◆ If the content did not exist in the original Solution Pack, it is displayed in Solution Manager as not installed. You can install, implement, and test the new content.
- ◆ If the content existed in the original Solution Pack but has been deleted from the modified Solution Pack, it does not appear in the Solution Manager.

NOTE: The Solution Manager only handles differences in the contents of Solution Packs. It does not recognize manual content changes that are performed after content is installed.

17.7 Solution Designer

You can use the Solution Designer to package and export different contents, such as a Correlation rule with associated actions and Dynamic Lists. These items can be selected and packaged with their configuration to a .zip file. You can then view or select the content of the file in the Solution Manager. For more information, see [Section 1.4, “Solution Designer,” on page 38](#).

A Backing Up and Restoring Data

The Sentinel backup and restore utility is a script that performs a backup of the system data and also lets you restore the data at any given point in time. However, this utility cannot be used for backing up a Collector Manager or the appliance operating system.

You can back up the following data:

- ♦ **Configuration data:** Data stored in the `config`, `data`, `3rdparty/postgresql`, and `3rdparty/jetty` directories, and the data in the Sentinel database. This data includes configuration files, property files, and keystore files. The Sentinel database contains various configuration information related to users, plug-ins, Collectors, Connectors, and filters.

NOTE: The configuration data can be critical and you should always include the configuration data in the backup.

- ♦ **Event data:** Dynamic event data and raw event data stored in the `data/eventdata` and `/var/opt/novell/sentinel/data/rawdata` directories. The event data also includes event associations stored in the `/var/opt/novell/sentinel/data/eventdata/exported_associations` directory. The event associations data includes correlated event association data and the incident event association data.
- ♦ **Networked storage data:** The closed event data files that have been moved to the networked storage.
- ♦ **Runtime data:** Dynamic file-based queues used by plug-ins, Sentinel Link, and other Sentinel components. This includes the data in the `data/plugindata` and the `/var/opt/novell/sentinel/data/sentinel_link.queues` directories.
- ♦ **Security Intelligence data:** The Security Intelligence data stored in the MongoDB database.
- ♦ **Sentinel logs:** Log files generated by Sentinel and stored in the `/var/opt/novell/sentinel/log` directory.
- ♦ [Section A.1, “Parameters for the Backup and Restore Utility Script,” on page 213](#)
- ♦ [Section A.2, “Running the Backup and Restore Utility Script,” on page 215](#)

A.1 Parameters for the Backup and Restore Utility Script

The following table lists the various command line parameters that you can use with the `backup_util.sh` script:

Table A-1 Backup and Restore Script Parameters

Parameters	Description
<code>-m backup</code>	Backs up of the specified data.

Parameters	Description
-m restore	<p>Restores the specified data. The restore mode of the script is interactive and allows you to specify the data to be restored from the backup file.</p> <p>The restore parameter can be used in the following scenarios:</p> <ul style="list-style-type: none"> ◆ System Failure: In the event of a system failure, you must first reinstall Sentinel and then use the <code>backup_util.sh</code> script with the restore parameter to restore the most recent data that you backed up. ◆ Data Loss: In the event of data loss, use the <code>backup_util.sh</code> script with the restore parameter to restore the most recent data that you had backed up. <p>You must restart the Sentinel server after you restore any data because the script might make several modifications to the database.</p> <p>NOTE: The restore parameter is not backward compatible for local storage and networked storage data. Therefore, the local storage data and networked storage data can be restored only on the same or a later version of Sentinel, and cannot be restored on an older version of Sentinel.</p>
-m info	Displays information for the specified backup file.
-m simple_event_backup	Backs up events located in a specified directory.
-m simple_event_restore	Restores events into a specified directory.
-c	Backs up the configuration data.
-e	Backs up the event data. All event partitions are backed up except the current online partition. If the backup is being performed with the Sentinel server shut down, the current online partition is also included in the backup.
-dN	<p>Backs up the event data for the specified number of days. The -dN option includes the local storage event data from up to N days ago in the backup. Based on the current data retention policy settings, many days of events might be stored on the system. Backing up all of the event data might not always be necessary and might not be desirable. This option allows you to specify how many days to include when backing up the event data. For example, -d7 includes only the event data from the last week in the backup. -d0 just includes the data for the current day. -d1 includes the data from the current day and previous day. -d2 includes the data from the current day and two days ago.</p> <p>Online backups (that is, backups performed while the system is running) only back up the closed event partitions, which means partitions two days old or older. For online backups, a value of -d2 is the appropriate specification for the number of days.</p>
-u	<p>Specifies the username to use when backing up the event associations data. If the username is not specified, "admin" is used as the default value.</p> <p>This parameter is required only when backing up the event associations data.</p>
-p	<p>Specifies the user password when backing up the event associations data.</p> <p>This parameter is required only when backing up the event associations data.</p>
-x	<p>Specifies a file name that contains the user password when backing up the event associations. This is an alternative to the -p option.</p> <p>This parameter is required only when backing up the event associations data.</p>
-f	Enables you to specify the location and name of the backup file.

Parameters	Description
-l	Includes the log files in the backup. By default, the log files are not backed up unless you specify this option.
-r	Includes the runtime data in the backup. Runtime data can only be backed up if the Sentinel server is shut down, because the data is dynamic. This means that this parameter can only be used in combination with the -s option (described below). If -s is not specified, this parameter is ignored.
-b	Backs up only the baseline Security Intelligence database collections and not the entire MongoDB database. The following baseline data is backed up: <ul style="list-style-type: none"> ◆ configs ◆ anomalydefs ◆ baselines ◆ baselines.ID.URN ◆ paths.UUID.URN ◆ anomalydeployment
-i	Backs up the entire Security Intelligence database in the backup.
-s	Shuts down the Sentinel server before performing the backup. Shutting down the server is necessary to back up certain dynamic data such as the Runtime data and the current local storage partitions. By default, the server is not shut down before performing the backup. If this option is used, the server restarts automatically after the backup is complete.
-w	Backs up the raw event data.
-z	Only available with the simple_event_backup and simple_event_restore options. Specifies the location of the event data directory, such as where the event data is collected during a simple_event_backup and where the event data is placed during a simple_event_restore.

A.2 Running the Backup and Restore Utility Script

- 1 Open a console, and navigate to the `/opt/novell/sentinel/bin` directory as the novell user.
- 2 Enter `backup_util.sh`, along with the necessary parameters for the data that you want to back up or restore.

For more information on the different parameters, see [Table A-1](#). The following table lists examples of how to specify the parameters:

Syntax	Action
<pre> backup_util.sh -m backup -c -e -i -l -r -w -s -u admin -x <mypassword.txt> -f / var/opt/novell/ sentinel/data/ <my_full_backup>.tar .gz </pre>	<p>Shuts down the Sentinel server and performs a full system backup.</p> <p>NOTE: If you have taken a full backup, the data can be restored only on the same or a later version of Sentinel, and cannot be restored on an older version of Sentinel.</p>

Syntax	Action
<pre> backup_util.sh -m backup -c -e -i -l -w -u admin -x <mypassword.txt> -f / var/opt/novell/ sentinel/data/ <my_weekly_backup>.t ar.gz </pre>	<p>Performs an online backup without shutting down the server. This backup includes everything except online event data and dynamic runtime data.</p>
<pre> backup_util.sh -m backup -b -c -e -d7 - u admin -x <mypassword.txt> -f / var/opt/novell/ sentinel/data/ <my_weekly_backup>.t ar.gz </pre>	<p>Performs an online backup with event data just from the last week. This backup includes configuration data, the baseline Security Intelligence collections, and the event data for the last 7 days. Event data older than 7 days is not backed up because that data can be extracted selectively, if necessary, from an older backup.</p>
<pre> backup_util.sh -m backup -c -f /var/ opt/novell/sentinel/ data/ config_backup.tar.gz </pre>	<p>Performs a local backup of the configuration data. This is a minimal backup of the system without any event data.</p>
<pre> backup_util.sh -m backup -e -f /var/ opt/novell/sentinel/ data/ events_backup.tar.gz </pre>	<p>Performs a local backup of the event data. This is a minimal backup of the local storage event data.</p>
<pre> backup_util.sh -m backup -e -d5 -f / var/opt/novell/ sentinel/data/ events_5days_backup. tar.gz </pre>	<p>Performs a local backup of the event data from the last 5 days. This is a minimal backup of the local storage event data from the last five days.</p>
<pre> backup_util.sh -m info -f /var/opt/ novell/sentinel/ data/ config_backup.tar.gz </pre>	<p>Displays the backup information for the specified backup file.</p>
<pre> backup_util.sh -m simple_event_backup -e -z /opt/archives/ archive_dir -f /opt/ archives/ archive_backup.tar.g z </pre>	<p>Performs a backup of event data on the machine where the networked storage directory is located.</p> <p>If the <code>/opt/archives/archive_dir</code> is not located in the server, you might need to copy the <code>backup_util.sh</code> script to the machine where the network storage is located and then run the <code>simple_event_backup</code> command from that machine.</p> <p>Alternatively, you can also use any 3rd party backup tool to backup the event directories on network storage.</p>
<pre> backup_util.sh -m restore -f /var/opt/ novell/sentinel/ data/ config_backup.tar.gz </pre>	<p>Restores the data from the specified filename.</p>

Syntax	Action
<pre>backup_util.sh -m simple_event_restore -z /opt/archives/ archivedir -f /opt/ archives/ archive_backup.tar.gz</pre>	Performs a restore of backed-up network storage data.

- 3 (Conditional) If you have restored any data, restart the server because the script might make several modifications to the database.
- 4 Use the Data Restoration feature to restore the extracted partitions. For more information, see [Section 5.8.6, “Restoring Data,” on page 107](#).

B Troubleshooting

This section contains some of the issues reported in Sentinel, along with the probable troubleshooting measures.

B.1 Cannot Restore Network Storage Data if the UIDs do not Match on the Source and the Destination Servers

Issue: The Data Restoration feature does not restore the network storage data if the novell user ID (UID) and the group ID (GID) are not the same on both the source (server that has the network storage data) and destination (server where the network storage data is being restored). (BUG 700564)

Workaround: Unsquash and squash the squash file system (`index.sqfs`):

- 1 Copy the partition that you want to restore to the Sentinel Log Manager server where you want to restore the data at the following location:

```
/var/opt/novell/sentinel_log_mgr/data/archive_remote/  
<sentinel_log_manager_server_UUID>/eventdata_archive
```

- 2 Log in to the Sentinel Log Manager server where you want to restore the data as the root user.
- 3 Change to the directory where you copied the partition that you want to restore:

```
cd /var/opt/novell/sentinel_log_mgr/data/archive_remote/  
<sentinel_log_manager_server_UUID>/eventdata_archive/<partition_ID>
```

- 4 Unsquash the `index.sqfs` file:

```
unsquashfs index.sqfs
```

The `index.sqfs` file is unsquashed and the `squashfs-root` folder is created.

- 5 Assign permission for novell user and novell group to the `<partition_ID>` folder:

```
chown -R novell:novell <partition_ID>
```

- 6 Remove the index:

```
rm -r index.sqfs
```

- 7 Switch to novell user:

```
su novell
```

- 8 Squash the `squashfs-root` folder:

```
mksquashfs squashfs-root/ index.sqfs
```

- 9 Restore the partitions by using the Data Restoration feature. For more information, see [Section 5.8.6, "Restoring Data," on page 107](#).

