

User Guide

Novell® Sentinel™

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Preface

Sentinel is a security information and event management solution 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.

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- ◆ Chapter 4, “Incidents Tab,” on page 91
- ◆ Chapter 5, “iTRAC Workflows,” on page 105
- ◆ Chapter 6, “Work Items,” on page 145
- ◆ Chapter 7, “Analysis Tab,” on page 151
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Audience

This documentation is intended for Information Security Professionals.

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 and enter your comments there.

Additional Documentation

For information on installing and configuring Sentinel 6.1, see [Sentinel 6.1 Installation Guide](#).

For information on Sentinel event fields, user accounts, permissions, and so on, see [Sentinel 6.1 Reference Guide](#).

For information on developing Collectors (proprietary or JavaScript) and JavaScript Correlation actions, go to the Sentinel SDK Web site: http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel (http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel).

For information on the complete product documentation, see the Sentinel 6.1 Documentation site: <http://www.novell.com/documentation/sentinel61/index.html> (<http://www.novell.com/documentation/sentinel61/index.html>)

Contacting Novell

- ◆ Web site: <http://www.novell.com> (<http://www.novell.com>)
- ◆ Technical Support: http://support.novell.com/phone.html?sourceidint=suplnav4_phonesup (http://support.novell.com/phone.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> (<http://download.novell.com/index.jsp>)
- ◆ 24x7 support: <http://www.novell.com/company/contact.html> (<http://www.novell.com/company/contact.html>)
- ◆ Sentinel Community Support Forum: <http://forums.novell.com/novell-product-support-forums/sentinel/> (<http://forums.novell.com/novell-product-support-forums/sentinel/>)
- ◆ Sentinel TIDs: <http://support.novell.com/products/sentinel> (<http://support.novell.com/products/sentinel>)
- ◆ Sentinel Plug-in Web site: <http://support.novell.com/products/sentinel/secure/sentinel61.html> (<http://support.novell.com/products/sentinel/secure/sentinel61.html>)
- ◆ Notification E-mail List: Sign up through the Sentinel Plug-in Web site

Sentinel Control Center

1

- ◆ [Section 1.1, “About Sentinel Control Center,” on page 19](#)
- ◆ [Section 1.2, “Log in to the Sentinel Control Center,” on page 22](#)
- ◆ [Section 1.3, “Introduction to the User Interface,” on page 23](#)

1.1 About Sentinel Control Center

Sentinel is a Security Information and Event Management solution 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 Control Center (SCC) is the main user interface for viewing and interacting with this data.

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 a more sensible GUI, identifies security or compliance issues, and tracks remediation activities, streamlining previously error-prone processes and building a more rigorous and secure management program.

The Sentinel Control Center includes the following functional tabs and interfaces:

- ◆ [Section 1.1.1, “Active Views,” on page 19](#)
- ◆ [Section 1.1.2, “Incidents,” on page 20](#)
- ◆ [Section 1.1.3, “iTRAC,” on page 20](#)
- ◆ [Section 1.1.4, “Analysis,” on page 20](#)
- ◆ [Section 1.1.5, “Advisor,” on page 20](#)
- ◆ [Section 1.1.6, “Admin,” on page 20](#)
- ◆ [Section 1.1.7, “Correlation,” on page 21](#)
- ◆ [Section 1.1.8, “Event Source Management,” on page 21](#)
- ◆ [Section 1.1.9, “Solution Packs,” on page 22](#)
- ◆ [Section 1.1.10, “Identity Integration,” on page 22](#)

1.1.1 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

1.1.2 Incidents

An incident is a set of events that require attention (for example, a possible attack). Incidents centralize the data and typically comprise a correlated event, the associated events that triggered a correlation rule, asset details of the affected systems, vulnerability state of the affected systems and any remediation information, if known. 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

1.1.3 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

1.1.4 Analysis

The Analysis tab is the historical reporting interface for Sentinel. Reports are published on a Web server and can be rendered in the analysis tab or in an external browser. You can also run and save an Offline Query for later quick retrieval of search results.

1.1.5 Advisor

Advisor is an optional module that provides real-time correlation between detected IDS attacks and vulnerability scan output in order to immediately indicate increased risk to an organization.

In the Advisor tab, you can view the products that Novell supports for Advisor and also the status of the last five Advisor feed files that have been processed or are being processed.

1.1.6 Admin

The Admin tab provides you access to perform the administrative actions and configuration settings in Sentinel. In the Admin tab, you can:

- ◆ Configure connection to Crystal Reports

- ◆ Create and modify filters
- ◆ Use filters to format data
- ◆ Use filters to determine event routing
- ◆ View system statistics about the Data Access Service
- ◆ Start and Stop system components
- ◆ Configure Sentinel event fields
- ◆ Configure the mapping service
- ◆ Create new options for right-click event menus
- ◆ Aggregate data for reporting
- ◆ Create users and assign them to roles for workflows
- ◆ Manage user sessions

1.1.7 Correlation

The Correlation tab provides an interface to create and deploy rules to detect suspicious or malicious patterns of events.

In the Correlation tab, you can:

- ◆ Create and edit rules
- ◆ Deploy/Undeploy rules
- ◆ Add an action and associate it to a rule
- ◆ Configure dynamic lists

1.1.8 Event Source Management

The Event Source Management (ESM) interface is available through the Sentinel Control Center menu. It allows you to manage and monitor connections between Sentinel and its event sources using Sentinel Connectors and Sentinel Collectors.

In the ESM, you can:

- ◆ Import/export Connectors and Collectors from/to the centralized repository available in ESM
- ◆ Add/edit connections to event sources through the configuration wizards
- ◆ View the real-time status of the connections to event sources
- ◆ Monitor data flowing through the Collectors and Connector

Sentinel Collectors

The Collectors parse the data and deliver a richer event stream by injecting taxonomy, exploit detection and business relevance into the data stream before events are correlated and analyzed and sent to the database.

Sentinel Connectors

The Connectors use industry standard methods to connect to the data source to get raw data.

1.1.9 Solution Packs

You can use the Solution Packs interface through the Tools menu in Sentinel Control Center. 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.

1.1.10 Identity Integration

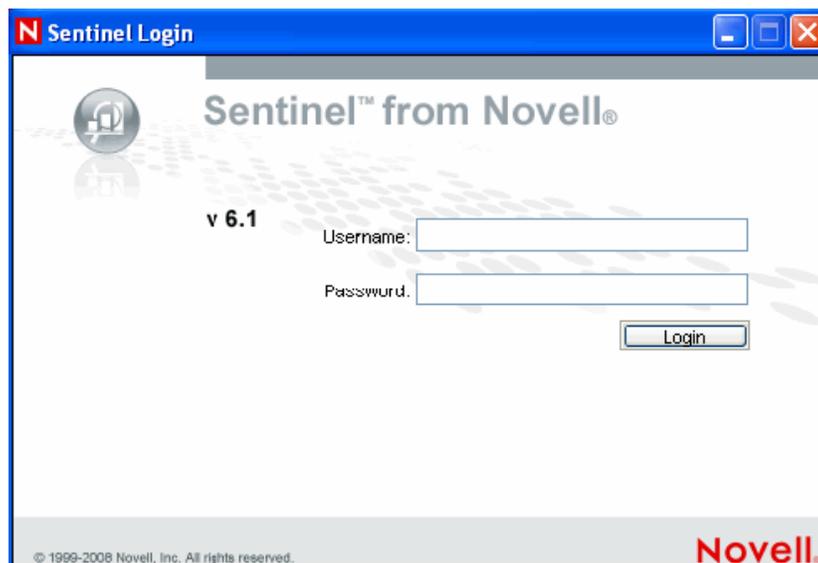
Novell Sentinel 6.1 provides an integration framework for identity management systems. This integration provides functionality on several levels. With the Identity Browser you can:

- ◆ Look up the following information about a user:
 - ◆ Contact information
 - ◆ Accounts associated with that user
 - ◆ Most recent authentication events
 - ◆ Most recent access events
 - ◆ Most recent permissions changes
- ◆ Lookup from events

1.2 Log in to the Sentinel Control Center

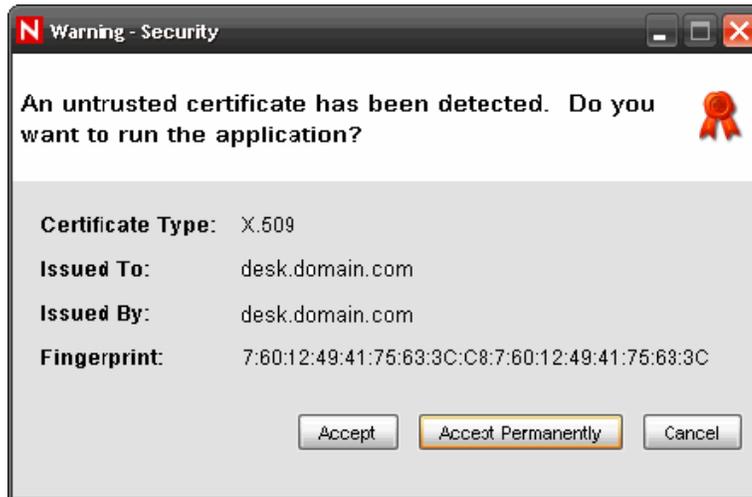
To Start the Sentinel Control Center on Windows:

- 1 Go to Start > Programs > Sentinel and select Sentinel Control Center. Sentinel Login window displays.



- 2 Provide the user credentials you are provided with to log-in to Sentinel Control Center.
 - ◆ Username and password, if using SQL Server authentication, OR
 - ◆ Domain\username and password, if using Windows authentication
- 3 Click Login.

- 4 On the first login, the following warning message displays. The user must accept the certificate in order to securely log in to the Sentinel Control Center



- 5 If you select Accept, this message displays every time you try to start Sentinel on your system. To avoid this, you can select Accept permanently.

To Start the Sentinel Control Center on Linux and Solaris:

- 1 As the Sentinel Administrator User (esecadm), change directory to:
`$ESEC_HOME/bin`
- 2 Run the following command:
`control_center.sh`
- 3 Provide your username and password and click OK.
- 4 A Certificate window displays, if you select Accept, this message displays every time you try to start Sentinel on your system. To avoid this, you can select Accept permanently.

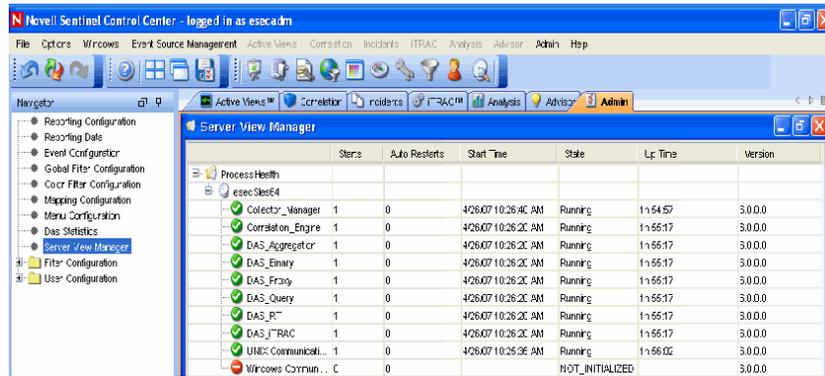
1.3 Introduction to the User Interface

In the Sentinel Control Center user interface, you can perform the activities through the following components:

- ♦ [Section 1.3.1, “Menu Bar,” on page 24](#)
- ♦ [Section 1.3.2, “Toolbar,” on page 24](#)
- ♦ [Section 1.3.3, “Tabs,” on page 25](#)
- ♦ [Section 1.3.4, “Frames,” on page 26](#)

Sentinel Control Center provides you the “dockable” framework, which allows you to move the Toolbars, Tabs or Frames from their default location to user-specific locations for ease-of-use.

Figure 1-1 Sentinel Control Center



1.3.1 Menu Bar

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

Figure 1-2 Figure 1-2: Menu Bar



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

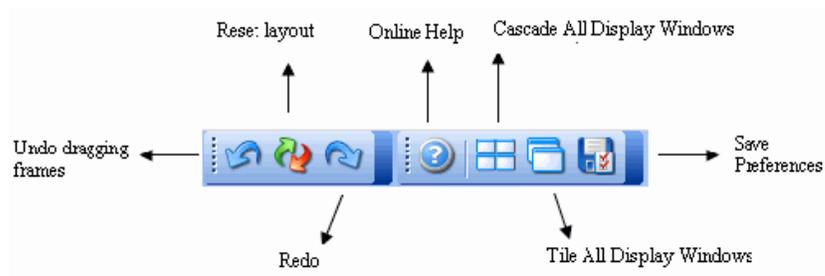
1.3.2 Toolbar

The Tool Bar allows you to perform the Tab specific functions. There are four system-wide toolbar buttons that are always displayed. These toolbar buttons are View Sentinel Help, Cascade All Display Windows, Tile All Display Windows and Save User Preferences. The availability of other toolbar buttons depends on your location in the console and permissions.

System-Wide Toolbar

The system-wide toolbar buttons are:

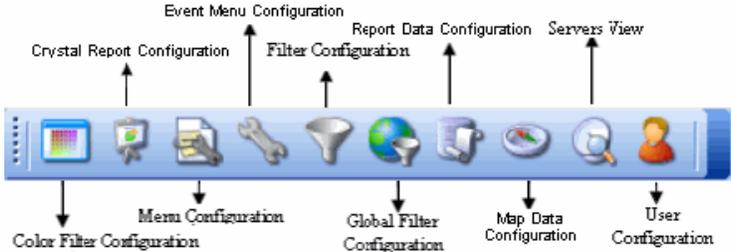
Figure 1-3 System-Wide Toolbar



Tab Specific Toolbar buttons

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

Table 1-1 *Tab Specific Toolbar Buttons*

Toolbar	View
Active Views	
Correlation	
Incidents	
iTRAC	
Analysis	 <p>Offline Queries Create Report</p>
Admin	 <p>Event Menu Configuration Report Data Configuration Servers View Crystal Report Configuration Filter Configuration Menu Configuration Global Filter Configuration Map Data Configuration User Configuration Color Filter Configuration</p>

For more information on Tabs-specific toolbar buttons, see the sections on each of the Tabs mentioned in the list above.

1.3.3 Tabs

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

- ◆ Active Views
- ◆ Correlation
- ◆ Incidents
- ◆ iTRAC
- ◆ Analysis
- ◆ Advisor
- ◆ Admin

For more information about Tabs, see the sections on each tab.

1.3.4 Frames

Sentinel provides a dock-able framework which allows you to drag frames on the screen to place them in user preferred locations. In a frame the following buttons displays, which allow you to drag/ hide frames.

- ◆ Toggle Floating
- ◆ Toggle Auto-hide

Figure 1-4 Navigator Frame



To drag a frame to any location:

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

To hide a frame:

- 1 Click Toggle Auto-hide icon.

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

1.3.5 Navigating through Sentinel Control Center

To navigate using Toolbar:

- 1 Click the tab you need to work on.
- 2 Click toolbar buttons to perform the actions.

To navigate using Menu bar:

- 1 Click the tab menu in the Menu bar.
- 2 Select an action you need to perform.

NOTE: This procedure is generic for all the tabs in Sentinel Control Center. Navigation specific procedures for tabs are discussed in the relevant sections.

1.3.6 Changing the appearance of Sentinel Control Center

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

- ◆ [“Setting the Tab Position” on page 27](#)
- ◆ [“Cascading Windows” on page 27](#)
- ◆ [“Tiling Windows” on page 27](#)

- ♦ “Minimizing and Restoring Windows” on page 27
- ♦ “Closing all open Windows” on page 27

Setting the Tab Position

To set the tab position:

- 1 Click Options > Tab Placement.
- 2 Select either Top or Bottom.

Cascading Windows

To cascade windows:

- 1 Click Windows > Cascade All. All open windows in the right panel cascade.

Tiling Windows

To Tile Windows:

- 1 Click Windows > Tile All.
- 2 Select from the following to meet your requirement:
 - ♦ Tile Best Fit
 - ♦ Tile Vertical
 - ♦ Tile Horizontal

Minimizing and Restoring Windows

To minimize all windows:

- 1 Click Windows > Minimize All. All open windows in the right panel minimize.

To restore windows to original size:

- 1 Click Windows > Restore All. All open windows in the right panel restores to their original size.

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

Closing all open Windows

To close all windows:

- 1 Click Windows > Close All.

1.3.7 Saving User Preferences

If the user has permissions to save their workspace, 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
- ◆ Navigator docked or floating and showing or hidden

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

- ◆ Snapshots
- ◆ Historical event queries
- ◆ Secondary windows opened from one of the primary windows in the Admin Navigator
- ◆ Column widths in Active Views

To save your preferences:

- 1 Click File > Save Preferences or click



1.3.8 Changing Password

To change your Sentinel Control Center password:

- 1 Click Options > Change Password.
- 2 Provide the old password.
- 3 Provide the new password and matching confirm password.
- 4 Click OK.

NOTE: For more information on password security, see “Setting Passwords” in “Best Practices section” in *Sentinel Installation Guide*.

1.3.9 Hostname updates

If the hostname of a system is changed, you might need to perform some of the following actions on the system depending on the Sentinel components installed on it.

IMPORTANT: Stop Sentinel Service before you perform these actions.

You might need to update all the machines (which have components affected by the hostname change) before you restart Sentinel service on any machine.

Scenario 1: Change in Sentinel Database Hostname

In this scenario, the affected components are DAS and SDM. So you might need to

- ◆ Update the DAS
- ◆ Update SDM

The configuration file enables DAS to connect to the database. So, you need to update the configuration files to update DAS.

To update DAS:

- 1** Login to the machine where DAS is installed as esecadm (on UNIX), or as an administrator (on Windows).
- 2** Stop the Sentinel Services running on the machine.
- 3** Go to ESEC_HOME\bin:
 - ◆ On Unix, type the command `cd $ESEC_HOME/bin`
 - ◆ On Windows, type the command `cd /d %ESEC_HOME%\bin`
- 4** Update DAS configuration files on Unix and Windows using the following commands.
 - ◆ On Unix, execute `./dbconfig -a ../config -h <new DB hostname>`.
 - ◆ On Windows, execute `.\dbconfig -a ..\config -h <new DB hostname>`.

You require the Database Hostname to login to SDM. To login to SDM, you might need to update the Database Hostname in SDM login window.

To Update SDM

- 1** Open Sentinel Data Manager.
- 2** In the login window, provide details of the Database, new hostname and other required details.
- 3** Click Connect.

Scenario 2: Change in Sentinel Communication Server Hostname

In this scenario, the affected components are Communication Server, DAS, Correlation Engine, Sentinel Collector Manager and Sentinel Control Center. So you might need to

- ◆ Update the Communication Server
- ◆ Update DAS, Correlation Engine, Sentinel Collector Manager, Sentinel Control Center

You might need to re-install the Communication Server to update the Hostname change.

To re-install Communication Server:

- 1** Login as root (Unix) or administrator (Windows) on the system where the Communication Server is installed.

- 2 Run Sentinel Uninstaller. In the Select components to Uninstall window, select Communication Server and deselect all other options.

Follow instructions in “[Uninstalling Sentinel](#)” in *Sentinel 6.1 Installation Guide* as required and complete uninstallation.

- 3 Click Finish.

- 4 Insert (and mount, on Solaris/Linux only) the Sentinel Installer CD.

- 5 Run the setup file. In the Select components to Install window, select Communication Server only.

Follow the instructions in “[Installing Sentinel 6.1 SP2](#)” in *Sentinel 6.1 Installation Guide* as required and complete installation.

- 6 Reboot the system.

The configuration file that connects the Communication Server and Sentinel processes needs to be updated. You might need to perform the steps given below on all machines with DAS, Correlation Engine, Collector Manager, and Sentinel Control Center installed.

To update DAS, Correlation Engine, Collector Manager, and Sentinel Control Center:

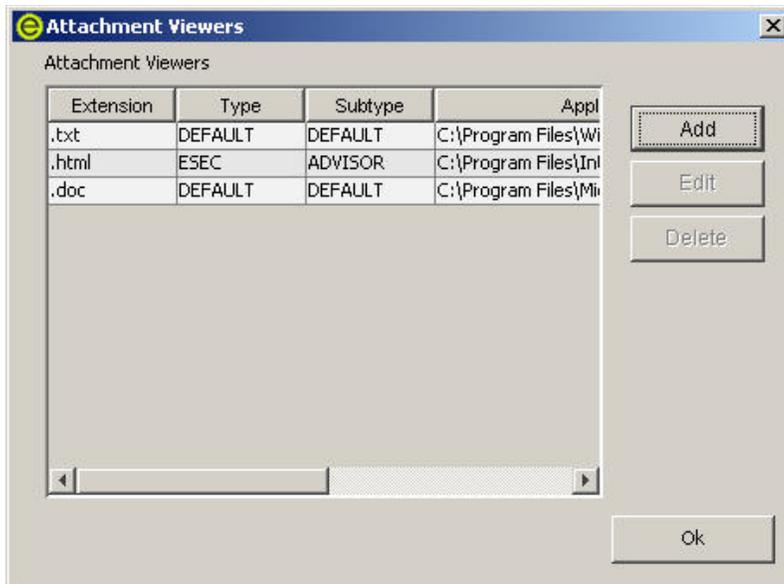
- 1 Go to `ESEC_HOME/config/` and edit `configuration.xml`.
- 2 Replace the four occurrences of the Communications Server Hostname with the new Hostname.
- 3 Save and exit the `configuration.xml` file.

IMPORTANT: After the steps mentioned above are performed, restart the Sentinel Services for the changes to take affect.

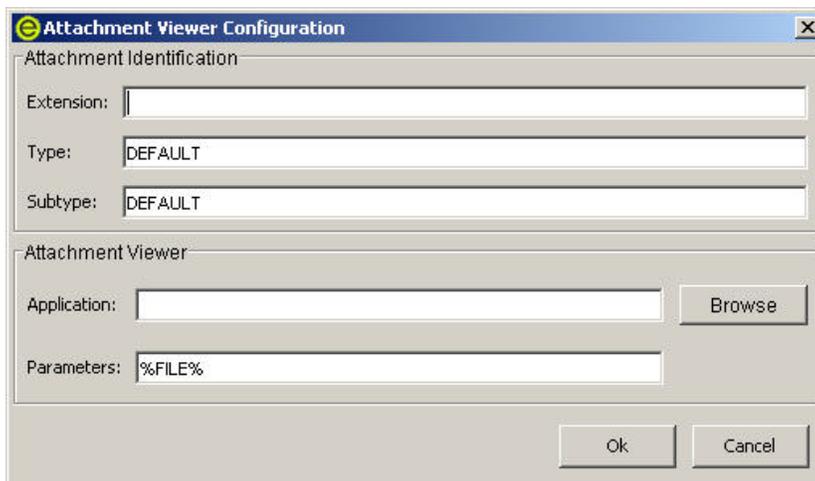
1.3.10 Configuring the Attachment Viewer

To configure the Attachment Viewer:

- 1 On the Tools menu, click Attachment Viewer Configuration or alternatively click Configure Attachment Viewers button. The Attachment Viewer Configuration window displays.



2 Click Add. The Attachment Identification window displays.



Specify the extension type (such as .doc, .xls, .txt, .html and so on) and click Browse or type in the application program to launch the file type (such as notepad.exe for Notepad).

3 Click OK.

- ◆ Section 2.1, “Understanding Active Views,” on page 33
- ◆ Section 2.2, “Introduction to the User Interface,” on page 34
- ◆ Section 2.3, “Reconfiguring Total Display Time,” on page 37
- ◆ Section 2.4, “Viewing Real Time Events,” on page 37
- ◆ Section 2.5, “Showing and Hiding Event Details,” on page 41
- ◆ Section 2.6, “Sending Mail Messages about Events and Incidents,” on page 41
- ◆ Section 2.7, “Creating Incidents,” on page 43
- ◆ Section 2.8, “Viewing Events that Triggered Correlated Events,” on page 44
- ◆ Section 2.9, “Investigating an Event or Events,” on page 45
- ◆ Section 2.10, “Viewing Advisor Data,” on page 51
- ◆ Section 2.11, “Viewing Asset Data,” on page 52
- ◆ Section 2.12, “Viewing Vulnerabilities,” on page 53
- ◆ Section 2.13, “Ticketing System Integration,” on page 58
- ◆ Section 2.14, “Viewing User Information,” on page 58
- ◆ Section 2.15, “Using Custom Menu Options with Events,” on page 59
- ◆ Section 2.16, “Managing Columns in a Snapshot or Navigator Window,” on page 59
- ◆ Section 2.17, “Taking a Snapshot of a Navigator Window,” on page 60
- ◆ Section 2.18, “Sorting Columns in a Snapshot,” on page 61
- ◆ Section 2.19, “Closing a Snapshot or Navigator,” on page 61
- ◆ Section 2.20, “Adding Events to an Incident,” on page 61

2.1 Understanding 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 Statistical Analysis
- ◆ Invoke right-click functions
- ◆ Initiate manual incidents and remediation workflows

An event represents a normalized log record reported to Sentinel from a third party security, network, or application device or from an internal Sentinel source. There are several types of events:

- ◆ External Events (event received from a security device), such as:
 - ◆ An attack detected by an Intrusion Detection System (IDS)

- ♦ A successful login reported by an operating system
- ♦ A customer-defined situation such as a user accessing a file
- ♦ Internal Events (an event generated by Sentinel), including:
 - ♦ A correlation rule being disabled
 - ♦ Database filling up

You can monitor the events in a tabular form or using several different types of charts, you can perform queries for recent events.

NOTE: Access to these features can be enabled or disabled for each user. For more information, see “[Sentinel Database Users, Roles, and Access Permissions](#)” in *Sentinel 6.1 Reference Guide*

2.2 Introduction to the User Interface

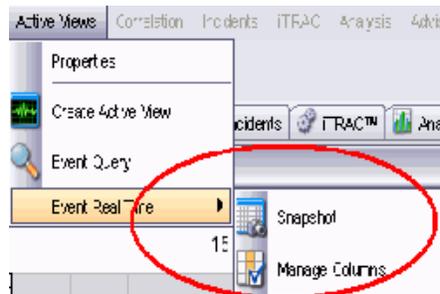
In Active Views, you can see Create Active View and Event Query. You can navigate to these functions from:

Table 2-1 Active View-User Interface

- ♦ The Active View menu in the Menu Bar



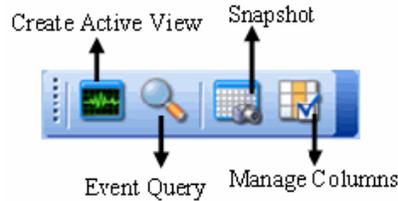
- ♦ When you create a filter, The Active View menu has these additional options.



- ♦ The Navigation Tree in the Navigation Pane



- ◆ The Toolbar Buttons



Active Views provides two types of views which display the events in Tables and Graphs.

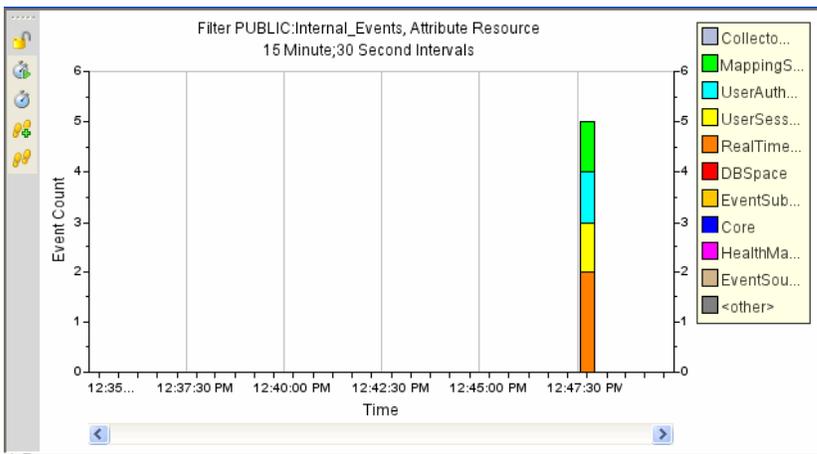
Table Format displays the variables of the events as columns in a table. You can sort the information in the grid by clicking on the column name.

Figure 2-1 Active View-Tabular Format

Severity	EventTime	EventName	EventID	SourceID	Collector
●	5/6/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D0A-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
●	5/6/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D08-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
●	5/6/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D04-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
●	5/6/07 12:33:31 PM	DbSpaceLow	B30E4A43-DAB9-1029-9D01-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	

Graphical Format displays events as Graphs. You can change the chart types to display other chart types.

Figure 2-2 Active View-Graphical Format



A near Real Time Event Table with graphical presentation and Snapshot are the two types of Active Views.

- ◆ Near Real Time Event Table:

- ◆ Holds up to 750 events per 30-second period. If there are more than 750 events, the events are displayed in the following priority order: correlated events, events that are sent to the GUI only using a global filter, and all remaining events.
- ◆ By default, the client maintains a 24-hour period of cached events. This is configurable through [Active View Properties](#).
- ◆ By default, the smallest possible display interval of an active view is 30 seconds. This is represented by a gray line in the event table.

Figure 2-3 *Gray Line- Smallest Possible Display Interval*

1	2005.06.21 / 06:34:38 EDT			Threshold_ex
2	2005.06.21 / 06:34:38 EDT	10.0.0.1	10.0.0.12	Password_ex
3	2005.06.21 / 06:34:28 EDT	10.0.0.22	10.0.0.9	Program_exe

In the event when there are more than 750 per 30-second time period, a red separation line displays indicating that there are more events than what is displayed. The other events can be viewed by using Historical Queries.

Figure 2-4 *Red Line- More Events then Displayed*

1	2005.06.21 / 07:07:00 EDT	10.0.0.11	10.0.0.21	unsuccessfu
2	2005.06.21 / 07:07:30 EDT	10.0.0.13	10.0.0.35	suspicious-fil
3	2005.06.21 / 07:06:58 EDT	10.0.0.54	10.0.0.25	successful-a

- ◆ On saving user preferences, system continues to collect data for 4 days. For instance, if you save your preferences, log out and log back in the following day, your Active View displays data as if you never logged off.
- ◆ If an Active View is created and not saved, it will continue to collect data for an hour. Within that hour time frame if an identical Active View is created, the Active View displays data for the last hour.
- ◆ **Snapshot:** Time-stamped views of a Real Time Event View table.

The following is what makes an Active View unique.

- ◆ Filter assigned to an Active View
- ◆ The z-axis attribute
- ◆ The security filter assigned to a user

The Active Views Tab allows you to:

Reconfigure Total Display Time	Send messages about Events by e-mail
Add Events to an incident	Show or Hide Event Details
Close a Snapshot or Navigator Window	Snapshot of a Navigator Window
Create an Incident	View Events that triggered a correlated event
Custom Menu Options with Events	View Vulnerability Visualization
Investigate Event Query	View Asset Data
Investigate Graph Map	Integrate with Ticketing System
View Advisor Data	View Identity Browser
Manage Columns	

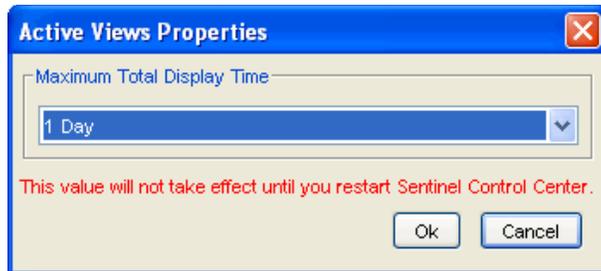
You can change labels (column names) to user-friendly names and the new names will be populated throughout the system. For more information, see [Section 2.15, “Using Custom Menu Options with Events,”](#) on page 59.

2.3 Reconfiguring Total Display Time

Active View Properties allows you to configure the cached time in each client. The default cache time value in an Active View is 24 hours.

To configure Maximum Total Display Time:

- 1 Click the Active Views tab.
- 2 Click Active Views > Properties.
- 3 Make your changes. Click OK.



NOTE: The new values will not take effect until you restart the Sentinel Control Center.

2.4 Viewing Real Time Events

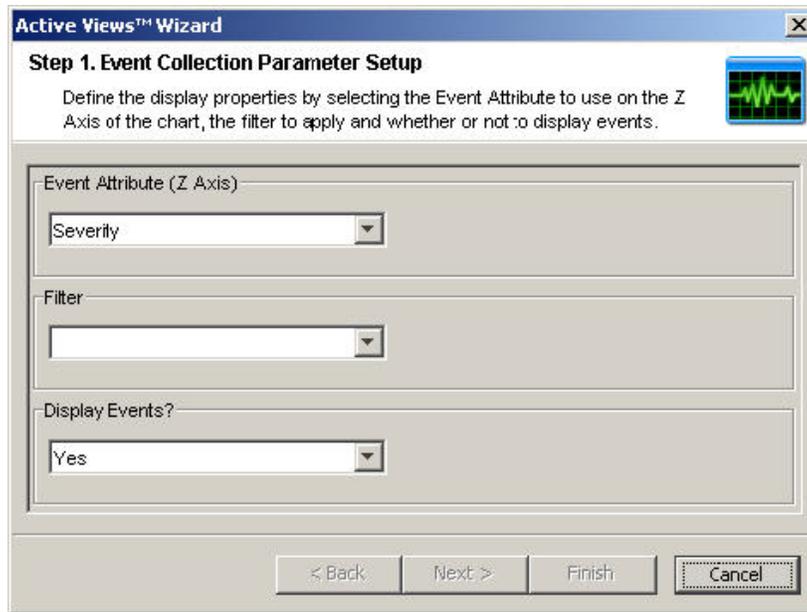
To View Real Time Events:

- 1 Click the Active Views tab.
- 2 Click Active Views > Create Active View or click Create Active View icon.



- 3 In the Event Visualization Wizard window, click the down arrows to select your Event Attribute (Z Axis), Filter and to Display Events (Yes or No).

NOTE: In the Filter Selection window you can build your own filter or select one of the already built filters. Selecting the All filter allows all events to display in your window. When creating an Active View, if the filter assigned to the Active View is changed or deleted after creation of the Active View, the Active View is unaffected.



After making your selection, you can click Next or Finish. If you select Finish, the following default values are selected:

- ◆ Display Interval and Refresh rate of 30 seconds
- ◆ Total Display Time of 15 minutes
- ◆ Y-axis as Event Count
- ◆ Chart type: Stacked Bar 2D

4 If you click Next, click the down arrows to select your:

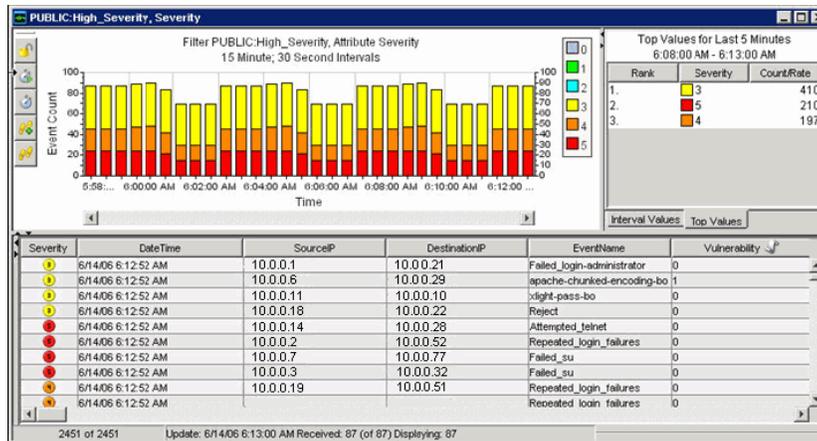
- ◆ **Display Interval and Refresh rate:**
 - ◆ Display Interval is the Time interval to display events.
 - ◆ Refresh Rate is the rate at which Active Views should refresh.
- ◆ **Total Display Time:** Amount of time to display the chart
- ◆ **Y-axis:** Either total Event Count or Event Count per Second

Click Next.

5 Select your chart type from the drop-down list and click Finish.

- ◆ Chart type: Stacked Bar 2D, Bar 3D, Line and Ribbon

Your graph looks similar to:



The five buttons to the left of the chart perform the following functions:

	<ul style="list-style-type: none"> ▪ Lock/Unlock the Chart: Used when performing a drill-down, zoom in, zoom out, zoom to selection and saving a chart as an html file.
	<ul style="list-style-type: none"> ▪ Increase Display Interval: Increases the display time interval for incoming events
	<ul style="list-style-type: none"> ▪ Decrease Display Interval: Decreases the display time interval for incoming events
	<ul style="list-style-type: none"> ▪ Increase Display Time: Increase the time interval along the x-axis
	<ul style="list-style-type: none"> ▪ Decrease Display Time: Decreases the time interval along the x-axis

When you click the Lock button, additional available buttons are:

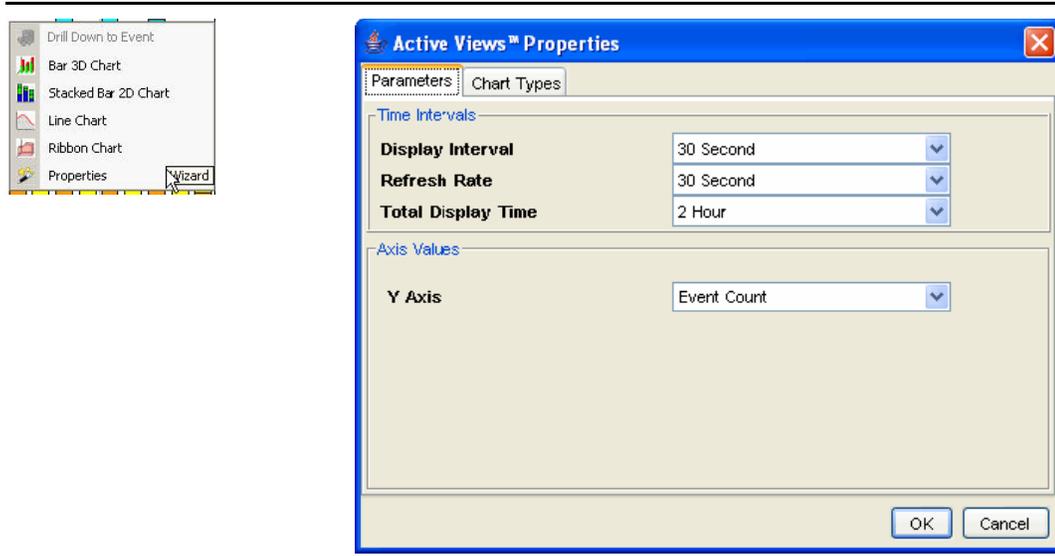
	<ul style="list-style-type: none"> ▪ Lock/Unlock the Chart: Used when performing a drill-down, zoom in, zoom out, zoom to selection and saving a chart as an html file.
	<ul style="list-style-type: none"> ▪ Zoom In: Zooms in without changing any of the time settings of the chart
	<ul style="list-style-type: none"> ▪ Zoom Out: Zooms out without changing any of the time settings of the chart
	<ul style="list-style-type: none"> ▪ Zoom to Selection: Zooms in on a selection of time intervals of events.
	<ul style="list-style-type: none"> ▪ Snapshot Active View: Save as an html file with chart as images and events in a tabular format.

2.4.1 To Reset Parameters and Chart Type of an Active View

When viewing an Active View, you can reset your chart parameters, change your chart type.

To Reset Parameters and Chart Type of an Active View:

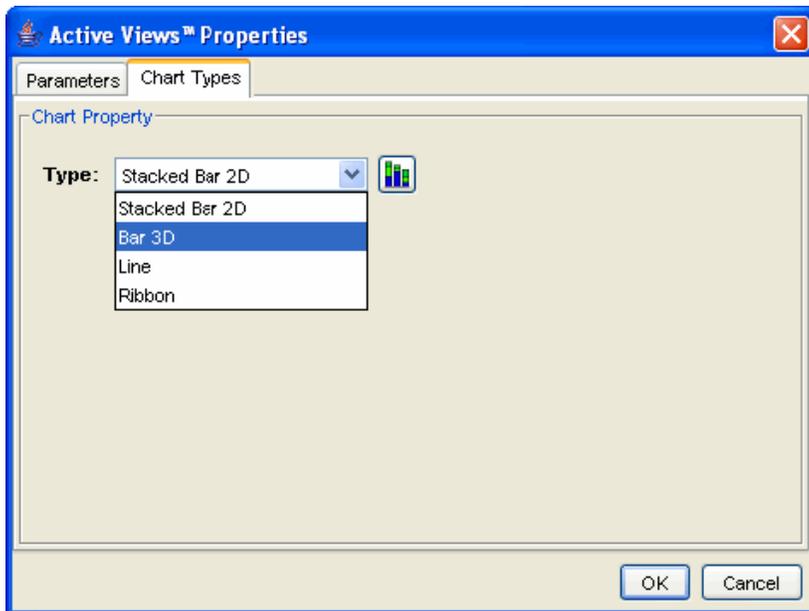
- 1 Within an Active View displaying a chart, right-click and select Properties.



Under the Parameters tab, you can set:

- ◆ **Display Interval:** Time between each interval
- ◆ **Refresh Rate:** Number of seconds for event rate to be updated
- ◆ **Total Display Time:** Amount of time to display the chart
- ◆ **Y-axis:** Either total Event Count or Event Count per Second

Under the Chart Types tab, you can set your chart to Stacked Bar2D, Bar 3D, Line or Ribbon.



2.4.2 Rotating a 3D Bar or Ribbon Chart

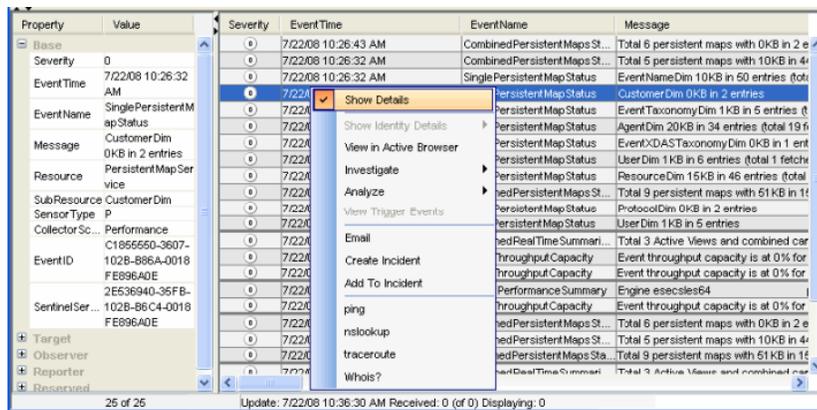
To rotate a 3D bar or ribbon chart:

- 1 Click anywhere on the chart and hold the mouse button.
- 2 Reposition the chart as desired by moving the mouse and holding the button.

2.5 Showing and Hiding Event Details

To show event details:

- 1 In a Real Time Event Table of the Navigator or Snapshot, double-click or right-click an event and click Show Details. An event details displays in the left panel of the Real Time Event Table.



To hide an event detail:

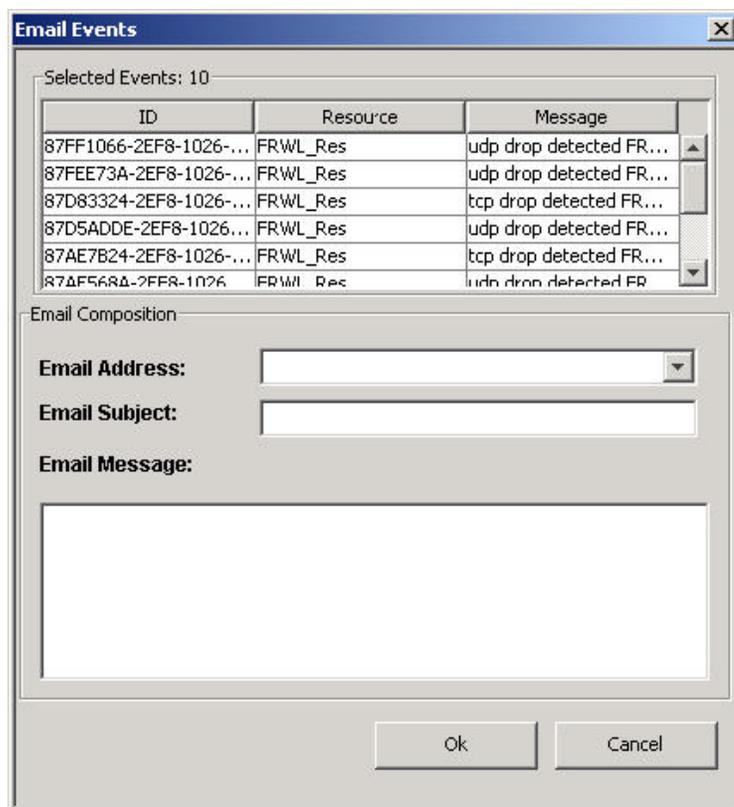
- 1 In an Real Time Event Table of the Navigator or Snapshot, with event details displayed in the left panel, right-click an event and click Show Details. The Event Details window closes.

2.6 Sending Mail Messages about Events and Incidents

To send mail messages from within the Sentinel Control Center, you must have an SMTP Integrator is configured with connection information and with the property SentinelDefaultEMailServer set to “true”.

To send an event message by e-mail:

- 1 In a Real Time Event Table, select an event or a group of events, right-click and select Email.



2 Provide the following information:

- ◆ Email Address
- ◆ Email Subject
- ◆ Email Message

3 Click OK.

To e-mail an Incident:

- 1** After you save your incident, click the Incidents tab, Incidents > Incidents View.
- 2** Click All Incidents option in the Switch View drop down list located at the bottom right corner.
- 3** Double-click an Incident.
- 4** Click Email Incident.



5 Provide the following information:

- ◆ Email Address

3 In the Create Incident dialog box, specify:

- ◆ Title
- ◆ State
- ◆ Severity
- ◆ Priority
- ◆ Category
- ◆ Responsible
- ◆ Description
- ◆ Resolution

4 Click Create. The incident is added under the Incidents tab of the Sentinel Control Center.

2.8 Viewing Events that Triggered Correlated Events

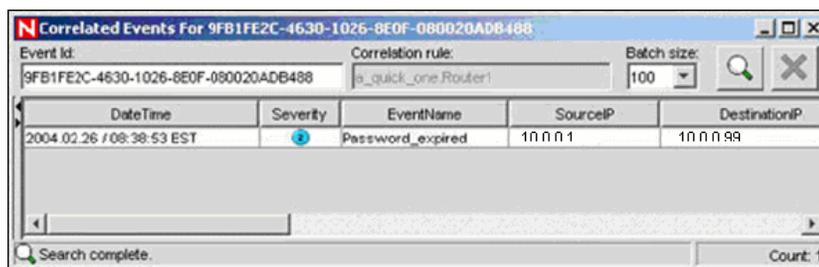
Correlated events are determined based on the *RT2* field value of the event. The *RT2* field is set to the name of the Correlation rule that triggered the Correlated event. This value is set only when the event is generated by the Correlation engine. For the Correlated events, the *Resource* field is set to *Correlation* and the *SensorType* field is set to *C*. However, the following are the exceptions:

- ◆ The *SensorType* field is set to *T* for the Correlated events that are routed to *gui only*.
- ◆ If you are using the action *Configure Correlated Event* with a Correlation rule and you set the *Resource* field to any value, the *Resource* field displays the value that you have set.

The *View Trigger Events* option is enabled only for Correlated events.

1 In the Real-Time event table of the Navigator or Snapshot, or an Event Query table, right-click a Correlated event, and select *View Trigger Events*.

A window displays showing the events that triggered the rule and the name of the Correlation Rule.



NOTE: For Correlated events, Trigger events are not available if events were routed to GUI only. However, the *View Trigger Events* option is enabled even if the Trigger events are not available.

2.9 Investigating an Event or Events

This Investigate options on the Event Menu allow you to:

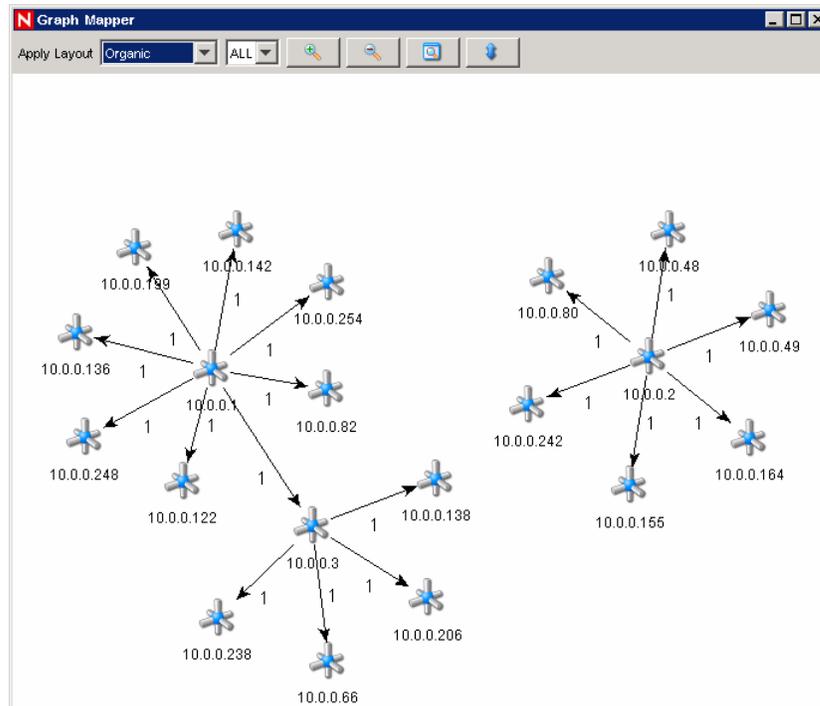
- ◆ Perform a Event Query for the last hour on a single event for:
 - ◆ Other events with the same target IP address
 - ◆ Other events with the same source (initiator) IP address
 - ◆ Other targets with the same event name

NOTE: You cannot perform a query on a null (empty) field.

- ◆ Graphically display the mappings between any two fields in the selected events. This is particularly useful to view the relationship between the initiators (IP, port, event, sensor type, Collector) and the targets (IP, port, event, sensor type, Collector name) of the selected events, but any fields can be used

Below is an illustration of initiator IP addresses mapped to target IP addresses.

Figure 2-5 Graph Mapper



2.9.1 Investigate – Event Query

This function allows you to perform Event Query within the last hour for events similar to the selected event.

To perform an Event Query using the Investigate function:

- 1 In a Navigator or Snapshot window, right-click an event>Investigate> <select one of three options below>

Option	Function
Show More Events to this target	Events with the same Destination IP address
Show More Events from this source	Events with the same Initiator IP address
What are the target objects of this event?	Events with the same event name as the selected event

2 An event table opens showing the chosen event information.

2.9.2 Investigate – Graph Mapper

To create a graph map:

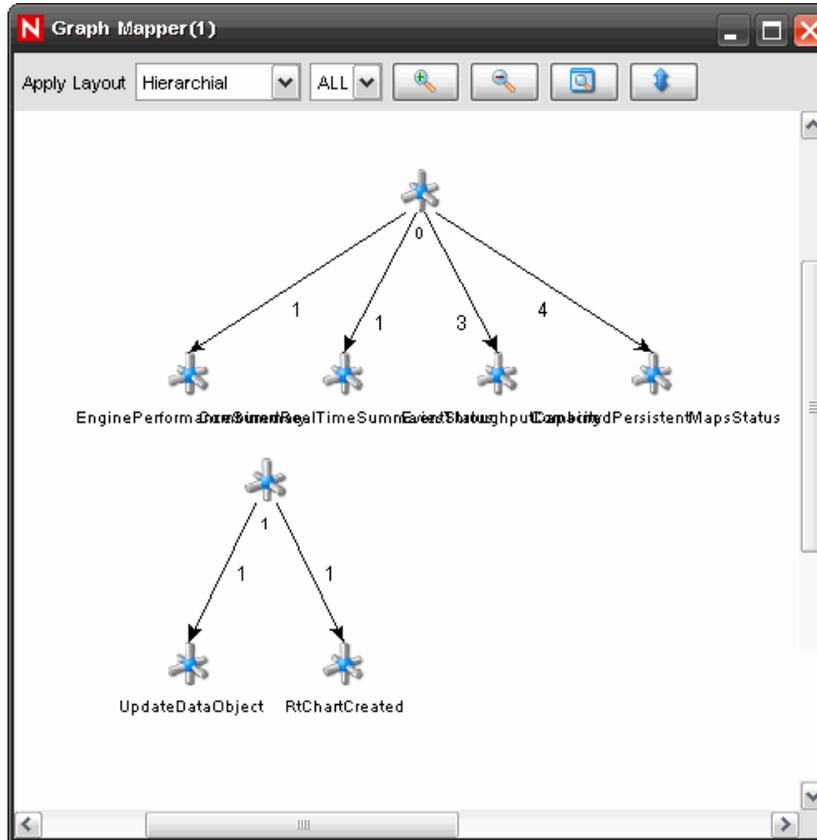
1 In Real Time Event Table right-click an event or events and select Investigate>Show Graph.

Severity	EventTime	SourceIP	DestinationIP	EventName
5	5/22/07 12:47:36 AM	10.0.0.2	10.0.0.136	Test Event
5	5/22/07 12:47:04 AM	10.0.0.2	10.0.0.70	Test Event
5	5/22/07 12:46:38 AM	10.0.0.2	10.0.0.203	Test Event
5	5/22/07 12:42:08 AM	10.0.0.2	10.0.0.227	Test Event
5	5/22/07 12:38:41 AM	10.0.0.2	10.0.0.208	Test Event
5	5/22/07 12:38:26 AM	10.0.0.2	10.0.0.120	Test Event
5	5/22/07 12:38:12 AM	10.0.0.2	10.0.0.175	Test Event
5	5/22/07 12:38:10 AM	10.0.0.2	10.0.0.167	Test Event
5	5/22/07 12:36:33 AM	10.0.0.2	10.0.0.175	Test Event
5	5/22/07 12:49:41 AM	10.0.0.2	10.0.0.175	Test Event
5	5/22/07 12:47:46 AM	10.0.0.2	10.0.0.175	Test Event
5	5/22/07 12:42:50 AM	10.0.0.2	10.0.0.175	Test Event
5	5/22/07 12:41:20 AM	10.0.0.2	10.0.0.175	Test Event
5	5/22/07 12:40:38 AM	10.0.0.2	10.0.0.175	Test Event

Show Details	
View in Active Browser	
Investigate	Show Graph...
Analyze	Show More Events to this target
View Trigger Events	Show More Events from this source
Email	What are the target objects of this event?

2 You must specify the From and To fields and click Finish. The Graph Mapper window displays. The following is a graphic depiction of Sensor Name to Event Name of severity 5 in an organic format. You can view a graphic mapping in the following formats:

- ◆ Circular
- ◆ Hierarchical
- ◆ Organic
- ◆ Orthogonal

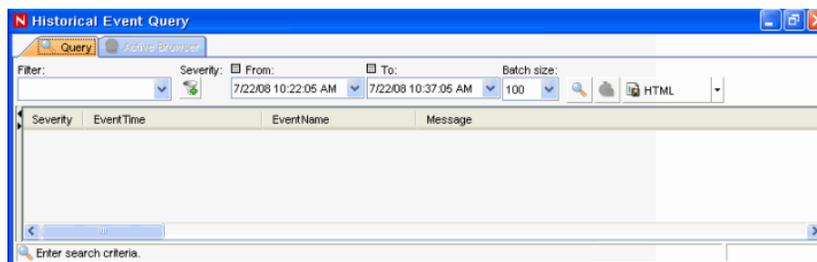


2.9.3 Historical Event Query

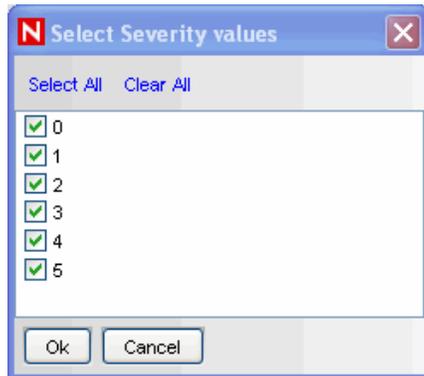
You can query the database for the past events through Historical Event Query. The events can be queried according to the filter and severity criteria in required batch size. You can export the results in HTML or CSV file format.

To query events in Historical Event Query window:

- 1 In the Active Views tab, select Active Views > Event Query. You can also open Historical Event Query window by clicking Historical Query Icon on the toolbar. The Historical Event Query window displays.



- 2 Click Filter. In Filter Selection window, select a filter from the list of available filters.
- 3 Click Severity Icon. Select Severity values window displays.

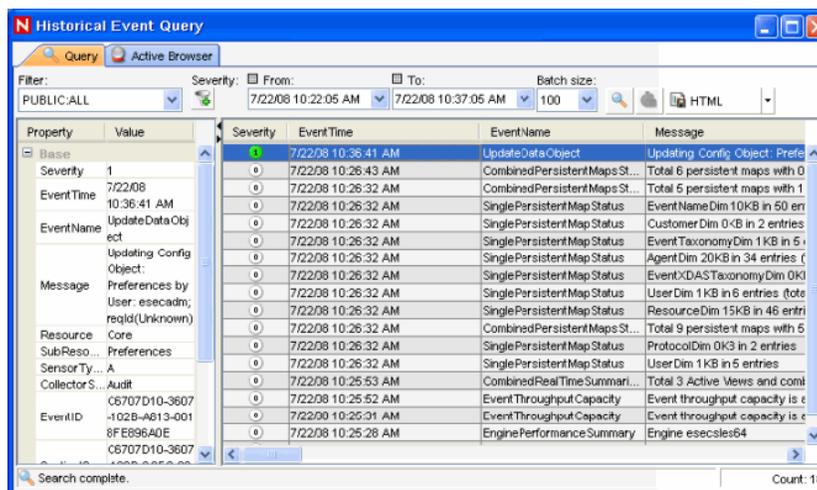


Select one or more values for Severity and click OK

- 4 You must select From and To Date and Time from From and To drop-down. The Time you select corresponds your system time.
- 5 Select a batch size from the Batch size drop down. The events queried displays in the batch size you specify.

If you select a batch size of 100, the first 100 events are displayed in the window first. After the query is processed, the Begin Searching icon changes to More results icon. You can see next 100 events along with the previous events by clicking More results icon.

- 6 Click Begin Searching Icon. The query is processed. You can stop/cancel the search by clicking Cancel search icon.



TIP: Select HTML or CSV from the drop-down list to export query results.

2.9.4 Active Browser

The Active Browser provides the ability to browse through a selected set of data to look for patterns and perform investigation. You can view the selected events in the Active Views in Active Browser. You can perform all the right-click activities that are available in Active Views in Active Browser too. When you open the Active Browser using Analysis > Offline Query and click Browse against a specific offline query, the events table is displayed only when the number of events are less than or equal to 1000.

The events are grouped according to the metatags. In these metatags various sub-categories are defined. The numbers in the parentheses against these sub-categories displays the total number of event counts corresponding to the value of the metatag.

To view events in Active Browser:

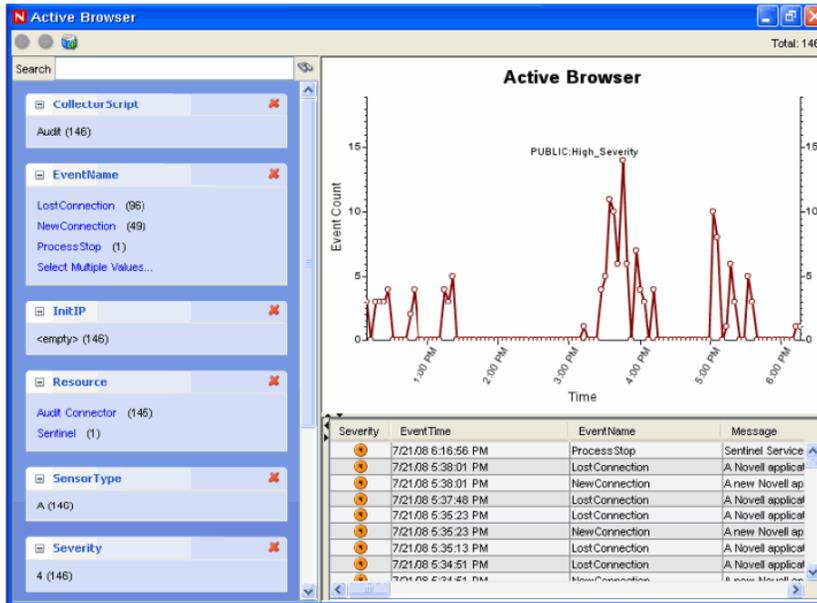
- 1 In the Active Views tab, highlight the event/s you want to view in Active Browser.
 - 2 Right-click event/s and select View in Active Browser. The selected event/s displays in the Active Browser window.
- Or
- 3 In the Active Views tab, select Active Views > Event Query. Historical Event Query window displays.
 - 4 In the Historical EventQuery window, run a Query and click Active Browser tab. The selected Query displays in the Active Browser window.

NOTE: The Active Browser tab will be enabled only if the Query results in at least one event displays.

To view events in Active Browser in Analysis tab:

- 1 In the Analysis tab, highlight the Query you want to view in Active Browser.

2 Click Browse. The selected Query result displays in the Active Browser window.



To search in Active Browser:

- 1 Specify the value or text you want to search for in the Search field
- 2 Press Enter or click the Search icon against the search field to search.

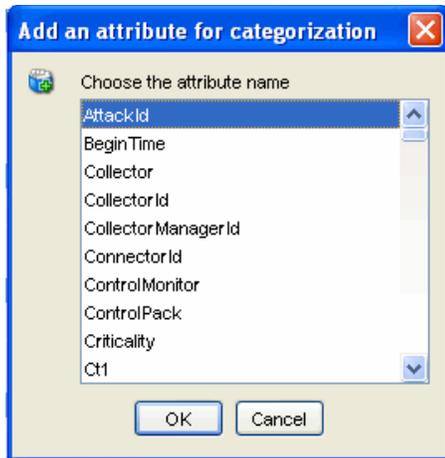
NOTE: You can move between the various searches by using the Forward and Backward button above the search field.

To add attributes in Active Browser:

- 1 Click Add an attribute for categorization icon as shown below:



- 2 Select an attribute in the Add an attribute for categorization window that displays.



- 3 Click OK.

2.10 Viewing Advisor Data

Advisor provides a cross-reference between real-time IDS attack signatures and Advisor's knowledge base of vulnerabilities.

The supported Intrusion Detection Systems are listed in [Chapter 8, "Advisor Usage and Maintenance,"](#) on page 157.

To View Advisor Data:

- 1 In a Real Time Event Table of the Navigator or Snapshot, right-click an event or a series of selected events > Analyze > Advisor Data. If the `DeviceAttackName` field is properly populated, a report similar to the one below displays. This example is for a WEB-MISC amazon 1-click cookie theft.

Advisor Summary

Attack	Attack ID	Alert IDs
WEB-MISC amazon 1-click cookie theft	9991272	1087, 1194, 8835, 9010
WEB-MISC amazon 1-click cookie theft	9992801	1194, 8835, 9010

Advisor Report

Microsoft Excel XLM Arbitrary Macro Execution (id 9991272) [top](#)

3	4	<p>Microsoft Excel contains a flaw that may allow a malicious user to warn the user. The issue is triggered when a malicious user creates Excel macro commands, and embeds commands in a spreadsheet that launch the macro without asking the user for permission. It may be possible to persuade the user to launch the file containing embedded macros, resulting in a loss of integrity and/or availability of data.</p> <p>Scenario:</p> <p>Impact: Loss of Integrity</p> <p>Safeguards:</p>
Urgency	Severity	

2.11 Viewing Asset Data

Asset data displays the asset information related to a machine or device from which you are receiving events. You can view and save the Asset data report as an HTML file. You must run your asset management Collector to view this data. The available data for viewing are:

- ◆ Hardware
 - ◆ MAC Address
 - ◆ Name
 - ◆ Type
 - ◆ Vendor
 - ◆ Product
 - ◆ Version
 - ◆ Value
 - ◆ Criticality
- ◆ Network
 - ◆ IP Address
 - ◆ Hostname
- ◆ Software
 - ◆ Name
 - ◆ Type
 - ◆ Vendor
 - ◆ Product
 - ◆ Version
- ◆ Contacts
 - ◆ Order
 - ◆ Name
 - ◆ Role
 - ◆ Email
 - ◆ Phone Number
- ◆ Location
 - ◆ Location
 - ◆ Address

To view Asset Data:

- 1** In the Active Views table of the Navigator or Snapshot window, right-click an event or multiple events.
- 2** Select *Analyze > Asset Data*.

If both the Source IP and Destination IP are populated in an event, the asset data is displayed for both. If either of them is populated, the respective asset data is displayed.

The screenshot shows a window titled "Asset Details" with a toolbar containing "Apply Template" and "AssetTransformerDefault". The main content is an "Asset Report" with the following sections:

- Hardware:**

MAC Address	04:23:A3:44:65:80			
Name		Value		
Type		Criticality		
Vendor		Product		
Version				
- Network:**

IP	192.168.0.3	Hostname	devbox03	
----	-------------	----------	----------	--
- Software:**

Name	Type	Vendor	Product	Version
Dev Box 3	DESKTOP	test3	Windows3	Msft3
- Contacts:**

Order	Name	Role	Email	Phone Number
- Location:**

Location	3
Address	HQ 1921 Gallows Rd Suite 700 Vienna VA 22182 USA

2.12 Viewing Vulnerabilities

Vulnerability Visualization provides a textual or graphical representation of the vulnerabilities of selected destination systems. Vulnerabilities for the selected destination IPs can be seen for the current time or for the time of the selected events.

Vulnerability Visualization requires that a vulnerability Collector is running and adding vulnerability scan information to the Sentinel database. The [Sentinel Collectors Web site \(http://support.novell.com/products/sentinel/collectors.html\)](http://support.novell.com/products/sentinel/collectors.html) provides Collectors for several industry-standard vulnerability scanners, and additional vulnerability Collectors can be written using Collector Builder.

NOTE: Vulnerability Collectors are distinct from Event Collectors and use different commands.

There are several Vulnerability Visualization views:

- ♦ HTML
- ♦ Graphical
 - ♦ Circular
 - ♦ Organic

Figure 2-7 Organic View

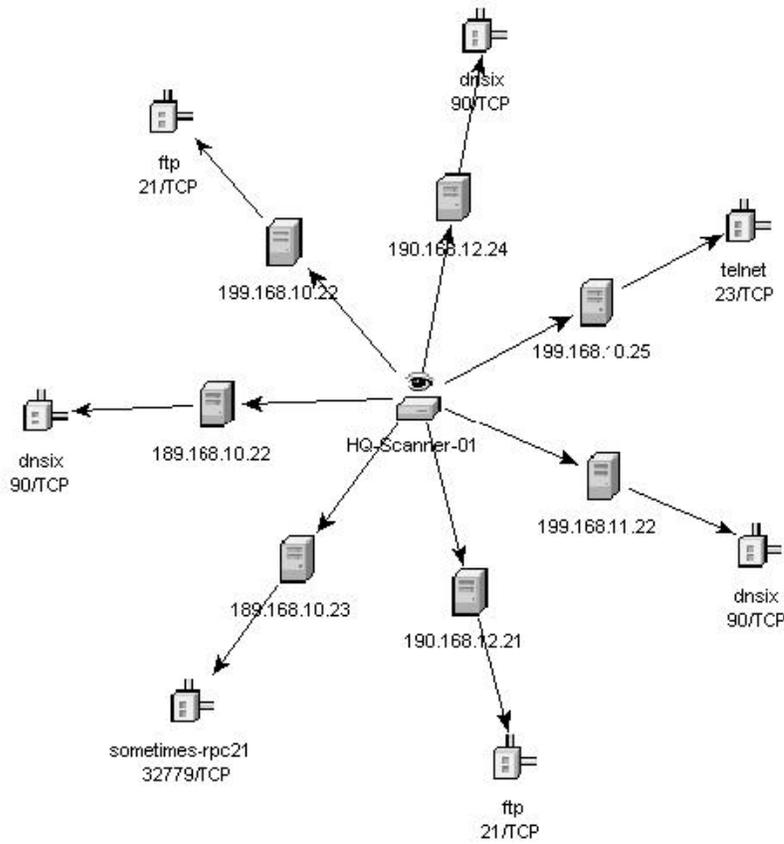
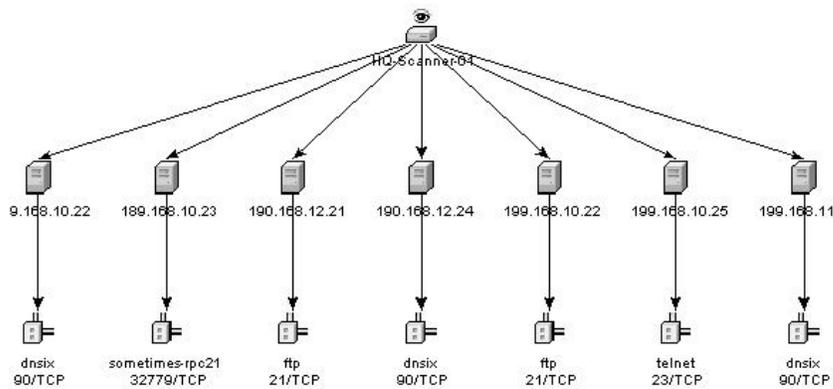


Figure 2-8 Hierarchical View



NOTE: Event mapping takes place only between the selected events and the vulnerability data returned.

The tree panel organizes data in same hierarchy as the graph. The tree panel also allows users to hide/show nodes at any level in the hierarchy.

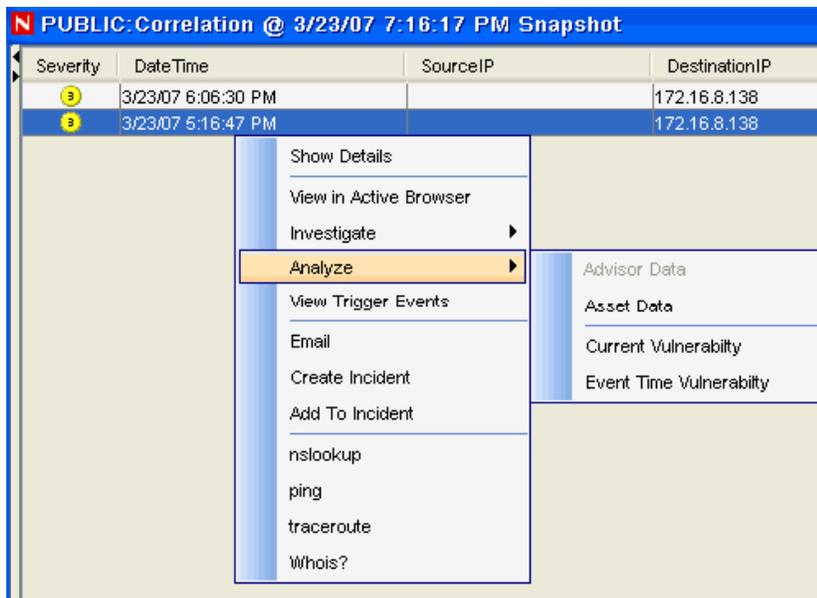
The control panel exposes all the functionality available in the display. This includes:

- ◆ Four different algorithms to display
- ◆ Ability to show all or selected nodes which have events mapped to them
- ◆ Zooming in and out of selected areas of the graph

There are two tabs in the Details/Events panel. When in the Details tab, clicking on a node results in displaying node details. When in the Events tab, clicking on an event associated with a node the node displays in tabular form as in a Real Time or Event Query window.

To run a Vulnerability Visualization:

- 1 In an Real Time Event Table of the Navigator or Snapshot, right-click an event or a series of selected events and click:
 - ◆ Analysis:
 - ◆ **Current Vulnerability:** Queries the database for vulnerabilities that are active (effective) at the current date and time.
 - ◆ **Event Time Vulnerability:** Queries the database for vulnerabilities that were active (effective) at the date and time of the selected event.



- 2 At the bottom the vulnerability results window, click either:
 - ◆ Event to Vulnerability Graph
 - ◆ Vulnerability Report

3 (For Event to Vulnerability Graph) Within the display, you can:

- ♦ move nodes and their labels
- ♦ use one of four different layout algorithms to display the graph
- ♦ show all nodes or only those nodes that have events mapped to them
- ♦ in-line tree filtering in the event that a large number of resources are returned as vulnerable
- ♦ zoom in and out of selected areas

2.13 Ticketing System Integration

Novell provides optional integration modules for BMC Remedy that allows you to send events from any display screen to one of these external ticketing systems.

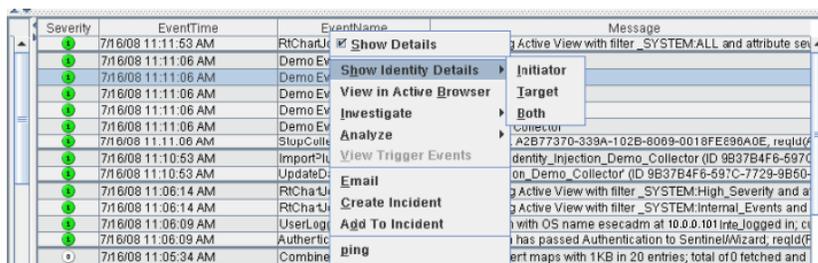
You can also send incidents and their associated information (asset data, vulnerability data, or attached files) to Remedy.

For more information on Remedy integration, see *Remedy Integration Guide*, available at the [Sentinel Content Web site \(http://support.novell.com/products/sentinel/sentinel61.html\)](http://support.novell.com/products/sentinel/sentinel61.html) for users with a Remedy integration license.

NOTE: The permission to create Remedy incidents is controlled by the administrator on a user-by-user basis.

2.14 Viewing User Information

Novell provides optional integration with identity management systems, specifically Novell Identity Manager. With this integration, user identity information will be added to incoming events when the account name matches one from Novell Identity Manager. When the `InitUserIdentity` or `TargetUserIdentity` column is populated in an event, a right-click option menu option is enabled to open the user's page in the Identity Browser.



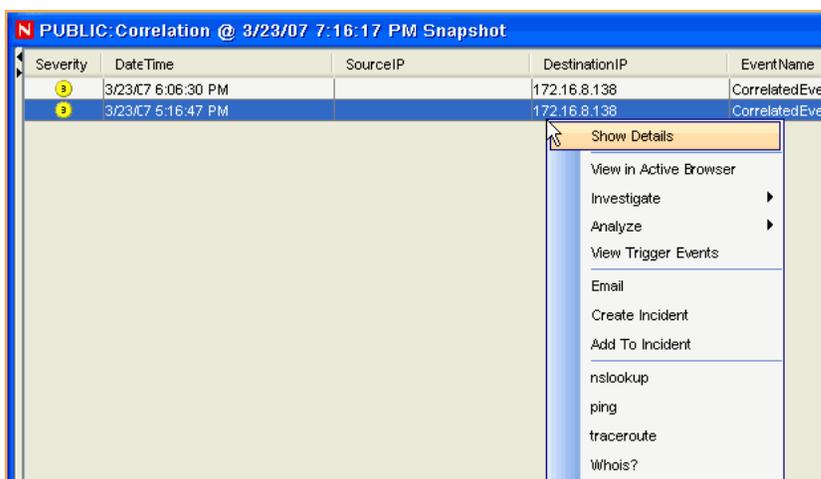
When you select Show Identity Details, you can choose to view the identity of the Initiator user, the Target user, or Both. The Identity Browser opens and shows identifying information about the user (or users) from the identity management system, all the accounts to which the user is provisioned, and the recent activity by that user. For more information on Identity Browser, see [Chapter 18, “Identity Integration,”](#) on page 429 section.

2.15 Using Custom Menu Options with Events

In an existing Real Time Event Table of the Visual Navigator or Snapshot, right-click an event and select a menu option. The default custom menu options are as follows:

- ◆ ping
- ◆ nslookup
- ◆ tracert
- ◆ Whois?

The default custom menu options are only available when you right-click a single event, and are disabled when you right-click multiple events. However, custom menus with JavaScript based actions are available as JavaScript actions support multiple events. You can further assign user permissions to View Vulnerability. You can add options using the Event Menu Configuration option on the *Admin* tab.



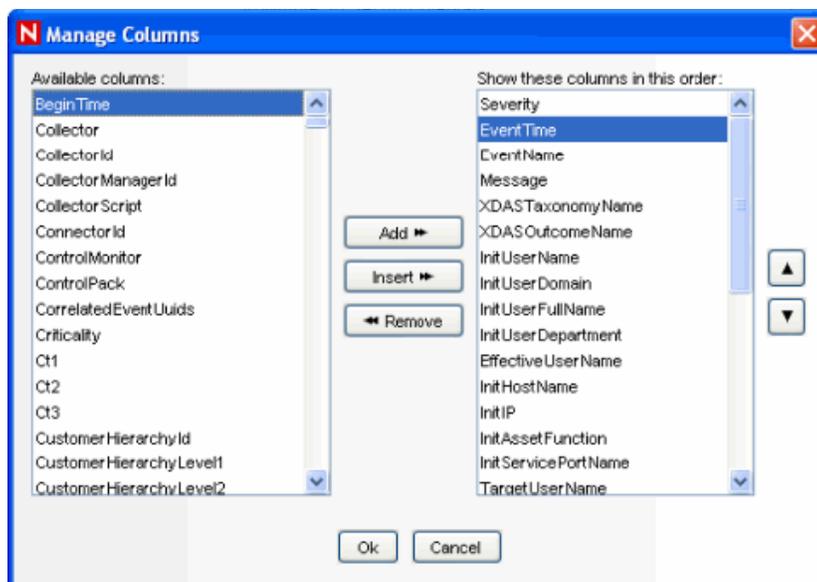
2.16 Managing Columns in a Snapshot or Navigator Window

To select and arrange columns in a Snapshot or Navigator:

- 1 With a Snapshot or Navigator window open, click Active View > Event Real Time > Manage Columns or click the Manage Columns of Real Time Event Table.



- 2 Use the Add and Remove buttons to move column titles between the Available Columns list and the Show these columns in this order list. The Insert button can be used to insert an available column item into a specific location. For example, in the illustration below clicking Insert will place AttackId above DateTime.



Use the Up and Down arrow buttons to arrange the order of the columns as you want them to display in the Real Time Event Table. The top to bottom order of column titles in the Manage Column dialog box determines the left to right order of the columns in the Real Time Event Table.

- 3 In the Manage Column dialog box, click OK.
- 4 If you want your columns to display the next time you open the Sentinel Control Center, click File > Save Preferences or click Save User Preference icon



2.17 Taking a Snapshot of a Navigator Window

To perform this function you must have user permission Snapshot.

This is useful to study events of interest because the Navigator refreshes automatically and the alert or alerts of interest will scroll off the screen. Also, within a snapshot, you can sort by column.

To take a snapshot of a Real Time Event Table:

- 1 With a Navigator window open, click Active View > Event Real Time > Snapshot or click Snapshot Event Real Time Table icon



A Snapshot window opens and is added to the Snap Shots folder list under Active Views in the Navigator. The graphical display will not be part of the snapshot.

2.18 Sorting Columns in a Snapshot

To sort columns in a Snapshot:

- 1 Click any column header once to sort by ascending value and twice to sort by descending value.

2.19 Closing a Snapshot or Navigator

To close a Snapshot or a Real Time Event Table:

- 1 With a Snapshot or Navigator open, close by using the Close button (upper right corner in Windows or upper right corner in Windows/SUSE Linux/Red Hat Linux or upper left corner in Solaris).

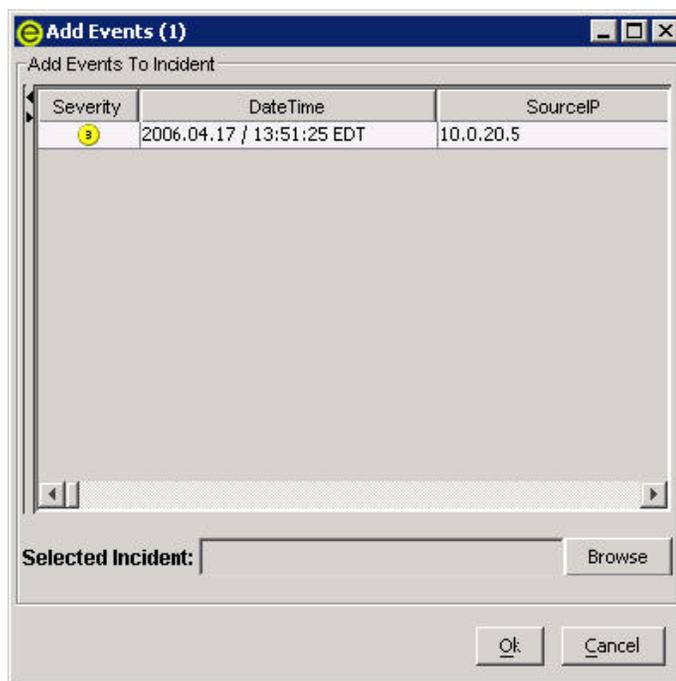
NOTE: The view or snapshot will not redisplay when you close and reopen the Sentinel Control Center.

2.20 Adding Events to an Incident

To perform this function you must have user permissions to Modify Incident(s) and Add to existing Incident(s).

To add events to an incident:

- 1 In a Real Time Event Table or a Snapshot, select an event or a group of events and right-click. Click Add To Incident.
- 2 In the Add Events To Incident dialog box, click Browse to list the available incidents.



- 3 Select Incident window displays. Click Search to view a list of incidents. List of incidents of selected criteria displays.

NOTE: You can define your criteria to better search for a particular incident or incidents in Select Incident window.

Severity	DateCreated	Priority	Criticality Ra...	Severity Rat...
Medium	04/17/2006 ...	None	0.0	0.0
Medium	04/17/2006 ...	None	0.0	0.0

- 4 Highlight an incident and click Add.
- 5 Click OK. The event or events selected are added to the incident in the Incidents Navigator.

NOTE: If events are not initially displayed in a newly created Incident, it is most likely because of a lag in the time between display in the Real Time Events window and insertion into the database. If this occurs, it will take a few minutes for the original events to finally be inserted into the database and display in the incident.

- ♦ [Section 3.1, “Understanding Correlation,” on page 63](#)
- ♦ [Section 3.2, “Introduction to the User Interface,” on page 65](#)
- ♦ [Section 3.3, “Correlation Rules,” on page 65](#)
- ♦ [Section 3.4, “Dynamic Lists,” on page 80](#)
- ♦ [Section 3.5, “Correlation Engine,” on page 83](#)
- ♦ [Section 3.6, “Correlation Actions,” on page 84](#)

3.1 Understanding Correlation

Sometimes, an event viewed in the system might not necessarily draw your attention. But, when you correlate a set of similar or comparable events in a given period, it might lead you to an alarming event. Sentinel helps you correlate such events with the rules you create and deploy in the Correlation engine and take appropriate action to mitigate any alarming situation.

Correlation adds intelligence to security event management by automating analysis of the incoming event stream to find patterns of interest. Correlation allows you to define rules that identify critical threats and complex attack patterns so that you can prioritize events and initiate effective incident management and response. Starting with Sentinel 6.0, the correlation engine is built with a pluggable framework, which allows the addition of new correlation engines in the future.

Correlation rules define a pattern of events that should trigger, or fire, a rule. Using either the correlation rule wizard or the simple RuleLG language, you can create rules that range from simple to extremely complex, for example:

- ♦ High severity event from a finance server
- ♦ High severity event from any server brought online in the past 10 days
- ♦ Five failed logins in 2 minutes
- ♦ Five failed logins in 2 minutes to the same server from the same username
- ♦ Intrusion detection event targeting a server, followed by an attempted login to root originating from that same server within 60 seconds

Two or more of these rules can be combined into one composite rule. The rule definition determines the conditions under which the composite rule fires:

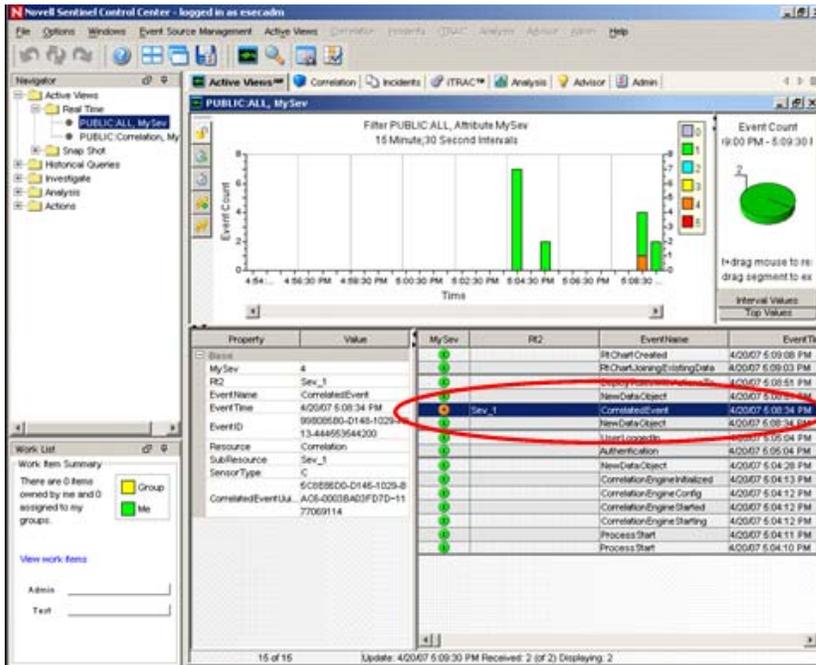
- ♦ All subrules must fire
- ♦ A specified number of subrules must fire
- ♦ The subrules must fire in a particular sequence

After the rule is defined, it should be deployed to an active Correlation Engine, and one or more actions can be associated with it. After the rule is deployed, the Correlation Engine processes events from the real-time event stream to determine whether they should trigger any of the active rules to fire.

NOTE: Events that are sent directly to the database or dropped by a Global Filter is not processed by the Correlation Engine.

When a rule fires, a correlated event is sent to the Sentinel Control Center, where it can be viewed in the Active Views window.

Figure 3-1 Active View window



The correlated event can also trigger actions, such as sending an email with the correlated event’s details or creating an incident associated with an iTRAC workflow.

3.1.1 Technical Implementation

All correlation is done in-memory on the machine (or machines) that host the correlation engine. This model allows fast, distributed processing that does not contend with database operations such as inserting events into the database.

For environments with large numbers of correlation rules or extremely high event rates, it might be advantageous to install more than one correlation engine and redeploy some rules to the new correlation engine. The ability to deploy multiple correlation engines provides the ability to scale as the Sentinel system incorporates additional data sources or as event rates increase.

Sentinel’s correlation is near real-time and depends on the timestamp for the individual events. To synchronize time, you can use an NTP (Network Time Protocol) server to synchronize the time on all devices on your network, or you can rely on the time on the Collector Manager servers and synchronize only those few machines.

Correlation relies on the data that is collected, parsed, and normalized by the Collectors, so a working understanding of the data is necessary to write rules. Many Novell correlation rules rely on an event taxonomy that ensures that a “failed login” and an “unsuccessful login” from two devices are classified the same.

In the Correlation tab, you can:

- ◆ Create/Modify Correlation rules and rule folders
- ◆ Deploy Correlation rules on Correlation Engine
- ◆ Create and associate an action to a rule
- ◆ Configure Dynamic lists

NOTE: Access to the correlation functions can be enabled by the administrator on a user-by-user basis.

3.2 Introduction to the User Interface

In Correlation, you can see the Correlation Rule Manager, Correlation Engine Manager, Correlation Action Manager and Dynamic Lists.

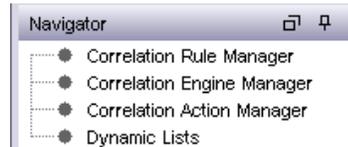
You can navigate to these functions from:

Table 3-1 Correlation-User Interface

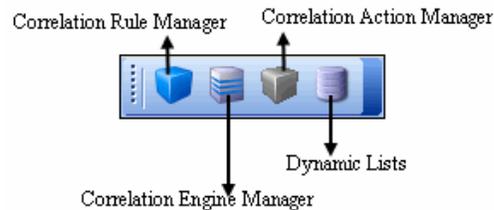
- ◆ The Correlation menu in the Menu Bar



- ◆ The Navigation Tree in the Navigation Pane



- ◆ The Toolbar Buttons



3.3 Correlation Rules

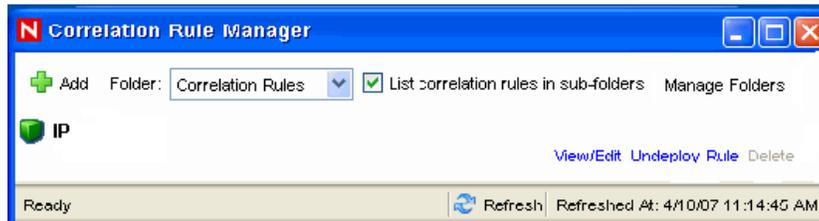
Correlation Rules are created, modified, renamed, deployed/undeployed in the Correlation Rule Manager. Correlation Rules are organized into Rule Folders, which can also be managed in the Correlation Rule Manager.

NOTE: There is no limit to the number of users that can access Correlation Rules. When more than one user is editing the same rule, the last person to save overwrites all previous saves.

3.3.1 Opening the Correlation Rule Manager

To open the Correlation Rules Manager:

- 1 Click Correlation tab.
- 2 In the navigator, click Correlation Rules Manager. Alternatively, click Correlation Rules Manager button in the Tool Bar. The Correlation Rule Manager window displays.



3.3.2 Creating a Rule Folder

To create a Rule Folder:

- 1 Open the Correlation Rules Manager window and click Manage Folder.
- 2 Highlight and right-click a folder and select Add Folder.
- 3 Specify Rule Folder name.

3.3.3 Renaming a Rule Folder

To rename a Rule Folder:

- 1 Open the Correlation Rules Manager window and click Manage Folder.
- 2 Select a folder and click Rename. Change the name of the folder.

To delete a Rule Folder:

- 1 Open the Correlation Rules Manager window and click Manage Folder.
- 2 Select a folder and click Delete. Click Yes when the system asks for confirmation.

3.3.4 Creating a Correlation Rule

To create a Correlation Rule:

- 1 Open the Correlation Rules Manager window and select a folder from the Folder drop-down list to which this rule is added.
- 2 Click Add button located on the top left corner of the screen.
- 3 The Rule Wizard displays. Select one of the following rule types and follow the steps for that particular rule type:
 - ♦ Simple
 - ♦ Composite

- ◆ Aggregate
 - ◆ Sequence
 - ◆ Custom/Freeform
- 4 Define the update criteria for the rule. If you select Continue to perform actions every time this rule fires, the rule fires every time the criteria is met. If you select Do not perform actions every time this rule fires for the next (t) time the events fires only once as per user-defined time period. All the other events that match the correlation rule within the specified time are grouped together with this correlated event. This user-defined time period can be a certain number of seconds, minutes, or hours.
 - 5 Click Next.
 - 6 Provide the rule name. The syntax of the rule is checked at the time it is created.
 - 7 Under Namespace, select a correlation rule folder in which to store the rule.
 - 8 Type the description of the rule.
 - 9 Click Next. The rule is created and displays in the Correlation Rules Manager window.
 - 10 Select Yes if you want to create another rule or No if you do not want to create another rule. Click Next.

The rule types and the steps to create them are described below.

3.3.5 Creating Correlation Rules

Correlation rules can be defined in the Correlation Rule wizard by walking through the wizard or by choosing the Custom/Freeform option to write the rule in the proprietary RuleLG language. All rule definitions are stored in the database in RuleLG.

Correlation rules can be defined based on any populated event field.

NOTE: When creating a Rule, you can refer to a dynamic list to it. For more information, see [Section 3.4.5, “Using a Dynamic List in a Correlation Rule,” on page 82.](#)

Simple Rule

A simple rule is defined by specifying which events can trigger the rule to fire (For example, firewall events, firewall events of severity 3 or higher). The filter criteria can be intersected (using the “all” option in the GUI or the “AND” operator in RuleLG) or the filter criteria can be unioned (using the “any” option in the GUI or the “OR” operator in RuleLG).

For example, a rule might be defined so that it fires anytime an event takes place on a server that is on the critical list. Another rule might be defined to fire anytime an event of severity 4 or greater takes place on a server that is on the critical list.

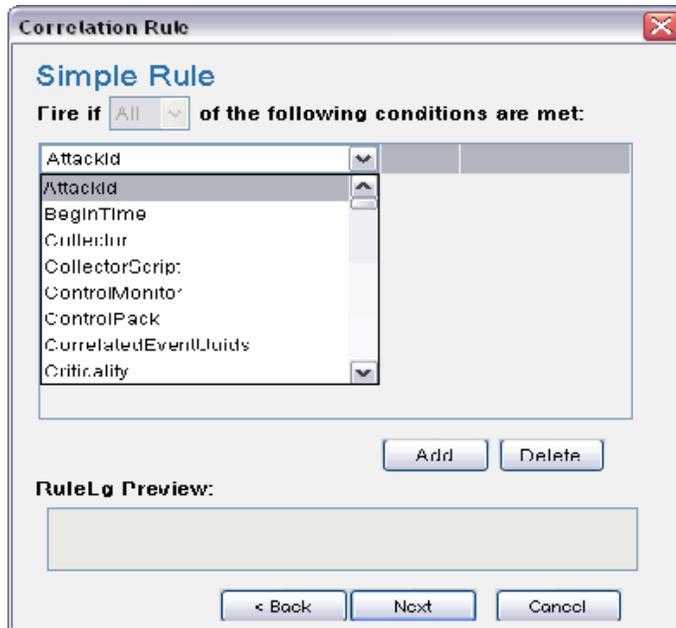
A simple rule requires only one event in order to fire.

NOTE: For users familiar with the correlation rule language (RuleLG), the defining operator for a simple rule is the “filter” operator. For more information about RuleLG, see “[Sentinel Correlation Engine RuleLG Language](#)” in the *Sentinel 6.1 Reference Guide*.

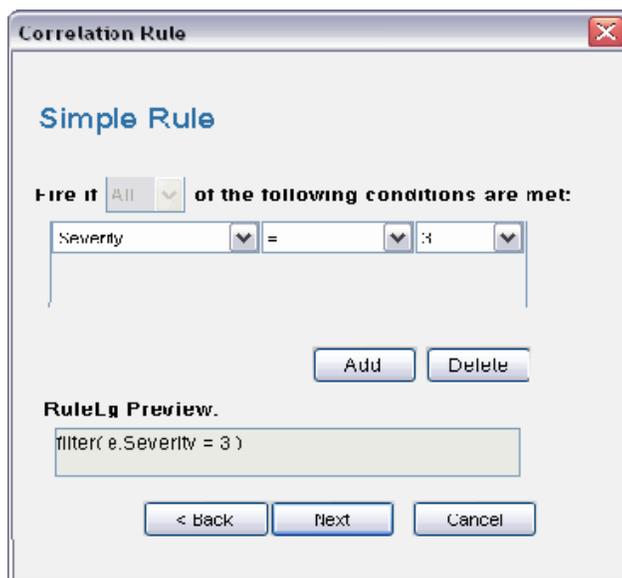
NOTE: In Sentinel 6, filter criteria must be defined in the correlation rule wizard. You cannot use existing public filters.

To create a simple rule:

- 1 Open the Correlation Rules Manager window and select a folder from the drop-down list to which this rule is added.
- 2 Click Add button located on the top left corner of the screen. The Correlation Rule window displays. Select Simple Rule.



- 3 In the Simple Rule window, define a condition for this rule. Select the Property and Operator values from the drop-down lists and specify data in value field.



- 4 Click Add to add additional definitions for this rule.
- 5 You can preview the rule in the RuleLG preview window. For example, `filter (e.sev=3)`. Click Next. The Update Criteria window displays.

- 6 Enable the update criteria for the rule to fire and click Next. The General Description window displays.

- 7 Provide a name to this rule. You have an option to modify the rule folder.
- 8 Provide rule description and click Next.
- 9 You have an option to create another rule from this wizard. Select your option and click Next.

Aggregate Rule

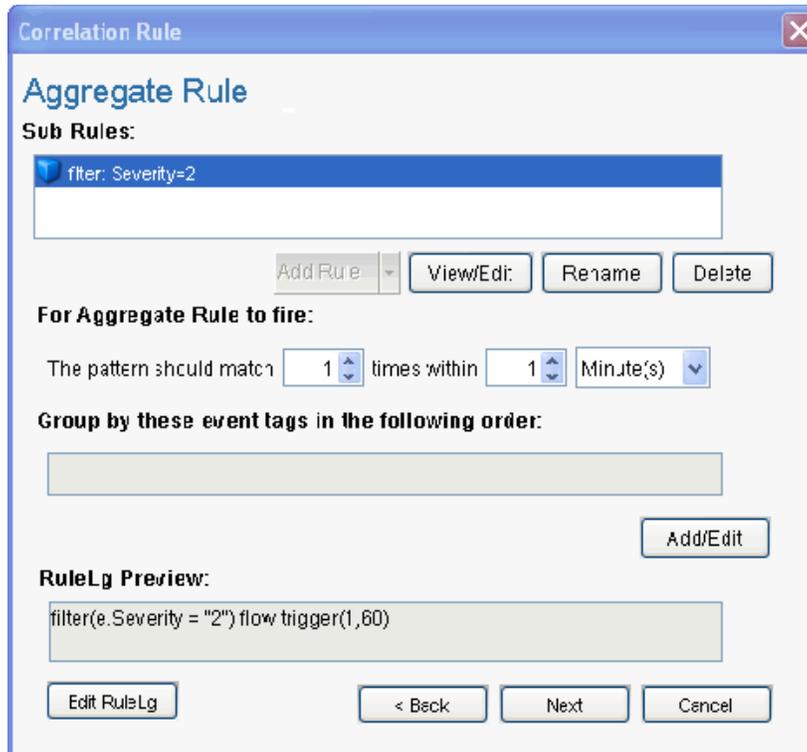
An aggregate rule is defined by specifying a subrule and the number of times the subrule must fire within a specific time window in order to trigger the aggregate rule. For example, an aggregate rule might require that a subrule fire 10 times within 5 minutes for the aggregate rule to fire.

Aggregate rules have an optional group by field, which can be any populated field from the events. For example, an aggregate rule might require that a subrule fire 10 times within 5 minutes where each of the 10 events has the same destination server.

NOTE: For users familiar with the correlation rule language (RuleLG), the defining operator for an aggregate rule is the “trigger” operator. The trigger clause might also use the “discriminator” operator to define the group by field. For more information about RuleLG, see the “[Sentinel Correlation Engine RuleLG Language](#)” in the *Sentinel 6.1 Reference Guide*.

To create an aggregate rule:

- 1 Open the Correlation Rules Manager window and select a folder from the drop-down list to which this rule is added.
- 2 Click Add button located on the top left corner of the screen. The Correlation Rule window displays. Select Aggregate Rule.

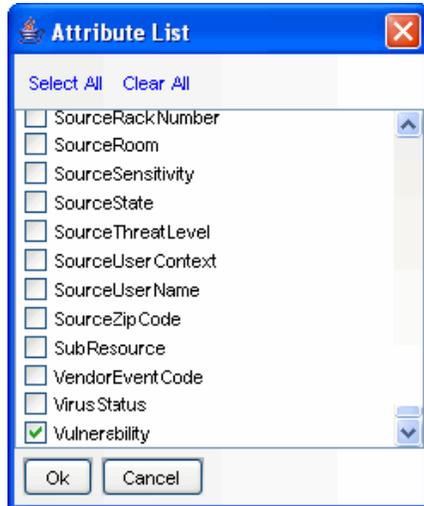


- 3 In Aggregate Rule window, you can select a sub-rule to create an aggregate rule. To select a sub-rule, click Add Rule button. Add Rule window displays.



NOTE: You can select only one sub-rule when creating an aggregate rule.

- 4 Select a rule and click OK.
- 5 Set parameters for the rule to fire.
- 6 To group event tags according to the attributes, Click Add/Edit. The Attribute List window displays.



- 7 Check the attribute as per your requirement. You can preview the rule in the RuleLG preview window. Click Next. The Update Criteria window displays.
- 8 Update the criteria for the rule to fire and click Next. The General Description window displays.
- 9 Provide a name to this rule. You have an option to modify the rule folder.
- 10 Provide rule description and click Next.
- 11 You have an option to create another rule from this wizard. Select your option and click Next.

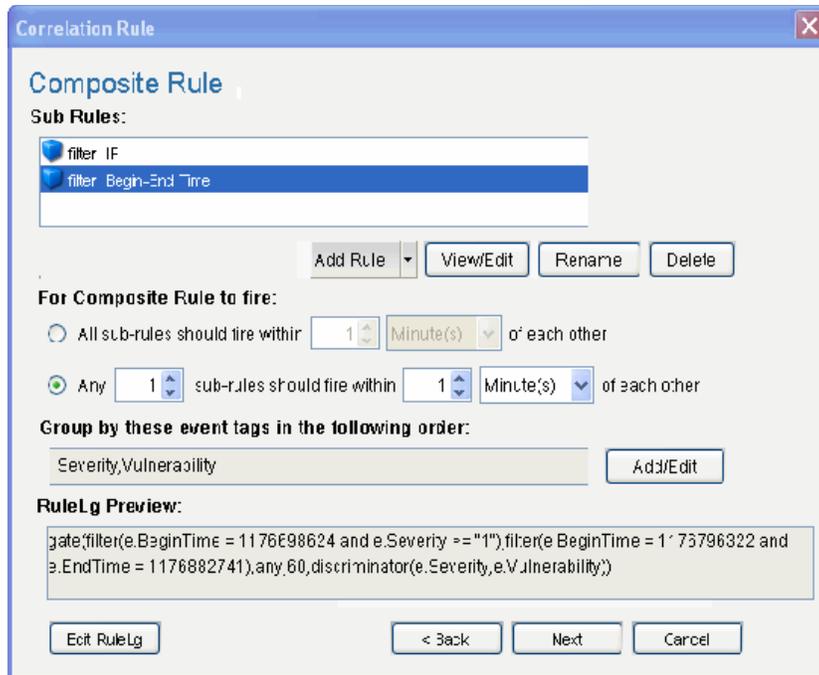
Composite Rule

A composite rule is comprised of 2 or more subrules. A composite rule can be defined so that all or a specified number of the subrules must fire within the defined timeframe. Composite rules have an optional group by field, which can be any populated field from the events.

NOTE: When a subrule is used to create a composite rule, a copy of the subrule is added to the composite rule's definition. Because a copy is added, changes to the original subrule do not affect the composite rule.

To create a composite rule:

- 1 Open the Correlation Rules Manager window and select a folder from the drop-down list to which this rule is added.
- 2 Click Add button located on the top left corner of the screen. The Correlation Rule window displays. Select Composite Rule.



- 3 In Composite Rule window, you can select sub-rules to create a composite rule. To select a sub-rule, click Add Rule button. Add Rule window displays.
- 4 Select a rule or a set of rules (hold control on your keyboard to select a set of rules) and click OK.
- 5 Set parameters for the rule to fire.
- 6 To group event tags according to the attributes, Click Add/Edit. The Attribute window displays.
- 7 Check the attribute as per your requirement. You can preview the rule in RuleLg preview box. Click Next, the Update Criteria window displays.
- 8 Update criteria for the rule to fire and click Next.
- 9 Provide a name to this rule. You have an option to modify the rule folder.
- 10 Provide rule description and click Next.
- 11 You have an option to create another rule from this wizard. Select your option and click Next.

Sequence

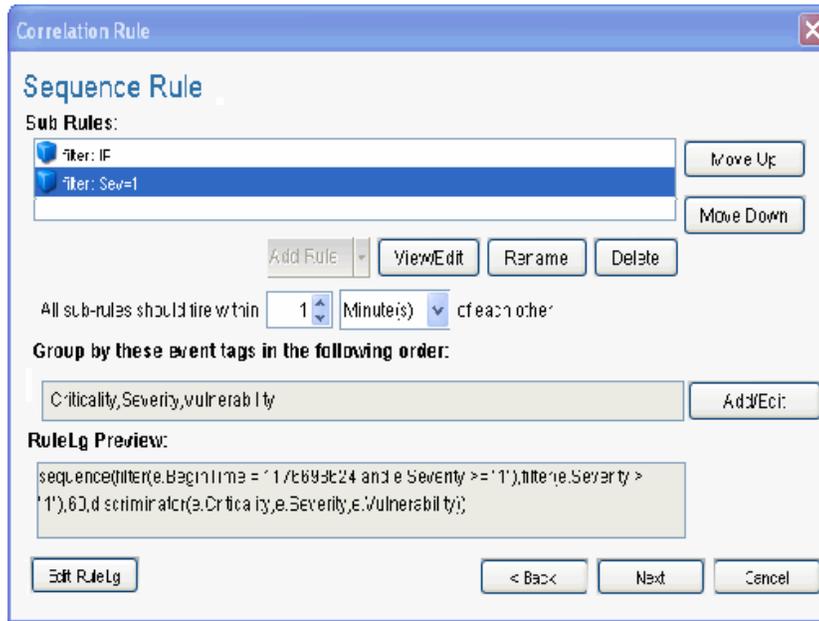
A sequence rule is comprised of 2 or more subrules that must have been triggered in a specific order within the defined timeframe. Sequence rules have an optional group by field, which can be any populated field from the events.

NOTE: When a subrule is used to create a sequence rule, a copy of the subrule is added to the sequence rule's definition. Because a copy is added, changes to the original subrule do not affect the sequence rule.

To create a sequence rule:

- 1 Open the Correlation Rules Manager window and select a folder from the Folder drop-down list to which this rule is added.

- 2 Click Add button located on the top left corner of the screen. The Correlation Rule window displays. Select Sequence Rule.



- 3 In Sequence Rule window, you can select a sub-rule to create a sequence rule. To select a sub-rule, click Add Rule button. Add Rule window displays.
- 4 Select a rule and click OK.
- 5 Set parameters for the rule to fire. To group event tags according to the attributes, Click Add/Edit. The Attribute List window displays.
- 6 Check the attribute as per your requirement. You can preview the rule in RuleLg preview box. Click Next, the Update Criteria window displays.
- 7 Update criteria for the rule to fire and click Next.
- 8 Provide a name to this rule. You have an option to modify the rule folder.
- 9 Provide rule description and click Next.
- 10 You have an option to create another rule from this wizard. Select your option and click Next.

Custom or Freeform Correlation Rules

The custom or freeform rule option is the most powerful option for creating a correlation rule. This allows the user to create any of the previous types of rules by typing the RuleLg correlation rule language directly into the Correlation Rule Wizard.

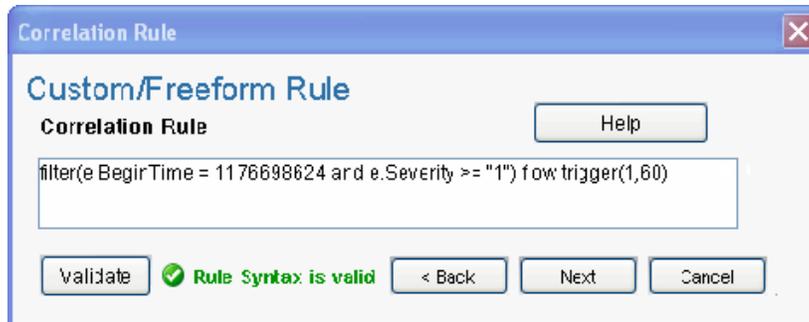
Freeform rules are the only way to include certain functionality in a correlation rule. Freeform rules give you the ability to do the following:

- ◆ Nest operations using parentheses (to specify order of operations)
- ◆ Use the `inlist` operator to refer to a dynamic list
- ◆ Use the `isnull` operator to refer to unpopulated fields
- ◆ Use the `w.` prefix for a field name in the window operation to compare an incoming event's value to a set of previous events

TIP: You can select the Functions, Operators and Meta-Tags from the drop-down list selection. Type `e.` or `w.` in the Correlation Rule section to view the drop-down lists.

To create a custom or freeform rule:

- 1 Open the Correlation Rules Manager window and select a folder from the Folder drop-down list to which this rule is added.
- 2 Click the Add button located on the top left corner of the screen. The Correlation Rule window displays. Select Custom/Freeform Rule.



- 3 In the Custom/Freeform Rule window, write the condition for the rule and click Validate to test the validity of the rule.
- 4 After validation of the rule, click Next, the Update Criteria window displays. Update the criteria for the rule to fire and click Next.
- 5 Provide a name to this rule. You have an option to modify the rule folder.
- 6 Provide rule description and click Next.
- 7 You have an option to create another rule from this wizard. Select your option and click Next.

3.3.6 Deploying/Undeploying Correlation Rules

Correlation rules can be deployed or undeployed from the Correlation Engine Manager or the Correlation Rule Manager. You can undeploy all rules or a single rule.

The rules can be associated with one or more actions. If no action is selected, a default Correlated Event is generated with the following values:

Table 3-2 *Default Correlated Event Details*

Field Name	Default Values
Severity	4
Event Name	Same as the event name for the trigger event
Message	Same as the message for the trigger event
Resource	Correlation
SubResource	<Rule Name>

Other types of actions can be configured in the Action Manager:

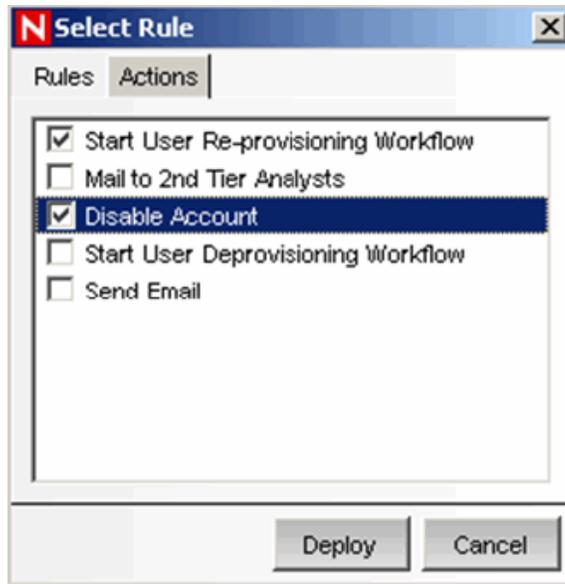
- ◆ Configure a Correlated Event (replaces the default correlated event settings)
- ◆ Add to Dynamic List (adds an element to a dynamic list)
- ◆ Remove from Dynamic List (removes an element from a dynamic list)
- ◆ Execute a Command (executes a shell or batch script)
- ◆ Execute a Script (executes a script; only available for actions created in Sentinel 6.0)
- ◆ Send an Email (using default Sentinel mail settings)
- ◆ Create an Incident (creates a Sentinel incident)
- ◆ Any Action configured in the Action Manager that was created from an Action plugin that takes a Correlated Event as input. For more information on [Action Manager \(page 364\)](#), see the [Chapter 16, “Actions and Integrator,” on page 363](#).

To deploy Correlation Rules (in Correlation Engine Manager):

- 1 Open the Correlation Engine Manager window.
- 2 Highlight and right-click the engine you want to deploy the rule on and select Deploy Rule.
- 3 In the Rules tab, select the rule or rules you want to deploy.



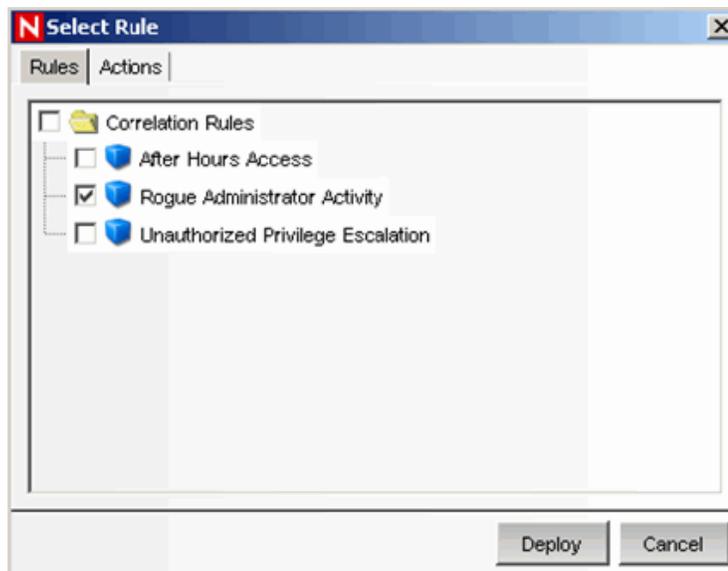
- 4 In the Actions tab, select the action or actions you want to associate with the rule.



5 Click Deploy. Rules are deployed in an enabled state.

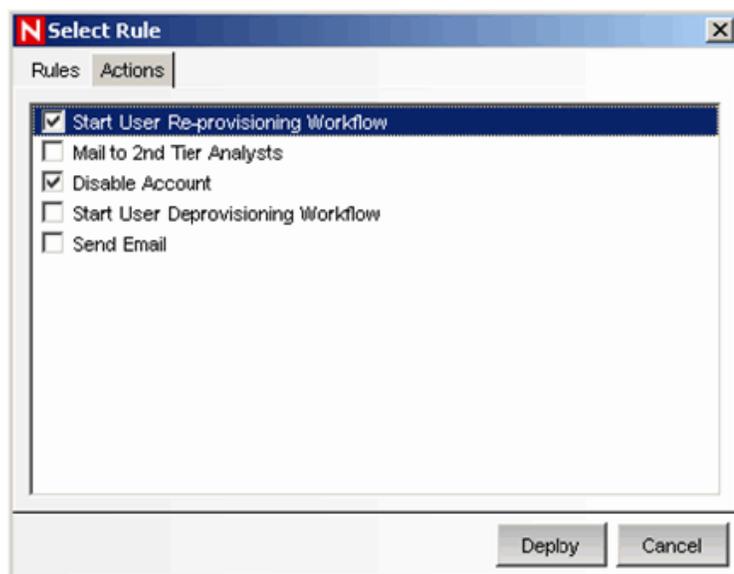
To deploy Correlation Rules (in Correlation Rule Manager):

- 1 Open the Correlation Rule Manager window.
- 2 Highlight a rule and click Deploy rules link. The Deploy Rule window displays.



3 In the Deploy Rule window, select the Engine to deploy the rule from the drop-down list.

4 [Optional] Select an action or add a new action.



If nothing is selected, a Correlated Event with default values is created.
Click Deploy.

To Undeploy a Single Rule:

- 1 In the Correlation Engine Manager, right-click the rule and select Undeploy Rule.
- 2 Alternatively, in the Correlation Rule Manager, highlight the rule and click Undeploy rule link.

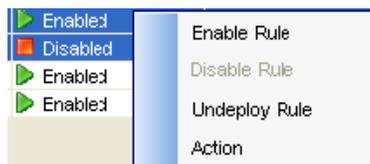
To Undeploy All Correlation Rules:

- 1 Open the Correlation Engine Manager window.
- 2 Right-click the Correlation Engine and select Undeploy All Rules.

3.3.7 Enabling/Disabling Rules

To Enable/Disable Rule:

- 1 Open the Correlation Engine Manager window.
- 2 Highlight and right-click the rule or set of rules and select Enable Rule or Disable Rule.



3.3.8 Renaming and Deleting a Correlation Rule

To rename a Correlation Rule:

NOTE: You must undeploy a rule before you rename or delete the rule.

- 1 Open the Correlation Rules Manager window and select the rule you want to rename.
- 2 If the rule is deployed, click Undeploy Rule link to undeploy the rule.
- 3 Click View/Edit link. In the General Description tab change the name of the Correlation Rule.
- 4 Click OK.

To delete a Correlation Rule:

- 1 Open the Correlation Rules Manager window and select the rule you want to delete.
- 2 If the rule is deployed, click Undeploy Rule link to undeploy the rule.
- 3 Click Delete link. Click Yes when the system prompts for confirmation.

3.3.9 Moving a Correlation Rule

To move a Correlation Rule:

- 1 Open the Correlation Rules Manager window and click Manage Folder.
- 2 Click and drag a correlation rule from one folder to another.

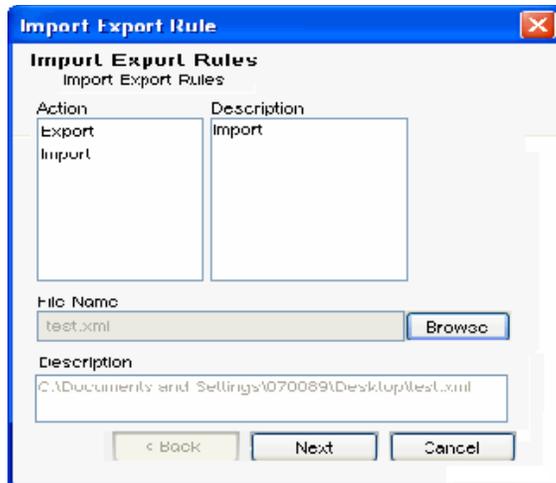
3.3.10 Importing a Correlation Rule

To Import a Correlation Rule:

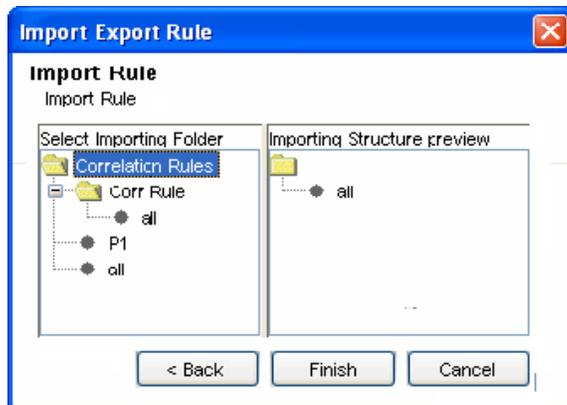
- 1 Open the Correlation Rules Manager window and click Import/Export Correlation Rule icon.



The Import Export Rule window displays.



- 2 Select the Import option from the Action pane. The Description in the Description pane changes to Import.
- 3 Click Browse to select the Correlation Rule you want to import. Select the file and click Import. Click Next. The Import Rule window displays.



- 4 Select the folder you want to import the Correlation rule into. Click Finish.

NOTE: When importing a correlation rule in a folder, if the correlation rule with the same name exists, the system displays a message and does not import the file.

IMPORTANT: If you import a correlation rule using the `inlist` operator, the dynamic list aligned to that rule must exist or you must create the dynamic list with the same name on the system to it is imported.

3.3.11 Exporting a Correlation Rule

To Export a Correlation Rule:

- 1 Open the Correlation Rules Manager window and click Import/Export Correlation Rule icon. The Import Export Rule window displays.

- 2 Select the Export option from the Action pane. The Description in the Description pane changes to Export.
- 3 Click Browse to export the rule. Specify a file name and click Export. Click Next. The Export Rule window displays.



- 4 Select the Correlation Rule you want to export. Click Finish.

3.4 Dynamic Lists

Dynamic Lists are distributed list structures that can be used to store string elements, such as IP addresses, server names, or usernames. The lists are then used within a correlation rule for a quick lookup to see whether an incoming event includes an element from the Dynamic List. Some examples of Dynamic Lists include:

- ♦ Terminated user lists
- ♦ Suspicious user watchlist
- ♦ Privileged user watchlist
- ♦ Authorized ports and services list
- ♦ Authorized server list

A Dynamic List can be built using the text values for any event metatag. Elements can be added to the list manually (by an administrator) or automatically whenever a correlation rule fires. Elements can be removed from a list if manually (by an administrator), automatically whenever a correlation rule fires, when their time limit expires, or when the maximum list size is reached.

IMPORTANT: The Time To Live (TTL) must be between 60 seconds and 90 days and the maximum list size is 100,000.

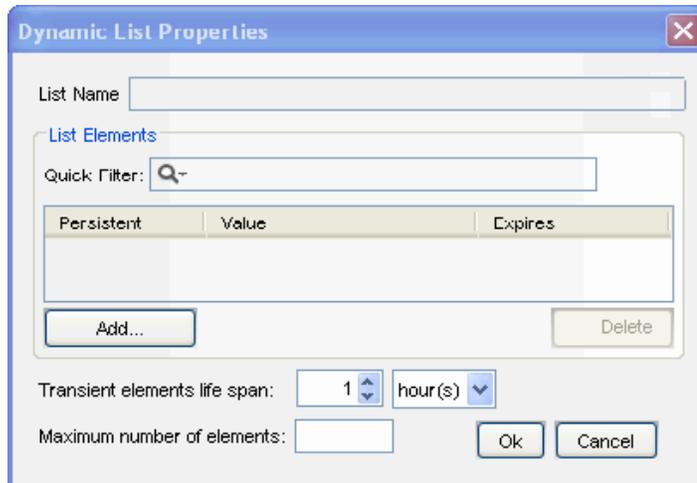
Regardless of how the values were added, they can be Persistent (active until manually removed or until the maximum list size is reached) or Transient (active only for a specified timeframe after being added to the list, also known as the Time to Live). The Time to Live can range from 60 seconds to 90 days.

NOTE: If the Time to Live period is updated on an active Dynamic List, the change is not retroactive to elements already on the list. Elements that are already added to the dynamic list retains their original Time to Live.

3.4.1 Adding a Dynamic List

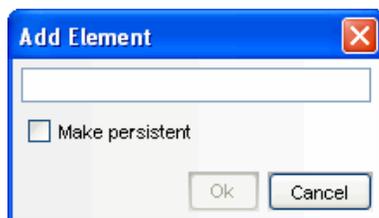
To add Dynamic Lists:

- 1 Click Correlation on the Menu Bar and select Dynamic Lists. Alternatively, you can click Dynamic Lists button on the Tool Bar.
- 2 Click Add button located on the top left corner of the screen. Dynamic List Properties window displays.
- 3 Provide the Name of the List.



NOTE: The name cannot contain special characters, such as quotations or hyphens. For MSSP customers, provide an intuitive name so that it can be easily identified as MSSP customer dynamic list.

- 4 Click Add. The Add Element window displays:



- 5 Provide name of the Element. To make the Element persistent, check Make Persistent Check box and Click OK.

NOTE: To make an existing element persistent, select the checkbox before the element name in the Dynamic Properties window.

- 6 Select Transient elements life span. It specify the time the persistent values are active in the list
- 7 Specify the Maximum Number of Elements. The number defined here limits the number of elements in the list.
- 8 Click OK.

NOTE: Select a filter type from Quick Filter drop-down list and specify the name of the element, to filter the available elements.

3.4.2 Modifying a Dynamic List

To edit a Dynamic List:

- 1 Click Correlation on the Menu Bar and select Dynamic Lists. Alternatively, you can click Dynamic Lists button on the Tool Bar.
- 2 Select a Dynamic List and click View/Edit link.
- 3 The Dynamic List Properties window displays. Edit the options as required and click OK.

3.4.3 Deleting a Dynamic List

WARNING: Do not delete a Dynamic List that is part of a correlation rule or rules.

To delete a Dynamic List:

- 1 Click Correlation on the Menu Bar and select Dynamic Lists. Alternatively, you can click the Dynamic Lists button on the Tool Bar.
- 2 Select a Dynamic List and click Delete link against it. Confirmation message alert displays.
- 3 Click Yes to delete.

3.4.4 Removing Dynamic List Elements

There are several ways an element can be removed from a Dynamic List.

- ♦ A user can remove it manually
- ♦ The element can be removed by a correlation rule action
- ♦ The Transient elements life span can expire
- ♦ If the maximum number of elements for a Dynamic List is reached, elements are removed from the list to keep the list at or below the maximum list size. The transient elements are removed (from oldest to newest) before any persistent elements are removed.

3.4.5 Using a Dynamic List in a Correlation Rule

Dynamic Lists can be referenced in a Correlation Rule by using the Custom/Freeform option of the Correlation Rule Wizard. For example:

```
filter(e.<tagname> inlist <Dynamic List Name>)
```

where

e.<tagname> represents a metatag in the incoming event, such as e.shn (Source Host Name) or e.dip (Destination IP address)
<Dynamic List Name> is the name of an existing Dynamic List, such as CriticalServerList

The following instructions assume that a Dynamic List already exists.

To add a Dynamic List to correlation rule:

- 1 Open the Correlation Rules Manager window and select a folder from the drop-down list to which this rule is added.
- 2 Click Add button located on the top left corner of the screen. The Correlation Rule window displays. Select Custom/Freeform Rule.
- 3 In the Custom/Freeform Rule window, write the condition for the rule including the name of the dynamic list. For example, `filter(e.sev inlist Severity)` where Severity is the dynamic list name.
- 4 Click Validate to test the validity of the rule.
- 5 After validation of the rule, click Next, the Update Criteria window displays.
- 6 Update the criteria for the rule to fire and click Next.
- 7 Provide a name to this rule. You have an option to modify the rule folder.
- 8 Provide rule description and click Next.
- 9 You have an option to create another rule from this wizard. Select your option and click Next.

NOTE: Users must have the permission to Start/Stop Correlation Engine to perform these actions.

The two states of Correlation engine are

Enable



Disable .



When the Correlation Engine is enabled, it processes active correlation Rules. When in a disabled state, all its in-memory data is preserved and no new correlation events are generated. Disabling the Correlation Engine does not affect other parts of the Sentinel system.

Correlation rules are stored in the Sentinel database. When you activate the Correlation Engine in Sentinel Control Center, it requests the deployment information and rules from the database. Changes to a rule are not reflected in the Correlation Engine until one of the following things happens:

- ♦ The rule is undeployed, edited and redeployed.
- ♦ The rule is freshly deployed

3.5 Correlation Engine

3.5.1 Starting or Stopping Correlation Engine

To Start or to Stop a Correlation Engine:

- 1 Open the Correlation Engine Manager window.
- 2 Highlight and right-click a Correlation Engine and select Start or Stop Engine.



3.5.2 Renaming Correlation Engine

A Sentinel system can have one or more Correlation Engines. You can rename the engines if desired.

To Rename a Correlation Engine:

- 1 Open the Correlation Engine Manager window.
- 2 Right-click the Correlation Engine and select Rename Engine.
- 3 Modify the name of the Engine and click OK.

3.6 Correlation Actions

The Action Manager allows you to configure repeatable Actions. There are several different types of Actions that can be configured and then associated with a correlation rule deployment:

- ◆ Configure a Correlated Event
- ◆ Add to Dynamic List
- ◆ Remove from Dynamic List
- ◆ Execute a Command
- ◆ Send an Email
- ◆ Create an Incident
- ◆ Any Imported JavaScript Action Plugin that is marked by the plugin developer as requiring a Correlated Event as input

NOTE: Although all of these actions can be used in correlation rule deployments, only the JavaScript Actions can be used in other areas of the Sentinel Control Center. For more information, see [Chapter 16, “Actions and Integrator,” on page 363](#).

Actions associated with a Correlation Rule are executed when the deployed correlation rule fires (with the frequency of their execution determined by settings on the Update Criteria window of the Correlation Rule Wizard).

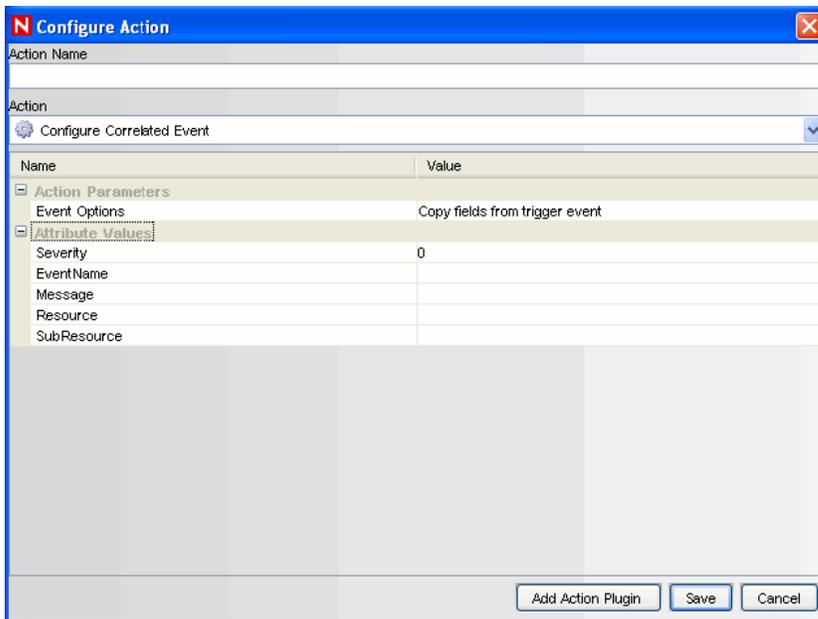
If no Action is specifically selected when deploying a correlation rule, a correlated event with the following default settings is created:

Table 3-3 *Default Settings*

Field Name	Default Values
Severity	4
Event Name	Final Event Name
Message	<message>
Resource	Correlation
SubResource	<Rule Name>

3.6.1 Configure Correlated Event

Figure 3-2 *Configure Correlated Event*



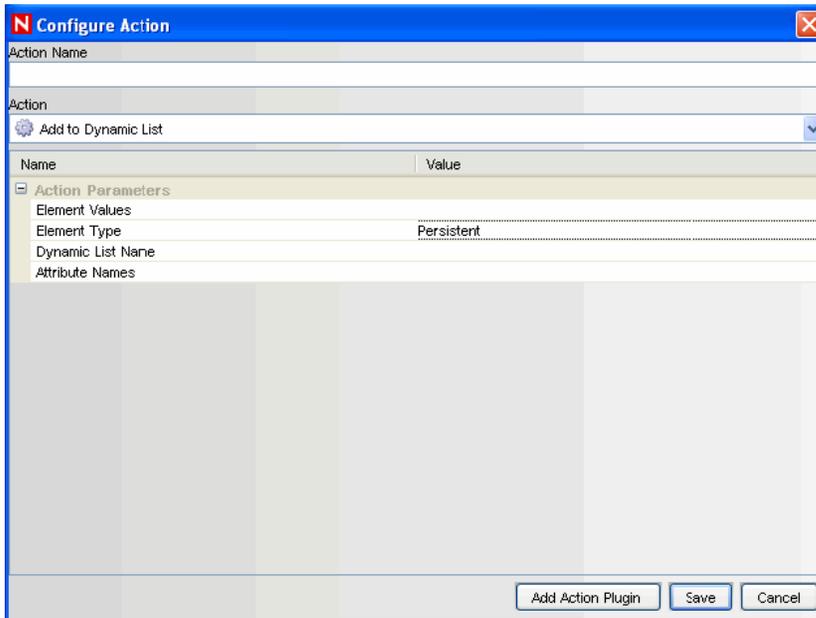
NOTE: This type of action can only be used in Correlation deployments.

To override the default values for the correlated event created when a rule fires, an action can be created to populate the following fields in the correlated event:

- ◆ Severity
- ◆ Event Name
- ◆ Message
- ◆ Resource
- ◆ SubResource

3.6.2 Add to Dynamic List

Figure 3-3 Adding to Dynamic List



NOTE: This type of action can only be used in Correlation deployments.

This action type can be used to add a constant value or the value of an event attribute (such as Target IP or Initiator User Name) to an existing Dynamic List. Any values that are repeated across multiple events are only be added to the dynamic list once. The various parameters available are:

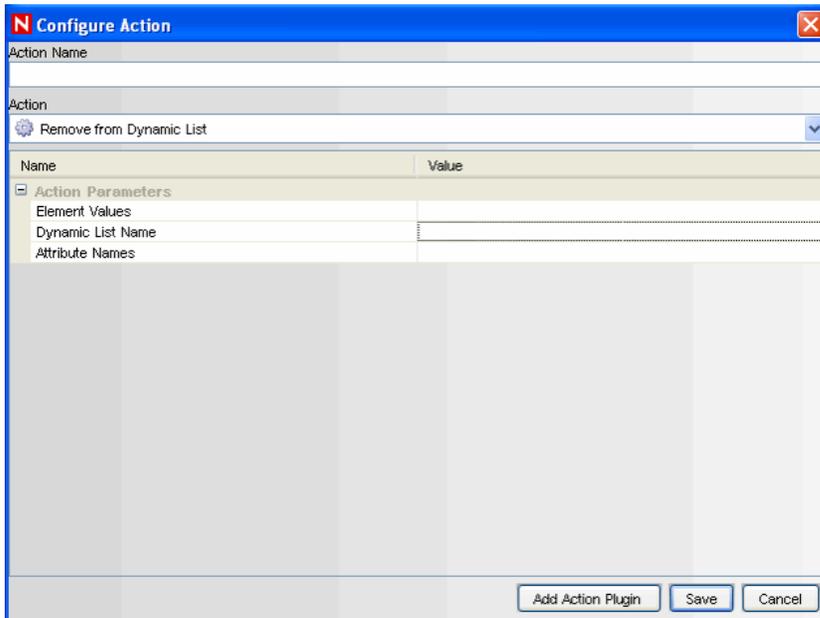
Table 3-4 Parameters

Option	Function
Element Values	[optional] Specify a constant value to add to the dynamic list. If this is blank, Attribute Name must be populated.
Element Type	Persistent or Transient
Dynamic List Name	Select an existing Dynamic List from the dropdown menu.
Attribute Names	[optional] For every event that is part of a correlated event, the value or values of the selected event attribute is added to the Dynamic List. If this is blank, Element Values must be populated.

If there are entries for both Element Values and Attribute Names, both are added to the Dynamic List when the rule fires. If the Element Value is filled in and the Element Type is Transient, the timestamp for the element in the Dynamic List is updated each time the rule fires.

3.6.3 Remove from Dynamic List

Figure 3-4 Removing from Dynamic List



NOTE: This type of action can only be used in Correlation deployments

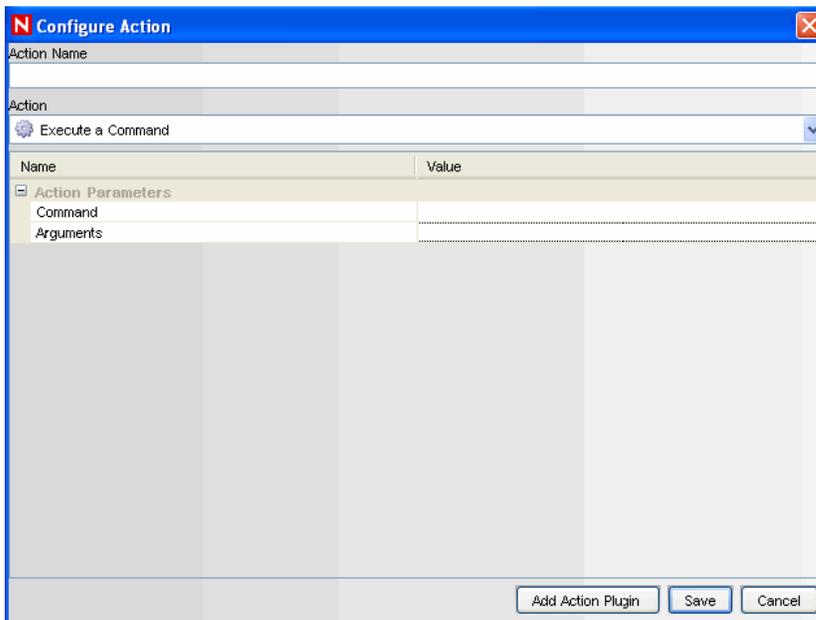
This action type can be used to add a constant value or the value of an event attribute (such as Target IP or Initiator User Name) from an existing Dynamic List. The various parameters available are:

Table 3-5 Parameters

Option	Function
Element Values	Specify a constant value to remove from the list.
Dynamic List Name	Select an existing Dynamic List from the dropdown menu.
Attribute Names	For every event that is part of a correlated event, the value or values of the selected event attribute are deleted from the Dynamic List.

3.6.4 Execute a Command

Figure 3-5 Executing a Command



NOTE: This type of action can only be used in Correlation deployments.

This action type can be used to execute a command when a correlated event triggers. You can set the following parameters:

- ◆ Command

NOTE: For actions that execute a command or run a script, the command or script must reside in the `$ESEC_HOME/config/exec` or `%ESEC_HOME%\config\exec` folder on the Correlation Engine. Symbolic links on UNIX are not supported.

- ◆ Arguments: This can include constants or references to an event attribute in the last event, the one that caused the rule to fire.

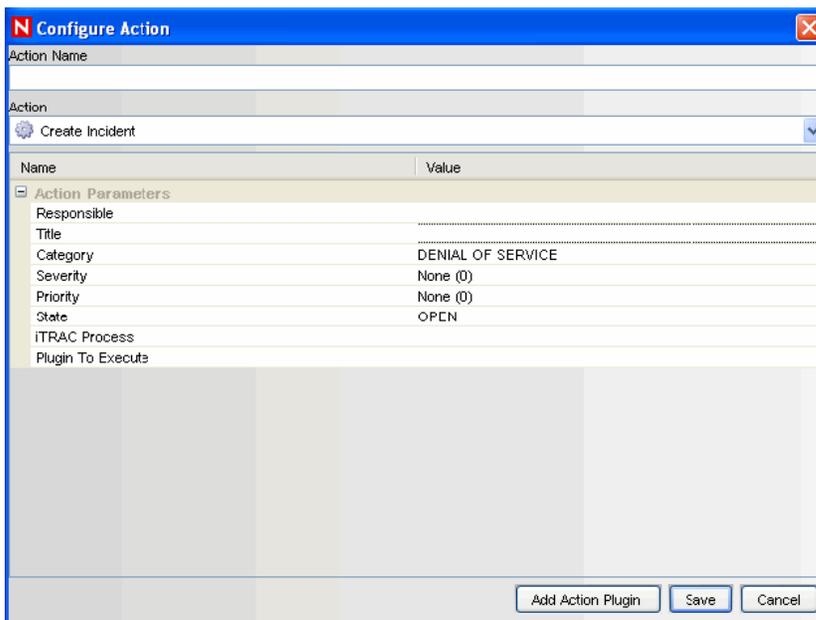
NOTE: References to event attributes must use the values in the metatag column enclosed in % or \$ symbols. For example, `%InitIP%` represents the Initiator IP address value from the Correlated Event, except in the Configure Correlated Event action. Because the correlated event has not been created before the action is executed, the `InitIP` value comes from the trigger event. `$InitIP$` always represents the value from the current event. Both `%all%` and `all` are the same, and they pass information (a limited set of attributes from both the trigger event and the correlated event along with some correlation rule data) to a correlation action. They are provided primarily for backward compatibility with existing correlation actions. They cannot be used in JavaScript actions or in the Configure Correlated Event action. For more information on metatags, see “[Sentinel Event Fields](#)” in *Sentinel 6.1 Reference Guide*.

Command actions can be created to perform a non-interactive action, such as modifying a firewall policy, entering a record in a database, or deactivating a user account. For an action that generates output, such as a command to run a vulnerability scan, the command should refer to a script that runs the command and then writes the output to a file.

NOTE: By default, the action output is stored to the working directory, \$ESEC_HOME/data. The action output can be written to a different directory by specifying a different storage location of the output file in the script

3.6.5 Create Incident

Figure 3-6 *Configure Action- Create Incident*



The screenshot shows a 'Configure Action' dialog box with a blue title bar. The 'Action Name' field is empty. The 'Action' dropdown menu is set to 'Create Incident'. Below this is a table with two columns: 'Name' and 'Value'. The table contains the following parameters:

Name	Value
Action Parameters	
Responsible	
Title	
Category	DENIAL OF SERVICE
Severity	None (0)
Priority	None (0)
State	OPEN
iTRAC Process	
Plugin To Execute	

At the bottom of the dialog are three buttons: 'Add Action Plugin', 'Save', and 'Cancel'.

NOTE: This type of action can only be used in Correlation deployments

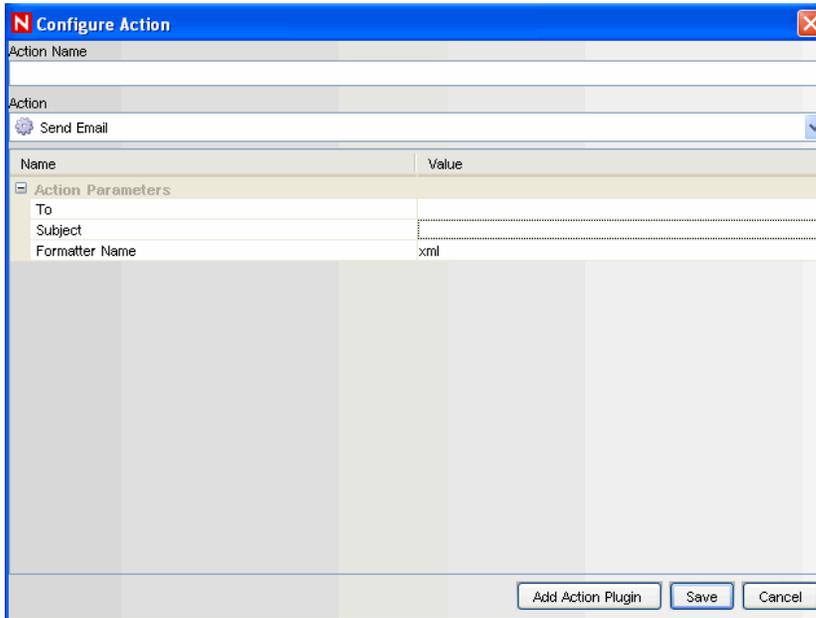
This action type create an incident whenever a correlated event fires. You can also initiate an iTRAC workflow process for remediation of that incident. For more information about the values of the following parameters, see [Chapter 4, “Incidents Tab,” on page 91](#).

- ◆ Responsible
- ◆ Title
- ◆ Category
- ◆ Severity
- ◆ Priority
- ◆ State
- ◆ [Optional] iTRAC Process: dropdown of configured iTRAC processes
- ◆ [Optional] Action Plugin to Execute: dropdown of configured JavaScript Actions

WARNING: Do not enable the Create Incident action until the correlation rule has been tuned. If the rule fires frequently, the system can create more incidents or initiate more iTRAC workflow processes than desired.

3.6.6 Send Email

Figure 3-7 Configure Action- Send Email



NOTE: This type of action can only be used in Correlation deployments

This action type can be used to send an Email when a correlated event triggers. The various parameters available are:

Table 3-6 Parameters

Option	Function
To	Specify the recipient email address
Subject	Specify the subject of the mail
Formatter Name	The format of the email will contain the correlated event formatted as "xml" or "Name Value Pair", depending on what you select

3.6.7 Imported JavaScript Action Plugins

For information on the JavaScript related actions and how to debug them, see [Section 16.2, "Action Manager,"](#) on page 364 in [Chapter 16, "Actions and Integrator,"](#) on page 363. The JavaScript Actions can be used in many places throughout the Sentinel interface.

Incidents Tab

- ♦ Section 4.1, “Understanding an Incident,” on page 91
- ♦ Section 4.2, “Introduction to User Interface,” on page 91
- ♦ Section 4.3, “Manage Incident Views,” on page 93
- ♦ Section 4.4, “Manage Incidents,” on page 97
- ♦ Section 4.5, “Switch between existing Incident Views,” on page 104

4.1 Understanding an Incident

In Sentinel, a set of related events (for example, a possible attack) can be grouped together form an Incident. An Incident in “open” state alerts you to investigate, resolve, and close the incident. For example, the resolution to an attack might be to close a port, block a source IP, or rebuild a machine.

Incidents can be created:

- ♦ Manually, by a security analyst monitoring incoming data or querying past data.
- ♦ Automatically, as a result of a correlation rule being triggered. For more information, see “Correlation Tab” section.

In the Incidents Tab, you can:

- ♦ Manage Incident Views
- ♦ Manage Incidents
- ♦ Switch between existing Incident Views

NOTE: You need to have appropriate permissions to access this tab. Only an Administrator has controls to enable/disable access to the features of Incidents for a user.

4.2 Introduction to User Interface

In the Incidents Tab, you will see the Display Incident View, Create Incident and Attachment Viewer Configuration.

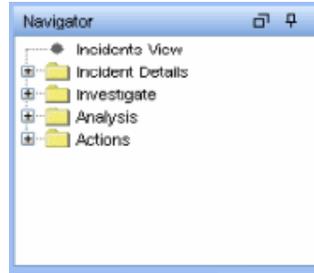
You can navigate to these functions from:

Table 4-1 Table 4-1: Incident Tab -User Interface

- ♦ The Incident menu in the Menu Bar



- ◆ The Navigation Tree in the Navigation Pane



- ◆ The Toolbar Buttons

Display Incident View Manager



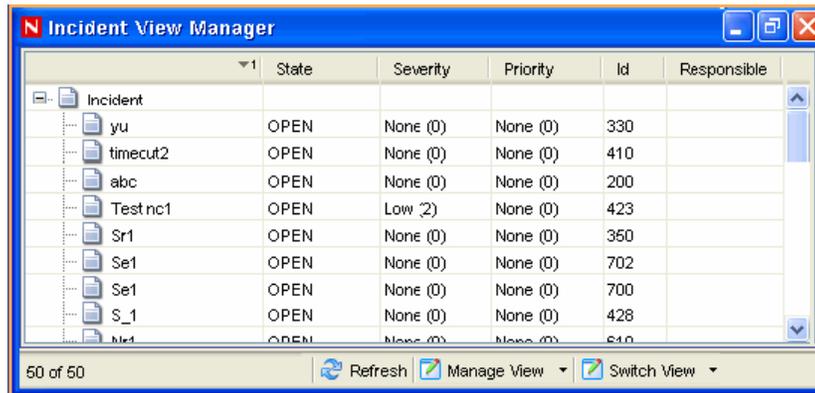
Create Incident

4.2.1 Incident View

In the Incident View Manager, you can view the list of incidents and the parameters you specified when adding an incident.

To open Incident View Manager:

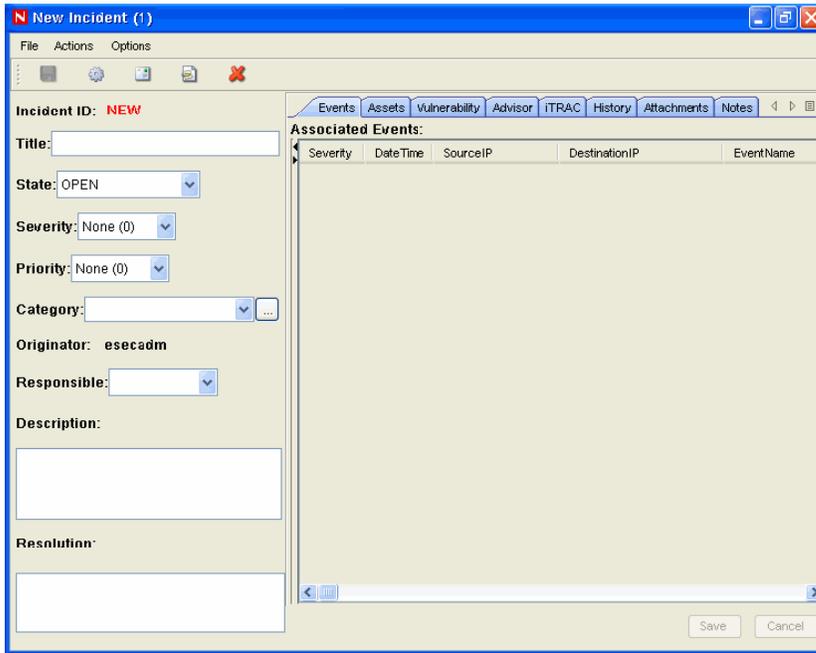
- 1 Click Incidents on Menu Bar and select Display Incident Views or click Display Incident View button in the Tool Bar.



4.2.2 Incident

When you add/edit an incident, you will see the tabs listed below where you can perform the incident related activities. As you investigate and remediate an incident, additional information can be added to these tabs. Except for Events and History, entering information on the tabs is optional.

Figure 4-1 Add/Edit Incident



- ◆ **Events:** Lists events attached to this incident. You can attach events to incidents in Active Views.
- ◆ **Assets:** Lists assets affected by the events of this incident.
- ◆ **Vulnerability:** Lists asset vulnerabilities.
- ◆ **Advisor:** Displays Asset attack and alert information.
- ◆ **iTRAC:** Allows you to add a workflow to incident from iTRAC Tab.
- ◆ **History:** Lists activities performed on the current incident.
- ◆ **Attachments:** Allows you to add an attachment to the incident created in the system.
- ◆ **Notes:** Allows you to add notes to the incident.

4.3 Manage Incident Views

Manage View allows you to:

- ◆ Add Views
- ◆ Edit Views
- ◆ Delete Views
- ◆ Mark a View as default

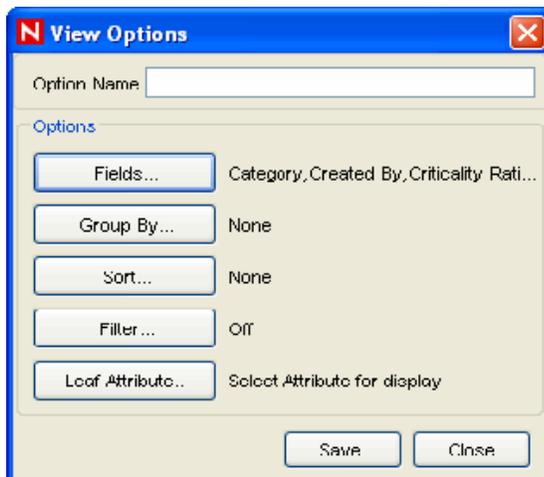
4.3.1 Adding a View

To add an Incident View:

- 1 Click Incidents > Display Incident View Manager. Alternatively, click Display Incident View button on the Tool Bar.

2 Open the View Options by either:

- Clicking the down-arrow on the Manage Views button located in bottom right corner of the window and selecting Add View. or
- Clicking the down arrow on the Manage Views button located in the bottom right corner of the window, selecting Manage Views and then clicking the Add View button.



3 Provide a name in the Option Name field. Click each button (listed below) to specify the options.

- **Fields:** The variables of the events attached to incidents are displayed as fields. By default, all the fields are arranged as columns in the Incident View. In the Field options window, you can add or remove columns that display and arrange the order of the columns by moving the up and down arrows.



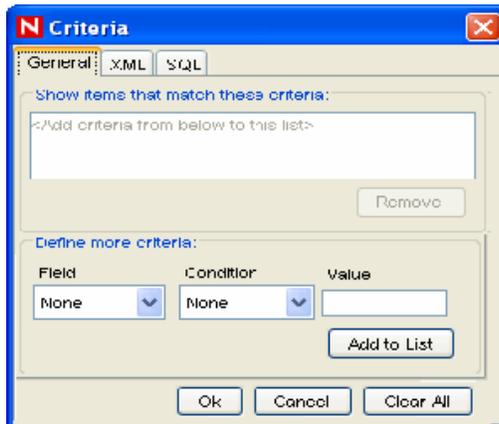
- **Group By:** You can set rules to group incidents in the display View.



- ◆ **Sort By:** You can set rules to sort the incidents in the display view.



- ♦ **Filter:** You can set Incident filters. Only the Incidents that match your filter displays in the View.



- ♦ **Leaf Attribute:** You can select an attribute from the list which is displayed as the first column in the Incident View.



4 Click Save.

4.3.2 Modifying a View

To edit an Incident View:

- 1 Click Incidents > Display Incident View or click Display Incident View Manager button on the Tool Bar.

- 2 Open a view by:
 - ♦ Clicking the down-arrow on the Switch View button in the bottom right corner, select the view you want to edit. Click the down-arrow on the Manage View button located in bottom right corner of the screen and select Edit Current View from the list. or
 - ♦ Clicking the down arrow on the Manage Views button located in the bottom right corner of the window, select Manage Views. Select a view to edit and click View/Edit.
- 3 Edit the options as required and click Save.

4.3.3 Deleting a View

To delete an Incident View:

- 1 Click Incidents > Incident View Manager or click Display Incident View button on the Tool Bar.
- 2 Click the down-arrow on the Manage Views button located in bottom right corner of the screen and select Manage View from the list. The Manage View window displays. Select a view and click Delete. A confirmation message alert displays.
- 3 Click Yes to delete.

4.3.4 Default View

To mark a View as default:

- 1 Click Incidents > Display Incident View Manager, or click Display Incident View Manager icon on the Tool Bar.
- 2 Click the down-arrow on the Manage Views button located in bottom right corner of the screen and select Manage Views from the list. The Incident View window displays.
- 3 Select the incident view you want as default, and click Mark as Default.

4.4 Manage Incidents

You can perform the following activities related to Incidents:

- ♦ Create an Incident
- ♦ Attach Workflows to Incidents
- ♦ Add Notes to Incidents
- ♦ Add Attachments to Incidents
- ♦ Execute an Incident Action
- ♦ Email an Incident
- ♦ Edit an Incident
- ♦ Delete an Incident

4.4.1 Creating Incidents

To create an Incident:

- 1 Click Incidents > Create Incident, or click Create Incident button on the Tool Bar. The New Incident window displays.

The screenshot shows the 'New Incident (1)' window. The left pane contains the following fields: Incident ID: NEW, Title: (text box), State: OPEN (dropdown), Severity: None (0) (dropdown), Priority: None (0) (dropdown), Category: (dropdown with search icon), Originator: esecadm, Responsible: (dropdown), Description: (text area), and Resolution: (text area). The right pane is titled 'Associated Events:' and contains a table with columns: Severity, DateTime, SourceIP, DestinationIP, and EventName. The table is currently empty. At the bottom right of the window are 'Save' and 'Cancel' buttons.

- 2 Specify the following information:
 - ◆ **Title:** Specify the Title of the Incident.
 - ◆ **State:** To set state of the incident, select from the drop-down list.
 - ◆ **Severity:** To mention the severity of the incident, select from the drop-down list.
 - ◆ **Priority:** To mention the priority of the incident, select from the drop-down list.
 - ◆ **Category:** Specify the category of the Incident.
 - ◆ **Responsible:** To assign the responsibility to investigate and close the incident, select from the drop-down list.
 - ◆ **Description:** Specify the description of the Incident in the text area.
 - ◆ **Resolution:** Specify the resolution description in the text area.
- 3 Click Create. The Incident ID automatically generates after you click Create.

NOTE: For more information on creating an incident grouping events, see Creating Incident in “Active Views Tab” section.

4.4.2 Viewing an Incident

To open an Incident

- 1 Click Incidents > Display Incident View Manager or click Display Incident View Manager button on the Tool Bar.
- 2 Open an Incident by:
 - ♦ Selecting a view from the Switch Views button in the bottom right corner.
 - ♦ Double click an incident in the Incident View Manager window.

4.4.3 Attaching Workflows to Incidents

To attach a workflow to an Incident:

- 1 Open an incident.
- 2 In the Incident window, click iTRAC Tab.
- 3 Select an iTRAC process from the drop-down list.
- 4 Click Save.

NOTE: You can attach only one process to an incident.

4.4.4 Adding Notes to Incidents

To add a note to an Incident:

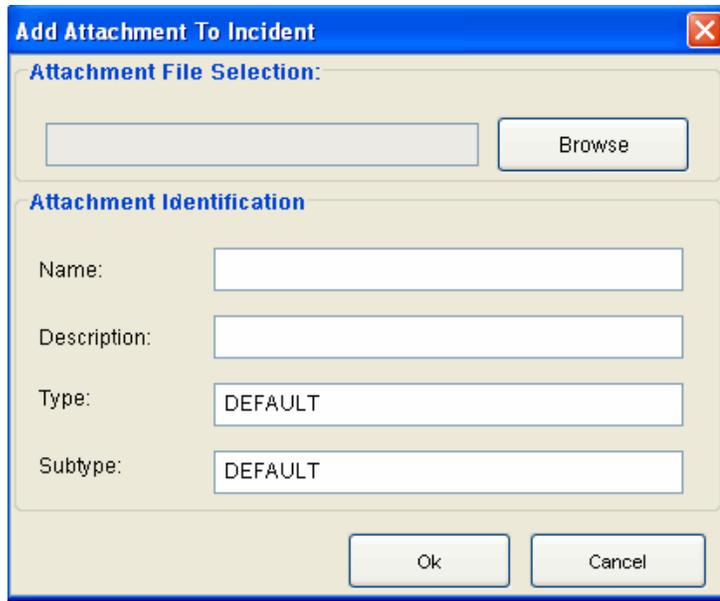
- 1 In the Incident window, click Notes Tab.
- 2 Click Add. Add Notes to Incident window displays.
- 3 Provide your notes and click OK.
- 4 Click Save.

NOTE: To edit or delete the note, select a note in the Notes tab of the Incident window, right-click the note and select edit or delete.

4.4.5 Adding Attachments to Incidents

To add an attachment to Incident:

- 1 In the Incident window, click Attachments Tab.
- 2 Click Add. Add Attachment to Incident window displays.



- 3 Click Browse, navigate to the attachment, and select it.
- 4 Provide the following information, or accept the default entries:
 - ◆ Name
 - ◆ Description
 - ◆ Type
 - ◆ Subtype

Click OK, click Save.

NOTE: Right-click the attachment to view or save.

4.4.6 Executing Incident Actions

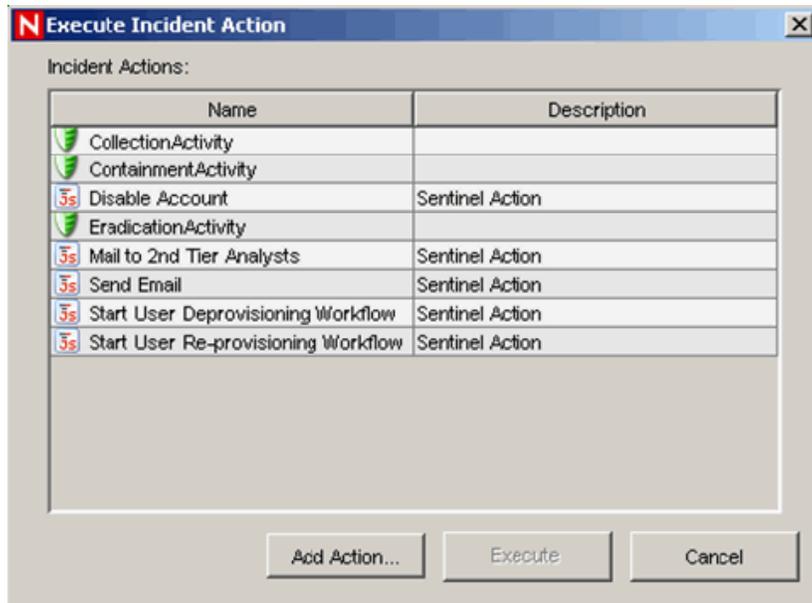
Any configured Javascript action or iTRAC activity can be executed on an incident.

To execute an incident action:

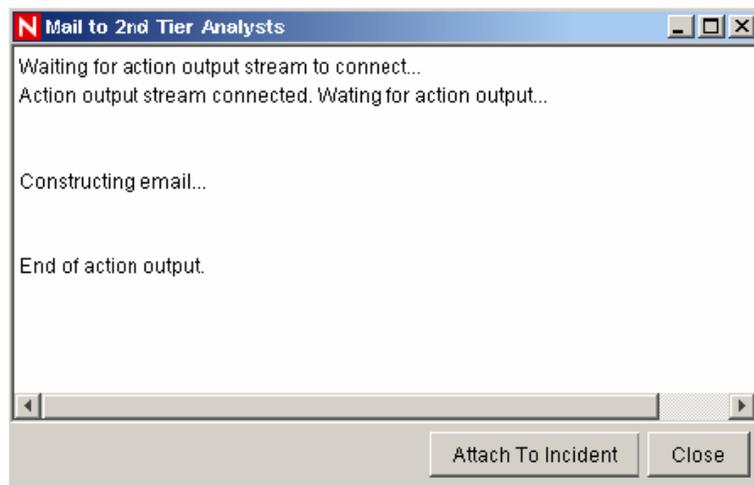
- 1 Open an Incident.
- 2 Click Execute Incident Action or select Actions>Execute Incident Action.



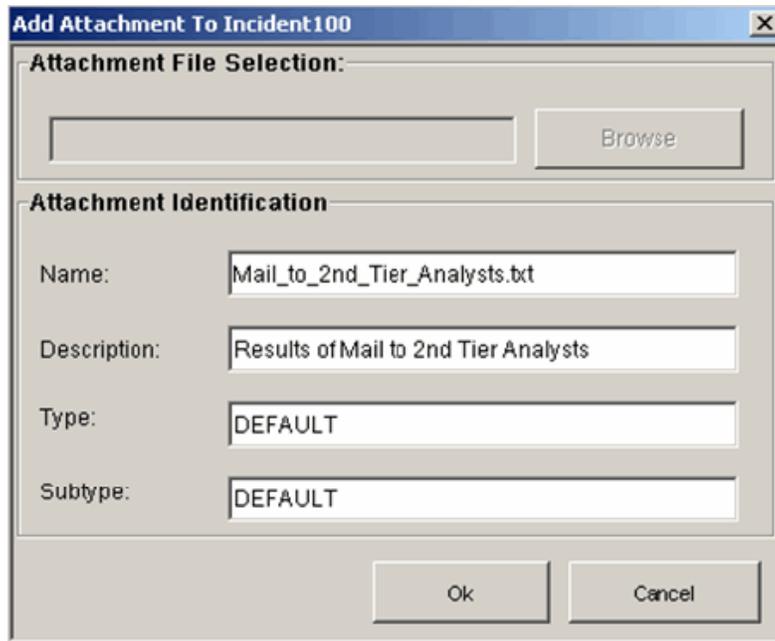
The Execute Incident Action window displays.



- 3 Select an Action or click Add Action to create a new one.
- 4 Click Execute. If the action is a Javascript Action, a window opens to show the progress of the action.



- 5 To add the command output to the Incident, click Attach to Incident.



The action output is saved and can be viewed from the Attachments tab of the Incident.

4.4.7 Emailing an Incident

To mail an incident using the preinstalled Email Incident action, you must have an SMTP Integrator is configured with valid connection information and with the property SentinelDefaultEMailServer set to “true”. For more information, see “SMTP Integrator” documentation available at [Novell website \(http://www.novell.com/documentation/sentinel61\)](http://www.novell.com/documentation/sentinel61).

To email an Incident:

- 1 Open an incident.
- 2 Click Email Incident button.



The Email Incident window displays.

3 Provide:

- ◆ Email Address
- ◆ Email Subject
- ◆ Email Message

4 Select which HTML attachments should be included in the mail message: the events included in the incident, assets, vulnerabilities, Advisor attacks, incident history, attachments, and notes.

5 Click OK.

4.4.8 Modifying Incidents

To edit an Incident:

1 Click Incident tab. Click Incidents > Display Incident View. Alternatively, click Display Incident View button on the Tool Bar. Incident View window displays with the list of incidents.

2 Right-click the incident you want to edit and select Modify.

3 Incident window displays. Edit the following information:

- ◆ Title
- ◆ State
- ◆ Severity
- ◆ Priority
- ◆ Category

- ♦ Responsible
- ♦ Description
- ♦ Resolution

4 Click Save.

NOTE: Save button gets active only if you modify any information in Incidents screen.

4.4.9 Deleting Incidents

To delete an Incident:

- 1 Click Incident tab. Click Incidents > Display Incident View Manager, or click Display Incident View button on the Tool Bar. The Incident View window displays.
- 2 Right-click the incident you want to delete and select Delete.
- 3 A confirmation Message displays. Select Yes.

4.5 Switch between existing Incident Views

To switch between Incident views:

- 1 Click the down-arrow on the Switch View button on the bottom right corner of the screen which displays a list of existing views.
- 2 Select a view.

- ◆ Section 5.1, “Understanding iTRAC Workflows,” on page 105
- ◆ Section 5.2, “Introduction to the User Interface,” on page 106
- ◆ Section 5.3, “Template Manager,” on page 107
- ◆ Section 5.4, “Template Builder Interface,” on page 108
- ◆ Section 5.5, “Steps,” on page 112
- ◆ Section 5.6, “Transitions,” on page 123
- ◆ Section 5.7, “Activities,” on page 131
- ◆ Section 5.8, “Process Management,” on page 140

5.1 Understanding iTRAC Workflows

iTRAC Workflows are designed to provide a simple, flexible solution for automating and tracking an enterprise’s incident response processes. iTRAC leverages Sentinel’s internal incident system to track security or system problems from identification (through correlation rules or manual identification) through resolution.

Workflows can be built using manual and automated steps. Advanced features such as branching, time-based escalation, and local variables are supported. Integration with external scripts and plugins allows for flexible interaction with third-party systems. Comprehensive reporting allows administrators to understand and fine-tune the incident response processes.

NOTE: Access to manage iTRAC templates, activities, and processes can be enabled on a user-by-user basis by any user with the ability to change user permissions.

The iTRAC system uses three Sentinel objects that can be defined outside the iTRAC framework:

Table 5-1 Sentinel Objects used by iTRAC

◆ Incident	Incidents within Sentinel are groups of events that represent an actionable security incident, plus associated state and meta-information. Incidents are created manually or through correlation rules, and can, but need not be associated with a workflow process. They can be viewed on the Incidents tab.
◆ Activity	An Activity is a pre-defined automatic unit of work, with defined inputs, command-driven activity, and outputs (for example, automatically attaching asset data to the incident or sending an e-mail). Activities can be included in a workflow template and executed during workflow processes, or they can be executed within an incident.
◆ Role	Sentinel users can be assigned to one or more Roles. Manual steps in the workflow processes can be assigned to a Role.

iTRAC Workflows have four major components that are unique to iTRAC:

Table 5-2 Major components of iTRAC

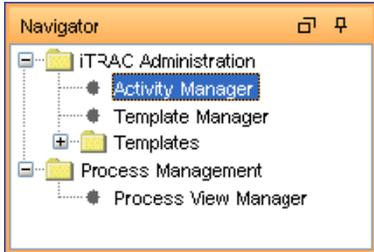
♦ Step	A Step is an individual unit of work within a workflow; there are manual steps, decision steps, command steps, mail steps, and activity-based steps. Each step displays as an icon within a given workflow template.
♦ Transition	A Transition defines how the workflow moves from one state (Activity) to another – this can be determined by an analyst action, by the value of a variable, or by the amount of time elapsed. .
♦ Templates	<p>A Template is a design for a workflow that controls the flow of execution of a process in iTRAC.</p> <p>The template consists of a network of manual and automated Steps. Activities and criteria for transition between them.</p> <p>Workflow templates define how an incident is responded to after a process based on that template is instantiated (see below).</p> <p>A template can be associated with many incidents.</p>
♦ Processes	<p>A process is a specific instance of a workflow template that is actively being tracked by the workflow system. It includes all the relevant information relating to the instance, including the current step in the workflow, the associated incident, the results of Steps, attachments, and notes.</p> <p>Each workflow process is associated to one and only one incident.</p>

5.2 Introduction to the User Interface

Within the Sentinel Control Center, you access the iTRAC administrative functions by selecting the iTRAC tab from the main screen. This tab gives you access to the Activity Manager (where you define Activities), the Template Manager (where you define Templates), and the Process View Manager (where you manage instantiated workflow Processes).

You can navigate to these functions from:

Table 5-3 iTRAC -User Interface

♦ The iTRAC menu in the Menu Bar	
♦ The Navigation Tree in the Navigation Pane	

- ◆ The toolbar buttons



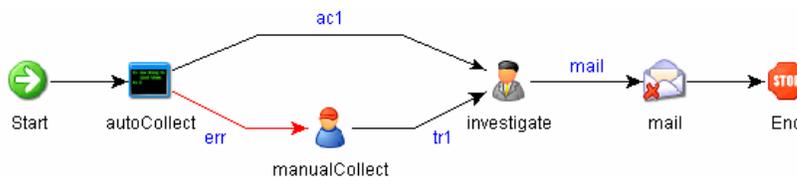
5.3 Template Manager

The Template Manager can be used to create, view, modify, copy, or delete a Template. Within the Template Manager you can add, delete, copy, view, and edit templates. Templates can be sorted into folders for easy management

In the Template Manager, you can:

- ◆ Create new workflow Templates
- ◆ Edit or copy existing Templates
- ◆ Define workflow Steps
 - ◆ Manual or Automated
 - ◆ Description of Step or instructions for iTRAC users
- ◆ Define transitions between Steps
 - ◆ Transition type
 - ◆ Escalation procedures
 - ◆ Timeout and alert attributes

Figure 5-1 iTRAC workflow



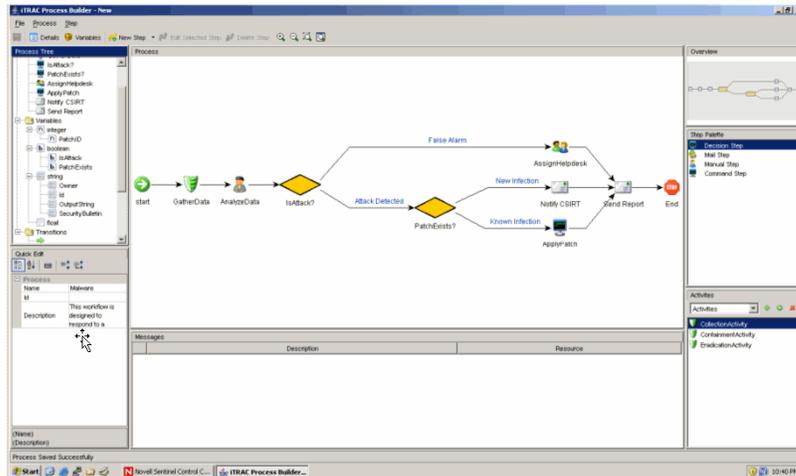
5.3.1 Default Templates

iTRAC is shipped with the following templates to use as examples. The process and activity attributes for these templates are set to pre-defined values. Users can modify these to suit their requirements. The default templates are:

- ◆ AlertTimeoutExample
- ◆ TwoStepSimpleExample
- ◆ ConditionalTransitionExample
- ◆ CommandExample

5.4 Template Builder Interface

Figure 5-2 Template Builder Interface



The following panes displays in the Template Builder window:

- ♦ **Process Tree:** This pane displays the Steps, Transitions and Variables added to the Template. User can add Steps or Variables, Edit or Remove Steps, Variables and Transitions.

To perform an action on a Step, Variable or Transition:

- ♦ Expand the relevant group in the Tree.
- ♦ Select and right-click an existing attribute.
- ♦ Select action you want to perform.
- ♦ **Process:** This is the main GUI for viewing and creating a Workflow template. For more information on creating a Workflow Template, see “[Section 5.4.1, “Creating Templates,” on page 110](#)”.

- ♦ **Quick Edit:** Select a Step or Transition to see its properties. This pane allows you to edit process attributes.

To edit the details of steps using Quick Edit:

- ♦ Click the Process Attribute value in the Quick Edit Pane.
- ♦ The attribute values are highlighted indicating Edit Mode.
- ♦ Modify the value and click anywhere outside the Quick Edit frame to save the new value.
- ♦ **Messages:** This pane displays messages if Steps or Transitions are incomplete. You must resolve any issues listed here before saving the Template.
- ♦ **Overview:** This pane displays an overview of the entire Template.
- ♦ **Step Palette:** There are four types of Steps in the Step Palette. You can Drag and Drop the Steps into the Process pane.
 - ♦ Decision Step
 - ♦ Mail Step

- ♦ Manual Step
- ♦ Command Step
- ♦ **Activities:** The activities added in the Activity Manager are shown in this pane and can be added to a workflow template. The user can also Add, Edit and Remove Activities. For more information, see [Section 5.7.5, “Managing Activities,” on page 138](#).

WARNING: Use caution when editing or deleting an Activity that is already in use.

The following icons are used in the Template Builder to represent the Steps:

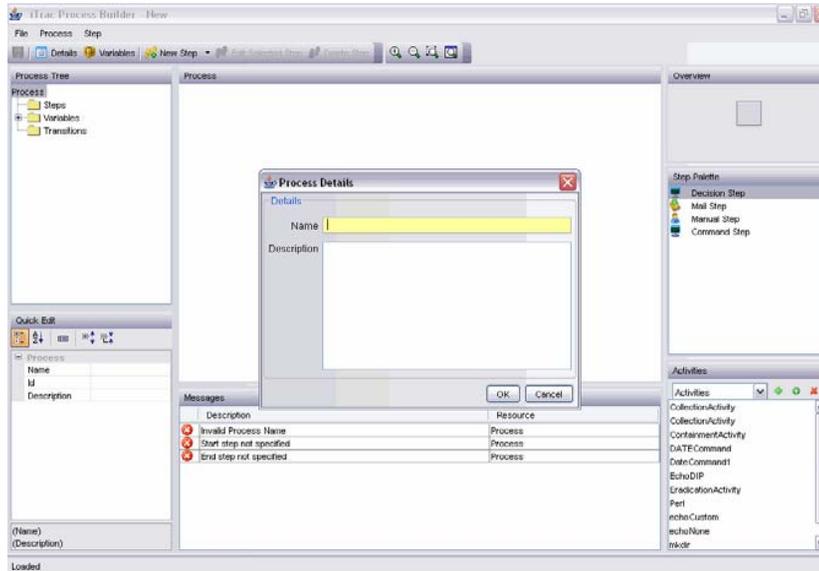
Table 5-4 Template Builder Icons

Icon	Description
	Start Step: All workflow templates have a Start Step.
	Decision Step: This step provides different execution paths depending on the value of a variable defined in a previous Step.
	Mail Step: This step sends a pre-written email.
	Manual Step: This step indicates that manual work must be performed, often outside the Sentinel system (For example, telephoning the owner of the affected system or analyzing the results of a scan).
	Activity Step: This step is a pre-defined set of Activities.
	Command Step: This step executes a command or script on the iTRAC workflow server, usually installed in the same place as the Data Access Service (DAS). The output of the command can be stored in a string variable and used as input to a Decision Step.
	End Step: This step signifies the completion of a workflow process.

5.4.1 Creating Templates

To create a New Template:

- 1 Click the iTRAC tab.
- 2 In the navigation pane, click iTRAC Administration > Template Manager.
- 3 Click Add. The iTRAC Template Builder window displays.



- 4 In the Process Details window, provide a name and description (optional) of the template and click OK.
- 5 Drag and drop a Step from the Step Palette or an Activity from the Activities pane into the Process window. Or click the New Step drop-down button in the upper left corner and select one of the following Step types. Or right-click Start step, select Insert New and select one of the following Step types.

-
- ◆ Decision Step
 - ◆ Manual Step
 - ◆ Mail Step
 - ◆ Command Step
-

- 6 Add as many Steps and Activities as needed to create the Template.
- 7 Create transitions between each Step. To create Transitions, right-click the step after which you need to add transition and click Add Transition.

NOTE: Any step (except for the End step) might have one or more exit transition lines. A Decision step must have at least two exit lines.

- 8 Right-click each final step in the Template and click Add End Transition.

NOTE: On the bottom of the iTRAC Template Builder is a message pane that lists any warnings or errors about incomplete steps during the construction.

- 9 To save your process, go to File>Save or click Save button.

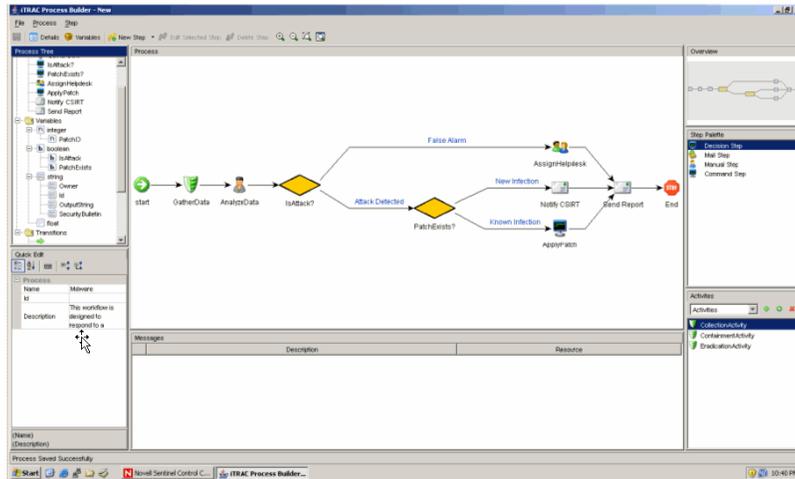
5.4.2 Managing Templates

After creating a template, you can modify, copy, delete the Template.

Viewing/Editing Templates

To view/edit an Existing Template:

- 1 In the Navigator, click iTRAC Administration > Template Manager.
- 2 Highlight a template and click View/Edit. The Template builder displays.



Copying Templates

One way to create a new workflow Template is to copy one of the default Templates and modify it.

To copy a Template:

- 1 Click the iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight a template and click Copy. A Template Builder with the copied template displays.
- 4 Provide a new name, save and edit the template as needed.

Deleting Templates

Even if you delete a Template, any instantiated workflow processes that are based on that Template still completes normally.

To delete a Template:

- 1 Click the iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight a template and click Delete.

5.5 Steps

Steps are the basic components of a Template. Every Template must have a Start Step and an End Step. The Start Step exists by default. You can also add the following types of Steps to a Template:

- ◆ Manual Step
- ◆ Decision Step
- ◆ Mail Step
- ◆ Command Step
- ◆ Activity Step
- ◆ End Step

5.5.1 Start Step

Every workflow template must have one and only one Start step. The transition from a Start step is always Unconditional.

5.5.2 Manual Steps



This type of step indicates that manual work must be performed. Every manual step in a Template must be assigned to a Role. The users in that role are notified through a worklist item when an instantiated workflow process reaches the Manual Step. When a user accepts the worklist item, it is removed from the queue of the other users in that Role. For more information about worklists and stepping through a workflow process, see [Section 6.1.1, “Work Item Summary,” on page 145](#). section.

The description of the step should indicate what work needs to be performed. The user is expected to perform that work and then acknowledge completion.

A Manual Step includes the following attributes:

- ◆ Name of step
- ◆ Role
- ◆ Variables
 - ◆ Delete
 - ◆ Add
- ◆ Description

Variables

The user can also be asked to set one or more variables to appropriate values. Four variable types can be assigned to manual steps: (1) Integer, (2) Boolean, (3) String and (4) Float. This variable can be set to an explicit default value during the Step definition, or the user can set the value at run-time as part of the workflow process. The value can be optional or required.

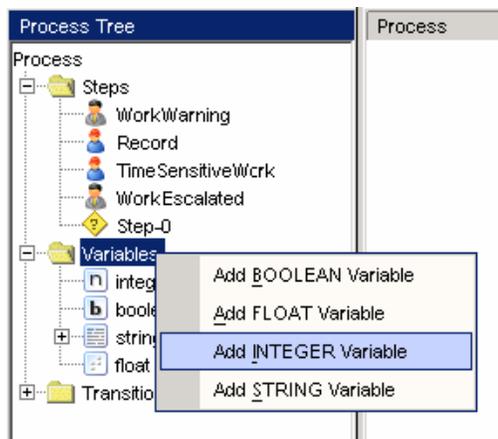
The value of the variable can be used as part of a Conditional transition to determine the path the workflow follows. It can also be used later as part of a Conditional Transition from a Decision step to determine the workflow path.

NOTE: If the value is going to be used later as part of a Decision step, it should be marked “Required.”

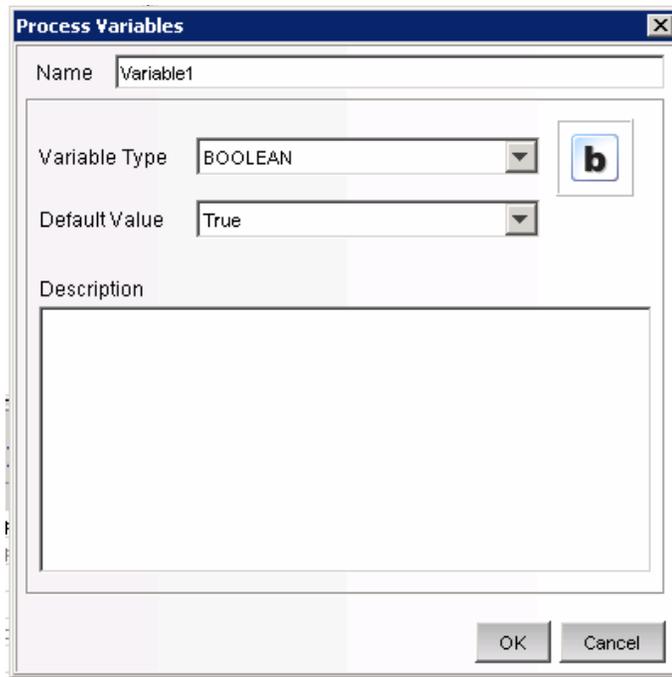
For example, an integer variable can be set by the user to hold the event rate. Output transitions from the Manual Step can be defined so that if the event rate is greater than 500, one path is followed; else another path is followed.

To create a variable:

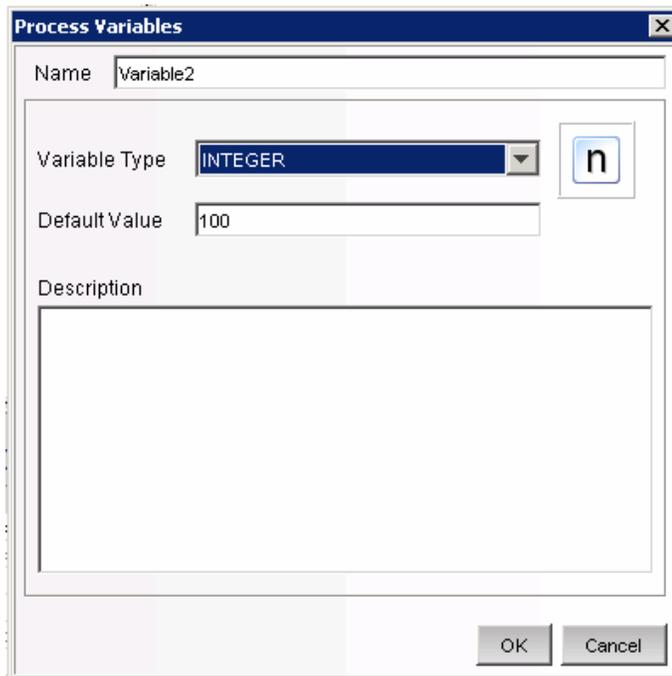
- 1 Click iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Click Add button in upper left corner to open a new template or highlight an existing template, click View/Edit.
- 4 Right click Variables in the Process Tree and select the type of variable to add or right-click the variable type and select Add [type] Variable.



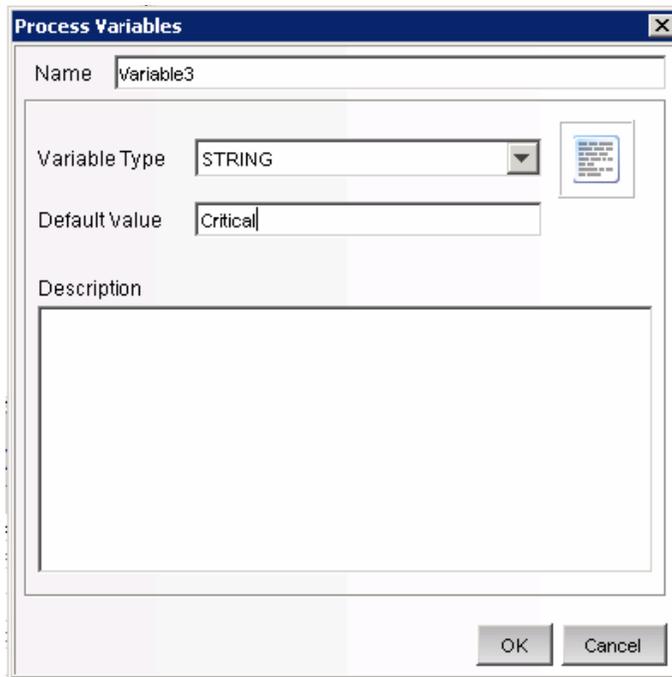
- 5 Give the variable a name and specify the Default Value, if desired.
Boolean Variable:



Integer Variable:

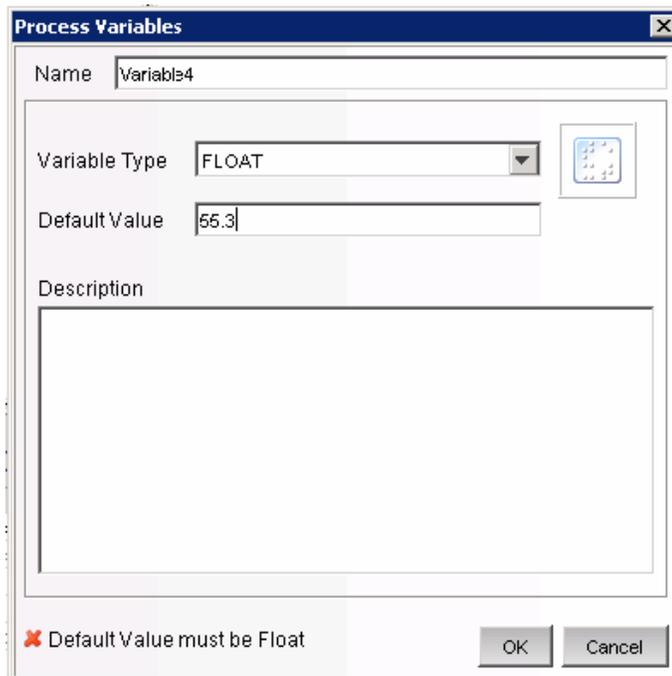


String Variable:



The image shows a dialog box titled "Process Variables" with a close button (X) in the top right corner. The "Name" field contains "Variable3". The "Variable Type" dropdown menu is set to "STRING". The "Default value" field contains "Critical". There is a small icon to the right of the dropdown menu. Below these fields is a large empty text area labeled "Description". At the bottom right, there are "OK" and "Cancel" buttons.

Float Variable



The image shows a dialog box titled "Process Variables" with a close button (X) in the top right corner. The "Name" field contains "Variable4". The "Variable Type" dropdown menu is set to "FLOAT". The "Default Value" field contains "55.3". There is a small icon to the right of the dropdown menu. Below these fields is a large empty text area labeled "Description". At the bottom left, there is a red error message: "Default Value must be Float". At the bottom right, there are "OK" and "Cancel" buttons.

6 Click OK.

From a Manual Step, you can set Conditional, Unconditional, Timeout, or Alert transitions.

5.5.3 Decision Steps



This type of step selects between exit transitions depending on the values of variables defined in prior steps. See [Section 5.5.2, “Manual Steps,” on page 112](#) for the available variable types. The Decision Step itself is very simple; you can edit only the step name and description. The workflow path is determined by the transitions.

From a Decision Step, you can set Conditional and Else transitions. Every Decision Step must have an Else transition and at least one Conditional transition. The Else transition leads to a workflow path that is followed if none of the criteria for the Conditional transitions is met.

5.5.4 Mail Steps



This step sends a pre-written email. A Mail Step includes the following attributes:

- ◆ Name of step
- ◆ To addressee
- ◆ From addressee
- ◆ Subject of email
- ◆ Body of email

From a Mail Step, you can set a Conditional, Unconditional, Timeout, Alert, or Error transition. An Error transition should always be included so error conditions can be handled properly.

NOTE: If the first step of a workflow fails without an error transition, the iTRAC process cannot proceed.

5.5.5 Command Steps



A Command Step is a step in which an operating-system level command or script (shell, batch, perl and so on) is executed. The name of the command can be provided explicitly or set as a string variable, and parameters can be passed in the same manner. Output from the command can also be placed back into a string variable.

A Command Step includes the following attributes:

- ◆ Name of step
- ◆ Description
- ◆ Command (Can be explicit or variable-driven)

- ◆ Arguments (Can be explicit or variable-driven)
- ◆ Output Variable

NOTE: The command (or a batch file or script that refers to the command) must be stored in the %ESEC_HOME%\config\exec or \$ESEC_HOME/config/exec directory on the iTRAC workflow server, usually the same machine where the Data Access Server (DAS) is installed. Symbolic links are not supported

Variables

The command output can also be used to set a variable to the appropriate values. Command steps must use String variable types.

The value of the variable can be used as part of a Conditional transition to determine the path the workflow follows. It can also be used later as part of a Decision step to determine the workflow path.

For example, a command step can return a value of 0 for failure and 1 for success. This output can be assigned to a variable, and then a Conditional transition or a Decision step can use this value to determine which workflow path to take.

The command and its arguments can each be specified explicitly by the person designing the workflow or be set as a string variable. If either one is set as a string variable, there must be a previous step in the Template where the variable is set to a string value.

From a Command Step, you can set Conditional, Unconditional, Timeout, or Alert, or Error transitions. An Error transition should always be included so error conditions can be handled properly.

NOTE: If the first step of a workflow fails without an error transition, the iTRAC process cannot proceed.

5.5.6 Activity Steps



An Activity Step is a type of automated step that can be used in a workflow Template. Activity Steps are created in the Activity Manager and can consist of internal Sentinel operations or external scripted operations. After Activity Steps are created, the user can select from the library of these Activities and include them into in a workflow. For more information on creating each type of pre-defined Activity, see [Section 5.7.4, “Creating iTRAC Activities,” on page 133](#).

An Activity Step includes the following attributes:

- ◆ Name
- ◆ Description
- ◆ Activity Assignment

From an Activity Step, you can set Conditional, Unconditional, Timeout, or Alert, or Error transitions. An Error transition should always be included so error conditions can be handled properly.

NOTE: If the first step of a workflow fails without an error transition, the iTRAC process cannot proceed.

5.5.7 End Step

Every workflow template must have an End Step to complete every branch of the workflow path.

5.5.8 Adding Steps to a Workflow

Steps can be added to a workflow using the Step Palette or using a right-click in the Process Builder. When adding steps to a workflow, a yellow entry field indicates an invalid entry.

To add a Step from the Step Palette:

- 1 Drag and drop a step from the Step Palette.
- 2 Right-click the step and select Edit Step.
- 3 Edit the details of the step and click Save.

To add a Step using a Right-Click:

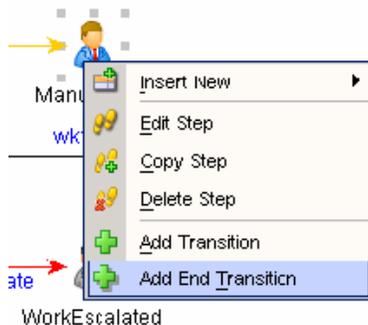
- 1 Right-click an existing step in the Process Builder and select Insert New.
- 2 Edit the details of the step and click Save.
- 3 Select Manual, Decision, Mail, Command or End Step.
- 4 Edit the details of the step and click Save.

To add an Activity Step:

- 1 Click and drag an Activity from the Activity Pane to the Process Builder.

To add an End Step:

- 1 Right-click a Step with no transition and select Add End Transition.



5.5.9 Managing Steps

Steps can be copied, edited, or deleted.

Copying Steps

To copy a Step:

- 1 Click the iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight an existing template, click View/Edit. iTRAC Process Builder window displays.
- 4 Select an existing step, right-click, and select Copy Step.
- 5 The Step window opens in edit mode with all the attributes of the selected step. Specify a name to the new step.
- 6 Edit step attributes as required. Click OK.

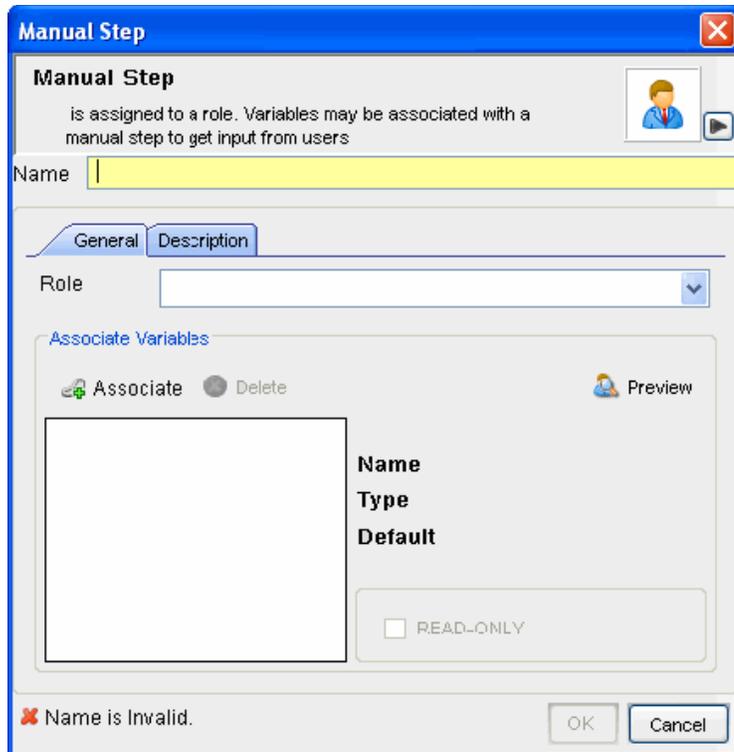
Modifying Steps

To edit a Step:

- 1 Click the iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight an existing template, click View/Edit. iTRAC Process Builder window displays.
- 4 Select an existing step, right-click, and select Edit Step.
- 5 Edit the step attributes. Click OK.

To edit a Manual Step:

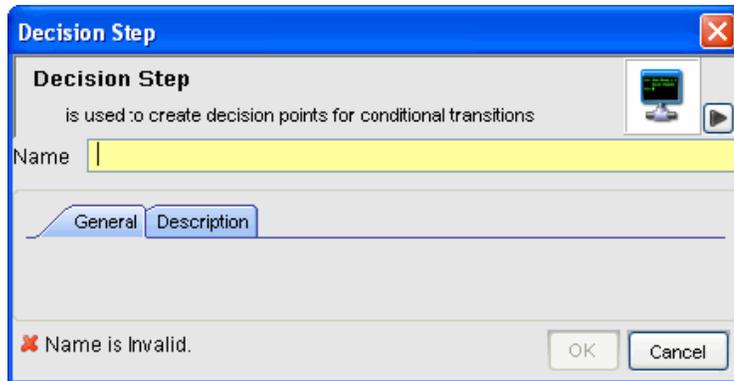
- 1 Right-click a Manual Step and select Edit Step.



- 2 Provide a Name for the step.
- 3 Attach a Role to this step by selecting a Role from the drop-down list. (For more information on Roles, see [Chapter 11, “Administration,”](#) on page 223.
- 4 Click Associate to associate a Variable; select the variable from the list or create new variables to be associated. Set a default value as desired.
- 5 Check the Read-Only box if this variable is to be forced to the default value.
- 6 Click Description tab to provide description for this step.
- 7 Click Preview to preview the step you created.
- 8 Click OK.

To edit a Decision Step:

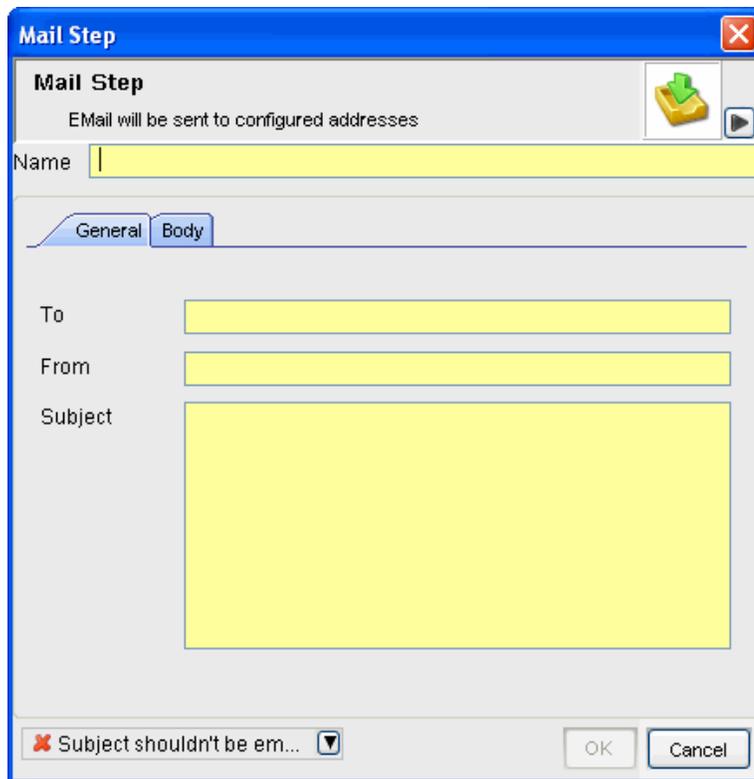
- 1 Right-click a Decision Step and select Edit Step.



- 2 Provide Name.
- 3 Click Description tab to provide description for this step.
- 4 Click OK

To edit a Mail Step:

- 1 Right-click a Mail Step and select Edit Step.



- 2 Provide Name for the step.
- 3 Provide To and From mail addresses and Subject in the General Tab.
- 4 Click Body tab and type the message.
- 5 Click OK.

To edit a Command Step:

- 1 Right-click a Command Step and select Edit Step.

Command Step

Command step executes the configured command. The output of the command may be mapped to process variable

Name

General Description

Command Use Variables

Arguments Use Variables

Output Variable

Output variable not set

OK Cancel

- 2 Provide a Name for this step.
- 3 Specify the path and name of the command or script to execute (relative to the \$ESEC_HOME/config/exec or %ESEC_HOME%\config\exec directory)
- 4 If you want to run a command or script referenced in a variable that gets populated during the workflow process, check the Use Variables box.
- 5 Specify any command-line arguments to pass to the command or script. If you want to use the contents of a variable that gets populated during the workflow process, check the Use Variables box.
- 6 Specify a variable to hold output from the command or script. Any standard output is placed into these variables.
- 7 Click Description tab to provide description for this step.
- 8 Click OK.

Deleting Steps

To delete a Step:

- 1 Click iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight an existing template, click View/Edit. iTRAC Process Builder window displays.

- 4 Select an existing step, right-click, and select Delete Step.
- 5 In the Alert Message window, select Yes to delete.

5.6 Transitions

Transitions are used to connect steps. There are several types of transitions:

♦ Unconditional	♦ Alert
♦ Conditional	♦ Else
♦ Timeout	♦ Error

A Transition can have the following attributes:

- ♦ Name
- ♦ Description
- ♦ Destination: Step to which the transition links
- ♦ Expression
- ♦ Timeout Values

Different steps have different properties and therefore they are associated with different transition types.

Table 5-5 Steps and Valid Transition

Step Type	Valid Transitions
♦ Decision	♦ Conditional ♦ Else
♦ Manual	♦ Unconditional ♦ Timeout ♦ Alert
♦ Command	♦ Unconditional
♦ Mail	♦ Timeout
♦ Activity	♦ Alert ♦ Error

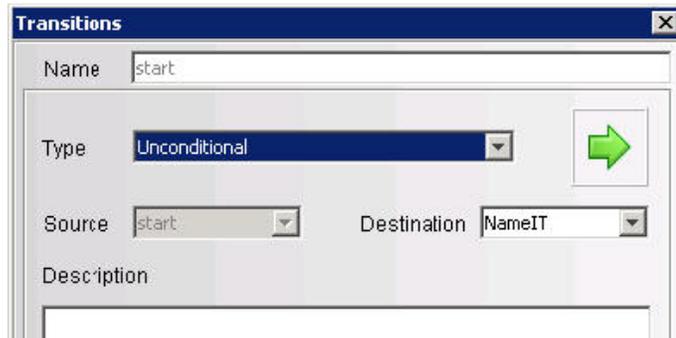
5.6.1 Unconditional Transitions

An unconditional transition must always be used from a Start step. Manual, Command, Activity, and Mail Steps can also have unconditional transitions. The only parameter for an unconditional transition is the next step.

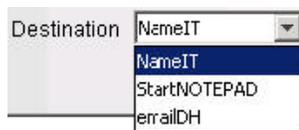
This path is taken when the current step is completed (unless a timeout transition is configured and the timeout period elapses).

To add an Unconditional Transition:

- 1 Open the Process Builder.
- 2 Select an existing step, right-click and select Add Transition.
- 3 Specify a name for the transition.
- 4 Select the Transition type Unconditional from the list.



- 5 Click the down arrow for the Destination field and select a step.



- 6 Provide a description for this transition and click OK.

5.6.2 Conditional Transitions

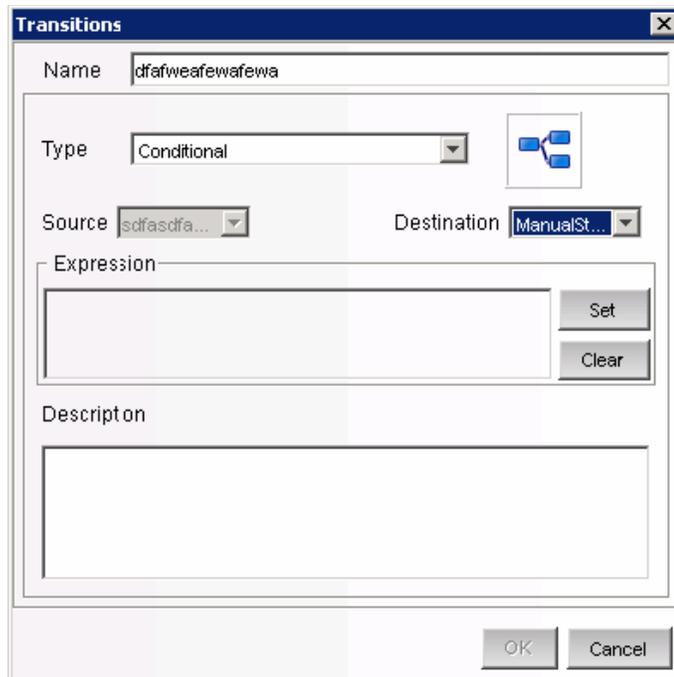
Select an exit path based on an expression using iTRAC variables set in a Manual or Command step.

NOTE: You can add Conditional Transitions only from a Decision Step to any other step.

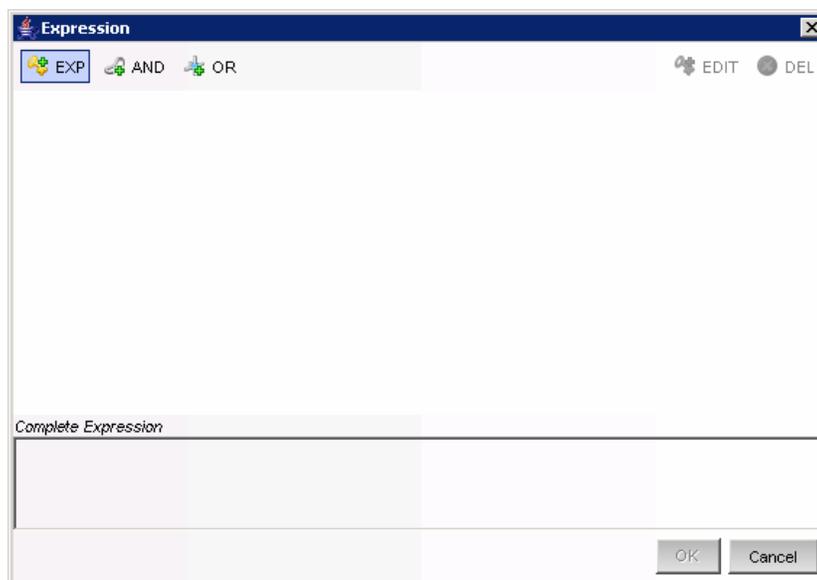
When creating a Conditional Transition, the conditional expressions can be based on comparing a variable that is populated during the workflow process to a specific value or to another variable populated during the workflow process. Multiple conditional expressions can be combined or nested using the AND and OR operator.

To add a Conditional Transition:

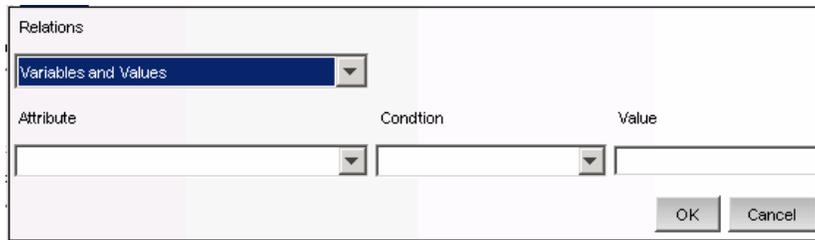
- 1 Open the Process Builder.
- 2 Select an existing Decision step, right-click and select Add Transition.
- 3 Provide a name for the transition.
- 4 Select the Transition type Conditional from the list.



- 5 Specify the destination Step.
- 6 Click Set to add an expression. The empty Expression window displays.

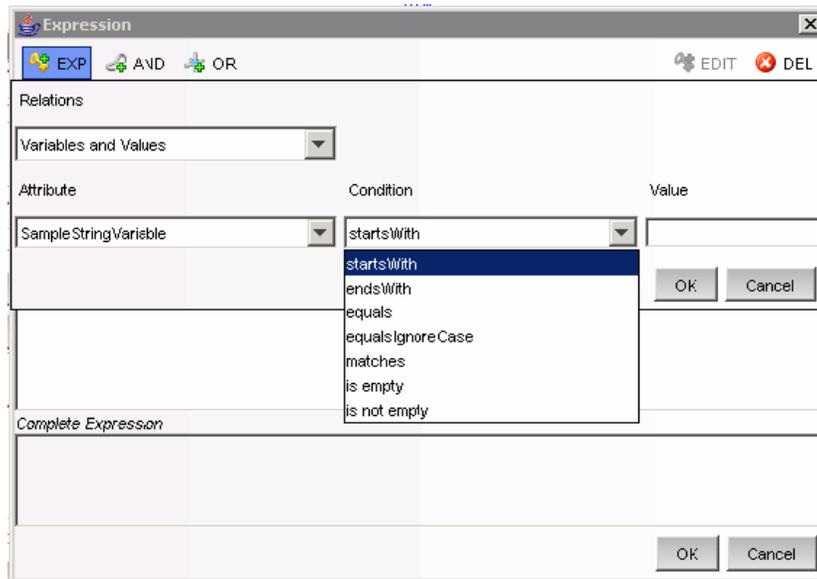


- 7 Click EXP to add the first expression. The evaluation expression is an expression that evaluates to TRUE or FALSE during the workflow process. Select the appropriate dropdown under Relations to compare a variable to a constant value (Variables and Values) or to another variable (Variables and Variables).

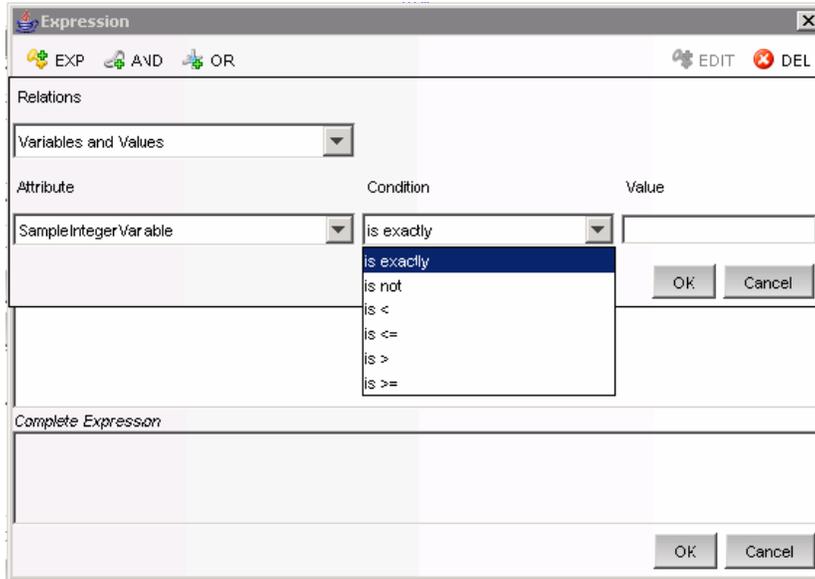


- 8 Select a variable from the Attribute dropdown or add a new one if desired.
- 9 Select a condition from the Condition dropdown. The condition list varies depending on the type of Attribute variable chosen.

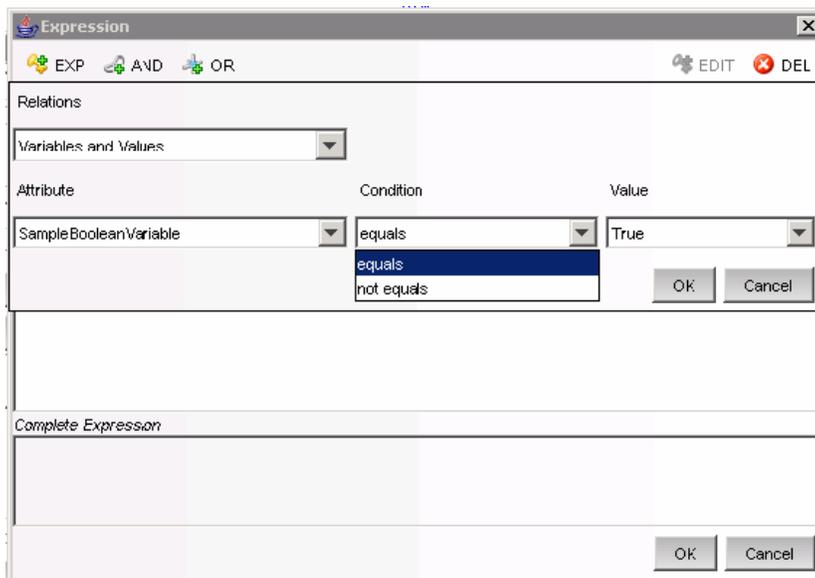
String Variable Conditions:



Integer and Float Variable Conditions:



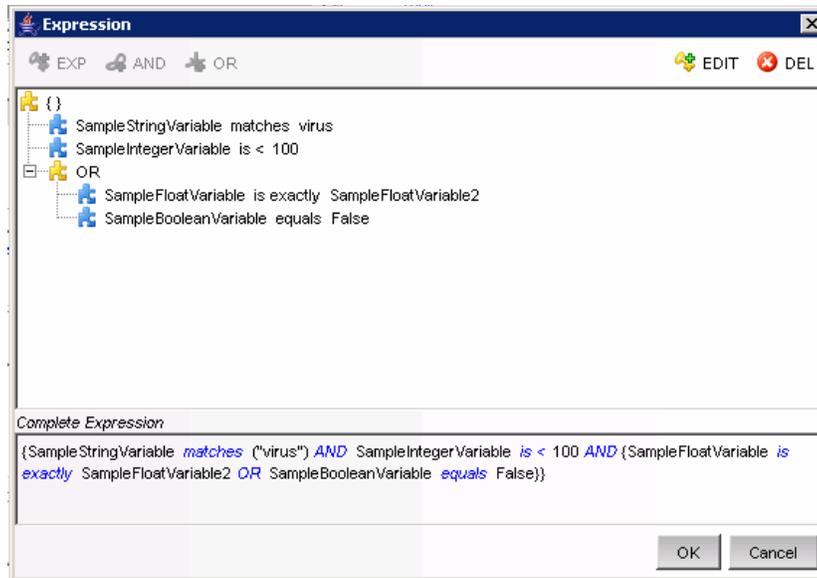
Boolean Variable Conditions:



- 10 Set the Value.
- 11 Click OK.
- 12 If a second expression is desired, highlight the root folder.



- 13 Repeat steps 7-12 as needed.
- 14 By default, all expressions at the root level is separated by AND operators. To nest expressions or to use the OR operator, click the appropriate operator button and drag and drop expressions onto that operator.



- 15 When the expression is complete, click OK.

NOTE: You can edit/delete an existing expression using the Edit and Delete buttons in the Expression window.

- 16 Click OK. The expressions you provided displays in Transition window under Expression section.
- 17 Provide a description for your transition and click OK.

5.6.3 Else Transitions

An Else transition leads to a path that is taken from a Decision Step when the criteria for the Conditional transitions are not met. This transition only applies to Decision Steps, and every Decision Step must have an Else transition. The workflow path with the Else transition is only followed if none of the criteria for the Conditional transitions is met.

NOTE: You can add Else Transitions only from a Decision Step to any other step.

To add an Else Transition:

- 1 Open the Process Builder.
- 2 Select an existing Decision step, right-click and select Add Transition.
- 3 Select the Transition type Else from the list.
- 4 Specify the destination Step.
- 5 Provide a description for this step and click OK.

5.6.4 Timeout Transitions

A Timeout transition leads to a path that is taken when a user-specified amount of time (minutes, hours or days) elapses after a Base Time, which is either `step_activated_time` or `step_accepted_time`. `Step_activated_time` is the time that iTRAC activates this step within the workflow process. `Step_accepted_time` is the time when a user accepts (or takes ownership) of the worklist item for this step. If the timeout time period passes without the step being completed, control moves to the next step.

Timeout transitions can be set for a Manual Step or a Command Step. `Step_accepted_time` is only relevant for Manual Steps and should not be selected for a Command Step.

This transition is represented by a red line.

To add a Timeout Transition:

- 1 Open the Process Builder.
- 2 Select an existing Decision step, right-click and select Add Transition.
- 3 Select the Transition type Timeout from the list.
- 4 Specify the destination Step.
- 5 Click Set to specify the Timeout details. Timeout details window displays.
- 6 Specify the timeout value in minutes, hours, or days. Click OK.
- 7 Select Base Time.
- 8 Provide a description for your transition and click OK.

5.6.5 Alert Transitions

An Alert transition leads to a path that is taken when a user-specified amount of time (minutes, hours or days) elapses after `step_activated_time` or `step_accepted_time`. At this point, the workflow process is usually escalated to a user who can intervene and take action.

`Step_activated_time` is the time that iTRAC activates this step within the workflow process. `Step_accepted_time` is the time when a user accepts (or takes ownership) of the worklist item for this step.

If the alert time period passes without the step being completed, the workflow process branches into two active paths. The original step remains active for user intervention. The alert path is also initiated. For example, the alert path might escalate the workflow process to the attention of a supervisor, although the main path is still open and the original owner still has the option to complete the worklist item. Another example is that if a command is taking too long to run, you might want to alert an analyst to investigate the delay or possibly run the command manually.

Alert transitions can be set for a Manual Step or a Command Step. `Step_accepted_time` is only relevant for Manual Steps and should not be selected for a Command Step.

This transition is represented by a yellow line.

To add an Alert Transition:

- 1 Open the Process Builder.
- 2 Select an existing Decision step, right-click and select Add Transition.

- 3 Select the Transition type Alert from the list.
- 4 Specify the destination Step.
- 5 Click Set to provide the Alert details. Alert details window displays.
- 6 Specify the Alert Time value, in minutes, hours, or days. Click OK.
- 7 Provide a description for your transition and click OK.

5.6.6 Error Transition

An Error transition leads to a path that is taken if an automated step cannot successfully complete. Error transitions can be used for Command, Mail, and Activity Steps (for example, if a Command Step fails to execute).

Error Transitions should typically lead to some kind of notification. For example, an Error Transition might lead to a Manual Step in which the user is instructed to manually run a process that previously failed.

NOTE: The Error transition is only taken if the iTRAC call to the Command, Mail, or Activity Step fails. If there is an internal error with the Command script or the mail server fails, this does not satisfy the conditions for an Error transition.

Only the destination Step can be specified, along with a description.

To add an Error Transition:

- 1 Open the Process Builder.
- 2 Select an existing Decision step, right-click and select Add Transition.
- 3 Select the Transition type Error from the list.
- 4 Specify the destination Step.
- 5 Provide a description for this step and click OK.

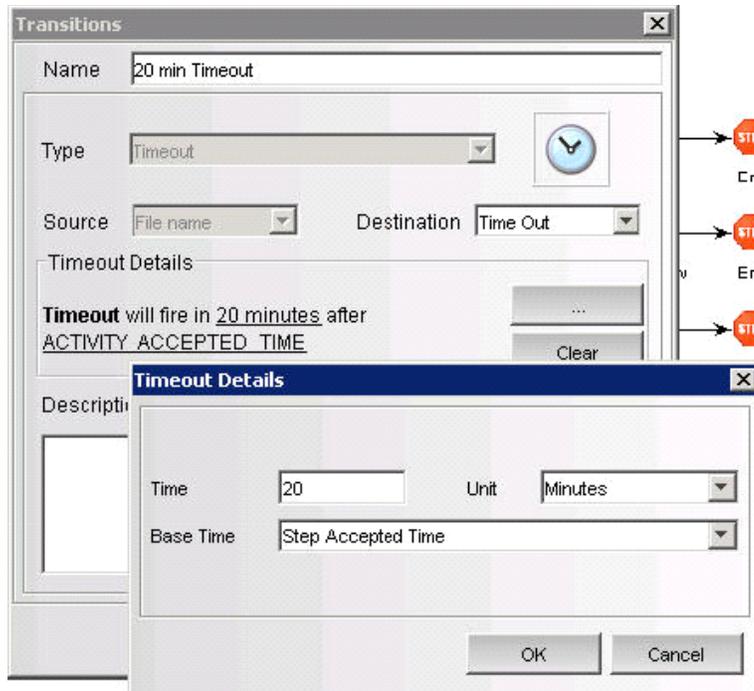
5.6.7 Managing Transitions

After creating a transition, you can edit or delete the transition.

Modifying Transitions

To edit a Transition:

- 1 Click the iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight an existing template, click View/Edit. iTRAC Process Builder window displays.
- 4 Double-click an existing transition line. The Transitions window displays.
- 5 Edit the transition as needed.
- 6 If you are editing an expression from a decision step, click ... button and double-click the expression.



- 7 Edit as needed.
- 8 Click OK until you exit the Transitions window.
- 9 Click Save.

Deleting Transitions

To Delete a Transition:

- 1 Click iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Template Manager.
- 3 Highlight an existing template, click View/Edit. iTRAC Process Builder window displays.
- 4 Select an existing step, right-click, and select Remove Transition.
- 5 In the Alert Message window, click Yes.

5.7 Activities

An Activity is very similar to a Command Step, except that Activities are reusable and cannot use input or output variables. The Activities pane shows a library of user-defined, reusable Activities that can reduce the amount of configuration necessary when building Templates.

Activities are exported or imported as xml files. These files can be exported or imported from one system to another.

Figure 5-3 Activity Pane



iTRAC Activities can be used in iTRAC templates to define a workflow step, or they can be manually executed from within an Incident. Sentinel provides three types of actions that can be used to build Activities:

- ◆ Incident Command Activity
- ◆ Incident Internal Activity
- ◆ Incident Composite Activity

5.7.1 Incident Command Activity

An Incident Command Activity enables you to launch a specific command with or without arguments. The following fields from the incident associated with the workflow process can be used as input to the command:

-
- | | |
|--------------------------|---|
| ◆ DIP [Target IP] | ◆ SIP [Initiator IP] |
| ◆ DIP : Port | ◆ SIP : Port |
| ◆ RT1 (DeviceAttackName) | ◆ Text (incident information in name value pair format) |
-

NOTE: The command (or a batch file or script that refers to the command) must be stored in the %ESEC_HOME%\config\exec or \$ESEC_HOME/config/exec directory on the iTRAC workflow server, usually the same machine where the Data Access Server (DAS) is installed.

5.7.2 Incident Internal Activity

An Incident Internal Activity enables you to mail and/or attach information from the Sentinel database to the incident associated with the workflow process. Each of these options has a prerequisite:

- ◆ **Vulnerability for the Initiator IP address (SIP) or the Target IP address (DIP):** This requires that you run a vulnerability scanner and bring the results of the scan into Sentinel using a Vulnerability (or “information”) Collector
- ◆ **Advisor attack-related data:** This requires the purchase and installation of the optional Advisor data subscription service.
- ◆ **Asset data:** This requires that you run an asset management tool such as NMAP and bring the results into Sentinel using an Asset Collector.

To send mail messages from within the Sentinel Control Center, you must have an SMTP Integrator that is configured with connection information and with the property SentinelDefaultEMailServer set to “true”.

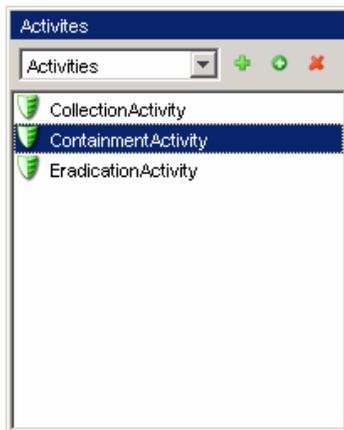
5.7.3 Incident Composite Activity

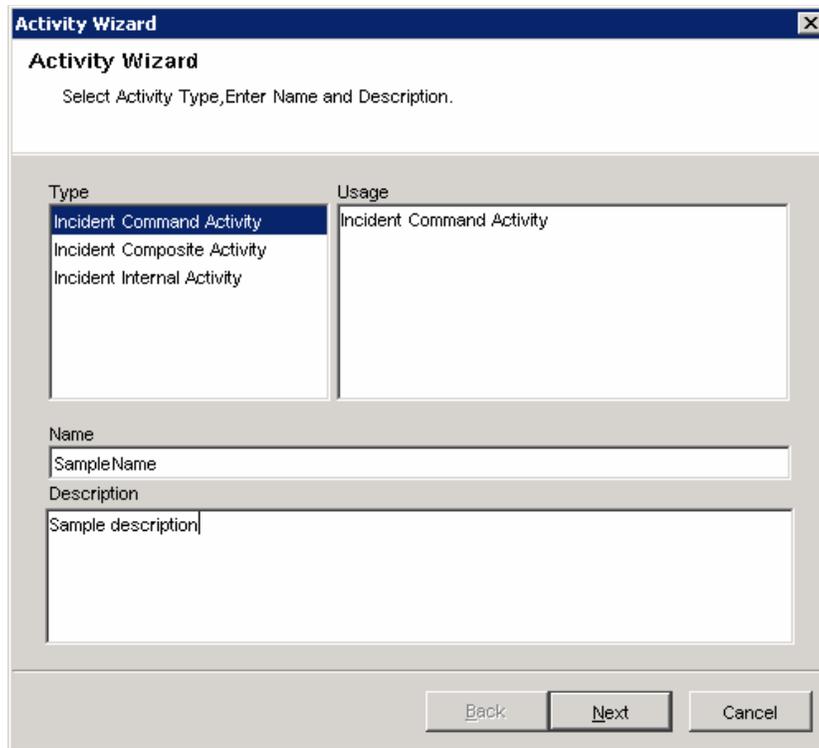
An Incident Composite Activity enables combine one or more existing Command and Internal activities.

5.7.4 Creating iTRAC Activities

To create an iTRAC Activity:

- 1 Click iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Activity Manager or click the Add button in the Activity Pane.
- 3 Highlight an existing activity and click > Add button. Activity Wizard window displays.
- 4 Select an Activity type: Command, Internal, or Composite.
- 5 Provide a name and description for this activity. Click Next.





6 Configure the necessary settings for the type of activity you chose.

- ◆ Incident Command Activity
 - ◆ In the Command Arguments Wizard, specify the Command.
 - ◆ Provide the Arguments for this command. You can select None, Incident Output (Values from the Drop-down list), or provide Custom values.

The screenshot shows a dialog box titled "Activity Wizard" with a sub-title "Command Arguments Wizard". The main instruction is "Provide command name and select required command argument type." The dialog contains the following fields and controls:

- Command:** A text input field.
- Arguments:** A section with three radio button options:
 - None
 - Incident Output: This option is selected, and it is associated with a dropdown menu currently showing "DIP".
 - Custom: This option is associated with a large text area and three small icons (up, list, down) on its right side.
- Description:** A text area with a blue "Description" label above it.
- Buttons:** "Back", "Next", and "Cancel" buttons are located at the bottom right of the dialog.

- ◆ Click Next.
- ◆ You can configure an Incident Command Activity to email the output to a specific address and/or attach the output to the incident associated with the workflow process in this window.
- ◆ Select Mail and specify the To and From email address and Subject.

Activity Wizard

Command Activity Mail and Attachment Wizard

Select required attachment options and provide the necessary mail details.

Mail

To :

From :

Subject :

Attach to Incident

Description

- ◆ Select Attach to Incident, if required.
- ◆ Click Next.
- ◆ View and confirm the details you chose in the Summary page and click Finish.
- ◆ Incident Internal Activity
 - ◆ In the Command Arguments wizard, specify the Command.
 - ◆ Provide the Arguments for this command. You can select None, Incident Output (Values from the Drop-down list), or specify Custom values.

Activity Wizard

Internal Activity Mail and Attachment Wizard

Select required mails and attachments.

Mail and Attach

Mail	Attach	
<input type="checkbox"/>	<input type="checkbox"/>	Vulnerability
<input type="checkbox"/>	<input type="checkbox"/>	Advisor Data
		SIP

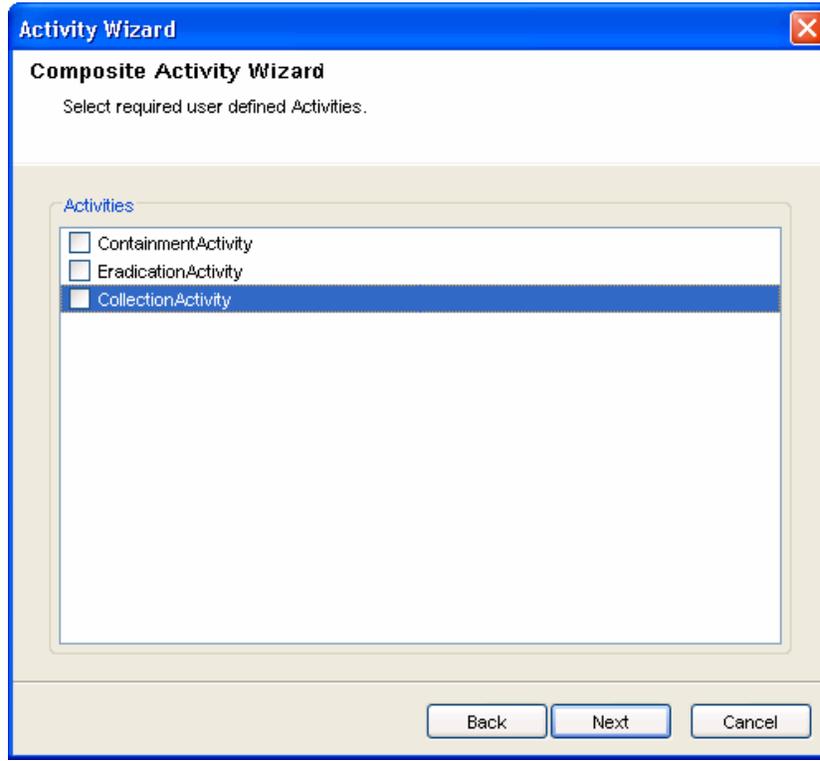
Description

Back Next Cancel

Click Next.

- ◆ Select your options (Mail and attach).
- ◆ If you select Mail, you are prompted to provide To, From email address and Subject. Provide this information and click Next.
- ◆ View and confirm the details you chose in the Summary page and click Finish.

- ◆ Incident Composite Activity
 - ◆ Select the activities from the list of available activities and click Next.



View and confirm the details you chose in the Summary page and click Finish.

5.7.5 Managing Activities

After creating an Activity, you can modify, import or export it.

Modifying Activities

To modify an Activity:

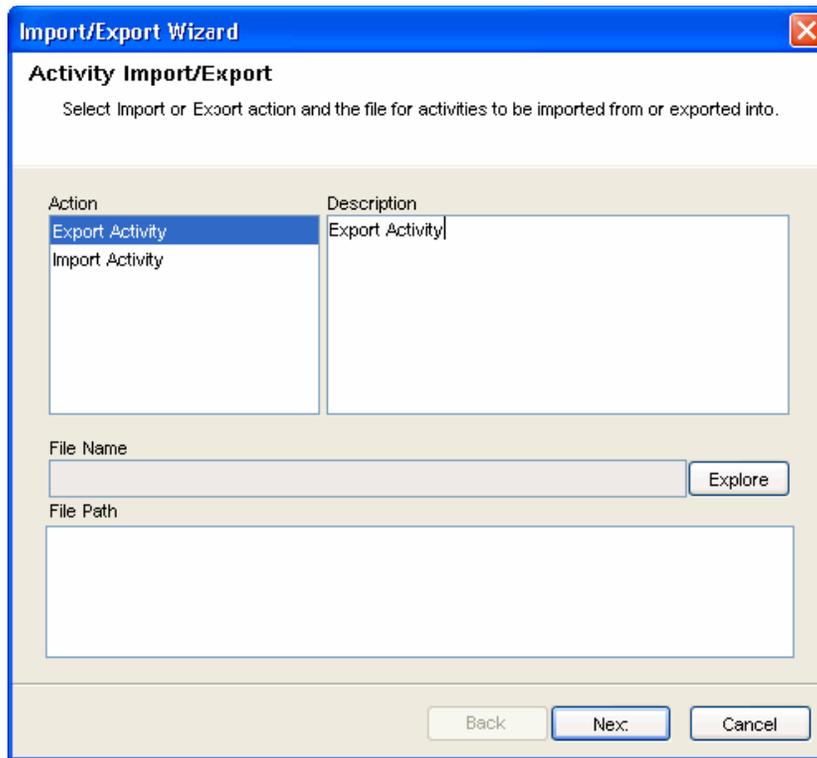
- 1 Click the iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Activity Manager.
- 3 Highlight activity that needs modification and click View/Edit. Edit Activity window displays.
- 4 Edit information in General, Attachment and Mail tabs.
- 5 Click OK.

Exporting Activities

To export an Activity:

- 1 Click iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Activity Manager.

- 3 Click Import/Export Activity icon. Import/Export Wizard window displays.



- 4 Select Export Activity and click Explore.
- 5 Navigate to where you want save your exported file.
- 6 Click Next.
- 7 Select one or more activities to be exported.
- 8 Click Next and click Finish.

Importing Activities

To import an Activity:

- 1 Click iTRAC tab.
- 2 In the Navigator, click iTRAC Administration > Activity Manager.
- 3 Click Import/Export Activity icon. Import/Export Wizard window displays.



- 4 Select Import Activity and click Explore.
- 5 Navigate to your import file. Click Import.
- 6 Click Next. You will see a list of activities that are imported.
- 7 Click Next and click Finish.

5.8 Process Management

Process Management allows you to view the incident's progress in the workflow or terminate a workflow process. Process Management allows you to:

- ◆ Display Status of your Process
- ◆ Start your Process
- ◆ Terminate your Process

Process Execution is the time period during which the process is operational, with process instances being created and managed.

When an iTRAC process is executed or instantiated in the iTRAC server, a process instance is created, managed and eventually terminated by the iTRAC server in accordance with the process definition. As the process progresses towards completion or termination it executes various activities defined in the workflow template based on the criteria for the transitions between them. The iTRAC workflow server processes Manual and Automatic Steps differently.

An iTRAC process must be created with a single associated incident; there is therefore a one-to-one match between iTRAC processes and incidents. Not all incidents are necessarily attached to processes, however.

NOTE: Only one incident can be associated to an iTRAC process instance.

5.8.1 Instantiating a Process

An iTRAC process can be instantiated in the iTRAC server by associating an incident to an iTRAC process by the following three methods

- ◆ Associate an iTRAC process to the incident at the time of incident creation
- ◆ Associate an iTRAC process to incident after an incident has been created
- ◆ Associate an iTRAC process to an incident through correlation

For more information on associating a process to an incident, see [Chapter 4, "Incidents Tab," on page 91](#).

5.8.2 Automatic Step Execution

When the process instance executes an automatic Activity Step, Command Step, or Mail Step, it executes the associated Activity or command defined in the Template, and stores the result in process variables. It then transitions to the next Step in the iTRAC template.

For example, an Activity might be defined to ping a server; when this Activity is executed in a workflow process the Activity runs and attach the results to the associated incident.

5.8.3 Manual Step Execution

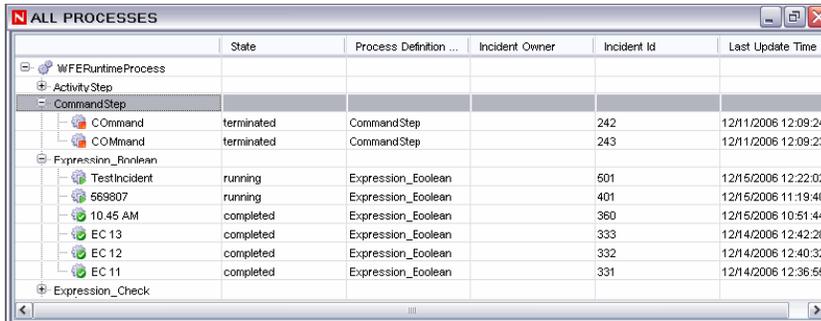
On encountering a Manual Step, the iTRAC server sends out notifications in the form of work items to the assigned resource. If the Step was assigned to a role then a work item is sent to all users within the role. The iTRAC server then waits for the user to complete the work item before proceeding to the next activity.

For more information, see [Section 6.1.1, “Work Item Summary,”](#) on page 145.

NOTE: All Manual Steps must be assigned to a Role, or group of users.

5.8.4 Display Status

The Display Status function is to monitor the progress of a process. As the process instance progresses from one activity the user might track the progress visually by clicking on the Refresh button, the process monitor also provides an audit trail of all the actions performed by the iTRAC server when executing the process.



	State	Process Definition ...	Incident Owner	Incident Id	Last Update Time
WFERuntimeProcess					
Activity Step					
CommandStep					
Command	terminated	CommandStep		242	12/11/2006 12:09:24
COMmand	terminated	CommandStep		243	12/11/2006 12:09:23
Expression_Runlean					
TestIncident	running	Expression_Eoolean		501	12/15/2006 12:22:02
569807	running	Expression_Eoolean		401	12/15/2006 11:19:40
10 45 AM	completed	Expression_Eoolean		360	12/15/2006 10:51:44
EC 13	completed	Expression_Eoolean		333	12/14/2006 12:42:28
EC 12	completed	Expression_Eoolean		332	12/14/2006 12:40:32
EC 11	completed	Expression_Eoolean		331	12/14/2006 12:36:55
Expression_Check					

Activities that are running are represented by  and those completed by  and terminated by  icons respectively.



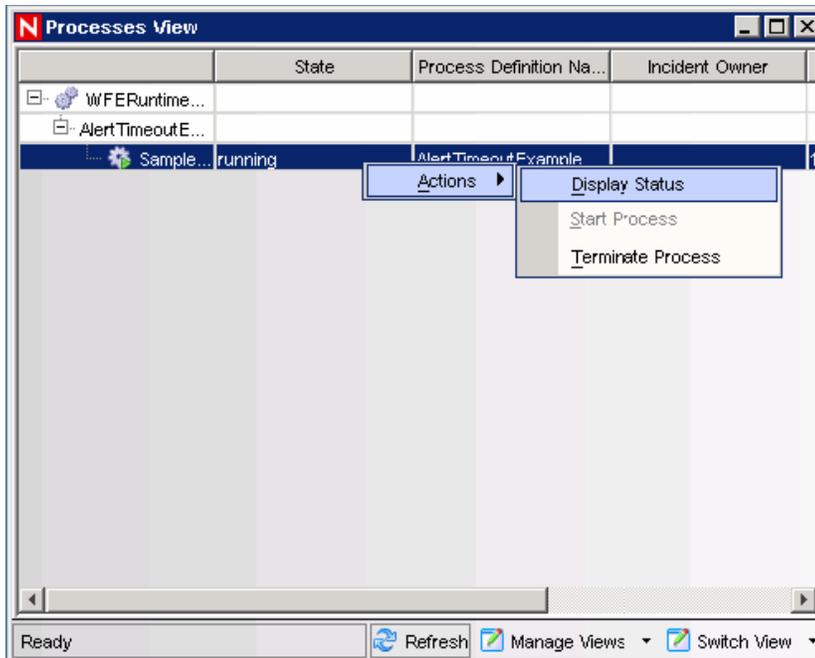
5.8.5 Displaying Status of a Process

To display Status:

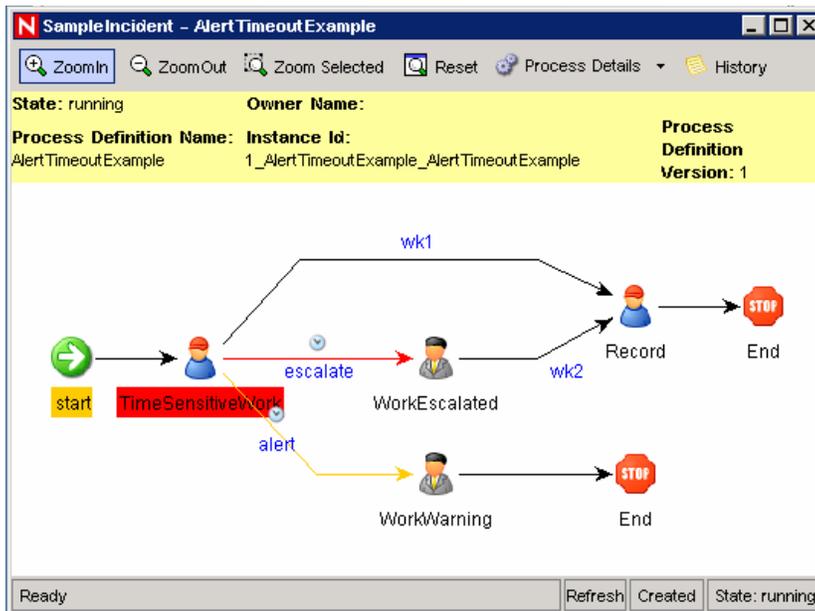
- 1 Click iTRAC tab.
- 2 Click Display Process Manager icon.



- 3 Click down-arrow on the Switch Views button to select a view or create a new view.
- 4 In the Process Manager window, highlight and right-click a process and select Actions > Display Status.



5 The current step is highlighted in red.



6 To close, click X in the upper right corner.

5.8.6 Changing Views in Process Manager

To Change the View in the Process View Manager:

- 1 Click iTRAC tab.
- 2 Click Display Process Manager icon.

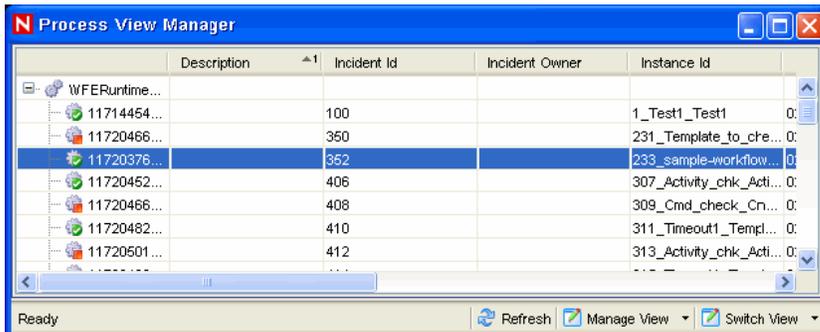
3 Click the drop down list in Manage View and select Edit Current View option.

4 In View Option window you can also set your:

- ◆ Fields
- ◆ Group by
- ◆ Sort
- ◆ Filter
- ◆ Tree Display

Click Apply and Save

The following is view with Tree Display set to Status (running and not started).



The screenshot shows the 'Process View Manager' window with a table of process instances. The table has columns for Description, Incident Id, Incident Owner, and Instance Id. The following table represents the data visible in the screenshot:

Description	Incident Id	Incident Owner	Instance Id
WFERuntime...			
11714454...	100		1_Test1_Test1
11720466...	350		231_Template_to_cre...
11720376...	352		233_sample-workflow...
11720452...	406		307_Activity_chk_Acti...
11720466...	408		309_Cmd_check_Crn...
11720482...	410		311_Timeout1_Templ...
11720501...	412		313_Activity_chk_Acti...

5.8.7 Starting or Terminating a Process

To Start or Terminate a Process:

- 1 Click iTRAC tab.
- 2 Click Display Process Manager icon.



Alternatively, you can select iTRAC > Display Process Manager.

- 3 Click drop down arrow on the Switch Views button to select a view or create a new view.
- 4 In the Process View Manager window, highlight a process, right-click and select Actions > Start Process or Terminate Process.

Work Items

- ♦ Section 6.1, “Understanding Work Items,” on page 145
- ♦ Section 6.2, “Processing a Work Item,” on page 148
- ♦ Section 6.3, “Manage Work Items Of Other Users,” on page 149

6.1 Understanding Work Items

A Work Item is a workflow task assigned to a particular user or role in the iTRAC application. The individual activities to be performed to complete an iTRAC process are listed as work items in Work Item Summary in the Sentinel Control Center. For more information on iTRAC processes, see [Chapter 5, “iTRAC Workflows,” on page 105](#). You can access the work items from any tab in the Sentinel Control Center.

NOTE: To have access to a work item, you must assign it to you or acquire the work item management permissions. If you have Work Item management permission, you can manage work items of other users.

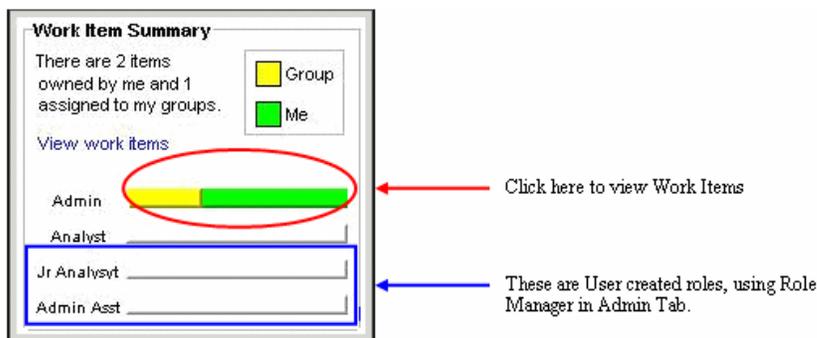
6.1.1 Work Item Summary

The Work Item Summary lists the work items allocated to a user as an individual and as a member of a group; it can be referred as an incident workflow to-do list for a user who is a part of the Incident response process. In the Work Item Summary, you can access the work items and:

- ♦ View the details of a work item
- ♦ Process the work item to complete the task

In the Work Item Summary, work items are grouped by current user and by other users with similar role. The following example is for a user who is a member of the Admin, Analyst, Jr Analyst and Admin Asst group.

Figure 6-1 Work Item Summary



The following is an example of a user who is a member of the Analyst group who has a process assigned to his role (group).

Figure 6-2 Work Item Summary-Example

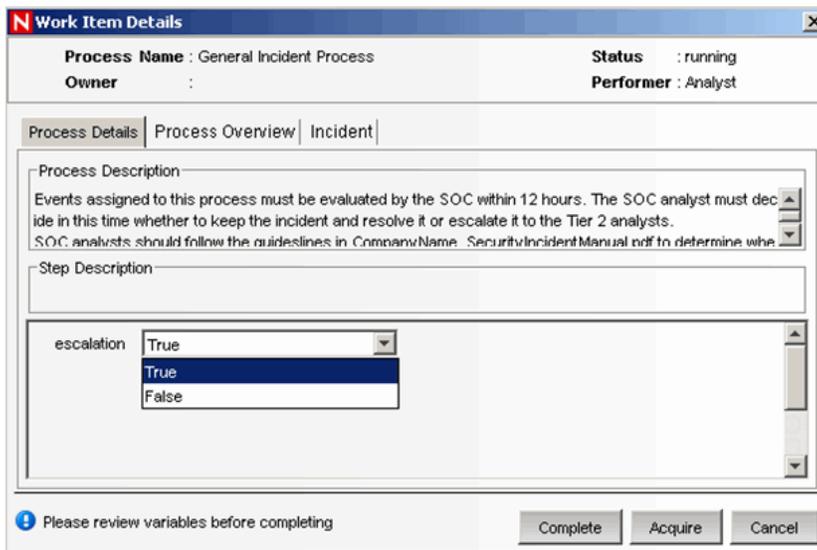


To view a Work Item:

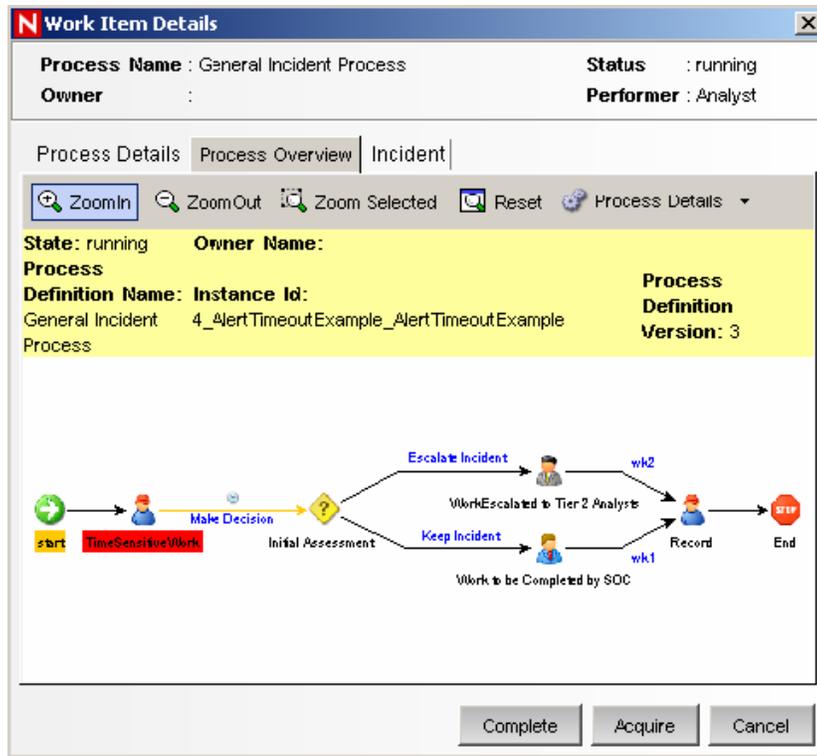
- 1 In the Work Item Summary, click the yellow or green bar. A work item list for the group or the current user displays and shows the name and ID of the incident, the workflow process name, and the step name and description



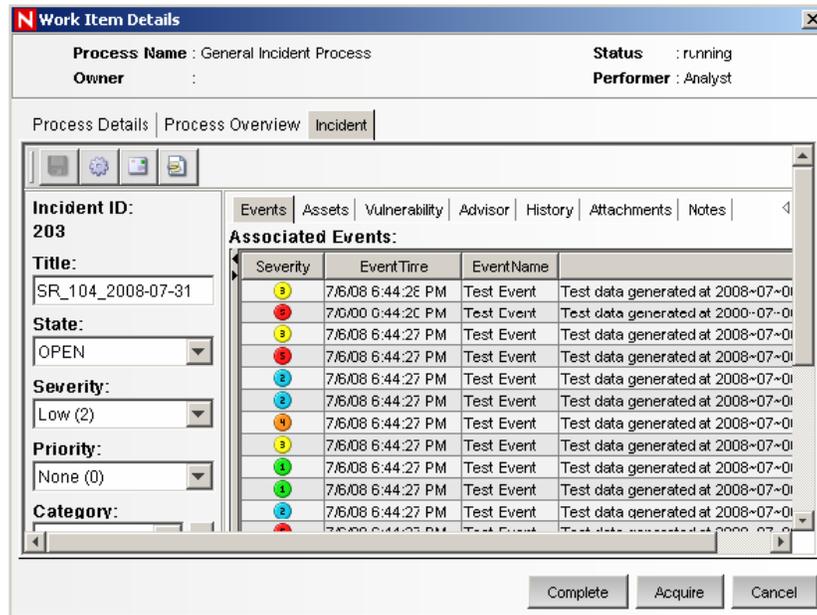
- 2 Double-click any work item and click View Details. Work Item Details window displays and shows the Process Details, including any detailed instructions included by the iTRAC workflow developer and any variables that need to be set in the step.



- 3 Click Process Overview to view an overview of the entire iTRAC process.



4 Click Incident to view the details of the associated incident.



5 To take responsibility for this work item, click Acquire. Otherwise, click Cancel.

NOTE: Any changes to the Incident from this screen must be saved. There is a Save button on the toolbar and Save button if you scroll down to the bottom of the screen.

The information on the Process Details and Process Overview tabs is defined by the iTRAC workflow designer. For more information on creating workflow templates, see [Chapter 5, “iTRAC Workflows,”](#) on page 105.

6.2 Processing a Work Item

A Work Item can be accessed from any part of the main tabbed Sentinel Control Center interface.

- ♦ You can still process a Work Item in a group even if you have logged in as a different user. However, you cannot acquire a step if you have login as a different user.
- ♦ The Work Item remains with the user of a group who has acquired it.
- ♦ Consecutive steps are dependent. If two steps in a row are assigned to the same Role, the user who acquires the first step will also be assigned the second step.
- ♦ Non-consecutive steps are independent. For example, if a workflow proceeds from steps that are assigned to the Tier 1 Analyst group to the Tier 2 Analyst group and then back to the Tier 1 Analyst group, the third step will be available to the entire Tier 1 Analyst group; it is not assigned to the individual user who handled the first step.

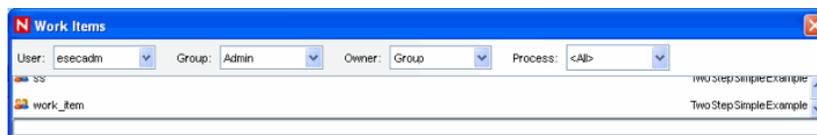
The two stages of processing a work item are

- ♦ Accepting a work item
- ♦ Completing a work item

6.2.1 Accepting a Work Item

To accept Work items:

- 1 In the Work Item Summary, click the yellow or green bar. A work item list for the group or the current user displays.

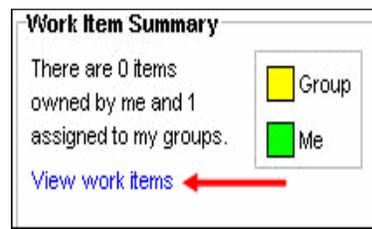


- 2 To assign an iTRAC process to you, highlight the process and click Acquire.

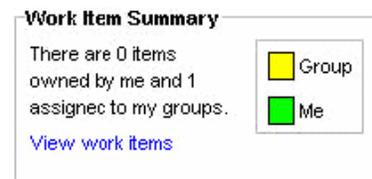


The Work Item Summary changes from yellow to green.

Work item assigned to a group (role)

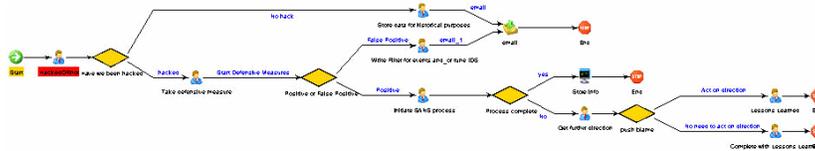


Work item assigned to the user under the Analyst role.



NOTE: When acquiring (accepting) a work item, it is removed from the queue of all other users in the same role. The work item can be returned to the group by clicking Release.

- 3 Click View Details.
- 4 The current step within a Work Item is highlighted in red.



- 5 To take action on the step, click the Process Details tab.
In the case of a manual step and depending on the type of variable (Integer, String, Boolean and Float) assigned to that step, click the down arrow and select a decision. If needed, you can add comments or add an attachment.
In all other cases, the steps are automatic.
- 6 Click Complete to complete the process.

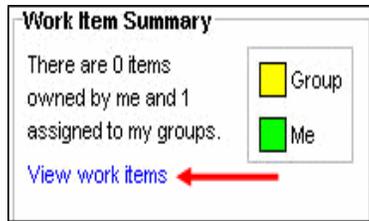
Completing the work item signals the completion of the task to the iTRAC server. The updateable variables from the work item are processed by the server to move to the next step, which depends on how the workflow is defined. The work item is removed from the user's worklist and appears in the worklist of the individual or role associated with the next step in the process.

6.3 Manage Work Items Of Other Users

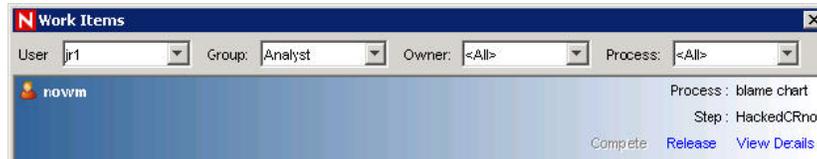
The Administration function allows an administrative user to release a Work Item from a specific user back to everyone in a role. This is beneficial in the event that a Work Item is in already in process but the assigned user cannot complete the work.

To release a Work Item back to a role (Admin):

- 1 Login into Sentinel as a user with iTRAC – Manage Work Items Of Other Users user rights.
- 2 In the Summary pane, click View work items.



3 In the Work Items window, set the following:



- ♦ **User:** Name of the user that has acquired the process
- ♦ **Group:** Name of the Group that the user belongs to. In the above example, the user belongs to the Analyst group.
- ♦ **Owner:** Select either <All> (all processes acquired or not), me (acquired processes) or Group (un-acquired processes).
- ♦ **Process:** Name of the process.

In the above example, all processes acquired by jr1, who belongs to Group Analyst, with all processes listed.

4 To release the Work Item, high light the Work item and click Release. Release changes to Acquire (not available).

In this example, only a member of the Analyst group can acquire this Work Item.

Analysis Tab

- ♦ Section 7.1, “Understanding Analysis,” on page 151
- ♦ Section 7.2, “Introduction to the User Interface,” on page 151
- ♦ Section 7.3, “Offline Query,” on page 154

7.1 Understanding Analysis

The Analysis tab allows historical reporting. Historical and vulnerability reports are published on a Web Server, these run directly against the database and they appear on the Analysis and Advisor tabs on the Navigator pane.

Analysis tab also provides Offline Query and Crystal Reports Server to view pre-defined reports. In Offline Query you can save and generate the queries offline. This helps in optimizing network usage as it relieves network from heavy processing when similar queries are triggered. Offline Query helps you in ad hoc reporting and with Crystal Reports Server you can view predefined reports. You can also customize reports to meet your requirements.

NOTE: Sentinel is integrated with Crystal Reports Server to generate and display reports. The administrator must configure the location of the Crystal Reports Server that publishes reports in the Crystal Report Configuration window of the Admin tab. The Navigator window on the Analysis tab shows a list of available reports.

In order to run the report templates, you must have Crystal Reports Server Edition installed and your Sentinel Control Center configured to access that server. For more information, see “[Crystal Reports for Windows](#)” or “[Crystal Reports for Linux](#)” in *Sentinel 6.1 Installation Guide*.

NOTE: You must have proper permissions to use Analysis tab. If this permission is not assigned, Analysis tab is not displayed.

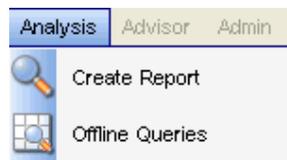
7.2 Introduction to the User Interface

In Analysis, you can see the Create Reports and Offline Queries options.

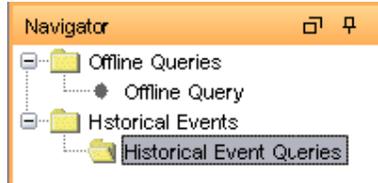
You can navigate to these functions from:

Table 7-1 Analysis Tab -User Interface

The Analysis menu in the Menu Bar



The Navigation Tree in the Navigation Pane



The Toolbar Buttons



7.2.1 Top Ten Reports

The following are the Top 10 reports which are available in Sentinel 6:

- ◆ Top 10 Correlation Rules Triggered
- ◆ Top 10 Destination Host Names
- ◆ Top 10 Destination IP Addresses
- ◆ Top 10 Destination Port Numbers
- ◆ Top 10 Destination User Names
- ◆ Top 10 Destination Event Names
- ◆ Top 10 Source Host Names
- ◆ Top 10 Source IP Addresses
- ◆ Top 10 Source to Destination IP Pairs
- ◆ Top 10 Source User Names
- ◆ Top 10 Virus Names
- ◆ Event Count by Top 10 Assets
- ◆ Event Count by Top 10 Departments
- ◆ Event Count by Top 10 Taxonomy Level 3
- ◆ Incidents by Top 10 Assets
- ◆ Incidents by Top 10 Users

The Top 10 reports are enabled by default, and the following summaries are turned on to enable the Top 10 reports:

- ◆ EventDestSummary
- ◆ EventSevSummary
- ◆ EventSrcSummary

If Top 10 reports are not needed, you can disable these summaries, or you can enable additional summaries in order to use them for reporting. If the summary service is not in use, you can disable it.

To enable/disable Aggregation:

- 1 In Sentinel Control Center, go to Admin > Server Views.
- 2 Right-click DAS Aggregation and select Start/Stop to enable/disable Aggregation.

To enable/disable summaries:

- 1 In Sentinel Control Center, go to Admin > Report Data Configuration.
- 2 Highlight the Summary to enable/disable and click the status (Active/Inactive) of that summary.
- 3 Select Yes to confirm that you want to change the status of the summary.

To enable or disable EventFileRedirectService:

- 1 At your DAS machine, using text editor, open:

For UNIX:

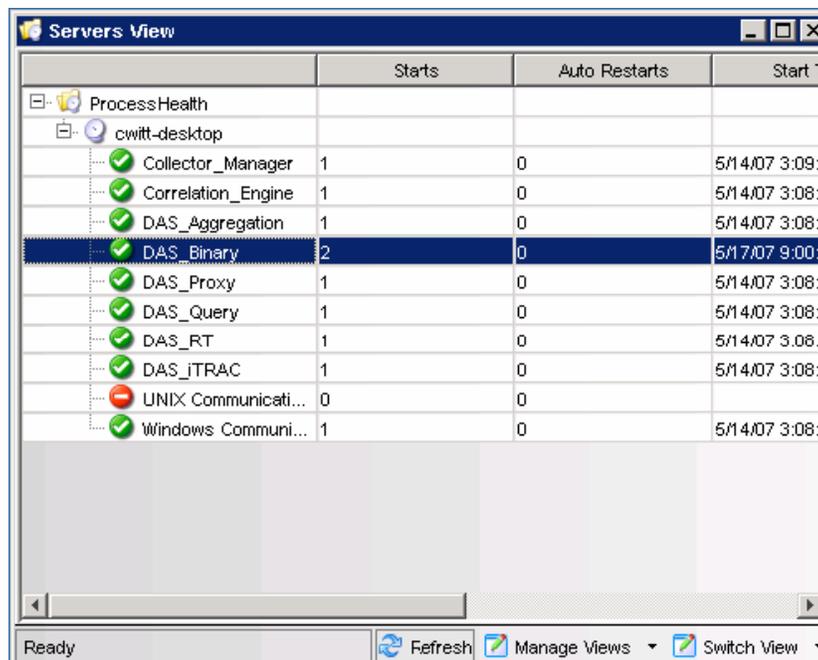
```
$(ESEC_HOME)/config/das_binary.xml
```

For Windows:

```
%ESEC_HOME%\config\das_binary.xml
```

- 2 For EventFileRedirectService, change the status to on or off, as appropriate. For example:

```
<property name="status">off</property>
```
- 3 Log into the Sentinel Control Center as the Sentinel Administrator.
- 4 Go to Admin > Servers View.



- 5 Right-click DAS_Binary and select Restart.

7.2.2 Running a Report from Crystal Reports Server

To run a report:

- 1 Click the Analysis tab.
- 2 In the Analysis Navigator, click a report from the available reports.

NOTE: To run any Top 10 reports, aggregation must be enabled and [EventFileRedirectService](#) in `DAS_Binary.xml` must be set to on. For information on how to enable aggregation, see [Section 11.10, “Report Data Configuration,”](#) on page 262.

- 3 Click Analysis > Create Report or click Create Report.



- 4 Complete the information prompts and click OK. The report displays.

7.2.3 Running an Event Query Report

To create an Event Query report:

- 1 Click the Analysis tab.
- 2 In the Analysis Navigator, open the Historical Events folder.
- 3 Click Historical Event Queries.
- 4 Click Analysis > Create Report or click Create Report icon. An Event Query window displays.
- 5 Set the following:
 - ♦ time frame
 - ♦ filter
 - ♦ severity level
 - ♦ batch size (this is the number of events to view – events display from oldest events to newer events)
- 6 Click Begin Searching.
- 7 To view the next batch of events, click More results icon.
- 8 Rearrange the columns by dragging and dropping them and arrange the sort order by clicking in the column heading.
- 9 When your query is complete, it is added to the list of quick queries in the Navigator.

7.3 Offline Query

Offline Query is most often used to run queries against large amounts of data. Offline Query will continue to run even after the user logs out of the Sentinel Control Center, if necessary.

NOTE: You can view the result of your query only after it is completely processed.

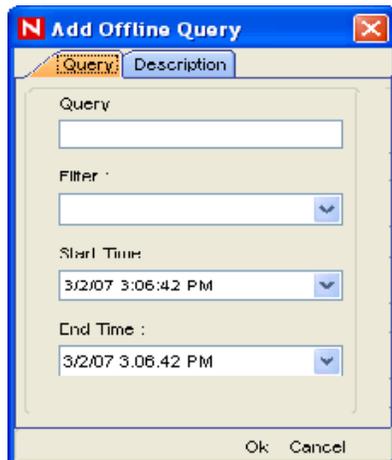
After the query has completely finished processing, the results are available to the user who initiated the Offline Query and other Sentinel users with the same security filter. When you attempt to browse or save the result as HTML or CSV, the data is transferred from the server to the local machine running the Sentinel Control Center.

NOTE: For performance reasons, the result set for Offline Query is limited to 100,000 records. For better results, you must specify a better filter or a smaller time range when creating an Offline Query.

7.3.1 Creating an Offline Query

To create an Offline Query:

- 1 Click Analysis on the Menu Bar. The Offline Query window displays. Alternatively, you can click Offline Query button on the Tool Bar.
- 2 In the Offline Query window, Click Add button located on the top left corner of the screen. The Add Offline Query window displays.



- 3 Provide a Query Name. Select an existing filter to be used for generation of offline query. For more information on the selection and creation of filters see [Chapter 2, “Active Views Tab,” on page 33](#).
- 4 Select the Start Date and End Date for which you want to generate an offline query.
- 5 Specify the description in the Description Tab.
- 6 Click OK. The Offline Query gets listed in the Offline Query window.

7.3.2 Viewing, Exporting or Deleting an Offline Query

To view, export or delete an Offline Query:

- 1 Click Analysis on the Menu Bar. The Offline Query window displays. Alternatively, you can click Offline Query button on the Tool Bar.

- 2** In the Offline Query window, select an offline query. The following options are available:
- ♦ **Browse:** Click Browse to view the output of the Offline Query in the Active Browser window.
 - ♦ **CSV:** Click CSV to generate a Comma Separated Value file with the queried information.
 - ♦ **HTML:** Click HTML to generate an HTML file with the queried information.
 - ♦ **Delete:** Click Delete to delete the Offline Query. Confirmation message alert displays. Click Yes to delete.
 - ♦ **Details:** Click Details to view the details of the Offline Query as specified when adding the Query.

Advisor Usage and Maintenance

8

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 8.1, “Understanding Advisor,” on page 157](#)
- ◆ [Section 8.2, “Understanding Exploit Detection,” on page 158](#)
- ◆ [Section 8.3, “Introduction to the Advisor User Interface,” on page 160](#)
- ◆ [Section 8.4, “Downloading the Advisor Feed,” on page 164](#)
- ◆ [Section 8.5, “Viewing the Advisor Status,” on page 165](#)
- ◆ [Section 8.6, “Viewing the Advisor Data,” on page 167](#)
- ◆ [Section 8.7, “Resetting the Advisor Password,” on page 168](#)
- ◆ [Section 8.8, “Deleting the Advisor Data,” on page 168](#)
- ◆ [Section 8.9, “Advisor Audit Events,” on page 168](#)

8.1 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: With Sentinel 6.1 SP2 or later, the initial Advisor data feed is installed by default on the Sentinel 6.1 server at `$ESEC_HOME/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.

8.2 Understanding Exploit Detection

- ♦ [Section 8.2.1, “How Exploit Detection Works,” on page 158](#)
- ♦ [Section 8.2.2, “Generating the Exploit Detection File,” on page 160](#)
- ♦ [Section 8.2.3, “Viewing the Events,” on page 160](#)

8.2.1 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 MSSP Customer Name. The MSSP Customer Name is a namespace identifier that prevents overlapping IP ranges from matching incorrectly.
- ♦ 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 Novell 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 8-1 Supported Products and the Associated Device Types

Supported Products	Device Type	RV31 Value
Cisco Secure IDS	IDS	Secure
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

Supported Products	Device Type	RV31 Value
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 Novell populate these variables by default.

- ◆ In intrusion detection systems and vulnerability Collectors, the RV31 (DeviceName) variable in the event must be set to the value in the RV31 column in [Table 8-1](#). This string is case sensitive.
- ◆ In the intrusion detection systems Collector, the DIP (Destination or Target IP) must be populated with the IP address of the machine that is being attacked.
- ◆ In the intrusion detection systems Collector, RT1 (DeviceAttackName) must be set to the attack name or attack code for that intrusion detection system.
- ◆ In the intrusion detection systems and vulnerability Collectors, RV39 (MSSPCustomerName) value must be populated. For a standard corporation, the value can be anything. For a Managed Security Service Provider (MSSP), the customer 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.

8.2.2 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 MSSP customer name are mapped to the Advisor product name and MSSP customer name. If the events match successfully, the exploit information (IP address, Device Name, Attack Name, and MSSP Customer Name) is updated in the `exploitdetection.csv` file in the `ESEC_HOME/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 `das_query.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 `das_query` services after you change the time.

8.2.3 Viewing the Events

To view events that indicate a possible exploitation, create an Active View with a filter that has the Vulnerability value set to 1.

Within an event, the values in the Vulnerability field convey 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 in Active Views, see [Section 2.4, “Viewing Real Time Events,”](#) on page 37.

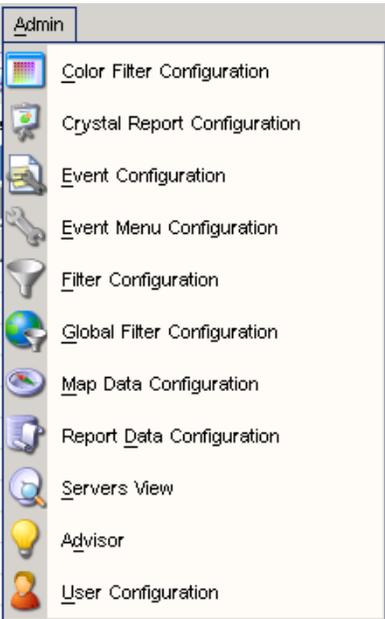
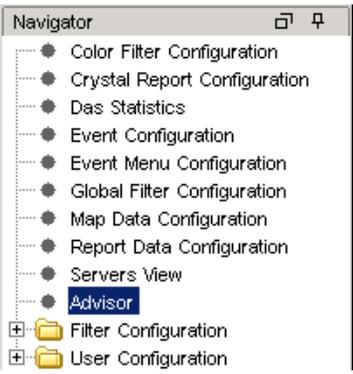
8.3 Introduction to the Advisor User Interface

- ♦ [Section 8.3.1, “The Advisor Window,”](#) on page 161
- ♦ [Section 8.3.2, “Processing the Advisor Feed,”](#) on page 162
- ♦ [Section 8.3.3, “Configuring the Advisor Products for Exploit Detection,”](#) on page 163

Ensure that you have Advisor Configuration permission to access the Advisor window.

You can access the Advisor user interface through one of the following methods:

Table 8-2 Navigating to Advisor

Location	User Interface
The <i>Admin</i> menu in the menu bar	
The Navigation tree in the Navigation pane	
Admin Toolbar	The Advisor icon  .

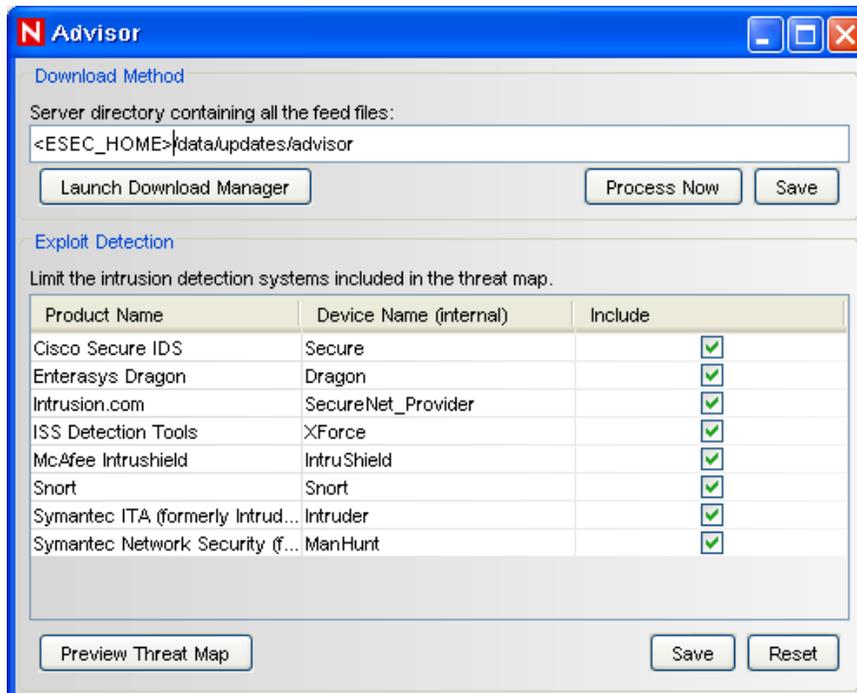
8.3.1 The Advisor Window

The Advisor window has two sections:

- ◆ **Download Method:** Enables you to process the Advisor feed files manually and launch the Download Manager feature to configure the Sentinel 6.1 server for automated processing of the feed files. For more information on processing the Advisor feed, see [Section 8.3.2, “Processing the Advisor Feed,”](#) on page 162.
- ◆ **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 8.3.3, “Configuring the Advisor Products for Exploit Detection,”](#) on page 163.

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 8.3.2, “Processing the Advisor Feed,”](#) on page 162.

Figure 8-1 Advisor Window



8.3.2 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.

- ◆ [“Processing the Feed Files Manually”](#) on page 162
- ◆ [“Processing the Feed Files Automatically”](#) on page 163

Processing the Feed Files Manually

- 1 In the Advisor window, select the directory where you downloaded the latest Advisor feed files.

The initial Advisor feed is loaded at `ESEC_HOME/data/updates/advisor`.

- 2 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.

- 3 (Optional) Click *Save* to save the location of the Advisor directory.

Processing the Feed Files Automatically

You can use the Download Manager to configure the Sentinel 6.1 server to automatically process the feed files after they are downloaded.

- 1 In the Advisor window, click *Launch Download Manager*. For more information, see [Chapter 9, “Download Manager,” on page 169](#).

8.3.3 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 Select the products that need to be included for Exploit Detection by selecting the corresponding check box.
- 2 (Conditional) To remove any product from the list, deselect the corresponding check box.
- 3 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 160](#).
- 4 (Optional) Click *Reset* to undo the changes made to the Exploit Detection products list.

For more information on exploit detection, see [Section 8.2, “Understanding Exploit Detection,” on page 158](#).

Viewing the 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*.

NOTE: This list is blank unless the `exploitdetection.csv` file has been generated.

Figure 8-2 Preview Threat Map

Based on the latest vulnerability scan, your assets are vulnerable to the following attacks. (The List below covers 90-100% of all the attacks)

IP	Device Name	Attack Name	MSSP Name
10.10.0.0	XForce	8812	default
10.10.0.0	Snort	ICMP Traceroute	default
10.10.0.0	Snort	ICMP traceroute	default
10.10.0.0	IntruShield	NETBIOS-SS: Net...	default
10.10.0.0	IntruShield	NETBIOS-NS: Sect...	default
10.10.0.0	XForce	3992	default
10.10.0.0	ManHunt	NetBIOS ADMIN N...	default
10.10.0.0	Snort	WEB-MISC nessus...	default
10.10.0.0	IntruShield	NETBIOS-SS: \PIP...	default
10.10.0.0	Snort	WEB-MISC TRACE...	default
10.10.0.0	Snort	FTP EXPLOIT STA...	default
10.10.0.0	Snort	FTP EXPLOIT STA...	default

Refresh Refreshed At:11/30/09 2:43:49 AM

8.4 Downloading the Advisor Feed

To access the updated Advisor feed, you must download the feed and process the downloaded feed to load 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 8.4.1, “Configuring the Sentinel Server for Automated Downloads,”](#) on page 164
- ◆ [Section 8.4.2, “Downloading the Advisor Feed Manually,”](#) on page 165

8.4.1 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 Download Manager, see [Chapter 9, “Download Manager,”](#) on page 169.

To launch Download Manager from the Advisor window:

1 Open the Advisor window by doing one of the following:

- ♦ Click *Admin > Advisor*.
- ♦ Select *Advisor* in the Navigation pane.
- ♦ Click the  icon on the toolbar.

2 Click *Launch Download Manager*.

The Download Manager window is displayed. For more information on Download Manager, see [Chapter 9, “Download Manager,”](#) on page 169.

8.4.2 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 6.1 server.

To process the downloaded feed, you must provide the location where you have saved the feed in *Admin > Advisor* window. The default location is `$ESEC_HOME/data/updates/advisor`.

8.5 Viewing the Advisor Status

The Advisor Status window lists the products Novell supports for Advisor and also displays the status of the last five feed files that have been processed or are being processed.

NOTE: Ensure that you have permissions to view the Advisor Status window.

To view the Advisor Status window: click the *Advisor* tab.

The Advisor Status window displays the Advisor information only if the feed files are loaded into the database.

Figure 8-3 Advisor Status

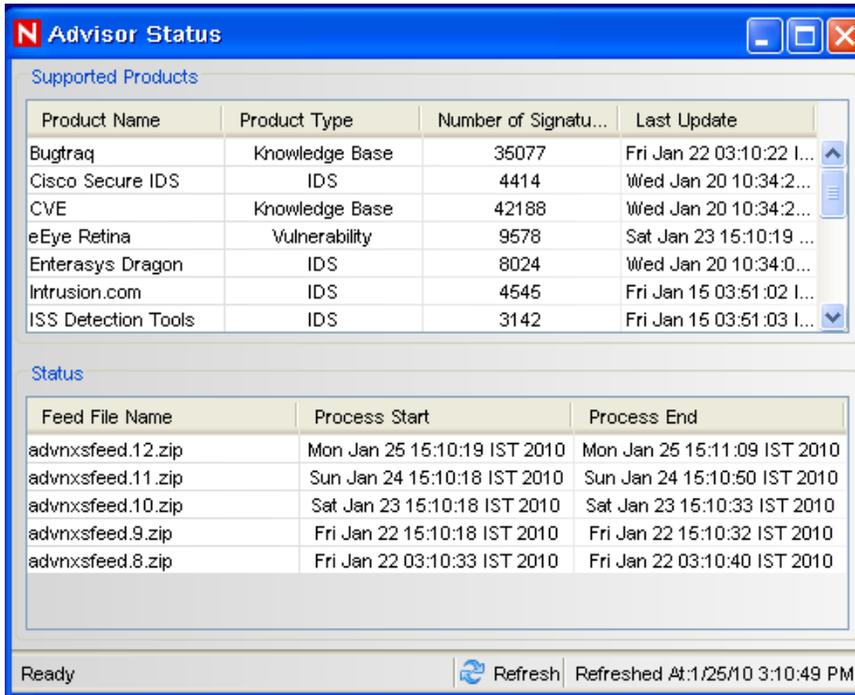


Table 8-3 Advisor Status

Fields	Description
Product Name	Name of the product supported by Novell 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.

8.6 Viewing the Advisor Data

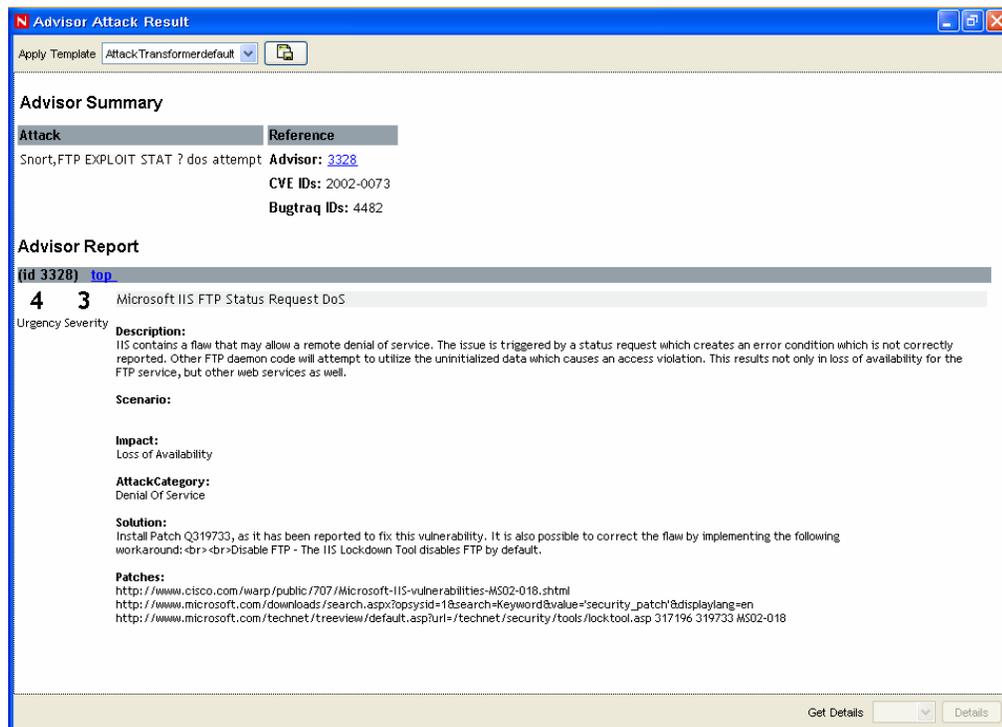
The following are the prerequisites to view the Advisor data:

- ♦ 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:

- ♦ *Active Views* tab
 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 *Create Incident > Advisor* or click *Analyze > Advisor Data*.

Figure 8-4 *Advisor Data*



- ♦ *Analysis* tab
 1. In the Sentinel Control Center, click *Analysis > Offline Queries*.
 2. Add an offline query that filters events with the Vulnerability value set to 1.
- For more information on adding an offline query, see [Section 7.3, "Offline Query,"](#) on [page 154](#).

8.7 Resetting the Advisor Password

If you have configured automated downloads for Advisor and if your Novell eLogin password changes, then 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 *Tools > 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 Download Manager, see [Chapter 9, “Download Manager,” on page 169](#).

- 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.

8.8 Deleting the Advisor Data

You can delete the Advisor data from the Sentinel database by running the `clean_database` script. For more information on running the `clean_database` script, see [Section 13.5, “Database Backup and Cleanup,” on page 295](#).

8.9 Advisor Audit Events

For information on Advisor audit events, see [Section B.1, “Advisor Audit Events,” on page 465 in Appendix B, “System Events for Sentinel,” on page 465](#).

The Download Manager enables you to configure the Sentinel 6.1 server for automated download and processing of the 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 6.1 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. However, for Advisor, you must purchase an additional license from Novell to download the updated Advisor feed.

- ♦ [Section 9.1, “Understanding the Download Manager User Interface,” on page 169](#)
- ♦ [Section 9.2, “Creating a Download Configuration,” on page 170](#)
- ♦ [Section 9.3, “Editing a Download Configuration,” on page 172](#)
- ♦ [Section 9.4, “Downloading the Feed Instantly,” on page 173](#)
- ♦ [Section 9.5, “Deleting a Download Configuration,” on page 173](#)
- ♦ [Section 9.6, “Audit Events for the Download Manager,” on page 173](#)

9.1 Understanding the Download Manager User Interface

You can access the Download Manager GUI from the *Tools* menu and also by clicking the  shortcut icon in the toolbar.

NOTE: Ensure that you have permission to access the Download Manager feature. For more information on user permissions, see “[Administration](#)” in the *Sentinel 6.1 Reference Guide*.

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 Advisor feed, by specifying the login credentials and other details, and activate the download configuration.

Figure 9-1 Download Manager

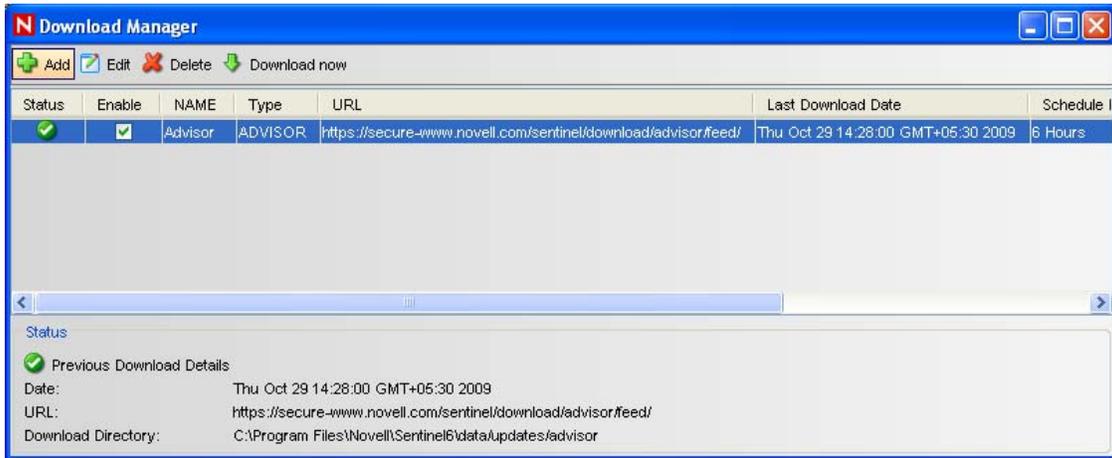


Table 9-1 Download Configuration Status

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.

9.2 Creating a Download Configuration

- 1 Open the Download Manager window by doing one of the following:
 - ♦ Click *Tools > Download Manager*.
 - ♦ Click the icon on the toolbar.
- 2 Click *Add* to configure the download feed.

3 Specify the following information:

Option	Description
<i>Repository Name</i>	<p>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.</p> <p>For example, to download Advisor data, specify the repository name as Novell Advisor.</p>
<i>URL</i>	<p>URL where the download feed is located.</p> <p>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/).</p> <hr/> <p>NOTE: 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/). However, the manual download URL does not work in Download Manager.</p>

Option	Description
<i>Anonymous</i>	Select the check box to download the information as an anonymous user. If <i>Anonymous</i> is selected, the <i>Username</i> and <i>Password</i> fields are disabled. You can only access the URLs that do not require authentication.
<i>Username and Password</i>	Specify valid credentials to log in to the URL of the repository.
<i>Download Directory</i>	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. NOTE: If the specified directory already has some existing files that are not in sync with the Sentinel server files, these files are deleted when the new download starts.
<i>Enable</i>	Select this check box to activate the configuration to download the feed.
<i>Schedule Interval</i>	Specify the time interval for the download by selecting one of the following options from the drop-down list: <ul style="list-style-type: none"> ◆ 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.
<i>Feed Type</i>	Select Advisor from the drop-down list to notify the Advisor processes on the Sentinel 6.1 server that the Advisor feed is downloaded.

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 login credentials.

5 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.

9.3 Editing a Download Configuration

1 Open the Download Manager window by doing either of the following:

- ◆ Click *Tools > Download Manager*.
- ◆ Click the  icon on the tool bar.

2 Select the download configuration that you want to edit, then click *Edit*.

The Edit window is displayed.

- 3 Edit the required information.
- 4 (Optional) Click *Validate* to validate the URL and the login credentials.
- 5 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.

9.4 Downloading the Feed Instantly

You can instantly download the feed for a selected download configuration, regardless of the time interval scheduled for the selected download configuration.

- 1 Open the Download Manager window by doing either of the following:
 - ♦ Click *Tools > Download Manager*.
 - ♦ Click the  icon on the tool bar.

- 2 Click *Download Now*.

The Advisor data feed is downloaded if you have specified the appropriate URL.

NOTE: The *Download Now* button is disabled if the download is in progress for the selected configuration.

9.5 Deleting a Download Configuration

- 1 Open the Download Manager window by doing either of the following:
 - ♦ Click *Tools > Download Manager*.
 - ♦ Click the  icon on the tool bar.

- 2 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.

- 3 Click *Yes* to confirm deletion.

The selected configuration is deleted.

9.6 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 [Section B.2, “Download Manager Audit Events,”](#) on page 466.

You can create appropriate correlation rules to receive notifications of these audit events through e-mail. For more information on creating correlation rules, see [Section 3.3, “Correlation Rules,”](#) on page 65.

- ◆ [Section 10.1, “Understanding Event Source Management,” on page 175](#)
- ◆ [Section 10.2, “Introduction to the User Interface,” on page 176](#)
- ◆ [Section 10.3, “Live View,” on page 183](#)
- ◆ [Section 10.4, “Components of Event Source Hierarchy,” on page 188](#)
- ◆ [Section 10.5, “Debugging,” on page 207](#)
- ◆ [Section 10.6, “Export Configuration,” on page 215](#)
- ◆ [Section 10.7, “Import Configuration,” on page 217](#)
- ◆ [Section 10.8, “Event Source Management Scratchpad,” on page 221](#)
- ◆ [Section 10.9, “Comparison between Sentinel 5.x and Sentinel 6.0,” on page 221](#)

10.1 Understanding Event Source Management

The Event Source Management (ESM) panel provides a set of tools to manage and monitor connections between Sentinel and the event sources which are providing data to Sentinel. The graphical interface shows at a glance the current event sources and the software components that are processing data from that event source. Each component can be easily deployed to quickly integrate the devices in the enterprise, and then can be monitored in real time within the ESM interface.

NOTE: You need to have appropriate permissions to access this tab. Only a Sentinel Administrator has controls to enable/disable access to the ESM panel for other users.

Through ESM, you can:

- ◆ Add/edit connections to event sources using Configuration wizards.
- ◆ View the real-time status of the connections to event sources.
- ◆ Import/export configuration of event sources to or from Live View/Scratchpad.
- ◆ View and configure Connectors and Collectors that are installed with Sentinel
- ◆ Import/export Connectors and Collectors from or to a centralized repository
- ◆ Monitor data flowing through the Collectors and Connectors
- ◆ Debug Collectors
- ◆ Design, configure and create the components of the Event Source Hierarchy, and execute required actions using these components. For more information, see [Section 10.3, “Live View,” on page 183](#).

10.1.1 Plugin Repository

A plugin is a package of code that provides additional functionality to Sentinel; ESM leverages two types of plugins called Collectors (Scripts) and Connectors. Implementing these features as plugins allows Novell to deliver enhancements to our event collection system without the need to deliver a new version of the Sentinel platform.

- ♦ **Collector:** The Collector plugin adds the ability to parse raw data from an Event Source. This is similar to the Collector in Sentinel 5, however in Sentinel 6 the plugin also provides additional meta-data to enable the ESM panel to prompt the user for parameter values as well as enable ESM to automatically select supported connection methods that work well with the Collector. This meta-data is added to the Collector plugin by the plugin developer. Collectors are written using JavaScript or our legacy scripting language and as such are sometimes called “Scripts.”
- ♦ **Connector:** In Sentinel 6, all Connectors are pluggable. A Connector plugin contains both the implementation of the connection mechanism used to gather data from an event source as well as the GUI screens needed to configure the Connector. This allows for a user to easily add additional Connectors to Sentinel.
- ♦ **Hot Fixes and New Functionality:** In the future, some Sentinel enhancements and defect fixes might be available as plugins.
- ♦ After you import a plugin into Sentinel, it is centrally stored in the Plugin Repository. The appropriate Sentinel component on other machines automatically starts using the plugin.

Auxiliary Files

Some plugins, such as database Connectors, require one or more auxiliary files in order to function. Auxiliary files are typically files that can not be shipped by Novell within the standard plugin such as user-specific configuration files or third party libraries that require specific licenses. In all cases the documentation for the plugin will include detailed instructions about which auxiliary files are necessary and where they can be obtained.

To add an Auxiliary File to a specific plugin:

- 1 Select the plugin to which the Auxiliary file will be added and then click Add Auxiliary File.
- 2 A wizard guides users through the process of importing the Auxiliary file.

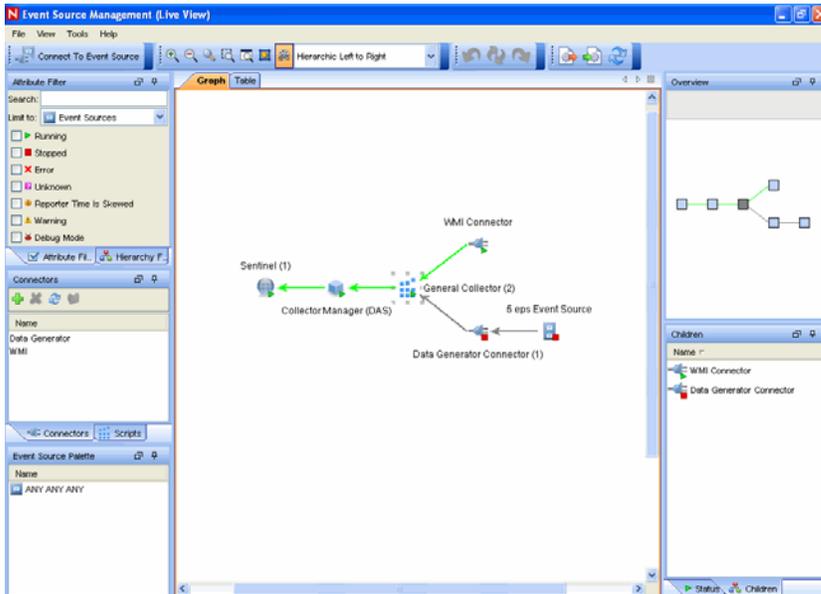
10.2 Introduction to the User Interface

The ESM Live View and Scratchpad are independent windows. This allows you to work on other tabs in Sentinel simultaneously as you work on ESM.

The Event Source Management windows include:

- ♦ A Menu Bar with the ESM menus
- ♦ A Tool Bar which helps you execute the functions of ESM
- ♦ Several different types of frames to display ESM data
- ♦ Display Health Monitor frame with graph and table views where you can perform your activities

Figure 10-1 Event Source Management-Live View



10.2.1 Menu Bar

The Menu Bar has File, View, Tools and Help options.

Figure 10-2 Event Source Management-Menu Bar



The following are the options available in the each of the Menu Bar options which are described in the document:

- ◆ File
 - ◆ Export Configuration
 - ◆ Import Configuration
 - ◆ Save Preferences
 - ◆ Close
- ◆ View
 - ◆ Reset Layout
 - ◆ Redo Layout
 - ◆ Undo Layout
- ◆ Tools
 - ◆ Connect to Event Source
 - ◆ Import plugin

- ◆ Help
 - ◆ About
 - ◆ Help

These options allow you to perform a set of actions mentioned below:

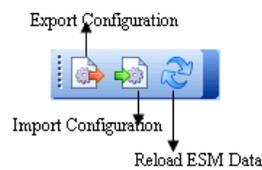
10.2.2 Tool Bar

Table 10-1 *Event Source Management -User Interface*

Launch the wizard for connecting to a new Event Source



Import/Export & Reload Event Source Management Configurations and plugging



The tool bar contains several tools for displaying objects in ESM. You can zoom the entire Graphical view in and out, or zoom directly to a selected region.



The Magnifying Glass allows you to enlarge the text and icons for a small portion of the Graphical view without affecting the overall zoom level.

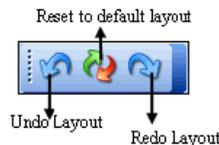
The Fit to Screen option adjusts the ESM view to fit the screen.

You can select from several different layouts to display the objects in ESM.



You can also enable/disable animations during transition from one layout to the other in the Graphical view of the Health Monitor Display.

You can reset to the default settings too.



10.2.3 Zoom

In ESM, you can use Magnifying Glass to zoom into a region.

TIP: To enable/disable magnifying glass in ESM, use the local zooming using a Magnifying Glass button on the toolbar.

Hot Keys:

You can increase or decrease the magnification factor with the following key combinations:

To increase or decrease the size of magnification glass cursor:

- ♦ **To increase:** Ctrl key + Backward scrolling of the Mouse wheel
- ♦ **To decrease:** Ctrl key + Forward scrolling of the Mouse wheel

To increase or decrease the zooming of the nodes:

- ♦ **To Zoom in:** Forward movement of the Mouse wheel
- ♦ **To Zoom out:** Backward movement of the Mouse wheel

NOTE: Magnification glass is available only in the Graphical View of ESM window.

10.2.4 Frames

You can see the following Frames in the Live View or Scratchpad window.

Attribute Filter

The Attribute Filter allows you to display the components of ESM. You can specify the components to be displayed based on the component name and status.

Figure 10-3 Attribute Filter frame

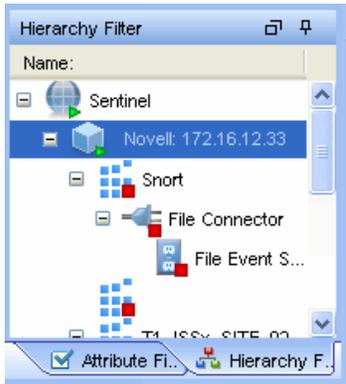


- ♦ **Text Filter:** It allow you to filter the nodes that are displayed in the graphical and tabular view based on the text they type in.
- ♦ **State Filter:** It allows you to filter the nodes that are displayed in the graphical and tabular view based on the current state of the node.

Hierarchy Filter

The Hierarchy filter sets the display based on the hierarchy you select in this frame. It allows the user to filter the nodes that are displayed in the graphical and tabular view based on the node hierarchy. All children and parents of selected nodes are shown.

Figure 10-4 Hierarchy Filter frame



To set Hierarchy filter for displaying components:

- 1 In Sentinel Control Center, click the Event Source Management in the menu bar and select Live View or Scratch Pad.
- 2 Click the Hierarchy Filter frame.
- 3 Select the Hierarchy Level to display the components.

Connectors

Connectors are plugins in Sentinel. Importing a Connector implements the Connector mechanism in the system. Connectors frame allows you to Add, Remove, and Refresh connectors and Add auxiliary file in the system.

Figure 10-5 Connector frame



Table 10-2 Connector frame Icons

	Add	Add Connectors to the system.
	Delete	Delete Connectors.
	Refresh	Refreshes the list.



Add Auxiliary Files

Add Auxiliary Files. For more information, see [Add Auxiliary Files](#)

To add Connector Plugins:

- 1 In Sentinel Control Center, click the Event Source Management in the menu bar and select Live View or Scratch Pad.
- 2 Click the Script or Connectors frame. You can plugin connectors from here. For more information, see “[Adding Connectors/Collector Plugins](#)” on page 190.

Scripts

Collectors are plugins in Sentinel. Collector plugins add the ability to parse raw data from a particular event source. The Scripts frame is used to manage the importing and updating of Collectors (also called “Scripts”) into Sentinel.

Figure 10-6 *Scripts frame*

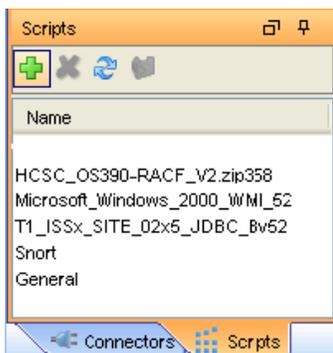


Table 10-3 *Scripts frame Icons*

	Add	Add Scripts (Collectors) to the system.
	Delete	Delete Collectors.
	Refresh	Refreshes the list.
	Add Auxiliary Files	Add Auxiliary Files. For more information, see Add Auxiliary Files

To add Collector Plugins:

- 1 In Sentinel Control Center, click the Event Source Management in the menu bar and select Live View or Scratch Pad.
- 2 Click the Script or Connectors frame. You can import Collectors from here. For more information, see “[Adding Connectors/Collector Plugins](#)” on page 190.

Event Source Palette

This frame displays the list of Devices or Event Sources supported by the existing Collectors in the Central Repository. Each Collector ships with meta-information that describes the list of event source types supported by that Collector – this information is compiled to provide the data in this palette. The supported devices for a particular Collector might not necessarily be the same as the name of the Collector.

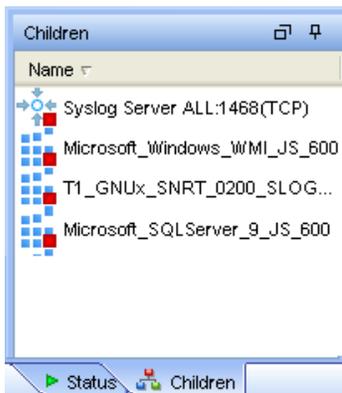
Figure 10-7 *Event Source Palette*



Children

This frame displays names of immediate children nodes of a parent (main) node when you click the parent node. This frame is useful to manage children of nodes which have been contracted in the Graphical View. To perform any action in ESM, right-click a component and select from options listed. For more information, see [Section 10.3.3, “Right-Click Menu,” on page 186](#).

Figure 10-8 *Children frame*



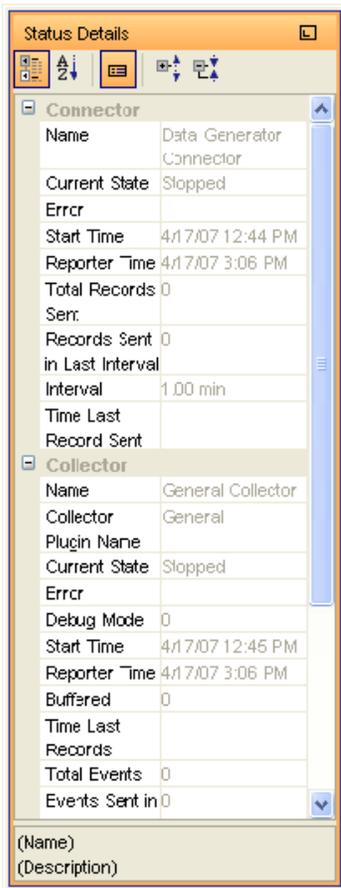
Status Details

This frame displays the status details of a selected component in the Health Monitor Display frame.

Available status information includes the current state, the number bytes processed, the number of records sent, the number of Sentinel Events sent, and various other status and statistical information.

NOTE: The status information varies based on the type of component that is selected.

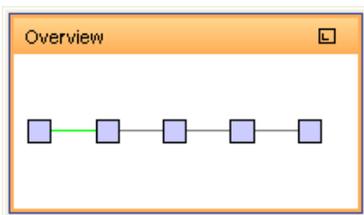
Figure 10-9 Status Details frame



Overview

The overview frame allows you to quickly move across the graphical view. This is particularly useful when there are a lot of objects in the screen.

Figure 10-10 Overview frame



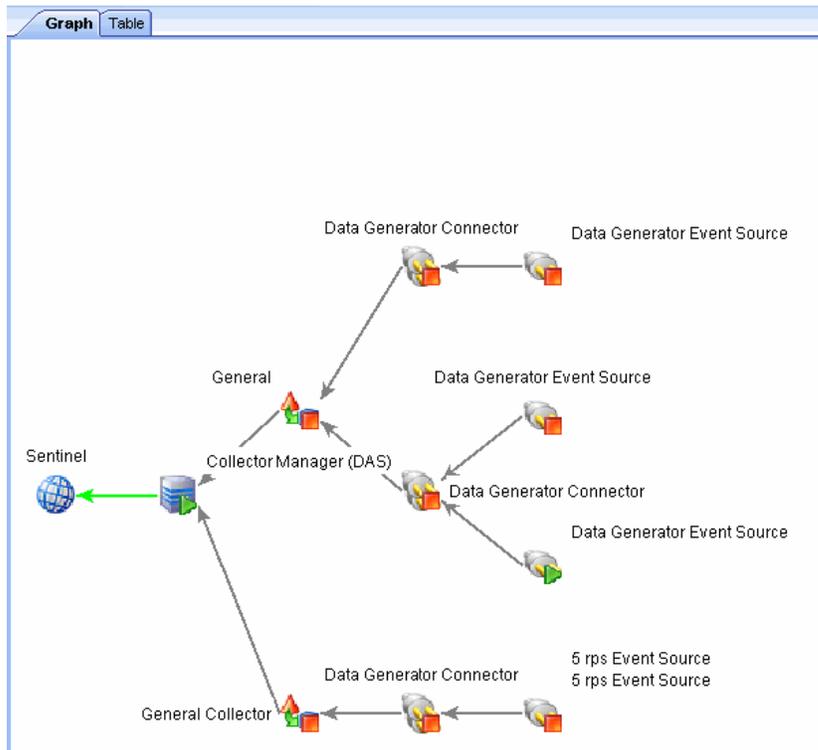
10.3 Live View

The ESM panel provides the main user interface to Event Source Management. You can view configuration data in Graphical or Tabular view.

10.3.1 Graphical ESM View

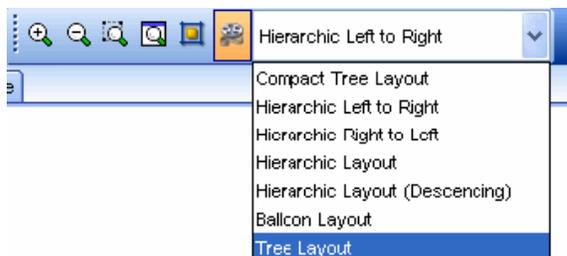
The Graphical view of ESM is the default view in Event Source Management. In Graphical view, you can view the status of a Collector and access the configuration settings of Collectors and Collector related objects as a graph of connected nodes.

Figure 10-11 Graphical View



By default, the Health Monitor Display frame displays in the Graphical View. The data can be displayed in seven 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 Tool Bar.

Figure 10-12 Layout Selection



TIP: Click in the Graphical ESM view and use “+” or “-” sign to zoom in or zoom out. Alternatively use 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 data is flowing between the components.
- ♦ **Grey Line:** Indicates 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.

The terminology used for nodes are:

- ♦ **Parent Node:** A Node from which child nodes originate
- ♦ **Immediate Children:** The sub nodes that are logically and functionally linked to a Parent Node.
- ♦ **Collapsed/Expanded nodes:** To improve the manageability and performance of the Graphical display, Sentinel automatically contracts 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.

TIP: Collapsed Nodes are identified by a “-” sign on the node and Expanded Nodes by “+” sign.

Double-click a node to expand or collapse.

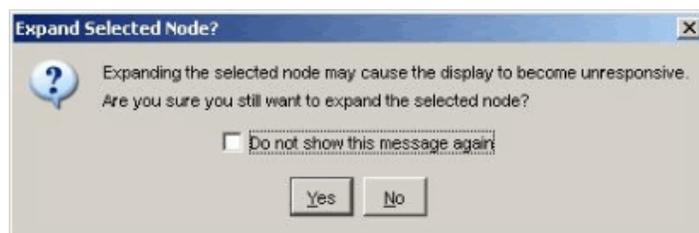
In collapsed state, a node displays the number of immediate children next to the node; for example, WMI Connector (3) [Collector name (Number of immediate children)]. The “Children” panel of a contracted node shows the immediate children of that node, each of which can be managed in the same way as nodes in the Tabular ESM View.

NOTE: Event Source Server node do not have “+” or “-” sign after its name even if it contains 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 over 20 children the node is contracted automatically. If an additional node is added to a manually expanded parent with over 20 children the node will not be contracted automatically.

The parent node can take several minutes to expand if the parent node has a large enough number of child nodes to potentially cause the UI to become unresponsive; an alert message displays on the user interface to warn you about the delay in response. Click Yes to continue.

Figure 10-13 Expand Selected Node prompt

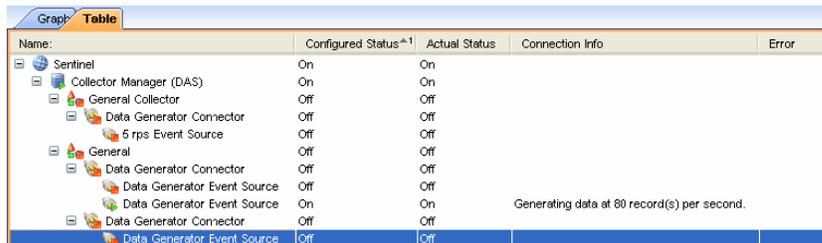


If you chose not to show this message again, the preferences are saved on that machine and any user logging into Sentinel from that machine will not get an alert again.

10.3.2 Tabular ESM View

The components visible in the Graphical view of ESM can also be viewed in tabular format. In Tabular view, you can view the status of a Collector in a table and access the configuration settings of Collectors and Collector related objects.

Figure 10-14 Tabular View



The screenshot shows a software interface with a 'Table' tab selected. The table has five columns: Name, Configured Status¹, Actual Status, Connection Info, and Error. The data is organized into a tree structure on the left side of the table.

Name:	Configured Status ¹	Actual Status	Connection Info	Error
Sentinel	On	On		
Collector Manager (DAS)	On	On		
General Collector	Off	Off		
Data Generator Connector	Off	Off		
5 rps Event Source	Off	Off		
General	Off	Off		
Data Generator Connector	Off	Off		
Data Generator Event Source	Off	Off		
Data Generator Event Source	On	On	Generating data at 80 record(s) per second.	
Data Generator Connector	Off	Off		
Data Generator Event Source	Off	Off		

The columns in the ESM Tabular View are:

- ♦ **Configured Status:** The On state the object is configured to be in. This is the state that is stored in the database and do not necessarily match the actual On state of the object. For example, the two states will not match if a parent object is turned off or if there is an error.
- ♦ **Actual Status:** The On state of the object as being reported by the actual running Collector Manager.
- ♦ **Connection Info (populated for Event Sources only):** A textual description of the Event Source connection.
- ♦ **Error:** A textual description of an error that occurred in the running object.

TIP: Use the Table/Graph tabs to change to Tabular/Graphical views.

10.3.3 Right-Click Menu

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

NOTE: The right-click actions available depend on the kind of object you clicked on.

- ♦ **Status Details:** You can view all information known about the status of the selected object.
- ♦ **Start:** You can set the object to be running.

NOTE: The selected object will only start after the parent nodes starts and its running.

- ♦ **Stop:** You can stop the running object.
- ♦ **Edit:** You can modify the editable information (Filter information, Object name and so on) with this option.
- ♦ **Debug:** You can debug the Collector. You must stop the running Collector before you debug it.
- ♦ **Move:** You can move the selected object from its current parent object to another parent object. You can move objects between the views that is live view to scratchpad and vice versa.

- ◆ **Clone:** You can create a new object that has its configuration information pre-populated with the settings of the currently selected object. This allows you to quickly create a large number of similar Event Sources without having to retype in the same information over and over again. You can clone objects between the views that is live view to scratchpad and vice versa. Cloning an object Copies all the settings except the “Run” status. New objects created using the Clone command will always be in the Stopped state after creation.
- ◆ **Remove:** You can delete a selected object from the system.
- ◆ **Contract:** Contract the child nodes into this node. This option is only available on parent nodes that are currently in an expanded state.
- ◆ **Expand:** Expand the child nodes of this node. This option is only available on parent nodes that are currently in a contracted state.
- ◆ **Add Collector:** It allows you to open an Add Collector wizard that guides you through the process of adding a Collector to the selected Collector Manager.
- ◆ **Add Connector:** It allows you to open an Add Connector wizard that guides you through the process of adding a Connector to the selected Collector.
- ◆ **:** It allows you to open an Add Event Source wizard that guides you through the process of adding an event source to the selected Connector.
- ◆ **Open Raw Data Tap:** You can view the live stream of raw data from an Event Source or flowing through the selected object.
- ◆ **Open Active View:** You can open Active View window that only displays events that have been generated by data from or flowing through the selected object.
- ◆ **Zoom:** You can zoom in the graphical view display on the selected object.
- ◆ **Show in Tabular/Graphical View:** You can switch over to the other view (to tabular view if on graphical view, or to graphical view if on tabular view) and automatically selects the object that is selected in the current view. When switching to graphical view, it also zooms in on the selected object.
- ◆ **Raw Data Filter:** It allows you to filter the raw data flowing through the selected node. The raw data filter is available on Collectors, Connectors, and Event Sources. If a filter is specified to drop data, the data to be dropped will not be passed to the parent node and, therefore, will not be converted into events.
- ◆ **Import Configuration:** You can import the configuration of ESM objects.
- ◆ **Export Configuration:** You can export the configuration of ESM objects
- ◆ **Add Event Source Server :** It allows you to add Event Source Server to the selected Collector Manager
- ◆ **Add Collector Manager:** In Scratchpad mode, you can add a Collector Manager to the scratchpad 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:** To start all the objects
- ◆ **Stop:** To stop all the objects
- ◆ **Remove selected objects:** To remove the selected objects along with its children

TIP: Press “Shift” and click the object to select multiple objects.

10.4 Components of Event Source Hierarchy

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

Figure 10-15 ESM Hierarchy



NOTE: ESM allows you to add Collector, Event Source and Connector.

Table 10-4 Components of 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	<p>Each Collector Manager 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 object are created in ESM automatically.</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 will cache the received data, and one or more Connectors will connect to the ESS to fetch a set of data for processing. The Connector will request only the data from its configured Event Source (defined in the meta-data for the Event Source) and that matches additional filters.</p>

	Event Source	The Event Source represents the actual source of data for Sentinel. Unlike other components this is not a plugin, but is a container for meta-data, including runtime configuration, about the event source. In some cases a single Event Source could represent many real sources of event data, for example if multiple devices are writing to a single file.
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10.4.1 Component Status Indicators

Indicators are used to represent various states as follows:

Table 10-5 *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	This indicator is displayed when the status of the object in the ESM panel is not yet known.

To set Attribute filter for displaying components:

- 1 In Sentinel Control Center, click the Event Source Management in the menu bar and select Live View or Scratch Pad.
- 2 Click the Attribute Filter frame.
- 3 Specify the Search and Limit to criteria.
- 4 Check Running and/or Stopped checkbox to specify the status of the components.

To hide components based on type:

- 1 In Sentinel Control Center, click the Event Source Management in the menu bar and select Live View or Scratch Pad.
- 2 Click Attribute Filter frame.

- 3 Specify the Search and Limit to criteria.
- 4 Select the component type by which to limit the view.

10.4.2 Adding Components to Event Source Hierarchy

Although some Sentinel components are pre-installed with the Sentinel system, Novell recommends that you check the [Sentinel Content Web site \(http://support.novell.com/products/sentinel/sentinel61.html\)](http://support.novell.com/products/sentinel/sentinel61.html) to download the updated versions.

Collectors, Connectors and Event Sources can be added to the system through the right-click menus on the main ESM display.

10.4.3 Collectors

To run the Collectors and generate the Events as per your requirements, you need to:

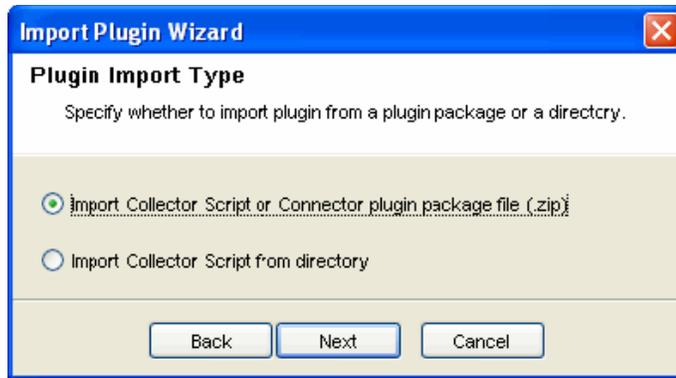
- ◆ Download Collectors
- ◆ Import and Deploy Collectors
 - ◆ After downloading Collectors, import and deploy the Collectors.
- ◆ Generate Events
 - ◆ Start (Right-click the Collector and select Start) the Collector to generate Events.
- ◆ Debug Collectors
 - ◆ For any errors in the output of a Collector, select the Collector, right-click and select Debug.
 - ◆ For more information, see [Section 10.5, “Debugging,” on page 207](#).
- ◆ Edit Collectors
 - ◆ To troubleshoot any misbehavior of a Collector, you can edit the Collector. The method for editing the Collector depends on the type of Collector
 - ◆ For proprietary (or legacy) Collectors, copy the Collector Script to a Windows machine that has Collector Builder installed.
 - ◆ For JavaScript Collectors, any standard development environment for JavaScript can be used.
 - ◆ For more information on editing Collectors, see Sentinel Collector SDK.
- ◆ Re-Import and deploy Collectors

Adding Connectors/Collector Plugins

NOTE: When you use the Sentinel Control Center to browse to locate a file on the Desktop of the Collector Manager, clicking Desktop takes you to the Desktop of the user running the Collector Manager, usually SYSTEM. Extra steps might be necessary to navigate to the correct user's desktop.

To add a Connector plugin:

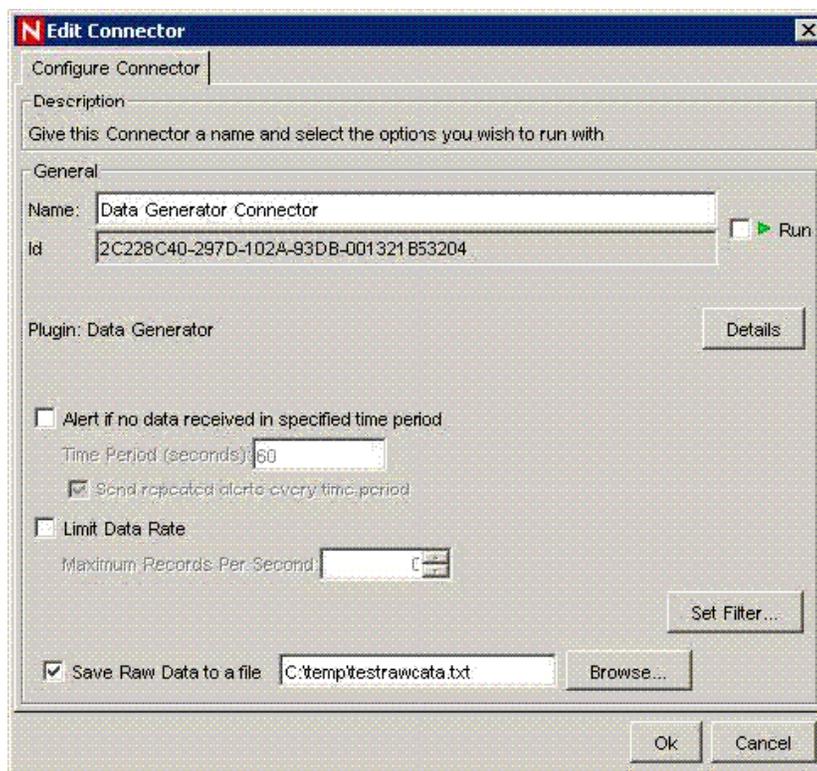
- 1 Click Tools on the Menu Bar and select Import plugin... Import Plugin wizard window displays.



- 2 Select Import Collector Script or Connector plugin package file (.zip). Click Next.
- 3 Browse to a location of the Connector Plugin package file and click OK. Click Next.

NOTE: If the file imported is not in the format specified for the Collector scripts or for the Connector plugin package, system displays an error message.

- 4 Plugin details window displays. Select the Deploy Plugin option to deploy the plugin from this window. For more information, see [“To connect to the Event Sources:” on page 198.](#)

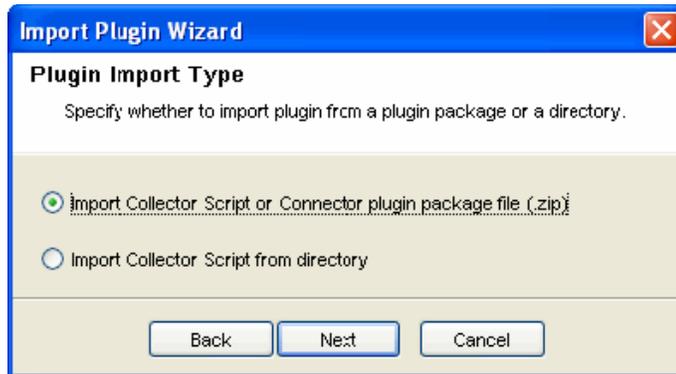


- 5 Click Finish.

NOTE: When you add a plugin into Sentinel, it is placed in the Plugin Repository, which enables Sentinel components on other machines to start using the plugin without having to add the plugin separately.

To add a Collector plugin:

- 1 Click Tools on the Menu Bar and select Import plugin. Import Plugin Wizard window displays.



- 2 You can select from the two options available in this window. Click Next.
- 3 If you chose first option, browse to a location of the Collector Script file and click OK. Click Next. If you chose second option, you are directed to the Collector workspace. Select a Collector Script directory and click Next.
- 4 Collector Script Detail window displays.

4a Click the button next to id field to generate UUID.

4b The name and author details are displayed. Edit the details as per your requirement. Specify Version number.

4c Browse and attach the help file.

NOTE: If the help file is not in the plugin directory, the system prompts to copy the help file to the plugin directory before import. Click Yes.

4d Provide description and click Next. Supported Devices window displays.

NOTE: You must specify at least one device.

Click Add. The Supported Devices window displays.

Provide vendor, name, version, description and click OK. Click Next.

NOTE: Use Edit button to edit the details of a device or use Delete button to delete a device from the list.

- 5 Plugin details window displays. Check the Deploy Plugin option to deploy the plugin from this window. For more information on deployment procedure, see [“To connect to the Event Sources:” on page 198.](#)
- 6 Click Finish.

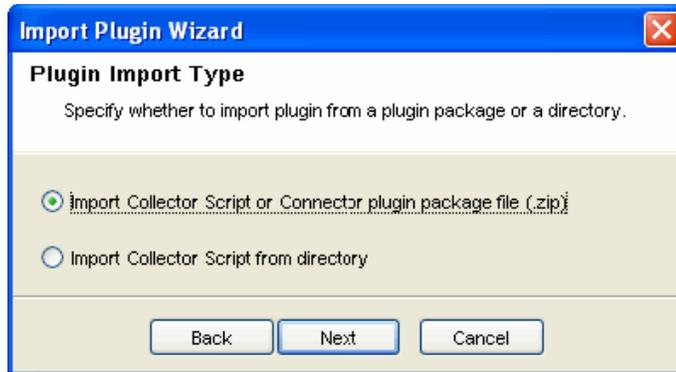
Updating Connector/Collector Plugins

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.

NOTE: When you use the Sentinel Control Center to browse to locate a file on the Desktop of the Collector Manager, clicking Desktop takes you to the Desktop of the user running the Collector Manager, usually SYSTEM. Extra steps might be necessary to navigate to the correct user's desktop.

To update a Connector or Collector plugin:

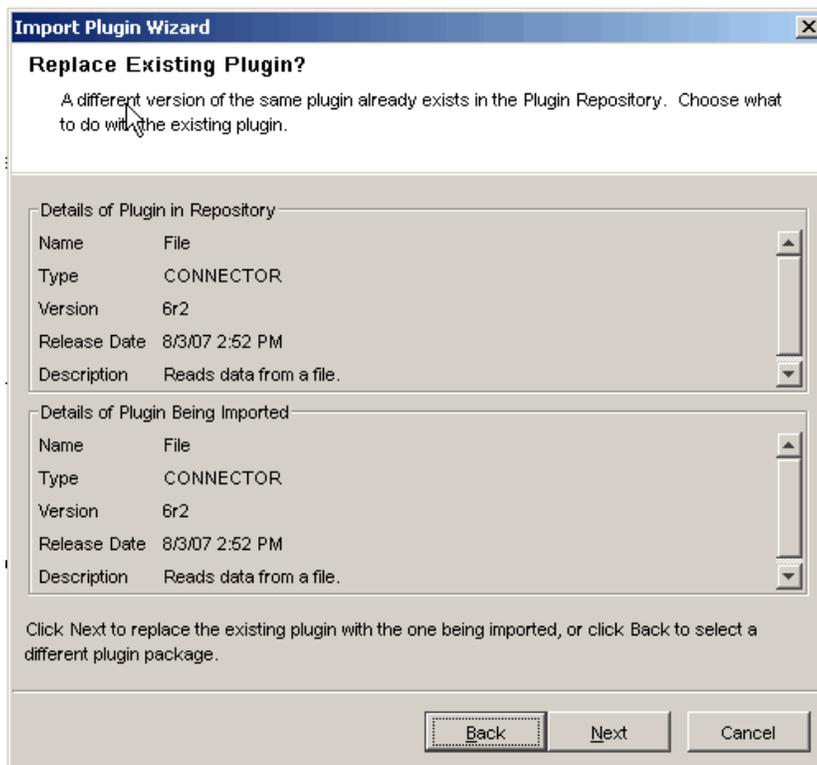
- 1 Click Tools Menu and select Import plugin...Import Plugin Wizard window displays.



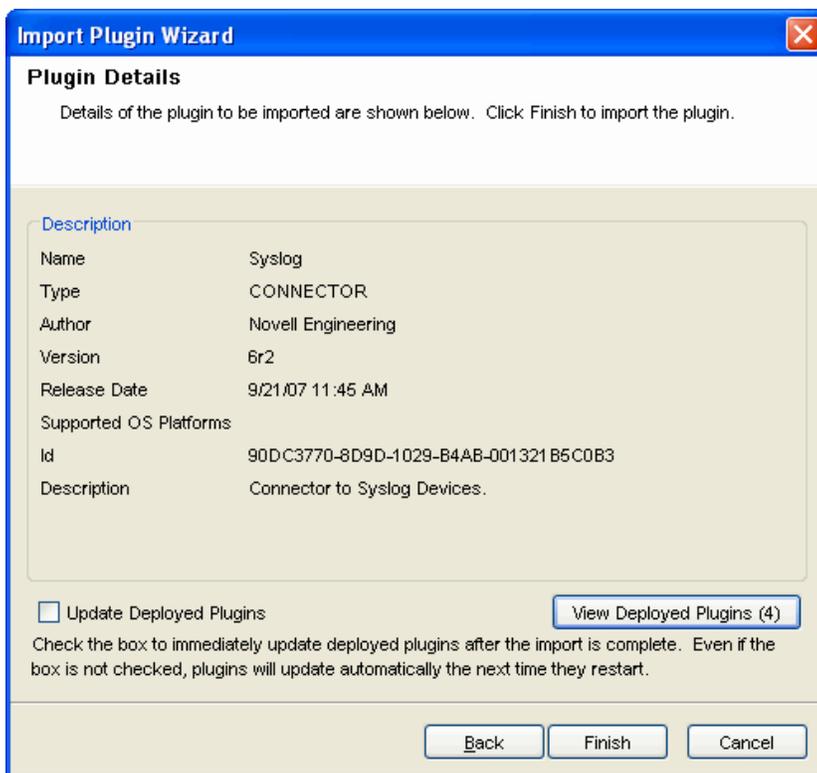
- 2 You can select from the two options available in this window. Click Next.
- 3 Browse to a location of the Connector or Collector Plugin package file and click OK. Click Next.

NOTE: If the file imported is not in the format specified for the Collector scripts or for the Connector plugin package, system displays an error message.

- 4 When updating an already-imported Connector or Collector, you are provided with the option of updating the existing plugin, going back and selecting a different plugin, or canceling the import. If you want to continue, click Next.

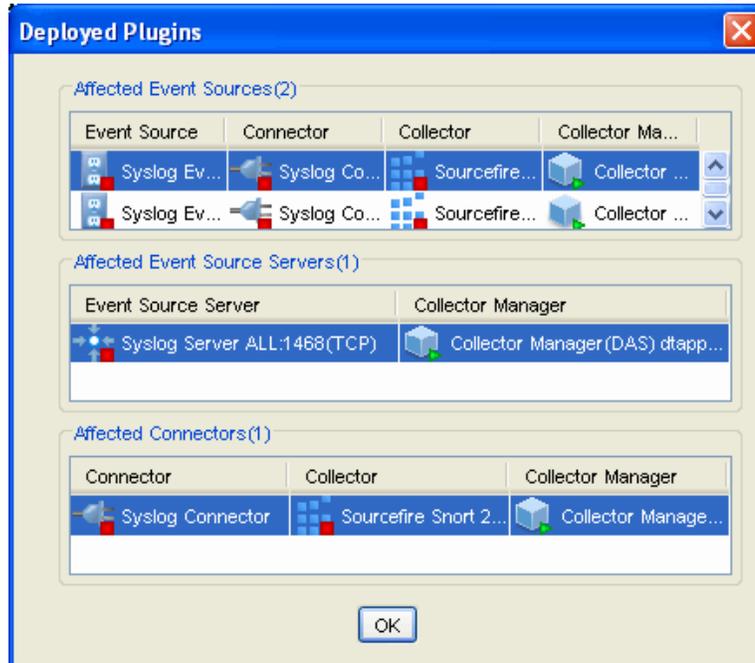


- 5 Plugin details window displays. Check the Update Deployed Plugins option to update any currently deployed plugins that use this Connector or Collector.

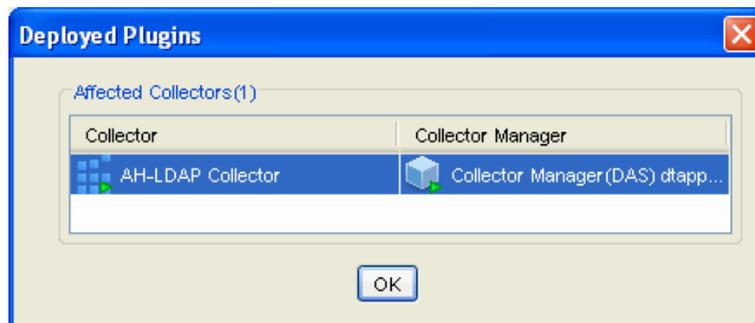


- Click View Deployed Plugins to view the Plugins deployed in ESM Live View. The number in parentheses represents the number of instances of this plugin that are currently deployed and configured. The Deployed Plugins window displays the Affected Connectors/Event Sources/Event Source Servers or Affected Collectors. These are the components whose configuration is affected because of adding already existing Connectors/Collectors in ESM.

Affected Event Sources/Connectors/Event Source Servers



Affected Collectors



Click Finish.

NOTE: When you add a plugin into Sentinel, it is placed in the Plugin Repository, which enables Sentinel components on other machines to start using the plugin without having to add the plugin separately.

Deploying a Collector

To add a Collector:

- 1 In the main ESM display, locate the Collector Manager to which the new Collector will be associated.
- 2 Right-click the Collector Manager and select the Add Collector menu item.
- 3 Follow the prompts in the Add Collector wizard.
- 4 Click Finish.

NOTE: Collector Script enables the ESM panel to prompt you for parameter values as well as enable ESM to automatically select supported connection methods that work well with the Collector Script.

Deploying a Connector

To add a Connector:

- 1 In the main ESM display, locate the Collector to which the new Connector will be associated.
- 2 Right-click the Collector and select the Add Connector menu item.
- 3 Follow the prompts in the Add Connector wizard.
- 4 Click Finish.

Deploying an Event Source

To add an Event Source:

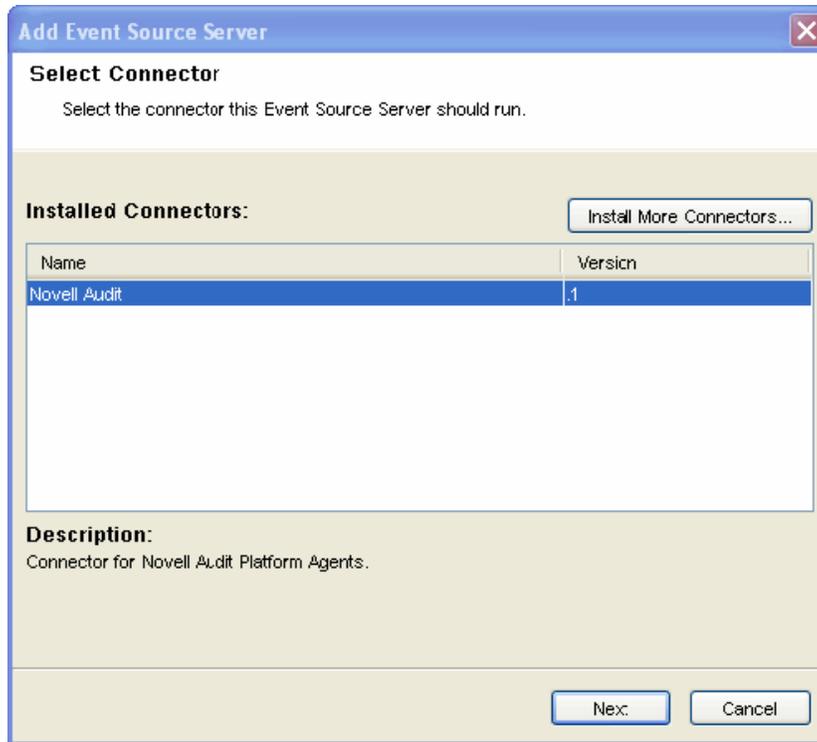
- 1 In the main ESM display, locate the Connector to which the new Event Source will be associated.
- 2 Right-click the Connector and select the Add Event Source menu item.
- 3 Follow the prompts in the Add Event Source wizard.
- 4 Click Finish.

Deploying Event Source Servers

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.

To add an Event Source Server:

- 1 In the Live View, right-click the Collector Manager and select Add Event Source Server. Select Connector window displays.



NOTE: To start the Add Event Source Server wizard, locate the Collector Manager on which the Event Source Server process will run.

- 2 Select a Connector that will support your device and click Next. If you do not have any connectors in the list that will support your device, click Install More Connectors. For more information on installing Connector, see “[Adding Connectors/Collector Plugins](#)” on page 190.
- 3 Configure the various parameters for the server with reference to the Connector selected (For example, Syslog Connector, NAudit Connector, and so on.). The configurable parameters are different for the different Connector types. Click Next.
- 4 Provide a Name for the Event Source Server. If you want this server to be running, select the Run checkbox.
- 5 Click Finish. In the Health Monitor Display frame, the Event Source Server added here displays with a dashed blue line showing the Collector Manager to which it is associated to.

NOTE: 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.

Connect to Event Source

There are several methods to configure an event source. Event sources can be deployed by right-clicking on an existing Collector Manager, Collector, or Connectors.

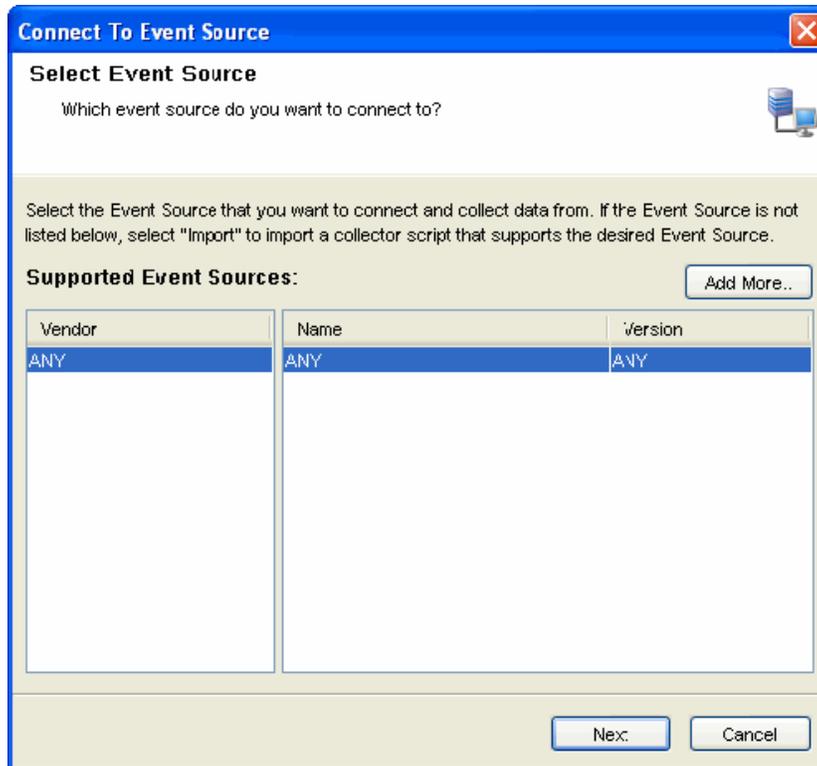
To deploy an event source, you need the following components:

- ♦ **Collector Script:** Collector scripts can be downloaded from the [Sentinel Content Web site \(http://support.novell.com/products/sentinel/sentinel61.html\)](http://support.novell.com/products/sentinel/sentinel61.html), copied from a previous Sentinel implementation (4.x or 5.x), or built using Collector Builder.

- ♦ **Connector:** Connector can also be downloaded from the [Sentinel Content Web site \(http://support.novell.com/products/sentinel/sentinel61.html\)](http://support.novell.com/products/sentinel/sentinel61.html). There are also some Connectors included in the installed Sentinel system, but there may be more recent versions on the web site.
- ♦ Configuration information for the event source

To connect to the Event Sources:

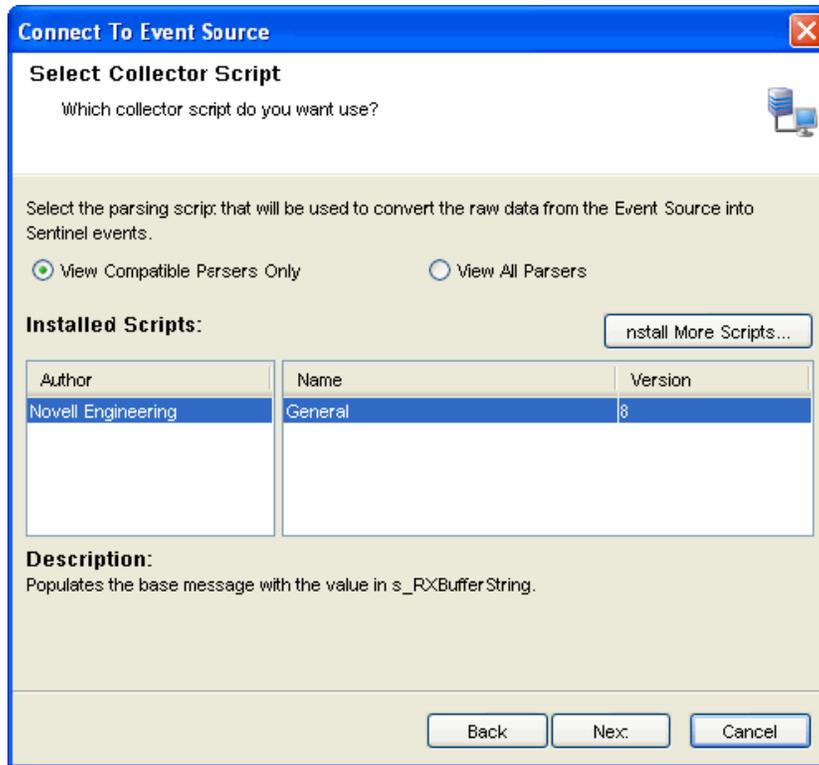
- 1 Click Tools on the Menu Bar and select Connect to Event Source. Alternatively, click the Connect to Event Source button on the Tool Bar. Connect to Event Source window displays.



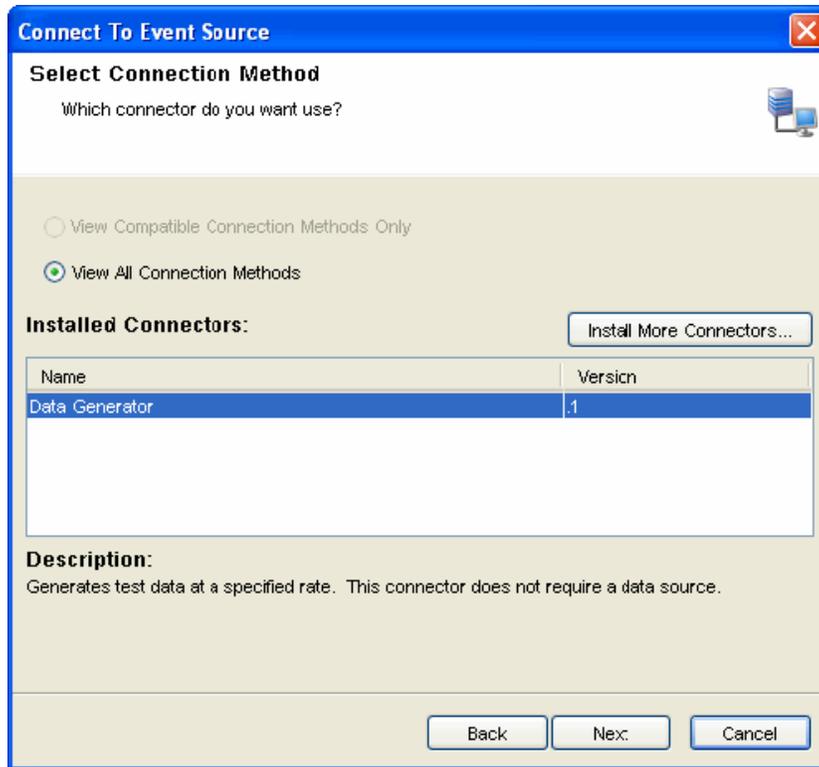
NOTE: Event Source types for which you currently have compatible Collector parsing scripts are listed here.

- 2 Select an Event Source from the list to which you want to connect to and collect data from. You can click Add More to import an Event Source. Click Next. Select Collector Script window displays.

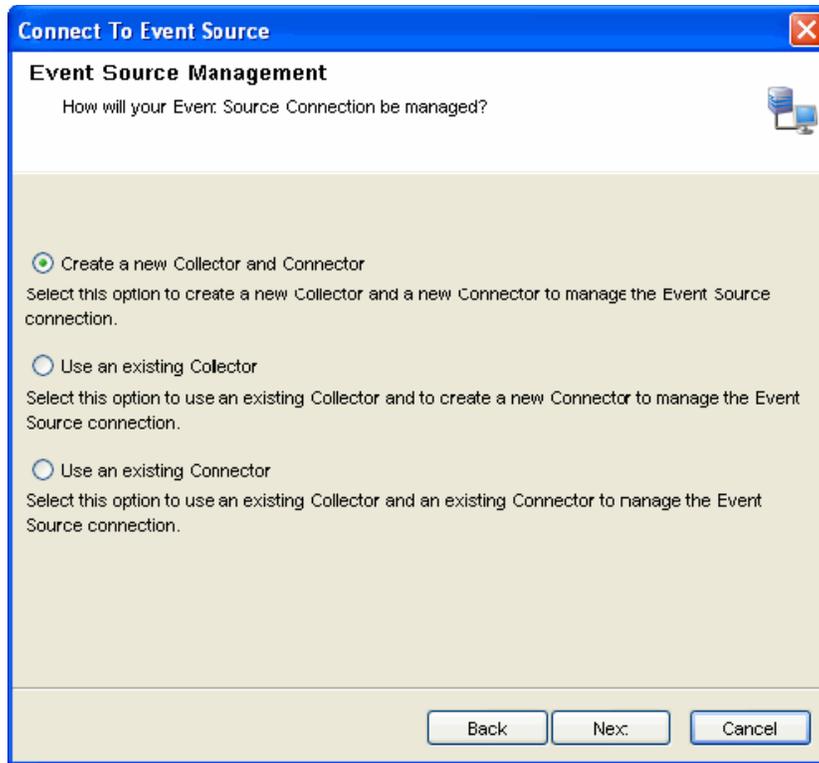
NOTE: You can open Select Collector Script window by double clicking or dragging a selected event source from the Event Source Palette window.



- 3 Select a Collector script from the list. You can also install additional Collector scripts (click Install More Scripts) that support your Event source, if it is not listed here (For more information on installing a Collector script, see [“Adding Connectors/Collector Plugins”](#) on page 190. Click Next. Select Connection Method window displays.



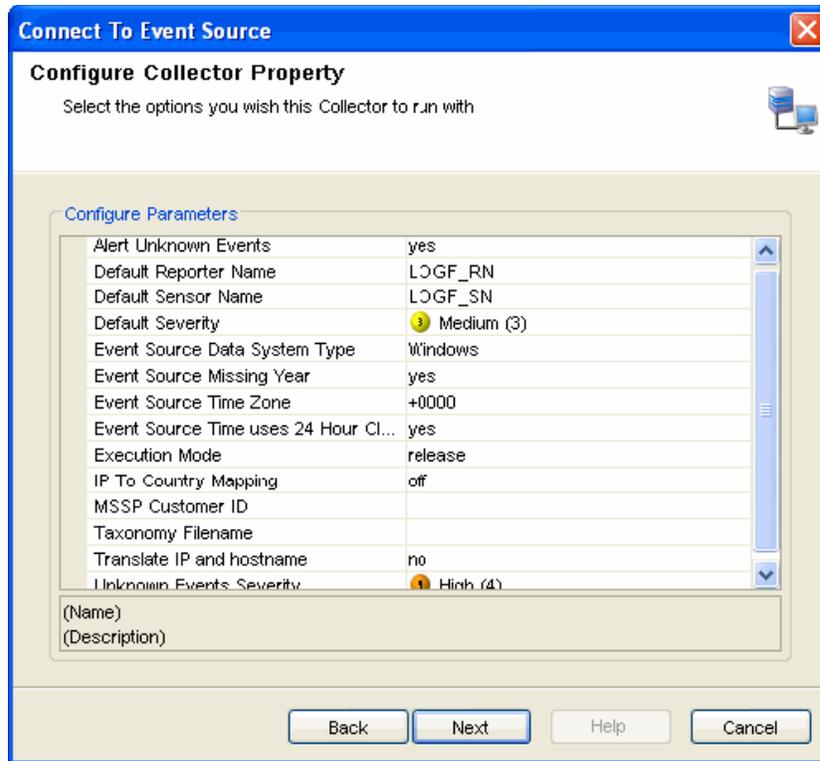
- 4 Select a connection method from the list. You can also install additional connectors by clicking on the Install More Connectors button. For more information, see [“Adding Connectors/Collector Plugins” on page 190](#) to install connectors. Click Next. Event Source Management window displays.



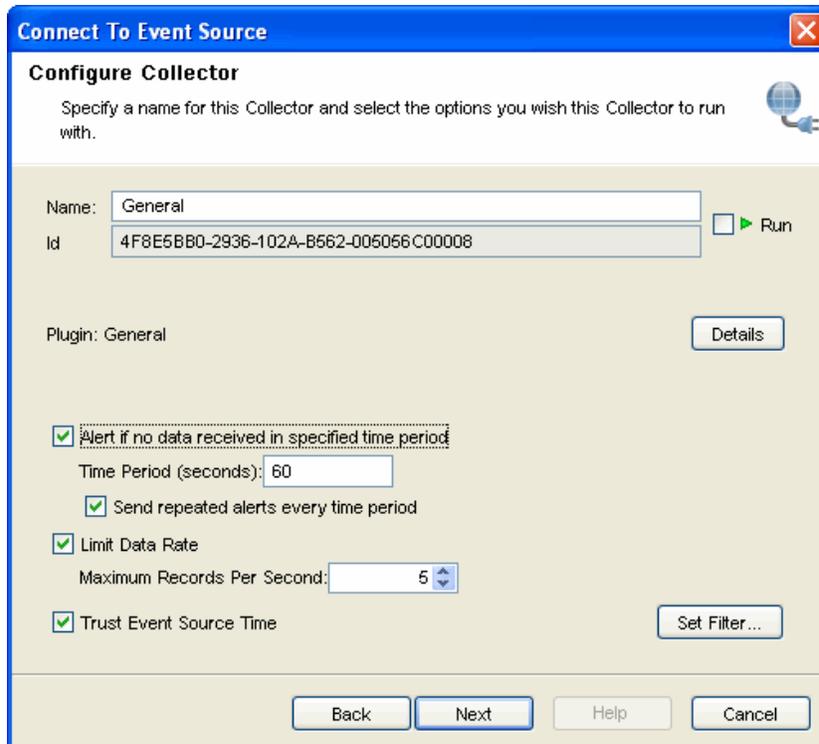
- 5 You can create a new Collector and Connector or you can use an existing Collector or Connector. Select an option and click Next.

NOTE: Based on the existing Collectors and Connectors in your system that is compatible with your new Event Source, one or more of these options might be unavailable.

- ◆ **Create a new Collector and Connector:** Select this option to create a new Collector and Connector to manage the Event Source connection.
 1. After you select this option and click Next, Select Collector Manager window displays.
 2. Select the Collector Manager you want to use and click Next. Configure Collector Property window displays.



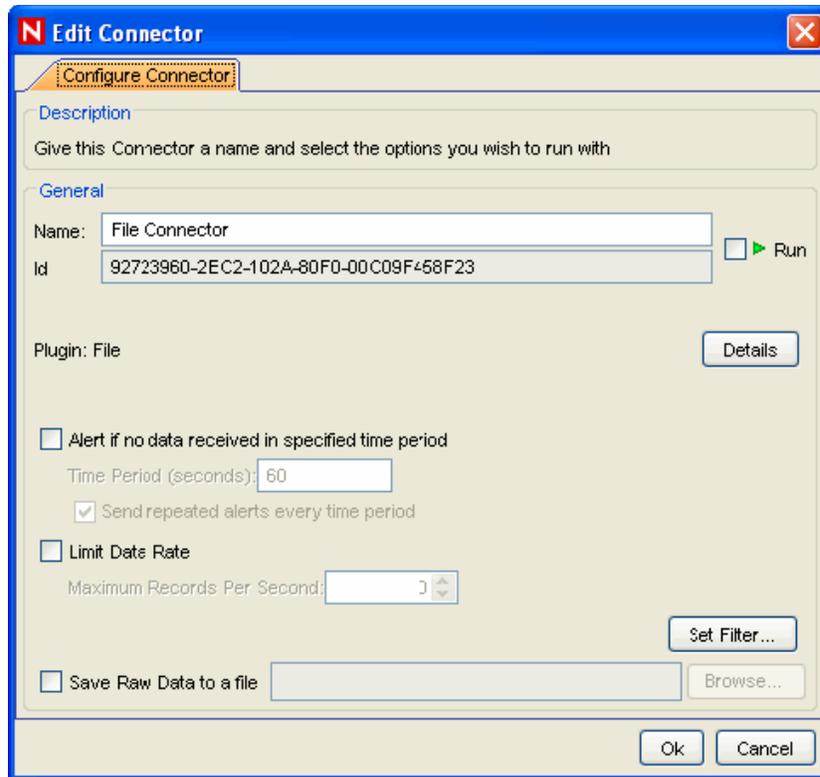
3. Configure the parameters available and click Next. Configure Collector window displays.
4. Provide the name of the Collector and configure the options.



- ◆ Check the Run checkbox if you want to run your Collector automatically.
- ◆ Click Details button to see plugin details.
- ◆ You can set alerts (with repeated option) if no data is received in a specific period.
- ◆ You can limit the data rate as maximum number of records per second.
- ◆ You can set filter through Set Filter button.
- ◆ You can check Trust Event Source Time to display the Device Time (time when the event occurred) instead of Event Source Time (time when the event was reported to console).

NOTE: If Trust Event Source Time option is selected, then all data flowing through the Collector will have their Event Source Time trusted even if the Event Sources do not have this option selected.

Click Next. The Configure Connector window displays.



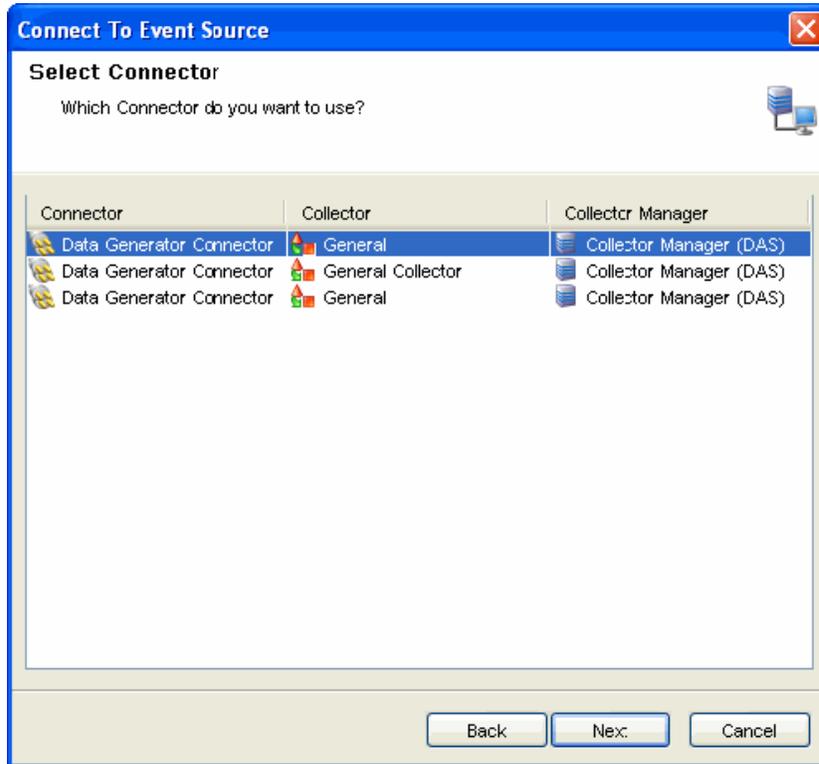
5. Provide the name of the Connector and configure the options.
 - ◆ Check the Run checkbox if you want to run your Connector automatically.
 - ◆ Click Details button to see plugin details.
 - ◆ You can set alerts (with repeated option) if no data is received in a specific period.
 - ◆ You can limit the data rate as maximum number of records per second.
 - ◆ You can set filter through Set Filter button.

Click Next. The Event Source Configuration window displays.

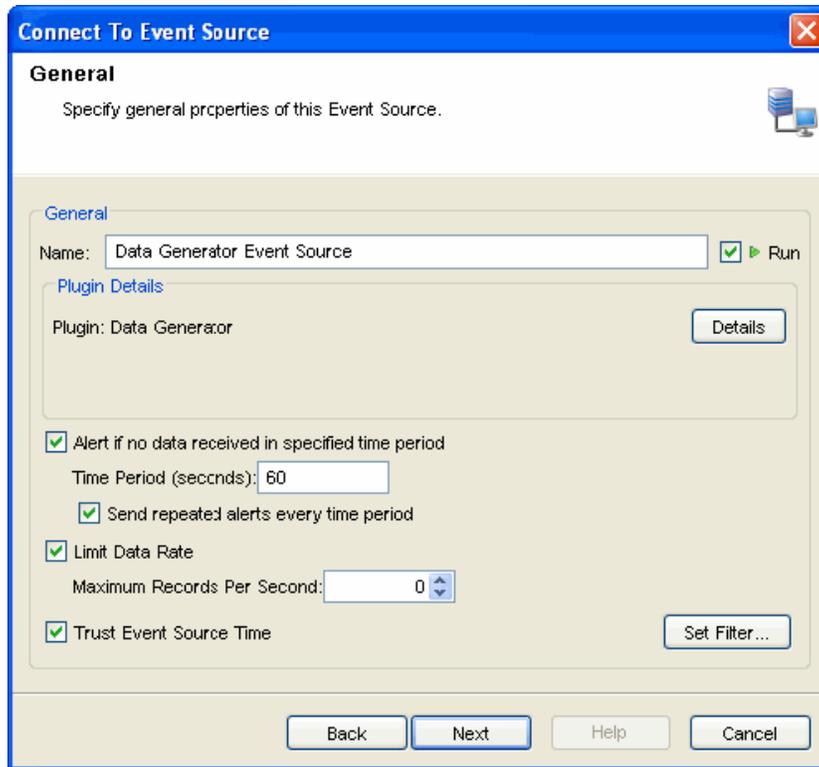
- ◆ **Use an existing Collector:** Select this option to use an existing Collector and to create a new Connector to manage the Event Source connection.
 1. After you select this option and click Next, the Select Collector window displays.
 2. Select the Collector you want to use and click Next. The Configure Connector window displays.
 3. Provide the name of the Connector and configure the options
 - ◆ Check the Run checkbox if you want to run your Connector automatically.
 - ◆ Click Details button to see plugin details.
 - ◆ You can set alerts (with repeated option) if no data is received in a specific period.
 - ◆ You can limit the data rate as maximum number of records per second.
 - ◆ You can set filter through Set Filter button.

Click Next. The Event Source Configuration window displays.

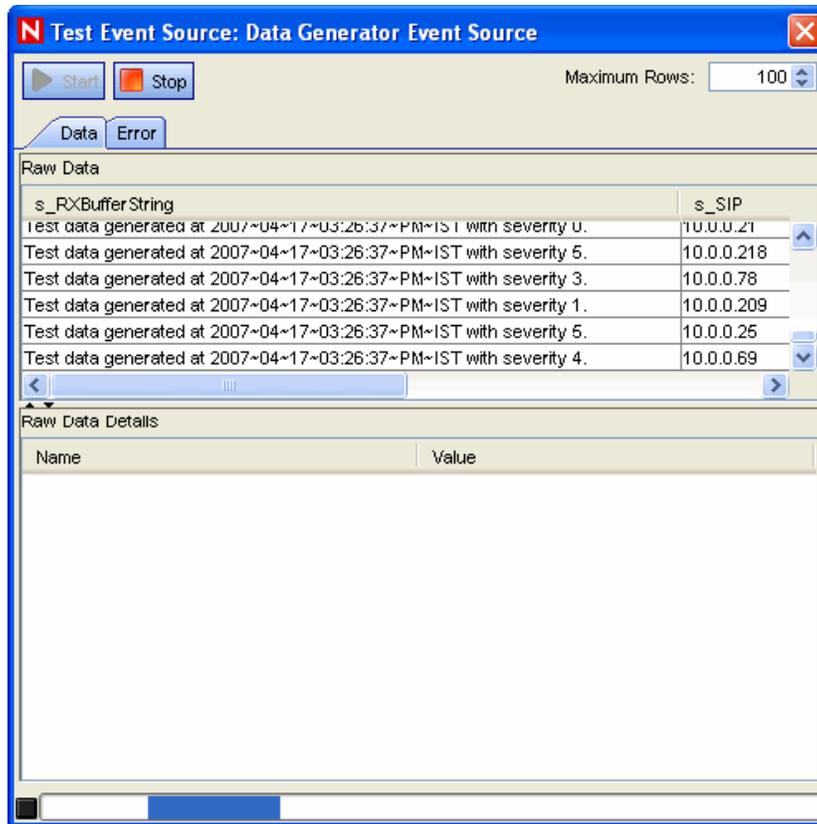
- ◆ **Use an Existing Connector:** Select this option to use an existing Collector and an existing Connector to manage the Event Source connection.
 1. After you select this option and click Next, the Select Connector window displays.



2. Select the Connector you want to use and click Next.
- 6 The Records Per Second window displays.
 - 7 Set the number of records to be transferred per second and click Next. The General window displays.



- ◆ Provide Name of the Event Source.
 - ◆ Check the Run checkbox if you want to run your Event Source automatically.
 - ◆ Click Details button to see plugin details.
 - ◆ You can set alerts (with repeated option) if no data is received in a specified time interval.
 - ◆ You can limit the data rate as maximum number of records per second.
 - ◆ You can check Trust Event Source Time to display the Device Time (time when the event occurred) instead of Event Source Time (time when the event was reported to console).
 - ◆ You can set filter through Set Filter button. In the Filter window, add/edit the filters and click OK.
- 8** Click Next. The Summary window displays.
- ◆ Click Test Connection to test the event source. Test Event Source window displays with Data and Error tabs. The Error tab displays the error message if there is any error in the configuration of event source.
 - ◆ After a few seconds, a sampling of raw data should be received from the Event Source and displayed in the Data tab.
 - ◆ Use the Start and Stop buttons to start or stop the test.
 - ◆ Use the “Maximum Rows” component to control the max number of raw data records to obtain at once.



You can test the event source in the Test Event Source window. It displays the data in the Data tab and errors in the Errors tab. You can select maximum rows to be displayed and can start and stop the test.

- 9 Click Finish.

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

10.5 Debugging

Sentinel's Collectors are designed to be easily customizable and to be created by customers and partners. There are two types of Sentinel Collectors: proprietary (or legacy) Collectors that are written in a language developed for Sentinel, and JavaScript Collectors. The debugging interface is slightly different for each type, and is intended to analyze the Collector code running in place on the Collector Manager. For more information on customizing or creating new Collectors, obtain the Novell Developer's Kit for Sentinel at [Sentinel SDK \(http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel\)](http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel).

10.5.1 Collector Workspace and Collector Directory

Collectors are simple textual 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 Plugin Repository on the central Sentinel Server when they are imported.

Location: ESEC_HOME\data\plugin_repository on 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 on the Collector Manager, in real time the Collector plugin 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: ESEC_HOME\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 will copy 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 Plugin Repository.

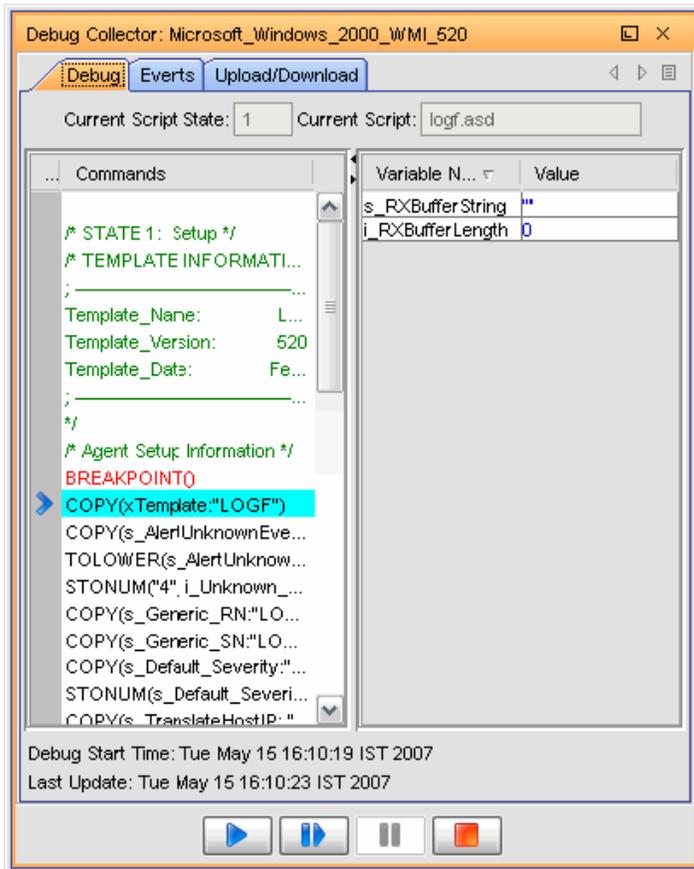
Location: ESEC_HOME\data\collector_workspace on the client application machine.

10.5.2 Debugging Proprietary Collectors

The Debugging Collector window allows you to debug Collectors written in Novell’s proprietary language. The left column on the debugger displays the commands for the current script state. The highlighted command is being executed.

The right column on the debugger displays the script’s variables and their current value. The variable list expands as all the script’s variables are used. The variables are color coded to show new variables in blue, changed variables in red, and variables whose value has not changed since the last “Step” as black.

Figure 10-16 Debug Collector window



The Events tab displays the events generated using this Collector and the Upload/Download tab allows you to upload/download another Collector Script file to make modifications.

The debugger has the following four controls:

Table 10-6 Debugger Icons

	Run	Run the script until the next breakpoint is encountered.
	Step Into	Step one instruction at a time.
	Pause	Pause the running script.
	Stop	Stop the script.

NOTE: The Command list and the Variable list are not displayed in the debugger when the Script is “Running”. To see the Command list and the Variable list, the debugger must be “Stepping”, “Paused” or “Stopped”.

You can view events as well as upload and download the Collector's script from the Events tab and Upload/Download tab.

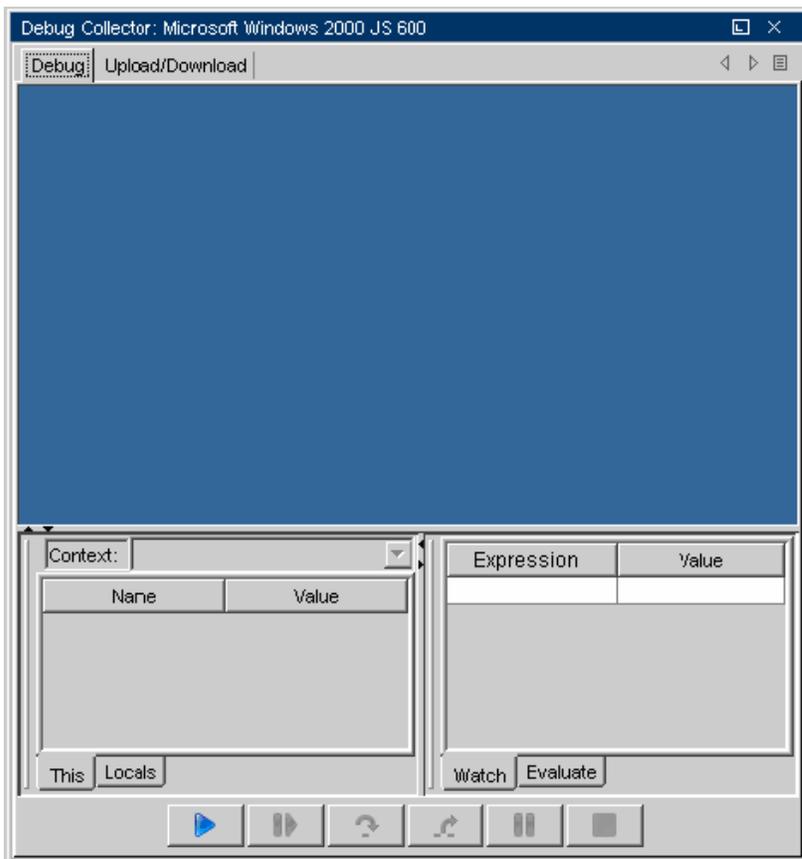
NOTE: Multiple Sentinel Control Center users might connect to the same debugging session. And for this reason, a Collector will remain in Debug mode until one of the users specifically presses the debugger's Stop button.

To debug a Collector:

- 1 In the main ESM display, locate the Collector that to run Debugging.
- 2 Right-click the Collector and select Debug.
- 3 In the Debug Collector window, select a variable from the list of variables in the right pane, click Run Debug button.
- 4 After debugging all the variables, close the Debug window.
- 5 Start the Collector to generate the Events.

10.5.3 Debugging JavaScript Collectors

The debugger for JavaScript Collectors can be used to debug any JavaScript Collector. The JavaScript debugger is launched the same way the debugger for Proprietary collectors is launched.



- ◆ **Debug:** Launches JavaScript file in this window to execute.

- ♦ **Upload/Download:** Upload/Download a JavaScript file here. You can download an existing JavaScript file, edit it, and upload again into the system to continue debugging.
- ♦ **Context:** Displays the variable (the debugger is pointing to at a point) and its value here.
- ♦ **Expression:** Watch the values of a selected parameter here.

You can use the following when debugging a Collector.

	Run	Click to start debugging.
	Pause	Click to pause debugging.
	Step Into	Click to step to then next line in the script.
	Step Over	Click to step over a function.
	Step Out	Click to step out of a function.
	Stop	Click to stop debugging.

Hot Keys

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

- ♦ CTRL+F, to find a string in the source code
- ♦ CTRL+G, go to a line number
- ♦ CTRL+M, to find the parenthesis or brace that matches the highlighted one

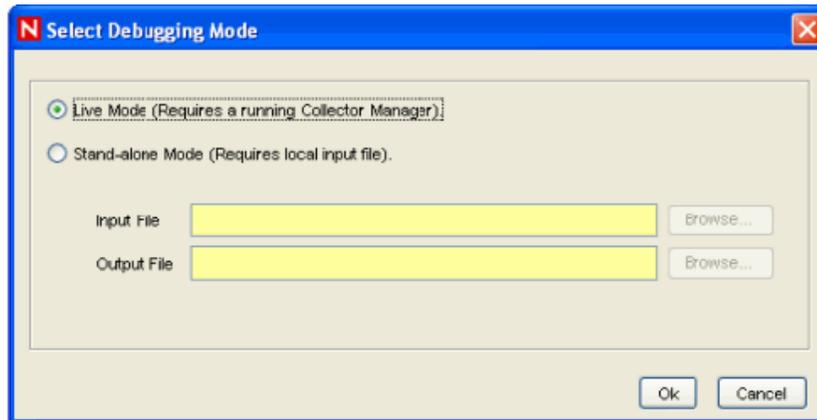
You can also open a script file, set break-point, step through the script code, and watch variables' and methods' values at each step.

You can debug Collectors in Standalone or Connected modes.

To debug a Collector:

- 1 Log into Sentinel Control Center. On the menu bar, click Event Source Management > Live View.
- 2 Right-click on the Collector and stop the Collector if it is running.
- 3 Right-click on the Collector and select Debug.

Upon selecting Debug, the Debug Mode Selection window displays. You can choose to debug in Standalone or Live mode. You can choose Standalone or Connected modes.



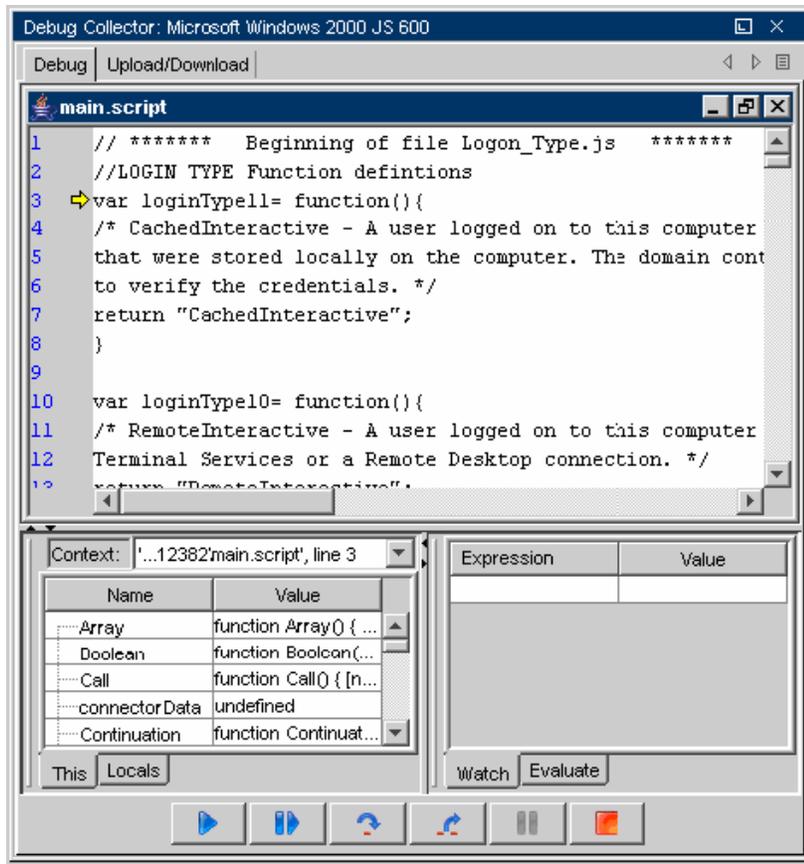
Standalone mode

- ◆ Standalone debug mode allows you to debug a Collector even if the associated Collector Manager is not running.
- ◆ For standalone 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 will be used as input. For Collectors that use a DB Connector, the input file should be a text file with log data in “nvp” format and for Collector that uses File Connector, input text file with log data in “csv” format.
- ◆ For standalone mode, Output from the script is to an output file rather than live Events. You must specify the path to the output file that the script will use for output. If you specify an output file that does not exist, the system creates the file for you

1. Select Standalone mode.

To debug in Standalone mode:

- ◆ Stop the Collector
 - ◆ The Collector Manager needs not be up and running.
 - ◆ The Events will not display in the Active Views.
2. Specify the path for the input and output files. If you specify the output file that does not exist, system creates the file for you. Click OK. Debug Collector window displays.



- In the Debug Collector window, click .



In the Source text area, the source code of the Collector appears and stops at the first line of the text script.

- Click left side bar and toggle a breakpoint in the script code. Click to go to the next breakpoint.
- You can click to step through the code. Click to pause debugging whenever required.
- After debugging is complete, click to stop debugging.
- Click 'Upload/Download' tab in the debugger window.
- Click Download and specify a location to download the script file.
- Open with any JavaScript editor or a text editor.
- Make your edits in the code and save the file. Click Upload.
- Debug the uploaded script to have a Collector Script ready to use.

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 ESM display. Starting/stopping Event Source(s) can be done any time during the debug session.

NOTE: If no Event Source is started during the debug session, then no data will be available in the buffer for the Collector and you will 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 displays.

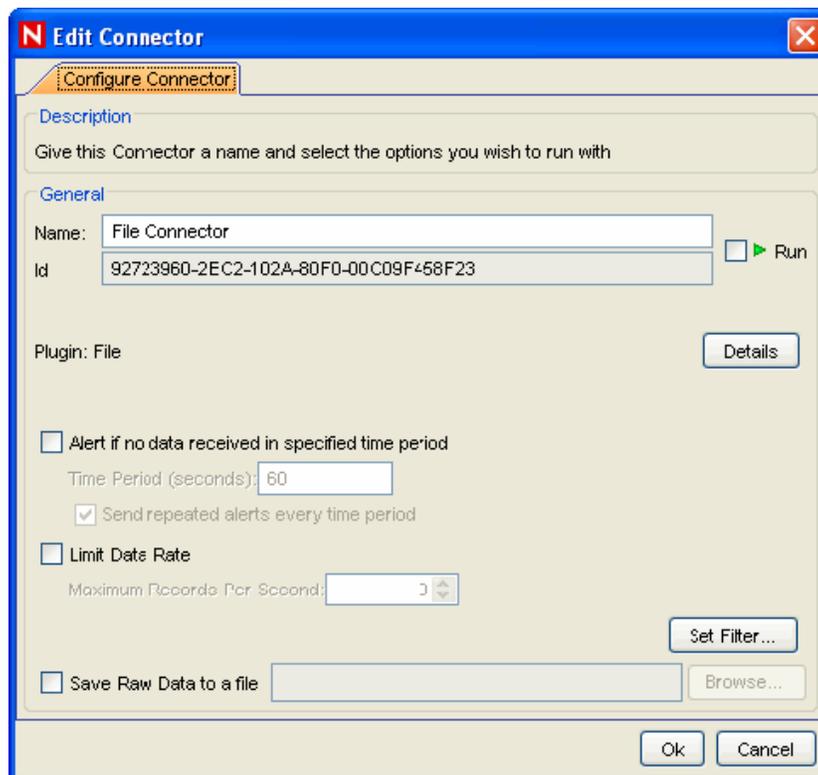
NOTE: When in "Live" debug mode, the script engine will be executed on the local box rather than the actual box that the associated Collector Manager is running on. The Connectors/Event Sources will still run on the same box as the Collector Manager. When running debug mode, data will automatically be routed from the Event Sources to the script engine running in debug on the local box.

10.5.4 Generating a Flat File using the Raw Data Tap

Occasionally when debugging, it might be helpful to view Connector output data. In addition to viewing raw data from the Connector using 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 Right-click the Connector node and select Edit. The Edit Connector dialog displays.



- 2 Check Save Raw Data to a file.
- 3 Specify (or browse to) 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.

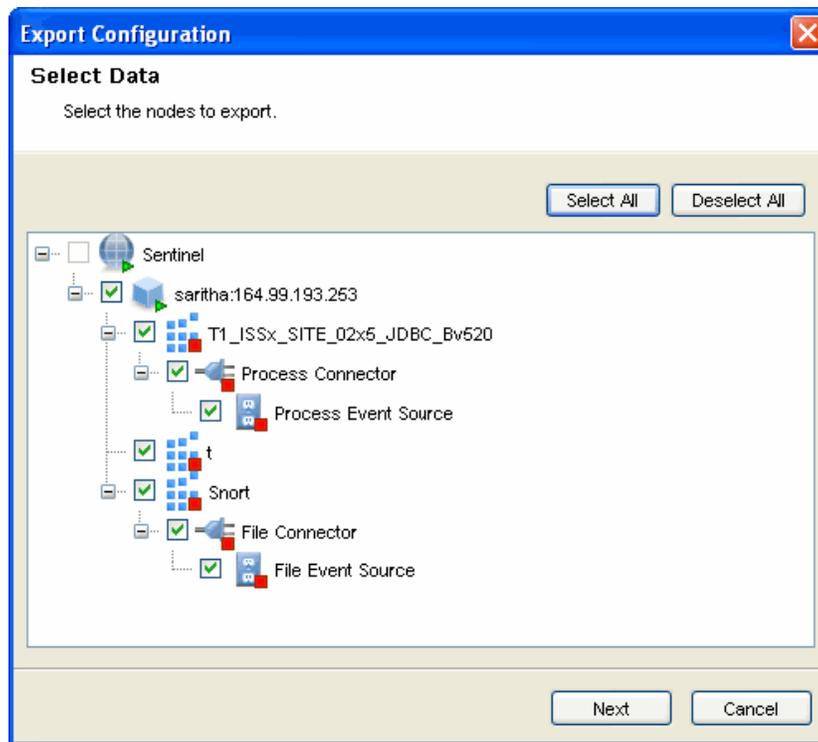
10.6 Export Configuration

Export configuration helps you export the configuration of ESM objects along with their Collector script and the Connector plugins.

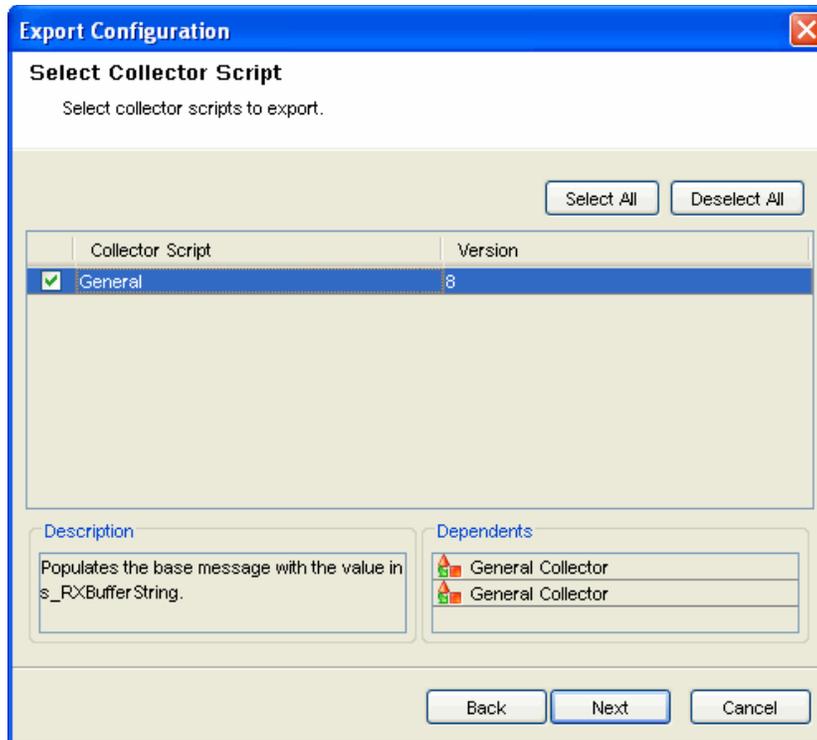
NOTE: You can export any object in the ESM panel. Depending on the object selected, all its children and parent should be displayed in the Select Data window of Export Configuration wizard.

To export your configurations:

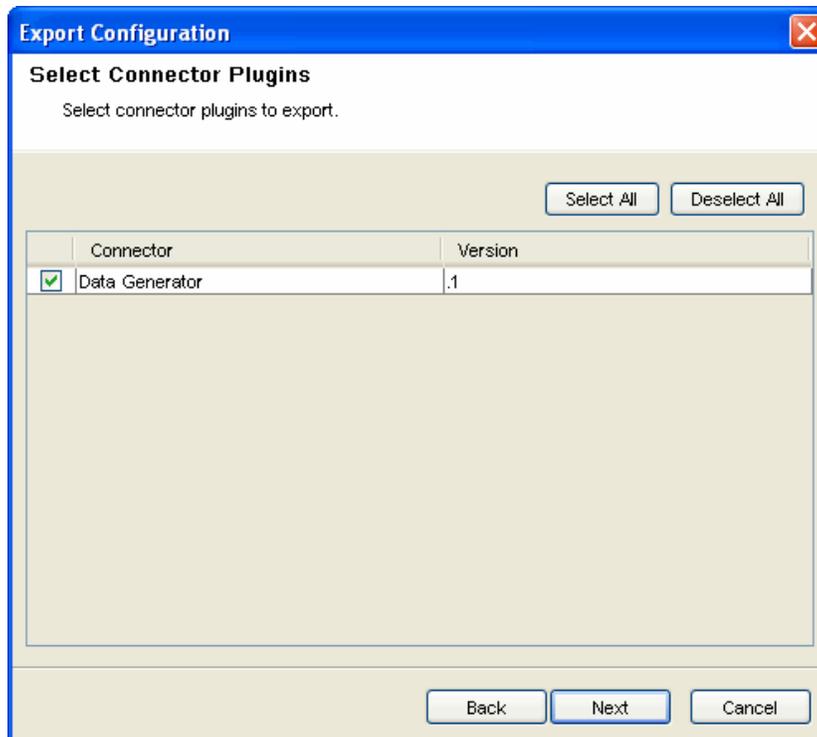
- 1 Go to Menu Bar and click File > Export Configuration or right click an object in the ESM panel and select Export Configuration. Export Configuration window displays.



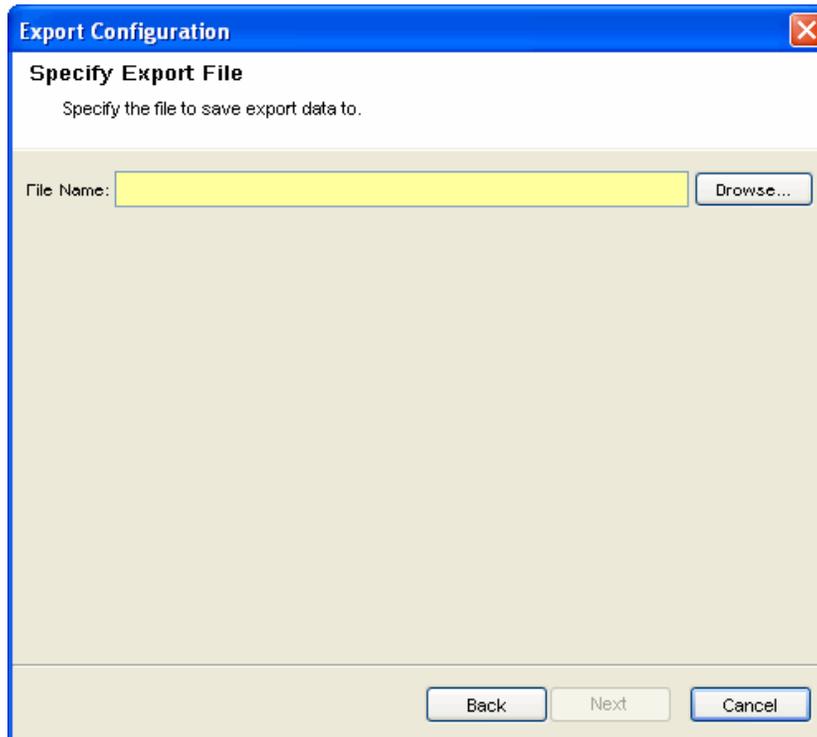
- 2 Check the data to export and click Next. Select Collector Scripts window displays.



- 3 Select the Collector scripts from the list to export. You can select or deselect all. Click Next. Select Connectors Plugin window displays.



- 4 Select the Connector Plugins from the list to export. You can select or deselect all. Click Next. Specify Export File window displays.



NOTE: If you want to view the description and dependents of a particular plugin in the above window, select that plugin from the table.

- 5 Browse a location to save the configuration and click Next.

NOTE: You can save the configurations only to a zip file.

- 6 Summary page with the details of the configurations and plugins selected to export displays.
- 7 Click Finish to export. The file is exported in zip format.

10.7 Import Configuration

Import configuration helps you to import the configuration of ESM objects exported to a zip file along with the plugins.

10.7.1 Enable/Disable Import Configuration

The import configuration option is enabled

- ♦ in Live view, when you select the Collector manager/Collector/Connector/
- ♦ in Scratch pad, when you select any node other than the Event source

Import Configuration in Live View and Scratchpad is disabled if you

- ♦ select "Sentinel" or "Event Source" nodes (only in Live View)

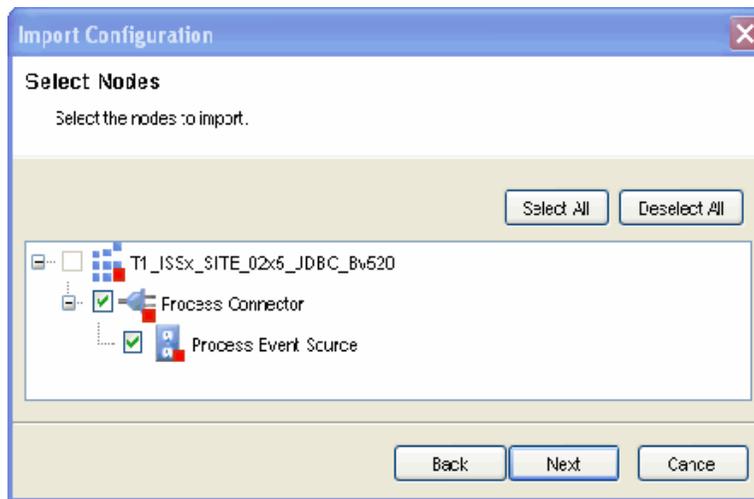
- ♦ do not select any node (only in Live View)
- ♦ select an Event Source node in child view of Graphical View
- ♦ select multiple nodes

To import your configurations:

- 1 Click File on the Menu Bar and select Import Configuration. You can also click the Import Configuration button on the Tool Bar. Import Configuration window displays.

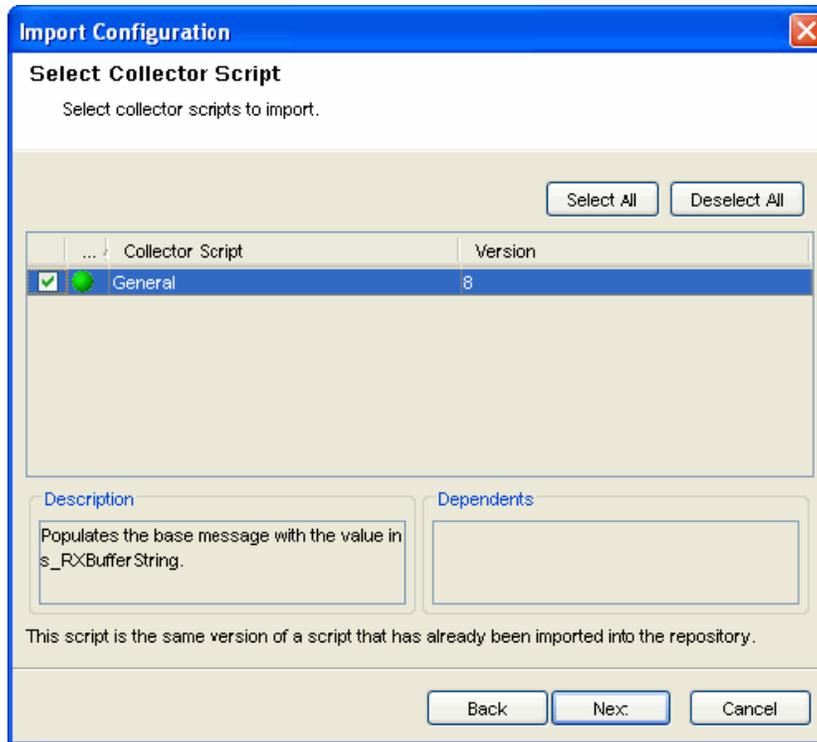
NOTE: You can also import configuration by right clicking on the object in the ESM panel. Depending on the object you have selected in the ESM panel, the node along with its child nodes are displayed in the Select Data window of Import Configuration wizard.

- 2 Browse and select the configurations file and click Next. Select Data window displays.



NOTE: Configurations must be saved to a zip file to import.

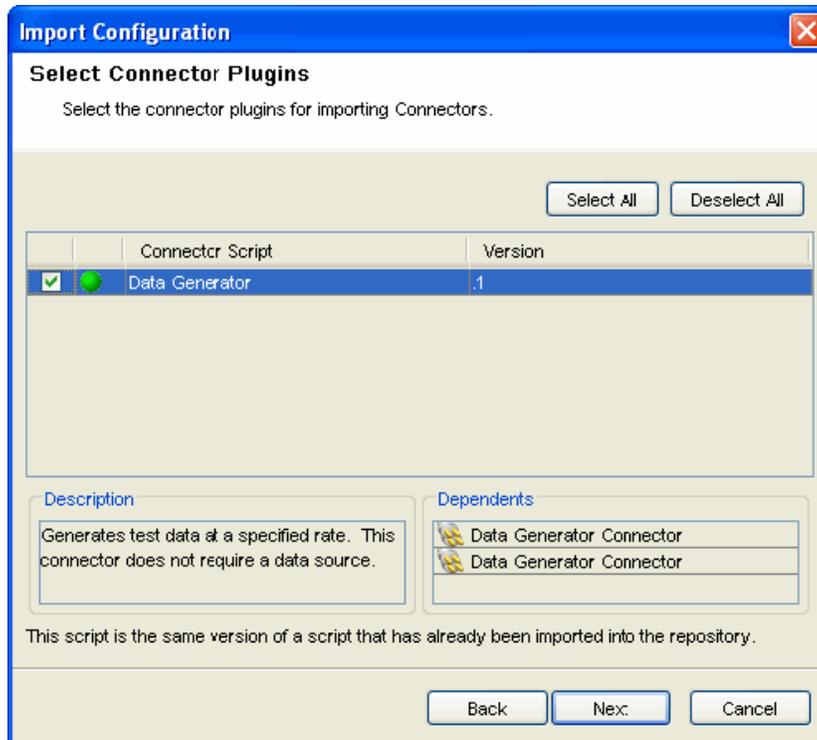
- 3 Check the data to import and click Next. Select Collector Script window displays.



- 4 Select the Collector script from the list to import.

NOTE: Color indicator is displayed in Select Collector Scripts and Select Connector Plugins window to indicate whether the plugin is already present in the repository or not. If the plugin does not present in the repository, then the color is displayed as red and if same version of plugin exists then the color is green else it is orange.

- 5 Click Next. Select Connector Plugins window displays.



- 6 Select the Connector plugins from the list to import.

NOTE: To view the description and dependents of a particular plugin in the above window, select that plugin from the table. If there are any Collectors or connectors in the ESM panel which gets affected on importing the plugin then Affected Collectors or Affected Connectors window is displayed.

- 7 Click Next. Summary page with the details of the configurations and plugin selected to import displays.
- 8 Click Finish.

10.7.2 Reset Layout

To reset to default settings:

- 1 Click View on the Menu Bar and select Reset Layout. Alternatively, click the Reset button on the Tool Bar.

10.7.3 Undo Layout

To undo layout changes:

- 1 Click View on the Menu Bar and select Undo Layout. Alternatively, click the Undo Layout button on the Tool Bar.

10.7.4 Redo Layout

To redo layout changes:

- 1 Click View on the Menu Bar and select Redo Layout. Alternatively, click the Redo Layout button on the Tool Bar.

10.8 Event Source Management Scratchpad

Scratchpad is the “Design Mode of the Health Monitor”. Through Scratchpad you can design and configure:

- ♦ Collector Managers
- ♦ Collectors
- ♦ Event Sources
- ♦ Connectors
- ♦ Event Source Servers

You can right-click the Sentinel icon and add the components. For more information, see [Section 10.4.2, “Adding Components to Event Source Hierarchy,” on page 190](#).

NOTE: You cannot view the status of any object in the design mode as they are not connected to an instance of a real Collector Manager.

10.9 Comparison between Sentinel 5.x and Sentinel 6.0

The following Sentinel 5 components have been rolled up into ESM. Along with the Sentinel 5 component name, there is a hint at where to find the related functionality in ESM.

Table 10-7 Comparison Table

Components	Sentinel 5.x	Sentinel 6.0
Build / Edit Collector	Building, Modifying or editing a Collector was possible in Collector Builder in 5.x	Building, Modifying or editing a Collector is possible in Collector Builder in 6.0
Import Collector	Importing a Collector is not applicable in 5.x	You can import a Collector from Sentinel Control Center in 6.0
Deploy Collector	Deploy Collector was possible in Collector Builder in 5.x	Deploy Collector is possible in Sentinel Control Center in 6.0
Debug Collector	A debugging interface that enabled a user to step through the parsing logic in a Collector. This interface was available in Collector Builder in Sentinel 5.x	In ESM, this is now done through the ESM panel in Sentinel Control Center. To debug a Collector in ESM, right click the Collector node you want to debug and select the Debug option.

Components	Sentinel 5.x	Sentinel 6.0
Storage location for files for Collectors in development	%ESEC_HOME%\wizard\Elements on Collector Builder machine	%ESEC_HOME\data\collector_workspace on Collector Builder machine
Storage location for files for running Collectors	%ESEC_HOME%\wizard\Elements on Collector Manager machine	%ESEC_HOME\data\collector_mgr.cache\collector_instances on Collector Manager Machine
Collectors Scripts	Collector Scripts were managed from Collector Builder in Sentinel 5.x	In Sentinel Control Center, Collector Scripts are plugins in 6.0. A Collector Script plugin must be added to the plugin repository before it can be deployed as a Collector. Collector parameters are now set when deploying a Collector in ESM.
Port Configurations	The configuration of the connection to the event source as well as the Collector to parse the data from the event source. Port Configurations were managed from Collector Builder in Sentinel 5.x	In ESM, this configuration is now managed in the ESM panel in Sentinel Control Center. The connection mechanisms are now plugins, which must be added to plugin repository before being deployed as Event Sources.
Collector Health Status View	A real-time view of the status (For example, on, off, events per second and so on) of Port Configurations configured across all Collector Managers. This view was available in the Sentinel Control Center in Sentinel 5.	In ESM, status information is now viewable in both graphical and tabular format of the ESM panel in Sentinel Control Center.
WORKBENCH_HOME directory	The WORKBENCH_HOME directory which was available in Sentinel 5.x and prior versions no longer exists.	

- ◆ [Section 11.1, “Understanding Admin Tab,” on page 223](#)
- ◆ [Section 11.2, “Introduction to User Interface,” on page 224](#)
- ◆ [Section 11.3, “Crystal Report Configuration,” on page 225](#)
- ◆ [Section 11.4, “Servers View,” on page 227](#)
- ◆ [Section 11.5, “Filters,” on page 230](#)
- ◆ [Section 11.6, “Configure Menu Options,” on page 239](#)
- ◆ [Section 11.7, “DAS Statistics,” on page 245](#)
- ◆ [Section 11.8, “Mapping,” on page 247](#)
- ◆ [Section 11.9, “Event Configuration,” on page 257](#)
- ◆ [Section 11.10, “Report Data Configuration,” on page 262](#)
- ◆ [Section 11.11, “User Configurations,” on page 267](#)

11.1 Understanding Admin Tab

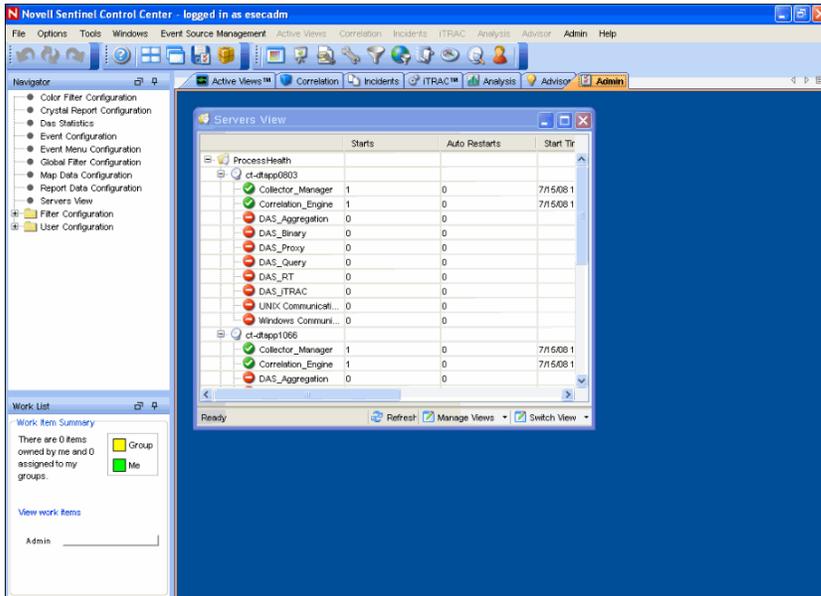
In Admin tab you can configure filters and reports. In User Manager you can create users and you can assign rights to the users.

The Admin tab allows you to access:

- ◆ [Crystal Report Configuration \(page 225\)](#): Configure connection to Crystal Reports Server
- ◆ [Servers View \(page 227\)](#): View health of server components
- ◆ [Filters \(page 230\)](#): Create and edit filters
- ◆ [DAS Statistics \(page 245\)](#): View health statistics for DAS components
- ◆ [Color Filter Configuration \(page 236\)](#): Format events based on filter criteria
- ◆ [Mapping \(page 247\)](#): Configure mapping service
- ◆ [Event Configuration \(page 257\)](#): Rename event fields and configure fields to be populated by mapping service
- ◆ [Event Menu Configuration](#): Configure options for right-click event menu options
- ◆ [Report Data Configuration \(page 262\)](#): Enable or disable aggregation service
- ◆ [User Configurations \(page 267\)](#): Create users and roles and manage active user sessions

NOTE: You need to have appropriate permissions to access this tab. Only an Administrator has controls to enable/disable access to the features of Admin for a user.

Figure 11-1 Sentinel Control Center



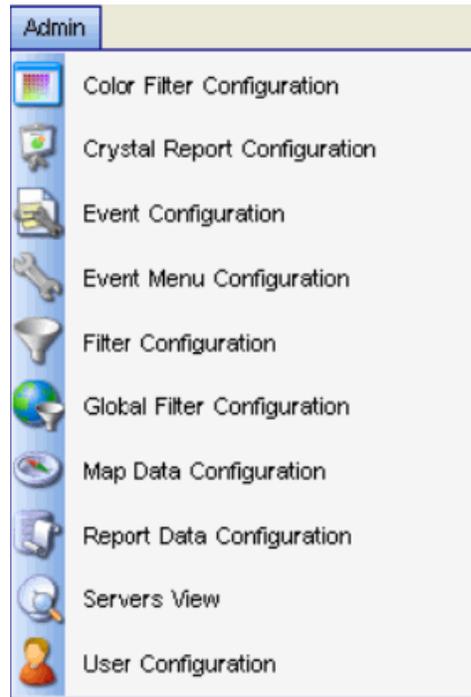
11.2 Introduction to User Interface

In Admin tab, you can see Server views, Filter Configuration and User Configuration in the Admin Navigator.

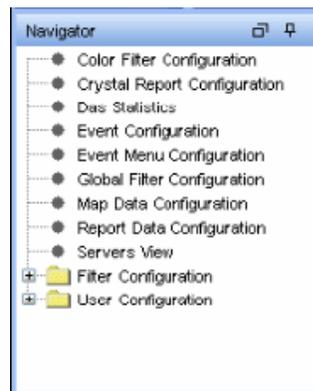
You can navigate to these functions from:

Table 11-1 Admin Tab- User Interface

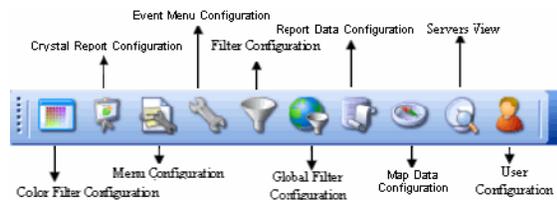
- ◆ The Admin menu in the Menu Bar



- ◆ The Navigation Tree in the Navigation Pane



- ◆ The Toolbar Buttons



11.3 Crystal Report Configuration

To configure the URL for Analysis and Advisor Reports:

- 1 Click *Admin*.

2 In the Admin Navigator, click Crystal Report Configuration.

For Crystal Reports Server running on Windows:

- ◆ In the Analysis URL box, specify the URL for the Crystal Reports Server and click Refresh.

```
http://<hostname_or_IP_of_web_server>/  
GetReports.asp?APS=<hostname>&user=Guest&password=&tab=Analysis
```

NOTE: <hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Reports Server.

NOTE: The URL above will not work properly if the APS is set to the IP Address. It must be the host name.

- ◆ In the Advisor URL box, specify the URL for the Crystal Reports Server and click Refresh.

```
http://<hostname_or_IP_of_web_server>/  
GetReports.asp?APS=<hostname>&user=Guest&password=&tab=Advisor
```

NOTE: <hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Reports Server.

NOTE: The URL above does not work properly if the APS is set to the IP Address. It must be the host name. For more information, see “[Crystal Reports for Windows](#)” in *Sentinel 6.1 Installation Guide*.

For Crystal Reports Server running on Linux (SUSE and Red Hat):

- ◆ In the Analysis URL box, specify the URL for the Crystal Reports Server and click Refresh.

```
http://<hostname_or_IP_of_web_server>:<web_server_port_default_8080>/  
esec-script/  
GetReports.jsp?APS=<hostname>&user=Guest&password=&tab=Analysis
```

where

<hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Reports Server

<APShostname> must be a hostname, not an IP address

<web_server_port_default_8080> must be replaced with the port of the Crystal Reports Server is listening on

- ◆ In the Advisor URL box, specify the URL for the Crystal Reports Server and click Refresh.

```
http://<hostname_or_IP_of_web_server>:<web_server_port_default_8080>/  
esec-script/  
GetReports.jsp?APS=<APShostname>&user=Guest&password=&tab=Advisor
```

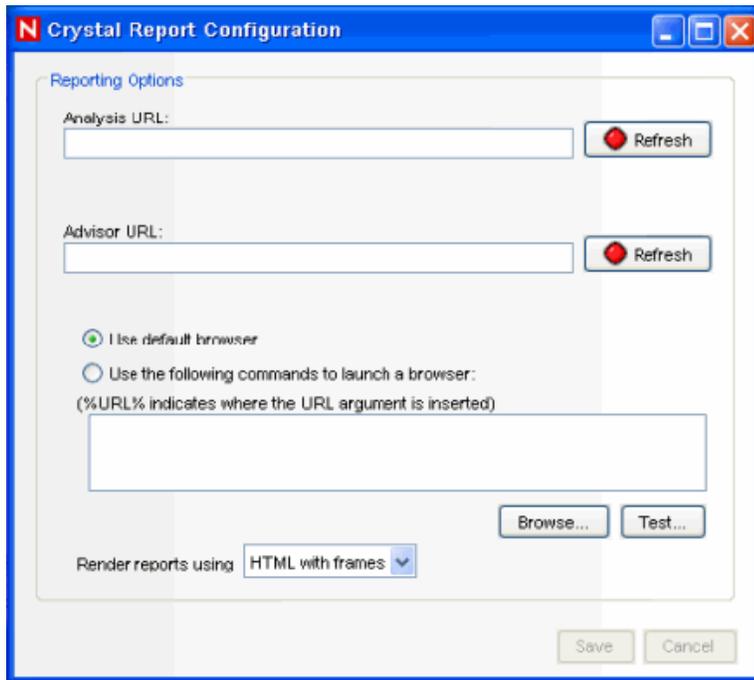
where

<hostname_or_IP_of_web_server> must be replaced with the IP address or hostname of the Crystal Reports Server

<APShostname> must be a hostname, not an IP address

<web_server_port_default_8080> must be replaced with the port of the Crystal Reports Server is listening on.

NOTE: For more information about Crystal Reports Server installation and configuration, see “Crystal Reports for Linux” in *Sentinel 6.1 Installation Guide*.



You can select Use default browser to use your default browser or select Use the following commands to launch a browser to specify a command to launch a browser. When using a browser other than the default browser, your command line must be followed by a %URL%. For example:

```
C:\Program Files\Internet Explorer\IEXPLORE.EXE %URL%
```

- 3 Wait for the Refresh button to turn green and click Save. You must logout of the Sentinel Control Center and login again.

11.4 Servers View

Through Servers View you can Start/Stop/Restart the processes that get installed on the product installation. Server Views allows you to monitor the status of all Sentinel Server processes across the system. The following are the Sentinel Server processes:

- ♦ Collector_Manager
- ♦ Correlation_Engine
- ♦ DAS_Aggregation
- ♦ DAS_Binary
- ♦ DAS_Proxy
- ♦ DAS_Query
- ♦ DAS_RT
- ♦ DAS_iTRAC

- ◆ Unix Communication Server
- ◆ Windows Communication Server

NOTE: Windows Communication Server and Unix Communication Server will run for their respective platform.

Figure 11-2 Server View window

	Starts	Auto Restarts	Start Time	State	Up T...	Version
ProcessHealth						
ct--dtapp0401						
Collector_Manager	1	0	4/6/07 10:26:23 AM	Running	26:03s	6.0.0.0
Correlation_Engine	1	0	4/6/07 10:26:23 AM	Running	26:04s	6.0.0.0
DAS_Aggregation	0	0		NOT_INITIALIZED		6.0.0.0
DAS_Binary	0	0		NOT_INITIALIZED		6.0.0.0
DAS_Proxy	0	0		NOT_INITIALIZED		6.0.0.0
DAS_Query	0	0		NOT_INITIALIZED		6.0.0.0
DAS_RT	0	0		NOT_INITIALIZED		6.0.0.0
DAS_JTRAC	0	0		NOT_INITIALIZED		6.0.0.0
UNIX Communicati...	0	0		NOT_INITIALIZED		6.0.0.0
Windows Communi...	0	0		NOT_INITIALIZED		6.0.0.0
esecsol6						

- ◆ **Start, stop or restart processes:** These actions can be taken on a process by right clicking on the process entry.

NOTE: The options in the right click actions on the Windows Communication Server and Unix Communication Server are not enabled because stopping these Communication Server will result in losing contact with all of the processes.

The terms Starts and AutoRestarts, in the context of the Server View, are defined as follows:

- ◆ **Starts:** The number of times the process was started, for whatever reason. This includes starts initiated by the user through the GUI or done automatically.
- ◆ **AutoRestarts:** The number of times the process was automatically restarted. Because this only applies to purely automatic restart scenarios, it does not apply to restarts initiated by a user. This field is helpful for determining if the process exited (For example, because of an error) and was automatically restarted by Sentinel Watchdog.

11.4.1 Monitoring a Process

To Monitor a Process:

- 1 Click the Admin tab.

Click Servers View. Alternatively, in Navigator click Servers View > Servers View. You can also click Servers View icon.



- 2 Expand the server view. All the processes will list as shown in the above figure.

11.4.2 Creating a Servers View

To Create a Servers View:

- 1 Click the Admin tab.

Click Servers View. Alternatively, in Navigator click Servers View > Servers View. You can also click Server View icon.



- 2 To create a new view, on the bottom right corner click Manage View drop down arrow. Click Add View.

- ◆ Specify your Option Name
- ◆ To arrange which fields you want to be shown, click Fields
- ◆ To group different attributes, click GroupBy
- ◆ To sort by different attributes, click Sort
- ◆ To filter, click Filter
- ◆ To change the display values of the processes shown in the servers view, click Leaf Attribute

- 3 Click Save.

11.4.3 Starting, Stopping and Restarting Processes

To Start, Stop and Restart Processes:

- 1 Click the Admin tab.

Click Servers View. Alternatively, in Navigator click Servers View > Servers View. You can also click Servers View icon.



- 2 Expand the servers view. All the processes will list as shown in the above figure. Select a process, right-click > Actions > select a function (Start, Restart or Stop).

...	✓ DAS_Aggregation	1		0
...	✓ DAS_Binary	1		0
...	✓ DAS_Proxy	1		0
...	✓ DAS_Query	1		0
...	✓ DAS_RT	1		0
...	✓ DAS_ITRAC	1		0

The image shows a table of processes with a right-click context menu open over the 'DAS_Binary' row. The menu options are Start, Restart, and Stop.

NOTE: You cannot stop the Windows Communication Server and Unix Communication Server using this feature.

11.5 Filters

Filters allow you to process data based on specific criteria for events in real-time and for users of the system. Filters enable you to manage data seen in the Sentinel Control Center. The Filter Engine drives the Real Time Event windows by maintaining the data structure for each security filter. Filters prevent users from viewing unauthorized events and drop events that users don't want to see. Filters are created in the Admin tab of the Sentinel Control Center.

NOTE: The following are invalid filter name characters: \$ # . * & : < >.

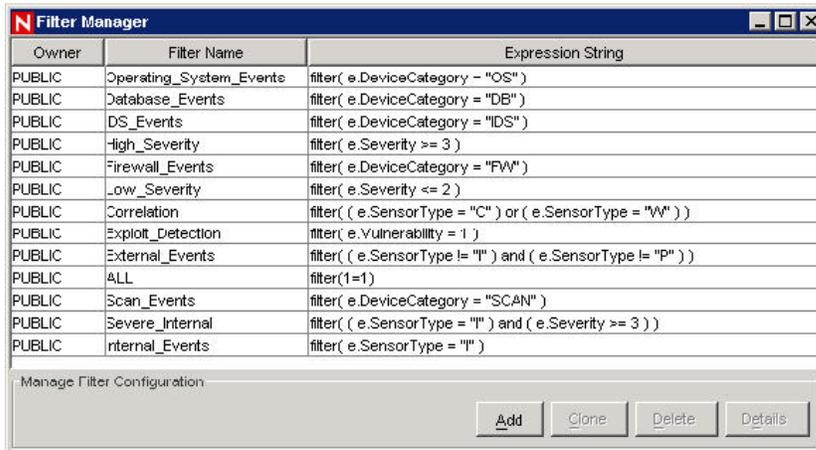
There are three types of filters:

- ◆ [Section 11.5.1, “Public Filters,” on page 230](#)
- ◆ [Section 11.5.2, “Private Filters,” on page 230](#)
- ◆ [Section 11.5.3, “Global Filters,” on page 231](#)
- ◆ [Color Filters](#)

11.5.1 Public Filters

Public filters are system-owned. Public filters can be used as security filters or display filters. Security filters are based on user permissions. Display filters determine which events are depicted in the real time event tables, charts and graphs.

Figure 11-3 Filter Manager window



Owner	Filter Name	Expression String
PUBLIC	Operating_System_Events	filter(e.DeviceCategory = "OS")
PUBLIC	Database_Events	filter(e.DeviceCategory = "DB")
PUBLIC	DS_Events	filter(e.DeviceCategory = "IDS")
PUBLIC	High_Severity	filter(e.Severity >= 3)
PUBLIC	Firewall_Events	filter(e.DeviceCategory = "FW")
PUBLIC	Low_Severity	filter(e.Severity <= 2)
PUBLIC	Correlation	filter((e.SensorType = "C") or (e.SensorType = "W"))
PUBLIC	Exploit_Detection	filter(e.Vulnerability = 1)
PUBLIC	External_Events	filter((e.SensorType != "I") and (e.SensorType != "P"))
PUBLIC	ALL	filter(1=1)
PUBLIC	Scan_Events	filter(e.DeviceCategory = "SCAN")
PUBLIC	Severe_Internal	filter((e.SensorType = "I") and (e.Severity >= 3))
PUBLIC	Internal_Events	filter(e.SensorType = "I")

Manage Filter Configuration

Add Clone Delete Details

11.5.2 Private Filters

Private filters are user-owned. Private filters are display filters and are shareable if you have the View Private Filters permission.

11.5.3 Global Filters

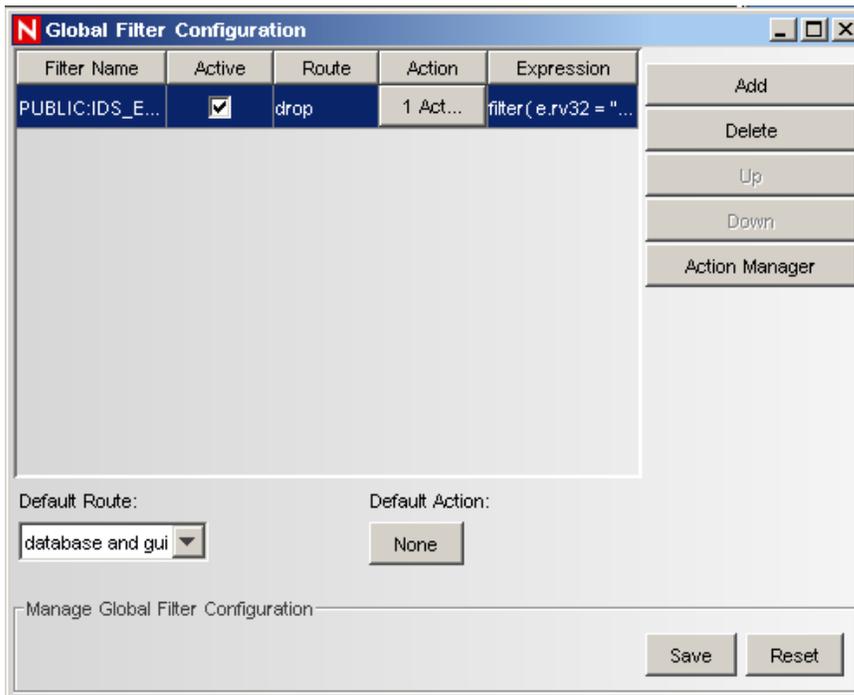
Global filters are classified as Public filters. Global filters are sequentially processed at the Collector Manager for each event. Once the global filter criteria are met, the evaluation stops for that event and the associated global filter action is taken for the event.

The order of evaluation of global filters is top to bottom, as shown in the console. They can be enabled or disabled as required. Global Filters enable routing actions and JavaScript actions on events. Routing actions include dropping events or routing events to database, database and GUI (SCC), or only to GUI (SCC).

This section includes the following topics:

- ♦ [Create Global Filter](#)
- ♦ [Rearrange a Global Filter](#)
- ♦ [Delete a Global Filter](#)

Figure 11-4 Global Filter Configuration



Creating a Global Filter

To create a Global Filter:

- 1 Click the *Admin* tab.
- 2 Click *Admin > Global Filter Configuration* or select *Global Filter Configuration* in the navigation tree.
- 3 In the *Global Configuration* window, click *Add*.
- 4 In the new blank row, click *Filter Name* column.

- 5 In the *Filter Selection* Window, highlight a relevant filter and click *Select*, or click *Add* if you need to create a filter.

The Expression column displays the selected filter in the RuleLg language.

- 6 In the *Active* column, select the checkbox to associate the filter with options specified in the *Route* and *Action* columns.

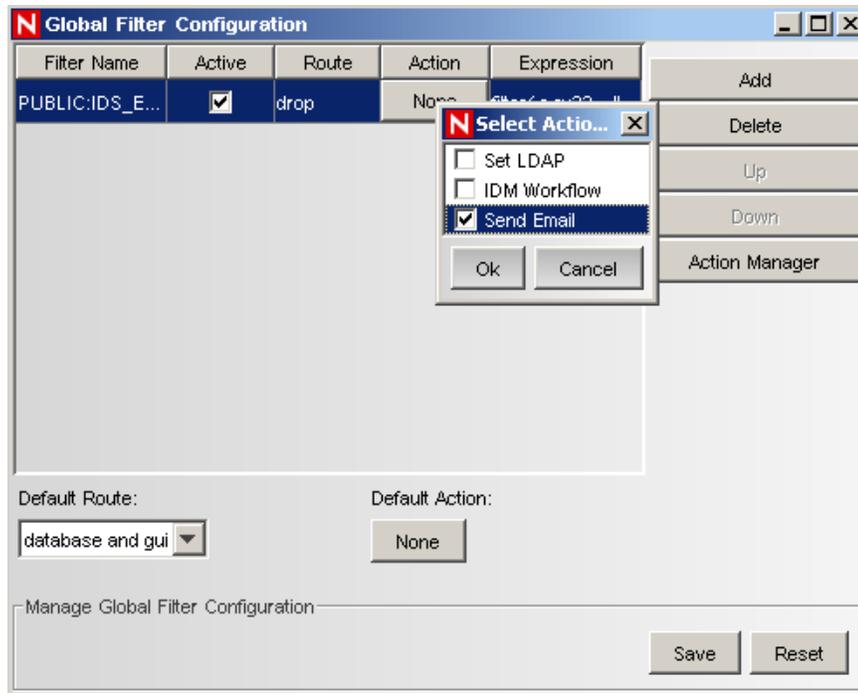
NOTE: If the Active checkbox is not selected, the options specified in the *Default Route* and *Default Action* will be associated to the filter. If the *Default Action* is set to *None*, then no action will be associated to the filter.

- 7 In the *Route* column, select the routing action that the global filter will have on events that pass this global filter. If an event does not meet any of the active global filters, then the *Default Routing* determines how the event is handled.

The following are the options available in the *Route* drop-down list:

- ♦ **drop:** Events are dropped and are not sent to Sentinel Control Center or the Sentinel Server database.
 - ♦ **database:** Events are sent directly to the Sentinel Server database, bypassing the Sentinel Control Center.
 - ♦ **database and gui:** Events are sent to the Sentinel Control Center and Sentinel Server database.
 - ♦ **gui only:** Events are sent to the Sentinel Control Center.
- 8 In the *Action* column, select the action that needs to be performed once the filter criteria are met.

NOTE: To create new actions for the filter, click *Action Manager* or select *Tools > Action Manager* from the menu bar. For more information on creating actions, see [“Actions” on page 377](#). You can associate single or multiple actions to a filter. By default, the *Action* and *Default Action* are set to *None*. Global Filters execute only JavaScript actions. Actions that are associated with global filters cannot be deleted from the Action Manager.



NOTE: The *Action* column and the *Action Manager* button are available only on systems that have Sentinel 6.1 SP1 Hotfix 2 or later installed.

- 9 Continue adding filters until you have completed adding all the required filters.
- 10 Click *Save*.

Rearranging Global Filters

To Rearrange Global Filters:

- 1 In the *Global Configuration* window, select a filter and click *Up* or *Down* to move it to a different location on the list.
- 2 Click *Save*.

Deleting a Global Filter

NOTE: When deleting a Global Filter, the confirmation message will not display.

To delete a global filter:

- 1 In the *Global Configuration* window, select a filter from the list and click *Delete*.
- 2 Click *Save*.

11.5.4 Configuring Public and Private Filters

Configuring Public and Private filters allow you to:

[Add a Filter](#)

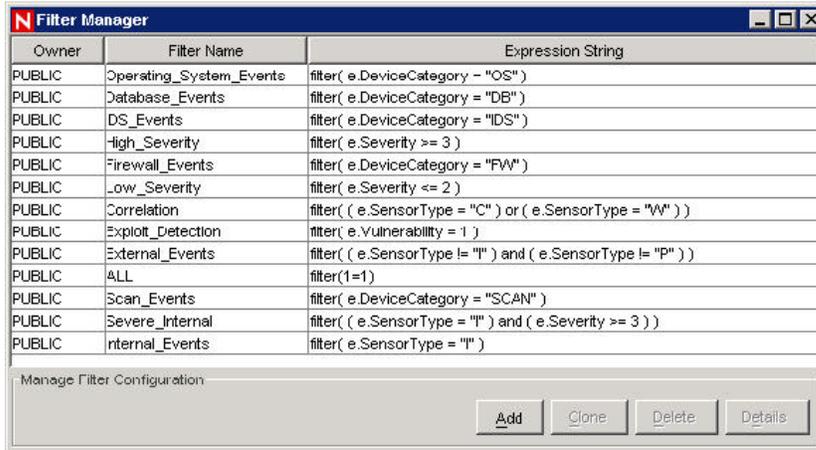
[View the Details of a Filter](#)

[Clone a Filter](#)

[Delete a Filter](#)

[Modify a Filter](#)

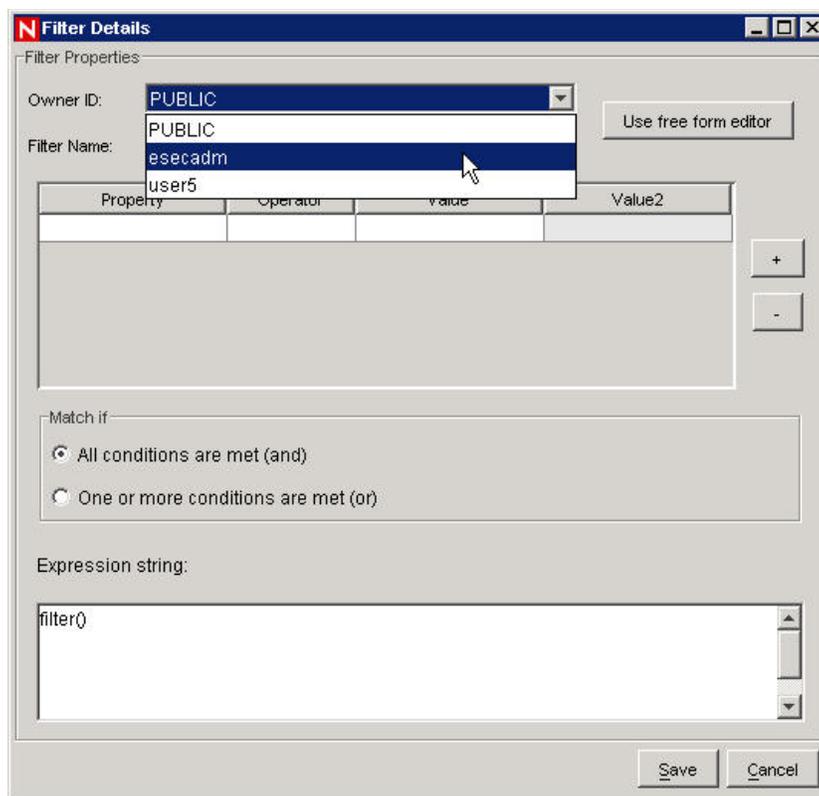
Figure 11-5 Filter Manager window



Adding a Filter

To add a public and private filter:

- 1 Click *Admin > Filter Manager* or select *File Manager* under the Filter Configuration folder in the Navigator; click *Add*.
- 2 Select an Owner ID (public or private [user owned]).



- 3 Specify a Filter Name.
- 4 The table editor is the default selection for editing the contents.

NOTE: Optionally, you can click Use free form editor to display a free form editor. The free form editor allows you to create complex expressions not possible with the table editor. However, after the expression is modified with the free form editor, the table editor cannot be used with the expression.

- 5 Select the criteria for the following columns:
 - ◆ Property
 - ◆ Operator
 - ◆ Value columns

NOTE: In order to include special characters in the *Value* column, you should provide the hexadecimal value (character code) of the special character. For example, if the Value is "10.1.1.1", then you should enter \x2210.1.1.1\x22 to embed the double quote in a string value.

The *Expression string* box displays the filters that you created in RuleLg language.

- 6 In the Match if box, click either:
 - ◆ All conditions are met (and)
 - ◆ One or more conditions are met (or)
- 7 To create another filter expression, click Create a New Filter Expression (+) to add another row to the filter expression table.

- 8 To remove a filter expression, select a filter expression from the table and click Remove the Selected Expression (-).
Click Save.

To Clone a Public and Private filter

Cloning is a convenient way to duplicate a filter to assure consistency of criteria among a group of filters or users.

To clone a public and private filter:

- 1 Open the Filter Manager window.
- 2 Click Clone.
Provide a new filter name.
Change any the original filter's criteria.
Click Save.

Modifying a Public and Private Filter

To modify a Public and Private filter:

- 1 Open the Filter Manager window.
- 2 Select a filter and click Details.
Change any of the criteria as desired. You will not be able to change the Owner ID and the Filter Name.
Click Save.

Viewing the Details of a Public and Private Filter

To view a public or private filter:

- 1 Open the Filter Manager window.
- 2 Select a filter and click Details.

Deleting a Public and Private Filter

To delete a Public and Private filter:

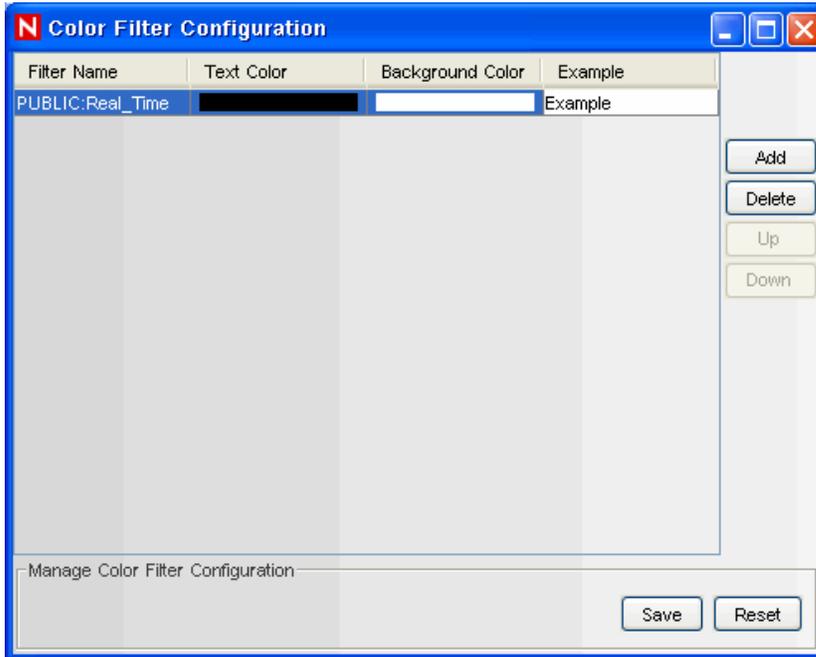
- 1 Open the Filter Manager window.
- 2 Select a filter and click Delete.
A confirmation window displays. Click Yes in delete confirmation dialog.

11.5.5 Color Filter Configuration

The Color Filter Configuration allows you to assign background and text colors to events in the Sentinel Control Center based on filter criteria. The background and text colors assigned to a filter apply to all Sentinel tables, including active views, event tables associated with Incidents, offline queries and historical event queries.

On applying a color filter, all the event tables are updated.

Figure 11-6 Color Filter Configuration



The Color Filter Configuration GUI displays a listing of all the color filters that are defined in the order in which they should be applied. If an event meets the criteria for more than one of the color filters, the topmost color filter configuration will be applied. For example, the following filter configurations are created and attached to color filter configuration:

- Color filter configuration 1: sev=2 (with background color red and text color yellow)
- Color filter configuration 2: sev>1 (with background color white and text color black)

Any event with severity=2 will meet the criteria for both color filters, but since the sev=2 color filter configuration is at the top, all the events with sev=2 will be coded as per color filter configuration 1. All the other events with sev>1 (For example, sev=3, 4, 5 and so on) will follow color filter configuration 2.

Adding Color Filter

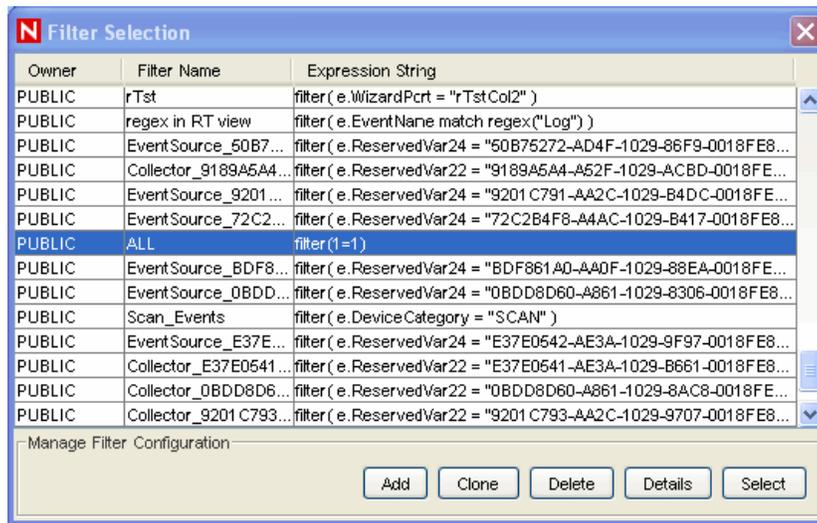
To add a color filter:

- 1 Click Color Filter Configuration in the navigation pane or click the Color Filter Configuration button.
- 2 Click Add. A new Color Filter Configuration row is created as shown below.

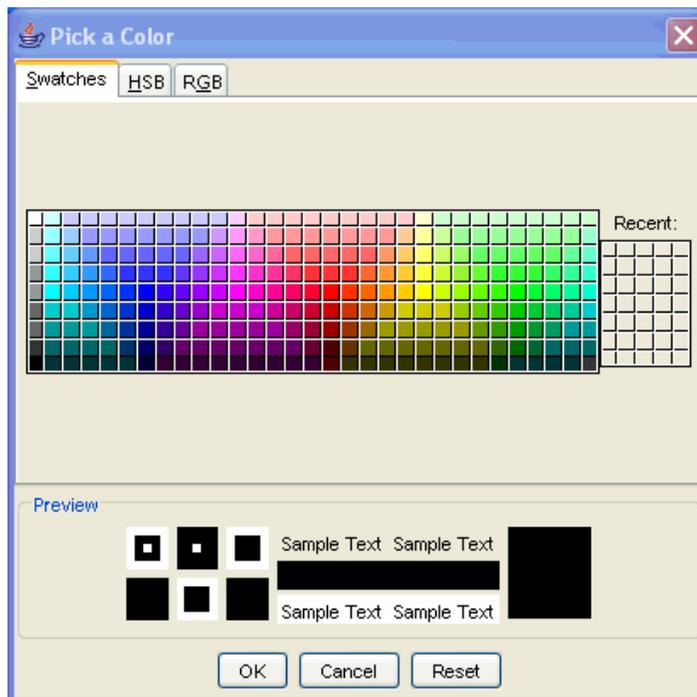
Filter Name	Text Color	Background Color	Example
	Black	White	Example

- 3 Click Filter Name drop down list. The Filter Selection window displays.

- From the list, select a filter to which you want to apply the color filter configuration and click Select or click Add to create a new filter. For more information on configuring filters, see [Section 11.5.4, “Configuring Public and Private Filters,”](#) on page 233.



- In the Color Filter Configuration window click Text Color. The Pick a Color window displays. Select a color from the Swatches tab. Alternatively, click HSB or RGB tab and specify the HSB or RGB color value in the respective tab. Click OK.



- In the Color Filter Configuration window, click Background Color. The Pick a Color window displays. Select a color from the Swatches tab. Alternatively, click HSB or RGB tab and specify HSB or RGB color value in the respective tab. Click OK.
- Click Save.

NOTE: The order of the color filter configuration row in the Color Filter Configuration window matters. In the case where more than one color filter definition applies to an event, the formatting for the topmost color filter takes precedence.

Deleting Color Filter

To delete a color filter:

- 1 Click Color Filter Configuration in the navigation pane.
- 2 Select a Color Filter Configuration row and click Delete.

Setting Color Filter Priorities

To set priority for a color filter:

- 1 Click Color Filter Configuration in the navigation pane or click the Color Filter Configuration button.
- 2 Select a Color Filter Configuration row.
- 3 Click Up or Down button to set the priority.

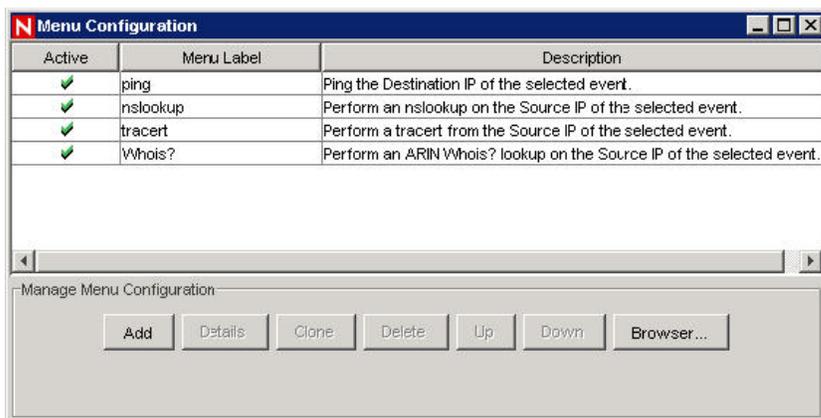
NOTE: The Up and Down button will be active only when there is more than one color filter configuration row available in the Color Filter Configuration window.

11.6 Configure Menu Options

NOTE: To use this feature, you must have the user permission Event Menu Configuration.

Use the Event Menu Configuration window to create the menu items that appear on the Event menu, which is available by right-click when an event (or set of events, if the action is written in JavaScript) is selected in any event table (for example, an Active View window, Snapshot window, Incidents Events window, or Offline Query window). Sentinel has the following default Event Menu Configuration items that you can clone, activate or deactivate:

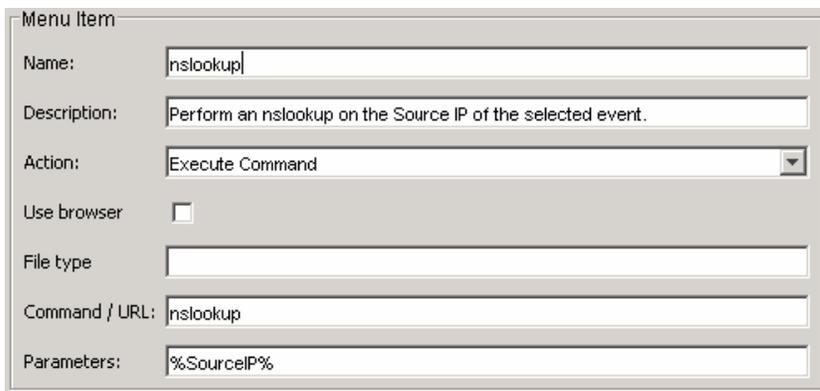
Figure 11-7 Event Menu Configuration



- ◆ **Ping:** Ping the destination (or target) IP of the selected event
- ◆ **nslookup:** Perform an nslookup on the Source (or initiator) IP of the selected event
- ◆ **tracert (tracert on Microsoft SQL 2005):** Perform a traceroute from the Source (or initiator) IP of the selected event to the Sentinel Server
- ◆ **Whois?:** Perform an ARIN Whois? lookup on the Source (or initiator) IP of the selected event

To view the configuration details for any of these options, select the item and click Details. The following is the nslookup configuration.

Figure 11-8 Menu Item



In addition, new options can be customized to execute a command, open a Web browser, or execute a JavaScript Action configured through the Action Manager.

NOTE: The Execute Command scripts, commands, or applications must be available in \$ESEC_HOME/config/exec (on UNIX) or %ESEC_HOME%\config\exec (on Windows). Symbolic links are not supported on UNIX.

Event Menu Configuration allows you to perform the following activities:

- ◆ [Section 11.6.1, “Adding an Option to the Event Menu,” on page 241](#)
- ◆ [Section 11.6.2, “Cloning an Event Menu Option,” on page 242](#)

- ◆ Section 11.6.3, “Modifying an Event Menu Option,” on page 243
- ◆ Section 11.6.4, “Viewing Event Menu Option Parameters,” on page 243
- ◆ Section 11.6.5, “Activating or Deactivating an Event Menu Option,” on page 243
- ◆ Section 11.6.6, “Rearranging Event Menu Options,” on page 244
- ◆ Section 11.6.7, “Deleting an Event Menu Option,” on page 244
- ◆ Section 11.6.8, “Editing Your Event Menu Browser Settings,” on page 244

11.6.1 Adding an Option to the Event Menu

Users with the appropriate permissions can add new actions to the event menu that appears when users right-click on an event or events in any event table. There are three types of actions that can be configured for the event menu:

- ◆ **Execute Command:** Executes a script or an application, opens the output in a specified application. This can take the value of a field or fields as input. This action can only be executed on a single event.
- ◆ **Launch a Web Browser:** Launches a web browser with a specified URL. This can take the value of a field or fields as input. This action can only be executed on a single event.
- ◆ JavaScript Actions configured through the Action Manager. JavaScript actions can be executed on a single event or multiple events.

NOTE: Some JavaScript Action Plugins require a correlated event or incident as input. Actions configured from these plugins will be excluded from the Event Menu Configuration list. This Action Plugin property is defined by the developer.

To add a command to the right-click menu:

- 1 Click Admin tab.
- 2 In the Admin Navigator, click Admin > Event Menu Configuration.
- 3 Click Add. The Event Menu Configuration window opens.

The screenshot shows the 'Event Menu Configuration' dialog box. The 'Name' field contains 'ping command'. The 'Description' field contains 'To execute "Ping" command'. The 'Action' dropdown menu is set to 'Execute Command'. Under the 'Options' section, the 'Use browser' checkbox is unchecked. The 'File type' field is empty. The 'Command / URL' field contains 'ping'. The 'Parameters' field contains '10.0.0.111'. At the bottom of the dialog, there are four buttons: 'Help', 'Add Action...', 'Ok', and 'Cancel'.

4 Enter a Name and Description.

NOTE: To place the command in a folder, provide [foldername]/[commandname] in the Name field.

5 Select an action from the dropdown menu or click Add Action to configure a new JavaScript action. The available settings vary based on which action is chosen:

Option	Description
Use browser	Displays the output of your command using the defaults configured for the web browser, based on the file type below. This is only available with the Execute Command Action
File Type	If you selected the Action Execute Command, your Browser settings are setup to Use Default Browser, and you selected the option Use the following commands to launch a browser, you have the option of setting the File Type for the output of this command (such as pdf or .pdf). This is only available with the Execute Command Action if Use browser is selected
Command/URL	The script or URL that the browser should open or the script/application name to invoke. This is only available with the Execute Command and Launch Web Browser Actions
Parameters	Parameters to represent information from the selected event must be enclosed by percent signs (for example, %InitIP%). For a list of available tags you can use when specifying parameters, click Help on the Event Menu Configuration dialog box or see “Sentinel Event Fields” in Sentinel 6.1 Reference Guide .

NOTE: This option is only available if your menu configuration browser settings are set to Use Default Browser. For more information, see [Section 11.6.8, “Editing Your Event Menu Browser Settings,”](#) on page 244.

NOTE: On Unix, the script or application for Execute Command must be located in \$ESEC_HOME/config/exec or \$ESEC_HOME%\config\exec.

6 Click OK. The new option is added to the list of menu items when users right-click on an event or events.

11.6.2 Cloning an Event Menu Option

To clone an Event Menu option:

- 1 Open the Event Menu Configuration window.
- 2 Select a menu item from the table and click Clone.
- 3 In the Event Menu Configuration dialog box, edit:
 - ◆ Name
 - ◆ Description
 - ◆ Action

- ◆ To use a browser or not. For information, see [Section 11.6.8, “Editing Your Event Menu Browser Settings,”](#) on page 244.
- ◆ Command/URL
- ◆ Parameters
- ◆ Select an action:
 - ◆ Execute Command
 - ◆ Launch Web Browser.
 - ◆ Any JavaScript action configured in the Action Manager

NOTE: For a list of available tags you can use when specifying parameters, click Help on the Event Menu Configuration dialog box or see “[Sentinel Event Fields](#)” in [Sentinel 6.1 Reference Guide](#).

- 4 Click OK. The new option is added to the list of menu items in the Event Menu Configuration window.

11.6.3 Modifying an Event Menu Option

To modify an Event Menu Configuration option:

- 1 Open the Event Menu Configuration window.
- 2 Double-click a menu option.
- 3 Type your desired changes and click OK.

11.6.4 Viewing Event Menu Option Parameters

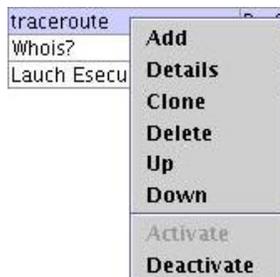
To view the parameters for an Event Menu Configuration menu option:

- 1 Open the Event Menu Configuration window.
- 2 Highlight a menu item and click Details.

11.6.5 Activating or Deactivating an Event Menu Option

To activate or deactivate an Event Menu Configuration option:

- 1 Open the Event Menu Configuration window.
Select a menu option, right-click and select either Activate or Deactivate.



11.6.6 Rearranging Event Menu Options

To move an Event menu option up or down:

- 1 Open the Event Menu Configuration window.
- 2 Select a menu option and click Up or Down.

11.6.7 Deleting an Event Menu Option

To delete a Menu Configuration option:

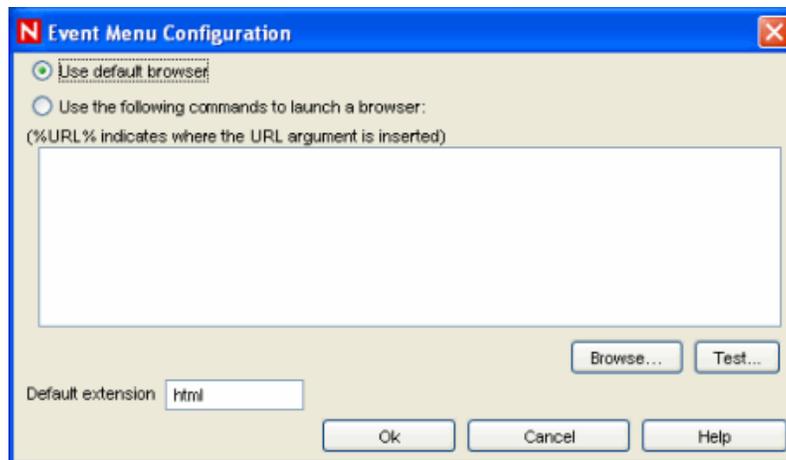
- 1 Open the Event Menu Configuration window.
- 2 Select a menu option and click Delete.
 - ♦ Click Yes to delete the menu option
 - ♦ Click No to retain the menu option

11.6.8 Editing Your Event Menu Browser Settings

This option allows you to send your Event Menu output to an external browser. The external browser can be any application. It is not restricted to Internet Browsers. By changing the file extension you can launch whatever application is associated with that extension. For example, txt is often associated with Notepad. You can also select to launch a specific program (for example, you can set txt files to be opened by Wordpad or other editor).

To Edit your Menu Configuration Browser Settings:

- 1 Open the Event Menu Configuration window.
- 2 Click Browser.



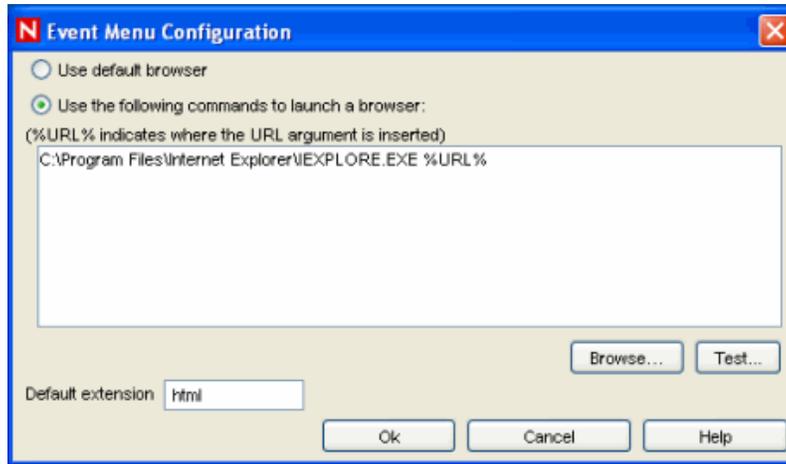
You can select from the following two options:

- ♦ **Use default browser:** Uses the default browser set in that particular machine. For example, in Windows, "Internet Explorer".

- ♦ **Use the following commands to launch a browser:** Allows you to specify a specific application to launch. When using a browser other than the default browser, your command line must be followed by a %URL%. For example:

```
C:\Program Files\Internet Explorer\IEXPLORE.EXE %URL%
```
- ♦ **Default extension:** This file extension is assumed if the File Type in a configured action is blank.

The following is an example where the output of the Menu Option launches into Internet Explorer.



- 3 After you set your configuration, click OK.

11.7 DAS Statistics

This feature is for internal monitoring of your system. It is not intended for the average user. DAS Statistics monitors the following:

- ♦ DAS_Binary
- ♦ DAS_Query
- ♦ DAS_rt
- ♦ Collector_Manager
- ♦ Correlation_Engine
- ♦ DAS_iTRAC

Statistics are broken down as follows:

- ♦ **Service:** Name of service such as DAS_Query
- ♦ **Time:** Time since the last update
- ♦ **num:** Number of requests processed for this entry
- ♦ **WaitTime:** Average wait time in seconds for a request before its processing starts
- ♦ **Runtime:** Average time to process a request (in seconds)
- ♦ **#wait:** Average size of the wait queue
- ♦ **#run:** Average size of the run queue

The information is divided into 3 sections:

- ◆ Requests
- ◆ Services
- ◆ ThreadPools

Under Requests it keeps all the requests by channel (such as services.CorrelationService). Under services it does the same by service. Sometimes it provides a breakdown by appending “<category>” under the name, such as Services.CorrelationService or Services.RemoteObjectService.EMap.getMapPK.

Under Services, all the remote method calls from user defined services (your XML services) are all under services.RemoteObjectService. Under that it puts the name of the service (EMap) in the above example and if asked, the name of the method (getMapPK in the above).

When a request is received by a server, such as DAS Query, a task is created and scheduled. The task is then assigned to a thread pool for execution. There can be more than one thread pool and a thread pool can service multiple services. For that reason, a request needs to wait for an available thread even if the service is not heavily used. If the statistics indicate that the wait time for a request is large and the number of requests for that service is low, check the information about the thread pools.

The numbers next to an entry are the sum for all its children. So requests 15 means that there are 15 requests for all requests method calls. Under that, requests.configurations 1 means that 1 of the 15 are to configurations, requests.esecurity.correlation.config 2 means that 2 of the 15 are to esecurity.correlation.config and so on.

Figure 11-9 Das Statistics window

Service	Time	Name	Num	Wait (sec)	Run (sec)	#Waiting	#Running
DAS_RT-0049E98C-DD...	9:00:00 AM						
		ThreadPools	931	0.000	0.211	0.0	0.1
		ThreadPools.Def...	7	0.005	0.096	0.0	0.0
		ThreadPools.Def...	7	0.005	0.096	0.0	0.0
		ThreadPools.RTE...	5	0.009	37.498	0.0	0.1
		ThreadPools.RTE...	5	0.009	37.498	0.0	0.1
		ThreadPools.RTI...	547	0.000	0.015	0.0	0.0
		ThreadPools.RTI...	4	0.000	0.136	0.0	0.0
		ThreadPools.RTI...	0			0.0	0.0
		ThreadPools.RTI...	4	0.000	0.000	0.0	0.0
		ThreadPools.RTI...	539	0.000	0.014	0.0	0.0
		ThreadPools.Tim...	372	0.000	0.001	0.0	0.0
		ThreadPools.Tim...	6	0.000	0.000	0.0	0.0
		ThreadPools.Tim...	6	0.000	0.078	0.0	0.0
		ThreadPools.Tim...	360	0.000	0.000	0.0	0.0
		requests	371	0.001	0.006	0.0	0.0
		requests.esecuri...	7	0.044	0.096	0.0	0.0
		requests.ewizer...	364	0.000	0.004	0.0	0.0
		services	371	0.001	0.006	0.0	0.0
		services.EventSt...	364	0.000	0.004	0.0	0.0

The information can be useful because it shows what is going on. The number of requests is especially useful, you can see where they are all going or concentrated. The #waiting is useful because it shows how busy the server is. That number should be small. If it is large, new requests (even for simple tasks) will need to wait for potentially slow ones. This is not a good situation. The average run time is very important because it shows which requests are actually taking all the time, as opposed to waiting for others.

11.8 Mapping

A map is a collection of values and keys defined in a CSV or text file. You can enrich your data by using maps. With the help of maps you can add additional information to the incoming events from your source device. This additional information which was not present can be used for correlation and reporting.

You can create your custom maps in addition to the default maps available. You can use event mapping which allows you to add additional data to an event by using data already present in the event and by referencing and pulling data from an outside source. For more information, see [Section 11.9, “Event Configuration,” on page 257](#) and [Section 11.9.1, “Event Mapping,” on page 257](#).

NOTE: In order to do Mapping, your `configuration.xml` file must be pointing to a Communication Server that has `DAS_Binary` and `DAS_Query` connected to it. This will normally be the case, by default, as long as the Communication Server and DAS processes are running.

The Mapping tab allows you to:

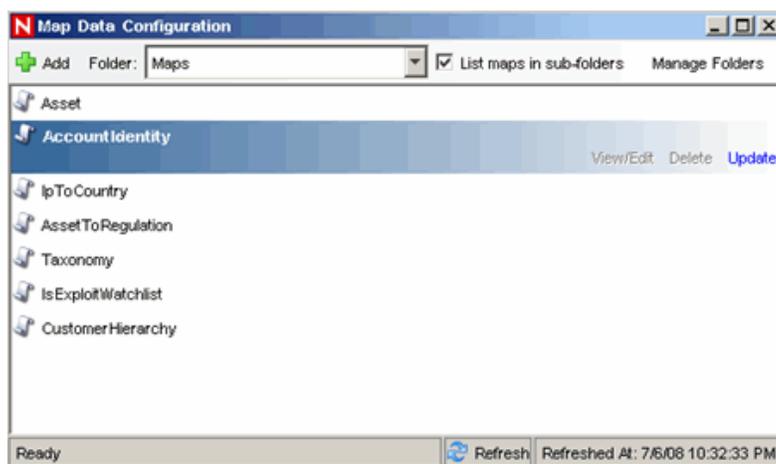
- ◆ [Add new map definitions](#)
- ◆ [Edit map definitions](#)
- ◆ [Delete map definitions](#)
- ◆ [Update map data](#)

Mapping works together with the Referenced from Map Data Source setting for individual fields under [Section 11.9, “Event Configuration,” on page 257](#). You can map by using a string or number range. The following are the default maps available:

- ◆ **AccountIdentity:** Contains information about identities and the accounts associated with them. The keys are `UserName`, `UserDomain`, and `CustomerName` (for MSSPs). This map is populated from information in the Account and Identity tables in the Sentinel database.
- ◆ **Asset:** Contains the data from the map data source file `asset.csv`. The `asset.csv` is automatically generated from asset data from Sentinel Database when an asset Collector is run. This file could be populated manually instead, if desired. The keys are `PhysicalAssetName` and `CustomerName` (for MSSPs).
- ◆ **AssetToRegulation:** Contains the data from the map data source file `AssetToRegulation.csv`. This file must be populated manually.
- ◆ **CustomerHierarchy:** Generally used for Managed Security Service Providers (MSSPs), this can be used to organize customers into a four-level hierarchy. Contains data from the `customerhierachy.csv`. This file must be populated manually. The key is `CustomerName`.
- ◆ **IpToCountry:** Contains the data from the map data source file `IpToCountry.csv`. This file must be populated manually.
- ◆ **IsExploitWatchlist:** Contains the data from the map data source file `exploitDetection.csv` (vulnerabilities and threats). The `exploitDetection.csv` file is automatically generated from Advisor and Vulnerability data from Sentinel Database when either an Advisor feed is completed or a vulnerability Collector is run. The keys are `IP`, `AttackName`, `DeviceName`, and `CustomerName` (for MSSPs).

To view maps in the GUI:

- 1 Navigate to Admin tab and select Map Data Configuration from the Navigation pane or click Map Data Configuration button.



The main Mapping GUI displays a listing of all of the maps that have been defined for the system.

NOTE: Default Sentinel maps cannot be edited or deleted.

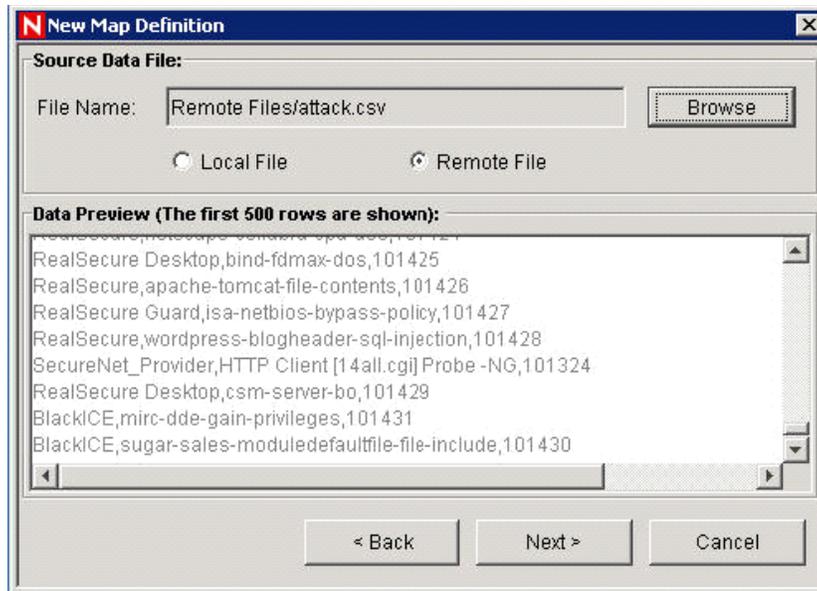
11.8.1 Adding Map Definitions

To add a map definition:

- 1 Navigate to Admin tab and select Map Data Configuration from the navigation pane or click Map Data Configuration button.
- 2 Click Add.
- 3 If you are creating a new map folder, click New Dir. Specify a folder name.
- 4 Ensure that the folder you want to provide your map definition into is selected. (that is, the folder indicates that it is open).
- 5 Specify your Map Name.
- 6 Click Next.

NOTE: The Map Type field box is disabled.

- 7 Select either Local File or Remote File.
 - ♦ **Local File:** Allows you to browse for your file on your local file system (on the machine where Sentinel Control Center was launched from).
 - ♦ **Remote File:** Allows you to select from existing map source data files on the server where DAS is running. Remote file points to %ESEC_HOME%\data\map_data (Windows) or \$ESEC_HOME/data/map_data (UNIX)



Select your map definition file. Click Next.

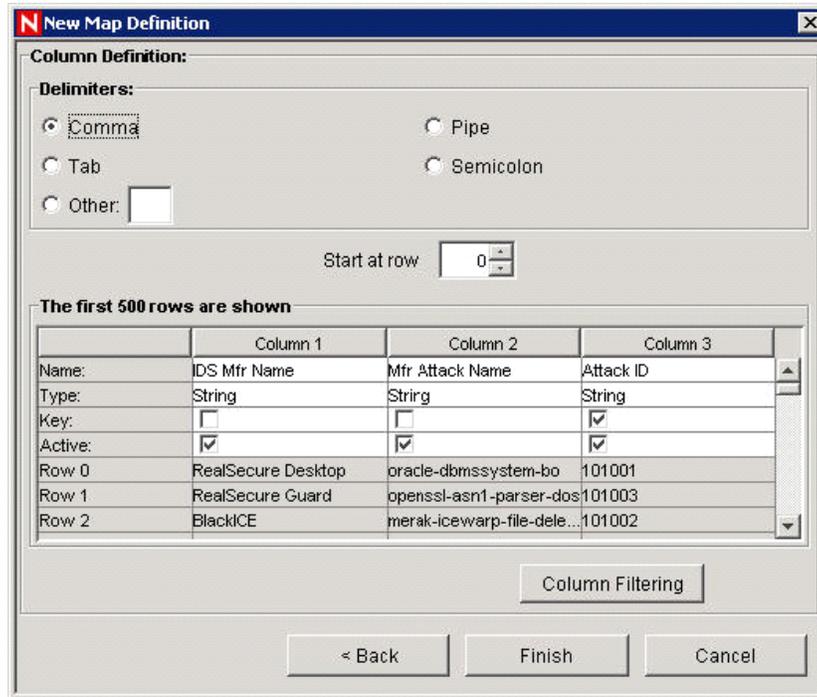
NOTE: Only the first 500 rows of the map appear in the interface.

8 In the New Map Definition window, set the following:

- ◆ **Delimiter:** (pipe, comma, semicolon and so on) of data in rows of the map data source file
- ◆ **Start at row:** The number of rows to skip from the top of the map data source file.
- ◆ **Column names**
- ◆ **Column types:** The currently supported column types are:
 - ◆ **String:** A string is a group of characters used as a single object by a computer. A string might consist of a single letter, word or number. The word FINANCE or IP Address 192.168.2.40 might be a string. A string can also consist of a combination of words, spaces, and numbers. The street address of 1313 LION DOG TOWER could be a string.
 - ◆ **Number Range:** A number range (NumberRange) is a range of numbers. For example, 10 to 200 are represented as 10-200. To use the range map functionality, a map definition must have exactly one key column and the key column must be of type NumberRange. If there are any other key columns, or the key column is of a different type, the mapping service will not consider the map a range map.
- ◆ **Active columns:** When a column is marked as active, the data in the column will be 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.
- ◆ **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, the overall key of the map will include all of the columns selected as keys.

- ◆ **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 will interfere with your mapping.

As you configure each setting and filter, the data table will automatically update to allow you to preview your data and ensure your data is being parsed as expected.



- 9 After you finish configuring all parameters and filters for the definition, click Finish.
- 10 If you selected Local File in step 7 above, you will be prompted to upload your file to the Remote Files virtual folder located: %ESEC_HOME%\data\map_data. Specify a file name and click OK.

11.8.2 Adding a Number Range Map Definition

To use the range map functionality, a map definition must have exactly one key column and the key column must be of type NumberRange. If there are any other key columns, or the key column is of a different type, the mapping service will not consider the map 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 (that is, 10-200). The maximum number in the range is not included in the range (that is, [m,n)). This means a range of 10-200 will only key off numbers equal to 10 to 199. An example set of data is with the first column as the key:

1-2, AA
 2-4, AA
 4-12, BB
 10-20, BB
 30-31, BB
 100-200, AA
 110-120, CC

Figure 11-10 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

The example table gets transformed to:

Figure 11-11 Table 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	

An example event configuration on the above map might look like:

Figure 11-12 Event Configuration

CustomerVar82	Data Source <input type="radio"/> External <input checked="" type="radio"/> Referenced from Map Map Name: <input type="text" value="Maps/RangeMap"/> Map Column: <input type="text" value="Value"/> Key Configuration: <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					

Where CustomerVar97 is expected to contain a numeric value (or is of a type that can be converted to a numeric value, such as an IP or Date).

When performing lookups into the example range map, the value in CustomerVar97 will take the range map and search for the range that the value belongs in (if any). Some examples and their results are:

```
CustomerVar97 = 1; CustomerVar89 will be set to AA
CustomerVar97 = 4; CustomerVar89 will be set to BB
CustomerVar97 = 300; CustomerVar89 will not be set
```

Internally, Sentinel converts IP addresses and dates to an integer for tags of the type IPv4 and Date.

IPv4 tags are:

- ◆ TargetIP (dip)
- ◆ InitIP (sip)

Date tags are:

- ◆ CustomerVar11 to CustomerVar20 (cv11 to cv20)
- ◆ DateTime (dt)
- ◆ ReservedVar11 to ReservedVar20 (rv11 to rv20)
- ◆ DeviceEventTime
- ◆ SentinelProcessTime
- ◆ BeginTime
- ◆ EndTime

For more information on meta-tags, see “Sentinel Event Fields” in *Sentinel 6.1 Reference Guide*.

For example, for the table below, column 1 is 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
```

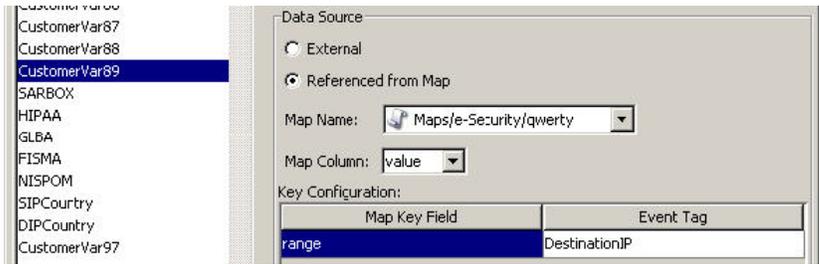
Using the same setup as the previous example, if:

- ◆ The Event Tag is set to TargetIP and key column set to column 1 (range)
- ◆ Map Column to column 2 (value). The output values for CustomerVar89.

Figure 11-13 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	167772160-167772415	AAA
Row 1	167772416-167772671	BBB
Row 2	167772672-167772927	CCC

Figure 11-14 Event Configuration



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 will be BBB.

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 $(2^{63} - 1)$.

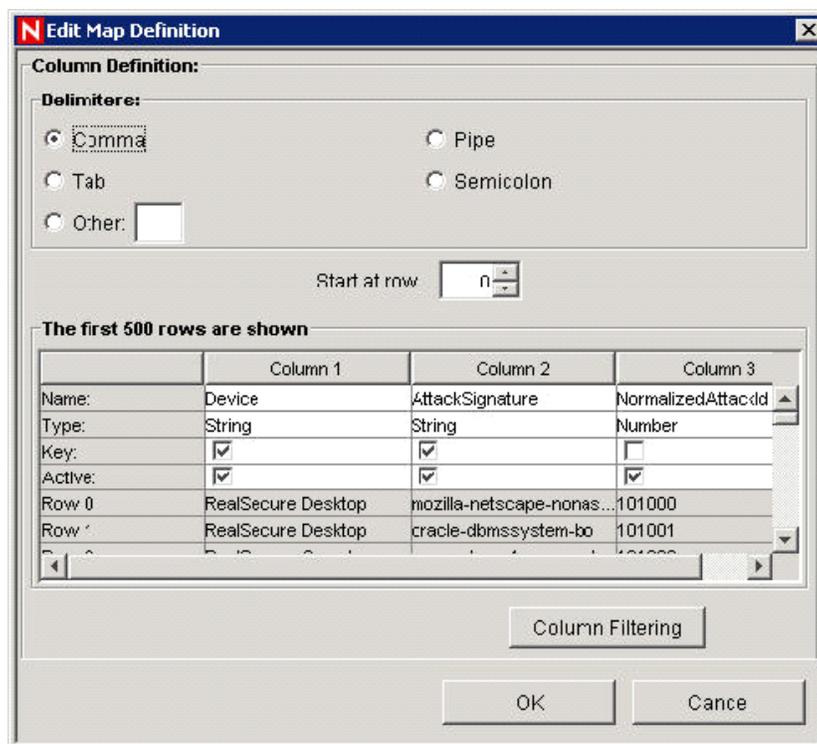
NOTE: In all cases, the min must be less than or equal to the max (for example, “-234- -235” is NOT valid).

11.8.3 Editing Map Definitions

To edit a map definition:

- 1 Navigate to Admin tab and select Map Data Configuration from the navigation pane or click Map Data Configuration button.
- 2 Expand the folder of interest.
- 3 Highlight a map definition and click Edit.

NOTE: The editing function is disabled for map definitions that are under the UNMANAGED ITEMS folder.



The edit function allows you to:

-
- ◆ set your delimiters
 - ◆ activate or deactivate a column
 - ◆ set which row to start your map
 - ◆ set your column keys
 - ◆ rename your columns
 - ◆ column filter
-

4 After making your changes, Click OK.

11.8.4 Deleting Map Definitions

To delete a map definition:

- 1 Navigate to Admin tab and select Map Data Configuration from the navigation pane or click Map Data Configuration button.
- 2 Expand the folder of interest.
- 3 Highlight the map definition to be deleted.
- 4 Click Delete.

NOTE: Default Sentinel maps cannot be edited or deleted.

11.8.5 Updating Map Data

Updating allows you to replace the map source data file of a map on the server running DAS 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 only differ from the existing file 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, it is possible to run an equivalent process from the command line using `map_updater.sh` or `map_updater.bat`.

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 (`$ESEC_HOME/data/map_data`). The internal representation of the map should never be manually updated.

To update map data from the Sentinel Control Center:

- 1 If you haven’t already, create a file containing the new map source data. This file can be generated (for example, from a data dump script), created manually from scratch, or be an edited version of the existing map data source file. If needed, you can obtain the existing map data source file from the location:

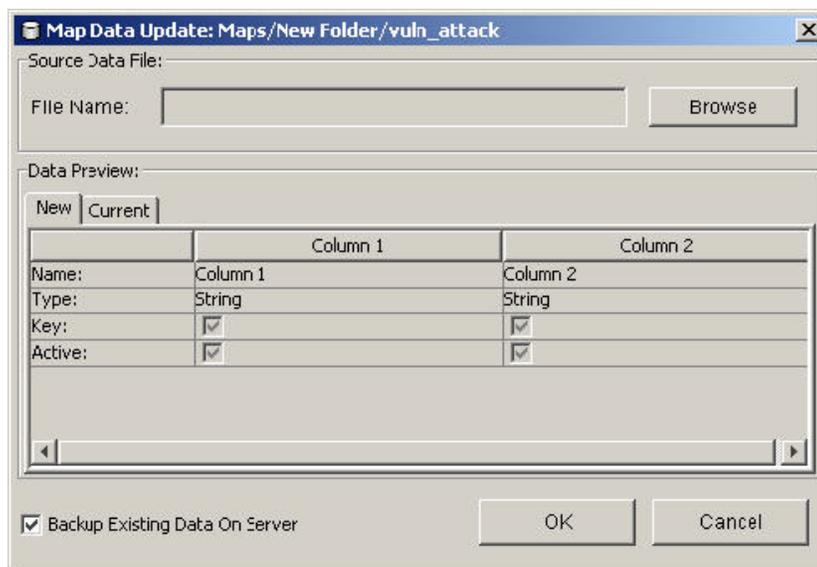
For Windows:

```
%ESEC_HOME%\data\map_data
```

For UNIX:

```
$ESEC_HOME/data/map_data
```

- 2 Navigate to Admin tab and select Map Data Configuration from the navigation pane or click Map Data Configuration button.
- 3 Expand the folder of interest. Highlight the mapping to be updated. Click Update.



- 4 Select the new map data source file by clicking Browse and selecting the file with the new map data. After selecting the file, the data from the new map data source file displays under the New tab. The map data you are replacing will be under the Current tab.
- 5 Uncheck or leave the default setting for Backup Existing Data On Server. Enabling this option results in a backup of the existing map data source file being put in the %ESEC_HOME%\bin\map_data (Windows) or \$ESEC_HOME/data/map_data (UNIX) folder. The prefix of the name of the backup map data source file will be the name of the existing map data source file. The end of the filename will contain a set of random numbers followed by the .bak suffix. For example: vuln_attacks10197.bak.
- 6 Click OK.
- 7 The data from the new map data source file will be uploaded to the server, replacing the contents of the existing map data source file. After the source data is completely uploaded, the map data will be regenerated and distributed to map clients (For example, Collector Manager).

To update map data using the command line:

- 1 If you haven't already, create a file containing the new map source data. This file can be generated (for example, from a data dump script), created manually from scratch, or be an edited version of the existing map data source file. If needed, you can obtain the existing map data source file from the location:

For Windows:

```
%ESEC_HOME%\data\map_data
```

For UNIX:

```
$ESEC_HOME/data/map_data
```

- 2 Log into the Sentinel database.
- 3 Find UUID for the map in the MD_CONFIG table (refer to the CONFIG_ID column for the appropriate map listed in the VALUE column).
- 4 On the Sentinel Server machine, log in as esecadm.
- 5 Run the following command:

On Windows:

```
map_updater.bat <uuid> <source path> [nobackup]
```

On UNIX:

```
map_updater.sh <uuid> <source path> [nobackup]
```

NOTE: On Windows, if the map data is in a directory including a space (For example, Program Files), it might be necessary to place double quotes around the new data file path.

- 6 The data from the new map data source file will be uploaded to the server, replacing the contents of the existing map data source file. After the source data is completely uploaded, the map data will be regenerated and distributed to map clients (for example, Collector Manager).

Unless the optional -nobackup argument is added, the previous map data will be saved in a backup file on the server. Enabling this option results in a backup of the existing map data source file being put in the %ESEC_HOME%\bin\map_data (Windows) or \$ESEC_HOME/data/map_data (UNIX) folder. The prefix of the name of the backup map data source file will be the name of the existing map data source file. The end of the filename will contain a set of random numbers followed by the .bak suffix. For example: vuln_attacks10197.bak.

11.9 Event Configuration

NOTE: In order to use the Event Configuration, your `configuration.xml` file must be pointing to a Communication Server that also has `DAS_Binary` and `DAS_Query` connected to it. This will normally be the case, by default, as long as your Communication Server and DAS processes are running.

11.9.1 Event Mapping

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. The outside data source is a map, which is defined using [Map Data Configuration](#). The data already in the event that should be used as the reference into the map and the data to be pulled from the map into the event are specified using the Events tab.

Because virtually any data set can be made into a map, Event Mapping is useful for incorporating into the event stream data from elsewhere in your organization. Some opportunities Event Mapping provides are:

- ◆ Regulatory Compliance monitoring
- ◆ Policy compliance
- ◆ Response prioritization
- ◆ Enable security data to be analyzed related to business operations
- ◆ Enhance accountability

When an Event Mapping is defined, it is applied system-wide to all events from all Collectors. Additionally, Sentinel will automatically distribute map data to all processes that perform event mappings as well as keep the map data in these processes up-to-date. For these reasons, Event Mapping provides significant capabilities to support enterprise deployments.

Event Mapping comprises of four main parts:

- ◆ **Controller:** Stores all map information
- ◆ **Distributor:** Automatically redistributes modified maps to those processes that registered for the map
- ◆ **Monitor:** A monitor to detect changes in map source data
- ◆ **Generator:** Generates maps from source data

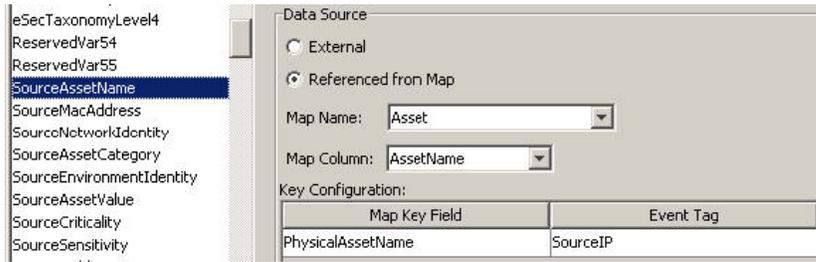
One application of Event Mapping is Sentinel's Asset Data functionality. For example, asset information is collected and stored in the Sentinel Database asset schema and is represented by a Physical Asset Entry. Soft assets, such as services and applications, are represented by an entry that is linked 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 tag.

- ◆ **Referenced from Map:** Data is retrieved from a map to populate the tag.

Figure 11-15 Data Sources



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 below example the IP corresponds to AssetName Finance35.

NOTE: When a column is set as a key, it will not appear in the Column drop down field.

Figure 11-16 Physical Assent Name corresponds to Asset Name

PhysicalAssetName	CustomerID	MacAddress	AssetName
198.168.1.91			Marketing01
198.168.1.95			Marketing02
198.168.1.96			ProgramMgmt03
198.168.1.98			Finance34
198.168.1.100			Finance35

You can have more than one column set as a key as 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 tag 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 Event Mapping just described is:

Figure 11-17 Event Mapping Configuration

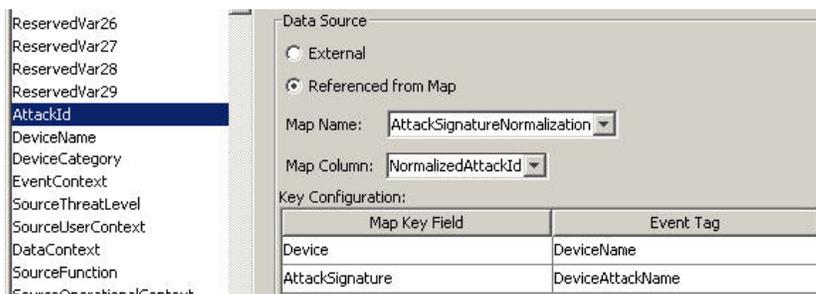


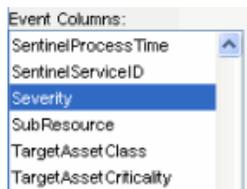
Figure 11-18 Device and Attack Signature corresponds to Asset Name

Device	AttackSignature	NormalizedAttackId	
Secure	BackDoorProbe (TCP 1234)	3	Trojan: Backdoor.SubSeven
Secure	BackDoorProbe (ICP 1999)	3	Trojan: Backdoor.SubSeven
Dragon	RWALLD:SYLOG-FORMAT	4	Sun Microsystems Solaris rwall Elevated F
Snort	RPC TCP rwalld request	4	Sun Microsystems Solaris rwall Elevated F
Snort	RPC UDP rwalld request	4	Sun Microsystems Solaris rwall Elevated F
Snort	WEB-IIS foxweb.dll access	12	Microsoft Exchange Server Arbitrary Code
RealSecure	SMTP_Exchange_Verb_DoS	12	Microsoft Exchange Server Arbitrary Code

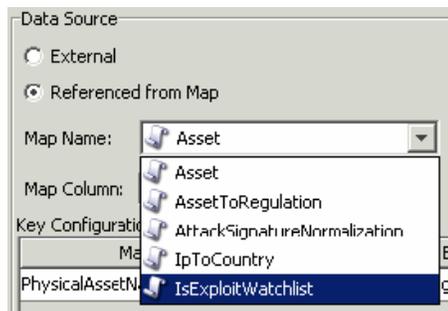
To Configure Event tags (columns) to use Mapping:

- 1 Navigate to Admin tab and click Event Configuration in the navigation pane or click Event Configuration button.
- 2 Highlight an event tag entry from the Event Columns list.

NOTE: The original Event Tag name displays above the Label field. In addition, the description of the event column is provided.

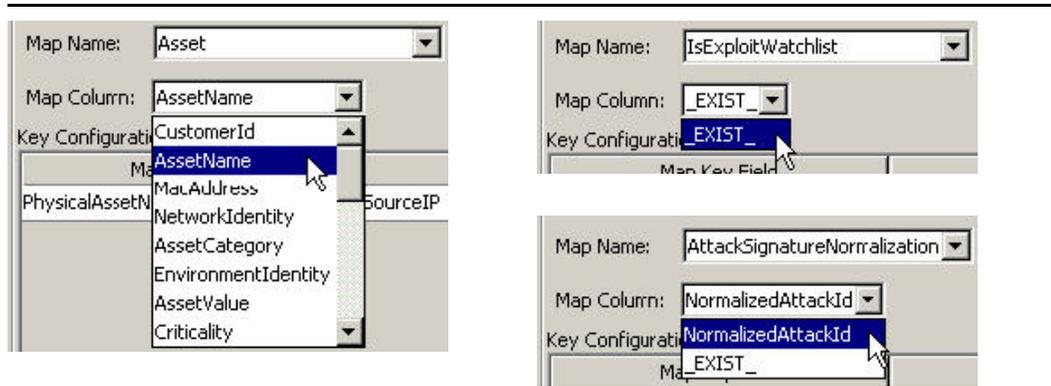


- 3 Click Referenced from Map to configure the event tag to be populated with data from a map. Click External to keep whatever value the Collector put in the event tag (if any).
- 4 Click the Map Name field down arrow.



Select one of the available default maps or a map you have created.

- 5 Click the Map Column field down arrow and select a Map Column name. Depending on your Map Name choice in the previous step, these values will vary.



- ♦ **_EXIST_ :** This is a special Map Column that exists in every map. If this Map Column is selected, a “1” will be put in the event tag if the key is in the map data. If the key is not in the map data, a “0” will be put in the event tag.
 - ♦ **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)
- 6** In the Key Configuration, for each row in the table select the event tag in the Event Tag column that will be matched against the map key column specified in the corresponding Map Key Field column. The rows in the Key Configuration table will depend on the Map Name selected.

NOTE: A key is a unique identifier for the row of data in the map data.

Key Configuration:

Map Key Field	Event Tag
Account Name	— Select a Tag —
Authority	— Select a Tag —
Customer Name	BeginTime
	Collector
	CollectorId
	CollectorManagerId
	CollectorScript
	ConnectorId
	ControlMonitor

- 7** Click Apply.

NOTE: Clicking Apply saves the changes you made for the currently selected event column in a temporary buffer. If you don't click Apply, when you select a different event column the changes you made to the previously selected event column are lost. Changes won't be saved to the server until you click Save.

- 8** 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.
- 9** Click Save.

NOTE: Clicking Save will save your changes to the server. The save function saves all changes stored in the temporary buffer (when you clicked Apply).

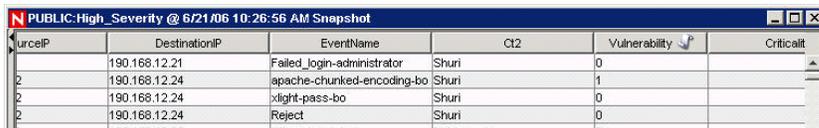
11.9.2 Renaming Tags

The Event Configuration window also allows you to assign names to existing event tag labels. For example, you can rename the label for event tag Ct2 to City. Doing this will result in the event tag that formally appeared in Sentinel Control Center as “Ct2” to now appear as “City”. Some places where event tags appear in Sentinel Control Center are filters, correlation rules, and Active Views.

Renaming tags does not change the name of the variable in Collector scripts or in internal Sentinel representations of the tag, however. For example, even if the event tag labeled Ct2 is renamed to City, the variable that must be used in a Collector script to reference this meta-tag will still be s_CT2. Any references to this variable in correlation or filters will still work, even if they were originally written using Ct2.

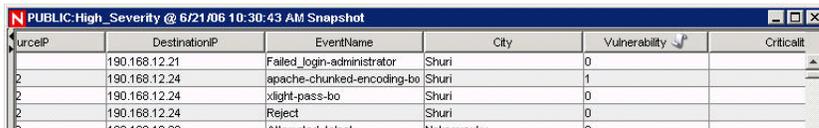
Below is a before and after illustration of this feature in an Active View.

Figure 11-19 Active View window-Before illustration



SourceIP	DestinationIP	EventName	Ct2	Vulnerability	Criticality
	190.168.12.21	Failed_login-administrator	Shuri	0	
2	190.168.12.24	apache-chunked-encoding-bo	Shuri	1	
2	190.168.12.24	xlight-pass-bo	Shuri	0	
2	190.168.12.24	Reject	Shuri	0	

Figure 11-20 Active View window-After illustration



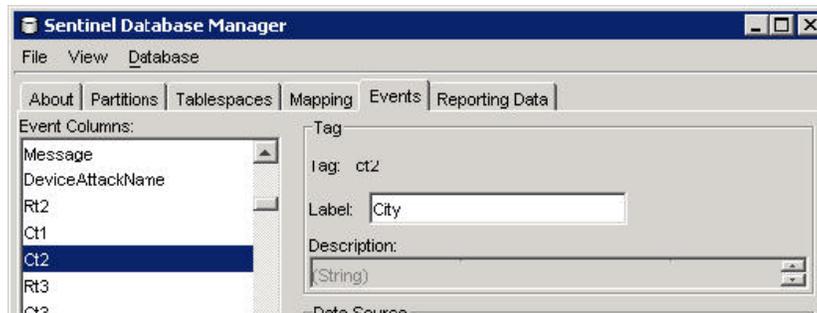
SourceIP	DestinationIP	EventName	City	Vulnerability	Criticality
	190.168.12.21	Failed_login-administrator	Shuri	0	
2	190.168.12.24	apache-chunked-encoding-bo	Shuri	1	
2	190.168.12.24	xlight-pass-bo	Shuri	0	
2	190.168.12.24	Reject	Shuri	0	

To rename an event column:

- 1 Click Event Configuration in the navigation pane or click the Event Configuration button.

NOTE: The original Event Column name displays above the Label field. In addition, the description of the event column is provided.

- 2 Highlight an event column entry.
- 3 Specify a new value for your Event Column in the Label field.



- 4 Click Apply.

NOTE: Clicking on Apply saves the changes you made for the currently selected event tag in a temporary buffer. If you don't click Apply, when you select a different event tag, the changes you made to the previously selected event tag are lost. Changes won't be saved to the server until you click Save.

5 Click Save.

NOTE: Clicking Save will save your changes to the server. The save function saves all changes stored in the temporary buffer (when you clicked Apply).

6 In order for changes to be visible in Sentinel Control Center, running Sentinel Control Centers must be closed and reopened.

11.10 Report Data Configuration

NOTE: In order to use Report Data Configuration, your `configuration.xml` file must be pointing to a Communication Server that has `DAS_Binary` and `DAS_Query` connected to it. This will normally be the case, by default, as long as the Communication Server and DAS processes are running.

The Report Data Configuration option allows you to enable and disable summaries, or aggregate tables in the Sentinel database. Enabling a summary allows aggregation to start computing the counts for that particular summary and will shorten the execution time for any report that uses the summary table. Sentinel Top 10 reports use summary tables.

A summary is a defined set of attributes that make up the key for which to compute the number of unique occurrences (event count) by each hour time period (event time). In the case of the `EventSevDestPortSummary`, when active, it saves the count of events for each unique combination of destination port and severity for an hour time frame. These saved computations of the event data allow for quicker summary reporting and querying. These reports are used by Crystal Reports Server. For more information, see “[Crystal Reports for Windows](#)” and “[Crystal Reports for Linux](#)” in the *Sentinel 6.1 Installation Guide*. Certain summaries will need to be active in order for the summary reports to be accurate.

Aggregation is the process of calculating the running count for all active summaries as events flow through the system. These running counts are saved to the database in the respective summary tables.

Summaries Benefits:

- ◆ Greatly reduced event data set
- ◆ Conformed dimensions that allow the ability to drill-down, roll-up and drill-across on event data
- ◆ Summary reports run much faster with pre-computed summaries

Aggregation Benefits:

- ◆ Only processes active summaries
- ◆ Does not affect event insertion into the real time database.

Report Data Configuration tab allows you to:

- ◆ enable/disable any predefined summaries
- ◆ view attributes of each summary
- ◆ see the validity of a summary for a timeframe
- ◆ query which eventfiles need to be run so that the summary is complete

The following are all summaries already defined in the system. It lists the summary name, database table name and it's attributes in a brief description about the summary.

Table 11-2 Summary Name description

Summary Name	Table/Description
EventSrcSummary	EVT_SRC_SMRY_1 This summary sums the event count by source ip, source asset information, source port, source user, taxonomy, event_name, resource, Collector, protocol, severity and event time by hour
EventDestSummary	EVT_DEST_SMRY_1 This summary sums the event count by destination ip, destination asset information, destination port, destination user, taxonomy, event_name, resource, Collector, protocol, severity and event time by hour.
EventSevDestTxnmySummary	EVT_DEST_TXNMY_SMRY_1 This summary sums the event count by destination ip, destination asset information, taxonomy, severity and event time by hour.
EventSevDestEvtSummary	EVT_DEST_EVT_NAME_SMRY_1 This summary sums the event count by destination ip, destination event asset, taxonomy, event name, severity and event time by hour.
EventSevDestPortSummary	EVT_PORT_SMRY_1 This summary sums the event count by destination port, severity and event time by hour.
EventSevSummary	EVT_SEV_SMRY_1 This summary sums the event count by severity and event time by hour.

To disable/enable Summary:

- 1 Click Report Data Configuration in the navigation pane or click Report Data Configuration button.
- 2 To disable a summary, click Active in the Status column until it changes to say InActive.
- 3 To enable a summary, click InActive in the Status column until it changes to say Active.

Source	Status
formedEvent	InActive

To enable Aggregation for Top 10 reports for Crystal Reports Server:

Enable the following three summaries:

- ◆ EventDestSummary
- ◆ EventSevSummary
- ◆ EventSrcSummary

Enable EventFileRedirectService in the `das_binary.xml` located:

For UNIX:

`$(ESEC_HOME)/config/das_binary.xml`

For Windows:

`%ESEC_HOME%\config\das_binary.xml`

NOTE: To enable the summary you must set the property “Status” to ON for EventFileRedirect in `das_binary.xml`

To view information for a Summary:

- 1 Click Report Data Configuration in the navigation pane or click the Report Data Configuration button.
- 2 Click the ... button in the Attributes column to see the attributes that makes up a summary.

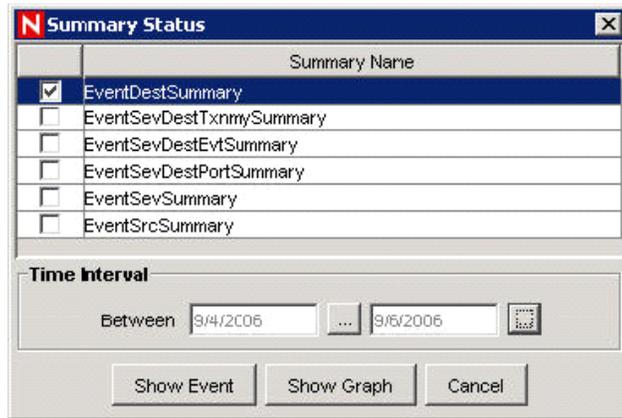
Attributes	
TIME.EVT_CNT	...
CUST_ID.DES	...
CUST_ID.DES	...
SEV.DEST_POI	...
CUST_ID.SEV	...
CUST_ID.RSR	...

Summary Attributes		
Summary Name: EventDestSummary		
	Attribute	Attribute Type
1	CUST_ID	attribute
2	RSRC_ID	attribute
3	DEST_EVT_ASSET_ID	attribute
4	DEST_IP	attribute
5	DEST_PORT	attribute
6	DEST_USR_ID	attribute
7	TXNMY_ID	attribute
8	SEV	attribute
9	AGENT_ID	attribute
10	EVT_NAME_ID	attribute
11	PRTCL_ID	attribute
12	EVT_TIME	attribute

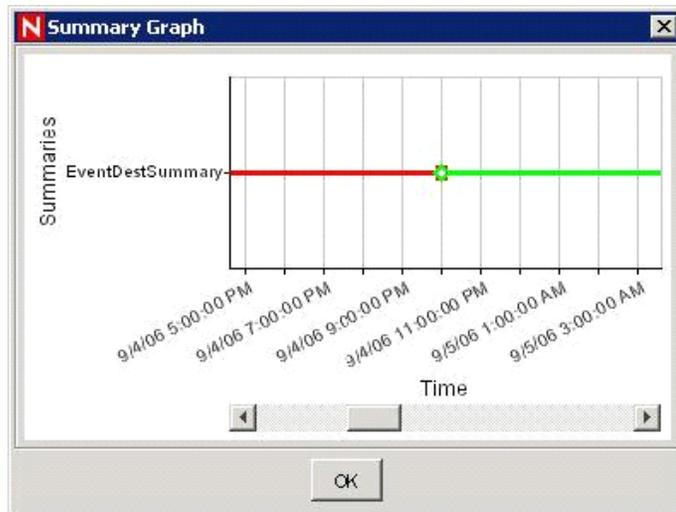
OK

To check the Validity of a summary:

- 1 Click Report Data Configuration in the navigation pane or click the Report Data Configuration button.
- 2 Select Status.
- 3 Select the summary or summaries you want to query.



- 4 Select a time interval.
- 5 Click Show Graph.
- 6 The green bars signify that the summary is complete for that time frame. The red sections signify that the summary is missing data during that time period.

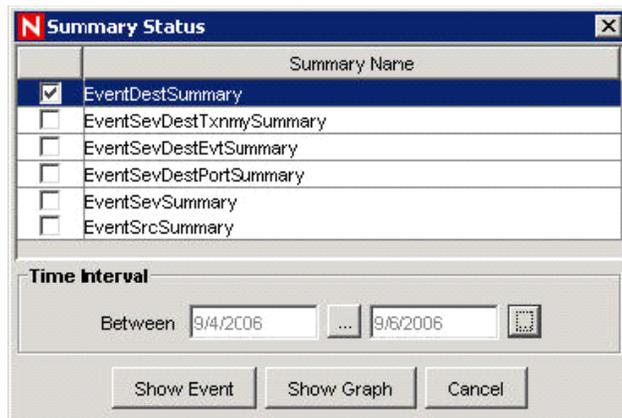


NOTE: To complete summaries, see [“To run Eventfiles for a summary:”](#) on page 266.

To query the Eventfiles for a summary:

- 1 Click Report Data Configuration in the navigation pane or click the Report Data Configuration button.
- 2 Select Status.

- 3 Select the summary or summaries you want to query.



- 4 Select a time interval.
- 5 Click Show Event.
- 6 The Eventfiles needed to complete the summary displays in a list format.

NOTE: To complete summaries, see [“To run Eventfiles for a summary:”](#) on page 266.

	Summary	File Name	Min Event Time	Max Event Time	Process
1	EventDestSummary	events_20060905...	9/5/06 8:52:21 AM	9/5/06 9:08:31 AM	<input type="checkbox"/>
2	EventDestSummary	events_20060905...	9/5/06 9:22:46 AM	9/5/06 9:52:47 AM	<input type="checkbox"/>
3	EventDestSummary	events_20060905...	9/5/06 9:52:46 AM	9/5/06 9:53:27 AM	<input type="checkbox"/>
4	EventDestSummary	events_20060905...	9/5/06 10:12:23 AM	9/5/06 10:42:23 AM	<input type="checkbox"/>
5	EventDestSummary	events_20060905...	9/5/06 10:42:33 AM	9/5/06 11:12:30 AM	<input type="checkbox"/>
6	EventDestSummary	events_20060905...	9/5/06 11:12:40 AM	9/5/06 11:42:37 AM	<input type="checkbox"/>
7	EventDestSummary	events_20060905...	9/5/06 11:42:47 AM	9/5/06 12:12:44 PM	<input type="checkbox"/>
8	EventDestSummary	events_20060905...	9/5/06 12:12:54 PM	9/5/06 12:42:52 PM	<input type="checkbox"/>
9	EventDestSummary	events_20060905...	9/5/06 12:42:54 PM	9/5/06 1:12:50 PM	<input type="checkbox"/>

To run Eventfiles for a summary:

- 1 Click Report Data Configuration in the navigation pane or click the Report Data Configuration button.
- 2 Select Status.
- 3 Select the Summary or Summaries you want to query.
- 4 Select a time interval.
- 5 Click Show Event.
- 6 The Eventfiles needed to complete the summary displays in a list format.
- 7 Check the Eventfiles that you want to run so that the summary is complete.

ie	Min Even...	Max Eve...	Process
...	Mon Jan ...	Mon Jan ...	<input checked="" type="checkbox"/>
...	Mon Jan ...	Mon Jan ...	<input checked="" type="checkbox"/>
...	Mon Jan ...	Mon Jan ...	<input checked="" type="checkbox"/>
...	Mon Jan ...	Mon Jan ...	<input checked="" type="checkbox"/>
...	Mon Jan ...	Mon Jan ...	<input type="checkbox"/>

8 Click Process.

11.11 User Configurations

You must have the user permission in order to work in the User Configuration window.

User configuration allows you to:

[Create a User Account](#)

[Terminating an Active Session](#)

[Modify a User Account](#)

[Add a iTRAC Role](#)

[View Details of a User Account](#)

[Delete iTRAC Role](#)

[Clone a User Account](#)

[Viewing details of an iTRAC Role](#)

[Delete a User Account](#)

The installer will create the following default users on the Sentinel Server:

11.11.1 Oracle and Microsoft SQL 2005 Authentication:

- ♦ **esecdba:** Schema owner (configurable at install time).
- ♦ **esecadm:** Sentinel administrator user (configurable at install time).

NOTE: For UNIX, the Installer also creates the operating system user with the same user name and password.

- ♦ **esecrpt:** Sentinel Reporter User, password as the admin user.
- ♦ **ESEC_CORR:** Sentinel Correlation Engine users, used to create incidents.
- ♦ **esecapp:** Sentinel application username for connecting to the database.

11.11.2 Windows Authentication:

- ♦ **Sentinel DB Administrator:** Schema owner (configurable at install time).
- ♦ **Sentinel Administrator:** Sentinel administrator user (configurable at install time).
- ♦ **Sentinel Report User:** Sentinel Reporter user, password as the admin user.
- ♦ **Sentinel Application DB User:** Sentinel application username for connecting to the database

11.11.3 Opening the User Manager Window

To open the User Manager window:

- 1 Click the Admin tab.
- 2 Click Admin > User Configuration.

11.11.4 Creating a User Account

In order to meet stringent security configurations required by Common Criteria Certification, Sentinel requires a strong password with the following characteristics:

- ♦ Select passwords of at least 8 with characters in length that includes at least one uppercase letter, one lower case letter, one special symbol (!@#\$%^&*()_+), and one numeral (0-9).
- ♦ Your password should not contain your e-mail name or any part of your full name.
- ♦ Your password should not be a common word. For example, it should not be a word in the dictionary or slang in common use.
- ♦ Your password should not contain words from any language, because numerous password-cracking programs exist that can run through millions of possible word combinations in seconds.
- ♦ You should select a password you can remember that is still complex. For example, Msi5!YOld (My Son is 5 years old) or IhliCf5#yN (I have lived in California for 5 years now).

To use this feature, you must have the User Management user permission. User permissions are fairly detailed. For more information, see “[Sentinel Database Users, Roles, and Access Permissions](#)” in the *Sentinel 6.1 Reference Guide*.

- ♦ “[Creating an LDAP User Account for Sentinel](#)” on page 268
- ♦ “[Creating a Database User Account for Sentinel](#)” on page 271
- ♦ “[Creating a Domain User Account for Sentinel](#)” on page 271

Creating an LDAP User Account for Sentinel

NOTE: By default, the LDAP option is disabled. Configure the Sentinel 6.1 server as given in “[Configuring the Sentinel 6.1 Server for LDAP Authentication](#)” in the *Sentinel 6.1 Installation Guide* to enable this option.

- 1 Select the *Admin* tab.
- 2 Expand the *User Configuration* folder in the navigation tree.
- 3 Select *User Manager*.
The User Manager window is displayed.
- 4 Click *Add User* or right-click any user and select *Add User*.
The Add User window is displayed.
- 5 In the Add user window, perform the following:
 - 5a Select *LDAP* for authentication.

- 5b** Specify the LDAP username based on the value you specified for “[Anonymous searches on LDAP directory](#)” parameter while configuring LDAP authentication.
- ◆ **y:** The *User Name* must be the same as the eDirectory username or Active Directory sAMAccountName.
 - ◆ **n:** The *User Name* need not be the same as the eDirectory username or Active Directory sAMAccountName.
- 5c** Click the drop-down arrow on the *Security Filter* drop-down list.
- The Filter Selection window is displayed that lists all the public filters.
- 5c1** Select a filter, and click *Select* or click *Add* to create a filter, then select the new filter.
- After assigning a security filter to a user, you cannot delete that filter.
- 5d** Specify the fully qualified Distinguished Name of the LDAP user in the *LDAP USER DN* field. Do not leave the *LDAP User DN* field empty.

For example, cn=sentinel_ldap_user,o=novell

This field is available only if you have specified **n** for “[Anonymous searches on LDAP directory](#)” parameter while configuring LDAP authentication. For more information, see “[LDAP Authentication](#)” in *Sentinel 6.1 Installation Guide*.

NOTE: If you had opted to perform anonymous searches when you had last run the `ldap_auth_config` script, and now you do not want to perform anonymous searches:

Run the script `ldap_auth_config` script again, and specify **n** for “[Anonymous searches on LDAP directory](#)”. For each existing LDAP user, right-click and select *User Details* and specify the fully qualified DN of the LDAP user in the *LDAP User DN* field.

5e (Optional) Under *Details*, specify the following:

- ◆ *First Name*
- ◆ *Last Name*
- ◆ *Department*
- ◆ *Phone*
- ◆ *Email*

5f Click the *Permissions* tab and assign user permissions. For more information about permissions, see “[Sentinel Control Center User Permissions](#)” in the *Sentinel 6.1 Reference Guide*.

5g Click the *Roles* tab and select an iTRAC workflow role for the user. This affects what work items appear in the user’s work list.

5h Click *OK*.

You can now log in to Sentinel Control Center and Sentinel Solution Designer using your LDAP username and password.

Creating a Database User Account for Sentinel

- 1 Select the *Admin* tab.
- 2 Expand the *User Configuration* folder in the navigation tree.
- 3 Select User Manager.
The User Manager window is displayed.
- 4 Click *Add User* or right-click any user and select *Add User*.
- 5 Under Authorization:
 - ♦ Select Local for Authentication.
 - ♦ Specify User Name.
 - ♦ Specify Password.
 - ♦ Confirm Password.
- 6 For Security Filter, click the down arrow. The Filter Selection window displays and shows all public filters.
- 7 Select a filter and click Select or click Add to create and then select a new filter.

NOTE: After assigning a security filter to a user, you cannot delete that filter.

(Optional) Under Details, specify:

- ♦ First Name
 - ♦ Last Name
 - ♦ Department
 - ♦ Phone
 - ♦ Email
- 8 Click the Permissions tab and assign user permissions.
 - 9 Click the Roles tab and select an iTRAC workflow role for the user.
 - 10 Click OK.

NOTE: Oracle does not allow the creation of users named the same as one of the Oracle Reserved words. Also, Sentinel does not allow you to use these names.

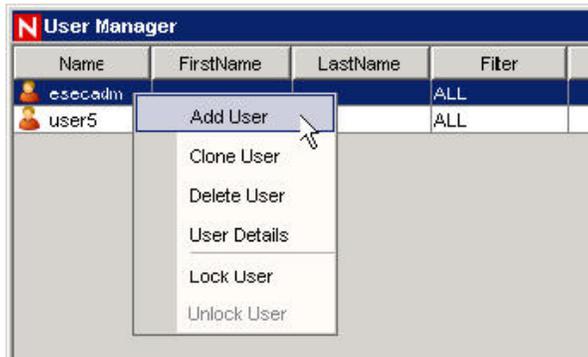
Creating a Domain User Account for Sentinel

NOTE: The *Domain* option is enabled only if the Sentinel server is installed on a Windows platform.

- 1 Select the Admin tab.
- 2 Open the User Configuration folder.
- 3 Open the User Manager window.
Click Add a new User,



or highlight any user, right-click any user and select Add User.



4 Under Authorization:

- ◆ Select Domain authentication.
- ◆ Specify an existing User Name in the form Domain\Username.

5 For Security Filter, click the down arrow. The Filter Selection window displays and shows all public filters.

6 Select a filter and click Select or click Add to create and then select a new filter.

NOTE: After assigning a security filter to a user, you cannot delete that filter.

(Optional) Under Details, specify:

- ◆ First Name
- ◆ Last Name
- ◆ Department
- ◆ Phone
- ◆ Email

7 Click the Permissions tab and assign user permissions. For more information about permissions, see “[Sentinel Control Center User Permissions](#)” in *Sentinel 6.1 Reference Guide*.

8 Click the Roles tab and select an iTRAC workflow role for the user. This affects what work items appear in the user’s work list.

9 Click OK.

NOTE: Oracle does not allow the creation of users named the same as one of the Oracle Reserved words. Also, Sentinel does not allow you to use these names.

11.11.5 Modifying a User Account

To use this feature, you must have the User Management permission.

NOTE: The Sentinel Database Administrator, Sentinel Administrator, Sentinel Application User, and Sentinel Report User are created during installation. For more information about changing passwords for these users, see “[Sentinel Accounts and Password Changes](#)” in *Sentinel 6.1 Reference Guide*.

To modify a user account:

- 1 Open the User Manager window.
- 2 Double-click a user account or right-click > User Details.
- 3 Modify the account.
- 4 Click OK.

11.11.6 Viewing Details of a User Account

To use this feature, you must have the User Management permission.

To view user account details:

- 1 Open the User Manager window.
- 2 Double-click a user account or right-click > User Details.
Review the details of the user account and close the window.

11.11.7 Cloning a User Account

To clone a user account:

- 1 Open the User Manager window.
- 2 Select a user account ID, right-click > Clone User.
Change the user information and the user permissions.
Click Save.

11.11.8 Deleting a User Account

To use this feature, you must have the User Management permission.

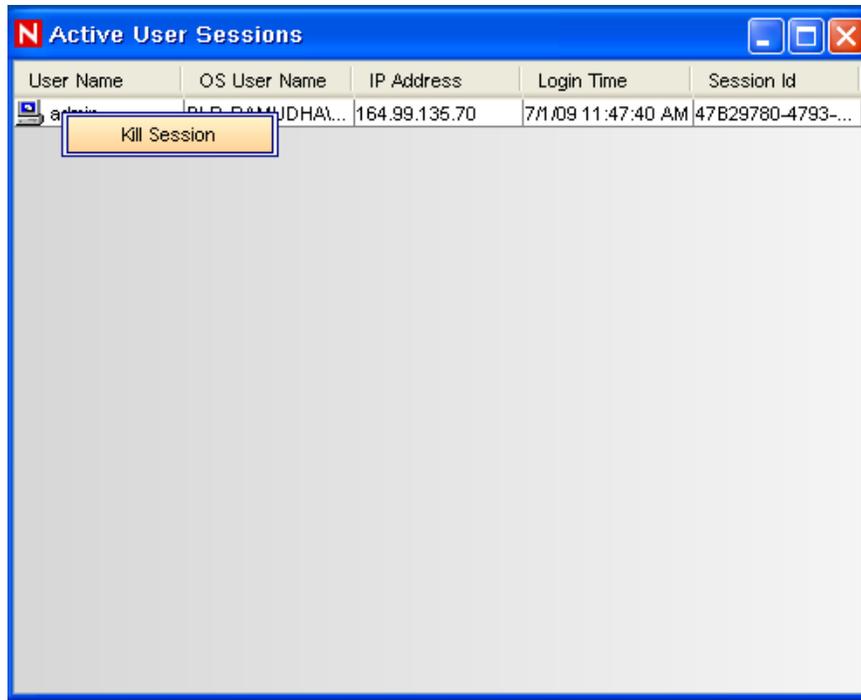
To delete a user account:

- 1 Open the User Manager window.
- 2 Select a user account ID, right-click > Delete User.
- 3 A Delete box displays. Click Yes to Delete the User.

11.11.9 Terminating an Active Session

To terminate an active session:

- 1 Open the Active User Sessions window.
- 2 Highlight an active session you want to terminate.
Right click > Kill Session.



You will be prompted for a termination message. This option is provided so that you can inform the user why you are killing the session.

NOTE: If the Client machine has multiple network interfaces, the IP Address displayed in the Active User Sessions window might not be the desired IP address, as the non-loop back IP address of the first NetworkInterface returned by the system is displayed.

11.11.10 Adding an iTRAC Role

To add an iTRAC Role:

- 1 Open the Role Manager window.
- 2 Click Add a new Role,



or right-click > Add New Role.

11.11.11 Deleting an iTRAC Role

To delete an iTRAC Role:

- 1 Open the Role Manager window.
- 2 Select a role, right-click > Delete Role.

11.11.12 Viewing Details of a Role

To view role details:

- 1 Open the Role Manager window.
- 2 Select a role, right-click > Role Details.

- ♦ Section 12.1, “Understanding Sentinel Data Manager,” on page 277
- ♦ Section 12.2, “Starting the SDM GUI,” on page 277
- ♦ Section 12.3, “SDM Command Line,” on page 285

12.1 Understanding Sentinel Data Manager

The Sentinel Data Manager (SDM) is a tool by which users can manage the Sentinel Database. The SDM allows users to perform the following operations:

- ♦ Monitor Database Space Utilization
- ♦ View and Manage Database Partitions
- ♦ Configure Auto-Archives
- ♦ Configure Auto-Addition of Partitions

Monitor Database Space Utilization, View and Manage Database Partitions and Configure Auto-Archives operations can be accessed using the Sentinel Data Manager GUI or using a command line interface to SDM.

NOTE: Event Mapping, Summary Data and Reporting data are SDM functionalities which are moved from SDM to Sentinel Control Center in Sentinel 6.x.

12.2 Starting the SDM GUI

- ♦ Section 12.2.1, “Partitions Tab,” on page 279
- ♦ Section 12.2.2, “Tablespaces Tab,” on page 283
- ♦ Section 12.2.3, “Partition Configuration,” on page 283

There are several prerequisites to run the SDM GUI on a machine:

- ♦ If using an Oracle database, the Oracle JDBC driver must be downloaded and placed in the \$ESEC_HOME/lib (UNIX) or %ESEC_HOME%\lib (Windows) directory. As of the print date of this document, this file could be found at the following URL: http://otn.oracle.com/software/tech/java/sqlj_jdbc/index.html (http://otn.oracle.com/software/tech/java/sqlj_jdbc/index.html). This file, typically called `ojdbc14.jar`, will be installed by default on the machine that hosts the Sentinel DAS component.

NOTE: Sentinel 6.x does not support Oracle 9i OCI-based connections.

- ♦ The user must know the following information:
 - ♦ Name and password for the Sentinel Database User (esecdba by default)
 - ♦ Database host server

- ♦ Database (instance) name
- ♦ Port used for database communications (1521 by default for Oracle and 1433 by default for SQL Server)

To start SDM GUI on UNIX:

- 1 Login to the UNIX box as a member of the esec group (for example: esecadm).
- 2 Go to \$ESEC_HOME/sdm
- 3 Provide the following command line:

```
./sdm
```

To start SDM GUI on Windows:

- 1 Click Start > All Programs (Win XP) or Program Files (Win2000) > Sentinel > Sentinel Data Manager.

NOTE: To run the SDM from the command line, see the [Section 12.3, “SDM Command Line,”](#) on [page 285](#).

To connect to the Database:

- 1 Log into the machine with SDM installed.

NOTE: If the Sentinel Database Administrator account uses Windows Authentication, you must log into the SDM machine using the Sentinel Database Administrator account.

- 2 Start the SDM GUI using the appropriate procedure (for Windows or UNIX).
- 3 Select the database type (Oracle or MSSQL).
- 4 Specify the Database instance name used during the Sentinel database installation.
- 5 Specify the Database Host (hostname or IP address).
- 6 Specify the port used for database communications.
- 7 If using SQL Server authentication, specify the Sentinel Database Administrator username and password.

NOTE: If you select Windows Authentication, you will be authenticated to the MS SQL database as the user you are currently logged into Windows as (that is, single sign-on).

For Oracle:



For Windows:



NOTE: If you select to save your connection settings, the settings are saved to the local `sdm.connect` file. By default the `sdm.connect` file is located in `$ESEC_HOME/bin` directory or `%ESEC_HOME%\bin` folder. Next time you start the GUI, the connection settings will be re-populated from the `sdm.connect` file. This file can be used when running SDM from the command line.

- 8 Click Connect. The SDM is now ready for use.

12.2.1 Partitions Tab

The Sentinel database is partitioned by time to simplify maintenance and improve the performance of the database. The Partitions tab in the SDM allows users to view and manage database partitions for the tables that hold event data, correlated event data, and summary data.

To view partitions in the GUI:

- 1 Click the Partitions tab.
- 2 Select the table in the dropdown list you want to see.

SDM displays the partitions of the currently selected Database Table.

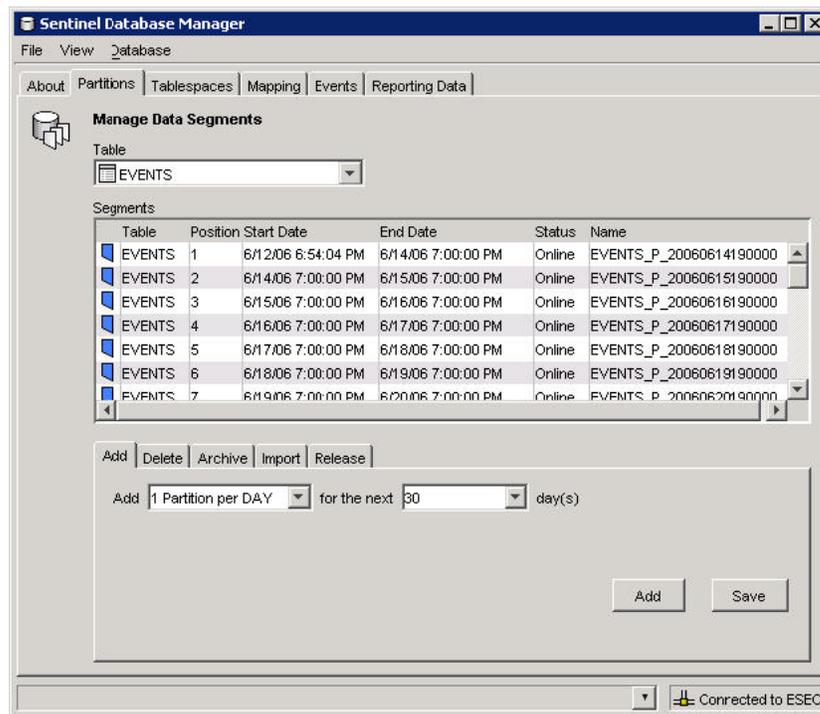
Each row in the Segments table displays the related Database Table, Time Range, Status and Name of the partition.

The Status of each of the partitions shown in the Segments table will have one of the following states:

Table 12-1 Partition States

Online	Partition with data that is available for access
Online Current	Partition to which events are currently getting inserted
Online Archived	Partition with data that has been archived but is still accessible because the partition has not been dropped
Offline Archived	Partition with data that has been archived and then dropped from the database
Online Archived Imported	Partition with data that has been archived, dropped from the database, and then re-imported into the database

NOTE: If you delete a partition without archiving it, it is deleted from the partition list in the GUI.



At the bottom of the Partitions tab, there are several smaller tabs that allow the user to perform the following operations:

- ◆ Add empty partitions to the database
- ◆ Delete partitions from the database

- ♦ Archive data from partitions to flat files in a specified, pre-existing directory
- ♦ Import Partitions
- ♦ Drop Partitions

Many of these operations can be executed automatically in the database using stored procedures, but this tab allows the administrator to perform these tasks manually.

To manage partitions:

- 1 Click the Partitions tab.
- 2 Select the table in the dropdown list.

NOTE: Sentinel partitioned tables are organized into 2 groups. One is the EVENTS table group, which includes EVENTS and CORRELATED_EVENTS; the other is the summary table group, which includes all summary, or aggregate, tables. If any one of the tables in the group is selected then the changes will apply to all the tables in the group.

- 3 Select the tab in the bottom of the window that relates to the operation that you want to perform – Add, Delete, Archive, Import or Release.

To add partitions:

- 1 Select the Add partitions tab.
- 2 Specify the number of days over which to add the partitions.

NOTE: You can specify the number of partitions in Partition Configuration in SDM GUI.

- 3 Click Add.

NOTE: In case of MS SQL (MS SQL 2000/2005/2008) databases, maximum number of online partitions allowed is 255. Therefore, you must schedule the offline delete / archive operations in such a way that the online partitions should not exceed 255.

To delete partitions:

- 1 Select the Delete partitions tab.
- 2 Specify the number of days for which older partitions will be deleted.
- 3 Click Delete.

To import partitions:

- 1 Select the Import partitions tab.
- 2 Select the partition in the Segment table into which the data will be imported.

NOTE: You can specify the input directory in the “Archive Destination” field in Partition configuration tab in SDM GUI.

- 3 Click Import.

To release imported partitions:

- 1 Select the Release partitions tab.
- 2 Select the partition in the Segment table that will be released.
- 3 Click Release.

Archiving

Events, correlated events, and aggregation (or summary) tables can all be archived using SDM. There are several requirements for archiving:

- ♦ The directory to which the partitions are archived must already exist on the database server (not the machine running SDM); SDM does not create the directory.
- ♦ On UNIX systems, archiving cannot be to the /root directory.
- ♦ On UNIX systems, the oracle user must have permissions to write to the archive directory.
- ♦ On Windows systems, owner of the SQL Server Agent service must have permissions to write to the archive directory.

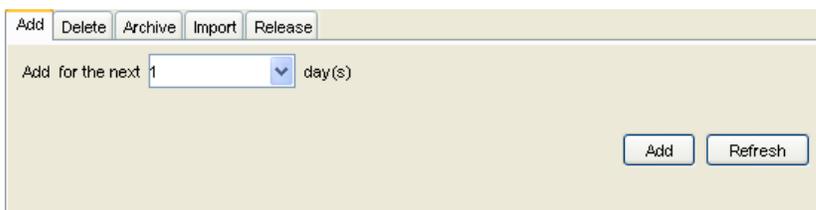
To archive partitions:

- 1 Select the Archive partitions tab.
- 2 Specify the number of days for which older partitions will be archived.

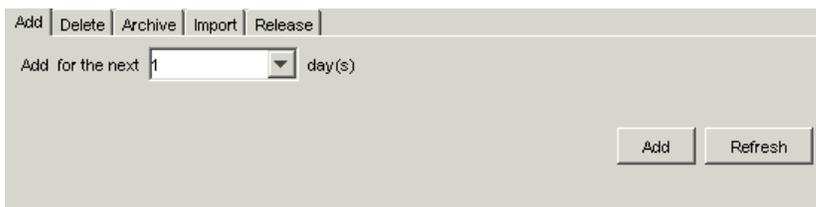
NOTE: You can specify the archive directory in the Archive Destination field in Partition configuration tab in SDM GUI.

- 3 Click Archive.

Oracle Archive Partitions tab:



Microsoft SQL Archive Partitions tab:

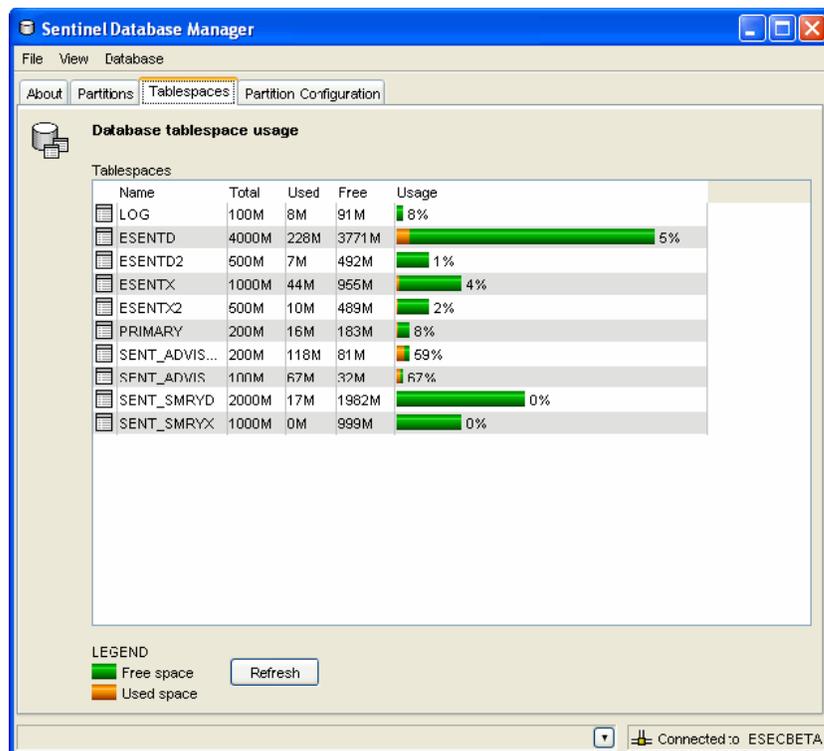


12.2.2 Tablespaces Tab

The Tablespaces tab in the SDM allows users to view the current database space utilization, including:

- ♦ Total space allocated for each tablespace
- ♦ Space used by each tablespace
- ♦ Space available (free) for each tablespace.

NOTE: All the tablespaces are set to Autogrow.



Color coded bar graphs help to visualize the total space allocated for each tablespace and the percent used of each tablespace.

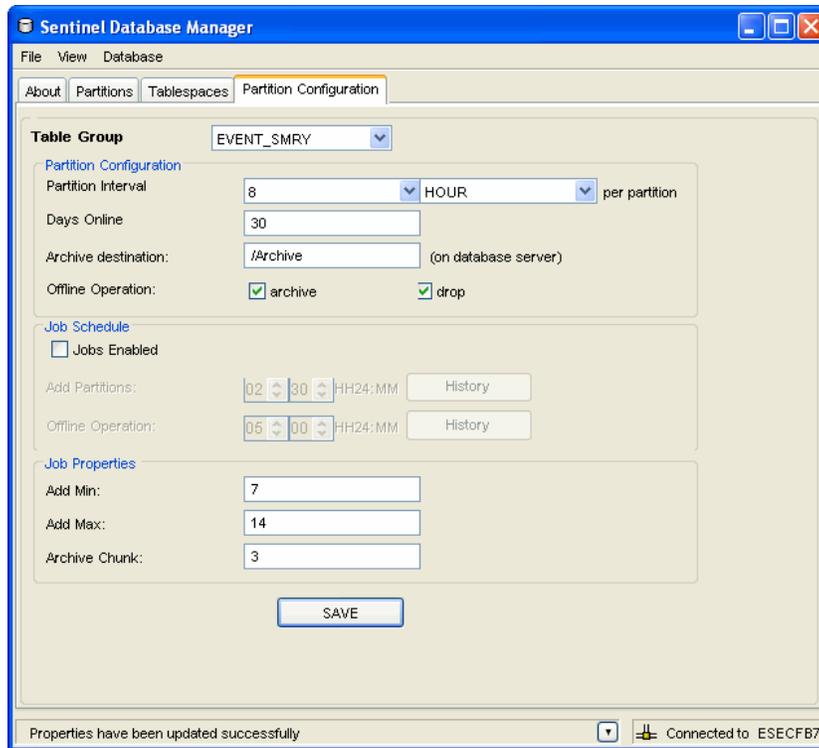
NOTE: On Microsoft SQL Server, “tablespace” usage represents “filegroup” usage.

12.2.3 Partition Configuration

The Partition Configuration tab in the SDM allows you to set parameters to auto-archive partitions. It also allows you to auto-add partitions.

To configure auto-archive parameters:

- 1 Click the Partition Configuration tab. The Partition Configuration window displays.



- 2 Select the table group from the drop-down list.
- 3 Specify the following partition configuration information:
 - ◆ **Partition Interval:** Specify the time interval to create a partition per day or per hour.
 - ◆ **Days Online:** Number of days of data to keep online in the database.
 - ◆ **Archive destination:** Specify the destination to store the automatically archived data and the manually archived data.
 - ◆ **Offline operation:** Select archive and/or drop the data.

NOTE: Data that is dropped without archiving cannot be retrieved using SDM. You should almost always select the archive option.

- 4 Specify the Job Schedule parameters:
 - ◆ Check *Jobs Enabled* checkbox if it's not selected. By default, the *Jobs Enabled* checkbox is checked if you have selected this feature during the installation.
 - ◆ Schedule adding partitions and offline operation parameters, then click *Save*.

NOTE: Partitioning Job scheduling through SDM is reflected only after the partition refresh interval. The default refresh interval is 5 minutes. To change the refresh interval, edit the `partitionJobRefreshInterval` specified in the `/opt/novell/pilin_1.0_x86-64/config/das_core.xml` file and restart the Sentinel service.

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

- ◆ Click *History* to view the Job History.

5 Specify the Job Properties:

- ♦ **Add Min:** Minimum number of days of partitions for future data that should exist in the database at any time
- ♦ **Add Max:** Maximum number of days of partitions for future data that should exist in the database at any time
- ♦ **Archive Chunk:** Minimum number of days of partitions that will account to total number of days of partitions for Archive.

NOTE: If the fewer than Add Min days partitions exist in the database, partitions are added until there are enough partitions for Add Max days. Archiving also is done in chunks of days so that these database operations are not necessary every day.

6 Click Save.

12.3 SDM Command Line

The SDM command line functions can be used instead of the GUI. The command line can be used to create a batch file or cron job for SDM operations, but Novell recommends using auto-archiving instead. Auto-archiving can be configured on the Partition Configuration tab of the SDM GUI.

The first step to using the SDM command line is to create a file that stores the connection properties for the database.

- ♦ [Section 12.3.1, “General Syntax of the SDM command,” on page 285](#)
- ♦ [Section 12.3.2, “Starting SDM GUI,” on page 285](#)
- ♦ [Section 12.3.3, “Viewing Sentinel Database Space Usage,” on page 285](#)

12.3.1 General Syntax of the SDM command

```
[path to SDM] -action [actionname] [action-specific flags] [path to database connection file]
```

The specific flags for each action are described below.

12.3.2 Starting SDM GUI

```
startGui (DEFAULT)  
-action startGui [-connectFile <filePath>]
```

12.3.3 Viewing Sentinel Database Space Usage

In Tablespace Management, the command line option allows you to:

- ♦ View Sentinel database space usage

This action (dbstats) displays the Sentinel database usage for all Sentinel tablespaces in Oracle and Sentinel filegroups in MS SQL.

This command uses the following flags:

Table 12-2 *Viewing Sentinel Database Space Usage flags*

-action	dbstats
-connectFile	<filePath>

To view Sentinel Database Space Usage (Command Line):

- 1 Execute the following command:

```
-action dbStats -connectFile <filePath>
```

The following example displays the tablespaces of Sentinel database with their total space, used space and free space available.

- ◆ Oracle Example:

```
./sdm -action dbStats -connectFile sdm.connect
```

- ◆ SQL Server Example:

```
Sdm -action dbStats -connectFile sdm.connect
```

This section helps you to understand the utilities provided by Sentinel.

- ♦ [Section 13.1, “Introduction to Sentinel Utilities,” on page 287](#)
- ♦ [Section 13.2, “Starting and Stopping the Sentinel Server,” on page 287](#)
- ♦ [Section 13.3, “Sentinel Scripts,” on page 289](#)
- ♦ [Section 13.4, “Version Information,” on page 294](#)
- ♦ [Section 13.5, “Database Backup and Cleanup,” on page 295](#)
- ♦ [Section 13.6, “Updating Your License Key,” on page 303](#)

13.1 Introduction to Sentinel Utilities

This section allows you to understand the utilities provided by Sentinel. You can use these utilities for the following purposes:

- ♦ For starting or stopping certain Sentinel services.
- ♦ For modifying Sentinel configuration.
- ♦ To determine the version of a Sentinel library.
- ♦ For troubleshooting activities.
- ♦ For configuring Sentinel email.

13.2 Starting and Stopping the Sentinel Server

A Sentinel Server is made up of the following components:

- ♦ Communication Server
- ♦ Correlation Engine
- ♦ DAS
- ♦ Collector Manager

Any combination of the above components can be installed in a particular Sentinel Server.

In a distributed installation of Sentinel, it is likely that there will be more than one machine with a Sentinel Server running on it. In this case, all of the Sentinel Servers work together to provide the complete Sentinel functionality.

NOTE: At most one Communication Server and DAS component can be installed across all Sentinel Servers in a distributed Sentinel installation. On the other hand, multiple instances of Correlation Engine and Collector Managers are allowed.

When a Sentinel Server is started or stopped, all components installed in that Sentinel Server are also started or stopped. To start or stop a particular component on a Sentinel Server, use the Servers View under the Admin tab in Sentinel Control Center.

You need to start or stop a Sentinel Server because of the following routine maintenance:

- ◆ Upgrades
- ◆ Patches
- ◆ Hotfixes

13.2.1 Starting a Sentinel Server

To start the UNIX Sentinel Server:

- 1 Log into the machine where the Sentinel Server you want to start is installed as the Sentinel Administrator operating system user (by default esecadm).
- 2 Go to the \$ESEC_HOME/bin directory.
- 3 Run the following command:

```
./sentinel.sh start
```

To start the Windows Sentinel Server:

- 1 Click Start > Settings > Control Panel.
- 2 Double-click Administrative Tools.
- 3 Double-click Services.
- 4 In the Services window, highlight Sentinel.
- 5 Right-click >Start or click Start in the tool bar.

13.2.2 Stopping a Sentinel Server

To stop the UNIX Sentinel Server:

- 1 Log into the machine where the Sentinel Server you want to stop is installed as the Sentinel Administrator operating system user (by default esecadm)
- 2 Go to the \$ESEC_HOME/bin directory.
- 3 Run the following command:

```
./sentinel.sh stop
```

To stop the Windows Sentinel Server:

- 1 Click Start > Settings > Control Panel.
- 2 Double-click Administrative Tools.
- 3 Double-click Services.
- 4 In the Services window, highlight Sentinel.
- 5 Right-click >Stop or click Stop in the tool bar.

13.3 Sentinel Scripts

Depending upon which components are installed, the \$ESEC_HOME/bin (on UNIX) or %ESEC_HOME%\bin (on Windows) directory might contain some or all of the scripts below. The operational scripts are appropriate for use during normal operations of Sentinel. The troubleshooting scripts should only be used when troubleshooting an issue.

For most scripts that require arguments, running the scripts without arguments provides details about the arguments and usage of the script.

13.3.1 Operational Scripts

The scripts below can be used during the normal operation of Sentinel.

Table 13-1 *Operational Scripts*

Script File:	Description:
adv_change_passwd.bat adv_change_passwd.sh	Resets the encrypted Advisor password stored in the Advisor configuration files. For more information, see Section 8.7, “Resetting the Advisor Password,” on page 168.
advisor.bat advisor.sh	Starts the Internet download and processing of Advisor feed data. This script is scheduled to run automatically when Advisor is installed.
AnalyzePartitions.sh	Runs the analyze partitions action on the Sentinel Database. This script is only available for Sentinel Database running on Oracle.
BackupIncidentData.bat BackupIncidentData.sh	Used to backup Incident related data before running the delete incident utilities. For more information, contact Novell Technical Support (http://support.novell.com/phone.html?sourceidint=suplnav4_phonesup) .
Clean_Database.bat Clean_Database.sh	Used to delete Incident and/or Identity information from the database. For more information, see Section 13.5, “Database Backup and Cleanup,” on page 295.
control_center.bat control_center.sh	Launches the Sentinel Control Center graphical user interface.
CreateStartStop	Creates start/stop scripts for Oracle 10
dbconfig.bat dbconfig	Configures the database connection settings stored in the DAS container xml files. For more information, see section “Reconfiguring Database Connection Properties” in the Sentinel 6.1 Reference Guide .
dbHealthCheck.sh	Displays Sentinel Database health information. This script is only available for Sentinel Database running on Oracle.
esm_manager.bat esm_manager.sh	Starts, stops, or restarts any of the Event Source Management nodes. Available in Sentinel 6.0 SP1 and above.

Script File:	Description:
extconfig.bat extconfig	Resets any of the encrypted 3rd Party Integration passwords stored in the <code>das_query.xml</code> file. For more information, see section Resetting the Remedy Password in the Remedy Help Desk Operations .
keymgr.bat keymgr.sh	Generates a random encryption key to be used to encrypt messages in transport over the iSCALE message bus. For more information, see the section “Changing the Communication Encryption Key” of “Communication Layer (iSCALE)” in Sentinel 6.1 Installation Guide .
map_updater.bat map_updater.sh	Uploads contents of a map to Sentinel
proxy_passwd_update.bat proxy_passwd_update.sh	Changes the password used for the proxy server if Advisor is downloading information through a proxy server.
register_trusted_client.bat register_trusted_client.sh	Registers the Sentinel installation as a trusted client of the Communication Server on the machine where this script is run. This script is used when manually configuring Collector Manager to connect to Sentinel through the proxy. For more information, see section “Collector Manager” in “Communication Layer (iSCALE)” in Sentinel 6.1 Installation Guide .
runadvisor_client.bat runadvisor_client.sh	Launches the client to download Advisor data.
sdm.bat sdm	Launches the Sentinel Data Manager application. For more information, see Chapter 12, “Sentinel Data Manager,” on page 277 .
sentinel.sh sentinel.bat	Starts or stops the Sentinel Server. For more information, see Section 13.2, “Starting and Stopping the Sentinel Server,” on page 287 .
setadventv.bat setadventv.sh	Used by the Advisor scripts to set some local environment variables.
setenv.sh	Used by many of the Sentinel scripts to set some local environment variables.
softwarekey.bat softwarekey.sh	Resets the Sentinel license key. For more information, see Section 13.6, “Updating Your License Key,” on page 303 .
solution_designer.bat solution_designer.sh	Starts the Solution Designer application.
uninstallAt.bat uninstallcron.sh	Removes the Advisor feed download and processing scheduled jobs. This script is run automatically by the uninstaller.
versionreader.bat versionreader.sh	Displays the version information stored in a Sentinel jar file. For more information, see Section 13.4.3, “Sentinel .jar Version Information,” on page 295 .

13.3.2 Troubleshooting Scripts

The scripts below are useful when troubleshooting an issue you are experiencing. They provide finer grain control of certain components in Sentinel, allowing you to drill down to the root cause of the issue.

NOTE: These scripts should not be used during normal operation of Sentinel. They are intended for troubleshooting purposes.

Table 13-2 *Troubleshooting Scripts*

Script File:	Description:
collector_mgr.bat	Starts the associated Sentinel Server process. These scripts are useful when troubleshooting a problem with a Sentinel Server process that is not running properly and when no helpful error message is written to the log file. Before running one of these scripts, make sure the associated process is not already running on that machine.
collector_mgr	
correlation_engine.bat	
correlation_engine	
das_aggregation.bat	
das_aggregation	
das_binary.bat	
das_binary	
das_cmd.bat	
das_cmd	
das_itrac.bat	
das_itrac	
das_query.bat	
das_query	
das_rt.bat	
das_rt	
event_file_info.bat	Displays information about an event file that will be processed by DAS Aggregation.
event_file_info	
list_broker_connections.bat	Displays all of the active connections to the iSCALE message bus.
list_broker_connections	
remove_sonic_lock.bat	Removes Sonic lock files in the event of an abnormal shutdown.
start_broker.bat	Starts the message bus component of the Communication Server. This script is useful if you are having problems starting the message bus (Sonic). For more information, see “Starting the Communication Server in Console Mode” on page 292.
start_broker.sh	

Script File:	Description:
StartSQLAgent.bat	Starts the SQL Server Agent Service and configures it to run automatically. This script is run automatically by the installer.
stop_broker.bat stop_broker.sh	Stops the message bus component of the Communication Server. For more information, see “Stopping the Communication Server in Console Mode” on page 292 .
stop_container.bat stop_container.sh	Stops a particular Sentinel Server process. This is useful when you need to restart a particular Sentinel Server process without stopping the entire Sentinel Server. Please note that the Sentinel Server watchdog will automatically restart the process after it is stopped. For more information, see “Restarting Sentinel Containers” on page 293 .

Starting the Communication Server in Console Mode

These scripts start the Communication Server on the command line in console mode. These scripts are useful for debugging the Communication Server without requiring you to run the rest of Sentinel Server.

NOTE: During normal operations, you should not use these scripts. Instead, follow the procedures in the [Section 13.2.1, “Starting a Sentinel Server,” on page 288](#). If you use these scripts on Windows, for example, the service will only run as long as the Command Prompt window remains open.

To start the Communication Server (Windows):

- 1 Either go or navigate through Windows Explorer to:

```
%ESEC_HOME%\bin
```

- 2 Either double-click (through Windows Explorer) or execute the following file:

```
start_broker.bat
```

To start the Communication Server (UNIX):

- 1 Login as Sentinel Administrator operating system user (default is esecadm).

- 2 Go to:

```
$ESEC_HOME/bin
```

- 3 Specify:

```
./start_broker.sh
```

Stopping the Communication Server in Console Mode

These scripts stop the Communication Server on the command line in console mode. These scripts are useful for troubleshooting the Communication Server without forcing you to stop the rest of Sentinel Server.

NOTE: During normal operations, you should not use these scripts. Instead, follow the procedures in the [Section 13.2.2, “Stopping a Sentinel Server,” on page 288](#).

To stop the Communication Server (Windows):

- 1 Either go or navigate through Windows Explorer to:

```
%ESEC_HOME%\bin
```

- 2 Either double-click (through Windows Explorer) or execute the following file:

```
stop_broker.bat
```

To stop the Communication Server (UNIX):

- 1 Login as user Sentinel Administrator operating system user (default is esecadm).

- 2 Go to:

```
$ESEC_HOME/bin
```

- 3 Specify:

```
./stop_broker.sh
```

Restarting Sentinel Containers

The following procedures describe how to restart a Sentinel Server process from the command line.

NOTE: During normal operations, you should not use these scripts. Instead, use the “Servers View” in the “Admin tab” of *Sentinel Control Center*.

Below are the names of the Sentinel Server processes that can be restarted using the procedure described below. The name must be used in the command line exactly as shown below.

Table 13-3 *Sentinel Server process names*

Name	Description
◆ Correlation_Engine	Processes Correlation Rules.
◆ Collector_Manager	Process raw event source data and sends events.
◆ DAS_Aggregation	Calculates event data summaries that are used in reports.
◆ DAS_Binary	Performs event database insertion.
◆ DAS_iTRAC	Provides the server-side functionality for the Sentinel iTRAC functionality.
◆ DAS_Proxy	Provides the server-side of the SSL proxy connection to Sentinel Server
◆ DAS_Query	Performs general Sentinel Service operations including Login and Historical Query.
◆ DAS_RT	Provides the server-side functionality for Active Views.

To restart a Sentinel Server process (Windows):

- 1 Go to:

```
%ESEC_HOME%\bin
```

- 2 Specify:

```
.\stop_container.bat <host machine> <process name>
```

For example:

```
.\stop_container.bat localhost DAS_RT
```

To restart a Sentinel Container (UNIX):

1 Login as user Sentinel Administrator operating system user (default is esecadm).

2 Go to:

```
$ESEC_HOME/bin
```

3 Specify:

```
./stop_container.sh <host machine> <process name>
```

For example:

```
./stop_container.sh localhost DAS_RT
```

13.4 Version Information

Below listed provides information about versions.

13.4.1 Executable Version Information

Sentinel has a command line option to display the version information of the following executable:

- ♦ agentengine

To display Sentinel executable version information (UNIX):

1 Go to:

```
$ESEC_HOME/bin
```

2 Specify:

```
./<process> -version
```

For example:

```
./agentengine -version
```

To display Sentinel executable version information (Windows):

1 Go to:

```
%ESEC_HOME%\bin
```

2 Specify:

```
.\<process> -version
```

For example:

```
.\agentengine -version
```

13.4.2 Sentinel .dll and .exe File Version Information

The following procedure describes how to gather the version information of Sentinel .dll and .exe files:

To obtain Sentinel .dll and .exe file version information:

- 1 Go to %ESEC_HOME%.
- 2 Within the bin and lib directory, right-click either a .dll or .exe file and select Properties.
- 3 Click the Version tab.
- 4 In the Item Name pane, select Product Version. The version number of the file appears in the Value pane.

13.4.3 Sentinel .jar Version Information

The following procedure describes how to gather the version information of Sentinel .jar files:

To obtain sentinel .jar file version information:

- 1 Log into the machine where Sentinel is installed as the Sentinel Administrator operating system user (default is esecadm) on UNIX or as an Administrator on Windows.
- 2 Go to:
For UNIX:
`$ESEC_HOME/bin`
For Windows:
`%ESEC_HOME%\bin`
- 3 At the command line, Specify:
For UNIX:
`./versionreader.sh <path/jar file name>`
For Windows:
`.\versionreader.bat <path/jar file name>`

13.5 Database Backup and Cleanup

The `Clean_Database` script is used to purge Incidents, Identities, Assets, Advisor data, and Vulnerabilities from the Sentinel database. For example, an improperly configured Correlation rule might create hundreds of unwanted incidents in the database. It is also possible that the identity information may encounter an error (for example, when someone attempts to delete the `IdentityAccountMap.csv` file).

WARNING: Because these scripts are designed to delete information from your database, they should be used very carefully and only after understanding the implications.

- ♦ [Section 13.5.1, “Components,” on page 296](#)
- ♦ [Section 13.5.2, “Prerequisites,” on page 297](#)

- ♦ [Section 13.5.3, “Running the Clean Database Script,” on page 297](#)
- ♦ [Section 13.5.4, “Importing the Backup Data to the Sentinel Database,” on page 301](#)

13.5.1 Components

\$ESEC_HOME/bin/Clean_Database.sh	Main database cleanup script. This calls the other scripts.
%ESEC_HOME%\bin\Clean_Database.bat	
\$ESEC_HOME/bin/BackupIncidentData.sh	Script used to backup Incident data
%ESEC_HOME%\bin\BackupIncidentData.bat	
%ESEC_HOME%\bin\PromptForDatabaseConnectionInfo.bat	Script used to prompt the user for SQL Server database connection information
%ESEC_HOME%\bin\BackupAdvisor.bat	Script used to backup Advisor data
\$ESEC_HOME/bin/BackupAdvisor.sh	
%ESEC_HOME%\bin\BackupAsset.bat	Script used to backup Asset data
\$ESEC_HOME/bin/BackupAsset.sh	
%ESEC_HOME%\bin\BackupVuln.bat	Script used to backup Vulnerability data
\$ESEC_HOME/bin/BackupVuln.sh	
esec_incidents_pkg.delete_incidents_by_query (Oracle)	Stored procedure used to delete Incidents specified by an SQL query
delete_incidents_by_query (SQL Server)	
esec_incidents_pkg.delete_incidents_by_rule (Oracle)	Stored procedure used to delete Incidents created by a specified Correlation Rule
delete_incidents_by_rule (SQL Server)	
esec_incidents_pkg.delete_incident_by_id (Oracle)	Stored procedure used to delete an Incident with a specified ID
delete_incidents_by_id (SQL Server)	
esec_identity_pkg.cleanup_identity (Oracle)	Stored procedure used to delete Identity related data
identity_cleanup (SQL Server)	
esec_advisor_pkg.delete_advisor_all (Oracle)	Stored procedure used to delete Advisor data
delete_advisor_all (SQL Server)	
esec_vuln_pkg.delete_vuln_all (Oracle)	Stored procedure used to delete Vulnerability data
delete_vuln_all (SQL Server)	
esec_assets_pkg.delete_assets_by_id (Oracle)	Stored procedure used to delete Asset data based on Asset ID
delete_assets_by_id (SQL Server)	
esec_assets_pkg.delete_assets_all (Oracle)	Stored procedure used to delete all Asset data
delete_assets_all (SQL Server)	

13.5.2 Prerequisites

There are several prerequisites for running the Clean_Database script.

- ♦ The user running the script must have permission to execute the cleanup script.
- ♦ The user running the script must have permission to access/execute all of the database tools/utilities. On Linux systems, this may involve making the esecadm user a member of the "oinstall" group. For example:

```
usermod -G esec,dialout,video,oinstall esecadm
```

- ♦ [Identity Cleanup only] The database must be in a healthy state and in good running condition as the Identity cleanup stored procedure will disable/enable foreign key constraints.
- ♦ [Identity Cleanup only] All Identity/Account loaders and collectors, such as the Identity Vault Collector, should be stopped.
- ♦ [Identity Cleanup only] Reports that are running queries against the Identity tables should be stopped.

The Identity cleanup DDL operations are NOT atomic so if one DDL statement execution fails, the script will exit with errors written to the specified log file. There is no recovery for this scenario and a DBA would be required to run the DDL again.

WARNING: If identity information is cleaned out of the database and then reloaded, the new identity information will not be synchronized with any past events that had identity information injected. Therefore, attempts to perform identity lookups on past events (received before the cleanup) or run reports on past events with identity information will not be successful.

Use this option with extreme caution.

13.5.3 Running the Clean Database Script

- ♦ [“Linux” on page 297](#)
- ♦ [“Windows” on page 299](#)

Linux

- 1 Open a console, go to \$ESEC_HOME/bin and enter `Clean_Database.sh` to start the script.

NOTE: At any time you can abort the execution of the cleanup script by entering "q" at any prompt.

- 2 At the prompt, indicate which objects you want to remove from the database:

```
Which objects would you like to cleanup?
```

- (1) Incidents
- (2) Identities
- (3) Assets
- (4) Advisor
- (5) Vulnerabilities
- (6) Incidents and Identities
- (7) All

- 3 At the prompts, enter the following information to connect to the Oracle database:

```
Database name (Example: ESEC) => Ansping will be performed to verify the
existing of the specified database instance.
Database username (Press ENTER for default esecdba)
<username> password =>
```

The connection to the database will be verified.

The database connection is verified before proceeding to the next step.

4 If cleaning Incidents, the following things happen:

4a The following prompt displays:

```
Would you like to backup Incidents first? (y or n) =>
Enter "y" to backup the Incident data (recommended) or "n" to skip the
Incident data backup.
```

4b If you select “y” to back up the Incidents, enter the destination directory (a full path or a path relative to the location of the cleanup script) for the backup files.

NOTE: The user running the script must have permission to write to this directory.

4c You will be prompted again to enter the password for the database user previously specified

NOTE: This prompt is necessary to prevent passing the password via the command line to the database exp command and making the password possibly visible in "ps" commands.

4d The .dmp files and a log file are created in the specified backup directory.

4e Choose an Incident cleanup option:

(1) Delete Incidents By Query – You will be prompted to enter a custom SELECT query. For example:

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

NOTE: The SELECT statement cannot include quotation marks.

(2) Delete Incidents By Rule – You will be prompted to enter the name of the Correlation Rule(s) that created the Incident(s) For example:

```
My Test Rule
```

(3) Delete Incidents By Id – You will be prompted to enter the ID of a specific Incident. For example:

```
101
(q) Quit without action
```

4f At the Incident Cleanup Confirmation prompt, type "start" to start the Incident cleanup (deletion) or "abort" to quit without performing any cleanup.

4g The results of the Incident Cleanup will be written to the specified log file.

NOTE: You should review the log file for any errors before continuing.

5 If cleaning Identity, the following things happen:

5a At the Identity Cleanup Confirmation prompt, type "start" to start the Identity cleanup or "abort" to quit without performing the Identity cleanup.

5b The results of the Identity Cleanup will be written to the specified log file.

NOTE: You should review the log file for any errors before continuing.

- 5c** In addition to deleting the Identity information from the database tables, the script will attempt to delete the Identity Account Map file (identityAccountMap.csv). So at the prompt

Please enter the esecadm user password =>
enter the esecadm user's password.

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

Windows

- 1** Open a console, go to %ESEC_HOME%\bin and enter Clean_Database.bat to start the script.

NOTE: At any time you can abort the execution of the cleanup script by entering "q" at any prompt.

- 2** At the prompt, indicate which objects you want to remove from the database:

Which objects would you like to cleanup?

- (1) Incidents
- (2) Identities
- (3) Assets
- (4) Advisor
- (5) Vulnerabilities
- (6) Incidents and Identities
- (7) All

- 3** At the prompt, enter the following connection information for the SQL Server database.

- ◆ SQL Server database server hostname
- ◆ SQL Server database instance name (Press ENTER to use the default instance)
- ◆ Database port number (Press ENTER to use the default port - 1433)
- ◆ Database name (for example, ESEC)
- ◆ Database authentication option ("1" for Windows Authentication and "2" for SQL Authentication)
- ◆ esecdba password

NOTE: This option is only required if using SQL Authentication. If using Windows Authentication, you must run the script as the domain user equivalent to esecdba.

The database connection is verified before proceeding to the next step.

- 4** If cleaning Incidents, the following things happen:

- 4a** The following prompt displays:

Would you like to backup Incidents first? (y or n) =>
Enter "y" to backup the Incident data (recommended) or "n" to skip the Incident data backup.

- 4b** If you select "y" to back up the Incidents, enter the destination directory (a full path or a path relative to the location of the cleanup script) for the backup files.

NOTE: The user running the script must have permission to write to this directory.

4c You will be prompted to confirm the Incident backup:

```
Backup Incidents to <directory>?
```

Type "start" to start the Incident backup (deletion) or "abort" to quit without performing any action. The backed up files will be placed in the specified backup directory.

4d Choose an Incident cleanup option:

(1) Delete Incidents By Query – You will be prompted to enter a custom SELECT query. For example:

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

NOTE: The SELECT statement cannot include quotation marks.

(2) Delete Incidents By Rule – You will be prompted to enter the name of the Correlation Rule(s) that created the Incident(s) For example:

```
My Test Rule
```

(3) Delete Incidents By Id – You will be prompted to enter the ID of a specific Incident. For example:

```
101  
(q) Quit without action
```

4e At the Incident Cleanup Confirmation prompt, type "start" to start the Incident cleanup (deletion) or "abort" to quit without performing any cleanup.

4f The results of the Incident Cleanup will be written to the specified log file.

NOTE: You should review the log file for any errors before continuing.

5 If cleaning Identity, the following things happen:

5a At the Identity Cleanup Confirmation prompt, type "start" to start the Identity cleanup or "abort" to quit without performing the Identity cleanup.

5b The results of the Identity Cleanup will be written to the specified log file.

NOTE: You should review the log file for any errors before continuing.

5c In addition to deleting the Identity information from the database tables, the script will attempt to delete the Identity Account Map file (identityAccountMap.csv). So at the prompt

```
Please enter username with privileges to delete the identity map file  
=>
```

enter the name of the user who has permission to delete the identity map file (located in %ESEC_HOME%/data/map_data directory).

5d Enter the user's password at the next prompt.

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

13.5.4 Importing the Backup Data to the Sentinel Database

You can import the backup data such as Incidents, Assets, and Vulnerabilities to the Sentinel database. While importing the backup data into the Sentinel database, ensure you import the data in the right sequence to avoid any errors. For more information, see [Sequence to Import the Backup Data](#). However, if you get any Unique Constraint Violation error, ignore the message and proceed with importing the data.

To load the backup data to the database, run the command:

Oracle

- 1 Log in to the Sentinel database as the `oracle` user.
- 2 Set the `ORACLE_HOME` environment variable to the directory where the Oracle software is installed.
- 3 Set the `PATH` variable to `$ORACLE_HOME/bin`.
- 4 Run the command:

```
imp esecdba/<esecdba_password> file = <backup_filename> log =  
<log_filename> tables = <table_name> ignore = y
```

where:

`imp` is the command used to import files

`esecdba/<esecdba_password>` is the database administrator user name and password

`backup_filename` is the backup data that you want to restore to the database

`log_filename` is the file in which you want to store the log messages

`ignore = y` ignores duplicate rows in the table

MS SQL

- 1 Log in to the Sentinel SQL Server database as `esecdba` user and run the command:

```
BULK INSERT <table_name> FROM "<backup_filename>" WITH ( BATCHSIZE =10000,  
FIELDTERMINATOR = '~$^' )
```

where:

`BULK INSERT` is the command to insert the backup data to the database

`table_name` is the name of the table in the database

`backup_filename` is the name of the backup file, which is in the `<table_name>.bcp` format

Sequence to Import the Backup Data

While importing the backup data into the Sentinel database, ensure you import the data in the following sequence. Otherwise, an error is displayed indicating that Referential Integrity constraint is violated and it does not allow you to import the backup data.

Asset Tables

ENTITY_TYP_LKUP
PERSON
ENV_IDENTITY_LKUP
VNDR
PRDT
ASSET_LOC
SENSITIVITY_LKUP
CRIT_LKUP
ASSET_VAL_LKUP
NETWORK_IDENTITY_LKUP
ORGANIZATION
ASSET_CTGRY
ROLE_LKUP
PHYSICAL_ASSET
ASSET_IP
ASSET_HOSTNAME
ASSET_X_ENTITY_X_ROLE
ASSET

NOTE: In MS SQL, the filename for Asset table is `assets.bcp`. Therefore, when you import the Asset table you must specify the `backup_filename` as `assets.bcp`.

Advisor Tables

ADV_NXS_OSVDB_DETAILS
ADV_NXS_PRODUCTS
ADV_NXS_SIGNATURES
ADV_NXS_KB_PRODUCTSREF
ADV_NXS_KB_PATCH
ADV_NXS_MAPPINGS

Vulnerability

VULN_SCANNER
VULN_SCAN
VULN_RSRC
VULN_RSRC_SCAN
VULN
VULN_SCAN_VULN
VULN_INFO
VULN_CODE

Incidents

INCIDENTS_ASSETS
INCIDENTS_VULN
INCIDENTS_EVENTS
ANNOTATIONS
ATTACHMENTS
EXT_DATA
WORKFLOW_INFO
ASSOCIATIONS
INCIDENTS

13.6 Updating Your License Key

If your Sentinel license key has expired and Novell has issued you a new one, run the software key program to update your license key.

To update your license key (UNIX):

- 1 Log into the machine where the DAS component is installed as the Sentinel Administrator operating system user (default is esecadm).
- 2 Go to \$ESEC_HOME/bin.
- 3 Specify the following command:
`./softwarekey.sh`
- 4 Specify the number 1 to set your primary key. Press enter.

To update your license key (Windows):

- 1 Log into the machine where the DAS component is installed as a user with administrative rights.
- 2 Go to %ESEC_HOME%\bin
- 3 Specify the following command:
`.\softwarekey.bat`
- 4 Specify the number 1 to set your primary key. Press enter.

- [Section 14.1, “Security Analysts,” on page 305](#)
- [Section 14.2, “Creating Incidents,” on page 308](#)
- [Section 14.3, “iTRAC,” on page 310](#)
- [Section 14.4, “Report Analyst,” on page 323](#)
- [Section 14.5, “Administrators,” on page 324](#)

14.1 Security Analysts

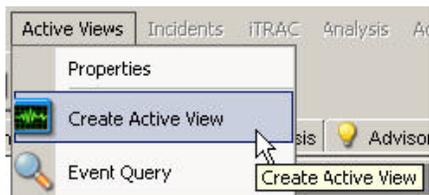
NOTE: This document assumes your Security Administrator has built the necessary filters and configured Collectors for your system.

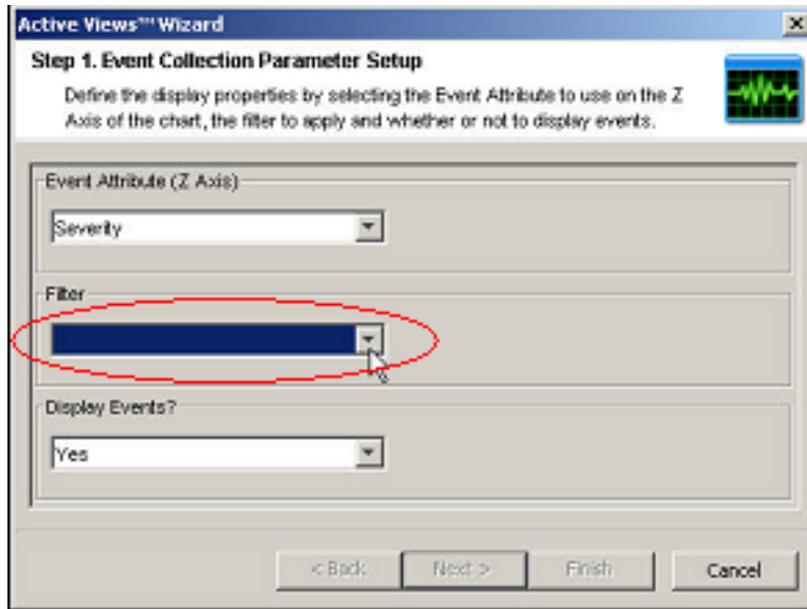
14.1.1 Active Views Tab

In the Active Views tab, you can monitor events as they happen, performing queries on these events. You can monitor them in a table form or through a 3-D graphical representation.

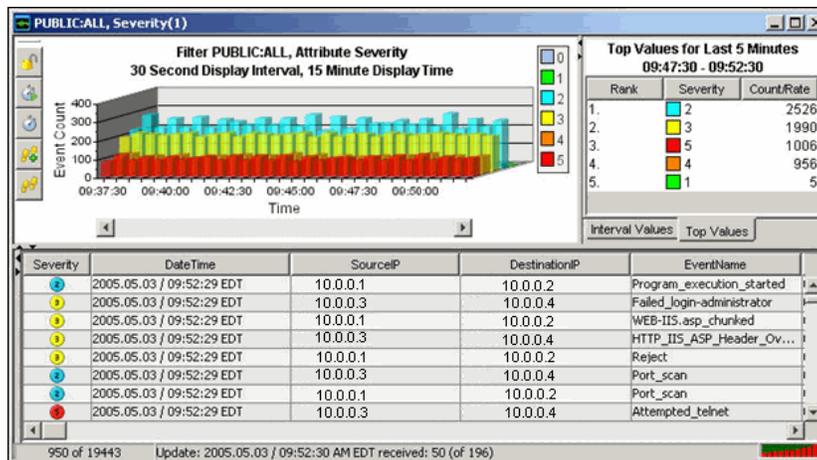
To get a Real-Time events started:

- 1 Go to the Active View tab.
- 2 Click Active Views > Create an Active View, select a filter from the Filter drop-down menu and click Select.





3 Click Finish. If you have an active network, you might see something similar to:



NOTE: To display a 3-D graph without real time events, click the Display Events down arrow and select No.

14.1.2 Exploit Detection

For information on how exploit detection works and which Intrusion Detection Systems and Vulnerability Scanners are supported, see [Chapter 8, “Advisor Usage and Maintenance,” on page 157.](#)

14.1.3 Asset Data

To view Asset information for any event, right-click an event or events > Analysis > Asset Data, a window similar to the one below displays:

Figure 14-1 Asset Report

Asset Report																										
Hardware	<table border="1"> <tr> <td>MAC Address</td> <td>04-23:A3:44:65:87</td> </tr> <tr> <td>Name</td> <td>Value UNKNOWN</td> </tr> <tr> <td>Type</td> <td>DESKTOP</td> </tr> <tr> <td>Vendor</td> <td>UNKNOWN</td> </tr> <tr> <td>Product</td> <td>UNKNOWN</td> </tr> <tr> <td>Version</td> <td>UNKNOWN</td> </tr> <tr> <td>Location</td> <td>UNKNOWN</td> </tr> </table>	MAC Address	04-23:A3:44:65:87	Name	Value UNKNOWN	Type	DESKTOP	Vendor	UNKNOWN	Product	UNKNOWN	Version	UNKNOWN	Location	UNKNOWN											
MAC Address	04-23:A3:44:65:87																									
Name	Value UNKNOWN																									
Type	DESKTOP																									
Vendor	UNKNOWN																									
Product	UNKNOWN																									
Version	UNKNOWN																									
Location	UNKNOWN																									
Network	<table border="1"> <tr> <th>IP</th> <th>Hostname</th> </tr> <tr> <td>192.168.0.10</td> <td>devbox10</td> </tr> </table>	IP	Hostname	192.168.0.10	devbox10																					
IP	Hostname																									
192.168.0.10	devbox10																									
Software	<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Vendor</th> <th>Product</th> <th>Version</th> </tr> </thead> </table>	Name	Type	Vendor	Product	Version																				
Name	Type	Vendor	Product	Version																						
Contacts	<table border="1"> <thead> <tr> <th>Order</th> <th>Name</th> <th>Role</th> <th>Email</th> <th>Phone Number</th> </tr> </thead> <tbody> <tr> <td>OwnerFirstName10</td> <td>OwnerLastName10</td> <td>ASSET_OWNER</td> <td>OwnerEmail10</td> <td>OwnerPhoneNumber10</td> </tr> <tr> <td>MaintainerFirstName10</td> <td>MaintainerLastName10</td> <td>ASSET_MAINTAINER</td> <td>MaintainerEmail10</td> <td>MaintainerPhoneNumber10</td> </tr> <tr> <td>BusinessUnit10</td> <td>LineOfBusiness10</td> <td>BUSINESS_UNIT</td> <td>LINE_OF_BUSINESS</td> <td></td> </tr> <tr> <td>Division10</td> <td>Department10</td> <td>DIVISION</td> <td>DEPARTMENT</td> <td></td> </tr> </tbody> </table>	Order	Name	Role	Email	Phone Number	OwnerFirstName10	OwnerLastName10	ASSET_OWNER	OwnerEmail10	OwnerPhoneNumber10	MaintainerFirstName10	MaintainerLastName10	ASSET_MAINTAINER	MaintainerEmail10	MaintainerPhoneNumber10	BusinessUnit10	LineOfBusiness10	BUSINESS_UNIT	LINE_OF_BUSINESS		Division10	Department10	DIVISION	DEPARTMENT	
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IP	Hostname																									
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14.1.4 Event Query

This section talks about event query

Example Scenario – Telnet Event:

During monitoring, you see numerous telnet attempts from source IP 10.0.0.1. Telnet attempts could be an attack. Telnet potentially allows an attacker to remotely connect to a remote computer as if they were locally connected. This can lead to unauthorized configuration changes, installation of programs, viruses, and so on.

You can use Event Query to determine how often this possible attacker has attempted a telnet; you can setup a filter to query for this particular attacker. For example, you know the following:

- ◆ Source IP: 10.0.0.1
- ◆ Destination IP: 10.0.0.2
- ◆ Severity: 5
- ◆ Event Name: Attempted_telnet
- ◆ Sensor Type: H (Host Intrusion Detection)

To Perform an Event Query:

- 1 In the Sentinel Control Center, click Event Query (Magnifying Glass icon) and click the Filter drop-down menu.
- 2 A window with a list of filters displays. Click Add; specify a filter name of telnet SIP 10.0.0.1. In the field below the Filter, specify:

-
- ◆ SourceIP = 10.0.0.3
 - ◆ EventName = Attempted_telnet
 - ◆ Severity = 5
 - ◆ SensorType = H
 - ◆ DestinationIP = 10.0.0.4
 - ◆ Match if, select All conditions are met (and)
-

- 3 Click Save. Highlight your filter and click Select.
- 4 Provide your time period of interest; click Search (Magnifying Glass icon). The result of your query displays. If your Event Query makes a match, you will get a result similar to the following illustration.

Severity	DateTime	SourceIP	DestinationIP	EventName
5	2005.05.03 / 09:25:24 EDT	10.0.0.1	10.0.0.5	Attempted_telnet
5	2005.05.03 / 09:25:22 EDT	10.0.0.2	10.0.0.7	Attempted_telnet
5	2005.05.03 / 09:25:20 EDT	10.0.0.1	10.0.0.5	Attempted_telnet
5	2005.05.03 / 09:25:18 EDT	10.0.0.2	10.0.0.7	Attempted_telnet
5	2005.05.03 / 09:25:16 EDT	10.0.0.1	10.0.0.5	Attempted_telnet
5	2005.05.03 / 09:25:14 EDT	10.0.0.2	10.0.0.7	Attempted_telnet
5	2005.05.03 / 09:25:12 EDT	10.0.0.1	10.0.0.6	Attempted_telnet
5	2005.05.03 / 09:25:10 EDT	10.0.0.2	10.0.0.9	Attempted_telnet
5	2005.05.03 / 09:25:08 EDT	10.0.0.1	10.0.0.6	Attempted_telnet
5	2005.05.03 / 09:25:06 EDT	10.0.0.2	10.0.0.9	Attempted_telnet

If you want to see how often in general this user is attempting a telnet, remove DestinationIP, SensorType and Severity from your filter or create a new filter. The results will show all the destinationIPs this user is attempting to telnet to.

If any of your events are correlated events, you can right-click > View Trigger Events to find what events triggered that correlated event.

NOTE: Correlated events will have the SensorType column populated with a C.

More Information about Attacks

Another event of interest could be excessive FTP events. This can also be a remote connection, allowing for transferring, copying and deleting of files.

Below is a short list of attacks of interest. Types of attacks are an extensive list. For more information about network/host attacks, there are many resources available (that is, books and the internet) that explain different types of attacks in detail.

-
- ◆ SYN Flood
 - ◆ Packet Sniffing
 - ◆ Smurf and Fraggle
 - ◆ ICMP and UDP Flood
 - ◆ Denial of Service
 - ◆ Dictionary Attack
-

14.2 Creating Incidents

NOTE: To perform this function you must have user permission to create Incidents.

This is useful in grouping a set of events together as a whole representing something of interest (group of similar events or set of different events that indicate a pattern of interest such as an attack).

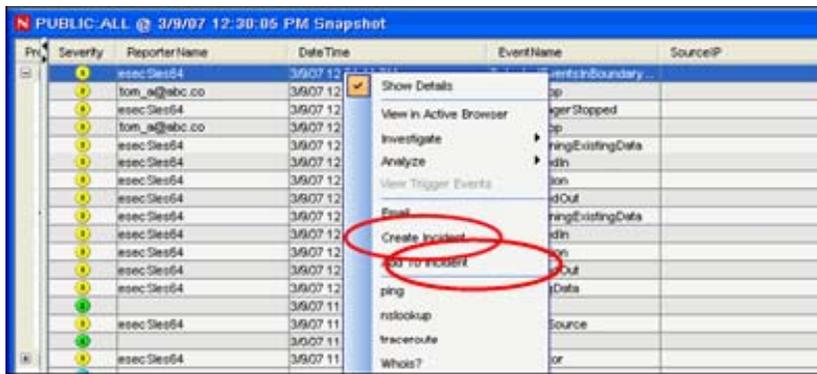
NOTE: If events are not initially displayed in a newly created Incident, it is most likely because of a lag in the time between display in the Real Time Events window and insertion into the database. If this occurs, it might take a few minutes for the original events to finally be inserted into the database and display in the incident.

To create an Incident:

NOTE: It is possible to create an incident that does not contain any events. Events can always be added to Incidents.

- 1 In a Real Time Event Table of the Visual Navigator or a Snapshot Real Time Event Table, select an event or a group of events and right-click and select Create Incident.

Figure 14-2 Creating Incident



- 2 In the Incident Window are the following tabs:
 - ◆ **Events:** Shows which events make up the incident
 - ◆ **Assets:** Show affected assets
 - ◆ **Vulnerability:** Show related asset vulnerabilities
 - ◆ **Advisor:** Shows the attack information
 - ◆ **iTRAC:** Under this tab, you can assign an iTRAC Process
 - ◆ **History:** Incident history
 - ◆ **Attachments:** You can attach any document or text file with pertinent information to this incident
 - ◆ **Notes:** You can specify any general notes you want to refer regarding this incident.
- 3 In the Create Incident dialog box, provide:

◆ Title	◆ Category
◆ State	◆ Responsible
◆ Severity	◆ Description
◆ Priority	◆ Resolution

- 4 Click Create. The incident is added under the Incidents tab of the Sentinel Control Center.

14.3 iTRAC

This section gives an idea relevant to iTRAC.

14.3.1 Instantiating a Process

An iTRAC process can be instantiated in the iTRAC server by associating an iTRAC process to an incident the following methods:

- ◆ Associate an iTRAC process to the incident at the time of incident creation
- ◆ Associate an iTRAC process to incident after an incident has been created
- ◆ Associate an iTRAC process to an incident as an action when deploying a correlation rule

For more information on associating a process to an incident, see [Chapter 3, “Correlation Tab,” on page 63](#) and [Chapter 4, “Incidents Tab,” on page 91](#).

Example Scenario – Creating a Simple Two Tiered iTRAC Process for a Possible Network Attack

NOTE: To perform all of the scenarios in the iTRAC section, iTRAC scenario sections must be followed in the order presented.

This discusses how to make a simple two tiered iTRAC Process. The process is flow of steps that can be taken in the event there is a possible attack on your system.

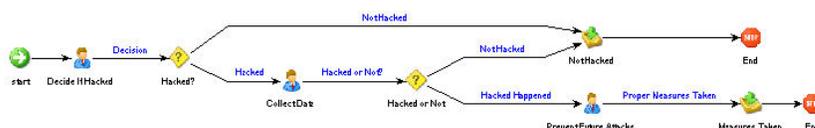
The example process is:

- ◆ Asks the question (in the first step – a manual step [Decide if Hacked]), from a preliminary look has the network been attacked? This leads to a Decision Step.

NOTE: All Decision Steps provide different execution paths depending on the value of the variable defined in the previous step.

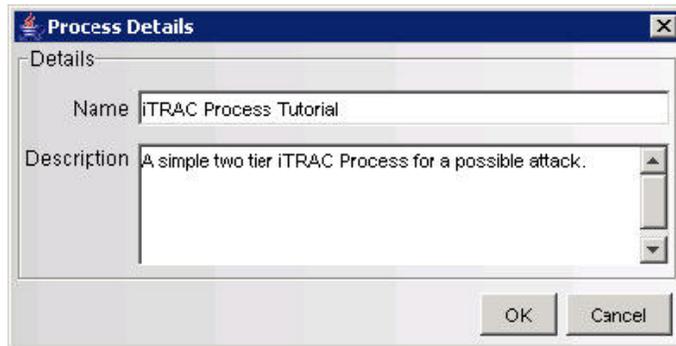
- ◆ If there has been an attack, go collect necessary data to determine if there has been an attack. If there is no attack, send an email out to the supervisor that there is not an attack.
- ◆ The Collect Data step is to review the data to make a better determination if there has been an attack.
- ◆ If there has been an attack, take measures to prevent another attack and send an email out to the supervisor that proper measures have been taken. If there is no attack, send an email out to the supervisor that there is not an attack.

Figure 14-3 iTRAC Process



To Create an iTRAC Process:

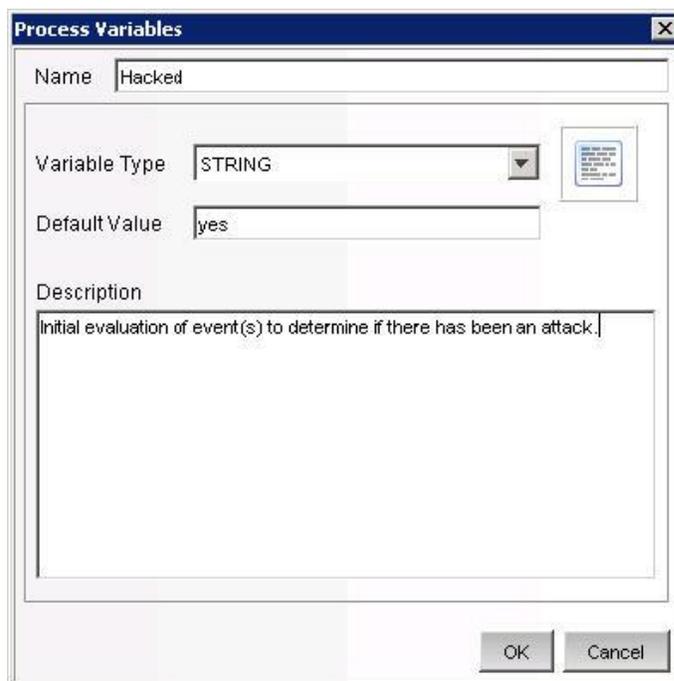
- 1 Click the iTRAC tab.
- 2 In the navigation pane, click iTRAC Administration > Template Manager.
- 3 In the Template Manager window, click Add.
- 4 The iTRAC Process Builder displays with a Process Details window. Provide the name iTRAC Tutorial. Optionally, add a description.



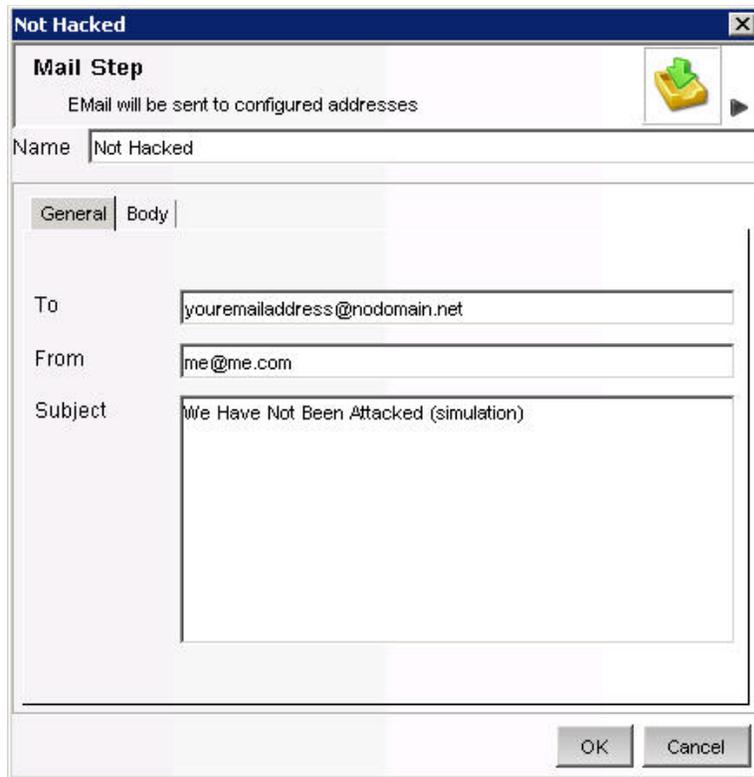
- 5 From the Step Palette pane, drag and drop three Manual Steps, two Mail Steps, and two Decision Steps. Rename and the attributes to the steps as follows by right-clicking and selecting Edit Step.
 - ♦ Manual Step-0 to Decide If Hacked
 - ♦ set Role to Analyst
 - ♦ click Associate
 - ♦ click Add
 - ♦ provide Hacked in the Name field



- ◆ in the Process Variables window select the Variable Type as String
- ◆ provide Default Value as yes



- ◆ under the Description tab, (optional) specify Initial evaluation of event(s) to determine if there has been an attack
- ◆ click OK
- ◆ highlight the newly created association, continue to click OK until the step is renamed
- ◆ Manual Step-1 to Collect Data
 - ◆ set Role to Analyst
 - ◆ click Associate
 - ◆ highlight Hacked, click OK
 - ◆ under the Description tab, (optional) specify To further evaluate after collecting of events to determine if there has been an attack.
 - ◆ click OK, the step should be renamed
- ◆ Manual Step-2 to Prevent Future Attacks
 - ◆ set Role to Analyst
 - ◆ under the Description tab, (optional) specify Take measures to stop the attack (firewall, router or other intrusion protection method). Also, if possible, determine how the attacked was done.
 - ◆ click OK, the step should be renamed
- ◆ Mail Step-3 to Not Hacked
 - ◆ in the To field, (because this is for tutorial) provide your email address. When this step completes it will send you an email
 - ◆ in the From field, provide a made up address such as me@nowhere.com
 - ◆ in the Subject field, specify We have not been hacked.



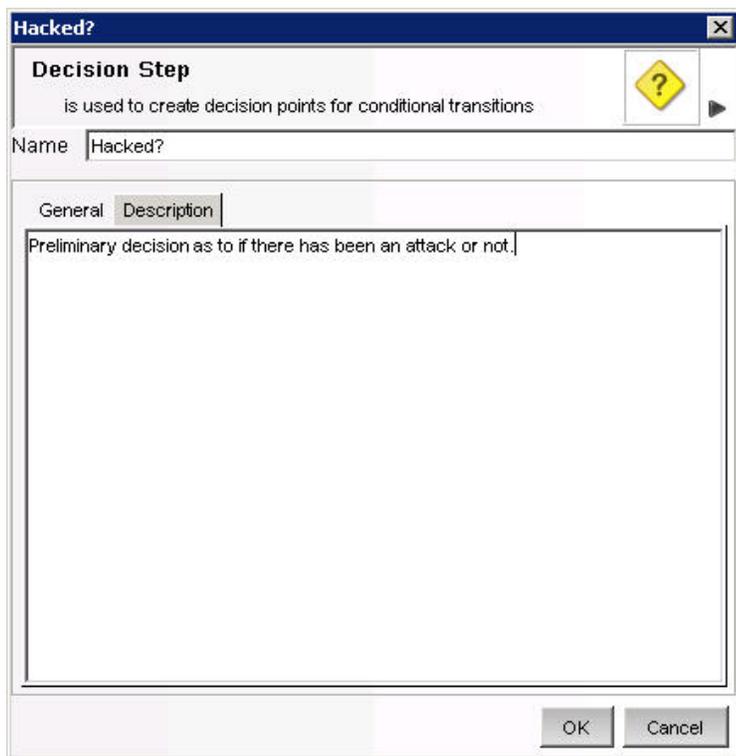
- ◆ Under the Body tab, (optional) specify This email is generated from a tutorial (simulation) iTRAC process.



- ◆ click OK
- ◆ Mail Step-4 to Prevent Future Attacks
 - ◆ in the To field, specify your email address
 - ◆ in the From field, specify a made up email address
 - ◆ in the Subject field, specify Proper Attack Measures Taken
 - ◆ Under the Body tab, (optional) specify This email is generated from a tutorial (simulation) iTRAC process.
- ◆ Decision Step-5 to Hacked? (optional) Under the Description tab, (optional) provide a description such as Preliminary decision as to if there has been an attack or not.



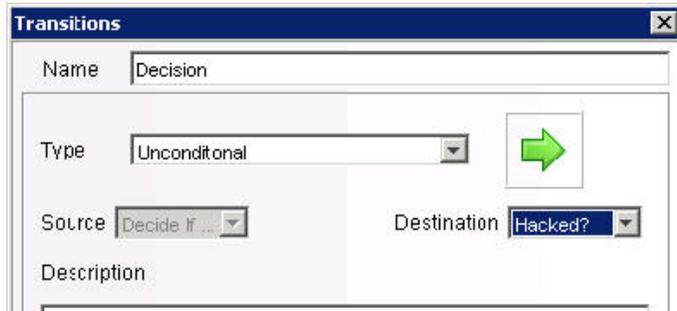
- ◆ Decision Step-6 to Hacked or Not. (optional) Under the Description tab, you might provide a description such as Decision as to if there has been an attack or not.



6 Right-click Start and select Add Start Transition. Select destination to step Decide If Hacked.

7 Right-click Decide If Hacked and select Add Transition. Select and specify the following:

- ◆ Name, provide Decision
- ◆ Type, select Unconditional
- ◆ Destination: Hacked?



- ◆ Click OK

8 Right-click Hacked? and select Add Transition. Select and specify the following:

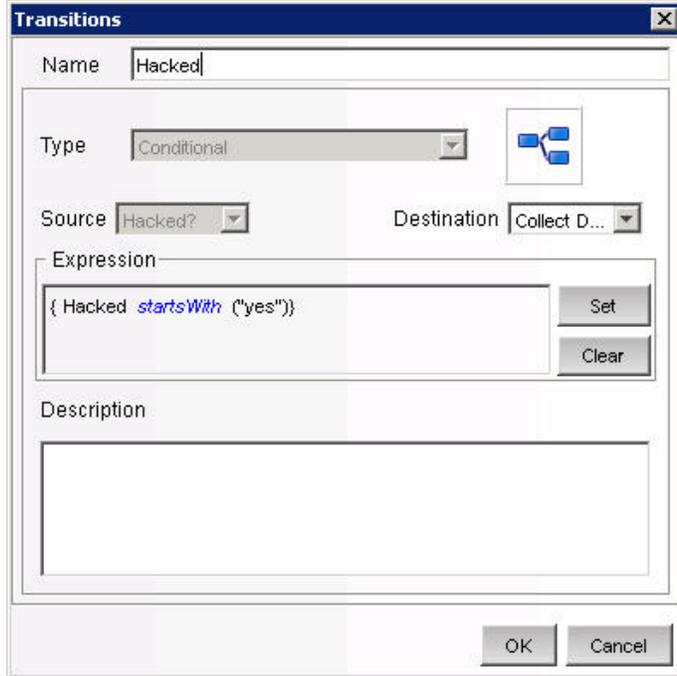
- ◆ Name, provide Not Hacked
- ◆ Type, select else
- ◆ Destination: Not Hacked
- ◆ Click OK

NOTE: A decision step provides different execution paths depending on the value of the variable defined in the previous step. A Decision Step can have more than two transitions.

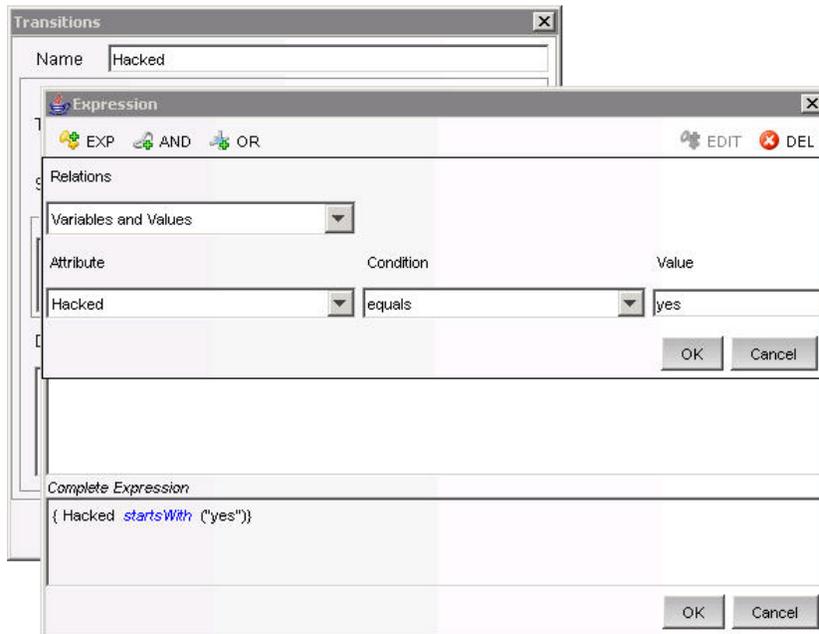
9 Right-click Not Hacked and select End Transition.

10 Right-click Hacked? and select Add Transition. Select and specify the following:

- ◆ Name, provide Hacked
- ◆ Type, select Conditional
- ◆ Destination: Collect Data

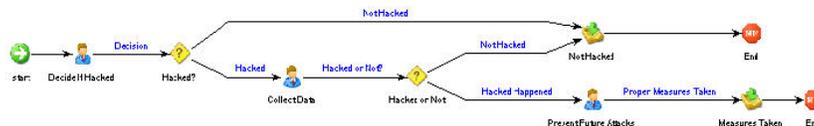


- ◆ Click Set > EXP
 - ◆ Select Variables and Values
 - ◆ Select Attribute Hacked
 - ◆ Select Condition equals
 - ◆ Specify Value of yes



- ◆ Click OK until the transition is complete

- 11 Right-click Collect Data and select Add Transition. Select and specify the following:
 - ◆ Name, Hacked or Not?
 - ◆ Type, Unconditional
 - ◆ Destination, Hacked or Not
- 12 Right-click Hacked or Not and select Add Transition. Select and specify the following:
 - ◆ Name, Not Hacked
 - ◆ Type, Else
 - ◆ Destination, Not Hacked
- 13 Right-click Hacked or Not and select Add Transition. Select and specify the following:
 - ◆ Name, Hack Happened
 - ◆ Type, Conditional
 - ◆ Destination, Prevent Future Attacks
 - ◆ Click Set > EXP
 - ◆ Select Variables and Values
 - ◆ Select Attribute Hacked
 - ◆ Select Condition equals
 - ◆ Specify Value of yes
 - ◆ Click OK until the transition is complete
- 14 Right-click Prevent Future Attacks and select Add Transition. Select and specify the following:
 - ◆ Name, Proper Measures Taken
 - ◆ Type, Unconditional
 - ◆ Destination, Measures Taken
- 15 Right-click Measures Taken and select Add End Transition.



- 16 Click Save. Your new process should appear in the Template Manager.

Example Scenario – Running an iTRAC Process for a Possible Network Attack

The following example assumes the following:

- ◆ A process named iTRAC Process Tutorial has been assigned to your role (analyst)

NOTE: This is a process created in Section. [“Example Scenario – Creating a Simple Two Tiered iTRAC Process for a Possible Network Attack”](#) on page 310.

- ◆ All steps within the process belong to the Analyst group

NOTE: By assigning steps to other roles, will mean having to log out and then log in as a user assigned to that role and accept the process. For simplicity, the following example is assigned to one role.

To run this process, this process must first be assigned to an incident.

To Start or Terminate a Process:

- 1 Click the Incident tab.
- 2 Click Incidents > Create Incidents.
- 3 Specify the following:
 - ♦ Title: iTRAC Tutorial
 - ♦ Category: Other
 - ♦ Responsible: assign this Incident to yourself
- 4 Click the iTRAC tab, select iTRAC Process Tutorial.
- 5 Click Create.

NOTE: Because this is a tutorial Incident and not a true Incident, it can be deleted without negatively affecting your Sentinel setup.

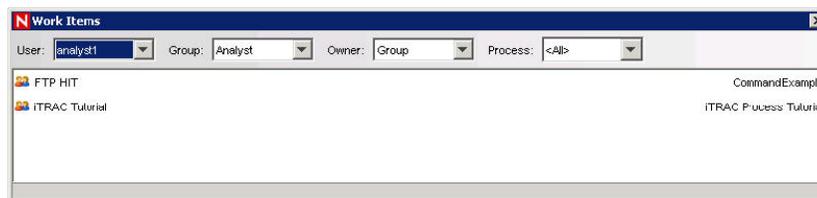
- 6 From anywhere in the Sentinel GUI, click the Analyst group (yellow bar) under View work items.

[View work items](#)

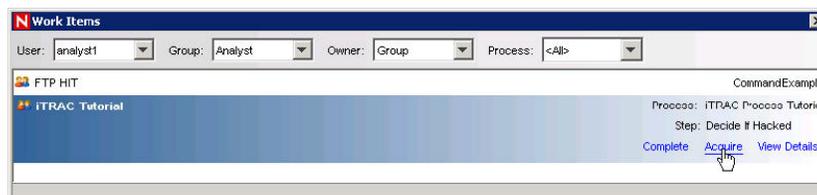
Analyst

NOTE: Your bar might already be partially green indicating that you have accepted (acquired) an iTRAC Process.

- 7 All of the processes assigned to the Analyst role displays.



- 8 To accept a Work Item, highlight iTRAC Tutorial and click Acquire.

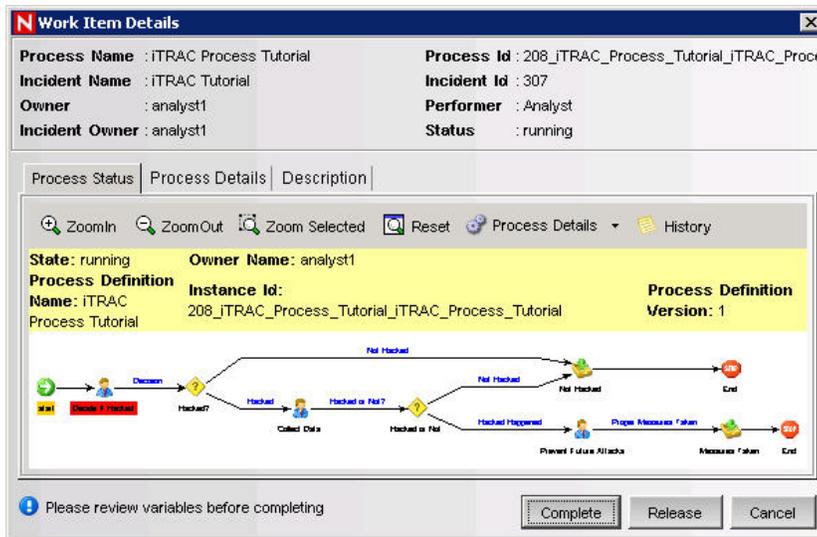
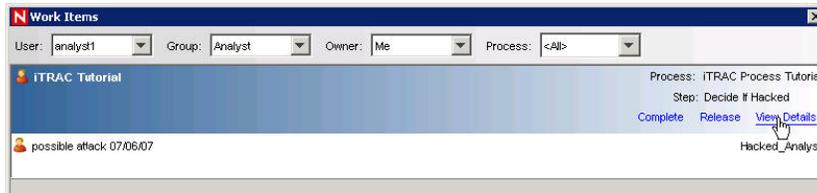


If the View Work Item list bar was yellow as illustrated above, it changes with an addition of a green bar.

[View work items](#)

Analyst 

- 9 Click the green bar under View work items. In the Work Items window, click View Details.

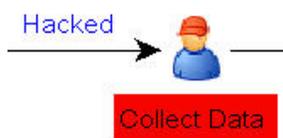


The red highlighted step indicates what step this process is currently in.

- 10 To start the steps within this process, click the Process Details tab.

For this manual step the variable yes is specified. Providing another value such as no or else (no attack) will result in going to an email that will send an automatic email and complete the process. Let say that initial assessment is that there is an attack, with the hacked variable equal to yes, click Complete (to complete this step, not complete the process).

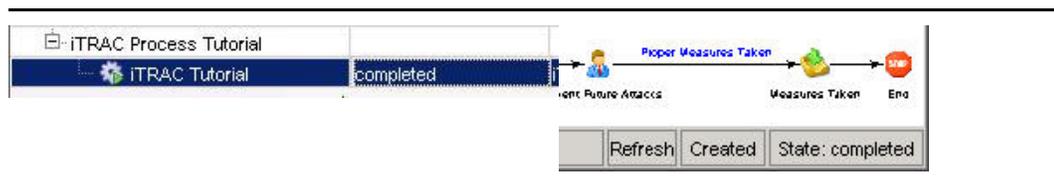
- 11 In the Work Items window, highlight the process and click View Details. The Collect Data step should be highlighted in red. As before, this is a manual step.



- 12 Click the Process Details tab.
- 13 Again, the variable page displays. In the previous step of the iTRAC Process, Collect Data is a step to further determine by analyzing the event(s) of interest if an attack has occurred. Let's say that an attack has occurred. Leave the default value of yes. If this were a real attack, it will be beneficial to add clear notes and/or attachments as to the information about this attack. Click Complete.
- 14 In Work Items window, highlight the process and click View Details. The Prevent Future Attacks step should be highlighted in red. As before, this is a manual step.
- 15 In this manual step, measures should be taken to harden the network to prevent future attacks. When this is done, as before it will be beneficial to add clear notes and/or attachments as to the information about this attack. Click Complete.

The next step is an automatic email step indicating that proper anti-attack measures have been taken. The iTRAC Process will be removed from the Work Items window.

Also, if you go to the Process View window it indicates as Complete or if you double-click this process, it indicates as Complete.



14.4 Report Analyst

NOTE: Assumption, your Security Administrator has configured your Crystal Enterprise Web Server and published a list of available reports.

14.4.1 Analysis Tab

The Analysis tab allows for historical reporting. Historical and vulnerability reports are published on a Crystal Web Server, these run directly against the Sentinel database. These reports can be useful to track and investigate activity over a large time frame, for instance a week or a month. These reports can also be used as a high level reporting method to your supervisors. If your reporting Web Server is installed, look in the navigator bar to see what reports are available.

NOTE: Your reports might be different, Sentinel Crystal Reports are “living” reports. They are under constant updating.

For example, if you are responsible for generating reports to upper management within your organization, you can run Source Destination Reports. These are Top 10 Source to Destination IP Pairs on hosts names, ports, IPs and users. To run this report, do the following:

To run a Crystal Report:

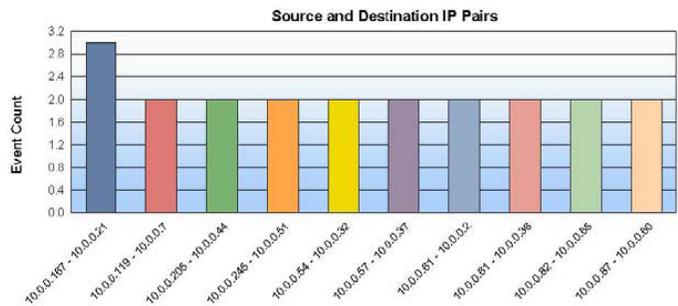
- 1 Expand Top 10 and highlight Top 10 Source to Destination IP Pairs and click Create Reports (magnifying glass).
- 2 Specify Sentinel Report User (for SQL authentication and Oracle) as the username or your Windows Authentication username and specify your password.
- 3 Under Report Type, select one of the following:
 - ◆ Specific Date Range
 - ◆ Prior Day
 - ◆ Daily Report
 - ◆ Weekly Report
 - ◆ Monthly Report

NOTE: Other reports might have additional parameters such as resource name and severity range.

- 4 Click OK. The following is a sample monthly report.

Top 10 Source to Destination IP Pairs: Monthly

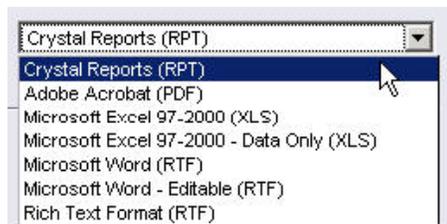
Report Description: This report displays the Top 10 Source IP - Destination IP pairs based on total event count for the selected severity and date range: 07-01-2007 12:00:00 AM - 07-08-2007 11:59:59 PM



SIP - DIP Pairs

Source IP	Destination IP	Number of Occurrences
10.0.0.167	10.0.0.21	3
10.0.0.119	10.0.0.7	2
10.0.0.205	10.0.0.44	2
10.0.0.245	10.0.0.51	2
10.0.0.54	10.0.0.32	2
10.0.0.57	10.0.0.37	2
10.0.0.81	10.0.0.2	2
10.0.0.81	10.0.0.398	2
10.0.0.82	10.0.0.65	2
10.0.0.87	10.0.0.60	2

- 5 You can export this file as a doc, pdf, rtf, xls or as a Crystal Report by clicking Export (envelope).



Similar to the Security Analyst, if you have an event or events of interest within your reports, you can run an Event Query under the Analysis tab. To run a query, highlight Historical Events > Historical Event Queries and click Create Reports (magnifying glass). For more information, see section [Event Query Sample Scenario](#).

14.5 Administrators

This section is about administrator actions.

14.5.1 Simple Correlation

Correlation is the process of analyzing security events to identify potential relationships between two or more events. Correlation allows quick association of priority attacks based on common elements of event data.

To Deploy the Simple Correlation Rule:

- 1 Click the Correlation tab and highlight Correlation Rule Manager in the navigation bar.
- 2 Click Tutorial_SourcePort_DestinationPort (this is the name of the rule from the previous example) > Deploy Rule.



- 3 (optional) In the Deploy Rule window, you can add an action. This allows you to:

-
- | | |
|------------------------------|---------------------|
| ◆ Configure Correlated Event | ◆ Execute a Command |
| ◆ Add to Dynamic List | ◆ Send Email |
| ◆ Remove from Dynamic List | ◆ Create Incident |
-



Click Next. The rule indicates deployed by the color green.



To view what events triggered your correlated event

- 1 Right-click the correlated event and select View Trigger Events to see how many events (could be more than 1) triggered this correlation rule.

SourcePort	DestinationPort	SensorType	Severity
10025	25	C	7/9/07 8:13:42 PM
10025	25	C	7/9/07 8:13:42 PM

- Show Details
- View in Active Browser
- Investigate
- Analyze
- View Trigger Events

Correlated Events For 5F0B6700-0FA9-102A-8612-000D56C7335A

Query: Active Browser

Event Id: 5F0B670C-0FA9-102A-8612-000D53C7335A Correlation rule: Tutorial_SourcePort_DestinationPort Batch size: 100

SourcePort	DestinationPort	SensorType	Severity	EventTime	SourceIP
10025	25	C	7/9/07 8:13:42 PM	10.0.0.156	

Search complete. Count: 1

- ♦ [Section 15.1, “Solution Packs,” on page 329](#)
- ♦ [Section 15.2, “Solution Manager,” on page 332](#)
- ♦ [Section 15.3, “Managing Solution Packs,” on page 334](#)
- ♦ [Section 15.4, “Solution Designer,” on page 352](#)
- ♦ [Section 15.5, “Deploying an Edited Solution Pack,” on page 362](#)

15.1 Solution Packs

Solution Packs allow Novell, partners, and customers to create and easily manage solutions to specific business problems. They 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, including JavaScript plugins and Integrators, 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.

Although Solution Packs have many uses, one is to package content related to governance and regulatory compliance into a comprehensible and easily enforceable framework that is easy to deploy. Novell and its partners will offer and extend Solution Packs around such regulations or other customer needs.

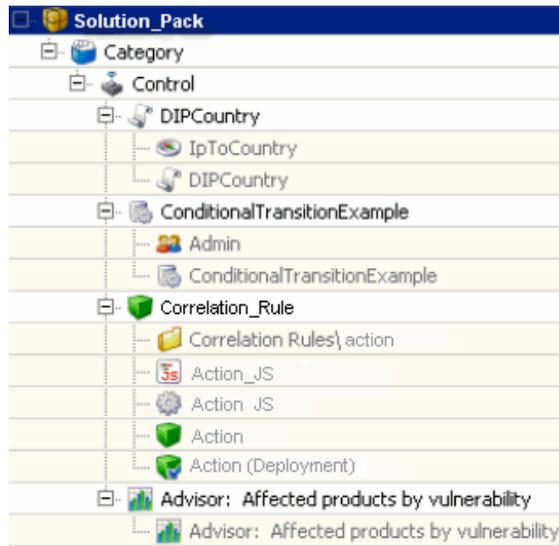
Solution Packs are created with Solution Designer application. Using this tool, a user creates the Solution Pack, associated controls and documentation (including implementation and testing steps), and then associates Sentinel content with each control. The entire package is then exported as a ZIP file.

The ZIP file containing the Solution Pack is imported and deployed into an existing Sentinel system using the Solution Manager in the Sentinel Control Center. The Solution Manager displays 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 implementation status for each control.

15.1.1 Components of a Solution Pack

Solution Packs consist of Categories, Controls, Content and Content Groups. These components are represented in a hierarchy. The following image depicts the hierarchy in a Solution Pack:

Figure 15-1 Solution Pack hierarchy



The table below describes each level in a Solution Pack hierarchy.

Table 15-1 Solution Pack hierarchy levels

	Solution Pack	Solution Pack is the root node in the content hierarchy. Each Solution Pack can contain one or multiple Category node(s).
	Category	Category is a conceptual classification. Each Category can contain one or multiple Control(s).
	Control	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 Group.
N/A	Content Group	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 the content that they contain.

Table 15-2 Table 14-2: Types of Content Group

	Event Configuration	Event Configuration is a Content Group that contains a Map Definition and the configuration of one or more related Sentinel metatags. This icon is also used for the metatag configuration definition.
	Map	Indicates the Map Definition Instance.

	Workflow	Workflow is a Content Group that contains an iTRAC Workflow template and any associated Roles. This icon is also used for the iTRAC workflow template itself.
	Role	Indicates a Role used in a Workflow.
	Correlation Rule	Correlation Rule is a Content Group that contains 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	Indicates Namespace Instance in which the correlation rule is stored
	JavaScript Action Plugin	Indicates a JavaScript Action plugin
	JavaScript Action	Indicates a configured JavaScript Action instance
	Integrator Plugin	Indicates an Integrator plugin
	Integrator	Indicates a configured Integrator instance
	Action	Indicates Action Configuration for a correlation action.
	Correlation Rule Deployment	Indicates the Correlation Rule deployment.
	Report	Report is a Content Group that contains a Crystal report. This icon is also used for the .rpt report file.
	Dynamic List	Indicates Dynamic List.

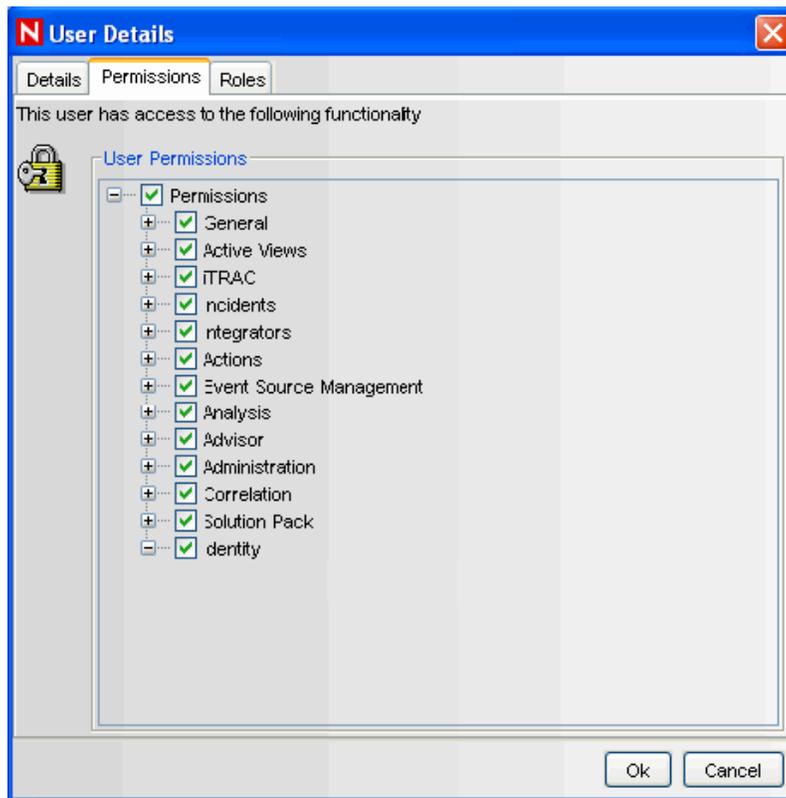
15.1.2 Permissions for Using Solution Packs

To use the Solution Manager or Solution Designer, a user must be assigned the necessary permissions in the User Manager.

To grant permissions for the Solution Pack:

- 1 Log into the Sentinel Control Center as a user with permissions to use the User Manager.
- 2 Go to the Admin tab.
- 3 Open the User Configuration folder.
- 4 Open the User Manager window.
- 5 Click the Permissions tab.

- 6 Select Solution Designer, Solution Manager, or Solution Pack (which will automatically select both child permissions). The new permissions will be applied the next time the user logs in.



15.2 Solution Manager

After a Solution Pack is imported, the Solution Manager in the Sentinel Control Center is used to install, implement and test each Control.

- ♦ Installing a Control installs the child content for the Control into the Sentinel system. When the content is initially installed, its status is Not Implemented.
- ♦ Implementing a Control is the process to configure event source systems and Sentinel to use the content associated with the Control. Novell Solution Packs include detailed documentation describing implementation steps. The user should change the status of the Control to Implemented after following all of these steps.
- ♦ Testing a Control is the process to verify the content associated with the Control. Novell Solution Packs include detailed documentation describing testing steps. The user should change the status of the Control to Tested after following all of these steps.

To use the Solution Manager, a user must be assigned Solution Manager permissions under Solution Pack. For more information, see [Section 15.1.2, "Permissions for Using Solution Packs," on page 331](#).

15.2.1 Solution Manager Interface

The Solution Manager window is divided into two frames: Content and Documentation.

Content Frame

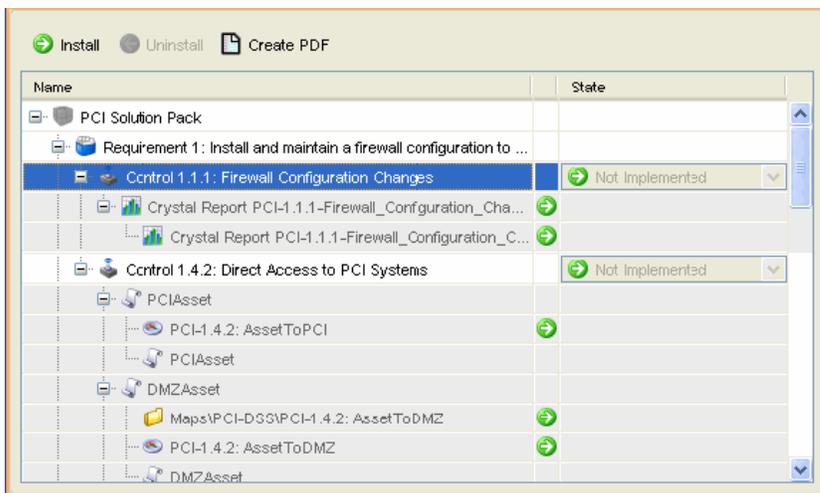
Content Frame provides Solution Pack zip extracted information. The Content frame displays a hierarchical view of the Category, Control, Content Group, and various types of content. All parent nodes reflect the overall state of the controls they contain. This means that parent nodes have an inherited status based on their child content.

The Content frame consists of 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 will be blank.
- ♦ **State:** This column is available for the control node. This column contain a drop-down box with the following values:
 - ♦ **Not Implemented:** This is the default state when the control is first deployed.
 - ♦ **Implemented:** This state indicates that the content is fully implemented using the associated documentation.
 - ♦ **Tested:** This state indicate that you have fully tested the content for this control using the associated documentation.

NOTE: Because of the regulatory significance of implementing controls, status changes for each control are tracked for auditing purposes.

Figure 15-2 Content Frame



Documentation Frame

The Documentation frame provides description of selected node Descriptive information provided when creating the Solution Pack using Solution Designer is displayed here. For more information on Solution Designer, see [Section 15.4, “Solution Designer,” on page 352](#).

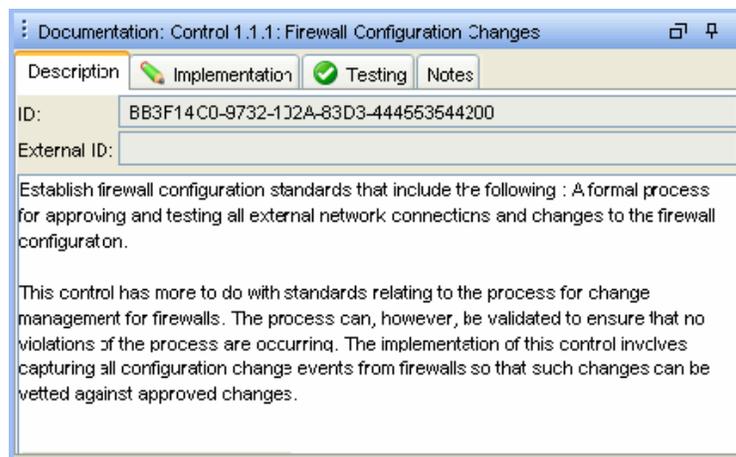
The following informational tabs, populated and edited using the Solution Designer, are available in Documentation frame:

- ♦ **Description:** This tab displays the description of selected node. An additional panel is attached to this tab called Attachment. You can view attachments and their description in the Description tab.

The user can add text to the External ID field to refer to specific regulations or corporate IDs.

- ♦ **Implementation:** This tab, associated with the control nodes, displays the instructions for implementing the selected control.
- ♦ **Testing:** This tab, associated with the control nodes, displays the instructions for testing the selected control.
- ♦ **Notes:** The Notes tab, associated with the control nodes, is editable. This can be used for any notes related to the control, including user comments on the testing or implementation process.

Figure 15-3 Documentation Frame



15.3 Managing Solution Packs

This section states to manage solution packs.

15.3.1 Importing Solution Packs

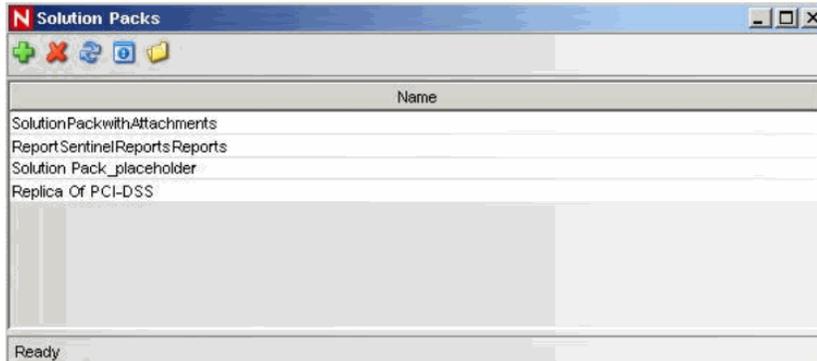
Solution Packs are available from several sources. They can be downloaded from [Sentinel Content Web site \(http://support.novell.com/products/sentinel/secure/sentinel61.html\)](http://support.novell.com/products/sentinel/secure/sentinel61.html). However, an additional license might be needed. They can be provided by one of Novell's partners, 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 using the Import Plugin Wizard. When a Solution Pack is imported, the .zip file is copied to the server where the DAS (Data Access Service) components are installed. The actual contents of the Solution Pack are not available in the target Sentinel system until the Controls are installed using the Solution Manager.

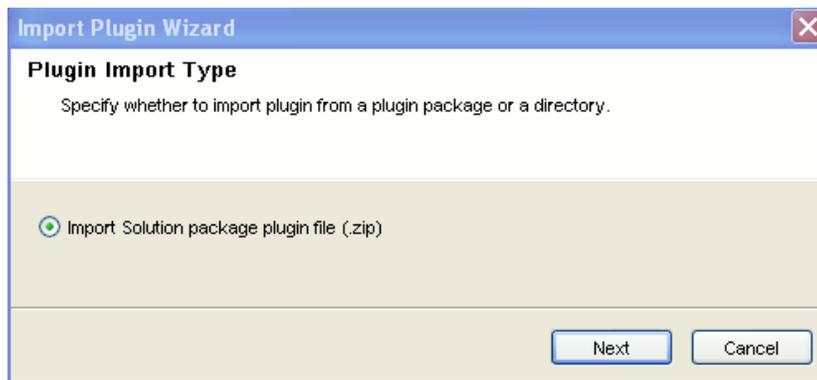
If you import an updated version of a Solution Pack, you are prompted to replace the existing plugin.

To import Solution Packs:

- 1 Click Tool menu and select Solution Packs. The Solution Packs window displays.

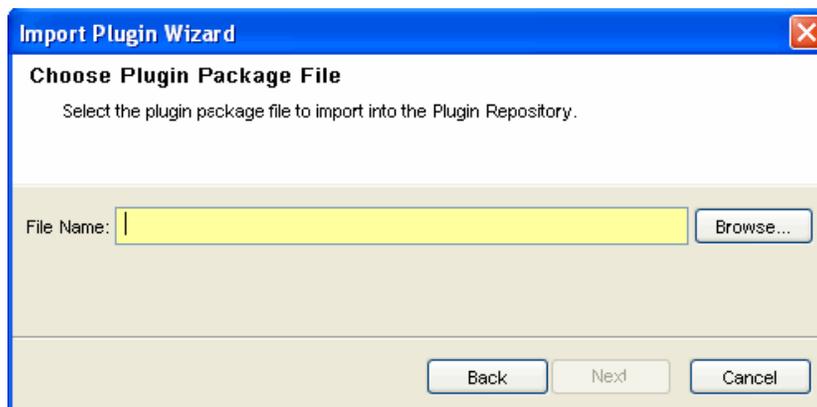


- 2 Click Import icon in the Solution Packs window. The Import Plugin Type window displays.

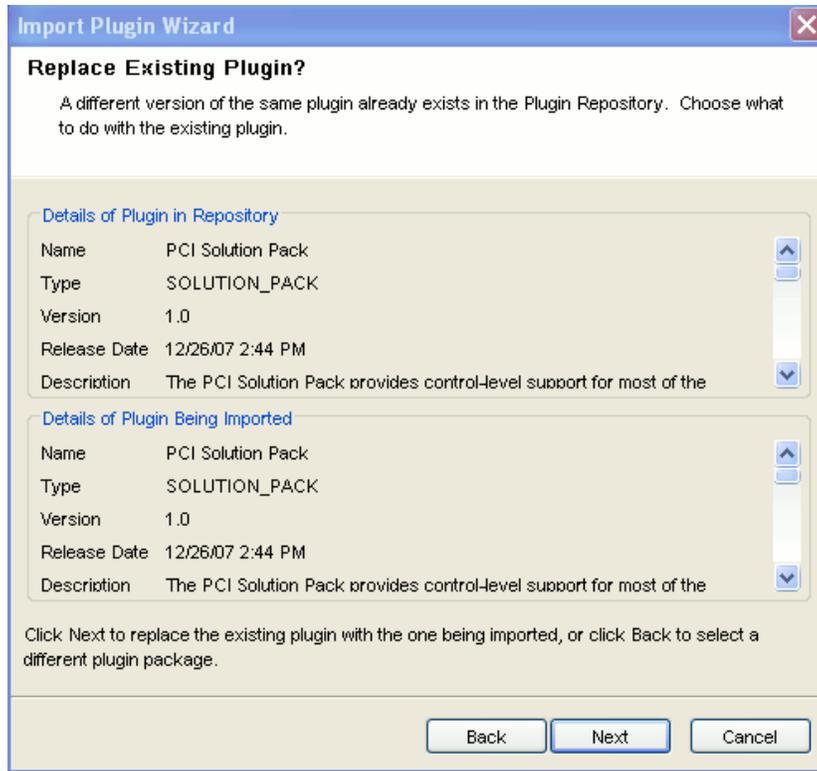


Select Import Solution package plugin file (.zip). Click Next. The Choose Plugin Package File window displays.

- 3 Use the Browse button to locate Solution Pack to import to the plugin repository. Select a zip file and Click Open.



If you have selected a solution pack which already exists then the Replace Existing Plugin window displays. Click Next if you want to replace the existing plugins.



Click Next. The Plugin Detail window displays.

- 4 The details of the plug-in to be imported are displayed. Check the Launch Solution Manager checkbox if you want to deploy the plug-in after importing the Solution Pack. If you check the Launch Solution Manager check box, the Solution Manager displays.

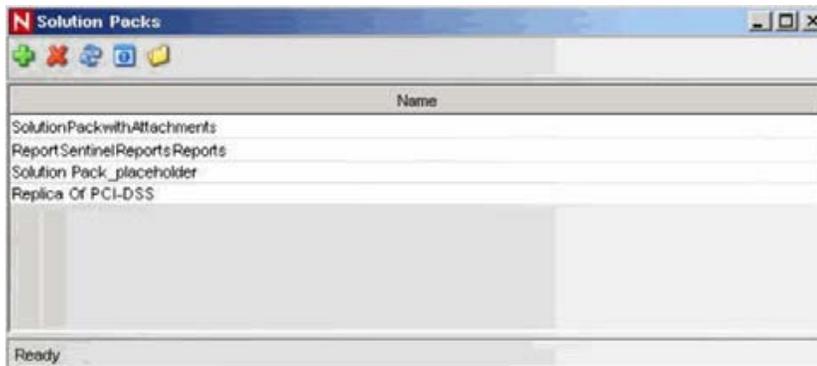
Click Finish

15.3.2 Opening Solution Packs

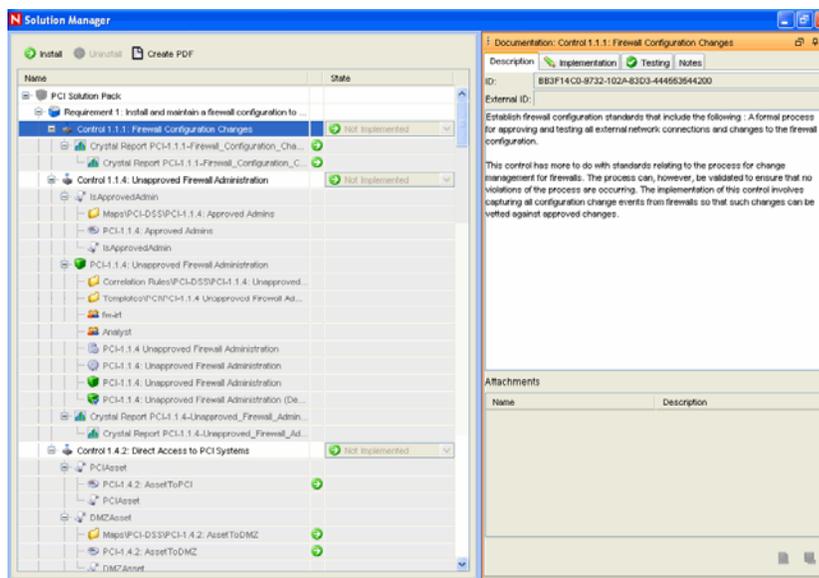
To use the Solution Manager and view the contents of a Solution Pack, a user must be assigned Solution Manager permissions. For more information, see [Section 15.1.2, “Permissions for Using Solution Packs,”](#) on page 331.

To open a Solution Pack in the Solution Manager:

- 1 Click Tool menu and select Solution Packs. The Solution Package window displays:



2 Double-click a Solution Pack in the Solution Packs window. The Solution Manager window displays.



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 15-3 Content Status

	Installed	Indicates that the content is already installed in the target Sentinel system.
	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; manual changes to content in the Sentinel Control Manager are not reflected in Solution Manager.

When you right-click a Solution Pack, you can select Expand Only Out of Sync Nodes. This option expands all Controls that are out of sync and collapses all Controls that are either uninstalled or in sync. This makes it easy to find the out of sync content in a large Solution Pack.

To resolve out of sync content:

- 1 Select the out of sync content (not the Control or Category) in the Solution Manager.
- 2 Right-click and select Out of sync content details. A message displays with information about which Solution Pack is the source of the out of sync content.
- 3 Compare the description of content item in the two Solution Packs to determine which version you want to keep.
- 4 Uninstall the out of sync Control from all Solution Packs. (Ideally you should resolve the out of sync issue before installing the new Solution Pack.)
- 5 Reinstall the Control with the content you want to keep.
- 6 Implement and test as required.

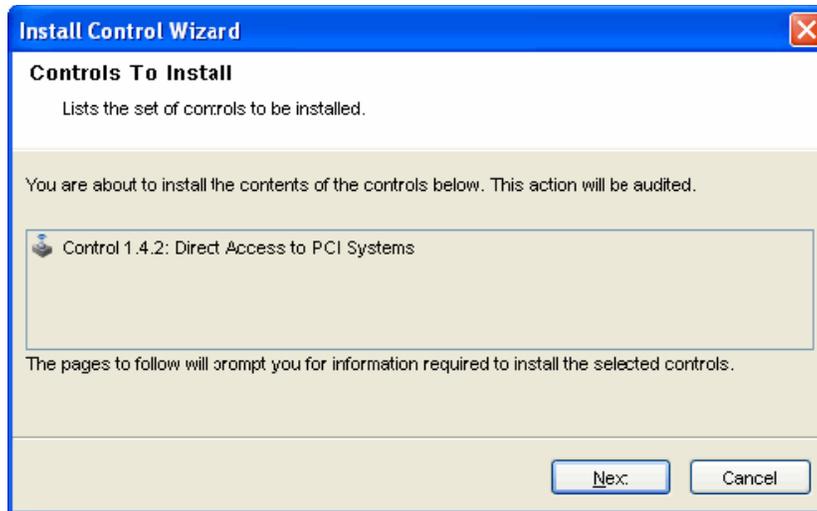
15.3.3 Installing Content from Solution Packs

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).

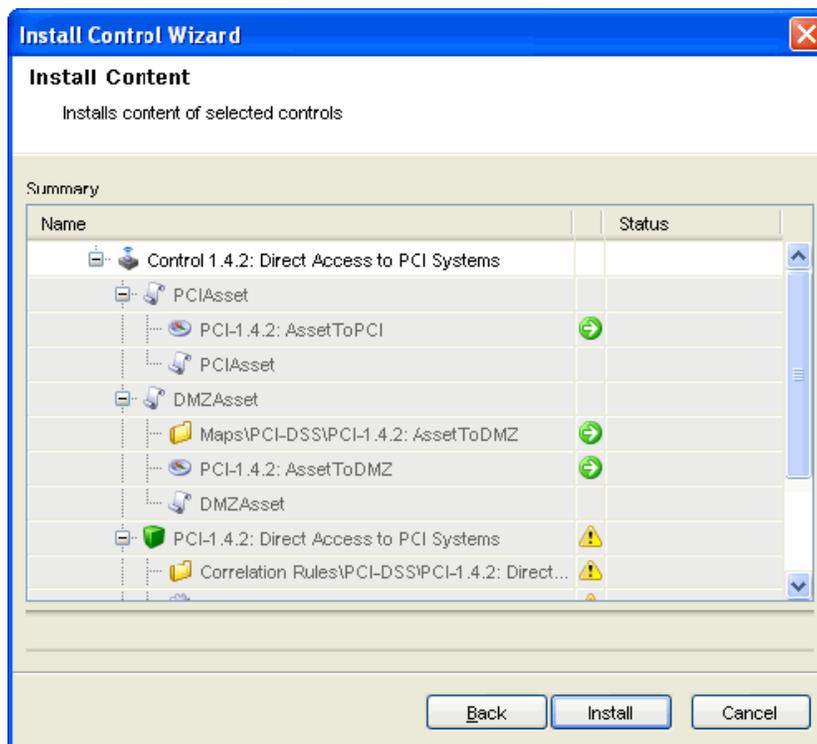
When you install either a Solution Pack or an individual Control, all of the child nodes are installed.

To install the contents of a Solution Pack:

- 1 Go to Tools > Solution Packs.
- 2 Double-click a Solution Pack to open Solution Manager. Alternatively you can click Open with Solution Manager icon. The Solution Manager window displays.
- 3 Select a Solution Pack or a Control which you want to install. Click Install. Alternatively, right-click on a Solution Pack or Control and select Install. The Install Control Wizard displays. If you select a Solution Pack, all the controls in that Solution Pack displays. If you select an individual Control then that control is displayed in the Install Control Wizard window.



- 4 Click Next. If Correlation Rules or Reports are included in the Solution Pack, you need to proceed through several additional screens until you reach the Install Content window.



Click Install.

- 5 After installation the Finish button displays.

Click Finish.

If the installation fails for any content item in the Control, the Solution Manager rolls back all the contents in that control to uninstalled.

There are special considerations for installing certain types of content, including Correlation Rules and Reports; these issues are described below.

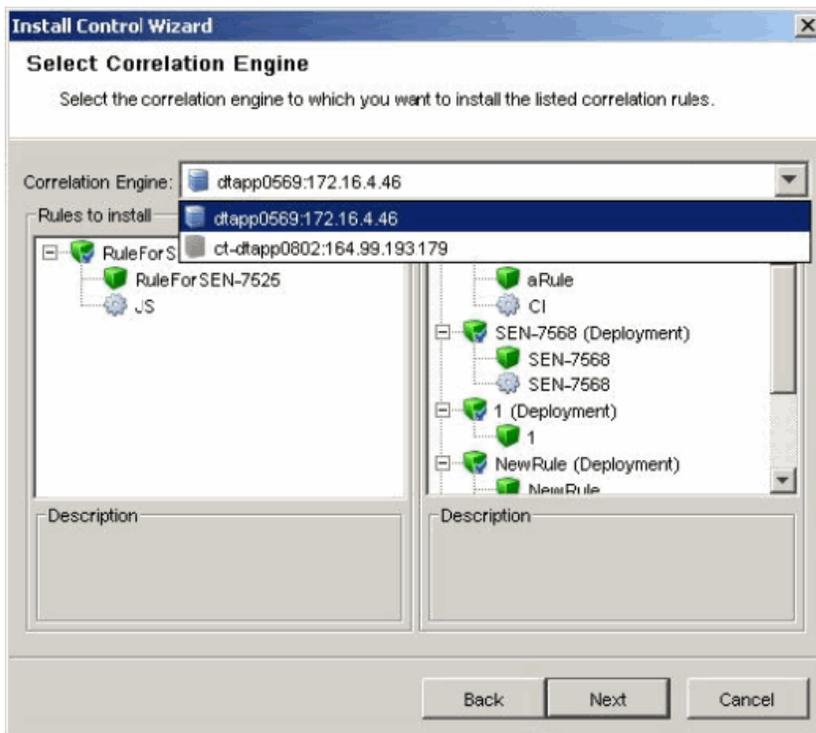
Correlation Rules and Actions

Correlation Rules are deployed to a specific correlation engine. During the Control installation, the following 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 which correlation engine to which you will deploy the Correlation Rule.

Correlation rules will deploy in an Enabled or Disabled state, depending on their status in the source Sentinel system when the Solution Pack was created.

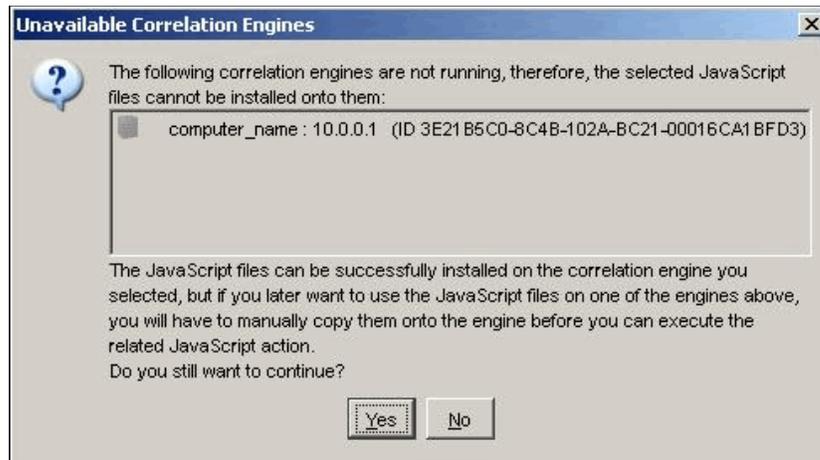
If an Execute Script Correlation Action (created in Sentinel 6.0) is associated with the Correlation Rule, the Solution Manager attempts to install the associated JavaScript code on all correlation engines. If any of the correlation engines is unavailable, a message displays.

Figure 15-4 Install Control Wizard-Select Correlation Engine



You can cancel the Control's installation and fix the problem or continue installation on only the available correlation engine(s).

Figure 15-5 Unavailable Correlation Engines



NOTE: The Execute Script Correlation Action (created in Sentinel 6.0) cannot run on a particular correlation engine if the installation of the JavaScript code fails for that correlation engine. The .js file can be manually copied to the proper directory on the correlation engine. In a default installation, the proper directory is \$ESEC_HOME/config/exec or %ESEC_HOME\config\exec.

If an Execute Command Correlation Action is associated with the Correlation Rule, the Solution Manager installs the command and its arguments, but the script, batch file, or utility must be manually configured on the correlation engine(s). This might require installing the utility, configuring permissions, or manually copying a script or batch file to the proper directory on the correlation engine(s).

NOTE: In a default installation, the proper directory for the script or batch file is \$ESEC_HOME/config/exec or %ESEC_HOME\config\exec.

If a JavaScript Action is associated with the Correlation Rule, the Solution Manager installs the Action configuration, the Action Plugin, and the associated Integrator configuration and Integrator Plugin (if needed).

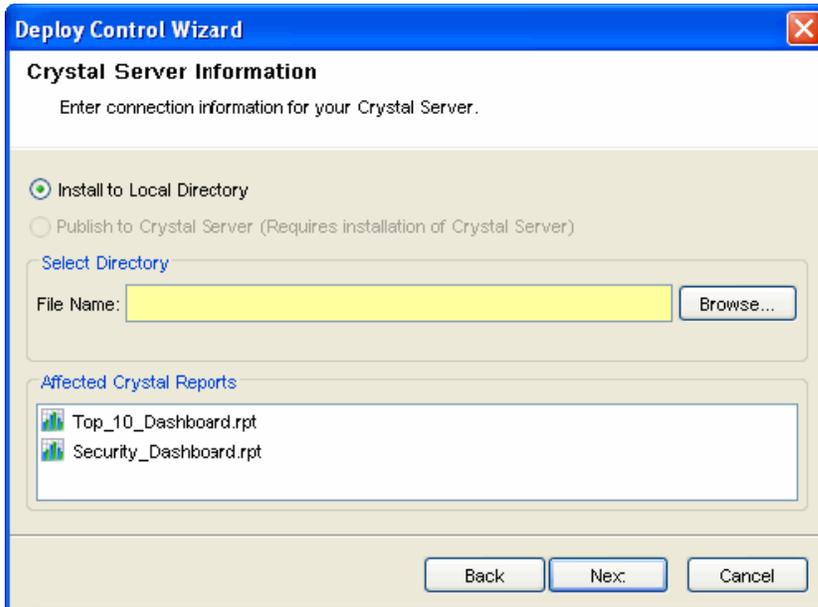
Reports

There are two options for publishing Crystal Reports. They can be installed to a local directory and then installed using the Crystal Publishing Wizard, or with additional configuration, they can be published directly from the Solution Manager to the Crystal Reports Server.

NOTE: Crystal Reports Server must be deleted in the same manner they were added. It is strongly recommended that the Notes tab of the Documentation frame be edited to indicate whether the reports are added using the local method or the Crystal Reports Server method.

To install to a local directory on the Sentinel Control Center machine, select Install to Local Directory on the screen below and then browse to the directory. Then the user must publish the reports to a SentinelReports folder using the Crystal Publishing Wizard. For more information, see “[Crystal Reports for Windows](#)” and “[Crystal Reports for Linux](#)” in *Sentinel 6.1 Installation Guide*.

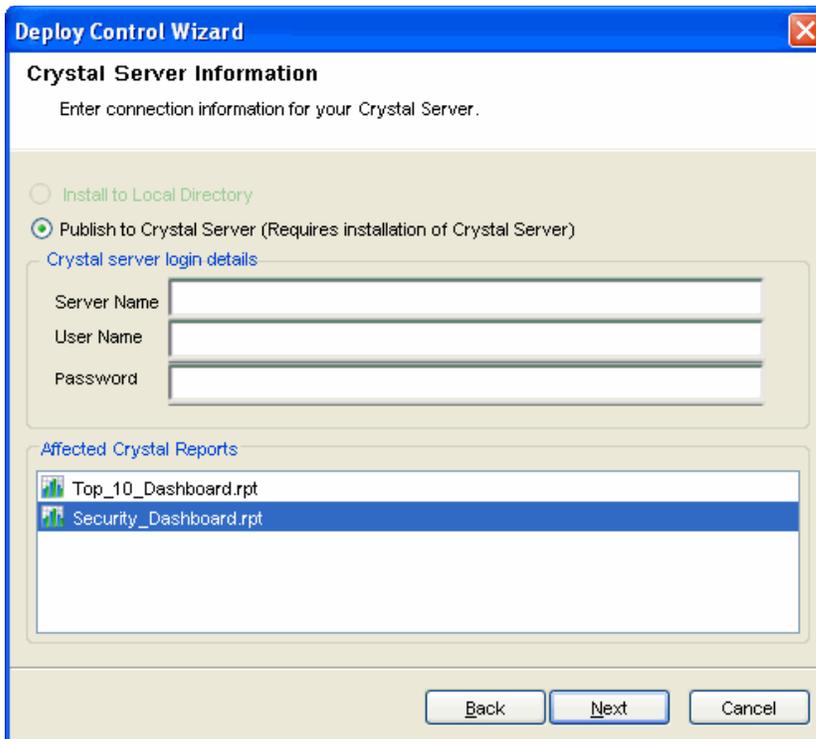
Figure 15-6 Deploy Control Wizard-Crystal Reports Server Information



To publish the reports directly to the Crystal Reports Server, select Publish to Crystal Reports Server and specify the Crystal Reports Server Name, Username and Password. (In a default installation, the Username is “Administrator” and Password is blank.) When you publish directly to the Crystal Reports Server, all reports are installed in the SentinelReports folder so they will be visible from the Analysis tab of the Sentinel Control Center. Any folder hierarchy below SentinelReports is also preserved.

NOTE: The direct publishing method is only possible if you configure the Web Server as described in the “Patching Crystal Reports Server for Use with Sentinel” section of “[Crystal Reports for Windows](#)” or “[Crystal Reports for Linux](#)” in the *Sentinel 6.1 Installation Guide*.

Figure 15-7 Deploy Control Wizard-Crystal Reports Server Information



Regardless of how the reports are published, they must have the appropriate permissions configured. If this is the first time you have added any reports for Sentinel, you must set View on Demand permissions on the SentinelReports folder. If the View on Demand permissions are set, use the following procedure:

To set View on Demand Permissions:

- 1 On the Crystal Reports Server, click Start > Programs > BusinessObjects > Crystal Reports Server > .NET Administration Launchpad.

NOTE: When launching .NET Administration Launchpad, if you find “HTTP 404 - File or Directory not found” error, see <http://support.microsoft.com/kb/315122> (<http://support.microsoft.com/kb/315122>) for resolution.

- 2 Click Central Management Console.
The System Name should be your host computer name. Authentication Type should be Enterprise. If not, select Enterprise.
- 3 Provide Administrator as the User Name. Provide your password (by default, this will be blank). Click Log On. In the Organize pane, click Folders.
- 4 Single-click SentinelReports.
- 5 Select All.
- 6 Click the Rights tab.
- 7 For Everyone, in the drop-down menu to the right under Access Level select View on Demand.

- 8 Click Update.
- 9 Logoff and close the window.

You can customize the URL's that the Solution Manager will attempt when installing reports. The following procedure allows you to customize the URL's:

To customize the URL:

- 1 Based on the operating system:
 - ♦ **For Windows:** Copy `publish_report.jsp` and `delete_report.jsp` files from <build unzipped directory>\reports_patch\IIS to \BusinessObjects Enterprise 11.5\Web Content\Enterprise115\WebTools\Sentinel
 - ♦ **For Linux:** Copy `publish_report.asp` and `delete_report.asp` files from <build unzipped directory>/reports_patch/Tomcat to /opt/crystal_xi/bobje/tomcat/webapps/esec-script/Sentinel

NOTE: You must create the Sentinel directory if it's not available.

- 2 Browse to %ESEC_HOME%/conf/ folder.
- 3 Open `SentinelPreferences.properties` file using Notepad for editing. Add the following two new properties to supply customized URL's for publishing and deleting reports:

```
com.eSecurity.Sentinel.crystal.publishURLs=http://##HOST##/  
businessobjects/Enterprise115/WebTools/Sentinel/publish_report.aspx  
http://##HOST##:8080/esec-script/publish_report.jsp
```

```
com.eSecurity.Sentinel.crystal.deleteURLs=http://##HOST##/  
businessobjects/Enterprise115/WebTools/Sentinel/delete_report.aspx http://  
##HOST##:8080/esec-script/delete_report.jsp
```

Each of these properties contains two URL's separated with single whitespace.

NOTE: Report generation will fail if the proper port is not specified for the URL's above (For example, 8080 default port for Tomcat).

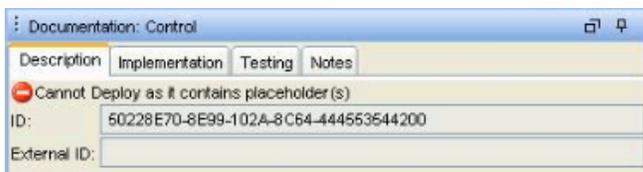
The string “##HOST##” is automatically substituted with the server name specified during deployment in Deploy Control Wizard, Crystal Reports Server Installation window of Solution Manager. You can modify these properties or append them with additional URL's.

Content Placeholders

Only fully defined Controls can be installed. For Controls that contain placeholders, the Install option is disabled:

Name	State
Solution Pack	
Category	
Control	Not Implemented
Report Placeholder	
Crystal Report testmap.txt	
Report Placeholder	

The following warning displays in the Description frame:

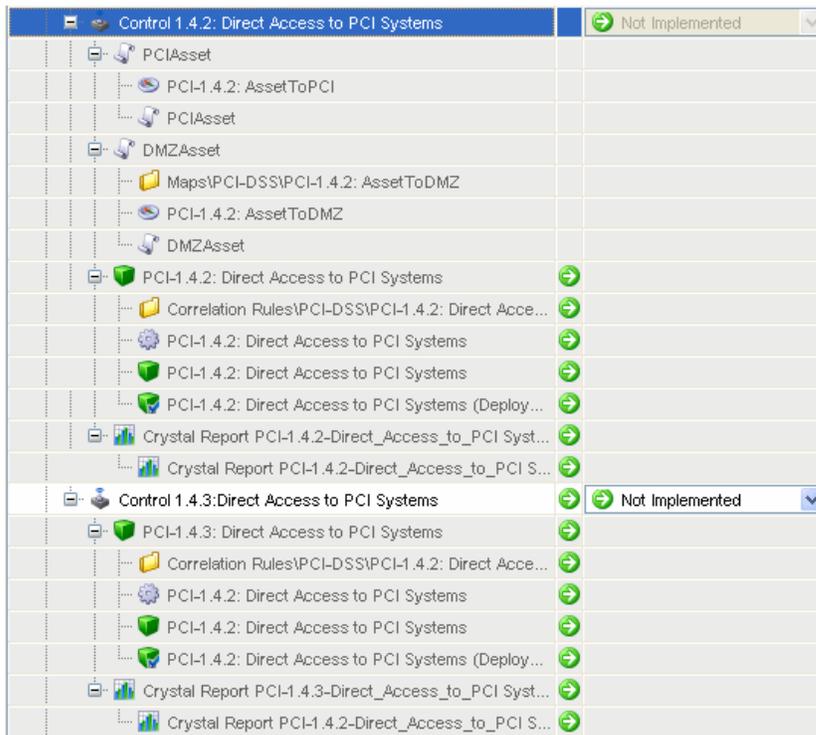


Duplicate Content within Solution Pack

If two separate Controls contain identical content and one Control is deployed 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. See Control 1.4.2 in the example below:

Figure 15-8 *Duplicating Content with Solution Pack*



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, Novell recommends that one of these rules be renamed.

15.3.4 Implementing Controls

After the content installation, additional steps might be necessary to fully implement a control, such as the following examples:

- ◆ Populate a `.csv` file that is used by the mapping service for event enrichment.
- ◆ Schedule automatic report execution in the Crystal Reports Server.
- ◆ Enable auditing on source devices.
- ◆ Copy an attached script for Execute Command Correlation Action to the appropriate location on the correlation engine(s).

These steps should be added when the Solution Pack is created in Solution Designer.

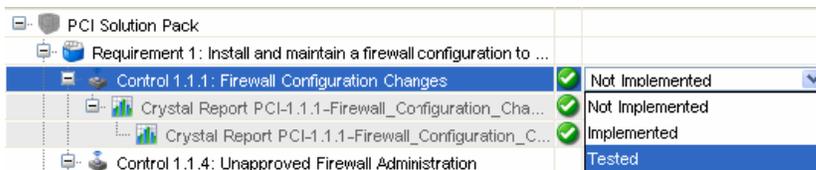
To implement a control:

- 1 Open a Solution Pack in Solution Manager.

- 2 Select a Control.
- 3 Click the Implementation tab in the Documentation frame.
- 4 Follow all of the instructions in the Implementation tab.
- 5 Add notes to the Notes tab of the Documentation frame as necessary to document progress or necessary deviations 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.

NOTE: A Control must be installed before it can be implemented.



15.3.5 Testing Controls

After the content implementation, the content should be tested to verify that it is working as expected. Testing might require steps such as the following:

- ♦ Run a report.
- ♦ Generate a failed login in a critical server and verify that a correlated event is created and assigned to an iTRAC workflow.

These steps should be added when the Solution Pack is created in Solution Designer.

To test a control:

- 1 Open a Solution Pack in Solution Manager.
- 2 Select a Control.
- 3 Click the Testing tab in the Documentation frame.
- 4 Follow all of the instructions in the Testing tab.
- 5 Add notes to the Notes tab of the Documentation frame as necessary to document progress or necessary deviations 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.

NOTE: A Control must be installed (and should be implemented) before it can be tested.

15.3.6 Uninstalling Controls

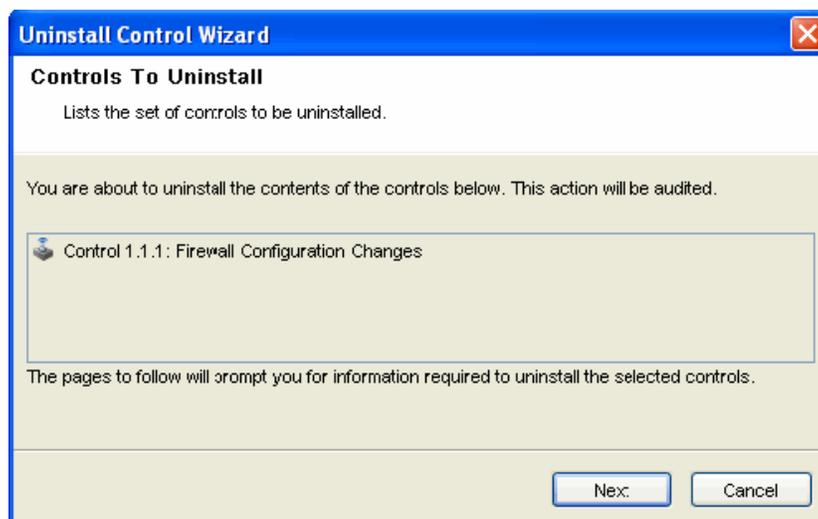
Controls are often used to meet legal or regulatory requirements. After they are implemented and tested, Controls should be uninstalled only after careful consideration.

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 engine(s).
- ◆ 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 complete even if the iTRAC workflow is uninstalled.

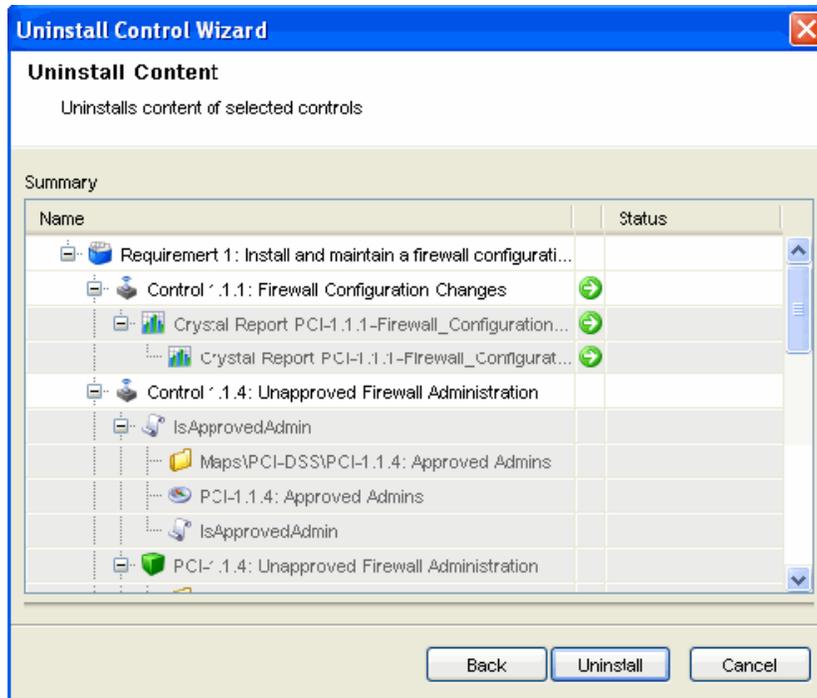
To uninstall a Control:

- 1 Right click the Control you want to uninstall and select Uninstall. Alternatively, you can click Uninstall icon. The Controls To Uninstall window displays



Click Next.

- 2 If the Control you are uninstalling includes one or more reports, you are prompted whether to uninstall the reports from the local server or the Crystal Reports Server. Ideally, this information was recorded on the Notes tab when the reports were installed. Click Next. The Uninstall Content window displays.



- 3 Click Uninstall. The selected contents are uninstalled.

NOTE: Local reports cannot be uninstalled from a different Sentinel Control Center machine than they were installed 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.

- 4 Click Finish.

15.3.7 Viewing Solution Pack Status

There are several sources of information about the status of a Solution Pack.

Viewing Status in Solution Manager

You can view the status of Solution Pack contents in the Solution Manager:

- ◆ **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:** This status indicates that a user has completed all of the implementation steps and manually set the Control status to Implemented.
- ◆ **Tested:** This status indicates that a user has completed all of the testing steps and manually set the Control status to Tested.

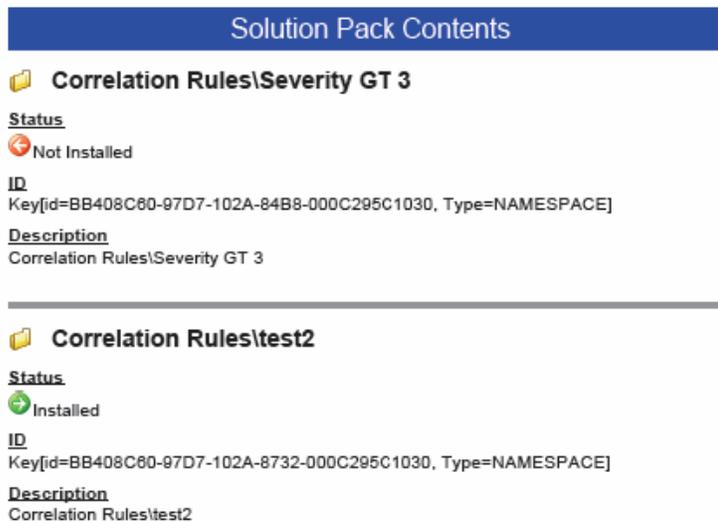
- ♦ **Out of Sync:** This status indicates that a different version of the content in the Solution Pack is deployed in the Sentinel target system by another Solution Pack (or a previous version of the same Solution Pack).

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 Category, Control, and Content Group. You can select the following available options:

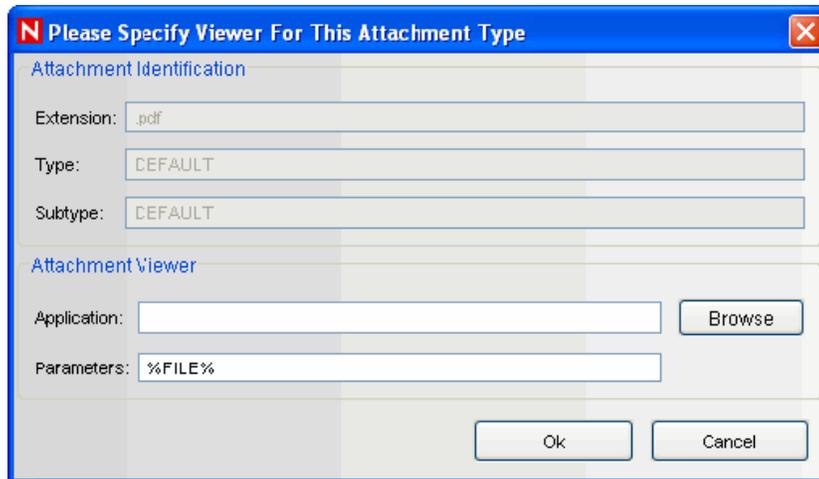
- ♦ **Show status:** Select this option to show deployment status for each control (Not Installed, Not Implemented, Implemented, or Tested) and whether it's Out of Sync.
- ♦ **Show individual content:** Check this option to include information about the child content for each Control in the documentation.

Figure 15-9 Status Document



To generate Solution Pack documentation:

- 1 Open a Solution Pack for which you want to generate a status report.
- 2 Click Create PDF... The Report Options window displays.
- 3 Check the Show status and Show individual content if desired.
- 4 To view the documentation, click Preview. If this is the first time a PDF has been opened from your Sentinel Control Center, you might need to locate Acrobat Reader.



- 5 To save the PDF, click Browse. Navigate the location where you want to save the PDF and specify a filename. 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.

15.3.8 Deleting Solution Packs

Solution Packs are often used to meet legal or regulatory requirements. After they are implemented and tested, Solution Packs should be deleted only after careful consideration.

All deletions are audited by the Sentinel system and sent to both the Sentinel Control Center and the Sentinel database.

- 1 To Click Tool menu and select Solution Packs. The Solution Packs window displays.
- 2 Select the Solution Pack you want to delete and click the Open icon on the tool bar.
- 3 Select the Solution Pack node and click Uninstall. All Controls are uninstalled.
- 4 Close the Solution Manager
- 5 With the same Solution Pack selected, click Remove plugin. You are prompted for deleting the Solution Pack. Click Yes to delete.

NOTE: If you attempt to delete a Solution Pack without uninstalling the content first, you are notified that content is still deployed. You have the option to open the Solution Pack in Solution Manager and uninstall the content.

15.4 Solution Designer

You can use the Solution Designer to package and export different contents for example, Correlation Rule with associated Actions and Dynamic lists and Crystal Reports Server. These contents can be selected and packaged with their respective configuration to a zip file. You can then view or select the content of the zip file using Solution Manager. For more information on Solution Manager, see [Section 15.2, “Solution Manager,” on page 332](#).

To use the Solution Designer, a user must be assigned Solution Designer permissions under Solution Pack. For more information, see [Section 15.1.2, “Permissions for Using Solution Packs,” on page 331](#).

15.4.1 Solution Designer Interface

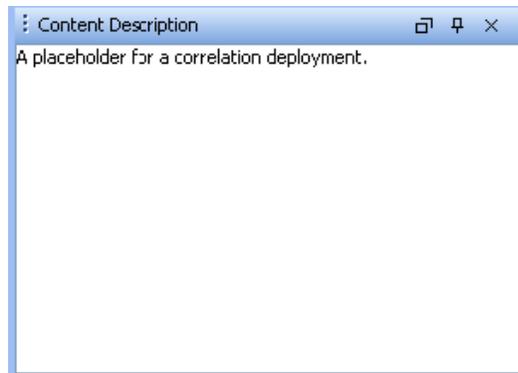
The Solution Designer is divided into several frames: Content Palette, Content Description, Solution Pack, and Documentation. The Content Palette includes several sections that can be expanded, including Correlation Deployment, Event Enrichment, Workflow Templates and Reports. The displayed contents are populated from the Sentinel Server and can be exported into a Solution Pack.

Table 15-4 Table 14-4: Solution Designer - User Interface

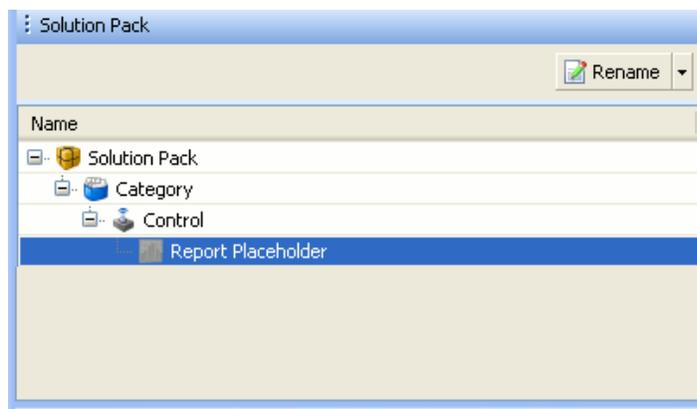
◆ Content Palette



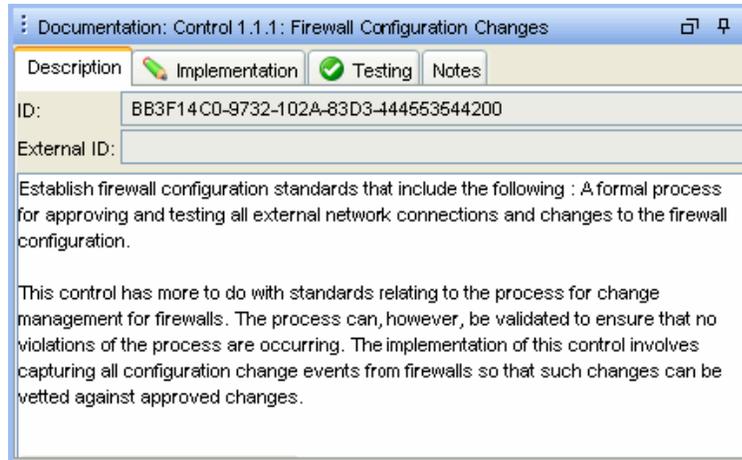
◆ Content Description



◆ Solution Pack



- ◆ Documentation



15.4.2 Connection Modes

Solution Packs can be created or edited in Solution Designer in connected or offline modes.

In offline mode, there is no connection to an active Sentinel Server or its content (such as iTRAC workflows, event enrichment, or correlation rules). However, you can perform the following actions:

- ◆ Define the structure of the Solution Pack (including Categories, Controls, and content placeholders).
- ◆ Write implementation documentation.
- ◆ Write testing documentation.
- ◆ Add reports (. rpt files) available in your local system or published on a connected Crystal Reports Server.
- ◆ Add attachments to any node of the Solution Pack.

In connected mode, all content in the Sentinel system is available. In addition to all of the actions that are available in offline mode, you can also perform the following actions:

- ◆ Add Sentinel content (such as Correlation Rules, Maps, iTRAC workflows).
- ◆ Replace placeholders with Sentinel content.

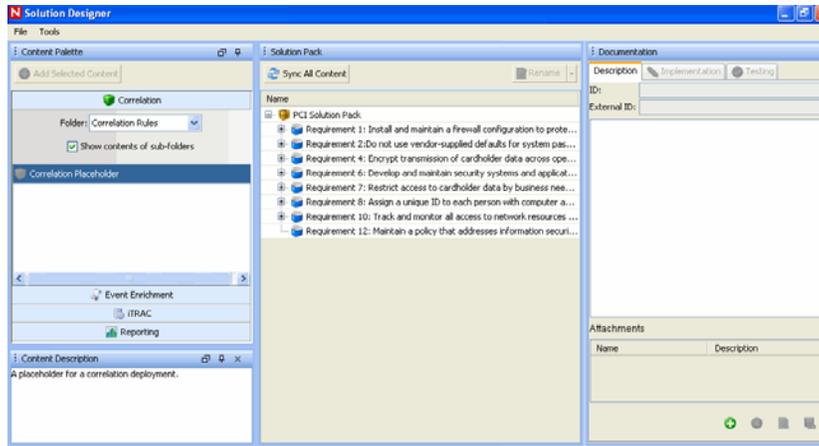
To open Sentinel Designer in offline mode:

- 1 In Windows, use the Sentinel Solution Designer shortcut on the desktop, or start Solution Designer by executing one of the following commands:

```
solution_designer.bat (in %ESEC_HOME%\bin on Windows)
solution_designer.sh (in $ESEC_HOME/bin on Solaris/Linux)
```

The Sentinel Solution Designer login window displays.

- 2 Provide your login credentials. Check Work Offline checkbox if desired, then click Login. The Solution Designer displays.



- 3 Open or create a Solution Pack.

15.4.3 Creating a Solution Pack

Using Solution Designer, you can create a Solution Pack using existing content objects (for example, Correlation Rules, Dynamic Lists, or iTRAC workflow templates) from Sentinel. The Solution Designer will analyze 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 and can also include one or more actions and the ability to create an incident using a workflow. The Solution Designer will include the correlation rule, the associated correlation actions, the iTRAC template, and the roles associated with the iTRAC template in the Solution Pack.

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

To create a new Solution Pack:

- 1 Open the Solution Designer in either connected or offline mode.
- 2 Click File > New. An empty Solution Pack displays in the Solution Pack frame.
- 3 Add Categories, Controls, Content Groups, and content placeholders using the proper procedures for each.
- 4 Add file attachments to the hierarchy nodes as desired.
- 5 Select File > Save. The Save window displays. Provide a name and click Save. The Solution Pack is saved in a .zip format.

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

15.4.4 Managing Content Hierarchy Nodes

All content in a Solution Pack is hierarchically organized into Categories, Controls, and Content Groups in those groups. These nodes in the hierarchy can be added, deleted, renamed, or reordered.

Table 15-5 *Adding, Deleting, Renaming and Reordering Content hierarchy*

Function	Description
Create	<p>Add a node to the existing control.</p> <p>Select an existing node. Right-click and select Create, or click Create in the Solution Pack frame. Specify the details and click Create.</p>
Rename	<p>Rename an existing node.</p> <p>Select an existing node. Right-click and select Rename, or click Rename in the Solution Pack frame. Provide the new name and click OK.</p>
Delete	<p>Delete a Category, Control or Content Group object.</p> <p>Select an existing node. Right-click and select Delete, or click Delete option in the Solution Pack frame. The Delete Selected Objects? message displays. Click OK.</p>
View or Edit Properties	<p>View or edit the properties of a Solution Pack, such as the creator.</p> <p>Select File > Properties from the menu bar or right-click the Solution Pack node and select Properties.</p>
Expand or Collapse Nodes	<p>Expand or collapse all child nodes.</p> <p>Select the Solution Pack or any Category, Control or Content Group level. Right-click a node and select Expand All or Collapse All.</p>
Move Nodes	<p>Category, Control, and Content Group nodes can be created in any order and then reordered or moved to a different parent in the hierarchy.</p> <p>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.</p> <p>To reorder a node, drag and drop it on top of the node it should appear after in the Solution Pack.</p>

15.4.5 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

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.

The general steps for Sentinel content are described below. The steps for reports, which are Crystal content, are slightly different. For more information, see [“Crystal Reports Server” on page 357](#).

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 Log into Solution Designer in connected mode.
- 2 Open or create a Solution Pack.
- 3 Click the appropriate panel to display the available Reports from the Content Palette-Solution Pack, Category, Control, Control Group and Contents.
- 4 Select the specific Content Group you want to add.
- 5 Select the appropriate Control or placeholder and click Add Selected Content. Alternatively, drag and drop the selected Content Group to the appropriate Control or placeholder in the Solution Pack frame.

NOTE: If you try to add pre-existing content in Solution Designer by drag and drop, the existing content is highlighted. After you drop the content, a message prompt displays stating existence of similar content.

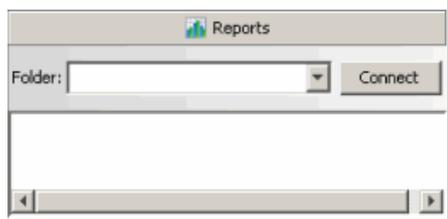
Crystal Reports Server

You can add a Crystal Report (`.rpt` file) from the SentinelReports folder on a Crystal Reports Server or from a local file system. Adding a Crystal report is similar to adding other types of content, but it requires an extra step to log into the Crystal Reports Server.

Crystal reports must be deleted in the same way they were added. It is strongly recommended that the Description be edited to indicate whether the report was added to the local file system or to the Crystal Reports Server.

To add a report from a Crystal Reports Server:

- 1 Log into Solution Designer in connected mode or offline mode and open or create a Solution Pack.
- 2 Click Report panel in the Content Palette. The Report Panel will expand.



- 3 Click Connect. The Login to Crystal Reports Server window displays. Specify the Server Name, User Name and Password in their respective fields.

NOTE: In a default Crystal installation, the User Name is “Administrator” and the password is blank.

Click Login.

- 4 All the report folders will be available as a dropdown. Select the folder to view all corresponding reports.

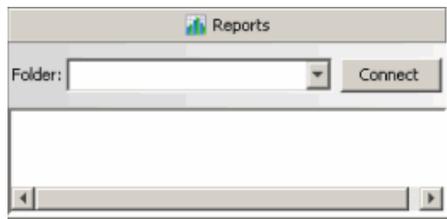


- 5 Select a report, drag and drop the report in the Solution Pack frame. The report can now be exported using the Save option in the File menu.

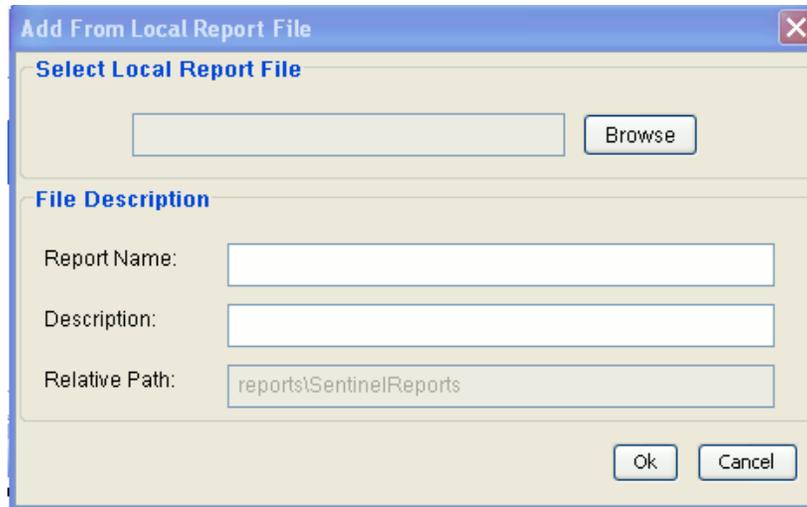
NOTE: Only reports from the SentinelReports folder and its subfolders are available. The folder hierarchy is preserved when the reports are added to a target Sentinel system. (Reports must be in the SentinelReports folder to be viewed on the Analysis tab of the Sentinel Control Center.)

To add a report from the local file system:

- 1 Log into Solution Designer (in connected or offline mode) on the machine where the .rpt files reside.
- 2 Open or create a Solution Pack.
- 3 Click Report panel in the Content Palette. The Report Panel will expand.



- 4 Select a control in the Content tree. Select a Local Report File... in Content Palette and click Add Selected Content button on the top left corner.
- 5 The Add From Local Report File window displays. Browse to the location on your local drive where the report is located.



- 6 Select the file and click Open. The file description is displayed.
- 7 Click OK.

Placeholders

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

To add a placeholder:

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

To replace a placeholder with content:

- 1 Click a button in the Content Palette to open the panel for the type of placeholder you want to replace: Correlation, Event Enrichment, iTRAC workflow or Report.
- 2 Drag and drop the appropriate Content Group from the Content Palette to the placeholder in the Solution Pack frame.

File Attachments

You can attach a file or files to any node in the hierarchy, and they will be included in the Solution Pack. These files can include anything useful for a user who must deploy the Solution Kit, 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.

Table 15-6 File Attachment

	Add File	<p>Add an attachment to a node. The system prompts for another file if you attempt to add one that is already attached.</p> <p>Select a node. Click Add a new attachment icon in the Attachments panel. Locate the file, provide a description, and save.</p>
	View	<p>View an attachment.</p> <p>Select a node and then select the attachment in the Attachment panel. Right-click and select View File. The file displays in the associated application.</p>
N/A	Rename	<p>Rename an attachment.</p> <p>Select a node and then select the attachment in the Attachment panel. Right-click and select Rename. Specify the new name and click OK.</p>
	Delete	<p>Delete an attachment.</p> <p>Select a node and then select the attachment in the Attachment panel. Right-click and select Delete. Click OK to delete.</p>
	Save	<p>Save a copy of the attachment to the local system.</p> <p>Select a node and then select the attachment in the Attachment panel. Right-click and select Save As. Select a file location and click Save.</p>

15.4.6 Documenting a Solution Pack

Implementation Steps

Add the steps required to implement the content in the target Sentinel system to the Implementation tab of the Documentation frame. 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 in the Crystal Reports Server.
- ♦ Enabling auditing on source devices.
- ♦ Copying an attached script for an Execute Command Correlation Action to the appropriate location on the correlation engine(s).

After the content implementation, the content should be tested to verify that it is working as expected. Testing might require steps such as the following:

Testing Steps

Add the steps required to test the content in the target Sentinel system to the Testing tab of the Documentation frame. The steps can include instructions for the following types of testing activities:

- ♦ Run a report and verify that data is returned.
- ♦ Generate a failed login in a critical server and verify that a correlated event is created and assigned to an iTRAC workflow.

15.4.7 Editing a Solution Pack

A saved Solution Pack can be edited using Solution Designer. For information about deploying the changes into an existing system, see [Section 15.5, “Deploying an Edited Solution Pack,”](#) on [page 362](#).

When an existing Solution Pack is saved, the user has several options:

- ♦ **Save:** Saves an updated version of the original Solution Pack. If the Solution Pack is re-imported into a Sentinel system, it replaces the old version.
- ♦ **Save As:** Saves a renamed version of the original Solution Pack. If the Solution Pack is re-imported into a Sentinel system, it replaces the old version.
- ♦ **Save As New:** Saves a Solution Pack with a new unique identifier. If the Solution Pack is imported into a Sentinel system, it does not impact any previously imported Solution Packs.

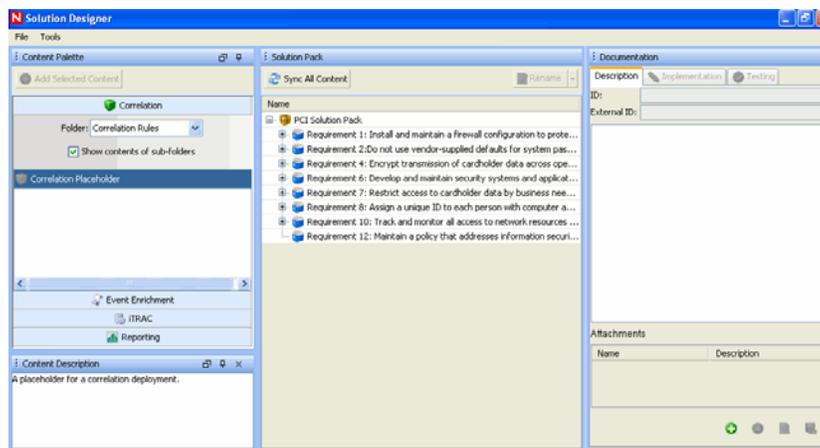
To edit a Solution Pack:

- 1 In Windows, use the Sentinel Solution Designer shortcut on the desktop, or start Solution Designer by executing one of the following commands:

```
solution_designer.bat (in %ESEC_HOME%\bin on Windows)
solution_designer.sh (in $ESEC_HOME/bin on Solaris/Linux)
```

The Sentinel Solution Designer login window displays.

- 2 Provide your login credentials. Check Work Offline checkbox if desired, then click Login. The Solution Designer displays.



- 3 To edit a Solution Pack, click File > Open. Browse and select the existing Solution Pack zip file. 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 Click File > Save, Save As, or Save As New.
- 7 If you selected Save or Save As and some of the content is out of sync, you will be prompted to synchronize.

Out of Sync 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 sync.

- ◆ 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 Sync All Content or when you save the Solution Pack.

NOTE: In the special case in which an action uses the Send Email action that is included in all 6.1 systems by default, the Send Email action will always appear as Out of Sync. This is expected and will not cause an error.

15.5 Deploying an Edited Solution Pack

When a Solution Pack is modified and saved using the Save or Save As options in Solution Designer, it is considered a new version of the original Solution Pack. When it 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 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. The user must decide how to resolve the synchronization issue. For more information, see [“Out Of Sync Status” on page 338](#).
- ◆ If the content didn't 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.

- ◆ [Section 16.1, “Overview,” on page 363](#)
- ◆ [Section 16.2, “Action Manager,” on page 364](#)
- ◆ [Section 16.3, “Action Plugins,” on page 365](#)
- ◆ [Section 16.4, “Actions,” on page 377](#)
- ◆ [Section 16.5, “Integrator Manager,” on page 383](#)
- ◆ [Section 16.6, “Integrator Plugins,” on page 385](#)
- ◆ [Section 16.7, “Integrators,” on page 386](#)

This section allows you to understand:

- ◆ Integrator Manager
- ◆ Action Manager
- ◆ Action Plugins
- ◆ Actions
- ◆ Integrator Manager
- ◆ Integrator Plugins
- ◆ Integrators

16.1 Overview

Actions are used to execute some type of action in Sentinel, either manually or automatically. An Action plugin framework was introduced in Sentinel 6.1. This framework consolidates several disparate ways of executing actions in Sentinel 6.0. The same Action framework is now used to execute actions in all of the following contexts:

- ◆ When a deployed correlation rule fires (automatic)
- ◆ When a user chooses the Action from within an Incident
- ◆ When a user chooses a right-click menu option using an Action in an Active View or other event table

The plugin framework has several advantages over the method for using JavaScript actions in previous versions of Sentinel. Using the plugin framework:

- ◆ There is no need to place the JavaScript file in a particular directory. The plugin is placed in a central repository.
- ◆ There is no need to manually distribute the file to multiple machines in a distributed environment. The plugins are downloaded as needed.
- ◆ Importing the updated plugin from one Sentinel Control Center machine is sufficient to update the plugin everywhere it is used.

One or more configured Action instances can be created from an Action plugin using different parameters.

An Action can be executed on its own, or it can make use of an Integrator instance, configured from an Integrator plugin. Integrators provide the ability to connect to an external system, such as an LDAP, SMTP, or SOAP server, to execute an action.

16.2 Action Manager

The Action Manager allows you to configure repeatable actions that can be executed in various contexts throughout the Sentinel system. The Action Manager allows you to configure the following types of actions:

- ♦ Configure a Correlated Event
- ♦ Add to Dynamic List
- ♦ Remove from Dynamic List
- ♦ Execute a Command
- ♦ Send an Email
- ♦ Create an Incident
- ♦ Execute JavaScript Action Plugins

NOTE: Except for JavaScript Actions, the Actions above can only be used in the context of a correlation rule deployment. For more information about correlation-only actions, see the Correlation section. This section focuses exclusively on JavaScript Action plugins and Actions.

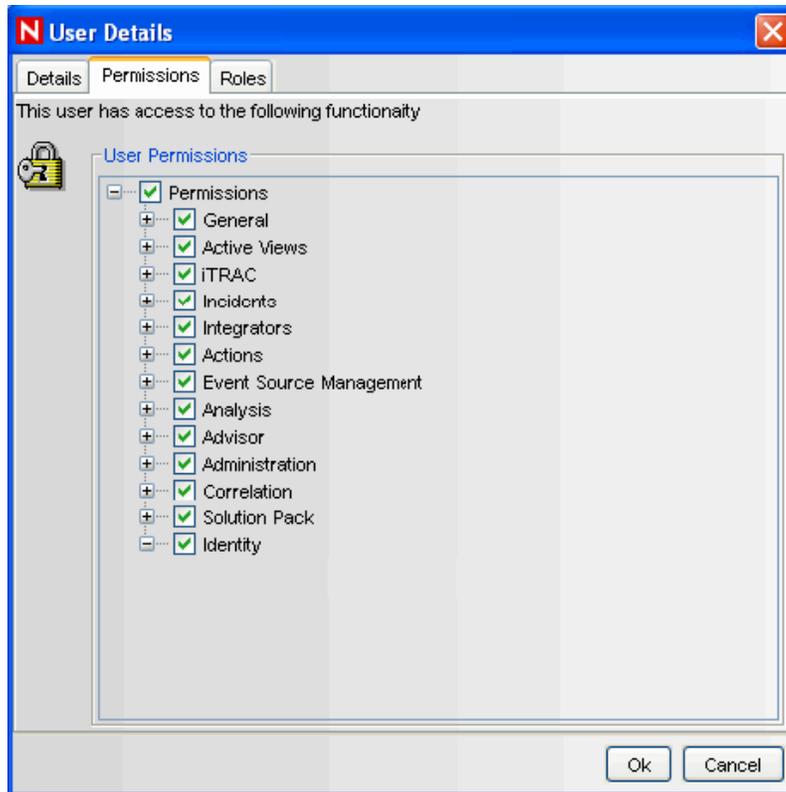
Using the Action Manager you can import, create, and manage Action plugins (.zip files) and configure specific Action instances.

16.2.1 Permissions for Using Action Plugins

To use Action Plugins, a user must be assigned the necessary permissions in the User Manager. By default these permissions are assigned to `esecadm`.

To grant permissions for the Action Plugins:

- 1 Log into the Sentinel Control Center as a user with permissions to use the User Manager.
- 2 Go to the Admin tab.
- 3 Open the User Configuration folder.
- 4 Open the User Manager window. Double-click the desired user. The User Details window displays.
- 5 Click the Permissions tab.



- 6 Select View Actions, Manage Actions, or Manage Action Plugins (which will automatically select all child permissions). The new permissions will be applied the next time the user logs in. For more information, see “[Sentinel Control Center User Permissions](#)” in *Sentinel 6.1 Reference Guide*.

16.3 Action Plugins

You can download Action plugins from the [Sentinel Content Web site \(http://support.novell.com/products/sentinel/sentinel61.html\)](http://support.novell.com/products/sentinel/sentinel61.html).

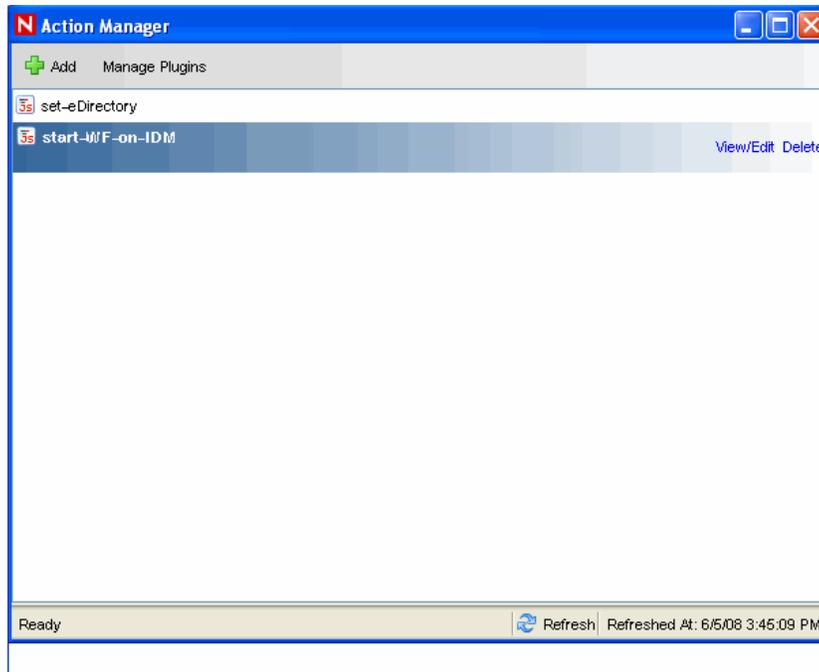
Action plugins are frequently included in Solution Packs. Also, JavaScript actions used in Execute Script actions in versions of Sentinel before Sentinel 6.1 can be converted to Action Plugins using the Action Manager.

16.3.1 Importing JavaScript Action Plugins

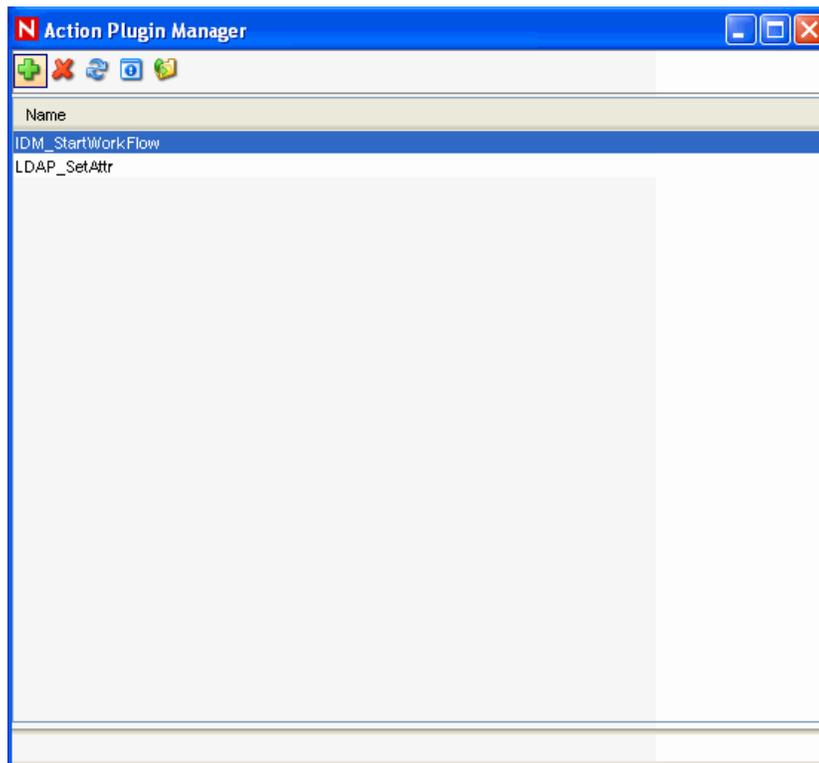
JavaScript plugins from Novell or other sources can be imported into Sentinel.

To import Action plugins:

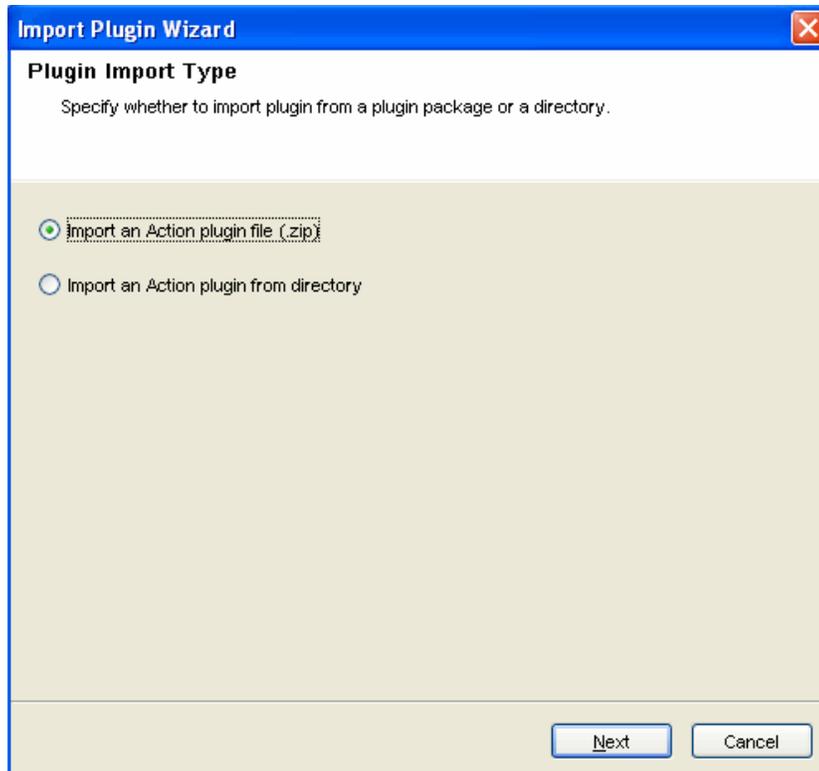
- 1 Click Tool menu and select Action Manager. The Action Manager window displays.



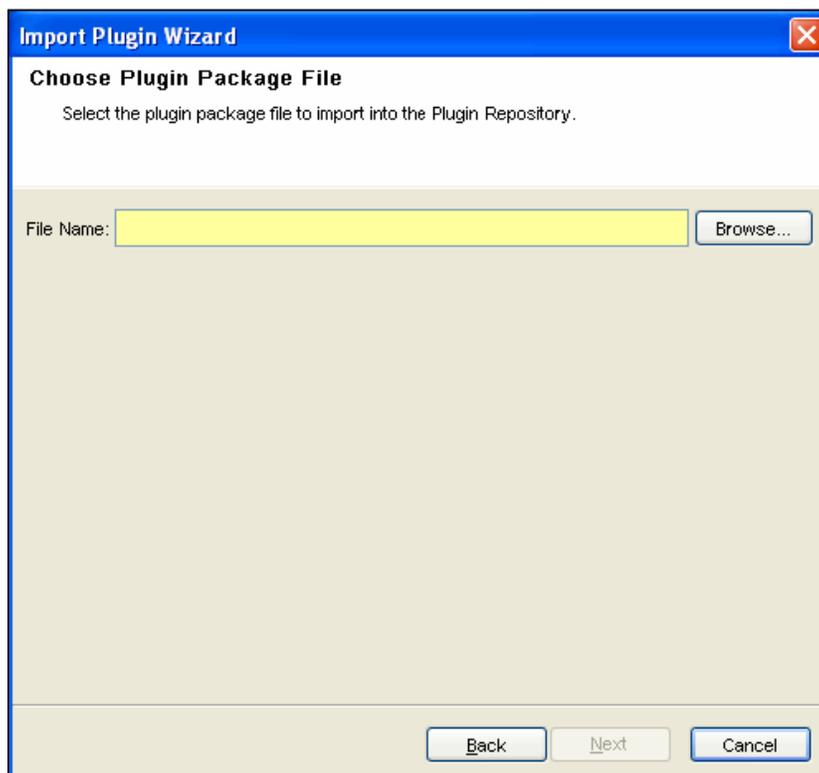
2 Click Manage Plugins. The Action Plugin Manager window displays.



3 Click the icon on the top left corner to Import plugins. Plugin Import Type window displays.



- 4 Select Import an Action plugin file (.zip). Click Next.
- 5 The Choose Plugin Package File window displays.

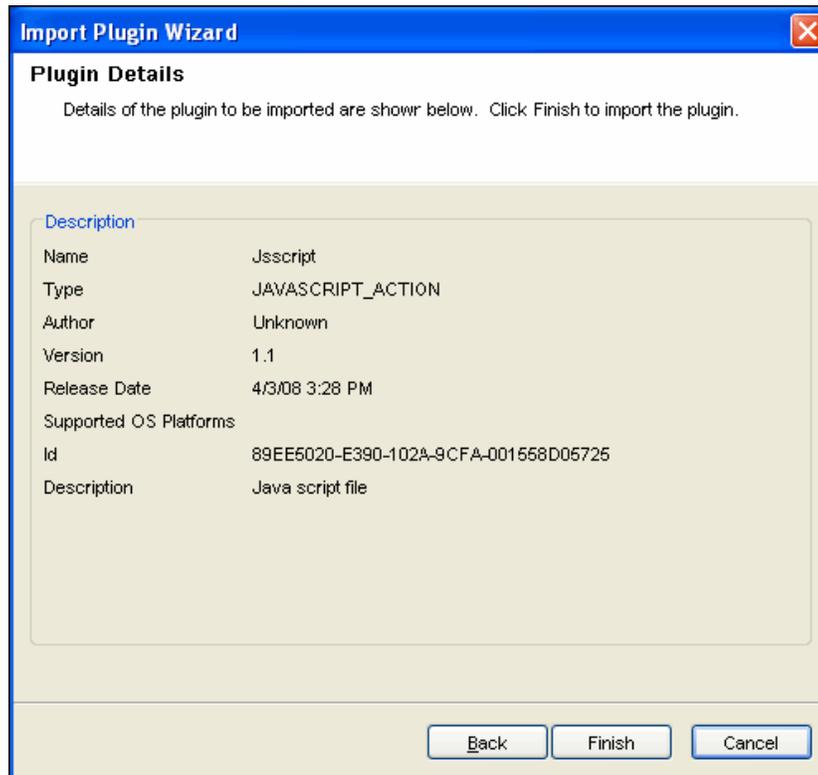


- 6 Browse to a location of the Plugin package file and click OK. Click Next.

NOTE: If the file you have selected is not of proper format, the Next button will not activate.

If you are updating an already-imported plugin file, you are provided with the option of updating the existing plug-in, going back and selecting a different plug-in, or canceling the import. If you want to continue, click Next.

- 7 The Plugin Details window displays. Details of the plugins to be imported are displayed.



Click Finish.

16.3.2 Importing JavaScript Files

Although JavaScript Action plugins can be obtained from Novell, it is also possible to create and manage your own JavaScript Action plugins. Plugins can be created using JavaScript files that were used in the Execute Script command in versions prior to Sentinel 6.1, or they can be created using any JavaScript file written using the Sentinel JavaScript API.

NOTE: For information about the API for developing JavaScript scripts for Sentinel correlation, see Sentinel JavaScript Action API on the [Novell Developer Community web site \(http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel\)](http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel).

After you import a JavaScript file into Sentinel, a JavaScript Action plugin is created and stored in the central plugin repository. Then the Action plugin can be used to configure an Action instance. Unlike the Sentinel 6.0 Execute Script command, the JavaScript file does not need to be manually moved to a specific directory location.

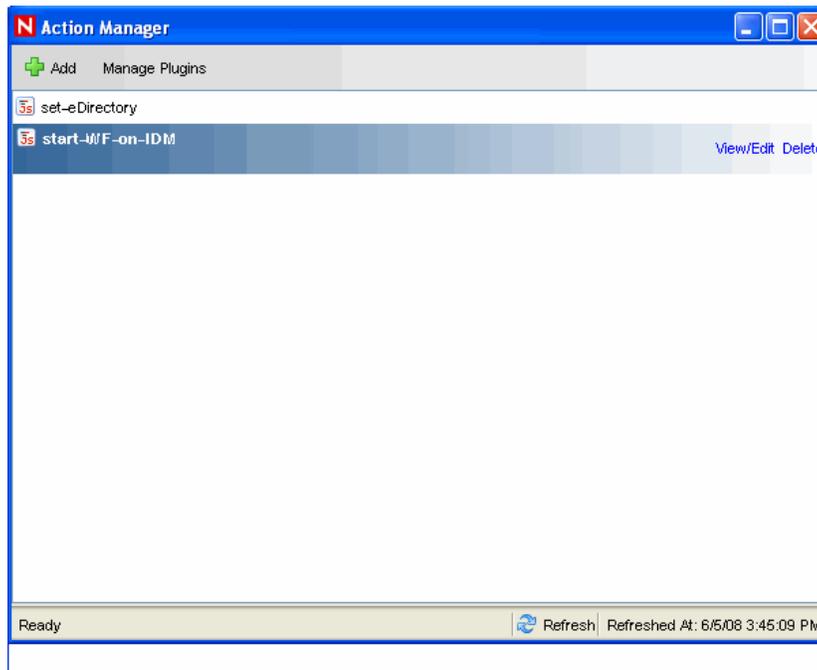
When you import a JavaScript file from a directory, it is important to define the required objects correctly so the JavaScript Actions that use the plugin are available in the right parts of the Sentinel Control Center interface. The following table shows the Required Objects options in the import wizard and where the Actions will be available if those options are checked.

Table 16-1 Required Objects

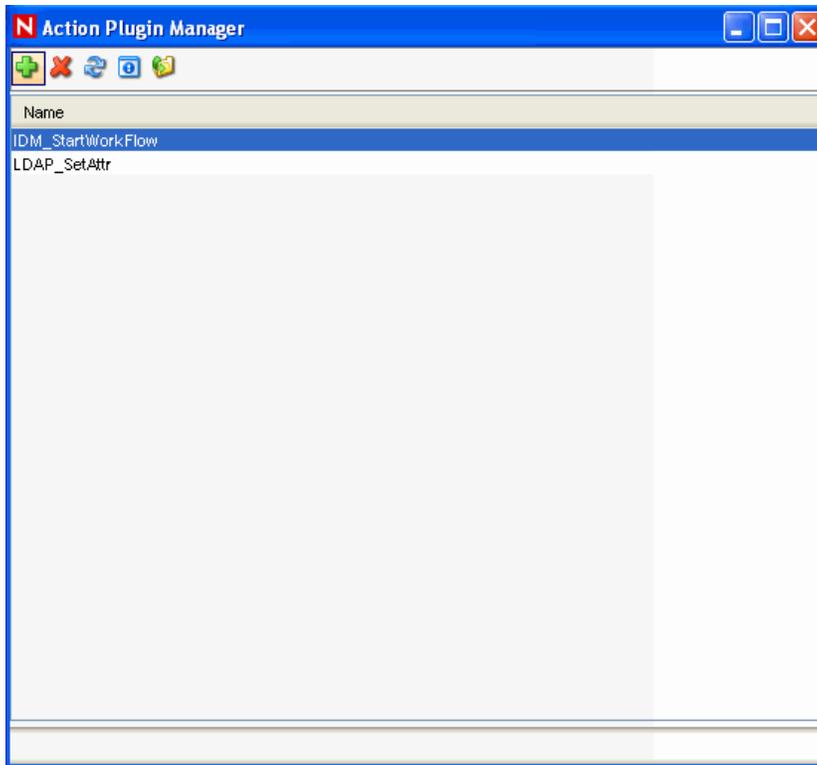
Required Object	Actions Available for Selection in these Contexts:			
	Event Menu Configuration	Deploy Correlation Rule	Associate with Create Incident Correlation.Action	Execute Incident Action
None	Yes	Yes	Yes	Yes
Event	Yes	Yes	Yes	Yes
Correlation Rule	No	Yes	Yes	Yes
Incident	No	No	Yes	Yes

To import JavaScript files:

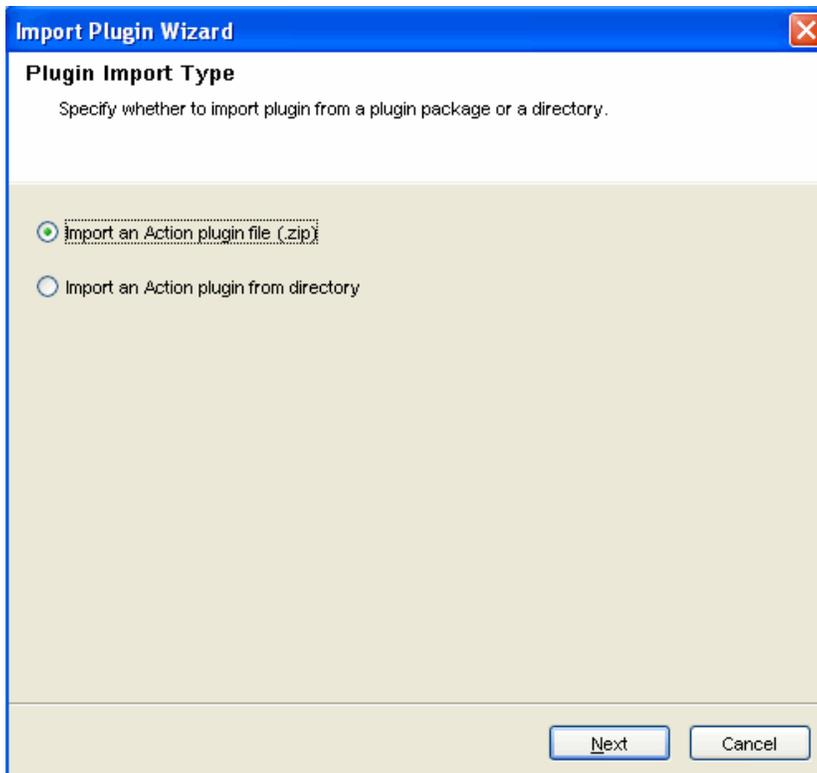
- 1 Click Tool menu and select Action Manager. The Action Manager window displays.



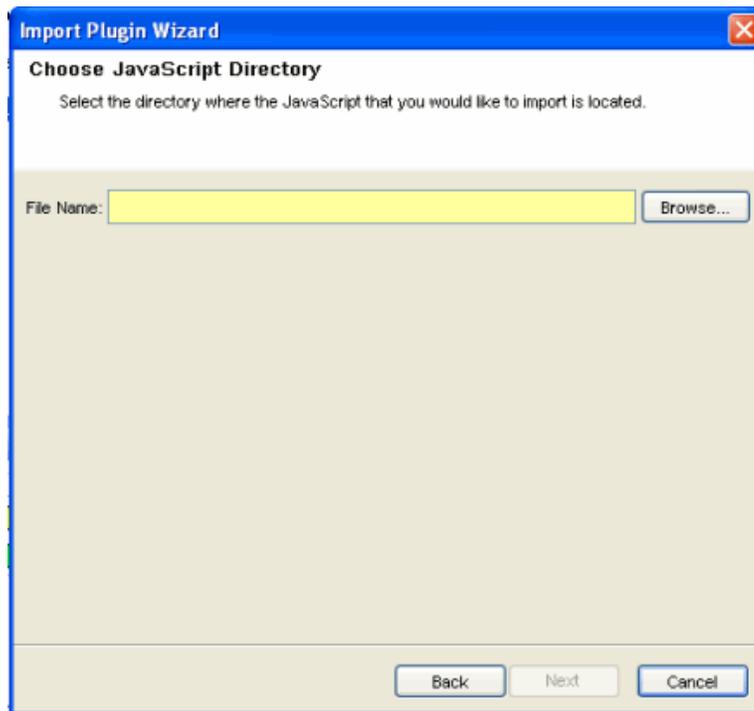
- 2 Click Manage Plugins. The Action Plugin Manager window displays.



3 Click the icon on the top left corner to Import plugins. Plugin Import Type window displays.



- 4 Select Import an Action plugin from directory. The Choose JavaScript Directory window displays.



- 5 Browse to a location of the JavaScript Plug-in directory and click OK. Click Next.
- 6 The Action Plugin Detail window displays. Provide the required information. Attach a Main JavaScript File and Help File.

The screenshot shows a dialog box titled "Import Plugin Wizard" with a close button in the top right corner. The main heading is "Action Plugin Details" with the instruction "Specify the details of the Action plugin." Below this, there are several input fields:

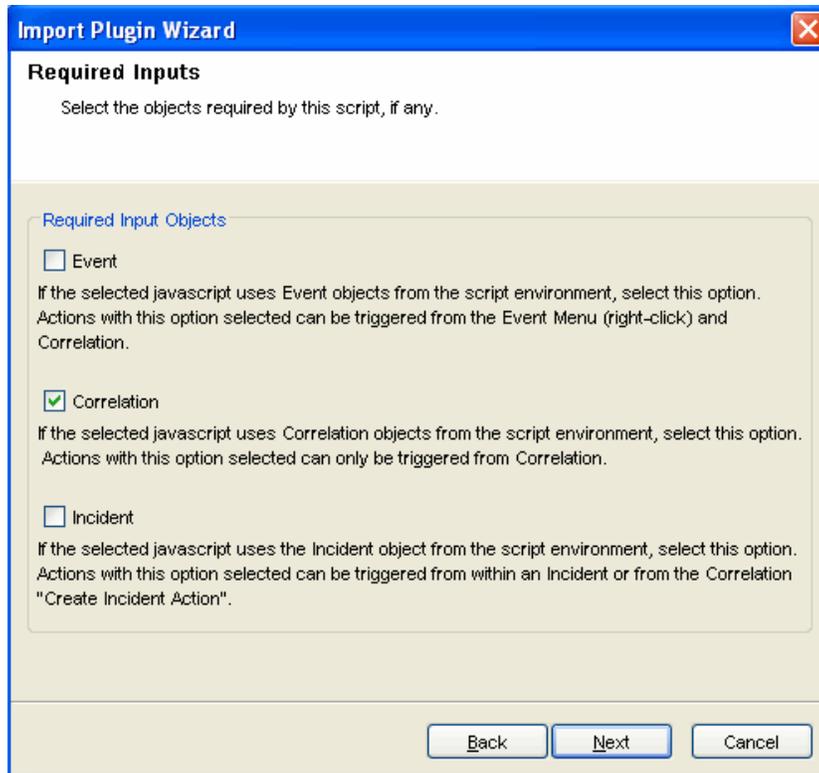
- Id:** A text box containing the GUID "BB449B00-135D-102B-9D0A-00123F9F4527" and a small icon button to its right.
- Name:** A text box containing "Jsscript".
- Author:** A text box containing "Unknown".
- Version:** A text box containing "1.0".
- Main JavaScript File:** A text box containing "example.js" and a browse button ("...") to its right.
- Help File:** An empty text box and a browse button ("...") to its right.
- Description:** A text area containing "Java script file".

At the bottom of the dialog, there are three buttons: "Back", "Next" (which is highlighted with a blue border), and "Cancel".

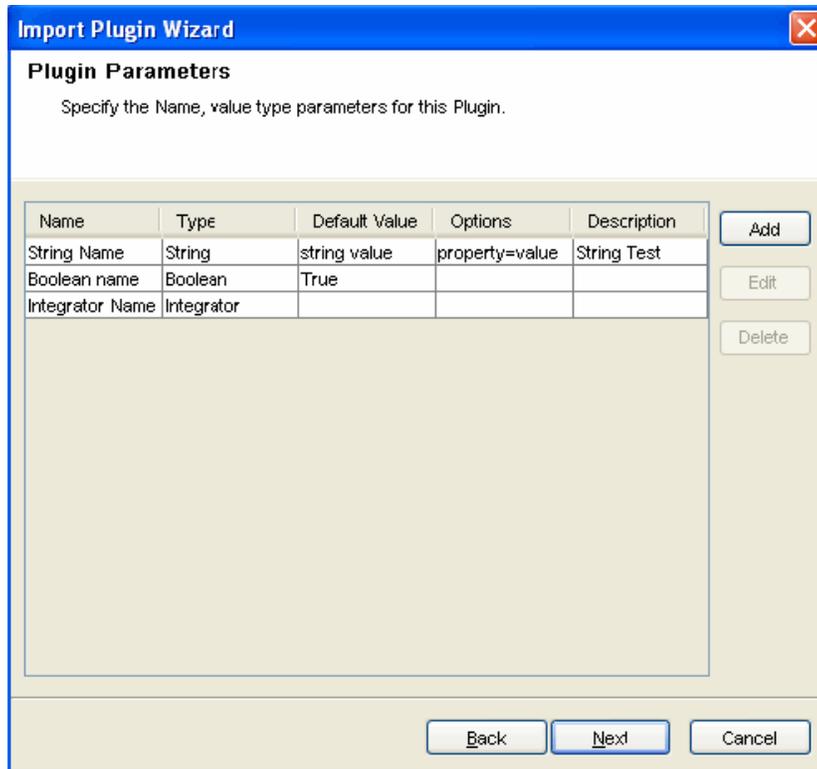
NOTE: If the file you have selected is not of proper format, the Next button will not activate.

When updating an already-imported JavaScript file, you are provided with the option of updating the existing plug-in, going back and selecting a different plug-in, or canceling the import. If you want to continue, click Next.

- 7 Click Next. The Required Input window displays.



- 8 Select the objects that the JavaScript action requires. This affects where the Action is available in the interface. For more information, see the [Table 16-1 on page 369](#). Click Next. The Plugin Parameters window displays.



- 9 [Optional] Click Add button to add parameters that can be set when an Action is configured. This option should be used for any JavaScript files that expect to receive parameterized information. The Parameter Definition window displays.

The screenshot shows a 'Parameter Definition' dialog box with the following components:

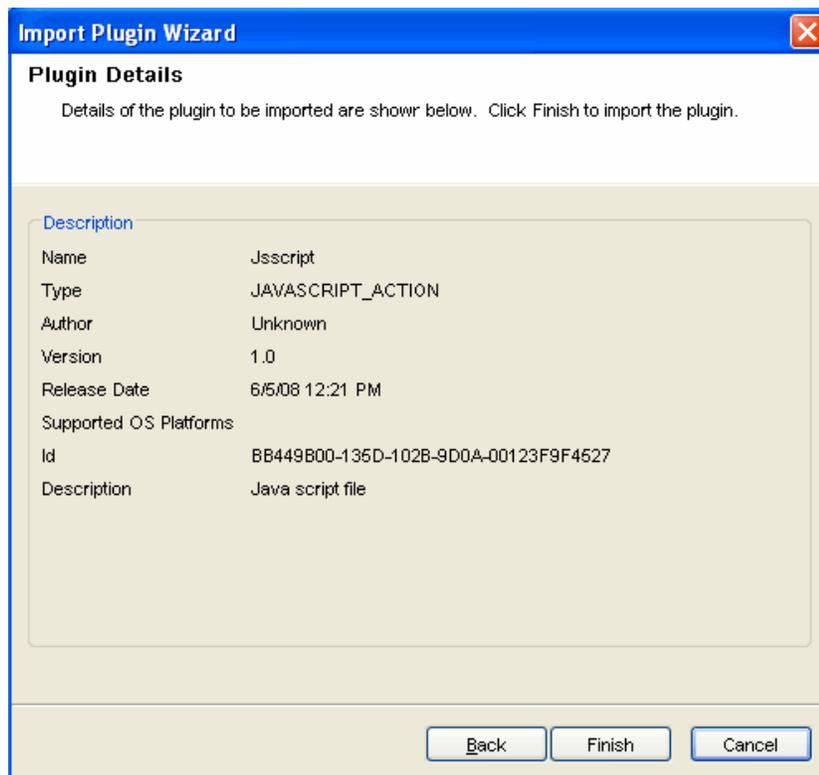
- Name:** A yellow text input field.
- Type:** A dropdown menu currently set to 'String'.
- Default Value:** An empty text input field.
- Options:** A table with two columns: 'Property' and 'Value'. The table is currently empty.
- Add/Delete:** Two buttons located below the Options table.
- Description:** A large text area with a vertical scrollbar on the right side.
- OK/Cancel:** Two buttons at the bottom right of the dialog.

- 9a** Specify the parameter name. The name used here should be identical to one used in the JavaScript API method `scriptEnv.getParameter("name>")` in the script that is being imported.
- 9b** Select parameter name from Type drop down. The various parameter types available are:
- ◆ **String:** Accepts the sting values for the parameters
 - ◆ **Boolean:** The parameter can take “True” or “False” value
 - ◆ **Integrator:** Select Integrator name for the parameters
 - ◆ **Event Tag:** Select Event Tag for the parameters
 - ◆ **Severity:** Select Severity for the parameters

NOTE: The “Options” area is only available for “String”-type parameters.

[Optional] Specify a description.

Click Next.



10 The Plugin Details window displays. Details of the plugins to be imported are displayed.

11 Click Finish.

If the directory from which the JavaScript file is imported contains a `package.xml` file, the system updates the `package.xml` file with the information defined in the wizard. If no `package.xml` file exists in the directory, a new `package.xml` file will automatically be created.

An Action plugin is also created from the JavaScript file. The `package.xml` file is zipped as part of the JavaScript plugin along with other files in the specified directory.

NOTE: When a plugin is created from a directory, the original contents of the directory are stored in a backup `.zip` file located on the same directory level as the directory being zipped. The name of the backup file will be in the format `<Directory Name>_<Randomly Generated Number>_bak.zip` where `<Directory Name>` is the directory in which the plugin is created.

The following is the example of `package.xml` file:

```
<?xml version="1.0" encoding="UTF-8"?>
<JavaScriptActionPackage>
  <ID>FA6944D0-DC43-102A-976F-001321B5C0B3</ID>
  <Name>Example JavaScript Plugin</Name>
  <Type>JAVASCRIPT_ACTION</Type>
  <DisplayName>Example JavaScript Plugin</DisplayName>
  <Author>Novell Engineering</Author>
  <Version>61r1</Version>
  <ReleaseDate>1206414663439</ReleaseDate>
  <MainScriptFile>example.js</MainScriptFile>
  <Description>An example JavaScript Action plugin.</Description>
</JavaScriptActionPackage>
```

NOTE: When a plugin is created from a JavaScript file and an existing `package.xml` file, the `package.xml` file is updated with the list of files contained in the package, hash codes, current dates and so on.

16.4 Actions

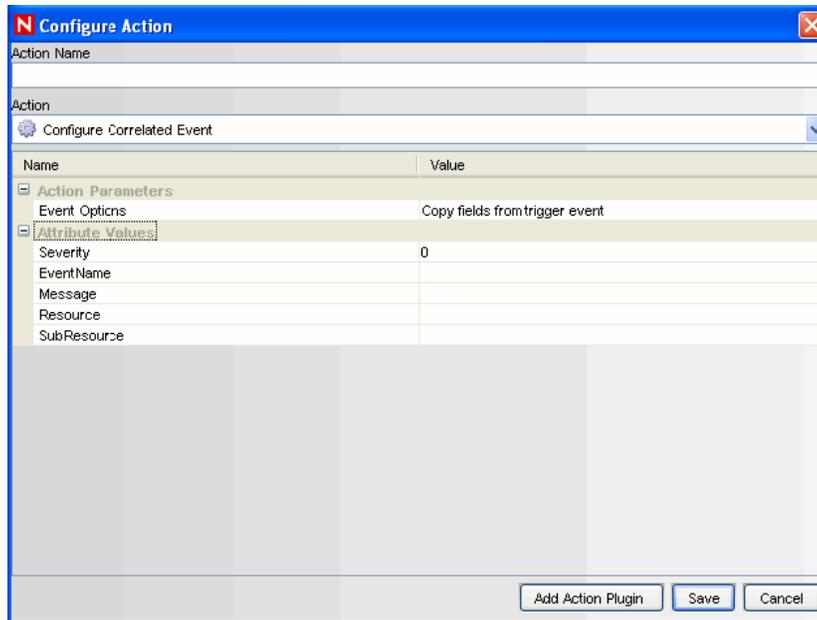
There are many types of Actions, many of which are intended only to be used with Correlation Rules. For more information about the Correlation Rule actions, see [Chapter 3, “Correlation Tab,” on page 63](#). This section focuses on JavaScript actions, which can be used in Correlation Rule deployments, within an Incident, or in a right-click menu action.

16.4.1 Creating Actions

The Action Manager allows you to manage Action instances, which are individual configurations of an Action plugin.

To add an Action:

- 1 Click Tools menu and select Action Manager.
- 2 Click Add button located on the top left corner of the screen. Configure Action window displays.



- 3 To create a JavaScript Action, select an already imported JavaScript Action plugin from the available action types in the Action dropdown. Alternatively you can import another plugin by clicking the Add Action Plugin button.

NOTE: If you select an Action plugin that is configured to use an Integrator to connect to an external system, the Add Integrator button displays.

- 4 The parameters for the selected plugin display. For Actions provided by Novell, more information about configuration and the available parameters are available in the help file for the Action.
- 5 Specify the attribute values for the type of action selected.
- 6 Click Save.

16.4.2 Editing Actions

If you edit an action that is associated with a deployed rule, the changes will take effect the next time the correlation rule fires.

To edit an Action:

- 1 Click Tools menu and select Action Manager.
- 2 Select an Action and click the View or Edit link next to it.
- 3 The Configure Action window displays. Edit the options as required and click Save.

16.4.3 Deleting Actions

You cannot delete an action if the action is associated to either of the following:

- ♦ Deployed correlation rule or Event Menu Configuration item.
- ♦ Global Filters

To delete an action:

- 1 Click *Tools* and select *Action Manager*.
- 2 Select an action and click the *Delete* the link.
- 3 Click *Yes* to delete.

16.4.4 Using JavaScript Actions

After an Action instance is configured, it can be selected in one or more of the following locations:

- ◆ Event Menu Configuration on the Admin tab (to create right-click menu actions)
- ◆ Actions tab when deploying a Correlation Rule (to be executed when a correlation rule fires)
- ◆ Execute Incident Action within an Incident (to be executed within an incident)

However, not all JavaScript Actions are available in all contexts. The developer who creates the JavaScript Action plugin can define the required inputs for a JavaScript action, which determines what type of input it requires and in what contexts it can be used. For more information, see the [Table 16-1 on page 369](#). For more information on using these actions, see [Chapter 3, “Correlation Tab,” on page 63](#), [Chapter 4, “Incidents Tab,” on page 91](#), and [Chapter 11, “Administration,” on page 223](#).

16.4.5 Developing JavaScript Actions

The information below is very basic development information about developing JavaScript Actions. For more information, see [Novell Developer Community web site \(http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel\)](http://developer.novell.com/wiki/index.php?title=Develop_to_Sentinel).

Creating a JavaScript Action

JavaScript Actions take advantage of the functionality and flexibility of the JavaScript language and can be used to execute actions using Sentinel system methods to do things such as:

- ◆ Start/Stop the Collectors
- ◆ Add/Remove from Dynamic Lists
- ◆ Get Current Event
- ◆ Get Correlated Event
- ◆ Get Correlation Event Collection
- ◆ Get Incident
- ◆ Execute actions using Integrators

The code sample below starts or stops a Collector based on information in the correlated event.

```
importPackage(java.lang);
var CollectorName = "TC_5";
var evt = scriptEnv.getCurrentEvent();
var collNm = evt.getPort();
var outfile = new java.io.PrintWriter(new java.io.FileWriter("/opt/jaya/
strtcoll.txt", true));
if(collNm && collNm.equals(CollectorName))
{
```

```

var collist = ESM.collectorsForName(collNm);
if (collist.size() > 0)
{
    var coll = collist.get(0);
    outfile.println("Stopping " + CollectorName);
    coll.stop();
    Thread.sleep(60000);
    outfile.println("starting " +CollectorName);
    coll.start();
}
}
else
{
    outfile.println("JSTest collector does not exist");
}
outfile.close();

```

Debugging JavaScript Actions

You can debug JavaScript files from the Sentinel Control Center with the help of the JavaScript debugger. The JavaScript Debugger is a local debugger that executes scripts with respect to the machine on which the Sentinel Control Center is running. The JavaScript Debugger instantiates a debug session from the Data Access Service (DAS) machine.

A JavaScript Correlation Action can only be debugged after it is associated with a fired Correlation Rule. Therefore, a prerequisite to debugging is to create a correlation rule that is guaranteed to fire, then associate the JavaScript Correlation Action with that rule.

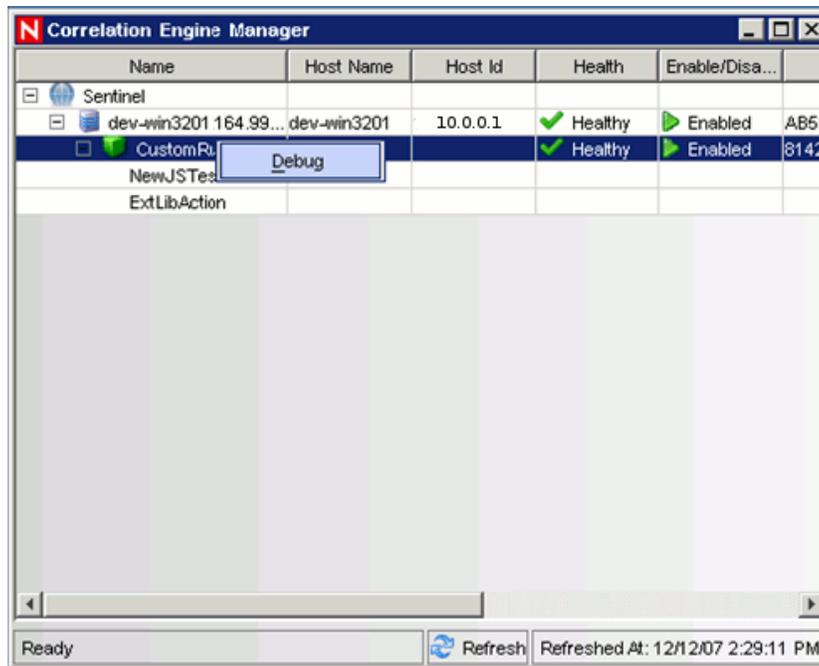
The debugger has the following controls:

Table 16-2 *Debugger Controls*

	Run	Run the script until the next breakpoint is encountered.
	Step Into	Step into a function, one line at a time.
	Pause	Pause the running script.
	Stop	Stop the script.
	Step Over	Step over a function to the next line in the script.
	Step Out	Step out of the function to the next line in the script.

To open a JavaScript Debugger:

- 1 Click Correlation on the Menu Bar and select Correlation Engine Manager. Alternatively, you can click Correlation Engine Manager button on the Tool Bar.



Select a JavaScript Action associated with Correlation Rule. Right click and select Debug. The Debug JavaScript Correlation Action window displays.

```
Debug Javascript Correlation Action
Retrieved source file, waiting for associated correlation rule to fire...
importPackage(java.lang);
var curevt = scriptEnv.getCurrentEvent();

outfile1 = new java.io.PrintWriter(new java.io.FileWriter("c:\jsout\curevt1.txt", true));
outfile1.println("Current Date ->" + curevt.getTime());
outfile1.println(curevt.toString());

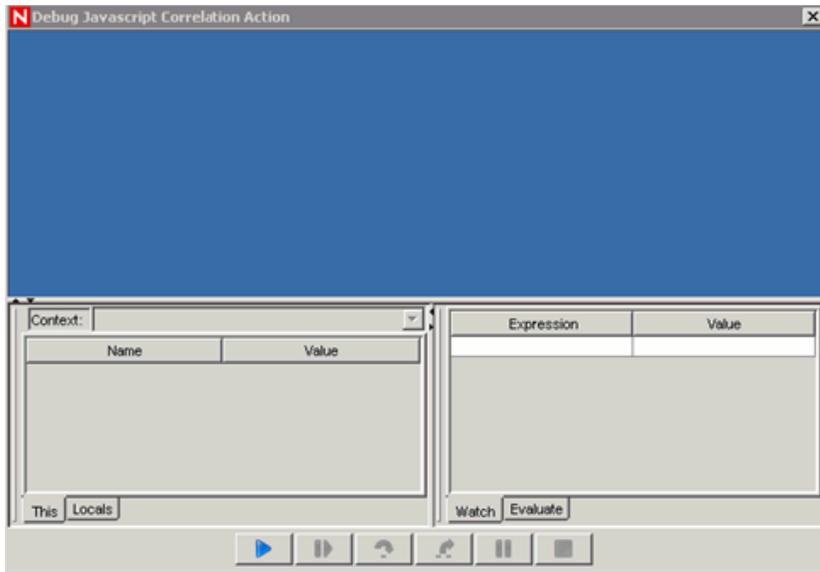
var dl = DynamicList.forName("MyList");

if (!dl)
{
    outfile.println("List does not exist");
}
else
{
    dl.addPersistent("TestEvent1");
    dl.addTransient("TestEvent2");
    outfile.println("Added to TestEvent1 and TestEvent2 to the list");
}

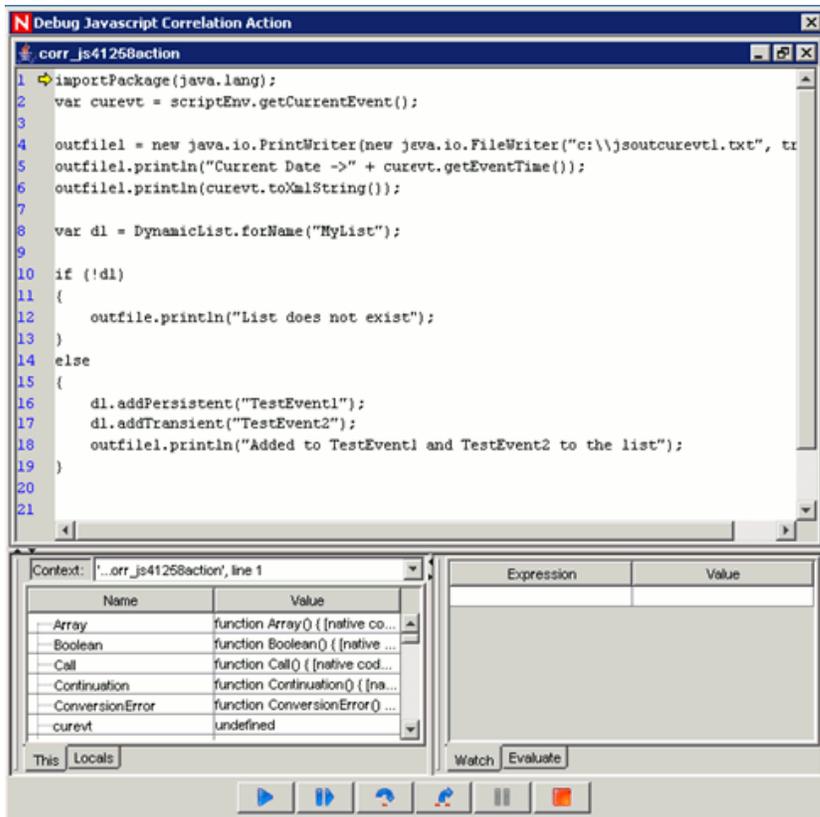
outfile1.close();
```

The screen displays the following message: Retrieved source file, waiting for associated correlation rule to fire....

The correlation rule must fire (and a correlated event or incident must be created) before you can debug the script. After the rule fires, this text panel is replaced by a debug panel and the actual debugging session begins. The following JavaScript Correlation Action window displays.



Click Run. The debugger panel displays the source code and positions the cursor on the first line of the script.



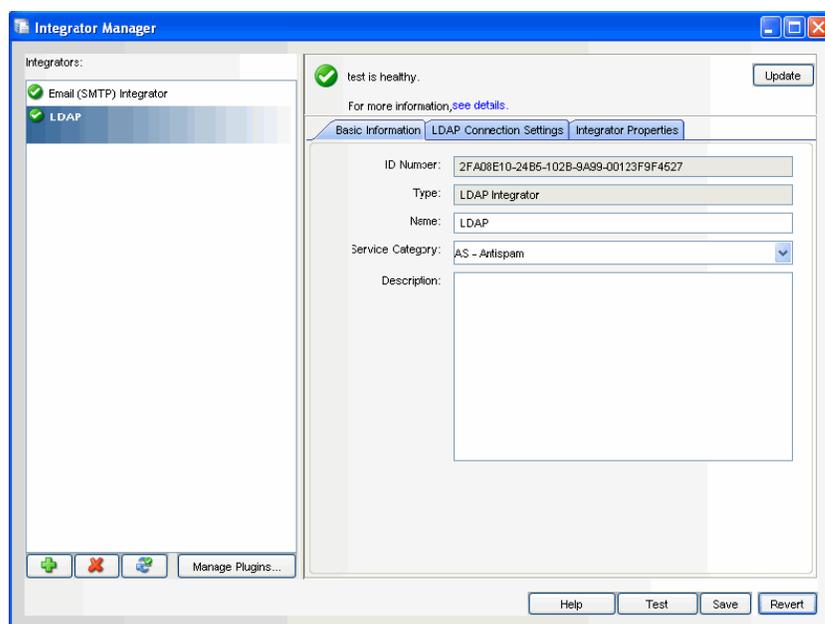
You can debug the script as many times as needed (without requiring a new correlation rule to fire). After the debugger gets to the end of the script (or after you click the Stop button), click Run again.

To debug the script using a different rule, different correlated event, or different incident, close the Debug JavaScript Correlation Action window and repeat the debugging process.

16.5 Integrator Manager

Integrators are plugins that can be used in Sentinel 6.1 to extend the features and functionality of Sentinel remediation actions. The Sentinel system is loaded with several Integrators by default, but you can download updates and additional Integrators from the Sentinel content download pages at [Sentinel Content Web site \(http://support.novell.com/products/sentinel/secure/sentinel61.html\)](http://support.novell.com/products/sentinel/secure/sentinel61.html).

Integrators allow Sentinel to connect to other external systems, for example, an LDAP server, SMTP server, or SOAP server. JavaScript actions can use Integrators to interact with other systems. For example, you can set the attribute in Novell eDirectory (an LDAP server) to enable or disable a user, edit details and so on. You could also start an Identity Manager workflow, such as a provisioning request, using SOAP calls.



The general process for using an Integrator to perform remediation actions includes the following steps:

To use an Integrator to perform remediation actions:

- 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.
- 3 Write a JavaScript action to be executed through the Integrator. This script makes calls to methods specific to the integrator in order to execute actions on the external system.
- 4 Import and configure the JavaScript action using the Action Manager.

- 5 Perform additional configuration, if desired, to associate the action with a deployed correlation rule or an event menu action.
- 6 The action can be executed when a correlation rule fires, manually by a user from the event menu, or from the Execute Incident Action menu in an incident.

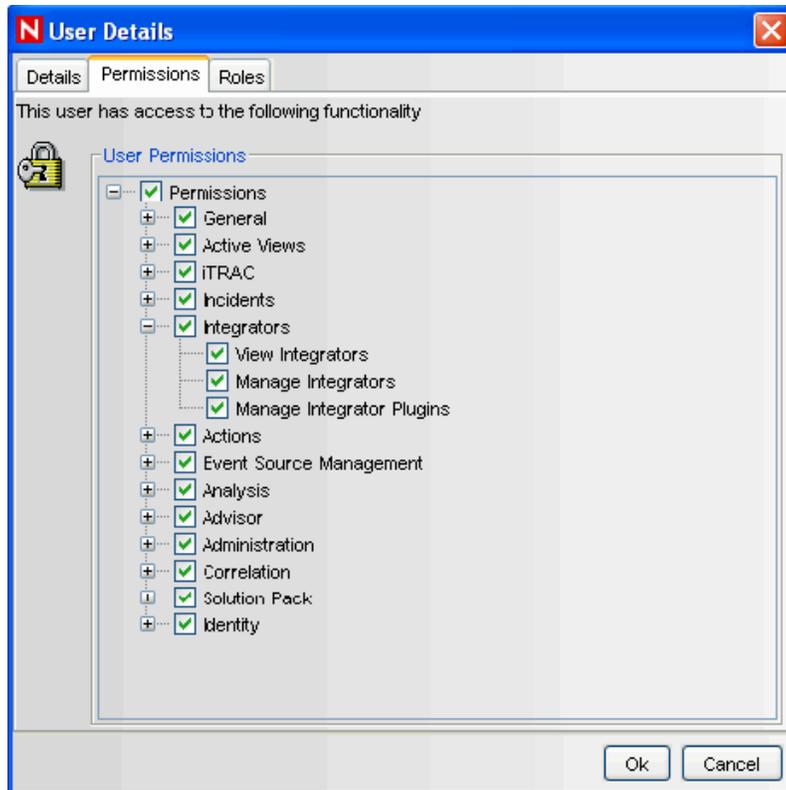
For more information on specific Integrators, see the documentation that is available with the integrators. You can download the updated integrators from <http://www.novell.com/documentation/sentinel61> (<http://www.novell.com/documentation/sentinel61>). Alternatively you can view the Integrators specific document by clicking Help button in Integrator Manager after configuring that Integrator.

16.5.1 Permissions for Using Integrators

To use the Integrator Manager, a user must be assigned the necessary permissions in the User Manager. By default these permissions are not assigned to the users.

To grant permissions for the Integrator:

- 1 Log into the Sentinel Control Center as a user with permissions to use the User Manager.
- 2 Go to the Admin tab.
- 3 Open the User Configuration folder.
- 4 Open the User Manager window. Double click User. The User Details window displays.
- 5 Click the Permissions tab.



- 6 Select View Integrators, Manage Integrators, Manage Integrator Plugins or Integrators (which will automatically select all child permissions). The new permissions will be applied the next time the user logs in. For more information, see “[Sentinel Control Center User Permissions](#)” in *Sentinel 6.1 Reference Guide*.

16.6 Integrator Plugins

This section talks about Integrator Plugins.

16.6.1 Importing Integrator Plugins

To import Integrator Plugin:

- 1 Click Tools on the menu bar and select Integrator Manager. The Integrator Manager window displays.
- 2 Click Manage Plug-Ins button. The Integrator Plugin Manager window displays. In Integrator Plugin Manager window you can add, delete, refresh, view Integration plugin details, configure Integrators and add auxiliary files
- 3 Click Import icon in the Integrator Plugin Manager window. The Plugin Import Type window displays.
- 4 Select Import an Integrator plugin file (.zip). Click Next. The Choose Plugin Package File window displays.

- 5 Use the Browse button to locate an Integrator file to import to the plugin repository. Select a zip file and Click Open.
- 6 If you have selected an Integrator file which already exists then the Replace Existing Plugin window displays. Click Next if you want to replace the existing plugins.
Click Next. The Plugin Detail window displays.
- 7 The details of the plug-in to be imported are displayed. Check the Launch Integrator Configuration Wizard checkbox if you want to deploy the plug-in after importing the Integrator Plugin.
Click Finish

16.6.2 Deleting Integrator Plugins

To delete an Integrator Plugin:

- 1 Click Tools menu and select Integrator Manager. The Integrator Manager window displays.
- 2 Click Manage Plug-Ins button. The Integrator Plugin Manager window displays.
- 3 Select an Integrator Plugin and click delete icon. A confirmation message displays. Click Yes.

NOTE: You can delete an Integrator plugin only if there are no Integrators configured to use it.

16.7 Integrators

This section talks about Integrators.

16.7.1 Creating an Integrator Instance

An Integrator is a configured instance of an Integrator plugin. There can be one or more Integrator instances with different parameters or settings using an Integrator plugin.

The specific steps to configure an Integrator instance depend on the type of Integrator, and those steps are described in detail in documents that come with the Integrators. Documentation for installed plugins can be viewed by selecting an integrator in the Integrator Manager and clicking Help.

16.7.2 Editing an Integrator Instance

To edit an Integrator Instance:

- 1 Click Tools menu and select Integrator Manager. The Integrator Manager window displays.
- 2 Select an Integrator from the left panel. You can edit the Integrator instance information using the Basic Information, Connection Settings and Integrator Properties tab.
- 3 Click Save after you have edited the information.

16.7.3 Deleting an Integrator Instance

An Integrator instance cannot be deleted if it is currently associated with an Action. To delete an Integrator instance, you must first delete or modify any Actions that are associated with it.

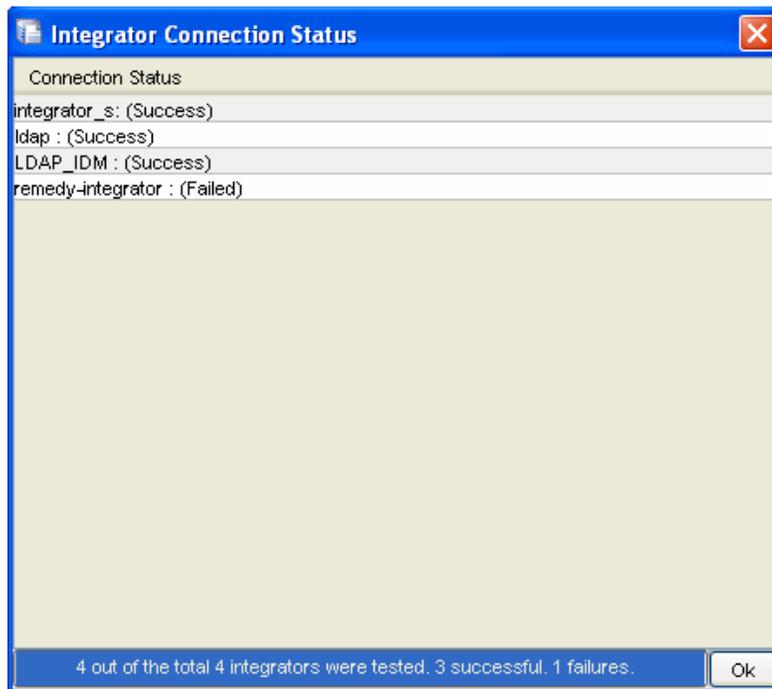
To delete an Integrator Instance:

- 1 Click Tools menu and select Integrator Manager. The Integrator Manager window displays.
- 2 Select an Integrator from the left panel. Click delete icon to delete an Integrator instance.

16.7.4 Integrator Connection Status

To check all Integrator connection status:

- 1 Click Tools menu and select Integrator Manager. The Integrator Manager window displays.
- 2 Click Refresh health of all Integrators button. The Integrator Connection Status window displays.



The server performs a test of the Integrators in the actual service where the Integrators will be used when actions are executed.

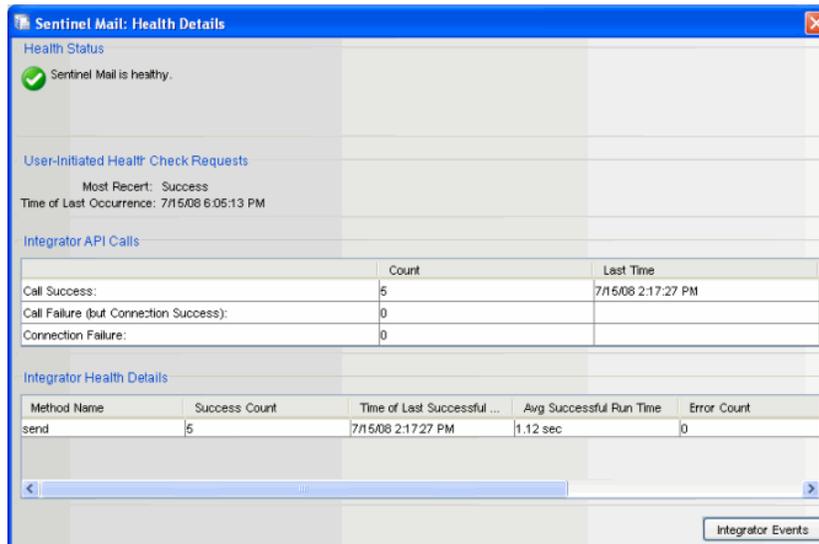
Click OK.

16.7.5 Viewing Integrator Health Details

To view Integrator Plugin health status:

- 1 Click Tools menu and select Integrator Manager. The Integrator Manager window displays.

- 2 Select an integrator from the left pane.
- 3 Click See Details. The Refresh Health Information window displays



Health screen displays the Refresh Health State, Time of last occurrence, its method calls and the related events of the selected Integrator configuration. The detailed description follows:

- ♦ **Integrator API Calls:** This section indicates the status of count and time of both the connection as well as the method calls used from the API of the selected integrator. For more information on JavaScript Plugin, see [Section 16.2, “Action Manager,” on page 364](#).
 - ♦ **Call Success Count:** Displays the count for 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 count for the number of times the connection was established successfully but the method(s) 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 count for 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 time among Connection Success and Call Success Count, Connection success and call failure count and Connection failure and call failure count is reflected in the overall health status for the configured Integrator.

- ♦ **Integrator Health Details:** The health details are displayed in Integrator Health Details pane. It provides information about the success of the API methods called in the JavaScript action file(s) associated with the Integrator. It provides information specific to the methods called. Below is the information for each method :
 - ♦ **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.

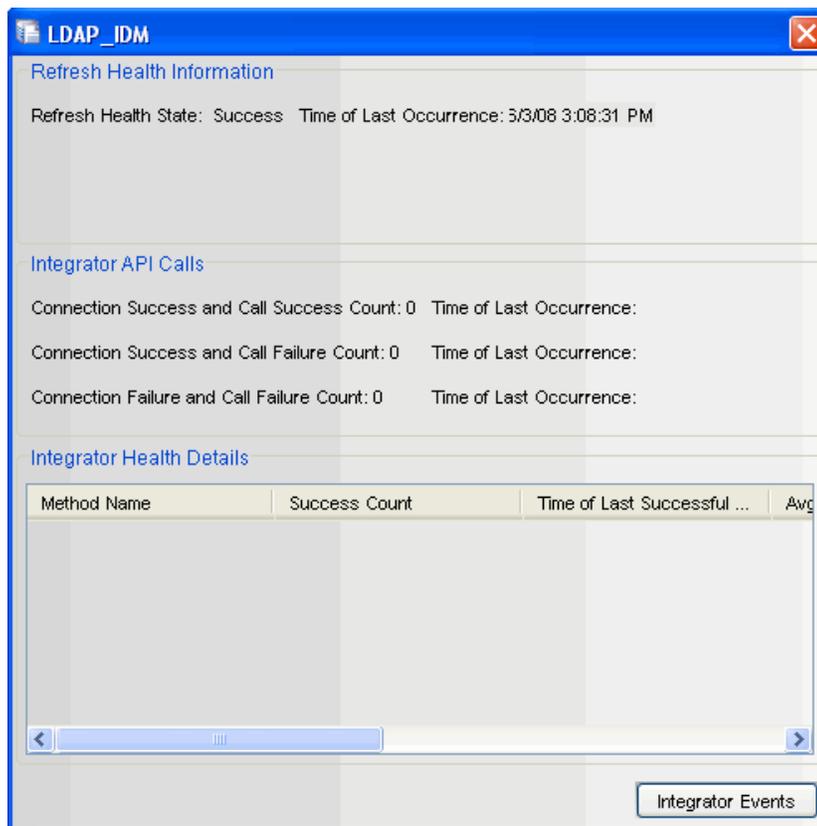
NOTE: The most recent time among Time of Last Successful Call and Time of Last Error Call is reflected in the overall health status of the method.

16.7.6 Integrator Events Query

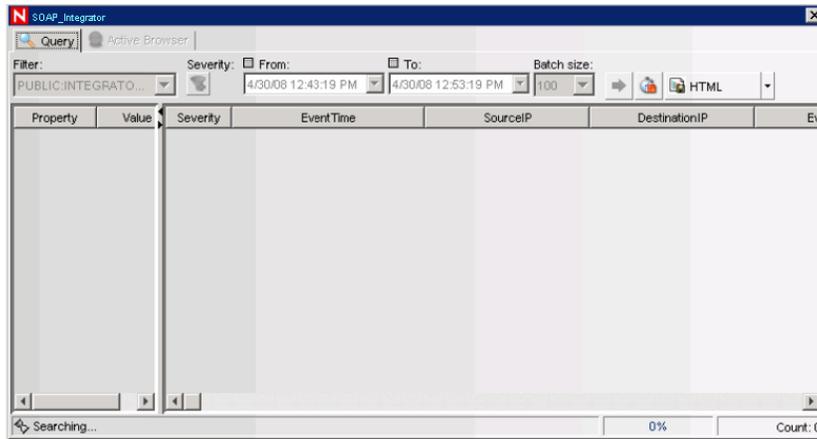
When an Integrator faces connection failures, it generates internal audit events. If you want to query these events, you can use Integrator Events Query. Using Integrator Events Query you can automatically create a filter for the selected Integrator and process a query.

To generate Integrator Events query:

- 1 Click Tools menu and select Integrator Manager. The Integrator Manager window displays.
- 2 Click See Details. The Refresh Health Information window displays.



- 3 Click Integrator Events button. The Query window displays. All the events related to the configured integrator automatically displays in the Query window. You can filter the displayed events using the filter criteria. For more information see, [Section 2.9.3, “Historical Event Query,” on page 47.](#)



16.7.7 Using Integrators from Actions

Some Actions may require an Integrator in order to make a connection to an external system. You can write or customize JavaScript code that connects to an external system using the Integrator and executes methods appropriate for the external system. Because all the connection and other configuration information is already configured as part of the Integrator, the code only needs to perform a task on the system with which it integrates.

When writing code that needs to access an Integrator, you must determine how to locate a specific Integrator. You can locate an Integrator in the following ways:

- ◆ Lookup an Integrator by its name
- ◆ Lookup an Integrator by its ID.
- ◆ Lookup a set of Integrators by their service category
- ◆ Retrieve a set of Integrators that have a specific property name or value
- ◆ Retrieve all Integrators and iterate through them to find the required one based on custom logic

After you retrieve the Integrator you can access the API for the external system to make programmatic calls to achieve the required integration.

Sentinel Link is a mechanism that provides the ability to hierarchically link multiple Sentinel systems, including Novell Sentinel Log Manager, Novell Sentinel, and Novell 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 17.1, “Benefits,” on page 391](#)
- ♦ [Section 17.2, “Supported Platforms,” on page 391](#)
- ♦ [Section 17.3, “Prerequisite,” on page 391](#)
- ♦ [Section 17.4, “Configuring Sentinel Link,” on page 392](#)
- ♦ [Section 17.5, “Configuring Sentinel Systems for Receiving Events,” on page 392](#)
- ♦ [Section 17.6, “Configuring Sentinel Systems for Sending Events,” on page 409](#)
- ♦ [Section 17.7, “Verifying a Sentinel Link,” on page 426](#)

17.1 Benefits

- ♦ Multiple Sentinel Log Manager servers, local or distributed, can be linked in a hierarchical manner. In this setup, Sentinel Log Manager servers can manage a large volume of data, retaining raw data and event data locally, while forwarding important events to a central Sentinel Log Manager for consolidation.
- ♦ One or more Sentinel Log Manager servers can forward important data to either a Sentinel 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 or Sentinel Rapid Deployment servers can be hierarchically linked to monitor the consolidated event information.
- ♦ One or more Sentinel or Sentinel Rapid Deployment servers can forward important events to a Sentinel Log Manager server for event consolidation.

17.2 Supported Platforms

- ♦ Sentinel 6.1 Rapid Deployment Hotfix 2 or later
- ♦ Sentinel 6.1 Service Pack 1 Hotfix 2 or later
- ♦ Sentinel Log Manager 1.0 Hotfix 1 or later

17.3 Prerequisite

- ♦ Before you forward events from the sender machine, ensure that the Sentinel Link server is up and running on the receiver machine.

17.4 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, read the following:

- ♦ “Configuring Sentinel Systems for Receiving Events” on page 392
- ♦ “Configuring Sentinel Systems for Sending Events” on page 409

17.5 Configuring Sentinel Systems for Receiving Events

On the receiver system, you must configure the Sentinel Link Collector, which generates events from the data received by the Sentinel Link Connector. You must also configure the Sentinel Link Connector and configure a Sentinel Link Event Source Server to receive the event data from the sender systems.

17.5.1 Accessing Event Source Management

- ♦ “Sentinel” on page 392
- ♦ “Sentinel Rapid Deployment” on page 392
- ♦ “Sentinel Log Manager” on page 393

Sentinel

- 1 As the Sentinel Administrator User (esecadm), change the directory to:
`$ESEC_HOME/bin`
- 2 Run the following command:
`control_center.sh`
- 3 Specify the administrator username and password, then click *OK*.
- 4 In the Sentinel Control Center, select *Event Source Management > Live View*.

Sentinel Rapid Deployment

- 1 Open a Web browser to the following URL:
`https://svrname.example.com: port/sentinel`
Replace `svrname.example.com` with the actual DNS name or IP address (such as 192.168.1.1) of the server where Novell Rapid Deployment is running.
- 2 If you are prompted to verify the certificates, review the certificate information, then click *Yes* if it is valid.
- 3 Specify the username and password for the Sentinel Rapid Deployment account you want to access.
- 4 Use the *Languages* drop-down list to specify which language you want to use.
- 5 Click *Sign in*.

- 6 In the Web interface, select *Applications* from the left panel.
- 7 In the Application page, click *Launch* to open the Sentinel Control Center.
- 8 Log in to the Sentinel Control Center as administrator.
- 9 Select *Event Source Management > Live View*.

Sentinel Log Manager

- 1 Open a Web browser to the following URL:
`https://svrname.example.com: port/novelllogmanager`
Replace `svrname.example.com` with the actual DNS name or IP address (such as 192.168.1.1) of the server where Novell Log Manager is running.
- 2 If you are prompted to verify the certificates, review the certificate information, then click *Yes* if it is valid.
- 3 Specify the username and password for the Log Manager account you want to access.
- 4 Use the *Languages* drop-down list to specify which language you want to use.
- 5 Click *Sign in*.
- 6 In the Novell Log Manager Web interface, click *Collection*.
- 7 In the Collection page, click *Advanced*.
- 8 In the Advanced page, click *Launch* to open the Event Source Management.

17.5.2 Setting Up a Sentinel Link Connection

This section describes how to set up the Sentinel Link connection to receive messages from another Sentinel or Sentinel Log Management system, and enable the messages to be processed by a Collector. To set up the Sentinel Link connection, you must, at a minimum, create and configure a Sentinel Link Event Source server. The Sentinel Link Event Source server automatically creates and configures the Connector, the Collector and the Event Source nodes as needed. You can also manually create the Collector, the Connector, and the Event Source nodes. However, it is easier and simpler to allow the Sentinel Link Event Source server auto-create them.

The instructions given in this section use the right-click menu items on the Event Source Management Graph View. However, all the steps described in this section can also be performed through the Event Source Management Table view and the *Connect to Event Source* option on the tool bar.

NOTE: These instructions assume that you have already downloaded and installed the Collector to process event data from the Sentinel Link Connector.

- ♦ [“Configuring Sentinel Link Event Source Server” on page 393](#)
- ♦ [“Manually Setting Up the Sentinel Link Connection” on page 398](#)

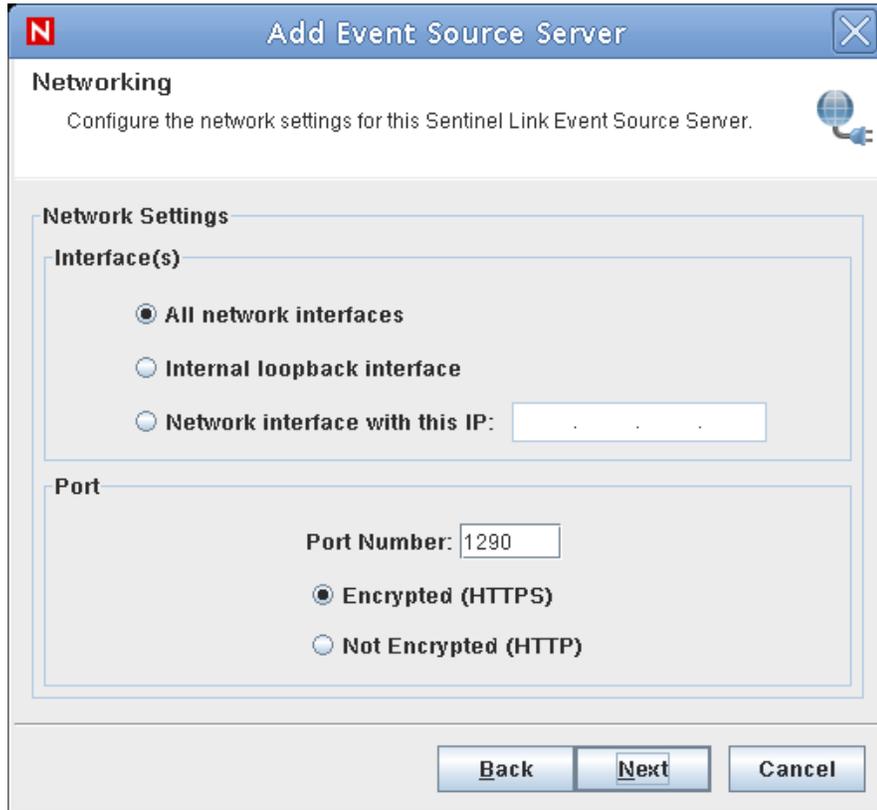
Configuring Sentinel Link Event Source Server

Configure a Sentinel Link Event Source server to set up a Sentinel Link connection to start processing the data received from the sender system. After you add a Sentinel Link Event Source server, the required Collector, the Connector, and the Event Source nodes are automatically created and configured when the server receives the events from the sender system. Allowing the Sentinel

Link Event Source server to auto-create the nodes is much simpler and is preferred over manual configuration because it ensures that nodes are properly configured and connected so that events are routed to the Sentinel Link Collector.

- 1 In the Event Source Management view, right-click the Collector Manager, select *Add Event Source Server*, then select *Sentinel Link Connector* and click *Next*.

The Networking window is displayed.

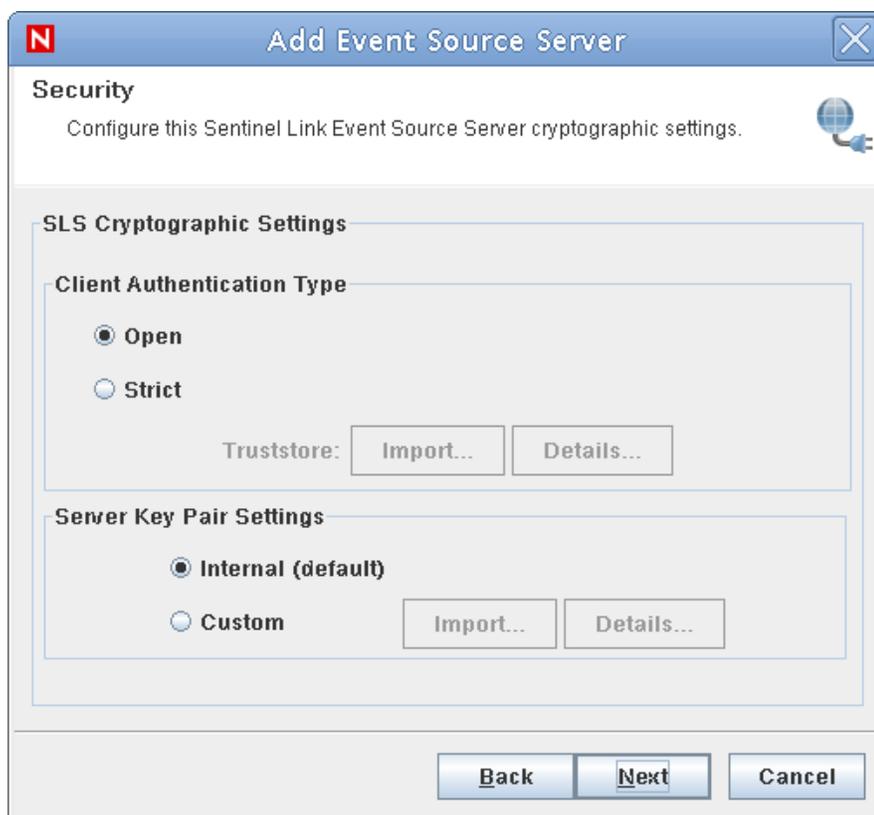


- 2 Specify the following, then click *Next*.

Options	Description
<i>Interface(s)</i>	Specify any of the following: <ul style="list-style-type: none"> ♦ All network interfaces: Binds the port on all the IP addresses of the machine, including local loopback. ♦ Internal loopback interface: Binds the port only to the local loopback address. ♦ Network interface with this IP: Allows the port to be bound to one IP address on the machine with multiple IP addresses.

Options	Description
<i>Port Number</i>	Specify the port number. The default port number is 1290. NOTE: If the Sentinel Link Event Source Server is running on a Linux/Unix machine, binding to port numbers less than 1024 requires root privileges. Therefore, Novell recommends that you run the server on a port greater than 1024 and change the source devices to send to this new port or use port forwarding.
<i>Encrypted (HTTPS) or Not Encrypted (HTTP)</i>	Select either of the following: <ul style="list-style-type: none"> ◆ Encrypted (HTTPS): Allows secure message transport to the Sentinel Link Event Source Server. ◆ Not Encrypted (HTTP): Allows insecure message transport to the Sentinel Link Event Source Server.

- 3 In the Security window for configuring authentication settings on the HTTPS port, specify the following:

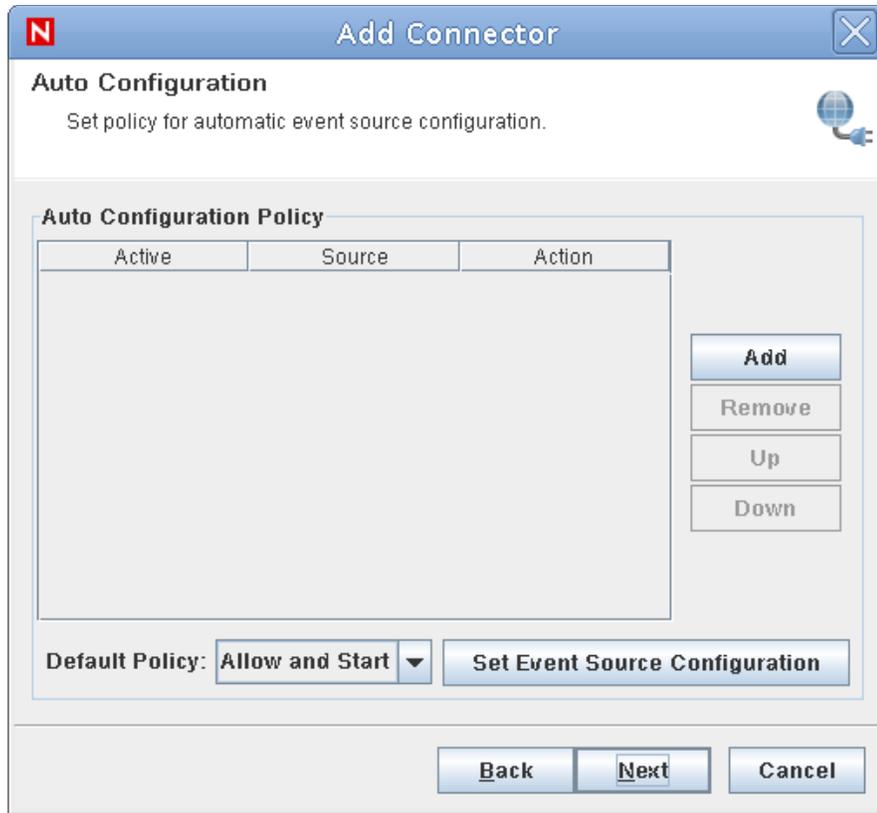


Options	Description
<i>Client Authentication Type</i>	Specify either of the following: <ul style="list-style-type: none"> ◆ Open: Allows HTTPS connections from any sender machines. It does not perform any client certificate validation or authentication. ◆ Strict: Validates that the sender's certificate in the trust store and is a valid X.509 certificate. For this option, a truststore needs to be imported. Use the <i>Import</i> button to do this. The truststore should have the sender's certificate, which is signed by a CA. Click the <i>Details</i> button to display the list of certificates imported from the truststore.
<i>Server Key Pair Settings</i>	Specify either of the following: <ul style="list-style-type: none"> ◆ Internal: The Internal (default) option directs the Sentinel Link Connector to generate a server key pair. ◆ Custom: Select this option, then click <i>Import</i> to import a server key pair that the embedded tomcat server uses. The imported keystore must contain at least one private/public key pair. If the keystore has more than one, a popup screen allows you to select one of the key pairs. The server key pair <i>Details</i> button displays the certificate imported from the keystore.

4 Click *Next*.

The Auto Configuration window is displayed.

In this window, you can create policies to automatically add or exclude individual Sentinel source machines. You can select IP addresses, ranges or subnets to be auto-configured, auto-configured and started, or ignored by the Connector.



The Sentinel Link Event Source Server simplifies Event Source configuration with the option to detect a new source device that is sending data to the Sentinel Link Event Source Server, evaluate its IP address by using a set of user-defined policies, and either ignore the new source device or automatically add it as an Event Source in Event Source Management.

- 5 Click *Add* if you want to create a new policy.
- 6 Double-click the *Source* field and enter a source IP address or a range of IP addresses in one of the following formats:
 - ♦ Specific IP address (such as 10.0.0.1)
 - ♦ IP address range (such as 10.0.0.1-10.0.0.25)
 - ♦ IP address with mask (like 10.0.0.1/16)
- 7 Select an action to associate with the IP address or range of IP addresses:
 - ♦ The *Allow and Start* action creates and starts Event Source node in the ESM view.
 - ♦ The *Allow* action auto-creates the Event Source node in the ESM view but does not auto-start the Event Source.

After the new Event Source node is created, an administrator can review and start it at any time.

- ♦ The *Deny* action prevents the auto-creation of an Event Source.

- 8 Select *Active* to activate the policy.

If there are multiple policies, reorder the order in which they are evaluated by using the *Up* and *Down* buttons.

- 9 Set the Default Policy, which applies to all sources that do not meet any of the criteria defined by the policies above.
- 10 To set the filtering and configuration settings for all automatically-created Event Sources, click the *Set Event Source Configuration* button. For more information on these options, see [“Adding Event Sources” on page 404](#).

TIP: Auto-configured Event Sources should not be manually deleted in the Event Source Management interface because they are auto-configured again when the Connector restarts. To block a particular source device, add a Deny policy in Auto Configuration.

- 11 Click *Next* to display the General properties window.
- 12 Select *Run* to run the Sentinel Link Server automatically whenever the Collector Manager is restarted.
- 13 Click *Finish* to complete the configuration of the Sentinel Link Event Source Server.

Manually Setting Up the Sentinel Link Connection

Although the Event Source server is capable of auto-creating the required Collector, Connector, and Event Source nodes, you might also want to manually create the Collector, the Connector, and the Event Source nodes.

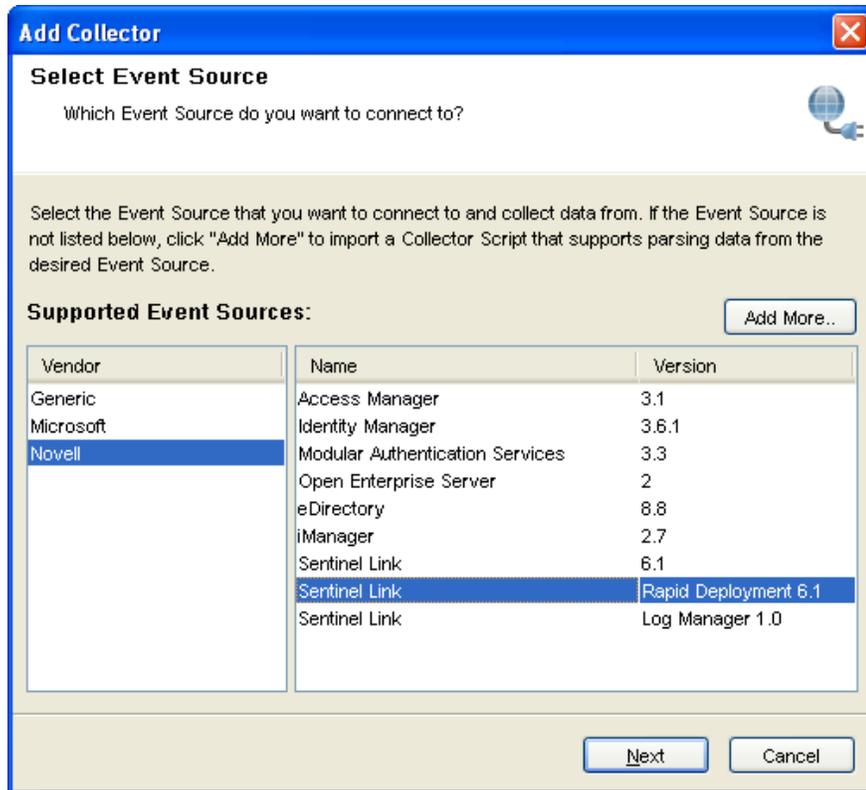
Regardless of which way you choose, you must configure an Event Source server. For more information, see [“Configuring Sentinel Link Event Source Server” on page 393](#). This section assumes that you have already configured an Event Source server.

NOTE: If you have not created an Event Source server, you are given the option to do so during the configuration of Connector nodes.

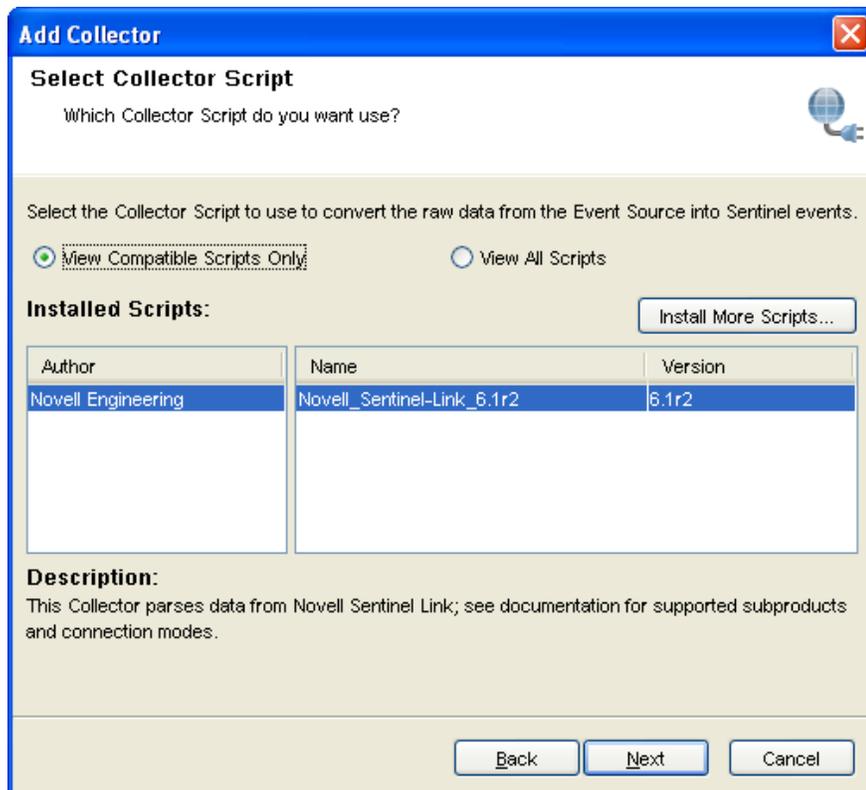
- ♦ [“Adding a Collector” on page 398](#)
- ♦ [“Adding a Connector” on page 400](#)
- ♦ [“Adding Event Sources” on page 404](#)

Adding a Collector

- 1 In the Event Source Management (Live View), right-click the Collector Manager node, then select *Add Collector*.
- 2 Select *Novell* from the list of vendors from the left panel, then select the desired Sentinel Link version from the list of supported event sources, and click *Next*.



3 Select the Novell Sentinel Link Collector, then click *Next*.



4 Click *Next* to accept the default Collector properties.

For more information on Collector properties, see the Sentinel Link Collector documentation.

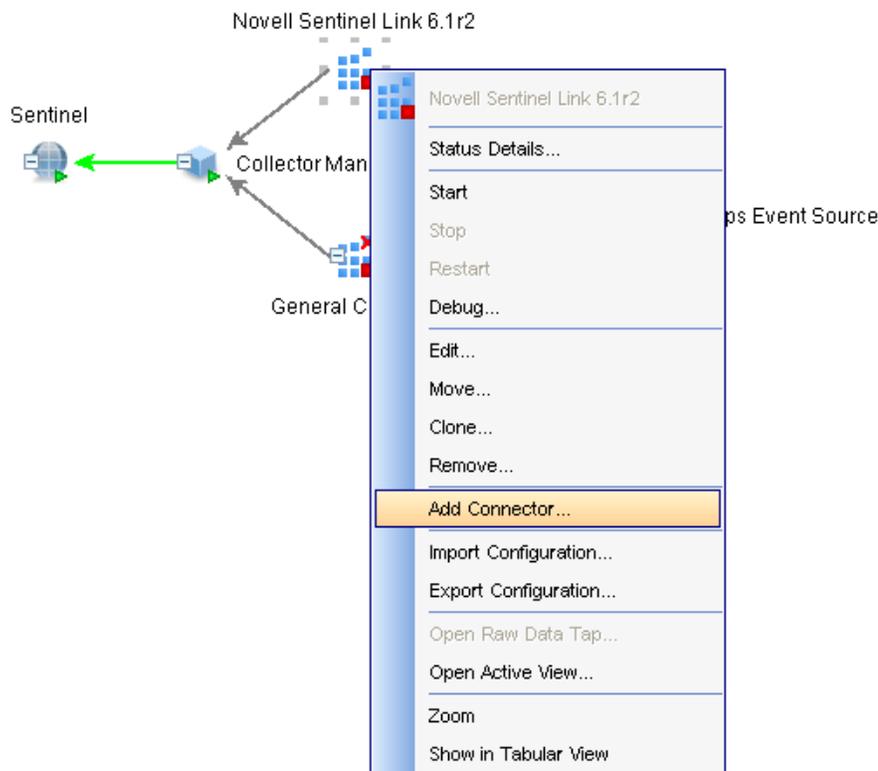
5 Accept the default Collector configuration, then click *Finish* to complete the configuration.

6 Continue with “[Adding a Connector](#)” on page 400.

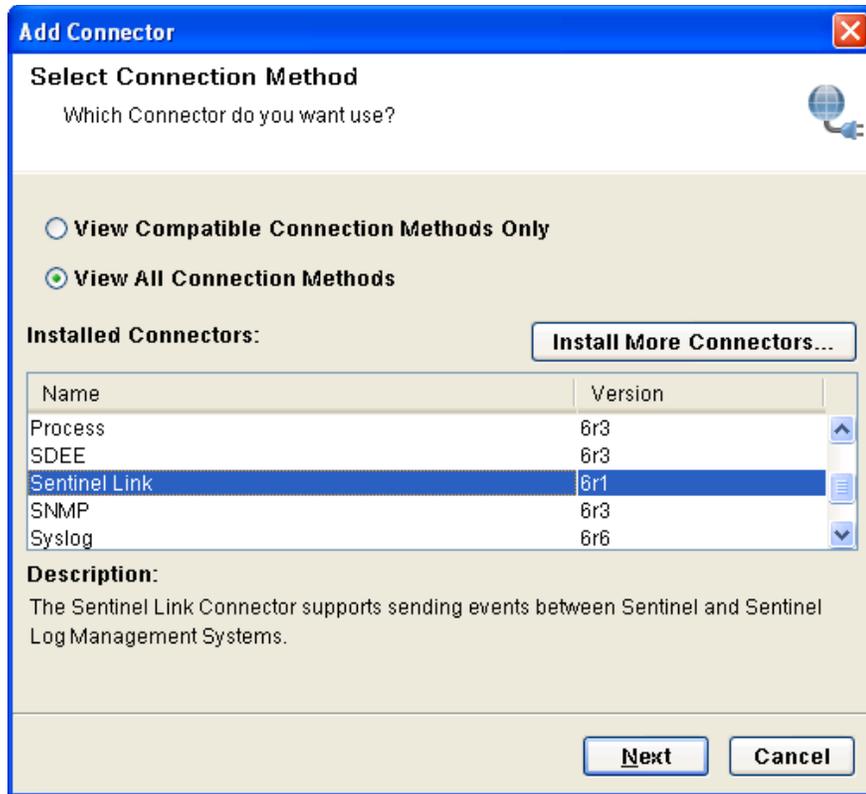
Adding a Connector

In addition to the typical Collector Manager > Collector > Connector > Event Source hierarchy, the Sentinel Link Connector also requires a Sentinel Link Event Source Server.

1 In the Event Source Management (Live View), right-click the Collector node that should process the data retrieved from the Sentinel Link Connector, then select *Add Connector*.



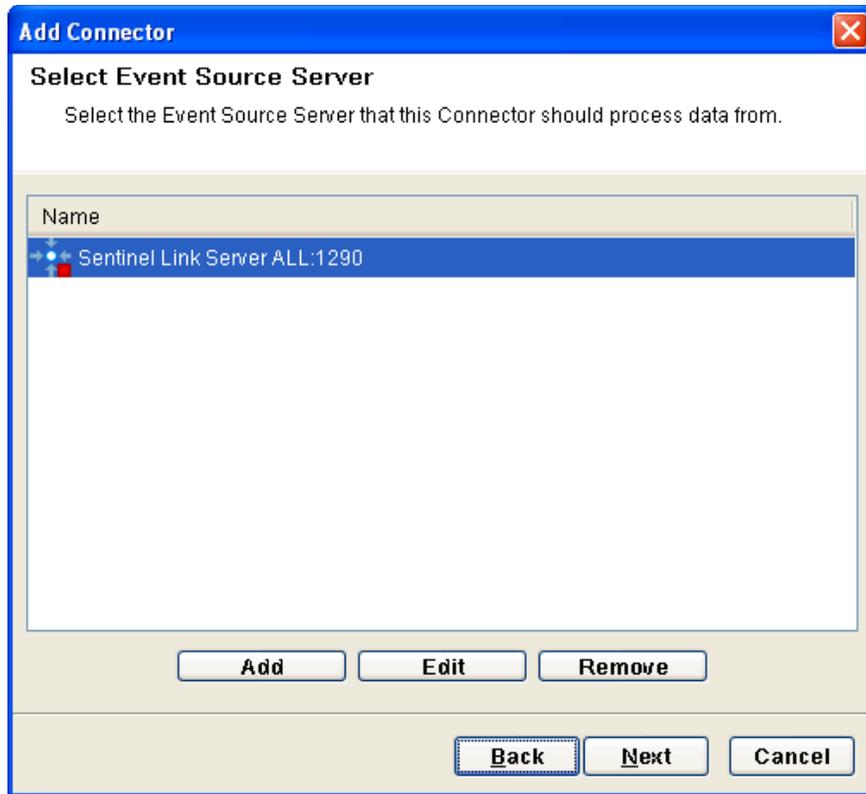
2 In the Select Connection Method window, select *Sentinel Link* from the list of plug-ins, then click *Next*.



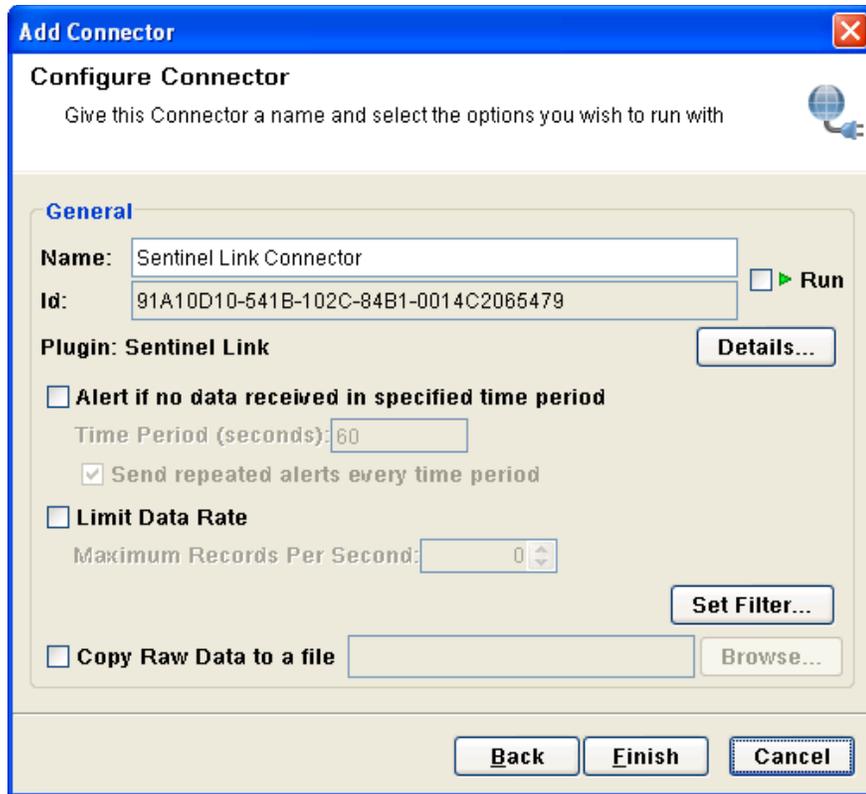
- 3 In the Select Event Source Server window, select the Event Source Server from the list of configured Event Source Servers.

If no Event Source Servers are configured, the following message displays:

There are no Event Source Servers configured on this Collector Manager that match the connection method selected. Please add an Event Source Server with a matching connection method or choose a different connection method.



- 4 Click *Add*, then create an Event Source Server. For more information on creating an Event Source server, see [Step 2](#) through [Step 13](#) in the “[Configuring Sentinel Link Event Source Server](#)” on page 393.
- 5 Click *Next* to open the Configure Connector window.



6 In the Configure Connector window, specify the following:

Options	Description
<i>Name</i>	The name by which you want to identify this Connector.
<i>Id</i>	The Id of the Connector. You cannot change this value.
<i>Details</i>	Click <i>Details</i> if you want to open the Plugin Details window.
<i>Run</i>	(Optional) Select this option if you want to specify that the Connector should by default be started whenever the Collector Manager is started.
<i>Alert if no data received in specified time period</i>	(Optional) Select this option to send <i>No Data Alert</i> event to Sentinel if no data is received by the Connector in the specified time period. You also have an option, <i>Send repeated alerts every time period</i> , to resend the alert if multiple time periods consecutively pass without receiving data from the Connector. Specify the time in seconds. By default the value is 60 seconds.
<i>Limit Data Rate</i>	(Optional) You can set a maximum limit on the rate of data the Connector can send to Sentinel. If the data rate limit is reached, Sentinel begins to throttle back on the source to limit the flow.
<i>Set Filter</i>	(Optional) You can specify a filter for the raw data that passes through this Connector.
<i>Copy Raw Data to a file</i>	(Optional) You can copy the raw data, which passes through this Connector, to a file for further analysis. To save the raw data, click the <i>Browse</i> button to choose a location to save the data.

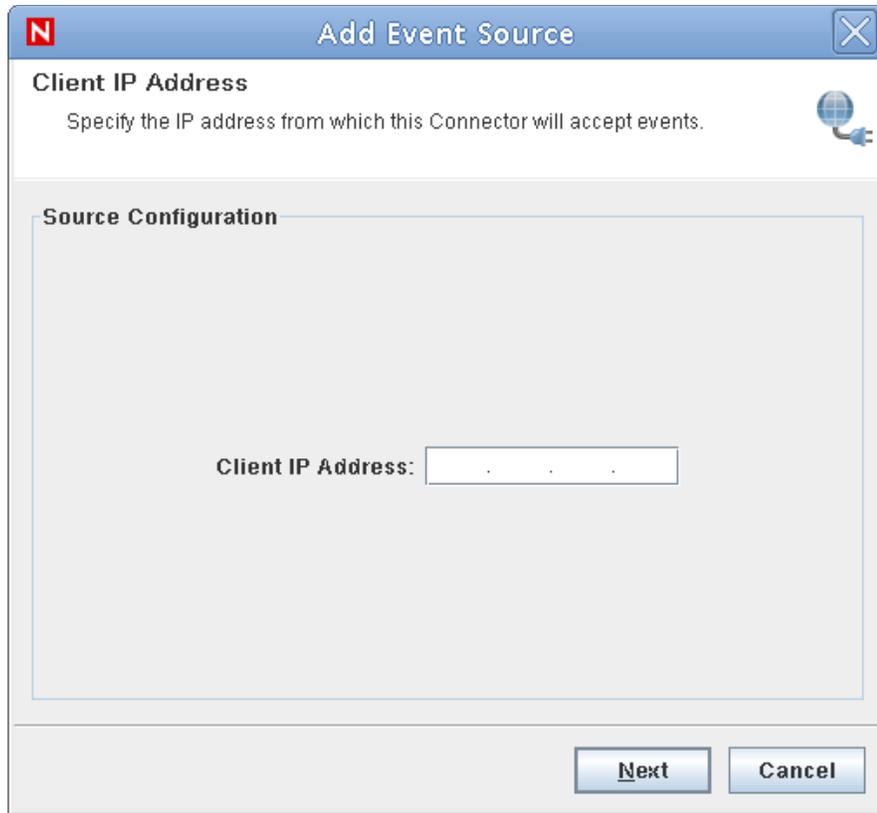
7 Click *Finish* to confirm adding the Connector to the Event Source Management view.

Adding Event Sources

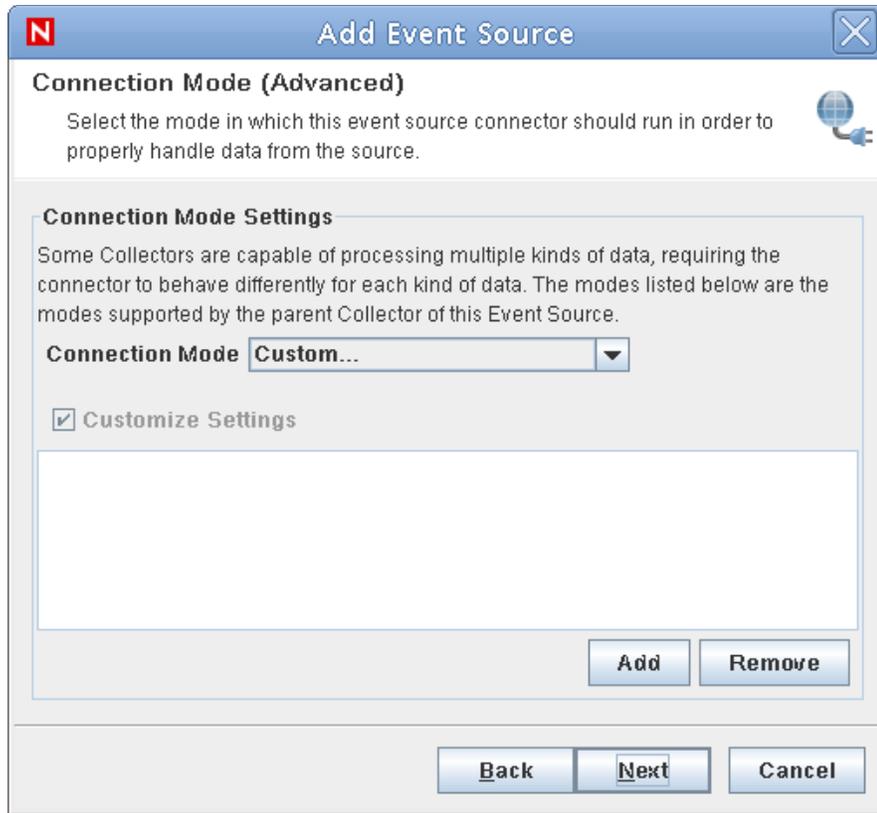
Sentinel Link Event Sources can be automatically detected and added according to user-configured rules, or they can be added manually.

1 In Event Source Management, right-click the Sentinel Link Connector, then select *Add Event Source*.

The Client IP Address window displays.

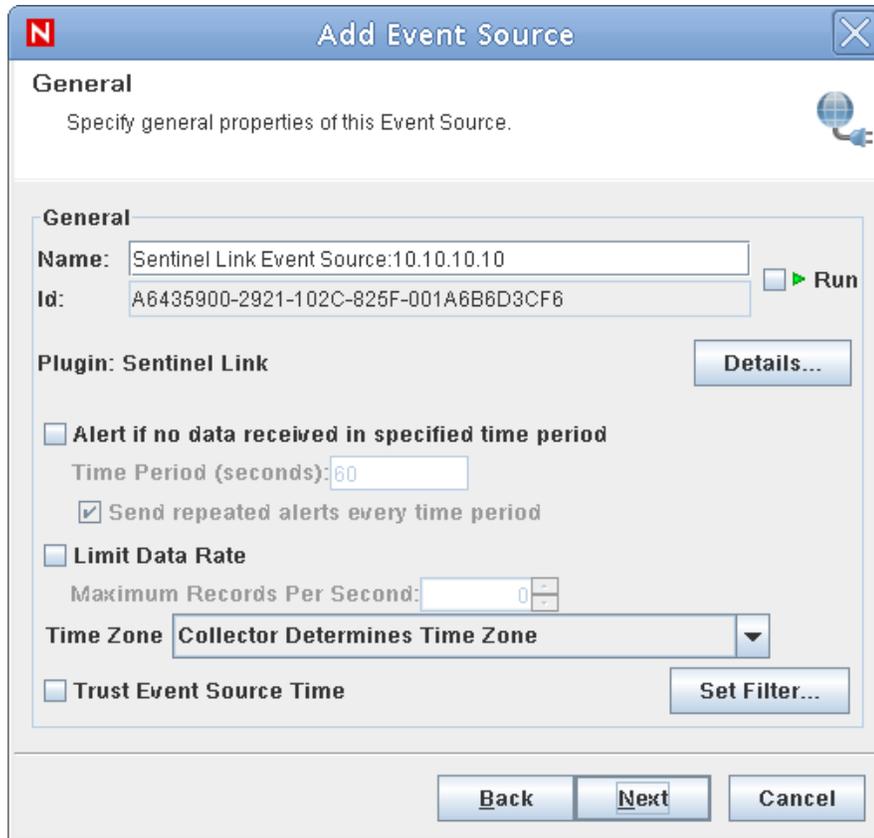


- 2** Specify the IP address of the sender machine, which the Sentinel Link event source receives the messages from.
- 3** Click *Next*.



The Connection Mode (Advanced) window displays and shows all preset connection modes that are supported by the Collector. Each connection mode sends the data in a different format. For the Novell Collectors, which support more than one connection mode for different data formats, see the Collector-specific documentation for information about which mode is appropriate for your particular Event Source.

- 4 Select a Connection Mode.
- 5 Click *Next*. The General window displays.



6 Specify the General settings for the Sentinel Link Connector:

Options	Description
<i>Name</i>	The name by which you want to identify this Event Source.
<i>Id</i>	Specifies the Id of the Event Source.
<i>Details</i>	Click <i>Details</i> to display the Plugin Details window.
<i>Run</i>	(Optional) Select this option to specify that this event source should by default be started whenever the Collector Manager is started.
<i>Alert if no data received in specified time period</i>	(Optional) Select this option to send <i>No Data Alert</i> event to Sentinel, if no data is received by the event source in the specified time period.
<i>Limit Data Rate</i>	(Optional) Set a limit for the rate of data this event source can send to Sentinel. If the maximum rate limit is reached, Sentinel begins to throttle back on the source to limit the flow.
<i>Timezone</i>	Specify the time zone for the event source.
<p>NOTE: This setting is not currently used by a Sentinel Link event source.</p>	

Options	Description
<i>Trust Event Source Time</i>	(Optional) Select this option to have the event time set to the time the event occurred rather than the time Sentinel received the data.
<i>Set Filter</i>	(Optional) Specify a filter on the raw data passing through this event source.

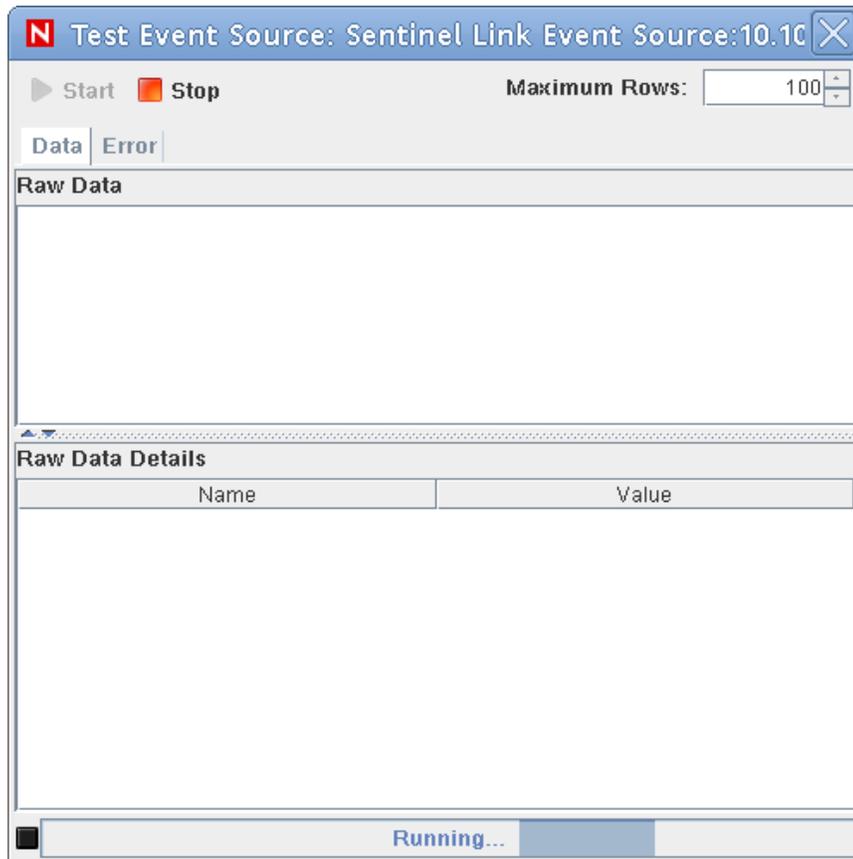
7 Click *Next*.

The Summary window is displayed.

8 To test the configuration, click *Test Connection*.

NOTE: The Sentinel Link Event Source Server and Connector must be running to list the messages in the Test Connection window.

The Test Connection window is displayed with *Data* and *Error* tabs.



8a On the *Data* tab, specify the maximum number of rows of data to be displayed in the Test Connection window at one time.

8b Click *Start* to start the connection test.

The *Data* tab displays the events generated on successful connection with the Event Source.

If there are errors, click the *Error* tab to display any errors in the event source configuration.

8c Click the *Stop* button to stop the connection test.

8d Close the Test Connection window.

9 Click *Finish* to add the Event Source to the Event Source Management view.

17.6 Configuring Sentinel Systems for Sending Events

You can configure Novell Sentinel Log Manager, Sentinel, or Sentinel Rapid Deployment to forward events to another Sentinel system.

- ◆ [Section 17.6.1, “Configuring Sentinel Log Manager as a Sender,” on page 409](#)
- ◆ [Section 17.6.2, “Configuring Sentinel or Sentinel Rapid Deployment System as a Sender,” on page 414](#)

17.6.1 Configuring Sentinel Log Manager as a Sender

In Sentinel Log Manager, the plug-ins and the event forwarding rule by default are installed. You only need to configure the system for Sentinel link and activate the rule for sending the event data.

Follow the instructions below to configure a Sentinel Log Manager for sending the event data:

- ◆ [“Configuring a Sentinel Link” on page 409](#)
- ◆ [“Configuring the Rule to Forward Events to Another System” on page 413](#)
- ◆ [“Activating the Rule to Forward Events to Another Sentinel System” on page 413](#)

Configuring a Sentinel Link

1 Log in to the Sentinel Log Manager Web interface as an administrator.

2 Click *rules* in the upper left corner of the page.

The *Rules* tab is displayed on the right panel of the page.

3 Click the *Configuration* link on the right side of the screen.

Scroll through the configuration settings to find the Sentinel Link settings.

Sentinel Link

Destination:

Port:

Encrypted (HTTPS)

Not Encrypted (HTTP)

Server validation mode:

None - *no server certificate required.*

Strict - *server certificate required.*

Client key pair:

None - *server does not require client certificate.*

Custom - *server validates (strict) client certificate.*

Maximum Event Queue Size (MB):

Drop OLDEST event when queue is full

Drop NEWEST event when queue is full

Maximum Data Rate (Kbps):

Forward Events Immediately

Queue Events Only (do not forward)

Scheduled Event Forwarding

Time Of Day (hh[:mm] [am/pm]) *Duration (Minutes)*

Sunday

4 Specify the following Sentinel Link settings, then click *Save*.

Options	Description
<i>Destination</i>	Specify the IP address or hostname of the receiver, where a Sentinel Link Connector is configured.
<i>Port</i>	Specify the port number for the receiver. The default port is 1290. Click <i>Test</i> to validate the hostname or IP address and port number.
<i>Encrypted (HTTPS) or Non Encrypted (HTTP)</i>	<p>Specify either of the following:</p> <ul style="list-style-type: none">◆ Non Encrypted (HTTP): Provides unsecured connections.◆ Encrypted (HTTPS): Provides secured connections between the Sentinel Link Connector and the Integrator. <p>If you select the encrypted (HTTPS) option, you are allowed to optionally specify a server validation mode and a client key pair.</p> <p>You need to import the client key pair into the Integrator only if the server operates in a mode where it restricts the Integrators it communicates with. The server does this when a client certificate is imported into its trust store.</p> <p>If you import a client key pair into the Integrator, it is assumed that you intend to import the corresponding certificate, which contains the public key, from the client key pair to the trust store of the server.</p> <hr/> <p>NOTE: If the receiver operates in a less restrictive <i>Open</i> mode, where it does not validate the sender certificates, it is not necessary to import a key pair into the receiver system. The receiver ignores even if you import one.</p> <hr/>
<i>Server validation mode</i>	<p>Specify either of the following:</p> <ul style="list-style-type: none">◆ None - no server certificate required: Select this option if you do not want to use any server certificate.◆ Strict - server certificate required: Select this option to import a server certificate. <p>The <i>Import</i> and <i>Details</i> buttons are displayed. If you click <i>Import</i>, a dialog box is opened with the following fields:</p> <ul style="list-style-type: none">◆ Certificate file: Click <i>Browse</i> to add the server certificate file.◆ File password: Specify the password for the certificate file. <p>Click <i>Import</i> to import the server certificate. Click <i>Cancel</i> to close the Import dialog box.</p> <hr/>

Options	Description
<i>Client key pair</i>	<p>Select either of the following:</p> <ul style="list-style-type: none"> ◆ None - server does not require client certificate: The receiver system does not validate the sender certificates. Select this option if the server does not require the client key pair. ◆ Custom - server validates (strict) client certificate: The receiver system validates the sender certificates. Selecting this option allows you to import a client key pair. The <i>Import</i> and <i>Details</i> buttons are displayed. Click <i>Import</i> to open a dialog box with the following fields: <ul style="list-style-type: none"> ◆ Keypair file: Click <i>Browse</i> to import the client keypair file. ◆ File password: Specify the password for the client key pair file. <p>Click <i>Import</i> to import the client key pair.</p> <p>Click <i>Cancel</i> to close the Import dialog box.</p>
<i>Maximum Event Queue Size (MB)</i>	Specify the maximum event queue size value in megabytes. The value must be between 0 and 2147483647.
<i>Maximum Data Rate (Kbps)</i>	<p>The following options are enabled only when you specify a value in the <i>Maximum Event Queue Size (MB)</i> field. The value must be between 0 and 2147483647.</p> <ul style="list-style-type: none"> ◆ Drop OLDEST event when queue is full: Select this option to drop the oldest events in the event queue when the value specified in the <i>Maximum Event Queue Size (MB)</i> field exceeds the limit. ◆ Drop NEWEST event when queue is full: Select this option to drop the newest event when the value specified in the <i>Maximum Event Queue Size (MB)</i> field exceeds the limit.

Options	Description
Event Forwarding mode	<p>Select one of the following options to specify the Event Forwarding Mode:</p> <ul style="list-style-type: none"> ◆ Forward Events Immediately: Select this option to forward the events immediately to the receiver. ◆ Scheduled Event Forwarding: Select this option to schedule event forwarding. You can specify <i>Time Of Day</i> and <i>Duration</i> (in minutes) for each day of the week. The valid format for <i>Time Of Day</i> is hh:[mm] [am pm]. The duration must be between 1 and 1440 minutes. If you do not specify time or duration for any of the days in the week, the schedule is considered to be 24 hours a day, seven days a week. It is equivalent to the <i>Forward Events Immediately</i> option. ◆ Queue Events Only (do not forward): Select this option to stop forwarding events to the receiver system. However, the integrator stores events it receives in its queue unless the queue has a size limit and has reached its capacity. This mode is useful if the receiver is down for maintenance or any network problems persist in communicating with the receiver system that might not be fixed immediately. In such situations, rather than continually trying to forward events, you can select this option to temporarily stop forwarding messages. After the problems are resolved, you can re-enable event forwarding by selecting the <i>Forward Events Immediately</i> or <i>Scheduled Events Forwarding</i> options.

Configuring the Rule to Forward Events to Another System

The Sentinel Log Manager is installed with a rule that forwards events to another sentinel system. The rule is called Forward Events to Another Sentinel System. By default, the Forward Events To Another Sentinel System rule is configured to filter out internal system events and events with severity greater than three. This rule filters the following three types of system events:

- ◆ Audit (A)
- ◆ Performance (P)
- ◆ Internal (I)

You can also change the conditions of the rule to filter more events or remove conditions to filter fewer events.

Novell recommends that you configure the rule to forward only those events that you want to store on the Sentinel system for more in-depth reporting and analysis.

Activating the Rule to Forward Events to Another Sentinel System

The Forward Events To Another Sentinel System rule is installed with Log Manager, but it is in the inactive (off) state. To forward the system events to another Sentinel system, the rule must be activated, and the Sentinel Link Integrator settings must be configured.

- 1 Log in to the Log Manager Web interface as an administrator.

- 2 Click *rules* in the upper left corner of the page.
- 3 The *Rules* tab displays on the right panel of the page.
The Forward Events To Another Sentinel System rule displays under the *Rules* tab.
- 4 To activate the Forward Events To Another Sentinel System rule, click the check box next to the rule.
If the rule is activated, a `Successfully activated the rule` message is displayed.

17.6.2 Configuring Sentinel or Sentinel Rapid Deployment System as a Sender

If Sentinel or Sentinel Rapid Deployment is the sender, you must configure the Sentinel Link Integrator plug-in and Sentinel Link Action plug-in to create a Sentinel Link configuration. You also need to create an action that forwards the selected events to the receiver system. To filter the events, set a correlation rule by using the Correlation Manager. After creating the rule, associate the action to it, and deploy the rule. You can also use Global Filters to filter the events and forward them to the receiver system.

Follow the instructions given below to configure Sentinel or Sentinel Rapid Deployment server for sending the events:

- ♦ [“Configuring the Integrator Plug-In” on page 414](#)
- ♦ [“Configuring the Action Plug-In” on page 421](#)
- ♦ [“Filtering Events to Forward to the Receiver” on page 421](#)

Configuring the Integrator Plug-In

The Sentinel Link Integrator allows you to forward the events to another Sentinel system.

To use an Integrator plug-in, one or more Integrator instances must be configured with valid connection information.

- 1 Log in to the Novell Sentinel Control Center as an administrator.
- 2 Select *Tools > Integrator Manager*. The Integrator Manager window displays.
- 3 Click the *Add Integrator* icon in the bottom left corner. The Basic Information window displays.

Configure Integrator

Basic Information
Provide general information to configure the Integrator

Select Integrator: Sentinel Link Integrator

ID Number: 2D480CC0-4547-102C-BBEE-000C29FE6889

Type: Sentinel Link Integrator

Name: Sentinel Link

Service Category: AS - Antispam

Description:

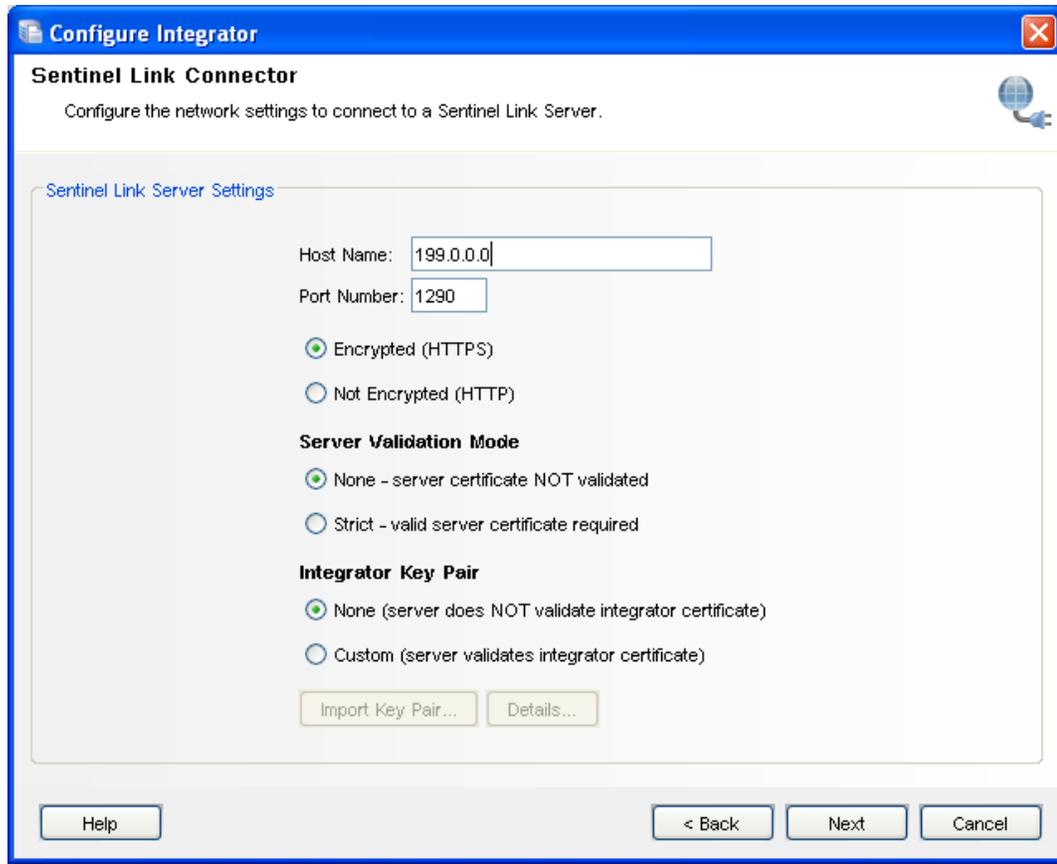
Buttons: Help, Add Integrator Plugin, Next, Cancel

- 4 Select *Sentinel Link Integrator* from the *Select Integrator* drop-down list.
- 5 Click *Add Integrator Plugin* to import the Integrator plug-in, if the Integrator plug-in is not already available.
The *ID Number* is the system-generated ID for the Integrator configuration and cannot be edited.
Type represents the type of Integrator plug-in selected from the drop-down.
- 6 Specify a name for the integrator in the *Name* field.
- 7 Specify a description for the integrator in the *Description* field.
- 8 Select an Integrator Service category from the *Service Category* drop-down list, or type a name in the field to create a custom service type. These services are used to group similar Integrator instances. The following table list of the Integrator Service categories:

Integrator Service Category	Description
AS	Antispam
AV	Antivirus
BM	Business Management
CM	Configuration Management
DB	Database

Integrator Service Category	Description
EML	E-Mail System
FIN	Financial Application
FW	Network Firewall
HFW	Host-based Firewall
HR	HR Application
IDM	Identity Management
IDS	Intrusion Detection/Prevention System
INCM	Incident Management
NETD	Network Router/Switch
OS	Operating System
PROX	Proxy
STO	Storage
VPN	Virtual Private Network
VULN	Vulnerability Scanner
WEB	Web Server

9 Click *Next*. The Sentinel Link Server Settings window displays.



- 10 Specify the IP address or hostname of the Sentinel Link server, where the Sentinel Link Connector is running.
- 11 Specify the port number for the sentinel system. The default port is 1290.
- 12 Select either of the following:
 - ♦ **Not Encrypted (HTTP):** Establish an unsecured connection.

- ◆ **Encrypted (HTTPS):** Establish a secured connection. If you select the encrypted (HTTPS) option, you are optionally allowed to specify a Server validation mode and an Integrator key pair.

Field	Description
Server Validation Mode	<p>Select either of the following:</p> <ul style="list-style-type: none"> ◆ None- server certificate NOT validated: The Integrator does not validate the receiver's certificate. ◆ Strict - valid server certificate required: The Integrator always verifies the receiver's certificate when connecting to the receiver. If this option is selected, the Integrator immediately attempt to retrieve the receiver's certificate over the network and validate that it is issued by an authorized CA. <p>If the certificate is not validated for some reason, 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. Henceforth, the Integrator allows communication only with a receiver that provides that certificate during the initial connection setup.</p>
Integrator Key Pair	<p>Select either of the following:</p> <ul style="list-style-type: none"> ◆ None (server does not validate integrator certificate): The receiver system does not validate the sender certificates. Select this option if the receiver's client authentication type is configured to <i>Open</i>. ◆ Custom (server validates integrator certificate): The receiver system validates the sender certificates. Select this option if the receiver's client authentication type is configured to <i>Strict</i>. If the receiver system performs a strict validation, it imports a trust store, which contains all the sender certificates that it trusts. <p>After selecting this option, click the <i>Import Key Pair</i> button to import a key pair. The key pair you import must match one of the certificates that is included in the trust store, which is imported by the receiver system.</p>

13 Click *Next*. The Queue Settings window displays.

14 Specify the following:

Options	Description
<i>Maximum Event Queue Size (MB)</i>	<p>Specify the maximum event queue size value in megabytes. The value must be between 0 and 2147483647.</p> <p>The following options are enabled only when you specify a value in the <i>Maximum Event Queue Size (MB)</i> field.</p> <ul style="list-style-type: none"> ◆ Drop OLDEST event when queue is full: Select this option to drop the oldest events in the event queue when the value specified in the <i>Maximum Event Queue Size (MB)</i> field exceeds the limit. ◆ Drop NEWEST event when queue is full: Select this option to drop the newest event when the value specified in the <i>Maximum Event Queue Size (MB)</i> field exceeds the limit.
<i>Maximum Data Rate (Kbps)</i>	<p>Specify the maximum data rate value in kilobytes per second. The value must be between 0 and 2147483647.</p>

Options	Description
<i>Event Forwarding Mode</i>	<p>Select one of the following options to specify the Event Forwarding Mode:</p> <ul style="list-style-type: none"> ◆ Send Immediately: Select this option to forward the events immediately to the receiver. ◆ Scheduled: Select this option to schedule event forwarding. You can specify <i>Time Of Day</i> and <i>Duration</i> (in minutes) for each day of the week. The valid format for <i>Time Of Day</i> is hh:[mm] [am pm]. The duration must be between 1 and 1440 minutes. If you do not specify time or duration for any of the days in the week, the schedule is considered to be 24 hours a day, seven days a week. It is equivalent to the <i>Forward Events Immediately</i> option. ◆ Queue Only (don't forward): Select this option to stop forwarding the events to the receiver system. However, the integrator stores the events it receives in its queue unless the queue has a size limit and has reached its maximum capacity. This mode is useful if the receiver is down for maintenance or any network problems persist in communicating with the receiver system that might not be fixed immediately. In such situations, rather than continually trying to forward events, you can select this option to temporarily stop forwarding messages. After the problems are resolved, you can re-enable event forwarding by selecting the <i>Forward Events Immediately</i> or <i>Scheduled Events Forwarding</i> options.

15 Click *Next*. The Integrator Properties window is displayed.

If the connection for your Sentinel Link server requires additional properties to establish a connection other than the fields provided, you can use the *Add* button to add properties. Specify the Property Name and Value. Press Enter. The Property is added to the Properties list in the Integrator Properties window. You can edit the property values if required. Repeat the steps to add more properties.

16 Click *Next*. The Integrator Configuration Summary window is displayed.

17 Click *Finish* to confirm configuring the Sentinel Link Integrator.

18 (Conditional) Click *Revert* to revert unsaved Integrator settings.

19 (Optional) To test the connection of the configured Sentinel Link Integrator, perform the following:

19a In the Integrator Manager window, select the Sentinel Link Integrator.

19b Click *Test* to test the configuration.

A message is displayed stating that the Integrator test was successful, then click *OK*.

NOTE: This method tests the connection without actually sending any events to the Sentinel Link server. It does not update any statistics for the Integrator.

Configuring the Action Plug-In

- 1 Log in to the Sentinel Control Center system as the administrator.
- 2 Select *Tools > Action Manager*.
- 3 In the Action Manager window, click *Add*.
The Configure Action window is displayed.
- 4 Specify the following:
 - ♦ **Action Name:** Specify a name for the action. For example, Sentinel Link.
 - ♦ **Action:** Select *Sentinel Link 6.1r1* from the drop-down.
 - ♦ **Integrator:** Select *Sentinel Link* from the drop-down.

Name	Value
Integrator	Sentinel Link

- 5 Click *Save*.

Filtering Events to Forward to the Receiver

To select events that you want to forward to a receiver system, you need some filtering mechanism. Use Correlation Manager or Global Filters to filter the desired events for forwarding to the receiver system.

NOTE: To forward events to another Sentinel or Sentinel Log Manager system based on simple filtering conditions, use Sentinel Link with Global Filters.

Sentinel Link can also be used wherever a JavaScript action can be executed in Sentinel such as Correlation, Incidents, and Event right-click. However, while event forwarding, the same event is likely to be forwarded more than once with these mechanisms. For example, using Correlation, you

can have `filter(1=1)` and `filter(e.sev>=3)` configured, and launch Sentinel Link action to forward the events to the same receiver. When the action is triggered, the receiver gets duplicated events. Therefore, use them only when simple filtering conditions are not enough.

Note that some field values of the events are changed during event forwarding. For example, the event id is changed, but, the event name is preserved when you forward an event.

Another advantage of Global Filters over Correlation rule is that the events are sent in batches of 500 events to the receiver system. With Correlation rule, each event is forwarded to the receiver system as soon as an event is generated.

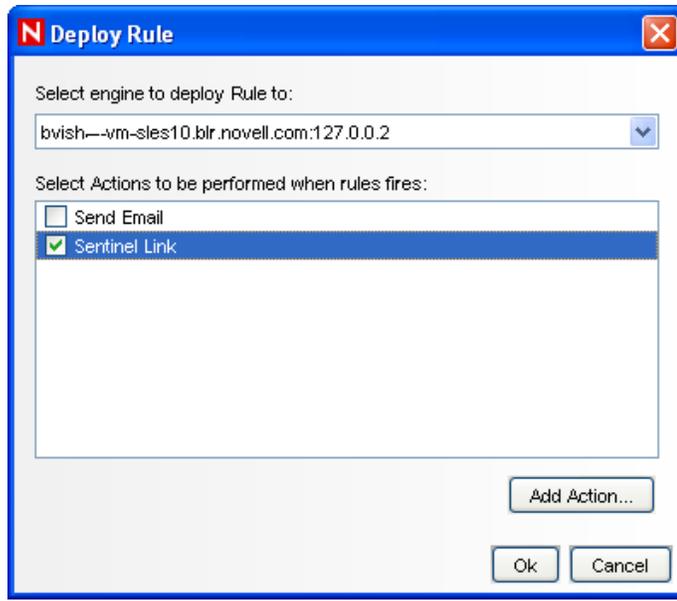
-
- ♦ [“Using Correlation Manager to Forward Events to the Receiver” on page 422](#)
 - ♦ [“Using Global Filters to Forward Events to the Receiver” on page 423](#)

Using Correlation Manager to Forward Events to the Receiver

Use Correlation Manager to set correlation rules that filter the desired events for forwarding to the receiver system. After creating a rule, add the Sentinel Link Action, then deploy the rule.

In the following example, a simple rule is created that forward events with severity greater than 3.

- 1** In the Sentinel Control Center, select *Correlation Rule Manager*.
- 2** Click *Add*.
The Correlation Rule wizard is displayed.
- 3** Click *Simple*. The Simple Rule windows is displayed.
- 4** Use the drop-down menus to set the criteria to `Severity>=3`, then click *Next*. The Update Criteria window displays.
- 5** Select *Do not perform actions every time this rule fires* and use the drop-down menu to set the time period to 1 minute. Click *Next*. The General Description window displays.
- 6** Name the rule as *Sev4Rule*, provide a description, and click *Next*.
- 7** Select *No, do not create another rule* and click *Next*.
- 8** Click *Save*.
- 9** Select the Correlation Rule Manager window.
- 10** Select *Sev4Rule* and click *Deploy Rules* link. The Deploy Rule window displays.
- 11** In the Deploy Rule window, select the Engine to deploy the rule.



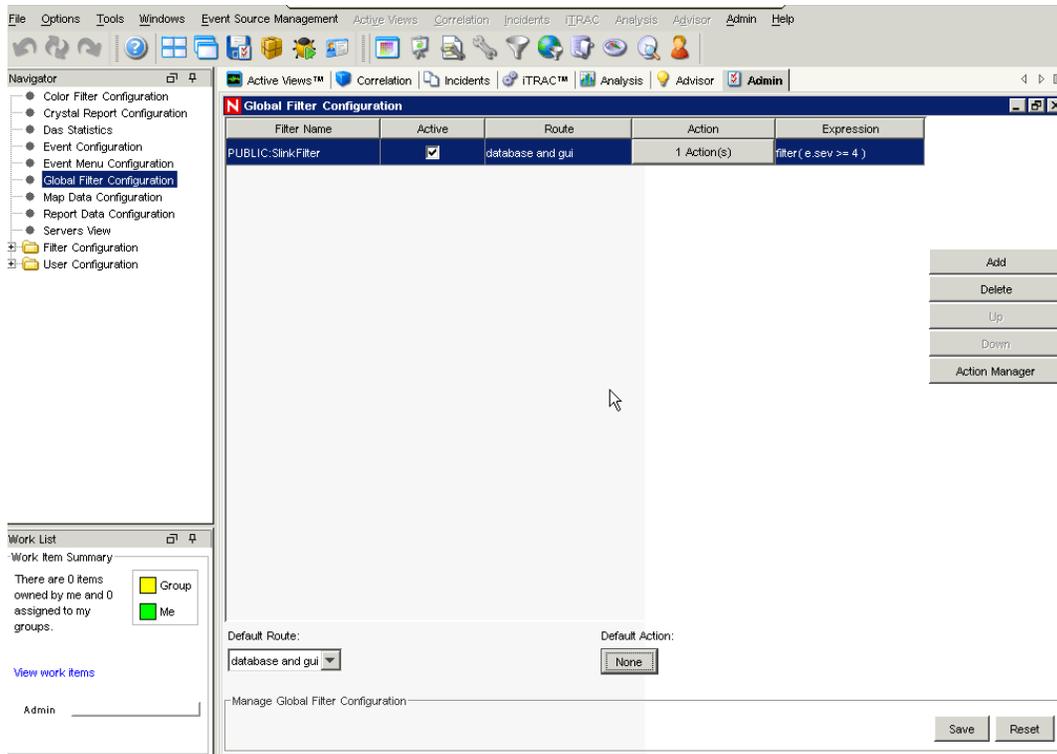
12 Select *Sentinel Link*, then click *OK*.

Using Global Filters to Forward Events to the Receiver

Use Global Filters to filter the desired events for forwarding to the receiver system. In the Global Filter Configuration window, you can add the Sentinel Link Action, then deploy the rule.

NOTE: This feature is supported only on Sentinel 6.1 SP1 Hotfix 2 or later, and Sentinel 6.1 Rapid Deployment 6.1 Hotfix 2 or later.

- 1** In the Sentinel Control Center, select the *Admin* Tab.
- 2** In the left navigation bar, select Global Filter Configuration.



The Global Filter Configuration window is displayed.

3 Click the *Add* button on the right-side of the window.

4 Click the button below the *Filter Name* field, then click the drop-down to set a filter.

For more information on Filters, see [Filters \(http://www.novell.com/documentation/sentinel61rd/s61rd_user/data/filters.html\)](http://www.novell.com/documentation/sentinel61rd/s61rd_user/data/filters.html) in the *Sentinel 6.1 Rapid Deployment User Guide*.

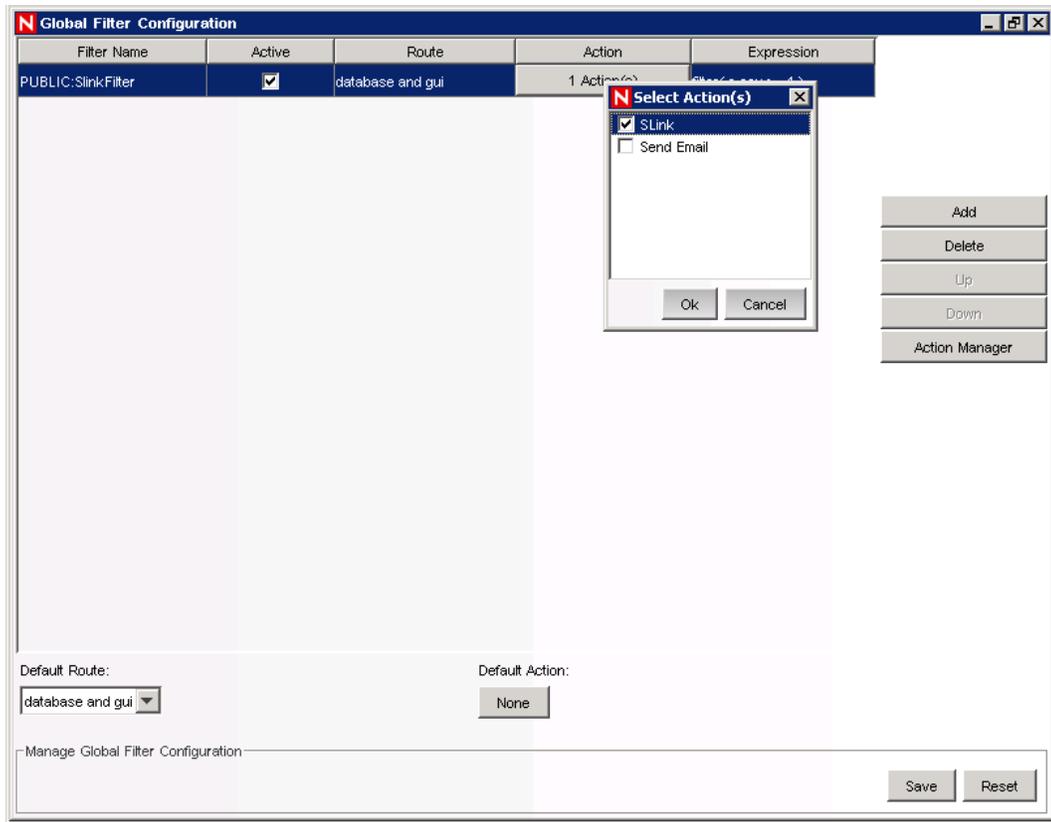
5 Select the *Active* check box.

6 Select a Route from the drop-down:

Based on the selection, the events are either dropped or sent to the selected option.

- ◆ drop
- ◆ database only
- ◆ database and gui
- ◆ gui only

7 Click the button below the *Action* field.



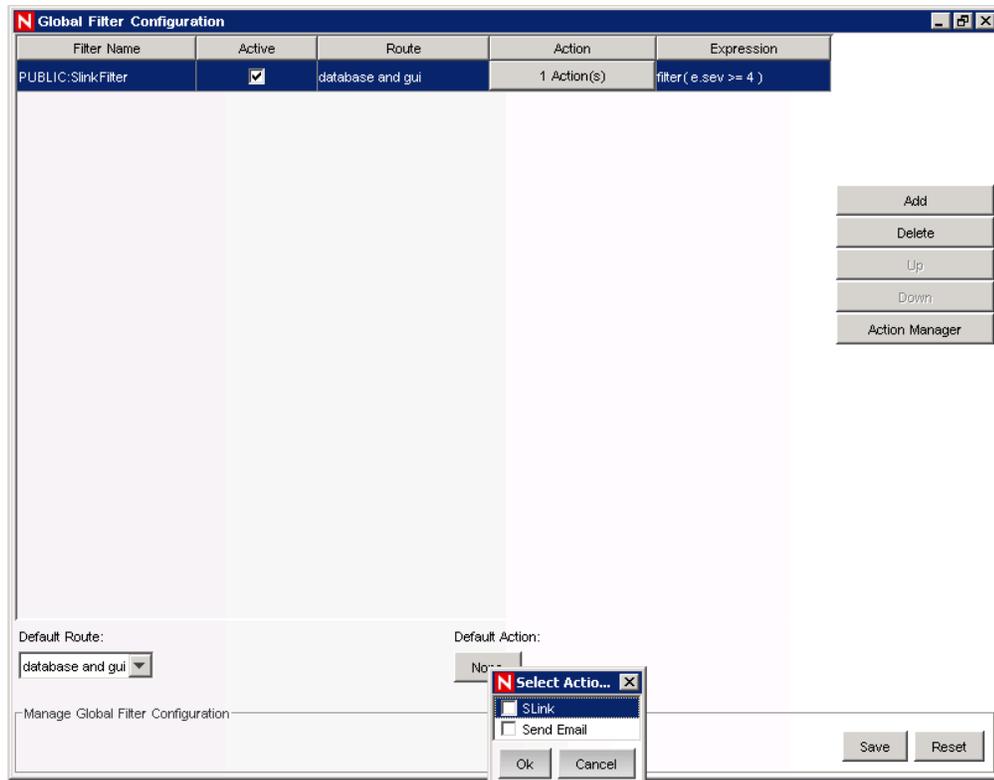
The Select Action window is displayed.

- 8 Select the Sentinel Link Action, then click *OK*.

If you have not created one, click *Action Manager* button at the right-side of the window, then follow the instructions.

- 9 Alternatively, you can also add Sentinel Link Action as the default Action.

9a Click the button below the Default Action.



9b Select the Sentinel Link Action, then click *OK*.

10 Click *Save*.

17.7 Verifying a Sentinel Link

In this example, a Sentinel Rapid Deployment machine is used as the sender and a Novell Sentinel Log Manager machine is used as the receiver.

- 1** Configure a Sentinel Rapid Deployment machine for sending events.
For detailed instructions, see [Section 17.6.2, “Configuring Sentinel or Sentinel Rapid Deployment System as a Sender,”](#) on page 414.
- 2** Configure a Novell Log Manager machine for receiving the events.
For detailed instructions, see [Section 17.5, “Configuring Sentinel Systems for Receiving Events,”](#) on page 392.
- 3** On the sender machine, generate an event with severity greater than 3, such as a failed login.

4 To view that event, go to the Novell Log Manager Web interface, then search for events with sev:[3 TO 5].

The screenshot shows the Novell Log Manager Web interface. At the top, there is a search bar with the query 'sev:[3 TO 5]' and a 'Search' button. Below the search bar, there are options to 'include system events' and 'search tips'. The main content area displays a list of search results for 'sev:[3 TO 5]'. On the left side, there is a sidebar with '3 events' and 'SORT BY' options: 'loosely time-sorted (faster)' (selected) and 'strictly time-sorted'. Below the sidebar, there are 'REFINE' options and a list of fields: 'DataContext (0)', 'EffectiveUserID (0)', 'EffectiveUserName (0)', 'EventName (1)', 'InitHostDomain (0)', 'InitHostName (0)', 'InitIP (0)', and 'InitServiceName (0)'. The search results list three 'Collector Message' events, each with a red arrow icon and a '5' in a red box. The first event is dated 9/9/09 at 6:50:05 PM. The second event is dated 9/9/09 at 2:13:10 PM. The third event is dated 9/7/09 at 3:51:46 PM. Each event includes details such as 'Unknown Initiator', 'Unknown Target', 'Unknown Domain', 'Unknown IP', and 'Unknown Observer'. The message for each event is: 'Message: TypeError: Cannot read property "unmodifiableData" from null'. The event IDs are: C4C66581-79CA-102C-A4D5-001CC00503E5, C4C66581-79CA-102C-9EF6-001CC00503E5, and C4C66580-79CA-102C-B49A-001CC00503E5. The retention periods are: min 12/9/09 (Default Data Retention), min 12/9/09 (Default Data Retention), and min 12/7/09 (Default Data Retention). Each event has a 'details-' link to its right.

- ♦ [Section 18.1, “Overview,” on page 429](#)
- ♦ [Section 18.2, “Identity Browser,” on page 432](#)
- ♦ [Section 18.3, “Reports,” on page 437](#)

18.1 Overview

Novell Sentinel 6.1 provides an integration framework for identity management systems. This integration provides functionality on several levels:

- ♦ Identity Browser provides the ability to look up the following information about a user:
 - ♦ Contact information
 - ♦ Accounts associated with that user
 - ♦ Most recent authentication events
 - ♦ Most recent access events
 - ♦ Most recent permissions changes
- ♦ Identity Browser lookup from events
- ♦ Reports and correlation rules provide an integrated view of a user's true identity, even across multiple system on which that user has separate accounts. For example, accounts like `NOVELL\testuser`; `> cn=testuser,ou=engineering,o=novell`, and `TUser@novell.com` can be mapped to the actual person who owns the accounts.

By displaying information about the people initiating a given action or people affected by an action, incident response times are improved and behavior-based analysis is enabled.

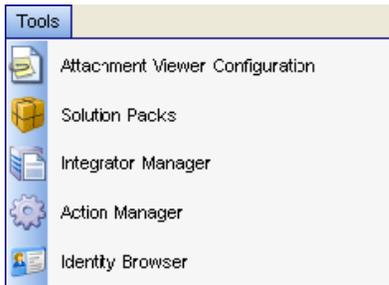
Novell provides an optional integration with Novell Identity Manager. The screenshots and descriptions in this section are based on Novell Identity Manager.

Sentinel 6.1 synchronizes Identity information with major Identity Management systems and stores local copies of key information about each Identity. The following table summarizes the commonly-used information provided:

Name	Description
AccountGUID	Auto-generated internal ID
Name	User name that references the account, generally provided by the user to log in.
ID	The numeric or other identifier that represents the account in Event Source. This ID is used for resolution when the username is not available.
Authority	The realm within which this account is unique. Collectors will calculate the realm based on event information.
Status	The status of the account
IdentityGUID	A reference to the identity that owns this account

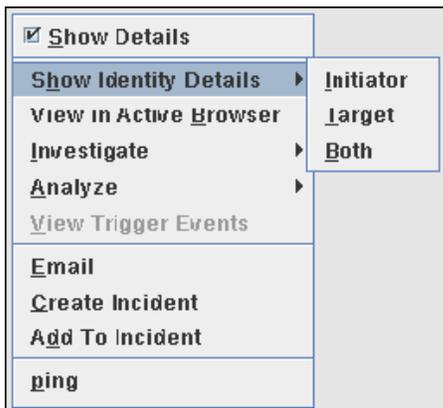
The Identities stored by Sentinel are then linked with accounts created on endpoint systems by the Identity Management system. This helps Sentinel associate the correct Identity information with the native events from those endpoint system. Some Identity information is injected directly into the inbound event by using the mapping service. The remaining identity information, such as photograph and contact information, is accessible through the Identity Browser.

Figure 18-1 *Accessing the Identity Browser*



The Identity information injected into the event can be used for correlation and for performing actions on the Identities that are associated with detected activity. For example, Sentinel is able to see multiple failed logins from a given person and not just an account. A detected violation could trigger disabling activities for all accounts associated with an Identity.

Figure 18-2 *Identity Details*



18.1.1 Integration with Novell Identity Manager

Integration with Novell Identity Manager is available as part of the Novell Compliance Management Platform, which includes the following components:

- ◆ Sentinel 6.1
- ◆ Identity Manager 3.6
- ◆ Access Manager 3.0.3
- ◆ Identity Tracking Solution Pack for Sentinel 1.0
- ◆ Analyzer for Identity Manager 1.0
- ◆ Identity Manager Resource Kit 1.2
- ◆ Identity Manager Driver for Sentinel 3.6

The Solution also requires “identity-enabled” Collectors, which are available for download at the [Sentinel Content Web site \(http://support.novell.com/products/sentinel/sentinel61.html\)](http://support.novell.com/products/sentinel/sentinel61.html).

After Sentinel and Identity Manager are installed, the Sentinel Driver for Identity Manager sends identity and account information from the Identity Vault to the Sentinel Identity Vault Collector, which populates the Sentinel database. The information is inserted into two new tables in Sentinel 6.1. These two tables are the Identity table (USR_IDENTITY) and the Account table (USR_ACCOUNT). For more information, see “[Sentinel Database Views for Oracle](#)” and “[Sentinel Database Views for Microsoft SQL Server](#)” in *Sentinel 6.1 Reference Guide*.

The time required to initially populate the Sentinel database will depend on the amount of data in the Identity Vault; identity information including photographs will require significantly more time to load.

The Sentinel Driver for Identity Manager and Identity Vault Collector also keep the identity information synchronized as information is updated in the Identity Vault during normal Identity Manager operations.

After the identity information and account information are loaded in their respective tables with a link between them, a map named `IdentityAccount` is generated automatically in the location `ESEC_HOME/DATA/MAP_DATA`. The map contains the following information:

- ◆ Account Name
- ◆ Authority
- ◆ Customer Name
- ◆ Identity GUID
- ◆ Full Name
- ◆ Department
- ◆ Job Title
- ◆ Manager GUID
- ◆ Account Status

IMPORTANT: An identity can have multiple accounts but one account cannot be assigned to multiple identities.

The identity map is automatically applied to all events from Collectors to look for an identical match between the information in the event and key fields in the map. The table below shows the fields that are populated if all of the map key fields and event data exactly match. These mappings are automatically configured and are not editable.

Label	Populated by which Column from IdentityAccount Map	Map Key Field : Event Label
InitUserDepartment	Department	Account Name : InitUserName Authority : InitUserDomain Customer Name : MSSPCustomerName

Label	Populated by which Column from IdentityAccount Map	Map Key Field : Event Label
InitUserFullName	Full Name	Account Name : InitUserName Authority : InitUserDomain Customer Name : MSSPCustomerName
InitUserIdentity	Identity GUID	Account Name : InitUserName Authority : InitUserDomain Customer Name : MSSPCustomerName
TargetUserDepartment	Department	Account Name : TargetUserName Authority : TargetUserDomain Customer Name : MSSPCustomerName
TargetUserFullName	Full Name	Account Name : TargetUserName Authority : TargetUserDomain Customer Name : MSSPCustomerName
TargetUserIdentity	Identity GUID	Account Name : TargetUserName Authority : TargetUserDomain Customer Name : MSSPCustomerName

NOTE: To find a match, the event fields and map key fields must match exactly. This may require modifications to existing Collectors to “identity enable” them to parse or concatenate data to make these fields match the data from the Identity Vault.

Once added to the event by the mapping service, these fields are used by correlation rules, remediation actions, and reports in the Identity Tracking Solution Pack. In addition to using the content included in the Solution Pack, users can also perform the following actions:

- ♦ Create correlation rules based on identity in addition to account name. This allows you to look for similar events from a single user, which provides a more comprehensive view than looking at events from a single account
- ♦ Create reports that show identity, including all accounts associated with a user
- ♦ Use the Identity Browser to get more information about a user and their activity

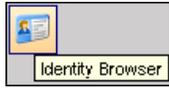
NOTE: For other identity systems, similar integration can be achieved by writing an identity synchronization collector that uses the Identity API.

18.2 Identity Browser

Identity Browser in Sentinel allows you to search and view user profiles of the identities in the Sentinel database that have been synchronized from the identity management system. In addition to information from the identity management system, the Identity Browser also shows recent activity for the user that has been collected using the Sentinel Collectors.

To open Identity Browser:

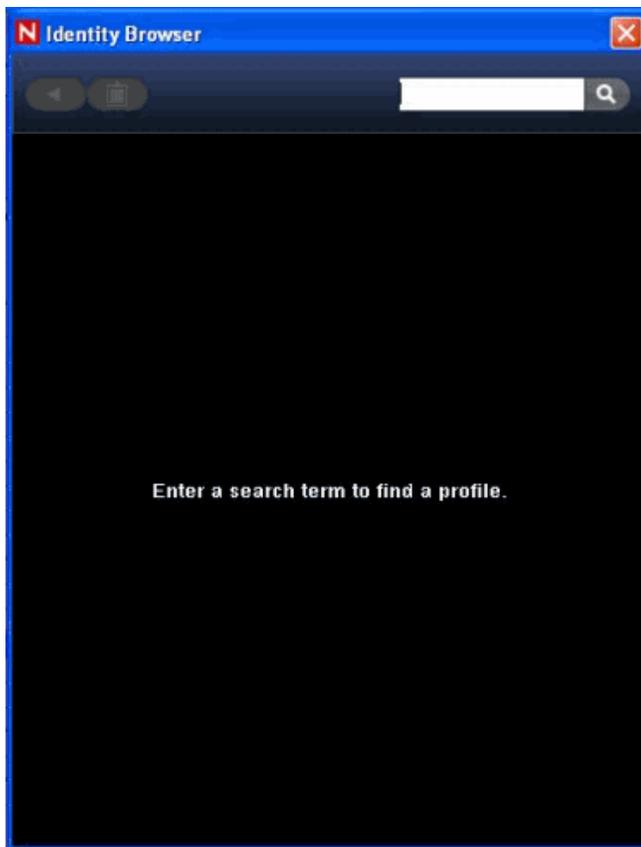
- 1 Click Tools menu and select Identity Browser. The Identity Browser window displays.
Alternatively, you can launch the Identity Browser through the icon that appears when you launch the Sentinel Control Center.



18.2.1 Searching Profiles

To search profiles:

- 1 Click Tools menu and select Identity Browser. The Identity Browser window displays.

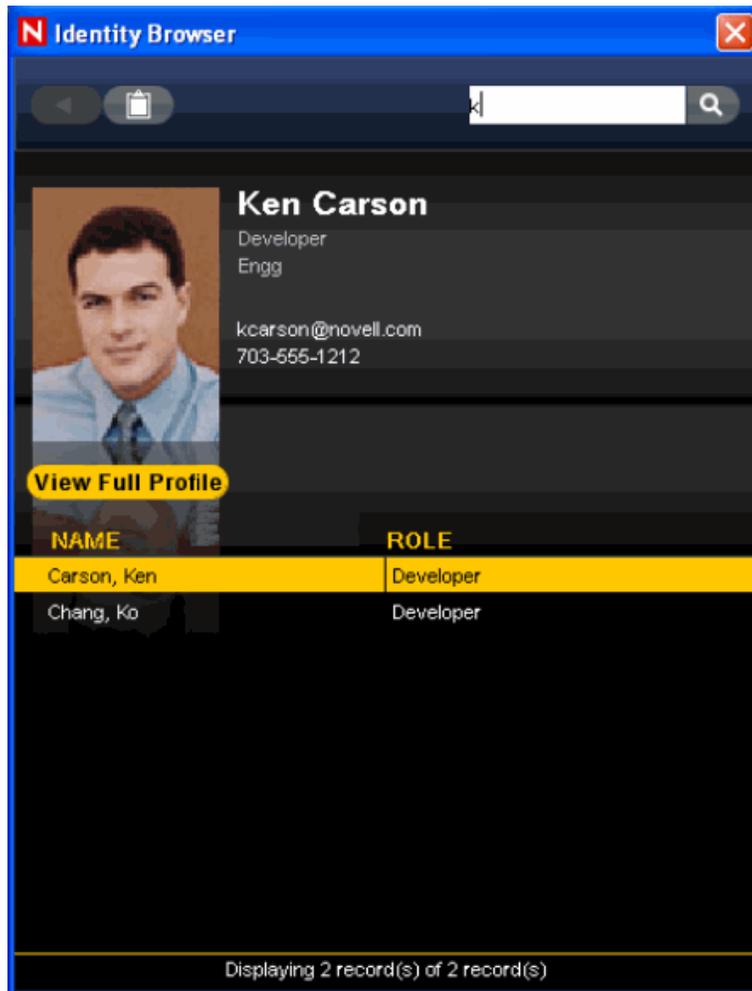


- 2 Enter the first name or last name or first character of either name for the profile in the Search box.

TIP: You can input letter(s) and you can view all the identities whose first or last name starts with the letter(s). For example, if the user enters the letter “ab” then the names Abraham, Abdullah and so on will be matched.

If the search is broad, the results will show the first 100 names with a Load <x> More Records button, where <x> depends on the number of records remaining and can be up to 100.

- 3 Click Search Icon. The searched profile displays:

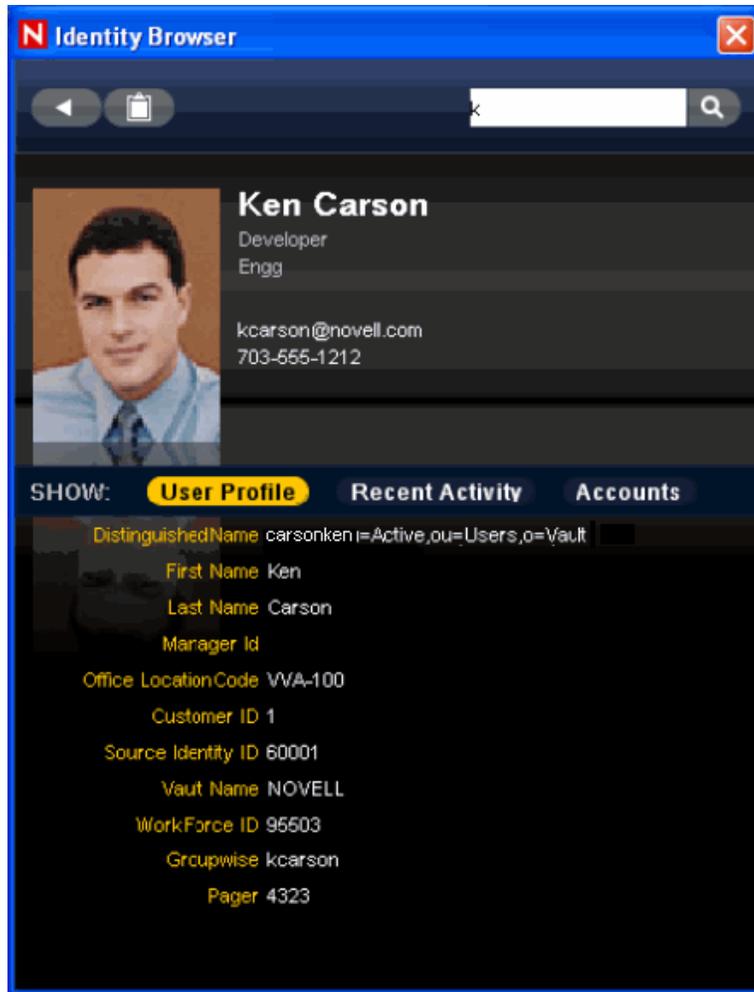


- 4 Select a user and click View Full Profile to see more information. Alternatively, you can right-click a user name (identity) and select Open New Window. It opens a new Identity Browser window. It is similar to the parent Identity Browser window and you view the full profile in a new window.
- 5 Use the back arrow icon to navigate to the previous profile.

18.2.2 Viewing Profile Details

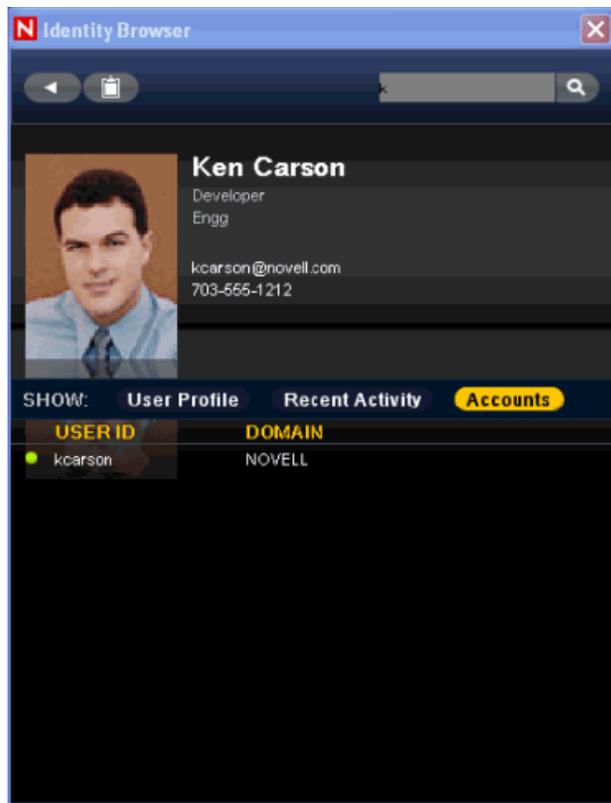
To view details of a profile:

- 1 Click Tools menu and select Identity Browser. The Identity Browser window displays.
- 2 Enter the first name or first character of the profile in the Search box. Click Search Icon. The searched profile displays.
- 3 Click View Full Profile button. The user profile displays:



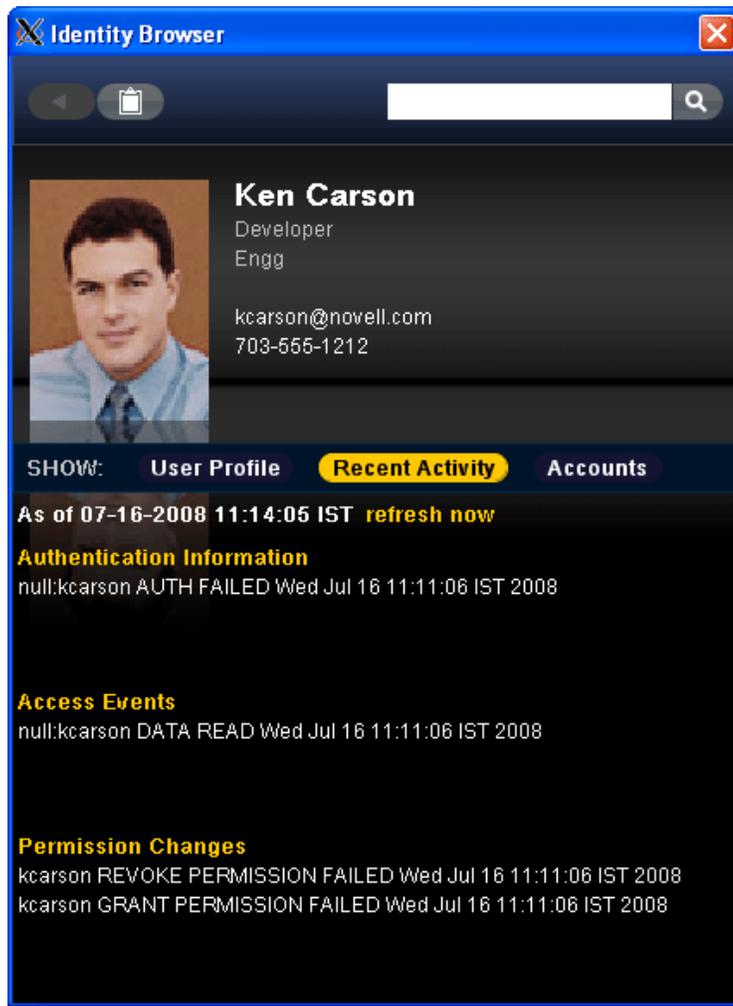
Using the view profile window, you can view User Profile, Accounts, and Recent Activities performed by the user. By default the User Profile displays when you click the view profile button as shown above.

- 4 Select Accounts. The details of the account are displayed:



You can access Accounts in Active View by right clicking on an event generated by the Identity Collector and by selecting Show Identity Details option. Select Initiator, Target or Both option. The account details of the associated Identity in that event displays in a pop up window.

- 5 Select Recent Activity. The contextual event information such as Authentication, Access and Permission change events for that identity are displayed. The events displayed are limited to last 10 events in each category as shown below:



Using the Clipboard Functionality

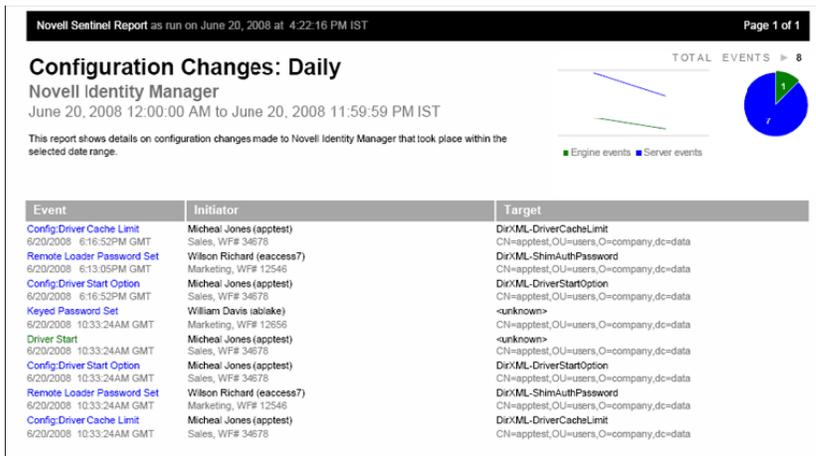
You can use the clipboard functionality to copy the data of User Profile, Recent Activity, or the Account tabs. On any of the three tabs, you can click the clipboard option and copy the related to the respective option to the clipboard. For example, if you viewing the Recent Activity tab and click the clipboard, the recent activity data is copied to the clipboard. You can then choose to paste the information on the clipboard to a Notepad and save.

You can also copy the information to the clipboard after you have visited the tabs. For example, you can visit User Profile, and Recent Activity tabs then use the clipboard to copy the data. Similarly, you can visit all the three tabs and then use the clipboard to copy the data.

18.3 Reports

Sentinel 6.1 reports include identity information. If identity management integration is configured, this information appears on the reports. For example, see the report below.

Figure 18-3 Reports



Sentinel Architecture



Sentinel is a security information and event management (SIEM) solution that automates the collection, analysis and reporting of system network, application and security logs to help organizations manage IT risk.

This section discusses the functional and technical architecture of Sentinel.

- ♦ [Section A.1, “Sentinel Features,” on page 439](#)
- ♦ [Section A.2, “Functional Architecture,” on page 439](#)
- ♦ [Section A.3, “Architecture Overview,” on page 440](#)
- ♦ [Section A.4, “Logical Architecture,” on page 450](#)

A.1 Sentinel Features

Sentinel allows you to monitor and manage a variety of functions. Some of the main functions include:

- ♦ Real-time views of large streams of events
- ♦ Reporting capabilities based on real-time and historical events
- ♦ Managing users and what they are able to see and do by permission assignment
- ♦ Managing access to events for different users
- ♦ Organizing events into incidents for efficient response management and tracking
- ♦ Detecting patterns in events and streams of events
- ♦ An intuitive and flexible rule-based language for correlation
- ♦ Rules compiled for high performance
- ♦ Scalable, multi-threaded, distributable, and extensible architecture

Sentinel processes communicate with each other through a message-oriented middleware (MOM).

A.2 Functional Architecture

Sentinel is composed of the following component subsystems, which form the core of the functional architecture:

- ♦ [Section A.3.1, “iSCALE Platform,” on page 440](#): An event-driven scalable framework.
- ♦ [Section A.3.3, “Event Source Management,” on page 445](#): An extensible framework built to manage and monitor connections between Sentinel and third-party event sources, using Sentinel Connectors and Sentinel Collectors.

In addition to ESM, there are a number of subcomponents that are hosted by a distributable service called the Collector Manager. This service can be installed on a number of systems to balance the processing load or for scalability. The data collection components are downloaded from the Novell Content Web page and are installed to the Collector Managers via a central ESM interface.

- ♦ [Section A.3.4, “Application Integration,” on page 446](#): An extensible application framework.

Sentinel treats both “services” and “applications” as abstract service end points that can readily respond to asynchronous events. Services are “objects” that do not need to understand protocols or how messages get routed to the peer services.

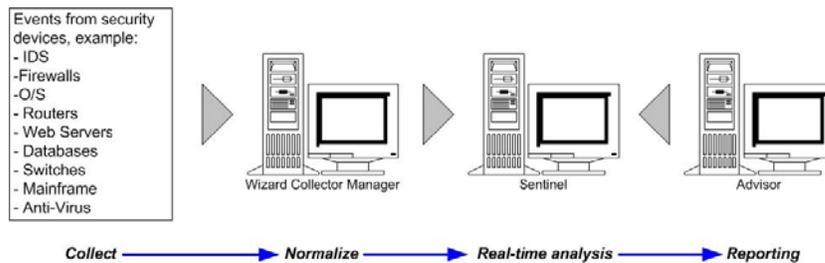
A.3 Architecture Overview

The Sentinel system is responsible for receiving events from the Collector Manager. The events are then displayed in real-time in an Active View and logged into a database for historical analysis.

At a high level, the Sentinel system uses a relational database and is comprised of Sentinel processes and a reporting engine. The system accepts events from the Collector Manager as its input. The Collector Manager interfaces with third-party products and normalizes the data from these products. The normalized data is then sent to the Sentinel processes and database.

Historical analysis and reporting can be done using the Sentinel integrated reporting engine. The reporting engine extracts data from the database and integrates the report displays into the Sentinel Control Center using HTML documents over an HTTP connection.

Figure A-1 Sentinel Architecture



- ◆ [Section A.3.1, “iSCALE Platform,” on page 440](#)
- ◆ [Section A.3.2, “Sentinel Event,” on page 442](#)
- ◆ [Section A.3.3, “Event Source Management,” on page 445](#)
- ◆ [Section A.3.4, “Application Integration,” on page 446](#)
- ◆ [Section A.3.5, “Time,” on page 446](#)
- ◆ [Section A.3.6, “System Events,” on page 447](#)
- ◆ [Section A.3.7, “Processes,” on page 448](#)

A.3.1 iSCALE Platform

The Sentinel iSCALE architecture is built using a standards-based, service-oriented architecture (SOA) that combines the advantages of in-memory processing and distributed computing. iSCALE is a specialized message bus capable of handling high data volumes.

- ◆ [“Message Bus” on page 441](#)
- ◆ [“Channels” on page 441](#)

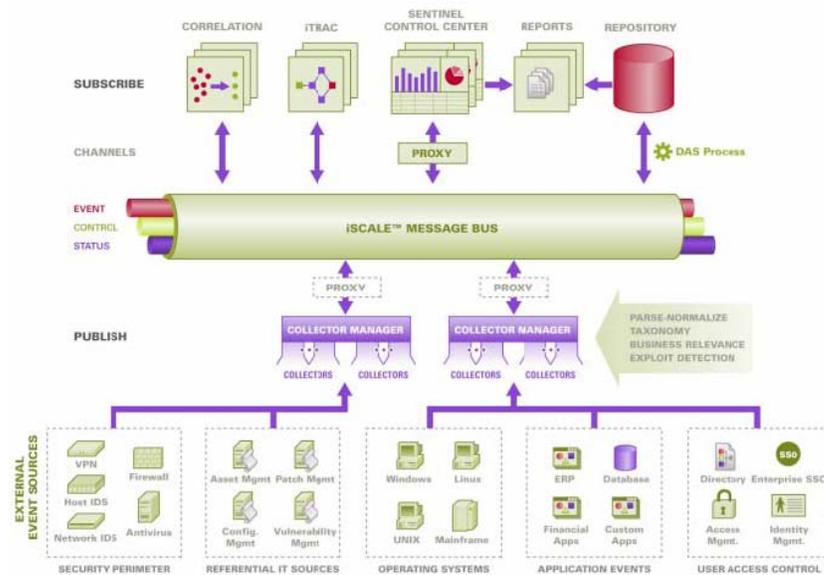
Message Bus

The iSCALE message bus allows for independent scaling of individual components while also allowing for standards-based integration with external applications. The key to scalability is that, unlike other distributed software, no two peer components communicate with each other directly. All components communicate through the message bus, which is capable of moving thousands of message packets per second.

Leveraging the unique features of the message bus, the high-throughput communication channel can maximize and sustain a high data throughput rate across the independent components of the system. Events are compressed and encrypted on the wire for secure and efficient delivery from the edge of the network or collection points to the hub of the system, where real-time analytics are performed.

The iSCALE message bus employs a variety of queuing services that improve the reliability of the communication beyond the security and performance aspects of the platform. Using a variety of transient and durable queues, the system offers unparalleled reliability and fault tolerance. For instance, important messages in transit are saved (by being queued) in case of a failure in the communication path. The queued message is delivered to the destination after the system recovers from the failure state.

Figure A-2 iSCALE Message Bus



Channels

The iSCALE platform employs a data-driven or event-driven model that allows independent scaling of components for the entire system based on the workload. This provides a flexible deployment model because each customer's environment varies: one site can have a large number of devices with low event volumes; another site can have fewer devices with very high event volumes. The event densities (that is, the event aggregation and event multiplexing pattern on the wire from the collection points) are different in these cases and the message bus allows for consistent scaling of disparate workloads.

iSCALE takes advantage of an independent, multi-channel environment, which virtually eliminates contention and promotes parallel processing of events. These channels and sub-channels work not only for event data transport but also offer fine-grain process control for scaling and load balancing the system under varying load conditions. Using independent service channels such as control channels and status channels, in addition to the main event channel, allows sophisticated and cost-effective scaling of event-driven architecture.

A.3.2 Sentinel Event

Sentinel receives information from devices, normalizes this information into a structure called a Sentinel Event, or Event for short and sends the event for processing. Events are processed by the real time display, correlation engine and the backend server.

An event comprises of more than 200 tags. Tags are of different types and of different purposes. There are some predefined tags such as severity, criticality, destination IP and destination port. There are two sets of configurable tags: Reserved Tags are for Novell internal use to allow future expansion and Customer Tags are for customer extensions.

Tags can be repurposed by renaming them. The source for a tag can either be external, which means that it is set explicitly by the device or the corresponding Collector or referential. The value of a referential tag is computed as a function of one or more other tags using the mapping service. For example, a tag can be defined to be the building code for the building containing the asset mentioned as the destination IP of an event. For example, a tag can be computed by the mapping service using a customer defined map using the destination IP from the event.

Mapping Service

Map Service allows a sophisticated mechanism to propagate business relevance data throughout the system. This facility aids scalability and provides an extensibility advantage by enabling intelligent data transfer between different nodes of the distributed system.

Map Service is a data propagation facility that gives the ability to cross-reference Vulnerability Scanner data with Intrusion Detection System signatures and more (for example, asset data, business-relevant data). This allows immediate notification when an attack is attempting to exploit a vulnerable system. Three separate components provide this functionality:

- ◆ Collection of real time events from an intrusion detection source;
- ◆ Comparing those signatures to the latest vulnerability scans; and
- ◆ Cross referencing an attack feed through Sentinel Advisor (an optional product module, which cross-references between real-time IDS attack signatures and the user's vulnerability scanner data).

Map Service dynamically propagates information throughout the system without impacting system load on the system. When important data sets (that is, “maps” such as asset information or patch update information) are updated in the system, the Map Service propagates the updates across the system, which can often get to be hundreds of megabytes in size.

iSCALE's Map Service algorithms handle large referential data sets across a production system processing large real-time data volumes. These algorithms are “update-aware” and selectively push only the changes or “delta data sets” from the repository to the edge or system perimeter.

Streaming Maps

Map Service employs a dynamic update model and streams the maps from one point to another, avoiding the build up of large static maps in dynamic memory. The value of this streaming capability is particularly relevant in a mission-critical real-time system such as Sentinel where there needs to be a steady, predictive and agile movement of data independent of any transient load on the system.

Exploit Detection (Mapping Service)

Sentinel provides the ability to cross-reference event data signatures with Vulnerability Scanner data. Users are notified automatically and immediately when an attack is attempting to exploit a vulnerable system. This is accomplished through:

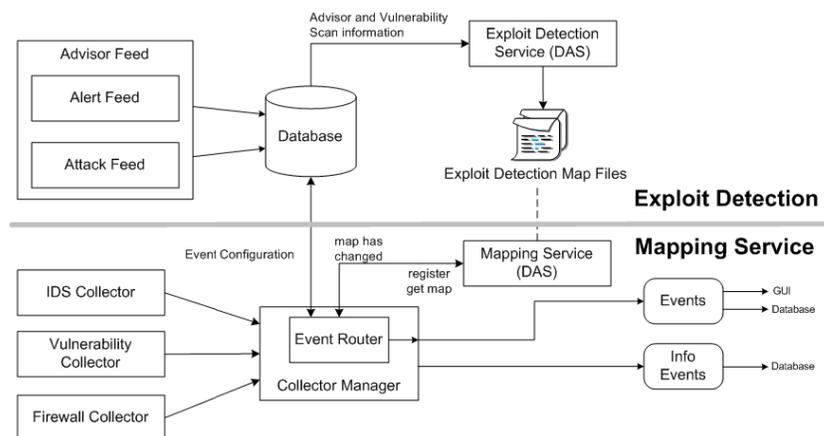
- ◆ Advisor Feed
- ◆ Intrusion detection
- ◆ Vulnerability scanning
- ◆ Firewalls

Advisor provides a cross-reference between event data signatures and vulnerability scanner data. Advisor feed has an alert and attack feed. The alert feed contains information about vulnerabilities and threats. The attack feed is a normalization of event signatures and vulnerability plug-ins. For more information on Advisor, see [Chapter 8, “Advisor Usage and Maintenance,”](#) on page 157.

You require at least one vulnerability scanner and either an IDS, IPS, or firewall. The IDS and Firewall DeviceName should appear in the RV31 field of the event. Also, the IDS and Firewall must properly populate the DeviceAttackName (rt1) field (for example, WEB-PHP Mambo uploadimage.php access).

The Advisor feed is sent to the database and then to the Exploit Detection Service. The Exploit Detection Service generates one or two files depending on the kind of data that has been updated.

Figure A-3 Exploit Detection



The Exploit Detection Map Files are used by the Mapping Service to map attacks to exploits of vulnerabilities.

Vulnerability Scanners scan for system (asset) vulnerable areas. IDS detects attacks (if any) against these vulnerable areas. Firewalls detect if any traffic is against any of these vulnerable areas. If an attack is associated with any vulnerability, the asset has been exploited.

The Exploit Detection Service generates the `exploitdetection.csv` file at:

```
$ESEC_HOME/bin/map_data
```

The `exploitDetection.csv` is generated after one of the following:

- ◆ Advisor feed
- ◆ Vulnerability scan
- ◆ Sentinel Server Startup (if enabled in `das_query.xml`, disabled by default)

By default, there are two configured event columns used for exploit detection and they are referenced from a map (all mapped tags have the Scroll icon).

- ◆ Vulnerability
- ◆ AttackId

Figure A-4 Event Columns

Severity	Vulnerability 	AttackId 
	0	
	0	

When the Vulnerability field (vul) equals 1, the asset or destination device is exploited. If the Vulnerability field equals 0, the asset or destination device is not exploited.

The map name for the `exploitdetection.csv` file is `IsExploitWatchlist`.

There are two types of data sources:

- ◆ **External:** Retrieves information from the Collector
- ◆ **Referenced from Map:** Retrieves information from a map file to populate the tag.

The Vulnerability tag has a column entry “_EXIST_”, which means that map result value will be 1 if the key is in `IsExploitWatchlist` (`exploitDetection.csv` file) or 0 if it is not. The key columns for the vulnerability tag are IP and NormalizedAttackId. When an incoming event with a DestinationIP event tag that matches the IP column entry and an AttackId event tag that matches the NormalizedAttackId column entry in the same row, the result is one (1). If no match is found in a common row, the result is zero (0).

Figure A-5 Vulnerability and Data Source

Map Key Field	Event Tag
IP	DestinationIP
NormalizedAttackId	AttackId

A.3.3 Event Source Management

Sentinel 6 delivers a centralized event source management framework to facilitate data source integration. This framework enables all aspects of configuring, deploying, managing and monitoring data Collectors for a broad set of systems, which include databases, operating systems, directories, firewalls, intrusion detection/prevention systems, antivirus applications, mainframes, Web and application servers, and many more.

Using adaptable and flexible technology is central to Sentinel’s event source management strategy, which is achieved through interpretive Collectors that parse, normalize, filter and enrich the events in the data stream.

These Collectors can be modified as needed and are not tied to a specific environment. An integrated development environment allows for interactive creation of Collectors using a “drag and drop” paradigm from a graphical user interface. Non-programmers can create Collectors, ensuring both current and future requirements are met in an ever-changing IT environment. The command and control operation of Collectors (for example, start, stop and so on) is performed centrally from the Sentinel Control Center. The event source management framework takes the data from the source system, performs the transformations and presents the events for later analysis, visualization and reporting purposes. The framework delivers the following components and benefits:

- ♦ **Collectors:** Parse and normalize events from various systems
- ♦ **Connectors:** Connect to the data source to get raw data
- ♦ **Taxonomy:** Allows data from disparate sources to be categorized consistently
- ♦ **Filtering:** Eliminates irrelevant data at the point of collection, saving bandwidth and disk space.
- ♦ **Business relevance:** Offers a way to enrich event data with valuable information
- ♦ **Collector builder:** An Integrated Development Environment (IDE) for building custom Collectors to collect from unique or proprietary systems
- ♦ **Live view:** User interface for managing live event sources.
- ♦ **Scratch pad:** User interface for offline design of event source configuration.

A.3.4 Application Integration

External application integration through standard APIs is central to Sentinel. For example, when dealing with a third party trouble-ticketing system, Sentinel 6 can open an initial ticket in its own iTRAC workflow remediation system. Sentinel then uses bi-directional API to communicate with the other trouble ticketing systems—for example, Remedy allowing straightforward integration with external systems.

The API is Web Services-based and therefore allows any external systems that are SOAP-aware to take advantage of pervasive integration with the Sentinel system.

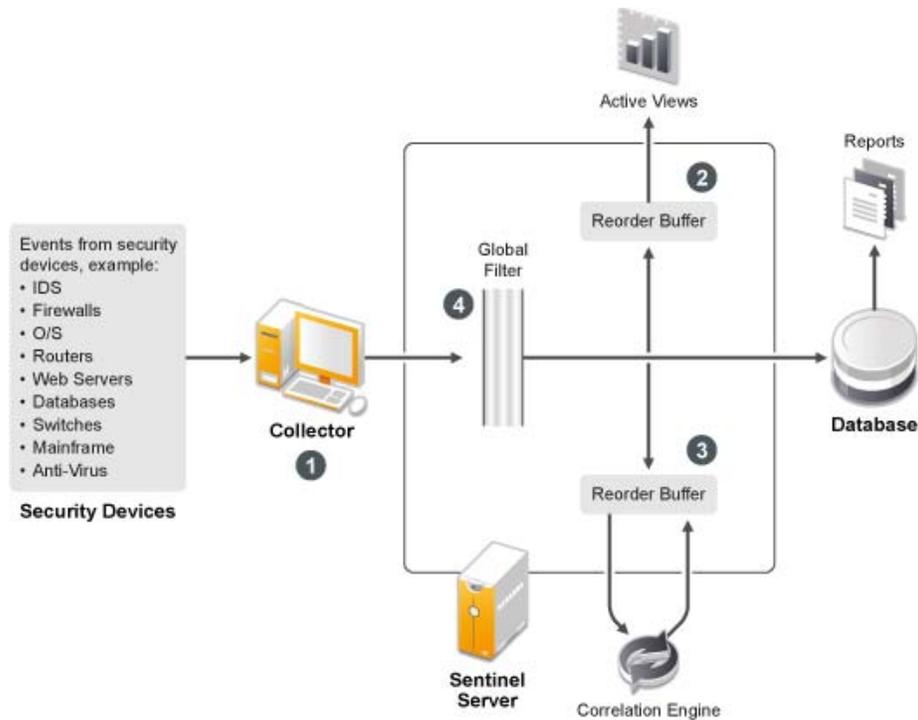
A.3.5 Time

The time of an event is very critical to its processing. It is important for reporting and auditing purposes as well as for real time processing. The correlation engine processes time-ordered streams of events and detects patterns within events as well as temporal patterns in the stream. However, the device generating the event might not know the real time when the event is generated. In order to accommodate this, Sentinel allows two options in processing alerts from security devices: trust the time the device reports and use that as the time of the event, or do not trust the device time and instead stamp the event at the time it is first processed by Sentinel (by the Collector).

Sentinel is a distributed system and is made up of several processes that can be in different parts of the network. In addition, there can be some delay introduced by the device. In order to accommodate this, the Sentinel processes reorder the events into a time-ordered stream before processing.

The following illustration explains the concept of Sentinel Time.

Figure A-6 Sentinel Time



1. By default, the event time is set to Collector Manager time. The ideal time is the device time. Therefore it is best to set the event time to the device time if the device time is available, accurate, and properly parsed by the Collector.
2. Events are sorted into 30 second buckets so that they can be viewed in Active Views. By default, the events that have a timestamp within a 5 minute range from the DAS_RT server time (in the past or future) are processed normally. Events that have timestamps more than 5 minutes in the future do not show in the Active Views, but are inserted into the database. Events that have timestamps more than 5 minutes and less than 24 hours in the past are still shown in the charts, but are not shown in the event data for that chart. A drill down operation is necessary to retrieve those events from the database.
3. Correlation reorder buffer. If the event time is more than 30 seconds older than the server time, the correlation engine does not process the events.
4. If the event time is older than 5 minutes than the Collector Manager time (correct time), events are directly routed to the database.

A.3.6 System Events

System Events is a means to report on the status and status change of the system. There are three types of events generated by the internal system, they are:

- ◆ Internal Events
- ◆ Performance Events
- ◆ Audit Events

Internal Events

Internal Events are informational and describe a single state or change of state in the system. They report when a user logs in or fails to authenticate, when a process is started or a correlation rule is activated.

Performance Events

Performance Events are generated on a periodic basis and describe average resources used by different parts of the system.

Audit Events

Audit Events are generated internally. Each time an audited method is called or an audited data object is modified, audit framework generates audit events. There are two types of Audit Events. One which monitors user actions for example, user login/out, add/delete user and another which monitors system actions/health, for example, process start/stop.

Some of these events used to be called Internal Events (mainly for system actions/health monitoring). So the functionality of Audit Events is similar to Internal Events. Audit Events can be logged into log files, saved into database, and sent out as Audit Event at the same time. (Internal Events are only sent out as events.).

All System Events populate the following attributes:

- ♦ **ST (Sensor Type) field:** For internal events it is set to “I” and for performance events it is set to “P”
- ♦ **Event ID:** A unique UUID for the event
- ♦ **Event Time:** The time the event was generated
- ♦ **Source:** The UUID of the process that generated the event
- ♦ **Sensor Name:** The name of the process that generated the event (for example, DAS_Binary)
- ♦ **RV32 (Device Category):** Set to “ESEC”
- ♦ **Collector:** “Performance” for performance events and “Internal” for internal events

In addition to the common attributes, every system event also sets the resource, sub resource, the severity, the event name and the message tags. For internal events, the event name specific enough to identify the exact meaning of the event (for example, UserAuthenticationFailed). The message tags add some specific detail; in the above example the message tag will contain the name of the user, the OS name if available and the machine name). For performance events the event name is generic describing the type of statistical data and the data itself is in the message tag.

Performance events are sent directly to the database. To view them, do a quick query.

For more information, see [Appendix B, “System Events for Sentinel,” on page 465.](#)

A.3.7 Processes

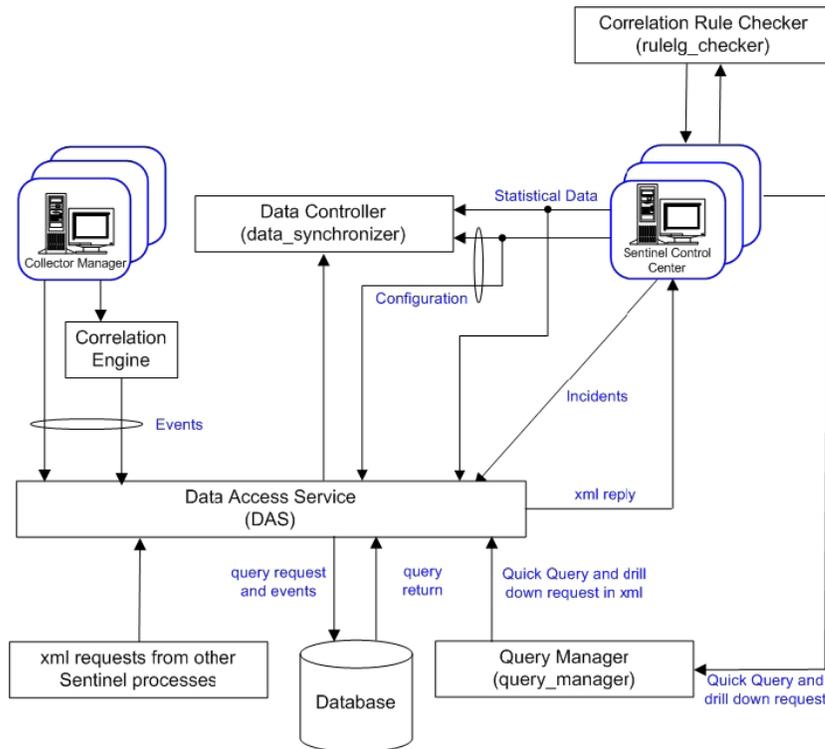
The following processes and Windows service communicate with each other through iSCALE - the message-oriented middleware (MOM).

- ♦ [Sentinel Service \(Watchdog\) \(page 449\)](#)

- ♦ [Data Access Service \(DAS\) Process \(page 450\)](#)
 - ♦ **DAS Query:** Performs general Sentinel Service operations including Login and Historical Query.
 - ♦ **DAS Binary:** Performs event database insertion.
 - ♦ **DAS RT:** Provides the server-side functionality for Active Views.
 - ♦ **DAS Aggregation:** Calculates event data summaries that are used in reports.
 - ♦ **DAS iTRAC:** Provides the server-side functionality for the Sentinel iTRAC functionality.
 - ♦ **DAS Proxy:** Provides the server-side of the SSL proxy connection to Sentinel Server.
- ♦ [Correlation Engine Process \(correlation_engine\) \(page 450\)](#)
- ♦ [Collector Manager \(page 450\)](#)
- ♦ [iSCALE \(page 450\)](#)

The following is the architecture for Sentinel Server.

Figure A-7 Sentinel Server Architecture



Sentinel Service (Watchdog)

Watchdog is a Sentinel Process that manages other Sentinel Processes. If a process other than Watchdog stops, Watchdog will report this and will then restart that process.

If this service is stopped, it will stop all Sentinel processes on that machine. It executes and reports health of other Sentinel processes. This process is launched by the “Sentinel” Windows Service or the “sentinel” UNIX service.

Data Access Service (DAS) Process

The Data Access Service (DAS) process is Sentinel Server's persistence service and provides an interface to the database. It provides data driven access to the database backend.

DAS is a container, composed of five different processes. Each process is responsible for different types of database operations. These processes are controlled by the following configuration files:

- ♦ **das_binary.xml:** Used for event and correlated event insertion operations
- ♦ **das_query.xml:** All other database operations
- ♦ **activity_container.xml:** Used for executing and configuring activity service
- ♦ **workflow_container.xml:** Used for configuring the workflow (iTRAC) service
- ♦ **das_rt.xml:** Used for configuring the Active Views function within the Sentinel Control Console

DAS receives requests from the different Sentinel processes, converts them to a query against the database, processes the result from the database and converts it that back to a reply. It supports requests to retrieve events for Quick Query and Event Drill Down, to retrieve vulnerability information and advisor information and to manipulate configuration information. DAS also handles logging of all events being received from the Collector Manager and requests to retrieve and store configuration information.

Correlation Engine Process (correlation_engine)

The Correlation Engine (correlation_engine) process receives events from the Collector Manager and publishes correlated events based on user-defined correlation rules.

Collector Manager

Collector Manager services, processes and sends events.

iSCALE

It is a message-oriented middleware (MOM) that provides the communication platform for all other Sentinel processes.

A.4 Logical Architecture

Sentinel is composed of three logical layers:

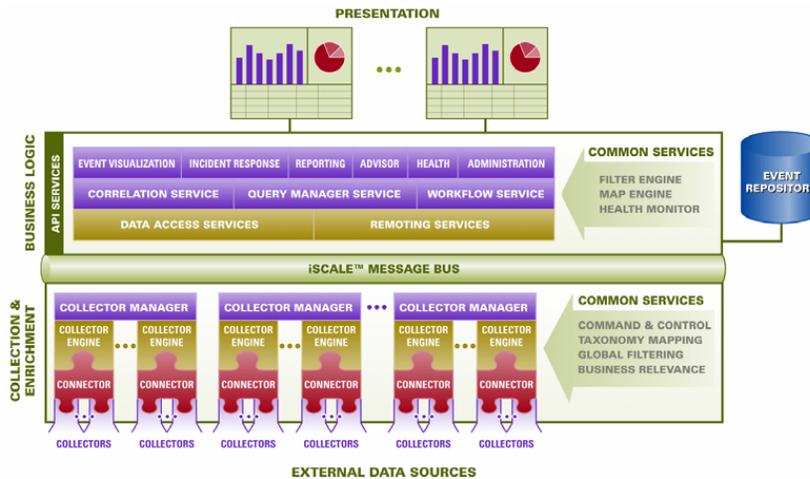
- ♦ [Section A.4.1, “Collection and Enrichment Layer,” on page 451](#)
- ♦ [Section A.4.2, “Business Logic Layer,” on page 454](#)
- ♦ [Section A.4.3, “Presentation Layer,” on page 462](#)

The collection/enrichment layer aggregates the events from external data sources, transforms the device-specific formats into Sentinel format, enriches the native events source with business-relevant data and dispatches the event packets to the message bus. The key component orchestrating this function is the Collector, aided by a taxonomy mapping and global filter service.

The business logic layer contains a set of distributable components. The base component is a Remoting service that adds messaging capabilities to the data objects and services to enable transparent data access across the entire network and Data Access service that is an object

management service to allow users to define objects using metadata. Additional services include Correlation, Query Manager, Workflow, Event Visualization, Incident Response, Health, Advisor, Reporting and Administration.

Figure A-8 Sentinel Logical Layers



The presentation layer renders the application interface to the end user. A comprehensive dashboard called the Sentinel Control Center offers an integrated user workbench consisting of an array of seven different applications accessible through a single common framework. This cross-platform framework is built on Java 1.4 standards and provides a unified view into independent business logic components – real-time interactive graphs, actionable incident response, automated enforceable incident workflow, reporting, incident remediation against known exploits and more.

Each of the layers are illustrated in the figure above and subsequently discussed in detail in the following sections.

A.4.1 Collection and Enrichment Layer

Event Source Management (ESM) provides tools to manage and monitor connections between Sentinel and third-party event sources. Events are aggregated using a set of flexible and configurable Collectors, which collect data from a myriad of sensors and other devices and sources. User can use pre-built Collectors, modify existing Collectors or build their own Collectors to ensure the system meets all requirements.

Data aggregated by the Collectors in the form of events is subsequently normalized and transformed into XML format, enriched with a series of metadata (that is, data about data) using a set of business relevance services and propagated to the server-side for further computational analysis using message bus platform. The Collection and Enrichment layer consists of the following components:

- ◆ Connectors and Collector
- ◆ Collector Manager and Engine
- ◆ Collector Builder

Connectors and Collectors

A Connector is a concentrator or multiplexed adapter that connects the Collector Engine to the actual monitored devices.

Collectors are the component-level aggregator of event data from a specific source. Sentinel primarily supports remote “Collector-less” connections to sources; however, Collectors can be deployed on specific devices where a remote approach is less efficient.

Collectors are controlled from the Sentinel Control Center, which orchestrates the communication between the Collectors and the Sentinel platform for real time analysis, correlation computation and incident response.

Collector Manager and Engine

Collector Manager manages the Collectors, monitors system status messages and performs event filtering as needed. Main functions of the Collector Manager include transforming events, adding business relevance to events through taxonomy, performing global filtering on events, routing events and sending health messages to the Sentinel server.

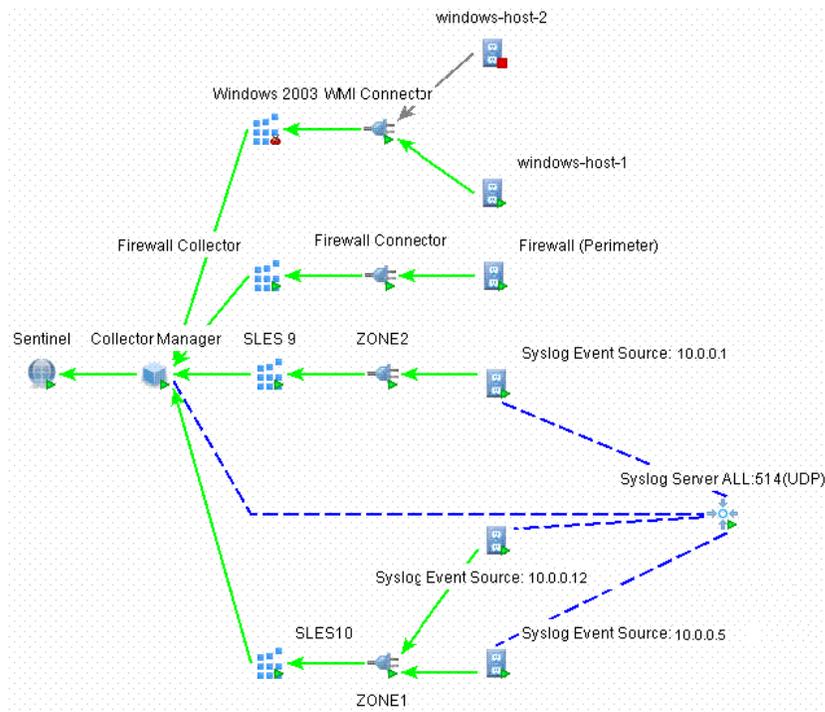
A Collector Engine is the interpreter component that parses the Collector code.

Collector Builder

Collector Builder is a standalone application that is used to build, configure and debug Collectors. This application serves as an integrated development environment (or IDE) that allows the user to create new Collectors to parse data from source devices using a special-purpose interpretive language designed to handle the nature of network and security events.

ESM introduces a new hierarchy of deployment objects that allow users to group multiple connections into sets. The hierarchy is as follows:

Figure A-9 ESM Hierarchy



The Event Source, Event Source Server, Collector, and Connector are configuration related objects and can be added through the ESM user interface.

- ♦ **Event Source:** This node represents a connection to a specific source of data, such as a specific file, firewall or Syslog relay, and contains the configuration information necessary to establish the connection. The health of this node represents the health of the connection to the data source. This node will send raw data to its parent Connector node.
- ♦ **Event Source Server:** This node represents a deployed instance of a server-type Connector plug-in. Some protocols, such as Syslog UDP/TCP, NAudit and others, push their data from the source to a server that is listening to accept the data. The Event Source Server node represents this server and can be configured to accept data from protocols that are supported by the selected Connector plug-in. This node will redirect the raw data it receives to an Event Source node that is configured to receive data from it.
- ♦ **Collector:** This node represents a deployed instance of a Collector Script. It specifies which Collector Script to use as well as the parameter values with which the Collector should run. This node will send Sentinel events to its parent Collector Manager node.
- ♦ **Connector:** This node represents a deployed instance of a Connector plug-in. It includes the specification of which Connector plug-in to use as well as some configuration information, such as “auto-discovery.” This node will send raw data to its parent Collector node.

Common Services

All of the above-described components in this Collection and Enrichment layer are driven by a set of common services. These utility services form the fabric of the data collection and data enrichment and assist in filtering the noise from the information (through global filters), applying user-defined tags to enrich the events information (through business relevance and taxonomy mapping services) and governing the data Collectors’ functions (through command and control services).

Taxonomy:

Nearly all security products produce events in different formats and with varying content. For example, Windows and Solaris report a failed login differently.

Sentinel’s taxonomy automatically translates heterogeneous product data into meaningful terms, which allows for a real-time homogeneous view of the entire network security. Sentinel Taxonomy formats and filters raw security events before adding event context to the data stream. This process formats all the security data in the most optimal structure for processing by the Sentinel Correlation engine, as you can see in the following diagram.

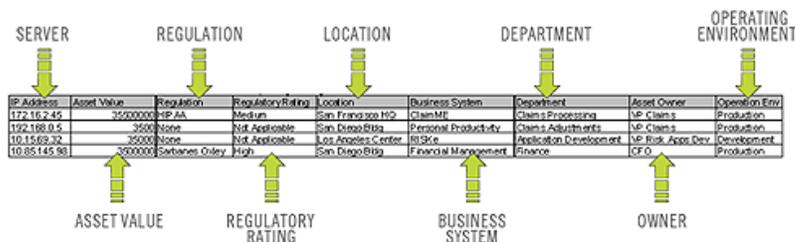
Figure A-10 Sentinel Taxonomy



Business Relevance:

Sentinel injects business-relevant contextual data directly into the event stream. It includes up to 135 customizable fields where users can add in asset specific information such as business unit, owner, asset value, geography. After this information is added into the system, all other components can take advantage of the additional context.

Figure A-11 Injecting Business Relevance



Exploit Detection: Exploit Detection enables immediate, actionable notification of attacks on vulnerable systems. It provides a real-time link between IDS signatures and vulnerability scan results, notifying users automatically and immediately when an attack attempt to exploit a vulnerable system. This dramatically improves the efficiency and effectiveness of incident response.

Exploit Detection provides users with updates of mappings between IDS and vulnerability scanner product signatures. The mappings include a comprehensive list of IDS and vulnerability scanners. Users simply upload vulnerability scan results into Sentinel. Exploit Detection automatically parses them and updates the appropriate IDS Collectors. It uses the embedded knowledge of vulnerability status to efficiently and effectively prioritize responses to security threats in real time.

When an attack is launched against a vulnerable asset, Exploit Detection alerts users with the corresponding severity level of the exploited vulnerability. Users can then take immediate action on high-priority events. This takes the guesswork out of alert monitoring and increases incident response efficiency by focusing reaction on known attacks against vulnerable assets.

Exploit Detection also enables users to map or “un-map” signatures and vulnerabilities to tune out false positives and negatives and to leverage custom signatures or vulnerability scans.

A.4.2 Business Logic Layer

The kernel of the Sentinel platform consists of a set of loosely-coupled services that can run in a standalone configuration or in a distributed topology. This service-oriented architecture (SOA) is called iSCALE. Specifically, Sentinel’s SOA comprises a set of engines, services and APIs working together for linear scaling of the solution against increasing data load and/or processing workload.

Sentinel services run in specialized containers and allow unparalleled processing and scaling because they are optimized for message-based transport and computation. The key services that make up the Sentinel Server include:

-
- ◆ “Remoting Service” on page 455
 - ◆ “Data Access Service” on page 455
 - ◆ “Query Manager Service” on page 455
 - ◆ “Correlation Service” on page 455
 - ◆ “Workflow Service (iTRAC)” on page 456
 - ◆ “Event Visualization” on page 456
 - ◆ “Incident response through iTRAC” on page 458
 - ◆ “Reporting Service” on page 460
 - ◆ “Advisor” on page 461
 - ◆ “Health” on page 461
 - ◆ “Administration” on page 462
-

Remoting Service

Sentinel’s Remoting Service provides the mechanism by which the server and client programs communicate. This mechanism is typically referred to as distributed object application.

Remoting Service provides the following capabilities:

- ◆ **Locate remote objects:** This is achieved through metadata that describes the object name or registration token, although the actual location is not required, because the iSCALE message bus allows for location transparency.
- ◆ **Communicate with remote objects:** Details of communication between remote objects are handled by the iSCALE message bus.
- ◆ **Object streaming and chunking:** When large amounts of data need to pass back and forth from the client to the server, these objects are optimized to load the data on demand.
- ◆ **Callbacks:** Another pattern and layer of abstraction built into the Remoting Service that allows for PTP remote object communication.
- ◆ **Service monitoring and statistics:** This provides performance and load statistics for usage of these remote services.

Data Access Service

Data Access Service (DAS) is an object management service, which allows users to define objects using metadata. DAS manages the object and access to objects and automates transmission and persistence. DAS also serves as a facade for accessing data from any persistent data store such as databases, directory services or files. The operations of DAS include uniform data access through JDBC.

Query Manager Service

The Query Manager Service orchestrates drill-down and event history requests from the Sentinel Control Center. This service is an integral component for implementing the paging algorithm used in the Event History browsing capability. It converts user-defined filters into valid criteria and appends security criteria to it before events are retrieved. This service also ensures that the criteria do not change during a paged event history transaction.

Correlation Service

Sentinel’s correlation algorithm computes correlated events by analyzing the data stream in real time. It publishes the correlated events based on user-defined rules before the events reach the database. Rules in the correlation engine can detect a pattern in a single event of a running window of events. When a match is detected, the correlation engine generates a correlated event describing the found pattern and can create an incident or trigger a remediation workflow through iTRAC. The

correlation engine works with a rules checker component which computes the correlation rule expressions and validates syntax of filters. In addition to providing a comprehensive set of correlation rules, Sentinel's correlation engine provides specific advantages over database-centric correlation engines.

- ♦ By relying on in-memory processing rather than database inserts and reads, the correlation engine performs during high steady-state volumes as well as during event spikes when under attack, the time when correlation performance is most critical.
- ♦ Correlation volume does not slow down other system components, so the user interface remains responsive, especially with high event volumes.
- ♦ Distributed correlation: Organizations can deploy multiple correlation engines, each on its own server, without the need to replicate configurations or add databases. Independent scaling of components provides cost-effective scalability and performance.
- ♦ The correlation engine can add events to incidents after an incident has been determined.

Users are encouraged to measure a metric called Event Rules per Second (ERPS). ERPS is the measure of the number of events that can be examined by a correlation rule per second. This measure is a good performance indicator as it estimates the impact on performance when two factors intersect: events per second and number of rules in use.

- ♦ **Dynamic Lists:** Dynamic lists are distributed list structures that can be used for storing elements and performing fast lookups on those elements. These lists can store a set of strings such as IP addresses, server names or usernames. Examples of dynamic lists include:
 - ♦ Terminated user list
 - ♦ Suspicious user watch list
 - ♦ Privileged user watch list
 - ♦ Authorized ports and services list
 - ♦ Authorized server list
- ♦ In all cases, correlation rules might reference named dynamic lists to perform lookups on list members. For example, a rule can be written to identify a file access event from a user who is not a member of the Authorized Users list. Additionally, correlation actions integrate with the dynamic list module to add or remove elements from a list. The combination of lookups and automated actions on the same list provides a powerful feedback mechanism used to identify complex situations.

Workflow Service (iTRAC)

The Workflow Service receives triggers on incident creation and initiates workflow processes based on pre-defined workflow templates. It manages the lifecycle of these processes by generating work items or executing activities. This service also maintains a history of completed processes that can be used for auditing incident responses.

Event Visualization

Active Views, the interactive graphical user interface for event visualization, provides an integrated, security management dashboard with a comprehensive set of real-time visualization and analytical tools to facilitate threat detection and analysis. Users can monitor events in real time and perform instant drill-downs from seconds to hours in the past. A wide array of visualization charts and aids allow monitoring of information through 3D bar, 2D stacked, line and ribbon chart representation

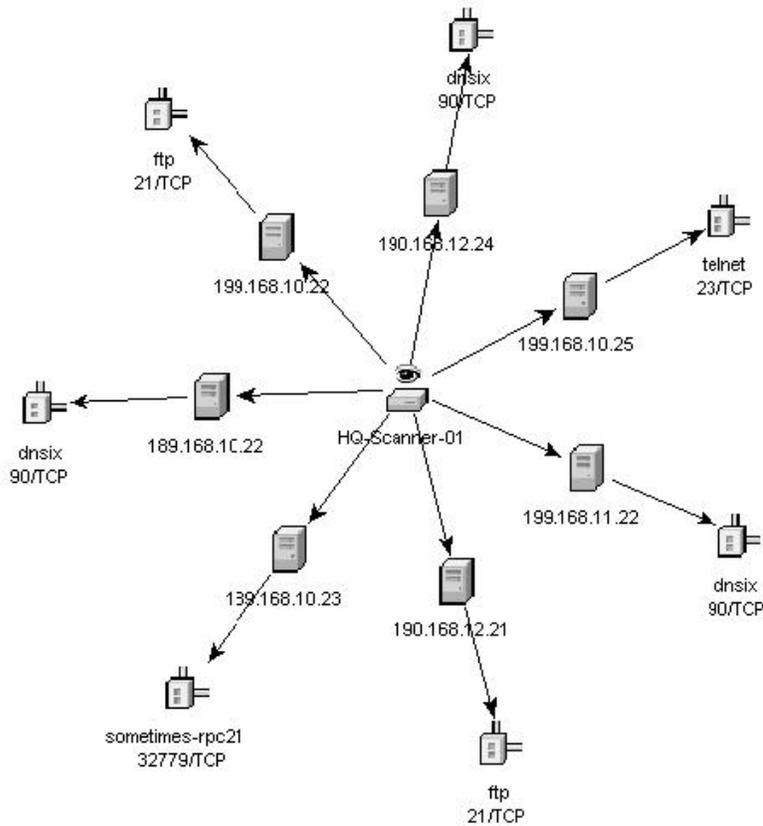
and others. Additional valuable information can be viewed from the Active Views dashboard, including notification of asset exploits (exploit detection), viewing asset information and graphical associations between pertinent source IPs and destination IPs.

Because Active Views uses the iSCALE architecture, analysts can quickly drill down for further analysis because Active Views provides direct access to the real-time memory-resident event data, which easily handles thousands of events per second without any performance degradation. Data is kept in memory and written to the database as needed (Active Views can store up to 8 hours of data in memory with typical event loads). This uninterrupted, performance-oriented real-time view is essential when under attack or in steady-state.

Figure A-12 Active View



Figure A-13 Network

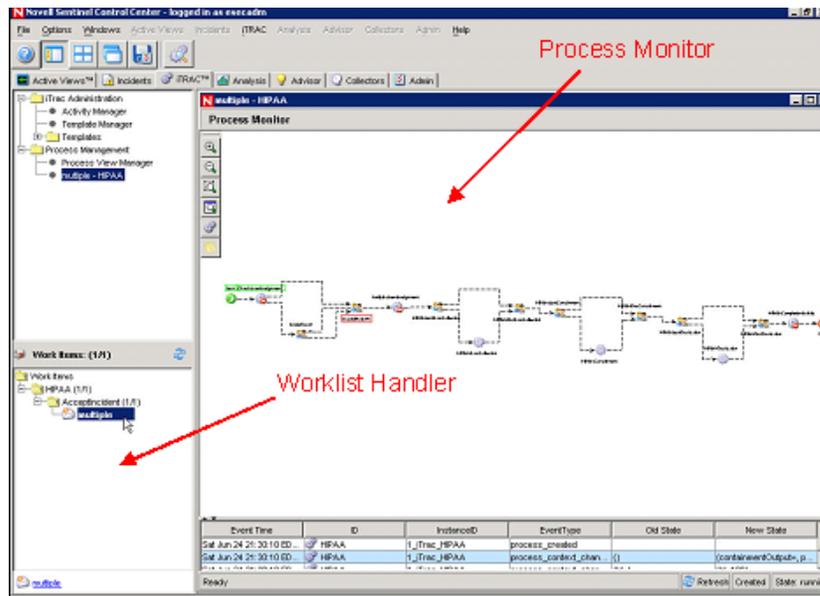


Incident response through iTRAC

Sentinel iTRAC transforms traditional security information management from a passive “alerting and viewing” role to an “actionable incident response” role by enabling organizations to define and document incident resolution processes and then guide, enforce and track resolution processes after an incident or violation has been detected.

Sentinel comes with “out-of-the-box” process templates that use the SANS Institute’s guidelines for incident handling. Users can start with these pre-defined processes and configure specific activities to reflect their organization’s best practices. iTRAC processes can be automatically triggered from incident creation or correlation rules or manually engaged by an authorized security or audit professional. iTRAC keeps an audit trail of all actions to support compliance reporting and historical analysis.

Figure A-14 Process Template



A worklist provides the user with all tasks that have been assigned to the user and a process monitor provides real-time visibility into process status during a resolution process lifecycle.

iTRAC's activity framework enables users to customize automated or manual tasks for specific incident-resolution processes. The iTRAC process templates can be configured using the activity framework to match the template with an organization's best practices. Activities are executed directly from the Sentinel Control Center.

iTRAC's automation framework works using two key components:

Activity container

It automates the activities execution for the specified set of steps based on input rules

Workflow container

It automates the workflow execution based on activities through a work-list.

The input rules are based on the XPD (XML Processing Description Language) standard and provide a formal model for expressing executable processes in a business enterprise. This standards-based approach to the implementation of business-specific rules and rule sets ensures future-proofing of process definitions for customers.

The iTRAC system uses three Sentinel 6 objects that can be defined outside the iTRAC framework:

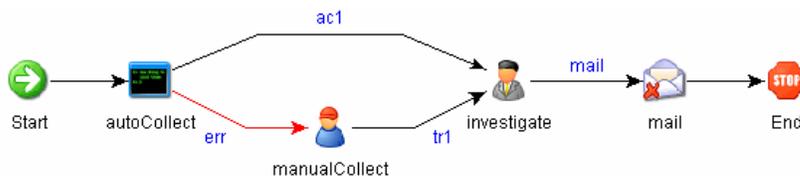
- ♦ **Incident:** Incidents within Sentinel 6 are groups of events that represent an actionable security incident, associated state and meta-information. Incidents are created manually or through correlation rules, and can be associated with a workflow process. They can be viewed on the Incidents tab.
- ♦ **Activity:** An Activity is a pre-defined automatic unit of work, with defined inputs, command-driven activity and outputs, such as automatic attachment of asset data to the incident or generation of an e-mail. Activities can be used within workflow templates, triggered by a correlation rule, or executed by a right-click when viewing events.

- ♦ **Role:** Users can be assigned to one or more Roles for example, Analyst, Admin and so on. Manual steps in the workflow processes can be assigned to a Role.

Sentinel 6 workflows have four major components that are unique to iTRAC:

- ♦ **Step:** A Step is an individual unit of work within a workflow; there are manual steps, decision steps, mail steps, and activity-based steps. Each step displays as an icon within a given workflow template.
- ♦ **Transition:** A Transition defines how the workflow will move from one state (Activity) to another and can be determined by an analyst action, by the value of a variable or by the amount of time elapsed.
- ♦ **Templates:** A Template is a design for a workflow that controls the execution of a process in Sentinel iTRAC. The template consists of a network of manual and automated steps, activities and criteria for transition between them. Workflow templates define how to respond to an incident when a process based on that template is instantiated. A template can be associated with many incidents.
- ♦ **Processes:** A process is a specific instance of a workflow template that is actively being tracked by the workflow system. It includes all the relevant information relating to the instance, including the current step in the workflow, the associated incident, and the results of the steps, attachments and notes. Each workflow process is associated with one and only one incident.

Figure A-15 iTRAC Workflow

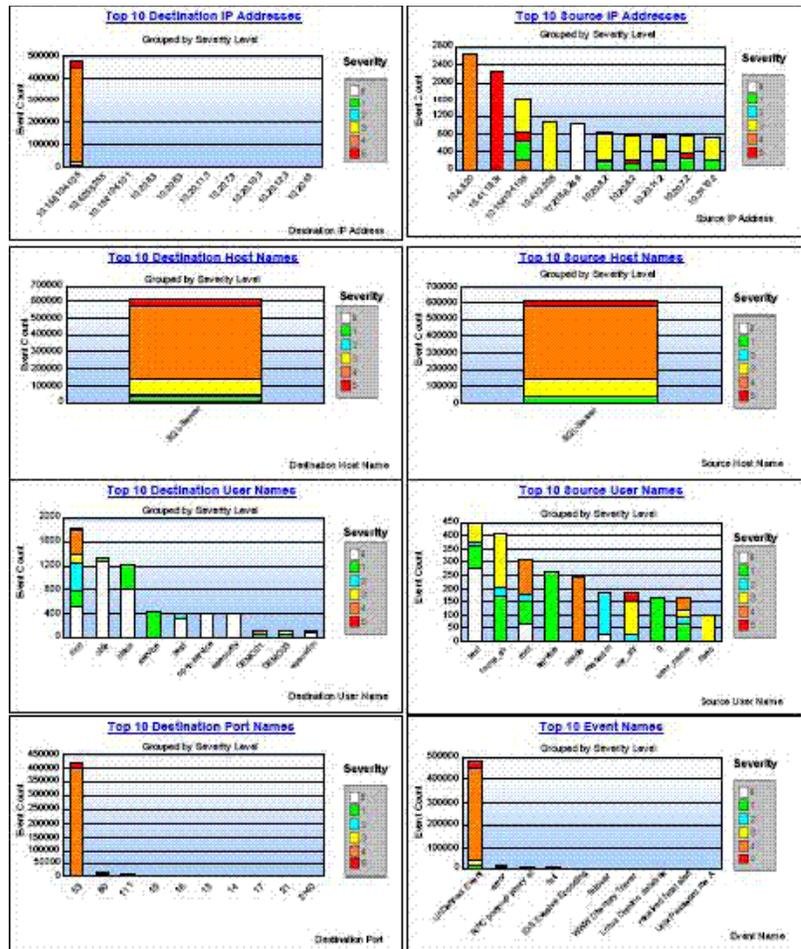


Reporting Service

The Reporting service allows for reporting, including historical and vulnerability reports. Sentinel comes with out-of-the-box reports and enables users to configure their own reports using Crystal Reports. Some examples of reports included with Sentinel are:

- ♦ Trend analysis
- ♦ Security status of lines of business or critical assets
- ♦ Attack types
- ♦ Targeted assets
- ♦ Response times and resolution
- ♦ Policy compliance violations

Figure A-16 Sentinel Top 10 Reports



Advisor

Sentinel Advisor, an optional module, cross-references Sentinel’s real-time alert data with known vulnerabilities and remediation information, bridging the gap between incident detection and response. With Advisor, organizations can determine if events exploit specific vulnerabilities and how these attacks impact their assets. Advisor also contains detailed information on the vulnerabilities that attacks intend to exploit, the potential effects of the attacks if successful and necessary steps for remediation. Recommended remediation steps are enforced and tracked using iTRAC incident response processes.

Health

The Health service enables users to get a comprehensive view of the distributed Sentinel platform. It aggregates health information from various processes that are typically distributed on various servers. The health information is periodically displayed on the Sentinel Control Center for the end user.

Administration

The Administration facility allows for user management and settings setup facilities typically needed by application administrators of Sentinel.

Common Services

All of the above described components in this business logic layer of the architecture are driven by a set of common services. These utility services assist in fine-grain filtering (through Filter Engine) of events to users, continuous monitoring of system health statistics (through Health Monitor) and dynamic updates of system wide data (through Map Service). Together, these utility services form the fabric of the loosely-coupled services that allow for unparalleled processing and scaling over the message bus-based transport for real-time analytics and computation.

A.4.3 Presentation Layer

The presentation layer renders the application interface to the end user. The Sentinel Control Center is a comprehensive dashboard that presents information to the user.

The presentation of event is possible through Active Views which displays the events in a tabular form or by using different types of charts. Table Format displays the variables of the events as columns in a table. Sorting of information is possible in the grid by clicking on the column name.

Figure A-17 Active Views-Tabular format

Severity	EventTime	EventName	EventID	SourceID	Collector
🟢	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-CAB9-1029-9D0A-00'23...	A6C489C0-DAB9-1029-9F5C-00123F9...	
🟢	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-CAB9-1029-9D08-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
🟢	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-CAB9-1029-9D04-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	
🟢	5/8/07 12:33:31 PM	DbSpaceLow	B30E4A43-CAB9-1029-9D01-00123...	A6C489C0-DAB9-1029-9F5C-00123F9...	

Graphical Format displays events as graphs. Stacked Bar 2D, Bar, 3D, Line and Ribbon graphs are available for proper representation of information in graphical format.

Figure A-18 Active Views-Graphical format-Stacked Bar 2D Graph

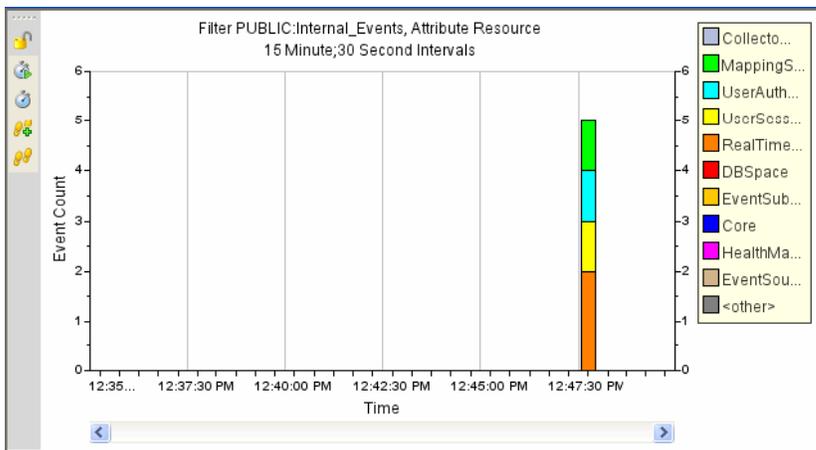


Figure A-19 Active Views-Graphical format-Bar Graph

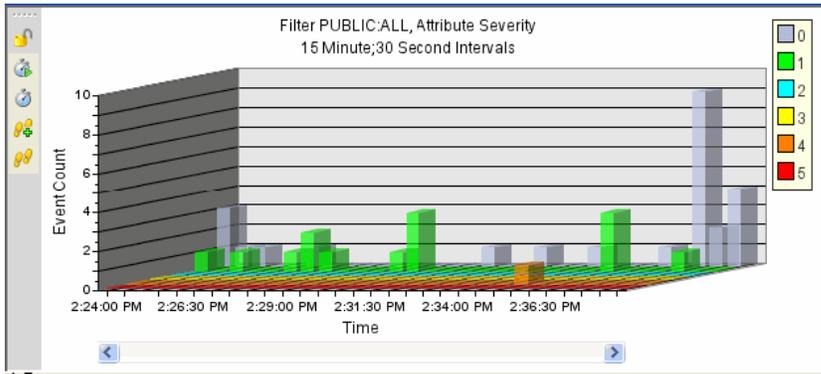


Figure A-20 Active Views-Graphical format-Line Graph

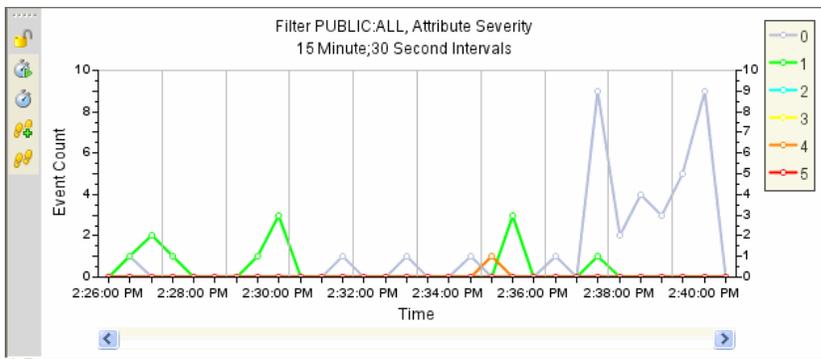
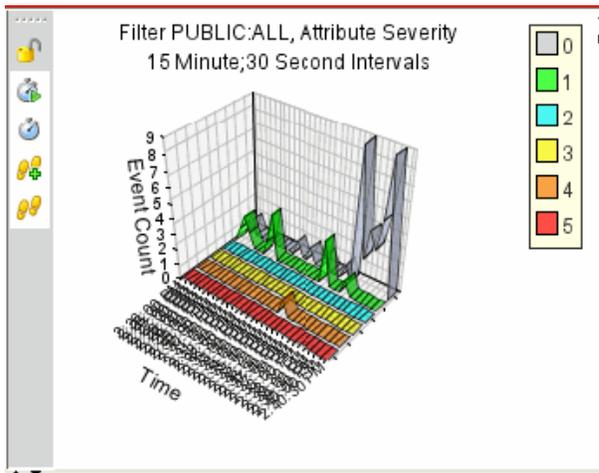


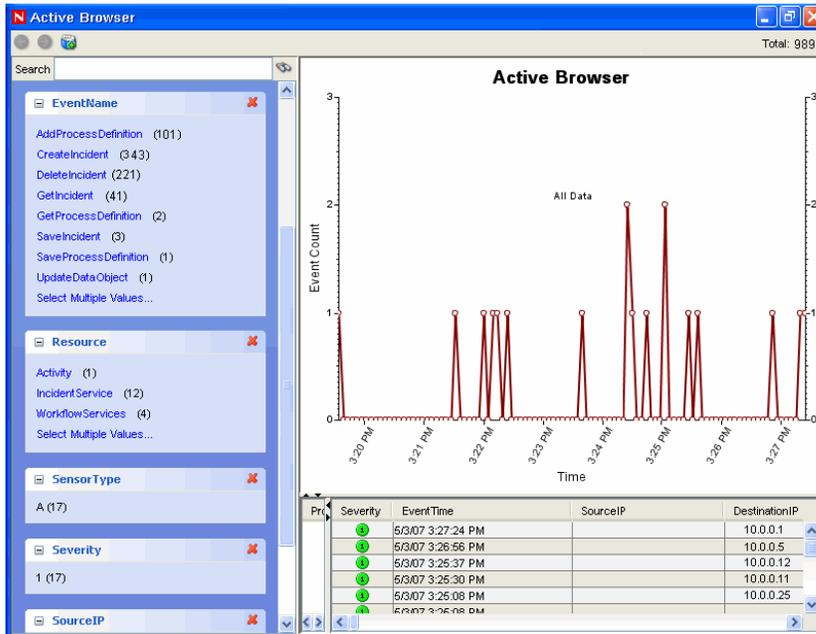
Figure A-21 Active Views-Graphical format-Ribbon Graph



Active Browser

Active Browser facility helps in viewing the selected events. In Active Browser, the events are grouped according to the metatags. In these metatags various sub-categories are defined. The numbers in the parentheses against these sub-categories display the total number of event counts corresponding to the value of the metatag.

Figure A-22 Active Browser



In Active Browser, the query manager service retrieves a list of events taken from any part of the system and performs a statistical analysis of these events to break them down into ranges of values for each desired attribute of the event. Using single clicks through a Web browser interface, you can select ranges to quickly drill down on a large set of events. Then individual event details can be viewed or exported to an html or csv file. Additional event attributes for analysis can be added dynamically at any time, and the interface provides an interactive way to drill down on events in a given time range.

System Events for Sentinel

B

In the description tables below, words in italics surrounded by <...> are replaced by relevant values in the real messages.

B.1 Advisor Audit Events

- ♦ [Section B.1.1, “Advisor Update Successful,” on page 465](#)
- ♦ [Section B.1.2, “Advisor Update Failure,” on page 465](#)

B.1.1 Advisor Update Successful

Table B-1 Advisor Update Successful Event Details

Tag	Value
Severity	1
Event Name	Advisor update succeeded
Resource	Advisor Processor
SubResource	Advisor Processor
Message	If the feed file is not available, the message displayed is: 'No new feed available to process' If the feed file is available, the message displayed is: "Number of records inserted: (value) Number of records updated (value) Processing started: (datetime) Processing ended: (datetime)'

B.1.2 Advisor Update Failure

For all types of failures the event would be similar, except that the Message field will have the actual cause of error.

Table B-2 Advisor Update Failure Event Details

Tag	Value
Severity	4
Event Name	Advisor update failed
Resource	Advisor Processor

Tag	Value
SubResource	Advisor Processor
Message	Advisor feed file advnxsfeed.1.zip could be corrupt

B.2 Download Manager Audit Events

- ◆ [Section B.2.1, “Download Successful,” on page 466](#)
- ◆ [Section B.2.2, “Download Failed,” on page 466](#)
- ◆ [Section B.2.3, “Download Config Updated,” on page 467](#)
- ◆ [Section B.2.4, “Download Config Added,” on page 467](#)
- ◆ [Section B.2.5, “Download Config Removed,” on page 467](#)

B.2.1 Download Successful

Table B-3 *Download Successful Event Details*

Tag	Value
Severity	1
Event Name	Download Success
Resource	DownloadFeedService
SubResource	DOWNLOAD
Message	Download successful for config:<Displays download configuration>

B.2.2 Download Failed

Table B-4 *Download Failed Event Details*

Tag	Value
Severity	1
Event Name	Download Failed
Resource	DownloadFeedService
SubResource	DOWNLOAD
Message	Exception for which the download failed

B.2.3 Download Config Updated

Table B-5 Download Config Updated Event Details

Tag	Value
Severity	1
Event Name	Update Download Config
Resource	DownloadFeedService
SubResource	DOWNLOAD
Message	Successfully updated Download Configuration

B.2.4 Download Config Added

Table B-6 Download Config Added Event Details

Tag	Value
Severity	1
Event Name	AddDownloadConfig
Resource	DownloadFeedService
SubResource	DOWNLOAD
Message	Successfully saved Download Configuration

B.2.5 Download Config Removed

Table B-7 Download Config Added Event Details

Tag	Value
Severity	1
Event Name	RemoveDownloadConfig
Resource	DownloadFeedService
SubResource	DOWNLOAD
Message	Successfully removed Download Configuration

B.3 Authentication Events

B.3.1 Authentication

When a user is authentic, the following event is generated.

Table B-8 *Authentication Events - Authentication*

Tag	Value
Severity	
Event Name	Authentication
Resource	UserAuthentication
SubResource	Authenticate
Message	User <name> has passed Authentication to Sentinel/Wizard

B.3.2 Creating Entry For External User

When creating an external user, the following event is generated.

Table B-9 *Authentication Events - Creating Entry For External User*

Tag	Value
Severity	
Event Name	CreatingEntryForExternalUser
Resource	UserAuthentication
SubResource	Authentication
Message	No existing local user entry with name <name> found, creating one

B.3.3 Duplicate User Objects

When there is an unexpected second active user object, this should not happen, the following event is generated. This is an internal error.

Table B-10 *Authentication Events - Duplicate User Objects*

Tag	Value
Severity	4
Event Name	TooManyActiveUsers
Resource	UserAuthentication
SubResource	Authenticate
Message	Error in user table : Multiple users with the name <name> found

B.3.4 Failed Authentication

When a user authentication fails, the following event is generated.

Table B-11 *Authentication Events - Failed Authentication*

Tag	Value
Severity	4
Event Name	AuthenticationFailed
Resource	UserAuthentication
SubResource	Authenticate
Message	Authentication of user <name> with OS name <domUser> from <IP> failed

B.3.5 Locked Account

When a locked user account is attempting to login, the following event is generated.

Table B-12 *Authentication Events - Locked Account*

Tag	Value
Severity	4
Event Name	LockedUser
Resource	UserAuthentication
SubResource	Authentication
Message	Attempt to login using locked account <acct>

B.3.6 No Such User Event

When a user attempts to login into the application and authentication succeeds but the user is not an Sentinel user, the following event is generated.

Table B-13 *Authentication Events - No Such User Event*

Tag	Value
Severity	4
Event Name	NoSuchUser
Resource	UserAuthentication
SubResource	Authenticate
Message	No existing user with name <name> found

B.3.7 Too Many Active Users

Table B-14 *Authentication Events - Too Many Active Users*

Tag	Value
Severity	
Event Name	
Resource	
SubResource	
Message	

B.3.8 User Discovered

If the server restarts, it loses the session information. It will then reconstruct the session when it receives messages from active users. When it discovers a connected user, the following internal event is generated.

Table B-15 *Table B-8: Authentication Events - User Discovered*

Tag	Value
Severity	1
Event Name	UserLoggedIn
Resource	UserSessionManager
SubResource	User
Message	Discovered active user <user> with OS name <osName> at <IP> logged in; currently <number> active users

B.3.9 User Logged In

When a user logs in, the following internal event is generated.

Table B-16 *Authentication Events - User Logged In*

Tag	Value
Severity	1
Event Name	UserLoggedIn
Resource	UserSessionManager
SubResource	User

Tag	Value
Message	User <user> with OS name <osName> at <IP> logged in; currently <number> active users

B.3.10 User Logged Out

When a user logs out, the following internal event is generated.

Table B-17 *Authentication Events - User Logged Out*

Tag	Value
Severity	1
Event Name	UserLoggedOut
Resource	UserSessionManager
SubResource	User
Message	Closing session for <user> OS name <osName> from <IP> was on since <date>; currently <number> active users

B.4 User Management

Below listed are for user management

B.4.1 Add Users To Role

Table B-18 *User Management - Add Users To Role*

Tag	Value
Severity	
Event Name	createRole
Resource	WorkflowServices
SubResource	WorkflowAdminService
Message	Adding users <name> to role <role>

B.4.2 Create Role

Table B-19 *User Management - Create Role*

Tag	Value
Severity	
Event Name	createRole
Resource	WorkflowServices
SubResource	WorkflowAdminService
Message	Creating role with name <name> and description <description>

B.4.3 Create User

Table B-20 *User Management - Create User*

Tag	Value
Severity	
Event Name	createUser
Resource	WorkflowServices
SubResource	WorkflowAdminService
Message	Creating user {0} Name {1} {2} belonging to roles <roles>

B.4.4 Creating User Account

Table B-21 *User Management - Creating User Account*

Tag	Value
Severity	
Event Name	createUser
Resource	Config
SubResource	UserManagementService
Message	Creating User Account: {0} with Last Name: <lastName>, First Name: <firstName>, State: <state>

B.4.5 Delete Role

Table B-22 *User Management - Delete Role*

Tag	Value
Severity	
Event Name	deleteRole
Resource	WorkflowServices
SubResource	WorkflowAdminService
Message	Deleting role with name <name>

B.4.6 Deleting User Account

Table B-23 *User Management - Deleting User Account*

Tag	Value
Severity	
Event Name	deleteUser
Resource	Config
SubResource	UserManagementService
Message	Deleting User Account: {0}

B.4.7 Locking User Account

Table B-24 *User Management - Locking User Account*

Tag	Value
Severity	
Event Name	lockUser
Resource	Config
SubResource	UserManagementService
Message	Locking User Account: {0}

B.4.8 Remove Users From Role

Table B-25 *User Management - Remove Users From Role*

Tag	Value
Severity	
Event Name	removeUsersFromRole
Resource	WorkflowServices
SubResource	WorkflowAdminService
Message	Removing users <name> from role <role>

B.4.9 Resetting Password

Table B-26 *Resetting Password*

Tag	Value
Severity	
Event Name	setPassword
Resource	Config
SubResource	UserManagementService
Message	Resetting password for User Account {0}

B.4.10 Unlocking User Account

Table B-27 *User Management - Unlocking User Account*

Tag	Value
Severity	
Event Name	unlockUser
Resource	Config
SubResource	UserManagementService
Message	Unlocking User Account: {0}

B.4.11 Updating User

Table B-28 *User Management - Updating User*

Tag	Value
Severity	
Event Name	updateUser
Resource	Config
SubResource	UserManagementService
Message	Updating user: {0} Last Name:<lastName>, First Name: <firstName>, State: <state>

B.5 Database Event Management

Below listed shows database event management

B.5.1 Database Space Reached Specified Percent Threshold

When event insertion is resumed after being blocked, the following event is sent.

Table B-29 *Database Event Management - Database Space Reached Specified Percent Threshold*

Tag	Value
Severity	0
Event Name	DbSpaceReachedPercentThrshld
Resource	Database
SubResource	Database
Message	Tablespace <string> has current size of <number> MB with a max size of <number> MB and has reached the percentage threshold of <number> %

B.5.2 Database Space Reached Specified Time Threshold

When event insertion is resumed after being blocked, the following event is sent.

Table B-30 *Database Event Management - Database Space Reached Specified Time Threshold*

Tag	Value
Severity	0
Event Name	DbSpaceReachedTimeThrshld

Tag	Value
Resource	Database
SubResource	Database
Message	Tablespace <string> has <number> MB left and growing <number> bytes per second and will run out space within the time threshold specified <number> seconds

B.5.3 Database Space Very Low

When event insertion is resumed after being blocked, the following event is sent.

Table B-31 Database Event Management - Database Space Very Low

Tag	Value
Severity	5
Event Name	DbSpaceVeryLow
Resource	Database
SubResource	Database
Message	Tablespace <string> has current size of <number> MB and has reached the physical threshold of <number> MB

B.5.4 Error inserting events

When inserting events into the database fails the following internal event is generated.

Table B-32 Database Event Management - Error inserting events

Tag	Value
Severity	5
Event Name	InsertEventsFailed
Resource	EventSubsystem
SubResource	Events
Message	Error inserting events into the Database—the events might be permanently lost. Please check the Database and backend server logs<Exception>

B.5.5 Error Moving Completed File

When an event file is completed it is moved to the output directory. If that move fails the following internal event is generated.

Table B-33 Database Event Management - Error Moving Completed File

Tag	Value
Severity	3
Event Name	MoveArchiveFileFailed
Resource	<DAS name>
SubResource	ArchiveFile
Message	Error moving completed archive file <fileName> to <directory>

B.5.6 Error Processing Event Message

Table B-34 Database Event Management - Error Processing Event Message

Tag	Value
Severity	
Event Name	ErrorProcessingEventMessage
Resource	EventSubsystem
SubResource	EventStore
Message	Error processing event message, events may be lost; check the log file for more details: {0}

B.5.7 Error Saving Failed Events

Table B-35 Database Event Management - Error Saving Failed Events

Tag	Value
Severity	
Event Name	ErrorSavingFailedEvents
Resource	EventSubsystem
SubResource	EventStore
Message	Error inserting failed events to cache; {0} events may be permanently lost. Check the logs for more detail and correct the problem immediately: {1}

B.5.8 Event Insertion is blocked

If DAS is writing into the overflow partition and the user attempts to add partitions SDM will send a request to DAS to temporarily stop inserting events into the database. When this happens DAS will send internal events every time it attempts to insert events into the database.

Table B-36 Database Event Management - Event Insertion is blocked

Tag	Value
Severity	4
Event Name	EventInsertionIsBlocked
Resource	EventSubSystem
SubResource	Events
Message	Event insertion is blocked, waiting <number> sec

B.5.9 Event Insertion is resumed

When event insertion is resumed after being blocked, the following event is sent.

Table B-37 Database Event Management - Event Insertion is resumed

Tag	Value
Severity	2
Event Name	EventInsertionResumed
Resource	EventSubSystem
SubResource	Events
Message	Event insertion has resumed after being blocked

B.5.10 Event Message Queue Overflow

Table B-38 Database Event Management - Event Message Queue Overflow

Tag	Value
Severity	
Event Name	EventMessageQueueOverflow
Resource	EventSubsystem
SubResource	EventStore
Message	In the previous {0}ms, failed to execute event store task for {1} events because task queue is full--Events were stored to file for later insertion. Check the log files and the database " "for more information. The error occurred {2} times in this time range: {3}";

B.5.11 Event Processing Failed

Table B-39 Database Event Management - Event Processing Failed

Tag	Value
Severity	
Event Name	EventProcessingFailed
Resource	EventSubsystem
SubResource	EventStore
Message	In the previous {0}ms, failed to process {1} events--Events were stored for later insertion. Check the log files and the database for more information. The error occurred {2} times in this time range: {3}, cause {4}";

B.5.12 No Space In The Database

Table B-40 Database Event Management - No Space In The Database

Tag	Value
Severity	
Event Name	DbNoSpace
Resource	DBSpace
SubResource	tableSpace
Message	

B.5.13 Opening Archive File failed

When opening an archive file for storing the events for aggregation fails, the following internal event is generated.

Table B-41 Database Event Management - Opening Archive File failed

Tag	Value
Severity	3
Event Name	OpenArchiveFileFailed
Resource	<Das name>
SubResource	ArchiveFile
Message	Error opening archive file <fileName> in <directory>

B.5.14 Partition Configuration

Table B-42 Database Event Management - Partition Configuration

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	
SubResource	PartitionConfig
Message	ableName=<name> PartTimeUnit={1} PartTimeFactor={2} NumberOfUnits={3}

B.5.15 Writing to Archive File failed

When opening an archive file for storing the events for aggregation fails, the following internal event is generated.

Table B-43 Database Event Management - Writing to Archive File failed

Tag	Value
Severity	3
Event Name	WriteArchiveFileFailed
Resource	<Das name>
SubResource	ArchiveFile
Message	Error writing newly received events to aggregation archive file <fileName>

B.5.16 Writing to the overflow partition (P_MAX)

An event is sent approximately every 5 minutes notifying the user when events are being written to the overflow partition (P_MAX). When this occurs, the administrator needs to use SDM and add more partitions otherwise performance will start degrading.

Table B-44 Database Event Management - Writing to the overflow partition (P_MAX)

Tag	Value
Severity	5
Event Name	InsertIntoOverflowPartition
Resource	EventSubSystem
SubResource	Events
Message	Error: currently inserting into the overflow partitions (P_MAX), add more partitions

B.6 Database Aggregation

Below listed states database aggregation.

B.6.1 Creating Summary

Table B-45 Database Aggregation - Creating Summary

Tag	Value
Severity	
Event Name	createSummary
Resource	
SubResource	
Message	Creating summary: <summaryDescription>

B.6.2 Deleting Summary

Table B-46 Database Aggregation - Deleting Summary

Tag	Value
Severity	
Event Name	deleteSummary
Resource	
SubResource	
Message	Deleting summary: <summaryDescription>

B.6.3 Disabling Summary

Table B-47 Database Aggregation - Disabling Summary

Tag	Value
Severity	
Event Name	disableSummary
Resource	
SubResource	
Message	Disabling summary: <summaryDescription>

B.6.4 Enabling Summary

Table B-48 Database Aggregation - Enabling Summary

Tag	Value
Severity	
Event Name	enableSummary
Resource	
SubResource	EventAggregationAdminService
Message	Enabling summary: <summaryDescription>

B.6.5 Error inserting summary data into the database

If an error is encountered while writing aggregation data into the database, the following internal event is generated.

Table B-49 Database Aggregation - Error inserting summary data into the database

Tag	Value
Severity	4
Event Name	SummaryUpdateFailure
Resource	Aggregation
SubResource	Summary
Message	Error saving summary batch to the database for summary <summaryName>

B.6.6 Saving Summary

Table B-50 Database Aggregation - Saving Summary

Tag	Value
Severity	
Event Name	saveSummary
Resource	
SubResource	
Message	Saving summary: <summaryDescription>

B.7 Mapping Service

Below listed are relevant to mapping service

B.7.1 Error

Table B-51 Database Aggregation - Error

Tag	Value
Severity	
Event Name	error
Resource	
SubResource	
Message	Error while updating map data: {0}

B.7.2 Error Applying Incremental Update

This event is sent when the mapping service fails to apply an update to an existing client map.

Table B-52 Database Aggregation - Error Applying Incremental Update

Tag	Value
Severity	4
Event Name	ErrorApplyingIncrementalUpdate
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	The error <error> occurred while applying updates to map <mapName> (ID <mapId>) v.<version>. Rescheduling a refresh to complete map update.

B.7.3 Error initializing map with ID

This internal event is generated from the client side of the mapping service (the one that is part of the Collector Manager). This error is generated when the Collector Manager attempts to retrieve a map that does not exist. This should not happen but can happen if maps are created and deleted.

Table B-53 Database Aggregation - Error initializing map with ID

Tag	Value
Severity	4
Event Name	ErrorNoSuchMap
Resource	MappingService
SubResource	ReferentialDataObjectMap

Tag	Value
Message	Error initializing map with id <ID>: no such map

B.7.4 Error Refreshing Map

This internal event is generated from the client side of the mapping service (the one that is part of the Collector Manager). When the Collector Manager is told to refresh the map because it has been modified or its definition has changed it sends an internal event. This means that there was some unexpected non-transient error while trying to refresh a map. The Collector Manager will wait 15 minutes and will try again. If this happens during initialization the initialization will proceed and this map will be ignored until it can be successfully loaded.

Table B-54 Database Aggregation - Error Refreshing Map

Tag	Value
Severity	4
Event Name	ErrorRefreshingMapData
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Error refreshing map <mapName>: <exc>

B.7.5 Error Saving Data File

Table B-55 Database Aggregation - Error Saving Data File

Tag	Value
Severity	
Event Name	ErrorSavingDataFile
Resource	MappingService
SubResource	MapService
Message	The error <error> occurred while saving data to file <fileName> (no) backup

B.7.6 Get File Size

Table B-56 Database Aggregation - Get File Size

Tag	Value
Severity	
Event Name	getFileSize

Tag	Value
Resource	
SubResource	
Message	Retrieving size for file <fileName>

B.7.7 Loaded Large Map

This internal event is an information event sent by the mapping service informing that a large map was loaded to the Collector Manager. A map is considered large if the number of rows exceeds 100,000.

Table B-57 Database Aggregation - Loaded Large Map

Tag	Value
Severity	0
Event Name	LoadedLargeMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Finished loading map <name> with id <ID> and <number> entries and total size <#>Kb in <##>sec

B.7.8 Long Time To Load Map

This internal event is an information event sent by the mapping service informing that loading a map took an unusually long time (greater than one minute).

Table B-58 Database Aggregation - Long time To load Map

Tag	Value
Severity	0
Event Name	LongTimeToLoadMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	It took <##>sec to load map <name> with id <ID> and <number> entries and total size <##>Kb

B.7.9 Out Of Sync Detected

This event is sent when the mapping service detects that a map is out of date. The mapping service will automatically schedule a refresh.

Table B-59 Database Aggregation - Out Of Sync Detected

Tag	Value
Severity	2
Event Name	OutOfsyncDetected
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Map <mapName> detected the map data is out-of-sync, probably because of a missed update notification--scheduling a refresh

B.7.10 Refreshing Map from Cache

This internal event is generated from the client side of the mapping service (the one that is part of the Collector Manager). When the Collector Manager is told to refresh the map because it has been modified or its definition has changed it sends an internal event. This means that its cache is up to date and is refreshing the map from cache.

Table B-60 Database Aggregation - Refreshing Map from Cache

Tag	Value
Severity	1
Event Name	LoadingMapFromCache
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Loading from cache v<version> of map <mapName> (ID <id>)

B.7.11 Refreshing Map from Server

This internal event is generated from the client side of the mapping service (the one that is part of the Collector Manager). When the Collector Manager is told to refresh the map because it has been modified or its definition has changed it sends an internal event. This means that the map was either not in the cache or the version in the cache was not up to date and the Collector Manager is retrieving the map from the server.

Table B-61 Database Aggregation - Refreshing Map from Server

Tag	Value
Severity	1
Event Name	RefreshingMapFromServer
Resource	MappingService
SubResource	ReferentialDataObjectMap

Tag	Value
Message	Refreshing from server map <name> with id <ID>

B.7.12 Save Data File

Table B-62 Database Aggregation - Save Data File

Tag	Value
Severity	
Event Name	saveDataFile
Resource	
SubResource	MapService
Message	Saving data file {0}, backup? {1}

B.7.13 Saved Data File

Table B-63 Database Aggregation - Saved Data File

Tag	Value
Severity	
Event Name	SavedDataFile
Resource	MappingService
SubResource	MapService
Message	Saved "+fileSize+" bytes to file <fileName> with original backed up to "+backupFile:"no backup of original

B.7.14 Timed Out Waiting For Callback

When the Collector Manager needs to refresh a map it sends a request to the backend. This request contains a callback. The backend generates the map and when it is ready it sends the map to the Collector Manager using the callback. If it takes too long for the response to arrive (more than ten minutes) the Collector Manager will submit a second request assuming the first was lost. When this occurs, the following internal event is generated.

Table B-64 Database Aggregation - Timed Out Waiting For Callback

Tag	Value
Severity	2
Event Name	TimedoutWaitingForCallback

Tag	Value
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Map <name> timed out waiting for callback with new map data--retrying

B.7.15 Timeout Refreshing Map

This internal event is generated from the client side of the mapping service (the one that is part of the Collector Manager). When the Collector Manager is told to refresh the map because it has been modified or its definition has changed it sends an internal. This means that the Collector Manager attempted to retrieve the map from the server and the server never acknowledged the request and timed out. This error is considered transient and the Collector Manager will retry.

Table B-65 Database Aggregation - Timeout Refreshing Map

Tag	Value
Severity	4
Event Name	TimeoutRefreshingMap
Resource	MappingService
SubResource	ReferentialDataObjectMap
Message	Request timed out while refreshing map <name>: <exception>

B.7.16 Update

Table B-66 Database Aggregation - Update

Tag	Value
Severity	
Event Name	update
Resource	
SubResource	MapDataCallback
Message	Updating map data

B.7.17 Update

Table B-67 Database Aggregation - Update

Tag	Value
Severity	
Event Name	update
Resource	
SubResource	(low)
Message	Updating map data (ser)

B.8 Event Router

Below listed are relevant to Event router.

B.8.1 Event Router is Initializing

This event is sent when an event router starts its initialization. The event router starts initializing when it has established a connection with the backend (DAS Query).

Table B-68 Event Router - Event Router is Initializing

Tag	Value
Severity	1
Event Name	EventRouterInitializing
Resource	CollectorManager
SubResource	EventRouter
Message	Event router is initializing in standalone mode; reqId(1EEAD430-E790-1029-93AC-000C296FC5D4)

B.8.2 Event Router is Running

Event router is the main component of the Collector Manager (the one that performs the maps, applies global filters and publishes the events). This internal event is sent when the event router is ready during initialization. When the Collector Manager is restarted, another event will be sent when it is ready.

This event is not sent until the event router successfully loaded all the global filters and map information.

Table B-69 *Event Router - Event Router is Running*

Tag	Value
Severity	1
Event Name	EventRouterIsRunning
Resource	CollectorManager

B.8.3 Event Router is Stopping

This event is sent when a request is received by the event router to stop during shutdown.

Table B-70 *Event Router - Event Router is Stopping*

Tag	Value
Severity	2
Event Name	EventRouterStopping
Resource	CollectorManager
SubResource	EventRouter
Message	Event router is stopping; reqId(B408EC15-F4D2-1029-A797-000C296FC5D4)

B.8.4 Event Router is Terminating

This event is sent when a request is received by the event router to stop during shutdown.

Table B-71 *Event Router - Event Router is Terminating*

Tag	Value
Severity	2
Event Name	EventRouterTerminating
Resource	CollectorManager
SubResource	EventRouter
Message	Event router is terminating; reqId(B408EC15-F4D2-1029-A797-000C296FC5D4)

B.9 Correlation Engine

Below listed are relevant to correlation engine.

B.9.1 Correlation Action Definition

Table B-72 Correlation Engine - Correlation Action Definition

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	Correlation
SubResource	CorrelationActionDefinition
Message	Action Name: <name> with Id: <ID>

B.9.2 Correlation Engine Configuration

Table B-73 Correlation Engine - Correlation Engine Configuration

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	Correlation
SubResource	CorrEngineConfig
Message	Correlation Engine ID: <ID> Name: <name> Active: {2}

B.9.3 Correlation Engine is Running

The correlation engine process can be idled by the user. Its running state determines whether the active process is processing events or not. The process starts in the idle (stopped) state and waits to retrieve its configuration from the database. This event is sent when the engine changes state from stopped to running.

Table B-74 Correlation Engine - Correlation Engine is Running

Tag	Value
Severity	1
Event Name	EngineRunning
Resource	CorrelationEngine
SubResource	CorrelationEngine
Message	Correlation Engine is processing events.

B.9.4 Correlation Engine is Stopped

This event is sent out when the engine changes state from running to stopped.

Table B-75 *Correlation Engine - Correlation Engine is Stopped*

Tag	Value
Severity	1
Event Name	EngineStopped
Resource	CorrelationEngine
SubResource	CorrelationEngine
Message	Correlation Engine has stopped processing events.

B.9.5 Correlation Rule

Table B-76 *Correlation Engine - Correlation Rule*

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	Correlation
SubResource	CorrRule
Message	Rule Name: <name> Type: <type> Rule Id: <ID>

B.9.6 Correlation Rule Configuration

Table B-77 *Correlation Engine - Correlation Rule Configuration*

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	Correlation
SubResource	CorrRuleConfig
Message	Correlation Rule Config ID: <ID> Rule Definition ID: {1} Name: <name> Active: {3}

B.9.7 Deploy Rules With Actions To Engine

Table B-78 *Correlation Engine - Deploy Rules With Actions To Engine*

Tag	Value
Severity	
Event Name	deployRulesWithActionsToEngine
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Deploy Rules With Actions To Engine <enginId>: Rules: <ruleID> Actions: <actionID>

B.9.8 Disabling Rule

Table B-79 *Correlation Engine - Disabling Rule*

Tag	Value
Severity	
Event Name	disableRule
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Disable Rule: {ruleCfgId}

B.9.9 Enabling Rule

Table B-80 *Correlation Engine - Enabling Rule*

Tag	Value
Severity	
Event Name	enableRule
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Enable Rule: {ruleCfgId}

B.9.10 Rename Correlation Engine

Table B-81 *Correlation Engine - Rename Correlation Engine*

Tag	Value
Severity	
Event Name	renameCorrEngine
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Rename Engine to: <name> with EngineId: <ID>

B.9.11 Rule Deployment is Modified

This event is sent out when an engine successfully reloads a rule deployment. This message is sent out regardless of the engine running state.

Table B-82 *Correlation Engine - Rule Deployment is Modified*

Tag	Value
Severity	1
Event Name	DeploymentModified
Resource	CorrelationEngine
SubResource	Deployment
Message	Deployment <name> modified

B.9.12 Rule Deployment is Started

This event is sent out when an engine successfully loads a rule deployment. This message is sent out regardless of the engine running state.

Table B-83 *Correlation Engine - Rule Deployment is Started*

Tag	Value
Severity	1
Event Name	DeploymentStarted
Resource	CorrelationEngine
SubResource	Deployment
Message	deployment <name> started

B.9.13 Rule Deployment is Stopped

This event is sent out when an engine successfully unloads a rule deployment. This message is sent out regardless of the engine running state.

Table B-84 *Correlation Engine - Rule Deployment is Stopped*

Tag	Value
Severity	1
Event Name	DeploymentStopped
Resource	CorrelationEngine
SubResource	Deployment
Message	deployment <name> stopped

B.9.14 Starting Engine

Table B-85 *Correlation Engine - Starting Engine*

Tag	Value
Severity	
Event Name	startEngine
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Start engine: <engineID>

B.9.15 Stopping Engine

Table B-86 *Correlation Engine - Stopping Engine*

Tag	Value
Severity	
Event Name	stopEngine
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Stop engine: <engineID>

B.9.16 UnDeploy All Rules From Engine

Table B-87 Correlation Engine - UnDeploy All Rules From Engine

Tag	Value
Severity	
Event Name	undeployAllRulesFromEngine
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Undeploy all rules from Engine:

B.9.17 UnDeploy Rule

Table B-88 Correlation Engine - UnDeploy Rule

Tag	Value
Severity	
Event Name	undeployRule
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Undeploy Rule: {ruleCfgId}

B.9.18 Update Correlation Rule Actions

Table B-89 Correlation Engine - Update Correlation Rule Actions

Tag	Value
Severity	
Event Name	updateCorrRuleActions
Resource	CorrelationManagementService
SubResource	CorrelationManagementService
Message	Update Rule Config {0} by deleting Actions: <actionID> and adding Actions: <actionID>

B.10 Event Source Management-General

Below listed are relevant to Event Source Management-General.

B.10.1 Collector Manager Initialized

Table B-90 *Event Source Management (General) - Collector Manager Initialized*

Tag	Value
Severity	
Event Name	CollectorManagerInitialized
Resource	CollectorManager
SubResource	Internal
Message	Initialized Collector Manager...

B.10.2 Collector Manager Is Down

Table B-91 *Event Source Management (General) - Collector Manager Is Down*

Tag	Value
Severity	
Event Name	CollectorManagerDown
Resource	HealthManager
SubResource	CollectorManagerHealth
Message	Collector manager <name> UUID {1} is down for {2} days {3} hrs {4} min

B.10.3 Collector Manager Started

Table B-92 *Event Source Management (General) - Collector Manager Started*

Tag	Value
Severity	
Event Name	CollectorManagerStarted
Resource	CollectorManager
SubResource	Internal
Message	Started Collector Manager...

B.10.4 Collector Manager Stopped

Table B-93 *Event Source Management (General) - Collector Manager Stopped*

Tag	Value
Severity	
Event Name	CollectorManagerStopped
Resource	CollectorManager
SubResource	Internal
Message	Stopped Collector Manager...

B.10.5 Collector Service Callback

Table B-94 *Event Source Management (General) - Collector Service Callback*

Tag	Value
Severity	
Event Name	restart
Resource	
SubResource	CollectorServiceCallback
Message	Restart Collector with Id: <ID>

B.10.6 Cyclical Dependency

Event Service sends this event when it detects a cycle in the Event Definition (in dependencies among tags because of referential map assignments). Check the event configuration in SDM and resolve the dependency.

Table B-95 *Event Source Management (General) - Cyclical Dependency*

Tag	Value
Severity	5
Event Name	CyclicalDependency
Resource	EventService
SubResource	ObjectAttrInfos
Message	Cyclical dependency detected in event transformations. Check event configuration.

B.10.7 Event Source Manager Callback

Table B-96 *Event Source Management (General) - Event Source Manager Callback*

Tag	Value
Severity	
Event Name	restart
Resource	
SubResource	EventSourceManagerCallback
Message	Restart node with Id: <ID>

B.10.8 Initializing Collector Manager

Table B-97 *Event Source Management (General) - Initializing Collector Manager*

Tag	Value
Severity	
Event Name	CollectorManagerInitializing
Resource	CollectorManager
SubResource	Internal
Message	Initializing Collector Manager...

B.10.9 Lost Contact With Collector Manager

Table B-98 *Event Source Management (General) - Lost Contact With Collector Manager*

Tag	Value
Severity	
Event Name	LostContactWithCollectorManager
Resource	HealthManager
SubResource	CollectorManagerHealth
Message	Lost contact with collector manager <name> UUID {1}--down for {2} days {3} hrs {4} min

B.10.10 No Data Alert

Table B-99 *Event Source Management (General) - No Data Alert*

Tag	Value
Severity	
Event Name	NoDataAlert
Resource	CollectorManager
SubResource	objectName
Message	No data received for {7} {0} (ID {1}) for last {2} days {3} hrs {4} min {5} sec (threshold {6} ms)

B.10.11 Persistent Process Died

Collector Engine sends this event when the persistent process connector detects its controlled process has died.

Table B-100 *Event Source Management (General) - Persistent Process Died*

Tag	Value
Severity	5
Event Name	PersistentProcessDied
Resource	AgentManager
SubResource	AgentManager
Message	Persistent Process on port <port ID> has died.

B.10.12 Persistent Process Restarted

Collector Engine sends this event when the persistent process connector is able to restart the controlled process that had died.

Table B-101 *Event Source Management (General) - Persistent Process Restarted*

Tag	Value
Severity	1
Event Name	PersistentProcessRestarted
Resource	AgentManager
SubResource	AgentManager
Message	Persistent Process on port <port ID> has restarted.

B.10.13 Port Start

Collector Manager sends this event when a port is started.

Table B-102 *Event Source Management (General) - Port Start*

Tag	Value
Severity	1
Event Name	PortStart
Resource	AgentManager
SubResource	AgentManager
Message	Processing started for port_<port ID>

B.10.14 Port Stop

Collector Manager sends this event when a port is stopped.

Table B-103 *Event Source Management (General) - Port Stop*

Tag	Value
Severity	1
Event Name	PortStop
Resource	AgentManager
SubResource	AgentManager
Message	Processing stopped for port_<port ID>

B.10.15 Reestablished Contact With Collector Manager

Table B-104 *Event Source Management (General) - Reestablished Contact With Collector Manager*

Tag	Value
Severity	
Event Name	ReestablishedContactWithCollectorManager
Resource	HealthManager
SubResource	CollectorManagerHealth
Message	Reestablished contact with collector manager {0} UUID {1} after {2} days {3} hrs {4} min

B.10.16 Restart Plugin Deployments

Table B-105 *Event Source Management (General) - Restart Plugin Deployments*

Tag	Value
Severity	
Event Name	restartPluginDeployments
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Restart deployments of plugin: {0}

B.10.17 Restarting Collector Manager (Cold Restart)

Table B-106 *Event Source Management (General) - Restarting Collector Manager (Cold Restart)*

Tag	Value
Severity	
Event Name	CollectorManagerRestart
Resource	CollectorManager
SubResource	Internal
Message	Restarting Collector Manager (Cold restart)

B.10.18 Restarting Collector Manager (Warm Restart)

Table B-107 *Event Source Management (General) - Restarting Collector Manager (Warm Restart)*

Tag	Value
Severity	
Event Name	CollectorManagerRestart
Resource	CollectorManager
SubResource	Internal
Message	Restarting Collector Manager (Warm restart)

B.10.19 Start Event Source Group

Table B-108 Event Source Management (General) - Start Event Source Group

Tag	Value
Severity	
Event Name	startEventSourceGroup
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Start Connector: {0}

B.10.20 Start Event Source Manager

Table B-109 Event Source Management (General) - Start Event Source Manager

Tag	Value
Severity	
Event Name	startEventSourceManager
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Start Collector Manager: <eventSourceManagerID>

B.10.21 Starting Collector Manager

Table B-110 Event Source Management (General) - Starting Collector Manager

Tag	Value
Severity	
Event Name	CollectorManagerStarting
Resource	CollectorManager
SubResource	Internal
Message	Starting Collector Manager

B.10.22 Stop Event Source Group

Table B-111 *Event Source Management (General) - Stop Event Source Group*

Tag	Value
Severity	
Event Name	stopEventSourceGroup
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Stop Connector: {0}

B.10.23 Stop Event Source Manager

Table B-112 *Event Source Management (General) - Stop Event Source Manager*

Tag	Value
Severity	
Event Name	StopEventSourceManager
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Stop Collector Manager: <eventSourceManagerID>

B.10.24 Stopping Collector Manager

Table B-113 *Event Source Management (General) - Stopping Collector Manager*

Tag	Value
Severity	
Event Name	CollectorManagerStopping
Resource	CollectorManager
SubResource	Internal
Message	Stopping Collector Manager...

B.11 Event Source Management-Event Sources

Below listed are relevant to Event Source Management-Event Sources.

B.11.1 Start Event Source

Table B-114 Event Source Management (Event Sources) - Start Event Source

Tag	Value
Severity	
Event Name	startEventSource
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Start EventSource: {0}

B.11.2 Stop Event Source

Table B-115 Event Source Management (Event Sources) - Stop Event Source

Tag	Value
Severity	
Event Name	stopEventSource
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Stop EventSource: {0}

B.12 Event Source Management-Collectors

Below listed are for Event Source Management-Collectors.

B.12.1 Start Collector

Table B-116 Event Source Management (Collectors) - Start Collector

Tag	Value
Severity	
Event Name	startCollector
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Start Collector: {0}

B.12.2 Stop Collector

Table B-117 *Event Source Management (Collectors)- Stop Collector*

Tag	Value
Severity	
Event Name	stopCollector
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Stop Collector: {0}

B.13 Event Source Management-Event Source Servers

Below listed are relevant to Event Source Management-Event Source Servers.

B.13.1 Start Event Source Server

Table B-118 *Event Source Management (Event Source Servers)- Start Event Source Server*

Tag	Value
Severity	
Event Name	startEventSourceServer
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Start EventSourceServer: <eventSourceServerID>

B.13.2 Stop Event Source Server

Table B-119 *Event Source Management (Event Source Servers)- Stop Event Source Server*

Tag	Value
Severity	
Event Name	stopEventSourceServer
Resource	EventSourceManagement
SubResource	EventSourceManagerService

Tag	Value
Message	Stop EventSourceServer: <eventSourceServerID>

B.13.3 Stop Event Source Server

Table B-120 Event Source Management (Event Source Servers)- Stop Event Source Server

Tag	Value
Severity	
Event Name	stopEventSourceServer
Resource	EventSourceManagement
SubResource	EventSourceManagerService
Message	Stop EventSourceServer: <eventSourceServerID>

B.14 Event Source Management-Connectors

Below listed are relevant to Event Source Management-Connectors.

B.14.1 Data Received After Timeout

When the File Connector is configured with a DataTimeout greater than 0 in the `package.xml` file and the DataTimeout period without reading any data and then new data is read from the file, the following internal event is generated.

Table B-121 Event Source Management (Connectors)- Data Received After Timeout

Tag	Value
Severity	4
Event Name	FileUpdatedAfterTimeout
Resource	FileConnector
SubResource	FileConnector
Message	After Event source<File Event Source ID> reached time out of<Timeout Period>, file<File Location> received new data.

B.14.2 Data Timeout

When the File Connector is configured with a DataTimeout greater than 0 in the `package.xml` file and no data is read from the file in the DataTimeout period, the following internal event is generated.

Table B-122 *Event Source Management (Connectors)- Data Timeout*

Tag	Value
Severity	4
Event Name	FileTimeout
Resource	FileConnector
SubResource	FileConnector
Message	Event source <File Event Source ID> reached time out of <Timeout Period> when processing file <File Location>.

B.14.3 File Rotation

When the File Connector is configured to use file rotation and the Connector changes from one file to the next, the following internal event is generated.

Table B-123 *Event Source Management (Connectors)- File Rotation*

Tag	Value
Severity	4
Event Name	RotatingFile
Resource	FileConnector
SubResource	FileConnector
Message	File rotated for event source <File Event Source ID>. Rotating file from <Previous File Location> to <New File Location>.

B.14.4 Process Auto Restart Error

Table B-124 *Event Source Management (Connectors)- Process Auto Restart Error*

Tag	Value
Severity	4
Event Name	ProcessAutoRestartError
Resource	ProcessConnector
SubResource	ProcessConnector
Message	Process <{0}> [command: {1}] was automatically restarted more than the allowed {2} automatic restart(s) in {3} min. The process will no longer be automatically restarted. Please check process configuration.

B.14.5 Process Start Error

Table B-125 Event Source Management (Connectors)- Process Start Error

Tag	Value
Severity	1
Event Name	ProcessStartError
Resource	ProcessConnector
SubResource	ProcessConnector
Message	Error starting command: {0}

B.14.6 Process Stop

Table B-126 Event Source Management (Connectors) - Process Stop

Tag	Value
Severity	1
Event Name	ProcessStop
Resource	ProcessConnector
SubResource	ProcessConnector
Message	Process <{0}> exited [command: {1}]

B.14.7 WMI Connector Status Message

Table B-127 Event Source Management (Connectors) - WMI Connector Status Message

Tag	Value
Severity	4
Event Name	WMIConnectorStatusMessage
Resource	WMIConnector
SubResource	WMIConnector
Message	<Exception>

B.15 Active Views

Below listed is about Active views.

B.15.1 Active View Created

DAS_Binary sends this event when an Active View is created.

Table B-128 *Active View - Active View Created*

Tag	Value
Severity	1
Event Name	RtChartCreated
Resource	RealTimeSummaryService
SubResource	ChartManager
Message	Creating new Active View with filter <filter> and attribute <attribute> for users with security filter <security filter>. Currently <n> Active View(s) Collecting.

B.15.2 Active View Joined

DAS_Binary sends this event when a user connects to an existing Active View.

Table B-129 *Active View - Active View Joined*

Tag	Value
Severity	1
Event Name	RtChartJoiningExistingData
Resource	RealTimeSummaryService
SubResource	ChartManager
Message	Joining existing Active View with filter <filter> and attribute <attribute> for users with security filter <security filter>. Currently <n> Active View(s) Collecting.

B.15.3 Active View No Longer Permanent

DAS_Binary sends this event when it detects a formerly permanent Active View that is no longer permanent. This check happens periodically, so it can be several minutes after an Active View is removed from preferences before this event is generated.

Table B-130 *Active View - Active View No Longer Permanent*

Tag	Value
Severity	1
Event Name	RtChartNotPermanent
Resource	RealTimeSummaryService

Tag	Value
SubResource	ChartManager
Message	Active View with filter <filter> and attribute <attribute> for users with security filter <security filter> is no longer permanent.

B.15.4 Active View Now Permanent

DAS_Binary sends this event when it detects an Active View as newly permanent. This check happens periodically, so it can be several minutes after an Active View is saved to preferences before this event is generated.

Table B-131 Active View - Active View Now Permanent

Tag	Value
Severity	1
Event Name	RtChartIsNowPermanent
Resource	RealTimeSummaryService
SubResource	ChartManager
Message	Active View with filter <filter> and attribute <attribute> for users with security filter <security filter> is now permanent.

B.15.5 Idle Active View Removed

DAS_Binary sends this event when a non-permanent Active View is removed because of inactivity.

Table B-132 Active View - Idle Active View Removed

Tag	Value
Severity	1
Event Name	RtChartInactiveAndRemoved
Resource	RealTimeSummaryService
SubResource	ChartManager
Message	Removed idle Active View with filter <filter> and attribute <attribute> for users with security filter <security filter>. Currently <n> Active View(s) Collecting.

B.15.6 Idle Permanent Active View Removed

DAS_Binary sends this event when a permanent Active View is removed because of inactivity. Permanent Active Views are ones saved in user preferences and timeout after several days of inactivity by default.

Table B-133 *Active View - Idle Permanent Active View Removed*

Tag	Value
Severity	1
Event Name	RtPermanentChartRemoved
Resource	RealTimeSummaryService
SubResource	ChartManager
Message	Removed idle permanent Active View with filter <filter> and attribute <attribute> for users with security filter <security filter>. Currently <n> Active View(s) Collecting.

B.16 Data Objects

Below listed is about Data objects.

B.16.1 Activity Definition

Table B-134 *Data Objects - Activity Definition*

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	
SubResource	ActivityDefinition
Message	Activaty Name: <name> Description: <description>

B.16.2 Configuration

Table B-135 *Data Objects - Configuration*

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	Core
SubResource	FilterConfig, GlobalFilterConfig, MenuConfig, OptionsConfig, IncidentActionConfig, AnalyzeDefaultConfig, AnalyzeReportConfig, AdvisorDefaultConfig and AdvisorReportConfig
Message	Updating Config Object: <name> by User: _SYSTEM

B.16.3 Viewing Configuration Store

Table B-136 *Data Objects - Viewing Configuration Store*

Tag	Value
Severity	
Event Name	New/Update/Remove
Resource	
SubResource	ViewConfigurationStore
Message	name <name> type <type> description <description>

B.16.4 Write Data

Table B-137 *Data Objects - Write Data*

Tag	Value
Severity	
Event Name	WriteData
Resource	ListService
SubResource	ListUpdater
Message	Could not write data for list

B.17 Activities

Below listed are relevant to Activities.

B.17.1 Creating an Activity

Table B-138 *Activities - Creating an Activity*

Tag	Value
Severity	
Event Name	createActivity
Resource	
SubResource	ActivityNamespace
Message	Creating iTRAC Activity <name>

B.17.2 Deleting an Activity

Table B-139 *Activities - Deleting an Activity*

Tag	Value
Severity	
Event Name	deleteActivity
Resource	
SubResource	ActivityNamespace
Message	Deleting iTRAC Activity <name>

B.17.3 Saving an Activity

Table B-140 *Activities - Saving an Activity*

Tag	Value
Severity	
Event Name	saveActivity
Resource	
SubResource	ActivityNamespace
Message	Saving changes for iTRAC Activity <name>

B.18 Incidents and Workflows

Below listed are relevant to Incidents and Workflows.

B.18.1 Add Events To Incident

Table B-141 *Incidents and Workflow - Add Events To Incident*

Tag	Value
Severity	
Event Name	addEventsToIncident
Resource	IncidentService
SubResource	IncidentService
Message	User: <name> adding <number> events to incident with ID: <ID>

B.18.2 Adding Process Definition

Table B-142 *Incidents and Workflow - Adding Process Definition*

Tag	Value
Severity	
Event Name	addProcessDefinition
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	reading iTRAC Template <name>

B.18.3 Create Incident

Table B-143 *Incidents and Workflow - Create Incident*

Tag	Value
Severity	
Event Name	createIncident
Resource	IncidentService
SubResource	IncidentService
Message	User: <name> created incident with name: <incidentName>, state: <state>, severity: <severity>, resolution: <resolution>

B.18.4 Creating Group

Table B-144 *Incidents and Workflow - Creating Group*

Tag	Value
Severity	
Event Name	createGroup
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Creating iTRAC Role {0} : description : <description>

B.18.5 Creating User

Table B-145 *Incidents and Workflow - Creating User*

Tag	Value
Severity	
Event Name	createUser
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Creating User in WorkFlow: {0} with firstname: <firstName> lastname : <lastName>

B.18.6 Delete Incident

Table B-146 *Incidents and Workflow - Delete Incident*

Tag	Value
Severity	
Event Name	deleteIncident
Resource	IncidentService
SubResource	IncidentService
Message	Delete incident with ID: <ID>

B.18.7 Deleting Group

Table B-147 *Incidents and Workflow - Deleting Group*

Tag	Value
Severity	
Event Name	deleteGroup
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Deleting iTRAC Role {0} : description : <description>

B.18.8 Deleting Process Definition

Table B-148 *Incidents and Workflow - Deleting Process Definition*

Tag	Value
Severity	
Event Name	deleteProcessDefinition
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Deleting iTRAC Template <ID>

B.18.9 Deleting User

Table B-149 *Incidents and Workflow - Deleting User*

Tag	Value
Severity	
Event Name	deleteUser
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Deleting User in WorkFlow: {0} with firstname: <firstName> lastname : <lastName>

B.18.10 E-mail Incident

Table B-150 *Incidents and Workflow - E-mail Incident*

Tag	Value
Severity	
Event Name	emailIncident
Resource	IncidentService
SubResource	IncidentService
Message	User: <name> emailed incident with name: <incidentName>, state: <state>, severity: <severity>{2}, resolution: <resolution> to email address: <e-mailID>

B.18.11 Get Incident

Table B-151 *Incidents and Workflow - Get Incident*

Tag	Value
Severity	
Event Name	getIncident
Resource	IncidentService
SubResource	IncidentService
Message	Get incident with ID: <ID>

B.18.12 Save Incident

Table B-152 *Incidents and Workflow - Save Incident*

Tag	Value
Severity	
Event Name	saveIncident
Resource	IncidentService
SubResource	IncidentService
Message	Save incident with name: <name>, state: <state>, severity: <severity>, resolution: <resolution>

B.18.13 Saving Group

Table B-153 *Incidents and Workflow - Saving Group*

Tag	Value
Severity	
Event Name	saveGroup
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Saving ITRAC Role {0} : description : <description>

B.18.14 Saving Process Definition

Table B-154 *Incidents and Workflow - Saving Process Definition*

Tag	Value
Severity	
Event Name	saveProcessDefinition
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Saving iTRAC Template <name>

B.18.15 Viewing Process Definition

Table B-155 *Incidents and Workflow - Viewing Process Definition*

Tag	Value
Severity	
Event Name	getProcessDefinition
Resource	WorkflowServices
SubResource	WorkflowObjectMgrService
Message	Viewing iTRAC Template <ID>

B.19 General

Below listed are relevant to General.

B.19.1 Configuration Service

Table B-156 *General - Configuration Service*

Tag	Value
Severity	
Event Name	saveConfig
Resource	
SubResource	ConfigService
Message	Saving configuration, unit {0} app {1} userId {2}

B.19.2 Controlled Process is started

Watchdog is run as a service. Its main purpose is to keep Sentinel processes running. If a process dies, Watchdog will automatically restart that process. This event is sent out when a process is started.

Table B-157 *General - Controlled Process is started*

Tag	Value
Severity	1
Event Name	ProcessStart
Resource	Sentinel
SubResource	Process
Message	Process <ProgramName> spawned (command <pID>)

B.19.3 Controlled Process is stopped

This event is sent out when a process is stopped. The severity is set to 5 if the process was set to respawn (that is, it is not expected to die). The severity is set to 1 if the process was set to run once.

Table B-158 *General - Controlled Process is stopped*

Tag	Value
Severity	1/5
Event Name	ProcessStop
Resource	Sentinel
SubResource	Process
Message	Process <ProgramName> exited (command <exit_code>)

B.19.4 Importing Auxiliary

Table B-159 *General - Importing Auxiliary*

Tag	Value
Severity	
Event Name	importAuxiliary
Resource	
SubResource	PluginRepositoryService (Medium)
Message	Import auxiliary file <auxiliaryJarName> into plugin <pluginID>.

B.19.5 Importing Plugin

Table B-160 *General - Importing Plugin*

Tag	Value
Severity	
Event Name	importPlugin
Resource	
SubResource	PluginRepositoryService
Message	Import plugin <name> (ID <ID>) of type <type>.

B.19.6 Load Esec Taxonomy To XML

Table B-161 *General - Load Esec Taxonomy To XML*

Tag	Value
Severity	
Event Name	loadEsecTaxonomyToXML
Resource	
SubResource	EsecTaxonomyNodeService
Message	Loading Esecurity taxonomy Info to an xml format:

B.19.7 Process Auto Restart Error

This event is sent out when a process is stopped. The severity is set to 5 if the process was set to respawn (that is, it is not expected to die). The severity is set to 1 if the process was set to run once.

Table B-162 *General - Process Auto Restart Error*

Tag	Value
Severity	1/5
Event Name	ProcessAutoRestartError
Resource	Sentinel
SubResource	Process
Message	Process <{0}> [command: {1}] was automatically restarted more than the allowed {2} automatic restart(s) in {3} min. The process will no longer be automatically restarted. Please check process configuration.

B.19.8 Process Restarts

Table B-163 *General - Process Restarts*

Tag	Value
Severity	
Event Name	ProcessRestart
Resource	Sentinel
SubResource	Process
Message	Process <ProgramName> spawned (command <pID>)

B.19.9 Proxy Client Registration Service (medium)

Table B-164 *General - Proxy Client Registration Service (medium)*

Tag	Value
Severity	
Event Name	registerClient
Resource	
SubResource	ProxyClientRegistrationService (medium)
Message	Registering new client

B.19.10 Restarting Process

Table B-165 *General - Restarting Process*

Tag	Value
Severity	
Event Name	restartProcess
Resource	SentinelHealth
SubResource	SentinelHealthService
Message	Restarting process <name> on Sentinel server <name> UUID {2}

B.19.11 Restarting Processes

Table B-166 *General - Restarting Processes*

Tag	Value
Severity	
Event Name	restartProcesses
Resource	SentinelHealth
SubResource	SentinelHealthService
Message	Restarting <number> processes: <number> name <name> server <name> server ID <ID>;

B.19.12 Starting Process

Table B-167 *General - Starting Process*

Tag	Value
Severity	
Event Name	startProcess
Resource	SentinelHealth
SubResource	SentinelHealthService
Message	Starting process <name> on Sentinel server <name> UUID {2}

B.19.13 Starting Processes

Table B-168 *General - Starting Processes*

Tag	Value
Severity	
Event Name	startProcesses
Resource	SentinelHealth
SubResource	SentinelHealthService
Message	Starting <number> processes: <number> name <name> server <name> server ID <ID>;

B.19.14 Stopping Process

Table B-169 General - Stopping Process

Tag	Value
Severity	
Event Name	stopProcess
Resource	SentinelHealth
SubResource	SentinelHealthService
Message	Stopping process <name> on Sentinel server <name> UUID {2}

B.19.15 Stopping Processes

Table B-170 General - Stopping Processes

Tag	Value
Severity	
Event Name	stopProcesses
Resource	SentinelHealth
SubResource	SentinelHealthService
Message	Stopping <number> processes: <number> name <name> server <name> server ID <ID>;

B.19.16 Store Esec Taxonomy From XML

Table B-171 General - Store Esec Taxonomy From XML

Tag	Value
Severity	
Event Name	storeEsecTaxonomyFromXML
Resource	
SubResource	EsecTaxonomyNodeService
Message	Storing Esecurity taxonomy Info :

B.19.17 Watchdog Process is started

As the Watchdog process starts, the following internal event is generated.

Table B-172 *General - Watchdog Process is started*

Tag	Value
Severity	1
Event Name	ProcessStart
Resource	WatchDog
SubResource	WatchDog
Message	WatchDog Service Starting

B.19.18 Watchdog Process is stopped

When the Watchdog service is stopped, the following internal event is generated.

Table B-173 *General - Watchdog Process is stopped*

Tag	Value
Severity	5
Event Name	ProcessStop
Resource	WatchDog
SubResource	WatchDog
Message	WatchDog Service Ended

